

## Hazard Profile – Trenchless Construction

### Preamble

This Hazard Profile (the Profile) has been prepared by Hunter Water Corporation for the purpose of assisting Principal Contractors with the identification of occupational health and safety (OHS) hazards associated with trenchless construction and the subsequent preparation of Safe Work Method Statements. Although the Profile is reasonably detailed, it is not intended to be exhaustive. The Profile provides examples of some of the hazards associated with trenchless construction. There may be other hazards associated with the work depending upon the site(s) and construction techniques proposed by the Principal Contractor.

The Principal Contractor must:

- undertake their own hazard identification and risk assessment for the particular site(s) at which the work under the contract will be carried out,
- determine the appropriate actions which must be taken to eliminate or satisfactorily control all identified hazards,
- provide Safe Work Method Statement(s) for approval of Hunter Water for employees and contractors which include the specific requirements of the contract,
- comply with all applicable OHS legislation.

For the purpose of the Profile, Principal Contractor means a person who is, under Clause 210 of the *OHS Regulation 2001*, for the time being appointed or taken to be the Principal Contractor for the construction work.

The Profile applies to all activities relating to trenchless construction whether a contract is in existence or not.

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Brian Grady  
Manager Contracts  
Hunter Water Corporation

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TYPICAL ACTIVITY	WHAT CAN HARM YOU (Hazards)	WHAT CAN HAPPEN (Risks)	TYPICAL SAFETY CONTROLS TO BE CONSIDERED AND IMPLEMENTED WHERE APPROPRIATE
<b>Secure Site</b>	Public safety	Injury to a member of the public.	Provide the appropriate / specified perimeter fencing and/or barricades as per site risk assessment (Ref Clause 235 of OHS Regulation 2001).  Apply appropriate signage and pedestrian control.  Devise and implement system for site inspection and security.  Ensure security of equipment suitable to minimise vandalism.
	Traffic	Personal injury to members of the public, contractors and employees;  Vehicle Accidents.	Traffic Control Plan (TCP) as per RTA Regulations.  Keep area clean & clear of obstacles.
	Inadequate access/egress	Slips, trips and falls, abrasions, strains and sprains; manual handling injuries such as back damage.	Provide safe access/egress for the task activities. Eg. ladders , ramping etc.
<b>Locate existing services</b>	Existing underground services	Explosion, electrocution, damage service, asbestos pipe.	Use Dial Before You Dig ( <a href="http://www.dialbeforeyoudig.com.au">www.dialbeforeyoudig.com.au</a> or phone 1100).  Check relevant Authority (e.g. telecommunications, power, water, gas, council) records for location of services.  If in doubt use experienced / accredited service locators.  When using hand prodders to locate pipes, do not drive prodders in to the ground using hammers or other implements.  Confirm location of services by “Pot holing” techniques.  Comply with the <i>OHS Regulation 2001</i> (Part 8.7 and Part 11.2) including the <i>Code of Practice for Safe Removal of Asbestos</i> [NOHSC: 2002 (1988)] and <i>Guide to the Control of Asbestos Hazards in Buildings and Structures</i> [NOHSC: 3002(1988)].

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<b>Excavate</b> Refer – <i>WCA Safety Guide Moving plant on construction sites, and WCA Code of Practice Excavation Work</i>	Working plant & equipment	Noise, falling objects; Damage to existing surfaces; Material spillage; Hit by moving plant.	Operations of plant by WorkCover accredited personnel. Personal Protective Equipment (PPE) – hardhat, high visibility vest, hearing protection, safety footwear etc. Maintain a safety working area around moving plant. Protect surfaces from plant movements. Ensure appropriate plant noise control. Maintain clean-up equipment on site. Maintain (specified) appropriate spillage control equipment. Employ observer where appropriate.
	Storage of materials	Falling objects.	No materials to be placed or stacked near the edge of any excavation. No load to be placed or moved near the edge of excavation where it is likely to cause collapse of side of work. No load handling/movement across excavation. No rollable objects stored uphill from excavation. Store all materials inside 1.8 metre high security fence.

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	Overhead & underground power cables	Electrocution.	<p>Determine location of underground services.</p> <p>If underground power cables are located in the vicinity, exercise extreme care while excavating.</p> <p>Consider any restriction on type of tools and equipment that may be required.</p> <p>Consult with local authority distributor (e.g. Energy Australia 13 1525, Integral Energy 13 1081, NorthPower 13 2080, Advance Energy 13 2795) and comply with requirements.</p> <p>Locate and keep clear of overhead services (3m up to 132kv, 6m over 132kv up to 330kv). If distances cannot be maintained, plant operator and observer must be trained and assessed as competent in crane and plant electrical safety.</p>
	Gas mains	Explosion.	<p>Check Authority records for location of services.</p> <p>If in doubt use experience service locators.</p> <p>When using hand prodders to locate pipes, do not drive prodders in to the ground using hammers or other implements.</p> <p>“Pot holing” techniques.</p> <p>Extreme care to be exercised when working near gas mains.</p> <p>No smoking or mobile phone use within defined radius.</p>
	Sloping ground	Falling, rolling objects.	<p>Maintain good house keeping (remove debris, trip hazards, site tidiness).</p> <p>Select locations to minimise potential for movement.</p> <p>Stack materials at level below excavation.</p> <p>Appropriate plant chosen for sloping ground.</p> <p>Secure / retain potential falling/rolling objects.</p>

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	Entry / Exit trenches	Collapse of trench, falling objects.	<p>Support / bench / batter excavation.</p> <p>Keeping safe distance from edge of trench (Refer Clause 3.10 of WCA Code of Practice Excavation Work).</p> <p>Materials not to be placed or stacked near the edge of trench.</p> <p>No load to be placed or moved near the edge of trench where it is likely to cause collapse of the trench.</p> <p>All entry and exit trenches to be secured within 1.8 metre high security fencing, unless deemed unnecessary via a risk assessment and approved by the HWC Project Manager.</p> <p>Provide submersible pump to dewater excavations where ground is water-charged.</p> <p>Personal Protective Equipment (PPE) – hardhat, high visibility vest, hearing protection, safety footwear etc.</p> <p>No load/personnel movement across trench.</p>
		Falling into.	<p>Installation of shoring system (Ref Clause 3.3 of WCA Code of Practice Excavation Work).</p> <p>Where possible backfill trenches.</p> <p>Erect 1.8 metre (min) security fence if open excavation is to be left unattended,</p> <p>or</p> <p>Cover open excavation with suitable steel plating if left unattended.</p> <p>No personnel movement across trench.</p>

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	Confined Space	Other risks associated with confined spaces such as gases etc	Entry / Exit excavations are considered to be a confined space and must use trained personnel when: - <ul style="list-style-type: none"> <li>• hotwork is being performed (eg. electric welding, oxy-acetylene cutting),</li> <li>• combustion engines are in use,</li> <li>• acid sulphate soil is detected.</li> </ul> Follow confined space entry procedures as per <i>OH&amp;S Regulation 2001</i> (Clauses 66-78), AS2865 clause 10.18 and HWC minimum requirements No smoking / mobile phone use, avoid sparking.
	Portable electrical equipment	Electrocution	All portable electrical equipment must be inspected and tagged in accordance with <i>WCA Code of Practice Electrical Practices for Construction Work</i> .
	Manual handling (shovelling)	Strains and sprains; injuries such as back damager.	Manual handling awareness. Adequate rest periods allowed, job rotation, minimise repetitious twisting and shovelling.
	Storage of fill	Trip hazard; Dust – eye injury; Environmental damage.	Secure fill stockpile. Provide a dedicated area for fill. Watering of material. Provide necessary environmental protection measures. Cover fill when unattended or unable to be watered. Wear appropriate eye protection AS1337
	Contaminated soil	Impact on health of persons generally.	Refer Section 4 of <i>WC A Code of Practice Excavation Work</i>
Materials Checking	Storage of Hazardous Materials	Risk of various injuries and illnesses.	Handling and storage to comply with requirements of relevant Materials Safety Data Sheets (MSDS).

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Lay bedding	Earth mounds	Engulfment; Dust – eye injury.	Control operation of mobile plant by competent person. Watering of material. Control slopes. Delineate earth mounds appropriately. Warning signage. Cover when unattended or unable to be watered.
Boring sleeves	Boring sleeves may move / roll or be tampered with by others	Injury to persons generally;	Provide secure stockpile area for boring sleeves. Secure boring sleeves to prevent movement irrespective of slope of surface by the use of sand bags, star pickets or place against fixed objects which will prevent the movement of boring sleeves. Place boring sleeves in secure compound if site left unattended. Ensure availability of sand / gravel bags / pegs / timber or other suitable materials for retaining or securing boring sleeves. Store sleeves inside minimum of 1.8 metre high security fence.
Craneage	Placement of Plant and boring sleeves	Collapse of trench; Falling objects.	Use shoring system (Ref Clause 3.3 of <i>WCA Code of Practice Excavation Work</i> ). Only use plant that is suitable for the task and has records of maintenance/inspection. Use slings/chains that are not damaged and have a record of inspection AS3775, AS1666, AS2741. Maintain control of loads when lifting & moving. Mechanical lifting task performed by component personnel only.

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	Working plant & equipment	Personal injury	Use only maintained mobile equipment fitted with yellow flashing lights and reversing alarms. Operated by component personnel. Maintain a safe distance from all working plant. Personal Protective Equipment (PPE) – hardhat, high visibility vest, hearing protection, safety footwear etc.
Hotwork	Electric welding, oxy-acetylene cutting	Electrocution, burns and sparks	Use only maintained oxy-acetylene fitted with flashback arresters and located on the outside of the trenches. Use well maintained electric welding equipment fitted with a dead man switch. Personal Protective Equipment (PPE) – hardhat, high visibility vest, hearing protection, safety footwear etc. Task to be performed by a component person. Refer AS1674
Restoration of site	Inadequate compaction	Public hazard	Compaction to specified standard.
	Construction refuse	Public hazard	Site cleared of debris and refuse.
	Inadequate re-surfacing	Public hazard	Re-surface appropriately. Do not leave gaps in turf or leave uneven surface. Erect appropriate perimeter fence around hazardous areas until restored and safe (Ref Clause 235 of OHS Regulation 2001).
General Activities	Inadequate training, consultation, planning and improvisation	Task specific injuries due to inexperience, inadequate consultation or failure to provide appropriate equipment	All personnel on-site to be appropriately inducted. All personnel on-site to be suitably qualified. Competent supervision to be provided on-site.

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Refer <i>WCA Code of Practice Occupational health and safety induction training for construction work</i>	Fire hazards/ misuse of equipment	Fire/Explosion	Care to be taken when refuelling machinery, ensure engines aren't running and there are no naked flames in the vicinity. Oxy-acetylene and gas equipment must be used strictly in accordance with the manufacturer's safe operating procedures. All personnel working on the site are to be trained in the correct operation of the tools and equipment they are using. All tools and equipment are to be serviced and in safe condition. All electrical tools are to be fitted with current test tags. Fire extinguishers are to be located on site. No work during high fire danger unless dry vegetation is cleared and/or watered down prior to carrying out hot work. Avoid driving or parking motor vehicles on long dry grass as the heat generated by the exhaust could start a fire.
	Exposure to ultra violet light, glare	Skin cancer, sunburn, eye damage	Protective clothing, sunscreen, flap on hard hat. AS rated sunglasses.
	Weather Conditions (e.g. hot, cold wet, flooding/inundation, electrical storms, high winds)	Dehydration and dizziness	Supply adequate drinking water in work area. Provide protection from UV rays. Personal Protective Equipment (PPE) – hardhat, high visibility vest, hearing protection, safety footwear etc.
	Slippery surfaces	Slips and falls	Non-slip safety footwear to be worn on all worksites. Extreme care when working in wet and slippery areas. Personnel should never run on worksite.
	Untidy site	Slips and falls	Keep worksite clean and tidy at all times.
	Storage of materials	Materials may be dislodged and fall onto people or property particularly when site is unattended	Materials to be stored in a safe manner.

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	Stockpile of pipes, drums (rolling objects)	Pipes or drums may roll onto the roadway causing an accident or may be rolled by unauthorised persons particularly when site is unattended causing injury to persons	All materials to be secured by suitable chocks, sandbags or other means. All pipes not laid during the course of a day are to be returned to the stockpile and secured appropriately. Secure within 1.8 metre high security fence.