

Substation Design Instruction

Substation signs and equipment labels

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SUBSTATION DESIGN INSTRUCTION

ASSET STANDARDS & DESIGN

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SDI 528 SUBSTATION SIGNS AND EQUIPMENT LABELS

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1.0 PURPOSE

To standardise the appearance and location of substation signs and equipment labels.

2.0 SCOPE

This instruction defines the requirements for signs and equipment labels in transmission and zone substations and switching stations.

This standard **must** be read in conjunction with SDI 505.

3.0 REFERENCES

Internal

Board Policy 4.0 - Environment

Company Policy 9.2.2 - Network Protection

Company Policy 9.2.5 - Network Asset Design

Company Policy 9.9.1 - Network Asset Maintenance

Company Form (Health & Safety) FSY0075 - Hazardous Materials Register

Company Procedure GPE 0069 - Polychlorinated Biphenyls (PCB) Management

Company Procedure GSY 1066 - Worksite Hazard and Risk Assessment

Endeavour Energy Brand Guidelines (available on the Intranet)

Endeavour Energy Electricity Network Safety Management System (ENSMS)

SDI 505 - Minimum requirements for design and construction of transmission and zone substations

Substation Design Instruction SDI 524 - Fencing

Substation Design Instruction SDI 526 - Control cabling, panels and terminations

Drawing no. 057943 - Zone substation high voltage danger sign

Drawing no. 290016 - Substation 1050HZ cell room danger keep out sign detail

Drawing no. 299654 - Deluge shower sign wall mounted arrangement and detail

External

Work Health and Safety Act 2011 (NSW)

ENA National Electricity Network Safety Code (Doc 01-2008)

SafeWork Australia - Code of Practice - Confined Spaces 2016

AS 1319:1994 - Safety signs for the occupational environment

AS 2293.3:2005 - Emergency escape luminaires and exit signs

AS 2419.1:2005 - Fire hydrant installations - System design installation and commissioning

4.0 DEFINITIONS AND ABBREVIATIONS

Fire brigade booster assembly	Connecting device enabling the fire brigade to pressurise or pump water into a fire hydrant system.
Block plans	Drawing showing the location, size and ratings of all devices connected to the fire water system.
Fire hydrant	Assembly installed on a branch from a water pipeline, which provides a valve outlet to permit a supply of water to be taken from the pipeline for firefighting.
PCB	polychlorinated biphenyls
CMEN	combined multiple earthed neutral
High voltage	Any fully fenced or walled area, room or compartment identified by a

room/cage notice, containing exposed un-insulated high voltage conductors that do not maintain standard safety clearances.

5.0 ACTIONS

5.1 General

Items that are required to be operated or identified for operational, safety or maintenance reasons **must** be suitably labelled.

Signs and labels **must** be located in a position that it is both prominent and legible under all likely viewing conditions. Care **must** be taken to position the signs where they are not expected to be blocked by future equipment.

Operational equipment **must** be labelled as indicated in the single line diagram for the specific location.

Where a particular need is identified, one-off type signs **must** be designed and fitted in accordance with this standard. For example, where there is a low busbar clearance, *Hazard Danger* signs in accordance with AS 1319 **must** be provided to identify the *Low Busbar Clearance*.

Unless otherwise indicated, the message content of a sign may be in text or symbols, or a combination of these.

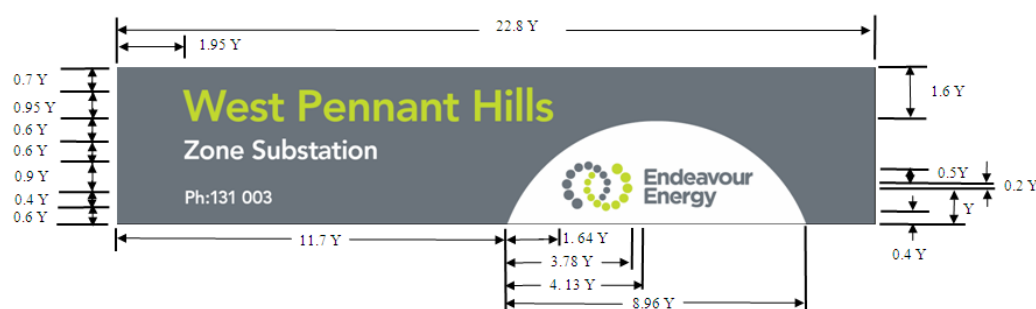
All signs and labels **must** be designed according to AS 1319 or AS 2293 as appropriate. All details such as letter sizes, colours, mounting heights, shapes and overall signage sizes **must** be in accordance with the appropriate standard. Refer also to Annexure 10. All labels, signs and fixing **must** be highly durable and suitable for the particular application and environmental conditions that they will be exposed to.

5.2 Substation name

A sign **must** be mounted with the following information in a prominent position, and visible from the street:

1. Endeavour Energy name.
2. Endeavour Energy logo.
3. Substation name.
4. An emergency contact phone number.

Example shows typical sign and proportional relationships.



"Y" = 150mm on the largest sign, however "Y" can be reduced where the use of a smaller sign is more suitable.

The sign **must** be designed according to specifications set out in the Endeavour Energy Brand Guidelines 2011.

The sign **must** be made from non-corrosive material, such as stainless steel or aluminium (minimum 3mm thick).

5.3 Multi-message sign

In order to reduce the number of signs around the substation entrances, while continuing to communicate all site risks in a clear and concise way, a multi-message sign **must** be fitted at the main pedestrian entry into the substation and at the main building entrance.

An example is shown below.

WARNING YOUR RESPONSIBILITY FOR ENTERING REQUIRES THE FOLLOWING TO BE READ AND FOLLOWED		
	ACCESS WAYS GIVING ENTRANCE INTO ELECTRICAL STATIONS SHALL ALWAYS BE LOCKED WHEN NOT IN USE	
	HAZARDOUS MATERIAL AND CHEMICALS Review the <i>Hazardous Material and Chemical Register</i> in the manifest tube or on the Main Notice Board within the building	
	SMOKING IS PROHIBITED WITHIN BUILDINGS AND WITHIN 5M OF EXTERNAL OPENINGS	
	PROTECTIVE EQUIPMENT SHALL BE WORN IN THIS AREA	
	NO	SITE CONTAINS LEAD MATERIAL
	YES	SITE CONTAINS ASBESTOS MATERIAL
	YES	GREEN AND/OR GREEN/YELLOW COLOURED INSULATION ON PANEL WIRING COULD BE 400/230V A.C AND NOT EARTH POTENTIAL
	YES	CMEN CONNECTED
	NO	ISOLATED FENCE Do not connect fence to substation earth grid
	YES	HERITAGE LISTED BUILDING Modifications shall be approved by the Property Manager before commencement of work

The multi-message sign **must** be typically sized to an A3 sheet in landscape orientation.

Specific signage of a mandatory nature, asbestos signs and signs needed to warn passer-by's, such as "HV Keep Out" and signage relating to security **must** continue to be displayed as a single sign in accordance with this standard.

5.4 Main building entrance

The entrance into the control room that provides immediate access to the *main notice board* is identified by the position of the multi-message sign shown in clause 5.3; therefore, there is no requirement for further signage.

5.5 Personal protective equipment

In addition to general safety personal protective equipment (PPE), PPE clothing is required within the electrical station.

The need for PPE clothing **must** be identified on the multi-message sign shown in clause 5.3; therefore, there is no requirement for further signage.

5.6 Heritage listed buildings

Heritage listed buildings **must** be identified on the multi-message sign shown in clause 5.3; therefore, there is no requirement for further signage.

5.7 Emergency evacuation

Emergency evacuation signs **must** be fixed to the main pedestrian entrance to the site. For example:

Emergency evacuation process for Arndell Park zone substation

- Identify and inspect emergency assembly area and record this on the Worksite Hazard and Risk Assessment (WHRA).
- Identify best evacuation routes – keep evacuation routes clear of obstructions at all times.
- Confirm all persons onsite and visiting site are aware of the emergency assembly area and evacuation routes.
- Identify emergency communication provisions (land line or mobile phone), confirm operational and note on WHRA – advise all persons onsite and visiting the site of emergency communications provisions.
- In the event of an emergency confirm all persons on site evacuate the substation to the emergency assembly area as identified on the WHRA.
- Contact the emergency organisations required (000 or 112 from mobile phones) with:
 - **Arndell Park Zone Substation, cnr Walters Rd and Holbeche Rd, Arndell Park; and,**
 - **contact the Control Room: 1300 133 780.**
- Worksite Coordinator **must** confirm all persons have evacuated the substation.
- All persons should remain in the evacuation area until further advised by the Worksite Coordinator.
- Confirm clear access is available for emergency services.
- Verify the substation is secured and unauthorised access is prevented.
- Provide necessary advice to emergency services as required.

Signs indicating the emergency assembly area **must** be visible from all work areas.

Where the emergency assembly area is not clearly visible from all work areas, direction arrows **must** be used to show the most logical emergency evacuation path.

Emergency assembly area signs and direction arrows **must** be in accordance with Annexure 6.

5.8 Exit signs

Exit signs and arrows **must** be located within buildings at all exits and at suitable positions to direct individuals to exits.

5.9 Unusual conditions

Unusual conditions **must** be noted on the *main notice board*, which is located above the operator desk.

5.10 Fire

5.10.1 Fire extinguishers

All fire extinguishers **must** be identified with a *Fire* sign located above every fire extinguisher to indicate the presence of the fire extinguisher.

For example:



A sign indicating its intended use **must** be located immediately alongside the fire extinguisher.

For example:



5.10.2 Fire blankets

Fire blankets **must** be identified with a *Fire* sign located in close proximity to each fire blanket to indicate the presence of the fire blanket.

For example:



A sign indicating if the blanket is suitable or unsuitable for electrical fires **must** be located alongside the fire blanket.

5.10.3 Fire hydrants

Fire hydrants **must** be identified with a *Fire* sign located in close proximity to the fire brigade booster assembly enclosure to indicate the presence of the fire hydrant booster.

For example:

FIRE
HYDRANT
BOOSTER

Block plans constructed in accordance with AS 2419.1 **must** be fixed within the fire hydrant enclosure or within the fire brigade booster enclosure and also adjacent to the main personnel entrance where fire-fighters and others responding to an alarm can readily see them. An example of a fire block plan is shown in Annexure 9.

5.10.4 Fire protection systems

At sites with existing fire protection systems, a *Fire* sign indicating the presence of a fire protection system **must** be mounted on the outside of the substation building external doors that provide access to the protected area.

Signs **must** read:

FIRE PROTECTION
SYSTEM INSTALLED

Signage providing information on how to reset the alarm **must** be mounted adjacent to the fire panel.

5.10.5 Internal doors

All internal doors **must** have a *Fire* sign on both sides of the door.

Signs **must** read:

DOOR TO BE CLOSED
WHEN NOT IN USE

Where fire doors are required in accordance with the Building Code of Australia (BCA), the signage requirements outlined in the BCA **must** be followed.

For example:

FIRE SAFETY DOOR
DO NOT OBSTRUCT
DO NOT KEEP OPEN

5.10.6 Decommissioned fire protection equipment

All decommissioned fire protection equipment **must** have a *Fire* sign located as close as possible to the decommissioned equipment.

Signs **must** read:

DECOMMISSIONED
EQUIPMENT

5.10.7 Fire system impairment notices

An A4 size clear plastic document holder **must** be mounted adjacent to the fire indicator panel to house fire protection system impairment notices.

5.11 Danger signs

5.11.1 High voltage keep out

The following locations **must** be fitted with a *Hazard Danger* sign indicating the words *High Voltage Keep Out* as shown on Drawing no. 057943.

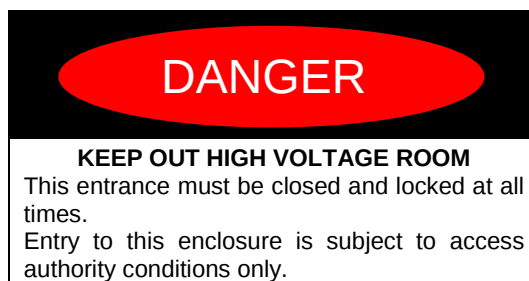
- All main access ways such as substation entrances and building entrance doors,

- On every third panel along the perimeter fence (including sites adjoining private property).

5.11.2 High voltage enclosures

All high voltage enclosures where entry is subject to access authority conditions **must** have a *Hazard Danger* sign mounted on the door leading into the enclosure.

Signs **must** read:



5.12 Potential and confirmed confined spaces

Potential confined spaces must be assessed by a competent person, to determine whether they are designated as a confined space. In accordance with the SafeWork Australia "Code of Practice – Confined Spaces", confirmed confined spaces entrances must have approved signage and restricted access – refer to WHS Business Partner.

For example:



5.13 Earthing

5.13.1 CMEN systems only

Earthing in some zone substations has been designed to be connected to the CMEN system. The cable sheaths on feeder cables at these substations are connected to the earth at the substation end, as well as to the earth at the remote end, such as to the distribution substation earth-grid.

The following *Hazard Warning* label **must** be fixed to both ends of the cable at the earth connection points.

Labels **must** read:



Where the label cannot be fixed to the power cable or interconnecting earthing conductor, it **must** be fitted in a prominent position on the switchgear adjacent to the cable.

5.13.2 Separately earthed substation fences

Fences that are not earthed to the substation earth grid **must** be identified on the multi-message sign shown in clause 5.3; therefore, there is no requirement for further signage.

5.13.3 Earth link boxes

All earth link boxes **must** be fitted with a *Hazard Warning* label.

Labels **must** read:

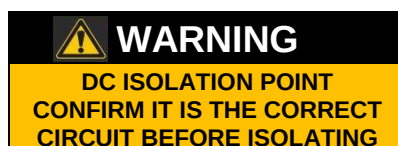


5.14 DC isolation points

Critical DC isolation points for DC supplies and protection systems **must** have signs identifying the isolation point to warn against unintentional operation.

Critical DC isolation points are those that could result in station battery or protection system complete loss of supply.

Labels **must** read:

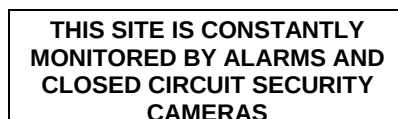


5.15 Security

5.15.1 Security equipment notice

Substations **must** have signs indicating the presence of security equipment. They **must** be fitted to the outside of the substation building perimeter doors, including the basement doors. The sign **must** be typically black writing on a white background.

Signs **must** read:

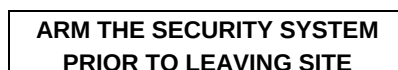


Larger signs stating the above **must** be installed on the outside of the substation fence line, a minimum of one every 30 metres. Commercially available signs that convey a similar message using wording or symbols, or a combination of these can be used for this purpose.

5.15.2 Security system arming notice

Signs to remind individuals to arm the security system **must** be placed in a prominent position, for example on the inside of the substation control building main exit door when the security panel is located within the building. The sign **must** be typically black writing on a white background.

Signs **must** read:



Instructions on how to enable and disable the security system, and other instructions deemed to be relevant to persons operating the system, **must** be provided at, or adjacent to the security panel. Instructions **must** be obvious and legible.

These signs **must** not include any of the service provider's details, for example, advertising or phone numbers. This type of detail is strictly limited to the control panels and external siren or bells.

5.15.3 *DataDot – spray packs and signs*

A product called *DataDot* is used to enable the identification of Endeavour Energy's assets, such as copper cables. This product is available in store under stock code 001554815, and it can be sprayed onto equipment to enable the identification of any stolen items that have been recovered.

The program includes spraying the *DataDot* product onto cable or equipment, as well as the installation of signs to advise that the equipment is identifiable.

The *Crime Stoppers* telephone number has been included on the signs to encourage staff and the public to report all crime or suspicious behaviour.

The *DataDot* warning sign is available in store under stock code 001554823.

The signs are required to be placed on the access gates and along the perimeter fence every four (4) to five (5) panels.

Where the site is not enclosed by intruder resistant fences the signs **must** be fitted adjacent to the access doors into the building.

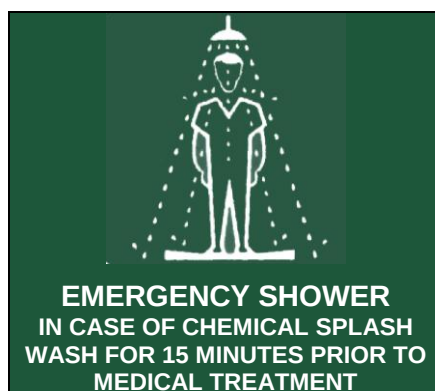
5.16 Emergency shower and eyewash systems

5.16.1 *Emergency shower*

Emergency deluge showers **must** be fitted with an *Emergency Information* sign to identify the shower and to also identify the need to wash for 15 minutes prior to medical treatment if a chemical splash occurs.

Sign size and pictorial representation **must** be as shown on Drawing no. 299654.

For example:



Other signage relevant to the correct operation of the shower system **must** also be fitted. The sign **must** be typically black writing on a white background.

For example:

**Deluge shower valve to be
left on at all times**

5.16.2 Eyewash systems

Eyewash systems **must** have an *Emergency Information* sign to identify the eyewash station.

For example:



5.17 Smoking

Substation battery rooms and battery room doors **must** have *Prohibition* signs indicating that there is to be no smoking.

For example:



Smoking restrictions in other areas **must** be identified on the multi-message sign shown in clause 5.3; therefore, there is no requirement for further signage.

5.18 Toilet

Toilet entrance doors **must** have a toilet sign. The sign **must** be typically black writing on a white background.

For example:

TOILET

5.19 Materials and chemicals

5.19.1 Site hazardous material and chemicals

To advise all persons entering a site of the presence of hazardous materials and chemicals, signage **must** be located at the main pedestrian entrance to the site and be clearly visible from the street frontage.

The sign **must** read:



HAZCHEM **must** be in red letters 100mm high on white background.

HAZARDOUS MATERIAL AND CHEMICALS **must** be in black letters on white background.

5.19.2 Hazardous material and chemical register

Two copies of the site *hazardous material and chemical register* in accordance with the example shown in Annexure 7 **must** be available at the site.

Each copy **must** be placed in a plastic A4 folder with a clear front cover, and relevant reports (such as asbestos & MSDS information) **must** be included in the folder behind the *hazardous material and chemical register* information.

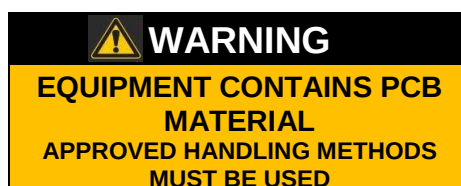
The two plastic A4 folders **must** be located as follows:

- One (1) **must** be available inside a container fixed adjacent to the HAZCHEM signage in a readily accessible but secure location, inside the substation yard. The container **must** be manufactured from 100mm uPVC tubing, 400mm long, with screw cap on both ends. The screw cap **must** be easily removable.
- The second **must** be placed in an A4 portrait acrylic brochure holder, located adjacent to *main notice board* within the building.

5.19.3 PCB

Any equipment that has a PCB content of more than two (2) parts per million **must** be fitted with a *Hazard Warning* label.

Labels **must** read:



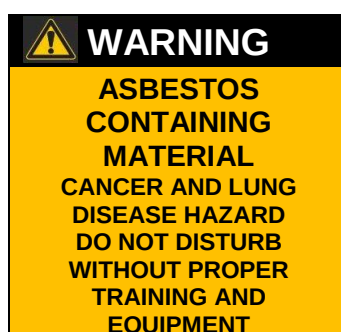
5.19.4 Asbestos materials

The presence of asbestos **must** be identified on the multi-message sign shown in clause 5.3.

In addition, all material and equipment that contains asbestos **must** be fitted with a *Hazard Warning* label.

The label **must** be fitted in a visible position as close as possible to the asbestos material.

For example:



Furthermore, where the asbestos is contained within a specific type of equipment the same specific type of equipment within the substation that does not contain asbestos **must** be fitted with a label that identifies the item as *not containing asbestos*.

The label **must** be typically black writing on a white background.

Labels **must** read:

ITEM DOES NOT CONTAIN ASBESTOS

For example, if particular equipment such as a GCN circuit breaker has been identified in substation “A” as containing asbestos, then all of the asbestos contaminated GCN circuit breakers within substation “A” **must** be identified with a label indicating that they contain asbestos. In addition, all of the GCN circuit breakers in substation “A” that do not contain asbestos **must** be fitted with a label indicating that they do not contain asbestos.

5.19.5 Transformers containing inhibited oil

Transformers and tap changers containing regenerated oil or inhibited oil **must** have a label fixed to the oil filling points of the main tank as well as the tap changer. The label **must** be typically black writing on a white background.

Signs **must** read:

USE INHIBITED OIL ONLY

5.19.6 Oil containment bunds

All oil containment bunds, with drain valves fitted and where oil separators have not yet been installed, are required to have a sign attached to the outside of the bund wall adjacent to the drain valve. The sign **must** be typically black writing on a white background.

Signs **must** read:

BUND DRAIN VALVE TO BE KEPT CLOSED AND LOCKED
--

5.20 Main notice board

A *main notice board* **must** be installed in all substation control rooms, above the operator’s desk, immediately accessible from the main building entrance (typically the control room entrance).

Option 1 (below) is preferred; however, option 2 may be used at locations where there are space constraints.

An example of option 1 is shown as a two (2) piece sign in Annexure 1, and option 2 is shown as a three (3) piece sign in Annexure 2.

5.20.1 Additional signage

Section 1B from the *main notice board*, option 2, **must** be mounted in readily seen areas of other main substation equipment rooms.

These rooms **must** include (but not necessarily be limited to) indoor switchgear rooms.

5.20.2 Mounting requirements

The posters **must** be arranged on a suitable backing board, such as cork or perforated foam board (pin board should not be used as it can be susceptible to white ant attack). A sliding glass door cabinet, or transparent plastic sheet laid over the top of the board, sandwiching the posters, **must** be used for protection against soiling and other damage.

The mounting arrangement **must** allow the individual posters to be readily changed or updated as required.

The Main Notice Board **must** be securely fixed to the wall.

5.21 Notices and posters

The notices and posters to be included on the Main Notice Board are listed below.

5.21.1 Substation familiarisation poster

The substation familiarisation poster **must** be in A4 size, landscape format as shown in the example in Annexure 3.

5.21.2 Emergency services poster

The emergency services poster **must** be in A4 size, landscape format, and separate from the body of the *main notice board*. It **must** be laminated, mounted and displayed on the wall immediately above the telephone.

The poster **must** contain the telephone numbers necessary for an emergency, as well as providing System Operations numbers that may be used in an emergency or upon entry to a substation.

An example of the emergency services poster is shown in Annexure 4.

All substations with medical emergency buttons **must** reference the medical emergency button on the emergency services poster.

5.21.3 Single line diagram poster

The single line diagram posters **must** be laminated A2 size, landscape format. The most recent single line diagrams **must** be used.

5.21.4 Low voltage rescue poster

This poster is an Endeavour Energy design, and can be obtained through Health and Safety at Huntingwood.

The poster **must** be laminated A3, size portrait format.

5.21.5 Resuscitation poster

The resuscitation poster **must** be obtained from the Department of Minerals and Energy. The poster **must** be laminated A3 size, in portrait format.

5.21.6 Burns treatment poster

The burns poster **must** be obtained from the Australian Red Cross organisation.

The poster **must** be laminated A3 size, in portrait format.

5.21.7 Hazardous material and chemical register

The *hazardous material and chemical register* in accordance with clause 5.19.2 **must** be placed in an A4 portrait acrylic brochure holder, fixed adjacent to the main notice board within the building.

5.21.8 Environmental risk documentation

The environmental risk documentation **must** be placed in an A4 portrait acrylic brochure holder, located adjacent to *main notice board* within the building.

The environmental risk cover sheet **must** be laminated, and if no risks have been identified, this document **must** state that there are no identified risks.

The environmental risk cover sheet forms the title page for an Environmental Management Plan should one be required.

5.22 Phase identification labels

Coloured phase identification markers are required on all outdoor equipment, including busbar supports, to indicate busbar phasing.

5.23 Indoor equipment

For indoor equipment, labels **must** be manufactured from laminated PVC or similar material and **must** be engraved to produce black writing on a white background unless indicated otherwise.

The minimum lettering sizes must be in accordance with AS 1319. As indicated in AS 1319, these lettering sizes must be increased when labels are in poor lighting conditions, or are located in less prominent positions.

Labels **must** be attached with double-sided adhesive tape, or screwed to the panel.

5.23.1 Operational equipment

Operational equipment **must** be labelled on consecutive lines as follows.

For 33kV, 66kV and 132kV equipment:

Line 1 - item *number* that the equipment relates to (for example, the feeder number),
Line 2 - item *name* that the equipment relates to (for example, the feeder name or transformer name, and the like),
Line 3 - operational *number*.

For example:

FDR 7112 NTH WOLLONGONG ZS CB CR3285

In the following examples, the item *number* is not applicable and is therefore omitted.

TRANSFORMER NO. 1 CB CR3529
--

BUS SECTION A-B CB CR3670
--

For 11kV and 22kV equipment:

Line 1 - item *name* that the equipment relates to (for example, the feeder name or transformer name, and the like),

Line 2 - operational *number*.

For example:

MORPHETT STREET CB CR1525		
TRANSFORMER NO. 2 CB CS1525		BUS SECTION 1A-1B CB NE1693

The labels **must** be fitted to the equipment as follows:

- To the front of fixed equipment.

The label **must** be fixed to non-removable items on the equipment.

Where the label is fitted to a hinged door and there are multiple hinged doors on the panel, then the label **must** be fitted to each hinged door.

- To the rear of the fixed equipment.

The label **must** be fixed to non-removable items on the equipment.

Where required, brackets **must** be fabricated to verify that the label is only fitted to the fixed (non-removable) part of the equipment.

- To the front of removable equipment such as circuit breaker trucks.
- To the **basement** cable supporting steelwork underneath switchgear fitted with plug in type connections (for example Pfisterer connections or similar); to identify the equipment that the plug in cable is connected to.

On switchboards where more than one busbar earth-switch is located on the same circuit breaker panel or where earth-switches are installed and it is not obvious as to which busbar the earth-switch will close on to, a label indicating the position or direction of the respective busbar **must** be affixed in addition to the earth-switch operational number label.

All fuse bases are to have a label attached indicating the type of link to be fitted to the fuse carrier. This label **must** indicate either:

- rating in Amps for fuse links (for example, 16A); or,
- link (LK), where solid link is to be fitted.

Where indoor equipment is enclosed within a separate room, the entrance door into the room **must** be fitted with a label to identify the equipment within the room.

For example:

INJECTION CELL No. 1
BATTERY ROOM No. 1

5.23.2 Control wiring

Where terminals carry 230V AC wiring they **must** have a warning label fitted either on the terminal or in a suitable position adjacent to the terminals.

Labels **must** read:



5.24 Outdoor equipment

All outdoor equipment, or equipment that may be subject to the elements, **must** have labels/signs manufactured from aluminium and in the dimensions shown in the following table.

The lettering **must** be black on a yellow background.

The labels **must** be attached with corrosion resistant bolts.

Estimated quantities shown in the table are for a two (2) transformer and two (2) HV feeder substation.

Equipment	Label size in mm		Estimated quantity	
	Large	Small (half-size)	Large	Small
	height x length	height x length		
Main transformers	450 * 250	225 * 125	2	2
Earthing transformer	450 * 250	-	2	-
Circuit breaker	450 * 250	225 * 125	5	5
Disconnectors	150 * 250	75 * 125	8	8
Earthing switches	150 * 250	-	4	-
Voltage transformers	150 * 250	-	4	-
Current transformers	150 * 250	-	8	-

Operational equipment **must** be labelled on consecutive lines on the sign as follows:

Line 1 - item *number* that the equipment relates to (for example, the feeder number),
 Line 2 – *name* of equipment type (for example, bus earth switch),
 Line 3 - operational *number*.

For example:



5.25 Electrical circuits and control panels

Refer to SDI 526.

6.0 AUTHORITIES AND RESPONSIBILITIES

Manager Asset Standards & Design has the authority and responsibility for approving the amendments to this Standard in accordance with GAM0001.

Substation Assets Manager, Asset Standards & Design has the authority and responsibility for keeping the content of this instruction up to date.

All **Endeavour Energy employees and/or contractors** have the authority and responsibility for:

- Meeting the requirements of this instruction and SDI 505;
- Working in accordance with local and statutory requirements;
- Maintaining public safety; and
- Working in accordance with Endeavour Energy's Electrical Safety Rules.

All **Project Managers** have the authority and responsibility for:

- Meeting the requirements of this instruction within their area of responsibility;
- Arranging for potential confined spaces to be assessed by a competent person, and to restrict access and fit approved signage to confirmed confined spaces entrances in conjunction with WHS Business Partner;
- Confirming that Endeavour Energy employees and/or contractors engaged to perform the work have appropriate qualifications; and
- Verifying that appropriate equipment details are entered into the Ellipse database as part of the work.

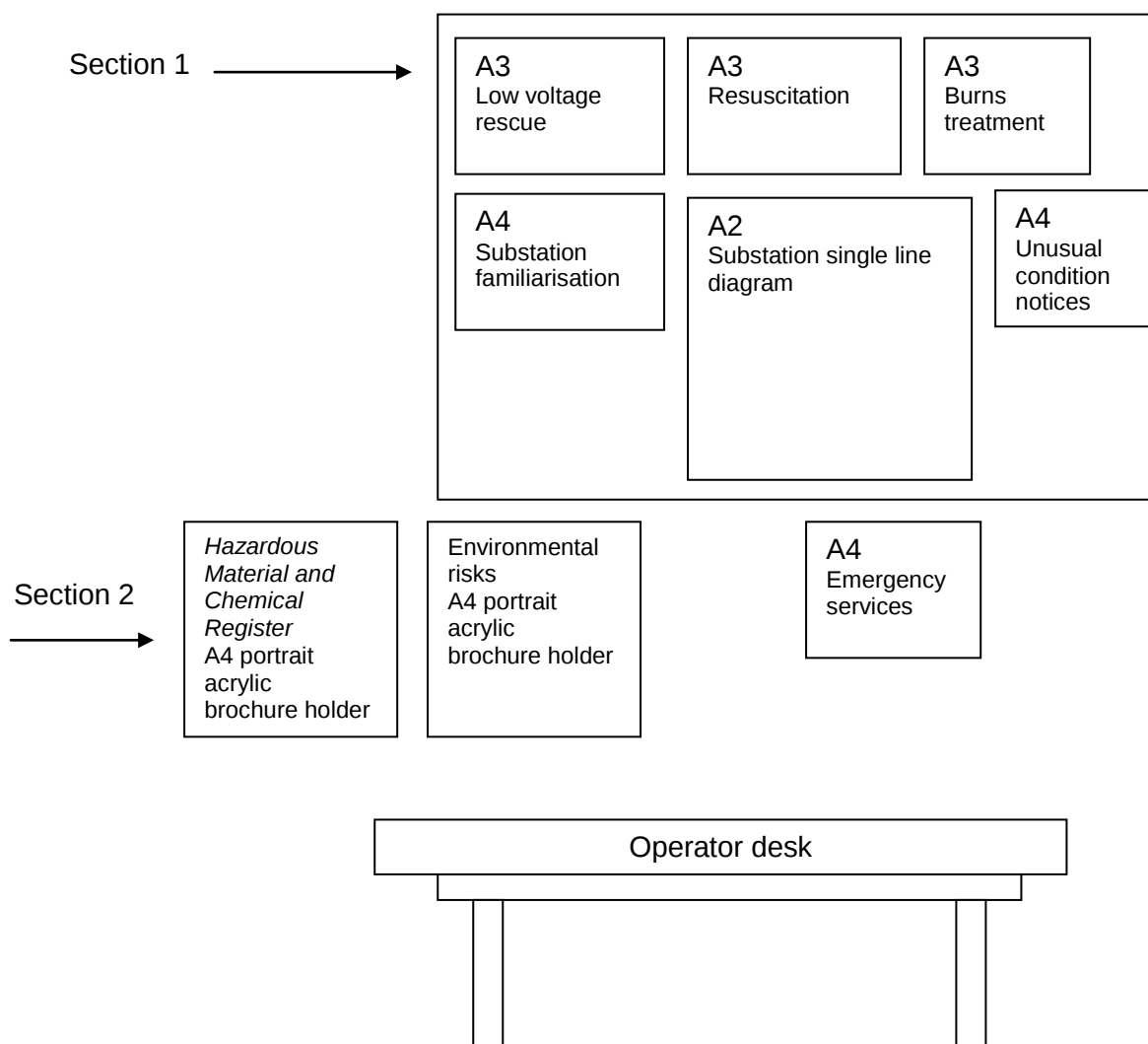
All **Regional Transmission Managers** have the authority and responsibility for:

- Preparing, fixing and maintaining all labels and signs.

7.0 DOCUMENT CONTROL

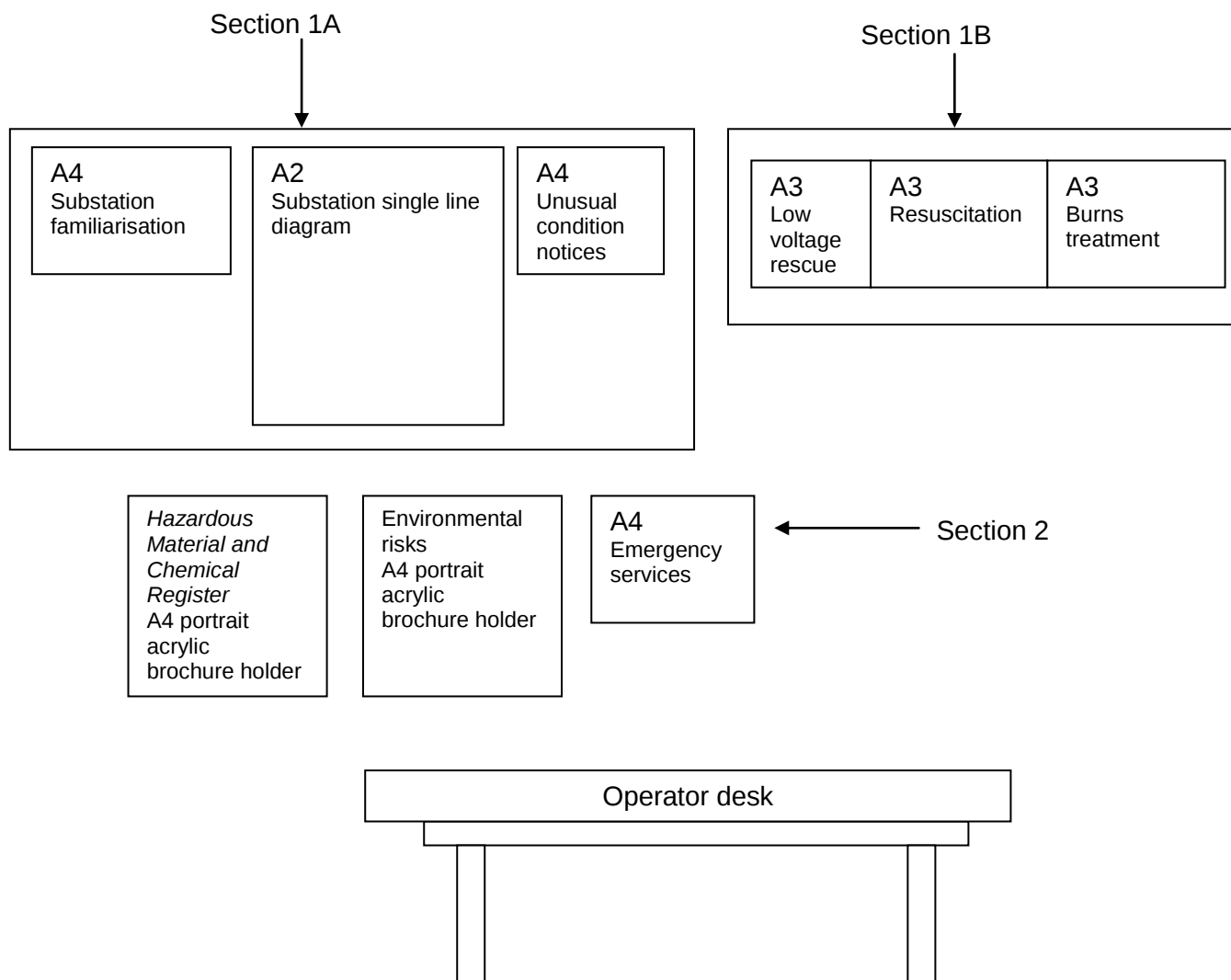
Documentation content coordinator:	Substation Assets Manager,
Documentation process coordinator:	Branch Process Coordinator

Annexure 1: Main notice board, option 1



Option 1 - Preferred option - main notice boards

Annexure 2: Main notice board, option 2



Option 2 - Main notice board - alternative option to be used in areas where option 1 cannot be fitted.

Annexure 3: Substation familiarisation sign

SUBSTATION FAMILIARISATION

Upon arrival on site at this substation persons are to:

- 1 **Check** that substation **telephones and communications are working.**
- 2 **Notify** the **Call Centre representative** on **1300 133 780** of:
 - **Identity** of the **caller.**
 - **Number of persons** in the party.
 - **Likely duration of stay.**
 - **Reason for visit, nature of work, restrictions on equipment** caused by work.
- 3 **Identify** location and condition of **Safety Equipment and Signs.**
- 4 **Identify Entrances and Exits and Assembly Areas**, check doors are not obstructed and work properly.
- 5 **Before departing, notify the Call Centre** of your intention to depart.

Annexure 4: Emergency services sign

The contact numbers shown are for example only.

Please indicate on the sign if a *dial out digit* is required to gain a phone signal.

EMERGENCY SERVICES

MEDICAL EMERGENCY – PRESS MEDICAL EMERGENCY BUTTON

- 1 Dial: 000 or 112 from mobile phone.
- 2 Give department required: AMBULANCE, POLICE, FIRE, RESCUE
- 3 Give: NUMBER OF PEOPLE INJURED and NATURE OF INJURIES
- 4 Give address: WALTERS RD, ARNDELL PARK, NSW
and nearest intersection: HOLBECHE RD
- 5 Give:..... YOUR NAME
and telephone number you are calling from:.....(02) 9672 1354
- 6 Notify System Operations:
Network Controller North1300 267 802
Control Room General Huntingwood1300 263 758
Endeavour Energy switchboard131 081

Annexure 5: Quick reference for signs and locations

Sign Location	Substation name	Fire block plan	Fire blanket	Fire hydrant	Fire extinguisher	Main safety/posters	Security alarm warning	Fire protection warning	Safety clothing required	Hazmat / chemical information and chemical manifest	PCB warning	No asbestos	Asbestos	Drain valve	No smoking	Equipment identification	Danger HV keep out	Check air quality	Toilet sign	Exit signs and arrows	Emergency shower	Keep out high voltage cage/room	Emergency assembly area	Isolated fence	Unusual condition	Emergency evacuation	DataDot warning signs
Visible from street	X																										
Perimeter fence							X										X										X
Main entrance gate/door																	X									X	
Adjacent to main entrance gate or door		X								X													X				
Substation building entrance door							X	X									X										
Cable basement doors							X											X									
Toilet door																			X								
Battery room															X	X											
Above desk in building						X																			X		
Adjacent to desk in building										X																	
Inside substation building																				X							
Fire hydrant enclosure		X		X																							
HV cage/room entrance																X						X					
Oil containment bund														X													
At or above fire fighting equipment			X	X	X																						
Emergency shower																					X						
Scheduled PCB equip.											X																
Materials containing asbestos													X														
Equipment not containing asbestos												X															

Annexure 5 (cont.)

Sign Location	Warning low busbar or clearance	MEN system	Decommissioned equipment	Heritage listed building	Fire door sign	Fire system impairment	CMEN warning	Use Inhibited oil only	Earth link box Warning do not disconnect	CB no.	Multi-message sign	240V AC warning												
At busbars with low clearance	X																							
Earthing points at MEN substations		X																						
Decommissioned equipment			X																					
Fire doors					X																			
Impaired fire protection equipment						X																		
CMEN earth points							X																	
Transformers with inhibited oil								X																
Earth link box									X															
Basement cables with Pfisterer fittings										X														
Main pedestrian entry into the substation and at the main building entrance											X													
Control wiring AC terminals												X												

Annexure 6: Emergency assembly area signage

Emergency assembly area sign of minimum size 600mm X 450mm must be visible from work areas.



Direction arrows are used where emergency assembly area is not clearly visible from work area. Arrows show the most logical emergency evacuation path and are required only where the emergency assembly area sign is not visible.



Annexure 7: Example of a site hazardous material and chemical register

SAFETY NOTICE

 Endeavour Energy	Site Hazardous Material and Chemical Register MSDS Information		
Site / Asset:	Cabramatta ZS	Asset No:	TZ9552
Type:	Network	Asset Owner:	Transmission Manager Central
Substation No:	9552	Address:	16-18 Cabramatta Road, East Cabramatta
Sub Type:	Zone Substation	Region:	Central

Chemicals & total quantity located on site (refer to folder for detailed copies of MSDS information)					
☒	Transformer oil	40,000L	☐	Diesel	
☒	Silica Gel	24kg	☐	Engine Oil	
☐	SF6		☐	Coolant	
☐	Jarylec C101 (In capacitor cans)		☐	Sulphuric Acid (In batteries)	
☐	DTE (In ABB Capacitor Cans)		☐	NiCad (in batteries)	
☐	Pitch		☒	Lead acid (In batteries)	18L
☐	PCB (In Power transformers: S, Capacitors: NS)		☐	CO ₂ gas (In Transformer enclosure fire system, fire extinguishers)	
			☐	Other <i>please indicate</i>	

	Risk Rating	Location	Hazardous material	Condition	Risk status	Recommendation
	3	(76414-9552-01) Transformer yard conduits, various locations, electrical equipment	Asbestos Non-Friable	Fair	Low	Encapsulate / contain and label
*		(76414-9552-02) Transformer yard high voltage cables, adjacent transformer No. 2, electrical equipment	Asbestos			
	4	(MG/001) Eaves, perimeter of building, building	Asbestos non-friable	Good	Low	Label and maintain
*		(MG/003) Feeder cables, basement, electrical equipment	Asbestos			
*		Throughout building	Synthetic mineral fibres			
*		(Not sampled: height restricted), various locations, ceiling, control room, building	PCB			
*		Transformer yard various locations, throughout, other	Lead paint			
*		Throughout, building	Lead dust			
	2	33kV, circuit breaker 9552SA03CB00Y048, electrical equipment	Asbestos friable	Good	Low	Controlled removal
	2	33kV, circuit breaker 9552SA03CB00Y059, electrical equipment	Asbestos friable	Good	Low	Controlled removal
	2	33kV, circuit breaker 9552SA03CB00Y058, electrical equipment	Asbestos friable	Good	Low	Controlled removal
	2	33kV, circuit breaker 9552SA03CB00Y047, electrical equipment	Asbestos friable	Good	Low	Controlled removal
*		A341 Control cabinet, 11kV CB, electrical equipment	Asbestos friable			
*		(5719-AsbP3) A344 housing, 11kV CB, electrical equipment	Asbestos			
*		(5753-AsbL2) A339 housing, 11kV CB, electrical equipment	Asbestos			
	1	(5879-Asb 1) A338 Control cabinet, 11kV CB, electrical equipment	Asbestos friable	Fair	Medium	Controlled removal
	1	(5879-Asb 2) A337 Control cabinet, 11kV CB, electrical equipment	Asbestos friable	Fair	Medium	Controlled removal

Substation signs and equipment labels
Amendment no. 6

1	(5879-Asb 5) A339 Control cabinet, 11kV CB, electrical equipment	Asbestos friable	Fair	Medium	Controlled removal
1	(5879-Asb 6) A343 Control cabinet, 11kV CB, electrical equipment	Asbestos friable	Fair	Medium	Controlled removal
1	(5879-Asb 7) A344 Control cabinet, 11kV CB, electrical equipment	Asbestos friable	Fair	Medium	Controlled removal
1	(5879-Asb 8) A338 Control cabinet, 11kV CB, electrical equipment	Asbestos friable	Fair	Medium	Controlled removal
1	(5879-Asb 9) A347 Control cabinet, 11kV CB, electrical equipment	Asbestos friable	Fair	Medium	Controlled removal
1	(5879-Asb 10) A348 Control cabinet, 11kV CB, electrical equipment	Asbestos friable	Fair	Medium	Controlled removal
1	(5879-Asb 11) A350 Control cabinet, 11kV CB, electrical equipment	Asbestos friable	Fair	Medium	Controlled removal
4	(MG/002) South east corner, fuse link board, substation building, electrical equipment	Asbestos non-friable	Good	Low	Label and maintain

Updated: September 2013

Hazardous Material: *Indicates no HAZMAT present

PCB material:

Scheduled: S

Non-scheduled: NS

Annexure 8: Environmental risks

An example of an environment risk cover sheet is provided below.



Environment Risks

RISKS

- CONTAMINATED SOIL ON SITE

CONTROLS

- IN THE EVENT OF EXCAVATION, THE FOLLOWING PPE IS REQUIRED:



WEAR PROTECTIVE GLOVES



WEAR DUST MASK IN WINDY OR DUSTY CONDITIONS



WASH HANDS PRIOR TO EATING, DRINKING OR LEAVING SITE

- WASTE DISPOSAL



SOIL MUST BE ASSESSED FOR CONTAMINATION PRIOR TO DISPOSAL FROM SITE



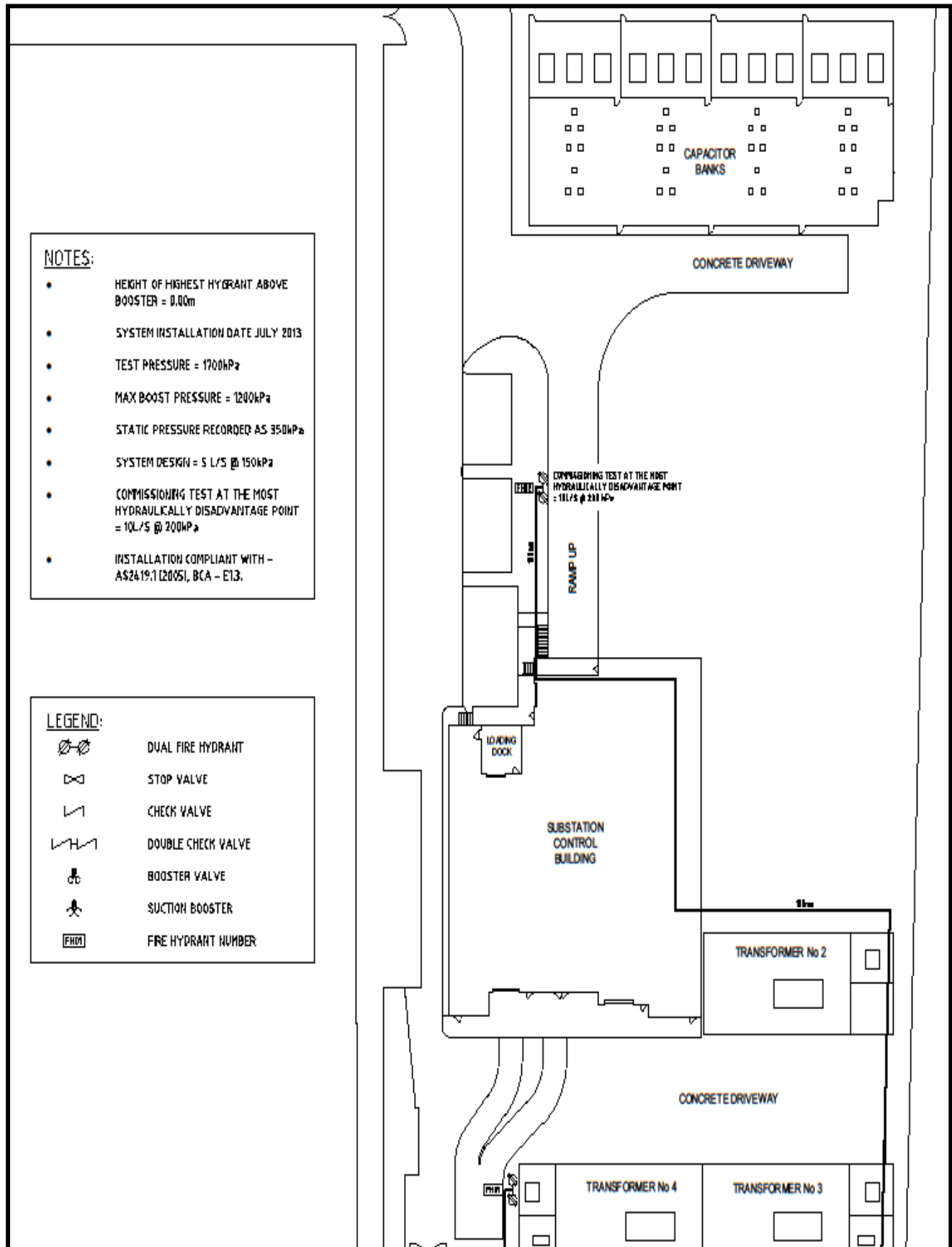
OIL FILLED ELECTRICAL EQUIPMENT MAY CONTAIN PCBs AND MUST BE ASSESSED PRIOR TO DISPOSAL

INFORMATION

For further information, refer to Environment Management Plan or contact the Manager Safety & Environmental Services, 8 4183. Substation

Updated: "include date"

Annexure 9: Typical fire block plan



Annexure 10: Signage colour and shape requirements

Sign Function Sign Function	Symbolic shape	Legend colour	Reference
Regulatory Prohibition		Black	AS1319
Regulatory Mandatory		White	
Regulatory restriction		Black	
Hazard Warning		Black	
Hazard Danger		Black	
Emergency Information		White	
Fire Sign		White	AS 2293.3
Exit sign		White	