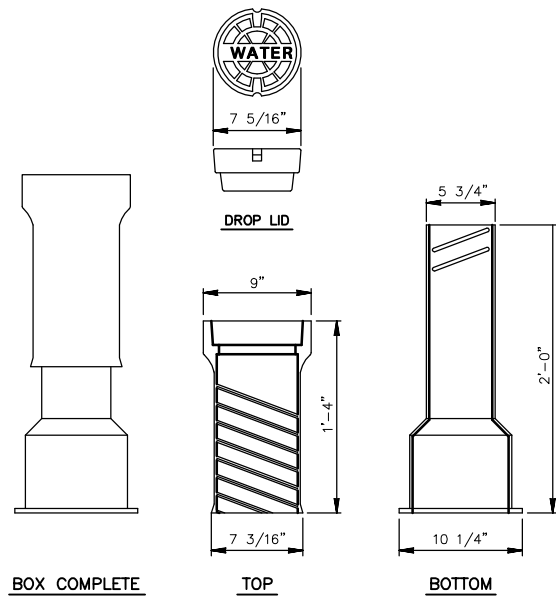


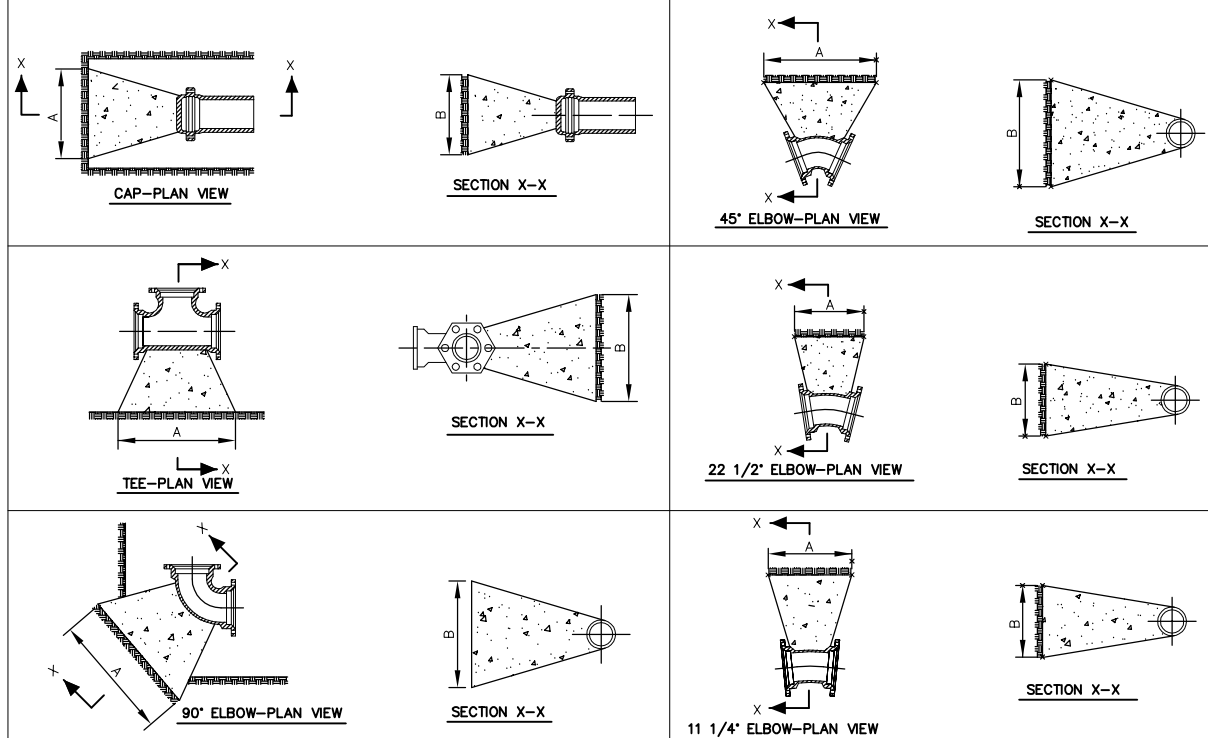
NOTES:

- FIRE HYDRANT SHALL BE THREE-WAY MUELLER SUPER CENTURION 250 MODEL A-421 WITH A FOUR (4) FOOT BURY, TWO - 2 1/2" DISCHARGE FITTINGS (WATERLOO THREADS), AND ONE 4 1/2" STEAMER FITTING (NATIONAL THREADS), ALL CONFORMING TO AWWA C-502
- EXECUTION SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE ILLINOIS STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION

FIRE HYDRANT INSTALLATION



CAST IRON VALVE BOXES



| PIPE SIZE | DEGREE OF BEND | DIMENSIONS | |
|-----------|----------------|------------|--------|
| | | A | B |
| 8" | TEE OR PLUG | 4' | 2' |
| 8" | 90 | 5' | 2 1/2' |
| 8" | 45 | 3' | 2' |
| 8" | 22 1/2 | 3' | 1' |
| 8" | 11 1/4 | 2' | 1' |
| 6" | TEE OR PLUG | 2 1/2' | 2' |
| 6" | 90 | 3' | 2' |
| 6" | 45 | 3' | 1 1/2' |
| 6" | 22 1/2 | 3' | 1' |
| 6" | 11 1/4 | 2' | 1' |

THRUST BLOCKS FOR HORIZONTAL BENDS, TEES & CAPS

1. WATER MAINS
WATER MAINS SHALL BE CONSTRUCTED USING EIGHT (8) INCH (AS SHOWN) PVC-AWWA C900, DR18 PIPE MATERIAL WITH ELASTOMERIC JOINTS IN CONFORMANCE WITH ASTM 3139.

2. FITTINGS
FITTINGS SHALL BE DUCTILE IRON, MECHANICAL JOINT AND CEMENT MORTAR LINED. FITTINGS SHALL BE IN CONFORMANCE WITH ANSI/AWWA C110/A21. CEMENT MORTAR LINING SHALL BE IN CONFORMANCE WITH ANSI/AWWA C104/A21.4. THE FITTINGS SHALL BE TAR-COATED IN CONFORMANCE WITH AWWA C151.

3. RUBBER GASKET JOINTS
JOINTS FOR PLASTIC PRESSURE PIPE USING FLEXIBLE ELASTOMERIC SEALS SHALL CONFORM WITH ASTM D3139. RUBBER GASKET JOINTS FOR DUCTILE IRON FITTINGS SHALL BE IN CONFORMANCE WITH ANSI/AWWA C111/A21.11.

4. GATE VALVES
GATE VALVES SHALL BE NON-RISING STEM, IRON BODY, BRASS MOUNTED, CONFORMING TO AWWA C500 AND HAVE MECHANICAL JOINTS.

GATE VALVES SHALL BE RATED FOR 200 PSI WATER PRESSURE IN THE 2 THROUGH 12 INCH SIZES AND 150 PSI WATER PRESSURE IN THE 14 INCH AND LARGER SIZES. GATE VALVES SHALL HAVE A STUFFING BOX WITH TEFLON PACKING AND THE OPERATING NUT SHALL BE A 2 INCH SQUARE AWWA NUT.

5. VALVE BOXES
CAST IRON VALVE BOXES SHALL BE INSTALLED OVER ALL VALVES TO FURNISH OPERATING ACCESS. THE LID OF THE VALVE BOXES SHALL BE BINGHAM AND TAYLOR 5 1/4 INCH CAST IRON WITH SCREW TYPE ADJUSTMENT OR EQUIVALENT AS APPROVED BY THE CITY OF WATERLOO. THE LIDS SHALL HAVE THE WORD "WATER" CAST IN THE LID.

6. CORPORATION STOPS
ALL CORPORATION STOPS SHALL BE FABRICATED OF BRASS AND SHALL BE PROVIDED WITH OUTLETS SUITABLE FOR COPPER CONNECTIONS. THE CORPORATION STOPS SHALL BE ONE (1) INCH MINIMUM.

SERVICE CLAMPS UTILIZED FOR TAPPING THE MAIN SHALL BE MANUFACTURED BY MUELLER CORPORATION OR EQUIVALENT AND SHALL BE CONSTRUCTED OF BRASS WITH DOUBLE STRAP DESIGN. THE CLAMPS SHALL BE FURNISHED WITH AN "O-RING" CEMENTED IN PLACE. THE CLAMPS SHALL BE CAPABLE OF SUSTAINING A 500 PSI WORKING PRESSURE.

7. COPPER SERVICE PIPE
COPPER PIPE SHALL BE COPPER WATER TUBE, TYPE K, SOFT TEMPER, FOR UNDERGROUND SERVICE, CONFORMING TO ASTM B-88 AND B-251. THE PIPE SHALL BE MARKED WITH THE MANUFACTURER'S NAME OR TRADEMARK AND A MARK INDICATIVE OF THE TYPE OF PIPE. THE OUTSIDE DIAMETER OF THE PIPE SHALL CONFORM TO ASTM B251 TABLE 2.

8. TRACER WIRE
TRACER WIRE SHALL BE #12 SOLID COPPER PE45 BLUE TRACER WIRE (POLYETHYLENE COATED) BE CONNECTED TO ALL VALVES AND HYDRANTS.

9. FIRE HYDRANTS
ALL FIRE HYDRANTS FOR THIS PROJECT SHALL BE MUELLER SUPER CENTURION 250 MODEL A-421 FIRE HYDRANTS WITH APPURTENANT SIX (6) INCH RESILIENT SEAT GATE VALVES IN ACCORDANCE WITH THE CITY OF WATERLOO REQUIREMENTS.

10. TESTING
AFTER THE PIPE HAS BEEN LAID, THRUST BLOCKING CURED, AND THE TRENCH BACKFILLED, THE ENTIRE PIPE LINE, OR ANY SECTION THEREOF, SHALL BE SUBJECTED TO HYDROSTATIC PRESSURE OF AT LEAST 150% OF NORMAL OPERATING PRESSURE, BUT NOT LESS THAN 100 PSI OR MORE THAN THE DESIGN RATING OF THE PIPE.
THE TEST PRESSURE SHALL BE DETERMINED BY THE ENGINEER.

TESTING CONT.

EACH SECTION OF PIPE WILL BE SLOWLY FILLED WITH WATER. THE SPECIFIED TEST PRESSURE, MEASURED AT THE POINT OF LOWEST ELEVATION, SHALL BE APPLIED BY MEANS OF A PUMP CONNECTED TO THE PIPE IN A MANNER SATISFACTORY TO THE ENGINEER. THE PUMP TO PIPE CONNECTION AND ALL NECESSARY APPURTENANCES INCLUDING GAUGES AND METERS SHALL BE FURNISHED BY THE CONTRACTOR. THE DURATION OF EACH PRESSURE TEST SHALL BE AT LEAST 1 HOUR UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

BEFORE APPLYING THE SPECIFIED TEST PRESSURE, ALL AIR SHALL BE EXPELLED FROM THE PIPE. IF PERMANENT AIR VENTS ARE NOT LOCATED AT ALL HIGH POINTS, THE CONTRACTOR SHALL INSTALL CORPORATION STOPS AT SUCH POINTS SO THE AIR CAN BE EXPELLED AS THE LINE IS FILLED WITH WATER. AFTER ALL THE AIR HAS BEEN EXPELLED, CORPORATION STOPS SHALL BE CLOSED AND THE PRESSURE APPLIED.

DURING THE TEST, ALL EXPOSED PIPES, FITTINGS, VALVES, HYDRANTS, AND JOINTS WILL BE CAREFULLY EXAMINED. ANY DEFECTIVE OR DAMAGED MATERIALS SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR WITH SOUND MATERIALS. THE TEST SHALL THEN BE REPEATED UNTIL SATISFACTORY TO THE ENGINEER.

A LEAKAGE TEST SHALL BE CONDUCTED UPON THE SUCCESSFUL COMPLETION OF THE PRESSURE TEST. THE PRESSURE DURING THE TEST SHALL BE THE NORMAL OPERATING PRESSURE, BUT NOT LESS THAN 100 PSI. THE PRESSURE TEST SHALL BE 2 HOURS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

THE ALLOWABLE LEAKAGE AT THE AVERAGE TEST PRESSURE IN GALLONS PER HOUR PER 1000 FEET FOR THE SPECIFIED PIPE SIZES IS SHOWN IN THE FOLLOWING TABLE:

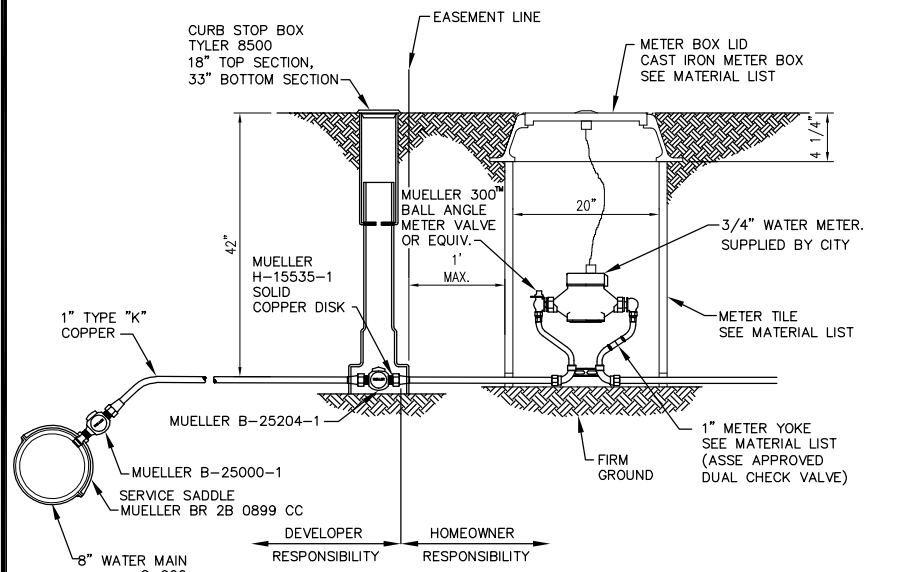
| AVERAGE TEST PRESSURE PSI | DIMENSIONS | | | | | |
|---------------------------|------------|------|------|------|------|------|
| | 2 | 6 | 8 | 12 | 16 | 20 |
| 100 | 0.30 | 0.90 | 1.20 | 1.80 | 2.40 | 3.00 |
| 110 | 0.31 | 0.94 | 1.26 | 1.89 | 2.52 | 3.15 |
| 120 | 0.33 | 0.99 | 1.32 | 1.98 | 2.63 | 3.29 |
| 130 | 0.35 | 1.03 | 1.37 | 2.06 | 2.74 | 3.42 |
| 140 | 0.36 | 1.07 | 1.42 | 2.13 | 2.84 | 3.55 |
| 150 | 0.37 | 1.10 | 1.47 | 2.20 | 2.94 | 3.68 |
| 175 | 0.40 | 1.19 | 1.59 | 2.38 | 3.18 | 3.97 |
| 200 | 0.42 | 1.27 | 1.70 | 2.55 | 3.40 | 4.25 |
| 225 | 0.45 | 1.35 | 1.80 | 2.70 | 3.60 | 4.50 |
| 250 | 0.48 | 1.42 | 1.90 | 2.85 | 3.80 | 4.75 |

SHOULD ANY TEST DISCLOSE LEAKAGE GREATER THAN THAT PERMITTED, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE AND REPAIR THE DEFECTIVE JOINTS AND/OR PIPE UNTIL THE LEAKAGE IS WITHIN THE PERMITTED ALLOWANCE.

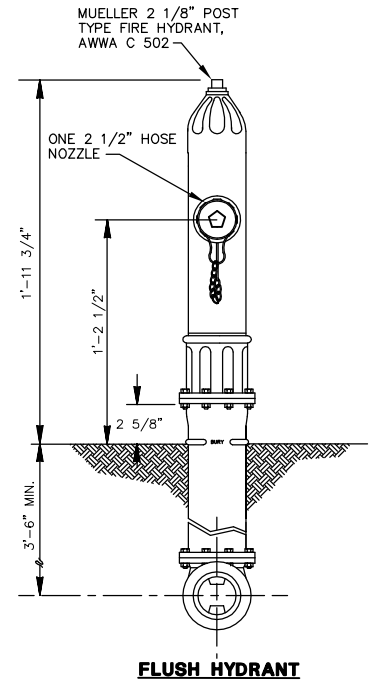
THE PUMP, PIPE CONNECTIONS, METERING DEVICES, AND ALL NECESSARY APPARATUS FOR THE PRESSURE AND LEAKAGE TESTS SHALL BE FURNISHED BY THE CONTRACTOR. THE CONTRACTOR SHALL MAKE ALL EXCAVATIONS AND BACKFILLS AND FURNISH ALL NECESSARY ASSISTANCE FOR CONDUCTING THE TESTS.

11. DISINFECTION

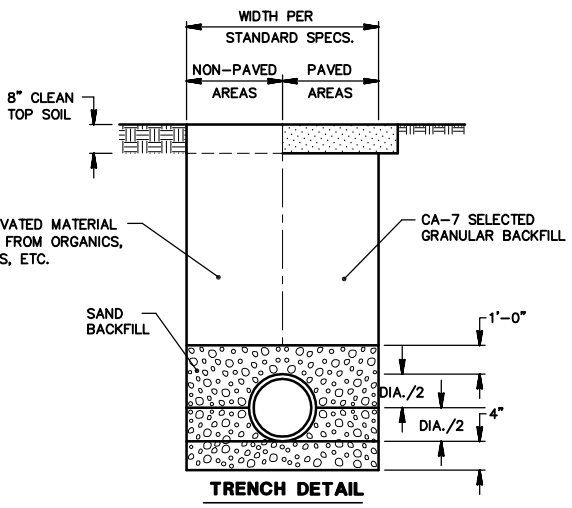
ALL SECTIONS OF PIPE TO BE DISINFECTED SHALL BE FLUSHED TO REMOVE ANY SOLIDS OR CONTAMINATED MATERIALS. ALL NEW MAINS OR EXTENSIONS TO EXISTING MAINS SHALL BE CHLORINATED SO THAT INITIAL CHLORINE RESIDUAL IS NOT LESS THAN 50 ppm AND THAT A CHLORINE RESIDUAL OF NOT LESS THAN 25 ppm REMAINS AFTER STANDING 24 HOURS IN THE PIPE. FOLLOWING CHLORINATION, ALL TREATED WATER MUST BE FLUSHED AND PIPES FILLED WITH REPLACEMENT WATER WITH CHLORINE RESIDUAL LESS THAN 1 ppm. PROVISIONS MUST BE MADE FOR THE COLLECTION OF WATER SAMPLES TO BE COLLECTED FOR BACTERIOLOGICAL ANALYSIS ON TWO CONSECUTIVE DAYS TAKEN AT 24 HOUR INTERVALS.



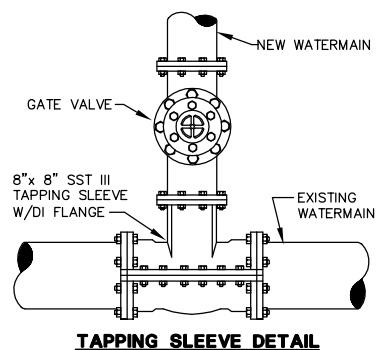
RESIDENTIAL WATER SERVICE



FLUSH HYDRANT



TRENCH DETAIL



TAPPING SLEEVE DETAIL

THOUVENOT, WADE & MOERCHEN, INC.
ENGINEERS • SURVEYORS • PLANNERS



- CORPORATE OFFICE
4940 OLD COLLINSVILLE RD.
SWANSEA, ILLINOIS 62226
TEL (618) 624-4488
FAX (618) 624-6688
corp@twm-inc.com
- WATERLOO OFFICE
113 SOUTH MAIN STREET
WATERLOO, ILLINOIS 62298
TEL (618) 939-5050
FAX (618) 939-3938
waterloo@twm-inc.com
- ST. LOUIS OFFICE
1001 CRAIG ROAD, SUITE 260
ST. LOUIS, MISSOURI 63146
TEL (314) 236-5052
FAX (314) 872-2194
stlouis@twm-inc.com

| PROFESSIONAL REGISTRATIONS | LICENSE NO. |
|-------------------------------------|-------------|
| ILLINOIS PROFESSIONAL DESIGN FIRM | 184-001220 |
| PROFESSIONAL ENGINEERING CORP. | 62-035370 |
| PROFESSIONAL STRUCTURAL ENGR. CORP. | 81-005202 |
| ILLINOIS PROF. LAND SURVEYING CORP. | 048-000229 |
| MISSOURI PROFESSIONAL ENGR. CORP. | NC 001528 |
| MISSOURI LAND SURVEYING CORP. | NC 000346 |

SEAL
Signature: _____
Signature Date: _____
Expiration Date: _____
STATEMENT OF RESPONSIBILITY
I hereby confirm that the document herein to be authenticated by my seal is restricted to this sheet, and I hereby disclaim any responsibility for all other drawings, specifications, estimates, reports or other documents or instruments relating to or intended to be utilized for any other part of the architectural, engineering or survey project.

WATER DETAILS

**OAK VALLEY ESTATES
FIRST ADDITION
CITY OF WATERLOO
MONROE COUNTY, ILLINOIS**

TITLE: _____ PROJECT: _____

| REV. | DATE | DESCRIPTION |
|------|-----------|---|
| 1 | 8/23/2007 | CREATED ON |
| 2 | 10/16/07 | REVISIONS PER JOINT PLAT MEETING ON 9/26/07 |

| DRAWN BY: | ALH | SHEET |
|--|---|--------------|
| DESIGNED BY: | | |
| CHECKED BY: | | |
| APPROVED BY: | | |
| PROJECT NUMBER | D33060065 | OF 23 SHEETS |
| <input type="checkbox"/> ISSUED FOR REVIEW | <input type="checkbox"/> RECORD DRAWING | |

23

G:\SDSK\PRJ\060065\dwg\060065-DTL-04.dwg 8/23/2007 4:07:36 PM CDT