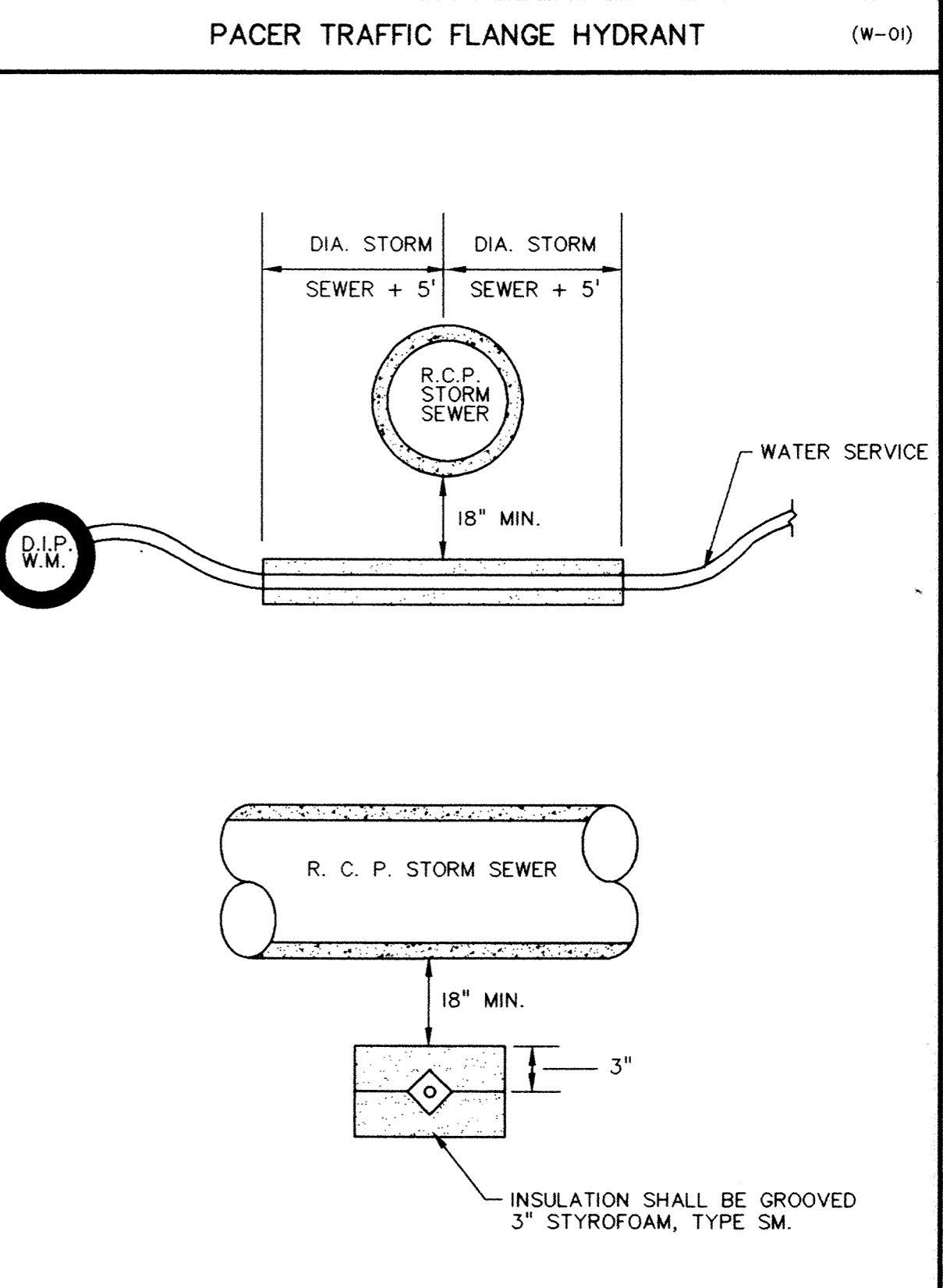
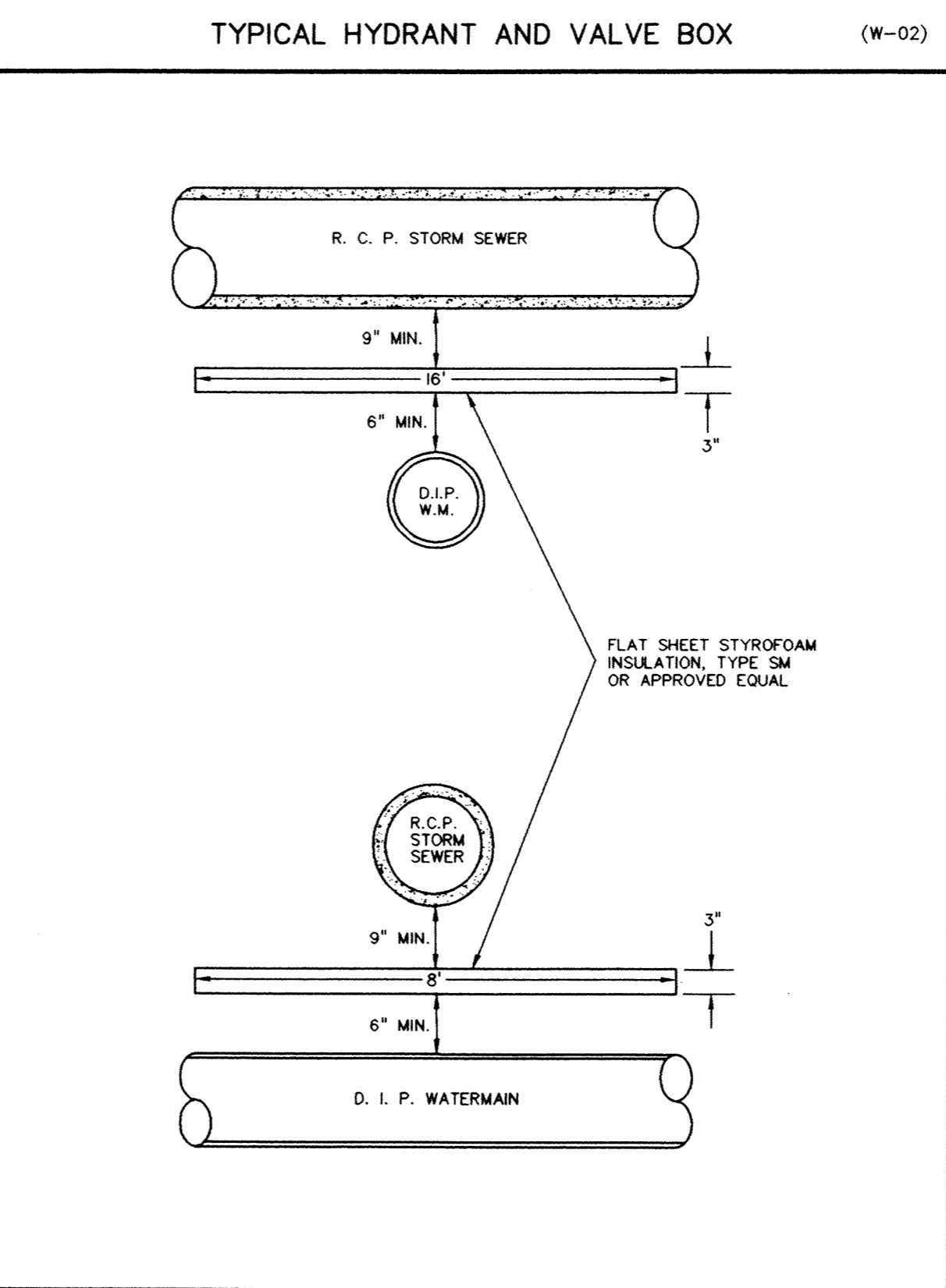
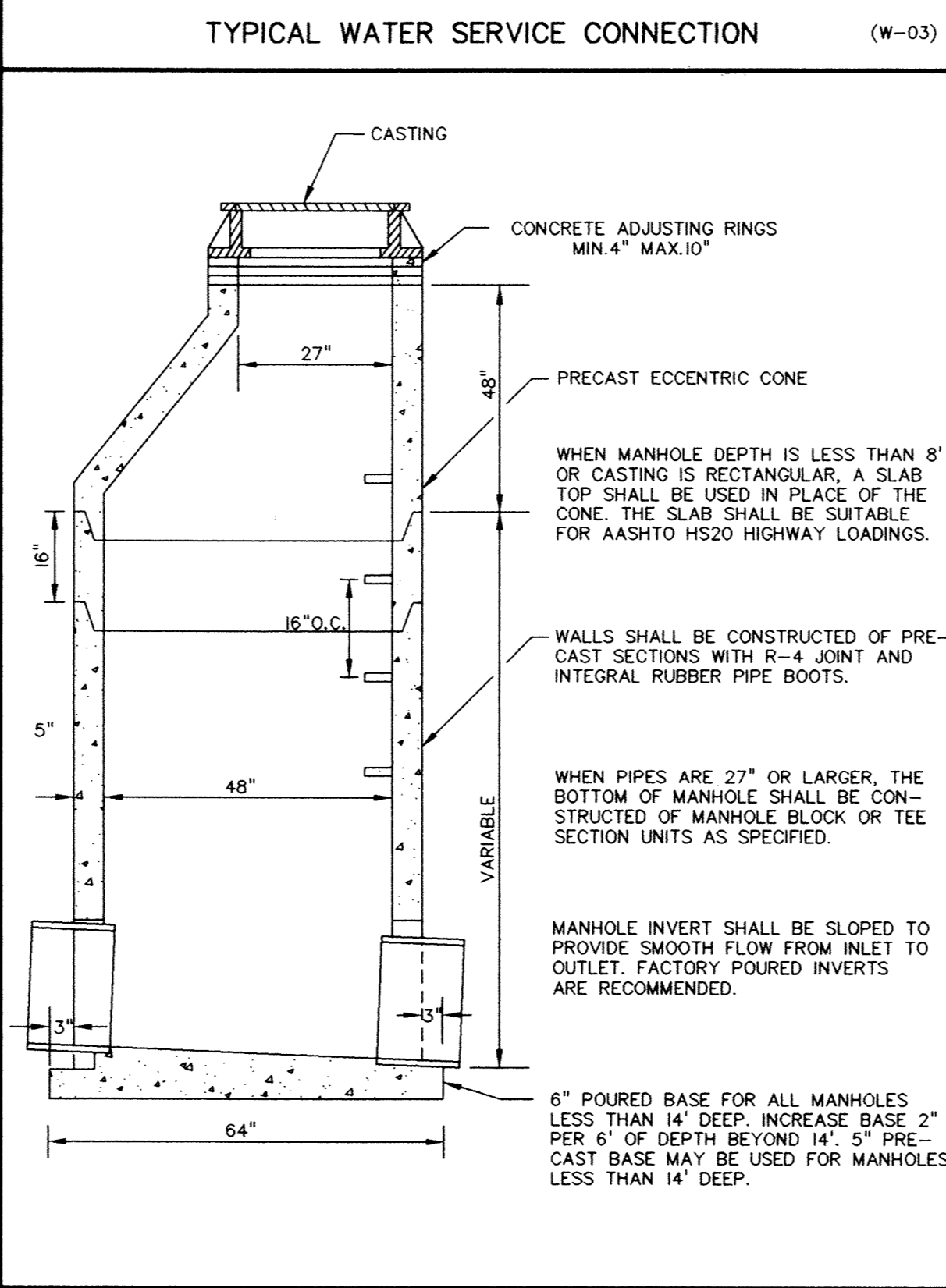
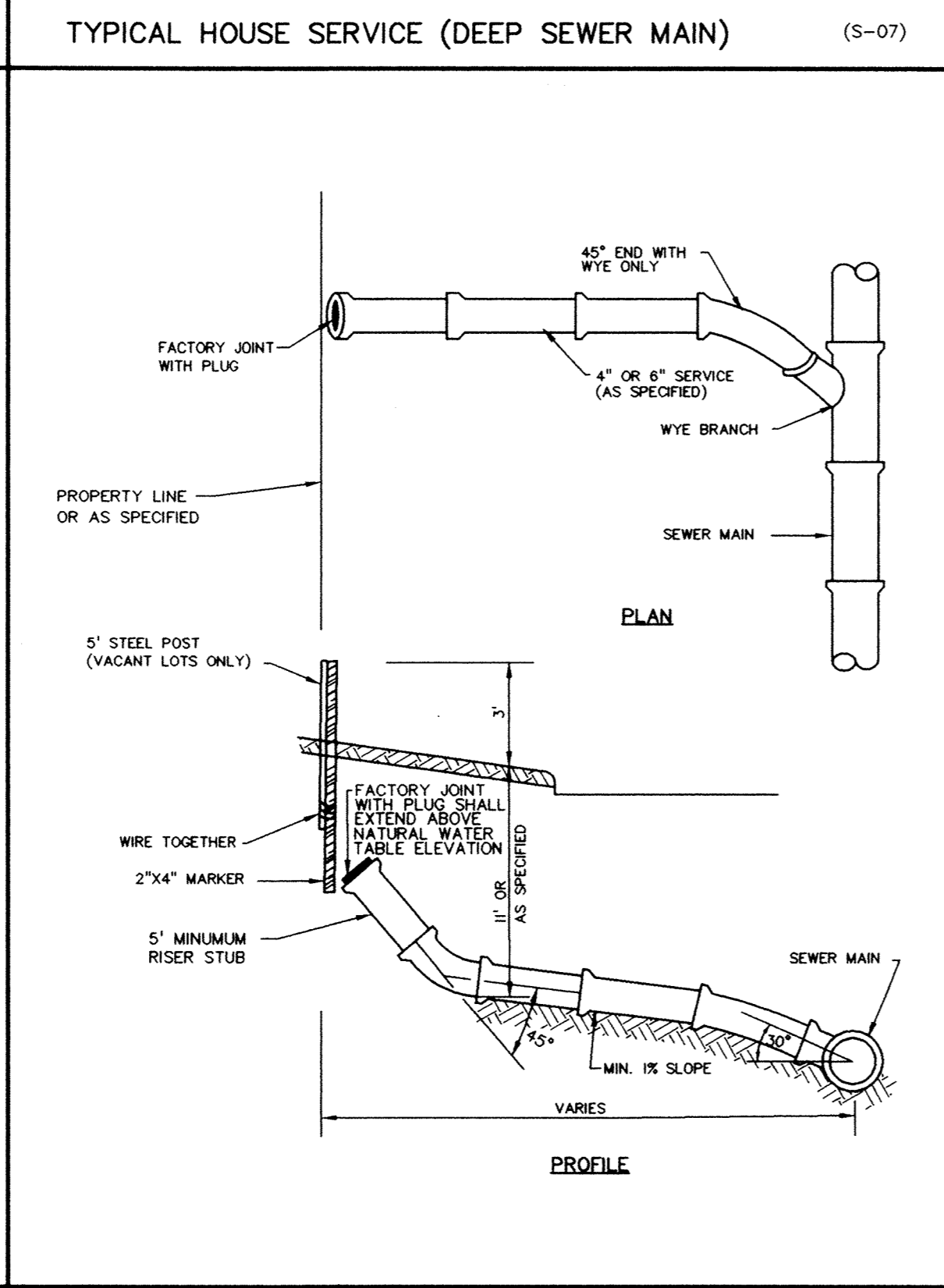


**THRUST BLOCKING DETAIL**

NOMINAL FITTING SIZE (INCHES)	TEE, WYE, PLUG OR CAP	90° BEND, PLUGGED CROSS		TEE PLUGGED ON RUN		45° BEND	22 1/2° BEND	11 1/4° BEND
		A <sup>1</sup>	A <sup>2</sup>	A <sup>1</sup>	A <sup>2</sup>			
4	1.0	1.4	1.9	1.4	1.0	---	---	---
6	2.1	3.0	4.3	3.0	1.6	1.0	---	---
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0	---
10	5.9	8.4	11.8	8.4	4.6	2.6	1.2	---
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7	---

**NOTE:**  
 1. Thrust restraint for 4-inch through 12-inch diameter pipe shall be with concrete blocking. Thrust restraint for vertical bends and pipe diameter over 12-inch shall be by restrained joints.  
 2. Restrained joints with tie rods, "restraining glands" or other method may be substituted for concrete blocking when approved by the engineer. Timber blocking will not be allowed.  
 3. Bearing area (ft<sup>2</sup>) against undisturbed earth is shown above, based on a test pressure of 150 psi and a soil bearing capacity of 2,000 psf.  
 4. For soil bearing capacity less than 2,000 psf and/or a test pressure > 150 psi, bearing area = (test pressure / .50) x (2,000 / soil bearing capacity) x (table value).



**RECORD DRAWINGS**

**TYPICAL HOUSE SERVICE (STD. DEPTH SEWER MAIN) (S-05)**

**STANDARD MANHOLE - SANITARY SEWER (S-01)**

PRIME CONTRACTOR/UTILITIES: C. W. HOULE, INC.  
 CURB & GUTTER: HALVORSON CONCRETE, INC.  
 STREETS: BAUERLY BROS., INC.  
 INSPECTION: RALPH BADER, HOWARD R. GREEN CO.  
 SURVEY: JOHN OLIVER & ASSOCIATES, INC.  
 EARTHWORK: SOIL-CON, INC.  
 RECORD DRAWINGS: FRED FRITSCHEL, JOHN OLIVER & ASSOCIATES, INC.  
 CONSTRUCTED: 1997

**TYPICAL WATERMAIN INSULATION (W-08)**

ORIG. DATE: 5/5/95  
 DESIGN BY: JR.PG.TM  
 DRAWN BY: PG  
 CHECKED BY: TM

REVISIONS: 12/23/97  
**RECORD DRAWING**

I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

Signed: *John Oliver*  
 Date: 7/22/96 Reg. No. 20383

**TYPICAL SERVICE INSULATION**

**John Oliver & Associates, Inc.**  
 Civil Engineering, Land Surveying, Land Planning  
 580 Dodge Avenue  
 Elk River, Minnesota  
 (612)441-2072 (FAX)441-5665

201 W. Travelers Trail, Suite 200  
 Burnsville, MN 55337  
 (612)894-3045 (FAX)894-3049

**MISSISSIPPI OAKS SECOND ADDITION DETAILS**

DRAWING FILE: MSDET2.DWG TEXT FILE:  
 SHEET 11 OF 12 FILE NO. 6521.20-03