2023 INNOVATION CHAMPIONS CONTEST

Asphalt Crevice Blaster

COUNTY: Walsh County Highway Department

DESIGNERS: Jerry Hodny, Chad Arendt

ADDRESS: Lankin, ND

CONTACT: Jerry Hodny, Jason Johnston

E-MAIL: jerry.hodny@gmail.com; shop4@polarcomm.com

TELEPHONE: (701) 331-1012 (cell), (701) 593-6188 shop

PROBLEM STATEMENT: Crevices (aka cracks) in asphalt roads, on bike and walking asphalt paths, fill with debris, dirt, sand, salt, and vegetation. The crevices are typically #2 pencil size and larger.

An air compressor and compressor tip were used to clean out loose debris and materials before applying sealant. However, compressed debris remained in the crevice. A weed eater was used to remove the top part of the vegetation but the roots remained in the crevice. When sealant was poured, the crevice could only be filled partially due to the remaining debris. Crevices with solidified sand and salt could not be filled, so pouring sealant over these crevices was not effective. Sealant application typically had to be repeated every 2 to 3 years. In addition, the tip on the air compressor would wear out.

SOLUTION: Designed and fabricated the asphalt crevice blaster. The cleaner attaches to the wand of an air compressor with a splice. With the blaster, the road crew can remove debris that has settled deep in the asphalt crevices. The cleaner was fabricated using a 3/8-inch bolt. The head on the bolt was removed, and the tip of the bolt is ground to 1/8” thick. The bolt is bent at an angle from the tip up 1.5 inches. The cleaner is welded to a ½-inch splice, and then fastened onto the wand. To use most effectively, the air compressor wand with the attached crevice cleaner is held at a 45-degree angle and pulled toward oneself. The cleaner loosens the debris and vegetation and the air from the compressor extracts the loosened material from the crevice and surrounding asphalt surface. The road department is fabricating cleaners with tips in different sizes so it can used on any size crevice.

LABOR, EQUIPMENT, AND MATERIAL:
Equipment used to build innovation:
Chop saw
Wire welder
Grinder
Vise
Hammer
Wrenches

Materials:
New material:
3/8-inch bolt – 5 1/2 inch long
Wire for welding
Sleeve splice – ½" or whatever fits on the end of the wand

Total Labor Hours: (*Consider time required for design and discussion.)*
2 hours
3 people

COST SUMMARY:
3/8-inch bolt – 5 1/2 inch long: $.60
Welding Wire - $1
Splice - $6
Total Cost: $ 7.60 plus labor

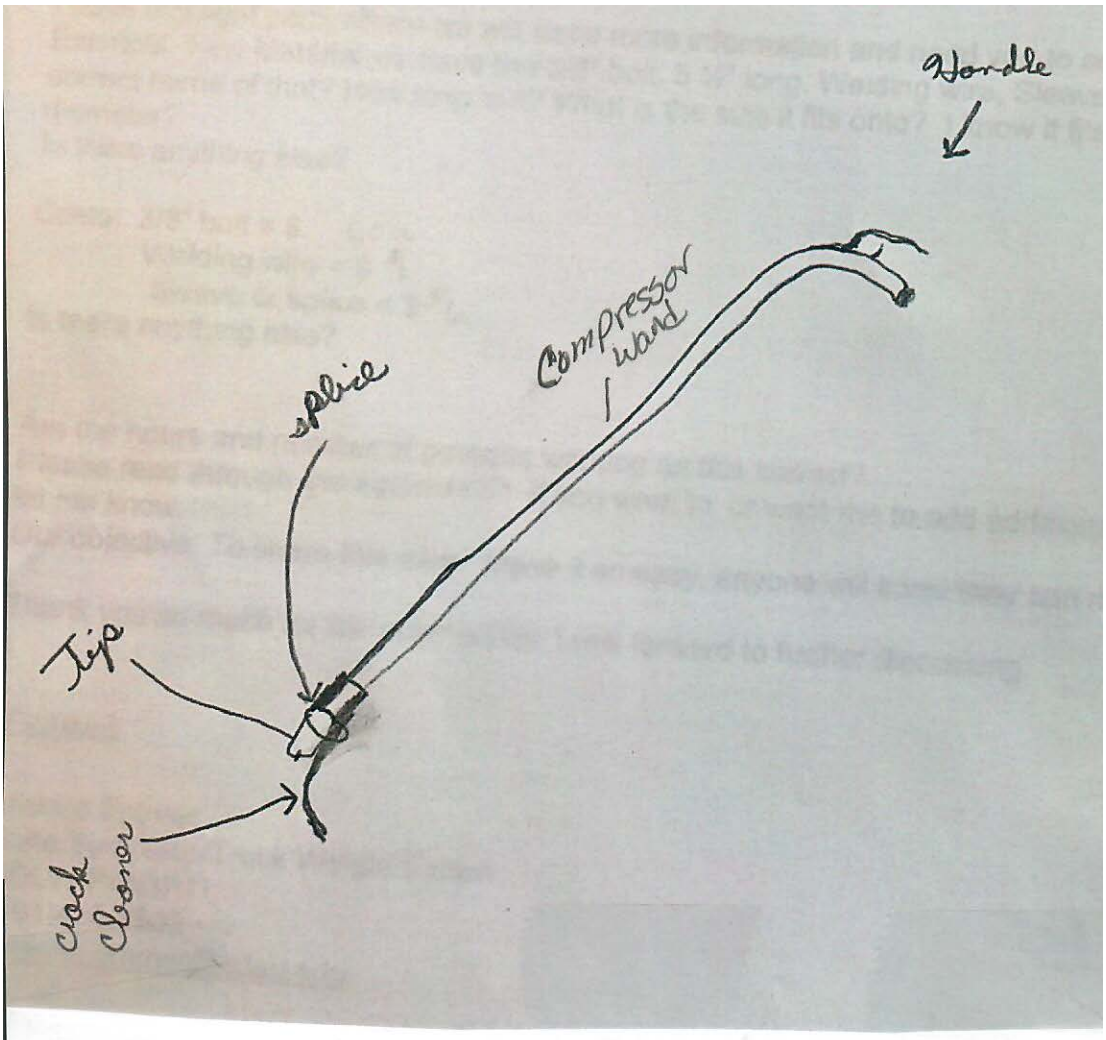
SAVINGS AND BENEFITS:
When using the asphalt crevice blaster, the crevices are cleaned more thoroughly so more sealant can fill the void in asphalt. Filling more of the void with sealant results in better adherence to the asphalt walls and path/road surface. With oil from the rubber sealant deeper and cohesive in the crevices, the life of paths and roads extended. After using the asphalt crevice blaster the applied sealant will last 5 to 7 years instead of 2 to 3 years if applied without using the blaster. With sealant life extended, road crew personnel is exposed to the motoring public less and product is applied less often. This blaster indirectly promotes safety and a cost savings to the road department in manpower and expense.

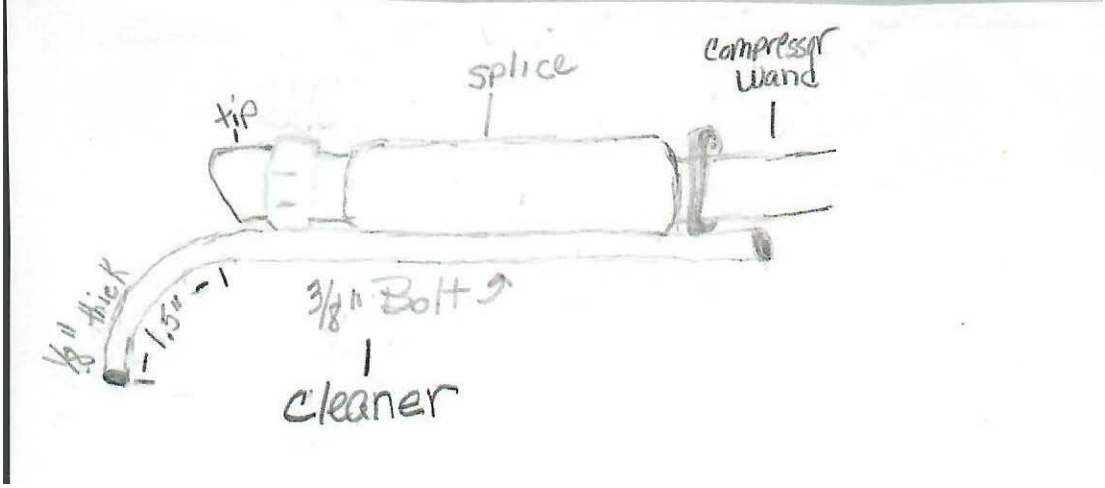
ANNUAL OPERATING COSTS:

Prior to using the innovation – Sealant wasn't as effective. Applied rubber sealant did not go very deep. Sealing the same asphalt crevices had to be redone every 2 to 3 years.

After using the innovation – Based on experience, it appears that the oil in the rubber sealant is more cohesive and is penetrating more deeply into the crevices. As a result, the life of paths and roads is extended.

DRAWING (SCHEMATIC) WITH DETAILS:



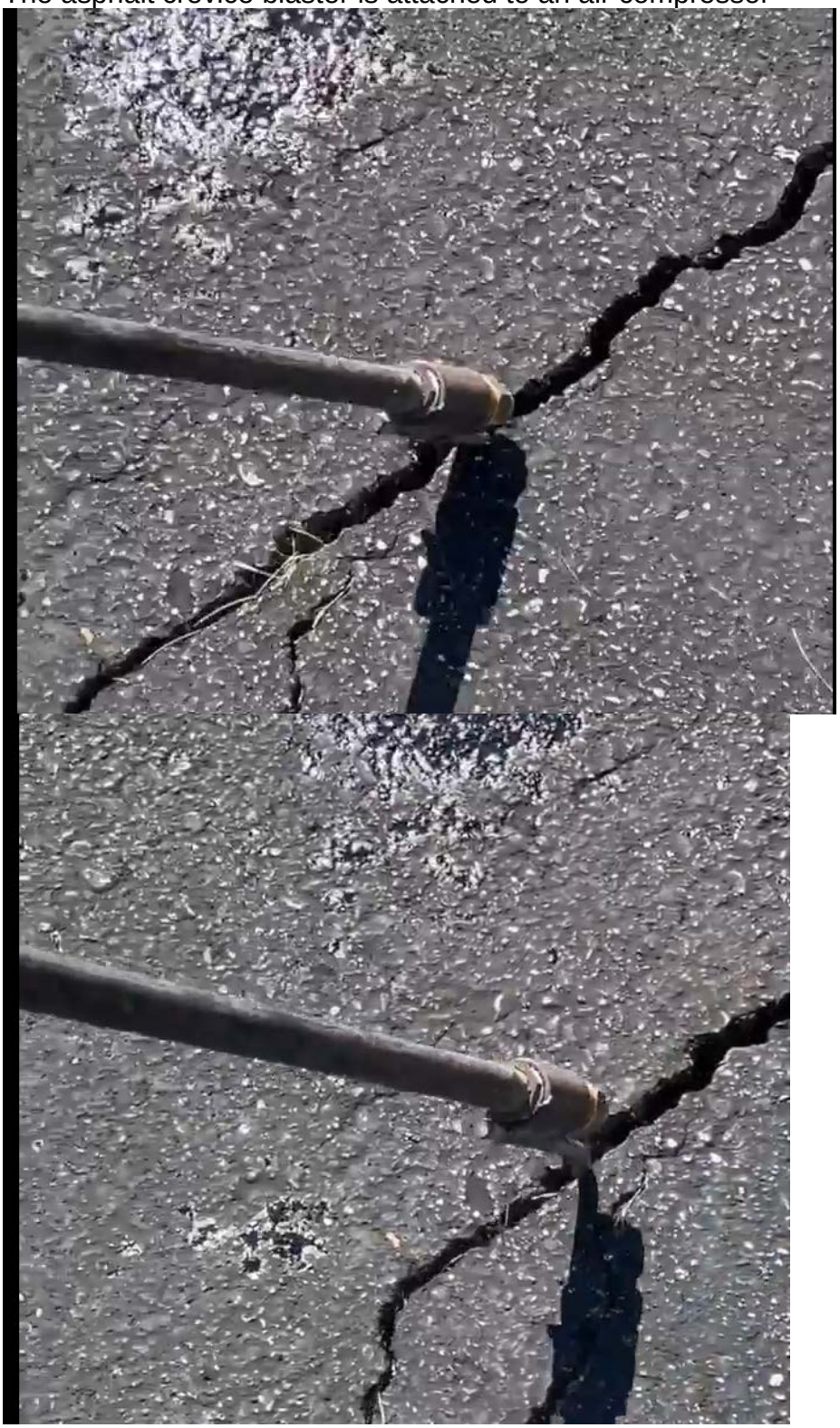


Asphalt Crevice Blaster

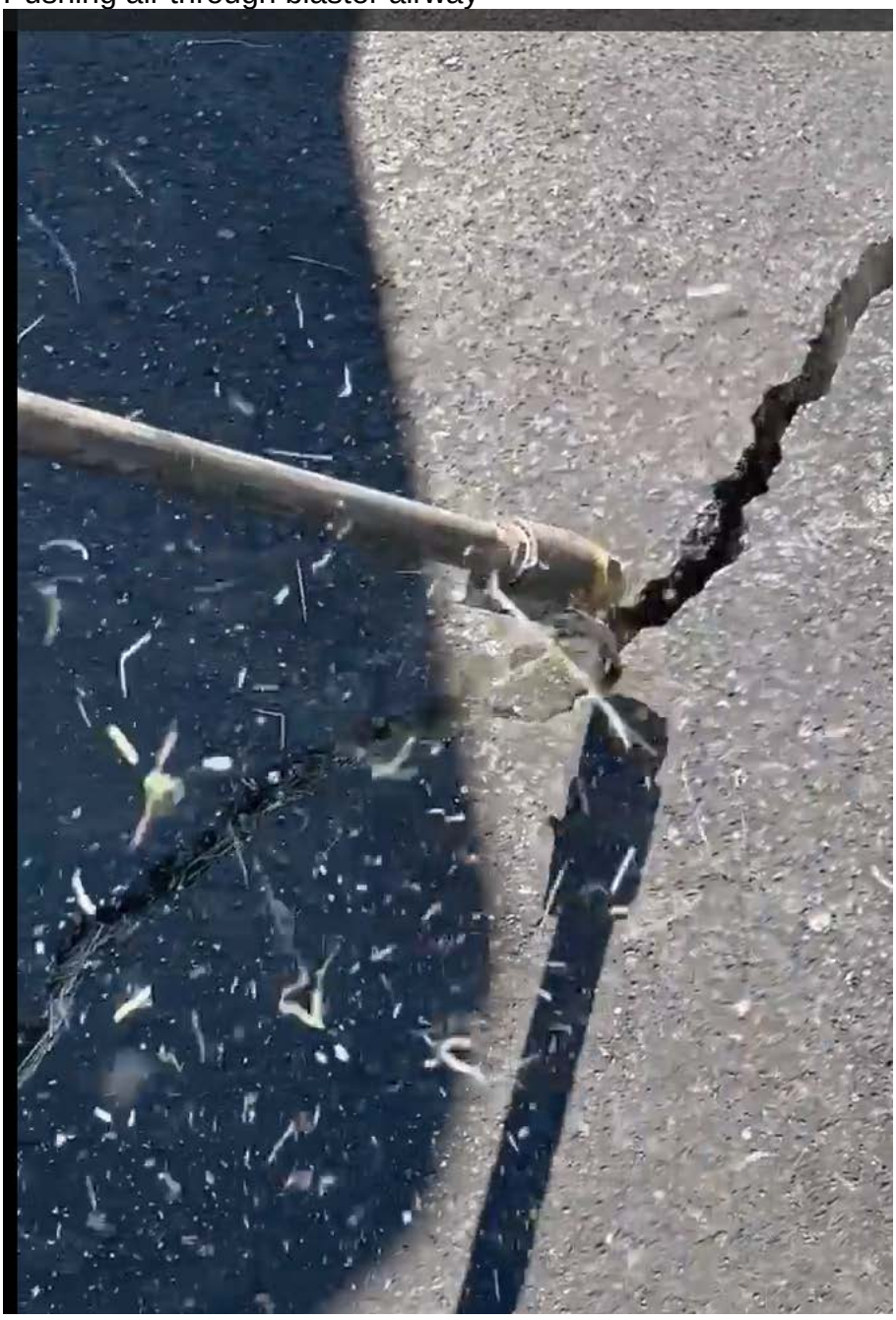
Angled bolt welded to splice.

Air compressor pushes air which removes loosened debris

The asphalt crevice blaster is attached to an air compressor



Pushing air through blaster airway



Tip loosens debris

Cleaned out crevices (cracks) allows sealant better cohesivity.