



# TECHNICAL NOTES

JANUARY 1997

Number 1

## EDITORIAL

*This Newsletter is the first of a series which will be issued by the Infrastructure Standards Unit.*

*It is designed to provide direction and guidance to everyone involved in the development of the water supply and sewerage infrastructure systems by providing details of changes and improvements to the systems as well as giving an insight into the reasoning behind them.*

*It is based on a very popular newsletter previously circulated by the Corporation called "Workshops Technical Notes" which provided updates on products, tools and equipment and it is hoped you find this new newsletter as useful.*

*As Manager of the unit I would like to remind every one that we are here to make sure we have systems that work and if you have any suggestions, queries or complaints please feel free to contact me or one of the other members of the Standards Unit.*

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## UPDATES - Jan 1997

The second set of updates to the Water Supply and Sewer documentation have now been issued and to ensure you gain the maximum value from the documents you are advised to spend time updating and reviewing the manuals. It might surprise you what you will learn!

## Handy Hint

With the sets of drawings (WSCM and SCM) an easy way to make the amendments is to reverse two of the four holding screws (alternating ones). Once this is done, remove the screw heads leaving the posts in position. Then carefully identify the location of the first amendment and split the pages at that point, laying the two parts back to back on a table. After that it is just a simple matter of working through the book placing the good sections and revisions in order onto the posts remaining in the front cover section of the manual. Once you have completed this place the back cover onto the front section and reinstalling the screws. Easy isn't it?

## CHANGES TO DS11

In the latest updates, a new Corporation Specification DS11(b) has been issued. This document is a specific Sewer CONSTRUCTION Specification and is designed to be used as the prime document for all construction work on SA Water's Sewerage Infrastructure system. Also in the pipeline are:-

DS11(a)  
*Sewer Design Specification (March 97)*

DS 9(a)  
*Water Supply Design Spec. (Late 97)*

DS 9(b)  
*Water Supply Construction Spec. (Mid 97)*

This new arrangement means that staff involved in construction and/or design will only need to familiarise themselves with one set of documentation thereby reducing confusion, improving efficiency and reducing costs.

Some of the original specifics, which were in DS11 have been removed and are included in the new addendum to DS10.

# NEW PRODUCTS

## ACCESS CHAMBERS

(Previously called MANHOLES)

The new DN 1050 mm Access Chamber Drawings are also included in the updates. These Access Chambers have been designed to incorporate the key features of the recently released Australian Standard AS4198 and current BEST PRACTICE procedures producing what we believe to be a superior chamber at a reduced cost.

Rocla, Humes, PCP and Beverley Foundry have all started production of the new components and they should be readily available in the near future.

There have been a number of queries about what chamber to use and in general it is as follows:-

DN 900

*Chambers up to 1 metre deep*

DN 1050 or DN 1200

*All chambers up to 6 metres deep*

DN 1500

*Control Access chambers (used upstream from Sewage Pumping Stations)*

Constructors have the option to choose either DN 1050 and DN 1200 chambers for all normal access chamber applications

## Some of the Changes

Because of information received from our maintenance staff, the new drawings show the inlet and outlet pipes finishing flush with inside of the chamber (Drgs L5 to L12). This is done intentionally because the Vector Jet and rodding machines need a solid corner to work against otherwise it breaks away the PVC pipe resulting in jagged edges which cause jamming and/or difficulties starting the cleaning process at subsequent call outs. For further explanation speak to the Superintendent's Representative or the Infrastructure Standards Unit staff.

## BLUE BRUTE PVC FITTINGS

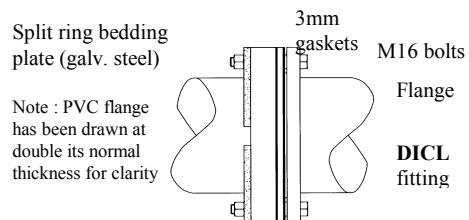
James Hardie Pipelines have spent \$5 million on an injection moulding machine and dies to produce a range of DN 100 PVC fittings to suit their Blue Brute pipe. The product has been comprehensively assessed (on a national basis) and on the basis of this appraisal (see WSAA article) SA Water has authorised the fittings for use with PVC pipe.

### Flanged Fittings

On all flanged fittings a galvanised MS backing plate (may be in two halves) must be used.

Where they are used against a raised face DICL flange (eg valve) a galvanised MS spacer plate must be used between the two flanges.

*Reason: If they are tightened incorrectly the raised face on the DICL flange can bite into the plastic flange causing shear failure of the plastic flange at the outside edge of the raised face*



PVC flange

Spacer plate (galv. steel)

### Corrosion Protection Requirements

- Socketed fittings do not require corrosion protection,
- **All the bolts and flanges must be wrapped** using the petrolatum anti-corrosion tape system as detailed in SA Water Specification DS 29. (see Pages 5 and 6)
- Greensleeve (2 layers) must be used to protect fittings when thrust blocks are installed.

### Note:

***These fittings are not to be used with ductile iron pipe.***

## NEW STREET BOX SYSTEM

Beverley Industries in association with PCP have developed a new Street Box Assembly system.

Apart from being cheaper for contractors, the main advantage is that it incorporates a simple height adjustment system that is similar to the method used on Sewer Access Chambers.

The main component changes are that the chamber is now pre cast concrete with a cast-in bearing plate to provide a flat surface for the new style frame and lid. It also includes a new frame with guide legs and non rotating cover and provision for locking bolts if they are required. Ductile Iron spacers are available for adjusting the height.

Testing of the system has proven that it meets Australian Standard and SA Water requirements.

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## MARKER TAPES

With more and more non-metallic piping systems being utilised in buried situation (some detectable and some not) there is a greater need for a mechanism to warn agencies what is buried below. Marker tapes both detectable and non detectable have been introduced as an aid to locating and/or advising contractors and machine operators of locations and type of piping systems buried below.

It also provides a buffer zone between the tape and top of the pipe to prevent accidental damage to the piping system.

SA Water have adopted the Australian Standard colours for marker tapes which are determined in relation to the type of piping system.

Laying of marker tape is being introduced as follows:-

- **Sewer Pressure Main**
  - Cream coloured tape : Non-detectable.
  - *Use:* - All pumped mains
  - *Reason:* - To prevent mains from being confused with water mains
- **Polyethylene Pipe**
  - Green coloured tape : Detectable.
  - *Use:* - All 25 mm connections which are not at Right Angles to the property boundary and the main
- **TYTON LOK Pipework**
  - Purple coloured tape : Non-detectable.
  - *Use:* - All TYTON LOK mains

Refer to the Authorised Item Catalogues for a lists of suppliers.

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## CHANGE OF COLOUR

You may have seen or shortly will see a different colour Sewer Pipe arriving on site. The traditional cream pipe and fittings are turning GREY. Australian Standard AS1260 has been re-issued and it includes a few changes, but the major change affecting us is the change of colour.

AS/NZS1260:1996 is now a combined Australian and New Zealand standard covering PVC pipes and fittings for drain, waste and vent applications. The new standard combines:

- the old AS1260 (PVC pipe and fittings for sewerage applications)
- AS1415 (PVC pipe and fittings for soil, waste and vent applications) and
- AS2340 (Lightweight PVC pipe and fittings for soil, waste and vent applications).

Manufacturers have a three year period to phase in the change. To ensure there is no confusion all pipe must be clearly marked at a maximum of 1 metre intervals.

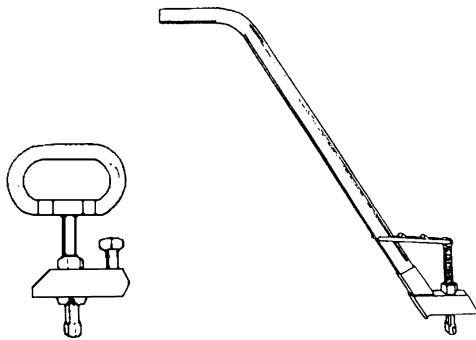
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## NEW KEYHOLES (to AS3996)

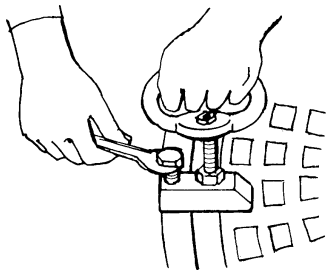
Occupational Health and Safety, National Water Agency requirements and product development have brought about a change in the lifting hole design used on all departments cast covers

The new Australian Standard lifting keyhole design, which is similar to the existing GATIC lifting key-hole, has been adopted nationally by manufacturers because it meets OH&S and Water Agency requirements.

On larger diameter covers there will be two keyholes located diametrically opposite at the outer edge of the cover. The GATIC series of lifters, and lifters of similar principle/design are ideally suited for this type of arrangement.



Removal of hard to lift covers will now be made a lot easier by use of screw action clamps and/or dedicated lifting devices.



## WSAA - PRODUCT APPRAISAL

Water Services Association of Australia is a formal network of all major Water Agencies around Australia. One of their initiatives is a National Product Appraisal scheme, which is designed to allow one centrally coordinated product appraisal, carried out by the most appropriate water industry assessment group, to be used as the basis of assessment by all Water Agencies.

The first of these appraisals was carried out by SA Water's Infrastructure Standards Unit and the Materials Science Centre (Ottoway) on the James Hardies Pipeline PVC pipe fittings (Blue Brute). The trial received enthusiastic support from the manufacturer and all major Water Agencies.

## TEMPERATURE - LAYING PIPE

There have been some queries about laying PVC sewer pipe on hot days. The new DS 11(b) states that embedment can not be placed if the temperature adjacent to the pipe is greater than 27°C. A simple method of checking is as follows:-

- If the temperature, when read with a thermometer placed directly on top of the pipe (for approximately 1 minute), is less than 27°C it is OK to proceed.

*Reason:* PVC pipe has a high rate of thermal expansion. Sewer pipe, with its solvent welded joints, has no allowance for expansion and contraction therefore if the embedment and backfill is placed on a hot day, when the pipe cools to normal soil temperature it will cause severe stressing or even failure of the main.

*Example:* If pipe is laid at a temperature of 35°C, when it cools to a soil temperature of 25°C a 200 metre length will shorten by 150 mm.

## DEFECT REPORTING

As part of the feedback system, there is a Defect Advice System by which faulty products can be reported. It is as simple as completing the details on a copy of the enclosed form and giving it to one of the Superintendent's Representatives or forwarding it to the Standards Unit. Copies of the form are also included as Annexes to Corporation Specifications DS9, DS10 and DS11(b).

The system serves two purposes, it allows us to identify potential problems with the system as well as creating a method of monitoring the authorised product manufacturer's QA system.

Feedback will be provided on all reports.



# CORROSION PROTECTION REVIEW

Supplement to **TECHNICAL NOTES - Number 1**

There is some confusion about which pipes and fittings should be corrosion protected and which corrosion protection system should be used. This brief is designed to clarify where the various systems should be used, taking into account recent changes to some requirements.

## **Petrolatum Anti Corrosion Tape System (in accordance with DS29)**

This corrosion protection system has been used for many years and is ideal for Cast Iron and Ductile Iron Fittings as well as bolted (flanged) connections, gibault joints, tapping saddles and DR brass fittings and connectors. This system is tolerant to limited surface preparation. When completely coated and wrapped it seals out the air and water preventing corrosion.

## **Bitumen Mastic Anti Corrosion Tape System (in accordance with DS81)**

This system has only recently been added to the SA Water system, because of the need for a better corrosion protection system. It is particularly suited for use in conjunction with MSCL Sintakote coated pipe and any other MSCL pipe where longer term corrosion protection is required.

Because this system provides a longer life, higher levels of surface preparation are required. It also has the advantage of increasing the performance of the cathodic protection systems. It is an essential requirement for use in conjunction with Sintakoted pipes and where an MSCL main is to have CP installed either now or in the future.

NOTE - Sintakote is the preferred below ground pipeline coating for MSCL pipes.

## **Linear Low Density Polyethylene Sleeving (LLDPE).**

This method of corrosion protection is utilised for the protection of all buried DICL pipes and fittings. It is designed to keep the soil and any free flowing water away from the pipes and fittings, it is not designed to keep the DICL dry.

In a correctly installed system, any moisture that does form between the sleeve and DI quickly becomes depleted of oxygen to form a very low corrosive environment. It is therefore essential to ensure the sleeving is fitted without damage and strapped or taped to the pipes to prevent free flowing water from gaining access. Double sleeving is sometimes specified where more complicated shapes are to be wrapped.

This method of protection is now authorised as an alternative option for use on DICL/CICL fittings installed on PVC pipe systems. It is essential however that the standard procedures are adopted for the sleeving of these fittings and that the sleeving that is utilised is from new rolls rather than oddments which may have been damaged or subjected to extended exposure to UV.

## **NOTES**

Stainless steel fittings and components require no corrosion protection. Wrapping or sleeving of stainless steel can promote corrosion so these practices are not to be used on stainless steel fittings.

All flanges, including PVC flanges must be completely petrolatum protected as shown on WSCM page C2.

*The table on the following page summarises the types of corrosion protection required for various product ranges.*

Application	Anti Corrosion System			
	Petrolatum (DS29)	LLDPE	Bitumen Mastic (DS81)	Water Supply Construction Manual Page No.
<b>DICL pipe</b>		YES		C1
<b>DICL/CICL Fittings</b> (on all pipe material types)				
Socketed joints	YES (choice)	YES (choice)		C2
Flanged joints				
Choice #1	YES (flange and bolts)	YES (pipe section)		C2
Choice #2	YES (all of fitting)			C2
<b>PVC pipe</b>		Not required		
<b>PVC Fittings</b> (for PVC pipe only)				
Socketed joints	Not required	Not required		
Flanged joints	YES (flange and bolts)	Not required (on pipe section)		C2
<b>MSCL pipe</b> small dia./short lengths	YES (choice)		YES (choice)	
<b>MSCL pipe</b> larger dia (>200mm)			YES	
<b>Brass Fittings</b>	YES			H1, H2, H3, H4 & H5
<b>Tapping Saddles:-</b>				
Gunmetal on PVC & AC	Not required			
Stainless Steel	<b>NOT REQUIRED</b>			
Glass Reinf. Nylon	Not required			
All others	YES			H1, H2, H3, H4 & H5

**NOTE -** In some instances combinations of the above protection methods can be used. If in doubt refer to the Water Supply Construction Manual.

### Fusion Bonded Coated fittings.

Some fittings are now authorised with factory applied high performance fusion bonded epoxy or nylon coatings. Additional corrosion protection is not generally required except in the following circumstances.

- Bolted Flanges - Petrolatum Tape System to DS 29
- DR Brass inserts - Petrolatum Tape System to DS 29

All fittings supplied with these coatings shall be inspected for coating damage or defects immediately before installation. Minor external damage shall be repaired in accordance with DS 29 being careful not to wrap any stainless steel assembly fasteners.

Fittings with internal damage/defects and/or extensive external damage (Greater than an area 25 mm x 25 mm) shall be rejected. In these situations a **Defect Advice Sheet** shall be raised and returned to the Infrastructure Standards Unit.

*For further information contact the Infrastructure Standards Unit.*