

# Water Reticulation O&M

Best practice guideline for Fulton Hogan staff



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We would like to acknowledge the contributions of Fulton Hogan's water specialists in preparing the content for the guideline. We also thank the Hawkes Bay Three Waters team for the photos.

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# Overview

You are reading this because you are working on a three waters reticulation O&M contract.

This guideline outlines how we work on these contracts. It includes guidance for activities we normally do for both reactive work such as water leaks and planned work such as hydrant inspections...

This guideline does not replace or supersede minimum requirement / water library documentation or substitute training required to work on water networks.





# General guidance

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# Important points for working on water networks

## Disinfection and hygiene

We are careful about disinfection and hygiene to protect the water network from contamination. These are minimum requirements and must be followed at all times. If in doubt, push pause and ask.

Go to theHub to access our [Disinfection Minimum Requirements](#).



Use this code to access to our KnowHow app.

Remember:

- We always have disinfection controls in place.
- We always carry disinfection solution.
- We always disinfect our tools and materials.
- We always protect the work area from contamination.
- We always separate water and wastewater activities, tools and equipment.
- We never discharge chlorinated water to the environment.
- We always test to see if the network has a safe level of chlorine when leaving a job.



## Public interactions

We often work close to people's homes and businesses. We may need disrupt their water supply or wastewater connection. We may need to go onto properties to investigate issues, access tobies or outdoor taps.

It's important that we do our best to minimise disruption. This means:

- Keeping clear of access ways and driveways where possible.
- Reducing noise.
- Working on the public side of the boundary wherever possible.

Keep people informed of work that affects them:

- When working near someone's home, tell them what's happening.
- Give them a customer card so they know who to call when they have a question. If no one is home, leave a card.
- If something changes, let them know.

Vulnerable people or people on life support systems cannot have their water supply turned off. Check your GIS maps or client system to see if there are any vulnerable customers that could be affected by your work.



## Water shutdowns / no water

If an incident has stopped water supply to a customer:

- Let them know immediately.
- The council might tell us to provide an alternative water supply.

If you are planning to cut off water to an area:

- Let all customers know at least 24 hours before.
- Provide temporary water supply to vulnerable customers, business and schools as directed.
- If water will be off for longer than 8 hours then Taumata Arowai must be advised. Talk with the council first.

## Temporary supplies

We use temporary connections to bring water from somewhere else while the normal connection can't be used. We only do this when water will be off for a long time, or to customers that can't be without water.

- Bury temporary connections where possible.
- Cover exposed pipe to protect it from heating in the sun.
- Protect temporary supply pipes from traffic.

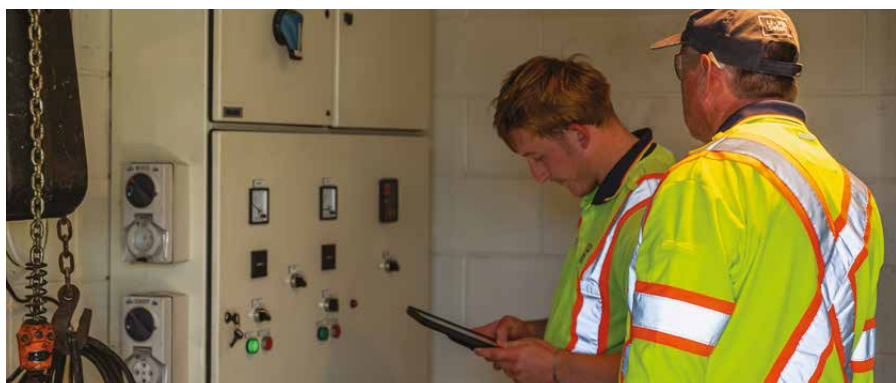
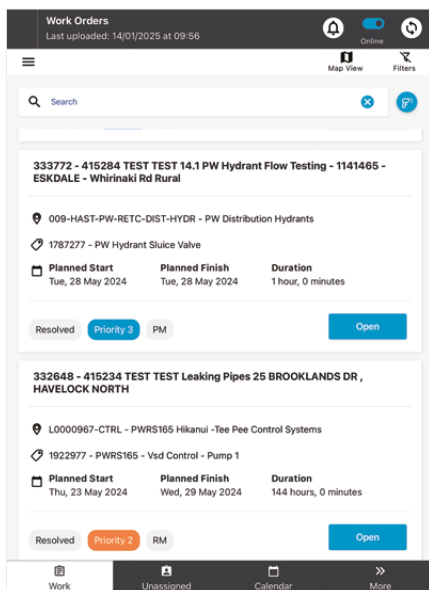
Disinfect the temporary line before turning it on. Look in the HowTo 'Water - Disinfection Minimum Requirements - NZ' work instruction for details of what's required.



# Work order management – Maximo / Touchstone

Maximo is the software our supervisors use to manage our work. Work Orders are sent from Maximo to Touchstone on our iPads for you to complete the work. Your jobs will appear in a list on your iPad. You can see details about your job including location, description and priority.

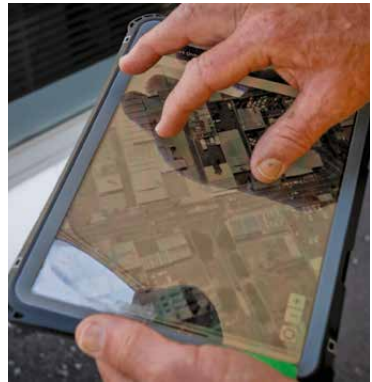
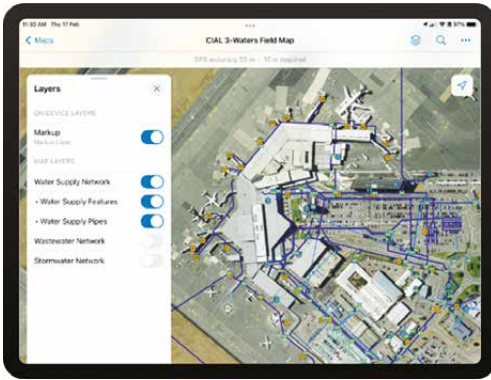
If you have any questions contact: [FHITMaximoSupport@fultonhogan.com](mailto:FHITMaximoSupport@fultonhogan.com).



# Fulton Hogan maps / GIS

Interactive maps help us find assets like pipes and hydrants.

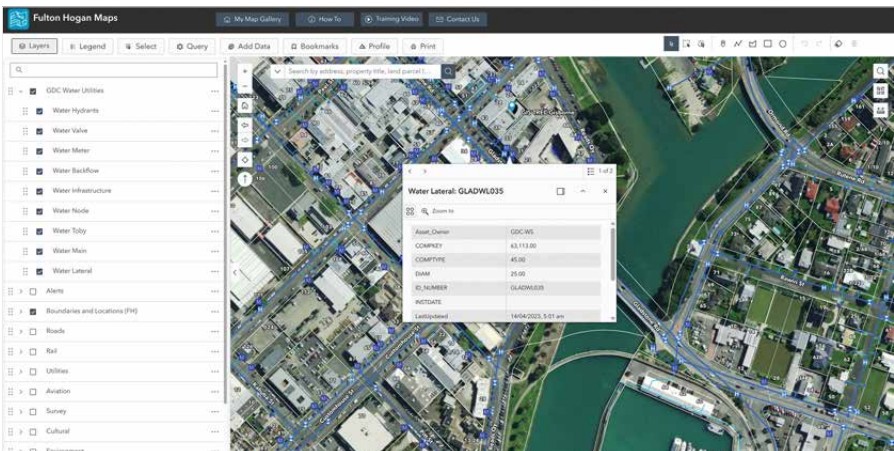
The maps are available to use inside Maximo and Touchstone on your devices and from your iPads via the ArcGIS Field Maps app.



You can also use Fulton Hogan Maps, as a free GIS tool for all Fulton Hogan staff. Access it from the Hub.

Our GIS team can assist you with getting more data added to your maps like Imagery or Property data or performing GIS analysis like finding critical assets.

Contact [FHNZGeospatial@fultonhogan.com](mailto:FHNZGeospatial@fultonhogan.com) for help.



# Work orders and priorities

Work is prioritised depending on the type of job. A big watermain burst is more urgent than a small leak.

## Priority 1 – P1 (high priority work)

Our P1s are usually watermain bursts, sewage overflows or a water outage to a customer. We usually need to be on site within one hour and complete the work in one day.

You may be asked to leave the work you are already doing to attend a P1.

## P2

Our P2s are usually water leaks. We have more time to complete P2s, usually 1 day to get to site and 7 days to complete the work.

## P3 and P4

Our P3 and P4 jobs are planned maintenance work such as valve exercising or hydrant flushing. We usually have 5 days to start P3 or P4 jobs.

The screenshot shows a mobile application interface for work orders. At the top, there is a dark header with the text "Work Orders" and "Last uploaded: 14/01/2025 at 09:56". To the right of the header are three icons: a bell, a toggle switch labeled "Online", and a refresh icon. Below the header is a navigation bar with a hamburger menu icon on the left, "Map View" in the center, and "Filters" on the right. A search bar is located below the navigation bar, containing the text "Search" and a magnifying glass icon. To the right of the search bar are two circular icons: a blue "X" and a blue icon with a wrench and a plus sign. Below the search bar is a list of work orders. The first work order is highlighted and contains the following information: "333772 - 415284 TEST TEST 14.1 PW Hydrant Flow Testing - 1141465 - ESKDALE - Whirinaki Rd Rural". Below this title are two location icons with their respective addresses: "009-HAST-PW-RETC-DIST-HYDR - PW Distribution Hydrants" and "1787277 - PW Hydrant Sluice Valve". At the bottom of the work order card is a table with three columns: "Planned Start", "Planned Finish", and "Duration". The values in the table are: "Tue, 28 May 2024", "Tue, 28 May 2024", and "1 hour, 0 minutes".

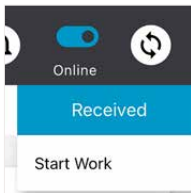
# Using iPads in the field

We record what we are doing in the field so we know what work has been done. Our clients need this information to meet regulatory requirements and to plan the future of the water network.

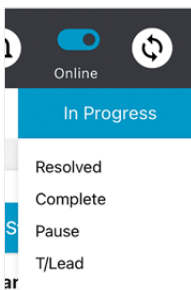
We usually record the following information:

- The time when we arrived at site, when the service was restored and when the job was completed.
- Photos of the job before we start work and of the completed repair.
- Information about the fault that we found e.g. leaking metal pipes.
- The parts and materials we used.
- The contamination risk assessment recorded on our RCP.
- Evidence of disinfection measures used onsite.

## Starting a job onsite and changing status (time stamping)



When you first get to site press 'Start'– this lets everyone know you have arrived. The start button records the On-Site time which is used to measure our performance.







- Use the other available status as you work through the job.
- Press 'Resolved' when water is back on for a customer.
- Press 'Pause' if you need to head away and come back to the job.
- Press 'T/Lead' when you need to stop work and hand the job back to your supervisor.
- Press 'Complete' once the work on the WO has been finished and the site is ready for reinstatement.

## Recording the work

Work orders have fields to complete. This is where we take photos and record asset information. This data gets sent to our clients when the work is finished – it's important we fill it out.

The required information depends on our contract requirements. If the question or check box is on your iPad is red then you have to answer it.

 **Instructions - 1000154 TEST ONLY TEST OW - REWORK WORK ORDER WW #2**    Online

Water Shutdown & Service Off

### Water Shutdown Assessment

---

**Dialysis in shutdown or work area?\*** Clear

No  
 Yes

**Businesses affected by shutdown?\*** Clear

No  
 Yes

**Time last business/restaurant/hairdresser closes (make quick assessment only)** Clear

0/250

**Schools in shutdown or work area\*** Clear

No  
 Yes

# | Asbestos pipes

Asbestos pipes were used in NZ until the mid-1980s when the hazards of asbestos were realised. The pipes were installed in 4-6m lengths and they are joined by collars with rubber ring joints.

Asbestos becomes soft over time and is very fragile. The only thing holding these pipes in the ground is the ground around them. Most councils are replacing asbestos pipes in their networks.

Everyone working with asbestos must be trained, and a permit is required for the work. See the Living Safely Manual for more information and specific requirements.

## **Key considerations for working with asbestos water pipes:**

- Minimise the number of joints in the pipe. Avoid cutting out a central section. Break at a collar and remove an end piece.
- The actual damage usually extends beyond what is obvious so remove at least 2x diameter lengths away from the damaged area.
- It is common for asbestos pipe to become squashed and oval in shape. Consider this when measuring the pipe and selecting fittings.

## **Asbestos contamination considerations:**

- We keep asbestos wet when we handle, break or cut it.
- Where you cut asbestos pipe becomes the contaminated zone. Keep this as small as possible.
- When wet asbestos slurry dries it is very hazardous. Keep it all in the contaminated zone. Don't let slurry (wet or dry) get into work vehicles.
- Consider using low-cost disposable hand saws for cutting. Bin these into the asbestos bag.
- Clean all tools and cutting equipment thoroughly after contact with asbestos. Wash tools into the contaminated area.



# Pressurised pipes

We are often working on or near in-service or pressurised water pipes. These are a source of stored energy that could harm us if we don't take measures to protect ourselves.

Our work could cause a pressurised pipe to fail near us releasing pressurised water, bits of pipe, gravel and road materials.

Isolating a pipe is the only way to remove the risk but this is not always possible or appropriate.

Stormwater and wastewater carry extra risks of disease or environmental contamination. Include these risks in the RCP.

## Excavation around live pipelines

Many pipes use the weight of the ground around them to hold them together. When we excavate material from around a pipe we're removing what is holding the pipe in place.

- We keep our excavations as small as possible. Aim to expose less than 10 x the diameter of the pipe. For a 100mm pipe, expose less than 1m.
- Joints are weaker than the pipe, so don't have them in the middle of the excavation.



Task	What we do
<b>Backfill and compaction</b>	
Buried pipes need to be correctly backfilled and compacted to protect them from the weight of traffic. It's not always appropriate to backfill with the excavated material.	<ul style="list-style-type: none"> <li>• Backfill with approved material</li> <li>• Never backfill using rocks around a pipe</li> <li>• Review local client requirements</li> </ul>
<b>Cleaning pipes</b>	
Grinders and other power tools can damage pipes.	<ul style="list-style-type: none"> <li>• Clean pipes with hand tools only</li> <li>• Avoid using mechanised equipment</li> </ul>
<b>Damaged pipes</b>	
Damage can weaken pipes and cause them to fail later.	<ul style="list-style-type: none"> <li>• Get damage inspected and signed off by a supervisor</li> <li>• The strength of the pipe may have been impacted</li> </ul>
<b>Ferrules / talbot fittings / lateral connections</b>	
These fittings used as take-off from a water main can come free if they are damaged or not installed correctly.	<ul style="list-style-type: none"> <li>• Only work around live pipelines if the fittings are installed correctly and are in good condition</li> <li>• If you find a fitting threaded directly into a pipe without a saddle, stop work and isolate the main</li> <li>• If you spot something else wrong push pause and isolate the main</li> </ul>
<b>Forces on pipelines</b>	
It's easy to damage pipes when installing and removing fittings.	<ul style="list-style-type: none"> <li>• Use a second spanner or wrench to support fittings when connecting / disconnecting from them</li> <li>• We don't stand on pipes or lever against them</li> </ul>

# | Surface reinstatement

Our jobs are judged first by the tidiness of our reinstatement work. We are proud to leave our work looking tidy using materials that match the surrounding surface.

The surfaces we mostly work with are grass, asphalt and plain concrete. Sometimes we have to do work under cobbled driveways or decorative concrete. We always try to match the surface we started with.

We use trafficable lids and bases in roads and driveways and plastic lids and boxes in other areas.

## **Grassed repairs**

- Backfill the area and finish with a layer of topsoil.
- Compact the topsoil using the heel of your boot and readjust the level with a rake to match the surrounding area.
- Sprinkle grass seed over the topsoil.

The finished job will look untidy if we use too little or too much soil, or if the soil isn't compacted.

## **Hard surfaces**

Reinstatement in concrete, asphalt or chipseal surfaces require careful attention. It's costly to fix up mistakes, especially once the surface material has been placed!

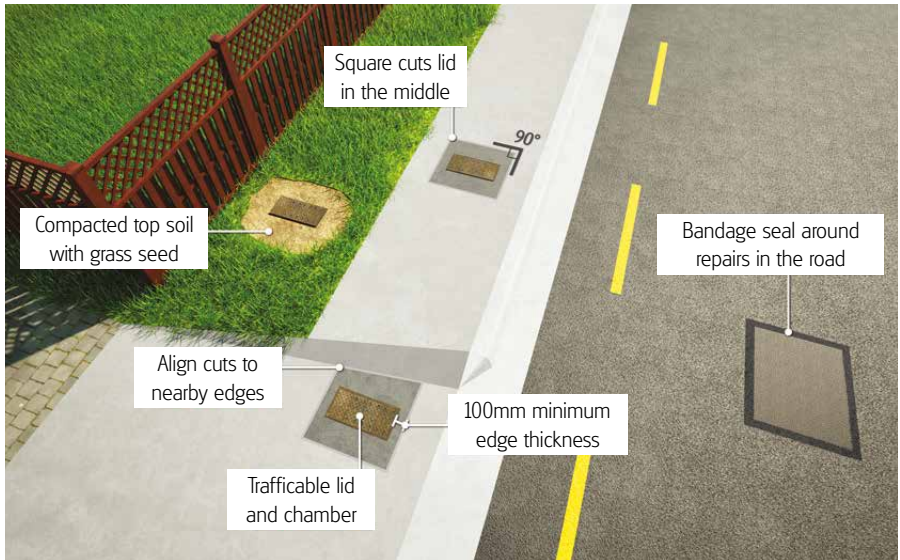
- Before cutting hard surfaces we mark out square straight lines – parallel with the surrounding surface edges.
- Cut the surface using a concrete saw.
- Protect the cut edges from damage during excavation and repair.
- Position valve lids or toby lids at least 100mm from the cut edge of an excavation. This prevents the surface from cracking easily.
- Some clients tell us a minimum measurement we need to cut.

## **Backfill**

- Backfill the job using client approved materials.
- Fill and compact in 100mm layers using a hand tamper. Leave enough room for surface reinstatement.

## Roads

If we do work in roads we need to meet the requirements of the local roading authority for reinstatement.



# Avoiding electric shocks when working on metal pipes

Before 1961 metal water supply pipes were often used as the electrical earth for homes. They could electrocute us when we cut them.

Before we cut a metal pipe we connect temporary bonding cables to each side of the cut location. This lets electricity move across the gap and stops us being electrocuted. Sometimes permanent bonding cables need to be left in place after the job.

When we replace a section of metal pipe with PE or PVC, remove as much metal pipe as practical.

Use of permanent bonding can introduce other risks, it is not required if:

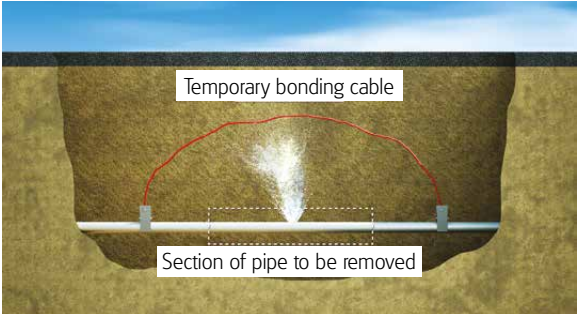
- Metal pieces are re-installed across the gap.
- When more than one meter of metal pipe is replaced with plastic.
- If you are removing all the metal pipe.

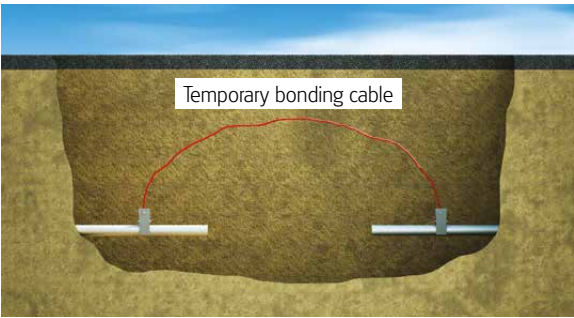
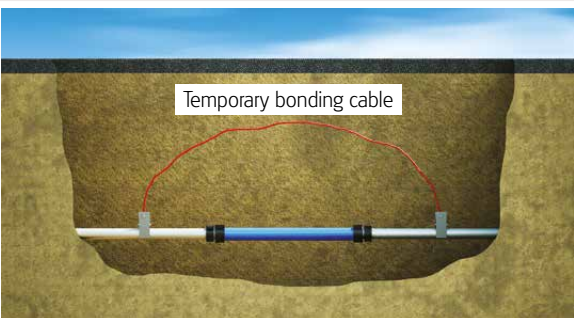
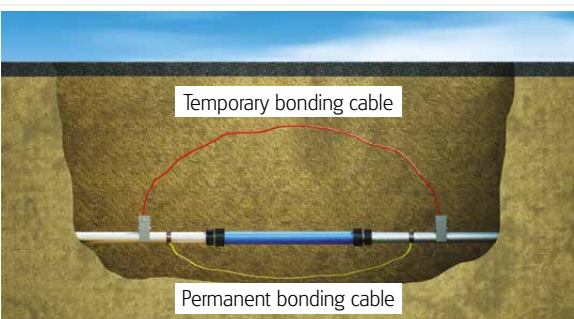
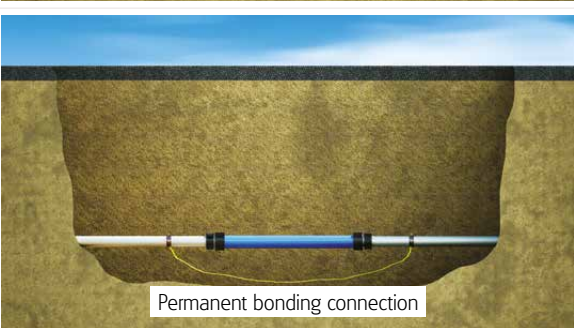
## You will need:

- Temporary bonding cables.
- If required, permanent bonding clamps and cables with a minimum 2.5mm<sup>2</sup> conducting cross section.
- Special PPE – electrical rated 00 gloves.

## How to do it:

Step	Action
1	Apply temporary bonding cables.



Step	Action	
2	Remove section of pipe.	
3	Repair pipe.	
5	Install permanent bonding cables if required.	
6	Remove temporary bonding cables with care.	

# Pump station inspection and maintenance

We inspect and monitor our pump stations to make sure they are tidy, working correctly and to identify any areas needing maintenance or repair. All stations are different.

When we visit site we spend some time to tidy up, even if just onsite for an inspection.

We are often doing a building inspection at the same time.

## Pumps and pipework

- Run pumps in manual and listen for vibrations or unusual noises.
- Inspect and exercise isolation valves.
- Check for leaks from pumps, pipework and fittings.
- Verify pump rotation.
- Check that duty / standby cycling is occurring.
- Return controls to their normal operating position before leaving.

## Control panels

- Are the mechanical and electrical assets operating correctly?
- Are the panels latched shut and locked?
- Are there any signs of corrosion or moisture?
- Are they clean?
- Are the penetrations sealed?
- Are there any exposed cables or bus bars that could be live?





# Building inspection and maintenance

We maintain buildings on our networks that are used for pump stations, control rooms, offices, and stores so that the equipment is protected.

## Plumbing and drainage

We check for:

- Plumbing for any leaks.
- Spouting for any blockages or leaks.

## Electrical and ventilation

We check for:

- Building earth – solid connection? Clear of vegetation? Labelled?
- Condition of plugs, switches and fuseboards.
- Lighting all working.
- Ventilation fans.
- Heat pump, filters cleaned and external unit checked for condition and obstruction.

## Security

We check for property and building security issues including:

- Locks.
- Fencing.
- Building doors and windows.
- Evidence of vandalism or break ins.

## Buildings and grounds

We check for:

- Grounds maintenance, overgrown vegetation, pathways and access.
- Building cleaning or painting requirements.
- Building penetrations are sealed.
- Walls floors and ceilings for corrosion.
- Doors, ladders, steps and covers.
- Lighting (including any emergency lighting).
- Check / replenish vermin control.
- Odour levels inside and outside the building.
- Inspect for any areas where vermin and birds can enter.





# Drinking water

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# | Water general / investigations

## **Investigating a leak**

When you are looking for a leak keep any eye out for the following:

- Damp patches on sealed surfaces.
- Pooling water.
- Unexpected green grass patches.
- Surface slumping.
- Running water in nearby stormwater pipes or sumps.
- Flooding in nearby valve / hydrant boxes.

Use a chlorine meter, or test strips to check the water where a leak is suspected, this can identify whether the water has been treated with chlorine.

Use listening sticks or other tools to listen for hissing sounds.

## **Leak on the customer's side of the toby**

Notify your client of the findings and proceed as agreed. The client may tell the customer to engage a plumber to complete the repair.

## **Customer reports no water**

Commonly this due to accidental shutdowns, water bursts, if someone has turned off water to another property accidentally such as the next-door unit, or if we haven't communicated a network shutdown. No water is a P1 activity.

## **Customer can't find their toby**

In most cases toby boxes have become covered by plants or grass.

We find the toby if we can. It's helpful to use google street view to go back in time, or to look for kerb markings, dips in the road and alignment with the customer's outdoor tap.

# Portable chlorine testing

We routinely test the chlorine level (free available chlorine (FAC)) in our water networks to confirm that it's within safe levels. FAC testing gives the network operators and the regulator confidence that the water is safe.

## You will need:

Different test equipment can test different FAC ranges.

Fulton Hogan recommends:

- HACH DR300 / DR900 for network and treatment testing.
- eXact Micro Photometer Kit for network testing, and pipeline disinfection testing.

## How to do it:

- Check if the meter you are using is within its calibration date. Check your reagents / strips are within expiry date.
- Flush customer tap for 3 minutes. It's important that the water being tested is fresh.
- Add reagents / strip and take sample as per device manufacturer method.
- If in doubt – repeat the test.

**Target FAC levels are between 0.2mg/l and 0.5mg/l.** These vary between networks so check with your network operator.

Are your results outside the acceptable level? Repeat flushing and testing two more times to confirm your results before alerting your supervisor.



# | P1 – water main burst repairs

Water main bursts are caused by pipe joints or connections failing due to age, poor installation or ground movement. Burst pipes require an emergency shutdown before repair.

Bursts are unpredictable and can grow quickly as failure points widen. High velocity water can throw stones and asphalt into the air or make holes in the ground. Always make the area safe before getting close.

## **You will need:**

- Traffic management.
- Road / footpath cutting equipment.
- Excavation / hydrovac capability.
- Watermain isolation tools such as valve key and hydrant stand.
- Pipe cutting and repair tools.
- Replacement pipe sections / connections.
- Backfill.



## How to do it:

1. Make the area safe – use appropriate traffic management at all times. Bursts and isolation valves are often in the road.
2. Undertake emergency isolation if required and approved.
3. Find the leak and check for services. Ensure the pipe is no longer pressurised before you excavate.
4. Cut the pavement and carefully expose the pipe. Excavate at least 300mm below the pipe to create a sump.
5. Install a pump to prevent water flooding the open pipe
6. Evaluate the contamination risk and disinfect the working area of pipe. **The risk level dictates the disinfection you need.**
7. Repair the pipe. Depending on the cause of the burst and the client's preference this may be a new fitting, repair strap or new section of pipe.
8. Backfill with approved materials.
9. Hold point: flush test.
10. Re-commission the pipe.

**Open and close valves slowly. When refilling a pipe let it fill slowly with the valve partially open, once its full open it all the way slowly. Sudden changes in water flow and pressure can break older pipes and cause another burst!**



# | P2 – leak repairs

Water leaks account for most of our customer service requests. Leaks are usually from pipe joints and lateral connections.

Before starting work on a leak, be prepared to conduct an emergency shutdown. A leak could develop into a burst.

Leaks aren't urgent – it's ok to take time to plan your repair.

- If it's safe to do so repairs can be made while the watermain is left pressurised.
- If it's not safe or practical to complete an under-pressure repair then a shutdown is required.

If you expose a leak and the area is unstable or unsafe, press pause and talk to your supervisor.

## **You will need:**

- Network isolation plan.
- Traffic management.
- Road / footpath cutting equipment.
- Excavation / hydrovac capability.
- Pipe cutting and repair tools.
- Temporary water supply / bottled water.
- Backfill.

### How to do it:

1. Make area safe.
2. Find the leak and check for services.
3. Cut pavement and carefully excavate to expose pipeline.
4. Push pause – review if a plan B shutdown is required.
5. Excavate at least 300mm below the pipe to create a sump.
6. Install a pump to prevent water flooding the failed area.
7. Evaluate the contamination risk and disinfect the working area of pipe. **The risk level dictates the disinfection you need.**
8. Repair the pipe. Depending on the cause of the leak and the client's preference this may be a new fitting, repair strap or new section of pipe.
9. Backfill with approved materials.
10. Hold point: flush and test.
11. Re-commission the pipe.

Open and close valves slowly. When refilling a pipe let it fill slowly with the valve partially open, once its full open it all the way slowly. Sudden changes in water flow and pressure can break older pipes and cause another burst!



# | Water connections

We often install new and replacement water connections.

Water connections can usually be made using under-pressure techniques.

## You will need:

- Network isolation Plan B.
- Traffic management.
- Road / footpath cutting equipment.
- Excavation / hydrovac capability.
- Watermain tapping equipment.
- Temporary water supply / bottled water.
- Backfill.
- Water meter / toby box / valves / lateral pipe.



## How to do it:

### Expose the water main

1. Establish TTM Make the area safe.
2. Establish lateral connection point and toby box position. Locate and mark services, adjust position as necessary.
3. Install toby and connect to customer side if applicable.
4. Cut pavement and carefully expose the water main. Excavate at least 300mm below the pipe to create a sump.
5. Install a pump to prevent water flooding the open pipe.
6. Evaluate the contamination risk level and disinfect the working area of pipe. **The risk dictates the disinfection you need.**

### Install the pipe

1. Install saddles and isolation valves (talbot fitting / ferrule).
2. Connect and lay lateral pipe to toby location.
3. **Hold Point** – Flush main connection for two minutes before connecting to toby valves.
4. **Hold Point** – Pressurise connection to toby box and visually inspect for leaks. Repair and re-flush if required.
5. **Hold Point** – Open valves to customer connection and flush at garden tap for 3 minutes. Cap toby connection if no customer connection yet.

### Closeout

1. Take a FAC reading.
2. Backfill excavation to council specification.
3. Close job and order surfacing work.
4. Make the site safe before leaving.

# Water meter installations

We replace meters when they stop working or if they leak. Some clients are replacing mechanical meters with smart electronic meters. Sometimes we add meters to connections that didn't have them.

When we replace meters, we record the meter information and current reading so water charges to the customers aren't impacted.

## You will need:

- New water meter.
- Pipe cutting and repair tools.

## How to do it:

1. Record previous meter reading if applicable.
2. Remove old meter.
3. Disinfect and install new meter. Ensure the dial / display is positioned for easiest reading.
4. Flush customer connection for 3 minutes. Inspect for leaks. Take FAC reading. If using a smart / digital meter check the meter has turned on. Manually activate the meter if required.
5. Check new meter is operating correctly.
6. Record new meter reading.
7. Label and store old meter as agreed with client.



# | Hydrant maintenance

Hydrants can become stiff or seized over time. The lids can break and the chambers can fill with silt. We maintain hydrants to make sure they are locatable and in good working order.

**We flush and flow test hydrants as a separate activity to painting as you cannot paint a wet road!**

## You will need:

- Yellow hydrant paint.
- Wire brush to clean lid.

## How to do it:

1. Cut grass and clean debris from around hydrant lid.
2. Clean out silt and debris from within the chamber.
3. Check for leaks.
4. Check nozzle cap and chain. Replace if missing or damaged.
5. Check for anything that could stop the hydrant working.
6. Clean and paint the hydrant lid and road / kerb markings.



# | Hydrant testing

We flow test hydrants to make sure they are in good working order and fit for firefighting use.

## You will need:

- Hydrant riser.
- Valve key.
- Flow testing equipment.

## How to do it:

1. Connect the hydrant standpipe to flow metering equipment.
2. Position the hydrant standpipe so that water is directed out to a clear area.
3. Open and flush the hydrant until the water is clear. Open and close twice and check for smooth turns. If it doesn't turn smoothly, turn it a few more times to loosen it.
4. Follow the specific test kit instructions for flow testing.
5. Record static pressure.
6. Record the flow rate.

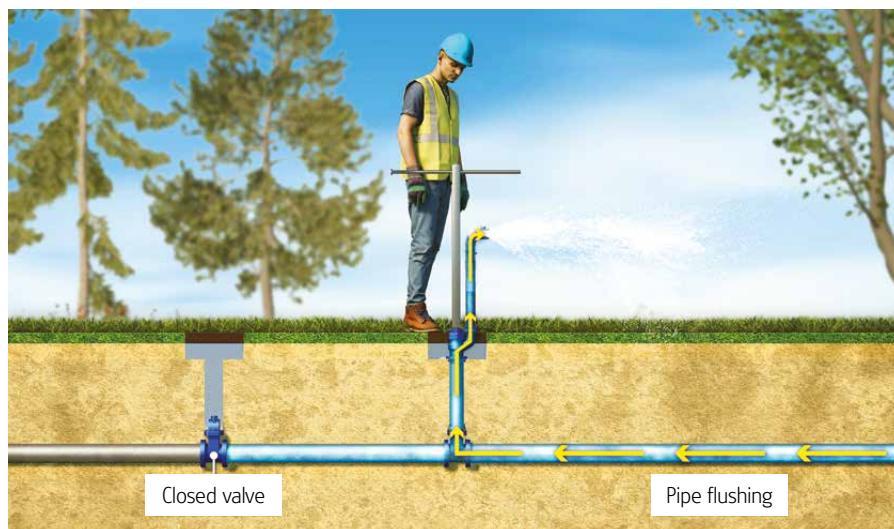
Flushing can cause unintended consequences such as water quality or pressure loss. Discuss and agree flushing plans with your network operator.



# Flush water mains

We flush water mains to ensure good water quality. Sediment and biofilm can build up in pipes. If it's not cleaned out regularly it can affect the water supply.

Hydrants are used as the outlet when we flush a water main. To effectively flush a water main we need a fast flow in the pipe. Close all other valves so the water follows a direct path to the outlet.



## You will need:

- Valve key.
- Hydrant stand.

## How to do it:

1. At the office: Use GIS to plan which valves will be open and closed.
2. Aim to flush up to 200m of pipe at a time.
3. Check plans with your supervisor before starting work. **Poor planning can reduce water quality.**
4. On site: Check all valves are working.
5. Close the valves required to flush the line.
6. Open the hydrant at the discharge location. Open to full flow and watch the colour of the water. Allow 1 second at full flow for every 1m of pipe you are flushing.

# | Water tanks and reservoirs

We inspect drinking water tanks and reservoirs to make sure they are secure, in good condition and free from anything that could contaminate the water.

## Look for contamination risks

- Inspect all roof parts including hatches, pipes and vents. Identify any gaps or failing sealants.
- Are there any birds / animals nesting or piles of poo?
- Are there any puddles?
- Are the vents protected with fine mesh, is it clean?

## Check for tank integrity

- Are there any leaks?
- Check concrete walls for any cracks that are damp or weeping.
- Locate pipes and valves, are the labels ok and easy to see?

## Tidy up the site

- Clear plants and overhanging branches from around the reservoir. At least 2 metres should be clear.
- Clear plants that are covering valve lids, pipes or any equipment.



# Backflow preventers

We have backflow preventers on some customer connections to stop water flowing back into the network and causing contamination. Our clients decide where backflow preventers are installed based on risk. They are usually installed where water is used for farming or industrial applications.

There are different types of backflow preventers, for this guide we are talking about RPZs – reduced pressure zone backflow preventers.

RPZs require annual testing by a qualified person.

## You will need:

- RPZ testing kit.
- Specialist training for IQP Backflow Testing.

## How to do it:

### Expose

- Inspect RPZ enclosure for any signs of vandalism.
- Is the enclosure secure / locked?
- Clean any grass / vegetation from around the enclosure.
- Is the RPZ clean?
- Is the RPZ leaking?
- Is the RPZ correctly tagged?

### Testing

- Test the RPZ using the procedure outlined by the test kit supplier.
- Photograph any test outputs for record.

If the RPZ fails the test or needs maintenance, tell your supervisor so a repair can be scheduled.





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# Stormwater & wastewater

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# Plants around water sites

We maintain grass and plants around our water sites to keep them tidy. Keeping plants under control helps to:

- Prevent corrosion on surfaces.
- Prevent rotting of timber structures.
- Keep accessways, lids, valve hatches and displays accessible.
- Reduce fire risk and flood risk.
- Prevent animals and birds from nesting.

**Clearing vegetation around waterways and ponds presents a drowning risk, especially near PE lined ponds. It's easy to fall into a lined pond and it can be impossible to get out. Include these risks in your risk control plan and avoid working alone.**

## You will need:

- Weed eater.
- Lawn mower.
- Garden hand tools.
- Spraying equipment (if approved).

**Spraying is only permitted where approved by our clients, any spray used must include dye, so we know what has been sprayed. Spraying presents several other risks and requires special PPE.**

## How to do it:

- Plan to clear at least 3 metres away from any structure or pond edge.
- Use weed eaters and mowers to clear grass and vegetation.
- Rake up and dispose of cuttings from site.

**Don't let clippings fall into ponds or waterways.**

# P1 blockages

Blockages in wastewater and stormwater infrastructure just happen! It's often because of objects, fat burgs, broken pipes, roots or poor network design.

When we attend blockages we try to determine the cause. It's not always obvious and sometimes we see blockages in the same place again and again.

Blockages usually result in overflows.

## You will need:

- Letter truck or trailer.
- Pole cam or CCTV.
- Hydrovac.

## How to do it:

- Manage the flows – you might need a hydrovac to manage the incoming flows and to reduce the levels in the network.
- Locate the blockage – blockages are often found at the discharge points of a manhole or in the downstream pipe.
- Clear the blockage – extract any foreign objects from the manhole or sump. Jet the blocked pipe until the blockage has cleared. Clear any material from the downstream manhole – this may cause another blockage further down the line.
- Flush the line and inspect downstream for flows.
- Inspect the line – some clients ask us to inspect the line once we've cleared a blockage. Use a CCTV setup to camera the pipe.
- What caused the blockage? – confirm the blockage details, objects, fats / grease, broken pipes etc.

## Clean up

- Raw sewage is a biological hazard so wear appropriate PPE.
- Clean up the work area and disinfect all contaminated areas with disinfection solution.
- Disinfect all tools and surfaces.
- Bag waste and dispose of it appropriately.

# P1 overflows

Wastewater and stormwater overflows happen when pipes and manholes block. Overflows are an immediate environmental and health concern so we need to act quickly to limit the impact.

## You will need:

- Gloves and gumboots.
- Barriers and cones.
- Containment bunding.
- Sump guard.
- Sandbags.
- Hydrovac capability.

## How to do it:

### First response

- Review the extent of the overflow, report immediately if the overflow has entered waterways or private property.
- Contain the spill using sandbags, bunding and sump guards. The aim is to prevent the contaminated area from spreading.
- Install barriers to prevent public accessing the area, talk to affected homeowners and businesses.

### Spill assessment

- Estimate the volume of spill that occurred and how much has entered any waterway or private property.
- Identify the source of the spill and determine the cause. Common causes are blocked pipes, overloaded sewer, pump blockage or pump failure.
- Call your supervisor to raise a repair job if required.

### Clean up

Overflows often contain raw sewage. This is a biological hazard so wear appropriate PPE. Clean up the full extent of the spill and disinfect all contaminated areas with disinfection solution. Disinfect all tools and surfaces. Bag waste and dispose of it appropriately.



# Manhole inspections

We inspect manholes to make sure they are in good condition. As manholes age they can start to fall apart. Problem manholes can be a safety issue for motorists and pedestrians and they can also cause flow issues or blockages.

We don't enter manholes for routine inspections.

## You will need:

- Manhole key and lifter.
- Inspection light.
- Pole cam.

## How to do it:

- Cone off area immediately around the manhole.
- Lift the lid using a safe lifting tool. Loosen the lid with a club hammer if required before lifting. Ask for help if the lid is too heavy.
- Use a stick or brush to clear any cobwebs from the opening.
- Use an inspection light to inspect the walls and base of the chamber.

Look for:

- Signs of concrete corrosion, cracks or damage.
- Broken or loose benching.
- Groundwater leaking into the chamber.
- Fat or solids buildup in the base.
- Inflow or outflow restrictions.
- Clean the seating surface for the lid.
- Take photographs:
  - Looking down into the chamber.
  - Chamber wall.
  - Above ground, lid open and lid closed.
- Make sure lid is closed and sitting well.
- Sometimes we are asked to take measurements.



# Wetwell inspections

We inspect wetwells to ensure they are free from foreign objects, buildup and are structurally secure. Wetwells are one of the most dangerous environments in the water industry.

- Wetwells are **confined spaces**. They almost always have high levels of methane and hydrogen sulphide which can mean there's not enough oxygen to breathe.
- Wetwells can be very deep. Follow **working at heights** procedures when entering or working above them.
- Wetwells usually have an incoming gravity sewer or pumped inlets, and can fill up quickly. Isolate and LOTO the inlet valves to manage **drowning risk**.
- All surfaces of a wetwell will be contaminated, special PPE must be worn.
- Older wetwells often have ladders fixed in place – do not use them. The ladders may be corroded and unsafe.

## You will need:

- Inspection torch.
- Water blaster.
- Hydrovac.
- Submersible pump.

## How to do it:

- Check the condition of filters and fans.
- Clean down dirty walls with a water blaster.
- Inspect interior coating (look for cracks, blisters, loose material, exposed concrete, etc.).
- Inspect any pipe penetrations (discharge piping, conduits, etc.) for damage to seals or evidence of leaks.
- Check for build up around sensors / float switches and clean as required.
- Check platforms / grating / handrails for corrosion and structural integrity.
- Check concrete walls and ceilings for corrosion and exposed reinforcing.







