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DATE: 02/20/2024
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WATER STANDARD DETAILS
 THRUST RESTRAINTS
 DETAILS 509.05 TO 509.08

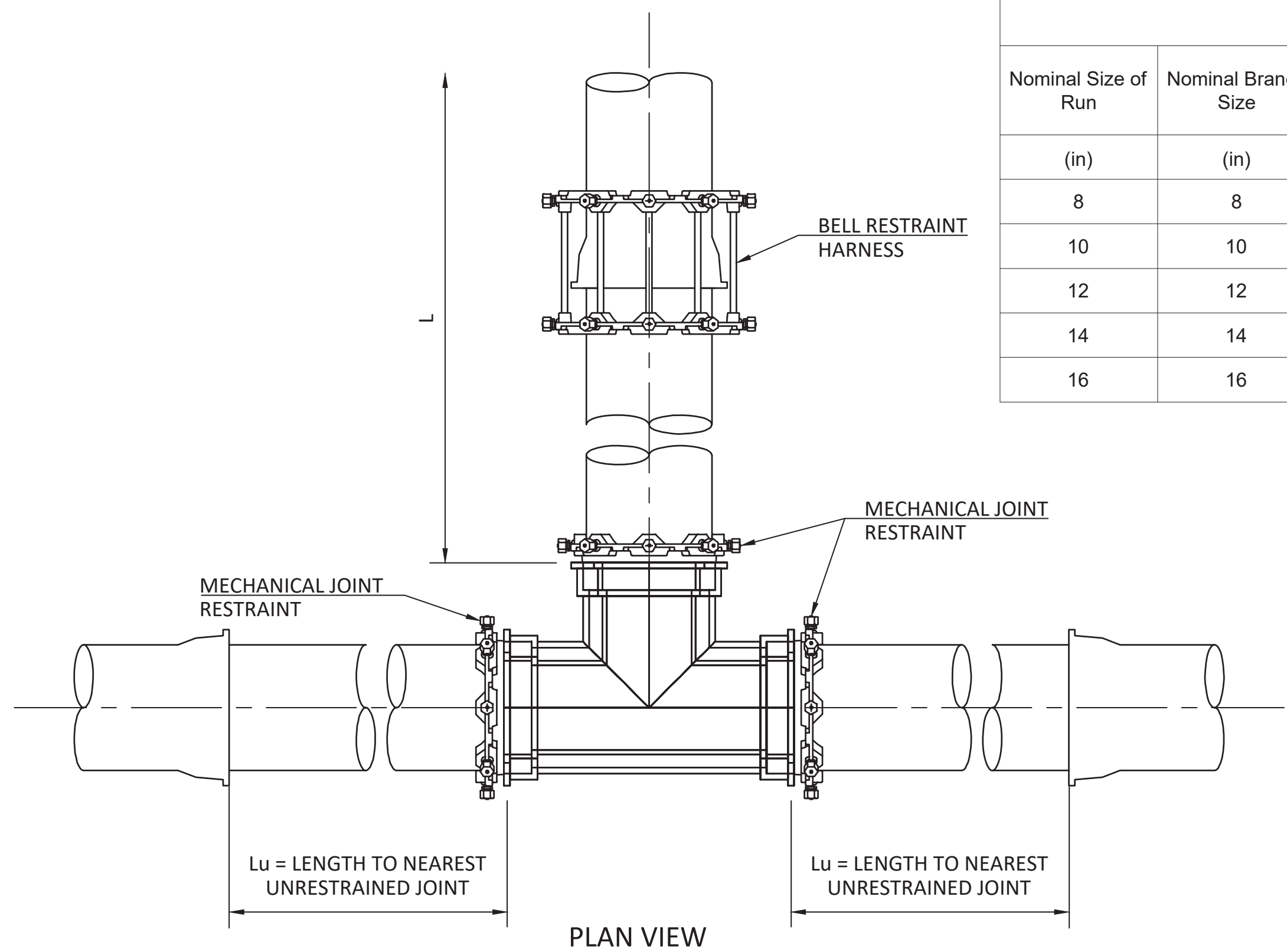
509.B

**STANDARD RESTRAINT LENGTH TABLE
TEES**

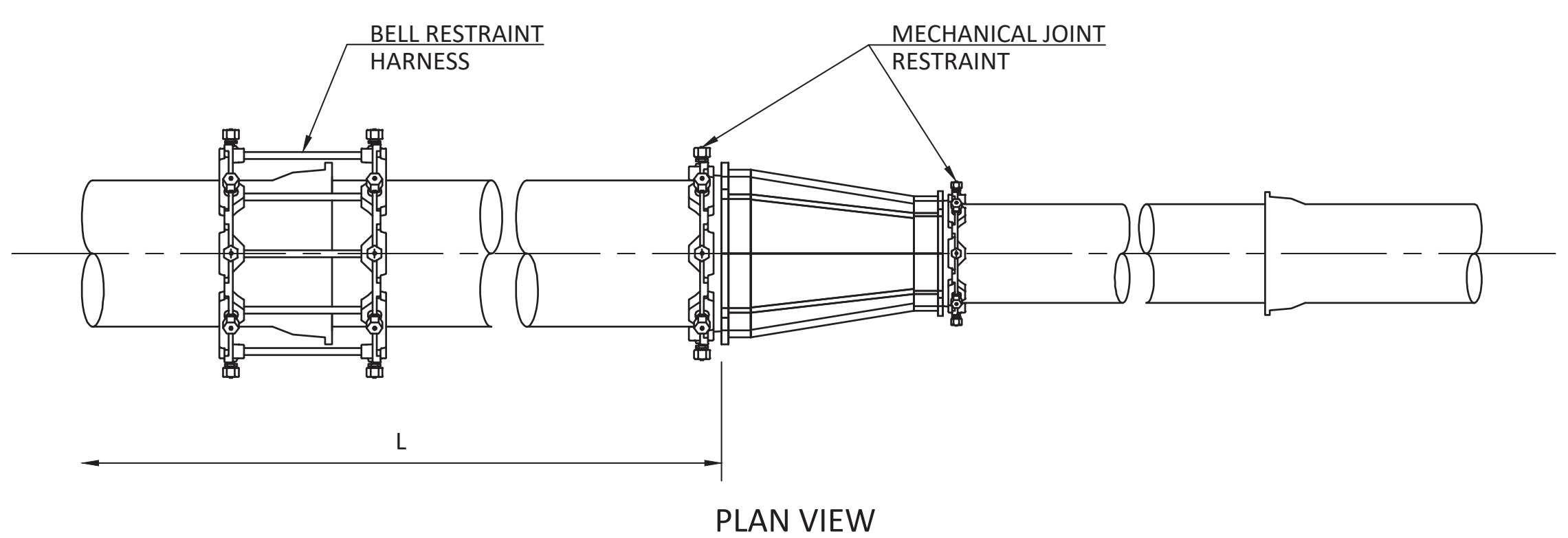
Nominal Size of Run	Nominal Branch Size	Depth of Cover	Restrained Length (DIP) (2)	Restrained Length (PVC) (2)
(in)	(in)	(ft)	(ft)	(ft)
8	8	4	L = 89 - (4.80 * Lu)	L = 97 - (5.21 * Lu)
10	10	4	L = 107 - (4.84 * Lu)	L = 117 - (5.27 * Lu)
12	12	4	L = 126 - (4.88 * Lu)	L = 138 - (5.31 * Lu)
14	14	4	L = 144 - (4.93 * Lu)	L = 161 - (5.33 * Lu)
16	16	4	L = 163 - (4.94 * Lu)	L = 178 - (5.40 * Lu)

**STANDARD RESTRAINT LENGTH TABLE
REDUCERS**

Nominal Pipe Size	Minimum Nominal Size of Reducer	Depth of Cover	Restrained Length (DIP)	Restrained Length (PVC)
(in)	(in)	(ft)	(ft)	(ft)
8	6	4	38	41
10	8	4	36	39
12	8	4	67	73
14	12	4	37	41
16	12	4	69	75



05
509
RESTRAINING TEE BEND
Scale: N.T.S.



06
509
RESTRAINING REDUCER FITTING
Scale: N.T.S.

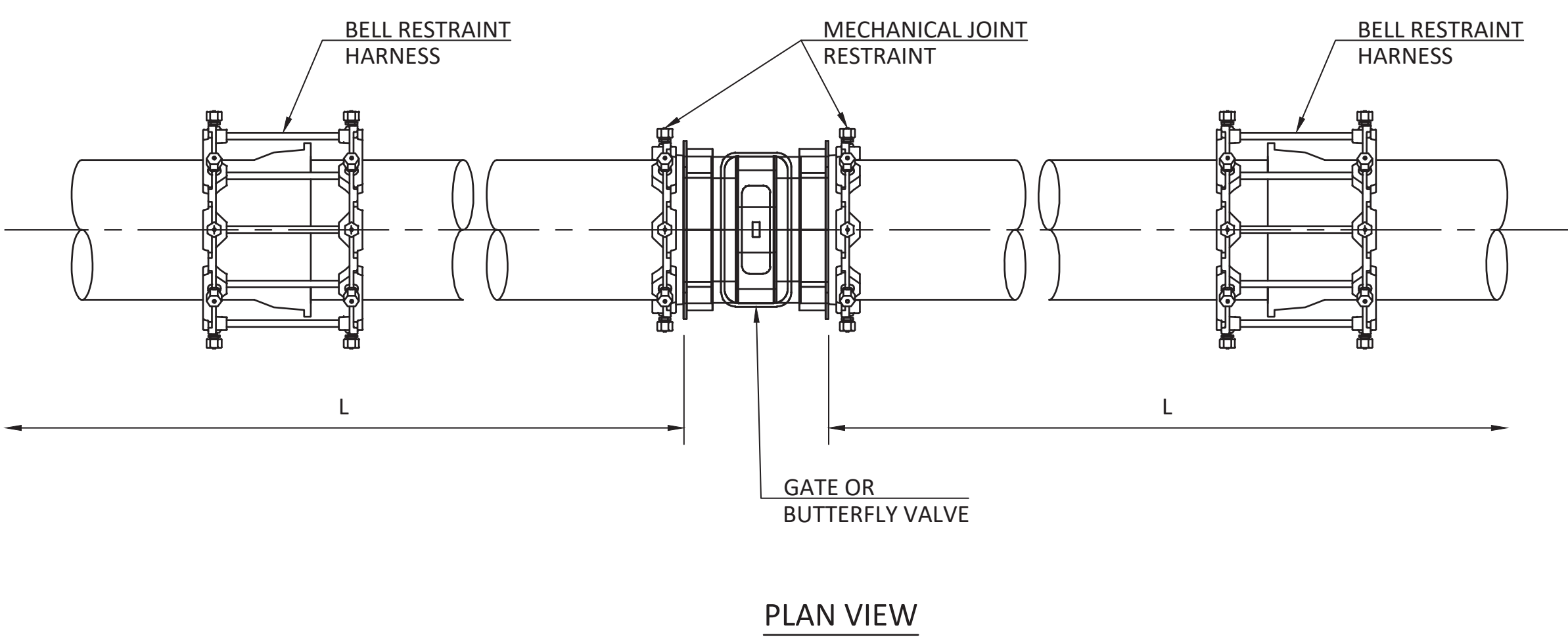
- GENERAL NOTES**
1. CONTRACTOR TO FOLLOW ALL MANUFACTURERS SPECIFICATIONS FOR INSTALLATION OF MECHANICAL JOINT RESTRAINTS AND BELL RESTRAINT HARNESES
 2. IF CALCULATION YIELDS NEGATIVE VALUE, NO RESTRAINED LENGTH IS REQUIRED ALONG THE BRANCH

**STANDARD RESTRAINT LENGTH TABLE
VALVES**

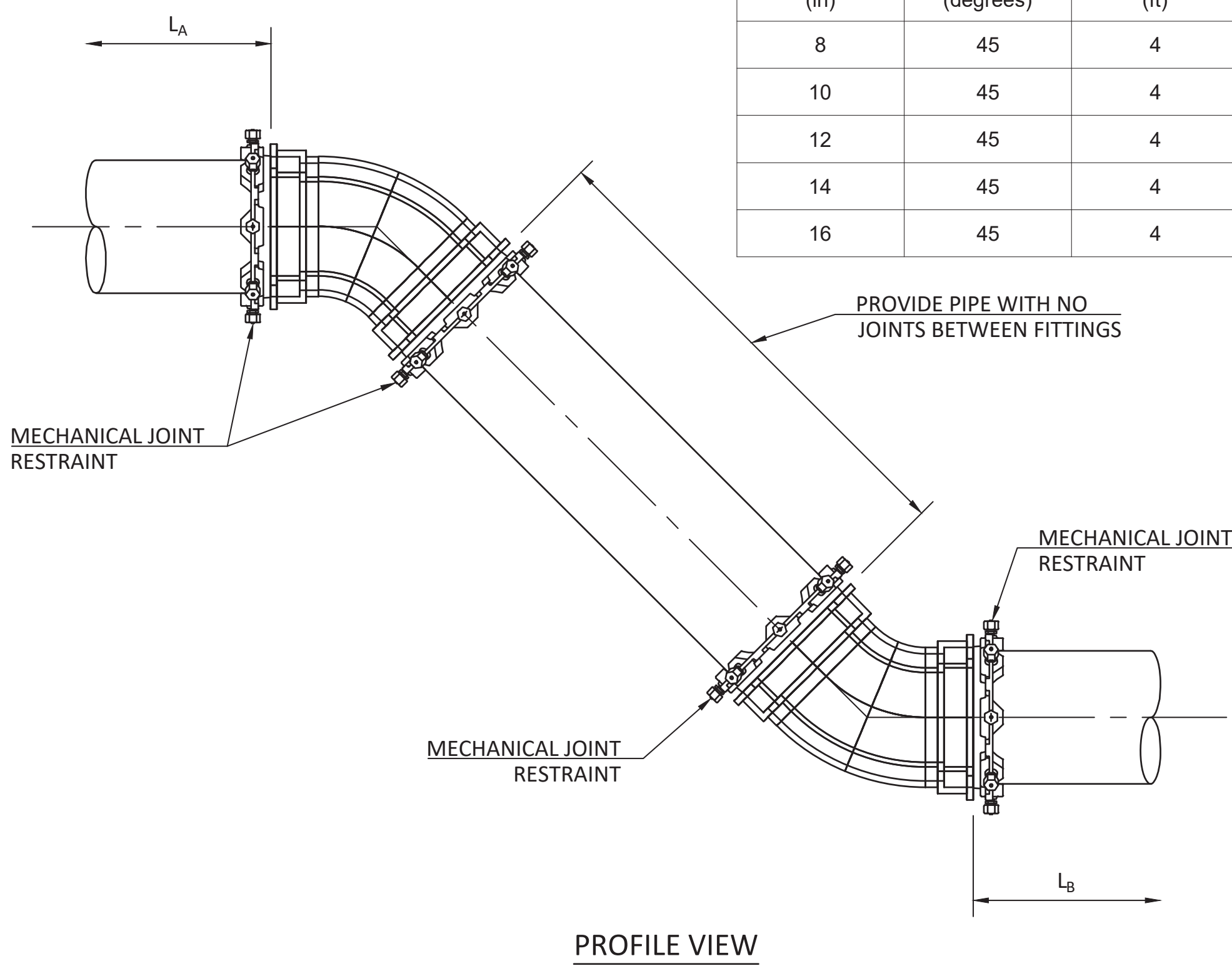
Nominal Pipe Size	Depth of Cover	Restrained Length (DIP)	Restrained Length (PVC)
(in)	(ft)	(ft)	(ft)
8	4	89	97
10	4	107	116
12	4	126	137
14	4	144	160
16	4	162	177

**STANDARD RESTRAINT LENGTH TABLE
VERTICAL OFFSET BENDS**

Nominal Pipe Size	Angle of Bend	Depth of Cover (Upper)	Depth of Cover (Lower)	Restrained Length L _A (Upper) (DIP)	Restrained Length L _B (Lower) (DIP)	Restrained Length L _A (Upper) (PVC)	Restrained Length L _B (Lower) (PVC)
(in)	(degrees)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
8	45	4	8	37	8	40	8
10	45	4	8	45	9	48	10
12	45	4	8	52	11	57	11
14	45	4	8	60	12	67	13
16	45	4	8	67	14	74	14



07
509
RESTRAINING VALVE CONNECTION
Scale: N.T.S.



08
509
RESTRAINING HORIZONTAL OR VERTICAL OFFSET
Scale: N.T.S.