

## Standard Operating Procedure

**CONTINUOUS**  
**MODERATE**

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## 1. INTRODUCTION

High pressure water jetting (hydro jetting) is a very efficient cleaning method. However, due to the very high pressures involved, it is also potentially dangerous if used incorrectly. It is, therefore, necessary that personnel required to operate high pressure water jetting equipment are trained and competent in the correct use of the equipment.

This procedure applies to the use of hydro jetting equipment operating at pressures at or less than 200 bar (20,000 kPa or about 2,900 psi).

### **WARNING**

**ANY PERSON STRUCK ON THE SKIN BY A HIGH PRESSURE WATER JET SHALL BE MEDICALLY ASSESSED IMMEDIATELY. THE INJURY MAY BE MORE SEVERE THAN IS APPARENT AND COULD BE INTERNAL.**

**LARGE QUANTITIES OF WATER MAY HAVE PUNCTURED THE SKIN, FLESH AND ORGANS THROUGH A VERY SMALL HOLE THAT MAY NOT EVEN BLEED.**

## 2. EQUIPMENT

### 2.1 Water Jetting Plant and Equipment

Water jetting plant, equipment and attachments should only be used in accordance with the manufacturer's recommendations.

No rigid lance attachment should be used unless it is fitted with a handle and a hold-to-activate device.

Jetting equipment and attachments should not be modified without the manufacturer's approval.

High pressure water jetting systems must be inspected or serviced and be free from faults before use.

Water jetting operations should stop when:

- Conditions change or new hazards are introduced.
- Unauthorised people enter the barricaded area.
- Recommended safe work practices are not being followed.
- When a malfunction occurs.

### 2.2 Hoses

Before each use, hose assemblies should be visually inspected by a competent person to ensure:

- Hoses are tagged to indicate manufacturers identification, date of manufacture and maximum operating pressure.
- The pressure rating and size are correct for the unit in use.

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- There is no apparent structural damage e.g. corroded or broken wires, bulging, kinking or cuts.
- Hoses have a bursting pressure at least 2.5 times that of the intended operating pressure.
- End fittings are in good condition and are of the correct pressure rating.
- Hose connections to equipment or other hoses are restrained in a suitable way to stop uncontrolled movement if the hose ends fail.
- Couplings are of such a design that they are unable to loosen or be accidentally dislodged during operation.

Any equipment that exhibits any of the below faults shall be tagged “out of service” and removed:

- Hoses with broken wires, deep abrasions, kinking, blisters or bubbles in the outer covering.
- End fittings and crimping with cracks, corrosion and damaged threads.

The service life of a hose assembly is affected by many factors. To maximise the life of a hose assembly, care shall be taken when laying out hoses on the ground to avoid constant pulsation damage, especially from corners. Hoses should not be exposed to temperatures in excess of the stated rating or to chemical/corrosive substances for a prolonged amount of time.

### 2.3 Nozzles

Nozzles should be inspected before each use for blocked or damaged orifices, damaged to threads or cracks. Any nozzle that is identified as defective shall be tagged “out of service” and removed.

### 2.4 High Pressure Jetting Guns

Using handheld guns for jetting operations increases the risk of the operator coming in contact with the high pressure water. All lances used on guns must be long enough to prevent the operator from directing the water jet onto themselves.

All pressure jetting guns or lances shall be fitted with a fast acting hold-to-activate device that when deactivated, will stop the flow of high pressure water.

High pressure jetting guns should be inspected and tested before each use. These inspections must include:

- Trigger mechanism operation.
- Hose connections and threads.
- Hose securing method to prevent whip injuries.

### 2.5 Hose Connection and Layout

The point where the hose attaches to a hand or foot controlled device should be protected by an over-sheath shroud manufactured from materials capable of withstanding the direct force of the water jet. This also protects the operator if the hose separates or the end fails.

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The point where the hose attaches to a hand or foot controlled device should also be protected by a braided stocking that can stop the hose from whipping around and causing injury or damage if the hose separates or the end fails.

Water supply and high pressure jetting hoses should not be laid across thoroughfares, walkways or roads where they are likely to be damaged. Where hoses are to be hung vertically, each hose should be supported by a wire stocking. Where multiple lengths of hose are used in this way, they should be supported at points below each coupling so there is no weight on the coupling.

### 3. PERSONAL PROTECTIVE EQUIPMENT

- A risk assessment shall be completed to determine the hazards of the task and the required controls to mitigate the risks, including the level of PPE.
- As a minimum the required PPE that shall be worn when operating high pressure water jetting equipment includes:
  - Safety helmet compliant with AS/NZS 1801.
  - Goggles and face shield compliant with AS/NZS 1337.
  - Gloves that provide protection against mechanical and chemical hazards compliant with AS/NZS 2161.1. Gloves must have a performance level of 1 or above for abrasion resistance, blade cut resistance, tear resistance and puncture resistance. Where there is a risk of injury from direct chemical contact, chemical resistant gloves shall be worn.
  - Safety footwear compliant with AS/NZS 2210.2. Where there is a risk of injury from direct contact with the water jet, suitable foot and lower leg guards or shields manufactured from materials capable of withstanding the direct force shall be worn.
  - Suitable industrial clothing compliant with WesCEF standards.
  - Hearing protection compliant with AS/NZS 1270.
- Operators should consider wearing waterproof protective clothing when hydro jetting.
- Where there is a potential risk of chemical contact or exposure, chemical protective clothing compliant with AS/NZS 4501.2, AS/NZS 4503.2, AS/NZS 4503.3, AS/NZS ISO6529 and AS/NZS ISO 6530 shall be worn. The approved chemical protective clothing at CSBP that comply with the above standards are:
  - PVC overalls/jacket/pants
  - Microchem 4000
  - Glanda T-Chem 2
- The type of chemical suit selected will be dependent on the chemical hazards. Review the chemical suit data sheet, prior to use, to ensure that it is rated for the chemical hazards of the task.
- Where there is a risk of injury from direct contact with the water jet, suitable body armour manufactured from materials capable of withstanding the direct force shall be worn.

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- Respiratory protection compliant with AS/NZS 1715 shall be worn where there is a risk of injury from exposure to hazardous substances.

## 4. HAZARDS

The hazards associated with, but not limited to, hydro jetting tasks include:

- piercing of the skin by the water jet.
- flying debris from the cleaning operations.
- release of hazardous materials into the atmosphere from dislodged deposits.
- noise of the cleaning operation that may damage hearing or drown out the sound of an alarm.
- difficulty in breathing in confined space due to the high-water vapour content in the air.
- electrostatic charging of nozzles and lances.
- reactive force generated by the discharge of water, creating a backward thrust against the nozzle holder.

## 5. PRECAUTIONS

The following safety precautions shall be observed when hydro jetting is in progress:

- A Responsible Person shall be designated for controlling all work involving hydro jetting.
- All operating areas shall be barricaded off with suitable barriers to prevent accidental entry of unauthorised personnel. Signs should have wording to the effect - DANGER HIGH PRESSURE WATER BLASTING, KEEP OUT. AUTHORISED PERSONNEL ONLY. Red and white bunting or tape and signs are to be used.
- Entry into the area must be authorised by the Responsible Person.
- All high pressure equipment shall be earthed before work starts and during operation, to prevent the development of electrostatic charges between the lance and the workplace.
- Correct safety instruction shall be provided before the use of any hire equipment being used for high pressure water cleaning.
- Where necessary, equipment near jetting operations should be shielded or protected from debris and the ingress of water from operating the jetting equipment.
- Any essential electrical installation should meet the required protection levels against the ingress of water vapour or overspray.
- Overhead work should be avoided where possible as this may cause unstable worker positioning and increase the risk of musculoskeletal disorders.
- Operators using manually operated jetting systems should be in a safe and well-balanced position before starting jetting operations.
- Jetting operations should not be performed from ladders or other surfaces not intended for use by workers as this can lead to loss of control of the jetting equipment.

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- Operators should check there is no interruption or interference to the release mechanism of hand or foot controls that could stop the equipment operating safely and consistent with the manufacturer's specifications.
- High pressure water jetting must not be conducted on asbestos or asbestos containing material.
- All high pressure equipment shall be isolated and depressurised before being left unattended.

## 6. USE IN A CONFINED SPACE

Hydro jetting inside of confined spaces is a high risk task. Where practical, the requirement to perform hydro jetting in a confined space should be assessed to try and eliminate the requirement.

When hydro jetting is to take place in a confined space, a Confined Space Entry Certificate, as described in *Work Permit System (CSBP-GM-11-031-51)* is to be obtained, and the precautions described in *Confined Spaces (CSBP-GM-11-031-52)* are to be followed, in addition to the precautions listed in this procedure.