

PROJECT REFERENCE NO. R-5023B	SHEET NO. UC-3C
UTILITY DESIGN ENGINEER	
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RESTRAINED JOINT TABLE FOR 4", 6" & 12" PVC PIPE

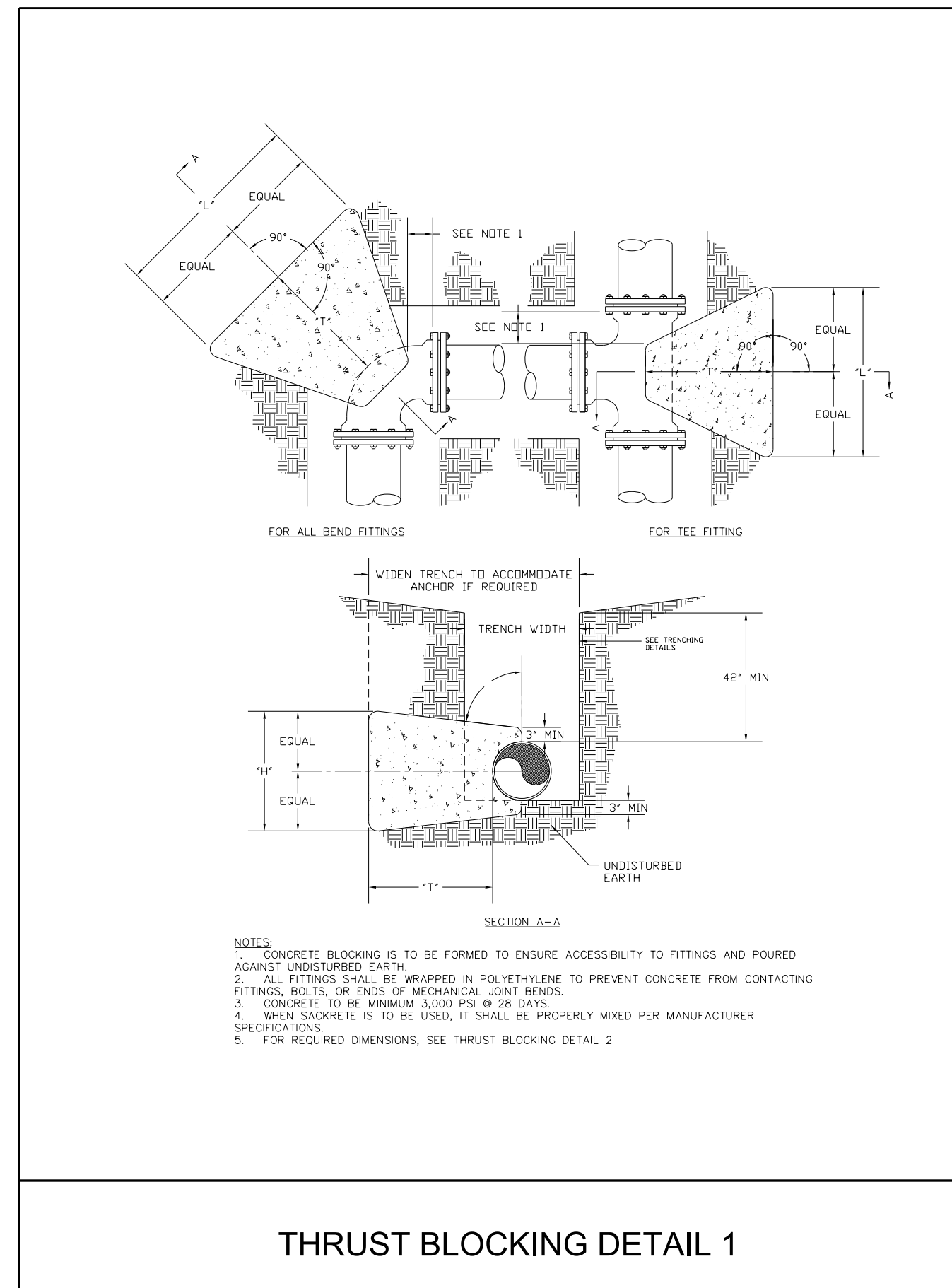
FITTING	REQUIRED RESTRAINED LENGTH (FT) OF PVC PIPE BY DEPTH OF COVER							
	3 FT	4 FT	5 FT	6 FT	7 FT	8 FT	9 FT	10 FT
HORIZONTAL BENDS								
4 INCH DIA - 11.25 DEG	2	2	2	1	1	1	1	1
4 INCH DIA - 22.5 DEG	4	3	3	3	2	2	2	2
4 INCH DIA - 45 DEG	7	6	5	5	4	4	4	3
4 INCH DIA - 90 DEG	16	14	12	11	10	9	8	7
6 INCH DIA - 11.25 DEG								
6 INCH DIA - 11.25 DEG	3	2	2	2	2	2	2	1
6 INCH DIA - 22.5 DEG	5	4	4	3	3	3	3	2
6 INCH DIA - 45 DEG	10	8	7	6	6	5	5	5
6 INCH DIA - 90 DEG	22	19	17	15	13	12	11	10
12 INCH DIA - 11.25 DEG								
12 INCH DIA - 11.25 DEG	5	4	3	3	3	3	2	2
12 INCH DIA - 22.5 DEG	9	7	7	6	5	5	4	4
12 INCH DIA - 45 DEG	17	15	13	12	10	8	9	8
12 INCH DIA - 90 DEG	41	35	31	27	25	22	20	19
VERTICAL DOWN BENDS								
4 INCH DIA - 11.25 DEG	6	5	4	4	3	3	3	3
4 INCH DIA - 22.5 DEG	12	10	8	7	6	6	5	5
4 INCH DIA - 45 DEG	24	20	17	15	13	12	11	10
6 INCH DIA - 11.25 DEG								
6 INCH DIA - 11.25 DEG	8	7	6	5	5	4	4	4
6 INCH DIA - 22.5 DEG	17	14	12	10	9	8	7	7
6 INCH DIA - 45 DEG	34	28	24	21	18	16	15	14
12 INCH DIA - 11.25 DEG								
12 INCH DIA - 11.25 DEG	15	13	11	10	8	8	7	6
12 INCH DIA - 22.5 DEG	31	25	21	19	17	15	14	12
12 INCH DIA - 45 DEG	63	52	44	38	34	31	28	25
VERTICAL UP BENDS								
4 INCH DIA - 11.25 DEG	2	2	2	1	1	1	1	1
4 INCH DIA - 22.5 DEG	4	3	3	3	2	2	2	2
4 INCH DIA - 45 DEG	7	6	5	5	4	4	4	3
6 INCH DIA - 11.25 DEG								
6 INCH DIA - 11.25 DEG	3	2	2	2	2	2	2	1
6 INCH DIA - 22.5 DEG	5	4	4	3	3	3	3	2
6 INCH DIA - 45 DEG	10	8	7	6	6	5	5	5
12 INCH DIA - 11.25 DEG								
12 INCH DIA - 11.25 DEG	5	4	3	3	3	3	2	2
12 INCH DIA - 22.5 DEG	9	7	7	6	5	5	4	4
12 INCH DIA - 45 DEG	17	15	13	12	10	10	9	8
DEAD ENDS / VALVES								
4 INCH DIA	45	38	33	29	27	24	22	20
6 INCH DIA	63	54	47	42	37	34	31	29
12 INCH DIA	118	101	88	79	71	64	59	54

ASSUMPTIONS

LAYING CONDITION = TYPE 4 DESIGN PRESSURE = 200 PSI (TEST PRESSURE)
 SOIL DESIGNATION = GC = COHESIVE-GRANULAR SAFETY FACTOR = 1.5

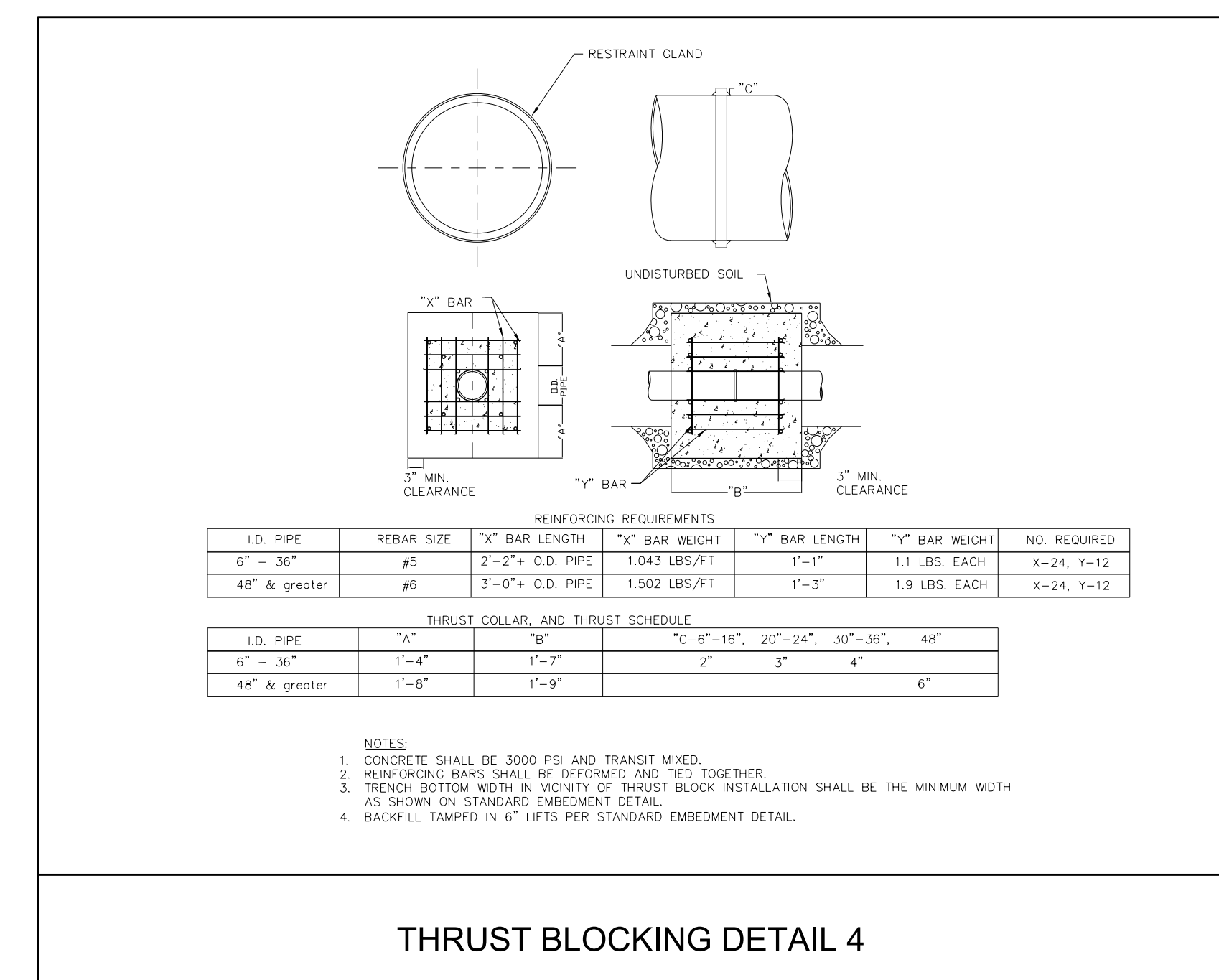
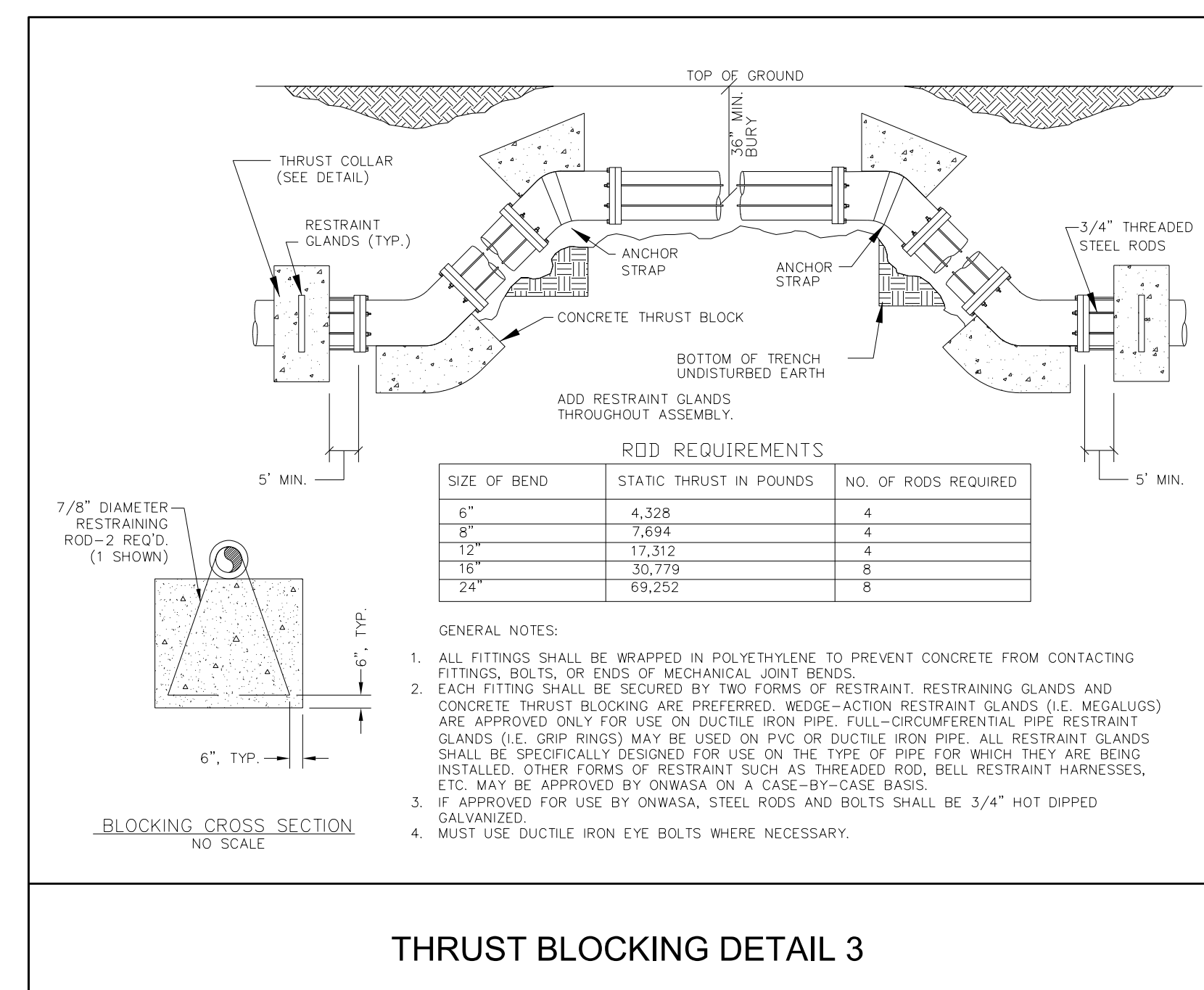
NOTES

- RL = RUN LENGTH BETWEEN FIRST JOINTS OF PIPE ALONG THE RUN LINE OF TEE.
- RESTRAINED LENGTH IS MEASURED AS FOLLOWS:
 - HORIZONTAL/VERTICAL BENDS: ALONG EACH SIDE OF BEND.
 - HORIZONTAL/VERTICAL BENDS - OFFSET: ALONG THE OUTER SIDE OF EACH BEND. ALL PIPE BETWEEN THE TWO BENDS SHALL BE RESTRAINED JOINT.
 - DEAD ENDS: ALONG PIPE FROM THE PLUG.
 - VALVES: ALONG THE PIPE IN EACH DIRECTION FROM THE VALVE.
 - REDUCERS: ALONG THE LARGER PIPE.
 - TEES: ALONG THE BRANCH PIPE FROM THE TEE.
- WHEN IT IS NOT POSSIBLE TO INSTALL THE RESTRAINED LENGTHS AS NOTED BY THIS TABLE, CONTRACTOR SHALL INSTALL THE APPROPRIATE CONCRETE THRUST RESTRAINTS AS PER THE DETAILS HEREIN.



TEST PRESSURE = 150 PSI					TEST PRESSURE = 200 PSI						
PIPE SIZE INCHES	TYPE FITTING	DIMENSIONS (FT)			VOLUME CONCRETE CU. YD.	PIPE SIZE INCHES	TYPE FITTING	DIMENSIONS (FT)			VOLUME CONCRETE CU. YD.
		L*	H*	T*				L*	H*	T*	
4 INCHES	11 1/4"	----	----	----	----	11 1/4"	100	100	100	100	0.04
	22 1/2"	100	100	150	0.06	22 1/2"	100	100	150	0.06	
	45"	100	100	150	0.06	45"	100	100	150	0.06	
	90"	100	100	250	0.09	90"	150	150	250	0.15	
6 INCHES	11 1/4"	100	100	250	0.07	11 1/4"	100	100	250	0.09	
	22 1/2"	100	100	250	0.09	22 1/2"	100	100	250	0.09	
	45"	100	100	250	0.09	45"	150	150	250	0.15	
	90"	150	150	250	0.15	90"	150	150	250	0.15	
8 INCHES	11 1/4"	150	150	250	0.15	11 1/4"	150	150	250	0.15	
	22 1/2"	150	150	250	0.15	22 1/2"	150	150	250	0.15	
	45"	150	150	250	0.15	45"	200	200	250	0.23	
	90"	200	200	250	0.23	90"	200	200	250	0.23	
10 INCHES	11 1/4"	200	200	250	0.23	11 1/4"	200	200	250	0.23	
	22 1/2"	200	200	250	0.23	22 1/2"	200	200	250	0.23	
	45"	200	200	250	0.23	45"	200	200	250	0.23	
	90"	300	300	300	0.39	90"	300	300	300	0.39	
12 INCHES	11 1/4"	200	200	300	0.28	11 1/4"	200	200	300	0.28	
	22 1/2"	200	200	300	0.28	22 1/2"	300	300	300	0.39	
	45"	300	300	300	0.47	45"	400	400	300	0.61	
	90"	450	300	350	0.64	90"	550	300	350	1.13	
16 INCHES	11 1/4"	200	200	300	0.28	11 1/4"	200	200	300	0.28	
	22 1/2"	300	200	300	0.39	22 1/2"	400	200	300	0.50	
	45"	400	300	350	0.64	45"	550	300	350	1.13	
	90"	650	350	350	1.54	90"	750	400	350	2.01	

- CHART NOTES:**
- IF BLOCKING EXCAVATION IS IN LIGHTLY COMPACTED FILL AREAS, OR IN AREAS WHERE BOULDERS OR STUMPS HAVE BEEN REMOVED, BLOCKING SIZE MUST BE RE-SIZED FOR THE SPECIFIC LOCATION/CIRCUMSTANCE BY A NC LICENSED PROFESSIONAL ENGINEER.
 - BLOCKING SIZES SHOWN IN THESE TABLES ASSUME THE FOLLOWING:
 - BLOCKING IS CONSTRUCTED IN RESIDUAL SOILS AS SHOWN IN DETAIL.
 - SOIL BEARING PRESSURE = 2000 PSF.
 - VELOCITY OF FLOW = 15 FPS.
 - THIS DETAIL NOT APPLICABLE TO REDUCING BENDS.
 - NEITHER THE WEIGHT OF THE CONCRETE BLOCKING NOR FRICTION BETWEEN CONCRETE BLOCKING AND SOIL WAS ADDED INTO BLOCKING SIZES COMPUTATION. THEREFORE, BLOCKING SIZE IS CONSERVATIVE.



- NOTES:**
- CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
 - REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
 - TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD EMBEDMENT DETAIL.
 - BACKFILL TAMPED IN 6" LIFTS PER STANDARD EMBEDMENT DETAIL.

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