



**Plastics Industry Pipe Association
of Australia Limited**

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Technical Manual

PVC PRESSURE PIPE SYSTEM MAINTENANCE GUIDE

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Pipelines Integrity For a Cleaner Environment



Disclaimer

In formulating this manual PIPA has relied upon the advice of its members and, where appropriate, independent testing.

Notwithstanding, users of the manuals are advised to seek their own independent advice and, where appropriate, to conduct their own testing and assessment of matters contained in the manuals, and to not rely solely on the manuals in relation to any matter that may risk loss or damage.

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PVC PRESSURE PIPE SYSTEM MAINTENANCE GUIDE

Introduction

PVC pressure pipe is used extensively for the supply of water and for pressure sewer pipelines in the Australian Water Industry both in new infrastructure and renewals of existing networks. PVC pressure pipe systems are an established part of the water industry and this guide has been developed to summarise the products that are readily available from PIPA members for maintenance purposes. The techniques and fittings shown in this guide are suitable for use with all types of PVC pressure pipe – PVC-U, PVC-M and PVC-O.

Whilst the products and techniques can be considered as well established, those involved with the use of these techniques and fittings should be suitably trained in the correct installation procedures for each product.

Users of this manual should note that this document does not constitute an approved list of products and the onus is on installers to ensure that the proposed fittings to be used have been authorised by the relevant asset owner.

1 TAPPING USING MECHANICAL SADDLES

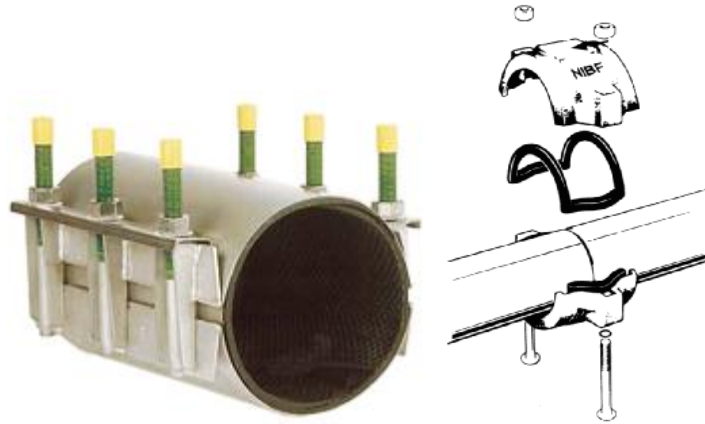


Manufacturers/Suppliers: Vinidex, Iplex/Crevet/Milnes,

Comments

- Can be installed with pipeline either pressurised or unpressurised and external surfaces can be wet.
- Provides a means to connect service isolation valve or direct connection to service pipe via threaded connection
- Ensure saddle is correct size for pipe DN and check it is for correct pipe Series
- Use saddles that fully encircle the pipe and have a positive “stop” to prevent overtightening
- Use sharp hole saws or shell cutters to cut the hole in the PVC pipe
- Don't use speed bore, spade or masonry drill bits to drill hole in pipe – these can damage the pipe
- Follow the manufacturer's installation instructions
- Use only saddles that meet the requirements of AS/NZS4793 for use on PVC pipe

2 PUNCTURE OR HOLE REPAIR USING MECHANICAL REPAIR CLAMPS



Size Range: Clamps are available for all PVC pressure pipe sizes. Stainless steel and cast iron are the common materials used for these clamps.

Manufacturers/Suppliers: Iplex/Crevet, PPI, Vinidex

Comments:

- Never use stainless steel clamps as a mechanical coupler to join two pipe ends
- Use only where the pipe is able to maintain its structural integrity.
- Use only where the damage is a clean puncture that is not going to extend beyond the clamp (consult suppliers information regarding maximum defect size for any specific clamp).
- Surfaces must be clean but may be wet during installation.
- Follow the clamp manufacturer's installation instructions.
- Stainless Steel clamps require particular diligence during installation
 - Pay particular attention to the recommended bolting torques
 - Apply ample lubricant to the seal. This allows the seal to slide over itself and the pipe preventing seal bunching.



- If leakage persists do not overtighten the bolts. Remove the clamp and repeat the installation procedure. Ensure the surfaces are clean and that the clamp is correctly positioned over the damaged area.
- Stainless steel fittings should not be used in permanent water charged conditions or in saline, estuarine or similar soils

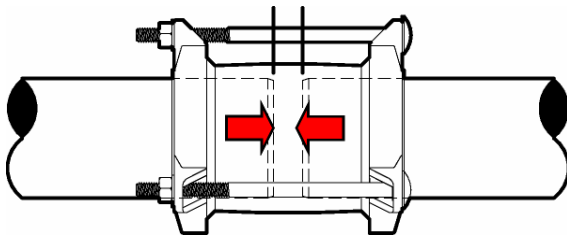
3 SECTION REPLACEMENTS USING MECHANICAL COUPLINGS



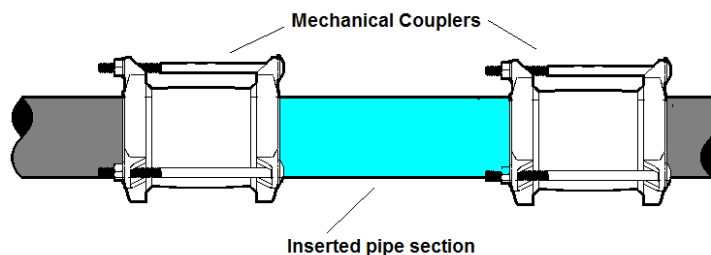
Manufacturers/Suppliers: AVK, Iplex/Crevet, Vinidex

Comments

- Follow the fitting manufacturer's installation instructions
- Cut the pipe ends squarely and don't over chamfer the pipes (see section 12 for further information).
- Leave a gap between the pipe ends (as recommended by the manufacturer) and lubricate the pipe spigots – this prevents the pipe ends being forced together during installation and potentially damaging the pipe ends.



- Tighten the bolts sequentially to keep the ends of the coupler parallel
- Don't over tighten the bolts – check and follow recommended tightening torques



4 BRANCH CUT-INS USING FLANGED BRANCH OFF-TAKE FITTINGS



Manufacturers / Suppliers: Crevet /Iplex, Vinidex

Comments

- Check the pressure rating of the fitting is compatible with the operating pressures of the pipe system
- Follow the manufacturers' installation instructions
- Fitting installation and connection of branch often carried out under pressure. In this case referred to as an Under Pressure Cut-In Connection - UPCIC
- When used under pressure specialised assemblies are required to cut the hole in the host pipe in order to connect the branch under pressure
- These fittings are size specific – therefore ensure the clamp size is matched to the pipe size, check the DN and Series (1 or 2) of the PVC pipe are compatible with the same DN and Series of the clamp.
- Only use fittings that comply with the relevant standards or industry specifications (AS, WSAA or PIPA)

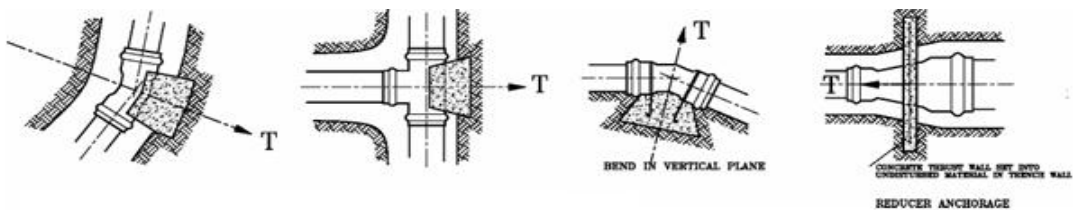
5 CONNECTIONS TO SOCKETED FITTINGS



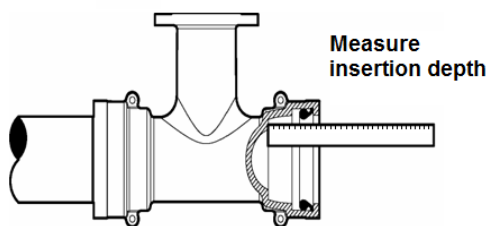
Manufacturers/Suppliers: AVK/Crevet/Iplex, Hawle/Vinindex

Comments

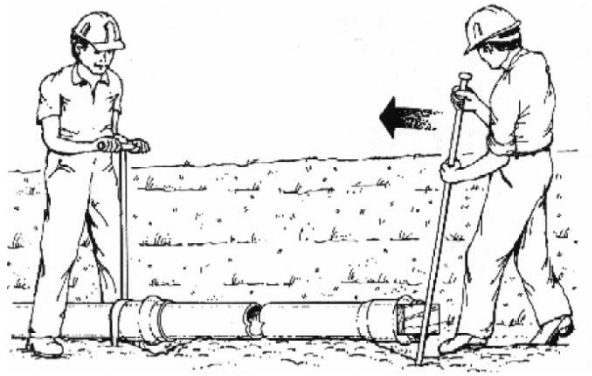
- Most fittings under pressure generate thrust. All unrestrained rubber ring jointed pipeline systems (regardless of pipe material) must be installed to resist those thrust loads. This is usually achieved with the use of suitably sized thrust blocks. (See WSAA Technical Note 4 and the National WaterCode or AS/NZS 2566).



- Check sockets for entry depth and place witness marks on pipe accordingly. Only insert to the witness mark. Over insertion can damage the pipe end.



- Clean and lubricate spigot and rubber seal prior to insertion.
- Any AS2280 socketed fitting is suitable for use with PVC pressure pipe
- Ensure the correct sized rubber ring is installed in the fitting
- When making the joint spread the load on the end of the pipe – e.g. use a block of timber between the bar and pipe end



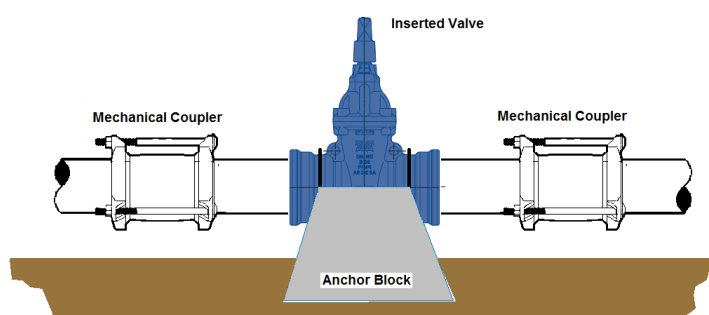
6 INSERTING SOCKETED VALVES



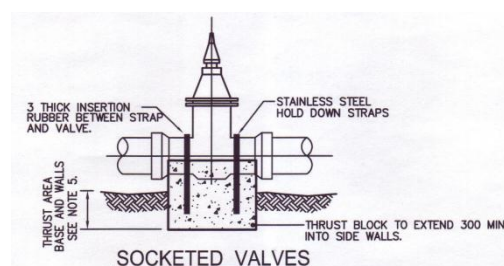
Manufacturers/Suppliers: AVK/Crevet/Iplex, Hawle/Vinidex

Comments

- All valves generate thrust. All unrestrained rubber ring jointed pipelines (regardless of pipe material) must be installed to resist those thrust loads. This is usually achieved with the use of suitably sized thrust blocks. (See WSAA Technical Note 4 and the National Water Code).
- Check sockets for entry depth and place witness marks on pipe accordingly. Only insert to witness mark. Over insertion can damage the pipe end.
- Clean and lubricate spigot and rubber seal prior to insertion.
- When inserting into an existing pipeline the usual method of insertion will also require short sections of straight pipe either side of the valve with mechanical couplers used to complete the connections – see Section 3 for further information.



Typical socketed valve insertion installation



Typical WSAA Recommended anchorage method for socketed valves

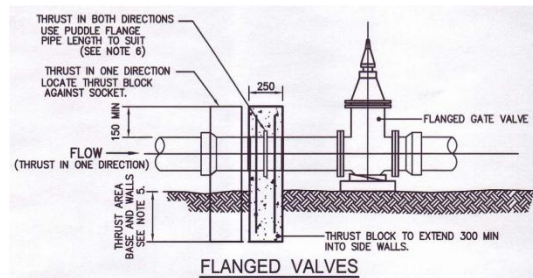
7 INSERTING FLANGED VALVES



Manufacturers/Suppliers: AVK/Crevet/Iplex, Hawle/Vinindex

Comments

- All valves generate thrust. All unrestrained rubber ring jointed pipelines (regardless of pipe material) must be installed to resist those thrust loads. This is usually achieved with the use of suitably sized thrust blocks. See WSAA Technical Note 4.
- For flanged valves WSAA recommends connection to a socket/flange pipe with a puddle flange and the anchor block around the puddle flange.



Typical valve restraint recommended in WSAA Code



Typical assembled flanged valve with puddle flange adapter. Flanges wrapped to protect bolts

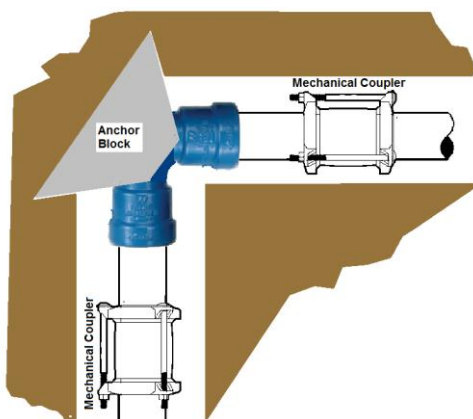
8 INSERTING A FITTING INTO AN EXISTING PIPELINE



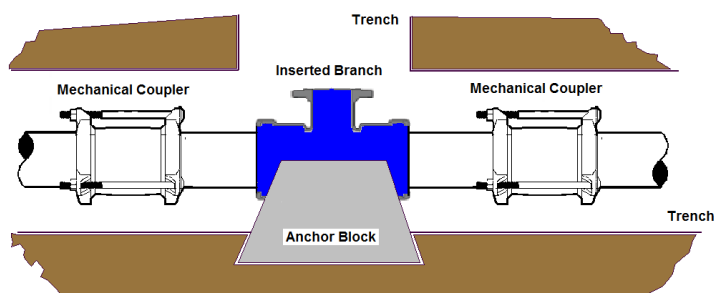
Manufacturers/Suppliers: AVK/Crevet/Iplex, Hawle/Vinidex

Comments

- Most fittings generate thrust. All unrestrained rubber ring jointed pipelines (regardless of pipe material) must be installed to resist those thrust loads. This is usually achieved with the use of suitably sized thrust blocks. (See WSAA Technical Note 4 and the National Water Code).
- Check sockets for entry depth and place witness marks on pipe accordingly. Only insert to witness mark. Over insertion can damage the pipe end.
- Clean and lubricate spigot and rubber seal prior to insertion.
- When inserting into an existing pipeline the usual method of insertion will also require short sections of straight pipe either side of the branch with mechanical couplers used to complete the connections – see Section 3 for further information.



Typical bend insertion into an existing pipeline



Typical branch insertion into an existing pipeline

9 Flange adapters

Size Range: Wide range of options with fixed flange adapters. Adjustable adapters limited to smaller reticulation sizes – check with manufacturers.

Manufacturers/Suppliers: Iplex, Vinidex

Comments

- Some flange adapters are fixed and others adjustable.
- Consider the need for anchorage – dependent on the type of fitting connecting to the flange.



Adjustable adapter – adjustments for both length and angle.



Fixed flange adapter

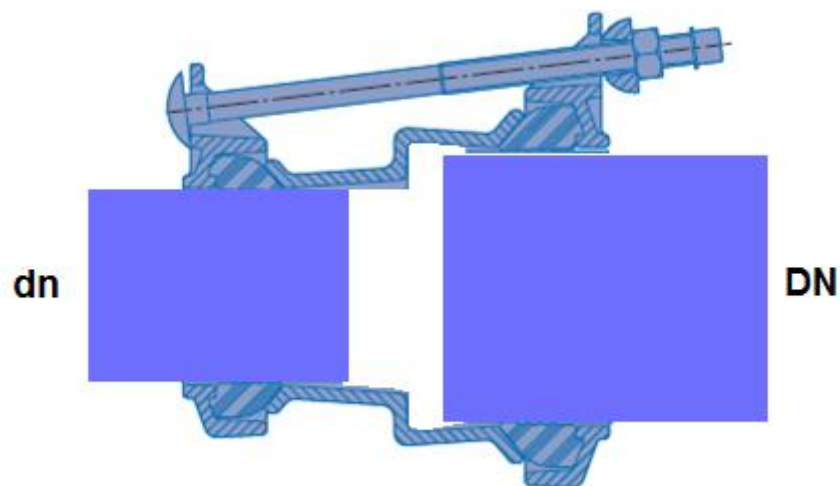
10 STEPPED COUPLINGS



Manufacturers/Suppliers: Iplex, Vinidex

Comments

- Used to connect pipes of different diameter.



11 CURVING PIPE

Comments

- Detailed instructions for curving PVC pipe are provided in POP202 available at www.pipa.com.au
- Curved PVC pressure pipe can be tapped provided the curve radius is no less than 300 x DN of the pipe – see POP202 and WSAA Technical Notes 4 and 5 for more details.
- Always assemble the joint in a straight line – then form the curve.
- Curve gradually and never bend sharply around edges or posts



12 CHAMFERING

Comments

- Particularly with PVC-O there is a tendency to over chamfer the pipe. It is recommended to use a file to chamfer PVC pipe.
- Remove outer edge to about 50% of wall thickness

