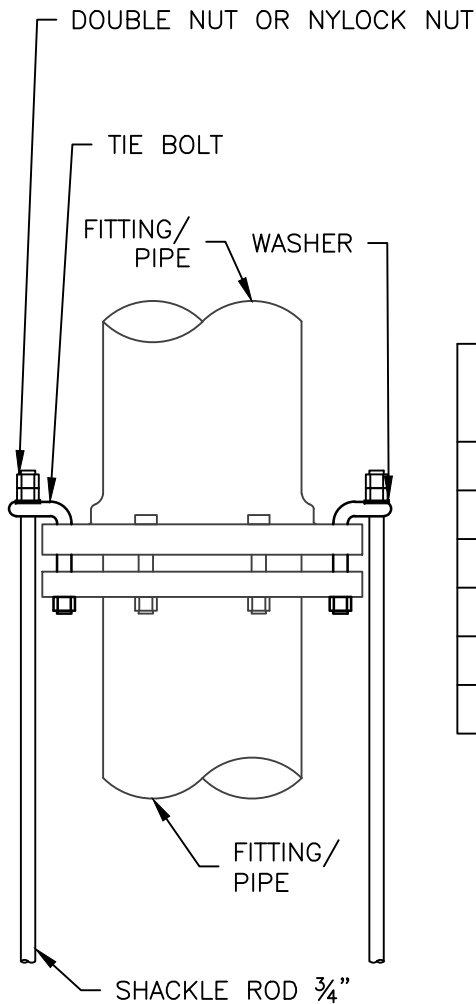


NOTES:

1. SHACKLE RODS SHALL BE "ALL THREAD" ROD OF EITHER ASTM A242 (COR-TEN) OR 304 STAINLESS STEEL. MILD STEEL WILL NOT BE ALLOWED. ASTM A307 GRADE A OR B ROD IS ALLOWED, BUT MUST BE FIELD COATED AFTER ASSEMBLY WITH EPOXY, COAL-TAR OR RUBBER.
2. SHACKLE RODS SHALL HAVE "NATIONAL-COARSE" THREAD WITH EITHER TWO NUTS OR ONE SELF-LOCKING NUT AT EACH END.
3. NUMBER OF SHACKLE RODS PER JOINT SHALL BE IN ACCORDANCE WITH SHACKLE ROD SELECTION TABLES UNLESS OTHERWISE SHOWN ON APPROVED DESIGN PLANS. NUMBER OF SHACKLE RODS REQUIRED MAY BE A RESULT OF THE FIELD STRENGTH OF EYE BOLTS RATHER THAN THE TIE RODS.
4. SHACKLE RODS SHALL BE ASSEMBLED SYMMETRICALLY ABOUT EACH JOINT. IF AN EVEN NUMBER OF RODS ARE USED THEN EACH ROD SHALL HAVE A ROD LOCATED ON THE DIRECT OPPOSITE SIDE OF JOINT. IF AN ODD OR UNEVEN NUMBER OF RODS TO BOLTS ARE USED THEN AN EQUAL NUMBER OF UNSHACKLED BOLT HOLES SHALL BE LEFT BETWEEN ANY TWO SHACKLE RODS TO THE MAXIMUM EXTENT POSSIBLE.
5. SHACKLE ROD NUTS SHALL BE TIGHTENED UNIFORMLY AT EACH JOINT.
6. SHACKLE RODS SHALL NOT EXCEED 30- FEET IN LENGTH UNLESS OTHERWISE APPROVED BY THE CITY.
7. SHACKLE RODS SHALL BE ATTACHED TO JOINTS WITH EYE BOLTS, "DUC-LUGS" ARE NOT ALLOWED.



NUMBER OF 3/4" DIAMETER SHACKLE RODS PER JOINT (250 PSI TEST PRESSURE)

PIPE DIAMETER	# OF BOLT HOLES	DEAD END VALVE 90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	4	2	2	2	2
6	6	2	2	2	2
8	6	4	3	2	2
10	8	6	4	2	2
12	8	6	6	4	2
18	12	12	10	6	4

APPROVED

\_\_\_\_\_  
City Engineer

\_\_\_\_\_  
Date

CITY OF BELLINGHAM

SHACKLE ROD DETAIL

DRAWING

WA-868