

Work Instruction

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Personal Protective Equipment and Clothing	<i>Protective eyewear, hardhats, gloves, steel capped boots, high-vis clothing, Face Shield, hearing protection.</i> 
Critical points	1. Charge water main Slowly and in a controlled manner 2. <i>Asbestos removal must only be performed by trained and competent personnel</i>

1 PURPOSE

This work instruction is in relation to the safe repair of water main and leaks when completing Downer operations on water projects. All employees, contractors and visitors are subject to the provisions outlined. This safety instruction supplements the Safety Management Plan, all training provided, site SWMS and risk assessments.

All works must be carried out in accordance with the Occupational Health and Safety Act, other relevant Acts, Codes of Practice, Statutory Regulations.

2 GENERAL

If a burst/leaking main is located under or near any street tree, then negotiations are required between Maintenance site personnel/Supervisor and the Council as to how the repair can be carried out. Temporary blank plates may need to be installed while these negotiations are taking place.

Without first obtaining the approval of the responsible authority, Maintenance personnel (including subcontractors) shall not cut down any street tree or cut any major limb or excavate around the base of a tree such that the stability of the tree or the life of the tree is threatened.

Refer: South East Water Specification section 4,8, and 8.10

3 DEFINITIONS

Leaking main water main where water is leaking from a pipe or fitting, and repairs can be affected without the necessity to replace pipes or fittings

4 PRE-COMMENCEMENT

- 1 Before commencing any work, Complete SWMS / Traffic management plan and make the site safe. Erect road signage, fluorescent traffic cones, barricades / paraweb, etc. appropriate for the work site.
Refer Vic Roads Roadworks Signing Code of Practice.
Refer: SEW Specification traffic management 4.4.2
- 2 Assess potential or actual risks to:
Environment, property, personal & public safety, other Authorities assets, key / critical customers and water quality.
Silt traps may be needed if there is a possibility of silt or foreign objects flowing into the drains, creeks or rivers.
If the main is either AC or Mild Steel containing AC coatings Refer: South East Water Specification section 8 coatings are to be used instead of this procedure.
If there is a risk of the water quality being contaminated due to any external presence (damage sewer or recycled main, burst occurring near or under a creek or dam, suspected backflow from a connected property) then the job must be escalated to SEW immediately, to undertake a risk assessment and remedial works.
If the main is to be shut down for repair, which will result in a large area pressure loss (i.e. on a water main supplying into a suburb/town, resulting in that entire town/suburb experiencing pressure loss) then it must be immediately escalated to SEW water quality team for assessment of risk to water quality.
Where other authorities' assets have not been located, use of excavator bucket to dewater/remove sloppy soil is prohibited.
- 3 Determine/ascertain location and severity of the leak by appropriate means, which may include the following:
Visual inspection, Leak detection, Drilling holes, taking care to not damage underground obstructions, look for pits, cables etc.
Acoustic (sound) services, Deduction or Probing
Hydro Excavation (if applicable)
- 4 Prove the location and depth of the water main. Program the repair to be carried out.
If probing of a job site is required where a void that is not visible may be present, the below procedure shall apply.
- 5 Starting at a minimum of 1 metre from the perimeter of the wet area in line with the water main, commence probing.
- 6 Once probed, if no sound is detected and the ground is solid, move forward 500 mm stepping on to the area that has just been probed.
NB: Easy probe penetration can signify a void beneath the surface.
- 7 Continue to move forward in increments of 500 mm until the problem is located.
Probe and manually excavate with caution.
- 8 If a void is located, move back to a safe area and evacuate an observation hole 300 mm x 300 mm by hand to determine extent of the void.
- 9 If the depth of excavation exceeds 1.5 metres, a "Notice of Intention to Commence Operations" form must be lodged with the WorkSafe Authority.
Use appropriate shields or shoring / benching.
- 10 Locate all assets around the burst, Contact the relevant authorities regarding the location of their underground assets if necessary.

5 PROCEDURE

5.1 Water Main Shutdown and Excavation.

1 Water main shutdown:

Refer: South East Water Specification Water supply network shut down section 4.

If the repair cannot be done under positive pressure, and the main is to be shut down, ensure all streets that are fed off the isolated section of main, including downstream, are isolated. This will prevent draining other mains that do not need to be drained, thus preventing dirty or white water/possible backflow in these mains.

2 Excavate water main – ensure there is a minimum 100mm (or fist size) clearance between the bottom of the pipe and the excavated soil

Provide ground support appropriate to the excavation.

Use of spotter.

Refer: South East Water Specification Risk event section 1.6

By ensuring there is adequate clearance between the pipe and the soil below, if the main needs to be shut down to negative pressure, then the gap will prevent soil/contaminants from entering the water main.

Spoil to be placed clear of drain channels, gutters

3 Determine the cause of the leak - Damaged pipe, lead joint, perforations, splits etc.

4 Some repairs can be undertaken under pressure or at reduced pressure without the need to affect supply, i.e, lead joints/perforations. It is preferred to undertake the repair with positive pressure in the main (albeit reduced pressure) where possible.

Ensure that during repair of the water main no foreign substance or ground water can enter the system. If it is considered that contamination of the main has occurred, immediately take steps to isolate that section of the main, notify the supervisor and undertake measures to remedy the situation.

If a broken sewer or recycled water main has occurred at the same time, the job must be escalated to SEW water quality immediately.

Ensure Correct PPE worn if working under pressure

5 If the task requires the use of perforation pegs to stem the flow of water, a clear, full-protection face mask must be worn until the installation of the perforation peg is complete.

PPE – Glasses must be worn to reduce the risk of any potential facial injuries in the event of the perforation peg failing to hold.

Temporarily back fill over Pegs post installation.

5.2 Repair

1 Clean surface of the main/pipe. Assess/determine pipe surface condition suitability for use of pipe clamp as a repair method.

Wash down with water or wipe with a clean rag. Clean underside of main using rope or descaling tool with handle attachments

2 **Circumferential (broken back), perforation.**

Water mains, repair leaks

Select the suitable/approved repair clamp (stainless steel pipe clamp) or clip.

Apply approved lubrication to the rubber seal.

Apply the suitable/approved repair clamp/clip. Remove the nuts, bolts and washers on the clamp/clip. Position and place the clamp/clip around the pipe and centrally over the split.

Replace and tighten the nuts, bolts and washers using an even tension technique all round in accordance with the manufacturer's instructions.

3 Longitudinal - *This process applies for all types of pipes with longitudinal splits.*

Longitudinal splits are not to be repaired using stainless steel repair clamps

Cut the split out using suitable cutting methods and tools and replace with a selected length of suitable pipe and Gibault in accordance with the relevant requirements of Work Instruction

Asbestos cement (AC) pipes are to be replaced from joint to joint only.

Replacement of a section of AC pipe can ONLY proceed with the approval of the Supervisor. *Asbestos removal must only be performed by trained and competent personnel.*

4 Lead Joint

Use a "knocking up" set of chisels (1 to 5). Knock (push) the lead back into the joint - uniformly. Commence at the base/invert of the joint and work in a clockwise direction around the joint.

For Mild Steel (MS) main contact the Supervisor for direction regarding possible installation for electrolysis protection. Following "knocking up" of the lead joint weld a steel band into position to prevent the joint from being dislodged again.

5 Rubber Ring - Cut the split out using suitable cutting methods and tools and replace with a selected length of suitable pipe and Gibault

6 Fittings

Check existing nuts, bolts and washers.

Replace any damaged nuts, bolts and washers.

Tighten nuts using an even tension technique all round.

If leak continues, loosen and remove nuts, bolts and washers. Replace the insertion rubber/gasket.

If replacing the insertion rubber/gasket reassemble the fitting using new nuts, bolts and washers.

7 Perforations on Mild Steel (MS) Mains Only

Contact the Supervisor for direction regarding possible installation for electrolysis protection.

Place and knock perforation peg in place. Cut/level peg flush with outside of main.

Weld a steel band/patch over perforation and peg.

Prime and replace protective coating as required

5.3 Water Main Recharge.

Water mains, repair leaks

- 1 Slowly recharge main and check for leaks
Refer: South East Water Specification Water supply network shut down section 4.6
Handy hint – Turn Hydrant all the way open, crack valve via quarter of a turn (Listen for noise and wait until clear water presents). There should be 500mm to 1m of protruding from Hydrant.
The next step is Choke the Hydrant Down (so that there is approx. 500mm to 1m of water protruding from Hydrant spout).
Every 5 to 10 minutes SLOWLY continue to close Hydrant until completely shut off. (THIS IS THE MOST IMPORTANT STEP OF REPAIRING A MAIN).
Please note – the pressure caused by the main will dictate the length of the water coming from the spout of the Hydrant. Please ensure your maintaining communication with valve operator on initial opening of valve.

6 REINSTATEMENT/RESTORATION

- 1 Repair and/or replace polyethylene wrapping/sleeving on Ductile Iron Pipes and fittings.
Cover with 2 layers of sleeving individually installed and fastened. Use either tape or strap and buckle.
Please ensure Blue wrap is applied as per SEW procedure.
- 2 Excavation to be backfilled and reinstated. If the excavation reinstatement requires cold mix to be positions until final reinstatement repairs are carried out the Montage is to be written in paint on the cold mix when marking up the road opening.
Backfilled material is to be equivalent or better than the material removed from the excavation.
- 3 If the excavation cannot be backfilled immediately supervisor must be informed.
The site is to be fenced off using para web, barrier tape, barricades, lights etc appropriate for the work site. Excavated hole to be covered where appropriate and made safe.
- 4 Clean up site
 - ☐ remove debris
 - ☐ remove signage / barricades
 - ☐ leave site in a neat and tidy condition

7 REFERENCED DOCUMENTS

WORK INSTRUCTIONS

Victorian OHS Act 2004, Regulations 2017 and applicable Codes of Practice

Document Number