

Incident Summary #II-1740368-2024 (#49609) (FINAL)

SUPPORTING INFORMATION	Incident Date	July 28, 2024	
	Location	Kelowna, BC	
	Regulated industry sector	Electrical - Low voltage electrical system (30 to 1000V)	
	Impact	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Damage	Damage description	Transit bus shelter low voltage electrical wire (flex cable) insulation and conduit melted due to electrical fire.
		Damage rating	Minor
	Incident rating	Minor	
	Incident overview	<p>Flames and smoke were coming out from behind a metal flashing which is present to prevent public access to the underground cabling and connection points for a bus shelter's transit sign.</p> <p>When fire crews removed the flashing at the base of a vertical support post for the roof structure during suppression efforts, they observed there was melted conduit plastic and bare wires due to the insulation melting. The wires sparked a couple of times while fire suppression efforts were done then stopped which indicated it was energized at that time.</p>	
INVESTIGATION CONCLUSIONS	Site, system and components	<p>The bus stop had both a light and a separate lighted transit sign that were installed with separate power supply conductors. The light was supplied with armoured (Teck 90) cable that was routed through an underground conduit.</p> <p>The transit sign was installed with cab tire (i.e. flex cable) that was routed through the same conduit as the lighting conductor. At some point, the light was decommissioned, and the cables were taped off but left energized.</p> <p>Canadian Electrical Code:</p> <p>Article 12-402 of the Canadian Electrical code specified that flexible cord shall not be used as a substitute for fixed wiring, and shall not be run through holes in walls, ceilings or floors.</p> <p>Canadian Electrical Code 12-910 Conductors and cables in conduit and tubing 1) Conduit and tubing shall be of sufficient size to permit the conductors to be drawn in and withdrawn without damage to the conductors or conductor insulation. Types of cable approved can be found noted in the Canadian Electrical Code Section 4. was run underground in an existing conduit for a lighting supply circuit of original tech 90 cable which was pulled in for lighting the bus shelter many years ago.</p> <p>Decommissioned cable was taped off at one end which is an industry widespread practice. Additionally, the installer and/or decommissioner would protect the cables</p>	

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	<p>from exposure to weather elements by having them inside a box, but they were left out as there is currently no requirement for this therefore it is up to the individual.</p> <p>The incident subject cable was added after for the sign (Image 3).</p>
<p>Failure scenario(s)</p>	<p>Cab tire cable (flexible cable) was used for the power supply to the transit sign when it was installed in an underground conduit. Cab tire cable is not approved for this type of installation and mechanical damage during installation could not be ruled out. Original Teck 90 cable was previously installed for lighting. The incident subject cable was added after for the sign.</p> <p>When the transit sign was decommissioned, the cable was left energized. It is possible that a combination of mechanical damage to the cable, as well as moisture intrusion resulted in a short circuit in the energized cable, creating heat and/or sparks which ignited nearby combustibles.</p>
<p>Facts and evidence</p>	<p>Field Observations:</p> <ul style="list-style-type: none"> No evidence of certification approval was observed on the shelter or components although rear/underneath could not be viewed. It would be typically located in plain sight from the top or sides (Image 1). Damage was isolated to an area with two electrical circuits known to have been energized at the time, a lighting circuit, and a circuit feeding a decommissioned transit sign. The transit light supply conductors were Teck 90 armoured cable and appeared to be part of the original installation. The transit sign conductors were cab tire (flexible cable). The cab tire cable that was the likely source of the fire although the exact failure point could not be identified after the fire (Image 2). <p>Correspondence with City Staff:</p> <p>City staff indicated a similar cable type and method of decommissioning was present at the bus station across the street, and likely others.</p> <p>Electric Field Service Representative (FSR):</p> <p>The FSR observed the cab-tire feed that had been installed for transit signage (now removed) appeared to have failed. They stated it may have occurred when stretched and ran underground in conduit that shares power supply for bus shelter lighting fan in Teck 90 cable. It rained that day and as cable was not under load, water may have migrated into contact with the conductors causing the incident. Cab-tire for all shelters was to be disconnected as it was not in use.</p> <p>Fire Department:</p> <p>The fire department observed there was melted conduit plastic and bare wires due to the insulation melting. The wires sparked a couple of times while fire suppression efforts were done then stopped indicating a likely energized cable.</p>

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Causes and contributing factors

It is likely when the transit shelter sign was decommissioned from electrical service, the cable supplying the transit shelter sign was not disconnected from the source voltage.

It is likely that a combination of moisture intrusion and mechanical damage led to a short circuit which created sufficient heat to ignite nearby combustibles. As a specific failure point could not be identified, it is possible a partial short circuit occurred resulting in heating, which did not immediately trip the overcurrent protection allowed a hazard to be present and combined with an eventual fail-point that combined may have caused the incident fire. As a specific failure point could not be identified, it is possible a partial short circuit occurred resulting in heating, which did not immediately trip the overcurrent protection.

As cab tire is not meant for this type of installation, it is possible that it was more susceptible to mechanical damage such as strain and/or abrasion during installation.

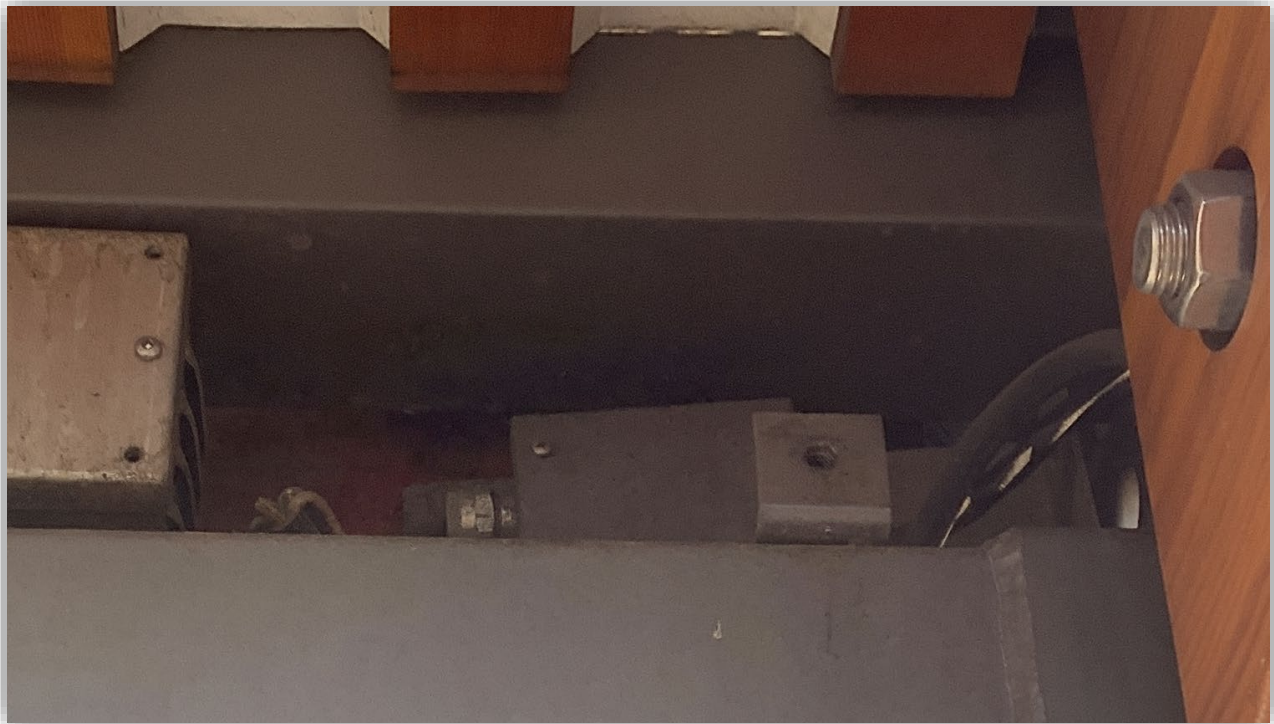


Image 1 - Bus shelter lighting; connection point part of shelter approval. No evidence of certification mark can be seen.



Image 2 - Cable taped off; sign disconnected-Energized from vault (see [image 3](#) -source).



Image 3 - City lighting vault; source voltage connected to flex cable.



Image 4 - Cable fail point inside bus shelter.



Image 5 - Overview bus shelter; damaged to armoured cable and sheath.