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## **Specification 039**

# **Fuse Pillars**

**DEFENCE ESTATE ORGANISATION (WORKS)  
MINISTRY OF DEFENCE**

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***Prepared by Pell Frishmann Projects Ltd on behalf of Defence Estate Organisation (Works)***

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# Foreword

This publication replaces the Ministry of Public Buildings and Works, Standard Specification (M&E) N° 105 (February 1970) Feeder Pillars and Load Shedding Contactor Pillars.

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# 1 - Introductory Clauses

## 1.1 SCOPE

1.1.1 This specification covers the design, manufacture and testing of fuse pillars used in the distribution of electrical power and suitable for installation within or near buildings or substations.

## 1.2 RELATED DOCUMENTS

1.2.1 This specification shall be read in conjunction with any particular specifications and drawings issued with it.

## 1.3 TERMINOLOGY

1.3.1 The words "as indicated", "where indicated" and "unless otherwise indicated" refer to items or requirements indicated elsewhere in the documents associated with this specification.

1.3.2 Reference in this specification to "schedules" means the schedules related to and associated with this specification.

1.3.3 Reference in this specification to EATS 37/2 means Technical Specification 37/2 Issue 3 published by the Electricity Association.

1.3.4 Reference in this specification to SNE cables means cables having separate neutral and earth conductors.

1.3.5 Reference in this specification to CNE cables means cables in which the functions of the neutral and earth conductors are combined in a single conductor.

## 1.4 STANDARDS

1.4.1 Unless expressly stated otherwise in this specification fuse pillars shall comply with the relevant parts of EATS 37/2 Issue 3. Where pillars

incorporate features not included in EATS 37/2 (such as duplicate busbars, transformer cable earthing, generator connecting facilities and the use of SNE cables), compliance with the intentions of EATS 37/2 is expected.

1.4.2 The equipment and components shall comply with all relevant British Standards and Codes of Practice.

1.4.3 This specification refers to the following British Standards:

BS 381C:

Specification for colours for identification coding and special purposes. 1988.

BS 3938:

Specification for current transformers.

BS EN 10142:

Continuously hot-dip zinc coated low carbon steel sheet and strip for cold forming.

BS EN 60439:

Specification for low-voltage switchgear and controlgear assemblies.

BS EN 60529:

Specification for degrees of protection provided by enclosures (IP code).

BS EN 60947:

Specification for low-voltage switchgear and controlgear.

BS EN ISO 9001:

Quality systems: Model for quality assurance in design, development, production, installation and servicing.

1.4.4 Reference to a Standard means, unless otherwise indicated, the edition or issue current six months prior to the date for return of tenders, or on which an order is issued.

## 1.5 QUALITY ASSURANCE

1.5.1 The manufacturer of the fuse pillar is to have been assessed by an independent authority for compliance with BS EN ISO 9001.



## 2 - General Requirements of the Equipment

### 2.1 SERVICE CONDITIONS

2.1.1 Unless otherwise indicated pillars are to be suitable for:

2.1.1.1 Installation outdoors in normal service conditions in a temperate climate as described in BS EN 60439-1;

2.1.1.2 Operation on a 3 phase, 4 wire, 50 or 60 Hertz alternating current system with earthed neutral and having a phase to phase voltage not exceeding 500 volts rms.

### 2.2 OPERATION AND MAINTENANCE

2.2.1 Pillars will be operated and maintained by competent personnel. They shall be constructed in such a manner that safe systems of work similar to those described in booklet HS(G)85 may be operated. Booklet HS(G)85 is entitled Electricity at Work - Safe Working Practices and is issued by the Health and Safety Executive.

### 2.3 MOUNTING

2.3.1 Pillars are intended to be mounted alongside cable trenches on purpose designed concrete bases. The manufacturer shall provide dimensional drawings showing the disposition of fixing holes in the pillar shell, and the recommended support locations.

### 2.4 PROTECTION AGAINST ELECTRIC SHOCK BY DIRECT CONTACT

2.4.1 When in the normal service condition with access doors open all live parts shall be protected to the level of IP2X of BS EN 60529.

### 2.5 FACILITIES PROVIDED

2.5.1 The incoming and outgoing circuits and other facilities provided within pillars shall be stated in Schedule No 1.

### 2.6 LOAD SHEDDING

2.6.1 Where load shedding facilities are indicated two sets of busbars shall be incorporated, the essential bars to which the incoming supply is connected, and the non-essential bars which are supplied from the essential bars through a contactor. The pillar shall include connecting devices enabling outgoing circuits to be connected to either set of busbars, a triple pole load shedding contactor, a load shedding relay, and associated small wiring and components.

### 2.7 DATA TRANSMISSION EQUIPMENT

2.7.1 Data transmission equipment is not to be mounted within the pillar enclosure; for reasons connected with safety, convenience of maintenance, and operational attention, such equipment is to be mounted in a cubicle having separate lockable access. The cubicle is to form part of, or be attached to, the pillar shell and is to have a similar profile and construction to the pillar shell.

2.7.2 Where the purchaser requires data transmission equipment to be associated with a pillar, the pillar manufacturer shall provide a suitably sized cubicle, attached to the pillar and allowing independent and separate lockable access. Terminals within the cubicle shall be wired back to voltage and current sources within the pillar. The purchaser is to advise which voltage and current sources are required.

2.7.3 The cubicle shall be provided with a removable sheet steel mounting plate, having the dimensions indicated, for use by others. This specification does not cover the provision or installation of the date transmission equipment.

## 2.8 TESTING

2.8.1 The manufacturer of pillars complying with this specification shall provide documentary evidence showing that the basic designs have successfully passed the type tests described in EATS 37/2. For pillars with load shedding facilities, temperature rise tests as described in Clause 13.2.1 of EATS 37/2 shall be undertaken to establish that, with both sets of busbars loaded, temperature rise limits are not exceeded.

2.8.2 Where pillars complying with EATS 37/2 are required, the manufacturer shall provide documentary evidence proving compliance with the type tests described in EATS 37/2.

2.8.3 In the manufacturer's works each pillar shall be subjected to the routine tests described in EATS 37/2.

## 3 - Detailed Requirements of the Equipment

### 3.1 ENCLOSURES

3.1.1 The enclosures of fuse pillars shall be fabricated from sheet steel of not less than 3mm thickness and shall be of indoor or outdoor type as indicated.

3.1.2 Outdoor pillars shall be provided with a watershed top and shall comply with BS EN 60529 degree of protection IP 33. Enclosures shall be protected as described in EATS 37/2, either zinc sprayed inside and out after fabrication or fabricated from hot dipped zinc coated steel with a minimum coating weight of Z275 in accordance with BS EN 10142. In either case the zinc coating shall be followed by a painting process in accordance with EATS 37/2. Where the proposed location is exposed to high levels of dust or sand, or an outdoor overseas location is indicated, the degree of protection shall be IP 43.

3.1.3 Enclosures for indoor type pillars shall comply with BS EN 60529 degree of protection IP 31 and shall be protected by a painting process as described in EATS 37/2 for indoor fuseboards.

3.1.4 For outdoor and indoor pillars the final coat of paint shall be Dark Admiralty Grey, colour 632 of BS 381 C.

3.1.5 Enclosures shall be provided with hinged access doors at the front. Hinges shall allow the doors to open through at least 120° and shall be provided with stays to prevent movement in high winds. The last closing door of a pair, or the single door if there is only one door, shall be secured at the top and bottom by locking bars operated by a central handle. The central handle shall have provision for padlocking by means of a security padlock in accordance with EATS 37/2.

3.1.6 Where a data transmission equipment cubicle is included, its door shall comply with the preceding requirements. It shall be possible to obtain independent access to the main cubicle and to the data transmission equipment cubicle.

3.1.7 The space between the base of the pillar and the bottom of the doors shall be covered by a removable apron plate.

3.1.8 Except for earthing terminals there shall be no fixings such as nuts, bolts or screw heads visible or accessible on the outside of the pillar shell. The intention of this clause is to discourage vandalism.

### 3.2 PADLOCKS

3.2.1 Each lockable door handle shall be provided with a security padlock as described in EATS 37/2. Padlocks shall be constructed of non-corroding material throughout.

### 3.3 BUSBARS

3.3.1 The phase busbars shall have a rated normal current of 1600 or 800 amperes as indicated. The neutral busbar shall be insulated from the pillar shell and shall have a current rating not less than one half of the phase busbar rating unless a higher rating is indicated.

3.3.2 Where load shedding facilities are required an additional set of busbars, for the non-essential load and having a rated normal current not less than that of the load shedding contactor, shall be installed. The incoming supply shall be connected to the essential bars and, through the load shedding contactor, to the non-essential bars.

### 3.4 NEUTRAL AND EARTH CONNECTIONS

3.4.1 Pillars constructed in accordance with this specification are, unless otherwise indicated, intended to be used with cables provided with separate neutral and earth conductors. The requirements for internal neutral and earth connections differ from those described in EATS 37/2 and are described in the clauses which follow.

**3.4.2** There shall be a low voltage earth busbar, having a copper cross section of not less than 150mm<sup>2</sup>, insulated from the pillar shell and provided with:

**3.4.2.1** One 12mm stud terminal with fasteners and locking facilities, and labelled:

**"LOW VOLTAGE NEUTRAL EARTH".**

**3.4.2.2** One clearance hole allowing an addition 12mm terminal to be added if required after installation of the pillar.

**3.4.2.3** Arrangements which ensure that the armour clamping glands of SNE incoming and outgoing cables are connected to the earth bar.

**3.4.2.4** A removable bolted link connecting the earth bar to the neutral bar.

**3.4.2.5** A removable bolted link connecting the earth bar to the pillar shell earthing terminal and labelled. The label should read:

**"WARNING - THIS LINK CONNECTS THE LOW VOLTAGE EARTH BAR TO THE PILLAR SHELL. FOLLOW THE DESIGNER'S INSTRUCTIONS REGARDING REMOVAL OR RETENTION".**

**3.4.3** There shall be a neutral busbar insulated from the pillar shell and provided with:

**3.4.3.1** The removable bolted link required by sub-Clause 3.4.2.5.

**3.4.3.2** A neutral link for each incoming and outgoing circuit.

**3.4.4** The labels required by sub-Clauses 3.4.2.1 and 3.4.2.5 are to be so located that they are clearly visible after cables have been installed.

**3.4.5** When the high voltage test described in EATS 37/2 Clause 13.3.1 is being undertaken, the busbars, low voltage earth bar and the neutral bar shall be bonded together and the test voltage applied between these bars and the pillar shell.

**3.4.6** The pillar shell shall be provided with a 12mm brass stud earthing terminal passing through the shell and provided externally with fasteners and locking facilities, and labelled in weather resistant material:

**"HIGH VOLTAGE STEELWORK EARTH".**

## **3.5 INCOMING UNITS**

**3.5.1** One or two incoming units of the type and rating indicated shall be provided. The alternative types of incoming units are:

**3.5.1.1** Incoming units incorporating three disconnecting devices intended for off-load operation.

**3.5.1.2** Incoming units incorporating a triple pole non-automatic moulded case circuit breaker or switch complying with BS EN 60947 and suitable for infrequent operation and Utilization Category AC22. The circuit breaker or switch shall provide independent manual operation and shall be rated to close on and carry fault currents of 18kA or 35.5kA as described in Section 5 of EATS 37/2.

**3.5.2** Moulded case circuit breakers or switches incorporated in units shall be provided with a facility enabling the devices to be padlocked in the open position for isolation purposes.

**3.5.3** Both types of incoming unit shall incorporate a bolted neutral link rated in accordance with Clause 3.3.1.

**3.5.4** Where indicated incoming units shall incorporate three current transformers, one on each phase conductor.

**3.5.5** Unless otherwise indicated cable cores will be terminated with flat palm lugs suitable for fixing by one M12 bolt or by four M8 bolts. The pillar terminals shall be provided with holes for both types.

**3.5.6** Incoming units shall include facilities for earthing the incoming cable cores, using the device described in Clauses 3.18.1 - 3.18.3.

**3.5.7** Access shall be available on the incoming side of the three phases and the neutral for the use of test probes complying with the recommendations of Guidance Note GS 38 published by the Health and Safety Executive.

**3.5.8** Where two incoming units are required they may be used either to complete a low voltage ring or as alternative supplies. In either case the currents flowing in the units or in the busbars will not exceed the rating.

### 3.6 OUTGOING UNITS

3.6.1 Outgoing units shall be provided as indicated. Each outgoing unit shall incorporate three fuse carriers and a neutral link. Fuses will be provided by others.

3.6.2 The fuse carriers are to be one of the following types as indicated:

3.6.2.1 Fuse links mounted in withdrawable carriers with through grip handles intended to be withdrawn and replaced off-load as a dependent manual operation as described in Clause 3.4 of EATS 37/2.

3.6.2.2 Fuse links mounted in carriers without handles and requiring the use of a portable mechanical device for removal and replacement. The fuse carrier and mechanical device together operate as a switch disconnector with independent manual operation suitable for load breaking and fault making. The design shall prevent the removal or replacement of any fuse carrier without using the mechanical device. The arrangement shall be as described in Appendix A of EATS 37/2.

3.6.3 The mechanical device and fuse carrier described in sub-Clause 3.6.2.2 shall, as an assembly, comply with the requirements of BS EN 60947 Part 3 for Utilisation Category AC22 and Operating Performance Category B. The mechanical device shall also have been tested for 5000 operations.

3.6.4 Outgoing units shall incorporate a bolted neutral link having a current rating not less than one half of the unit rating unless a higher rating is indicated.

3.6.5 Where indicated outgoing units shall incorporate three current transformers, one on each phase conductor.

3.6.6 Where load shedding facilities are required each outgoing unit shall incorporate three single phase connecting devices allowing each phase of the outgoing unit to be connected to the appropriate phase of either the essential busbars or the non-essential busbars. The changeover operation is intended to be undertaken on line but off-load. The degree of protection IP2X shall be maintained with the selecting device in either position. Whilst the selecting device is being moved or operated the degree of protection may be relaxed, but safe operation shall be easily achieved by a competent person.

3.6.7 With the pillar in a normal operating condition accidental access to the changeover devices shall be prevented by a transparent cover.

3.6.8 There shall be labelling on the device or on the unit which clearly establishes whether connection is to the essential or non-essential busbars.

3.6.9 Where the pillar incorporates outgoing ways which are "spare" or are to be cabled at some indeterminate future date, the supply side contacts of the units shall be protected as required by Clause 2.4.1. Unless the design inherently provides this protection, it shall be provided by the insertion of fuse carriers with insulating bridges.

3.6.10 Outgoing units shall include facilities for earthing the outgoing cable cores, using the device described in Clauses 3.19.1 - 3.19.3.

3.6.11 Access shall be available on the three phases and the neutral for the use of test probes complying with the recommendations of Guidance Note GS 38 published by the Health and Safety Executive. It shall be possible to make contact with the top and bottom fuse link contacts when the fuse carrier is in position in the unit.

### 3.7 EMERGENCY MOBILE GENERATOR CONNECTION UNITS

3.7.1 Facilities for connecting a temporary supply from an emergency manually controlled mobile generator shall be included in pillars where this is so indicated. The rating of the temporary supply shall be as indicated.

3.7.2 Generator connection units shall incorporate three isolating links mounted in carriers similar to those provided for the outgoing units, and as described in Clause 3.6.2.1 or 3.6.2.2.

3.7.3 Generator connection units shall incorporate a bolted neutral link having a current rating not less than one half of the unit rating unless a higher rating is indicated.

3.7.4 Where the pillar incorporates duplicate busbars the generator connection unit shall incorporate three single phase connecting devices allowing the generator to be connected to either set of busbars. The devices shall be as described in Clause 3.6.6.

3.7.5 The generator cables may be assumed to be four single cores of flexible construction which will approach the pillar at ground level. The cores will be terminated with cable lugs. A section of the apron plate shall be hinged or removable to provide sufficient space to allow the cables to enter and rise to the unit terminals.

3.7.6 To allow the exposed conductive parts of the generator to be connected to the low voltage earth bar, the bar shall be provided with a conveniently placed clearance hole allowing the installation of a M12 terminal.

3.7.7 It shall be possible to safely connect and disconnect the generator cables whilst the pillar is energised and in use.

3.7.8 A permanent warning label, as described in Clause 3.7.9 or 3.7.10, shall be fixed to the inside of the pillar door giving access to the generator connection unit.

3.7.9 For pillars without load shedding facilities the label shall read:

**WARNING - ENSURE THAT NORMAL INCOMING CABLE IS ISOLATED BEFORE SUPPLYING FROM A GENERATOR.**

3.7.10 For pillars with load shedding facilities the label shall read:

**WARNING - IF SUPPLYING ESSENTIAL BUSBARS ENSURE THAT NORMAL INCOMING CABLE IS ISOLATED BEFORE SUPPLYING FROM A GENERATOR.**

**WARNING - IF SUPPLYING NON-ESSENTIAL BUSBARS REMOVE THE CONTACTOR CONTROL COIL FUSE AND ENSURE THAT THE CONTACTOR CONTROL SWITCH IS TURNED OFF.**

### 3.8 OPERATING DEVICES

3.8.1 Within each pillar there shall be the provision for the convenient storage of any mechanical operating devices.

### 3.9 CABLE TERMINATIONS

3.9.1 Unless CNE cables are indicated, cables will be SNE type and the following shall apply:

3.9.1.1 A removable gland plate shall be provided for each incoming and outgoing unit at a little above ground level.

3.9.1.2 Gland plates shall be insulated from the pillar shell and connected to the low voltage earth bar.

3.9.1.3 Gland plates for single core cables shall be of non-magnetic metallic material but excluding aluminium and its alloys.

3.9.2 Where CNE cables are indicated a removable insulating clamp shall be provided for each incoming and outgoing cable.

3.9.3 Gland plates and clamps shall be marked with the centre or centres of the intended positions of glands or cables, holes will be cut on site by others. Unless gland plates and clamps are interchangeable they shall be marked to indicate their intended position within the pillar shell. Glands will be provided by others.

3.9.4 A gland plate in accordance with Clause 9.1 shall be provided for any auxiliary cables that are required for load shedding or data transmission purposes.

3.9.5 Spaces between the gland plates or clamps and the pillar shell shall be covered to provide a degree of protection IP2X against the entry of rodents.

3.9.6 It may be assumed that cables will be buried to a sufficient depth, having consideration for the minimum bending radius, to enable them to rise vertically at ground level.

### 3.10 LOAD SHEDDING CONTACTORS AND RELAYS

3.10.1 Load shedding contactors shall have a current rating as indicated and shall comply with the requirements of BS EN 60947 Part 4 for Utilisation Category AC2 and Uninterrupted duty.

3.10.2 Contactors shall be electrically held closed and the control circuit shall include a hand/off/auto switch and a control circuit fuse. In the automatic mode of operation the contactor coil shall be energised through the contacts of a load shedding relay. The switch and control circuit fuse shall be mounted on the instrument panel.

3.10.3 Terminals of contactors may be connected to supplies which are not synchronised. Contactors shall therefore withstand continuously, when in the open position, a voltage across each phase equal to twice the nominal phase voltage. Under these conditions the user's operating procedures will ensure that the contactor will not operate.

3.10.4 The load shedding contactor may be regarded as a fault free zone, and is protected only by the transformer protection.

3.10.5 Load shedding relays shall be suitable for operation from a remote dc supply between 44 and 56 volts. Relays shall operate satisfactorily from a 44 volt supply when connected in series with a 12,500 ohm resistor. (This is equivalent to 21 relays connected to the end of a line having a loop resistance of 600 ohms).

3.10.6 Small wiring and voltage suppression diodes shall be included as necessary.

### 3.11 CURRENT TRANSFORMERS

3.11.1 Current transformers shall comply with BS 3938 and have a ratio as indicated. Unless otherwise indicated they shall be of the bar primary type with a rated output of 5VA, and a Class 5 accuracy suitable for use with a maximum demand indicator.

### 3.12 INTERNAL HEATERS

3.12.1 Outdoor pillars shall include internal anti-condensation metalclad heaters as necessary within each cubicle, including any data transmitting equipment cubicle. Heaters shall be mounted at low level and shall be supplied through a single switch from an auxiliary fuse connected to a convenient phase. The heater switch and fuse shall be mounted on the instrument panel.

### 3.13 INTERNAL LAMPS

3.13.1 An internal lamp, protected by a robust glass or plastic cover and suitable for accepting an 18W Low Energy bayonet cap lamp, shall be mounted near the top of the pillar. The lamp shall be supplied through a switch from an auxiliary fuse connected to a convenient phase. The switch and the fuse shall be mounted on the instrument panel.

### 3.14 INSTRUMENT PANELS

3.14.1 Pillars shall incorporate an instrument panel on which is to be mounted:

- Auxiliary supply fuses for the heater and lamp.
- On/off switches for the heater and the lamp.

- Where appropriate, a hand/off/auto switch for the load shedding contactor.
- Any instrumentation that is required.
- Where appropriate, auxiliary supply fuses for instrumentation, load shedding contactor, and data transmission equipment.

3.14.2 The 13A switched socket outlet required by EATS 37/2 **is not to be installed** in pillars complying with this specification, nor is any other type of electrical power socket outlet to be installed.

### 3.15 EXTERNAL NAMEPLATES

3.15.1 A permanent weather resistant nameplate detailing the following information shall be affixed to each pillar:

Manufacturer's serial number, which shall be unique.

Year of manufacture.

Nominal current rating of busbars (ratings of essential and non-essential busbars for pillars with load shedding facilities).

Nominal current rating of load shedding contactor if installed.

Reference to this specification.

Gross weight when fully equipped.

Manufacturer's name and reference number.

3.15.2 Where indicated, any other reference number shall also be displayed.

### 3.16 WARNING SIGNS

3.16.1 A permanent weather resistant safety sign as described in Schedule 1 of the Electricity Supply Regulations shall be affixed to the outside of the first opening door of each pillar. The overall dimensions of the sign shall be not less than 150 x 200mm.

### 3.17 LOCKING-OFF DEVICES FOR INCOMING AND OUTGOING UNITS

3.17.1 Portable locking-off devices preventing access to the units and capable of being padlocked in position shall be available. When installed the devices shall afford protection to the level of IP2X of BS EN 60529.

3.17.2 For incoming units incorporating disconnecters - it shall not be possible to fit the locking-off devices unless all three disconnectors are open.

3.17.3 Moulded case circuit breakers or switches incorporated in units shall include locking facilities as required by Clause 3.5.2.

3.17.4 For outgoing types two types of device are required, a three phase type which locks off access to three phases, and a single phase type which locks off access to one phase only. With one phase locked off, the other two phases are to be accessible for withdrawal, replacement or switching of fuse carriers.

3.17.5 For the three phase type it shall not be possible to fit the locking-off device unless all three fuse carriers are withdrawn, and for the single phase type it shall not be possible to fit the device unless the appropriate fuse carrier is withdrawn.

### 3.18 INCOMING CIRCUIT EARTHING DEVICES

3.18.1 Portable earthing devices for the earthing of the incoming cable cores shall be available.

3.18.2 The device shall consist of a conducting link or bar which may be fitted to conducting links provided for the purpose within the pillar and which are connected to the four incoming cable cores. A flexible cable, with provision for connection to the low voltage earth bar, shall be attached to the conducting link or bar.

3.18.3 The star point copperwork shall, for 1600 ampere rated units, have a cross section not less than 225mm<sup>2</sup> and for 800 ampere rated units, not less than 150mm<sup>2</sup>. The flexible cable between the star point and the earth bar shall have a cross section not less than 70mm<sup>2</sup>.

3.18.4 Earthing of the incoming cable cores shall not prevent the busbars from being supplied with power from an emergency generator or by other temporary means.

### 3.19 OUTGOING CIRCUIT EARTHING DEVICES

3.19.1 Portable earthing devices for the earthing of outgoing cable cores and capable of being padlocked in position shall be available. When installed the devices shall afford protection of live parts to the level of IP2X of BS EN 60529.

3.19.2 The device shall consist of a conducting link or bar with suitable connectors attached and a flexible cable with provision for connection to the low voltage earth busbar.

3.19.3 With all three fuse carriers withdrawn it shall be possible to insert the connectors into the cable side contacts of the unit and thereafter lock the device in position. It shall not be possible to insert the connectors into the busbar sockets.



# Schedule No 1

Information to be supplied to the Tenderer:

Clause	Item	Requirement
		Delete as necessary. Provide the required information or state where it can be found.
	Client's Contract Number for drawings and documentation.	
	Fuse pillar designation(s) or name(s).	
	Electrical power supply.	Nominal Volts. Hertz.
	If details of the electrical requirements appear on a drawing or schedule: State number or None available.	
	Phase busbar rating.	See information entered for Clause 3.3.1.
	Number of outgoing units.	See information entered for Clause 3.6.1.
1.2.1	Related specifications and drawings.	
1.4.1	Standards: If not EATS 37/2 name other specification.	As EATS 37/2.
1.4.4	Standards: If not as Clause 1.4.4. describe alternative.	As Clause 1.4.4.
2.1.1.1	Service Conditions (location): If not as Clause 2.1.1.1 describe alternative.	As Clause 2.1.1.1.
2.1.1.2	Service Conditions (supply details).	See top of this Schedule.
2.3.1	Drawings - number of prints to be supplied.	
2.6.1	Is load shedding required?	Yes/No.
2.7.2	Is space of data transmission equipment required: If Yes state: Where the details of the electrical requirements (supply, current signals and voltage signals) to be found?	Yes/No.
2.7.3	Dimensions of the mounting plate. Projection of the equipment from the mounting plate.	
3.1.1	Type of enclosure.	See information entered for Clause 2.1.1.1.
3.1.2	Is the location exposed to high levels of dust or sand, or an outdoor overseas location?	Yes/No.

Clause	Item	Requirement
3.3.1	Busbar rating. Are neutral bars to be rated at one half of the phase bar rating? If No state higher rating required.	1600/800 Ampere  Yes/No.
3.3.2	Non-essential busbar rating (for pillars with load shedding facilities).	See information entered for Clause 3.10.1.
3.4.1	Are incoming and outgoing cables of SNE type? If No state type: Incoming Outgoing	Yes/No.
3.5.1	Number of incoming units  Type of incoming units  Rating of incoming units	One/Two  As Clause 3.5.1.1. As Clause 3.5.1.2  1600/800 Amperes.
3.5.4	Are current transformers required on the incoming unit(s):  If required state:  Ratio Purpose KVA Class	Yes/No    1600/5, 1200/5, 800/5, 400/5.
3.5.5	Are standard cable connecting devices to be used?  If No state type to be used.	Yes/No.
3.6.1	Number and ratings of outgoing units. (The maximum ratings available are 630, 700 or 800 Amperes depending upon the manufacturer).  Are fuse carriers with insulating bridges required with any of these ways? (See Clause 3.6.9).	
3.6.2	Type of fuse carriers.	As Clause 3.6.2.1. As Clause 3.6.2.2.
3.6.4	Are neutral links to be rated at one half of the unit rating?  If No state higher rating required.	Yes/No.  Amperes.
3.6.5	Are current transformers required on any outgoing units?  If required state on which units, and:  Ratio Purpose KVA Class	Yes/No.    800/5, 400/5.

Clause	Item	Requirement
3.7.1	Is an emergency generator connection unit required?  If Yes state rating required. (The maximum ratings available are 630, 700 or 800 Amperes depending upon the manufacturer).  Is neutral link to be rated at one half of the unit rating?  If No state higher rating required.	Yes/No.  Amperes.  Yes/No.  Amperes.
3.9.1 and 3.9.2	Type of cables.	See information entered for Clause 3.4.1.
3.10.1	If load shedding facilities are required (see information entered for Clause 2.6.1) state the contactor rating.	1000/800/630/400/250/160 Amperes.
3.11.1	Are current transformers required in incoming and outgoing units?	See information entered for Clauses 3.5.4 and 3.6.5.
3.14.1	Is any instrumentation required?  If Yes state details.	Yes/No.
3.15.2	Is any other information to be displayed on the nameplate?  If Yes state details.	Yes/No.
Indicate below any Portable Safety Devices required:		
3.17.1	Locking-off devices for incoming units.	
3.17.4	Locking-off devices for outgoing units:  Three phase devices.  Single phase devices.	
3.18.1	Earthing devices for incoming cable cores.	
3.19.1	Earthing devices for outgoing cable cores. If the pillar has outgoing ways of different ratings, state ratings required.	

## Schedule No 2

Information to be supplied by the Tenderer:

Item	Details	
Fuse Pillar Designation(s)		
Tenderer's Name		
1. Is the enclosure fabricated from zinc coated steel or zinc sprayed after fabrication?		
2. For how long have similar pillars been in successful commercial service?		
3. Main Components:  Load shedding contactor  Load shedding relay  Moulded case circuit breaker  Maximum demand indicator	Manufacturer and Type	Country of Origin
4. Fuses:  State the lengths of the fuse links (82mm or 92mm) which the fuse carriers accept.		
5. Drawings and other information enclosed with tender.		

Item	Details
6. Any other relevant information:	

Signed (as in tender) .....

for and on behalf of .....  
.....

Date .....