



Colour Standard for Pipe, Pipe Wrappings, Detectable Pipe Marker Tape and Valve Surrounds

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Detectable Pipe Marker Tape and Valve
Surrounds**

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1	4/12/2015	Gavin Milne	Initiation of the document

1 Objective

To simplify and standardise a field-based asset marking system, which ensures risk, associated with the identification & operation of these assets is minimised.

2 Background

As Gippsland Waters reticulated Water & Sewer systems grow, these systems are becoming more complex and therefore more difficult to manage/maintain. Furthermore, Field Services group has a desire to utilise resources across all regions rather than 'region specific' staff for both day-to-day tasks and on-call maintenance activities. Many of our customers and/or specific assets require careful consideration prior to undertaking water/sewer system outages. In addition to this, recognition of an assets function often relies on either staff experience/knowledge, or time consuming investigations utilising GIS, as-constructed drawings, system profile drawings, or process & instrumentation drawings prior to works commencing. During Emergency response activities, the luxury of time is often not available and places additional pressures on response crews.

Field Services Group has developed this colour/field marking standard to mitigate these system risks. It is hoped this standard simplifies the asset marking through use of a combined colour and/or letter marking system. This standard can be applied to other operational groups within the business should the need apply - to standardise labelling of all future asset at their introduction. The existing asset base will however need to be brought up to standard through various maintenance initiatives.

3 Definitions

Term	Interpretation
Air valve	A valve that if altered will affect the supply to a system.
Critical system feed valve	An automatic valve for the discharge of air from or the admission of air to, a water main, each containing a buoyant ball which seats itself to close an orifice.
Designated fire plug valve	A fire plug that has been approved for use by metered hydrant permit holders as a point to draw water from.
Dialysis patient valve	A valve that if altered will affect the supply to a to a dialysis patient customer.
Fire plug	A fire hydrant, generally below ground, with identifying cover and marker, having provision for connection of a fire hydrant standpipe to permit operation of the outlet valve and connection of hose(s).
Fire service	A service comprising water pipes, fire hydrants, fire hose reels, fittings, and including water storage or pumping facilities, which is installed solely for firefighting and extinguishing purposes in and around a building or property. Under certain conditions part of a fire sprinkler system may be included.
GIS system	A geographic information system (GIS) is a system designed to capture, store, manipulate, analyse, manage, and present all types of spatial or geographical data.
High low divide	A valve used to separate two different potable water pressure zones
Hospital medical valve	A valve that if altered will affect the supply to a hospital or medical centre.

Hydrant	A fitting installed in a water pipeline, which provides a valved outlet (above or below ground), to permit a controlled supply of water to be taken from the pipeline for firefighting or street flushing.
Major customer Valve	A valve that if altered will affect the supply to a major customer.
Pipe	A pipeline component of uniform bore, normally straight in axis, having socket, spigot or flanged ends.
Potable water	Water that is suitable for human consumption, food preparation, utensil washing and oral hygiene.
Pressure sewer system	A complete system wherein macerated sewage is conveyed under pressure generated by pumping units located on each property to a sewage treatment facility or another sewerage system.
Pressure zone	A reticulated supply area connected to a controlled water pressure source (typically a service reservoir or tank), covering a limited area and range of elevations to enable supply within a range of minimum and maximum operating pressures.
Pumped system	A system where flow and/or pressure are provided by means of one or more pumps and where the pipe(s) operate full.
Pumped water valve	A valve that will require a pump to be isolated prior to the valve position being altered.
Raw water	is natural water found in the environment, such as rainwater, ground water, and water from bodies like lakes and rivers.
Recycled water	Water that has been treated and provided for reuse by a water distributor through a reticulated water system.
Scour valve	A valve fitted to a pipe to allow scouring (cleaning or flushing) of the pipe.
Sewage	The wastewater from the community, including all faecal matter, urine, household and commercial wastewater that contains human waste.
Sewer system	a network of pipelines and ancillary works that conveys sewage to a treatment works or other place of disposal.
Sewerage	the infrastructure (pipes, plumbing, pumps etc.) that carries sewage.
Valve	a mechanical device used for stopping or regulating flow and controlling pressure e.g. gate valve, isolating valve, control valve, pressure reducing valve, air valve and hydrant.
Water system	a network of pipelines and ancillary works that conveys water to the customers. It generally begins at the outlet of a water treatment works (or source, if there is no treatment) and includes the reticulation system.

4 Referenced Documents:

Reference	Title
AS/NZS 1477-2006	PVC pipes and fittings for pressure applications
AS/NZS 2280-2014	Ductile iron pipes and fittings
AS/NZS 2566.2-2002	Buried flexible pipelines - Installation
AS/NZS 2648.1-1995	Underground marking tape - Non-detectable tape
AS 2700-2011	Colour standards for general purposes
AS 3680-2008	Polyethylene sleeving for ductile iron piping
AS 3681-2008	Application of polyethylene sleeving for ductile iron piping
AS 4041-2006	Pressure piping

WSA 03-2011-MRWA	Water Supply Code of Australia, MRWA Version
A3-53036	GIPPSLAND WATER STANDARD DRAWING WATER RETICULATION NETWORK VALVE LABELS - SHEET 1
A3-53037	GIPPSLAND WATER STANDARD DRAWING WATER RETICULATION NETWORK VALVE LABELS - SHEET 2
A3-53038	GIPPSLAND WATER STANDARD DRAWING SEWER RETICULATION NETWORK VALVE LABELS - SHEET 1
A3-53039	GIPPSLAND WATER STANDARD DRAWING SEWER RETICULATION NETWORK VALVE LABELS - SHEET 2

5 Identification Systems

5.1 Pipe

Where possible the buried pipe is to be colour coded such that it will not create confusion in the field.

The pipe colour shall be in accordance with Table 1

Table 1

Application	Description	Base Identification Colour	Conforming AS2700 colour	AS2700 ref. No.
Potable water	Transfer Material/Liquid	Blue	Ultramarine*	B21
Raw water	Transfer Material/Liquid	Green	Jade#	G21
Sewage	Transfer Material/Liquid	Beige	Beige	X43
Recycled water / non-potable water	Transfer Material/Liquid	Violet	Lilac	P12
Fire services	-	Red	Signal red	R13

Notes:

* It is acknowledged that all current pipe manufacturers produce water pipe in a light blue (not "Ultramarine") colour material. This is accepted as an appropriate colour, and meets the requirements of this standard.

If it is not possible for the pipe to be coloured to meet the above criteria the pipe should be 'sleeved' using appropriate pipe wrappings, and appropriate colour coded marking tape utilised.

5.2 Pipe Wrappings

The pipe wrappings (sleeve - typically used for DICL pipelines) are to match the pipe identification colour as far as practicable, Refer Table 1.

5.3 Pipe Marker Tape

The pipe marker tape is to match the pipe identification colour as far as practicable, Refer Table 1.

5.4 Valves Surrounds

The system for valve identification comprises of the following elements:

1. A base identification colour#
2. A secondary 'half-moon' colour only to be used only where an identified hazard exists (see Fig 3)
3. A Gippsland Water valve number plate (metal)
4. A Gippsland Water Valve type/function plate (metal)
5. A Gippsland Water direction to close plate (metal) *where not anticlockwise close*
6. An additional single letter code where applicable.

Base Valve colour is typically Yellow in potable water applications. Where yellow surrounds are used without hazard identification and/or type/function plates it is assumed the valve is a standard Gate Valve with normal anti-clockwise direction to close, without hazards. Yellow can be used in both High & Low pressure applications. High/Low valve labelling applies at the pressure zone perimeter only.

5.4.1 Base identification colour

The base identification colour provides immediate information as to the contents of the pipe. This information then provides relative hazard of a potential leak or spill and the criticality of such a leak, spill or failure to operators and maintenance workers.

Refer Table 1 for pipe identification colours.

5.4.2 Secondary 'half-moon' colour

The secondary 'half-moon' colour is only required where an identified hazard exists. The purpose of this is to give further information to the operator, so that a prompt decision can be made with the best possible information readily available. For the purposes of this document the hazards that have been considered critical are as follows:

1. High pressure water (as part of a high/low divide valve)
2. Dialysis patient valve
3. Hospital / Medical valve
4. Pumped water valve
5. Major customer valve
6. Critical feed valve

At pressure system boundaries, high/low divide valve labelling shall be applied where yellow depicts the "low pressure" side and white the "high pressure" side. This will not be complimented by a corresponding "ultramarine" half-moon unless a hazard exists

5.4.3 Gippsland Water valve number plate (refer A3-53036 & A3-53038)

A Gippsland Water valve number plate provides a unique identification number so that the valves are easily identified in the field. When a valve is placed in the field, or a valve is relabelled, a number is to be attached directly to the surround. The number is then to be updated in the GIS system.

5.4.4 Gippsland Water Valve type/function plate (refer A3-53037 & A3-53039)

A Gippsland Water valve type/function plate provides further details regarding the valves status and/or type.

1. "V" describes a "Valve" (applicable in both Water & Sewer applications). The location of this label varies. Attachment to the valve surround, curb & channel, fence posts etc is common. Placement of this label is largely to assist in quickly locating a valve in the field.
2. "NC" describes a valve that is left in a "Normally Closed" state. "High/Low Divide" & "Scour/ScV" are excluded, as it is commonly accepted that these valves are left in a "NC/Normally Closed" state.
3. "BV" (water only) describes a "Butterfly Valve" which due to its design should be operated differently to the more common Sluice valve.
4. "AV" describes an "Air Valve" (applicable in both Water & Sewer applications)
5. "ScV" describes a "Scour Valve" (applicable in both Water & Sewer applications). It is commonly accepted that Scour Valves are left in a "Normally Closed/NC" state, and therefore will NOT be accompanied by a "Normally Closed/NC" label

5.4.5 Gippsland Water direction to close plate (refer A3-53037) where not anticlockwise close

The direction to close identification plate is affixed to valve surrounds whereby the valve open/close direction differs to the more common anti-clockwise-close/clockwise-open operation. It is common for "Butterfly Valves/BV" to be a clockwise-close/anti-clockwise-open operation and will be labelled with both identification plates. Anti-clockwise-close/clockwise-open valves will NOT be labelled as they form the majority of 'typical' valve operation.

5.4.6 Additional single letter code (where applicable)

The additional marker symbol provides more information on the pipe contents or who will be affected by isolating a particular part of system. This information is important for numerous reasons. Some customers have special procedures regarding the isolation of the network, other valves are normally closed as they serve as a divide valve & operating these valves could lead to water pressure issues within the network.

Refer Table 2 for additional markings.

5.5 Valve Layout

All valve markings to be in direction of system layout, e.g. a High Low divide valve to have the white part on the side of the high pressure water and have the yellow part on the side of the low pressure water. Valve markings to be orientated such that all markings can be read from the one side.

For valve marking layouts refer Fig. 1 and Fig. 2. Fig. 1 Shows a layout of a Normally Closed Butterfly Valve that would be on a Potable Water tank outlet or alike. Fig. 2 Shows the layout of a High Low divide valve

For valve label sizing refer Fig. 3 and Fig. 4.

Fig. 1

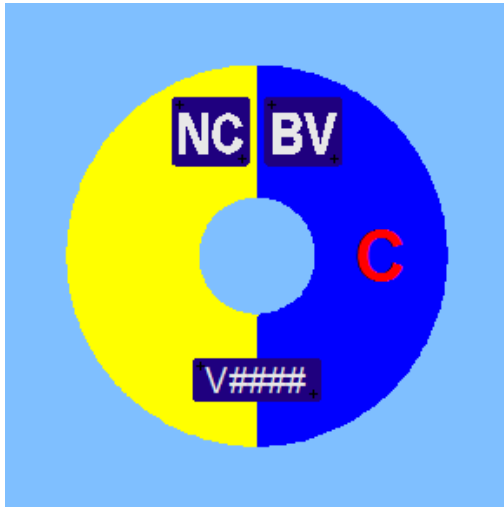


Fig. 2

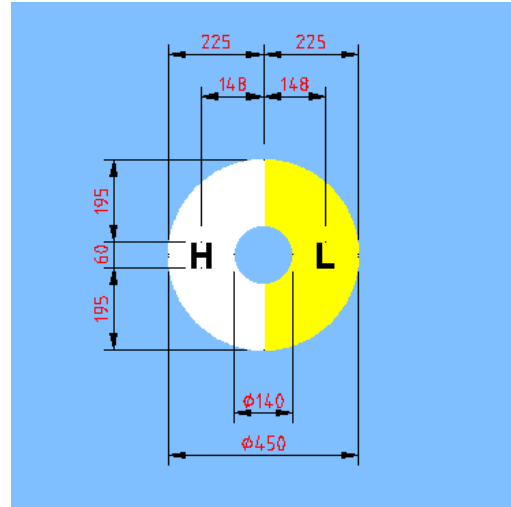


Fig. 3

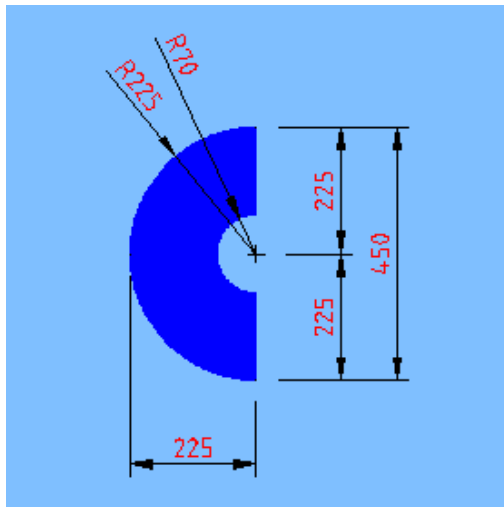


Fig. 4

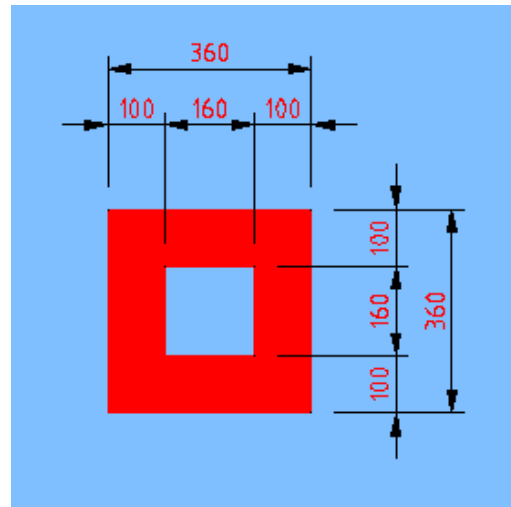
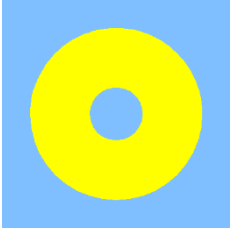
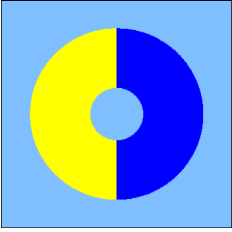
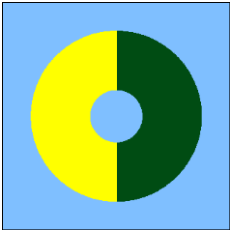
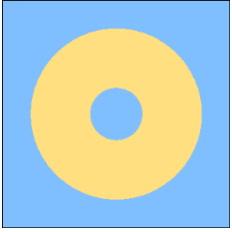

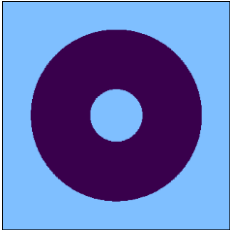
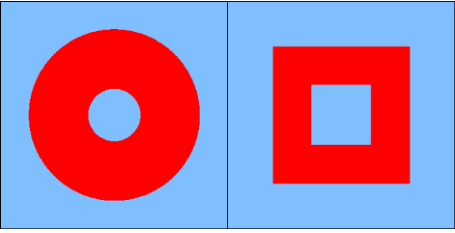

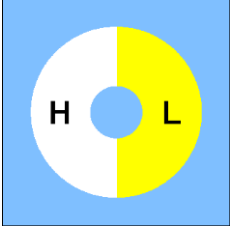

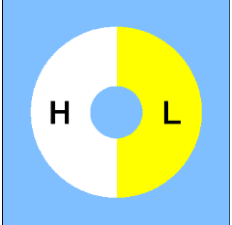

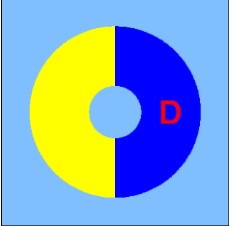

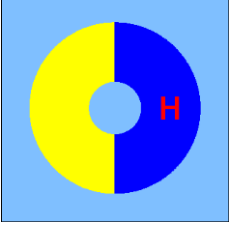

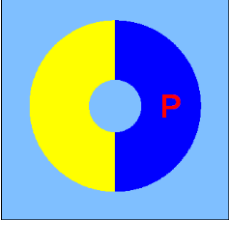

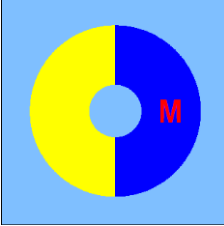

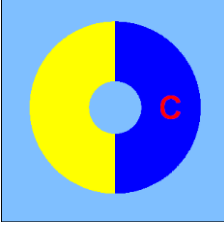

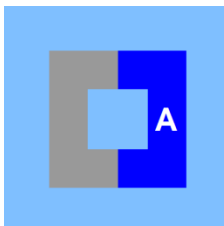



Table 2

<i>Application</i>	<i>Description</i>	<i>Base Identification Colour</i>	<i>Colour</i>	<i>Conforming AS2700 colour</i>	<i>AS2700 ref. No.</i>	<i>Shape</i>	<i>Additional letter markings</i>	<i>Additional letter marking Colour</i>	<i>Additional marking colour</i>	<i>Additional marking Conforming AS2700 colour</i>	<i>Additional marking AS2700 ref. No.</i>
<i>Water - potable</i>	<i>Transfer Liquid</i>	<i>Yellow</i>		-	-	<i>All valve surrounds to be circular</i>	-	-	-	-	-
<i>Water - potable</i>	<i>Transfer Liquid</i>	<i>Yellow with Blue half-moon where a hazard exists</i>		<i>Ultramarine</i>	<i>B21</i>	<i>Half moon (all valve surrounds to be circular)</i>	<i>D, H, P, M, or C -</i>	<i>Red</i>	-	-	-
<i>Water - Raw</i>	<i>Transfer Material/Liquid</i>	<i>Yellow and Green</i>		<i>Jade</i>	<i>G21</i>	<i>Half moon (all valve surrounds to be circular)</i>	-	-	-	-	-
<i>Sewerage</i>	<i>Transfer Material/Liquid</i>	<i>Beige</i>		<i>Beige</i>	<i>X43</i>	<i>Full (all valve surrounds to be circular)</i>	<i>Letter 'S'</i>	<i>Black (Information)</i>		<i>Black</i>	<i>N61</i>
<i>Recycled water / non-potable water</i>	<i>Transfer Material/Liquid</i>	<i>Violet</i>		<i>Lilac</i>	<i>P12</i>	<i>Full (all valve surrounds to be circular)</i>	-	-	-	-	-
<i>Fire services</i>	-	<i>Red</i>		<i>Signal red</i>	<i>R13</i>	<i>Full (all valve surrounds to be circular or rectangular)</i>	-	-		<i>White</i>	<i>N14</i>

potable low pressure water (when used in conjunction with white)	-	Yellow	 <i>*It is commonly accepted that High/Low divide Valves are left in a "Normally Closed/NC" state, and therefore will NOT be accompanied by a "Normally Closed/NC" label</i>	Buttercup	Y23	Half moon (all valve surrounds to be circular)	Letter 'L'	Black (Information)		Black	N61
potable high pressure water (when used in conjunction with yellow)	-	White	 <i>*It is commonly accepted that High/Low divide Valves are left in a "Normally Closed/NC" state, and therefore will NOT be accompanied by a "Normally Closed/NC" label</i>	White	N14	Half moon (all valve surrounds to be circular)	Letter 'H'	Black (Information)		Black	N61
Dialysis patient valve	A valve that will isolate the section of main that a Dialysis patient is connected to	As per material contained within pipe (See above)	 EG.	-	-	Half moon (all valve surrounds to be circular)	Letter 'D'	Red (Hazard)		Signal red	R13
Hospital / Medical valve	A valve that will isolate the section of main that a Hospital is connected to	As per material contained within pipe (See above)	 EG.	-	-	Half moon (all valve surrounds to be circular)	Letter 'H'	Red (Hazard)		Signal red	R13
Pumped water valve	-	As per material As per material contained within pipe (See above)	 EG.	-	-	Half moon (all valve surrounds to be circular)	Letter 'P'	Red (Hazard)		Signal red	R13

Major customer valve	E.G. power station	As per material contained within pipe (See above)	EG. 	-	-	Half moon (all valve surrounds to be circular)	Letters 'M'	Red (Hazard)		Signal red	R13
Critical system feed valve	E.G. tank outlet	As per material contained within pipe (See above)	EG. 	-	-	Half moon (all valve surrounds to be circular)	Letter 'C'	Red (Hazard)		Signal red	R13
Designated fire plug valve (metered hydrant program)	-	As per material contained within pipe (See above)	EG. 	-	-	Half 'U' (all valve surrounds to be rectangular)	Letter 'A'	White (Information)		White	N14