

PERMIT – GROUND DISTURBANCE



This permit must be completed and signed off by the nominated responsible person below prior to any ground disturbance work taking place.

Refer to the Project Environmental Plan for direction regarding resource consent, ecological, archaeological, ground contamination and buried services requirements.

Project Environmental Plan provided ☐ Reference number and date _____

RESOURCE CONSENT	Issued: YES <input type="checkbox"/> / NO <input type="checkbox"/>	Resource consent number: _____
Notification requirements	_____	
Resource consent requirements	_____	

ECOLOGICAL REQUIREMENTS
<i>At all times be aware of the possibility of encountering endangered flora and fauna, and the risk of polluting the air, water and ground.</i>

ARCHAEOLOGICAL REQUIREMENTS
<i>At all times be aware of the possibility of accidental finds such as middens, pre 1900 rubbish tips, etc.</i>

GROUND CONTAMINATION			
<i>At all times be aware of the possibility of encountering ground contaminants such as heavy metals (e.g. lead), hydrocarbons, solvents, pesticides (e.g. dioxins), sewage, asbestos, etc.</i>			
Possible contaminants	Present	Located	Responsible person
Heavy metals (lead, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	_____
Hydrocarbons	<input type="checkbox"/>	<input type="checkbox"/>	_____
Solvents	<input type="checkbox"/>	<input type="checkbox"/>	_____
Pesticides (dioxins)	<input type="checkbox"/>	<input type="checkbox"/>	_____
Sewage	<input type="checkbox"/>	<input type="checkbox"/>	_____
Asbestos	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other	<input type="checkbox"/>	<input type="checkbox"/>	_____
Handling methods	_____		

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BURIED SERVICES

At all times be aware of the possibility of encountering unmarked and/or undetected existing services.

Names of buried service locators _____

Services located _____

Possible buried service	Present	Located	Responsible person
High voltage cables	<input type="checkbox"/>	<input type="checkbox"/>	_____
Low voltage cables	<input type="checkbox"/>	<input type="checkbox"/>	_____
Copper communication cables	<input type="checkbox"/>	<input type="checkbox"/>	_____
Fibre optic communication cables	<input type="checkbox"/>	<input type="checkbox"/>	_____
Water pipes	<input type="checkbox"/>	<input type="checkbox"/>	_____
Stormwater pipes	<input type="checkbox"/>	<input type="checkbox"/>	_____
Sewage pipes	<input type="checkbox"/>	<input type="checkbox"/>	_____
Gas lines	<input type="checkbox"/>	<input type="checkbox"/>	_____
Other – e.g. fuel, compressed air	<input type="checkbox"/>	<input type="checkbox"/>	_____

Safety observation, protection, relocation methods _____

***I have reviewed the work authorised by this permit and the information pertaining to each item.
Safety procedures have been received and are understood by all personnel.***

Ground disturbance authorised by: _____ Date: _____

Person responsible for excavation: _____ Date: _____

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UNDERGROUND SERVICE DETECTION TECHNIQUES

1. Hydroexcavation – preferred



Example of use of hydro excavation by SCL in Timaru Substation – Note – hydrovac both sides of trench, mark large X on ground at service locations so that digger operator has visual alert when approaching buried service.

2. Ground Penetrating Radar GPR



https://en.wikipedia.org/wiki/Ground-penetrating_radar

Ground-penetrating radar (GPR) is a geophysical method that uses radar pulses to image the subsurface. This non-destructive method uses electromagnetic radiation in the microwave band (UHF/VHF frequencies) of the radio spectrum, and detects the reflected signals from subsurface structures. GPR can have applications in a variety of media, including rock, soil, ice, fresh water, pavements and structures. In the right conditions, practitioners can use GPR to detect subsurface objects, changes in material properties, and voids and cracks.

GPR uses high-frequency (usually polarized) radio waves, usually in the range 10 MHz to 1 GHz. A GPR transmitter emits electromagnetic energy into the ground. When the energy encounters a buried object or a boundary between materials having different dielectric constants, it may be reflected or refracted or scattered back to the surface. A receiving antenna can then record the variations in the return signal. The principles involved are similar to seismology, except that electromagnetic energy is used instead of acoustic energy, and energy may be reflected at boundaries where subsurface electrical properties change rather than subsurface mechanical properties as is the case with seismic energy.

3. Cable Avoidance Tools - CAT



<http://www.essentialwaterservices.co.uk/equipment/cat.asp>

Buried services represent a major hazard to all construction workers the world over. Poorly planned excavations can cause cable or pipe damage resulting in costly repairs, delays and personal injury. The cable avoidance tool known as CAT is used to locate these services so that they can be avoided.

The CAT can detect signals naturally radiating from metallic services or in conjunction with a Genny that applies a distinctive signal that the CAT can detect. The CAT can be used in 3 modes: Power (P), Radio (R) and Genny (G). The CAT can detect most buried cables and conductors however some cables and conductors (even live ones) do not radiate signals. This applies to plastic pipe work however if used in conjunction with the Flexi-trace these can be located.

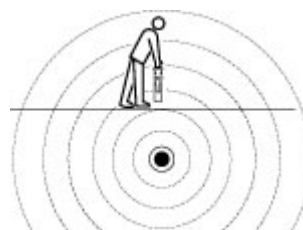
Power (P)

In the power (P) mode the CAT can detect 'power' signals that are being radiated by loaded cables. This is used to detect, locate and avoid buried electricity cables.



Radio (R)

In the radio (R) mode the CAT detects VLF radio signals re-radiated by buried metallic pipes and cables. This is used to detect, locate and avoid other buried metallic pipes and cables i.e. gas, phone & communication lines, ducts & water services.



Genny (G)

In the Genny (G) mode the CAT detects a tone radiated by the Genny to a buried conductor. This is used to detect, locate and avoid all services as a direct connection to the source i.e. plug sockets, water valves or gas valves.

