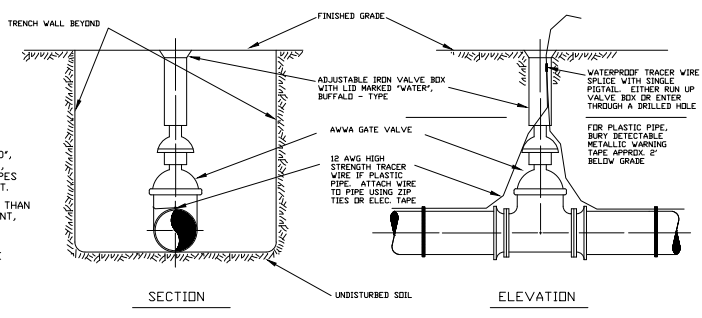


TYPICAL TRENCH DETAIL

N.T.S.

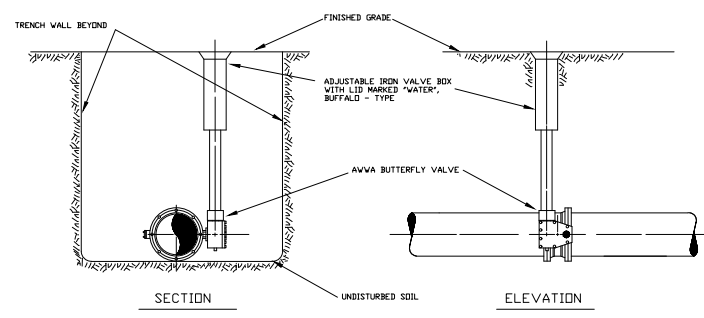
Y - DIMENSION	CONDITION & PIPE	SELECT MATERIAL	LINING
0'	DUCTILE IRON PIPE IN "ORDINARY SOIL"	TYPE I II OR III	-
6'	ALL PIPE OVER BEDROCK OR LEDGE	TYPE II OR III	SAND OR TYPE III
4'	DUCTILE IRON PIPE IN CLAY OR MUCK	TYPE II OR III	SAND
6'	PLASTIC - ALL	SAND	SAND

- \* SUITABLE MATERIAL SHALL CONTAIN NO STONES GREATER THAN 4" IN DIAMETER, NO FROZEN LUMPS, AND ONLY MINOR AMOUNTS OF CLAY OR ORGANIC MATERIAL. ALL MATERIAL TO BE PLACED IN MAXIMUM OF 12" LIFTS AND COMPACTED BEFORE PLACING NEXT LIFT.
- \* TYPE I MATERIAL SHALL BE EITHER GRAVEL OR EXCAVATED MATERIAL CONTAINING NO STONES GREATER THAN 1 1/2" IN DIAMETER, NO FROZEN MATERIAL, NO CLAY, AND NO ORGANIC MATERIAL.
- \* TYPE II MATERIAL SHALL BE CLEAN, HARD, CRUSHED DR NATURAL STONE WITH A GRADATION BY WEIGHT OF 100% PASSING A 1 1/2" SQUARE OPENING, NOT MORE THAN 25% PASSING A 3/4" SQUARE OPENING, AND NOT MORE THAN 5% PASSING A 1/2" SQUARE OPENING.
- \* TYPE III MATERIAL SHALL BE CLEAN, HARD, CRUSHED STONE FREE FROM COATINGS AND THOROUGHLY WASHED WITH A GRADATION BY WEIGHT OF 100% PASSING A 1" SQUARE OPENING AND 0 TO 5% PASSING A 1/4" SQUARE OPENING.



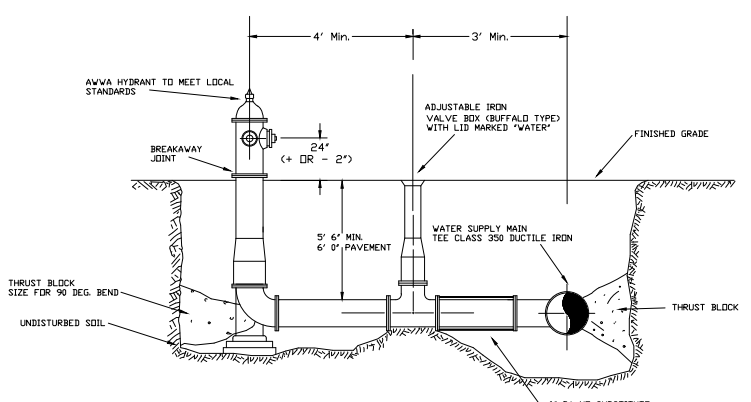
BURIED GATE VALVE DETAIL

N.T.S.



BURIED BUTTERFLY VALVE DETAIL

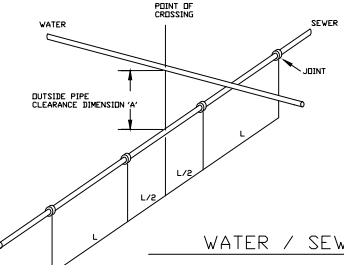
N.T.S.



TYPICAL HYDRANT INSTALLATION

N.T.S.

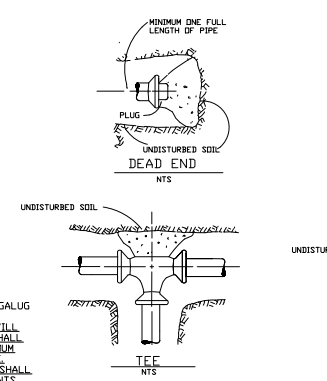
- 1 ALL HYDRANT DRAINS MUST BE PLUGGED SEE SPECIFICATION NO. 8
- 2 WHERE VALVE CANNOT BE RESTRAINED TO MAIN TEE, ANCHOR VALVE AS IN BURIED GATE VALVE DETAIL.
- 3 USE MEGALUG RETAINER GLANDS FOR ALL CONNECTIONS



WATER / SEWER CROSSING DETAILS

N.T.S.

- CONSTRUCTION RESTRICTIONS
1. IN ALL NEW CONSTRUCTION, DIMENSION 'A' SHALL NEVER BE LESS THAN 18 INCHES.
  2. WITH ALL NEW CONSTRUCTION, THE CROSSING SHALL BE ARRANGED AS SHOWN IN THIS DIAGRAM, SO THAT THE SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.
  3. IF THE WATER MAIN MUST PASS BENEATH THE SEWER IN NEW CONSTRUCTION, OR IT IS IMPOSSIBLE TO MAINTAIN THE 18 INCH SEPARATION DUE TO EXISTING UTILITY PREVIOUS CONSTRUCTION ONLY, THEN ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER, PLUS THE WATER MAIN OR THE SEWER SHALL BE COMPLETELY ENCASED IN A SEAMLESS SLEEVE CONSISTING OF A FULL (MINIMUM 19 FEET) LENGTH OF PIPE (e.g. SDR 35 PVC), CENTERED ON THE CROSSING UTILITY.



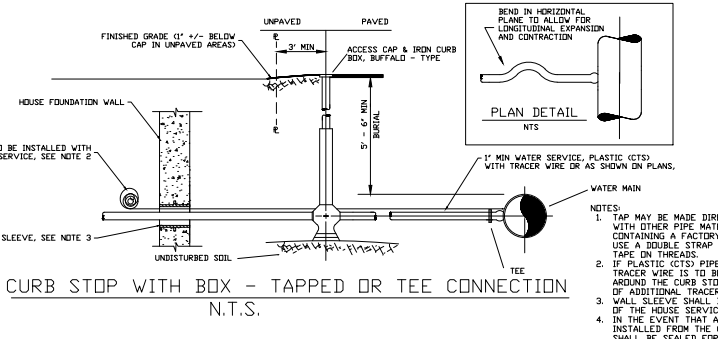
THRUST BLOCK DETAILS

N.T.S.

MINIMUM AREA OF BEARING SURFACE OF CONC. THRUST BLOCKS (IN SQUARE FEET)

3"		4"		6"		8"		12"		SOIL CONDITION	SAFE BEARING LOAD (PSF)				
ENDS	TEES	ENDS	TEES	ENDS	TEES	ENDS	TEES	ENDS	TEES						
0.5	0.5	0.5	0.5	1.0	1.5	1.0	1.5	2.0	2.5	1.5	1.0	SOUND SHALE	10,000		
1.0	1.0	1.5	2.0	1.0	0.5	3.0	4.0	2.0	1.0	4.5	6.5	3.5	2.0	CEMENTED GRAVEL & SAND	4,000
1.0	1.5	0.5	2.0	2.5	1.5	1.0	3.5	5.0	3.0	1.5	6.0	8.5	5.0	COARSE & FINE COMBED SAND	3,000
1.5	2.5	1.5	2.5	3.5	2.0	1.0	5.5	7.5	4.0	2.0	9.0	13.0	7.0	MEDIUM CLAY (CAN BE SHAVED)	2,000
3.0	4.5	2.5	1.5	5.0	7.0	4.0	2.0	10.5	15.0	8.0	4.0	18.0	25.0	SOFT CLAY	1,000

MAXIMUM WATER PRESSURE = 300 PSI NOTE: REDUCE BEARING AREA = 45 DEG. BEND, LARGER PIPE



CURB STOP WITH BOX - TAPPED OR TEE CONNECTION

N.T.S.

- NOTES:
1. TAP MAY BE MADE DIRECTLY TO DUCTILE IRON PIPE, WITH OTHER PIPE MATERIALS USE EITHER A COUPLING CONTAINING A FACTORY - TAPPED BRASS BUSHING OR USE A DOUBLE STRAP SERVICE CLAMP. USE TEFLON TAPE ON THREADS.
  2. IF PLASTIC (CTS) PIPE IS USED FOR HOUSE SERVICE, TRACER WIRE IS TO BE INSTALLED FROM THE MAIN, AROUND THE CURB STOP INTO THE HOUSE WITH A COIL OF ADDITIONAL TRACER WIRE, INSIDE THE HOUSE.
  3. WALL SLEEVE SHALL BE TWO (2) TIMES THE DIAMETER OF THE HOUSE SERVICE BEING INSTALLED.
  4. IN THE EVENT THAT A HOUSE SERVICE IS NOT BEING INSTALLED FROM THE CURB STOP, THE CONNECTION SHALL BE SEALED FOR FUTURE INSTALLATION.

NOTES:

- Before construction of any utilities or improvements, the Contractor shall notify the Department of Public Works (DPW), IN WRITING, of intent to proceed.
1. All water mains, fittings, appurtenances and other materials, and construction shall conform to all applicable AWWA, State and City codes, standards and regulations. In the case of conflict between these construction details and specifications and a code or regulation, the decision of the Vermont Department of Health or VTDEC Water Supply shall be binding.
  2. All water mains, fittings, appurtenances shall be installed in a workmanlike manner. Installation shall be under the general inspection of the Public Works Department. Before any water line work is commenced by the Contractor, they shall notify the Public Works Department at least five (5) work days in advance of his intention to proceed.
  3. Connection to an existing water main shall be done under the supervision of, and with the approval of the Public Works Department. It is the Contractor's responsibility to secure ALL necessary permits and permission to make the connection and to coordinate all parties involved in the process. The Public Works Department shall be notified AT LEAST five (5) work days in advance of the intended connection time.
  4. An inspector employed by the Public Works Department shall be notified at least two (2) days in advance of all water line installations. Said inspector shall be on the premises for all water line installations.
  5. As-Builts prepared by the Contractor are required by the Public Works Department at the time of the completion of the water system. The contractor shall provide accurate tie sheets for all valves, fittings and curb stops. The contractor shall allow the city to access the construction site to obtain additional infrastructure information throughout the project.
  6. All water mains shall have horizontal and vertical distances as detailed on this drawing.
  7. All public and private water mains: 1) 4' or greater shall be C-900 pipe (per note 21 below); 2) less than 4' in diameter shall be ULTRA-HIGH WEIGHT, CTS POLYETHYLENE TUBING DESIGNED FOR A WORKING PRESSURE OF 200 PSI (AWWA C-901, ASTM-D1248 AND ASTM-D-2737). All water line fittings shall be ductile iron, (AWWA C-110), cement-lined. For water lines less than 4 inches in diameter, fittings (other than valves) shall MEET MANUFACTURER'S RECOMMENDATIONS AND MEET VERMONT ACT 193 REQUIREMENTS FOR LEAD CONTENT.
  8. All buried valves shall conform to AWWA C-504 or C-509, and be resilient wedge gate valves up to 12 inch in size, and either resilient wedge or butterfly valves for larger sizes. All gate valves shall open right (clockwise) and shall have adjustable iron valve boxes extending to the finished grade (see Typical Details).
  9. Hydrants shall be in accord with AWWA C-502, 3-way post type breakaway Kennedy (KB-1), with two (2) 2-1/2" hose nozzles and one (1) 4-1/2" steamer nozzle. Nozzle threads shall be Roxbury double-seal. Hydrants shall be provided with a 6.5" bury (riser). In all cases, it is the Contractor's responsibility to check with the Public Works Department to secure approval of the selected hydrant(s) and assure compatibility. All hydrant drains shall be permanently plugged, a non-driping hydrant shall be installed. All hydrants shall be set back a minimum of three (3) feet from paved surfaces. In addition, wherever a traffic hazard appears to exist (in the opinion of the Public Works Department), the hydrant shall be protected by curbing and/or post-stanchions.
  10. Curb boxes shall be Buffalo type with telescoping top and bolt-on caps.
  11. All water lines and appurtenances shall be pressure and leak-tested, before being placed into service, according to AWWA Standard C-600. The test pressure shall be 200 psi (+/- 5psi), measured at or near the high point in the portion of the system being tested, and the test shall be run for two (2) hours. The Public Works Department shall be given at least twenty-four (24) hours notice before the test is to be conducted, and DPW personnel shall witness the test. Allowable leakage shall be computed by the following formula, L=(S x D x sq. root(P))/133200, where L=number of gallons allowed leakage per hour, S=length of pipe tested in feet, D=inches of nominal pipe diameter, P=average test pressure (psi gauge). The person(s) conducting the test(s) shall, IN WRITING, certify the results to the Public Works Department.
  12. All water lines, before being put into service, shall be disinfected in accordance with the latest edition of AWWA C-651, or as directed by the Public Works Department. Contractor shall install 1" diameter tap in water main for chlorine injection. Tap shall be located as approved by the Public Works Department. The person(s) responsible for disinfection shall certify, IN WRITING, to the Public Works Department and Vermont Department of Health that this disinfection procedure was followed and the required minimum results were obtained. Contractor shall be responsible for all sampling and analysis costs. TAP USED FOR CHLORINATION SHALL BE CLOSED AND PLUGGED PRIOR TO BACKFILL. The contractor shall perform all construction activities in conformance with the latest edition of AWWA C-651. THE CONTRACTOR SHALL RECEIVE THE LATEST EDITION OF BURLINGTON'S WATER REPAIR FLOW CHART TO ENSURE CONFORMANCE WITH AWWA C-651. THE CITY REQUIRES PAC-1 SAMPLES BE COLLECTED AND TESTED ANY TIME THE EXISTING WATER SYSTEM IS CUT INTO.
  13. Water main valves and curb stops shall be inside city right-of-way.
  14. No valves, hydrants, curb stops, etc. shall be operated without prior approval by the Public Works Department.
  15. All taps larger than 1" require the use of bronze saddles. SADDLES ARE REQUIRED FOR ALL TAPS ON PVC PIPE.
  16. All brass unions and adapters shall be low-lead by Cambridge.
  17. All corporations and curb stops shall be Cambridge with nitrile gaskets.
  18. Water mains 4" and larger shall be AWWA C900 PVC pipe with a pressure class of 305 psi (DR14). Mains 2" or less shall conform to AWWA C901 and be HDPE CTS pipe with a pressure class of 200 psi (SDR 9). All plastic pipe (INCLUDING SERVICES) will require a 12 AWG high strength copper clad steel tracer wire with blue insulation fastened directly to the top of pipe with nylon tie wraps or electrical tape. This tracer wire shall be a continuous run (no splices) between valves with ends for attaching a locating signal at every valve box, end of pipe run or every 500' of pipe, whichever is less. If no valve boxes are located within 500' of each other, a magnetized tracer box is required. Waterproof splices shall be allowed in valve boxes as per the detail on this sheet. Tracer wire, tracer boxes and wire nuts shall be manufactured by Copperhead Industries or approved equal. In addition, detectable metallic underground tape labeled "Caution Buried Water Line Below" shall be manufactured by Trumbull Industries or approved equal and buried approx. 2' below finished grade.
  19. Nitrile Butadiene Rubber (NBR) gaskets shall be used in lieu of the standard Styrene Butadiene Rubber (SBR) gaskets for C900 water pipe and fittings.



DESIGNED: SR/MSL  
 DRAWN: SR/MSL  
 CHECKED: SR/MSL  
 SCALE: NONE  
 DATE: 12/11/18

WATER SYSTEM CAPITAL IMPROVEMENTS  
 2019 WATER MAIN REHABILITATION

CITY OF BURLINGTON, VT

DRAWING NO. D-1

REV. NO.	DATE	DESCRIPTION	DRAWN	CHECKED