Incident Summary #II-1411128-2022 (#28895) (FINAL)

SUPPORTING INFORMATION	Incident Date		July 25, 2022
	Location		Salmon Arm
	Regulated industry sector		Electrical - Low voltage electrical system (30V to 750V)
	Impact – Injury	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Impact – Damage	Damage description	The underground service cable of a private electrical system was damaged during an excavation.
		Damage rating	Minor
	Incident rating		Minor
	Incident overview		When excavating a trench for a new underground sub distribution cable and water line for a new single-family dwelling under construction, a previously buried underground cable providing the main electrical services for the existing single-family dwelling was hooked by the bucket of the excavator causing damage to the cable.
INVESTIGATION CONCLUSIONS	Site, system and components		Approved underground electrical cables and raceways installed to the requirements of the Canadian Electrical Code allow electrical systems to operate to their full potential while providing secure and reliable operation. Ground conditions and location in which the underground cables and raceways are to be buried in are important for the cable's physical protection and identification for future excavation projects within the area. Installed underground cables are placed in a trench at a depth between 450mm to 1000mm dependent of location and voltage. The underground cable is then encased in screened earth or sand at a minimum of 75mm above and below the cable providing physical protection from potentially damaging backfill materials. Backfilling caution tape is placed above the cable approximately halfway between the installation and grade to help prevent future damage when excavating by providing a visual of a potential buried cable.
	Failure scenario(s)		While the excavator was being used to dig a trench, the operator stated they started the excavation one foot to the right from where the underground caution tape was visibly protruding from the ground at the exterior wall of the structure. The spotter assisting the equipment operator did not notice the cable in the ground and the bucket contacted the underground service cables causing damage to the cables outer jacket and to the cables armour, the internal conductors had minor damage but did not appear to puncture through to the internal aluminum conductor.

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Facts and evidence	- The backhoe operator stated that he was aware there was buried cables within the area and was taking smaller scoops of earth as a precaution. Once the resistance of the underground cable was felt in the bucket the operator stopped digging. - The backhoe operator stated that the excavating was performed one foot to the right from where the caution tape protruded from the ground at the exterior wall of the structure. - The backhoe operator stated that he had the assistance of a shovel operator on the ground watching to identify any potential cables within the area being trenched. - The electrical contractor stated that he told the backhoe operator where to dig as underground caution tape identifying the cable was protruding from the earth at the structure. - The electrical contractor stated that he assumed that caution tape was identifying the precise location of the underground cable. - Marking tape and sand was provided for the underground cable, The marking tape was installed directly above the cable for the entire run, except near the building it had been installed approx. 1.5 feet off center of the cable at the point of entrance to the structure. - A phone call to BC One Call was not made prior to the excavation. BC one call does not identify privately owned underground electrical services. - The Electrical contractor immediately disconnected the power supply at the main overcurrent device and locked out the equipment. - The conductors were live at the time of the incident.
Causes and contributing factors	The failure was likely caused by the burial tape not being placed directly over the buried cable near the building and not located hallway between the installation and grade.

Photo 1 - Burial tape installed at time of original installation. Burial tape coming away from building and protruding from grade

Photo 2 - Existing buried cable and burial tape coming away from building. Burial tape not installed at proper depth.

Photo 3 - Burial tape installed on top of sand and not half way between installation and grade.

Photo 4 - Damage to outer jacket of cable where bucket came in contact with cable.

Photo 5 - Damage to outer jacket of cable where bucket came in contact with cable.

Photo 6 - Damage to outer jacket and armour of cable where bucket came in contact with cable.