



Subject: Use of Aluminum Electrical Conductors	
Date: June 27, 2012	Author: Steve Drew
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Audience	Standards Affected
Ministry Managers, Electrical Services; all holders of the Electrical and Traffic Engineering Manual; all Project Managers and Traffic Engineers; all Design Consultants	Electrical & Traffic Engineering Manual, Electrical & Signing Materials Standards, Standard Specification for Highway Construction

Background:

In recent years the theft of copper electrical conductors from Ministry infrastructure has resulted in substantial annual replacement costs. Electrical systems rendered non-operational compromise the safety of the travelling public and have a negative impact on normal maintenance operations.

Numerous attempts have been made to prevent the theft of copper wire, including:

- direct bury of conductors
- placing concrete slabs over junction boxes or removing them entirely
- security bolts on junction box lids and hand-hole covers
- patented devices installed in pole hand-holes to make wire removal difficult

These measures have varied degrees of effectiveness with corresponding penalties to maintenance.

The scrap value of aluminum wire is a fraction of the value of copper wire. It has been observed that when thieves discover aluminum conductors, the theft is abandoned leaving the infrastructure relatively intact. Improvements to the properties of aluminum conductors have made them as effective as copper, with the minor detriment of a slightly increased diameter for a given ampacity.

Policy:

Aluminum conductors should be used for:

1. Underground circuits feeding roadway lighting.
2. Underground circuits from service disconnect to distribution panel, where applicable.
3. Underground circuits feeding equipment such as island flashers, web cameras, speed reader signs, etc.
4. Direct buried Teck cable.



TECHNICAL BULLETIN

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TRAFFIC, ELECTRICAL, HWY SAFETY AND
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In some circumstances the minimum wire gauge of aluminum conductors may make it impractical to use; in such cases copper wire may be used.

Aluminum wire shall not be used between the traffic signal controller cabinet and controlled electrical loads. These circuits shall continue to use copper only.

Where aluminum conductors are used, the bonding conductor shall be aluminum.

The use of aluminum conductors shall be in compliance with Canadian Electrical Code and follow manufactures recommended procedures for splices and terminations.

Procedure:

The Electrical Engineering Centre (EEC), in conjunction with the appropriate Manager Electrical Services, shall assess all new electrical designs and all electrical projects in the construction phase to determine if aluminum conductors may be used. At the discretion of the Manager, Electrical Services, existing circuits may have copper wire replaced with aluminum.

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