

C:\JEA\2020\1445259803 - Mechanical Details - JEA STANDARD WATER MAIN DETAILS.dwg User: Layout Date: 1/5/2020 8:30 AM

PVC PIPE RESTRAINT NOTES:

- THIS SCHEDULE SHALL BE UTILIZED ON ALL WATER, SEWER FORCE MAIN OR RECLAIMED WATER SYSTEMS. ALL FITTINGS SHALL BE RESTRAINED TO LENGTHS INDICATED ON THE ABOVE SCHEDULE, AT A MINIMUM.
- ASSUMPTIONS: PVC PIPE, SAFETY FACTOR=1.5, TEST PRESSURE=160PSI, SOIL=CM OR SM, TRENCH TYPE 3, DEPTH OF COVER=30 INCHES FOR 20" AND SMALLER PIPE SIZE OR 36 INCHES FOR 24" AND LARGER PIPE SIZE.
- BENDS AND VALVES: SHALL BE RESTRAINED ON EACH SIDE OF FITTING.
- VERTICAL OFFSETS: ARE APPROX. 3 FEET COVER ON TOP AND APPROX. 8 FEET COVER ON BOTTOM. PER THE DETAILS, L_U IS THE RESTRAINED LENGTH FOR THE UPPER (TOP) LEVEL, L_D IS THE RESTRAINED LENGTH FOR THE LOWER (DEEPER) LEVEL. ASSUME 45 DEGREE BENDS.
- 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 ABOVE FOR RESTRAINT LENGTH ON TEE "BRANCH" LINE.
- HOPE TO PVC TRANSITIONS: THE PVC PIPE SIDE SHALL BE RESTRAINED 35 FT (MIN).
- THE INSTALLATION OF BELL HARNESS RESTRAINTS AT PVC JOINTS (DR-19 & 26 PIPE) 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. OVER TIGHTENING THE JOINT MAY CAUSE A FAILURE AT THE BELL RESULTING IN A SERVICE OUTAGE.

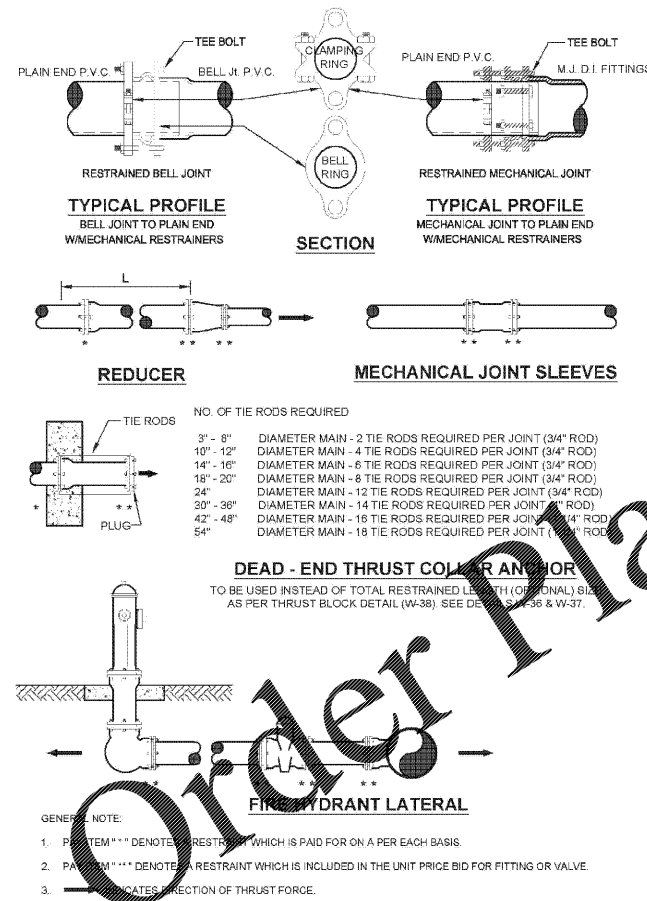
LENGTH (L) TO BE RESTRAINED (SEE PLATE Nos. 36C & 38D FOR ADDITIONAL DETAILS)

NOMINAL PIPE SIZE (IN.)	HORIZONTAL BENDS				VERTICAL OFFSETS 45° BENDS (SEE NOTE #1)		VALVES OR DEAD ENDS	REDUCERS		TEES (SEE NOTE 5)	
	90° BENDS L (FT.)	45° BENDS L (FT.)	22.5° BENDS L (FT.)	11.25° BENDS L (FT.)	UPPER L (FT.)	LOWER L (FT.)		SIZE (IN.)	L (FT.)	RUN SIZE (IN.)	BRANCH SIZE (IN.)
4	21	9	5	3	17	3	47	8x4	34	4	F.O.
6	30	13	8	3	23	4	66	8x6	38	4	6
8	38	16	8	4	30	6	86	8x8	42	4 < LESS	F.O.
10	45	19	9	5	36	7	103	10x8	35	8	8
12	53	22	11	6	43	8	121	10x6	63	6 < LESS	F.O.
14	61	26	13	6	50	9	140	12x10	36	10	10
16	66	28	14	7	55	10	154	12x8	64	8 < LESS	F.O.
18	73	30	15	8	60	11	170	16x12	66	12	12
20	79	33	16	8	66	12	186	20x16	66	16	16
24	79	33	16	8	77	15	165	20x12	117	10 < LESS	F.O.
30	93	39	19	10	97	17	222	24x20	56	20	20
36	106	39	21	11	107	20	257	24x16	60	24	24
42	117	49	24	12	120	24	289	24x12	101	12 < LESS	F.O.
48	144	53	26	13	133	26	321	30x24	76	30	30
								30x20	121	24	24
								36x30	78	30	30
								36x24	141	16	16
								42x36	75	36	36
								42x30	140	20	20
								46x42	75	42	42
								46x36	139	18 < LESS	F.O.

PVC PIPE RESTRAINT JOINT SCHEDULE

JANUARY 2020

PLATE W-31A



MECHANICAL RESTRAINT DETAILS - I

JANUARY 2020

PLATE W-31C

DUCTILE IRON PIPE RESTRAINT NOTES:

- THIS SCHEDULE SHALL BE UTILIZED ON ALL WATER, SEWER FORCE MAIN OR RECLAIMED WATER SYSTEMS. ALL FITTINGS SHALL BE RESTRAINED TO LENGTHS INDICATED ON THE ABOVE SCHEDULE, AT A MINIMUM.
- ASSUMPTIONS: DUCTILE IRON PIPE (WITHOUT POLY WRAP), SAFETY FACTOR=1.5, TEST PRESSURE=150PSI, SOIL=CM OR SM, TRENCH TYPE 3, DEPTH OF COVER=30 INCHES FOR 20" AND SMALLER PIPE SIZE OR 36 INCHES FOR 24" AND LARGER PIPE SIZE. FOR D.I.P. W/POLY WRAP, USE RESTRAINT JOINT SCHEDULE FOR PVC PIPE.
- BENDS AND VALVES: SHALL BE RESTRAINED ON EACH SIDE OF FITTING.
- VERTICAL OFFSETS: ARE APPROX. 3 FEET COVER ON TOP AND APPROX. 8 FEET COVER ON BOTTOM. PER THE DETAILS, L_U IS THE RESTRAINED LENGTH FOR THE UPPER (TOP) LEVEL, L_D IS THE RESTRAINED LENGTH FOR THE LOWER (DEEPER) LEVEL. ASSUME 45 DEGREE BENDS.
- 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 ABOVE FOR RESTRAINT LENGTH ON TEE "BRANCH" LINE.
- HOPE TO D.I.P. TRANSITIONS: THE D.I.P. PIPE SIDE SHALL BE RESTRAINED 35 FT (MIN).

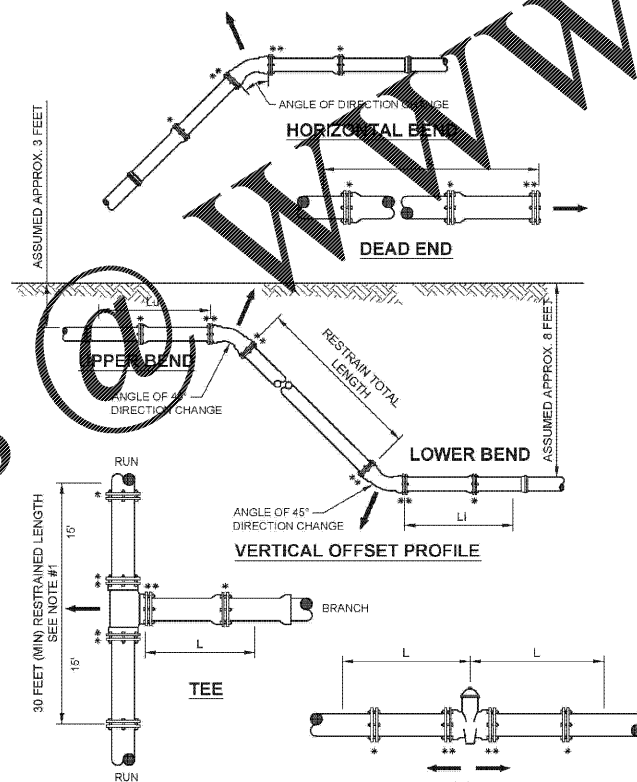
LENGTH (L) TO BE RESTRAINED (SEE PLATE Nos. 36C & 38D FOR ADDITIONAL DETAILS)

NOMINAL PIPE SIZE (IN.)	HORIZONTAL BENDS				VERTICAL OFFSETS 45° BENDS (SEE NOTE 4)		VALVES OR DEAD ENDS	REDUCERS		TEES (SEE NOTE 6)	
	90° BENDS L (FT.)	45° BENDS L (FT.)	22.5° BENDS L (FT.)	11.25° BENDS L (FT.)	UPPER L (FT.)	LOWER L (FT.)		SIZE (IN.)	L (FT.)	RUN SIZE (IN.)	BRANCH SIZE (IN.)
4	17	7	4	2	11	3	30	6x4	22	4	4
6	24	15	5	3	15	4	42	6x6	23	4	6
8	31	13	6	3	20	5	55	6x4	36	6	6
10	36	15	8	4	23	6	65	10x8	22	8	8
12	42	18	9	5	27	7	77	12x10	40	10	10
14	48	20	10	5	31	7	87	12x8	41	12	12
16	53	22	11	6	35	8	97	16x10	42	10 < LESS	F.O.
18	58	24	12	6	39	9	107	20x16	42	16	16
20	63	27	13	6	42	10	118	20x12	42	12	12
24	63	27	13	7	49	10	118	24x20	36	20	20
30	75	31	15	8	59	14	141	24x18	41	24	24
36	86	36	17	9	68	17	168	24x16	64	10 < LESS	F.O.
42	95	40	19	10	76	19	183	30x24	50	24	24
48	117	43	21	11	84	21	203	30x20	77	16	16
								36x30	50	30	30
								36x24	88	30	30
								42x36	48	24	24
								42x30	88	20	20
								46x42	48	36	36
								46x36	88	12 < LESS	F.O.

DUCTILE IRON PIPE RESTRAINT JOINT SCHEDULE

JANUARY 2020

PLATE W-31B



- NOTES:**
- TOTAL LENGTH BETWEEN FIRST JOINTS OR RESTRAINED LENGTH ON EITHER SIDE OF TEE (RUN) SHALL BE A TOTAL DISTANCE OF 30 FEET (MIN).
 - PAY ITEM *** DENOTES A RESTRAINT WHICH IS PAID FOR ON A PER EACH BASIS.
 - PAY ITEM **** DENOTES A RESTRAINT WHICH IS INCLUDED IN THE UNIT PRICE BID FOR FITTING OR VALVE.

MECHANICAL RESTRAINT DETAILS - II

JANUARY 2020

PLATE W-31D

DESIGNER:	DATE:	NO.	BY	DATE
DRAWN BY:	SECRETARY:	6		
DATE:	DATE:	4		
DESIGN ENGINEER:	DESIGNER REGISTRATION NO.	3		
JEA Building Community™				
JEA STANDARD WATER AND RECLAIM DETAILS				
PROJ. NO.	DATE:	PROJ. NO.	DATE:	SCALE:
	JANUARY 2020			AS NOTED
NO. SHEETS	SHEET NO.	DRAWING NO.	SCALE:	
	1	S-STD-1		