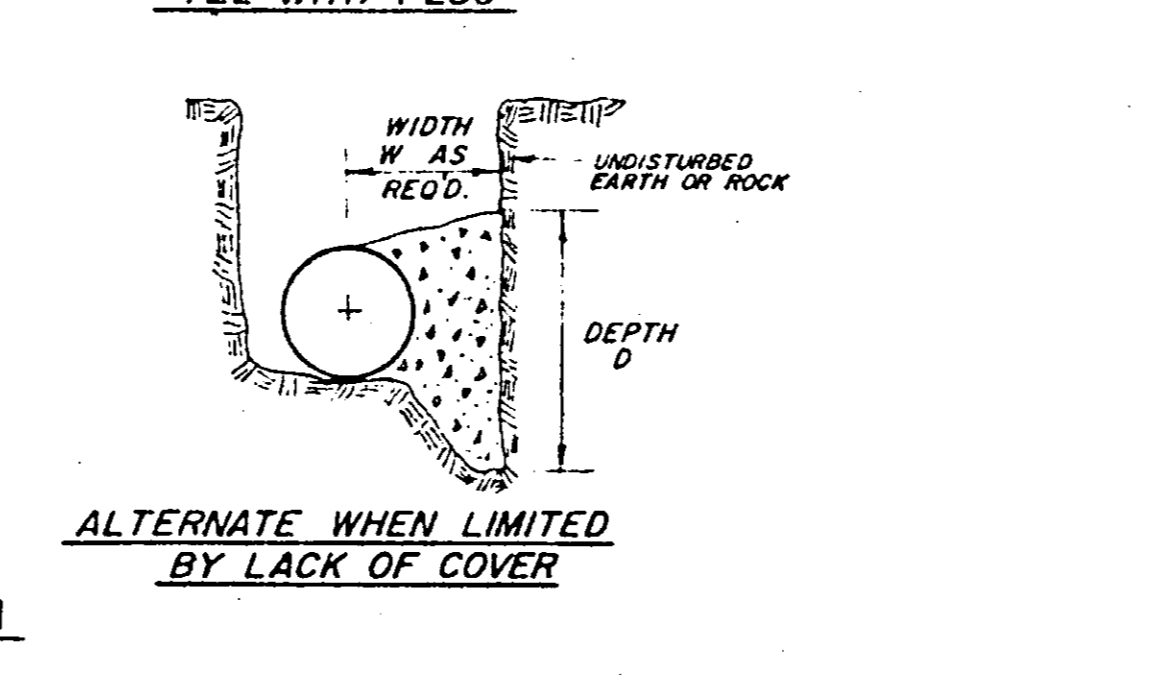
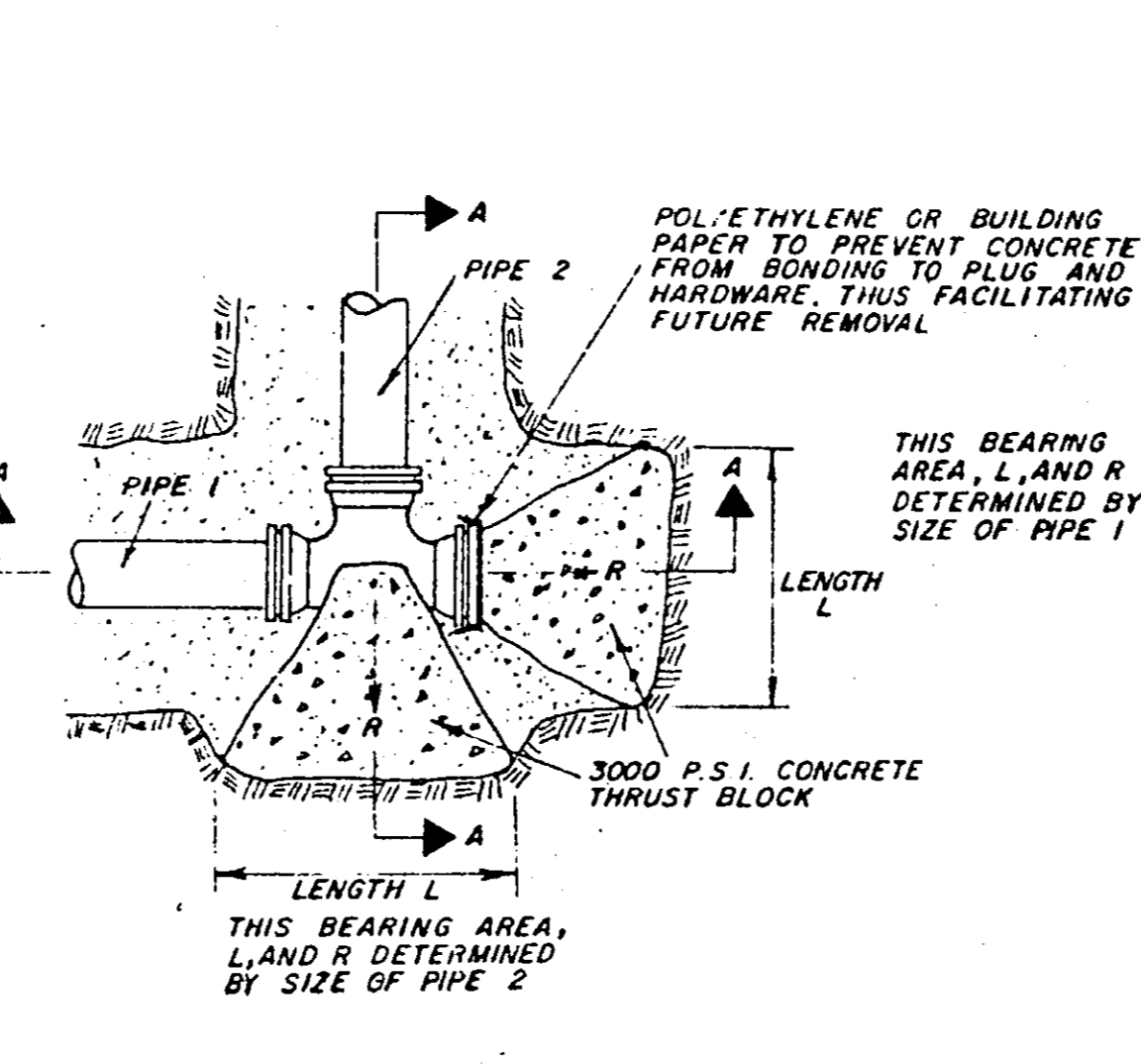
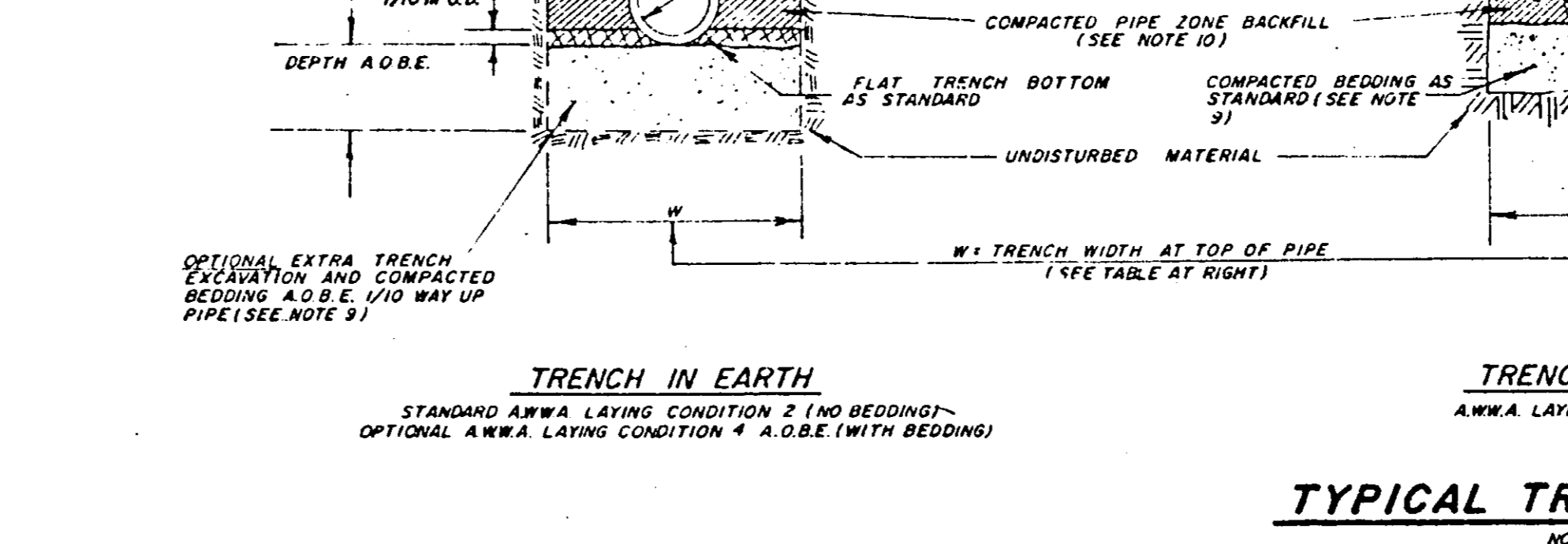
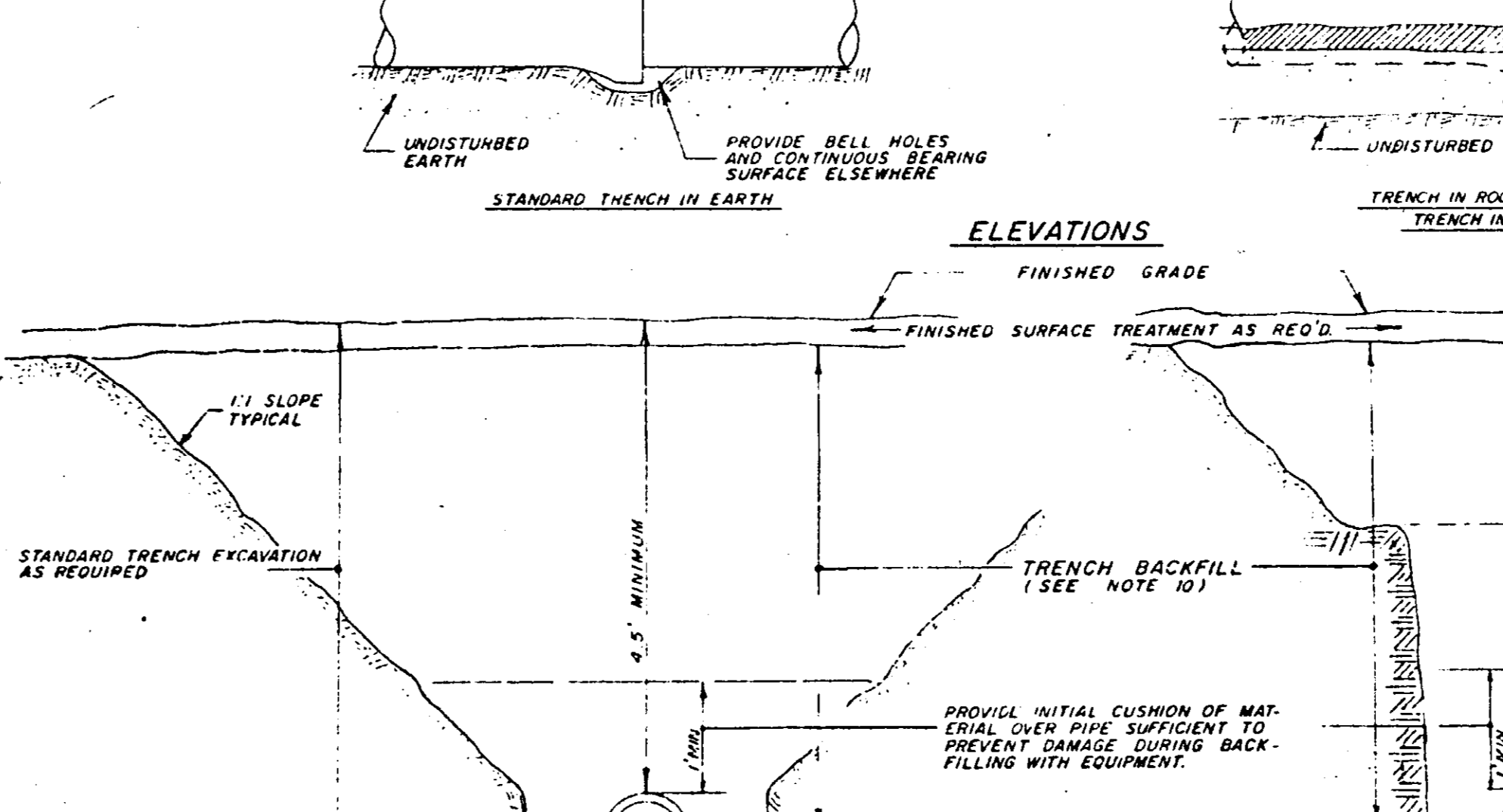


TYPICAL CONCRETE THRUST BLOCK DETAILS
NO SCALE

- FOR REQUIRED BEARING AREA AND DIMENSIONS D, B, L, AND R, SEE TABLE AT RIGHT. VALUES OF D, B, L, AND R OTHER THAN THOSE SHOWN IN THE TABLE MAY BE USED PROVIDED THEY YIELD A BEARING AREA EQUAL TO OR LARGER THAN THAT REQUIRED.
- CONCRETE NOT TO OVERLAP ANY JOINT.
- CONCRETE TO BE PLACED SO AS NOT TO INTERFERE WITH REMOVING OR INSTALLING ANY OF THE JOINTING HARDWARE.
- APPROXIMATE VOLUME OF CONCRETE THRUST BLOCK:
 $V = \frac{L \cdot W \cdot (D + B)}{2}$
WHERE:
V = VOLUME IN CUBIC YARDS
L = LENGTH OF BLOCK IN FEET
D = DEPTH OF BLOCK IN FEET
W = WIDTH OF BLOCK IN FEET
B = BORE DIAMETER OF PIPE IN FEET



TYPICAL CONCRETE THRUST BLOCK DETAILS
NO SCALE



TYPICAL TRENCH DETAILS
NO SCALE

REQUIRED BEARING AREAS & DIMENSIONS FOR CONCRETE THRUST BLOCKS (BASED ON NOMINAL PIPE DIMENSIONS)						THRUST REACTIONS-R PER 100 PSI INTERNAL PRESSURE (BASED ON ANNUAL PIPE DIMENSIONS)														
PIPE SIZE INCHES	TEE AREA SQ. FT.	90° (L/A) BEND		45° (L/B) BEND		22 1/2° (L/B) BEND		11 1/4° (L/B) BEND		PIPE SIZE INCHES	TEE (SQ. FT.)	90° (L/A) BEND		45° (L/B) BEND		22 1/2° (L/B) BEND		11 1/4° (L/B) BEND		
		AREA SQ. FT.	D x L	AREA SQ. FT.	D x L	AREA SQ. FT.	D x L	AREA SQ. FT.	D x L			AREA SQ. FT.	D x L	AREA SQ. FT.	D x L	AREA SQ. FT.	D x L	AREA SQ. FT.	D x L	AREA SQ. FT.
2	0.4	0.5 x 1.0	0.5	0.5 x 1.0	0.3	0.5 x 1.0	0.1	0.5 x 1.0	0.1	0.5 x 1.0	2	300	450	240	120	60				
3	0.8	1.0 x 1.0	1.1	1.0 x 1.5	0.6	0.5 x 1.5	0.3	0.5 x 1.0	0.2	0.5 x 1.0	3	710	1000	540	280	140				
4	1.4	1.0 x 1.5	2.0	1.0 x 2.0	1.1	1.0 x 1.5	0.6	0.5 x 1.5	0.3	0.5 x 1.0	4	1260	1780	960	490	250				
6	3.2	1.5 x 2.5	4.5	2.0 x 2.5	2.4	1.5 x 2.0	1.2	1.0 x 1.5	0.6	0.5 x 1.5	6	2830	4000	2160	1100	550				
8	5.7	2.0 x 3.0	8.0	2.0 x 4.0	4.3	2.0 x 2.5	2.2	1.5 x 1.5	1.1	1.0 x 1.5	8	5030	7110	3850	1960	990				
12	12.7	3.5 x 3.5	18.0	4.0 x 4.5	9.7	2.5 x 4.0	5.0	2.0 x 2.5	2.5	1.5 x 2.0	12	11,310	16,000	8650	4410	2220				
14	17.3	3.5 x 5.0	24.5	4.5 x 5.5	13.3	3.5 x 4.0	6.8	2.0 x 3.5	3.4	1.5 x 2.5	14	15,890	21,770	11,780	6000	3020				
16	22.6	4.5 x 5.0	32.0	5.0 x 6.5	17.3	3.5 x 4.5	8.8	2.5 x 3.5	4.4	2.0 x 2.5	16	20,110	28,430	15,380	7840	3940				
18	28.6	5.0 x 6.0	40.5	5.5 x 7.0	21.9	4.0 x 5.5	11.2	3.0 x 4.0	5.6	2.0 x 3.0	18	25,450	35,980	19,470	9920	4990				
20	35.3	5.5 x 6.5	50.0	6.5 x 8.0	27.0	4.5 x 6.0	13.8	3.5 x 4.0	6.9	2.0 x 3.5	20	31,420	44,420	24,030	12,250	6160				
24	50.8	7.0 x 7.5	72.0	7.5 x 10.0	38.9	5.0 x 8.0	19.8	4.0 x 5.0	10.0	2.5 x 4.0	24	45,240	63,970	34,610	17,640	8870				
30	78.5	8.0 x 10.0	112.4	8.5 x 13.5	60.8	6.0 x 10.5	31.0	4.5 x 7.0	15.6	3.5 x 4.5	30	70,690	99,880	54,080	27,570	13,850				
36	114.5	10.0 x 11.5	161.9	10.5 x 15.5	87.6	8.0 x 11.0	44.7	5.0 x 9.0	22.4	4.5 x 5.0	36	101,790	143,930	77,870	39,700	19,950				

PIPE SIZE - I.D. (INCHES)	I.D.	W MIN.	W MAX.
2	18	26	
3	18	27	
4	18	28	
6	21	30	
8	24	32	
12	28	36	
14	31	38	
16	33	40	
18	35	42	
20	38	44	
24	42	48	
30	48	54	
36	54	60	

NOTE: ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE FOLLOWING CODES: A. SUBPART 25-4, 'EXCAVATION OPERATIONS' OF N.Y.S. DEPARTMENT OF LABOR INDUSTRIAL CODE RULE 25; B. SUBPART 17, 'EXCAVATIONS, TRENCHING AND SHORING' OF U.S. DEPARTMENT OF LABOR OSHA REGULATIONS FOR CONSTRUCTION. THE MORE STRINGENT REQUIREMENT IN EACH CODE SHALL APPLY.

NOTE: 1. SHEETING AND SHORING SYSTEMS OTHER THAN THOSE ALLOWED BY THE CODES MAY BE IN ACCORDANCE WITH SPECIFIC DESIGN PLANS DONE BY A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER.

NOTE: 2. ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE FOLLOWING CODES: A. SUBPART 25-4, 'EXCAVATION OPERATIONS' OF N.Y.S. DEPARTMENT OF LABOR INDUSTRIAL CODE RULE 25; B. SUBPART 17, 'EXCAVATIONS, TRENCHING AND SHORING' OF U.S. DEPARTMENT OF LABOR OSHA REGULATIONS FOR CONSTRUCTION. THE MORE STRINGENT REQUIREMENT IN EACH CODE SHALL APPLY.

NOTE: 3. VALUES FOR TEE ALSO APPLY TO END PLUGS, CAPS, AND TAPPING SLEEVES.

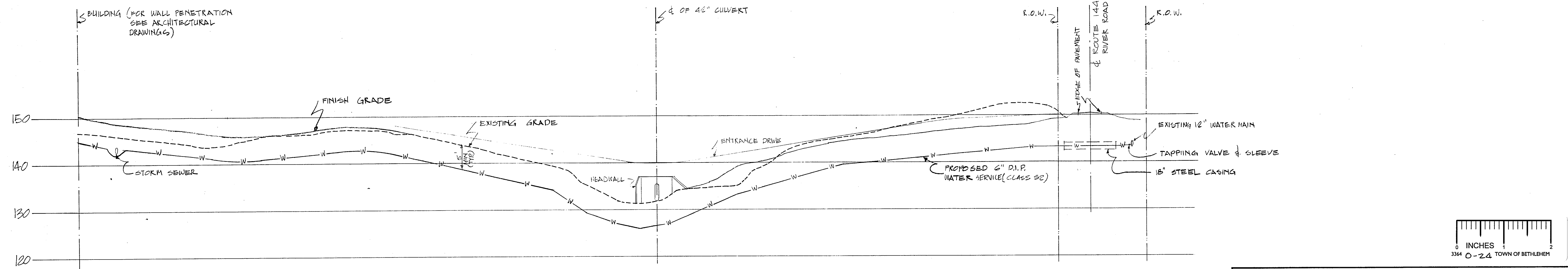
NOTE: 4. REQUIRED BEARING AREAS ARE DUE TO THRUSTS CAUSED BY 150 P.S.I. WORKING PRESSURE PLUS 30% (75 P.S.I.) SURGE ALLOWANCE, RESULTING IN 225 P.S.I. TOTAL INTERNAL PRESSURE. NOMINAL PIPE DIAMETER USED.

NOTE: 5. REQUIRED BEARING AREAS ARE BASED ON ALLOWABLE SOIL BEARING CAPACITY OF 1000 POUNDS PER SQUARE FOOT FOR SAND DUE TO OTHER SOIL CONDITIONS ENCOUNTERED, BEARING AREAS MAY BE MODIFIED BY THE ENGINEER BY MULTIPLYING THE AREA GIVEN IN THE TABLE FOR THE APPROPRIATE PIPE SIZE AND FITTING BY THE CONNECTION FACTORS LISTED TO THE RIGHT.

SOIL	ALLOWABLE SOIL PRESSURE (LB./SQ. FT.)		CORRECTION FACTOR
	SOIL	ALLOWABLE SOIL PRESSURE (LB./SQ. FT.)	
SOFT CLAY	1000	2.00	
SAND	2000	1.00	
SAND & GRAVEL	3000	0.67	
CEMENTED W/CLAY	4000	0.50	
HARD SHALE	10,000	0.20	

NOTE: 6. IN MUCH, PEAT, OR RECENTLY PLACED FILL ALL THRUSTS SHALL BE RESISTED BY PILES OR TO BE SOLID FOUNDATIONS, OR BY REMOVAL OF SUCH UNSTABLE MATERIAL AND REPLACEMENT WITH BALLAST OF SUFFICIENT STABILITY TO RESIST THE THRUSTS, ALL AS REQUIRED BY THE ENGINEER.

HYDRANT TYPE: CLOW 26-40, 5/4" MAIN VALVE OPENING OPERATING NUT & CAPS IS A 5 SIDED - 4B



WATER SERVICE PROFILE
SCALE HORIZONTAL 1"=50'
VERTICAL 1"=10'

**WATER SERVICE PROFILE AND DETAILS
B & W TRANSPORTATION
ROUTE 144 TOWN OF BETHLEHEM
ALBANY COUNTY, N.Y.**

HERSHBERG & HERSHBERG
CONSULTING ENGINEERS
LAND SURVEYORS
19 COLVIN AVENUE
ALBANY, N.Y.

DATE: 4/1/87
SCALE: AS SHOWN
BY: NH
CHK: AS
FILE NO. 86-500

ALTERATION OF THIS DOCUMENT, EXCEPT BY A LICENSED PROFESSIONAL ENGINEER OR LAND SURVEYOR, IS ILLEGAL.