

2024 INNOVATION CHAMPIONS CONTEST

Bridge Cleaner

COUNTY: Richland

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PROBLEM STATEMENT:

We needed to find a simpler and faster solution to clean out the buildup of dirt under guardrail and bridge rail that allowed for vegetation and weed growth. The vegetation hindered vision during summer months and allowed for snow buildup during the winter months. The use of a brush trimmer was only temporary and was not a good use of time.

We wanted something that was easy to use with the least amount of manpower and was the least amount of hinderance to traffic. It was decided to design an attachment for a skid steer since it would be easily moved from bridge to bridge, the attachment was compact enough to stay in one traffic lane, and could serve the dual purpose of cleaning under and around the railing and for debris removal.

SOLUTION:

The attachment was made to be compact enough to be transported on the car trailer along with the skid steer and bucket. It is also intended to be set off to one side of the pallet fork attachment so you can avoid having to drive over the dirt as you pull it out from under the railings and are able to clean behind each post. This setup allows it to be done with only 2 employees. One operator in the skid steer and someone to help with traffic. It was designed to fit under the railing and able to reach four feet. The operator has very good visibility by using the skid steer and can see exactly what they are doing. The dirt and vegetation is pulled from behind and under the railing and laid in a row on the edge of the roadway. Depending on the amount of traffic on the road the operator can remove the debris after completing one section of the rail or can do on entire side before removal is necessary. To switch operations the operator simply detaches the pallet fork attachment and attaches the bucket and removes the debris from the road before moving to the next sections. We are able to clean off an entire county highway bridge including debris removal in less than one hour making it very efficient.

LABOR, EQUIPMENT, AND MATERIAL:

Equipment used (to build innovation): Wire welder, band saw, side grinder, tape measure

Materials:

Salvage material: (Example: 2 -9/16 x 3" bolts, 1 shaft 1-3/4" x 10")

54" of flat iron, two feet of 3/8 chain and 12" load binder.

New material:

None

Total Labor Hours: (No. of persons, number of hours for each)

(Note: Consider time required for design and discussion.)

Since we were busy with shop projects for the week, I don't consider labor cost to be included.

COST SUMMARY: (approximate cost of each item purchased)

10 ft piece of 4" wide channel iron cut into 2 pieces.	\$7.00
2 ft of 2.5" flat iron	\$5.00
3 ft of 3.25" angle iron	\$6.00
3 ft of 4" cutting edge.	\$10.00

Total Cost: \$ 30.00 no labor

SAVINGS AND BENEFITS (to agency – monetary and/or safety related):

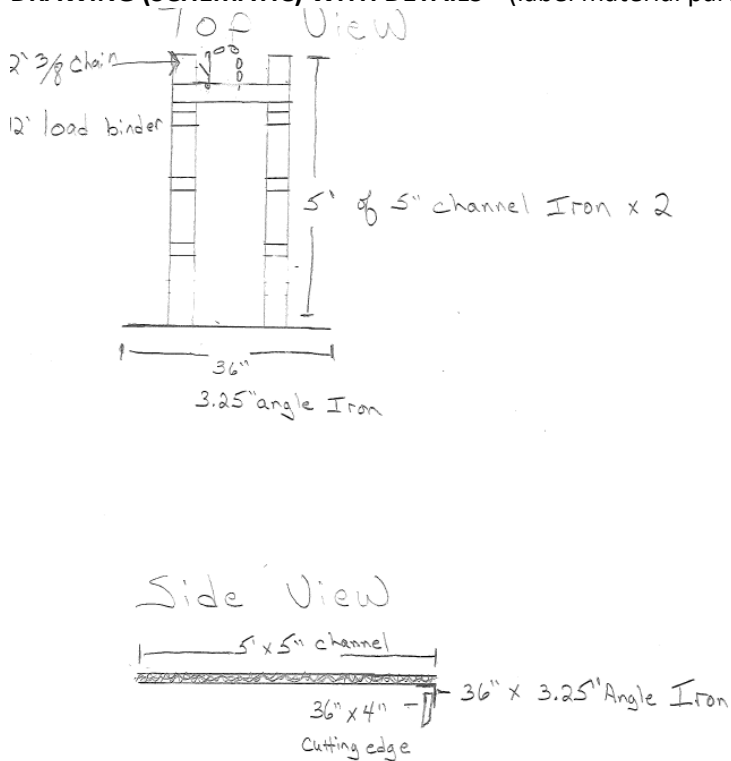
The immediate cost savings of this attachment will be for less snow buildup during the winter making for less time spent at those locations removing snow and better water drainage resulting in less gravel erosion on unpaved surfaces. In the long term, the hope is that the better drainage will result in longer lasting railing posts and less chance of tree growth which will save on labor costs.

ANNUAL OPERATING COSTS:

Prior to using the innovation -

After using the innovation – last winter (2023) was so mild that we never had any issues with drifting snow building up at the locations we cleaned. The bridge cleaner has been used extensively this summer, we will re-evaluate the usage savings later this fall.

DRAWING (SCHEMATIC) WITH DETAILS-- (label material parts/components in detail):



The attachment is connected to a set of roller tines using a short piece of chain and a load binder. This allows easy switching between tines, bucket and attachment.

Vegetation to be removed under the guard rail.



Bridge cleaner pulling the vegetation.



Bridge guardrail after using the bridge cleaner. Vegetation is removed well.



The other side of the bridge after cleaning vegetation with the bridge cleaner.

