

ACS1520 Utility investigation pits

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ACS1520.1 Scope

This specification covers excavations to pipes and cables for the purpose of confirming their location, size, and material.

ACS1520.2 Liaison with utility owners

The Contractor shall:

- Liaise with all utility providers/owners to obtain service plans and locate all utilities on site prior to commencement of work on site
- Take all practicable measures to ensure that records are obtained for all utilities, of whatever type, within the area of the works. Where there are no utilities of a certain

type within the vicinity of the excavation, the Contractor shall obtain confirmation from the utility owner that they have no assets present in that area

- Adhere to any specific requirements of the utility owner
- Inform the Engineer of all utility owners contacted and provide copies of all records and other relevant correspondence prior to commencing any excavation works.

ACS1520.3 Marking out utility locations

Current service location plans shall be obtained by the Contractor and compared with visible indicators (such as manhole lids) on site. All known buried services shall have their position confirmed, and this position shall be physically marked at the surface.

ACS1520.4 Excavation general

Safe excavation practices shall be followed in accordance with the *WorkSafe NZ: Excavation Safety – Good Practice Guidelines 2016*.

Safe working practices shall be followed in accordance with *WorkSafe NZ: Underground Services - Guide for safety with underground services*.

Excavations shall comply with Auckland Council Standard Specification *ACS510 Earthworks*.

Pits shall be excavated by one of the following methods:

- a) Hand excavation
- b) Vacuum excavation (air)
- c) Vacuum excavation (water)
- d) Other method if approved by the Engineer.

Excavation of pits by mechanical excavators is prohibited unless agreed with the Engineer. The use of mechanical excavators may be used to within 300 mm of the crown of the service provided that:

- a) The use of mechanical excavators has been approved by the utility owner
- b) Other conditions imposed by the utility owner are strictly adhered to
- c) The depth of the service is indicated on the asset drawings
- d) The excavation is closely supervised by the investigation supervisor.

Prior to excavation, a cable locating tool shall be used to confirm the location of all cables and other metallic utilities within 5 m of the excavation and to confirm that there are no unrecorded cables.

ACS1520.4.1 Hand excavation

Hand excavation shall be undertaken using only hand-held non-mechanical tools. All reasonable care shall be taken to avoid damaging ducts, pipes, or cables with sharp tools.

ACS1520.4.2 Vacuum excavation (air)

Air-vacuum excavation may only be used as an alternative to hand excavation of small, localised areas. The excavation shall be directed away from bearing surfaces of existing structures that may compromise the structural purpose or integrity. Hand excavation or mechanical plant shall be used to complete to the required dimensions.

The air wand shall never remain motionless and may not advance ahead of the vacuum unit. The maximum air pressure shall be 200 psi (1379 kPa), unless otherwise agreed with the Engineer. Pressure shall be monitored, and the wand fitted with an emergency shut-off as well as at the connection at the truck.

The air-vacuum excavation equipment and operators shall be protected by equipotential bonding. Air-vacuum excavation in the vicinity of energized plant, suspect or damaged cables shall be excavated with the infrastructure isolated and where practical de-energised.

The excavation shall be screened to prevent any flying debris causing harm or damage.

ACS1520.4.3 Vacuum excavation (water)

Water-vacuum (hydrovac):

- Hydrovac excavation may only be used as an alternative to hand excavation of small, localised areas
- The excavation shall be directed away from bearing surfaces of existing structures that may compromise the structural purpose or integrity
- Hand excavation or mechanical plant shall be used to complete to the required dimensions.

Hydrojet or wand:

- Shall never remain motionless and may not advance ahead of the vacuum unit so as to cause flooding of the excavation area or washout of adjacent service bedding
- The maximum water pressure for straight nozzles shall be 100 bar and for spinning nozzles shall be 200 bar (20,000 kPa)
- Pressure shall be monitored, and the water supply fitted with an emergency shut-off at the wand as well as the connection at the truck.

Hydrovac equipment and operators:

- Shall be protected by equipotential bonding
- Hydro excavation in the vicinity of energized plant, suspect or damaged cables shall be excavated with the infrastructure isolated and where practical de-energised
- The excavation shall be screened to prevent any flying debris causing harm or damage.

ACS1520.4.4 Saw cutting hard surfaces

Saw cutting of hard surfaces shall be permitted provided that the saw blade does not extend beneath the hard surface material (concrete or bituminous seal) by more than 25 mm.

Saw cutting shall not be used when there is the possibility of shallow services being affected.

ACS1520.4.5 Excavating to utilities

Prior to any excavation, the Contractor shall obtain a Works-Over Consent from the utility owner (when required by the utility owner) and shall submit copies to the Engineer.

The pipe, cable, or duct shall be exposed sufficiently to enable the diameter to be accurately measured.

The following information shall be recorded:

- a) Diameter (measured with a pipe diameter tool). The use of tapes is not permitted unless they have been specifically designed for pipe diameter measurement. Callipers are preferred
- b) Horizontal position using either surveying equipment or measurement by tape measure to permanent features in three horizontal directions
- c) Depth to crown from commencing surface level
- d) Relative level of crown of the pipe, cable, or duct to the nearest survey mark unless, in the opinion of the Engineer, the depth to crown is sufficient for the purpose of the

survey (i.e. for non-gravity pipes and cables in roads where the starting surface level is reasonably known, and the depth is not required to be precise)

- e) Pipe, cable, or duct material and record any markings identifying the pipe material, type, and grade
- f) Records and photographs of any visible defects
- g) Photographs at the surface prior to excavation
- h) Photographs of the exposed pipe, duct, or cable

Where defects are observed, the Engineer and the utility owner shall be notified immediately.

Where details or position of the utility differs from the GIS records, the Engineer and utility owner shall be notified within 3 days.

The excavation shall be reinstated to match the existing bedding condition for the utility or as otherwise directed by the utility owner. The reinstatement shall comply with Auckland Council Standard Specifications ACS510 Earthworks and ACS520 Reinstatement.

Any pipe caution tape or protective tiles shall be replaced to their condition prior to potholing.

ACS1520.4.6 Utilities not in marked position

Where a utility is not found in the marked position, the Contractor shall extend the excavation a minimum of 0.5 m either side of the marked position and to a depth at least 300 mm below the marked depth (or to 1.5 m below ground when no depth is indicated on the utility records).

If the utility is still not located in the extended excavation, the Contractor shall notify the Engineer immediately. The Engineer may instruct that the excavation is extended further or that other measures are taken to locate the service.

ACS1520.4.7 New or unmarked utilities

Where a pit uncovers any utility that is not shown on the asset drawings, its location and details shall be recorded on an inspection log sheet and submitted to the Engineer and utility owner within 3 days.

ACS1520.5 Accuracy of measurement

Asset details shall be measured to the tolerances given in Table 1: Measurement tolerances.

Table 1: Measurement tolerances

Measurement	Tolerance
Horizontal position (pipes > 300Ø)	Within 50 mm
Horizontal position (pipes, ducts, and cables ≤ 300Ø)	Within 30 mm
Diameters	± 2 mm
Crown level	± 10 mm

ACS1520.6 Inspection log sheets

Details of the inspection shall be recorded on the standard log sheet, or similar checklist, provided that all of the information required by the standard log sheet.

Photographs shall be date and time stamped and shall be, in the opinion of the Engineer, sufficiently clear for their purpose.

Still images shall be supplied in JPEG or format shall be taken in 32-bit colour and minimum resolution of 720 pixels wide and 576 pixels high.