

**THRUST BLOCK DETAIL**  
NOT TO SCALE

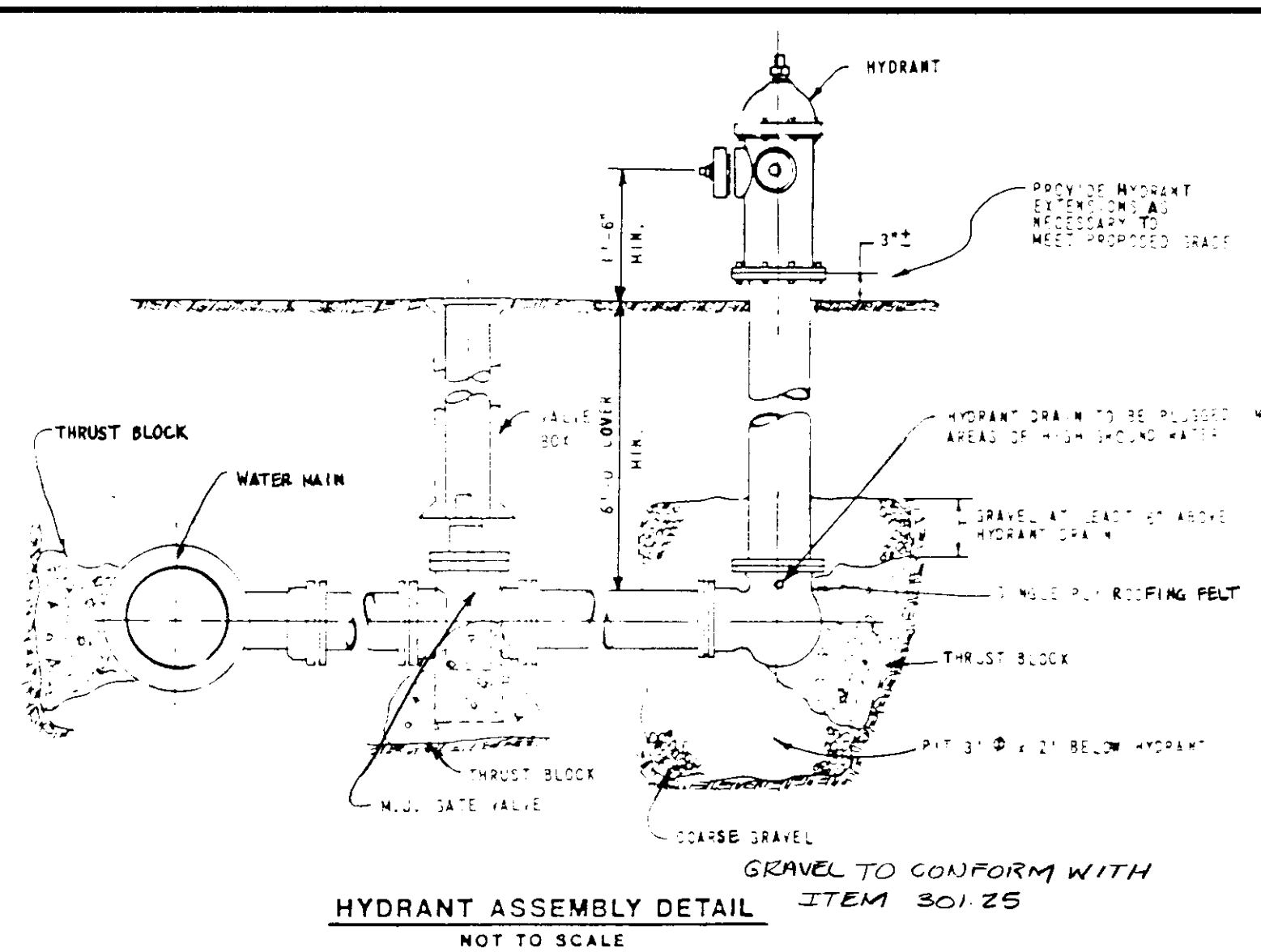
**SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL**

REACTION TYPE	PIPE SIZE											
	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"
(A) 90°	0.69	2.19	3.92	5.57	8.62	10.91	15.41	18.02	24.06	34.64	53.83	77.39
(B) 100°	0.65	1.55	2.76	4.19	6.09	8.37	10.69	13.87	17.01	24.49	36.06	54.72
(C) 45°	0.48	1.19	2.12	3.01	4.66	5.91	8.34	9.71	13.02	18.75	29.13	41.88
(D) 22 1/2°	0.25	0.60	1.08	1.54	2.37	3.01	4.25	4.97	6.64	9.56	14.85	21.35
(E) 11 1/4°	0.13	0.30	0.54	0.77	1.19	1.52	2.12	2.51	3.33	4.79	7.45	10.71

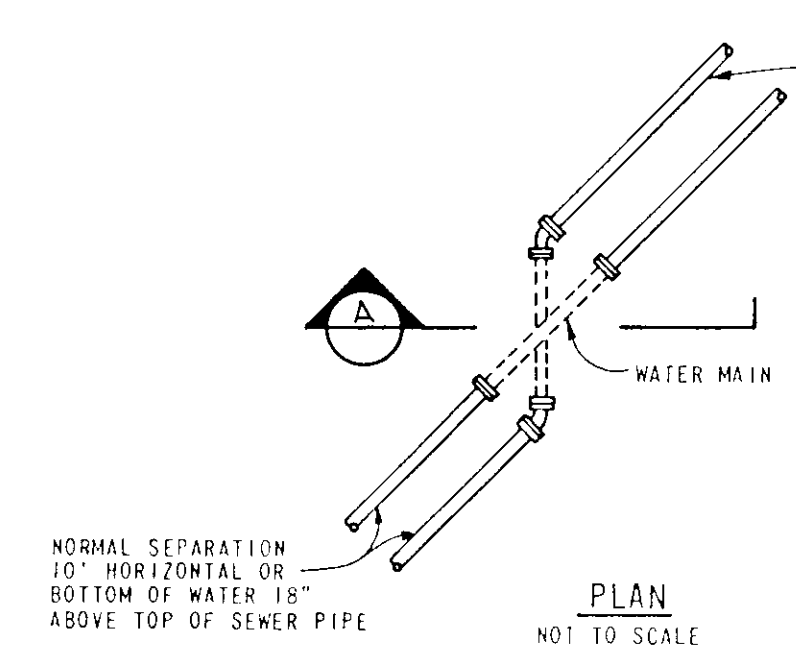
OTHER TEST PRESSURES FOR THE ABOVE REACTIONS: SQUARE FEET OF CONCRETE THRUST BLOCKING FOR OTHER TEST PRESSURES IS DIRECTLY PROPORTIONAL TO THE ABOVE TABLE. FOR INSTANCE, AT 200 PSI TEST PRESSURE THE ABOVE NUMBERS DOUBLE.

**NOTE: THE TEST PRESSURE FOR PIPE INSTALLED AT EL. 517 WILL BE 300 P.S.I.**

- NOTES:**
1. PUSH THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
  2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
  3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCK.
  4. REQUIREMENTS OF THE ABOVE TABLE PRESUME MINIMUM SOIL BEARING OF 1 TON PER SQUARE FOOT, AND MAY BE VARIED BY THE ENGINEER TO MEET OTHER CONDITIONS ENCOUNTERED.
  5. WHERE M.J. PIPE IS USED, M.J. PLUG MAY BE SUBSTITUTED FOR END BLOCKINGS.
  6. Retainer glands are required for all mechanical joints. These glands do not reduce the requirements for thrust restraint.
  7. All fittings shall be wrapped in polyethylene or building paper prior to installation of concrete restraint.
  8. Threaded rod shall be ANSI A242 FV50 pipe restraint nuts to match AWWA C111. Threaded rods and nuts to be field coated with bituminous paint.



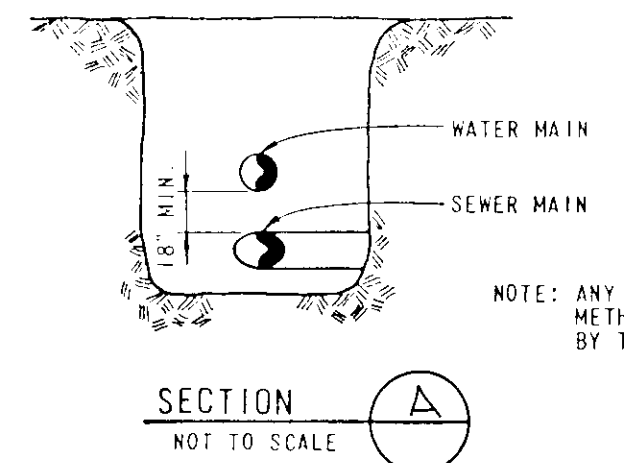
**HYDRANT ASSEMBLY DETAIL**  
NOT TO SCALE



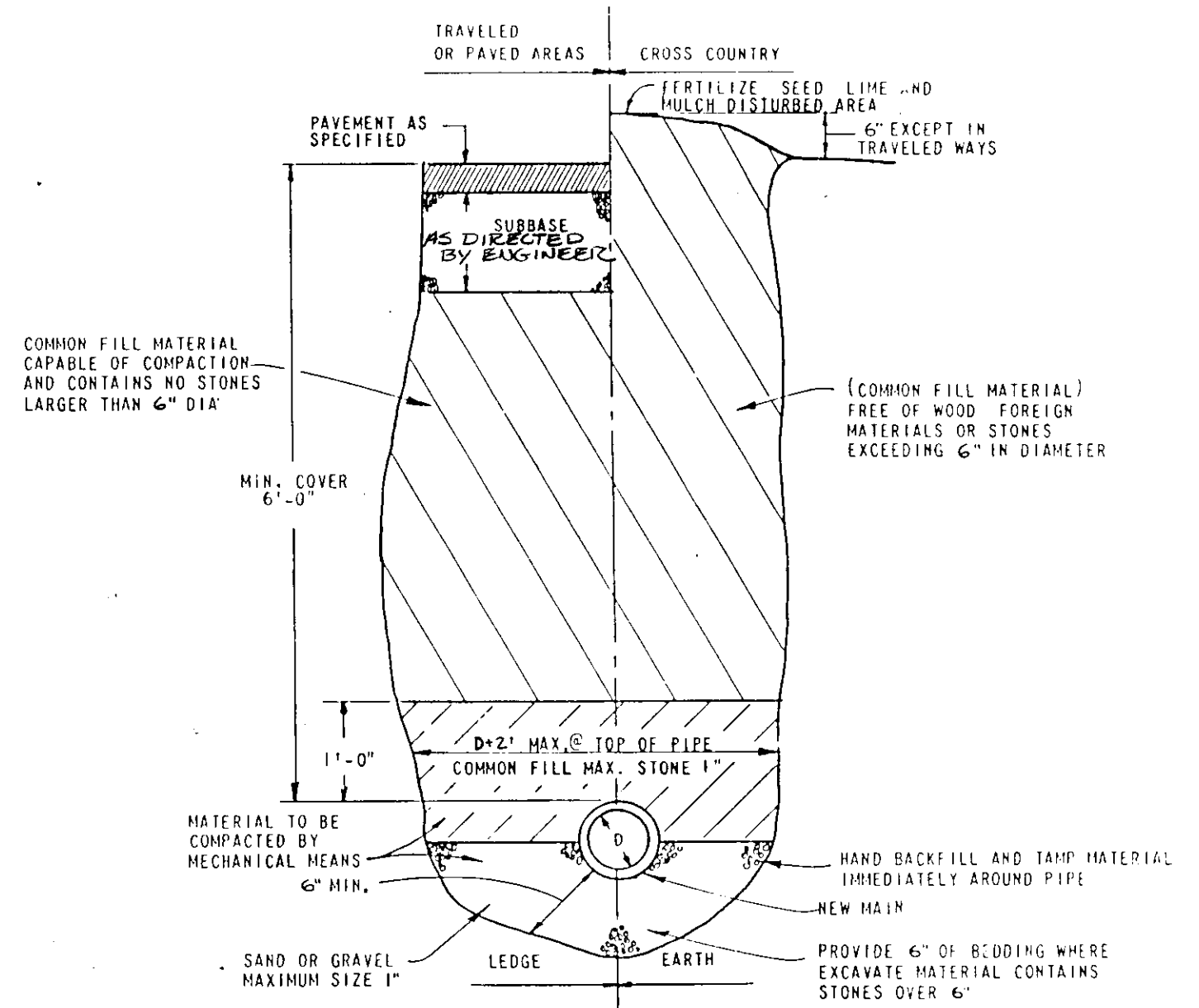
NOTE: SEWER MAINS SHALL BE LAID BENEATH THE WATER MAIN WITH AT LEAST 18" VERTICAL CLEARANCE BETWEEN THE OUTSIDE OF THE SEWER AND THE OUTSIDE OF THE WATER MAIN.

WHEN 'B' CAN NOT BE MAINTAINED THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

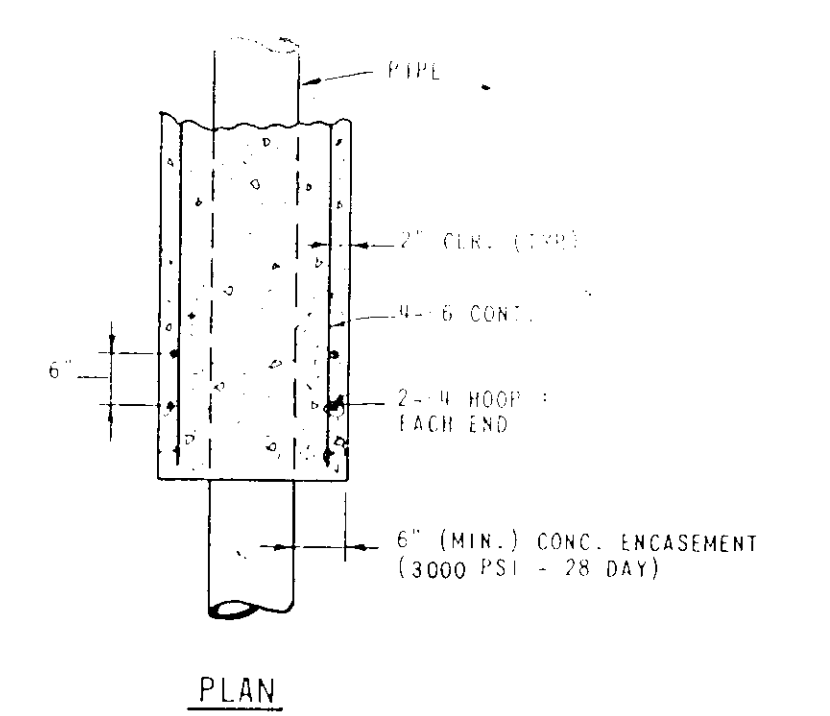
WHERE WATER MAIN CROSSES OVER OR UNDER A SEWER MAIN, A FULL LENGTH OF D.I. WATER PIPE SHALL BE PLACED WITH MID-LENGTH CENTERED UNDER THE SEWER MAIN.



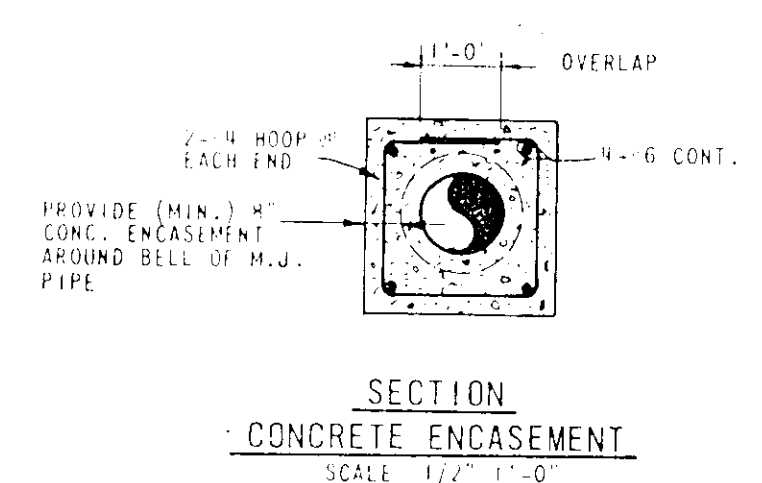
**CROSSING DETAIL**  
WATER & SEWER (STORM OR SANITARY) MAIN



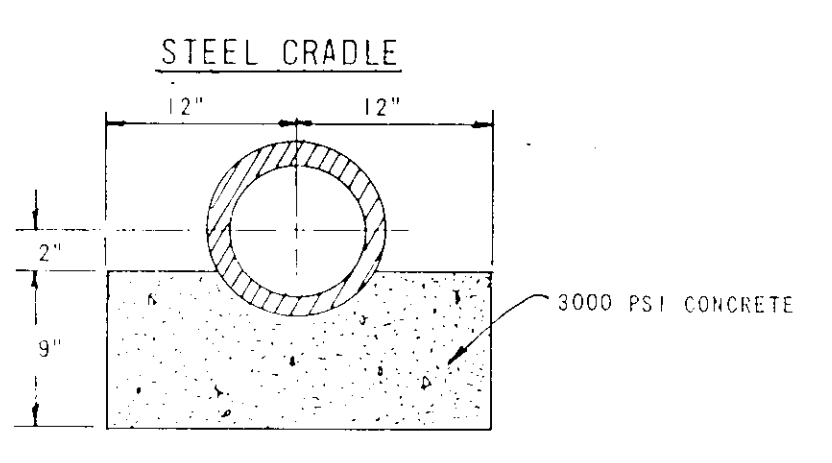
**DUCTILE IRON PIPE TYPICAL TRENCH SECTION**  
NOT TO SCALE



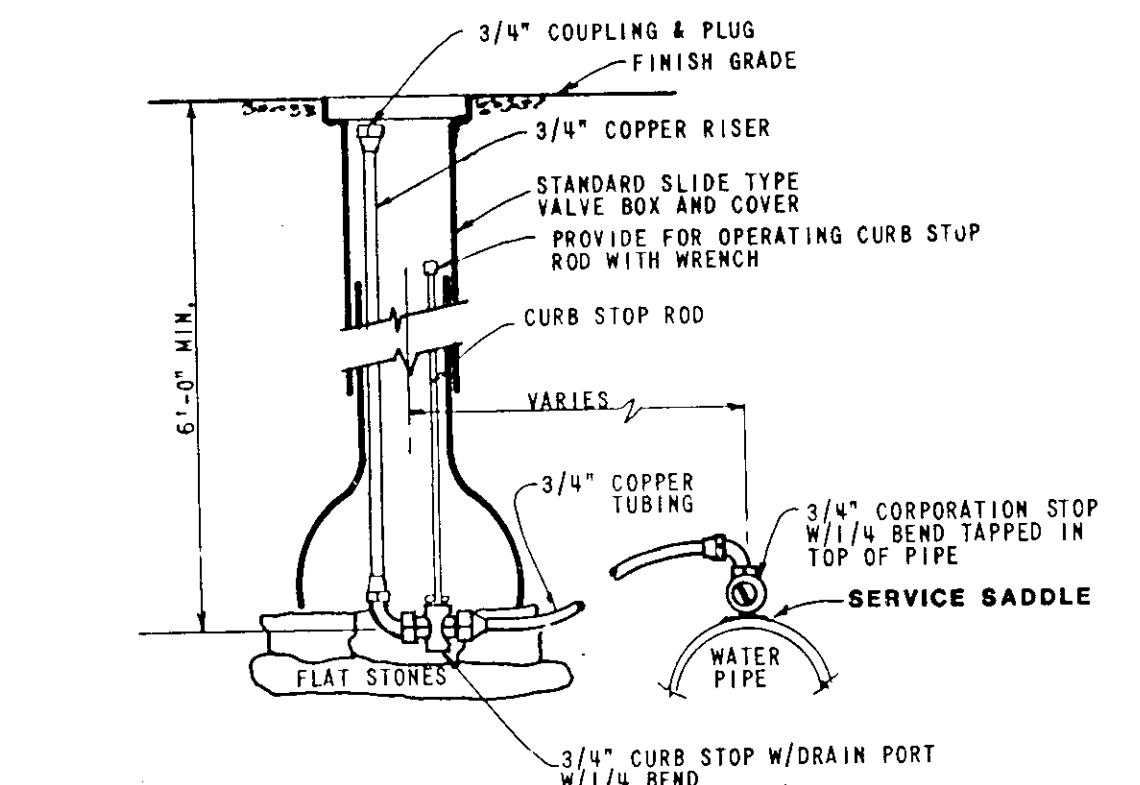
**PLAN**



**SECTION CONCRETE ENCASEMENT**  
SCALE 1/2" = 1'-0"



**CONCRETE CRADLE**



**TYPICAL INSTALLATION - TRAVEL WAY FOR AIR VENT OR CHLORINATION INJECTION**  
NOT TO SCALE

**MATERIAL SPECIFICATION**

- ALL PIPE, FITTINGS, VALVES AND FIRE HYDRANTS SHALL MEET ALL AWWA (AMERICAN WATER WORKS ASSOCIATION) PROJECT STANDARDS.
- Pipe - Ductile Iron, CL 52, push on joint.
  - Copper - Type K (Heavy Wall) Soft - ASTM B-89.
  - Fittings - Cast Iron, Mechanical Joint w/Retainer Glands ANSI A21.10.
  - Gate Valves - Waterous series 500 Resilient Wedge or American Darling CRS-80 gate valves or equal, non rising stem, Mechanical Joint, open left.
  - Butterfly Valve - Mueller Lineseal Xp<sup>(TM)</sup>, American-Darling Class 250, Butterfly or equal. Rubber-sealed tight-closing type and shall meet or exceed AWWA Specification C-504-87, Mechanical Joint; M.J. Open left. Valve operators shall be of the traveling-nut type and shall use full AWWA C504 Class 130-B torque rating throughout entire travel.
  - Corporation Stops - Ford type F600 or Mueller H-15000, inlet AWWA taper thread outlet, pack joint, Electrical Continuity Required.
  - Curb Stops - Ford Ball Valve Curb Stop Model B22-333 or Mueller H-1502-1.
  - Tapping Sleeve and Valve - Mechanical joint sleeve with flange fitting for tapping valve. 200 psi work pressure, tapping sleeves shall meet the requirements for resilient wedge gate valves, above insofar as they apply. Tapping valves shall be flanged by mechanical joint. Tapping valves shall be American-Darling Model No. 805 or equal. Tapping sleeves shall be American Darling Mechanical joint or equal.
  - Valve Boxes and Covers - Cast Iron, Two piece sliding tape, 5 1/4" diameter, Flared Base, the work "WATER" shall be cast into cover.
  - Curb Box - Shall be adjustable in lengths consistent with pipe depths. Curb boxes shall be equal to Mueller H-10314 or E.J. Prescott No. 4537 with No. 45420 with No. 45525, stationary rods will be supplied with curb boxes.
  - Flexible Couplings - Dresser Style 3R.
  - Solid Sleeve Couplings - Clow F-1014 long sleeve or equal.
  - Adapter Couplings - Adapter couplings may be required for fittings new services to existing service lines. Such fittings shall be flared connections and provide electrical continuity. Fitting shall be equal to Mueller H-15402.
  - Tapping Pipe - Tapping ductile iron pipe; corporation stops shall be installed in ductile iron pipe with direct tape.
  - Hydrants - Eddy F-2640, 6 inch MJ inlet, 5 1/4" main valve, 2-2 1/2" hose outlets, 1 - 4 1/2" pumper outlet, National Standard threads.
  - Rigid Insulation - Upjohn CPE Tryster rigid urethane, or approved equal - 2' x 8' x 2" rigid urethane insulation for house services - 2 inch O.D. x 3/4 inch I.D.
  - POLYVINYL CHLORIDE PIPE: SHALL BE SDR-35, PUSH-ON JOINT CONFORMING WITH ASTM D3034. FITTING SHALL COMPLY WITH ASTM D3034. JOINTS SHALL COMPLY WITH ASTM D3212.

**DATUM**

VERTICAL \_\_\_\_\_

HORIZONTAL \_\_\_\_\_

REV.	DESCRIPTION	BY	DATE
2	MATERIAL SPEC/CROSS DETAIL	LEB	3/19/90
1	CROSSING DETAIL	LEB	3/21/90



SHEET 100 OF 335

CITY OF MONTPELIER

**MISCELLANEOUS DETAILS**  
& MATERIAL SPECIFICATIONS

MONTPELIER, VERMONT

Duffness-Henry  
18 East State Street  
Montpelier, Vermont 05602

Client No. 010040 Proj. Mgr. T.D.N. Date 4-14-89

DRAWING 44-232-74957