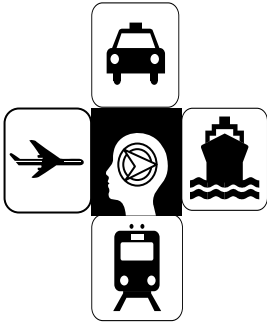


JERSEY DOT'S

"TURNING PROBLEMS INTO SOLUTIONS"



Need a solution?
Think Jersey DOT

Tech Brief

Research & Develop Locking Design for NJDOT Junction Boxes

NJ-2008-002

April 2009

SO, HERE'S THE PROBLEM

The New Jersey Department of Transportation (DOT) has been experiencing vandalism of the copper cables located with their junction boxes. Vandals have been opening the covers and removing the copper wire. The removal of the copper wire has caused light failures. Furthermore, it is also dangerous because of the voltage that the copper wires carry.

AND HERE'S OUR SOLUTION

For junction boxes in non-pedestrian or non-vehicle areas (i.e., boxes located in grass areas), two stainless steel bars would be placed over the top of the junction box cover and either secured on the ends of the box by a threaded screw or hinged on one end and secured with a nut that has a lock on top to prevent vandalism.

For junction boxes located in pedestrian areas, the first option would use a bolt and nut with a built in lock to secure the cover the concrete box in four locations. The detail of the nut is star shaped to prevent a person from just being able to unscrew the nut easily. The bolt is recessed into the opening to make it harder for someone to remove the nut and bolt to open the junction box cover. Another option is to use a screw with a star head on the top. NJDOT would have to have a tool manufactured with this particular star shape in order to remove the screw. We examined using hex heads and other similar type of shapes but we believe that to provide the maximum protection, an irregular shape should be used. We recommend that quick setting non-shrink grout be used to hold the bolt in place.

TECH BRIEF

INTRODUCTION

The New Jersey Department of Transportation (DOT) has been experiencing vandalism of the copper cables located with their junction boxes. Vandals have been opening the covers and removing the copper wire. The removal of the copper wire has caused light failures. Furthermore, it is also dangerous because of the voltage that the copper wires carry. Our task was to research other Department of Transportation's (DOT's) and possible vendor, that manufacture junction boxes to be determined how the cover could be locked.

WHAT SOLUTION IS PROPOSED?

For junction boxes in non-pedestrian or non-vehicle areas (i.e., boxes located in grass areas), two stainless steel bars would be placed over the top of the junction box cover and either secured on the ends of the box by a threaded screw or hinged on one end and secured with a nut that has a lock on top to prevent vandalism.

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We recommend that quick setting non-shrink grout be used to hold the bolt in place. Non-shrink grout will provide the strongest bond between the bolt and the concrete. Other options such as using concrete or some other type of bonding agent are not prudent because they will crack and the bolt will become free and could be removed.

HOW DID WE ARRIVE AT THIS SOLUTION?

Research team members reviewed information available from transportation agency websites and contacted several agencies by phone to identify potential locking solutions for NJDOT. Contacts were made with 5 DOTs, New Jersey Transit, and Union County, New Jersey.

Based on the research and conversations conducted with these agencies, they are not experiencing the same vandalism as NJDOT. Therefore, the existing NJDOT electrical junction box was examined and several possible design alternatives for locking the cover were developed.

RECOMMENDATIONS - WHAT ARE THE NEXT STEPS TO MAKE THIS PROGRAM A SUCCESS?

- Potential locking system designs have been developed for consideration by NJDOT. These locking systems should be reviewed by NJDOT and a determination should be made which system would be appropriate to use.

- Once a decision has been made on the locking system, NJDOT should meet with the junction manufacturer to determine the cost impacts to implement the locking system.
- There should also be a determination whether it is cost efficient to replace the existing junction box covers and modify the existing junction boxes to accept the new locking system.

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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, please FAX the NJDOT, Bureau of Research, Technology Transfer Group at (609) 530-3722 or send an email to Research.Bureau@dot.state.nj.us and ask for:

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