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Work instruction:	Date Raised
CAT & Genny (Water Mains)	12/08/2017

Work Description
Tracing metallic and non-metallic water services using the CAT & Genny
Instruction
<p>Refer to W0001 & W0002</p> <p>Tracing Metallic Services</p> <ol style="list-style-type: none"> 1. Metallic services (Copper, Lead, Galvanised Steel, & Iron) can be traced in a variety of ways using both Radio mode and Genny mode on the CAT Scanner. 2. Walk through the proposed area of work holding the CAT scan vertically above ground with Radio mode selected gently sweeping and tracing across the ground in a grid pattern. 3. When a signal is detected adjust the sensitivity control for exact location of services. 4. If services are identified use your ground marking spray to mark these up in order to make the location of these known to all operatives. 5. Any metal services in the ground are conductors so should still give off a slight signal even with no signal induction through the use of a Genny 6. Metallic Services can also be traced through Signal Induction this is where the Genny is switched on and placed over a known location of the existing service lengthways at ground level. This Genny then emits a signal that will run along the metallic service as this is the path of least resistance. 7. The CAT Scanner should then be placed in Genny mode and the trigger held with the sensitivity set to high initially. 8. Keeping the CAT Scanner vertical, walk through the area of the signal response. If the visual response goes off the scale then stop, reduce the sensitivity of the locator slightly before continuing. 9. The width of the signal response will begin to shrink as the sensitivity is reduced. Once the sensitivity is reduced enough then a clear peak response will be seen on the bar display as the locator traverses the service. The CAT Scanner is positioned directly above the buried service when the bar display is at its highest (peak) reading 10. Carefully rotate the CAT Scanner over the peak reading until the visual response falls to a minimum level. The CAT Scanner will now be roughly in line with the direction of the buried service. 11. Mark the position of the buried service 12. Carefully follow the direction of the signal holding the locator at right angles to the line of the signal. It is necessary to constantly 'slice' the CAT Scanner from side to side in order to be sure of still being over the peak signal response. 13. Stop and mark the position of the signal at regular intervals. As more marks are recorded the precise direction of the service will become more apparent. 14. If Signal Induction is unsuccessful then Direct Induction will have to be completed. 15. An excavation onto the metallic pipework will be required, this should be located at the boundary or at the Point Of Entry (POE) or where the location of the metallic pipe is known. 16. The metallic pipework should be exposed and the Genny clipped onto the service within the excavation. This will directly induct a signal into the service which can then be traced. Follow steps 7 to 13 in order to ascertain the location and direction of the service.

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N.B. Limitations of using CAT & Genny to trace metallic pipework

- Be mindful that the signal will not be continuous throughout the length of the supply if previous 'cut and caps' have been completed on the service and if part of the service has been replaced in plastic historically.
- The CAT4+ model of CAT & Genny also gives an indicative depth of the service but this is not always accurate and should only be used for guidance purposes.

Tracing Non-Metallic Services

1. Non-Metallic Services (Blue MDPE & Black Alkathene pipework) cannot be traced using Signal Induction or Direct Induction. Instead they must be traced using a Tracer Wire (Flexitrac)
2. Establish a position at which an open end of the plastic pipework can be utilised, this may be done by taking apart the Internal Stop Valve at the POE, by completing a small excavation at the boundary or by cutting open the pipe at an existing known location.
3. From each of these positions the Tracer Wire can be pushed into the pipework (after ensuring that it has been treated with Chlorine).
4. Turn on the Genny and use the clips to attach the Genny to the tracer wire. This will directly induce the signal into the Tracer Wire and allow the pipework to be traced.
5. Keeping the CAT Scanner vertical, walk through the area of the signal response. If the visual response goes off the scale then stop, reduce the sensitivity of the locator slightly before continuing.
6. The width of the signal response will begin to shrink as the sensitivity is reduced. Once the sensitivity is reduced enough then a clear peak response will be seen on the bar display as the locator traverses the service. The CAT Scanner is positioned directly above the buried service when the bar display is at its highest (peak) reading
7. Carefully rotate the CAT Scanner over the peak reading until the visual response falls to a minimum level. The CAT Scanner will now be roughly in line with the direction of the buried service.
8. Mark the position of the buried service
9. Carefully follow the direction of the signal holding the locator at right angles to the line of the signal. It is necessary to constantly 'slice' the locator from side to side in order to be sure of still being over the peak signal response.
10. Stop and mark the position of the signal at regular intervals. As more marks are recorded the precise direction of the service will become more apparent.

N.B. Limitations of using CAT & Genny with Tracer Wire to trace Non-metallic pipework

- When tracing the service with Tracer Wire it may only be possible to push the tracer wire up to the next fitting along the service. This means that if a number of fittings have been used historically along the supply, or if previous repairs have been completed, a number of additional excavations will also be required which will be a time consuming process.
- The CAT4+ model of CAT & Genny also gives an indicative depth of the service but this is not always accurate and should only be used for guidance purposes.

Responsibilities

Water Mains Engineers

Key Objectives

The accurate tracing and locating of buried metallic and non-metallic water services in order to aid in water mains investigation, leak detection and repairs to water supplies.