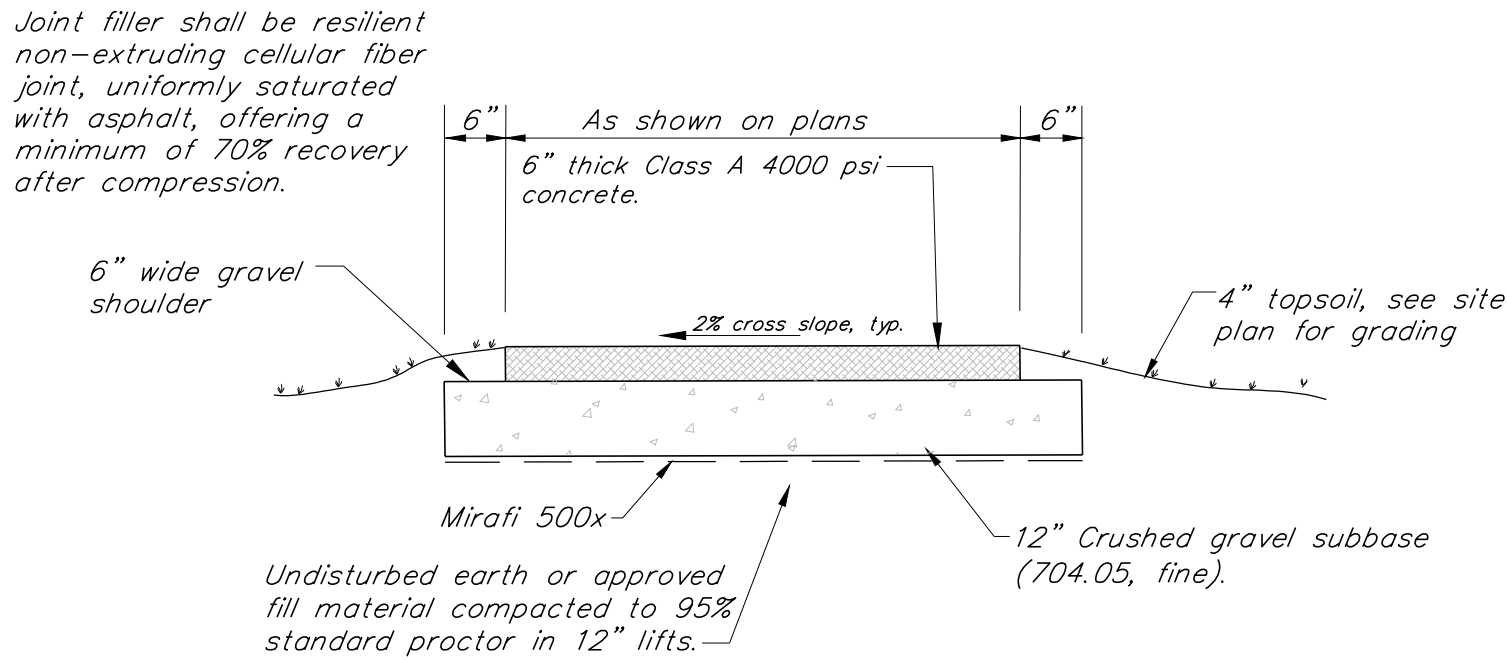


Road Construction Notes

1. New road shall be constructed to the line and grade shown on the drawings. The road and utility locations shall be as typically detailed unless otherwise shown.
2. All road and parking construction shall be completed in accordance with the Vermont Agency of Transportation "Standard Specifications for Construction" 2011, hereafter called Vermont Highway Specifications, specifications found on these plans, and project specifications. In case of conflict, the more stringent specification shall apply as determined by the Engineer.
3. The Contractor shall follow Vermont Highway Specifications (2011) Section 203.11 for placing and spreading embankments.
4. Fill material for road embankment shall meet Note #13 below and be approved by the Engineer. Fill shall be placed in 12" lifts, wetted and compacted with satisfactory compaction equipment to 95% of maximum density (Standard Proctor).
5. Road in fill sections shall be placed and compacted a minimum of 3 feet above top of any utility to be installed before trench is excavated for pipe placement. In trenches and cut sections, the Contractor shall provide all necessary sheeting, shoring and bracing to maintain compliance with all OSHA/VOSHA regulations.
6. Methods for construction of subgrade shall conform to Vermont Highway Specifications (2011) 203.12 or as determined by the Engineer.
7. Any subgrade or subbase disturbed by Contractor, or rendered unsuitable by construction machinery, shall be removed and replaced with approved granular backfill at the Contractor's expense. The subgrade shall be compacted to attain at least 95% of the maximum density (Standard Proctor) before placing road or embankment materials.
8. The Owner will pay for on site soils testing (compaction, sieve, and proctor). The Contractor shall pay for failing tests.
9. Sand borrow and cushion shall conform to Vermont Highway Specifications (2011) 703.03. Granular borrow shall conform to the Vermont Highway Specifications 703.04.
10. Gravel subbase for pavement shall conform to Vermont Highway Specifications (2011) 704.06, Dense Graded Crushed Stone. Substitute materials identified in VAOT Specifications Section 301 - Subbase are not allowed.
11. Leveling course shall conform to Vermont Highway Specifications (2011) 704.05, fine grading. Shoulders shall conform to Section 704.12, Aggregate for Shoulders. Substitute materials identified in VAOT Specifications Section 301 - Subbase are not allowed.
12. Bituminous concrete pavement shall conform to Vermont Highway Specifications (2011) Section 404 and 406. Binder course shall be Type I + II, and finish wearing course shall be Type III, IV, or as detailed.
13. Embankment fill for all impervious areas, EXCLUDING BUILDINGS, shall be a sieve specification as follows:
- | Sieve | % Finer |
|-------|------------|
| 4" | 100 |
| 2" | 85-100 |
| #4 | 60-100 |
| #200 | 30 maximum |
14. Dense graded crushed stone, crushed gravel and sand borrow shall not be contaminated by work. Construction traffic shall not travel over exposed areas of this material.
15. Contractor is responsible for all pavement markings (ie parking striping, handicap markings, stop bars, etc.) shown or implied on the Plans. This includes both new and replacement of existing.
- Paint for pavement markings shall be Hydrophast Waterborne Traffic Paint by Franklin Paint Company. It shall be reflective, VOC compliant, fast drying, 100% acrylic waterborne traffic paint. Paint for parking line striping shall be white.
 - Traffic paint shall be applied with a uniform thickness and at a rate such that no pavement is visible after drying. Additional paint application will be required if underlying pavement is visible.

All concrete used in the construction of concrete sidewalk shall be air entrained and made with Portland cement. The concrete shall meet section 541 of the State of Vermont Standard Specification for Construction for Class A concrete and have 28 day compressive strength of 4,000 psi.

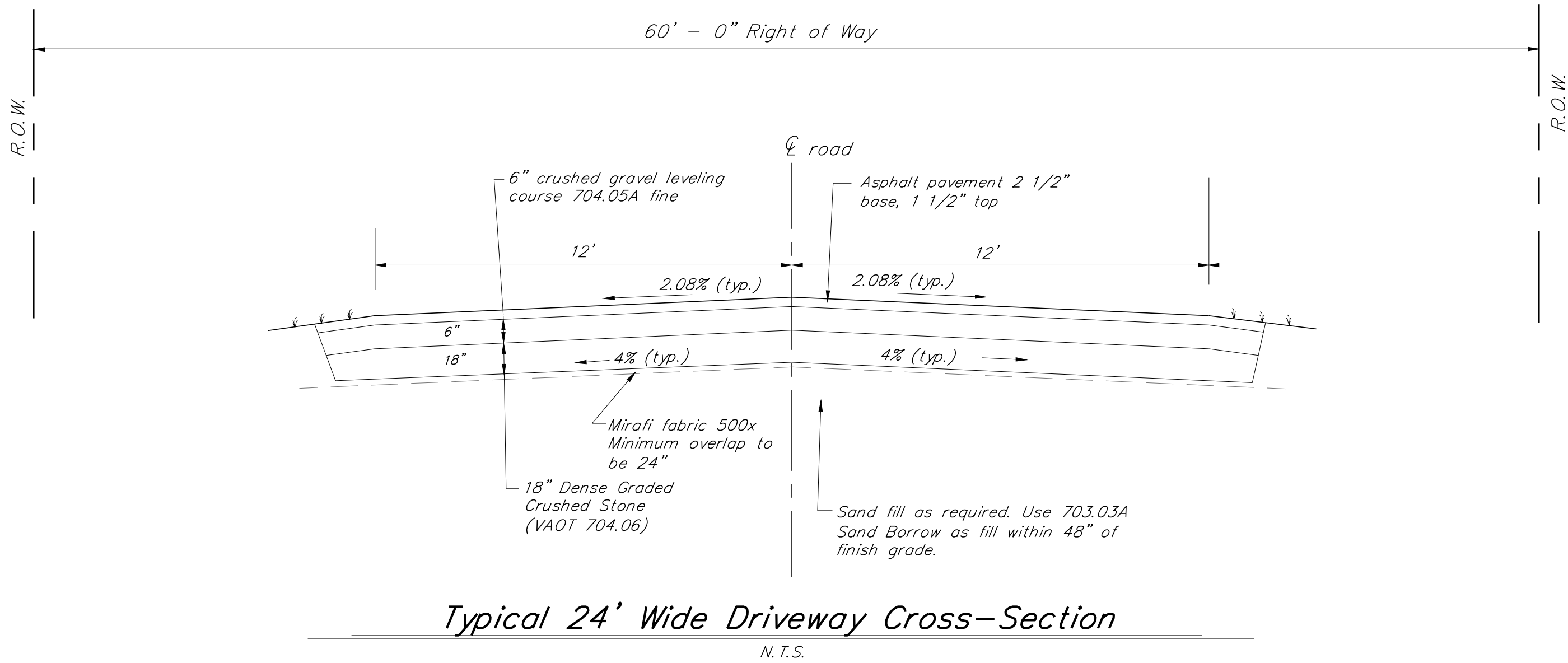
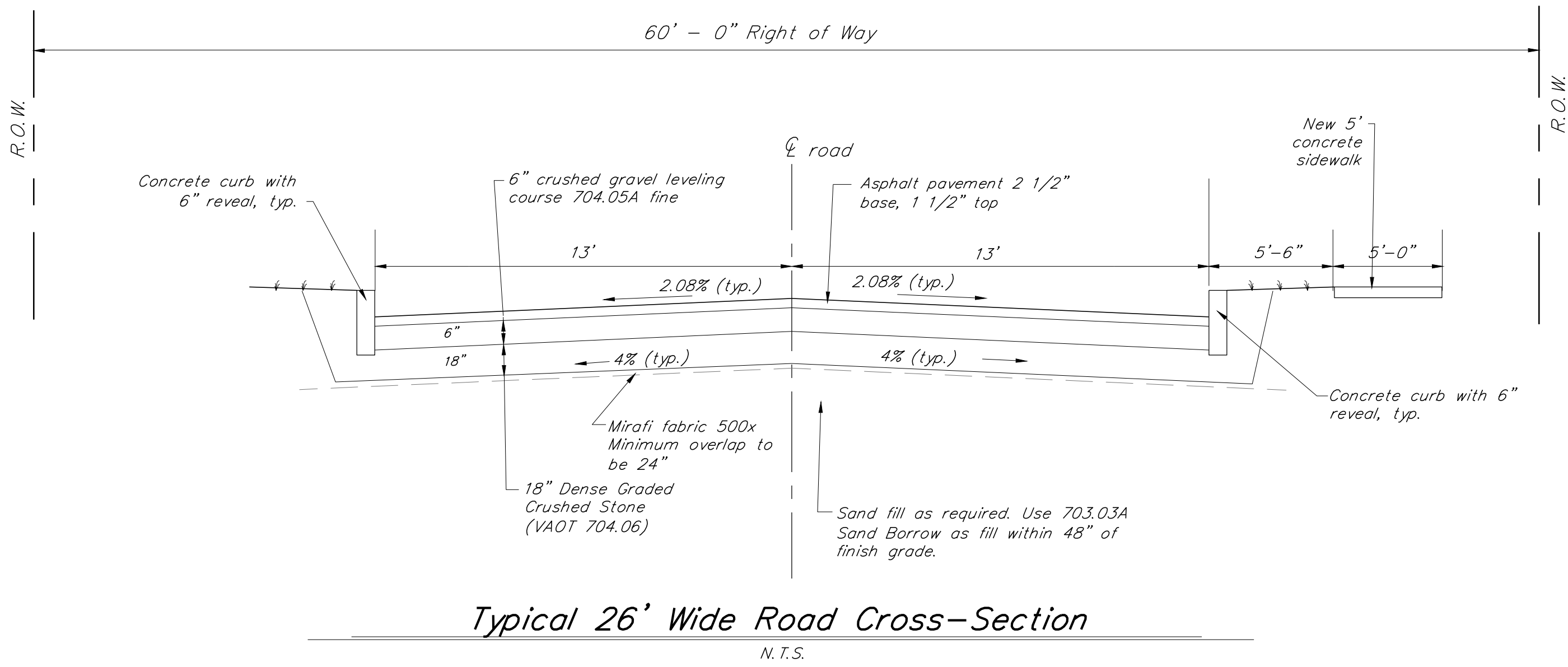


Concrete Notes

- Broom finish concrete
- Construction joints shall be spaced max. 24' in all directions. See Concrete Construction Joint Detail.
- Score control joints 1-1/2" depth at intervals equal to width of sidewalk. Contractor is responsible for providing appropriately sized tooling trowel.
- Apply SpecChem Cure Shield cure/seal compound to all concrete surfaces, per the manufacturer's specifications.
- Concrete construction and curing shall conform to section 618.03 of the current VAOT Standard Specifications for Construction

New Concrete Sidewalk Detail

N.T.S.



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STAMP:

Project:

**BRAULT
3-LOT SUBDIVISION**

0 Bombardier Road
Milton, Vermont

Project No. 21282

Scale N.T.S.

Drawn by TJB

Checked by DMR

Date 08/31/2021

Revisions		
No.	Date	Description

Drawing Title

CIVIL DETAILS

Drawing No.

CD-1

1. The Contractor shall test both the pump station wetwell and the valve pit for watertightness prior to backfill. The leakage test shall conform to applicable sections of the State of Vermont Environmental Protection Regulations, Chapter 14, Indirect Discharge Rules (April 2003). This test shall be witnessed by the Engineer and shall be performed as follows:

Pump Station structure shall be checked for infiltration by filling with water to the top of the cone section. A stabilization period of one hour shall be provided to allow for absorption. At the end of this period, the structure shall be refilled to the top of the cone, if necessary, and the measuring time of at least six hours begun. At the end of the test period, the structure shall be refilled to the top of the cone measuring the volume of water added. This amount shall be converted to a 24 hour rate and the leakage determined on the basis of depth. The leakage for each structure shall not exceed one gallon per vertical foot for a 24 hour period for exfiltration and there shall be no visible infiltration.

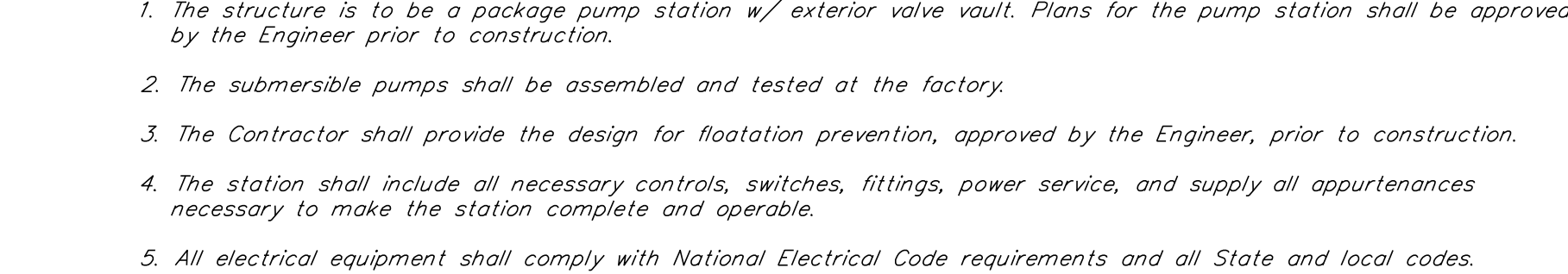
2. All penetrations and joints shall have watertight seals.

4. The pump station shall include all the necessary controls, switches, fittings and appurtenances to make the station complete.

6. The Contractor shall use Schedule 80 PVC with solvent weld joints for all piping inside pump station and valve pit.

8. Any modifications to pump station design or location must be approved by the Engineer and other permitting authorities.

9. The Contractor shall anchor tank as required to prevent flotation of valve pit and pump station wet well. Flotation calculations for the structures must be provided by the Contractor.



1. The sewage pumps shall be designed such that, with any one pump out of service, the remaining unit(s) will have capacity to handle the design peak hourly flow.
2. The pumps shall be recessed impeller, explosion proof, non-clog type specifically designed for raw sewage applications.
3. Each pump shall be of heavy cast iron construction. The shaft shall be of solid stainless steel construction sealed against leakage by a double mechanical seal.
4. Pumping sequence shall be arranged in an alternating "lead"/"lag" configuration. When liquid level reaches the predetermined "lead" elevation, the designated lead pump shall start automatically. This pump shall continue to operate until such time as the liquid level falls below the designated "pump off" elevation. When the liquid level rises above the "pump off" level, the liquid level rises to the "lag pump" on elevation, then the designated lag pump shall be automatically activated. Both the lag pump and the lead pump shall continue to operate until liquid level reaches the designated "pump off" elevation. A "high level alarm" condition shall occur if liquid level rises above the predetermined alarm level (specifically established at an elevation 6" above the "lag pump" on elevation). When alarm condition occurs, the alarm shall remain in effect until manually reset from the control panel.

The main equipment control system shall be mounted on separate posts or on buildings as specified on Electrical Plans in a NEMA 4 panel, complete with suitable latching devices. All circuit breakers, motor starter reset buttons, and pump control switches shall be mounted so that they are operable without opening the cabinet. The low voltage pump control switch shall be mounted separate from the high voltage circuit breaker motor starter section and shall be provided with a hinged access door and latch. The control switches shall be mounted on the face of the automatic pump control section door. A grounding-type convenience duplex outlet shall be provided for operation of 115 volt AC devices.

Thermal magnetic circuit breakers shall be provided for branch disconnect service and over-current protection of all motor, control and auxiliary circuits. Magnetic across-the-line starters with under voltage release and overload coils for each phase shall be provided for each pump motor to give protection against single phasing. Each single phase auxiliary motor shall be equipped with an over-current protection device, in addition to its branch circuit breaker, or shall be impedance protected. All switches shall be labeled and a coded wiring diagram shall be provided.

A running time meter shall be supplied for each pump to record the hours of operation. The meter shall be enclosed in a dust- and moisture proof molded plastic case. The flush mounted dial shall register in hours and tenths of hours up to 99999.9 hours before repeating. The meter shall be suitable for operation from 115 volt, 60 cycle supply and shall be mounted on the surface of the control cabinet.

The pump station shall be completely pre-wired at the factory, except for the power feeder lines. All wires shall meet the requirements of the National Electric Code and shall be color-coded as indicated on the wiring diagram. All wiring outside the panel shall be in conduit, except for the 115 volt accessory items which are provided with insulated service cord. Conduit shall be provided from the control panel across the ceiling, and up the entrance tube to receive the feeder lines, and shall terminate in a threaded conduit connection through the wall of the entrance tube. All receptacles shall be of the ground fault type.

All material and equipment necessary for a complete and workable electrical system shall be furnished and installed including: conduit and fittings, wire and cable, service panel, grounding, alarm system, connections to pump station, power company connection fees, telephone service fees.

Packaged pump station will be furnished completely wired including controls and will require only power wiring from the service panel to the control panel in the pump station and signal wiring for the high level signal from the pump station control to the service panel. The above grade panel and signal communicator shall be provided by the pump station manufacturer.

All materials and equipment shall meet the standards of the National Electrical Manufacturer's Association and Underwriters Laboratories, Inc., and shall bear their label wherever standards have been established and label service is available.

Installation of electric systems and controls shall be in conformance with the latest edition of the National Electric Code, local ordinances and regulations prescribed by the local power company.

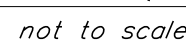
Completed electric work performed shall comply with the latest edition of the National Electric Code. Underwriters Laboratories regulations and all Municipal, State and other public or private authorities having jurisdiction. The contractor is responsible for acquiring all necessary permits. All equipment and materials shall be guaranteed to be free from mechanical and electrical defects for a period of one year from the day of final acceptance. Any replacement of parts or adjustments, including labor made necessary by such defects and adjustments, shall be rectified without cost to the Owner.



All mechanical, control and alarm functions shall be tested in the presence of the Owners representative to demonstrate that all equipment is fully operational.

Any grounds, opens, shorts or other defects shall be rectified at no cost to the Owner before acceptance.

The contractor and electrician shall perform a start up test with potable water. Engineer shall witness test. Flow rate of pumps, start up amperage, run amperage, flow rate, alarms, floats, alternator, etc. shall be measured.



STAMP:

Drawing No.

CD-2

Construction Notes

The Contractor will be responsible for all construction of water main, storm and sanitary sewer systems as shown on the plans. The Contractor will be responsible for all necessary adapters, fittings, etc. to make connections to the existing and proposed units. The Contractor shall be responsible for all work shown or implied on the plans and/or referenced in the specifications and permits. The Contractor shall submit, for approval by the Engineer, all types of materials and products used.

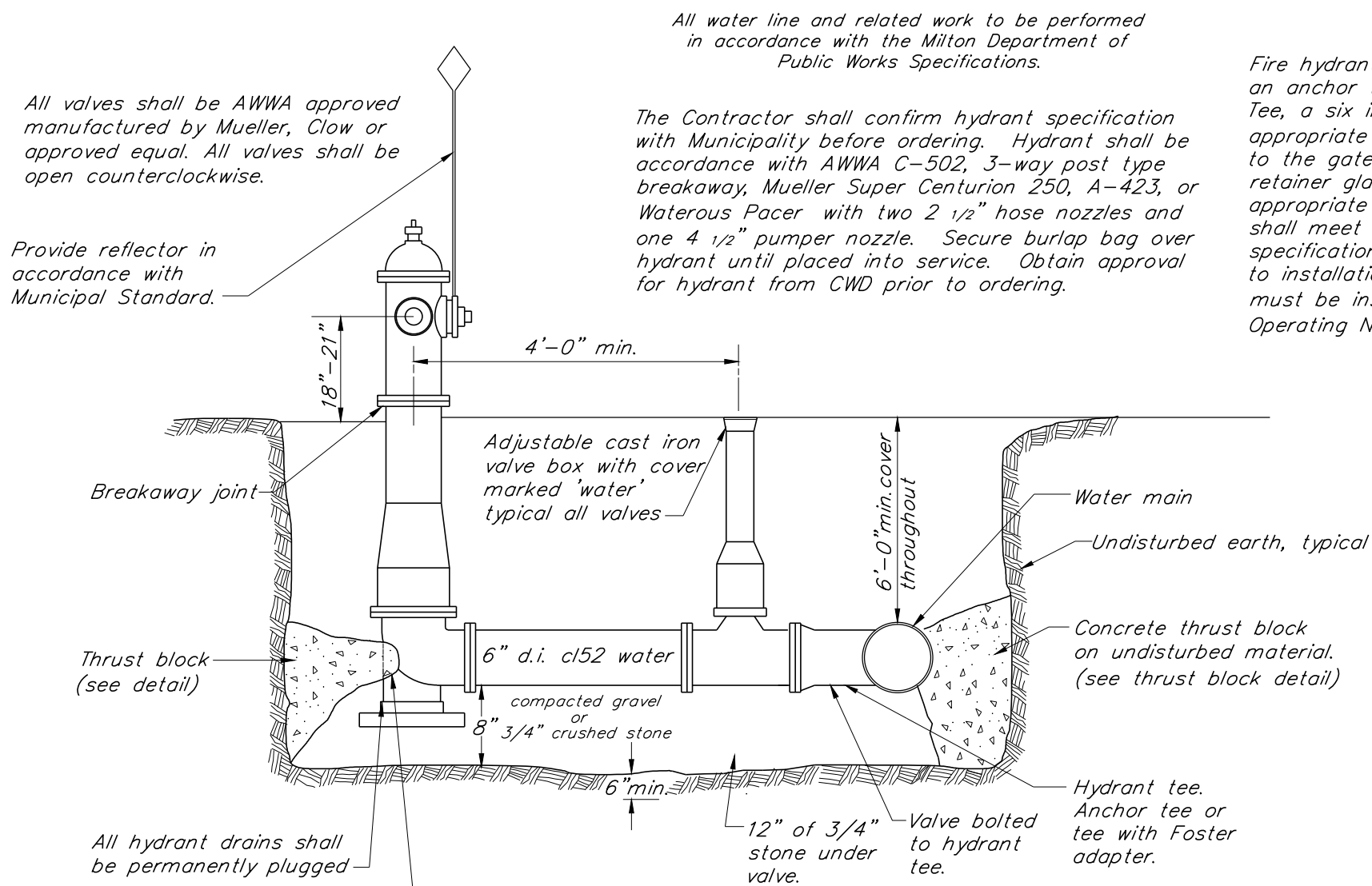
Water Main (Applies to new domestic water mains and services) (See also Fire Service Main Notes)

- The pipe for water main shall be CL52 ductile iron. Ductile iron fittings shall conform to AWWA C110, 350 pounds working pressure. Valves shall be manufactured to meet all requirements of AWWA specification C509.
- All pipe shall be installed in accordance with AWWA C600. The pipe ends of pipe shall be kept free of foreign matter and debris during installation. When the process of pipe laying has stopped, any open ends of pipe shall be plugged. There shall be a minimum of 6'-0" (1.82 m) cover over all pipe and service lines. Any pipe deflection shall not exceed fifty (50%) percent of recommended manufacturer's maximum deflection. Backfill materials and procedures shall be as detailed on the drawings. The Contractor shall be responsible for any and all sheeting and/or shoring necessary to comply with OSHA - VIOSHA regulations.
- The testing of the water main shall consist of the testing of all installed pipe, services and hydrants in accordance with AWWA C600. The testing shall consist of a pressure test and leakage test. All testing shall be done with potable water and in the presence of the Engineer, and representatives from the Town of Milton Water Department. The pressure test consists of maintaining a minimum internal pipe pressure of 200 psi (140,620 kg/m²) for two (2) hours. The testing allowance shall be defined as the maximum quantity of makeup water that is added into a pipeline undergoing hydrostatic pressure testing, or any valved section thereof, in order to maintain pressure within +/- 5 psi of the specified test pressure (after the pipeline has been filled with water and the air has been expelled). No pipe installation will be accepted if the quantity of makeup water is greater than that determined by the following formula:

$$L = \frac{SD\sqrt{P}}{148,000}$$

L = testing allowance (makeup water), in gallons per hour
S = Length of pipe tested, in feet
D = Nominal pipe diameter, in inches
P = average test pressure during the hydrostatic test, in pounds per square inch (gauge)

$$L = \frac{SD\sqrt{P}}{148,000}$$
- Chlorinating of the system shall be accomplished after the water main has been successfully pressure tested and thoroughly flushed. Disinfecting shall be in accordance with AWWA C-651. The disinfecting process shall be deemed acceptable only after two consecutive sets of acceptable samples, taken from the flushed and disinfected main 24 hours apart, shows no evidence of bacteriological contamination. For proper disinfection use minimum 25 mg/l chlorine concentration for 24 hours. The concentration must remain above 10 mg/l. Tablet disinfecting is not acceptable.
- The water main shall be thoroughly flushed with a minimum flow velocity of 2.5 ft/s to flush foreign materials out of the valves and hydrants. Prior to flushing, the Contractor shall contact the Owner, Fire Department in the municipality, the District Water Supply or Department of Public Works, and the Engineer.

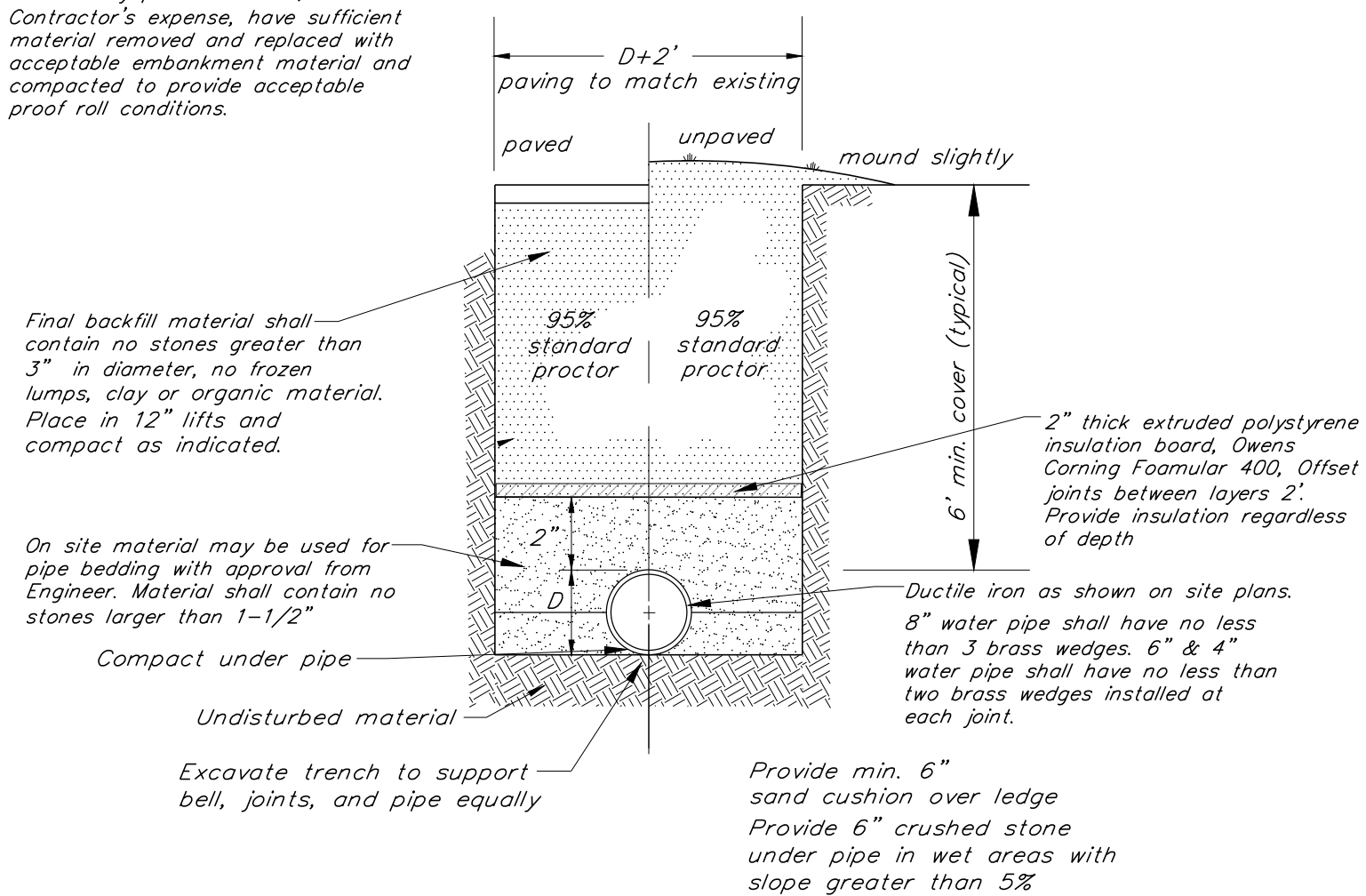


Typical Hydrant & Gate Valve Assembly

N.T.S.

Backfill material under roads or paved areas must pass subgrade proof roll. Any trench area that does not successfully proof roll shall, at the Contractor's expense, have sufficient material removed and replaced with acceptable embankment material and compacted to provide acceptable proof roll conditions.

The Contractor shall be responsible for complying with OSHA - VIOSHA regulations.



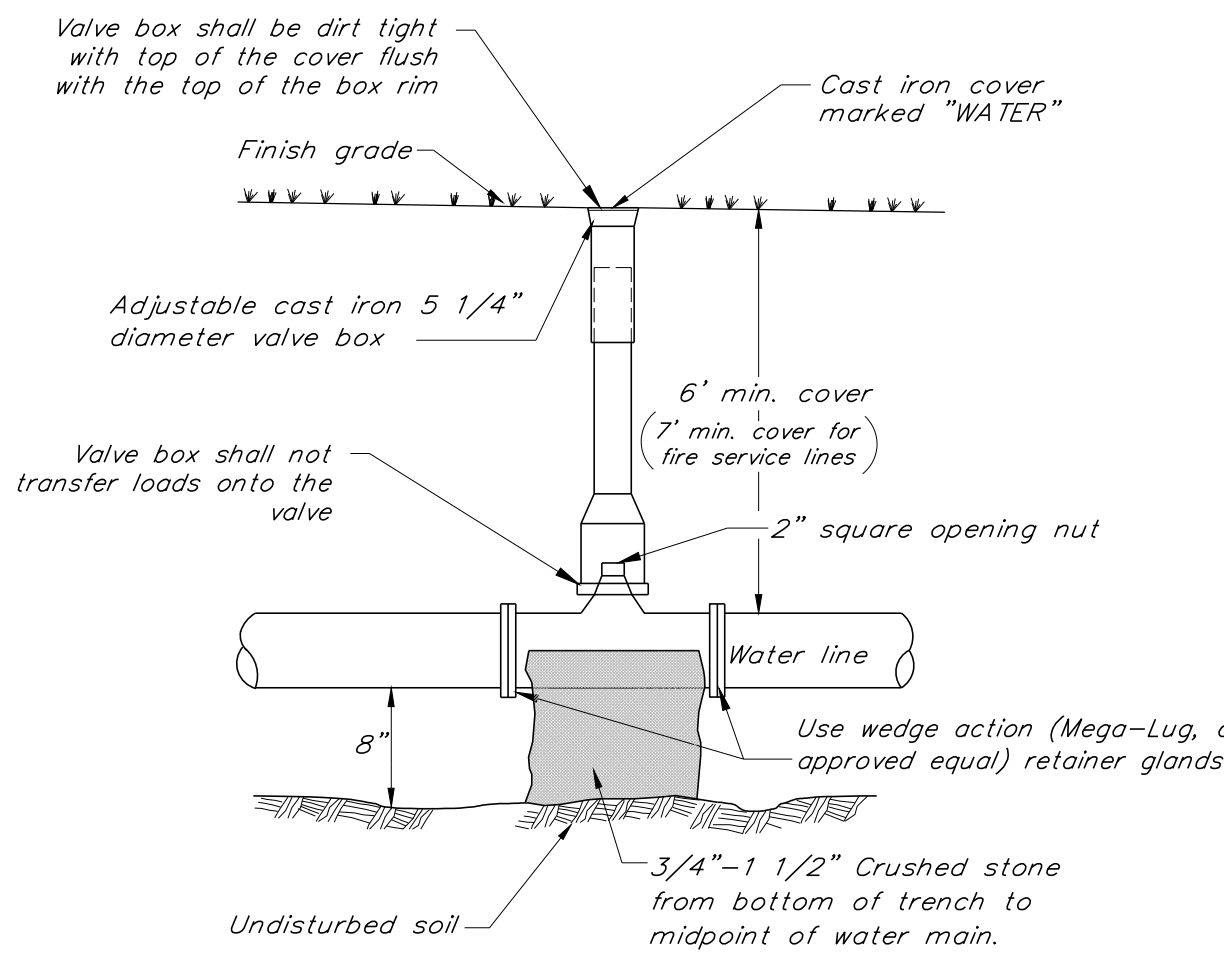
Typical Water Trench Detail

N.T.S.

WATER & SEWER Testing and Contractor Coordination Requirements

- All water lines and sewer lines shall be thoroughly tested by the Contractor in accordance with the Environmental Protection Rules (09/29/07), and the Chapter 21 Water Supply Rules (the more stringent rule shall apply).
- All private or municipal waterlines shall be tested by the Contractor in accordance with the procedures outlined in AWWA C600 and/or NFPA 24.
- The Contractor will be responsible for all construction of water main and sanitary sewer systems as shown on the plans. The Contractor will be responsible for all necessary adapters, fittings, etc. to make connections to the existing and proposed units. The Contractor shall be responsible for all work shown or implied on the plans and/or referenced in the specifications and permits. The Contractor shall submit, for approval by the Engineer, all types of materials and products used.
- No water main shall be closer than ten (10) feet to any sanitary sewer or sanitary manhole and five (5) feet to any catch basin or storm sewer line. Provide minimum of 18" vertical separation between water main and storm/sanitary sewer crossing.
- The Contractor shall be responsible for construction as-builts to service locations, and any water main fittings. As-builts shall be recorded in accordance with the outlined procedures.
- The Contractor shall be responsible for contacting the Engineer, Municipality, and Water District, when applicable, at least 48 hours prior to starting construction on any portion of the exterior water or sanitary systems. This notification requirement shall continue to the completion of the water and sanitary systems.
- Utility Testing. The Contractor shall be responsible for scheduling water and sanitary testing, with the Engineer, Municipality Public Works Department, and/or the Water District at a minimum of 48 hours prior to the test. Based on availability of Engineer's staff, the Engineer shall accommodate the testing schedule within 48 hours of the Contractor requested test date/time.
- The Contractor must successfully pre-test the water and forcemain for 2 hours prior to scheduling the Engineer. The Contractor shall notify Engineer immediately if pre-test failed.
- The Contractor shall immediately contact the Engineer if pre-scheduled testing and/or water/sewer construction is canceled. If Contractor does not contact Engineer and Engineer visits the site, the Contractor shall be responsible for Engineer's fees/mileage for site visit.
- The Contractor shall coordinate water construction with the Milton Water Department. The Contractor shall leave thrust blocks and other required sections of new line exposed until the Water Department has inspected and approved them.

- Valves shall be manufactured to meet all requirements of AWWA C509 or C515 latest edition. Valves twelve inches (12") and smaller shall be bubble tight, zero leakage at 200 psi working pressure. Valves shall have non-rising stems, open counter clockwise (left) and provide a two inch (2") square operating nut with an arrow cast in the metal indicating direction of opening. Each valve shall have the maker's name, pressure rating and year in which it was manufactured cast on the body. Valves shall be mechanical joint on each end, and secured to the adjoining pipe with an approved retainer gland. Prior to shipment from the factory each valve shall be tested by hydrostatic pressure equal to twice the specified working pressure.
- Gate valves shall be Mueller, Kennedy, AFC, M&H or approved equal on water distribution mains and Mueller, AFC, or approved equal on CWD Transmission mains.
- Gate valves used to convey or dispense water for human consumption shall comply with the Vermont Law (Act 193) An Act Relating to Prevention of Lead Poisoning By Exposure to Lead in Consumer Products, and shall contain no more than 0.25% lead by weighted average. Fixtures containing brass must comply with NSF/ANSI 61 Annex G.
- Buried gate valves shall be provided with a two inch (2") square wrench nut and shall be installed with a cast iron valve box as required to allow access to the valve operating nut at all times. In installations where the depth from grade to top of valve operating nut is greater than five feet (5'), a valve stem riser shall be provided and installed such that the depth from the valve stem riser nut to grade is from four feet to five feet (4'-5'). Valve stem risers shall be of high strength stainless steel and of welded construction (see Valve Stem Extension Detail in CWD Standard Specifications).
- All gate valve bolts, studs and nuts shall be made from corrosion resistant stainless steel.
- Tapping valve inlet and outlet connection shall be Standardized Mechanical Joint unless specified otherwise on the drawings for the type of pipe required for the branch or lateral pipeline.
- Valve boxes located in roadways shall have one non-adjustable paving riser of a height ranging from one and a half inches (1.5") to six inches (6") as needed, to be brought to final pavement grades

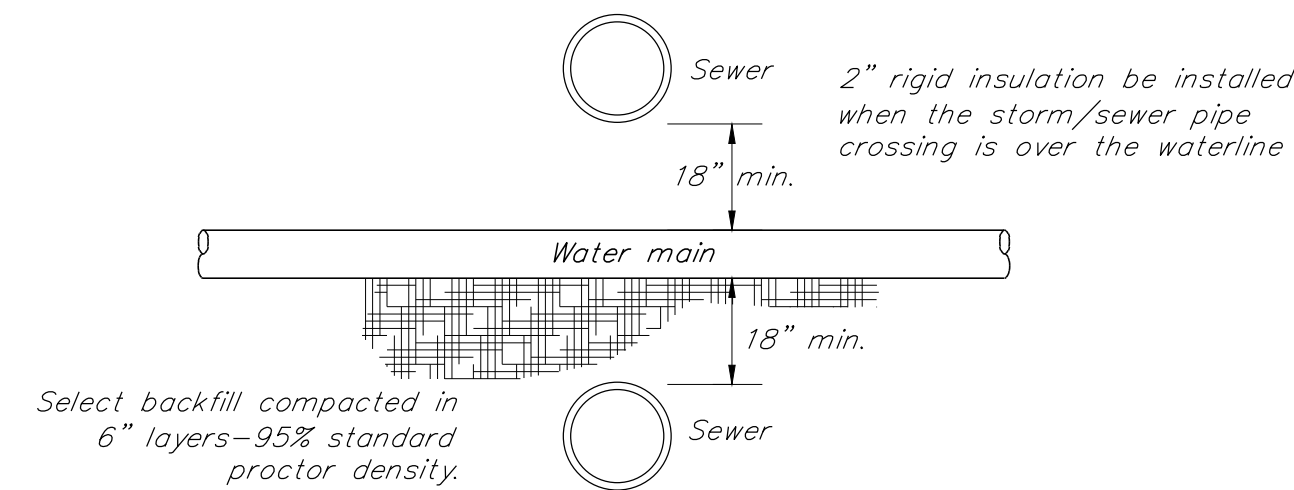


Typical Resilient Wedge Gate Valve

N.T.S.

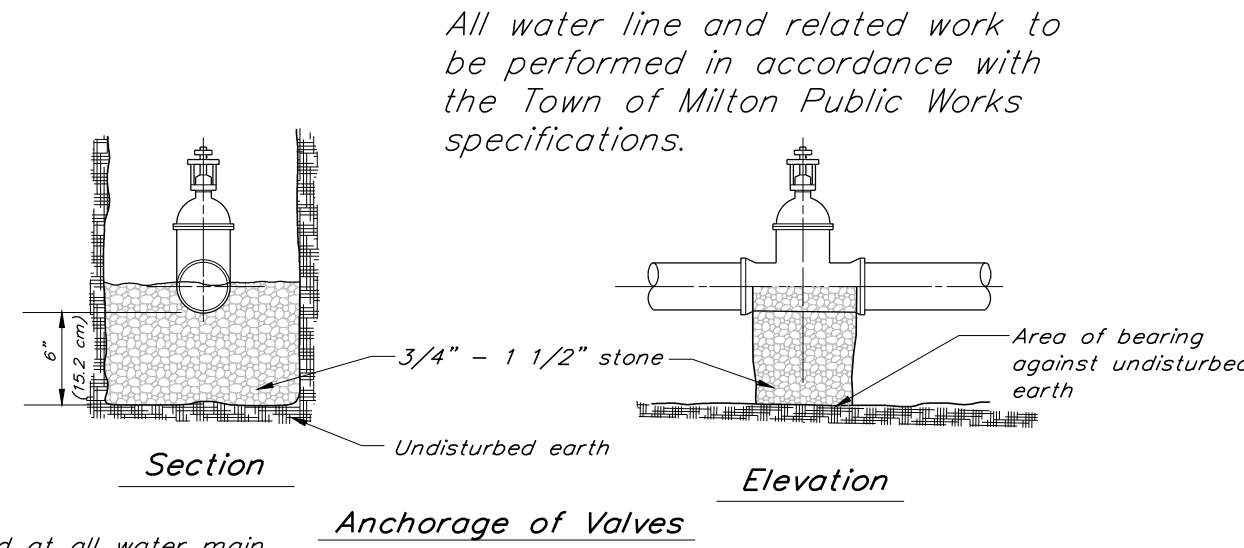
NOTES:

- The location of sewer/storm mains in relation to water mains shall be in accordance with the Vermont Water Supply Rules.
- Water mains shall be laid at least 10 feet horizontally from any existing or proposed sanitary manholes, sanitary sewer, or force mains. Storm sewers and manholes shall be at least 5 ft horizontally from any existing or proposed water main. The distance shall be measured edge to edge. If this distance cannot be obtained variance shall be approved by the ANR Drinking Water & Groundwater Protection Division.
- 18" separation shall be maintained whether water is over or under sewer. At crossings, one full length of water pipe shall be located so both joints are as far from the sewer as possible. If the sewer main is over the water main, the water main shall be wrapped in V-Bio Enhanced Polyethylene Encasement in accordance with the manufacturer's requirements. At a minimum, the V-Bio wrap shall extend beyond the water pipe joint on each side of the sewer pipe crossing. If the 18" vertical separation distance cannot be obtained, then a variance must be approved in accordance with the Water Supply Rule.
- A minimum separation of 25 ft. shall be maintained between waterlines and underground storage tanks. 50 ft. separation is preferred, if possible.



Sewer / Water Separation Detail

N.T.S.



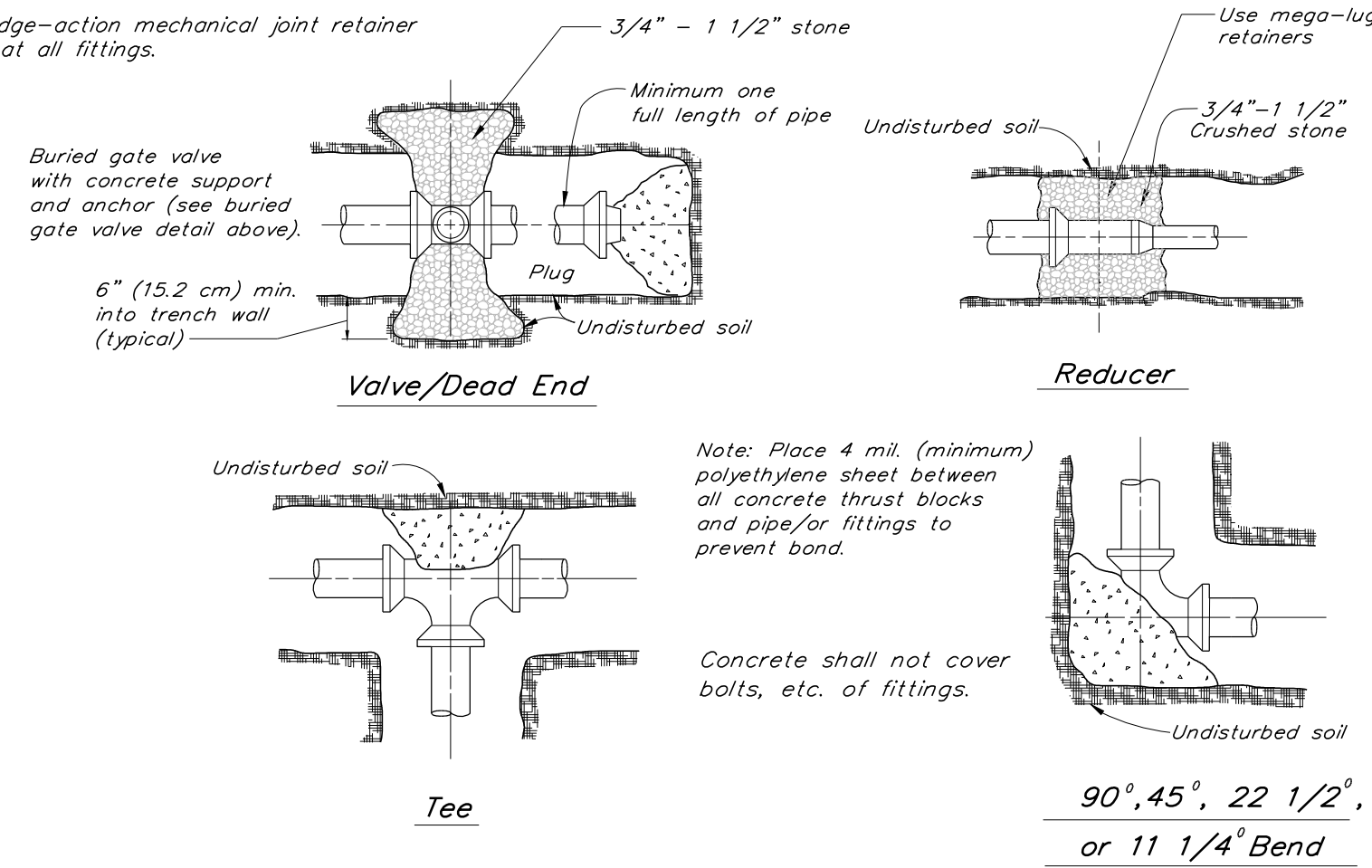
Note

A thrust block shall be installed at all water main bends, end caps, and tees.

Precast thrust blocks are NOT acceptable.

Redi-mix concrete (2,500 psi min) must be used for thrust blocks. Sacrete is NOT acceptable.

Use wedge-action mechanical joint retainer glands at all fittings.



Minimum Area of Bearing Surface of Concrete Thrust Block (in square feet)

3"				4"				6"				8"				12"				SOIL CONDITION	SAFE BEARING LOAD(PSF)
ENDS & TEES	90° ELR	45° ELR	22.5° ELR	ENDS & TEES	90° ELR	45° ELR	22.5° ELR	ENDS & TEES	90° ELR	45° ELR	22.5° ELR	ENDS & TEES	90° ELR	45° ELR	22.5° ELR	ENDS & TEES	90° ELR	45° ELR	22.5° ELR		
0.5	0.5	0.5	0.5	0.5	1.0	0.5	0.5	1.0	1.5	1.0	0.5	2.0	2.5	1.5	1.0	4.0	5.5	3.0	1.5	Sound shale	10,000
1.0	1.0	1.0	0.5	1.5	2.0	1.0	0.5	3.0	4.0	2.0	1.0	4.5	6.5	3.5	2.0	10.0	14.0	7.5	4.0	Cemented gravel & sand	4,000
1.0	1.0	1.0	0.5	2.0	0.5	1.5	1.0	3.5	5.0	3.0	1.5	6.0	8.5	5.0	2.5	13.0	18.5	10.0	5.0	Coarse & fine compact sand	3,000
1.5	2.5	1.5	1.0	2.5	3.5	2.0	1.0	5.5	7.5	4.0	2.0	9.0	13.0	7.0	3.5	20.0	27.5	15.0	8.0	Medium clay (can be spaded)	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	14.0	7.0	39.0	55.0	30.0	15.0	Soft clay	1,000

Maximum water pressure = 200 PSI (140,620 kg/m²)

Thrust Block Details

N.T.S.

CIVIL ENGINEER
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Scale

As Noted

Drawn by

TJB

Checked by

DMR

Date

08/31/2021

Revisions

No. Date Description

Drawing Title

CIVIL DETAILS

Drawing No.

CD-3