2018 YOU SHOW US CONTEST

Swing-A-Way Bridge Marker

COUNTY: Bottineau County in North Dakota

DESIGNERS: Ritch Gimbel

ADDRESS: 314 5th Street West, Bottineau, ND 58318

CONTACT: Ritch Gimbel

E-MAIL: ritch.gimbel@co.bottineau.nd.us

TELEPHONE: (701)263-1607

PROBLEM STATEMENT: Wide equipment being transported on county roads break off bridge end marker signs, or those transporting the wide equipment remove the signs and fail to put them back up. The signs end up in the creek, river, or lake. The county incurs costs for lost signs and for the labor to put them back up. The missing signs create safety issues for the motoring public and liability concerns for the county.

DISCUSSION OF SOLUTION: The swing-a-way bridge marker is designed and constructed so the sign/post will swing down when hit and return to its original upright position after the vehicle had passed. Removing the sign is no longer necessary. The steel rod and roller bearings offset the sign/post and enable it to pivot when struck. The counterweight, made from the used cutting edges off a motor grader moldboard, brings the sign back to its upright position. A concise weight for the counterweight is critical. The swing-a-way bridge marker is mountable on all bridge styles, using telespar square tubing or angle iron.

We used 3 feet of 2-inch telespar for the base section and 2-3/4 feet of 1-¾ inch telespar for the upper part of the bridge marker post. The 1-3/4 inch telespar inserts into the 2-inch telespar and a 3-inch 3/8-inch bolt holds them together. Toward the top of the post, two 12- x 18-inch chevron signs, one on each side of the post, are attached using two rivets for each sign (Option 2: use only one chevron sign on each post at each end of the structure.) The counterweight, made with three 12-inch cutting edges (off a moldboard) welded together, attaches to the base section of the post using washers, a sleeved 7-inch long ½-inch bolt, and a nut. A ¾-inch steel rod that is 9 inches in length inserts through the post base section and roller bearings. Two bolts hold the roller bearings to the post base section. The steel rod is welded to the bridge mount. For the bridge mount, we use 12 inches of 2-inch telespar. The bridge mount of the swing-a-way marker attaches to the bridge with two bolts. The swing-a-way bridge marker pivots at two points – where the counterweight, and the steel rod/roller bearings, attach to the post.

LABOR, EQUIPMENT, AND MATERIALS:

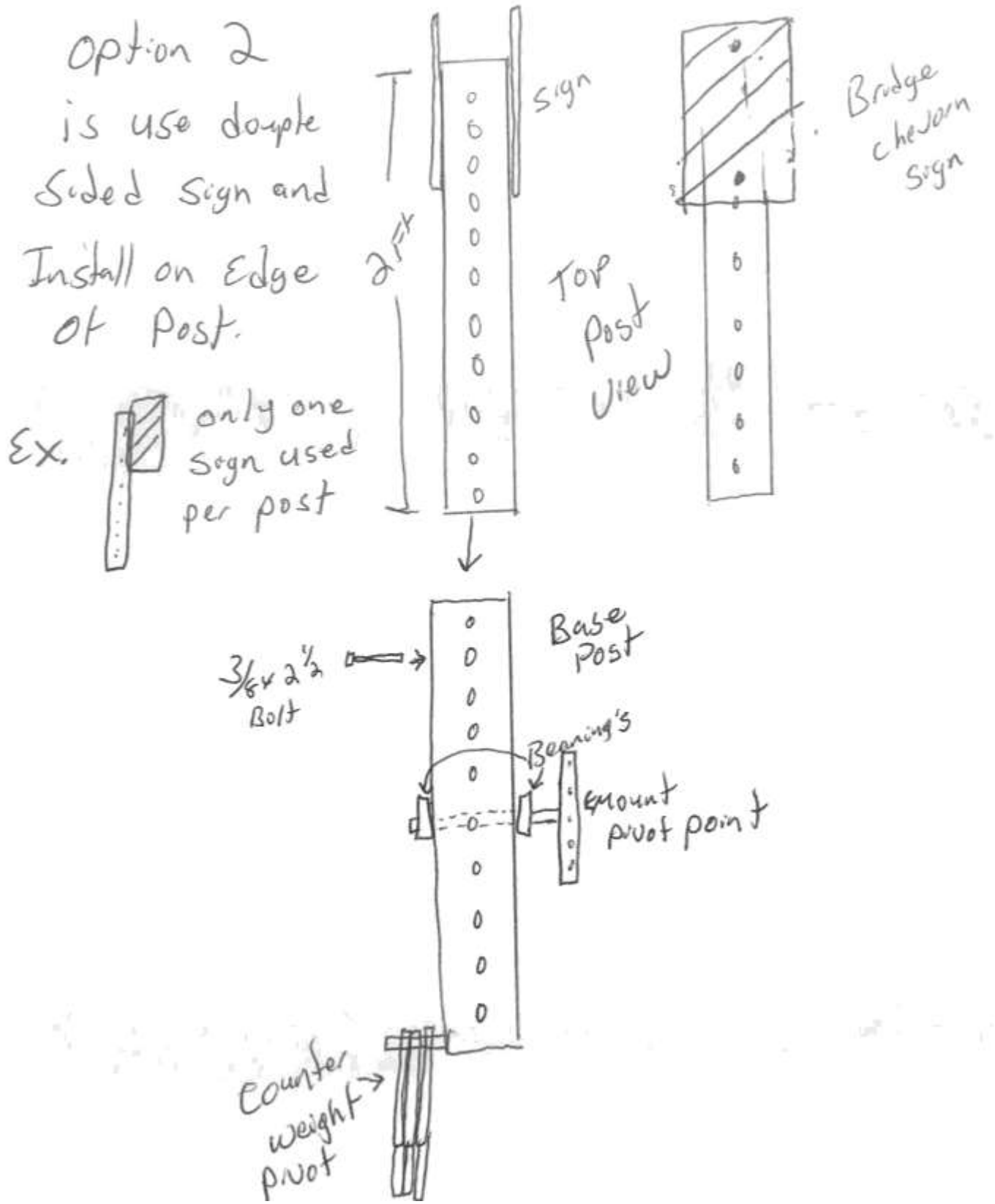
Equipment used: Welder, chop saw, acetylene torch, wrenches.

Salvage Material:
Used cutting edges off a moldboard, cut to three 12-inch lengths and welded together.
3 feet of 2-inch telespar
2-3/4 feet of 1 ¾-inch telespar
12 inches of 2-inch telespar

New Material:
2 - 12x18” chevron bridge signs
2 roller bearings (greasable)
9” long 3/4-inch steel rod
4 sign rivets - $.25 to $.50
7” long 1/2-inch sleeved bolt
3” long 3/8-inch bolt
Washers, nuts

Total Labor Hours:
Total number of persons: 2
Total hours: 2 to 3

DRAWING (SCHEMATIC) WITH DETAILS:



COST SUMMARY:
Salvage Material:
Used cutting edges off a moldboard, cut to 3 12-inch lengths and welded together.
3 feet of 2-inch telespar
2-3/4 feet of 1 ¾-inch telespar
12 inches of 2-inch telespar

New Material:
2 - 12x18" chevron bridge signs - $50 ($25 each)
2 roller bearings (greasable) - $8
9" long 3/4-inch steel rod - $2
4 sign rivets - $.25 to $.50
7" long 1/2-inch sleeved bolt - $2
3" long 3/8 inch bolt - $.15
Washers, nuts

Total Cost: $37.65 plus labor

SAVINGS AND BENEFITS: This innovation has saved the county time and money. Signs are no longer torn off or removed from bridges. The need to repair or replace signs at these locations has decreased significantly. Fewer personnel are needed, so fewer labor hours are used. The liability risk to the county, for not having a sign in place because it has been removed is significantly reduced. Having the signs in place at all times increases the safety of the motoring public.

OPERATING COSTS:
Prior to using the innovation: $300 per sign for parts and labor. This includes the need to have an extra person assisting with the sign/post replacement and the travel time for employees.
After using the innovation: Since we began using the Swing-A-Way bridge marker in 2007, there have been very few, if any, signs that have been lost because they were broken off or removed.

Swing-A-Way Bridge Marker.

Post: 3/8 inch bolt, 3 inches in length holds upper and base sections of post together.

Steel rod inserted and roller bearings mounted on post creating pivot point. Rod welded to bridge mount.

Bridge mount bolted to bridge.

Counterweight – welded cutting edges off a moldboard.

Countweight attaches to post using a sleeved 7-inch long 1/2-inch bolt, washer, nut, creating a pivot point.

Counterweight – keeps sign in upright position.

Signs mounted on post.

Video link
https://drive.google.com/open?id=1M4YgiSjGtR88jAWK8IX6fkWP6NsOUO1A

https://drive.google.com/open?id=1z-yUxyua_aw7kzq9pdT6ai78WhPJLKB4