

APPROVED MATERIALS LIST PVC Witness Mark Memorandum

Background

During restoration of the water supply and waste water infrastructure following the September and February earthquakes it has become apparent that the design of the socket and spigot joints between pipes is critical to the pipe's seismic performance.

It has been observed that joints which allow a greater range of movement are better able to accommodate ground movements. Essentially socket dimensions control the amount of elongation or compression that can be accommodated within the joint.

AS/NZS 1254 *PVC-U pipes and fittings for stormwater and surface water applications* and AS/NZS 1260 *PVC-U pipes and fittings for drain, waste and vent application* specify the Effective Sealing Length to be equal to the insertion depth plus the clearance between the end of the spigot and the base of the socket. Clause 4.7 also states: "*the witness mark shall be provided for the full circumference of the pipe at a distance from the pipe end equivalent to the insertion depth +0-5 mm*". (..) **NOTE: The insertion depth/witness mark location may vary from manufacturer to manufacturer depending in the socket/joint design**".

Purpose of this Memorandum

The purpose of this memorandum is to specify minimum socket dimensions and to clarify for suppliers and contractors what is required by Christchurch City Council (Council) for minimum socket dimensions and witness marking on approved Polyvinylchloride (PVC) pipes.

Performance Required

Witness marks on PVC pipes are required under AS/NZS 1254 and AS/NZS 1260 and are an established construction technique for ensuring the correct depth of engagement of socketed pipes.

The correct alignment and insertion of the spigot into the socket allows the pipe to expand and contract under test and operating pressures, and allows the pipe to elongate and contract due to changes in operating temperature. Adopting a suitable insertion depth and clearance (gap between end of spigot and base of socket) will allow the pipe to elongate and compress when ground movement occurs.

Council require that socket dimensions be standardised to provide the deepest insertion length and clearance that can reasonably be formed by all manufacturers.

Recommendation for Witness mark

After consultation with the industry Council has adopted socket dimensions that are 25 mm longer than the minimum Effective Sealing Length specified by AS/NZS 12540 and AS/NZS 1260 (see sketch below).

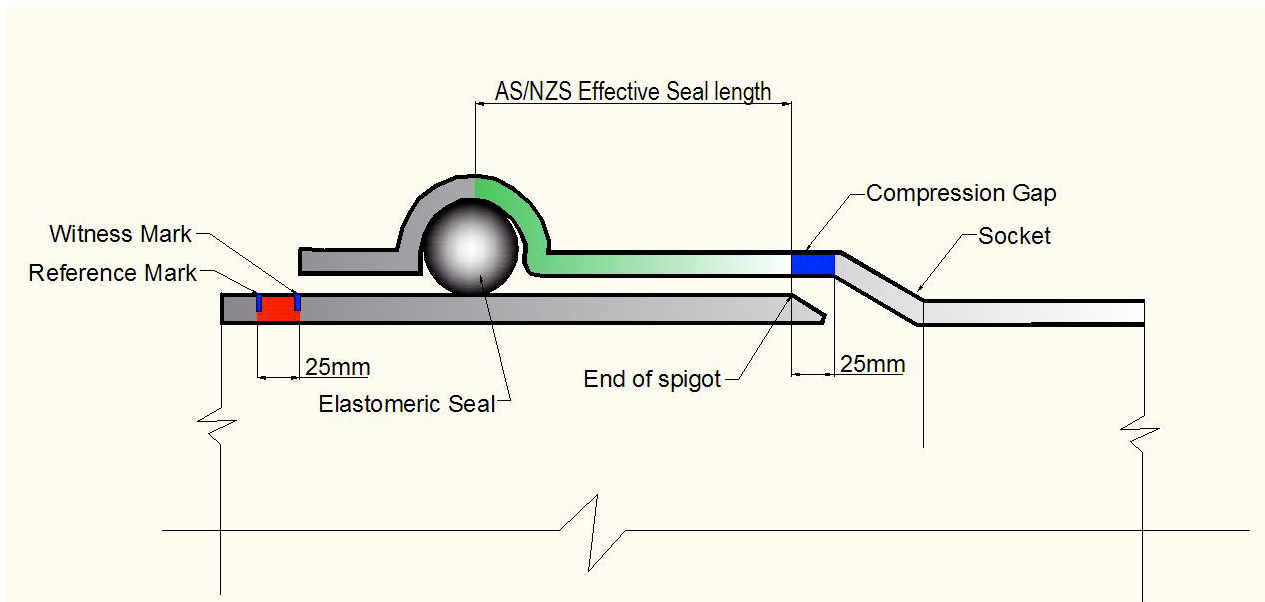
The **Witness Mark** shall be placed so that there is a clearance (to act as a compression gap) of 25 mm between the end of the spigot and base of the socket.

A **Reference Mark** shall be placed 25 mm from the witness mark so that when the pipe is pushed home in the socket the reference mark is visible and 25 mm from the end of the pipe socket. The reference mark may be a band of clearly legible colour 25 mm wide and bordering the witness mark.

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PVC Pipe sizes DN (mm)	Minimum effective sealing length PVC pipes (mm)
150	55
225	75
300	85
375	95

The following sketch illustrates the requirements.



Additional information to assist pipe installers:

- Each witness mark must be placed around the circumference of the pipe barrel.
- All socketed/pipe connections must have a specific witness mark to match the correct socket depth.
- Each pipe spigot shall not be over-inserted or pushed beyond the witness mark (make sure the reference mark can be seen).
- Placing a witness mark around the circumference of the pipe barrel after pipe insertion is not permitted.