November 2009 **NJ-2009-004**

New Jersey Department of Transportation
Bureau of Research

Technical Brief

Junction Box Lid Redesign

The New Jersey Department of Transportation has been experiencing damage to electrical wires and electrical outages from rodents chewing through wires. Several transportation agencies in the Northeast experience these issues and use a variety of methods, including steel wires, duct seal (the most common), epoxy coating, and poison to address this issue. The DOT should conduct a field test of one or more of these approaches to determine their ability to solve this problem.

Background

The New Jersey Department of Transportation (DOT) has been experiencing rodents entering into junction boxes and accessing the electrical wires. Once in the boxes, the rodents begin to chew on the electrical wires and cause shorts, which trip circuit breakers. Over time, the electrical cables are damaged or severed.

Research Objectives and Approach

Research team members reviewed information available from transportation agency websites and contacted several agencies by phone to identify solutions for NJDOT. Contacts were made with seven agencies.

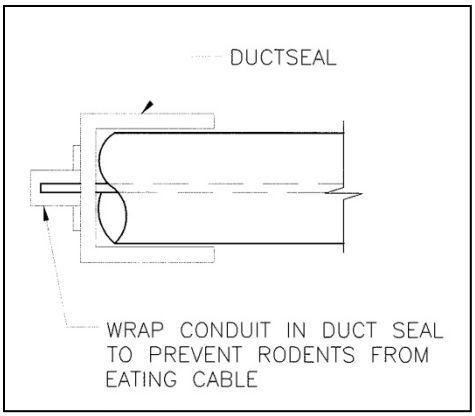
Based on the research and conversations conducted with these agencies, several are experiencing the same issues. The solutions were identified directly from other agency's experiences.

Findings

There are several options for addressing this problem, including:

1. The most common solution is a duct seal. This is placed around the opening of the conduit providing a seal that the rodents cannot penetrate. This is the most common method to prevent rodents from entering the conduit.

2. Another option to use an epoxy compound that is also placed on the outside and inside



the conduit for approximately three-inches. It is important to completely block the opening.

3. A third option is to install small steel wires into the conduit opening reducing the opening so that rodents cannot enter into the conduit.

4. A fourth option would be to use a combination of items 1-3 above and also poison.

Each of the potential options is labor intensive, but would lengthen the life of the cable reducing signal malfunctions and outages. A potential implementation effort would include the following steps:

- NJDOT should obtain the items such as duct seal, small steel wires, and/or epoxy compounds and create a trial using the various methods to determine which will work best. Areas near water or where the ground tends to be damp or wet should be selected for the trial.

- Once a decision has been made on which method(s) to use, NJDOT should then issue a directive to the maintenance department and a design bulletin requiring traffic signal designs to include the selected method(s) be included in the traffic signal design. NJDOT should issue a standard specification for designers to follow.

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A final report is available online at: http://www.state.nj.us/transportation/refdata/research/. If you would like a copy of the full report, send an e-mail to: Research.Bureau@dot.state.nj.us.

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