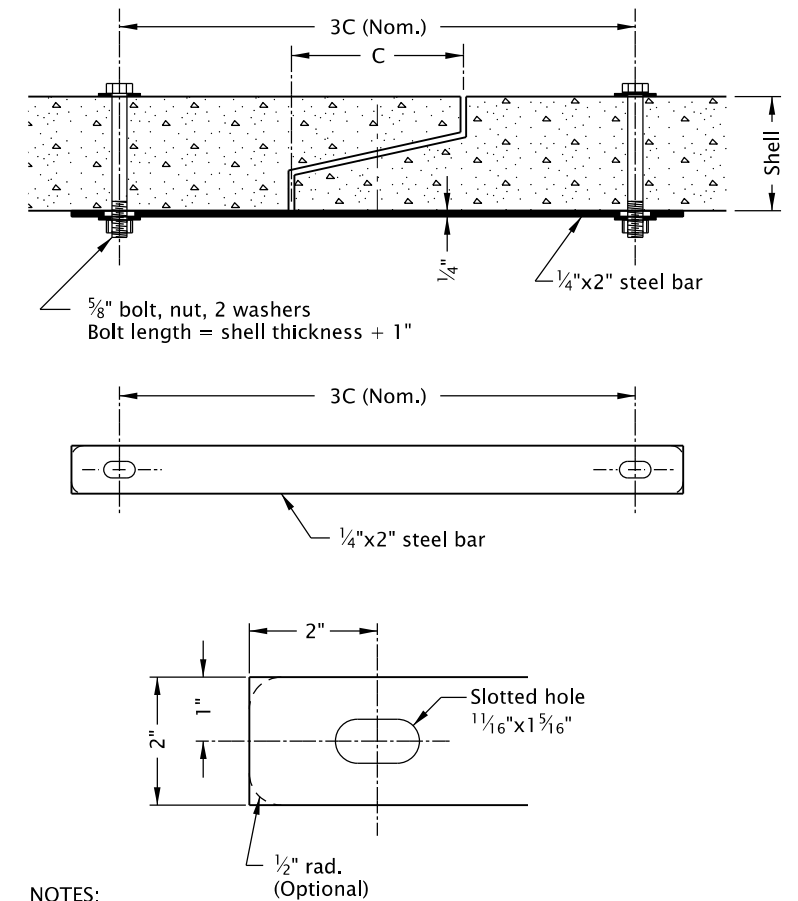




NOTES: (Optional)

1. All bolts, nuts and washers to be galvanized.
2. Tie bar to be galvanized after fabrication.
3. "C" is tongue length.
4. Install 2 tie bars at each joint (See end view, Case 2 & 3).

TIE BAR DETAIL

GENERAL NOTES FOR ALL DETAILS ON THIS SHEET:

1. For dimensions indicated by letter, see Table A.
2. Open ends of pipes normally require a site specific design, and may require special treatment (Slope ends, culvert embankment protection, paved end slopes, safety end sections, or other measures).
See special details or Standard Drawings as called for on plans.
3. See Std. Dwg. RD317 for culvert embankment protection and riprap pads (When reqd.).

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without first consulting a Registered Professional Engineer.

All materials shall be in accordance with the current Oregon Standard Specifications.

SLOPED ENDS FOR CONCRETE PIPE

2024

DATE	REVISION DESCRIPTION

CALC.
BOOK NO. - _-_- N/A _-_-
SDR DATE - 15-JAN-2016 -
RD318

Effective Date: June 1, 2026 – November 30, 2026

NOTE:
Sloped ends shall be made from minimum Class III concrete pipe.
"X" Values shown are for vertical dimension at bottom of sloped end = 0.

TABLE A

SIZE (Diameter)	SLOPE																				SIZE (Diameter)
	1:1.5			1:2			1:2.5			1:3			1:4				1:6				
	X	CASE 1	CASE 2	X	CASE 1	CASE 2	X	CASE 1	CASE 2	X	CASE 1	CASE 2	X	CASE 1	CASE 2	CASE 3	X	CASE 1	CASE 2	CASE 3	
		L (Min.)	L (Min.)		L (Min.)	L (Min.)		L (Min.)	L (Min.)		L (Min.)	L (Min.)		L (Min.)	L (Min.)						
DIMENSION IN INCHES																					
12	18	36	36	24	36	36	30	48	36	36	72	36	48	72	36		72	90	48		12
15	22.5	36	36	30	48	36	37.5	72	36	45	72	36	60	72	36		90		72		15
18	27	48	36	36	48	36	45	72	36	54	72	36	72	90	48		108		72		18
21	31.5	48	36	42	72	36	52.5	72	36	63	90	48	84		72		126		90		21
24	36	48	36	48	72	36	60	90	48	72	90	48	96		72		144		90		24
27	40.5	72	36	54	72	36	67.5	90	48	81		72	108		72		162			72	27
30	45	72	36	60	90	48	75		48	90		72	120		90		180			72	30
33	49.5	72	36	66	90	48	82.5		72	99		72	132		90		198			90	33
36	54	72	36	72	90	48	90		72	108		72	144		90		216			90	36
42	63	90	48	84		72	105		72	126		90	168			72	252			90	42
48	72	90	48	96		72	120		90	144		90	192			90	288				48
54	81		72	108		72	135		90				216			90	324				54