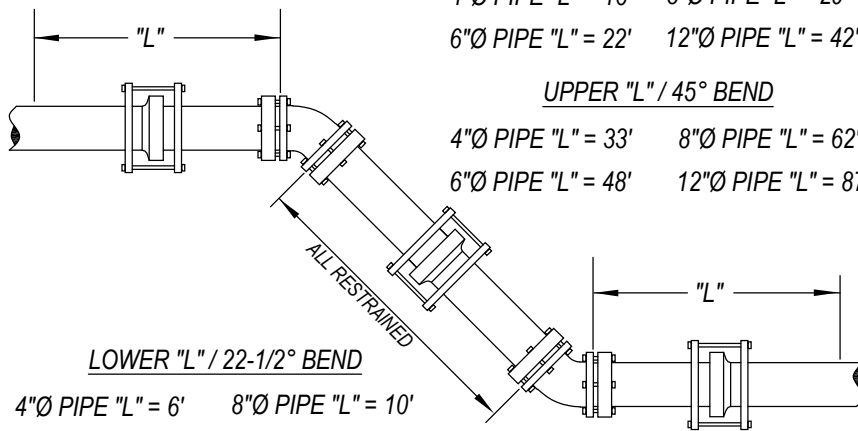


UPPER "L" / 22-1/2° BEND

4"Ø PIPE "L" = 16' 8"Ø PIPE "L" = 29'
 6"Ø PIPE "L" = 22' 12"Ø PIPE "L" = 42'

UPPER "L" / 45° BEND

4"Ø PIPE "L" = 33' 8"Ø PIPE "L" = 62'
 6"Ø PIPE "L" = 48' 12"Ø PIPE "L" = 87'



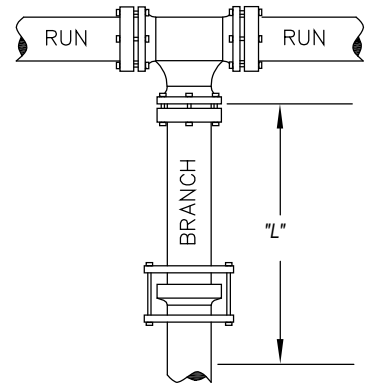
LOWER "L" / 22-1/2° BEND

4"Ø PIPE "L" = 6' 8"Ø PIPE "L" = 10'
 6"Ø PIPE "L" = 8' 12"Ø PIPE "L" = 16'

LOWER "L" / 45° BEND

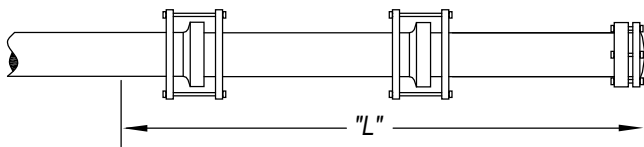
4"Ø PIPE "L" = 13' 8"Ø PIPE "L" = 19'
 6"Ø PIPE "L" = 24' 12"Ø PIPE "L" = 35'

VERTICAL BENDS



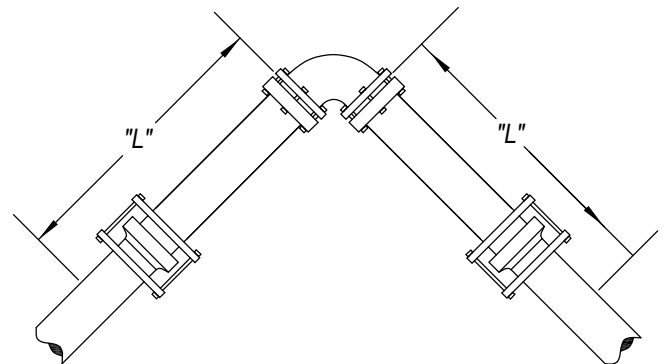
4"Ø PIPE "L" = 41' 8"Ø PIPE "L" = 75'
 6"Ø PIPE "L" = 58' 12"Ø PIPE "L" = 107'

TEE



4"Ø PIPE "L" = 41' 8"Ø PIPE "L" = 75'
 6"Ø PIPE "L" = 58' 12"Ø PIPE "L" = 108'

DEAD END & EACH SIDE OF A VALVE



NOTES:

1. ALL JOINTS WITHIN LENGTH "L" SHALL BE RESTRAINED.
2. ALL FOUR "BRANCHES" ON A CROSS SHALL BE RESTRAINED PER THE TEE BRANCH LENGTH AS SHOWN.
3. LENGTHS SHOWN ASSUMES ALL PIPES ARE INSTALLED AT CITY STANDARD MINIMUM DEPTHS. FOR VERTICAL BENDS, LOW SIDE LENGTH PROVIDED IS FOR A 1' DROP.
4. ASSUMES SAFETY FACTOR OF 1.5 AND TEST PRESSURE OF 150 PSI.
5. ASSUMES BEDDING AND BACKFILL IS PER CITY STANDARD W-13A.
6. RESTRAINT SHOWN IS FOR NEW PIPING, WHEN CONNECTING TO EXISTING PIPING, UTILIZE THE APPROPRIATE CITY STANDARDS FOR PROPER SYSTEM RESTRAINT. FOR RESTRAINT OF THE EXISTING PIPING COORDINATE WITH THE WATER DIVISION ENGINEER, SEE CITY STANDARD W-14A, W-14B, W-15, & W-16B.
7. ALL JOINT RESTRAINTS SHALL BE PER THE ENGINEER'S LIST OF APPROVED ITEMS OR A CITY ACCEPTED SUBMITTAL.
8. WHERE MAIN IS 12"Ø OR LARGER AND AREA WATER PRESSURE IS 90 PSI OR GREATER, CONCRETE THRUST BLOCKING PER APPLICABLE CITY STANDARDS, AND RESTRAINED JOINTS, SHALL BE INSTALLED.

11-1/4° BEND

4"Ø PIPE "L" = 2' 8"Ø PIPE "L" = 3'
 6"Ø PIPE "L" = 3' 12"Ø PIPE "L" = 4'

22-1/2° BEND

4" Ø PIPE "L" = 4' 8" Ø PIPE "L" = 6'
 6" Ø PIPE "L" = 5' 12" Ø PIPE "L" = 9'

45° BEND

4" Ø PIPE "L" = 7' 8" Ø PIPE "L" = 13'
 6" Ø PIPE "L" = 10' 12" Ø PIPE "L" = 17'

90° BEND

4" Ø PIPE "L" = 17' 8" Ø PIPE "L" = 30'
 6" Ø PIPE "L" = 23' 12" Ø PIPE "L" = 42'

HORIZONTAL BENDS

CITY OF NAPA

UTILITIES DEPARTMENT

TITLE
 TYPICAL SYSTEM RESTRAINT LENGTHS

DRAWN BY: DF	CHECKED BY: SL
APPROVAL DATE: 09/2021	APPROVED BY: DD
SCALE: NTS	DRAWING NO.
REVISED DATE: 09/2021	W-14C