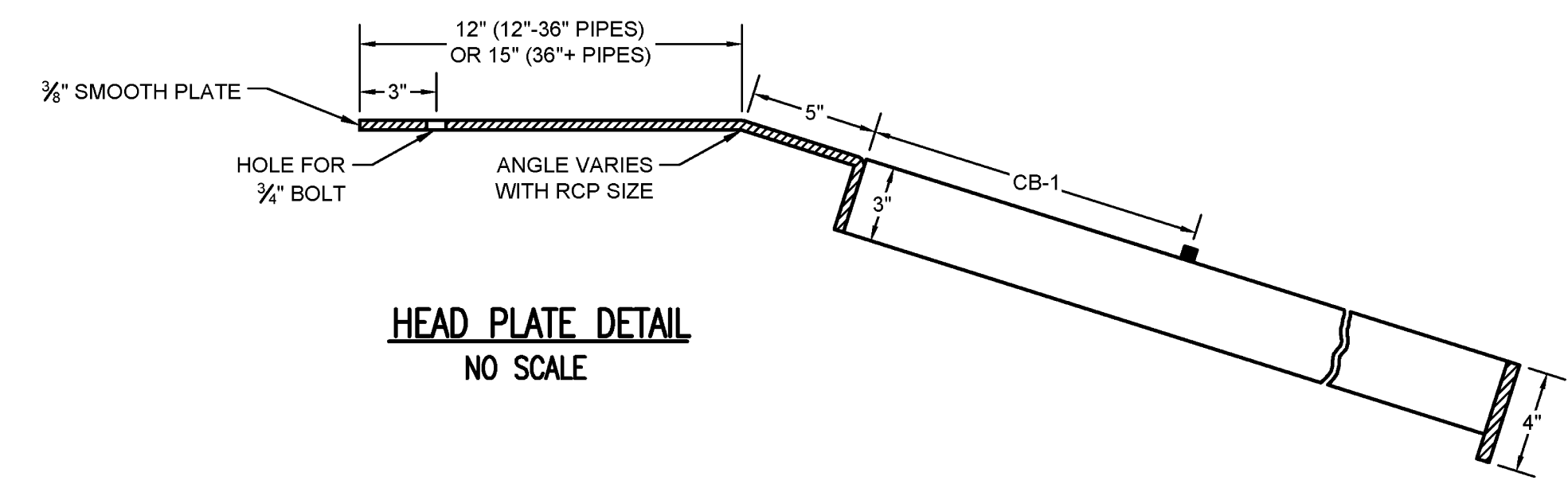
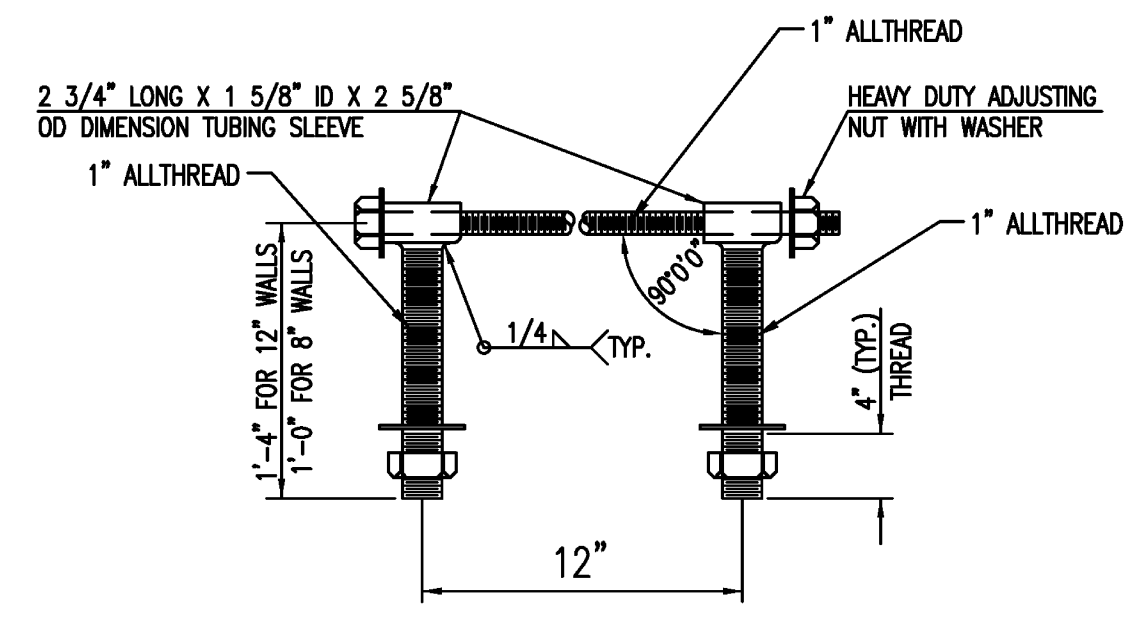


**END GRATE DETAIL**  
NO SCALE  
NOTE: GRATE TO BE USED AS DIRECTED BY THE CITY OF WICHITA.

GRATE DIMENSIONS													
PIPE SIZE	HEAD PLATE	A	B	C	D	E	F	CB-1	CB-2	CB-3	CB-4	SP-1	SP-2
12"	13"	19 1/4"	19 3/8"	-	-	-	27"	10 3/8"	-	-	-	3 @ 4"	3 @ 6"
15"	13"	23 1/2"	25 1/8"	-	-	-	34"	10 3/4"	-	-	-	3 @ 4"	3 @ 8"
18"	13"	25"	26 3/8"	-	-	-	40"	12 7/8"	-	-	-	3 @ 4"	3 @ 9"
24"	17"	41 1/2"	42 1/2"	43 1/2"	-	-	53"	12"	15"	-	-	4 @ 4"	4 @ 9"
30"	19"	51 1/2"	52 1/2"	53 1/2"	-	-	65"	16 1/4"	11 3/4"	12"	-	2 @ 3" + 3 @ 4"	5 @ 9"
36"	21"	60 1/2"	61 1/2"	62 1/2"	-	-	78"	18 5/8"	14 1/4"	16"	-	2 @ 2" + 4 @ 4"	6 @ 9"
42"	22"	65 1/2"	66 1/2"	67 3/8"	68 3/4"	-	86"	13 3/8"	12 5/8"	13"	11 3/4"	7 @ 3"	7 @ 9"
48"	25"	70 7/8"	71"	71 3/4"	73"	74 1/2"	90"	16 1/4"	14 3/4"	14 3/4"	14 3/4"	8 @ 3"	8 @ 9"
54"	26"	71 3/4"	73"	74 1/2"	74 3/4"	76 3/4"	96"	6 7/8"	20 7/8"	17 7/8"	15 5/8"	4 @ 2 3/4" + 5 @ 3"	9 @ 9"
60"	28"	61 1/8"	61 3/4"	62 3/4"	64 1/2"	66 5/8"	102"	12"	12"	11 1/2"	13"	2 @ 2" + 8 @ 3"	10 @ 9"

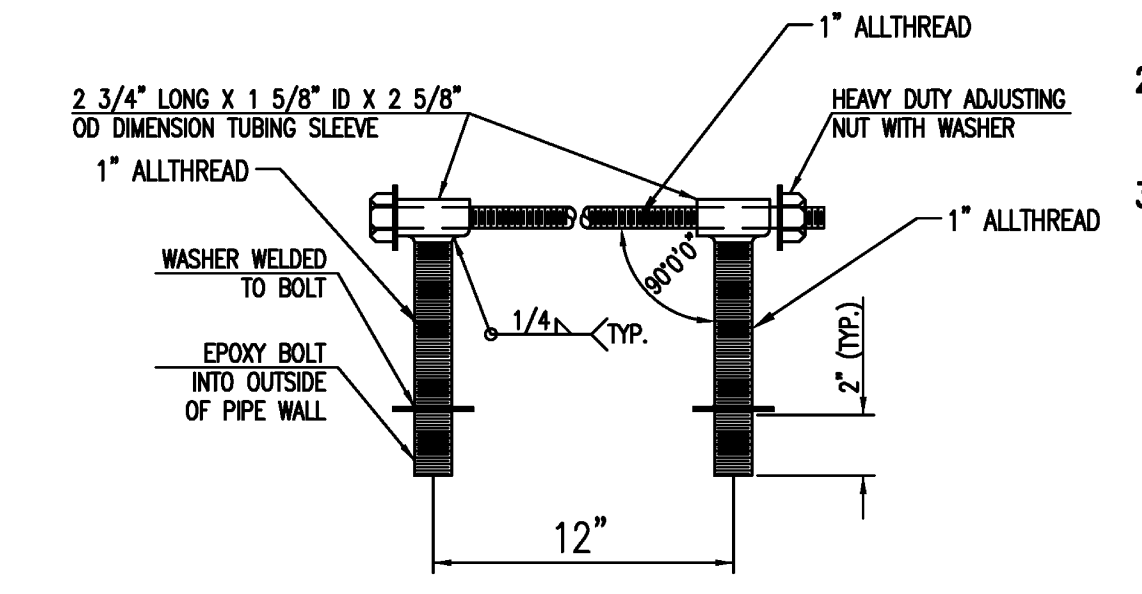


**HEAD PLATE DETAIL**  
NO SCALE



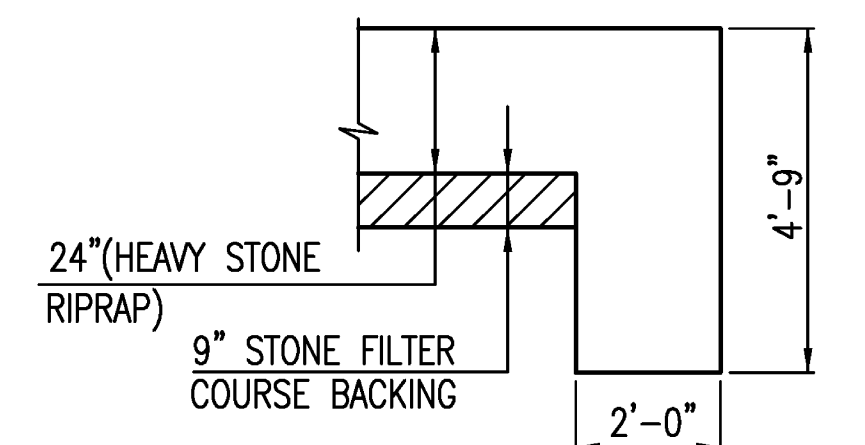
**HEAVY DUTY (H.D.) COUPLER (>=36")**  
NO SCALE

- NOTES
1. BOLTS TO BE A-36 1 1/2" DIAMETER.
  2. BOLTS, NUTS, WASHERS AND SLEEVES TO BE ZINC PLATED.
  3. WASHERS TO BE 3 1/2" O.D. X 7 GAUGE.
  4. SHIP WITH NUTS AND WASHERS PLACED ON BOLTS.



**HEAVY DUTY (H.D.) COUPLER (<=30")**  
NO SCALE

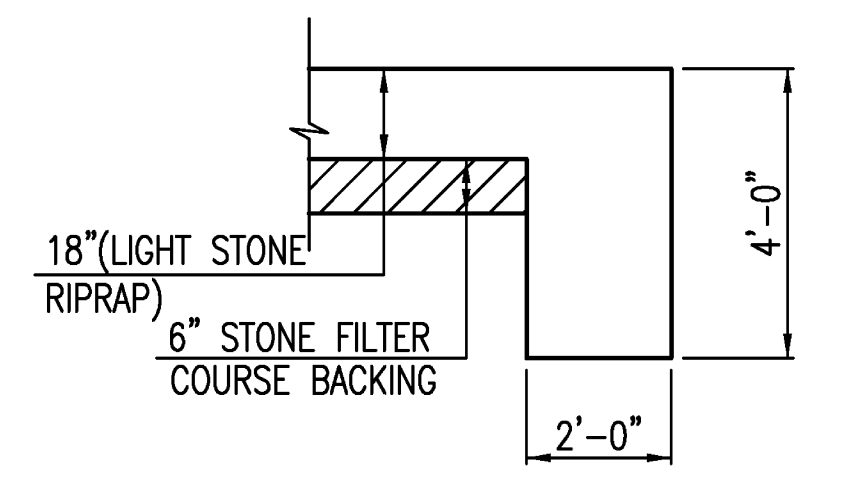
- NOTES
1. BOLTS TO BE A-36 1 1/2" DIAMETER.
  2. BOLTS, NUTS, WASHERS AND SLEEVES TO BE ZINC PLATED.
  3. WASHERS TO BE 3 1/2" O.D. X 7 GAUGE.
  4. SHIP WITH NUTS AND WASHERS PLACED ON BOLTS.



**TYPICAL SECTION THRU TOEWALL**  
NO SCALE

- NOTES
1. ALL RIPRAP FOR THIS PROJECT SHALL BE NATURAL STONE. NEITHER BROKEN CONCRETE, FABRIC ENVELOPE, NOR PREMIXED DRY PACKAGED CONCRETE BAG ALTERNATES WILL BE ALLOWED, UNLESS INDICATED OTHERWISE.
  2. TOEWALLS SHALL BE INSTALLED ALONG ALL UNPROTECTED EDGES OF STONE RIPRAP.
  3. GROUTING OF THE SURFACE OF THE RIPRAP SHALL NOT BE PERFORMED, UNLESS INDICATED OTHERWISE. GROUTING OF THE TOEWALLS SHALL BE PERFORMED PER CITY SPECIFICATIONS.

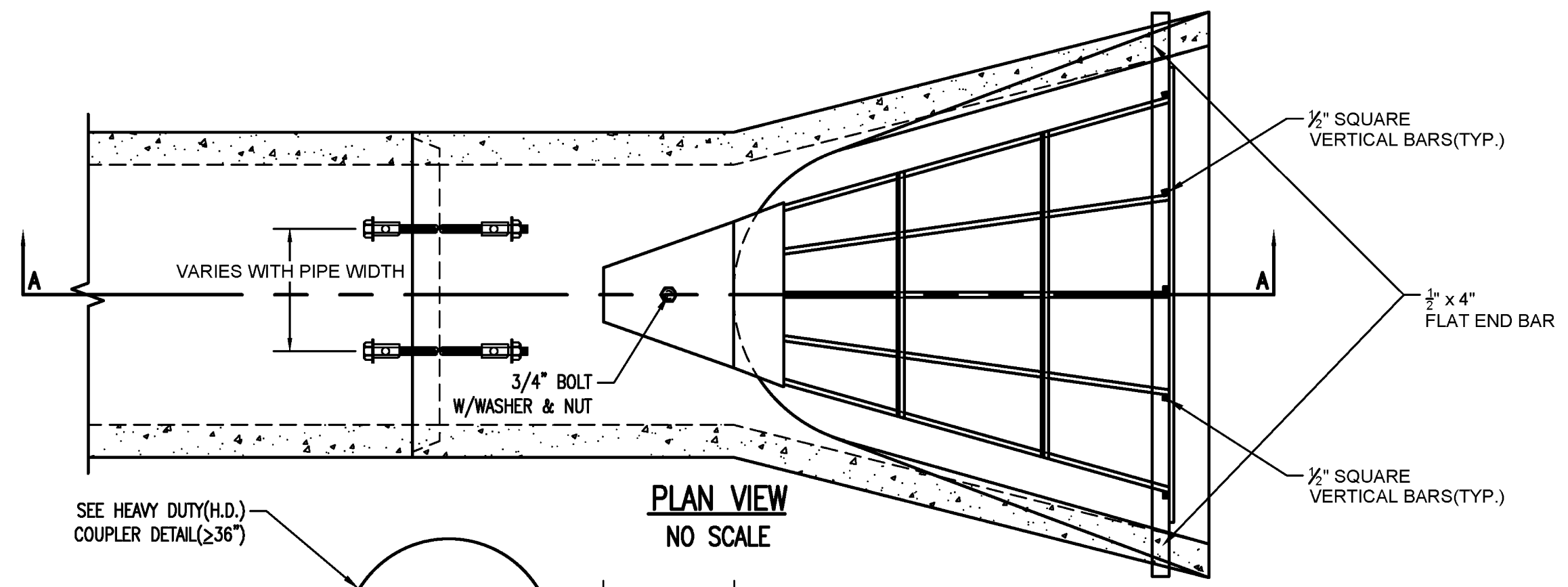
**HEAVY STONE RIPRAP DETAILS**



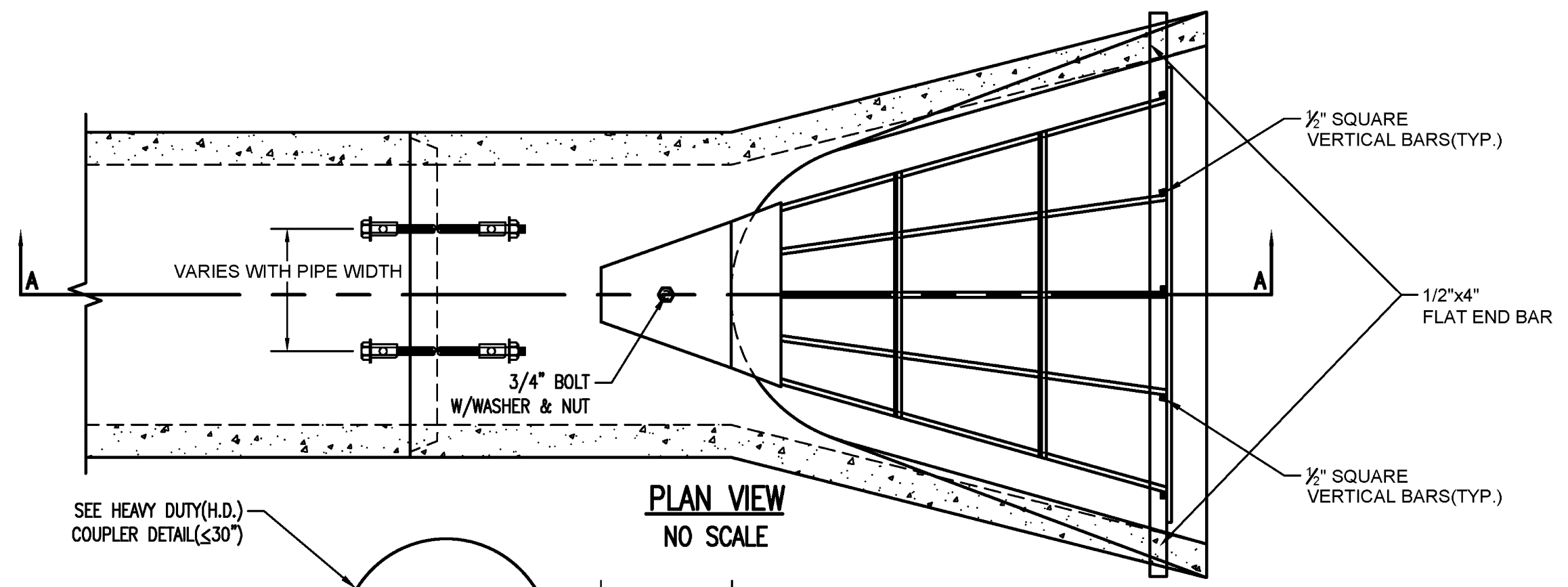
**TYPICAL SECTION THRU TOEWALL**  
NO SCALE

- NOTES
1. ALL RIPRAP FOR THIS PROJECT SHALL BE NATURAL STONE. NEITHER BROKEN CONCRETE, FABRIC ENVELOPE, NOR PREMIXED DRY PACKAGED CONCRETE BAG ALTERNATES WILL BE ALLOWED, UNLESS INDICATED OTHERWISE.
  2. TOEWALLS SHALL BE INSTALLED ALONG ALL UNPROTECTED EDGES OF STONE RIPRAP.
  3. GROUTING OF THE SURFACE OF THE RIPRAP SHALL NOT BE PERFORMED, UNLESS INDICATED OTHERWISE. GROUTING OF THE TOEWALLS SHALL BE PERFORMED PER CITY SPECIFICATIONS.

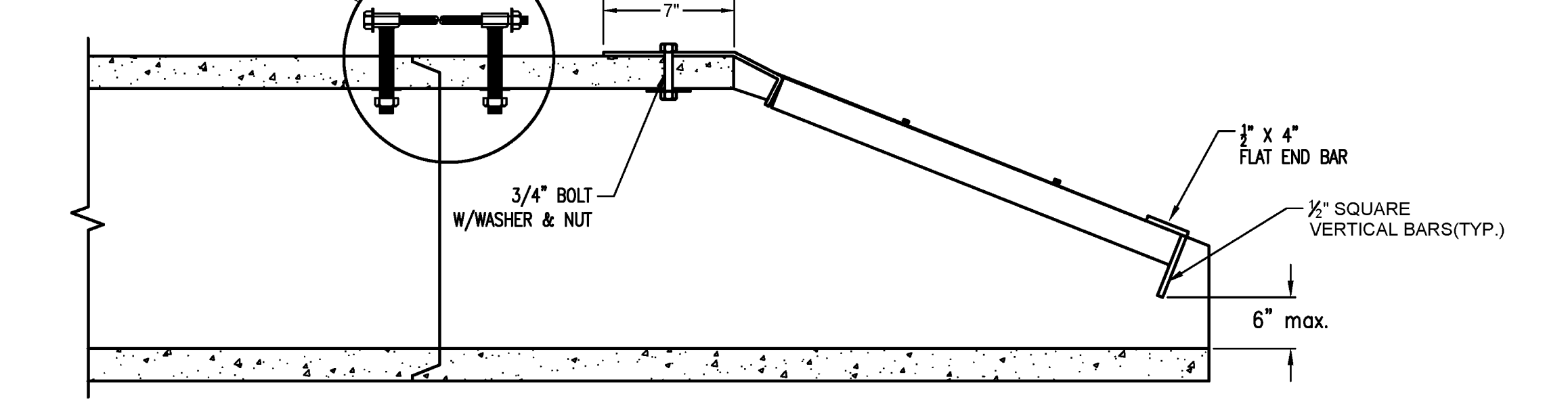
**LIGHT STONE RIPRAP DETAILS**



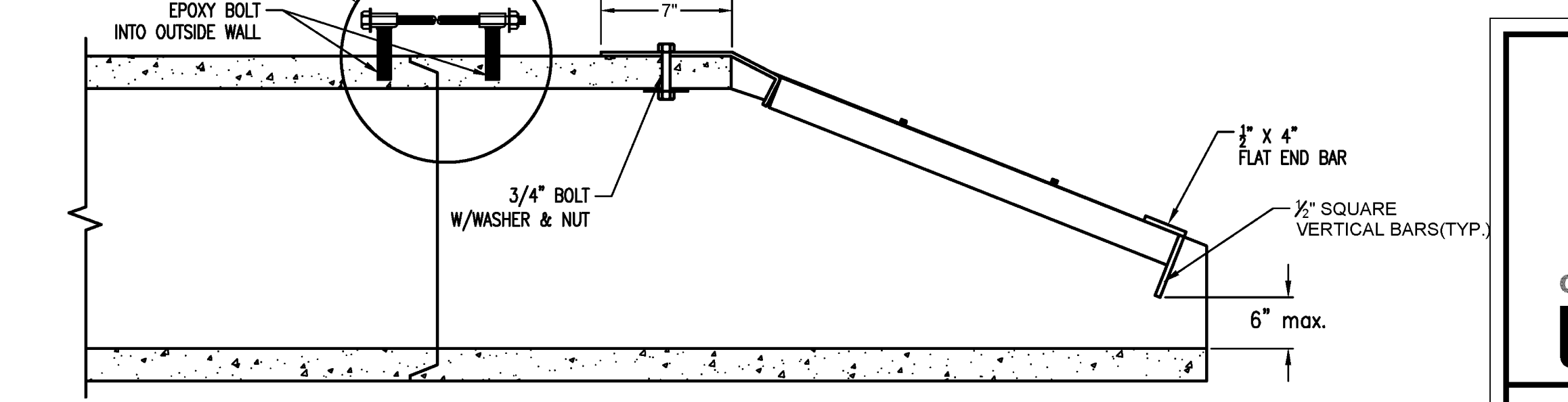
**PLAN VIEW**  
NO SCALE



**PLAN VIEW**  
NO SCALE



**SECTION A-A**



**SECTION A-A**

Sheet 01-10-2015 8:12:38 AM by CERRANTES  
 Plot Scale 1:1 01-10-2015 8:12:58 AM by CARLOS CERRANTES  
 S:\Drawing Files\Project 03\12-7-09\City Details-Sturmwater(20112002)\COW Std Details - Base(1,23,15)



**END SECTION, PIPE RESTRAINT COUPLER & END GRATE**

CITY ENGINEER  
**GARY JANZEN, P.E.**

PROJECT NUMBER 472-85104	OCA NUMBER 766369	DATE 01/2015
CITY ENGINEER'S OFFICE CITY HALL - SEVENTH FLOOR 455 NORTH MAIN STREET WICHITA, KANSAS 67202-1620 (316) 268-4501		
DESIGN	DRAWN	SHEET
		10 OF 24