

REFER TO DETAIL 100.11 FOR TRENCH RESTORATION WITHIN A PAVED AREA

PLACE 4" THICK TOPSOIL, SEED, FERTILIZE, AND MULCH

FINISH GRADE

FINISH GRADE

UNDISTURBED SOIL OR LEDGE (TYP.)

BACKFILL WITH APPROVED EXCAVATED MATERIAL THOROUGHLY COMPACTED IN 6" LIFTS, SEE NOTES

TRACER WIRE (SEE NOTE #8)

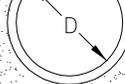
MIN. 6' COVER

NOTE 5

12"

6"

D+6"



LEDGE PAYMENT LIMIT SHALL BE D+2' IN WIDTH TO A DEPTH OF 12" BELOW THE PIPE INVERT.

PIPE BEDDING SEE NOTE 7

D+2 FEET

NOTES :

1. THE CONTRACTOR SHALL KEEP THE TRENCH ENTIRELY FREE OF WATER AT ALL TIMES UNTIL THE WORK IS COMPLETE AND READY FOR BACKFILLING.
2. THE SIDES OF THE TRENCHES SHALL BE SHEETED OR SLOPED TO THE ANGLE OF REPOSE IF THE TRENCH IS 4' OR MORE IN DEPTH.
3. BACKFILL TRENCH IN 6" LIFTS AND COMPACT EACH LIFT TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698 STANDARD PROCTOR.
4. BACKFILL SHALL HAVE NO STONES LARGER THAT 1.5-INCHES IN DIAMETER.
5. SEE DETAIL 400.09 FOR PIPE INSULATION REQUIREMENTS.
6. ALL WORK SHALL CONFORM TO THESE SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.
7. THE PIPE BEDDING FOR DUCTILE IRON PIPE SHALL BE THOROUGHLY COMPACTED SAND OR GRAVEL. 3/4" STONE BEDDING SHALL BE USED AS PIPE BEDDING FOR PVC OR PE PIPE.
8. INSTALL A CONTINUOUS SHEATHED SOLID CONDUCTOR COPPER TRACER WIRE OVER PIPE. THE WIRE SHALL BEGIN IN A TEST BOX ADJACENT TO ONE HYDRANT AND RUN TO A TEST BOX ADJACENT TO THE NEXT HYDRANT. SEE DETAIL 400.02.



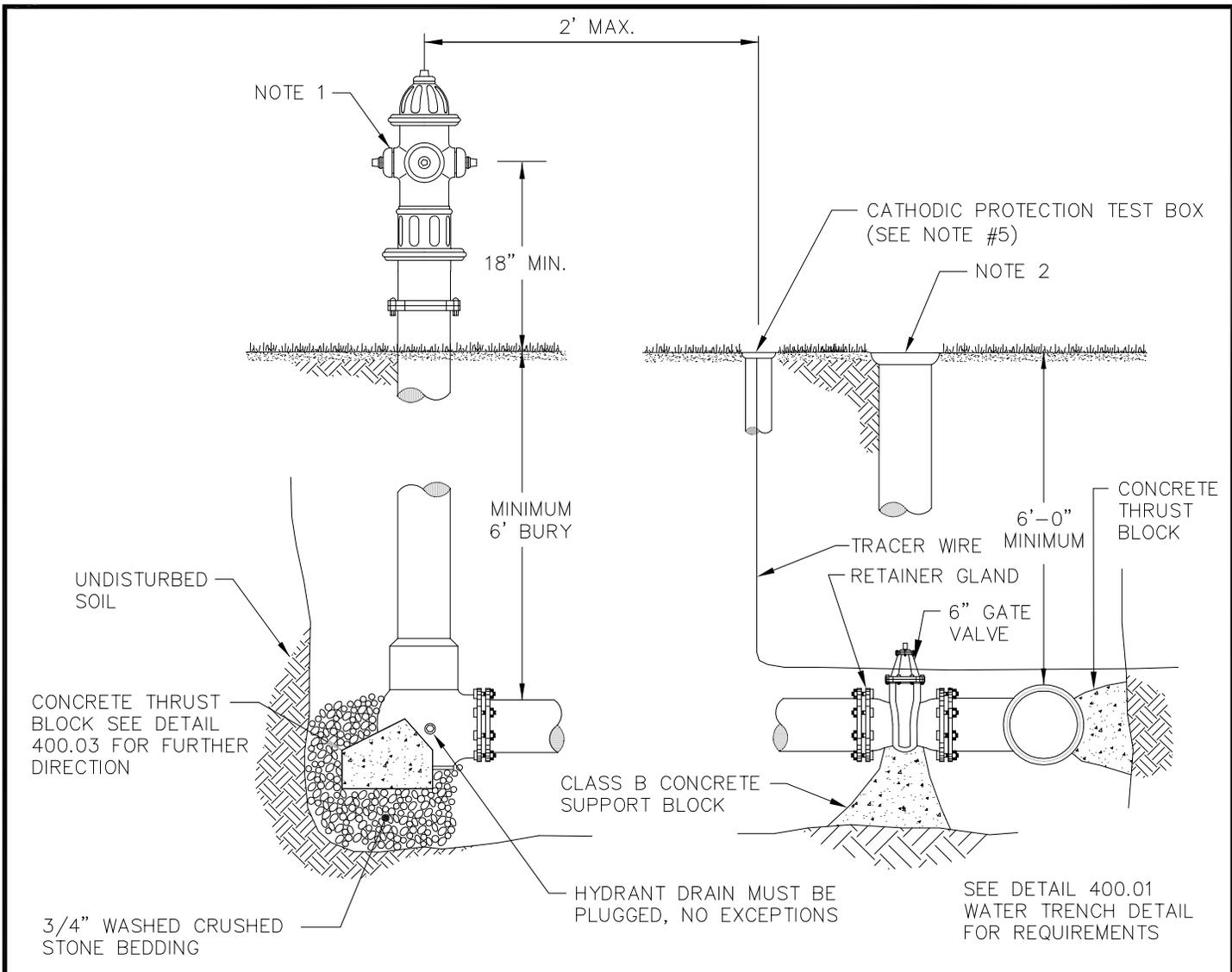
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TOWN OF ESSEX, VERMONT  
STANDARD SPECIFICATIONS FOR CONSTRUCTION

WATER TRENCH

Detail No: 400.01  
Scale: NOT TO SCALE  
Date: JAN. 2017

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**NOTES:**

1. NEW HYDRANT SHALL BE KENNEDY GUARDIAN K-81D. NO SUBSTITUTIONS WILL BE APPROVED UNLESS NOTED.
2. VALVE BOXES SHALL BE CAST IRON TWO PIECE SLIDE TYPE WITH 5 1/4" SHAFT AND A CAST IRON COVER MARKED "WATER".
3. ALL HYDRANT PIPING OFF OF MAIN SHALL BE 6" AND MATCH THE EXISTING WATERMAIN PIPE MATERIAL EITHER CLASS 52 DUCTILE IRON OR C900 PVC. ALL MECHANICAL JOINT FITTINGS AND RETAINER GLANDS SHALL CONFORM TO CURRENT AWWA STANDARDS, SEE SPECIFICATIONS FOR REQUIREMENTS.
4. ALL WORK SHALL CONFORM TO THE WRITTEN SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.
5. INSTALL A CATHODIC PROTECTION TEST BOX (BINGHAM & TAYLOR MODEL P200NFG OR APPROVED EQUAL) WITHIN 2' OF ALL NEW HYDRANTS FOR TERMINATING THE TRACER WIRES IN.



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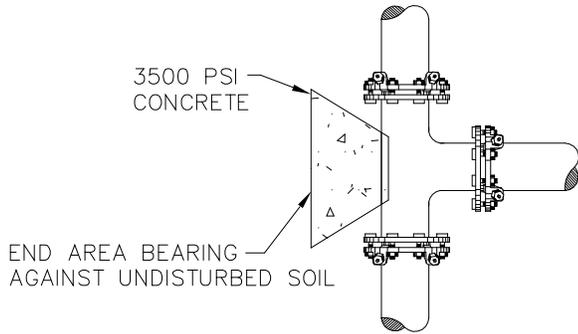
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**FIRE HYDRANT**

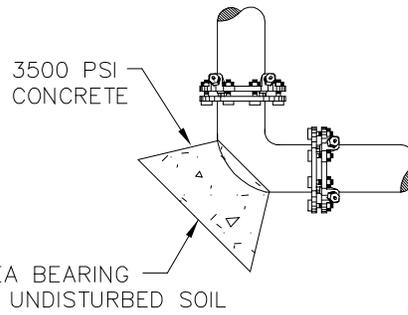
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NOTE: PLACE 4 mil POLYETHYLENE BETWEEN FITTINGS AND THRUST BLOCK



TEES – CAPS



BENDS: 11°, 25°, 22.5°, 45°, 90°

SOIL TYPE – CLAY/SILT

SIZE FITTING	6"	8"	12"
1 1/4 & 2 1/2	3	4	9
45°	4	8	17
90°	9	16	35
TEES OR END CAPS	6	11	25
VALVES	3	3	3

SQ FT BEARING AREA

BASED ON 100 PSI WORKING  
PRESSURE PLUS 100 PSI SURGE  
ALLOWANCE AND BEARING  
CAPACITY OF 1000 LBS/SQ FT

SOIL TYPE – SAND

SIZE FITTING	6"	8"	12"
1 1/4 & 2 1/2	2	2	5
45°	2	4	9
90°	4	8	17
TEES OR END CAPS	3	6	12
VALVES	2	2	2

SQ FT BEARING AREA

BASED ON 100 PSI WORKING  
PRESSURE PLUS 100 PSI SURGE  
ALLOWANCE AND BEARING  
CAPACITY OF 2000 LBS/SQ FT

SOIL TYPE – TILL/SHALE

SIZE FITTING	6"	8"	12"
1 1/4 & 2 1/2	1	1	2
45°	1	2	4
90°	2	4	9
TEES OR END CAPS	2	3	6
VALVES	2	2	2

SQ FT BEARING AREA

BASED ON 100 PSI WORKING  
PRESSURE PLUS 100 PSI SURGE  
ALLOWANCE AND BEARING  
CAPACITY OF 4000 LBS/SQ FT



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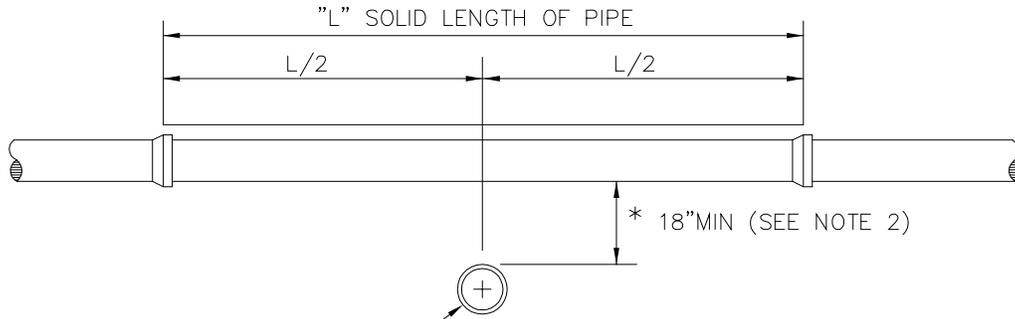
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CONCRETE THRUST BLOCK

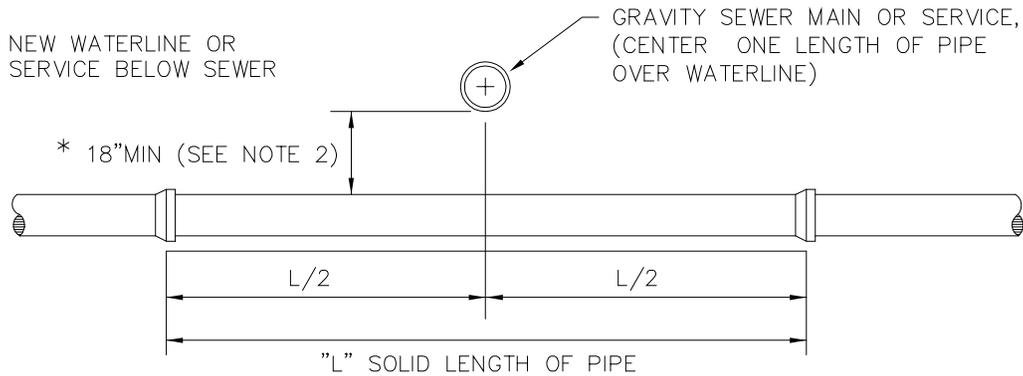
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NEW WATERLINE OR SERVICE ABOVE SEWER PREFERRED METHOD



GRAVITY SEWER MAIN OR SERVICE,  
(CENTER ONE LENGTH OF PIPE  
ON WATERLINE)



NEW WATERLINE OR SERVICE BELOW SEWER

GRAVITY SEWER MAIN OR SERVICE,  
(CENTER ONE LENGTH OF PIPE  
OVER WATERLINE)

NOTES :

1. ALL WATER LINES CONSTRUCTED SHALL HAVE A MINIMUM OF 10' HORIZONTAL SEPARATION,
- \* 2. IF 18" OF VERTICAL SEPARATION CANNOT BE MAINTAINED, THE SEWER SHALL BE CONSTRUCTED TO WATERLINE STANDARDS, A MINIMUM OF 20 FEET CENTERED ON THE CROSSING.
3. ALL WORK SHALL CONFORM TO THESE SPECIFICATIONS, THE PROJECT PLANS, AND AWWA STANDARDS, UNLESS OTHERWISE SPECIFIED.



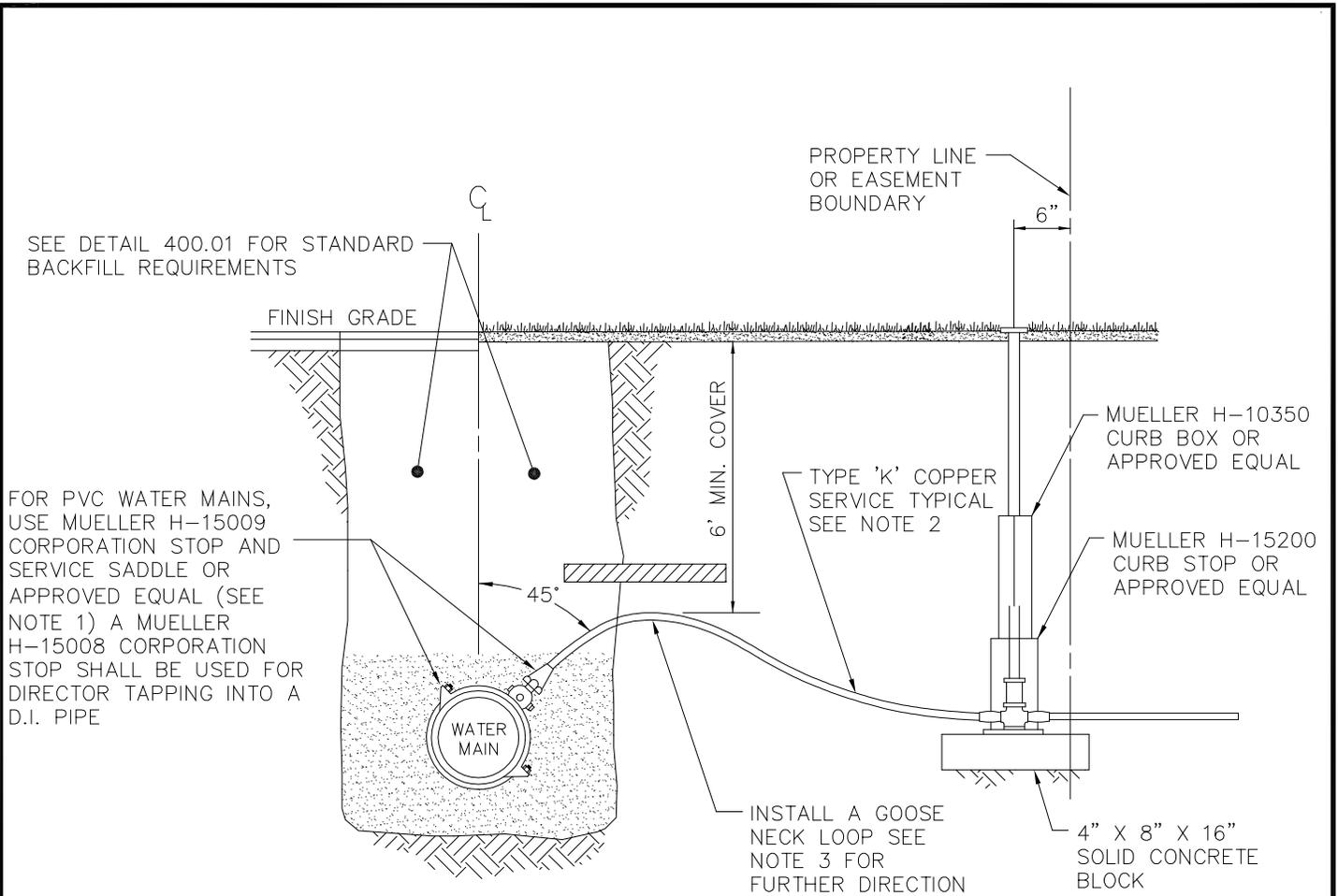
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WATER AND SEWER CROSSING

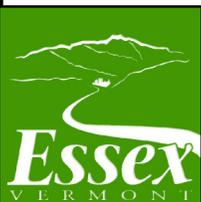
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**NOTES :**

1. SERVICE SADDLES SHALL BE COATED IRON WITH STAINLESS STEEL BANDS AND HARDWARE OR APPROVED EQUAL.
2. ALL RESIDENTIAL SERVICE LINES UP TO AND INCLUDING 1.5" DIAMETER SHALL BE TYPE K COPPER. ALL SERVICE LINES GREATER THAN 1.5" MAY BE PVC OR PE AS APPROVED BY THE DEPARTMENT OF PUBLIC WORKS.
3. ALL SERVICE CONNECTIONS 1-1/2" AND UNDER SHALL HAVE A LOOP INSTALLED DIRECTLY OFF OF THE MAIN. THE HIGHEST POINT OF THIS LOOP SHALL BE INSULATED IF LESS THAN 6' OF COVER.
4. IF COVER OVER SERVICE IS BETWEEN 5'-6', PLACE 2" THICK INSULATION BOARD OVER PIPE. IF COVER IS BETWEEN 4'-5' THEN PLACE 4" THICK INSULATION BOARD OVER PIPE. IN NO CASE SHALL THERE BE LESS THAN 5' OF COVER IN PAVED AREAS OR 4' OF COVER IN GRASS AREAS.
5. ALL WORK SHALL CONFORM TO THESE SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.
6. THE PIPE BEDDING FOR TYPE "K" COPPER PIPE SHALL BE THOROUGHLY COMPACTED SAND, 3/4" STONE BEDDING SHALL BE USED AS PIPE BEDDING FOR PVC OR PE PIPE.



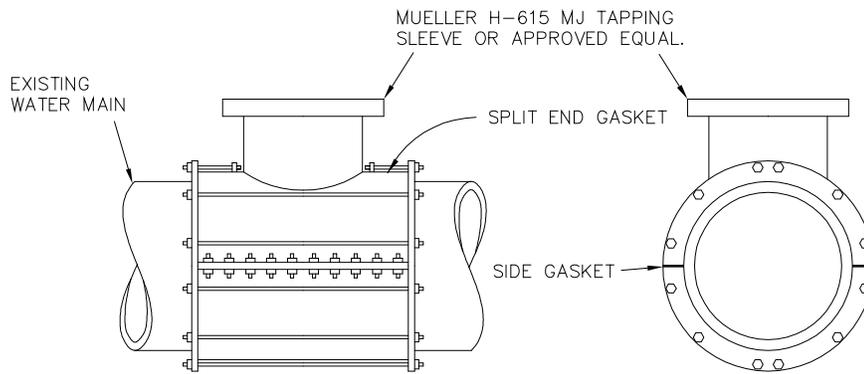
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**WATER SERVICE CONNECTION**

Detail No: 400.05  
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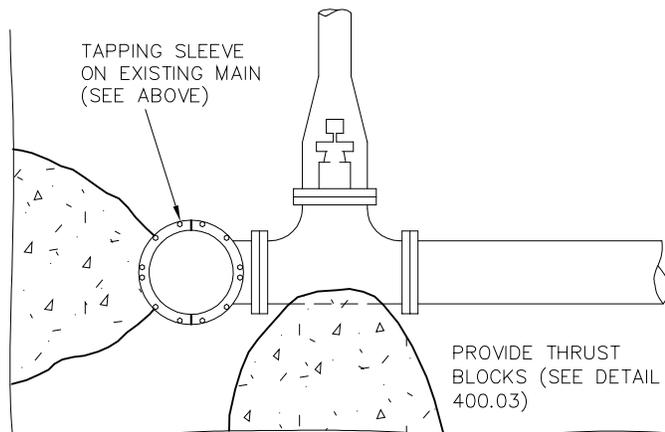


**TAPPING SLEEVE**

**NOTES:**

1. TAPPING SLEEVES SHALL BE OF THE SPLIT SLEEVE DESIGN CONSTRUCTED WITH TWO SOLID HALF-SLEEVES BOLTED TOGETHER SLEEVES SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, SHALL HAVE A WORKING PRESSURE OF AT LEAST 150 PSI, AND SHALL HAVE MECHANICAL JOINT ENDS AND SIDE GASKET SEALS.
2. ALL IRON BODY TAPPING SLEEVES SHALL BE PROVIDED WITH A 3/4" NPT TEST PLUG, OR OTHER PROVISIONS MUST BE MADE FOR AIR TESTING THE VALVE AND SLEEVE AT MAXIMUM WORKING PRESSURE, PRIOR TO TAPPING.
3. ALL BOLTS AND NUTS FOR MECHANICAL JOINTS OF TAPPING SLEEVES SHALL BE OF HIGH-STRENGTH CAST IRON OR HIGH-STRENGTH, LOW-ALLOY STEEL CONFORMING TO ANSI/AWWA C111/A21.11-90.
4. ALL BOLTS AND NUTS FOR FLANGED JOINTS OF TAPPING SLEEVES SHALL BE OF HIGH-STRENGTH, LOW-CARBON STEEL CONFORMING TO ANSI/AWWA C110/A21.1087, APPENDIX A.
5. ALL BOLTS AND NUTS SHALL BE SOUND, CLEAN, AND COATED WITH A RUST RESISTANT-LUBRICANT; THEIR SURFACES SHALL BE FREE OF OBJECTIONABLE PROTRUSIONS THAT WOULD INTERFERE WITH THEIR FIT IN THE MADE-UP MECHANICAL OR FLANGED JOINT.
6. ALL BOLTS AND NUTS USED WITH ALL PIPE SLEEVES SHALL, UPON FINAL TIGHTENING AND TESTING, BE BRUSH COATED HEAVILY WITH BITUMASTIC COLD-APPLIED MATERIAL TO THOROUGHLY COVER ALL EXPOSED SURFACES OF THE BOLTS AND NUTS.

**NOTES:**



**TAPPING VALVE**

1. TAPPING VALVE SHALL CONFORM TO ANSI/AWWA 0509-87 STANDARD FOR RESILIENT-SEALED GATE VALVES FOR WATER AND SEWAGE SYSTEMS, EXCEPT AS MODIFIED HEREIN. VALVES SHALL OPEN COUNTERCLOCKWISE AND SHALL HAVE A MINIMUM WORKING PRESSURE OF 150 PSI. INLET FLANGES SHALL BE CLASS 125 CONFORMING TO ANSI SPECIFICATION B16.1 OR ANSI/AWWA C110/A21.10, AND OUTLET CONNECTIONS SHALL BE STANDARDIZED MECHANICAL JOINTS.
2. BURIED TAPPING VALVES SHALL BE PROVIDED WITH A 2" SQUARE WRENCH NUT AND SHALL BE INSTALLED WITH A CAST IRON VALVE BOX AS REQUIRED TO ALLOW POSITIVE ACCESS TO THE VALVE OPERATING NUT AT ALL TIMES. IN INSTALLATIONS WHERE THE DEPTH FROM GRADE TO TOP OF VALVE IS GREATER THEN 6' 0", A VALVE STEM RISER SHALL BE PROVIDED AND INSTALLED SUCH THAT THE DEPTH FROM VALVE STEM RISER NUT TO GRADE IS FROM 4'-0" TO 6'-0" (MINIMUM LENGTH OF VALVE STEM RISER IS 2' 0"). VALVE STEM RISER SHALL BE OF HIGH STRENGTH STEEL AND OF WELDED CONSTRUCTION.



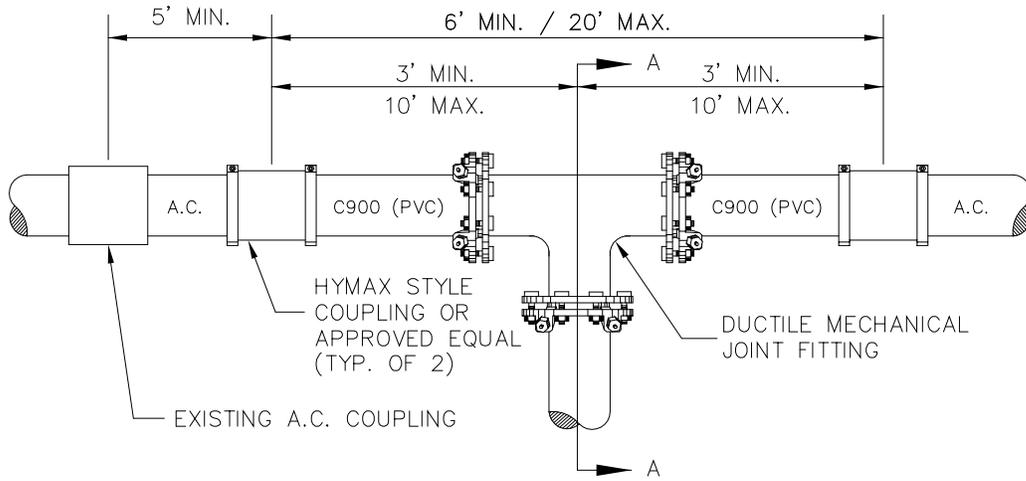
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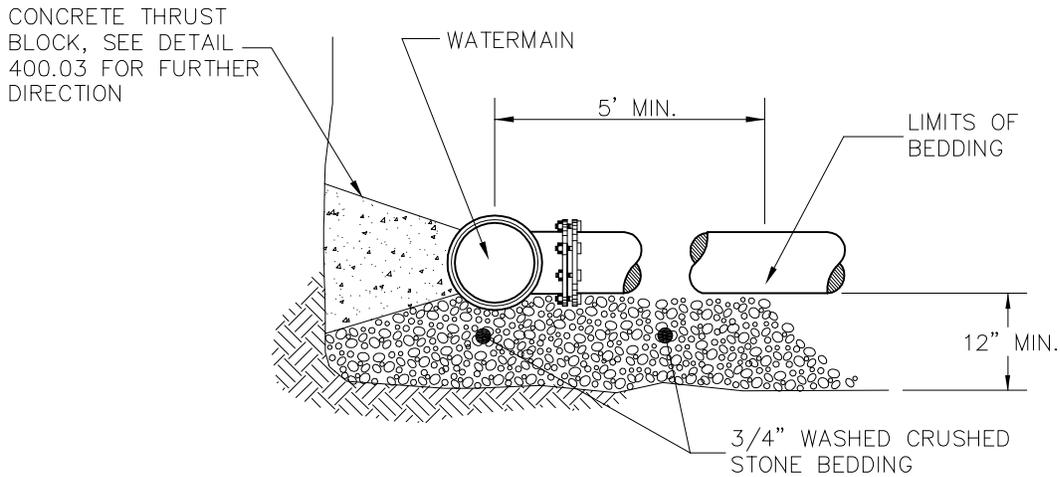
**TAPPING SLEEVE AND VALVE**

Detail No: 400.06  
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PLAN



SECTION A-A



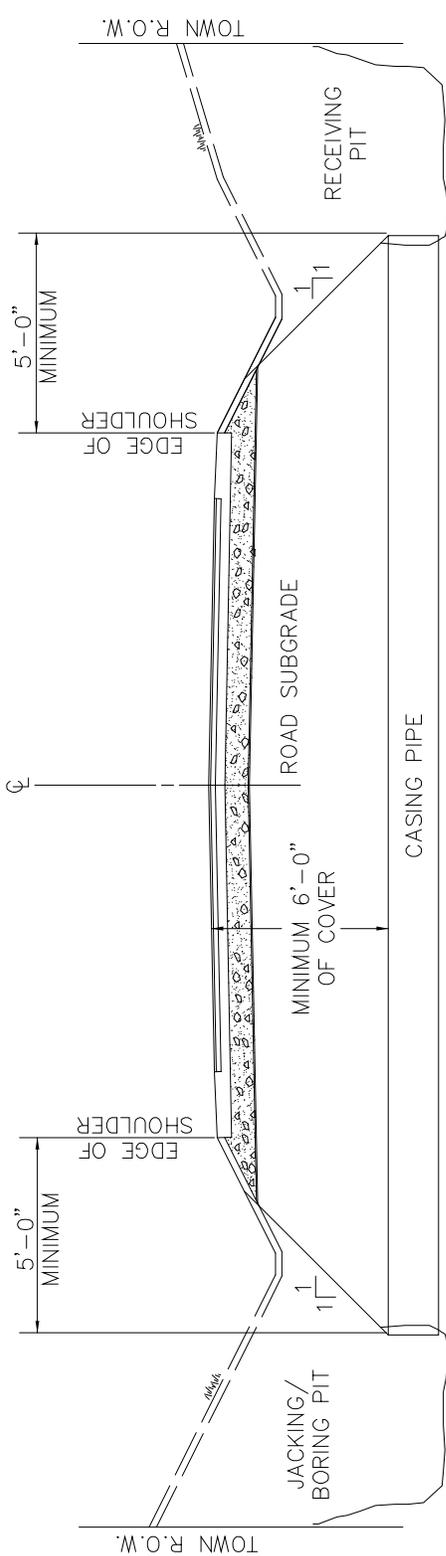
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STANDARD SPECIFICATIONS FOR CONSTRUCTION

TRANSITE WATER MAIN CONNECTION

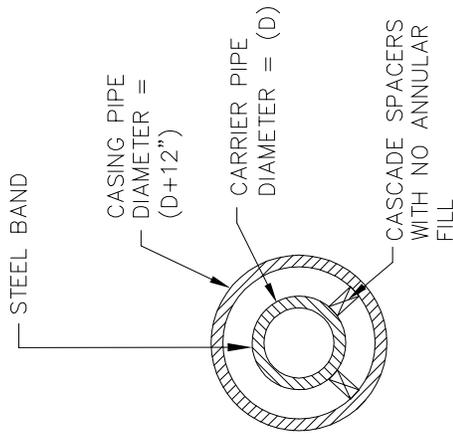
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**NOTES :**

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE VERMONT STATE STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND THE APPROVED ENGINEERING PLANS AND SPECIFICATIONS.
2. CONTRACTOR MAY USE SHEET PILING DRIVEN VERTICALLY A MINIMUM OF (5) FIVE FEET OUTSIDE EDGE OF SHOULDER TO ALLOW FOR SHOULDER SLEEVE.
3. PIT AREA TO BE BACKFILLED IN (6) SIX INCH LIFTS & MECHANICALLY TAMPED.
4. AT NO TIME SHALL ANY MATERIAL BE PLACED ON THE PAVED PORTION OF THE HIGHWAY.
5. STEEL SLEEVE SHALL CONFORM TO A.S.T.M. SPECIFICATIONS A-53, WITH BUTT-WELDED JOINTS. INTERIOR OF SLEEVE SHALL BE COATED IN ACCORDANCE WITH A.W.W.A. C. 203.62.
6. PIPE WITHIN SLEEVE SHALL BE SUPPORTED BY WOOD BLOCKING IN ORDER TO PROHIBIT MOVEMENT OF PIPE IN ANY DIRECTION. THERE SHALL BE A MINIMUM OF TWO SETS OF BLOCKING PER LENGTH OF PIPE. EACH BLOCKING SHALL BE POSITIONED (4) FOUR FEET FROM PIPE ENDS. INDIVIDUAL BLOCKING PIECES SHALL BE BANDED TOGETHER IN A MANNER TO BE APPROVED BY THE ENGINEER.
7. OTHER METHODS OF SUPPORTING THE CARRIER PIPE MAY BE USED WHEN APPROVED BY THE TOWN ENGINEER.
8. SEAL ENDS OF CASING WITH FLOWABLE FILL.



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STANDARD SPECIFICATIONS FOR CONSTRUCTION**

**JACK AND BORE SLEEVE**

Detail No: 400.08  
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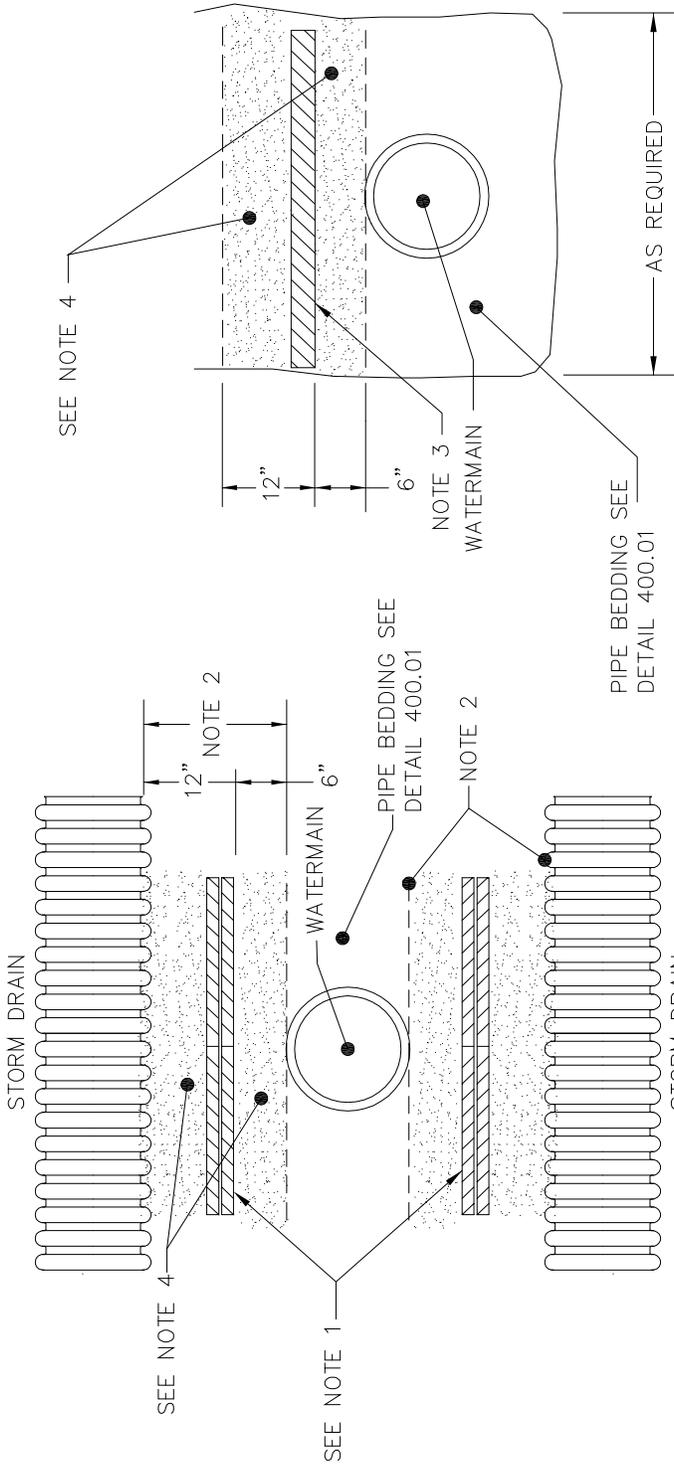
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**PIPE INSULATION**

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Date:	JAN. 2017

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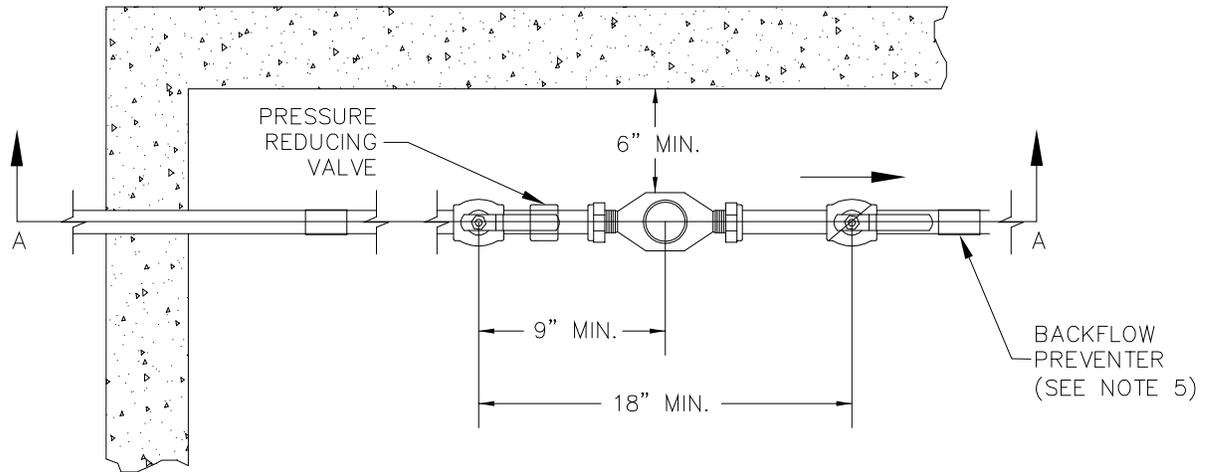


STORM CROSSING

LACK OF COVER

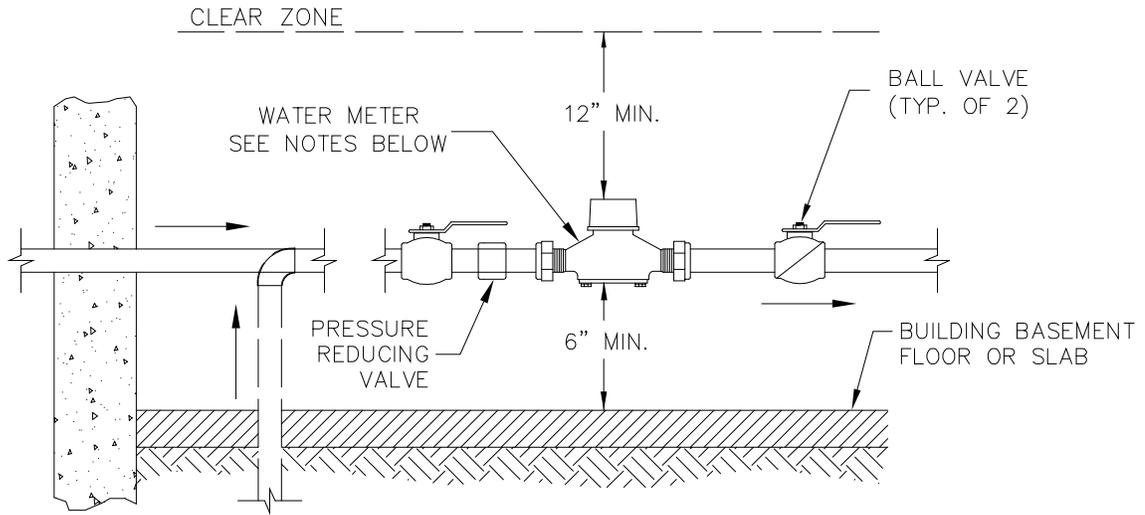
NOTES :

- INSULATION THICKNESS BETWEEN WATER MAINS AND STORM DRAINS SHALL BE A MINIMUM OF 4" IN THICKNESS. EACH SHEET SHALL BE OFFSET ON EACH LAYER SO AS TO NOT CREATE VOIDS. INSULATION IS REQUIRED IF THE SEPARATIONS IS LESS THAN 18".
- THE ISOLATION DISTANCES FOR INSULATING STORM DRAINS UNDER WATER MAINS ARE THE SAME AS CROSSING OVER.
- IF COVER OVER SERVICE IS BETWEEN 5'-6', PLACE 2" THICK INSULATION BOARD OVER PIPE. IF COVER IS BETWEEN 4'-5" THEN PLACE 4" THICK INSULATION BOARD OVER PIPE. IN NO CASE SHALL THERE BE LESS THAN 5' OF COVER IN PAVED AREAS OR 4' OF COVER IN GRASS AREAS.
- BACKFILL WITH APPROVED EXCAVATED MATERIAL IN 6" LIFTS AND COMPACT EACH LIFT TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE. BACKFILL SHALL HAVE NO STONES LARGER THAN 1.5-INCHES, IN ORDER TO AVOID DAMAGING INSULATION.
- ALL WORK SHALL CONFORM TO THESE SPECIFICATIONS AND PLANS UNLESS OTHERWISE SPECIFIED.



PLAN

BACK FLOW PROTECTION  
DEVICE TO BE DETERMINED  
IN ACCORDANCE WITH  
CURRENT PLUMBING CODE



SECTION A-A

NOTES :

1. THE CONTRACTOR SHALL INSTALL ASPACER BAR IN THE LOCATION WHERE THE NEW METER IS TO BE LOCATED.
2. THE TOWN OF ESSEX WATER AND SEWER DEPARTMENT SHALL INSTALL ALL METERS UP TO AND INCLUDING 1". ALL METERS GREATER THAN 1-1/2" WILL BE INSTALLED BY A CONTRACTOR. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SCHEDULE AN APPOINTMENT WITH THE TOWN FOR ALL METER INSTALLATIONS.
3. ALL NEW METERS AND METER READERS WILL BE PROVIDED BY THE TOWN OF ESSEX.
4. ALL PLUMBING FOR METER CONNECTION MUST BE INSTALLED LEVEL. THE TOWN OF ESSEX WILL NOT INSTALL A METER IF THE PIPING IS NOT LEVEL.
5. DUAL CHECK VALVE / BACKFLOW PREVENTER SHALL BE INSTALLED ON THE HOUSE SIDE OF THE METER. CHECK VALVE SHALL BE A WILKINS MODEL 700XL OR APPROVED EQUAL.



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WATER METER INSTALLATION

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