



Engineering

Technical Standard

TS0133 Requirements for Asset Labelling

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Significant/Major Changes Incorporated in This Edition

- Changed document ID
- Added Section 7 Other labelling requirements
- Added more detail to placement and installation

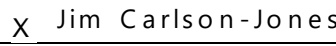
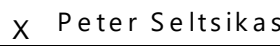
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1 Introduction

This Technical Standard (TS) is comprised of the following sections:

Section 1 – Introduction

Describes the document layout and how to use this TS.

Section 2 – Scope

Defines the scope of this TS by listing the asset types that will require labels.

Clarifies the meaning of location as the place where assets are operated and maintained. This should not be confused with the actual asset at the location.

Section 3 – Asset Labelling Requirements

Details the general labelling requirements. Includes the procedure for obtaining the list of asset component locations that need to be labelled. A labelling schedule, described in this section, shall be used to manage the information engraved on the labels and for field confirmation that the labels have been placed on the correct asset with the correct information.

Section 4 – Label Specification

This section explicitly details the layout, size, material, engraving method and installation of the labels.

This section and the labelling schedule shall be used to specify the labels for production.

Section 5 – Example Fitted Labels

Contains sample labels fitted to common asset components.

Section 6 – Sample Labelling Schedule

Shows a sample completed Labelling Schedule.

Section 7 – Other Labelling Requirements

Lists labelling requirements specified in other SA Water technical standards, Australian Standards and International Standards.

1.1 Purpose

The purpose of this technical standard is to ensure consistent asset labelling of SA Water infrastructure assets. The technical standard details:

- the process for ordering labels, and
- the content and material of the label.

This TS should be used by SA Water staff and contractors to order labels and by suppliers for the production of labels.

1.2 Glossary

The following glossary items are used in this document:

Term	Description
Ancillary Fittings	Underground equipment usually associated with pipes such as maintenance holes, access openings, fireplugs etc.
Asset	A single piece of equipment such as a pump, motor, valve, tank structure etc. Also referred to as <i>Equipment</i> , <i>Asset Component</i> .
Asset and Works Management system	System for recording and managing asset information. Also, initiates work orders for asset maintenance jobs.
Asset Class	Logical aggregation of asset components and other asset classes to achieve a distinct, quantifiable business function.
Asset Input worksheet	Worksheet in Excel spreadsheet, provided by SA Water, containing information about new or updated assets.
Asset Location	A place where assets are operated, stored or repaired. Also referred to as <i>Location</i> , <i>Asset Component Location</i> .
Asset Tag Number	Number or code that identifies the equipment on the drawing.
Drawing Number	Drawing reference number, for example: P&ID, SLD, GA etc.
Energy Isolation	Disconnection or separation of equipment or part of equipment from power supplies and other sources of energy, including the satisfactory discharge of stored energies.
Facility	A unique installation with a single purpose such as Pump Station, Water Treatment Plant, Tank etc.
GA	General Arrangement drawing.
Isolation Plan	A formal document identifying the isolations required to safely undertake work on specific devices or plant. Category two isolation plans are approved by the Responsible Person and for complex group isolations Category three must be authorised by the Authorising Officer.
Location Code	A code that uniquely identifies the location in the Asset and Works Management System.
Maintainable Asset	A maintainable asset has an independent physical and functional identity and age, (e.g. valve, pump, motor, sedimentation tank, main).
Maintainable Asset Location	A maintainable asset location is the equivalent physical location where the maintainable asset is located. The maintainable asset location is constant regardless of whether the physical asset is replaced.
Manufacturer Nameplate	Asset plate. Details specific to the assets such as model number, serial number, etc.
Maximo	Asset and Works Management system used at SA Water.
O&M	Operations and Maintenance.
P&ID	Process / Piping & Instrumentation Diagram.
Plate Label	Type of label that is fixed to a surface using screws or adhesive.
Project Manager	Refers to the person(s) responsible for the delivery of the asset components.
QR Code	Quick Response (or Reference) Code.
SA Water	South Australian Water Corporation
SLD	Single Line Drawing
Tag Label	Type of label that is fixed to an asset with a wire and connector or cable tie
TG	SA Water Technical Guideline
TS	SA Water Technical Standard

1.3 References

1.3.1 Australian

The following table identifies the standards, documents and/or articles that are referenced in this document:

Title/URL	Version	Date
ISO Standard 18004 - QR Code 2005 bar code symbology specification		
AS1657 - Fixed platforms, walkways, stairways and ladders - Design, construction and installation	AS1657:2018	15/05/2018
AS1664 - SAA Aluminium Structures Code	AS1664-1979	1/07/1979

1.3.2 SA Water

The following table identifies the standards, documents and/or articles that are referenced in this document:

Title/URL	Version	Date
TS0300 Supply and Installation of Low Voltage Electrical Equipment	2.00	24/08/2018
TS0131 Asset Hierarchy Technical Standard	1.50	21/03/2014
TS0132 Operations and Maintenance Manuals	1.00	17/12/2013
TS0200 Process and Instrumentation Diagrams (P&ID)	2.00	16/12/2015
HMS-005 Energy Isolation	3.00	14/12/2016
PHS-064 Energy Isolation: Lock out and Tag Out Procedure	3.00	14/12/2016
FHS-121 Lock Out / Tag Out Isolation Plan	4.00	07/01/2016
TG25 Guide to the Requirements and Specifications for the Painting and Coating of Mechanical Plant	1.00	7/2/2007
TS0204 Colour Coding for Pipework	1.00	22/12/2015

1.4 Definitions

The following definitions are applicable to this document:

Term	Description
SA Water's Representative	The SA Water representative with delegated authority under a Contract or engagement, including (as applicable): Superintendent's Representative (e.g. AS 4300 & AS 2124 etc.) SA Water Project Manager SA Water nominated contact person
Responsible Discipline Lead	The engineering discipline expert responsible for TS 0133 defined on page 3 (via SA Water's Representative)

2 Scope

This Technical Standard describes the requirements for labelling assets to meet the following purposes:

- uniquely identifying assets and components for maintenance requirements – **Asset Location Label**;
- uniquely identifying assets and components for energy isolation and operating tasks – **Asset Identification Label**.

Asset Location Label

These labels describe the **location** of asset components (or equipment) that should be labelled – see [3.3 What Assets are labelled?](#)

The **location** can be considered as a place where an asset is operated or maintained. Associated with the **location** is an actual asset component or equipment. For example:

At Murray Bridge WPS there is a **location** with code: *MU3320.0301*.

At this location (*MU3320.0301*) there is a pump recorded in the Asset and Works Management system with identifier 21107070. If this pump is replaced with another pump (identified with 55512355), the **location** does not change and remains as *MU3320.0301*.

The asset component location (or **location**) will appear on the label. So if the asset at this location changes, the label does not change.

Maintainable assets, recorded in Maximo, may require an asset location label.

Asset Identification Label

These labels describe the asset and include the reference to supporting plans that can be used for energy isolation planning; particularly the P&ID and asset tag number. These labels shall be small tags as described in [4.2.2 Asset Identification Label](#).

Components that are needed for energy isolation (and are not already labelled with an asset location label) will require an asset identification label.

This TS does not apply to the Manufacturer Nameplate which are attached to and remain with the asset.

The terms *location*, *asset component location*, and *asset location* can be used interchangeably.

The terms *asset*, *equipment* and *asset component* can be used interchangeably to refer to a physical asset at a location.

Other Labelling Requirements

It is important to be aware of labelling requirements that are specified in other SA Water technical standards and Australian or International standards. See [7 Other Labelling Requirements](#) for a list of additional labelling standards.

3 Asset Labelling Requirements

3.1 Overview

Labelling asset components enables clear identification of equipment for maintenance and operation activities. The contents on the label link to SA Water's asset and works management system and enhances the quality of information captured about the equipment.

The Location Code, stored in the QR Code, enables scanning devices to identify the location (and therefore the asset component) for maintenance and operation activities.

Depending on the category, the label includes the drawing number and asset tag number which can be used for on-site energy isolation planning. For example, a P&ID and asset tag number links to a drawing to show the sequential flow of energy (such as water, electricity, gas etc.). This information on the label improves staff safety by associating the asset at a site with the drawing.

3.2 Label Category

The label categories are:

- Asset Location Label
- Asset Identification Label

For maintainable assets where the service history is recorded the Asset Location Label will be used.

For smaller equipment that participates in energy isolation the Asset Identification Label will be used.

The label category and content is specified by SA Water and listed in the **Asset Input** worksheet¹.

3.3 What Assets are labelled?

In general terms all asset components, other than below ground pipes and their ancillary fittings, can be labelled.

The individual asset component locations that shall be labelled are determined by the project manager in collaboration with the relevant stakeholders and listed in the **Asset Input** worksheet of the **Asset data Update Request Form** spreadsheet. The **Asset Input** worksheet has a row for each asset component and location, however not all will require a label.

The column entitled *Label Required (Y/N)* will contain a 'Y' indicating the locations that need labels. This list is used to prepare a labelling schedule – see [3.7 Asset Label Schedule](#).

Refer to **TS0131 – Asset Hierarchy Technical Standard** for instructions on how asset components are specified and recorded in the **Asset Input** worksheet including the relevant information for labelling such as Description, Location Code, Drawing Number and Asset Tag Number.

The list of locations that will need to be labelled is finalised during the design stage of construction. It is possible that this list could change during the project delivery. The **Asset Input** worksheet is kept up to date by SA Water throughout a project.

¹ Excel spreadsheet containing information about new or updated assets

3.4 Label Content

Label content refers to the information that is engraved on the label which is specified in the **Asset Input** worksheet and summarised in a schedule as described in [3.7 Asset Label Schedule](#).

The content is different on Asset Location and Asset Identification labels.

3.4.1 Asset Location Label

The content of the Asset Location Label shall be:

Table 1: Asset Location Label Content

Label Item	Label Item Description
Location Description	Uniquely describes the asset component location
Location Code	Unique identifier of the asset component location
Drawing Number	Piping & Instrumentation Drawing number, or Single Line Drawing number, or other.
Asset Tag Number	Links to the equipment depicted on the drawing.
QR Code ²	Scanning matrix encoded with Location Code

3.4.2 Asset Identification Label

The content of the Asset Identification Label shall be:

Table 2: Asset Identification Label Content

Label Item	Label Item Description
Location Description	Uniquely describes the asset component location
Drawing Number	Piping & Instrumentation Drawing number, or Single Line Drawing number, or other.
Asset Tag Number	Links to the equipment depicted on the drawing.

² SA Water will provide the *Location Code* that is encoded. The supplier will create the QR matrix.

3.5 Label Type

Label type refers to the size of label and in some cases how the label is fixed to the asset. There are two types of labels; Plate and Tag. Plate labels are fixed to the asset with screws or rivets and tag labels are attached to the asset with a wire and connector or cable tie. In addition there is a small tag label (S-tag) that can only be used as an Asset Identification label.

3.6 Scanning Code

The asset location labels have a Quick Response (QR) scanning matrix storing the Location Code. See [4.7 – QR Code](#) for the QR Code specification.

The label supplier will encode the QR Code.

3.7 Asset Label Schedule

The project manager will provide a schedule with asset labelling information that can be used to order the label. The schedule is derived from the **Asset Input** worksheet – see [3.3 What Assets are labelled?](#)

The format of the schedule is:

Table 3: Label Schedule

Label Content Item	Label Content Value
Label Count	Identifies the label in the schedule.
Location Description	Uniquely describes the asset component location
Location Code	Unique identifier of the asset component location
Drawing Number	Relevant Drawing number
Asset Tag Number	Links to the equipment depicted on the drawing
QR Code	Encoded item – the Location Code
Label Type	'Plate', 'Tag' or 'S-tag'
Self-Adhesive (Y/N)	Indicate if label should have self-adhesive
Batch Number	Used to group and package labels
Label Material	e.g. 316 Stainless Steel
Following completed after the labels are installed	
Location Note	Short description of where label was fitted
Date Installed	Date the label was installed
Date Checked and Signature	Date the label was check during asset commissioning

See [6 - Sample Labelling Schedule](#) (Location and Identification).

3.8 Ordering Labels

Labels shall be supplied to comply with the specifications as described in 4 – Label Specification.

The process for ordering the labels is:

1. SA Water issues the labelling schedule.
2. Use the schedule and this specification (TS0133) to order the labels from a suitable supplier.

3.9 Installing Labels

The labels shall be installed as per the guidelines described in 4.10 – Placement and Installation.

The *Date Installed* on the label schedule is updated.

3.10 Checking Labels

During commissioning of the asset the label shall be checked to confirm:

- The label has been mounted at the correct location,
- The details on the label are correct.

Date Checked on the label schedule is updated.

3.11 Finalise Label Information

The completed label schedule shall be included in the O&M Manual and returned to SA Water after the asset is commissioned – refer to **TS0132 Operations and Maintenance Manuals**.

4 Label Specification

4.1 Introduction

This section specifies the details of the labels, including:

- content,
- layout and size,
- material,
- QR code specification
- engraving method, and
- fitting.

This specification describes a standard for 'Plate', 'Tag' and 'S-tag' labels.

The preferred label type for the Asset Location is Plate unless it is not possible to securely mount the label near the asset component, in which case a Tag can be used.

The Plate label shall be mounted using either adhesive, rivets or screw. The Tag label is fixed with stainless steel wire and connector or cable tie (see [4.9 Fitting](#)).

The layout shall comply with this specification.

The minimum size of the labels shall be as listed in Table [5: Minimum Size](#), however the size can vary depending on number of letters and the space available to install the label.

The engraving method shall be as described in Table [8: Engraving Method](#).

Labels shall be securely fitted in accordance with Table [9: Fitting](#).

The installation of the label shall be such that it is securely mounted and readily visible on or near the asset. Labels for underground asset components shall be installed so that it is not necessary to open or remove a cover or access lid.

See [5: Example Fitted Labels](#) for examples of labels that have been fitted on the asset.

4.2 Label Content

4.2.1 Asset Location Label

Refers to label types: Plate and Tag.

The label shall include the following information:

- Location Description
- Location Code
- QR Code

Where the component is referenced on a current drawing, the label shall also include:

- Drawing Number
- Asset Tag Number

The content of label shall be as shown in Figure 1 below.

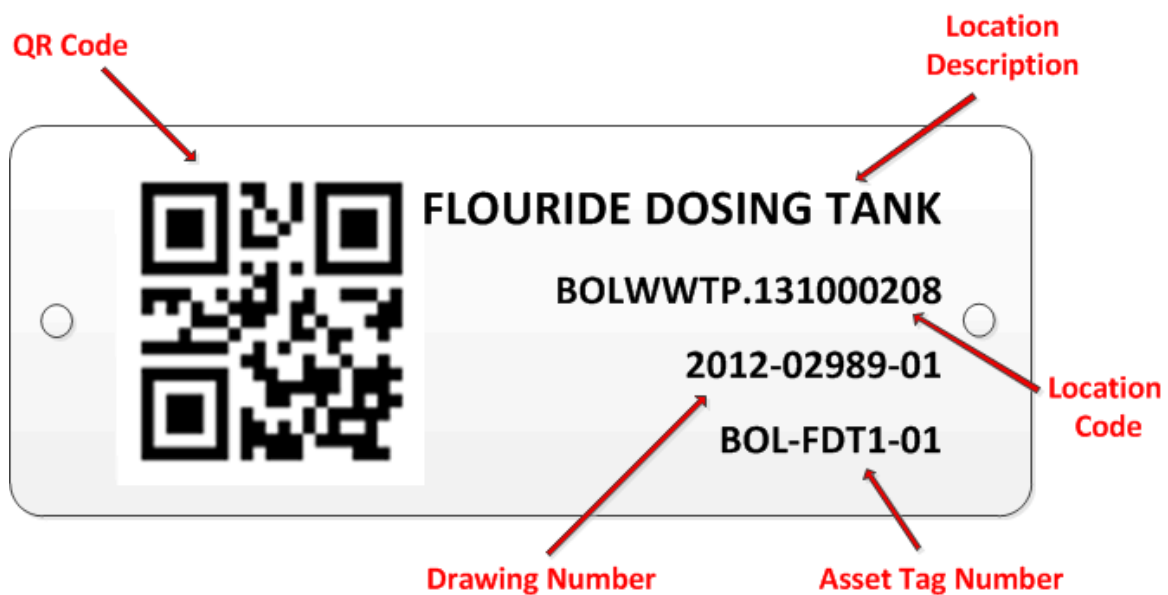


Figure 1: Sample Asset Location Label Content

4.2.2 Asset Identification Label

Refers to label type: S-tag.

This category of labels will use small stainless steel tags.

The label shall be engraved on both sides.

Side 1 shows:

- Location Description

Side 2 shows:

- Drawing Number
- Asset Tag Number

The content of label shall be as shown below:

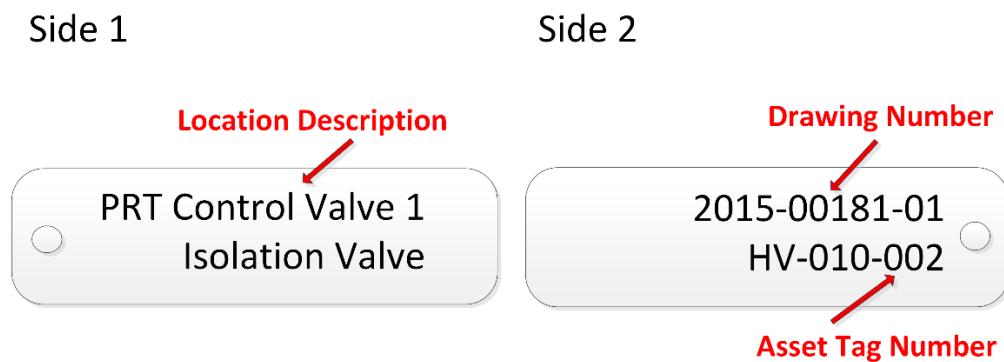


Figure 2: Sample Asset Identification Label Content

4.3 Layout

The layout, as described below, should not be altered unless:

- Location Description is too long to fit on the label. In this situation the size of the text can be reduced. In addition, the length of the label can be increased if the description still does not fit at the smaller text size,
- The size of the holes can vary if necessary to ensure the label is securely fixed. For example, it may be necessary to use larger diameter wire and connector for tags.

It is important to include the complete Location Description. However, there may be Location Descriptions that are too long even after the text size is reduced and the label length increased. In these situations the Location Description can be abbreviated provided it clearly and unambiguously describes the location.

In all situations the label shall be securely mounted at the asset location and the text must be able to be clearly and safely read.

The position and size of the QR code must not change.

Note that the dimensions on the QR code include the 'quiet zone' around the black matrix.

4.3.1 Asset Location Label

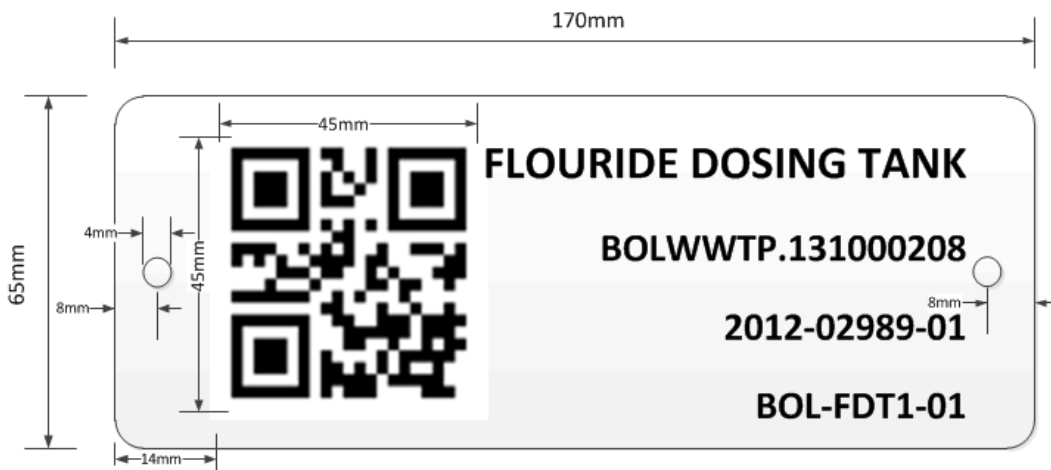


Figure 3: Asset Location Label Dimension and Content (not to scale)

4.3.2 Asset Identification Label



Figure 4: Asset Identification Label Dimension and Content (not to scale)

Note: the position of the text applies to both sides of the label.

4.4 Text Size

The text size shall not be smaller than the minimum size.

Table 4: Label Text

Text Item	Font and Size
Text colour	On stainless steel material – black infill, all other materials white in-fill.
Location Description	Arial, CAPITAL, 7mm (minimum 5mm). May break line.
Location Code	Arial, CAPITAL, 6mm (minimum 5mm). Single line only.
Drawing Number	Arial, CAPITAL, 6mm (minimum 5mm). Single line only.
Asset Tag Number	Arial, CAPITAL, 6mm (minimum 5mm). Single line only.

4.5 Minimum Size

Table 5: Minimum Size

Label Category	Size
Asset Location	Minimum size 170mm x 65mm Rounded corners
Asset Identification	Minimum size 85mm x 35mm Rounded corners

4.6 Material

4.6.1 Asset Location Label

The table below shows a hierarchy of material choices depending on label category, location, and conditions where the label is mounted.

Table 6: Material

Option	Location	Exposure Condition	Material Description
1	Outdoor / Indoor	Exposed to chemicals, oil or corrosives (liquid or gaseous) environment	Must use: 1.2mm, 316 stainless steel. Rounded corners. Bevelled edges. Fibre or YAG laser markable. Example asset: Chemical Dosing Station
2	Outdoor / Indoor	Ultra violet (UV), Water	Option 1 or: Alternatively any suitable laser markable aluminium product meeting performance requirements of MIL-STD-130, A-A-50271 and MIL-DTL-15024F, such as Durablack ³ . Black label background. Rounded corners. Bevelled edges. Example asset: Water Tank
3	Indoor		Options 1, 2 or: Black Anodised Aluminium, Fibre or CO2 laser markable. Exterior engravable Plastic, CO2 laser markable. Acceptable products - Rowmark, Gravoply, IPI or Durablack. Black label background. Rounded corners. Bevelled edges. Example asset: Induction Panel

4.6.2 Asset Identification Label

All labels must be 1.2mm, 316 stainless steel. Rounded corners. Bevelled edges.

Fibre or YAG laser markable.

³ Minimum thickness – 0.5mm

4.7 QR Code

Applies only to Asset Location labels.

The QR Code shall be generated compliant with ISO Standard 18004.

See Figure 5 below for an explanation of the QR Code structure.

Table 7: QR Code

Material	QR Specification
Stainless Steel	QR Code. 45mm x 45mm (including quiet zone). Encoding region black pattern with stainless steel separators. Level M Error Correction. Version 2 25 x 25 Array. Encoded with value of <i>Location Code</i> as data type: Text.
Other	QR Code. 45mm x 45mm (including quiet zone). Encoding region black pattern with white separators. Level M Error Correction. Version 2 25 x 25 Array. Encoded with value of <i>Location Code</i> as data type: Text.

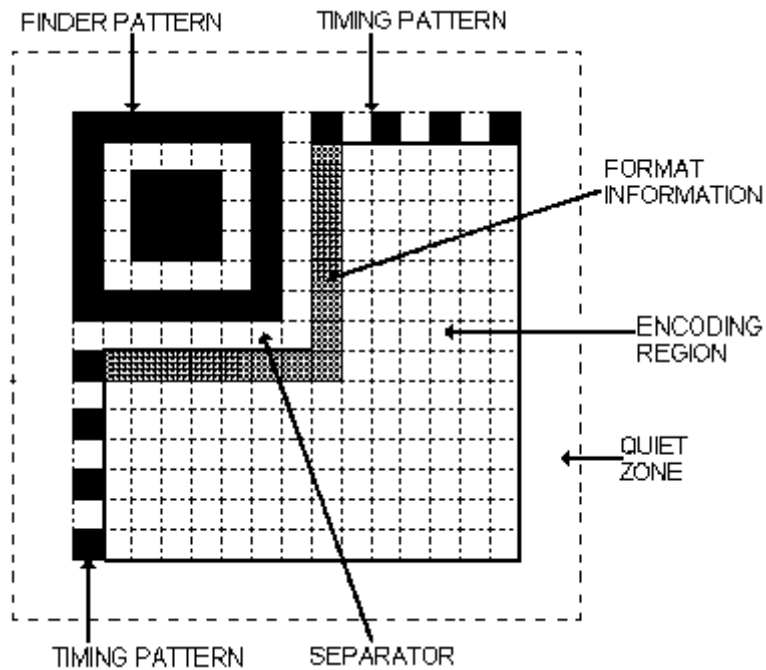


Figure 5: QR Code Structure

4.8 Engraving Method

Table 8: Engraving Method

Label Material	Engraving Method
Stainless Steel	Text – Fibre or YAG laser
	QR Code - Laser Annealing or engraved.
Anodised Aluminium	Text - Fibre or CO2 laser engraved
	QR Code - CO2 engraved.
Exterior Plastic	Text - Fibre laser or CO2 engraved.
	QR Code – Fibre laser or CO2 engraved.

4.9 Fitting

Table 9: Fitting

Location	Fitting Description
Outdoors or exposed to water, chemicals, oil or other hazards	Stainless steel fixtures. Minimum two screws or stainless steel rivets.
Indoors ⁴	Galvanised iron fixtures. Minimum two screws or rivets. Alternatively, a suitable self-adhesive can be used.
Tag and S-tag	316 stainless steel wire and connector or, 3.6mm diameter black nylon cable tie, halogen free and flame retardant. Resistant to UV, heat, chemicals and abrasion.

4.9.1 Wire and Connector



Figure 6: Stainless steel wire and Connector

⁴ The fitting method chosen should ensure the label is securely mounted.

4.9.2 Cable Tie



Figure 7: Cable Tie

4.10 Placement and Installation

In all situations labels shall be fixed so they are secure and not likely to come loose and possibly cause damage to equipment.

Labels shall be mounted so they can be easily read from a normal viewing point, are not subject to damage and are clearly associated with the component the label refers to.

Where an asset component is likely to be removed for maintenance then the label shall be permanently fixed adjacent to the component. Where the asset component is unlikely to be removed the label may be fixed directly to the component. For example, the valve label shall not be fixed to the valve body but could be mounted on a suitable bracket on the valve flange or valve-supporting plinth, except in the case of small valves or congested sites where a tag type label is acceptable.

Labels shall be fixed by pins, screws, rivets, stainless steel wire and connector, cable tie or self-adhesive. Labels which are fixed to the outside surfaces of outdoor switchboards, control panels and other equipment shall be fixed with corrosion resistant (preferably stainless steel) pins or screws. Contact between stainless steel and aluminium, for example switchboard cabinets, shall comply with requirements of AS 1664.

Adhesives shall not be used for fixing outdoor labels.

Tags with wire or cable tie can be used on exterior assets, however they must be securely bound to restrict noise and friction caused by wind.

Labels for below ground assets or in corrosive environments such as wet well pumps shall be visible without the removal of a cover or access lid.

The fixing of labels or tags should not compromise the International Protection (IP) rating of electrical cabinets, or interfere with the mechanic or operation of any plant or equipment.

Where feasible multiple labels can be attached to a suitable surface, for example switchboard cabinet, provided the asset can be easily identified; see [5.9 Stacked Labels](#) below.

5 Example Fitted Labels

5.1 Submersible wastewater pump station

Labels for submersible wastewater pump stations components shall be mounted on the outside of the switch cubicle (or electrical cabin) door.



5.2 Air valve

Tag type label fixed with stainless steel wire and connector.



5.3 Pump set

Label fixed to pump set mount.



5.4 Sewage pump

Tag type label fixed with stainless steel wire and connector.



5.5 Flowmeter

Label fitted to wall with stainless steel screws.



5.6 Indicator panel



5.7 Identification Tag – side 1



5.8 Identification Tag – side 2

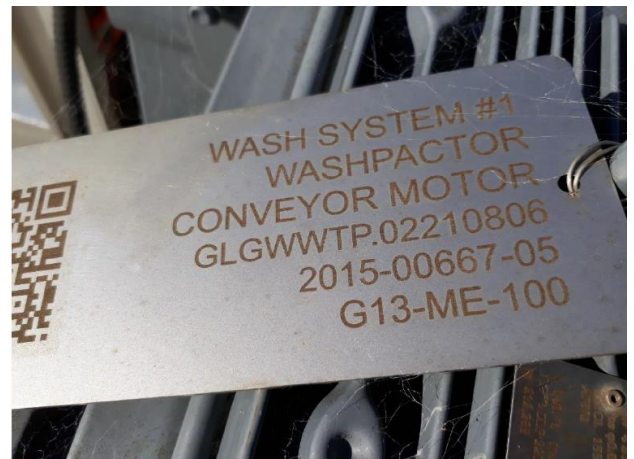


5.9 Stacked Labels

Labels for a wet well pump are attached to the junction box.



5.10 More Sample labels



6 Example Labelling Schedule

C5891 Queensbury WWPS Labelling Schedule (TS0133 Requirements for Asset Labelling)												
Label Count	Location Description	Location Code (Maximo ID)	Drawing Number	Asset Tag Number	QR Code	Label Type	Self-Adhesive (Y/N)	Batch #	Label Material	Location Note. (Confirm with pre-labelling inspection)	Date Installed	Date Checked and signature
1	Hendon (Queensbury) WWPS	QU40423			QU40423	Plate	Y	1	316 SS	Building Entrance	15/11/2014	22/12/2014 <i>Niall</i>
2	Wet Well No. 1	QU40423.01	2012-004-02	GV-PN16-19	QU40423.01	Plate	Y	1	316 SS	Access Hatch 1	15/11/2014	22/12/2014 <i>Niall</i>
3	Hose Reel 1 Isolation Valve		2012-004-24	BBV-PN16-50		S-tag	Y	2	316 SS	Non Maximo	17/11/2014	22/12/2014 <i>Niall</i>

Note 1: Leave Drawing Number and Asset Tag Number blank where the asset is a facility (e.g., Tank)

Note 2: Leave Drawing Number and Asset Tag Number blank where they are not known

7 Other Labelling Requirements

7.1 Introduction

This section lists labelling requirements specified in other SA Water technical standards, Australian Standards and International Standards

7.2 TS0300 – Supply and Installation of Low Voltage Electrical Equipment

TS0300 covers the general requirements for the supply and installation of low voltage electrical equipment and extra low voltage equipment where it applies to control and instrumentation.

See [3.5 Labelling](#).

7.3 TG25 – The Painting and Coating of Mechanical Plant

Refer to the requirements specific to pipework.

7.4 AS1657 Walkways, Ladders and Platforms

AS1657 covers the selection, design, risk assessment and testing of fixed platforms, walkways, stairways and ladders.

The standard mandates permanent labelling to verify compliance with AS1657, namely:

- to identify the designer, fabricator, installer and certifier, and
- to provide effective product recalls of faulty equipment

7.5 TS0204 Colour Coding for Pipework

The purpose of this standard is to ensure that pipework is coated or painted to a consistent standard that will ensure all substances contained in the pipework are clearly identified in order to achieve safe management of substances, chemicals and processes.

7.6 Safework Australia – Labelling Chemicals

Refer to [Labelling of Workplace Hazardous Chemicals](#)