

APPROVED NOVEMBER 1, 2000

*Delbert W. Godes*  
STATE DESIGN ENGINEER

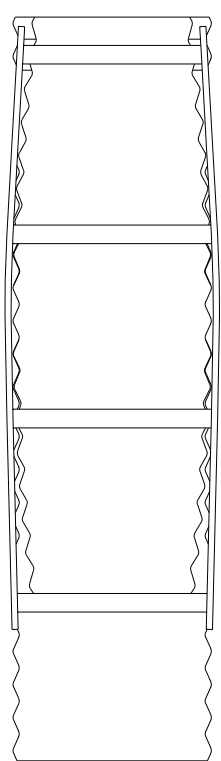
STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**METAL SAFETY APRON & GRATE**  
FOR USE ON APPROPRIATE CULVERT ENDS  
WITHIN REQUIRED CLEAR ZONE

SPECIFICATION  
REFERENCE  
2501  
REVISED  
3-12-2003

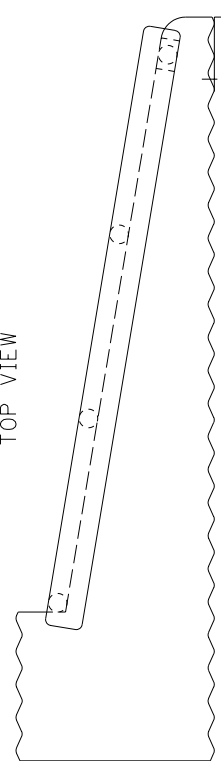
STANDARD  
PLATE  
NO.  
3128H  
1 OF 2

PIPE SIZE AND TYPE	GAGE	NUMBER OF LONGITUDINAL BARS	NUMBER OF CROSS BARS	"L" LENGTH OF GRATE	NO. OF PIECES TO GRATE (1)	TOTAL WEIGHT OF PIECES (APPROX.)	"M" LENGTH OF PIPE
18" ROUND	12	0	5	5'7"	1	75 LBS.	6'9"
21" ROUND	12	1	6	7'1"	2	145 LBS.	7'6"
24" ROUND	12	1	6	8'7"	2	165 LBS.	9'3"
30" ROUND	10	1	8	11'8"	4	245 LBS.	12'9"
36" ROUND	10	1	10	14'8"	5	325 LBS.	15'3"
21" CMP-A	12	1	4	4'1"	1	85 LBS.	5'0"
24" CMP-A	12	1	5	5'7"	2	120 LBS.	6'9"
28" CMP-A	12	1	6	6'7"	2	155 LBS.	7'3"
35" CMP-A	10	1	6	8'7"	3	195 LBS.	9'3"

(1) EACH SECTION SHOULD BE OF EQUAL LENGTH FOR SPLIT GRATE WHEN POSSIBLE.  
(2) SPAN DIMENSIONS.

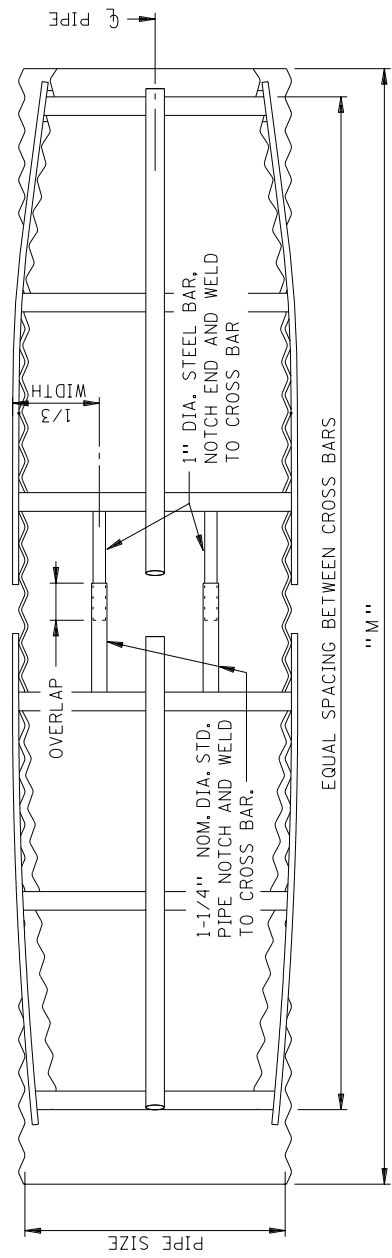


TOP VIEW

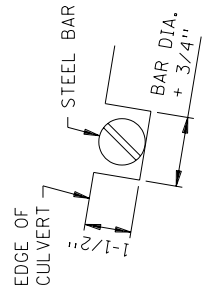


SIDE VIEW

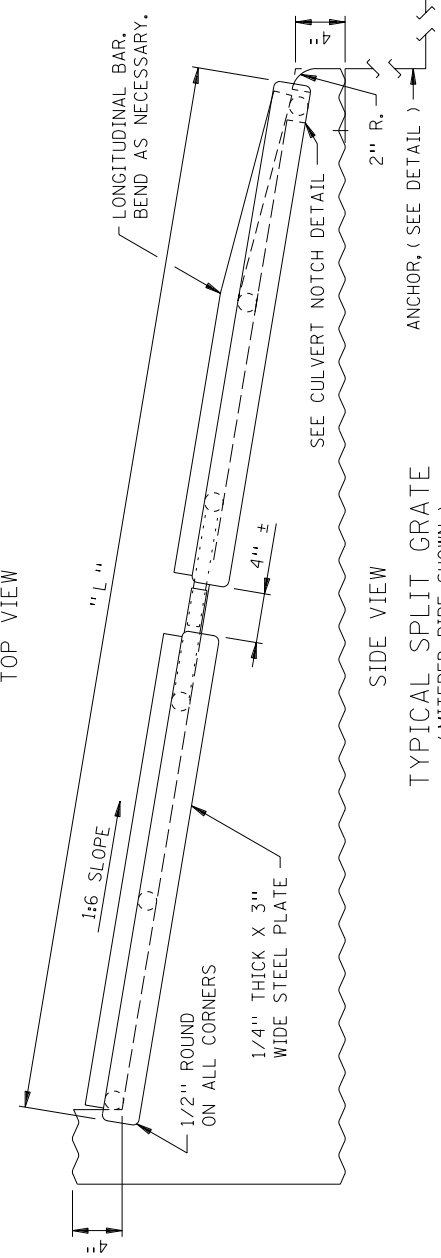
TYPICAL SINGLE PIECE GRATE



TOP VIEW



CULVERT NOTCH DETAIL



SIDE VIEW

TYPICAL SPLIT GRATE  
(MITERED PIPE SHOWN)

**NOTES:**  
GALVANIZE PER SPEC. 3394 AFTER FABRICATION.  
SAFETY APRON SHALL BE CONSTRUCTED OF STRUCTURAL STEEL PER SPEC. 3306.  
ALL CROSS BARS SHALL BE WELDED ALL AROUND TO STEEL PLATE FRAME.  
THE APRON SHALL BE FASTENED TO THE CULVERT WITH A STANDARD COUPLING BAND. SEE STANDARD PLATE 3221. SEE SHEET 2 OF 2 FOR CONNECTION TO CONCRETE CULVERTS.  
ALL CROSS BARS AND CENTER LONGITUDINAL BARS SHALL BE 1-1/2" DIAMETER.  
NO GRATE OF ANY KIND IS ALLOWED ON AN OUTLET WITHOUT A GRATE BEING PLACED ON THE INLET ALSO.

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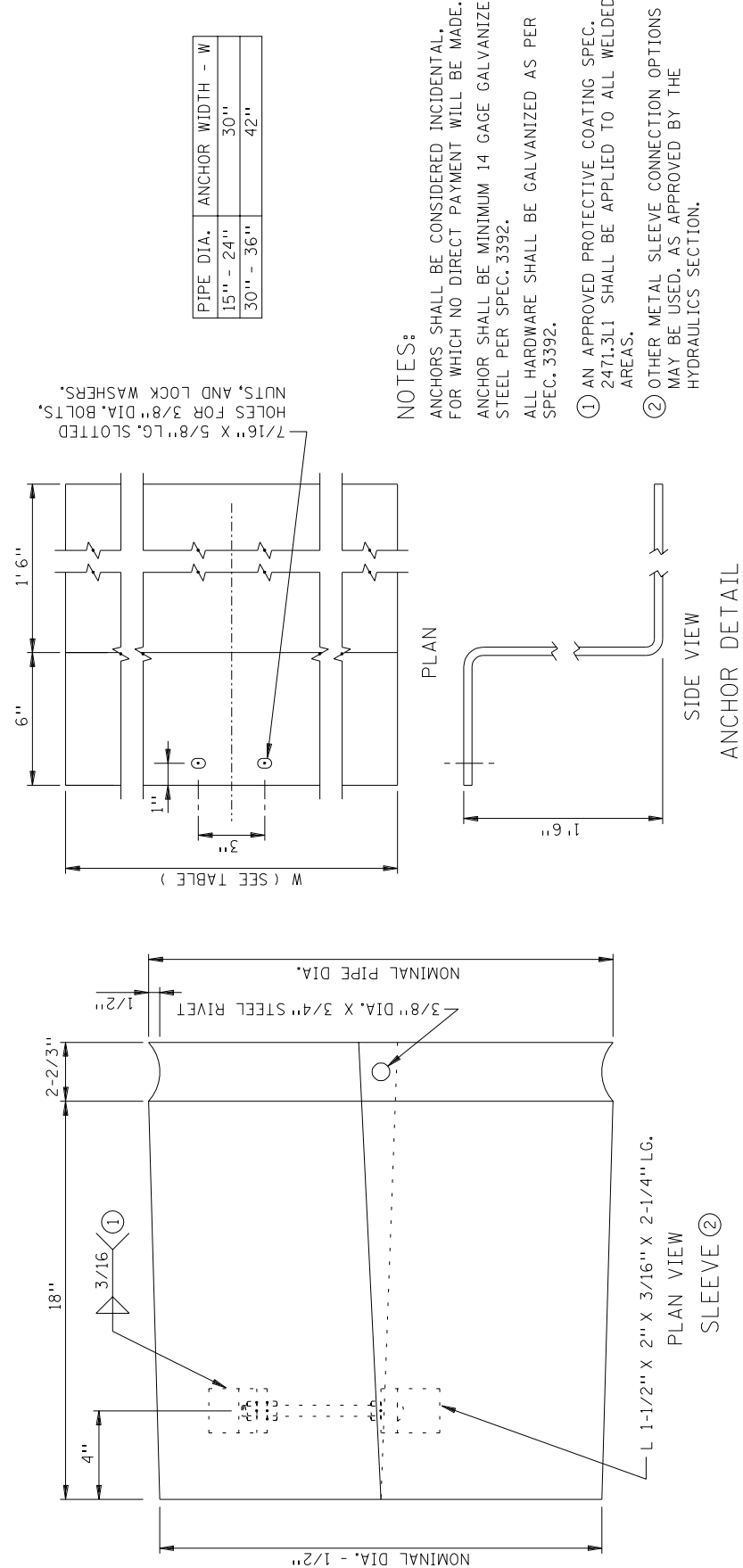
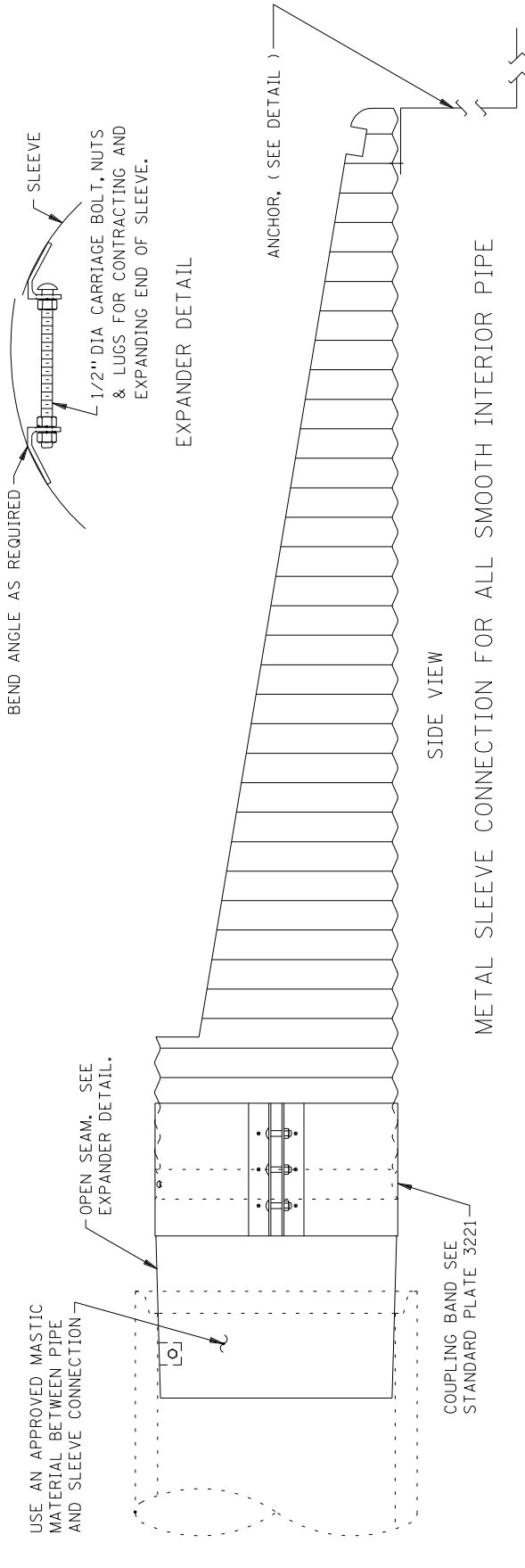
METAL SAFETY APRON & GRATE  
( METAL APRON CONNECTIONS )

SPECIFICATION  
REFERENCE

2501

STANDARD  
PLATE  
NO.

3128H  
2 OF 2



PIPE DIA.	ANCHOR WIDTH - W
15" - 24"	30"
30" - 36"	42"

NOTES:  
 ANCHORS SHALL BE CONSIDERED INCIDENTAL, FOR WHICH NO DIRECT PAYMENT WILL BE MADE.  
 ANCHOR SHALL BE MINIMUM 14 GAGE GALVANIZED STEEL PER SPEC. 3392.  
 ALL HARDWARE SHALL BE GALVANIZED AS PER SPEC. 3392.  
 ① AN APPROVED PROTECTIVE COATING SPEC. 2471.3L1 SHALL BE APPLIED TO ALL WELDED AREAS.  
 ② OTHER METAL SLEEVE CONNECTION OPTIONS MAY BE USED, AS APPROVED BY THE HYDRAULICS SECTION.