

Design Assumptions for  
Nebraska Base Drawing NE100-30-010  
Debris Rack with Anti-Vortex Devices for  
Twin 54" and 60" Risers

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Revised:03/05 Replaces:5001-9

**Debris Rack with Anti-Vortex Device for Twin 54" and 60" Dia. Risers**

An anti-vortex device is required on all risers, this debris rack with the anti-vortex devices meets this requirement for large diameter risers.

If the PI of the soil in the embankment is less than 15 the inlet area should be armor coated with riprap or have a concrete apron to prevent erosion.

Grouted rock riprap should be considered for erosion protection.

Instructions for  
Nebraska Base Drawing NE100-30-010  
Debris Rack with Anti-Vortex Devices for  
Twin 54" and 60" Risers

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Fill in the following data fields to automatically fill in the necessary data fields on the drawing.

**Title block**

Title line(s)

Subtitle line

County, State

Sheet number                      of

**Who / When**

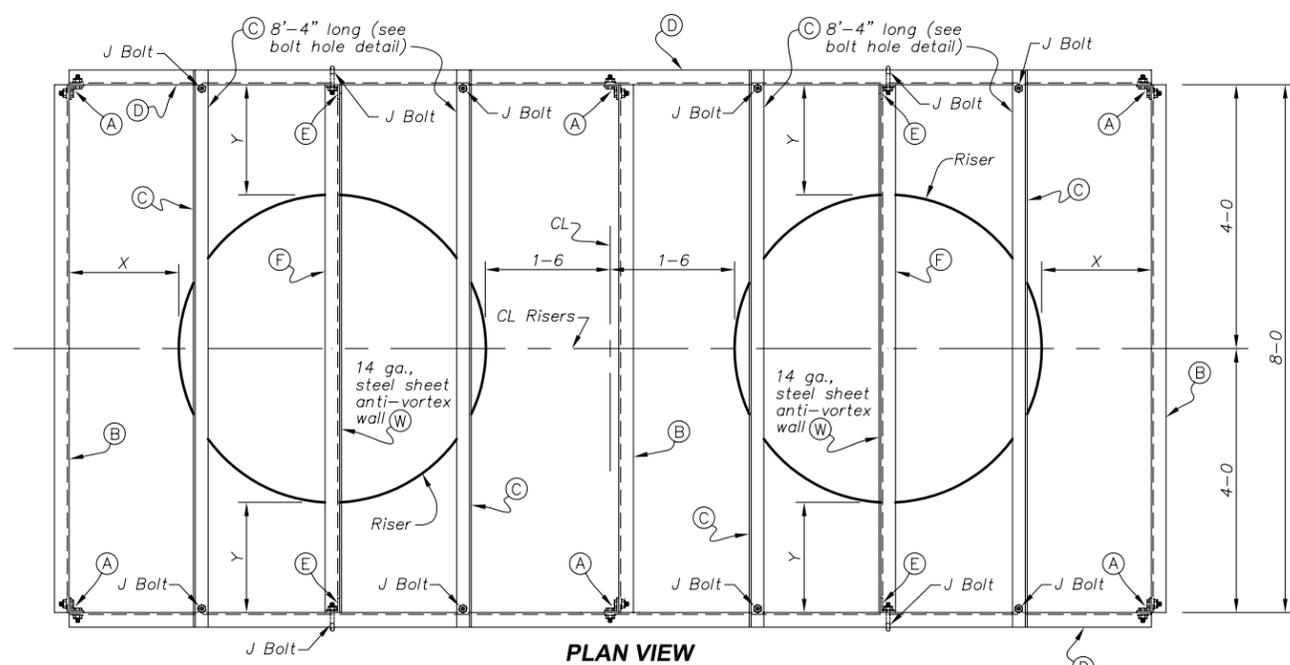
Designed

Drawn

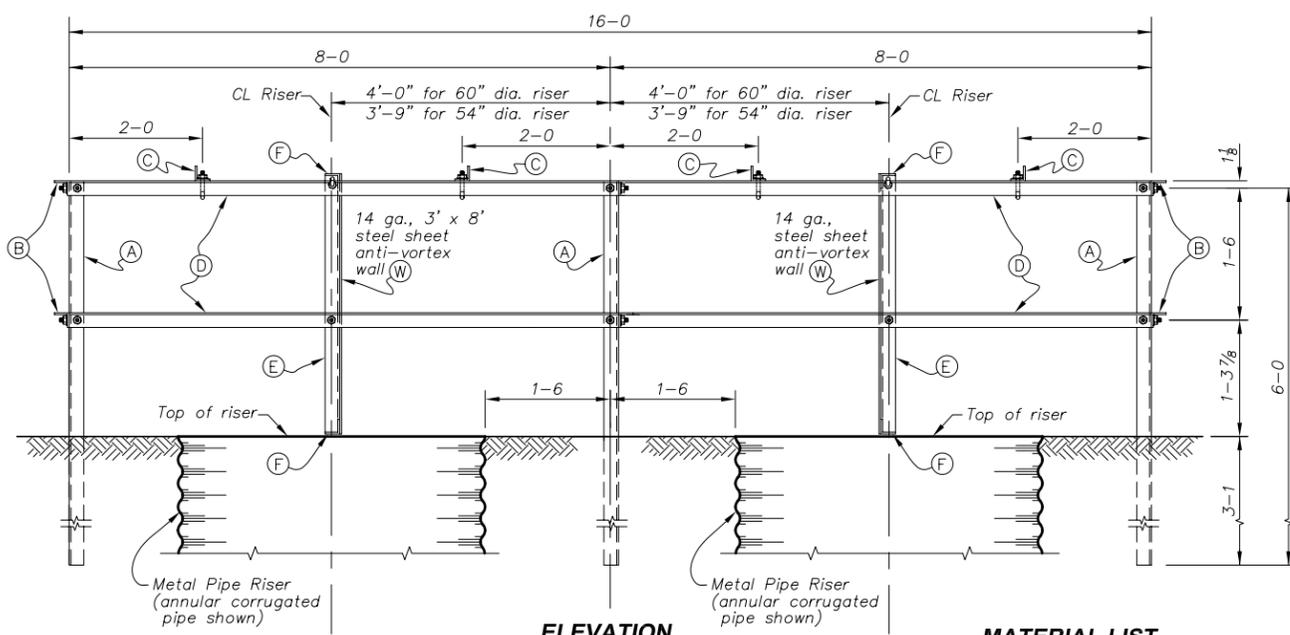
Checked

**Enter directly on drawing**

Left click on yellow boxes on drawing to mark with X as required.  
Left click on blue data fields to enter required data.



PLAN VIEW



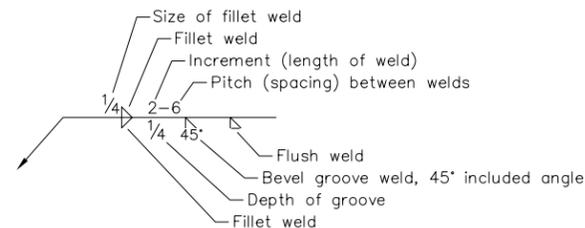
ELEVATION

MATERIAL LIST

**CONSTRUCTION TABLE**

DIMENSION	54" DIA. RISER	60" DIA. RISER
X	2'-0"	1'-6"
Y	1'-9"	1'-6"

**WELDING SYMBOLS**

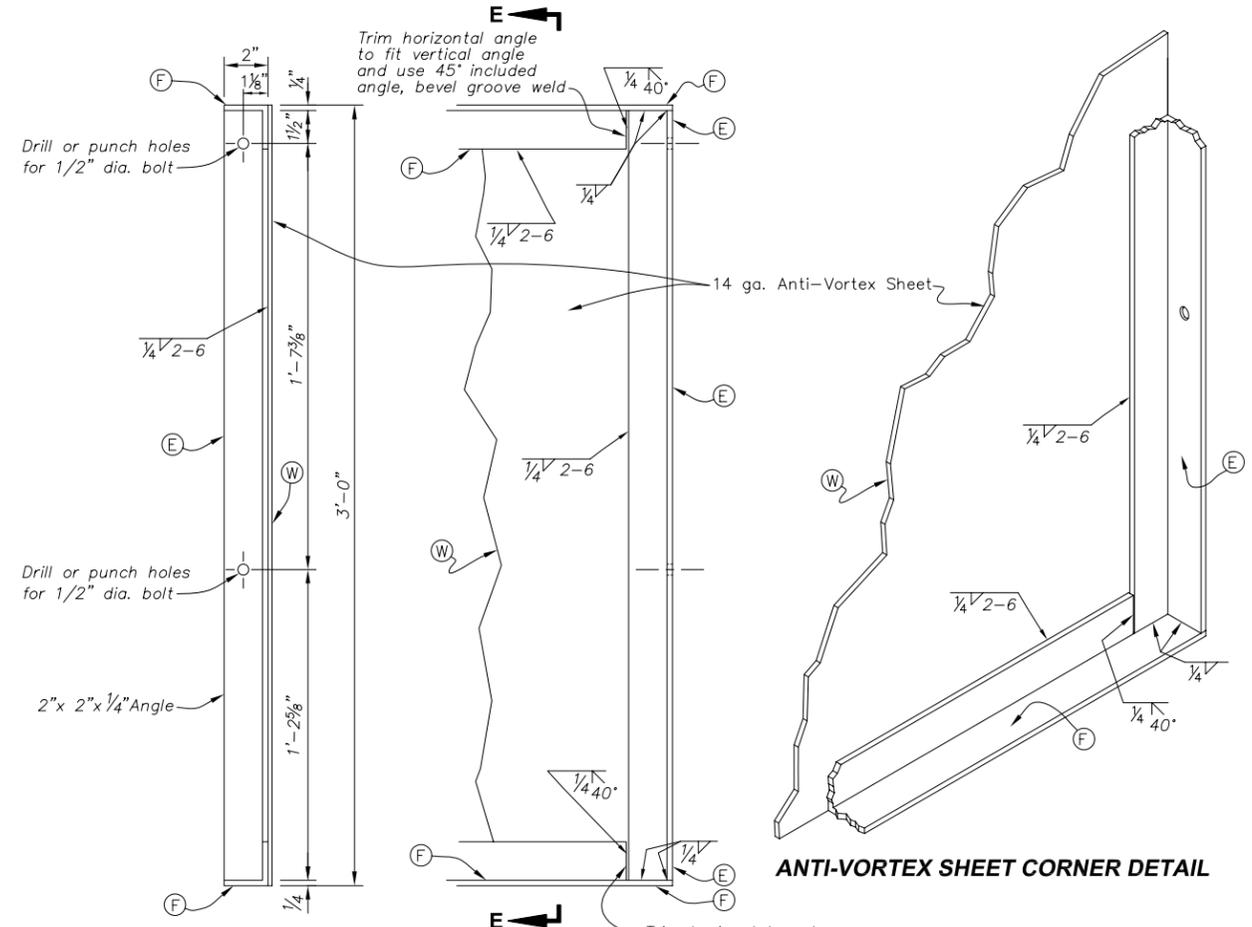


Note:  
 Symbol above line indicates weld is on the opposite side of joint to which arrow points.  
 Symbol below line indicates weld is on side of joint to which arrow points.  
 2-6 indicates making a 2" weld every 6 inches.

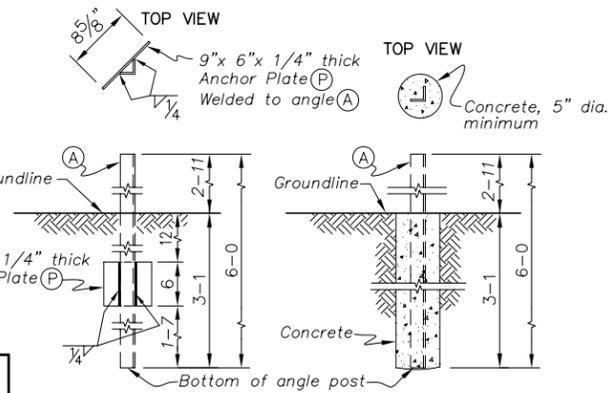
MARK	ITEM	NUMBER REQUIRED
A	2" x 2" x 1/4" x 6'-0" ANGLE (POSTS)	6
B	2" x 2" x 1/4" x 8'-0" ANGLE	6
C	2" x 2" x 1/4" x 8'-4" ANGLE	4
D	2" x 2" x 1/4" x 16'-0" ANGLE	4
E	2" x 2" x 1/4" x 2'-11 1/2" ANGLE	4
F	2" x 2" x 1/4" x 8'-0" ANGLE	4
P	6" x 9" x 1/4" ANCHOR PLATE (DETAIL "A")	6
W	14 GA. STEEL SHEET, 3'-0" x 8'-0"	2
	1/2" x 1-1/2" HEX STEEL BOLTS (INCLUDING NUTS)	28
	1/2" DIA. x 3" LENGTH STEEL "J" BOLT (INCLUDING NUTS)	12
	1/2" DIA. STEEL LOCK WASHER (FOR ABOVE BOLTS)	40

ITEM	WEIGHT LBS.(STEEL)
2" x 2" x 1/4" ANGLES (28)	718
ANTI-VORTEX STEEL SHEET (2)	158
STEEL BOLTS, NUTS AND LOCK WASHERS (40)	6
ANCHOR PLATES (6) (DETAIL A ONLY)	24
TOTAL STEEL (DETAIL A ONLY)	906
TOTAL STEEL (DETAIL B ONLY)	882

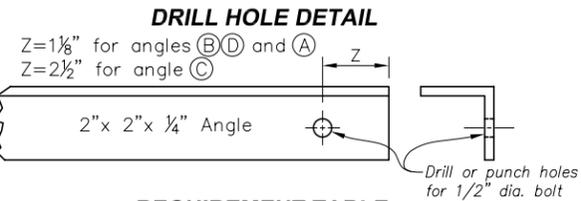
TOTAL (MIN.) CONCRETE REQUIRED (DETAIL B ONLY) 0.1 CU.YD.  
 ALUMINUM ALLOY = 1/3 WT. OF STEEL.  
 FOR USE OF ALUMINUM SEE DESIGNER'S NOTES.



SECTION E-E ANTI-VORTEX DETAIL



DETAIL "A" ANGLE POST ANCHORING DETAILS  
 DETAIL "B" ANGLE POST ANCHORING DETAILS



DRILL HOLE DETAIL

**REQUIREMENT TABLE**

<input checked="" type="checkbox"/>	X IN BOX INDICATES DETAILS WHICH APPLY TO STRUCTURE
<input type="checkbox"/>	RACK WITH ANTI-VORTEX DEVICE FOR _____" DIA. PIPE RISER
<input type="checkbox"/>	METAL TYPE, STEEL <input type="checkbox"/> METAL TYPE, ALUMINUM
<input type="checkbox"/>	PROTECTIVE COATINGS, GALVANIZED OR PAINTED ACCORDING TO PAINT SYSTEM "C" OF PAINT SPECIFICATION
<input type="checkbox"/>	POSTS WITH ANCHOR PLATE (DETAIL "A")
<input type="checkbox"/>	POSTS WITH CONCRETE BASE (DETAIL "B")

**NOTES:**

- ALL BOLTS, NUTS AND LOCK WASHERS SHALL BE GALVANIZED.
- ALL ANGLES, SHEETS AND PLATES TO BE SECURELY WELDED AND/OR BOLTED AS SHOWN ON THE DRAWING, IN ACCORDANCE WITH SPECIFICATIONS.
- ALL WELDS AND HEAT AFFECTED AREAS, ON GALVANIZED METAL SHALL BE TREATED IN ACCORDANCE WITH CONSTRUCTION SPECIFICATIONS.
- WHEN MATERIALS USED ARE NOT GALVANIZED, OR NOT OF ALUMINUM ALLOY, ALL PARTS SHALL BE PAINTED ACCORDING TO PAINT SYSTEM "C" OF PAINT SPECIFICATIONS.

**DESIGNER'S NOTES:**

- ALL COMPONENT PARTS OF DEBRIS TRASH RACK SHALL BE OF ONE TYPE OF METAL. EITHER ALL STEEL OR ALL ALUMINUM AS SPECIFIED.
- ALUMINUM ALLOYS WILL NOT BE USED IN SOILS THAT HAVE A pH GREATER THAN 9 OR LESS THAN 4 OR WHERE RAPID CORROSION OF SIMILAR MATERIAL IS KNOWN TO HAVE OCCURRED.
- GALVANIZED STEEL BOLTS, NUTS (HEX HEAD) AND LOCK WASHERS MAY BE USED WITH ALUMINUM ALLOY ONLY WHEN PROPERLY INSULATED WITH TWO (2) THICKNESSES OF 12 MIL (MINIMUM) PLASTIC TAPE.

**DEBRIS RACK WITH ANTI-VORTEX DEVICES FOR TWIN 54" AND 60" DIA. RISERS**

Date \_\_\_\_\_  
 Designed \_\_\_\_\_  
 Drawn \_\_\_\_\_  
 Checked \_\_\_\_\_  
 Approved \_\_\_\_\_

**NRCS**  
 Natural Resources Conservation Service  
 United States Department of Agriculture

CAD file:  
 NE100-30-010.dwg  
 Drawing No. \_\_\_\_\_

Sheet \_\_\_\_\_ of \_\_\_\_\_