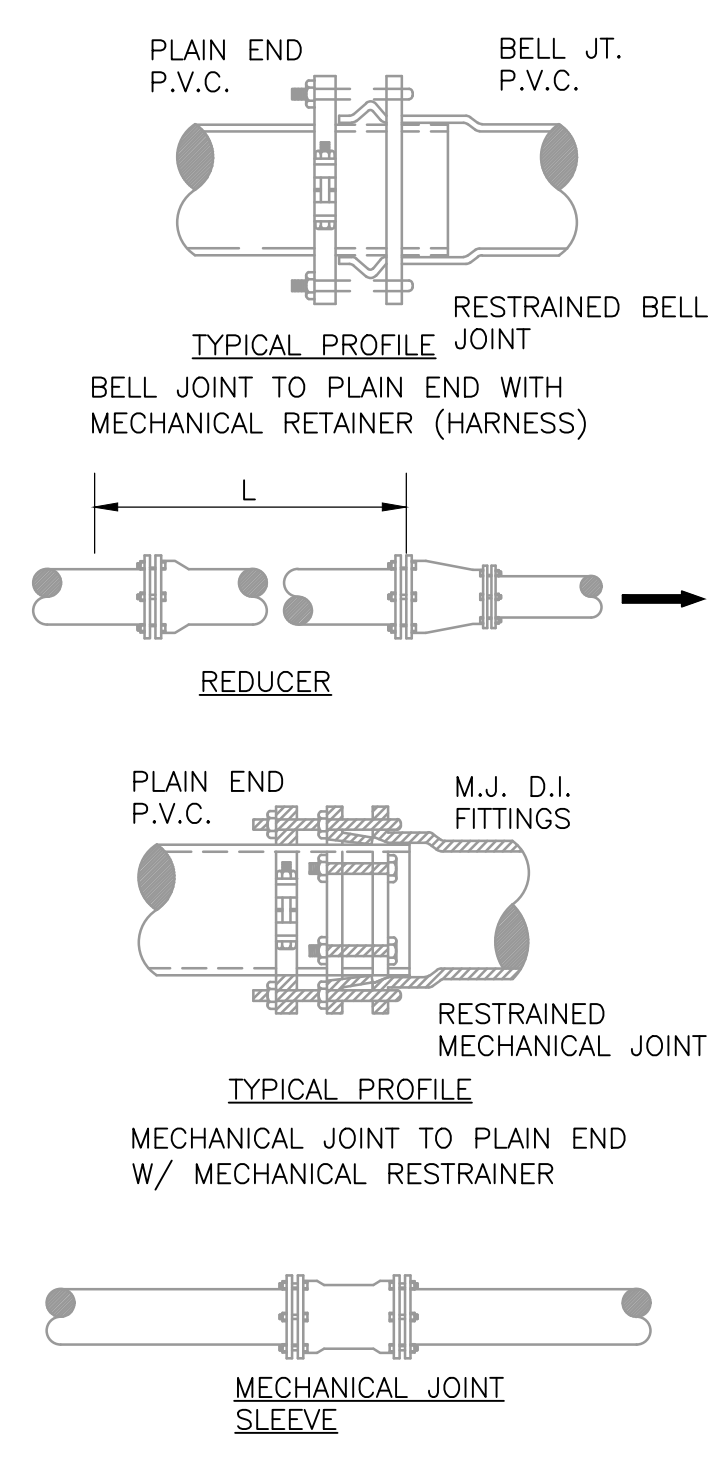
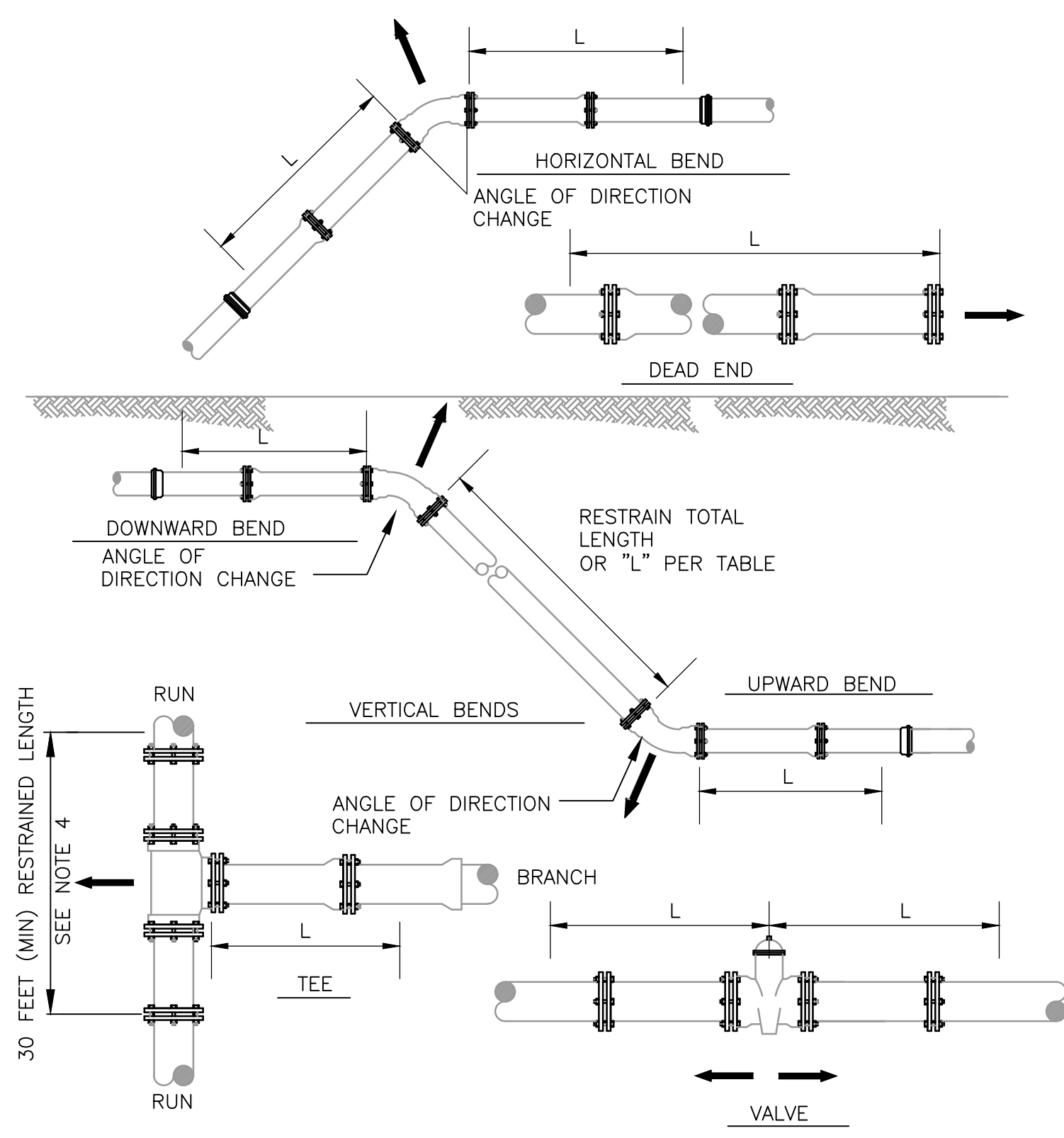


**UTILITY CONSTRUCTION**

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**



**PVC PIPE RESTRAINT NOTES:**

- THIS SCHEDULE SHALL BE UTILIZED ON ALL PVC PIPING.
- ASSUMPTIONS: PVC PIPE, SAFETY FACTOR=1.5, TEST PRESSURE=200 PSI, SOIL = SP, TRENCH TYPE 5, DEPTH OF COVER=36". CALCULATIONS DONE IN ACCORDANCE WITH AWWA M23 AND M41 MANUALS.
- BENDS AND VALVES: SHALL BE RESTRAINED ON EACH SIDE OF FITTING.
- TEES: TOTAL LENGTH BETWEEN FIRST JOINTS OR RESTRAINED LENGTH ON EITHER SIDE OF TEE (RUN) SHALL BE A TOTAL DISTANCE OF 30 FEET (MIN). SEE SCHEDULE FOR RESTRAINT LENGTH ON TEE "BRANCH" LINE.
- CONTRACTOR SHALL USE FULL (20 FT NOMINAL) LENGTH JOINTS OF PVC PIPE INTO AND OUT OF EACH FITTING UNLESS OTHERWISE DIRECTED. WHERE SHORTER JOINTS ARE REQUIRED ON EITHER SIDE OF A FITTING ADDITIONAL JOINT RESTRAINT MAY BE REQUIRED BY USE OF HARNESS ASSEMBLIES.
- FIRST JOINT BEYOND LENGTH SPECIFIED IN SCHEDULE SHALL BE RESTRAINED IN ACCORDANCE WITH THE SPECIFICATIONS. FOR EXAMPLE, IF 23 FEET OF RESTRAINT IS REQUIRED, FITTING AND NEXT TWO PIPE JOINTS SHALL BE RESTRAINED (ASSUMING 20 FOOT NOMINAL LENGTH OF ONE JOINT OF PIPE), FOR A TOTAL RESTRAINED LENGTH OF 40 FEET.
- WHERE NON-STANDARD CIRCUMSTANCES ARISE IN THE FIELD CONSULT THE ENGINEER PRIOR TO INSTALLATION OF RESTRAINT SYSTEMS. FAILURE TO CONSULT THE ENGINEER MAY REQUIRE EXCAVATION AND ADJUSTMENT TO THE RESTRAINED JOINT ASSEMBLIES.
- ALL FITTINGS USED ON 4" AND LARGER PVC PIPING SHALL BE DUCTILE IRON MECHANICAL JOINT FITTINGS.
- FITTINGS SHALL BE RESTRAINED BY USE OF A MECHANICAL JOINT RETAINER GLAND DESIGNED FOR USE WITH PVC PIPING. PIPE JOINTS SHALL BE RESTRAINED BY USE OF HARNESS JOINT ASSEMBLIES DESIGNED FOR USE WITH PVC PIPE.
- THE INSTALLATION OF BELL HARNESS RESTRAINTS AT PVC JOINTS SHALL BE COMPLETED PER THE MANUFACTURERS RECOMMENDATION, WHICH INCLUDES NOT OVER TIGHTENING THE PARALLEL RODS/NUTS. THESE NUTS SHOULD ONLY BE SNUG TIGHT. THE HOME MARKS ON THE PIPE SHOULD ALWAYS BE VISIBLE AFTER THE RESTRAINT IS INSTALLED.
- WHERE ADJACENT OR OFFSET BENDS HAVE OVERLAPPING RESTRAINED LENGTH, ALL PIPE BETWEEN THE BENDS SHALL BE RESTRAINED. RESTRAINED LENGTH FOR THE OUTERMOST BEND(S) SHALL BE TWICE THE STANDARD LENGTH SHOWN IN THIS DETAIL.
- IF FIELD CONDITIONS REQUIRE LESS THAN 3 FEET OF COVER, CONTRACTOR SHALL COORDINATE WITH ENGINEER TO DETERMINE REQUIRED RESTRAINT LENGTH.
- ALL CARRIER PIPE SHALL BE RESTRAINED WITHIN AN ENCASEMENT PIPE. RESTRAINED PIPE WITHIN AN ENCASEMENT PIPE SHALL NOT COUNT TOWARDS THE REQUIRED RESTRAINED LENGTH.

**SUMMARY TABLE - PVC PIPE RESTRAINED JOINT LENGTHS**

NOMINAL PIPE SIZE (IN)	HORIZONTAL BENDS AND VERTICAL UPWARD BENDS				VERTICAL DOWNWARD BENDS				VALVES OR DEADENDS L (FT)
	90° BENDS L (FT)	45° BENDS L (FT)	22.5° BENDS L (FT)	11.25° BENDS L (FT)	90° BENDS L (FT)	45° BENDS L (FT)	22.5° BENDS L (FT)	11.25° BENDS L (FT)	
	4	153	64	30	15	153	64	30	
6	220	91	44	22	220	91	44	22	220
8	287	119	57	28	287	119	57	28	287
10	351	145	70	35	351	145	70	35	351
12	417	173	83	41	417	173	83	41	417

REDUCERS		TEES		
SIZE	L (FT)	RUN SIZE	BRANCH SIZE	L (FT)
12X10	122	4" TO 12"	4"	144
12X8	221	6" TO 12"	6"	201
12X6	303	8" TO 12"	8"	255
10X8	118	10" TO 12"	10"	304
10X6	216	12"	12"	351
8X6	120			
8X4	206			
6X4	113			

PVC PIPE RESTRAINED JOINT SCHEDULE

DETAIL A  
NTS

REVISIONS

8/17/99