



Technical Standard - TS108

Technical Standard for Indoor Equipment Room

Published: March 2026

Revision Notice:

Date	Details	Author	Authorised
July 2018	<ul style="list-style-type: none"> Updated all Sections 	A Pradhan	J Ali
21 November 2024	<ul style="list-style-type: none"> Complete rewriting and restructure of the document. Previous Section: 'Land Tenure' moved into TS102. Previous Section: 'Authority to proceed energisation works' - Removed. 	A Pradhan	A Walsh
March 2026	<ul style="list-style-type: none"> Update fire ratings throughout the document Ventilation section added Updated requirements for access to equipment rooms Updated earthing requirements Included pressure relief requirements 	R Sykes	A Walsh

SA Power Networks:

SA Power Networks, ABN 13 332 330 749, a partnership of:

Spark Infrastructure SA (No. 1) Pty Ltd, ABN 54 091 142 380
 Spark Infrastructure SA (No. 2) Pty Ltd, ABN 19 091 143 038
 Spark Infrastructure SA (No. 3) Pty Ltd, ABN 50 091 142 362
 each incorporated in Australia.

CKI Utilities Development Limited, ABN 65 090 718 880
 PAI Utilities Development Limited, ABN 82 090 718 951
 each incorporated in The Bahamas

1 Anzac Highway, Keswick, South Australia, 5035.

SA Power Networks' Disclaimer:

- Unless otherwise agreed in writing between SA Power Networks and a specific person or entity, SA Power Networks makes no representation that this standard is appropriate for any other purpose and, to the extent permitted by law, has no liability to a person who (without SA Power Networks written consent) purports to use the standard for any purpose(s) other than the purpose described in this standard.. SA Power Networks has made no assessment of any nature whether this standard is appropriate for use in any other circumstance than that noted in paragraph 1.
- Nothing in paragraph 1 waives or licences any copyright SA Power Networks has in this document.
- This standard is subject to change from time to time.

SA Power Networks' Copyright© 2026:

This publication is copyright protected.

SA Power Networks reserves to itself all rights in such material. You shall not reproduce any content by any process without first obtaining the SA Power Networks permission, except as permitted under the Copyright Act 1968.

All rights reserved.

Contents

Figures	4
1. Introduction	5
2. Definitions and abbreviations	5
2.1 Definitions	5
2.2 Abbreviations	7
2.3 Terminology	7
3. Relevant rules, regulations, standards and codes	8
3.1 Standards and codes	8
3.2 Legislation and regulations	9
4. General	10
5. Site location	10
6. Easement	10
7. Room sizes and layouts	10
7.1 Main doors	11
7.2 Emergency exit door	12
7.3 Hatchway type entrance	12
8. Building structure	13
8.1 Foundation	13
8.2 Floor	13
8.3 Vault	13
8.4 Walls and ceilings	14
8.5 Hauling eyes	14
9. Ventilation	14
9.1 Natural Ventilation	15
9.2 Forced Ventilation	15
10. Fire protection.....	15
10.1 Fire detection and alarm setting	15
10.2 Firefighting system	15
10.3 Fire ratings.....	16
10.4 Protection of adjacent buildings	16
11. Pressure relief	16
12. Access requirements	16
12.1 Access route doors/gates lock	17
12.2 Carriageway area.....	17
12.3 Basement/under loading dock access	17
12.3.1 Loading dock access	17
12.3.2 Gatic/hatchway access	17
12.4 Crane operating area.....	18

12.4.1	Pick-and-carry crane operating area requirements.....	18
12.4.2	Equipment handling area for skating system.....	19
12.5	Stairway and passageway areas.....	20
13.	Room requirements	20
13.1	Noise	20
13.2	Water drainage system	20
13.2.1	Site drainage - outside equipment room.....	20
13.2.2	Area drainage - inside equipment room.....	20
13.2.3	Water tightness	20
13.3	Lighting and power requirements.....	21
13.3.1	Temporary (during construction stage)	21
13.3.2	Permanent	21
13.4	Avoidance of services and encroachments.....	21
14.	Installation works (conduits and cabling system)	21
14.1	Conduits system	21
14.1.1	Incoming HV supply route	21
14.1.2	Conduits system (underground)	22
14.1.3	Conduits through building structure	22
14.2	Cable support system.....	22
14.3	Earthing requirements	23
14.3.1	Earth bars.....	23
14.3.1.1	<i>Building MEN earth bars</i>	<i>23</i>
14.3.1.2	<i>SA Power Networks vault earth bars</i>	<i>23</i>
14.3.2	Earth stakes.....	23
14.3.3	Earthing requirements for non-ground-level equipment rooms.....	23
14.3.4	Identification tags	24
15.	Who should you talk to?	24
	Appendices.....	25
A.	Fire Resistance Level (FRL).....	25
B.	Equipment room layouts	26
B.1	Padmount transformer within building layout	26
B.2	Distribution equipment within building layout.....	27
B.3	Padmount transformer with street frontage layout	28
B.4	Distribution equipment with street frontage layout.....	29
B.5	Distribution equipment within a basement/under loading docks layout.....	30
B.6	HV switching cubicle within building layout	31
B.7	Padmount transformer under a roof with two walls	32
C.	External fire risk zone	33
D.	Generic earthing example	34

Figures

Figure 1: Example of doorframe and door leaf information	11
Figure 2 Security plate on internal handle	12
Figure 3: Example of a hauling eye.....	14
Figure 4 Crane operating area requirements.....	18
Figure 5 Equipment handling area	19
Figure 6: Warning signage (SA Power Networks' stock item no. KS 1167)	22
Figure 7: LV cable signage (SA Power Networks' stock item no. KS 1020).....	22
Figure 8 Multiple earth connection.....	23
Figure 9 Earth connection in an earth stake pit	24
Figure 10 Earth connection signage (SA Power Networks' stock item no. KS1050)	24
Figure 11: Padmount transformer within building layout.....	26
Figure 12: Distribution equipment within building layout	27
Figure 13: Padmount transformer with street frontage layout	28
Figure 14 Distribution equipment with street frontage layout.....	29
Figure 15: Distribution equipment under loading docks layout.....	30
Figure 16: HV switching cubicle within building layout.....	31
Figure 17 Padmount transformer under roof with two walls	32
Figure 18 Fire risk zone for external facing doors	33
Figure 19 Generic earthing example	34

WARNING: printed copies of this document ARE DEEMED UNCONTROLLED. The most up-to-date version is located on SAPN Intranet/Internet.

1. Introduction

This document specifies the minimum design and construction requirements for equipment rooms accommodating equipment that forms part of the SA Power Networks distribution network.

The specifications in this document are applicable to all parties engaged in activities associated with the design and construction of equipment rooms containing SA Power Networks equipment.

The trenching and installation works for underground conduits shall be in accordance with [TS085](#) and [TS100](#) requirements.

2. Definitions and abbreviations

2.1 Definitions

Contractor	A contractor who is a suitably accredited installer (full or provisional) engaged by the customer and has satisfied the SA Power Networks terms and conditions (i.e. Construction Terms (Non-Contestable & Contestable) 3302) to undertake the civil and electrical installation works.
Connection point	For this document, connection point also has the same meaning as ‘point of supply’ as defined in AS/NZS 3000.
Customer	The customer as set out in the project specific ‘connection offer’ letter.
Customer’s agent	A contractor and/or a designer engaged by the customer.
Designer	A person who is a suitably accredited designer (full or provisional) engaged by the customer and has satisfied the SA Power Networks terms and conditions (i.e. Construction Terms (Non-Contestable & Contestable) 3302) to undertake the design works.
Distribution equipment	Includes padmount transformer, switching cubicle, earth busbars, earth rods, earth pit, associated cables, and accessories.
Distribution network	The assets (e.g. poles, wires, underground cables, transformers, substations) operated by SA Power Networks, which transports electricity to and from a customer’s connection point.
Indoor equipment room	A room within a building/structure or a free-standing building/structure which has a roof enclosed within a minimum of two (2) walls and houses padmount distribution transformer and/or switchgear including accessories. Note: This type of transformer enclosure does not apply to residential development where domestic style fencing encloses the transformer.
Easement	The right to enter private property, to erect, or lay and maintain the SA Power Networks infrastructure subject to any condition stated in the easement document.
Emergency exit door	An emergency exit door specially designed to help people move out of the building during emergencies, such as fire, earthquake, hazardous material spills and floods.
Fire dampers	Fire dampers are activated either by a thermal element which melts at temperatures indicative of a fire, or by an electric signal from a remote fire alarm system.
Fire rating	The fire rating relates to the fire resistance periods for structural adequacy, integrity, and insulation. Also known as ‘FRL = Structural adequacy/Integrity/Insulation in that order.
High voltage (HV)	Voltage exceeding low voltage.

Definitions Continued:

Low voltage (LV)	Voltage exceeding 50 Vac or 120 Vdc ripple free and not exceeding 1,000 Vac or 1,500 Vdc.
National Construction Code (NCC)	The 'National Construction Code' specifies the technical requirements for the design, construction, and performance of buildings, plumbing and drainage systems. The NCC is made up of the Building Code of Australia (BCA) and the Plumbing Code of Australia (PCA).
Owner/Landowner	The owner/landowner is the person or an entity that is the registered proprietor/owner of the land, as recorded at the Land Titles Office. All easement agreements shall be with the owner/landowner.
Padmount Transformer	A padmount transformer which forms a part of the distribution network, typically with a secondary voltage of less than 1,000 Vac.
Property	<p>Either what is commonly described as a Torrens Title allotment, a Community Title Scheme or Land which is owned by the crown on which the owner/occupier has the right to the installation of the electricity supply.</p> <p>A property may include:</p> <ul style="list-style-type: none"> • a single parcel of freehold, leasehold and/or public land, and/or land held under lease or license on which the customer or controlling body has the right to install their electrical installation; • any combination of contiguous land to which the customer or controlling body has the right to install their electrical installation; and • contiguous land and/or individual titles to which a corporate body, customer and/or controlling body has the right to install their electrical installation.
Public land	Land owned by the crown or an instrumentality or agent of the crown or by a council or other local government body, including any such land that is subject to native title.
The SA Power Network Project Manager	The SA Power Networks Network Project Manager, Network Project Officer, Network Service Officer, Customer Service Officer, Strategic Project Manager, or any Officer/Supervisor who is responsible for the management of a project.
Works agreement	The agreement as per the SA Power Networks construction terms booklet, i.e. Construction Terms (Non-Contestable & Contestable) 3302 .
Works	For the purposes of this document, "Works" refers to any activities associated with the design or construction requirements specified in this Standard. This definition is distinct from the term "Works" as defined in the Construction Terms (Non-Contestable & Contestable) 3302 .

2.2 Abbreviations

AS/NZS	A jointly developed Australian and New Zealand Standard
AS	Australian Standard
CMEN	Common Multiple Earthed Neutral Systems
DIT	The Department of Infrastructure and Transport
EPA	Environment Protection Authority
HV	High Voltage
LTO or LTRO	Lands Titles Office or Lands Titles Registration Office
LV	Low Voltage
MEN	Multiple Earthed Neutral Systems
NAP	Network Access Permit
NCC	National Construction Code
NICC	The SA Power Networks Network Information for Contractors and Customers
OTR	The Office of Technical Regulator
RMU	Ring Main Unit
T/F	Padmount Transformer
TS	The SA Power Networks Technical Standard

2.3 Terminology

Shall	Indicates a mandatory requirement.
May or Should	Indicates a recommendation that will not be mandatory but can be imposed as deemed appropriate by SA Power Networks.

3. Relevant rules, regulations, standards and codes

3.1 Standards and codes

The following listed documents are for additional information and other documentation may be required on a project specific basis.

Please Note: It is the responsibility of the customer/customer's agent to ensure you have complied with all applicable, SA Legislative Regulations (under Acts), ESCOSA/ENA/AEMC/IEC documentations, relevant AS/NZS standards, the SA Power Networks publications, and you have ensured their current publications, before implementing them.

Australian Standards publications

AS 1319	1994	Safety signs for the occupational environment
AS 1530.7	2007	Methods for fire tests on building materials, components, and structures. Part 7: Smoke control assemblies - Ambient and medium temperature leakage test procedure
AS 1668.1	2015	The use of ventilation and airconditioning in building – Fire and smoke control in buildings
AS 1668.2	2024	The use of ventilation and airconditioning in buildings – Mechanical ventilation in buildings
AS 1668.4	2024	The use of ventilation and airconditioning in buildings – Natural ventilation of buildings
AS 1670.1	2024	Fire detection, warning, control and intercom systems – System design, installation and commissioning
AS 1905.1	2016	Components for the protection of openings in fire-resistant walls. Part 1: Fire-resistance doorsets
AS 2067	2016	Substations and high voltage installations exceeding 1 kVac
AS 2444	2001	Portable fire extinguishers and fire blankets – Selection and location
AS/NZS 3000	2018	Electrical installations (known as the wiring rules)
AS/NZS 3100	2022	Approval and test specification - General requirements for electrical equipment
AS 3600	2021	Concrete structures
AS 3700	2018	Masonry structures
AS 3798	2007	Guidelines on earthworks for commercial and residential developments
AS 4100	2020	Steel structures
AS 4254.1	2021	Ductwork for air-handling systems in buildings – Flexible duct
AS 4254.2	2012	Ductwork for air-handling systems in buildings – Rigid duct
AS 5577	2013	Electricity network safety management systems
AS 60038	2022	Standard voltages
AS 60068.1	2023	Environmental testing - General and guidance

National Construction Code (NCC) publications

Complete Series	2022	National Construction Code
-----------------	------	----------------------------

Energy Networks Association (ENA) publications

ENA Doc 018	2015	Guideline for the fire protection of electricity substations
-------------	------	--

CIGRE publications

Doc 537		Guide for transformer fire safety practices
---------	--	---

The SA Power Networks publications

Manuals	
Manual 14	Safety, reliability, maintenance and technical management plan
Manual 32	Service and Installation Rules
Network Information for Customers and Contractors	
NICC401	Information on network design and installation by an external contractor
NICC404	Working in the vicinity of the SA Power Networks Infrastructure - Network access permit process
NICC802	Padmount transformers - General information
Technical Standards	
TS085	Trenching and installation of underground conduits and cables (up to and including 33 kV)
TS099	Distribution and sub-transmission CAD drafting standards
TS100	Electrical design standards for underground distribution networks (up to and including 33 kV)
TS102	Easement standard for distribution networks (up to and including 33kV)
TS105	Testing standard for underground and overhead distribution powerlines up to and including 33 kV Networks
TS105A (Forms)	Standard forms for SA Power Networks underground & overhead electricity distribution and sub-transmission cable networks
TS109	Earthing of the distribution network

3.2 Legislation and regulations

This section provides a list of the relevant legislation and regulations which shall apply to the design, manufacture, installation, testing and commissioning, and operations and maintenance of all plant and equipment for the distribution network.

In an event where there is any inconsistency between legislation and regulations and these technical requirements, the legislation and regulations shall prevail.

- Electricity Act 1996 and Electricity (General) Regulations 2012
- Work Health & Safety Act 2012 and Work Health & Safety Regulations 2012
- Environment Protection Act 1993 and Environment Protection Regulations 2023
- Electricity Corporations (Restructuring and Disposal) Act 1999 and Electricity Corporations (Restructuring and Disposal) Regulations 2014

4. General

The indoor equipment room shall be designed and constructed to the industry best practice and shall comply with Electricity (General) Regulations 2012, National Construction Code (NCC), relevant Australian Standards, project specifications, this document, and other statutory authorities' requirements.

The indoor equipment room should be designed to accommodate a larger transformer than currently required, allowing for future upgrades in response to an increase in load requirements. On receipt of preliminary drawings of the indoor equipment room, the SA Power Networks Project Manager will provide additional assistance to the associated parties regarding the building details, location, and access requirements.

5. Site location

The SA Power Networks preference is for the distribution equipment to be located at street level with 24 hours/7 days per week, unrestricted access from the street. When this is not practicable, the indoor equipment is permitted to be installed in a room of the building.

The selection of a suitable site involves a range of considerations, which will vary depending on the specific installation. Where an indoor equipment room is located within a building, the following requirements must be considered:

- provision for SA Power Networks to replace major plant (e.g. padmount transformer and switching cubicle) under emergency conditions;
- minimising the impact (such as noise levels, load bearings, obstructions) on the areas adjacent to, above, and below the equipment room;
- avoidance of the surrounding hazardous environment and encroachments;
- provision of ventilation and room cooling facilities; and
- the equipment installation methods.

Subject to the written approval of the SA Power Networks Project Manager, the indoor equipment room may be located at the building's basement level, provided it complies with all requirements of this document.

6. Easement

Refer to [TS102](#) for the customer/customer's agent responsibility for registering the required easements for indoor equipment rooms. This includes rights of access for the SA Power Networks personnel, equipment, related services, and vehicles, where necessary.

7. Room sizes and layouts

The indoor equipment room size will be dependent on the type and size of the padmount transformer and/or switching cubicle selected. A minimum clearance of 1,000 mm shall be maintained between the equipment and the equipment room walls. Confirmation of the distribution equipment selected should be sought from the SA Power Networks Project Manager prior to designing the indoor equipment room.

A minimum separation of 1,065 mm shall be provided between the equipment room wall and the HV door side of the padmount transformer. In addition, a minimum clearance of 600 mm shall be maintained between the fully open transformer doors and the surrounding walls.

For installations requiring multiple units (e.g. switching cubicle and/or additional padmount transformer), a minimum of 1,000 mm clearance shall be maintained between each unit.

The mains switch board (MSB), and metering equipment shall not be installed within the equipment room, whereas the fire damper trip wires (when necessary) are permitted.

The typical separations between the indoor equipment room walls and the distribution equipment are shown in Appendix B.

For a padmount transformer’s technical data, including size, refer to [NICCC802](#) and [TS100](#). For a switching cubicle’s technical data, including size, refer to [TS100](#).

7.1 Main doors

The following are the minimum requirements for the equipment room main doors:

- (1) The fire rating of the main doors shall be three (3) hours (i.e. FRL -/180/30) and shall comply with AS 1905.1 when the main doors open to any part of the building.
The fire rating of the main doors may be reduced to two (2) hours if the main door has a minimum separation of 1.2m from any part of the transformer in accordance with the Electricity (General) Regulations.
- (2) SA Power Networks requires that each of the two main doors measures 2.0 m in width and 4.0 m in height. However, the implementation of "split-style" main doors is permissible, given they meet the following requirements:
 - (a) The main doors shall be interconnected to enable folding, which will result in a combined opening width of 4.0 m. Additionally, these doors shall be fitted with locking mechanisms.
 - (b) When these doors are folded and opened outward, they shall safely extend to 180 degrees. They shall be lockable, and their placement shall not impede pedestrian walkways or vehicular traffic.
 - (c) Furthermore, it is essential to maintain unrestricted and unobstructed access to the main doors at all times. The area in front of these doors shall not be designated for storage, car parking, or as a standing zone, and shall always be kept clear.
- (3) The main doors shall be weatherproof, and in the case of mild steel construction, two (2) coats of exterior gloss paint shall be applied.
- (4) No air space larger than 15 mm is allowed between frame and wall, door and frame, and door to door.
- (5) Any opening adjacent to any door lock shall be fitted with a suitable barrier to prevent unauthorised opening of the door lock.
- (6) It is the responsibility of the customer or customer’s agent to supply and install danger HV electrical equipment signage (SA Power Networks’ stock item no. KS 1167).
- (7) All main doors and frames shall be with approved underwriters label as shown in Figure 1 and in accordance with AS 1905.1.

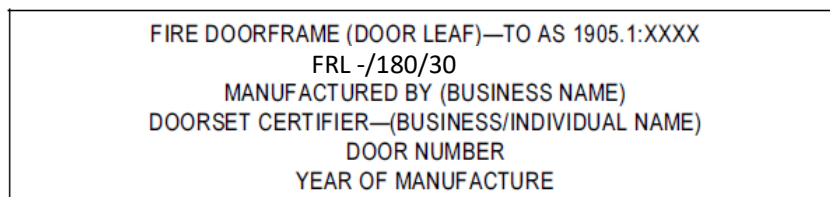


Figure 1: Example of doorframe and door leaf information

- (8) For main doors that are external facing, it is recommended that brush seals be installed at the base of the main doors to prevent debris entering the equipment room.
- (9) The safety signage shall be installed in accordance with AS 1319, the NCC and the Work Health and Safety regulatory requirements. There may be additional requirements for safety signage, which will be project specific.

- (10) All main doors shall have the following attachments:
- self-latching;
 - latching mechanism to be operated at ground level;
 - hinges fitted with stainless steel pins; and
 - handles which are to be installed on both the interior and exterior sides of the main doors. The exterior handles shall be securely fixed, while the interior handles shall permit free movement to facilitate emergency exit access for the personnel. A security plate, latch, or a similar mechanism shall be installed to safeguard the handles on the interior side from unauthorised access. An example of a security plate is shown in Figure 2.



Figure 2 Security plate on internal handle

7.2 Emergency exit door

Each equipment room shall be provided with a minimum of one (1) emergency exit door, which can provide an escape in the event of an emergency.

The fire ratings of the emergency exit door shall be three (3) hours (i.e. FRL -/180/30). The fire rating of the emergency exit door may be reduced to two (2) hours if the door is at least 1.2m from any part of the transformer in accordance with the Electricity (General) Regulations.

The emergency exit door size shall be a minimum of 920 mm wide x 2040 mm high x 40 mm thick. The standard door width may vary (i.e. 920 mm and 1020 mm).

The emergency exit door shall open outwards and must be indicated on the design drawings.

Exit signage and emergency lighting shall be provided and clearly visible.

To allow safe egress the emergency exit door shall remain clear 24 hours/7 days per week.

Danger HV electrical equipment signage (SA Power Networks' stock item no. KS 1167) is to be fitted.

7.3 Hatchway type entrance

Hatchway type entrances for basement equipment rooms are acceptable only if two (2) separate emergency exit doors, via stairs to the exterior, are provided.

The fire ratings of the hatchway type entrance shall be three (3) hours (i.e. FRL -/180/30). The fire rating of the hatchway type entrance may be reduced to two (2) hours if the hatchway is at least 1.2m from any part of the transformer in accordance with the Electricity (General) Regulations.

The emergency exit doors, including the necessary hatch cover and frame assembly, shall be designed and installed to the best industry standards.

Personnel hatchways and vertical ladders as an access or escape means are not acceptable.

Refer to Section 12.3 for the access requirements applicable to hatchway entrances.

8. Building structure

The structural strength of the building and all materials used for construction of the indoor equipment room, shall be in accordance with the current NCC, relevant Australian Standards, and specifications stated on the structural design drawings.

At the preliminary stage, the design of the conduits and cable system (including conduit numbers, sizes, types, location, pits, cable trays, etc.) shall be specified on the building construction drawing, which shall be approved by the SA Power Networks Project Manager, before construction commences.

The equipment room shall be free from steps or irregular surfaces, thereby ensuring a safe environment for the installation, removal and operation of the equipment.

The hauling eyes on the wall/floor shall be designed and installed in accordance with Section 8.5.

The building structure shall maintain fire ratings as stated in Section 10.

The equipment room shall be watertight construction and be suitably proofed against vandals and unauthorised access.

Where the indoor room has openings, roof ceiling space/cavities, install galvanized steel mesh (with openings less than 130 mm²) to prevent vermin (e.g. rats, mice, etc.) and birds from entering the room.

8.1 Foundation

The equipment room foundation constructed on the natural or filled ground shall withstand all the anticipated load combinations (i.e. static and dynamic).

Where the foundation is placed on soil, the soil shall be clear of any obstruction or rubble that could interfere with the installation of the earthing electrode system through the equipment room floor.

8.2 Floor

The equipment room floor shall be constructed in accordance with the specifications stated on the structural design drawings.

The floor shall be designed to withstand the anticipated load combinations (i.e. static and dynamic) of the distribution equipment, its associated accessories, including the additional weight of cranes/skating systems that are required for the installation and removal of the distribution equipment.

The floor shall have the same load bearing characteristics as the equipment handling and carriageway areas and will have a non-slip finish.

In instances where the equipment is installed on a suspended slab, it is mandatory to display appropriate signage indicating the designed load capacity. This measure is crucial to prevent potential overloading issues in the future.

The equipment room floor shall consider the need for access to the earthing cables/electrodes.

8.3 Vault

All padmount transformers and HV switchgear must have a suitable vault size with appropriate earthing arrangement.

A minimum volume of 1.5 m³ is required in the vault below the Schneider RM6 for pressure relief in the event of an arc fault. Refer to Section 11 for additional pressure relief requirements.

For the site-specific footing and vault requirements, consult with the relevant SA Power Networks Manager.

8.4 Walls and ceilings

The equipment room walls shall have sufficient structural strength to support the weight of any equipment mounted on it without collapsing.

The ceiling shall be constructed of a suitable material that provides sufficient structural strength for the mounting of the hauling eyes. Refer to Section 8.5 for more details.

8.5 Hauling eyes

The following are the minimum requirements for the hauling eye (Refer to Figure 3 as an example):

- (1) At the preliminary stage, the location and number of hauling eyes shall be confirmed by the SA Power Networks Project Manager prior to designing of the indoor equipment room.
- (2) Where approved, the anchors and/or hauling eyes (provided by the owner/associated parties) shall be installed to achieve the overall equipment load.
- (3) The hauling eyes should also be specified for intermediate cable pits outside the equipment room.
- (4) All anchors and hauling eyes shall be permanently stamped to indicate their safe working load.
- (5) The hauling eyes located in floors shall be removable and, upon removal, the floor surface shall be level to avoid a tripping hazard.
- (6) Threaded recesses shall be provided with reusable removable plugs to stop ingress of foreign matter.



Figure 3: Example of a hauling eye

9. Ventilation

The SA Power Networks indoor equipment rooms shall be designed with ventilation to dissipate heat losses from electrical equipment. The following are the minimum requirements for ventilation of indoor equipment rooms:

- Ventilation shall be designed to maintain the indoor temperature within the range of -5°C to 40°C under normal conditions.
- The average ambient temperature over a 24-hour period in the equipment room shall not exceed 35°C under normal conditions.
- Air being removed from an internal equipment room must be directed and independently ducted to outside air.
- The air inlets and outlets shall be arranged to achieve an even distribution of air flow over the padmount transformer.
- Inlet and outlet openings should be clear of pedestrian areas and shall be located to prevent entry of noxious gases (e.g. vehicle exhausts, fuel exhausts, refrigeration plant gas discharge valves, pollutants such as smoke, soot, dust, ash etc.).
- Equipment room ventilation ducts must not contain other services, give access to other portions of the building, or form part of the ventilation system for the building.
- All vents are to be fitted with fire dampers with three (3) hours fire ratings (i.e. FRL 180/180/180).

9.1 Natural Ventilation

Natural ventilation is achieved through vermin proof and weatherproof louvered vents of a specified design in the walls of the indoor equipment room. Vents on personnel access doors are not acceptable.

Substantial vertical separation is required between inlet and outlet openings, with the outlet positioned as high as possible.

The position of the vents must be directed to outside air. If this is not achievable, such as in the case of a basement type equipment room, then forced ventilation is required. Additionally, if natural ventilation is not practicable, forced ventilation shall be used.

9.2 Forced Ventilation

Forced ventilation consists of fans, ductwork, and inlet/outlet vents. SA Power Networks requires that the forced ventilation system be designed so that the cool inlet air is drawn through the circulation fan and then blown over the padmount transformers.

In all circumstances, the fans must be installed inside the equipment room and all wiring contained within the equipment room with sufficient distance from padmount transformers. The outlet ventilation shall be discharged independently and directed to open air.

Fans installed in equipment rooms must not exceed the db (A) requirements as specified in the Environmental Protection (Noise) Policy 2007. Refer to Section 13.1 for additional information.

A fire damper with a fire rating equivalent to that of the surrounding walls shall be installed in each duct opening in the equipment room to isolate the air supply in the event of a fire, in accordance with AS 1668.1.

10. Fire protection

The SA Power Networks equipment room shall be designed to prevent the spread of fire to other parts of the building by containing all fire products within the room. The room shall also be designed to prevent fumes and gases from entering the indoor equipment room.

Equipment rooms with street frontage shall be designed to prevent the spread of fire to adjacent structures.

10.1 Fire detection and alarm setting

The fire detection and alarm system shall be installed in accordance with AS 1668.1 and AS 1670.1.

The compliant fire detection system and alarm setting shall be installed, maintained, and tested prior to the building being occupied.

The testing and maintenance of the fire detection system will require a ['Network Access Permit'](#).

10.2 Firefighting system

The firefighting equipment, fire-hydrant system and other water sources shall be installed outside the equipment room.

At least one portable, manually operated fire extinguisher suitable for electrical fires, and compliant with AS 2444, should be installed in a readily accessible location internal to each entry.

10.3 Fire ratings

All walls, floors, and ceilings (i.e. building structure) of the equipment room shall have three (3) hours fire rating. It is essential that the fire ratings be maintained for any penetration of the walls, floors, and ceilings(i.e. building structure) or other services.

The use of a spray on material to achieve fire ratings is not permitted.

The sealing of the penetration shall be done strictly in accordance with the manufacturer's instructions.

Refer to Appendix A for fire rating definitions.

10.4 Protection of adjacent buildings

A fire risk assessment shall be undertaken where the following conditions apply:

- The equipment room main doors open onto a street frontage; and
- The main doors are not fire-rated; and
- Adjacent buildings are located within the fire risk zone described in Appendix C.

The fire risk assessment shall determine the appropriate protection measures for the adjacent buildings.

11. Pressure relief

Equipment rooms house equipment that may, under fault conditions, cause an explosion. Such events can generate significant internal pressure, leading to damage to walls or other structural elements. This damage may compromise the building's structural integrity and invalidate the fire rating of the walls. The effects of an explosion can be mitigated by either designing the room with sufficient volume to accommodate the pressure rise or by installing appropriate pressure relief devices.

The equipment room shall be designed to deal with any pressure rise from an electric arc, and any potential transformer deflagration.

12. Access requirements

The following are the minimum requirements for the SA Power Networks personnel safety and access:

- (1) Unrestricted Personnel Access for 24 hours/7 days per week, including without notice Emergency Access to the equipment room and associated mains from the date of handover, shall be provided to the SA Power Networks personnel. This requirement shall be included in any immediate or future building security arrangements.
- (2) Provide access details such as keys, key codes etc, prior to connection of supply and keep SA Power Networks informed, should access alter.
- (3) Unhindered Vehicle Access may be required for emergency situations and maintenance purposes. Access points shall be located where there will be no obstructions by vehicles, equipment, site usage or any other impediments.

Entering the equipment room without being accompanied by an accredited SA Power Networks representative is prohibited.

12.1 Access route doors/gates lock

Where access to the equipment room is not direct from the street, any locked doors/gates on the route to the equipment room shall be fitted with either:

- lock with a cylinder keyed to the SA Power Networks master key system; or
- pad bolt or similar fixing capable of accepting Lockwood series padlocks and keyed to the SA Power Networks master key system; or
- Australian Locksmiths P1 deadlatch incorporating a heavy-duty key-in-knob lock with rigid external knob, key-retracting bolt, and an internal lever that is always free.

Refer to the section titled 'Locking facilities' in the [Service and Installation Rules](#) and E-Drawing E2774 (sheets 1.1 and 1.2) for additional details.

The building owner/landowner shall bear the cost for the installation and maintenance of all doors/gate locks.

12.2 Carriageway area

The following are the minimum requirements for the equipment carriageway area which shall be available for the SA Power Networks personnel, for the safe handling and removal of the equipment:

- (1) This area shall be a minimum of 4.5 m wide x 4.5 m high to accommodate mobile crane operation to install and remove equipment.
- (2) The ground slope of this area should not exceed 1:12.
- (3) This area shall be designed to withstand the combined loads (including static and operational loads) of the distribution equipment and its associated accessories, as well as the additional loads imposed by mobile cranes and any skating system used.

12.3 Basement/under loading dock access

Basement level equipment rooms will have equipment installed either via a gatic/hatchway system or through loading dock access.

12.3.1 Loading dock access

Where equipment is installed in a basement via loading dock access, a minimum headroom clearance of 6.5 m shall be provided to facilitate crane access for the loading and unloading of the equipment.

12.3.2 Gatic/hatchway access

Where equipment is installed via a gatic or hatchway system, the following requirements shall be met:

- (1) The clear height above the equipment hatchway shall be not less than 4.5 m to allow for crane use when installing and removing equipment.
- (2) Vehicle access shall be provided directly adjacent to the equipment room. A minimum headroom of 3.5 m shall be provided to allow test vehicle access to the equipment room.

12.4 Crane operating area

The minimum crane operating area requirements are dependent on the method used to place equipment into the equipment room. Direct placement of the equipment with a pick-and-carry crane is the preferred method of installation.

12.4.1 Pick-and-carry crane operating area requirements

The following specify the minimum requirements for the crane operating area located in front of the equipment room. This area shall be available to SA Power Networks personnel to enable the safe handling, installation, and removal of equipment when equipment is placed directly into the room using a pick-and-carry crane:

- (3) This area shall comply with the minimum dimension requirements specified in Figure 4 to accommodate mobile crane operations for the installation and removal of equipment.
- (4) The ground slope of this area should not exceed 1:20.
- (5) This area shall have the same load bearing characteristics as the equipment room floor and carriageway areas.

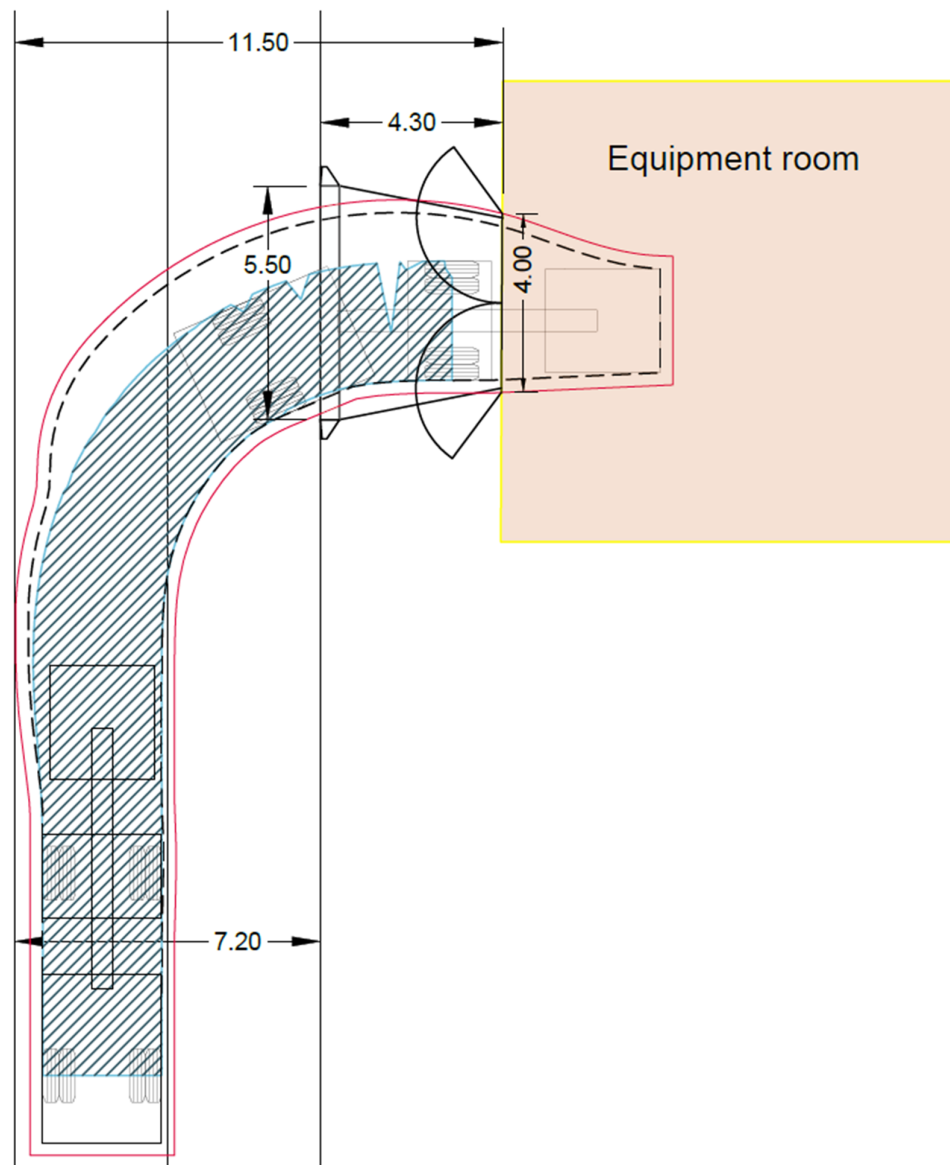


Figure 4 Crane operating area requirements

Note: All dimensions in Figure 4 are in 'm' and are minimum requirements.

12.4.2 Equipment handling area for skating system

The following outlines the minimum requirements for the equipment handling area (i.e. the area directly in front of the main equipment room doors). This area shall be made available to SA Power Networks personnel to facilitate the safe handling, installation, and removal of equipment using a skating system:

- (1) This area shall be a minimum of 4.0 m wide x 4.0 m deep (refer to Figure 5) to accommodate the operation of a mobile crane when placing equipment onto the equipment handling area.
- (2) For the effective operation of a skating system, this designated area shall be kept flat and free from any potential obstructions, thus guaranteeing safe and unimpeded manoeuvrability.
- (3) The ground slope of this area should not exceed 1:20.
- (4) This area shall have the same load bearing characteristics as the equipment room floor and carriageway areas.

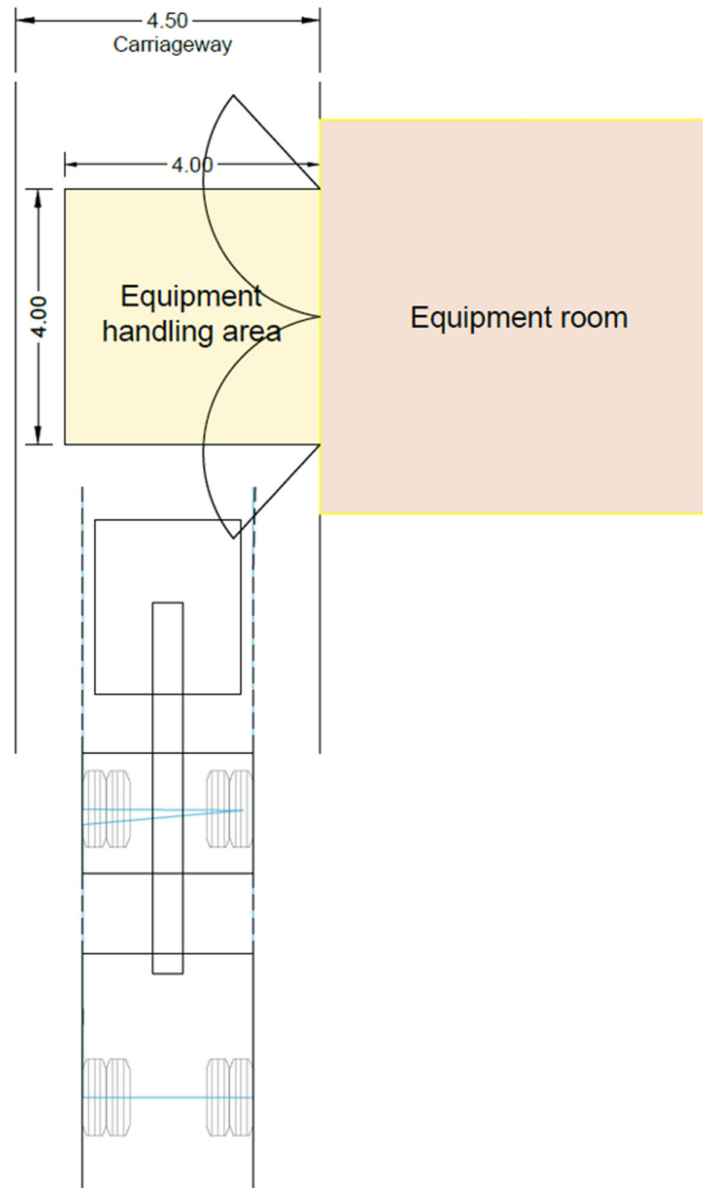


Figure 5 Equipment handling area

Note: All dimensions in Figure 5 are in 'm' and are minimum requirements.

12.5 Stairway and passageway areas

The following are the minimum requirements for the stairway and passageway areas:

- (1) These areas shall be a minimum of 1.2 m wide x 2.2 m high (i.e. for headroom)
- (2) The access doors should be fitted with micro-switches to automatically activate the stairway and/or passageway lighting.
- (3) The installation of stairways, handrails, and/or guardrails within the equipment room is strictly prohibited.
- (4) Stairway access to basement equipment rooms shall be dedicated solely to the equipment room and shall not provide access to any other part of the building.
- (5) The customer or their agent is responsible for supplying and installing appropriate handrails and guardrails outside the equipment room, but only when specified in the layout drawing. All installations shall comply with the relevant AS/NZS standards and the NCC requirements.
- (6) These areas shall always be kept clear.
- (7) It is not acceptable for passageway routes to be through hazardous areas.

13. Room requirements

13.1 Noise

The overall noise levels generated from the equipment room shall not exceed the db(A) requirements specified in the Environmental Protection (Noise) Policy, and shall comply with local councils, and other authorities' requirements.

The ventilation fans are a major source of noise and may need to be silenced by the attenuator attachments and baffles.

The attenuator attachment can protrude substantially within the equipment room; therefore, the equipment room size may be increased.

The size and position of fans within the equipment room shall be acceptable to the SA Power Networks Project Manager.

13.2 Water drainage system

13.2.1 Site drainage - outside equipment room

The site shall be effectively drained to keep the area outside the equipment room completely drained and dry.

13.2.2 Area drainage - inside equipment room

The area inside the equipment room shall be free of the risk of flooding and storm water damage, and any drains provided shall be kept in working condition.

The equipment room is to be equipped with a level actuated sump pump/s installed at the lowest point, which can be utilised to achieve suitable drainage and separation of oil, according to EPA standards.

13.2.3 Water tightness

The equipment room shall be watertight to the best industry standards, to safeguard all equipment, which are subject to risk of damage from exposure to water or dampness.

13.3 Lighting and power requirements

13.3.1 Temporary (during construction stage)

Prior to handing over of the equipment room, the equipment room shall contain suitable temporary lights and power supplied from the customer's installation to allow for the safe installation of equipment in a room.

13.3.2 Permanent

Within the equipment room, the customer/customer's agent shall provide and install the necessary permanent light fittings and power outlets. All wiring shall be in accordance with the NCC and the relevant Australian Standards.

Where required, the customer/customer's agent shall provide and install exhaust fans, pumps, and controls in accordance with the manufacturer's specifications.

13.4 Avoidance of services and encroachments

The equipment room shall remain free of encroachments into the designated floor and trench zones. Structural elements such as columns, beams, footings, and walls may only occupy areas specifically identified on the equipment room plans, and only where they do not obstruct the placement of consumer mains, conduits, trenches, or ventilation ducts. These elements must also not impede the safe movement and installation of equipment into the room.

14. Installation works (conduits and cabling system)

14.1 Conduits system

All electrical conduits and cable enclosures, between the equipment room and the property boundary shall be specified on the design drawings to enable SA Power Networks to install HV and LV cables in the equipment room. Any subsequent alteration to the design during construction shall be approved by the SA Power Networks Project Manager.

The equipment room should be located to minimise the length of conduits or other cable enclosures. The conduits and other cable enclosures should run in a horizontal straight line from the property boundary to the equipment room.

Refer to the relevant e-drawings for the specified minimum bending radius of cables and conduits.

All conduits are to be installed free of obstructions or any material that could hinder or damage the cable during the cable pull.

Where SA Power Networks cables or conduits are routed through a building and are accessible to the public, the customer or their agent shall supply and install warning signage along their entire length.

HV cable signage (SA Power Networks stock item no. KS 1167), as shown in Figure 6, shall be installed at 4.0 m intervals. LV cable signage (SA Power Networks stock item no. KS 1020), as shown in Figure 7, shall be installed in a similar manner.

When installation of the conduits is completed, the associated parties shall arrange inspection from the SA Power Networks representative.

14.1.1 Incoming HV supply route

The incoming high voltage supply route between the SA Power Networks HV distribution system and the equipment room shall be via underground conduits/cables system.

The customer/customer's agent is responsible for installing conduits/cables between the property boundary and the equipment room.

Refer to [TS102](#) for underground cable easement requirements.

No structures should be erected, or levels altered within the easement without written permission from the SA Power Networks Project Manager.

14.1.2 Conduits system (underground)

The conduits, conduit bends sizes, installation arrangements, minimum cover and separations to other services shall be in accordance with [TS085](#). The HV and/or LV cables shall be in accordance with [TS100](#).

When entering the equipment room, all conduits shall be installed with bell mouths to protect the cables from damage during installation and setting of cables.

14.1.3 Conduits through building structure

There are various acceptable methods for installing conduits through a building on a route to the equipment room from the property boundary. Consult with the SA Power Networks Project Manager for the agreed methodology.

Conduits shall be securely fixed to prevent movement when cable hauling forces are applied, and to support the weight of the cables.

Cables routed through parts of the building other than the equipment room shall be protected by a fire-rated enclosure (e.g. conduit) with a minimum FRL of 120/120/120.

14.2 Cable support system

The cable support system (including cable ladders, cable trays and their supports) shall be designed to meet the load requirements of the cable management system (i.e. for HV, LV, earth cables' loads).

The overall loading of cable support system on the building structure is assumed to be 50 kg/m, unless specified otherwise. The cable support system loads shall be considered as permanent live loads. Retrofitting of existing cable support systems shall consider loading requirements on a case-by-case basis.

The cable support system shall be installed in accordance with the manufacturer's instructions and ensure that:

- it can safely support the loads being imposed upon it;
- the proposed fixings to adjacent components are also sufficient for the intended load;
- any declared deflection limits are not exceeded;
- signage on cables support system should state the load for which the cables support system has been designed for to avoid any future overloading issues; and
- install appropriate signages for HV, LV and/or earthing cables displayed on the cable tray at 4.0 m intervals along their entire length.
 - For HV cables, use signage (SA Power Networks' stock item no. KS 1167), refer to Figure 6.
 - For LV cables, use signage (SA Power Networks' stock item no. KS 1020), refer to Figure 7.
 - For earthing cables, use signage (SA Power Networks' stock item no. KS 1050), refer to Figure 10.

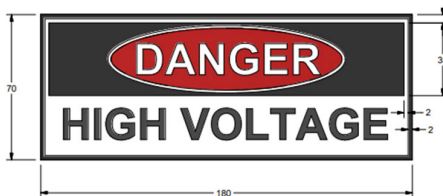


Figure 6: Warning signage (SA Power Networks' stock item no. KS 1167)



Figure 7: LV cable signage (SA Power Networks' stock item no. KS 1020)

14.3 Earthing requirements

The customer or their agent(s) bear the responsibility for designing an earthing system that complies with [TS109](#), AS 2067, and the SA Power Networks site project specifications. The design will be subject to review and approval by the relevant SA Power Networks Project Manager.

SA Power Networks will nominate the appropriate earthing scheme to be employed at the site-specific location (i.e. CMEN or MEN).

A minimum size of 120 mm² Cu earth cable is recommended; however, the earthing design drawing will determine the number and sizes of earth cables required on a site-specific basis.

14.3.1 Earth bars

The recommended dimensions of the earth bars are 50mm (H) x 6mm (D) with 13mm holes as shown in **Figure 8**.

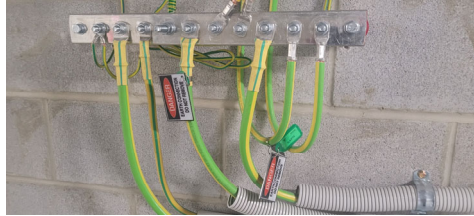


Figure 8 Multiple earth connection

The equipment room contains an earth bar for the building MEN, and an earth bar for the SA Power Networks vault. The connections to each of these earth bars are described in the following sections, and a generic earthing example is given in Appendix D.

14.3.1.1 Building MEN earth bars

The main doors of the equipment room, building reinforcement, and auxiliary systems (such as forced ventilation, lighting, fire detection, alarms) shall be connected to the building's MEN earthing bars.

14.3.1.2 SA Power Networks vault earth bars

The floor containing structural steel beams that support the distribution equipment, checker plates, and gatic lids shall be connected to the SA Power Networks equipment CMEN earth bars.

When there are multiple pieces of the SA Power Networks equipment to be installed, additional earth bars should be provided to accommodate earthing cables.

14.3.2 Earth stakes

The position of the earth stake must make good contact with the soil. The preferred location is close to the source transformer to reduce the length of the connection.

14.3.3 Earthing requirements for non-ground-level equipment rooms

A dedicated earth stake pit shall be provided for the SA Power Networks earthing system. Where multiple items of SA Power Networks equipment are installed, two earthing conductors with dedicated earth stakes shall be connected to the earth stake pit to provide redundancy.

14.3.4 Identification tags

At every earth stake pit and at the earth bar, install the SA Power Networks identification tags (SA Power Networks' stock item no. KS 1050) as shown in Figure 9 and Figure 10.

The customer/customer's agent shall conduct a regular earthing test program for the ongoing compliance of the earthing system as per the relevant Australian Standards.



Figure 9 Earth connection in an earth stake pit



Figure 10 Earth connection signage (SA Power Networks' stock item no. KS1050)

15. Who should you talk to?

(1) The SA Power Networks Customer Solutions Managers:

- Website: [Customer Solutions Managers Contact Details](#)

(2) General enquiries:

Contact the SA Power Networks customer service team:

- Website: <https://www.sapowernetworks.com.au/contact-us>, or
- Email: customerservice@sapowernetworks.com.au, or
- Call: 13 12 61

(3) Faults and emergencies:

Contact SA Power Networks 24/7 phone line:

- Call: 13 13 66

(4) Network access permit enquiries:

Contact the SA Power Network customer solutions-connection central team during business hours 8:00 am to 3:00 pm, Monday to Friday:

- Email: connectioncentral@sapowernetworks.com.au, or
- Call: (08) 8404 5409

(5) Before You Dig Australia (BYDA) enquiries:

- Website: <https://www.byda.com.au/>

(6) Material sales group

Contact Material sales group for assistance with any materials purchase:

- Email: materialsales@enerven.com.au

Appendices

A. Fire Resistance Level (FRL)

The meaning of Fire Resistance Level (FRL) is the grading periods in minutes as specified in NCC for determining the following criteria:

- structural adequacy; and
- integrity; and
- insulation, and
- expressed in that order (e.g. Structural adequacy/Integrity/Insulation).

For an example, a building load bearing element (e.g. Walls) with FRL of three (3) hours (i.e. 180/180/180) will maintain, when tested as per AS 1503.7:

- structural adequacy for a period of 180 min; and
- integrity for a period of 180 min; and
- insulation for a period of 180 min.

A non-load bearing element (e.g. Fire Doors), with FRL of -/180/30, meaning that in a standard fire test, the element is not required to retain any structural adequacy criterion. However, the element shall maintain its:

- structural adequacy -/
- integrity for at least 180 min; and
- insulation properties for at least 30 min.

The fire resistance test applies a fourth criterion, radiation to fire-resistant doorsets, dampers and glazing, but the radiation grading is not included in the statement of FRL given on the door-tag.

For details on the use of the radiation criterion, refer to the NCC.

B. Equipment room layouts

B.1 Padmount transformer within building layout

Where a padmount transformer to be installed within a building where 3.0 m operating area is provided inside the building, the equipment room size shall be width (A) x depth (B) x 4.0 m height (H). Refer to Figure 11, for the room layout.

The main doors' fire ratings are specified in Section 7.1.

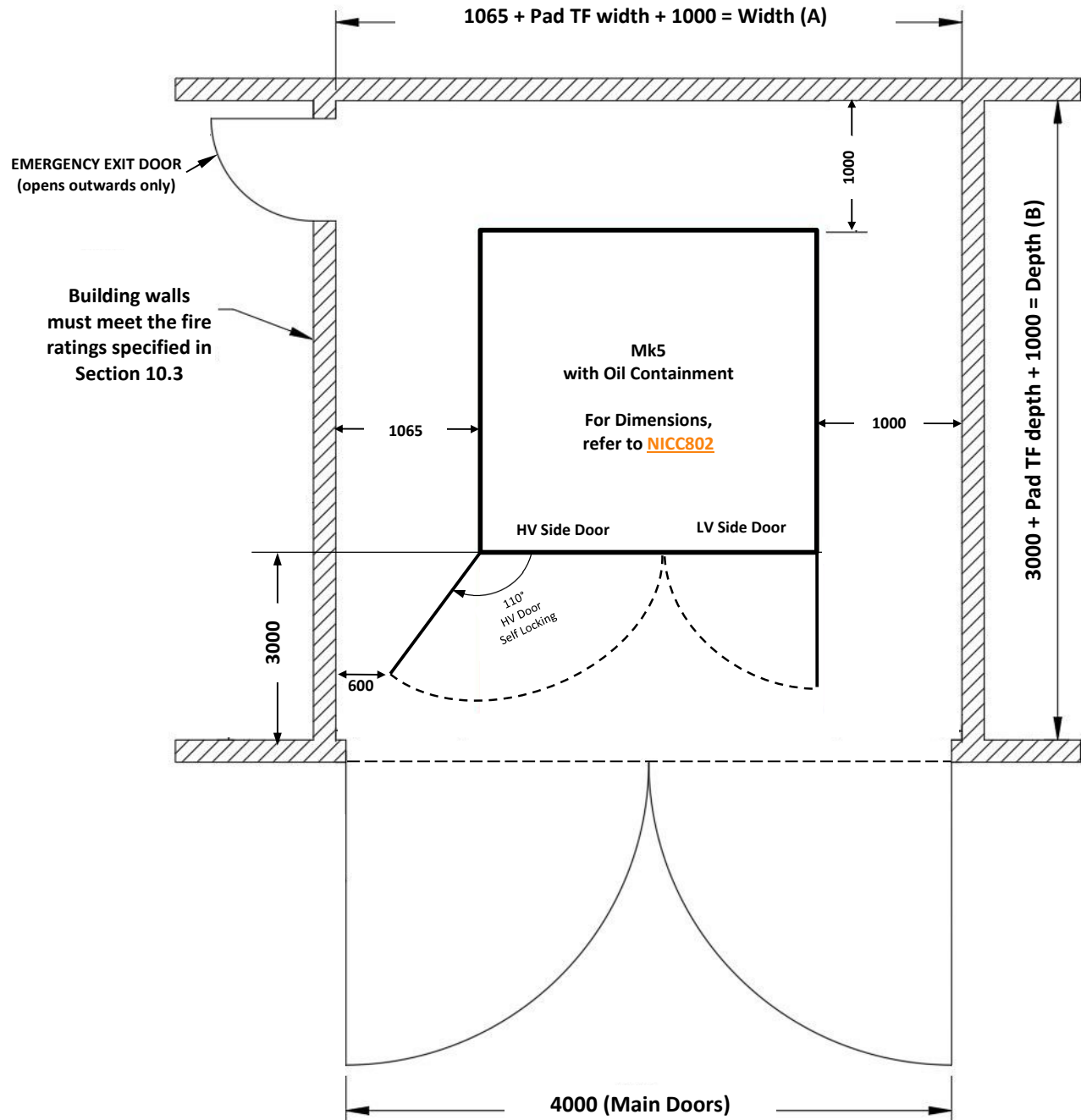


Figure 11: Padmount transformer within building layout

Notes:

- (1) All dimensions are in 'mm' and are minimum requirements.
- (2) Drawing is 'Not to Scale'.
- (3) The operating area shall be kept clear of obstructions and free from tripping hazards.

B.2 Distribution equipment within building layout

Where the distribution equipment is to be installed within a building where 3.0 m operating area is provided inside the building, the equipment room size shall be width (A) x depth (B) x 4.0 m height (H). Refer to Figure 12, for the room layout.

The main doors' fire ratings are specified in Section 7.1.

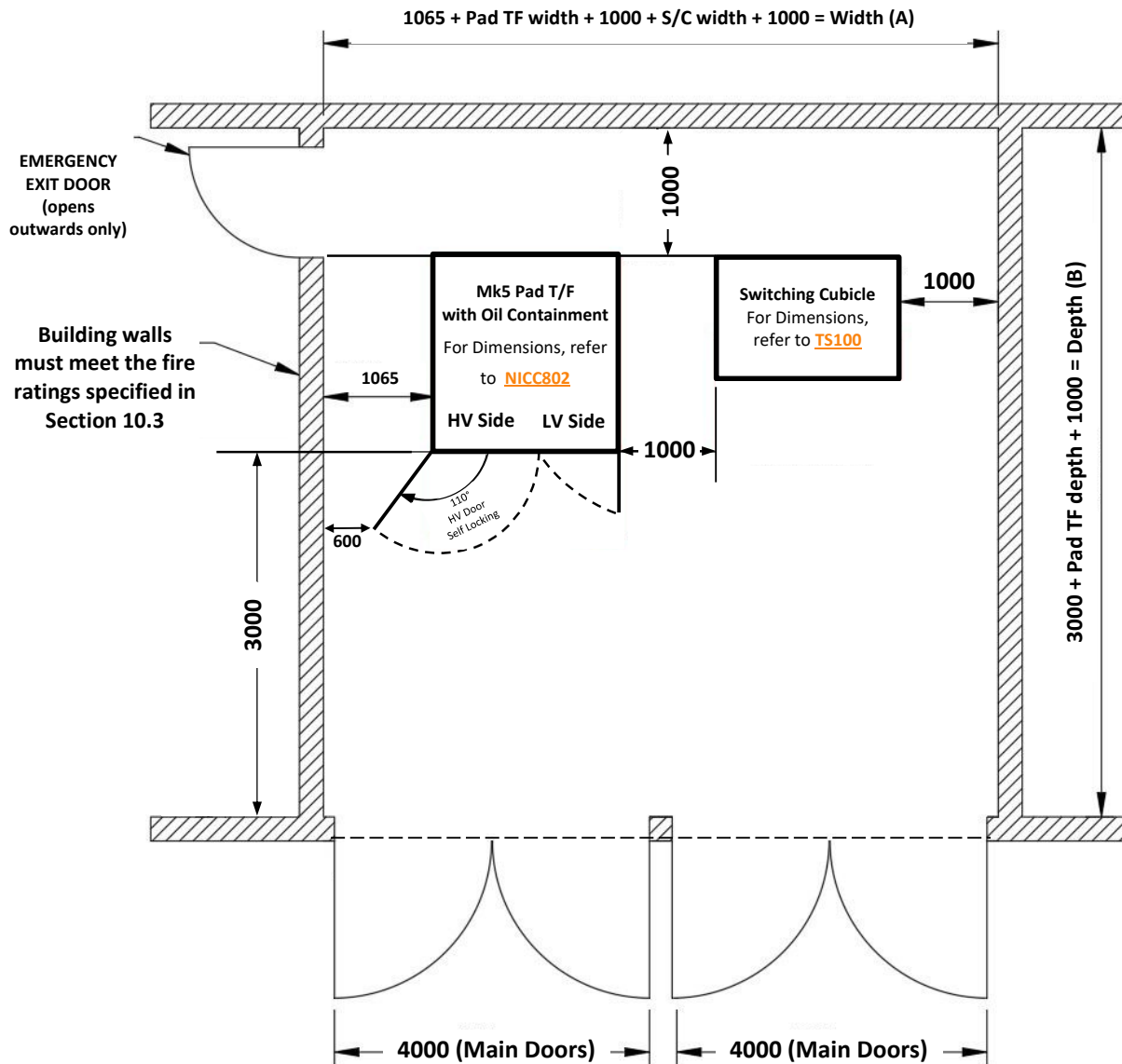


Figure 12: Distribution equipment within building layout

Notes:

- (1) All dimensions are in 'mm' and are minimum requirements.
- (2) Drawing is 'Not to Scale'.
- (3) The operating area shall be kept clear of obstructions and free from tripping hazards.

B.3 Padmount transformer with street frontage layout

Where a padmount transformer sits 1.5 m (min) back within the equipment room and 1.5 m (min) unrestricted access is available from the footpath (i.e. to achieve a minimum 3.0 m overall operating area), the equipment room size shall be width (A) x depth (B) x 4.0 m height (H). Refer to Figure 13, for the room layout.

The main doors' fire ratings are specified in Section 7.1.

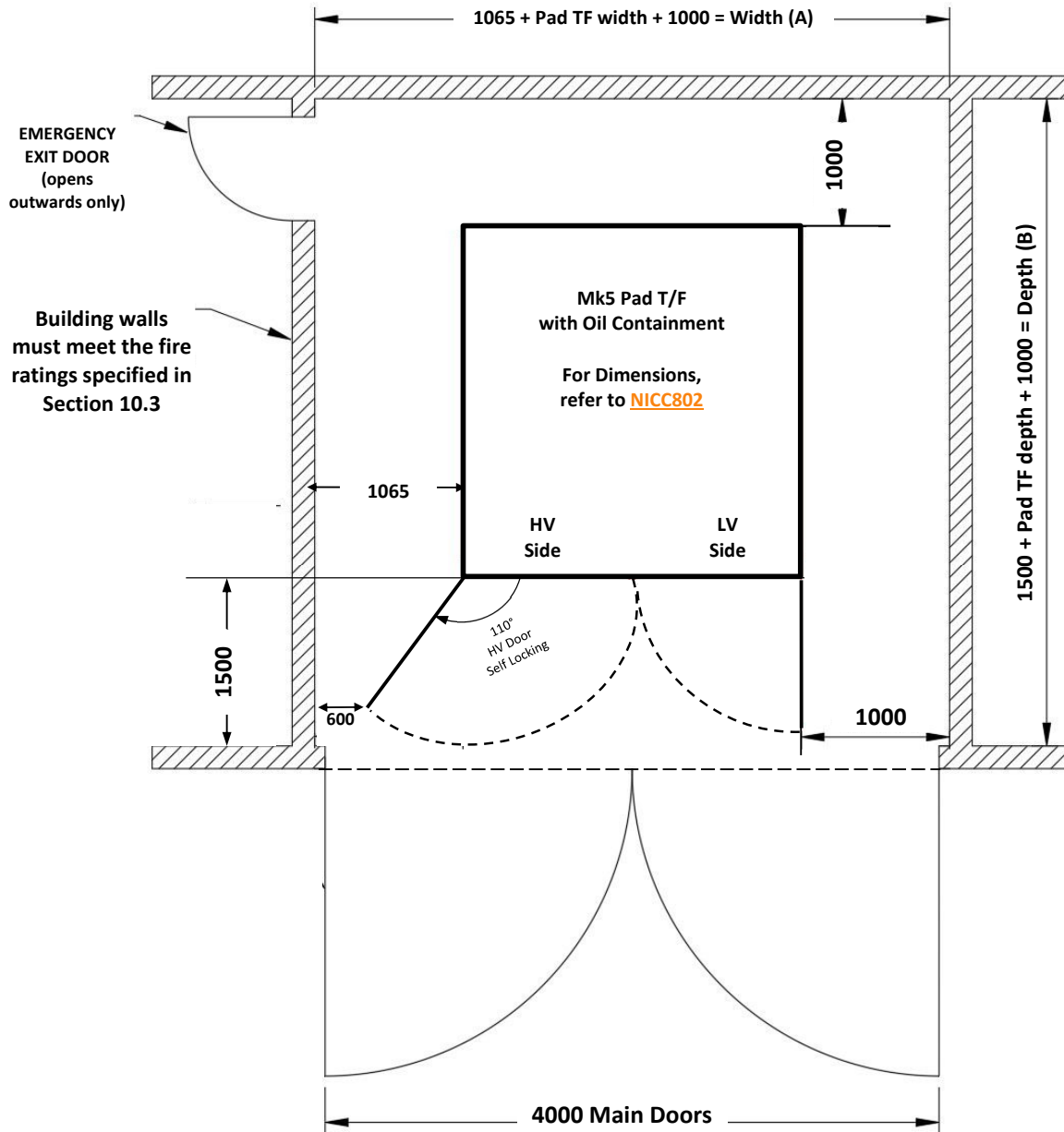


Figure 13: Padmount transformer with street frontage layout

Notes:

- (1) All dimensions are in 'mm' and are minimum requirements.
- (2) Drawing is 'Not to Scale'.
- (3) The operating area shall be kept clear of obstructions and free from tripping hazards.

B.4 Distribution equipment with street frontage layout

Where the distribution equipment sits 1.5 m (min) back within the equipment room and 1.5 m (min) unrestricted access is available from the footpath (i.e. to achieve a minimum 3.0 m overall operating area), the equipment room size shall be width (A) x depth (B) x 4.0 m height (H). Refer to Figure 14, for the room layout.

The main doors' fire ratings are specified in Section 7.1.

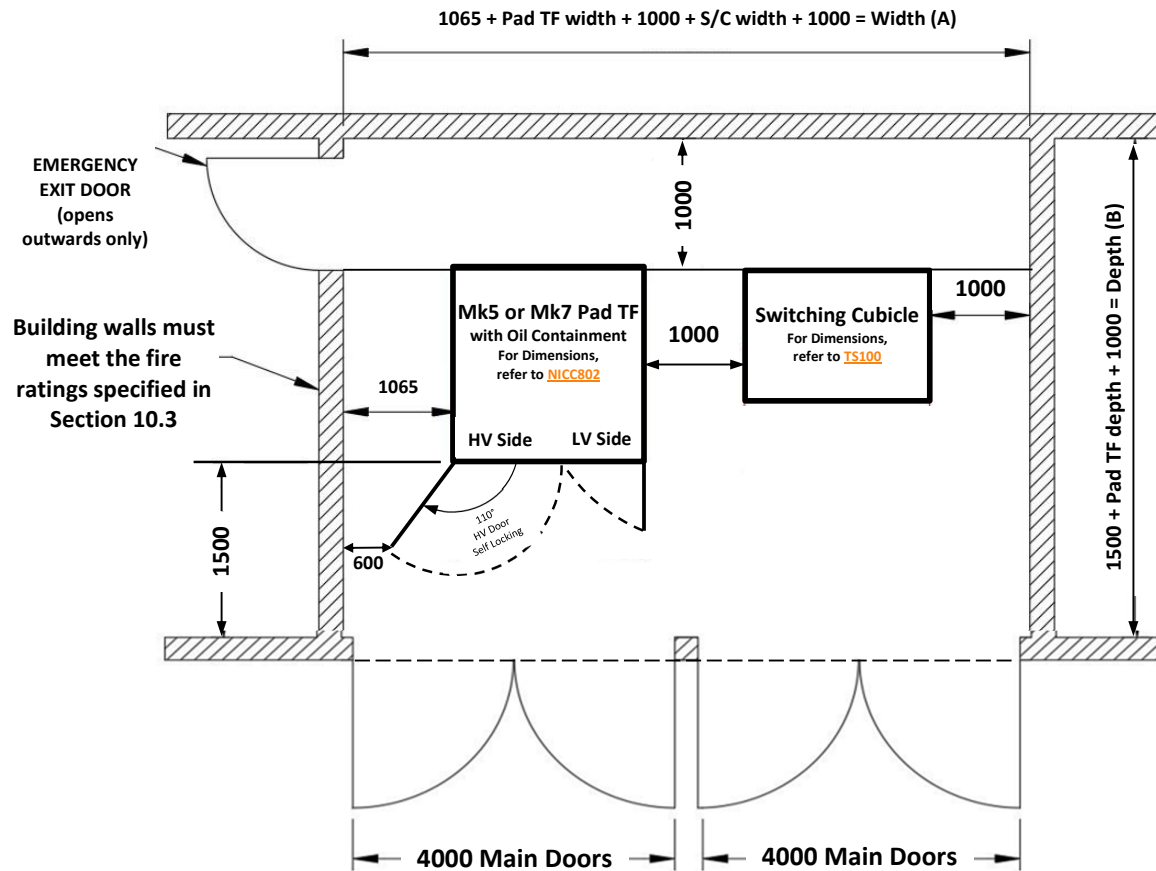


Figure 14 Distribution equipment with street frontage layout

Notes:

- (1) All dimensions are in 'mm' and are minimum requirements.
- (2) Drawing is 'Not to Scale'.
- (3) The operating area shall be kept clear of obstructions and free from tripping hazards.

B.5 Distribution equipment within a basement/under loading docks layout

Where the distribution equipment is required to be installed in a basement/under loading docks, and 3.0 m operating area is provided inside the room, then the equipment room size shall be width (A) x depth (B) x 4.0 m height (H). Refer to Figure 15, for the room layout.

The fire ratings of each door are specified in Section 7.

Note that two (2) emergency exit doors (outward opening only) are required. Refer to Section 12.3 for additional access requirements.

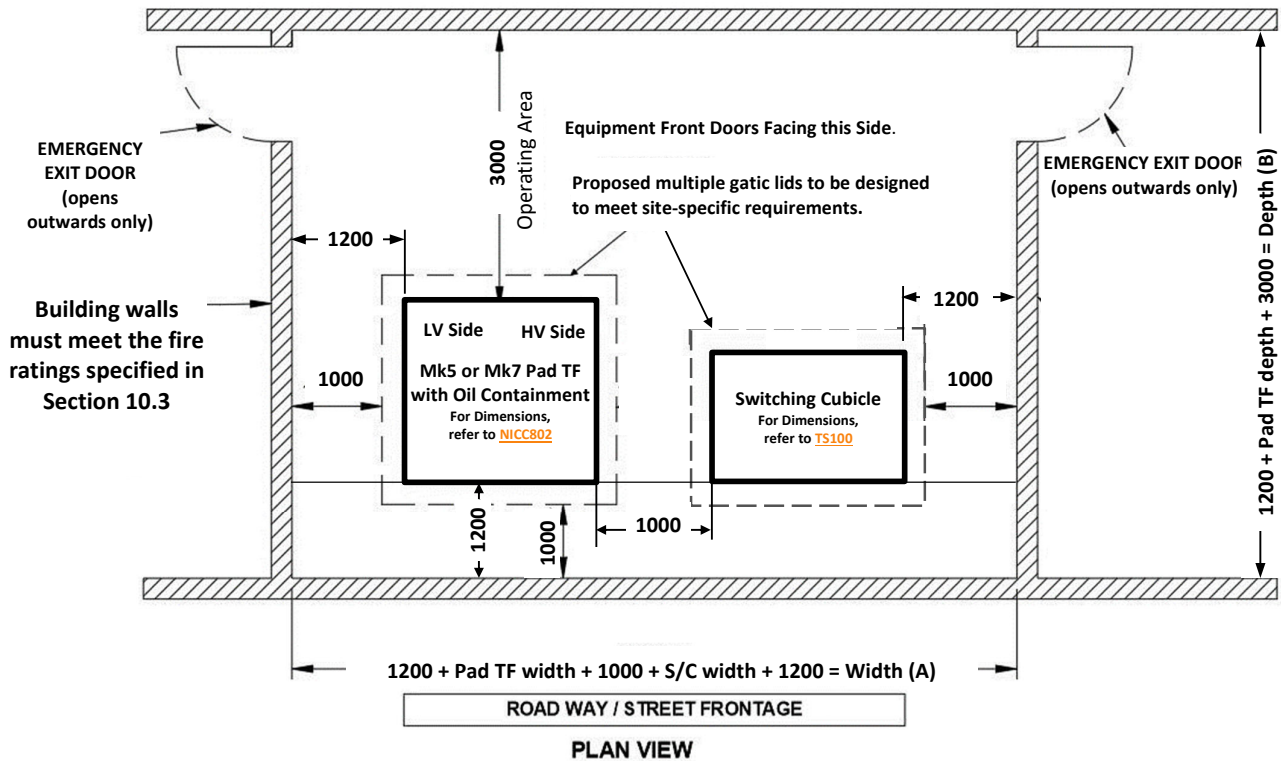


Figure 15: Distribution equipment under loading docks layout

Notes:

- (1) All dimensions are in 'mm' and are minimum requirements.
- (2) Drawing is 'Not to Scale'.
- (3) The operating area shall be kept clear of obstructions and free from tripping hazards.
- (4) Any wall and/or structure must have a minimum of 1.0 m separation to any gatic cover opening.

B.6 HV switching cubicle within building layout

Where a HV switching cubicle is to be installed within building where 3.0 m operating area is provided inside the building, the equipment room size shall be width (A) x depth (B) x 4.0 m height (H). Refer to Figure 16, for the room layout.

The main doors' fire ratings are specified in Section 7.1.

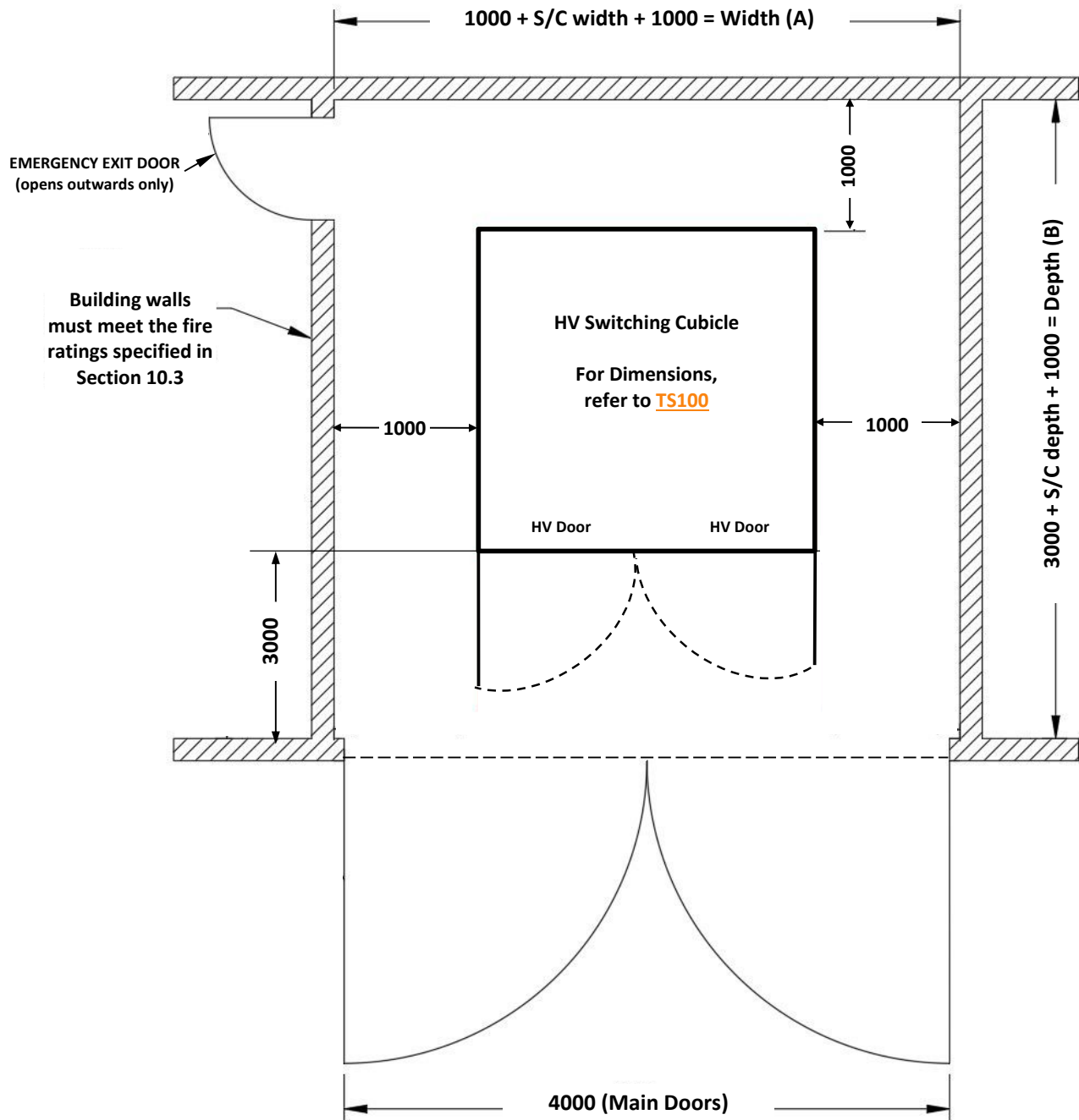


Figure 16: HV switching cubicle within building layout

Notes:

- (1) All dimensions are in 'mm' and are minimum requirements.
- (2) Drawing is 'Not to Scale'.
- (3) The operating area shall be kept clear of obstructions and free from tripping hazards.

B.7 Padmount transformer under a roof with two walls

When a padmount transformer is to be located under a roof, with two (2) walls, then this must be considered an 'Equipment Room' and all conditions specified in this standard must be met. This includes the need for a personnel door, and equipment doors adjacent to open areas with unrestricted access to provide an emergency escape.

Where a padmount transformer sits 1.5 m (min) back within this equipment room and 1.5 m (min) unrestricted access is available from the footpath (i.e. to achieve a minimum 3.0 m overall operating area), the equipment room size shall be width (A) x depth (B) x 4.0 m height (H). Refer to Figure 17, for the room layout.

For the two sides of the room that are not enclosed by walls, refer to Section 10.4 for protection requirements applicable to adjacent buildings located within the external fire risk zone (shown in Appendix C).

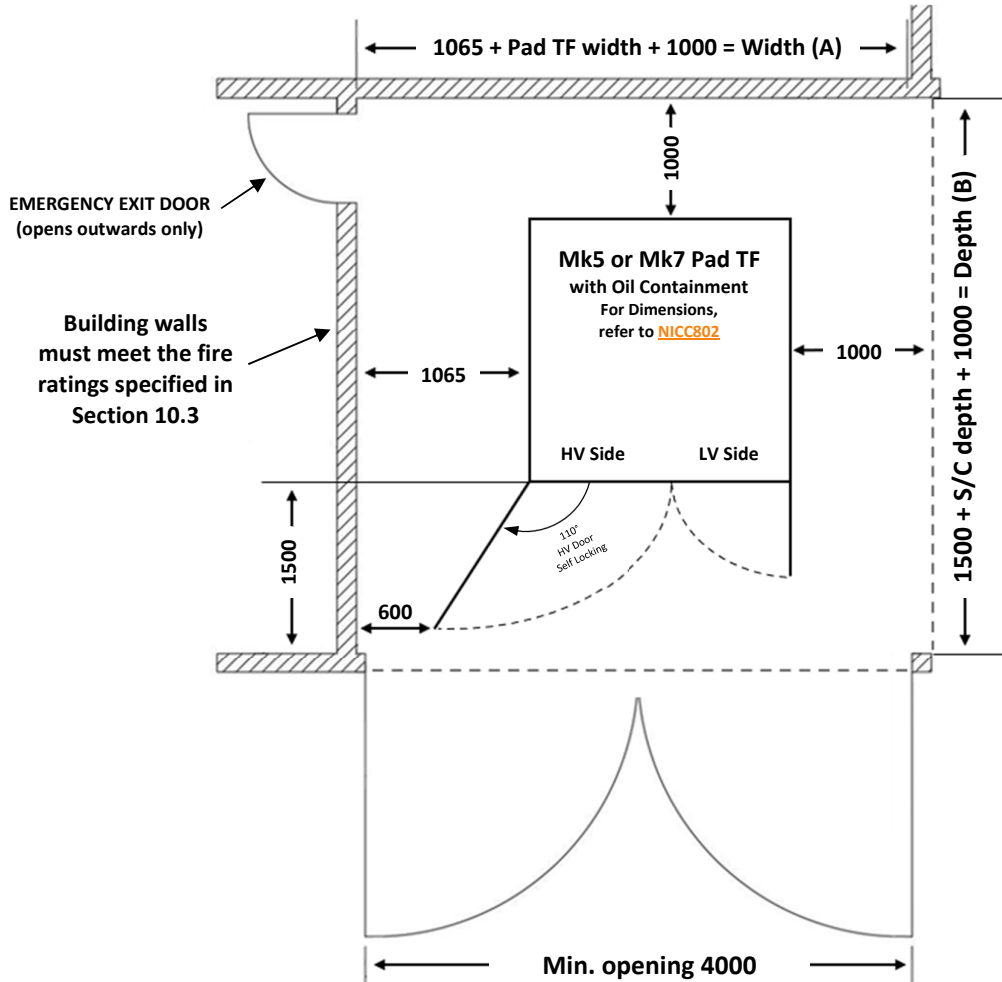


Figure 17 Padmount transformer under roof with two walls

Notes:

- (1) All dimensions are in 'mm' and are minimum requirements.
- (2) Drawing is 'Not to Scale'.
- (3) The operating area shall be kept clear of obstructions and free from tripping hazards.

C. External fire risk zone

Equipment room layouts with external facing doors (such as those shown in Appendices B.3, B.4, and B.7) have a potential fire risk zone. Figure 18 shows the fire risk zone for external facing doors as defined by AS 2067.

Refer to Section 10.4 for the requirements applicable when other buildings or combustible materials are located within the fire risk zone illustrated in Figure 18.

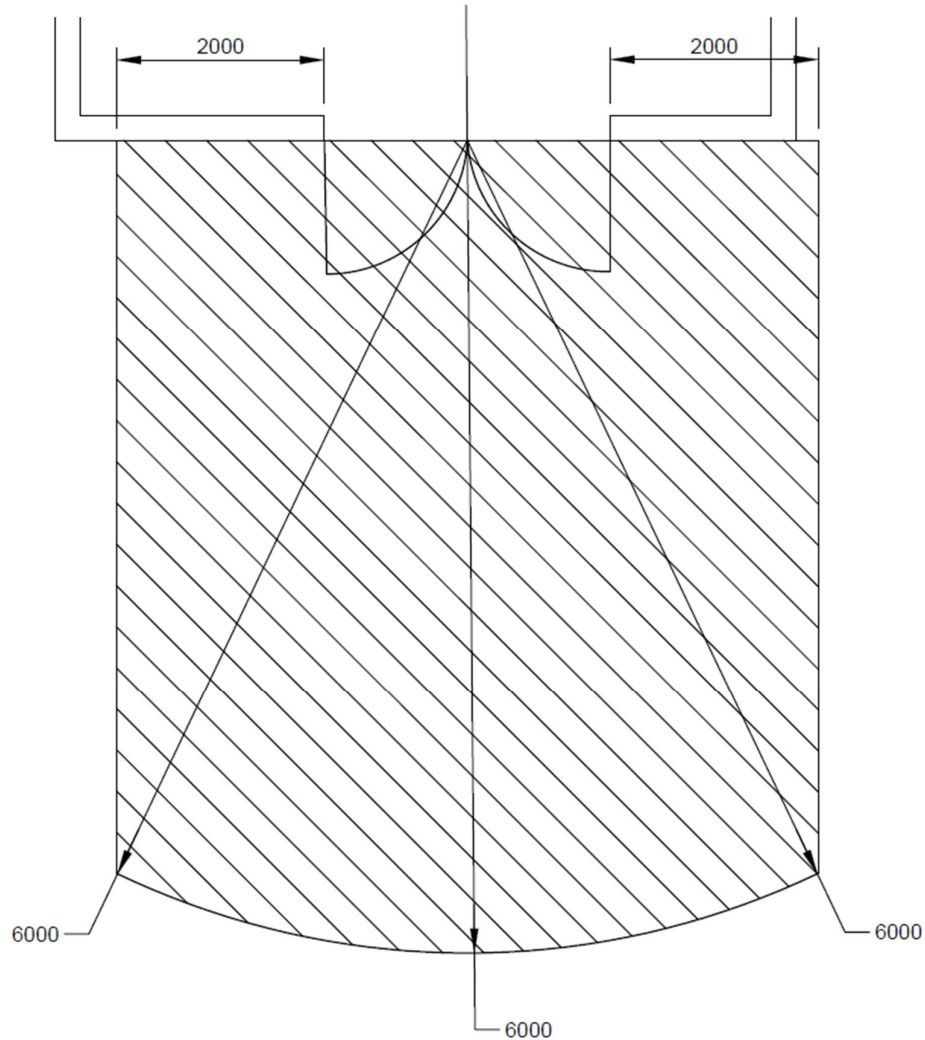


Figure 18 Fire risk zone for external facing doors

Notes:

- (1) All dimensions are in 'mm'.

D. Generic earthing example

A generic example of some earthing elements in an equipment room is shown in Figure 19. Each equipment room requires a custom designed earthing arrangement designed by the customers building services engineer. The cable sizes, bus bar sizes, and general arrangements shall be specified by an electrical engineer.

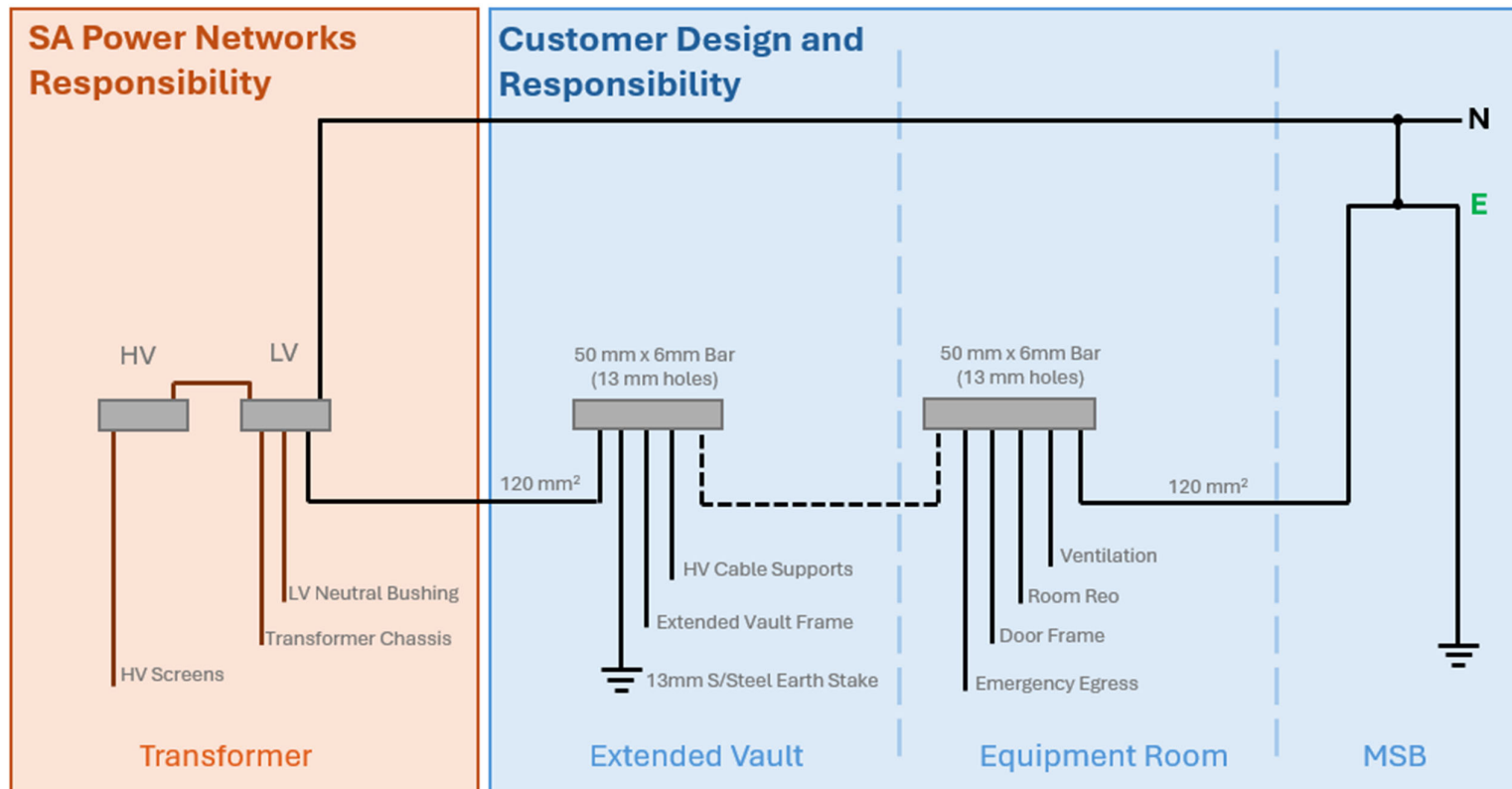


Figure 19 Generic earthing example