



Asset Planning and Delivery Group
Engineering

DESIGN STANDARD DS 79-04

Chemical Signage, Labelling and Markers

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REVISION 0

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FOREWORD

The intent of Design Standards is to specify requirements that assure effective design and delivery of fit for purpose Water Corporation infrastructure assets for best whole-of-life value with least risk to Corporation service standards and safety. Design standards are also intended to promote uniformity of approach by asset designers, drafters and constructors to the design, construction, commissioning and delivery of water infrastructure and to the compatibility of new infrastructure with existing like infrastructure.

Design Standards draw on the asset design, management and field operational experience gained and documented by the Corporation and by the water industry generally over time. They are intended for application by Corporation staff, designers, constructors and land developers to the planning, design, construction and commissioning of Corporation infrastructure including water services provided by land developers for takeover by the Corporation.

Nothing in this Design Standard diminishes the responsibility of designers and constructors for applying the requirements of WA WHS General Regulations 2022 (Part 6.2 – Duties of designer of structure and person who commissions construction work) to the delivery of Corporation assets. Information on these statutory requirements may be viewed at the following web site location:

https://www.legislation.wa.gov.au/legislation/statutes.nsf/law_s53267.html

Enquiries relating to the technical content of a Design Standard should be directed to the Senior Principal Engineer Water Treatment, Advisory Section, Engineering. Future Design Standard changes, if any, will be issued to registered Design Standard users as and when published.

Head of Engineering

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REVISION STATUS

The revision status of this standard is shown section by section below:

REVISION STATUS						
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DESIGN STANDARD DS 79.4

Chemical Signage, Labelling and Markers

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1 Introduction

The purpose of this document is to summarise the Legislative and Water Corporation requirements concerning the installation of signage, labelling and markers at Water Corporation owned chemical facilities.

1.1 Scope

This standard applies to Water Corporation personnel and associated consultants and contractors during the design, construction, commissioning, operation and maintenance of treatment and chemical dosing plants, and includes depots that store and handle hazardous chemicals at Water Corporation sites.

1.2 Regulations and Standards

This design standard makes reference (directly or indirectly) to the following legislation and standards:

1.2.1 Department of Mines, Industry Regulation and Safety

1.2.1.1 Dangerous Goods Division

Legislation and Compliance requirements as contained at the website:

<http://www.dmp.wa.gov.au/Dangerous-Goods/Dangerous-Goods-258.aspx>

Dangerous Goods Safety Act 2004

Dangerous Goods Safety (Storage & Handling of Non-explosives) Regulations 2007

1.2.1.2 WorkSafe Division

Legislation and Compliance requirements as contained at the website:

<https://www.commerce.wa.gov.au/worksafe>

Work Health Safety Act 2020

Work Health Safety (General) Regulations 2022

1.2.2 Water Corporation Standards (Internal Reference Only)

S111 Water Source Protection Signage

S197 Public Safety & Site Security Signage

WC Hazardous Chemicals Procedure

Corporate Identity Style Guide

1.2.3 Australian Standards

AS1319 Safety Signs for the Occupational Environment

AS1345 Identification of the Contents of Pipes, Conduits and Ducts

AS1596 The Storage & Handling of LP Gas

AS1940 The Storage and Handling of Flammable and Combustible Liquids

AS2022 Anhydrous Ammonia – Storage and Handling

AS2700	Colour Standards for General Purposes
AS2927	The Storage and Handling of Liquefied Chlorine Gas
AS3780	The Storage and Handling of Corrosive Substances
AS3833	The Storage & Handling of Mixed Classes of DGs in Packages & IBCs
AS4326	The Storage & Handling of Oxidizing Agents
AS4332	The Storage & Handling of Gases in Cylinders
AS4452	The Storage and Handling of Toxic Substances

2 Types and Design of Signage

2.1 Classifications

The classification of signage within AS 1319 – 1994 Safety Signs for the Occupational Environment provides for four categories;

2.1.1 Regulatory signs

- a. Prohibition signs – these indicate that an action or activity is not permitted;
- b. Mandatory signs – these indicate that an instruction must be carried out;
- c. Limitation or restriction sign – signs that place a numerical or other defined limit on an activity or use of a facility.

2.1.2 Hazard signs

- a. Danger sign – warns of a particular hazard or hazardous condition that is likely to be life threatening.
- b. Warning sign – provides for the warning of a hazard not considered life threatening.

2.1.3 Emergency information signs

Provide information on the location and or direction to, emergency related facilities such as exits, safety equipment or first aid facilities.

2.1.4 Fire signs

Advise of the location of fire alarms and fire-fighting facilities.

2.2 Symbolic Colours and Shapes Applicable to Structural Elements

A comprehensive listing of colour and shape requirements is detailed within AS 1319 – 1994 Safety Signs for the Occupational Environment.

S197 “Public Safety & Site Security Signage”, provides summary examples of signage colours and shapes typically used at Water Corporation sites.

3 Dangerous Goods Specific Requirements

3.1 Placarding

Placarding provides a visual warning of the class, division or subsidiary hazard and the hazards associated with the storage of dangerous goods at a site. This is important information for Department of Fire and Emergency Services personnel in the event of an emergency. For consistency in the Water Corporation, placards shall be displayed for bulk dangerous goods or aggregated small packages, but not minor packages – refer Appendix A: Schedule 1 – Quantities of Dangerous Goods.

3.1.1 Outer Warning Placard

This Placard is required where the quantity of one or more classes or divisions of dangerous goods exceeds the placarding quantity for that specific class or division as per Appendix A: Schedule 1 – Quantities of Dangerous Goods. This Hazchem placard shall be posted at the main entrance and other vehicle entry points around the site.

An example Hazchem Placard (DS WCSS001_1) - <http://aqua/link/Link.aspx?doc=1083491>

3.1.2 Bulk Storage Placard

This Placard is required where a dangerous goods storage area has:

- a) a container that has a capacity greater than 500 L; or
- b) a container that may hold a capacity greater than 500 kg; or
- c) goods that are not in a container and there is an undivided quantity exceeding 500 kg.

A bulk storage placard is to be posted on the storage container and at the entrance(s) to the storage area.

An example Chlorine Bulk Placard (DS WCSS002_2) - <http://aqua/link/Link.aspx?doc=1083497>

Note: Bulk Diesel storage areas require a ‘COMBUSTIBLE LIQUID’ placard as per (DS WCSS023_1) - <http://aqua/link/?doc=1084076>

3.1.3 Package Storage Placard

This Placard is required where a quantity of dangerous goods are stored in a container that has:

- a) a capacity of not more than 500 L; or
- b) net mass not more than 500 kg.

A package placard shall be posted on the entrance to the storage compound/bund or on the wall near the DGs store.

An example Chlorine Package Placard (DS WCSS002_3) - <http://aqua/link/Link.aspx?doc=1083507>

4 General Safety Requirements

4.1 Labels and Markers

Labels and markers shall be provided to clearly identify to personnel any rooms, pipework and tanks that may contain hazardous chemicals and their status if it can change. An example is a Chemical Container or Equipment Status Label (DS WCSS400) - <http://aqua/link/Link.aspx?doc=1086198>

4.2 Building Signage Layout

Mandatory signage requirements for chlorine modules are detailed in the following standard drawings EO28-91-21 and EO28-91-24. Other facilities shall follow similar principles for signage as outlined in the Typical Signage Layouts below:

- Chlorine and FSA building : <http://aqua/link/Link.aspx?doc=1081272>
- Chlorine and Carbon Dioxide module: <http://aqua/link/Link.aspx?doc=1084968>

4.3 Chemical Pipe Identification

Exposed chemical pipework shall be colour coded in accordance with the Water Corporation's standard colour coding drawing EG71-1-1 which is based upon AS1345.

<http://aqua/link/Link.aspx?doc=1086678>.

Where colour painting is not practicable or desirable (e.g. stainless steel pipework, HDPE pipework), identification labels and colour banding labels shall be applied regularly enough along the pipework to ensure that personnel can readily identify the contents. Refer section 4.4.2.

4.4 Signage for Chemical Pipework

4.4.1 Signage for underground pipework

Hazard warning signs shall be posted to identify buried chemical lines as protection against potential heavy vehicle and/or excavation damage, and to aid their locating for repairs. Signs shall be positioned at every change of direction and at no more than 50m intervals. Lesser intervals shall be used where visual obstructions exist.

An example buried chemical pipework sign - <http://aqua/link/Link.aspx?doc=1085427> (DS WCSS154)

4.4.2 Markers for above and below ground pipework

Markers shall be applied to large and small pipework to provide highly visible indication of contents and direction(s) of flow.

An example Chemical marker for large pipework - <http://aqua/link/Link.aspx?doc=1086635> (DS WCSS156)

5 Comprehensive Listing of Plant Safety Signage

A Comprehensive listing of plant safety signage is available on cFolders OR on the Dangerous Goods Management website:

<https://.../adg/engineering/pages/SignageandChemicalEquipmentStandards.aspx>

APPENDIX A: Schedule 1 – Quantities of Dangerous Goods

Item	Description of dangerous goods	Packing group	Placarding quantity	Manifest quantity
1.	Division 2.1 except aerosols	N/A	500 L	5 000 L
2.	Division 2.2 except aerosols	N/A	1 000 L	10 000 L
3.	Division 2.3	N/A	50 L	500 L
4.	Division 2.1 and 2.2 aerosols	N/A	5 000 L	10 000 L
5.	Any one of Class 3, Division 4.1, 4.2 or 4.3, Division 5.1 or 5.2, Division 6.1, Class 8 or Class 9, or any combination of those classes or divisions	I	50 kg or L	500 kg or L
		II and III (aggregate)	1 000 kg or L	10 000 kg or L
		I, II and III (aggregate) where quantity of goods in packing group I does not exceed 50 kg or L	1 000 kg or L	10 000 kg or L
6.	Goods too dangerous to transport	N/A	5 kg or L	50 kg or L
7.	Combustible liquids with fire risk	N/A	1 000 L	10 000 L
8.	Other combustible liquids	N/A	10 000 L	100 000 L

Note: Packing Groups identify the degree of danger of the Dangerous Good:

- PG I – High
- PG II – Medium
- PG III – Low

END OF DOCUMENT