DESIGN STANDARD DS 79-04
Chemical Signage, Labelling and Markers

Asset Delivery Group
Engineering

VERSION 1
REVISION 0
DECEMBER 2018
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.

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Nothing in this Design Standard diminishes the responsibility of designers and constructors for applying the requirements of WA OSH Regulations 1996 (Division 12, Construction Industry – consultation on hazards and safety management) to the delivery of Corporation assets. Information on these statutory requirements may be viewed at the following web site location:


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

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# DESIGN STANDARD DS 79.4

## Chemical Signage, Labelling and Markers

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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 – Dangerous Goods Division

Legislation and Compliance requirements as contained at the website:


Dangerous Goods Safety Act 2004
Dangerous Goods Safety (Storage & Handling of Non-explosives) Regulations 2007

1.2.2 Worksafe Western Australia

WA Occupational Safety and Health Regulations 1996 - Regulation 3.11 Warning signs

1.2.3 Water Corporation Standards (Internal Reference Only)

SG111 Source Protection Signage Standard
S197 Site Security, Public Safety and OSH Signage
Corporate Identity Style Guide

1.2.4 Australian Standards

AS1319 Safety Signs for the Occupational Environment
AS1345 Identification of the Content of Pipes, Conduits and Ducts
AS1596 The Storage & Handling of LP Gas
AS1940 The Storage and Handling of Flammable and Combustible Liquids
AS2022 The Storage & Handling of Anhydrous Ammonia
AS2700 Colour Standards for General Purposes
AS2927 The Storage and Handling of Liquefied Chlorine Gas
AS3780 The Storage and Handling of Corrosive 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 “Site Security, Public Safety and OSH Signage”, provides summary examples of signage colours and shapes typically used at Water Corporation sites.

3 DANGEROUS GOODS SAFETY REQUIREMENTS

3.1 Placarding

Placarding provides a visual warning of the type of, 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 dangerous goods bulk 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 is the Hazchem Placard (DS WCSS001_1) - http://aqua/link/Link.aspx?doc=1083491

3.1.2 Bulk Storage Placard

This Placard is required where a storage area contains:

a) Dangerous goods in a container that has a volumetric capacity greater than 500 L; or
b) Dangerous goods in a container that may hold a net mass capacity greater than 500 kg; or

c) an undivided quantity of dangerous goods exceeding 500 kg.

This Hazchem placard shall be posted at the main entrance and other vehicle entry points around the site. A bulk storage placard is to be posted on the storage container or near the compound/bund or at the entrances to the storage area.

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

Note: Diesel does not require a bulk storage placard. A COMBUSTIBLE LIQUID label should be used instead as per (DS WCSS023_1) - http://aqua/link/?doc=1084076

3.1.3 Package Storage Placard

This Placard is required where in relation to dangerous goods this means a quantity of dangerous goods or 1 combustible liquids are stored in a container that has:

a) a capacity of not more than 500 L; or
b) dangerous goods in a container that has a net mass of 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 DG’s store.

An example is a 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 dangerous goods 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 pipe work shall be colour coded in accordance with the Water Corporation’s standard colour coding drawing EG71-1-1 which is based upon AS1345. 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 Pipe Work

4.4.1 Signage for underground pipe work

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 of a buried chemical pipework sign - http://aqua/link/Link.aspx?doc=1085427 (DS WCSS154)

4.4.2 Markers for above and below ground pipe work

Markers shall be applied to large and small pipe work to provide highly visible indication of contents and direction of flows.

An example of a Chemical marker for large pipe work - 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:

APPENDIX A: Schedule 1 – Quantities of Dangerous Goods

<table>
<thead>
<tr>
<th>Item</th>
<th>Description of dangerous goods</th>
<th>Packing group</th>
<th>Placarding quantity</th>
<th>Manifest quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Division 2.1 except aerosols</td>
<td>N/A</td>
<td>500 L</td>
<td>5 000 L</td>
</tr>
<tr>
<td>2.</td>
<td>Division 2.2 except aerosols</td>
<td>N/A</td>
<td>1 000 L</td>
<td>10 000 L</td>
</tr>
<tr>
<td>3.</td>
<td>Division 2.3</td>
<td>N/A</td>
<td>50 L</td>
<td>500 L</td>
</tr>
<tr>
<td>4.</td>
<td>Division 2.1 and 2.2 aerosols</td>
<td>N/A</td>
<td>5 000 L</td>
<td>10 000 L</td>
</tr>
<tr>
<td>5.</td>
<td>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</td>
<td>I</td>
<td>50 kg or L</td>
<td>500 kg or L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>II and III (aggregate)</td>
<td>1 000 kg or L</td>
<td>10 000 kg or L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I, II and III (aggregate) where quantity of goods in packing group I does not exceed 50 kg or L</td>
<td>1 000 kg or L</td>
<td>10 000 kg or L</td>
</tr>
<tr>
<td>6.</td>
<td>Goods too dangerous to transport</td>
<td>N/A</td>
<td>5 kg or L</td>
<td>50 kg or L</td>
</tr>
<tr>
<td>7.</td>
<td>C1 combustible liquids with fire risk dangerous goods</td>
<td>N/A</td>
<td>1 000 L</td>
<td>10 000 L</td>
</tr>
<tr>
<td>8.</td>
<td>Other C1 combustible liquids</td>
<td>N/A</td>
<td>10 000 L</td>
<td>100 000 L</td>
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</table>

Note: Packing Groups identify the degree of danger of the Dangerous Goods:
- ___ (PG I – High)
- ___ (PG II – Medium)
- ___ (PG III – Low)
END OF DOCUMENT