

WATER:

- A. THE STANDARD SPECIFICATIONS FOR WATER AND SEWER CONSTRUCTION IN ILLINOIS, LATEST REVISED EDITION, HAS BEEN ADOPTED AS THE CITY'S STANDARD. THE FOLLOWING ARTICLES ARE IN ADDITION TO THE ABOVE REFERENCED STANDARDS AND, IN CASE OF CONFLICT, SHALL PREVAIL. NOTE: ALL MATERIALS WILL BE AMERICAN MADE.
- B. VALVE BOX:
1. VALVE BOXES SHALL BE PROVIDED FOR ALL BURIED VALVES. BOXES SHALL BE PLACED AT THE FINISHED GRADE FOR BOTH PAVEMENT AND LAWN AREAS. SEE DETAIL SHEET #2 FOR VALVE BOX REQUIREMENTS.
 2. VALVE BOXES SHALL BE ONE COMPLETE ASSEMBLED UNIT COMPOSED OF THE VALVE BOX AND EXTENSION STEM. ALL MOVING PARTS OF THE EXTENSION STEM SHALL BE ENCLOSED IN A HOUSING TO PREVENT CONTACT WITH THE SOIL. VALVE BOX ASSEMBLIES SHALL BE ADJUSTABLE TO ACCOMMODATE VARIABLE TRENCH DEPTHS.
 3. THE ENTIRE ASSEMBLY SHALL BE MADE OF CAST IRON. THE VALVE BOX SECTION SHALL BE ADAPTABLE TO FIT INSIDE A VALVE BOX UPPER SECTION.
 4. THE STEM ASSEMBLY SHALL BE OF A TELESOPING DESIGN THAT ALLOWS FOR VARIABLE ADJUSTMENT LENGTH. THE STEM MATERIAL SHALL BE MADE OF CAST IRON. THE STEM ASSEMBLY SHALL HAVE A BUILT IN DEVICE THAT KEEPS THE STEM ASSEMBLY FROM DISENGAGING AT ITS FULLY EXTENDED LENGTH. THE EXTENSION STEM MUST BE TORQUE TESTED TO 1000 FOOT-POUNDS. VALVE BOXES SHALL BE TYLER UNION 6850 SERIES OR EQUIVALENT. A RUBBER ADAPTOR FOR THE BOX TO REST AND LOCK INTO PLACE ON THE VALVE SHALL BE INCLUDED.
- C. VALVES:
1. VALVES SHALL BE EQUAL TO AMERICAN FLOW CONTROL'S SERIES 2500 DUCTILE IRON RESILIANT WEDGE GATE VALVE (4"-12"), MUELLER CENTURION, OR ARC BUTTERFLY VALVE (16"+). VALVE BODY, BONNET AND WEDGE SHALL BE CONSTRUCTED OF DUCTILE IRON. THE EXTERIOR OF THE DUCTILE IRON WEDGE SHALL BE ENCAPSULATED WITH NITRILE RUBBER AND HAVE ACE/FEL GUIDES. THE WEDGE SHALL BE SYMMETRICAL AND SEAL EQUALLY WELL WITH FLOW IN EITHER DIRECTION. VALVES 16" & LARGER SHALL BE BUTTERFLY VALVES.
 - 1.a. WHEN VAULTS AND TRENCH BACKFILL ARE REQUIRED, THE AGGREGATE BACKFILL MATERIAL SHALL BE COMPACTED BY MEANS OF FLOODING OR WATER JETTING. IN ADDITION TO MECHANICAL COMPACTION, COMPACTION AND FLOODING/JETTING SHALL BE REQUIRED IN LIFTS OF NO MORE THAN 16", EXCEPT FOR THE FIRST LIFT, WHICH SHALL BE 24".
 2. THERE SHALL BE NO EXPOSED METAL SEAMS, EDGES OR SCREWS WITHIN THE WATERWAY. THE STEM SHALL BE BRONZE IN FULL COMPLIANCE WITH SECTION 4.7 OF AWWA C515. WRENCH OPERATING SHALL BE CONSTRUCTED OF DUCTILE IRON. WRENCH NUT SHALL HAVE FOUR FLATS AT STEM CONNECTION TO ASSURE EVEN DISTRIBUTION OF OPERATING INPUT TORQUE TO THE STEM. THE WORDS "DI" OR "DUCTILE IRON" SHALL BE CAST ON THE VALVE OR STAMPED ON A PERMANENTLY ATTACHED CORROSION RESISTANT METAL TAG.
 3. ALL BODY-TO-BONNET AND BONNET-TO-COVER SEALS SHALL BE O-RINGS. FLAT GASKETS SHALL NOT BE ALLOWED. STEM SHALL BE SEALED BY THREE O-RINGS. THE TOP TWO O-RINGS SHALL BE REPLACEABLE WITH VALVE FULLY OPEN AND WHILE SUBJECT TO FULL RATED WORKING PRESSURE. O-RINGS SET IN A CARTRIDGE SHALL NOT BE ALLOWED.
 4. VALVE SHALL HAVE THRUST WASHERS LOCATED ABOVE AND BELOW THRUST COLLAR TO ASSURE EASY OPERATION OF THE VALVE. ALL INTERNAL AND EXTERNAL FERROUS SURFACES OF THE VALVE BODY AND BONNET SHALL HAVE A FUSION-BONDED EPOXY COATING, COMPLYING WITH ANSI/AWWA C550, APPLIED ELECTROSTATICALLY PRIOR TO ASSEMBLY.
 5. 250# RAISED FACE FLANGES SHALL BE PROVIDED WHEN REQUIRED.
- D. CUTTING-IN VALVES & SLEEVES:
1. CUTTING-IN VALVES SHALL BE MANUFACTURED TO CONFORM TO AWWA C515 STANDARD FOR RESILIANT SEATED GATE VALVES. BODIES AND BONNETS TO BE CAST IRON. WEDGES TO BE CONSTRUCTED OF DUCTILE IRON, FULLY ENCAPSULATED ON THE EXTERIOR BY SYNTHETIC RUBBER EDGE SHALL SEAT AGAINST SEATING SURFACES ARRANGED SYMMETRICALLY ABOUT THE CENTERLINE OF THE OPERATING STEM, SO THAT SEATING IS EQUALLY EFFECTIVE REGARDLESS OF DIRECTION OF PRESSURE UNBALANCED ACROSS THE WEDGE. RUBBER SEAT SHALL BE BONDED TO THE DUCTILE WEDGE WITHOUT THE USE OF SCREWS, RIVETS OR SIMILAR FASTENERS. VALVE SHALL HAVE ONE END STANDARD MECHANICAL JOINT AND THE OTHER END SHALL BE ABLE TO ACCEPT OVERSIZED PIT CAST IRON PIPE. THE OVERSIZED END SHALL BE OF A DIFFERENT COLOR THAN REST OF VALVE FOR IDENTIFICATION. VALVE SHALL BE AMERICAN FLOW CONTROL'S SERIES 2500 CUTTING-IN VALVE. CUTTING-IN SLEEVE, STAINLESS STEEL, SHALL BE AS MANUFACTURED BY CASCADE WATERWORKS, YORKVILLE, IL, STYLE CST-EX.
- E. RETAINER GLANDS:
1. MECHANICAL JOINT RESTRAINT SHALL BE INCORPORATED IN THE DESIGN OF THE FOLLOWER GLAND. THE RESTRAINT MECHANISM SHALL CONSIST OF A PLURALITY OF INDIVIDUALLY ACTIVATED GRIPPING SURFACES TO MAXIMIZE RESTRAINT CAPABILITY. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536-80. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARDIZED MECHANICAL JOINT BELL AND TEE-HEAD BOLTS CONFORMING TO ANSI/AWWA A211.11 AND ANSI/AWWA A21.53/C153. LATEST REVISION. TWIST-OFF NUTS, SIZED SAME AS TEE-HEAD BOLTS, SHALL BE USED TO INSURE PROPER ACTUATING RESTRAINING DEVICES. THE MECHANICAL JOINT RESTRAINT SHALL HAVE A WORKING PRESSURE OF AT LEAST 100 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1 AND SHALL BE EBAA IRON INCORPORATED MEGALUG OR EQUAL.
- F. WATERMAIN/DUCTILE IRON FITTINGS:
1. ALL WATERMAINS IN THE CITY SYSTEM SHALL BE AT LEAST AWWA C151, CLASS #52 (PC 150) DUCTILE IRON PUSH PIPE, C909 (PC 150) OR C900 (200) PLASTIC PIPE. PIPE CROSSING UNDER A MAJOR ARTERIAL ROADWAY SHALL BE MINIMUM CLASS #56 DUCTILE IRON. ALL SERVICE CONNECTIONS FOR PVC SHALL BE SADDLED. PIPE MUST BE BURIED WITH 6 FEET OF COVER. FITTINGS SHALL BE AVAILABLE IN 4 THROUGH 24-INCH SIZES AND SHALL BE CAST FROM DUCTILE IRON IN ACCORDANCE WITH ANSI/AWWA C153/A21.53 WITH MECHANICAL JOINT BELLS, GLANDS, BOLTS, NUTS, AND GASKETS SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF ANSI/AWWA C153/A21.53. FITTINGS SHALL BE LISTED BY AN APPROVED CERTIFYING AGENCY AS CONFORMING TO THE REQUIREMENTS OF ANSI/ANSI 61. THE WORKING PRESSURE RATING SHALL BE 350 PSI.
- G. FIRE HYDRANTS:
1. FIRE HYDRANTS SHALL MEET OR EXCEED AWWA C502, LATEST REVISION. RATED WORKING PRESSURE SHALL BE 250 PSI AND HYDRANTS SHALL INCLUDE THE FOLLOWING SPECIFIC DESIGN CRITERIA:
 - a. HYDRANTS SHALL BE AMERICAN FLOW CONTROL'S WATEROUS PACER, MODEL WB-67-250 WITH VENTED CAPS, OR MUELLER CENTURION. ALTERNATES SHALL NOT BE ALLOWED. THE NOZZLE SECTION, UPPER AND LOWER STANDPIPES AND HYDRANT BASE SHALL BE DUCTILE IRON. NOZZLE SHALL BE MECHANICALLY ATTACHED. NOZZLES PINNED OR SCREWED IN WILL NOT BE ALLOWED. THE STEAMER NOZZLE SHALL HAVE A STORE COUPLING. THE MAIN VALVE CLOSURE SHALL BE OF THE COMPRESSION TYPE, OPENING AGAINST THE PRESSURE AND CLOSING WITH THE PRESSURE. NOZZLE SECTION TO BE DESIGNED FOR EASY 360-DEGREE ROTATION BY THE LOOSENING OF NO MORE THAN FOUR BOLTS. THE SEAT DIAMETER SHALL BE 5-1/4". HYDRANT MUST BE DESIGNED SO THAT REMOVAL OF ALL WORKING PARTS CAN BE ACCOMPLISHED WITHOUT EXCAVATING. THE BRONZE SEAT TO BE THREADED INTO MATING THREADS OF BRONZE FOR EASY FIELD REPAIR. HYDRANT SHALL HAVE FACTORY INSTALLED 304 STAINLESS STEEL BOLTING BETWEEN BARREL AND SHOE. THE DRAINING SYSTEM OF THE HYDRANT WILL BE BRONZE AND BE POSITIVELY ACTIVATED BY THE MAIN OPERATING ROD. HYDRANT TO BE FURNISHED WITH A SLIDING BRONZE DRAIN VALVE. SLIDING DRAIN VALVES MADE OF RUBBER, PLASTIC OR LEATHER WILL NOT BE ALLOWED. HYDRANT MUST HAVE INTERNAL TRAVEL STOP NUT LOCATED IN THE TOP-HOUSING HYDRANT. HYDRANT MUST HAVE A DOUBLE OIL RESERVOIR SO THAT OPERATING THREADS ARE OIL LUBRICATED AND O-RING SEALED FROM WATER, MOISTURE AND FOREIGN MATTER. HYDRANT MUST HAVE A TRAFFIC FLANGE DESIGN ALLOWING FOR QUICK AND ECONOMIC REPAIR OF DAMAGE RESULTING FROM A VEHICLE'S IMPACT. THE ROD COUPLING MUST BE TWO PIECES BOLTED ON BY TWO STAINLESS STEEL STUDS AND FOUR BRASS LOCK NUTS. PINS, STANDARD NUTS AND BOLTS SHALL NOT BE ALLOWED.
 - b. THE CONTRACTOR SHALL INSTALL BLUE PAVEMENT REFLECTOR IN THE CENTER OF THE NEAREST DRIVE LANE AT EACH FIRE HYDRANT.
 2. COATING SYSTEM PERFORMANCE REQUIREMENTS FOR EXTERIOR SURFACES ABOVE GRADE
 - a. ALL FERROUS METAL PARTS OF THE HYDRANT SHALL BE COATED TO MEET THE MINIMUM REQUIREMENTS OF SECTION 4.2, PAINTING, IN AMERICAN WATER WORKS ASSOCIATION STANDARD ANSI/AWWA C502-94 DRY BARREL FIRE HYDRANTS.
 - b. PRIMER: PRIMER SHALL BE USED ON ALL SURFACES AND SHALL BE CROSSED-LINKED TWO-PART LIQUID EPOXY. EPOXY PRIMER SHALL BE APPLIED USING AN ELECTROSTATIC SPRAY PROCESS.
 - c. TOPCOAT: SURFACES SHALL BE TOP COATED WITH HIGH-GLOSS TWO-PART LIQUID URETHANE THAT USES AN ALIPHATIC ISOCYANATE CATALYST TO PRODUCE A CROSS-LINKED CURE. TOPCOAT SHALL BE APPLIED USING AN ELECTROSTATIC SPRAY PROCESS.
 - d. THE HYDRANT BASE SHALL BE COATED WITH FUSION-BONDED EPOXY ON INTERIOR AND EXTERIOR SURFACES USING MATERIALS AND COATING APPLICATION PROCEDURES THAT MEET OR EXCEED THE REQUIREMENTS OF AWWA C550-01 STANDARD FOR PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES AND HYDRANTS.
 - e. FINAL INSPECTION - HYDRANT COATING SHALL NOT BE DISTURBED. ANY SCRATCHES, CHIPS, OR OTHER DEFECTS IN SURFACE COATING SHALL BE REPAIRED PER MANUAL REQUIREMENTS PRIOR TO ACCEPTANCE OF THE PROJECT.
 3. VALVES SHALL BE DIRECTLY CONNECTED TO THE HYDRANT. FIRE HYDRANTS USED WHERE SPACE IS LIMITED WILL USE A HYDRANT TEE (CLOW F1224 MJ) HYDRANT TEE WITH ANCHORING ON THE TEE OR ITS EQUIVALENT). ALL NEW HYDRANTS MUST BE A MINIMUM OF 24" CLEAR FROM CURB AND PAVEMENTS.
 4. HYDRANTS WILL HAVE A MINIMUM OF 2 FT. OF A STONE FROM THE SHOE BASE UP THE BARREL AND A MINIMUM OF 2 FEET ON EITHER SIDE OF THE HYDRANT BARREL AND COVERED WITH 25 MIL PLASTIC COVER. ALL STONE SURROUNDING THE HYDRANT TO ALLOW FOR DRAINAGE OF HYDRANT. HYDRANT BLOCKING MUST BE WITH CONCRETE BLOCKING ONLY, SET AGAINST THE BACK OF THE SHOE AND AGAINST UNDISTURBED EARTH.

- H. BACKFLOW PREVENTERS:
1. BACKFLOW PREVENTERS ARE REQUIRED FOR ALL DOMESTIC AND FIRE LINES. CONTACT THE WATER DEPARTMENT FOR MORE DETAILS. ALL LOCATIONS MUST BE APPROVED AND ASSEMBLIES WILL BE PURCHASED FROM THE WATER DEPARTMENT.
 2. BACKFLOW PREVENTERS SHALL BE PLACED INSIDE AT THE METER LOCATION (SEE CITY DETAIL SHEET), REDUCED PRESSURE ZONE DEVICES WILL HAVE PIPED DRAIN LINES TO A SUMP PIT OR FLOOR DRAIN (DRAIN LINES WILL NOT BE REDUCED).
 3. FOR ALL COMMERCIAL, EXTERIOR INSTALLATIONS, THE CONTRACTOR SHALL PROVIDE ENGINEER'S DRAWINGS SHOWING LOCATION, TYPE AND SIZE, AND PROTECTION FOR CITY APPROVAL. ALL LOCATIONS AND INSTALLATIONS MUST BE APPROVED BY THE WATER DEPARTMENT. ALL UNDERGROUND SPRINKLER SYSTEMS MUST BE INSTALLED PER CITY SPECIFICATIONS. BACKFLOW PREVENTERS WILL BE TESTED AND TAGGED. REPORTS MUST BE SUBMITTED BEFORE SYSTEM CAN BE USED. FAILURE TO COMPLY WITH ALL REQUIREMENTS COULD RESULT IN TERMINATION OF SERVICE.
 4. ALL SINGLE SERVICE COMMERCIAL (INCLUDING MULTI-FAMILY) AND INDUSTRIAL WATER SERVICES SHALL HAVE A REDUNDANT BACKFLOW PREVENTER AND BYPASS AS SHOWN IN THE DETAIL DRAWINGS. THE SECOND (REDUNDANT) BACKFLOW PREVENTER MAY BE ½ THE APPROVED METERED SERVICE SIZE. THESE REQUIREMENTS ARE IN ADDITION TO ANY STATE AND LOCAL PLUMBING CODES THAT MAY APPLY.
- I. SERVICE PIPE:
1. COPPER USED IN THE CITY SYSTEM MUST BE OF TYPE K. PLASTIC WATER SERVICE LINES WILL ALSO BE ACCEPTED BY THE CITY.
 - a. ALL WATER SERVICES MUST BE 1" MINIMUM.
 - b. ALL EXISTING SERVICES UNUSED FOR A 12 MONTH PERIOD WILL BE DEEMED ABANDONED BY THE CITY AND MUST BE REPLACED. DISCONNECTION OF THE EXISTING SERVICE DEEMED ABANDONED WILL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. ABANDONMENT OF THE EXISTING WATER SERVICE SHALL INCLUDE CUTTING AND PERMANENTLY CAPPING THE SERVICE AT THE CORPORATION STOP AND CLOSING THE CORPORATION STOP. SERVICES THAT MEET CORRECT CITY STANDARDS MAY BE EXCEPTED FROM THIS RULE. WITH THE APPROVAL OF THE WATER SUPERINTENDENT, THESE ACTIONS MUST BE COMPLETED BEFORE NEW SERVICE CONNECTIONS AND CONSTRUCTION IS STARTED. ALL SERVICE REMOVALS MUST BE INSPECTED BY THE WATER DEPARTMENT. ALL SERVICES MUST COMPLY WITH CITY SPECIFICATIONS.
- J. SERVICE FITTINGS:
1. BRASS FITTINGS USED MUST BE ONLY A.Y. MACDONALD, FORD, OR MUELLER. NO SUBSTITUTES ARE TO BE USED AND MUST BE COMPRESSION TYPE ONLY.
- K. CURB BOXES:
1. WATER CURB BOXES MUST BE A.Y. MACDONALD OR FORD CAST IRON EXTENSION TYPE WITH ARCH PATTERN BASE AND PLUG CAP, USING STATIONARY ROD AND PLACED WITHIN 6" TO THE STREET SIDE OR THE PROPERTY LINE, UNLESS APPROVED OTHERWISE. WHEN A CURB BOX IS TO BE PLACED IN CONCRETE OR BLACKTOP, A CURB BOX SLEEVE MUST BE USED (SEE SPEC SHEET CURB BOX) AND SHALL BE MARKED IN THE CURB NEAR THE CROSSING BY MEANS OF AN IMPRINT "W" AT LEAST 3" X 3" IN SIZE.
- L. WATER METERS:
1. ONLY SENSES METERS SHALL BE USED IN THE CITY SYSTEM AND MUST BE PURCHASED FROM THE CITY.
 2. THERE SHALL BE A SEPARATE SERVICE CONNECTION WITH A SEPARATE CURB STOP AND CURB BOX LOCATED WITHIN 6" OF THE PROPERTY LINE FOR EACH BUILDING SERVED BY THE CITY WATER SUPPLY. BUILDINGS REQUIRING MORE THAN ONE METERED SERVICE, BUT LESS THAN FIVE METERED SERVICES, MAY BE SERVED BY A SINGLE SERVICE LINE WITH A MASTER CURB STOP AND CURB BOX FOLLOWED BY A MAXIMUM OF FOUR ADDITIONAL SEPARATE SERVICE LINES WITH CURB STOPS AND CURB BOXES ON EACH SERVICE.
 3. ANY BUILDING REQUIRING MORE THAN FOUR METERED SERVICES WILL BE ALLOWED ONLY ONE MASTER SERVICE CONNECTION WITH A SEPARATE CURB STOP AND CURB BOX LOCATED AT THE PROPERTY LINE AND
 - a. A SINGLE MASTER METER FOR THE ENTIRE BUILDING OR
 - b. MULTIPLE METERS FOR EACH UNIT WITHIN THE BUILDING.
 - i. BEFORE ANY INSTALLATION BEGINS, IT MUST BE APPROVED AS TO WHICH OPTION YOU INTEND TO USE.
 - d.2. ALL SINGLE METERS SHALL BE PLACED NO LESS THAN 12" ABOVE THE FLOOR AND 12" AWAY FROM THE WALL.
 - c. IN EITHER CASE, THE FOLLOWING CRITERIA MUST BE MET TO ALLOW ACCESS AND SERVICING OF THE METERS:
 - c.1. A COMMON UTILITY/METER ROOM MUST BE PROVIDED IN WHICH ALL METERS ARE LOCATED (SEE CITY ORDINANCE FOR SPECIFIC REQUIREMENTS). THE ROOM MUST HAVE LOCKABLE, PERMANENT OUTSIDE ACCESS DOORWAY AT LEAST 32" WIDE X 6'-8" HIGH. THIS ROOM MUST BE ACCESSIBLE TO THE BELVIDERE WATER DEPARTMENT AT ALL TIMES AND TWO KEYS FOR ENTRY MUST BE FURNISHED TO THE DEPARTMENT PRIOR TO FINAL INSPECTION. THE ROOM WILL HAVE EXTERIOR GRADE SWITCHES, RECEPTACLES, AND LIGHT SOCKETS. THERE MUST BE A MINIMUM OF ONE LIGHT LOCATED OVERHEAD AT THE METER LOCATIONS. THE LIGHT SWITCH MUST BE LOCATED INSIDE THE DOORWAY IMMEDIATELY ADJACENT TO THE DOOR. THE ROOM MUST BE HEATED TO MAINTAIN A TEMPERATURE OF AT LEAST 50 DEGREES FAHRENHEIT TO PREVENT FREEZING AND MUST HAVE A FLOOR DRAIN. ALL METERS IN THE ROOM WILL HAVE LOCKABLE 1/4 TURN BALL VALVES LOCATED BEFORE AND AFTER THE METER UP TO 2". IN ADDITION, A LOCKABLE 1/4 TURN MASTER VALVE MUST BE INSTALLED ON THE MAIN SERVICE LINE UP TO 2". ALL OTHERS WILL BE RISING STEM RESISTANT WEDGE AMERICAN FLOW CONTROL SERIES 500. ALL VALVES MUST BE PERMANENTLY TAGGED IDENTIFYING THE UNIT WITHIN THE BUILDING IT SERVES. EACH METER MUST ALSO HAVE A PERMANENT RIDGED 1/2" DIAMETER CONDUIT RUN FROM THE METER HEAD TO THE OUTSIDE WALL. EACH CONDUIT WILL BE PERMANENTLY LABELED OUTSIDE AND ABOVE THE CONDUIT INDICATING WHAT UNIT IS SO SERVED.
 - c.2. CONTRACTORS MUST SUPPLY A DETAILED DRAWING FOR THE METER AREA TO THE CITY FOR APPROVAL.
 4. FIRE SERVICE:
 - a. FIRE SERVICE SHALL BE HYDROSTATICALLY TESTED PER N.F.P.A. STANDARDS. VALVE AND BOX SHALL BE LOCATED 6" BEHIND PROPERTY LINE.
 5. SHOP DRAWINGS SHOWING THE SIZE, LOCATION, MATERIAL TYPE AND CONFIGURATION OF ALL MANIFOLDS MUST BE FURNISHED AND APPROVED BY THE DEPARTMENT OF PUBLIC WORKS PRIOR TO INSTALLATION. MANIFOLDS MUST BE NO LESS THAN 12" OR MORE THAN 48" ABOVE THE FLOOR OF THE UTILITY/METER ROOM.
 6. ALL METERS REQUIRE A REMOTE READER FOR READING OUTSIDE THE BUILDING. FOR METERS NOT WITHIN 20 FEET OF AN OUTSIDE WALL, A 3/4" CONDUIT MUST BE INSTALLED FROM THE METER INSTALLATION TO THE OUTSIDE WALL CLOSEST TO A WALK OR DRIVE LOCATED NEAR THE FRONT OF THE BUILDING.
 7. ALL RESIDENTIAL METERS INSTALLED MUST HAVE A BACKFLOW PREVENTOR. TYPE, DEPENDS ON HAZARD INVOLVED, DETERMINED BY THE WATER DEPARTMENT.
 8. ALL METERS OVER 1" MUST HAVE A BYPASS AT LEAST 2/3 THE SIZE OF THE DOMESTIC LINE. ALL DOMESTIC LINES OVER 1" MUST HAVE TWO SHUT-OFF VALVES, ONE BEFORE AND ONE AFTER THE METER AND MUST BE GATE VALVES OR BALL VALVES WITH LOCKABLE HANDLES. ALL OTHERS REQUIRE ONLY ONE VALVE OF THE SAME TYPE.
 9. FOR ALL WATER CONNECTIONS 3/4" AND LARGER, WHERE A METER CANNOT BE PLACED IN A BUILDING AND A METER CANNOT BE USED FOR EACH SERVICE, THE METER MUST BE INSTALLED IN A METER HOUSE WITH BACKFLOW PROTECTION ABOVE GROUND. SEE ATTACHED METER HOUSE EXAMPLE SHEET.
 10. ALL SERVICE PIPE ON CITY SIDE OF THE METER SHALL BE BELOW GRADE, INCLUDING INTERIOR LOCATIONS.
- M. FLUSHING STATION:
1. PROVIDE BLOW-OFF HYDRANT OR AUTOMATIC STATION AT ALL STUBS FOR FUTURE EXTENSION WHERE ALLOWED BY IEPA. CITY SHALL DETERMINE STATION TYPE. STATION EQUIPMENT SHALL BE SPECIFIED BY THE CITY.
- N. DIRECTION DRILLING METHODS AND MATERIALS SHALL BE APPROVED BY THE CITY ON A PROJECT BASIS. APPROVED CASINGS SPACERS AND CASINGS ARE REQUIRED ON ALL CASINGS AND TRENCHED CASINGS WHEN REQUIRED BY THE CITY. SPACERS AND BOOTS SHALL BE AS MANUFACTURED BY CASCADE WATERWORKS MANUFACTURING.
- O. PROVIDE AIR RELEASE VALVE AND VAULT AT ALL HIGH POINTS ON 8" DIAMETER AND LARGER WATERMAINS. VALVES SHALL BE A MINIMUM 1" DIAMETER OUTLET ON 8" WATERMAINS AND 2" DIAMETER ON LARGER WATERMAINS. VALVES SHALL BE IN ACCORDANCE WITH AWWA C152 AND SHALL HAVE AN ISOLATION VALVE FOR MAINTENANCE PURPOSES.

WATER TESTING:

- A. WATERMAIN FLUSHING:
1. CONTRACTORS MUST USE DECHLORINIZATION METHODS APPROVED BY THE EPA AND RECOGNIZED BY THE CITY. FOR FLUSHING THE WATERMAINS, DURING INITIAL FILLING, THE FIRST NEW VALVE SHALL BE CLOSED TO ALLOW 5 MINUTES OF CHLORINE MIXING PRIOR TO FILLING THE REMAINDER OF TEST SECTION; REFERENCE ITEM B, "WATERMAIN COMPLETION TESTS", BELOW.
- B. WATERMAIN COMPLETION TESTS:
1. CONTRACTORS MUST SIGN AND COMPLETE A FORM WITH COPIES FOR THE WATER DEPT. BEFORE WATERMAIN CHARGING, DISINFECTION, PRESSURE TESTING AND FLUSHING. CONTRACTORS WILL CONTACT THE WATER DEPT. 48 HOURS IN ADVANCE OF EACH REQUESTED STEP. SIGNATURES FROM A REPRESENTATIVE, OF THE CONTRACTOR AND CITY WATER DEPT., MUST APPEAR ON EACH FORM FOLLOWING COMPLETION OF EACH STEP.
 2. MAXIMUM OF 3000 FEET OF WATERMAIN MAY BE TESTED IN ANY ONE TEST EVENT. CONTRACTOR SHALL ISOLATE SECTIONS OF THE SYSTEM AS NECESSARY AT VALVES TO MEET THIS REQUIREMENT. ALL SYSTEM JOINTS SHALL BE TESTED.
- C. WATERMAIN TEST REPORTS:
1. ALL WATERMAINS UPON COMPLETION WILL BE BACTERIA, LEAKAGE, AND PRESSURE TESTED. TEST REPORTS MUST BE FILED WITH THE WATER DEPARTMENT. NO CONNECTIONS OR BUILDING PERMITS WILL BE PERMITTED UNTIL ACCEPTABLE REPORTS ARE RECEIVED BY THE CITY.
 2. ALL TESTS SHALL BE IN ACCORDANCE WITH AWWA AND IEPA STANDARDS. AN ACCEPTABLE PRESSURE TEST SHALL BE AT 150 PSI MINIMUM FOR 1 HOUR AND NO PRESSURE DROP.
- D. PROVIDE STANDARD SAMPLE STATION HYDRANT AS DIRECTED BY THE CITY. MINIMUM ONE PER SUBDIVISION.

SANITARY SEWER:

- A. SEWER MAIN:
1. SANITARY SEWER LINES MAY BE PVC SOLID WALL OR V10N PIPE (ASTM F-794; UNI-B-9) FOR 8" AND LARGER PIPE WITH PROPER TRENCH BACKFILL AS REQUIRED BY THE CITY (SEE BEDDING DETAIL AND MATERIAL LIST FOR SPECIFICATIONS). ANY MAIN EXCEEDING 11" DEEP MUST BE APPROVED BY PUBLIC WORKS PRIOR TO SUBMITAL OF CONSTRUCTION PLANS. FORCEMAIN MAY BE PVC SOLID WALL OR DIP.
- B. SEWER LATERALS:
1. MATERIALS SHALL BE SDR 26, WATERMAIN QUALITY. LATERALS SHALL BE LEAKAGE TESTED UNDER THE SAME SPECIFICATIONS AS SEWER MAINS.
 2. ALL LATERALS SHALL EXTEND TO THE PROPERTY LINE, WITH A 4" DIAMETER CLEAN OUT LOCATED 6" BEHIND THE PROPERTY LINE. LATERALS SHALL BE A MAXIMUM 9' DEEP, AND NOT LESS THAN 8". AT THE PROPERTY LINE IN ACCORDANCE WITH THE DETAIL, THE CLEAN OUT CAP SHALL BE WITHIN 8' BELOW THE TOP OF THE GROUND AND PROTECTED BY A CAST SLEEVE AND LID FLUSH WITH GROUND, MARKED "SEWER" (SEE CITY SPEC.). IF THEY ARE NOT CONNECTED TO THE BUILDINGS WHEN INSTALLED, THEY MUST BE MARKED AT THE END OF THE UNCONNECTED STUB WITH A 2" X 4" TREATED POST PROTRUDING A MINIMUM OF 14" ABOVE THE GROUND. PAINTED GREEN. SERVICE SHALL BE MARKED ON THE CURB (NEAR THE TOP) BY MEANS OF AN IMPRINT OF AN "S" AT LEAST 3" X 3".
 3. ALL LATERAL SEWER CONNECTIONS THAT ARE MADE TO EXISTING SANITARY SEWER MAINS SHALL BE SADDLED AND CUTS IN PIPE SHALL BE CIRCULAR.
- C. MANHOLES:
1. ALL MANHOLES SHALL BE A MINIMUM 4 FOOT DIAMETER PRECAST. ALL SHALL HAVE AN APPROVED EXTERNAL RUBBER SEAL AT THE ADJUSTING RING AND FRAME OF THE MANHOLE BARREL TO FORM A WATERTIGHT CONNECTION. APPROVED EXTERNAL SEALS AS MANUFACTURED BY CRETEK. ALL BARREL JOINTS SHALL BE SEALED WITH INFI SHIELD. WRAPID SEAL OR APPROVED EQUAL. WHEN MANHOLES ARE DEEPER THAN 15 FEET AND/OR WHEN GROUND WATER IS PRESENT, BARREL JOINTS SHALL HAVE AN EXTERNAL SEAL "MAC WRAP" AS MANUFACTURED BY MAR MAC MANUFACTURING COMPANY. ALL EXTERNAL BARREL SURFACES SHALL HAVE A WATER PROOFING COATING. COATINGS SHALL BE DOUBLE APPLIED (2 COATS) AND SHALL BE EITHER BITUMINOUS BASED OR POLYMER BASED CEMENT.
 2. ALL MANHOLE INVERTS MUST BE PRE-POURED AND PIPE CONNECTIONS SEALED WITH AN APPROVED WATERTIGHT CONNECTION.
 3. ALL SEWER MANHOLE LIDS SHALL BE OF THE PICKLESS TYPE, EXTRA HEAVY REGARDLESS OF LOCATIONS, STAMPED SEWER.
 4. ALL CASTINGS SHALL BE OF THE EXTRA HEAVY LID AND LIDS SHALL BE OF THE PICKLESS AND SELF-SEALING TYPE.
- D. SEWER METERS:
1. MONITORING FOR SEWER ONLY CHARGES - SEE METER DEPARTMENT EQUIPMENT TYPES.
- E. SANITARY SEWER CROSSING OVER WATER:
1. SDR 26 WATERMAIN CLASS PIPE SHALL BE USED IN PLACE OF ENCASEMENT PIPE.
 2. WATERMAIN MECHANICAL JOINTS SHALL BE RESTRAINED BY RESTRAINING RINGS "MEGA-LUG" OR EQUAL (THE TYPE TO BE COMPLIANT WITH THE PIPE USED).
 3. WATERMAIN LAID ON A CURVE SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING TABLE. PIPE JOINTS ARE PERMITTED A MAXIMUM 2" ANGULAR DEFLECTION. FITTINGS SHALL BE USED FOR GREATER DEFLECTIONS.
- | NOMINAL SIZE, IN | 4 | 6 | 8 | 10 | 12 |
|------------------|-----|-----|-----|-----|-----|
| MIN. RADIUS, FT | 100 | 144 | 189 | 231 | 273 |
- F. SANITARY SEWER MAIN TEST REPORTS:
1. ALL SANITARY SEWER MAINS SHALL BE LEAKAGE TESTED BY LOW PRESSURE AIR AND A PORTION OF THE MAIN DEFLECTION TESTED; ALL IN ACCORDANCE WITH ILLINOIS RECOMMENDED STANDARDS FOR SEWAGE WORKS. DEFLECTION TESTING SHALL BE PERFORMED ON THE FIRST 1200 FEET AND 10% OF THE REMAINDER WITH A MINIMUM OF 25% OF THE ENTIRE PROJECT.
 2. ALL SANITARY SEWER MAINS UPON COMPLETION, SHALL BE MANDRELED 30 DAYS AFTER FINAL INSTALLATION.
 3. TEST REPORTS SHALL BE FILED WITH THE WATER AND SEWER DEPARTMENT. NO CONNECTIONS OR BUILDING PERMITS WILL BE PERMITTED UNTIL ACCEPTABLE REPORTS ARE RECEIVED BY THE CITY.
 4. ALL REPORTS SHALL BE SENT TO BELVIDERE WATER AND SEWER DEPARTMENT. ATTENTION: WATER AND SEWER SUPERINTENDENT, 401 WHITNEY BLVD, SUITE 200, BELVIDERE, IL 61008.
- G. SANITARY MANHOLE TEST REPORTS:
1. ALL SANITARY MANHOLES SHALL BE LEAKAGE TESTED BY VACUUM TEST IN ACCORDANCE WITH ASTM C1244 AND THE ILLINOIS RECOMMENDED STANDARDS FOR SEWAGE WORKS. TEST REPORTS SHALL BE FILED WITH THE WATER AND SEWER DEPARTMENT. NO CONNECTIONS OR BUILDING PERMITS WILL BE PERMITTED UNTIL ACCEPTABLE REPORTS ARE RECEIVED BY THE CITY.
 2. ALL REPORTS SHALL BE SENT TO BELVIDERE WATER AND SEWER DEPARTMENT. ATTENTION: WATER AND SEWER SUPERINTENDENT, 401 WHITNEY BLVD, SUITE 200, BELVIDERE, IL 61008.
- H. MANHOLE BACKFILL FLOODING/JETTING:
1. WHEN TRENCH BACKFILL IS REQUIRED, THE AGGREGATE BACKFILL MATERIAL SHALL BE COMPACTED BY MEANS OF FLOODING OR WATER JETTING. IN ADDITION TO MECHANICAL COMPACTION, COMPACTION AND FLOODING/JETTING SHALL BE REQUIRED IN LIFTS OF NO MORE THAN 16", EXCEPT FOR THE FIRST LIFT, WHICH SHALL BE 24".
- I. REPAIR OF SANITARY SEWER LINES:
1. THE REPAIR OF DAMAGED SANITARY SEWER LINES SHALL BE AS FOLLOWS:
 - a. PVC PIPE - REPLACE DAMAGED SECTION OF SEWER WITH CITY STANDARD PVC PIPE CUT TO FIT WITH MAXIMUM 1/4" OPENING AT COUPLED JOINTS AND INSTALL A FERNOCO COUPLING OR REPAIR COUPLING AT EACH END AS APPROVED BY THE CITY.
 - b. DIP - REPLACE DAMAGED SECTION WITH SOLD SLEEVE MECHANICAL JOINT COUPLING AT EACH END.
 - c. REPAIRS TO NEW LINES, NOT YET ACCEPTED BY THE CITY, SHALL BE TESTED IN ACCORDANCE WITH THESE STANDARD SPECIFICATIONS.

ABANDONMENT OF SANITARY SEWER SERVICE LATERALS:

- A. ABANDONMENT SHALL INCLUDE:
1. EXCAVATION AS NEAR AS PRACTICAL TO THE EDGE OF ROAD (BUT NOT SO CLOSE AS TO POTENTIALLY UNDERCUT THE ROAD OR CURB);
 2. CUTTING OF THE UPSTREAM SERVICE LATERAL PIPE;
 3. INSERTION OF A SNUG FITTING PLUG OR BALL AS FAR INTO THE DOWNSTREAM SERVICE LATERAL PIPE AS POSSIBLE (BUT IN NO MEANS GETTING CLOSER THAN 5' TO THE SEWER MAIN). SAID PLUG OR BALL TO BE A TIGHT ENOUGH FIT TO PREVENT CEMENTITIOUS MATERIAL FROM GETTING TO THE SEWER MAIN;
 4. FILLING THE PIPE ABOVE THE PLUG WITH FLOWABLE FILL OR HYDRAULIC CEMENT, ENSURING THAT THE PIPE IS FULL TO THE TOP FOR AT LEAST 3' OF LENGTH;
 5. SAID PLUG OR BALL TO INCLUDE A TETHER IN THE SERVICE LATERAL PIPE TO ENSURE IT REMAINS IN PLACE DURING THE PLACEMENT OF THE CEMENTITIOUS MATERIAL AND TO HOLD THE PLUG IN PLACE FOR ALL TIME;
 6. PLACEMENT OF A WATERTIGHT CAP OR PLUG AT THE UPSTREAM END (FERNOCO OR CITY APPROVED EQUAL).
 7. BACKFILLING THE EXCAVATION WITH AGGREGATE TRENCH BACKFILL COMPACTED IN 6" LIFTS (IN ANY AND ALL AREAS WITHIN 2' OF A PAVED SURFACE) AND COMPACTED EARTHEN MATERIALS IN ALL OTHER LOCATIONS.
- B. A PERMIT MUST BE OBTAINED FROM THE CITY PRIOR TO INITIATION OF ABANDONMENT WORK INCLUDING A BOND TO COVER ANY AND ALL DAMAGE TO PUBLIC OR PRIVATE PROPERTIES AND MATERIALS.

ADDITIONAL WATER/SEWER REQUIREMENTS:

- A. UNDERGROUND LOCATING SERVICES
1. THE CONTRACTOR WILL INSTALL AN OMNI BALL DIRECTLY ON TOP OF ALL NEW WATERMAINS, FORCEMAINS, AND SEWER SERVICES; THIS IS A DEVICE USED FOR UNDERGROUND LOCATION OF PLASTIC PIPES. THERE ARE OMNI BALLS FOR WATER AND SEWER; EACH HAS A DISTINCT COLOR. THESE DEVICES ARE TO BE PURCHASED DIRECT FROM THE MANUFACTURER. THE WATER DEPT. MAY MAKE ADVANCED PURCHASES FOR THE CONTRACTOR. PREPAYMENT IS MADE TO THE CITY BEFORE ANY ORDER CAN BE PLACED. THE CONTRACTOR WILL PLACE THE OMNI BALL IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:
 - a. AT NO LESS THAN 250' INTERVALS ON ALL WATERMAINS AND FORCEMAINS, REGARDLESS OF FITTINGS OR VALVES.
 - b. AT ALL FITTINGS ON WATERMAIN.
 - c. AT THE LOW POINTS OVER THE WATERMAIN WHEN OVER 6' DEEP.
 - d. AT ALL SEWER SERVICES, PLACED 6' FROM PROPERTY LINE.
 - e. AT A DEPTH NO DEEPER THAN 3' BELOW FINISH GRADE.
- B. ALL PAVEMENT CUTS SHALL HAVE APPROVAL FROM THE CITY. ALL TRENCHES SHALL BE PROPERLY BACKFILLED AT THE END OF EACH WORKING DAY UNLESS OTHERWISE APPROVED BY THE CITY. ALL PAVEMENT CUTS SHALL BE REPAIRED WITHIN MAXIMUM OF THREE DAYS FROM THE DATE THE CUT IS MADE. IF CONDITIONS DO NOT PERMIT A PERMANENT REPAIR WITHIN THE GIVEN TIME LIMIT, PERMISSION TO MAKE A TEMPORARY REPAIR MUST BE OBTAINED FROM THE CITY.

MATERIAL SUMMARY LIST:

(THE CITY OF BELVIDERE ONLY ACCEPTS AMERICAN MADE PRODUCTS)
ALL MATERIALS SHALL BE APPROVED BY CITY OF BELVIDERE WATER AND SEWER DEPARTMENT PRIOR TO INSTALLATION.

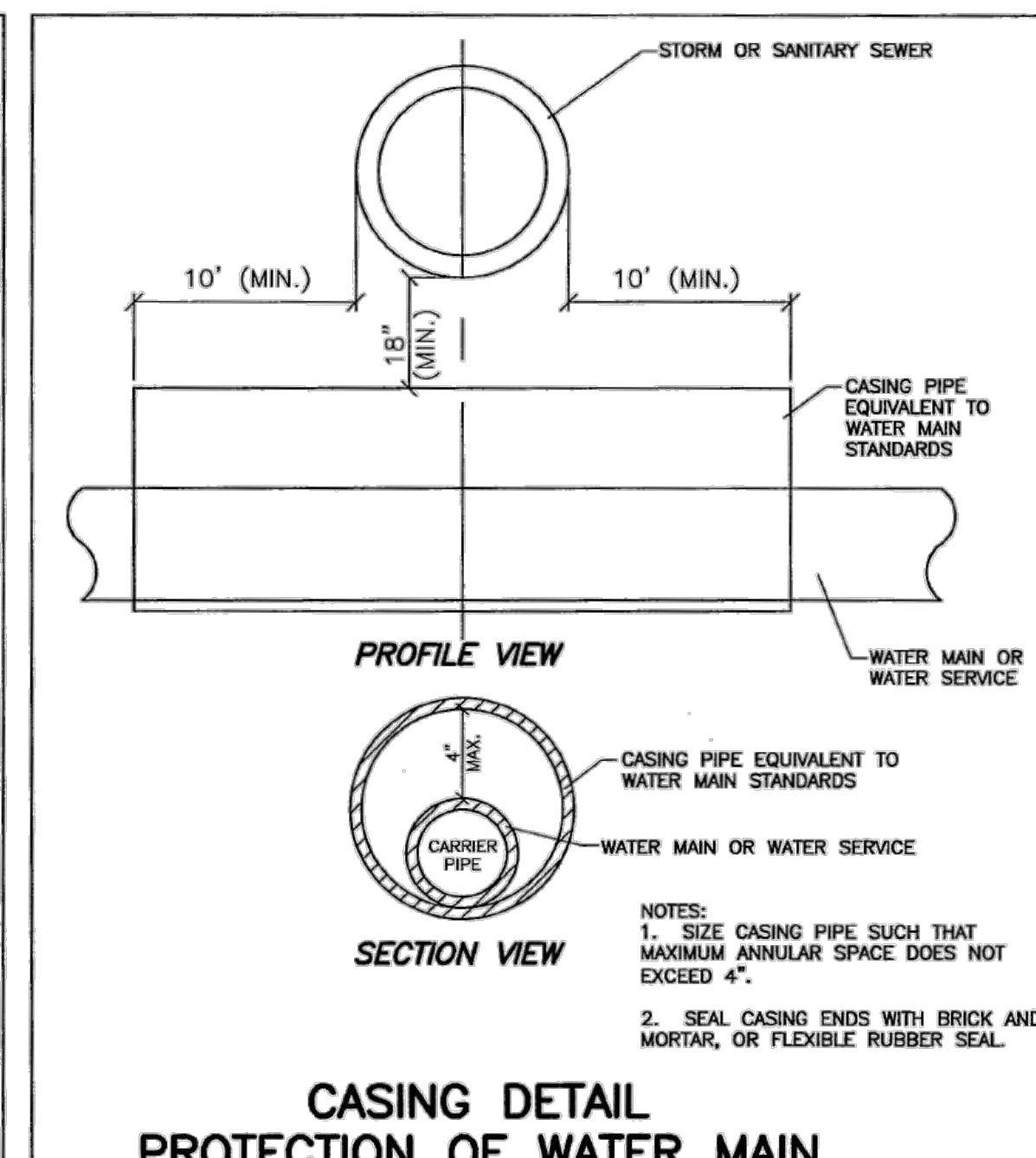
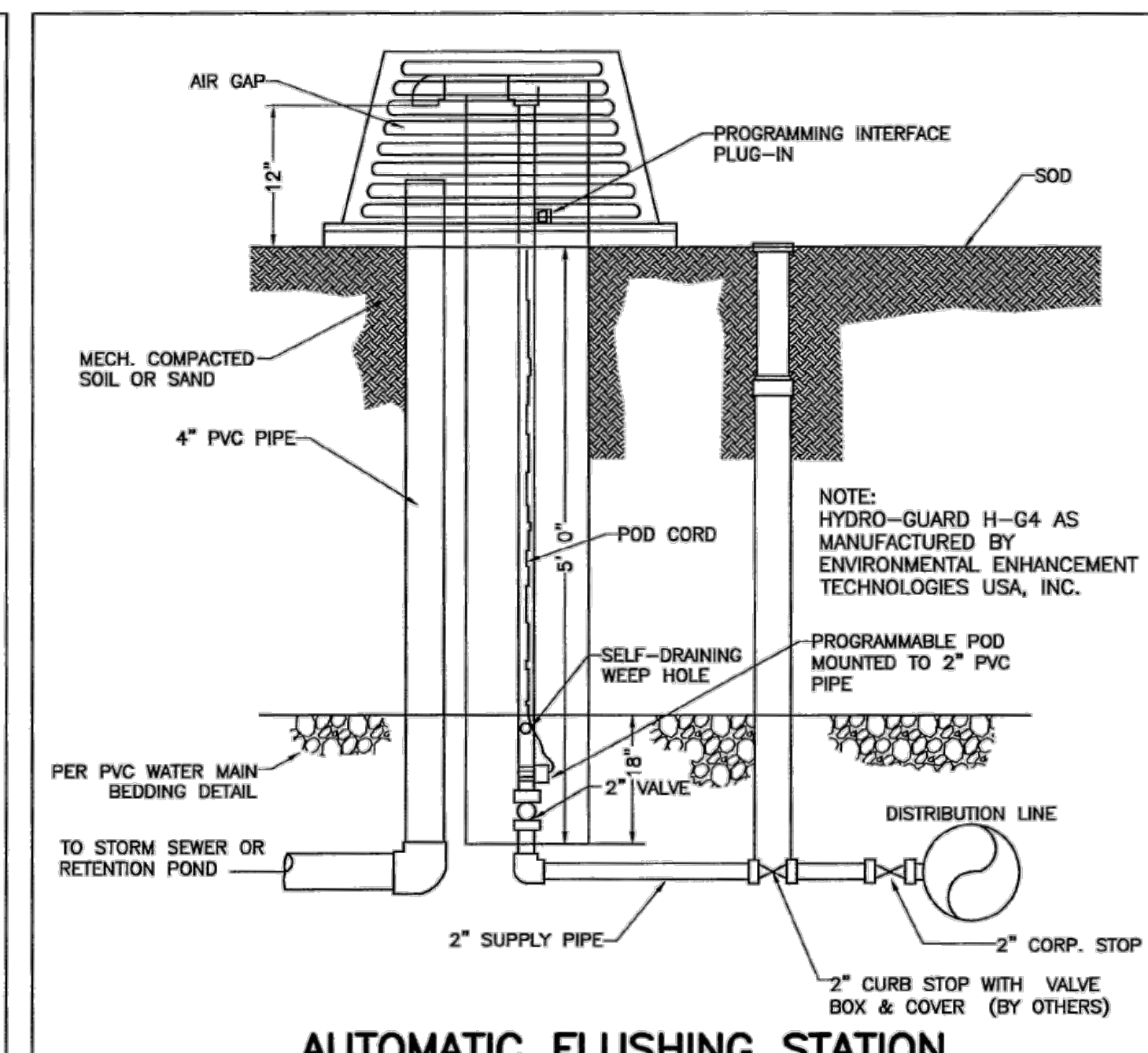
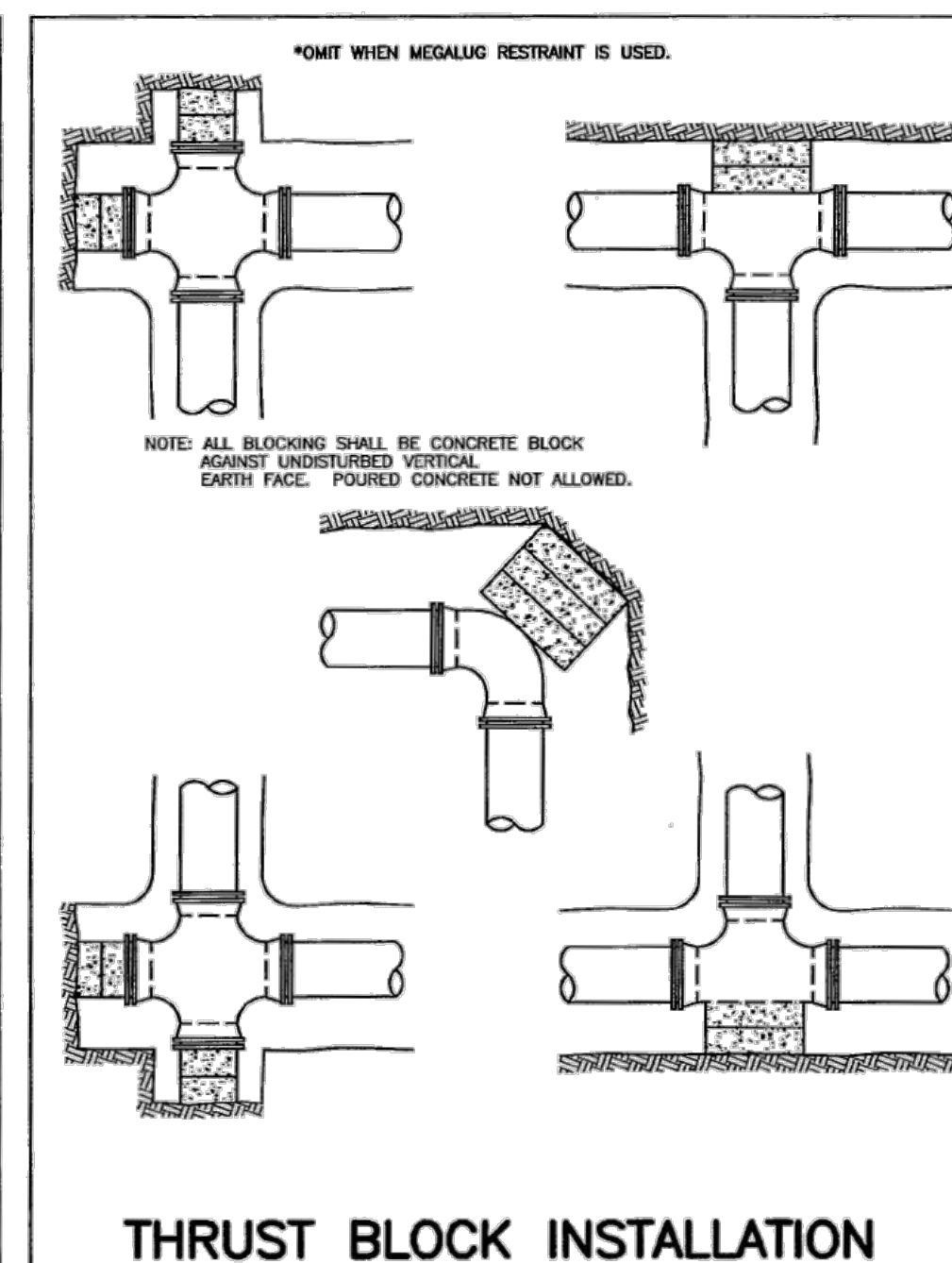
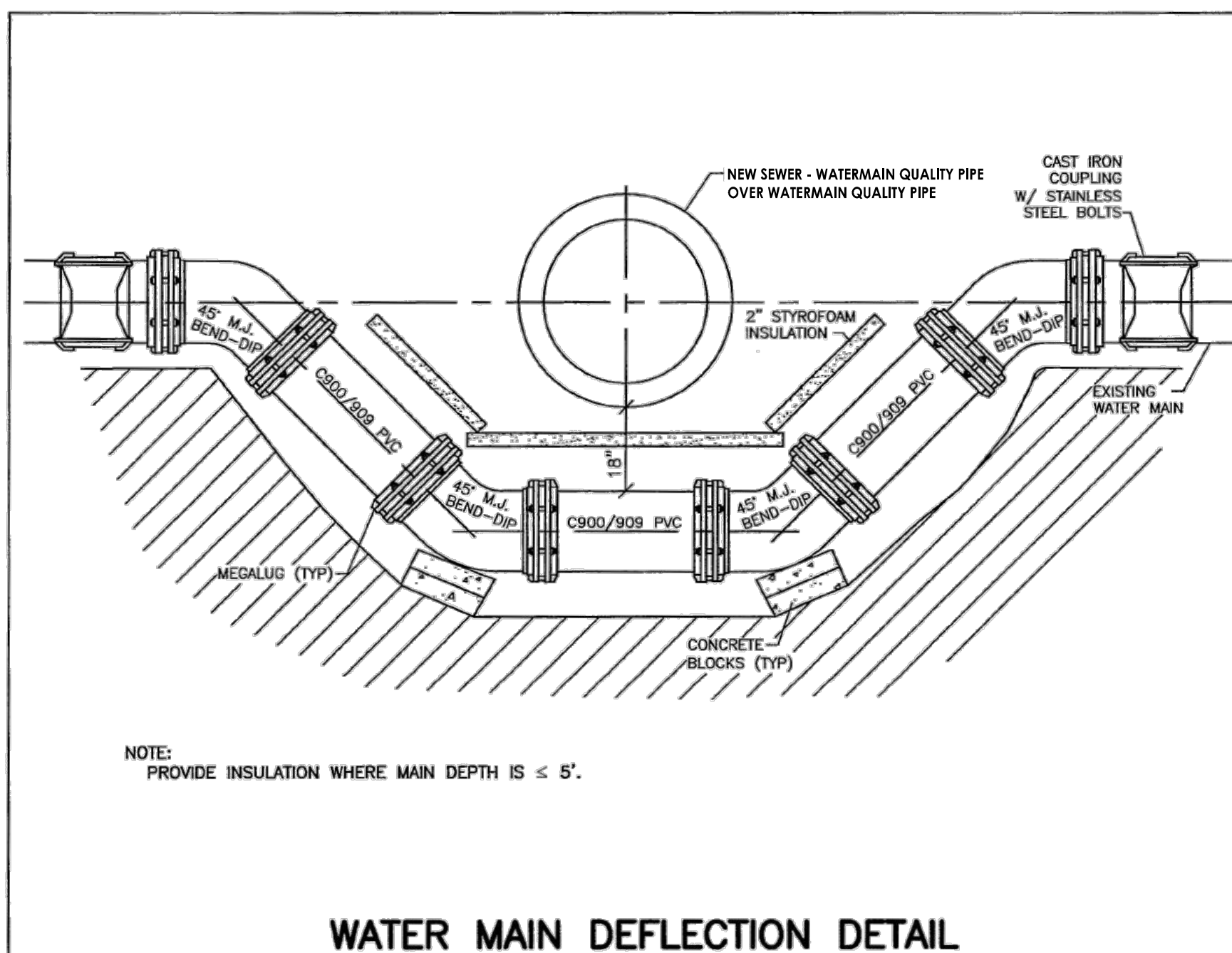
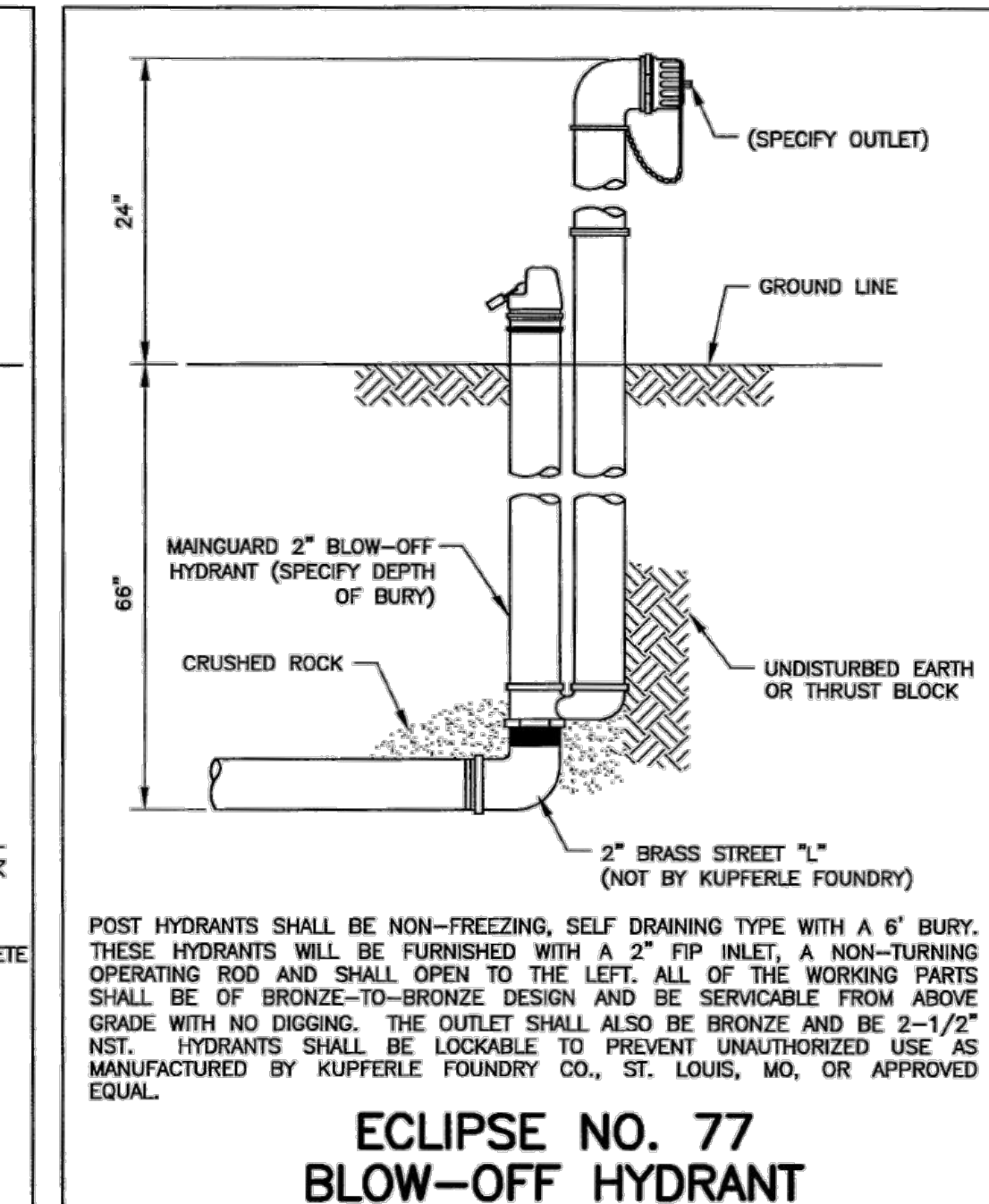
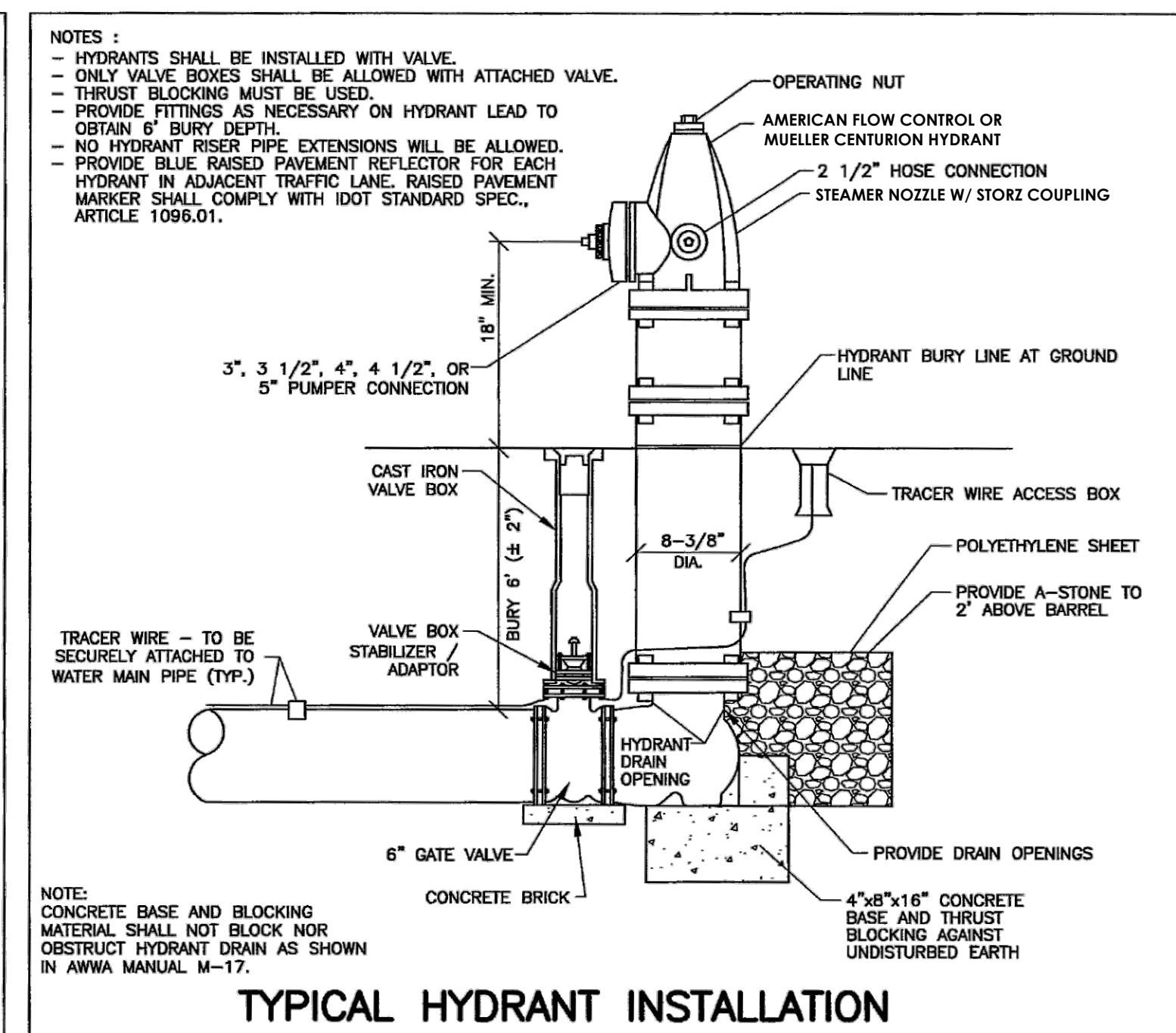
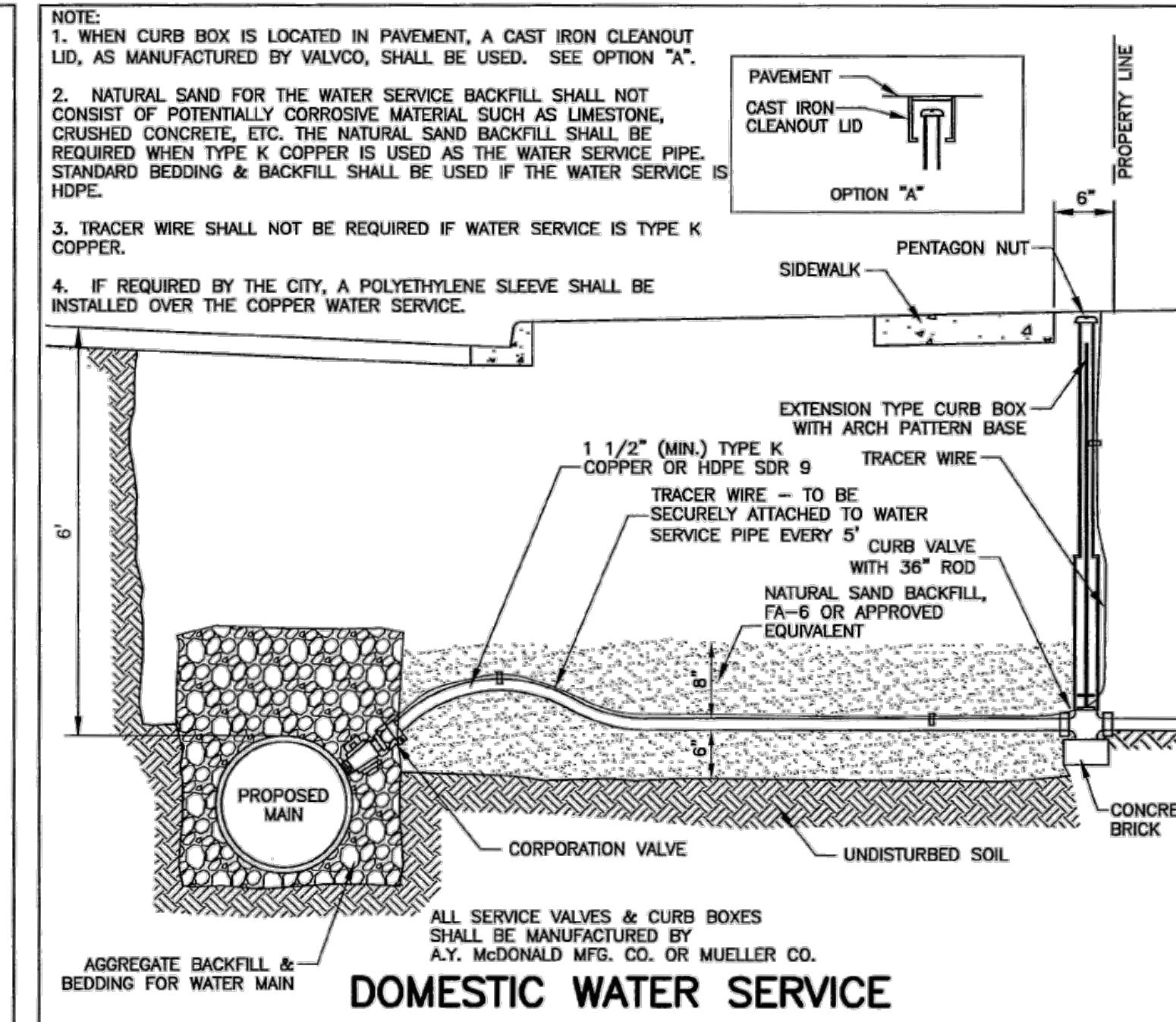
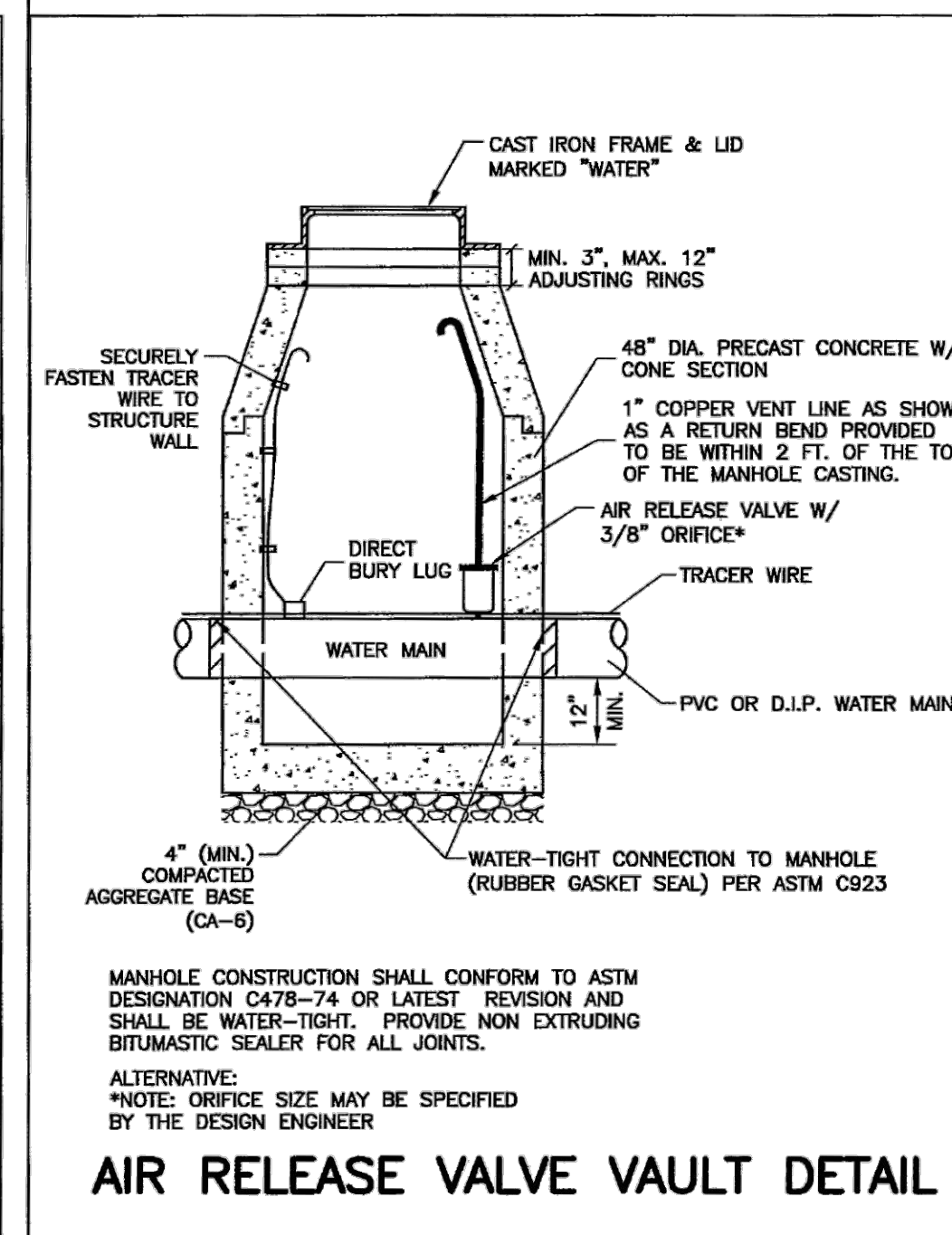
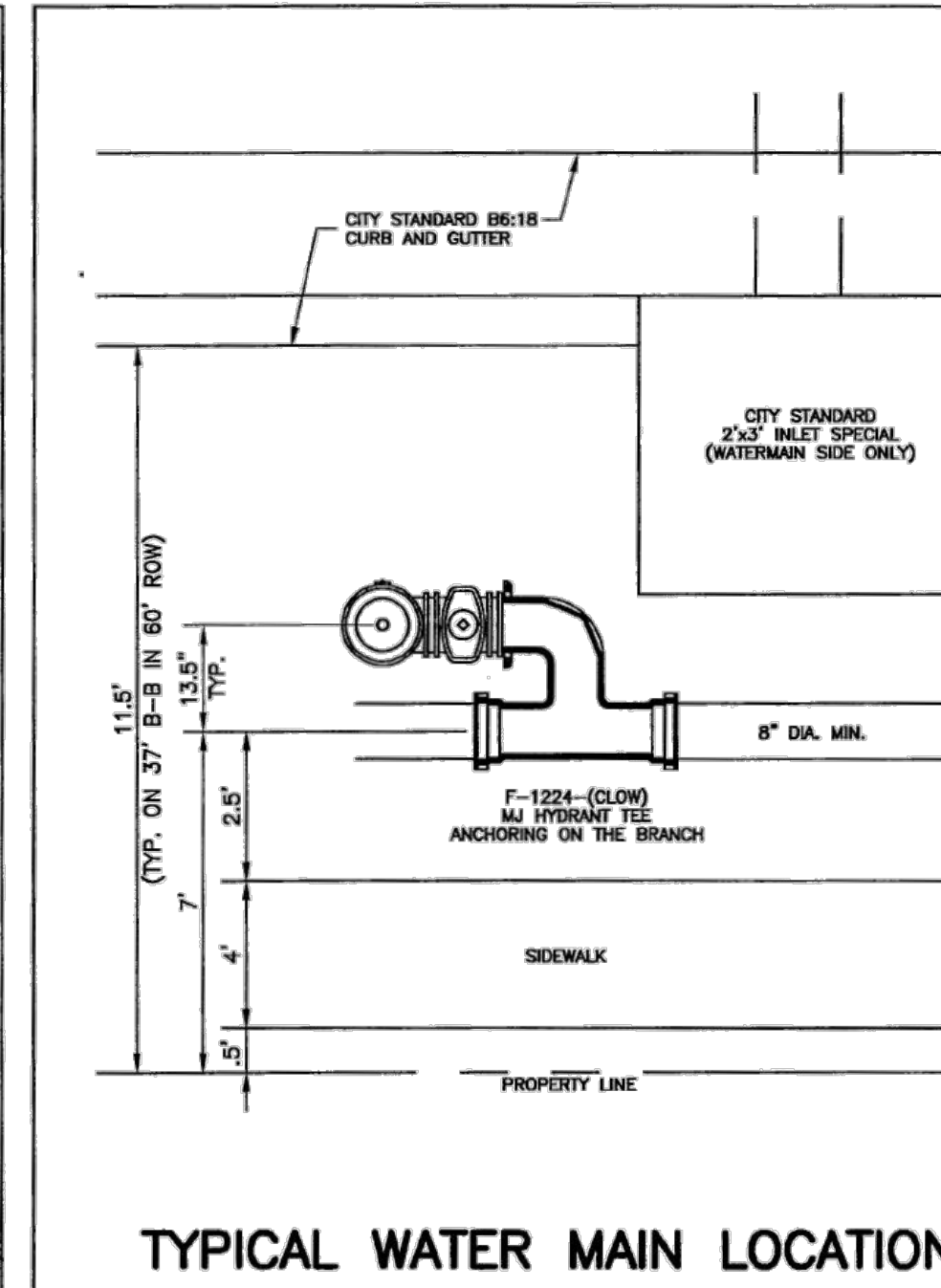
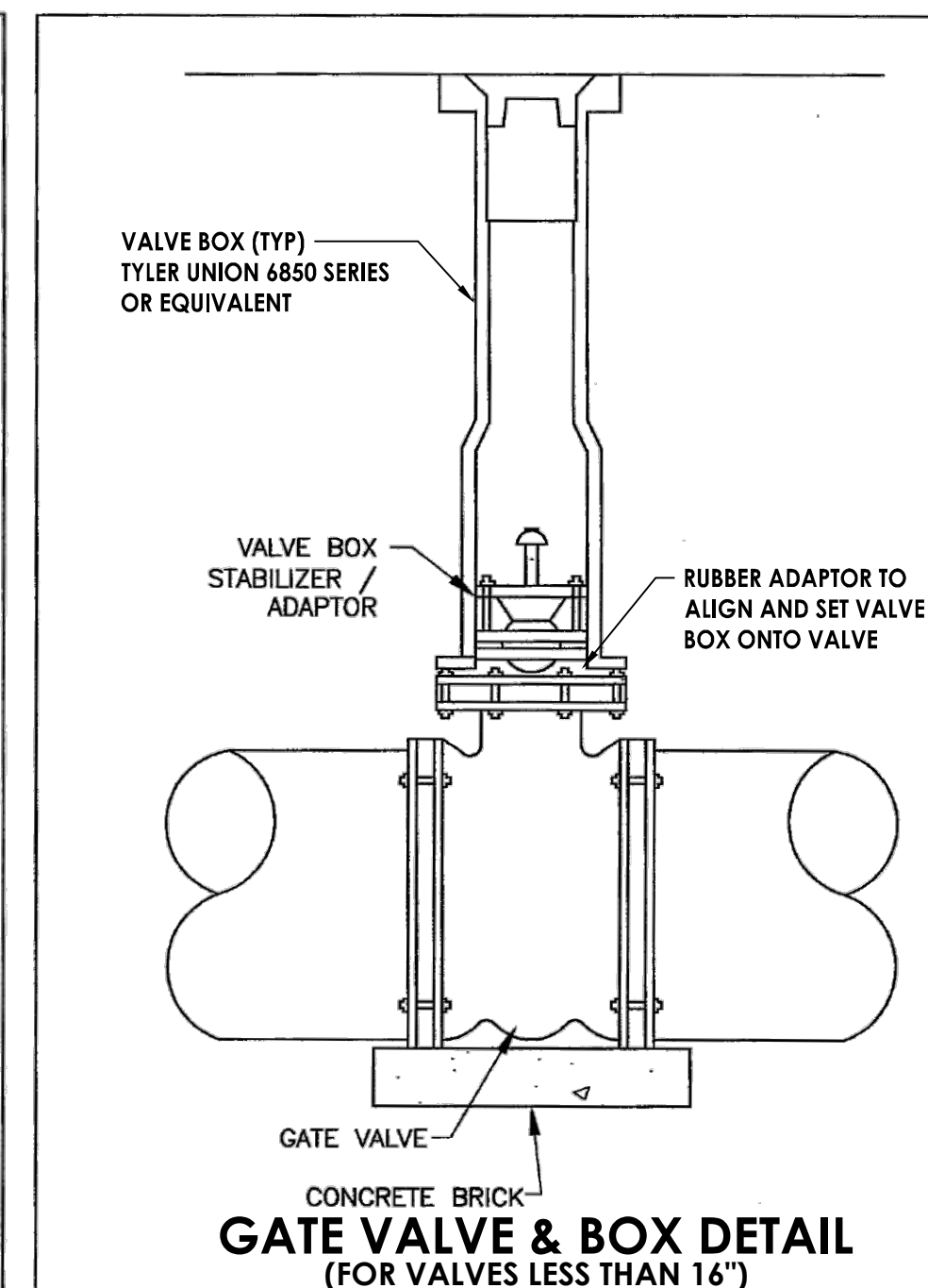
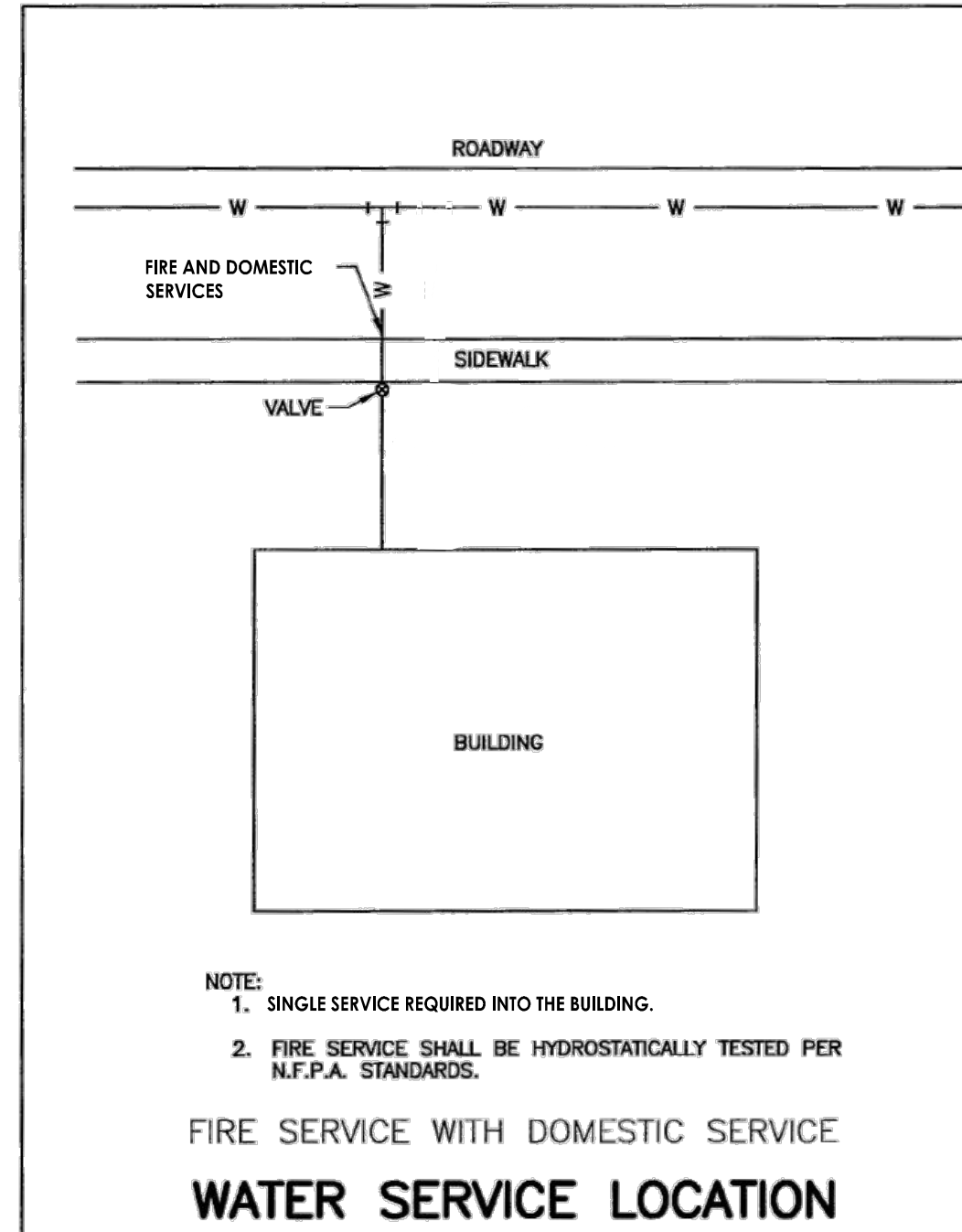
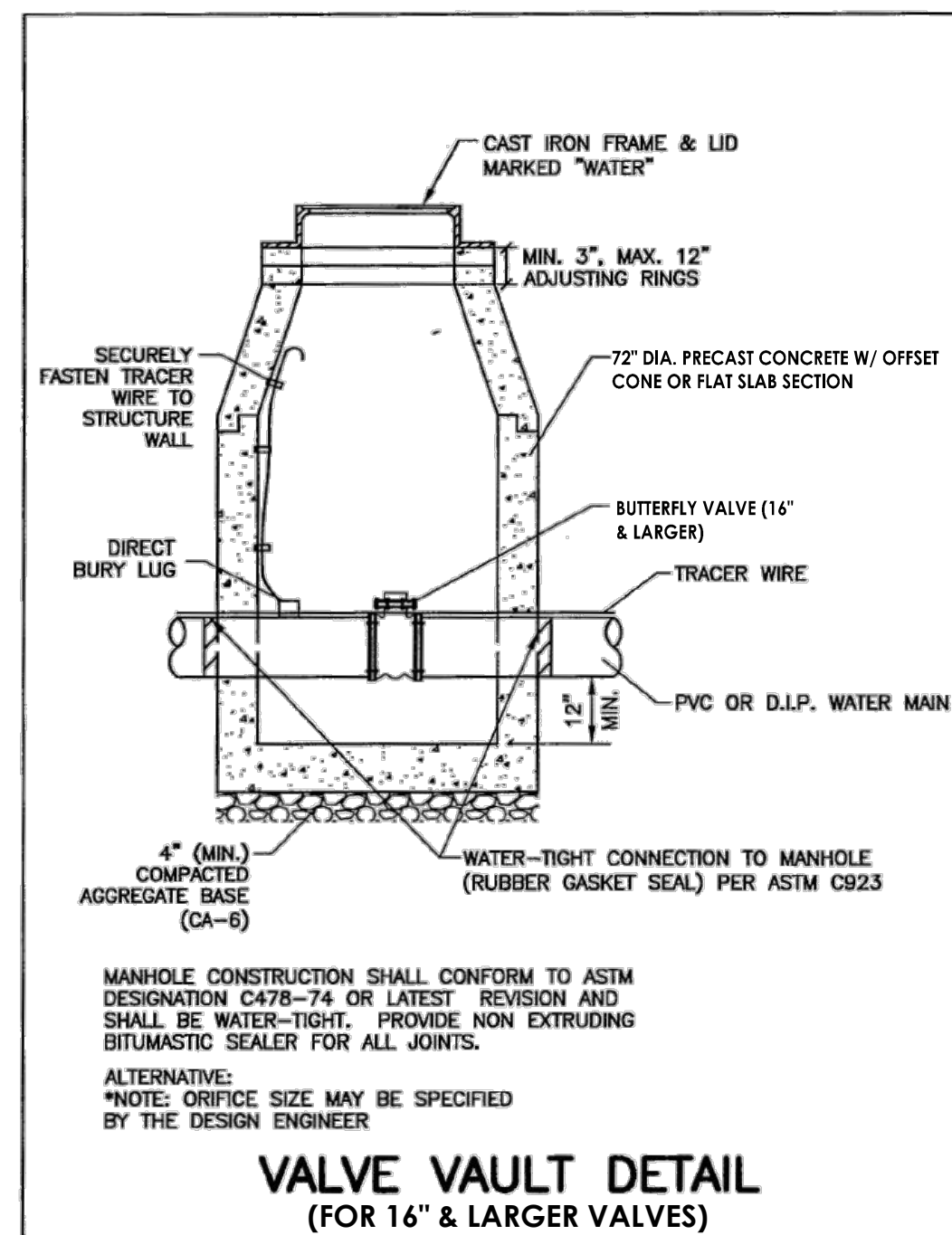
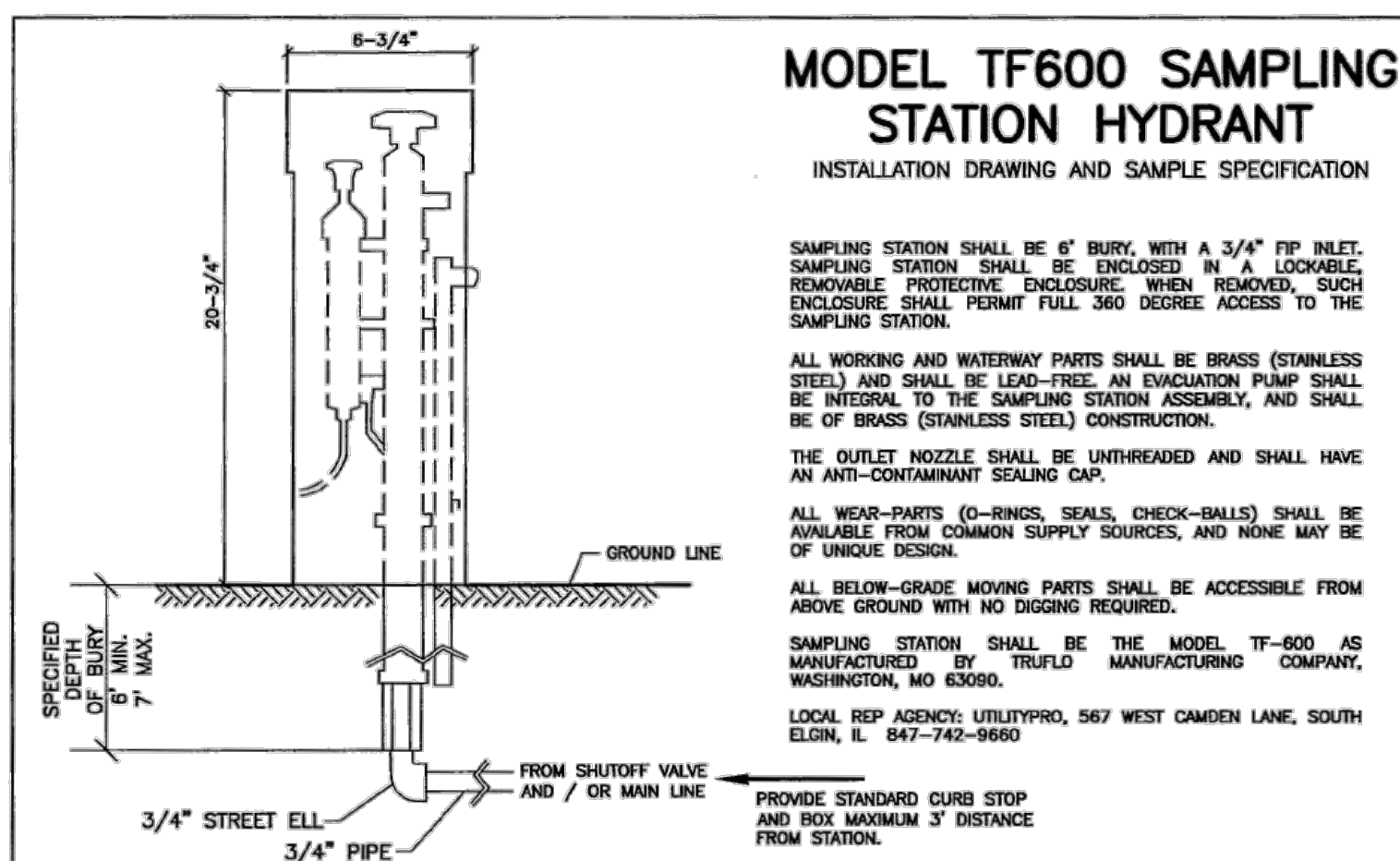
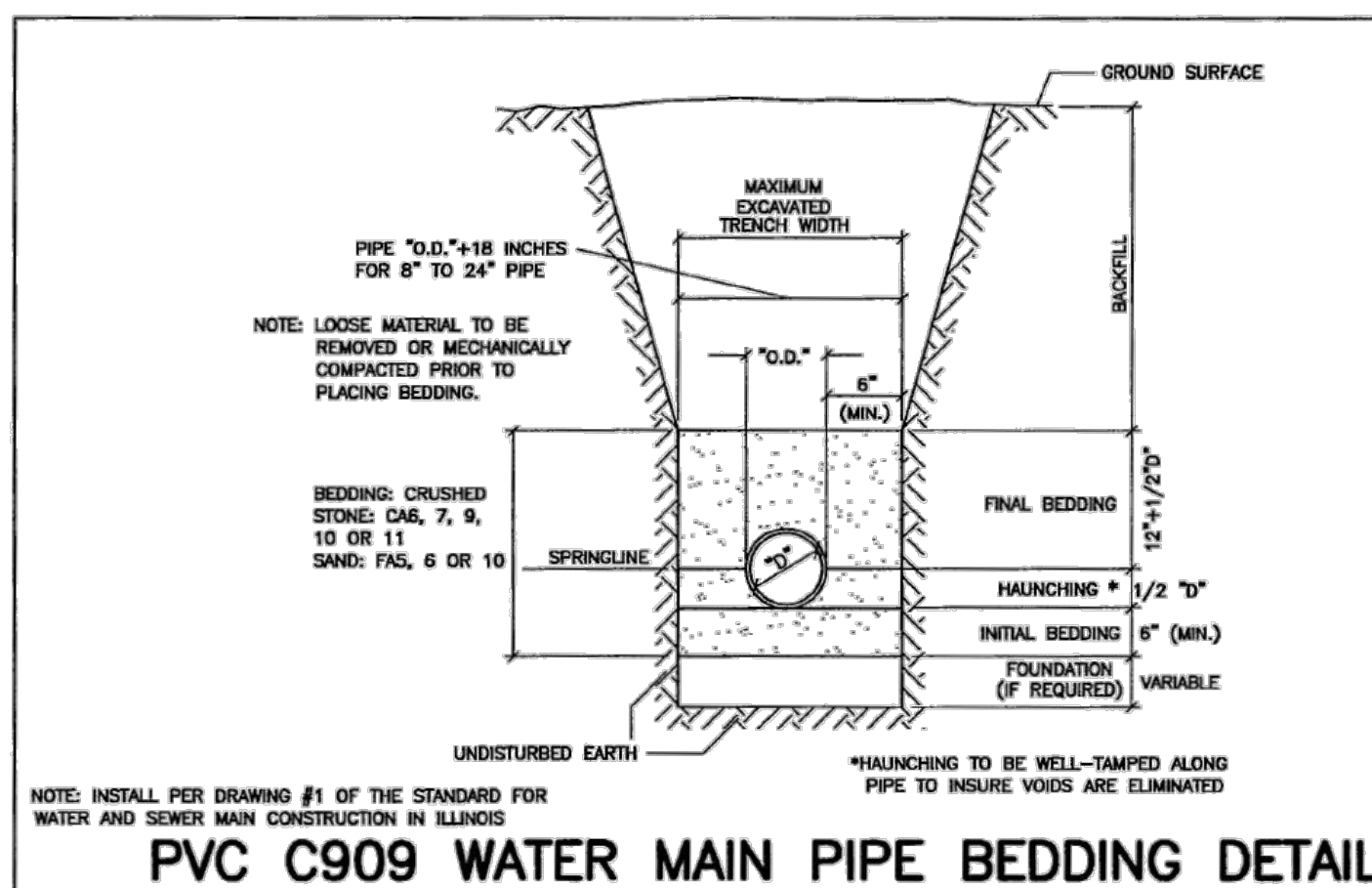
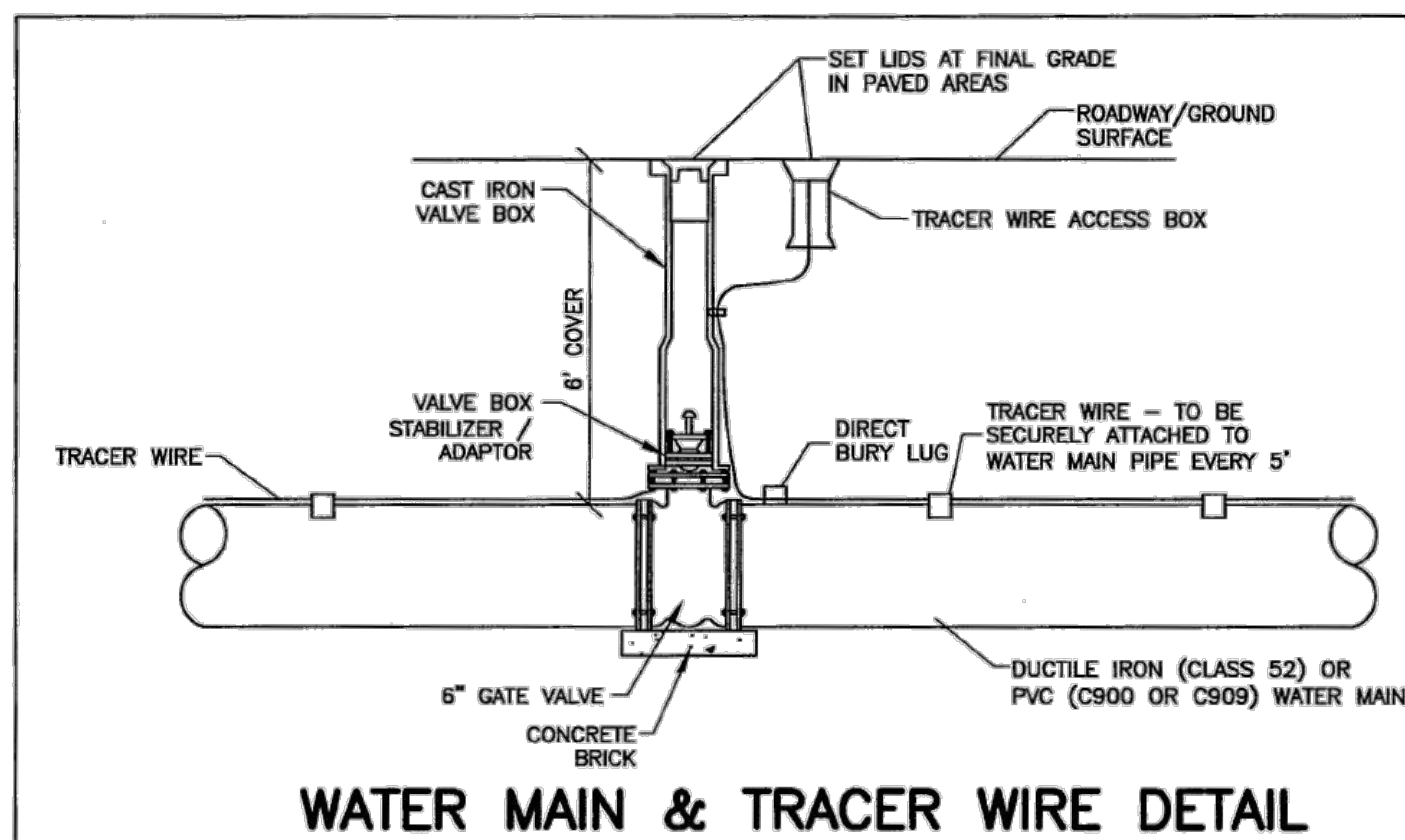
- A. WATER
2. SERVICE
 - a. NOTE: THE CITY OF BELVIDERE WILL ONLY ACCEPT A.Y. MCDONALD, FORD, OR MUELLER BRASS.
 - b. TYPE K COPPER 1" OR PLASTIC 1"
 - c. CORPORATION STOP, A.Y. MCDONALD 4701BT ONLY, FORD BRASS, OR MUELLER BRASS EQUAL.
 - d. CURB STOP, A.Y. MCDONALD #6100T ONLY, WITH 36" ROD, FORD BRASS, OR MUELLER BRASS EQUAL.
 - e. CURB BOX, A.Y. MCDONALD #5610 WITH 5607 LID ONLY, FORD BRASS, OR MUELLER BRASS EQUAL.
 - f. SERVICE SADDLE FOR C909 PIPE SHALL BE SMITH BLAIR 372. ALL STAINLESS STEEL FULL CIRCUMFERENCE SADDLE.
- B. MAINS
1. C909 PVC, C900 PVC, OR CLASS 52 DUCTILE, UNDER MAJOR ARTERIALS, CLASS 56 DUCTILE IRON ONLY.
 2. VALVES, AMERICAN FLOW CONTROL SERVICES 2500 ONLY! NO SUBSTITUTES WILL BE ALLOWED!
 3. HYDRANTS, 5 1/2" SEAT DIAMETER (NO SUBSTITUTES WILL BE ALLOWED). BURY WITH STEAMER NOZZLE AND VALVE ATTACHED. AMERICAN FLOW CONTROL WATEROUS PACER, WB-67-250.
 4. WITH LIMITED SPACE FOR HYDRANTS USE HYDRANT TEE (CLOW F1224 MJ OR EQUAL).
 5. VALVES IN ROAD MUST USE AMERICAN FLOW TRENCH ADAPTOR BOX.
 6. ALL FITTINGS MUST BE OF DUCTILE IRON (AMERICAN MADE).
 7. RESTRAINTS FOR PVC AND DUCTILE PIPE WILL BE MEGA LUGS OR EQUAL AND WILL BE USED ON ALL MECHANICAL JOINTS (AMERICAN MADE).
- B. SEWER
1. PIPE
 - a. MAINS SDR 35 ASTM D3034 PVC. PIPE BURIED UNDER 12 FEET MUST BE APPROVED BY PUBLIC WORKS PRIOR TO SUBMITAL OF CONSTRUCTION PLANS.
 - b. LATERALS SHALL BE OF PVC ASTM D2241 SDR 26, WATERMAIN QUALITY PIPE.
 - c. FORCEMAINS SHALL BE AWWA C905 OR C909 DR26 MINIMUM PIPE OR D.I.P..
- C. MANHOLES
1. CASTINGS
 - a. WATER: EJIW 102221 FRAME WITH 1020 LID OR NEENAH MANHOLE FRAME & LID 1077.
 - b. SEWER: EJIW 102221 MANHOLE FRAME WITH 1020 GASKET SEAL LID OR NEENAH MANHOLE FRAME & LID 1077.
 - c. ALL MANHOLES MUST USE A MANHOLE ENCAPSULATION SYSTEM (FOR SEWER ONLY) AND IT MUST BE APPROVED BY THE CITY.
 - d. LABEL LID PER DETAIL.
- D. ALL WATER METERS MUST BE PURCHASED FROM THE CITY OF BELVIDERE WATER DEPARTMENT.

GENERAL SPECIFICATIONS FOR WATER AND SEWER CONSTRUCTION

SANITARY SEWER AND WATER DETAILS

CITY OF BELVIDERE

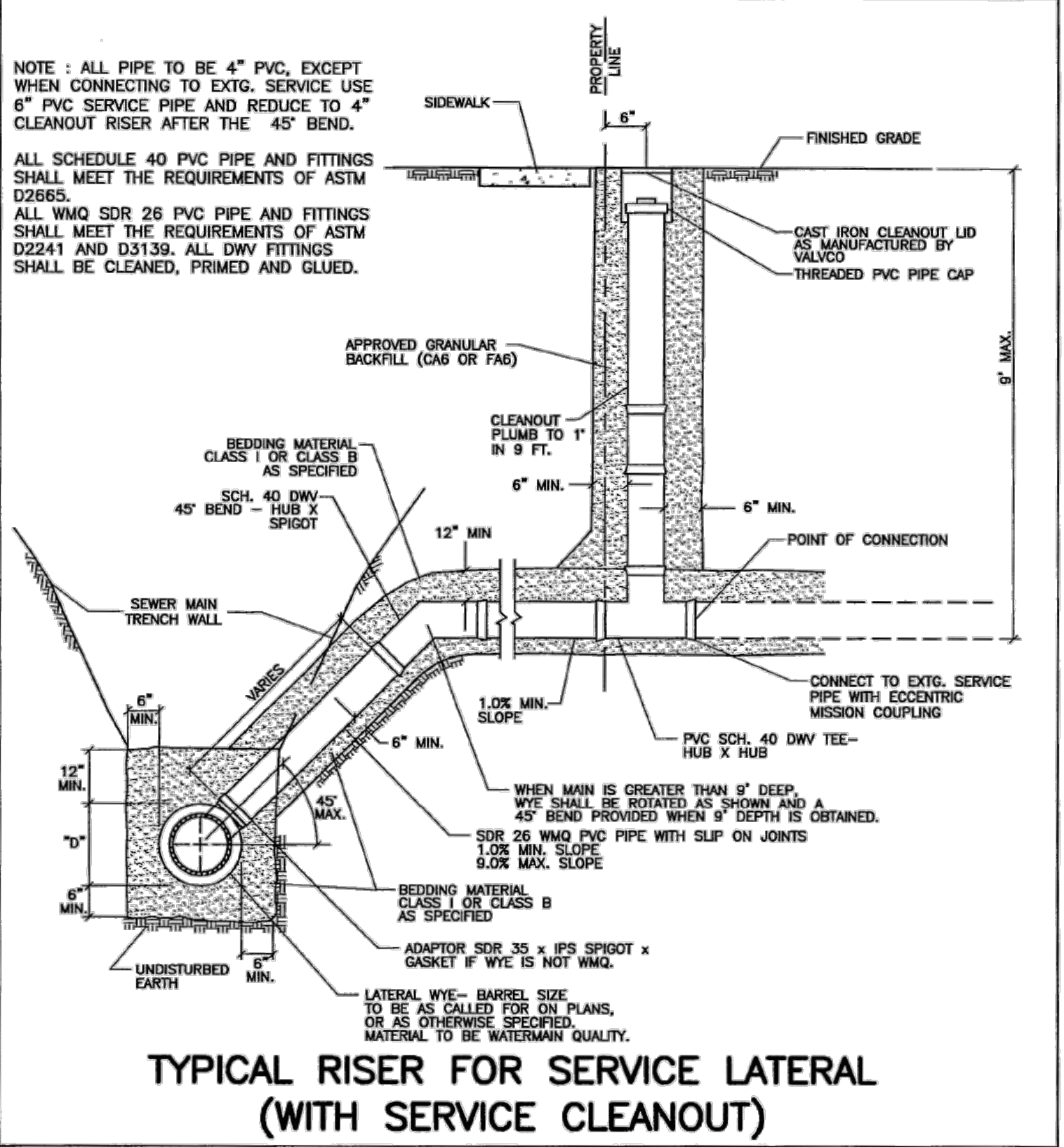
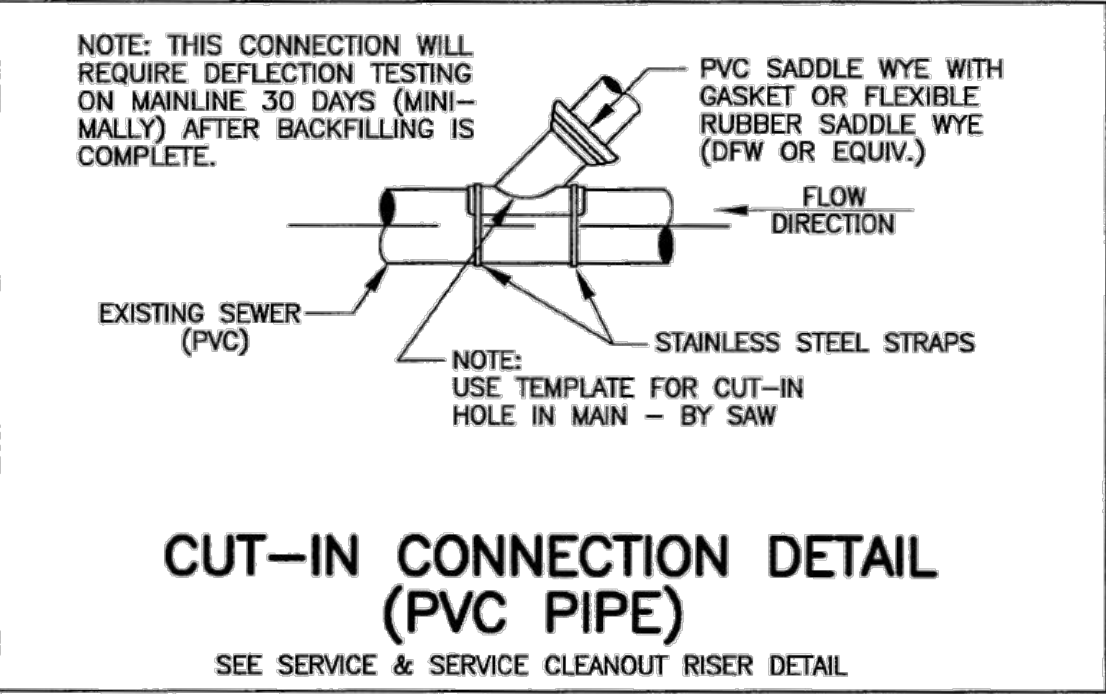
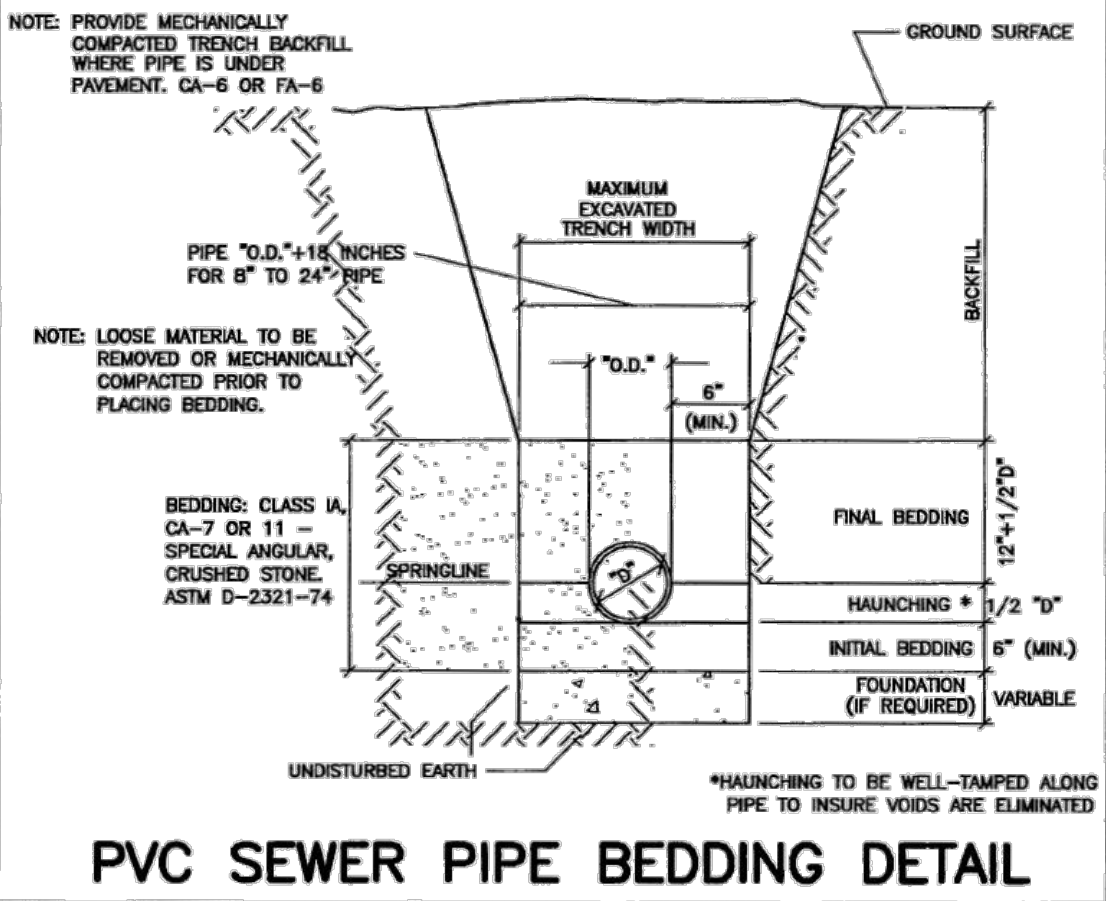
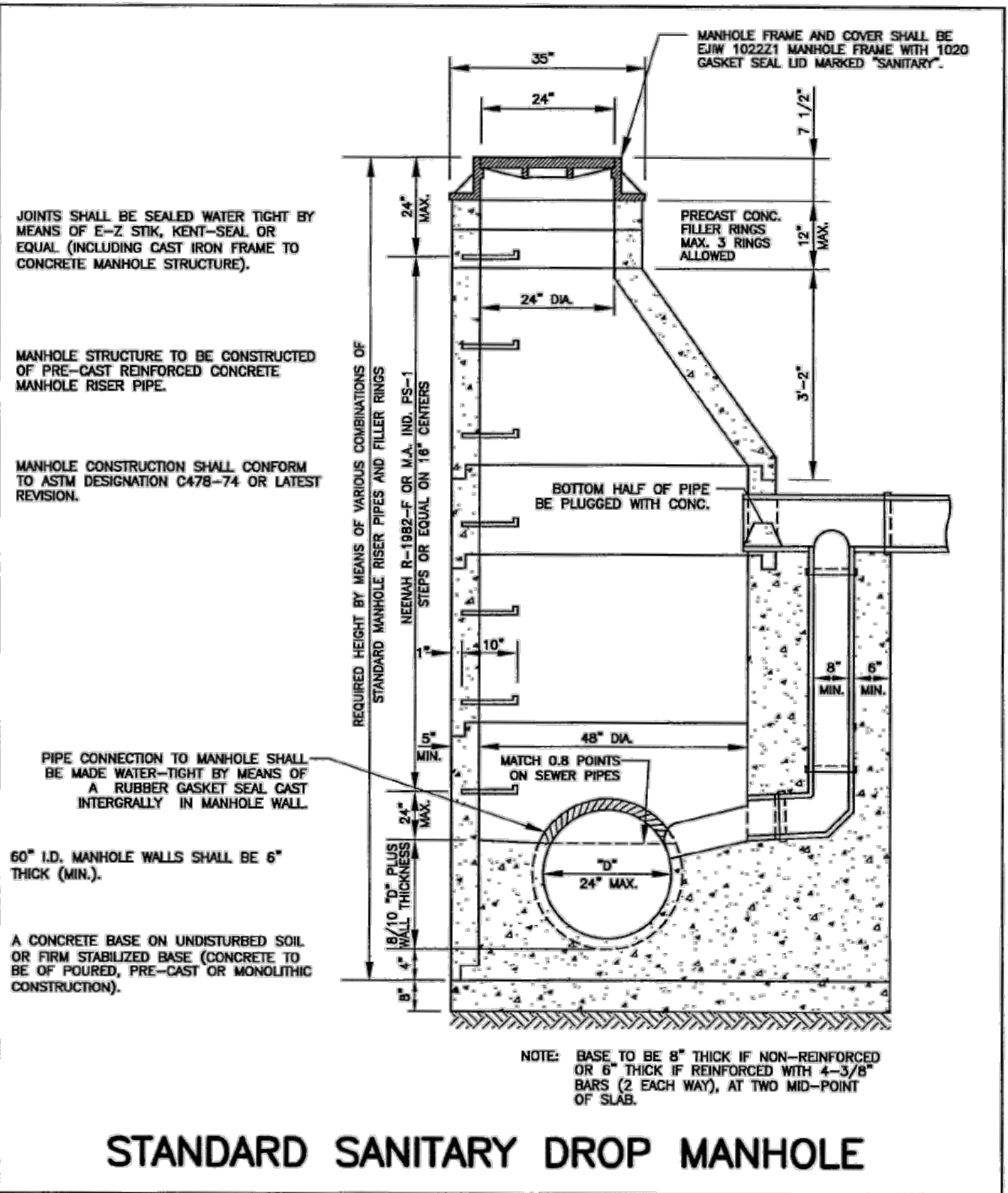
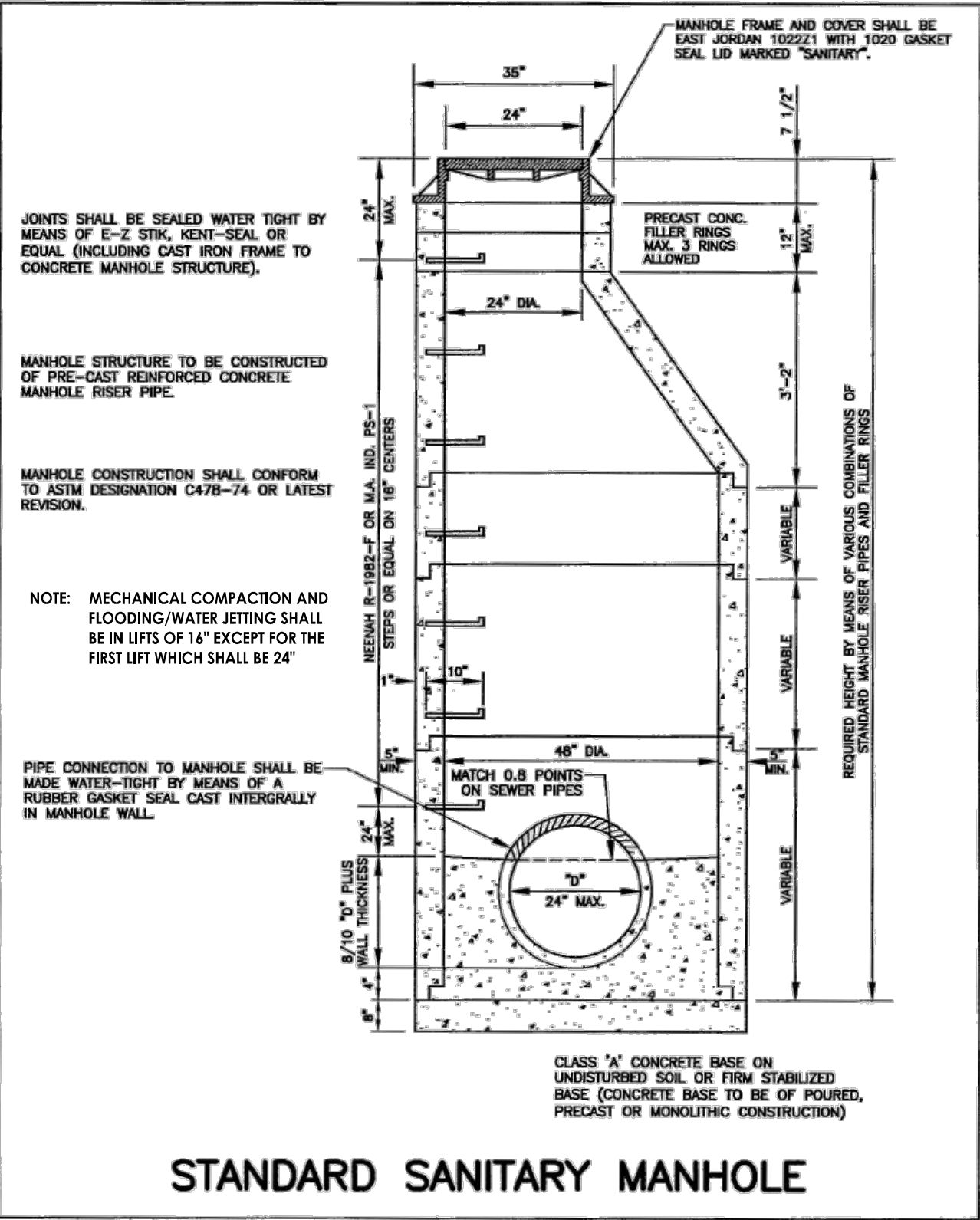
BY: D. ANDERSON	DATE: 04/19/2023
	SHT. NO. 1 OF 3
REV:	



SANITARY SEWER AND WATER DETAILS

CITY OF BELVIDERE

BY: J. GRIMES	DATE: 09/20/2002
NOT TO SCALE	SHT. NO. 2 OF 3
REV: 12/02/2024	



SANITARY SEWER AND WATER DETAILS

CITY OF BELVIDERE

BY: J. GRIMES DATE: 09/20/2002
NOT TO SCALE SHT. NO. 3 OF 3
REV: 12/02/2023

WATER:

- A. THE STANDARD SPECIFICATIONS FOR WATER AND SEWER CONSTRUCTION IN ILLINOIS, LATEST REVISED EDITION, HAS BEEN ADOPTED AS THE CITY'S STANDARD. THE FOLLOWING ARTICLES ARE IN ADDITION TO THE ABOVE REFERENCED STANDARDS AND, IN CASE OF CONFLICT, SHALL PREVAIL. NOTE: ALL MATERIALS WILL BE AMERICAN MADE.
- B. VALVE BOX:
- VALVE BOXES SHALL BE PROVIDED FOR ALL BURIED VALVES. BOXES SHALL BE PLACED AT THE FINISHED GRADE FOR BOTH PAVEMENT AND LAWN AREAS. SEE DETAIL SHEET #2 FOR VALVE BOX REQUIREMENTS.
 - VALVE BOXES SHALL BE ONE COMPLETE ASSEMBLED UNIT COMPOSED OF THE VALVE BOX AND EXTENSION STEM. ALL MOVING PARTS OF THE EXTENSION STEM SHALL BE ENCLOSED IN A HOUSING TO PREVENT CONTACT WITH THE SOIL. VALVE BOX ASSEMBLIES SHALL BE ADJUSTABLE TO ACCOMMODATE VARIABLE TRENCH DEPTHS.
 - THE ENTIRE ASSEMBLY SHALL BE MADE OF CAST IRON. THE VALVE BOX SECTION SHALL BE ADAPTABLE TO FIT INSIDE A VALVE BOX UPPER SECTION.
 - THE STEM ASSEMBLY SHALL BE OF A TELESCOPING DESIGN THAT ALLOWS FOR VARIABLE ADJUSTMENT LENGTH. THE STEM MATERIAL SHALL BE MADE OF CAST IRON. THE STEM ASSEMBLY SHALL HAVE A BUILT-IN DEVICE THAT KEEPS THE STEM ASSEMBLY FROM DISENGAGING AT ITS FULLY EXTENDED LENGTH. THE EXTENSION STEM MUST BE TORQUE TESTED TO 1000 FOOT-POUNDS. VALVE BOXES SHALL BE TYLER UNION 6850 SERIES OR EQUIVALENT. A RUBBER ADAPTOR FOR THE BOX TO REST AND LOCK INTO PLACE ON THE VALVE SHALL BE INCLUDED.
- C. VALVES:
- VALVES SHALL BE EQUAL TO AMERICAN FLOW CONTROL'S SERIES 2500 DUCTILE IRON RESILIENT WEDGE GATE VALVE (4"-12"), MUELLER CENTURION, OR ARC BUTTERFLY VALVE (16"+). VALVE BODY, BONNET AND WEDGE SHALL BE CONSTRUCTED OF DUCTILE IRON. THE EXTERIOR OF THE DUCTILE IRON WEDGE SHALL BE ENCAPSULATED WITH NITRILE RUBBER AND HAVE ACE/EL GUIDES. THE WEDGE SHALL BE SYMMETRICAL AND SEAL EQUALLY WELL WITH FLOW IN EITHER DIRECTION. VALVES 16" & LARGER SHALL BE BUTTERFLY VALVES.
 - WHEN VAULTS AND TRENCH BACKFILL ARE REQUIRED, THE AGGREGATE BACKFILL MATERIAL SHALL BE COMPACTED BY MEANS OF FLOODING OR WATER JETTING. IN ADDITION TO MECHANICAL COMPACTION, COMPACTION AND FLOODING/JETTING SHALL BE REQUIRED IN LIFTS OF NO MORE THAN 16", EXCEPT FOR THE FIRST LIFT, WHICH SHALL BE 24".
 - THERE SHALL BE NO EXPOSED METAL SEAMS, EDGES OR SCREWS WITHIN THE WATERWAY. THE STEM SHALL BE BRONZE IN FULL COMPLIANCE WITH SECTION 4.7 OF AWWA C515. WRENCH OPERATING SHALL BE CONSTRUCTED OF DUCTILE IRON. WRENCH NUT SHALL HAVE FOUR FLATS AT STEM CONNECTION TO ASSURE EVEN DISTRIBUTION OF OPERATING INPUT TORQUE TO THE STEM. THE WORDS "DI" OR "DUCTILE IRON" SHALL BE CAST ON THE VALVE OR STAMPED ON A PERMANENTLY ATTACHED CORROSION RESISTANT METAL TAG.
 - ALL BODY-TO-BONNET AND BONNET-TO-COVER SEALS SHALL BE O-RINGS. FLAT GASKETS SHALL NOT BE ALLOWED. STEM SHALL BE SEALED BY THREE O-RINGS. THE TOP TWO O-RINGS SHALL BE REPLACIBLE WITH VALVES. THEY OPEN AND WHILE SUBJECT TO FULL RATED WORKING PRESSURE. O-RINGS SET IN A CARTRIDGE SHALL NOT BE ALLOWED.
 - VALVE SHALL HAVE THRUST WASHERS LOCATED ABOVE AND BELOW THRUST COLLAR TO ASSURE EASY OPERATION OF THE VALVE. ALL INTERNAL AND EXTERNAL FERROUS SURFACES OF THE VALVE BODY AND BONNET SHALL HAVE A FUSION-BONDED EPOXY COATING, COMPLYING WITH ANS/AWWA C550, APPLIED ELECTROSTATICALLY PRIOR TO ASSEMBLY.
 - 250# RAISED FACE FLANGES SHALL BE PROVIDED WHEN REQUIRED.
- D. CUTTING-IN VALVES & SLEEVES:
- CUTTING-IN VALVES SHALL BE MANUFACTURED TO CONFORM TO AWWA C515 STANDARD FOR RESILIENT SEATED GATE VALVES. BODIES AND BONNETS TO BE CAST IRON. WEDGE TO BE CONSTRUCTED OF DUCTILE IRON, FULLY ENCAPSULATED ON THE EXTERIOR BY SYNTHETIC RUBBER EDGE SHALL SEAT AGAINST SEATING SURFACES ARRANGED SYMMETRICALLY ABOUT THE CENTERLINE OF THE OPERATING STEM, SO THAT SEATING IS EQUALLY EFFECTIVE REGARDLESS OF DIRECTION OF PRESSURE UNBALANCED ACROSS THE WEDGE. RUBBER SEAT SHALL BE BONDED TO THE DUCTILE WEDGE WITHOUT THE USE OF SCREWS, RIVETS OR SIMILAR FASTENERS. VALVE SHALL HAVE ONE END STANDARD MECHANICAL JOINT AND THE OTHER END SHALL BE ABLE TO ACCEPT OVERSIZED PIT CAST IRON PIPE. THE OVERSIZED END SHALL BE OF A DIFFERENT COLOR THAN REST OF VALVE FOR IDENTIFICATION. VALVE SHALL BE AMERICAN FLOW CONTROL'S SERIES 2500 CUTTING-IN VALVE. CUTTING-IN SLEEVE, STAINLESS STEEL, SHALL BE AS MANUFACTURED BY CASCADE WATERWORKS, YORKVILLE, IL, STYLE CST-EX.
- E. RETAINER GLANDS:
- MECHANICAL JOINT RESTRAINT SHALL BE INCORPORATED IN THE DESIGN OF THE FOLLOWER GLAND. THE RESTRAINT MECHANISM SHALL CONSIST OF A PLURALITY OF INDIVIDUALLY ACTIVATED GRIPPING SURFACES TO MAXIMIZE RESTRAINT CAPABILITY. GLANDS SHALL BE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A535-80. DIMENSIONS OF THE GLAND SHALL BE SUCH THAT IT CAN BE USED WITH THE STANDARDIZED MECHANICAL JOINT BELL AND TEE-HEAD BOLTS CONFORMING TO ANS/AWWA A211.11 AND ANS/AWWA A21.53/C153. LATEST REVISION. TWIST-OFF NUTS, SIZED SAME AS TEE-HEAD BOLTS, SHALL BE USED TO INSURE PROPER ACTUATING RESTRAINING DEVICES. THE MECHANICAL JOINT RESTRAINT SHALL HAVE A WORKING PRESSURE OF AT LEAST 100 PSI WITH A MINIMUM SAFETY FACTOR OF 2:1 AND SHALL BE EBAA IRON INCORPORATED MEGALUG OR EQUAL.
- F. WATERMAIN/DUCTILE IRON FITTINGS:
- ALL WATERMAINS IN THE CITY SYSTEM SHALL BE AT LEAST AWWA C151, CLASS #52 (PC 150) DUCTILE IRON PUSH PIPE, C909 (PC 150) OR C900 (200) PLASTIC PIPE. PIPE CROSSING UNDER A MAJOR ARTERIAL ROADWAY SHALL BE MINIMUM CLASS #56 DUCTILE IRON. ALL SERVICE CONNECTIONS FOR PVC SHALL BE SADDLED. PIPE MUST BE BURIED WITH 6 FEET OF COVER. FITTINGS SHALL BE AVAILABLE IN 4 THROUGH 24-INCH SIZES AND SHALL BE CAST FROM DUCTILE IRON IN ACCORDANCE WITH ANS/AWWA C153/A21.53 WITH MECHANICAL JOINT BELLS, GLANDS, BOLTS, NUTS, AND GASKETS SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF ANS/AWWA C153/A21.53. FITTINGS SHALL BE LISTED BY AN APPROVED CERTIFYING AGENCY AS CONFORMING TO THE REQUIREMENTS OF ANS/NSF 61. THE WORKING PRESSURE RATING SHALL BE 350 PSI.
- G. FIRE HYDRANTS:
- FIRE HYDRANTS SHALL MEET OR EXCEED AWWA C502, LATEST REVISION. RATED WORKING PRESSURE SHALL BE 250 PSI AND HYDRANTS SHALL INCLUDE THE FOLLOWING SPECIFIC DESIGN CRITERIA:
 - HYDRANTS SHALL BE AMERICAN FLOW CONTROL'S WATEROUS PACER, MODEL WB-67-250 WITH VENTED CAPS, OR MUELLER CENTURION. ALTERNATES SHALL NOT BE ALLOWED. THE NOZZLE SECTION, UPPER AND LOWER STANDPIPES AND HYDRANT BASE SHALL BE DUCTILE IRON. NOZZLE SHALL BE MECHANICALLY ATTACHED. NOZZLES PINNED OR SCREWED IN WILL NOT BE ALLOWED. THE STEAMER NOZZLE SHALL HAVE A STORZ COUPLING. THE MAIN VALVE CLOSURE SHALL BE OF THE COMPRESSION TYPE, OPENING AGAINST THE PRESSURE AND CLOSING WITH THE PRESSURE. NOZZLE SECTION TO BE DESIGNED FOR EASY 360-DEGREE ROTATION BY THE LOOSENING OF NO MORE THAN FOUR BOLTS. THE SEAT DIAMETER SHALL BE 5 1/4". HYDRANT MUST BE DESIGNED SO THAT REMOVAL OF ALL WORKING PARTS CAN BE ACCOMPLISHED WITHOUT EXCAVATING. THE BRONZE SEAT TO BE THREADED INTO MATING THREADS OF BRONZE FOR EASY FIELD REPAIR. HYDRANT SHALL HAVE FACTORY INSTALLED 304 STAINLESS STEEL BOLTING BETWEEN BARREL AND SHOE. THE DRAINING SYSTEM OF THE HYDRANT WILL BE BRONZE AND BE POSITIVELY ACTIVATED BY THE MAIN OPERATING ROD. HYDRANT TO BE FURNISHED WITH A SLIDING BRONZE DRAIN VALVE. SLIDING DRAIN VALVES MADE OF RUBBER, PLASTIC OR LEATHER WILL NOT BE ALLOWED. HYDRANT MUST HAVE INTERNAL TRAVEL STOP NUT LOCATED IN THE TOP-HOUSING HYDRANT. HYDRANT MUST HAVE A DOUBLE OIL RESERVOIR SO THAT OPERATING THREADS ARE OIL LUBRICATED AND O-RING SEALED FROM WATER, MOISTURE AND FOREIGN MATTER. HYDRANT MUST HAVE A TRAFFIC FLANGE DESIGN ALLOWING FOR QUICK AND ECONOMICAL REPAIR OF DAMAGE RESULTING FROM A VEHICLE'S IMPACT. THE ROD COUPLING MUST BE TWO PIECES BOLTED ON BY TWO STAINLESS STEEL STUDS AND FOUR BRASS LOCK NUTS. PINS, STANDARD NUTS AND BOLTS SHALL NOT BE ALLOWED.
 - THE CONTRACTOR SHALL INSTALL BLUE PAVEMENT REFLECTOR IN THE CENTER OF THE NEAREST DRIVE LANE AT EACH FIRE HYDRANT.
 - COATING SYSTEM PERFORMANCE REQUIREMENTS FOR EXTERIOR SURFACES ABOVE GRADE
 - ALL FERROUS METAL PARTS OF THE HYDRANT SHALL BE COATED TO MEET THE MINIMUM REQUIREMENTS OF SECTION 4.2, PAINTING, IN AMERICAN WATER WORKS ASSOCIATION STANDARD ANS/AWWA C502-94 DRY BARREL FIRE HYDRANTS.
 - PRIMER: PRIMER SHALL BE USED ON ALL SURFACES AND SHALL BE CROSSED-LINKED TWO-PART LIQUID EPOXY. EPOXY PRIMER SHALL BE APPLIED USING AN ELECTROSTATIC SPRAY PROCESS.
 - TOPCOAT: SURFACES SHALL BE TOP COATED WITH HIGH-GLOSS TWO-PART LIQUID URETHANE THAT USES AN ALIPHATIC ISOCYANATE CATALYST TO PRODUCE A CROSS-LINKED CURE. TOPCOAT SHALL BE APPLIED USING AN ELECTROSTATIC SPRAY PROCESS.
 - THE HYDRANT BASE SHALL BE COATED WITH FUSION-BONDED EPOXY ON INTERIOR AND EXTERIOR SURFACES USING MATERIALS AND COATING APPLICATION PROCEDURES THAT MEET OR EXCEED THE REQUIREMENTS OF AWWA C550-01 STANDARD FOR PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES AND HYDRANTS.
 - FINAL INSPECTION - HYDRANT COATING SHALL NOT BE DISTURBED, ANY SCRATCHES, CHIPS, OR OTHER DEFECTS IN SURFACE COATING SHALL BE REPAIRED PER MANUAL REQUIREMENTS PRIOR TO ACCEPTANCE OF THE PROJECT.
 - VALVES SHALL BE DIRECTLY CONNECTED TO THE HYDRANT. FIRE HYDRANTS USED WHERE SPACE IS LIMITED WILL USE A HYDRANT TEE (CLOW F1224 MJ HYDRANT TEE WITH ANCHORING ON THE TEE OR ITS EQUIVALENT). ALL NEW HYDRANTS MUST BE A MINIMUM OF 24" CLEAR FROM CURB AND PAVEMENTS.
 - HYDRANTS WILL HAVE A MINIMUM OF 2 FT. OF A-STONE FROM THE SHOE BASE UP THE BARREL AND A MINIMUM OF 2 FEET ON EITHER SIDE OF THE HYDRANT BARREL AND COVERED WITH 25 MIL PLASTIC OVER ALL STONE SURROUNDING THE HYDRANT TO ALLOW FOR DRAINAGE OF HYDRANT. HYDRANT BLOCKING MUST BE WITH CONCRETE BLOCKING ONLY, SET AGAINST THE BACK OF THE SHOE AND AGAINST UNDISTURBED EARTH.

H. BACKFLOW PREVENTERS:

- BACKFLOW PREVENTORS ARE REQUIRED FOR ALL DOMESTIC AND FIRE LINES. CONTACT THE WATER DEPARTMENT FOR MORE DETAILS. ALL LOCATIONS MUST BE APPROVED AND ASSEMBLIES WILL BE PURCHASED FROM THE WATER DEPARTMENT.
 - BACKFLOW PREVENTERS SHALL BE PLACED INSIDE AT THE METER LOCATION (SEE CITY DETAIL SHEET). REDUCED PRESSURE ZONE DEVICES WILL HAVE PIPED DRAIN LINES TO A SUMP PIT OR FLOOR DRAIN (DRAIN LINES WILL NOT BE REDUCED).
 - FOR ALL COMMERCIAL, EXTERIOR INSTALLATIONS, THE CONTRACTOR SHALL PROVIDE ENGINEER'S DRAWINGS SHOWING LOCATION, TYPE AND SIZE, AND PROTECTION FOR CITY APPROVAL. ALL LOCATIONS AND INSTALLATIONS MUST BE APPROVED BY THE WATER DEPARTMENT. ALL UNDERGROUND SPRINKLER SYSTEMS MUST BE INSTALLED PER CITY SPECIFICATIONS. BACKFLOW PREVENTERS WILL BE TESTED AND TAGGED. REPORTS MUST BE SUBMITTED BEFORE SYSTEM CAN BE USED. FAILURE TO COMPLY WITH ALL REQUIREMENTS COULD RESULT IN TERMINATION OF SERVICE.
 - ALL SINGLE SERVICE COMMERCIAL (INCLUDING MULTI-FAMILY) AND INDUSTRIAL WATER SERVICES SHALL HAVE A REDUNDANT BACKFLOW PREVENTER AND BYPASS AS SHOWN IN THE DETAIL DRAWINGS. THE SECOND [REDUANT] BACKFLOW PREVENTER MAY BE ½ THE APPROVED METERED SERVICE SIZE. THESE REQUIREMENTS ARE IN ADDITION TO ANY STATE AND LOCAL PLUMBING CODES THAT MAY APPLY.
- I. SERVICE PIPE:
- COPPER USED IN THE CITY SYSTEM MUST BE OF TYPE K. PLASTIC WATER SERVICE LINES WILL ALSO BE ACCEPTED BY THE CITY.
 - ALL WATER SERVICES MUST BE 1" MINIMUM.
 - ALL EXISTING SERVICES UNISUED FOR A 12 MONTH PERIOD WILL BE DEEMED ABANDONED BY THE CITY AND MUST BE REPLACED. DISCONNECTION OF THE EXISTING SERVICE DEEMED ABANDONED WILL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. ABANDONMENT OF THE EXISTING WATER SERVICE SHALL INCLUDE CUTTING AND PERMANENTLY CAPPING THE SERVICE AT THE CORPORATION STOP AND CLOSING THE CORPORATION STOP. SERVICES THAT MEET CORRECT CITY STANDARDS MAY BE EXCEPTED FROM THIS RULE. WITH THE APPROVAL OF THE WATER SUPERINTENDENT, THESE ACTIONS MUST BE COMPLETED BEFORE NEW SERVICE CONNECTIONS AND CONSTRUCTION IS STARTED. ALL SERVICE REMOVALS MUST BE INSPECTED BY THE WATER DEPARTMENT. ALL SERVICES MUST COMPLY WITH CITY SPECIFICATIONS.
 - SERVICE FITTINGS:
 - BRASS FITTINGS USED MUST BE ONLY A.Y. MACDONALD, FORD, OR MUELLER. NO SUBSTITUTES ARE TO BE USED AND MUST BE COMPRESSION TYPE ONLY.
 - CURB BOXES:
 - WATER CURB BOXES MUST BE A.Y. MACDONALD OR FORD CAST IRON EXTENSION TYPE WITH ARCH PATTERN BASE AND PLUG CAP. USING STATIONARY ROD AND PLACED WITHIN 6" TO THE STREET SIDE OR THE PROPERTY LINE, UNLESS APPROVED OTHERWISE. WHEN A CURB BOX IS TO BE PLACED IN CONCRETE OR BLACKTOP, A CURB BOX SLEEVE MUST BE USED (SEE SPEC SHEET CURB BOX) AND SHALL BE MARKED IN THE CURB NEAR THE CROSSING BY MEANS OF AN IMPRINT "W" AT LEAST 3" X 3" IN SIZE.
 - WATER METERS:
 - ONLY SENSES METERS SHALL BE USED IN THE CITY SYSTEM AND MUST BE PURCHASED FROM THE CITY.
 - THERE SHALL BE A SEPARATE SERVICE CONNECTION WITH A SEPARATE CURB STOP AND CURB BOX LOCATED WITHIN 6" OF THE PROPERTY LINE FOR EACH BUILDING SERVED BY THE CITY WATER SUPPLY. BUILDINGS REQUIRING MORE THAN ONE METERED SERVICE, BUT LESS THAN FIVE METERED SERVICES, MAY BE SERVED BY A SINGLE SERVICE LINE WITH A MASTER CURB STOP AND CURB BOX FOLLOWED BY A MAXIMUM OF FOUR ADDITIONAL SEPARATE SERVICE LINES WITH CURB STOPS AND CURB BOXES ON EACH SERVICE.
 - ANY BUILDING REQUIRING MORE THAN FOUR METERED SERVICES WILL BE ALLOWED ONLY ONE MASTER SERVICE CONNECTION WITH A SEPARATE CURB STOP AND CURB BOX LOCATED AT THE PROPERTY LINE AND
 - A SINGLE MASTER METER FOR THE ENTIRE BUILDING OR
 - MULTIPLE METERS FOR EACH UNIT WITHIN THE BUILDING.
 - BEFORE ANY INSTALLATION BEGINS, IT MUST BE APPROVED AS TO WHICH OPTION YOU INTEND TO USE.
 - ALL SINGLE METERS SHALL BE PLACED NO LESS THAN 12" ABOVE THE FLOOR AND 12" AWAY FROM THE WALL.
 - IN EITHER CASE, THE FOLLOWING CRITERIA MUST BE MET TO ALLOW ACCESS AND SERVICING OF THE METERS:
 - A COMMON UTILITY/METER ROOM MUST BE PROVIDED IN WHICH ALL METERS ARE LOCATED (SEE CITY ORDINANCE FOR SPECIFIC REQUIREMENTS). THE ROOM MUST HAVE LOCKABLE, PERMANENT OUTSIDE ACCESS DOORWAY AT LEAST 32" WIDE X 6'-8" HIGH. THIS ROOM MUST BE ACCESSIBLE TO THE BELVIDERE WATER DEPARTMENT AT ALL TIMES AND TWO KEYS FOR ENTRY MUST BE FURNISHED TO THE DEPARTMENT PRIOR TO FINAL INSPECTION. THE ROOM WILL HAVE EXTERIOR GRADE SWITCHES, RECEPTACLES, AND LIGHT SOCKETS. THERE MUST BE A MINIMUM OF ONE LIGHT LOCATED OVERHEAD AT THE METER LOCATIONS. THE LIGHT SWITCH MUST BE LOCATED INSIDE THE DOORWAY IMMEDIATELY ADJACENT TO THE DOOR. THE ROOM MUST BE HEATED TO MAINTAIN A TEMPERATURE OF AT LEAST 50 DEGREES FAHRENHEIT TO PREVENT FREEZING AND MUST HAVE A FLOOR DRAIN. ALL METERS IN THE ROOM WILL HAVE LOCKABLE 1/4 TURN BALL VALVES LOCATED BEFORE AND AFTER THE METER UP TO 2". IN ADDITION, A LOCKABLE 1/4 TURN MASTER VALVE MUST BE INSTALLED ON THE MAIN SERVICE LINE UP TO 2". ALL OTHERS WILL BE RISING STEM RESISTANT WEDGE AMERICAN FLOW CONTROL SERIES 500. ALL VALVES MUST BE PERMANENTLY TAGGED IDENTIFYING THE UNIT WITHIN THE BUILDING IT SERVES. EACH METER MUST ALSO HAVE A PERMANENT RIDGED 1/2" DIAMETER CONDUIT RUN FROM THE METER HEAD TO THE OUTSIDE WALL. EACH CONDUIT WILL BE PERMANENTLY LABELED OUTSIDE AND ABOVE THE CONDUIT INDICATING WHAT UNIT IS SO SERVED.
 - CONTRACTORS MUST SUPPLY A DETAILED DRAWING FOR THE METER AREA TO THE CITY FOR APPROVAL.
 - FIRE SERVICE:
 - FIRE SERVICE SHALL BE HYDROSTATICALLY TESTED PER N.F.P.A. STANDARDS. VALVE AND BOX SHALL BE LOCATED 6' BEHIND PROPERTY LINE.
 - SHOP DRAWINGS SHOWING THE SIZE, LOCATION, MATERIAL TYPE AND CONFIGURATION OF ALL MANIFOLDS MUST BE FURNISHED AND APPROVED BY THE DEPARTMENT OF PUBLIC WORKS PRIOR TO INSTALLATION. MANIFOLDS MUST BE NO LESS THAN 12" OR MORE THAN 48" ABOVE THE FLOOR OF THE UTILITY/METER ROOM.
 - ALL METERS REQUIRE A REMOTE READER FOR READING OUTSIDE THE BUILDING. FOR METERS NOT WITHIN 20 FEET OF AN OUTSIDE WALL, A 3/4" CONDUIT MUST BE INSTALLED FROM THE METER INSTALLATION TO THE OUTSIDE WALL CLOSEST TO A WALK OR DRIVE LOCATED NEAR THE FRONT OF THE BUILDING.
 - ALL RESIDENTIAL METERS INSTALLED MUST HAVE A BACKFLOW PREVENTOR. TYPE, DEPENDS ON HAZARD INVOLVED, DETERMINED BY THE WATER DEPARTMENT.
 - ALL METERS OVER 1" MUST HAVE A BYPASS AT LEAST 2/3 THE SIZE OF THE DOMESTIC LINE. ALL DOMESTIC LINES OVER 1" MUST HAVE TWO SHUT-OFF VALVES, ONE BEFORE AND ONE AFTER THE METER AND MUST BE GATE VALVES OR BALL VALVES WITH LOCKABLE HANDLES. ALL OTHERS REQUIRE ONLY ONE VALVE OF THE SAME TYPE.
 - FOR ALL WATER CONNECTIONS 3/4" AND LARGER, WHERE A METER CANNOT BE PLACED IN A BUILDING AND A METER CANNOT BE USED FOR EACH SERVICE, THE METER MUST BE INSTALLED IN A METER HOUSE WITH BACKFLOW PROTECTION ABOVE GROUND. SEE ATTACHED METER HOUSE EXAMPLE SHEET.
 - ALL SERVICE PIPE ON CITY SIDE OF THE METER SHALL BE BELOW GRADE, INCLUDING INTERIOR LOCATIONS.

M. FLUSHING STATION:

 - PROVIDE BLOW-OFF HYDRANT OR AUTOMATIC STATION AT ALL STUBS FOR FUTURE EXTENSION WHERE ALLOWED BY IEPA. CITY SHALL DETERMINE STATION TYPE. STATION EQUIPMENT SHALL BE SPECIFIED BY THE CITY.

N. DIRECTION DRILLING METHODS AND MATERIALS SHALL BE APPROVED BY THE CITY ON A PROJECT BASIS. APPROVED CASING SPACERS AND CASING BOOTS ARE REQUIRED ON A LLAUGHER AND JACK CASINGS AND TRENCHED CASINGS WHEN REQUIRED BY THE CITY. SPACERS AND BOOTS SHALL BE AS MANUFACTURED BY CASCADE WATERWORKS MANUFACTURING.

O. PROVIDE AIR RELEASE VALVE AND VAULT AT ALL HIGH POINTS ON 8" DIAMETER AND LARGER WATERMAINS. VALVES SHALL BE A MINIMUM 1" DIAMETER OUTLET ON 8" WATERMAINS AND 2" DIAMETER ON LARGER WATERMAINS. VALVES SHALL BE IN ACCORDANCE WITH AWWA C152 AND SHALL HAVE AN ISOLATION VALVE FOR MAINTENANCE PURPOSES.

WATER TESTING:

- A. WATERMAIN FLUSHING:
- CONTRACTORS MUST USE DECHLORINIZATION METHODS APPROVED BY THE EPA AND RECOGNIZED BY THE CITY. FOR FLUSHING THE WATERMAINS, DURING INITIAL FILLING, THE FIRST NEW VALVE SHALL BE CLOSED TO ALLOW 5 MINUTES OF CHLORINE MIXING PRIOR TO FILLING THE REMAINDER OF TEST SECTION; REFERENCE ITEM B, "WATERMAIN COMPLETION TESTS", BELOW.
- B. WATERMAIN COMPLETION TESTS:
- CONTRACTORS MUST SIGN AND COMPLETE A FORM WITH COPIES FOR THE WATER DEPT. BEFORE WATERMAIN CHARGING, DISINFECTION, PRESSURE TESTING AND FLUSHING. CONTRACTORS WILL CONTACT THE WATER DEPT. 48 HOURS IN ADVANCE OF EACH REQUESTED STEP. SIGNATURES FROM A REPRESENTATIVE OF THE CONTRACTOR AND CITY WATER DEPT., MUST APPEAR ON EACH FORM FOLLOWING COMPLETION OF EACH STEP.
 - MAXIMUM OF 3000 FEET OF WATERMAIN MAY BE TESTED IN ANY ONE TEST EVENT. CONTRACTOR SHALL ISOLATE SECTIONS OF THE SYSTEM AS NECESSARY AT VALVES TO MEET THIS REQUIREMENT. ALL SYSTEM JOINTS SHALL BE TESTED.
- C. WATERMAIN TEST REPORTS:
- ALL WATERMAINS UPON COMPLETION WILL BE BACTERIA, LEAKAGE, AND PRESSURE TESTED. TEST REPORTS MUST BE FILED WITH THE WATER DEPARTMENT. NO CONNECTIONS OR BUILDING PERMITS WILL BE PERMITTED UNTIL ACCEPTABLE REPORTS ARE RECEIVED BY THE CITY.
 - ALL TESTS SHALL BE IN ACCORDANCE WITH AWWA AND IEPA STANDARDS. AN ACCEPTABLE PRESSURE TEST SHALL BE AT 150 PSI MINIMUM FOR 1 HOUR AND NO PRESSURE DROP.
- D. PROVIDE STANDARD SAMPLE STATION HYDRANT AS DIRECTED BY THE CITY. MINIMUM ONE PER SUBDIVISION.

SANITARY SEWER:

- A. SEWER MAIN:
- SANITARY SEWER LINES MAY BE PVC SOLID WALL OR VYLON PIPE (ASTM F-794, UNI-B-9) FOR 8" AND LARGER PIPE WITH PROPER TRENCH BACKFILL AS REQUIRED BY THE CITY (SEE BEDDING DETAIL AND MATERIAL LIST FOR SPECIFICATIONS). ANY MAIN EXCEEDING 11" DEEP MUST BE APPROVED BY PUBLIC WORKS PRIOR TO SUBMITTAL OF CONSTRUCTION PLANS. FORCEMAINS MAY BE PVC SOLID WALL OR DIP.
- B. SEWER LATERALS:
- MATERIALS SHALL BE SDR 26, WATERMAIN QUALITY. LATERALS SHALL BE LEAKAGE TESTED UNDER THE SAME SPECIFICATIONS AS SEWER MAINS.
 - ALL LATERALS SHALL EXTEND TO THE PROPERTY LINE, WITH A 4" DIAMETER CLEAN OUT LOCATED 6' BEHIND THE PROPERTY LINE. LATERALS SHALL BE A MAXIMUM 9' DEEP, AND NOT LESS THAN 8" AT THE PROPERTY LINE IN ACCORDANCE WITH THE DETAIL. THE CLEAN OUT CAP SHALL BE WITHIN 8" BELOW THE TOP OF THE GROUND AND PROTECTED BY A CAST SLEEVE AND LID FLUSH WITH GROUND, MARKED "SEWER" (SEE CITY SPEC.). IF THEY ARE NOT CONNECTED TO THE BUILDINGS WHEN INSTALLED, THEY MUST BE MARKED AT THE END OF THE UNCONNECTED STUB WITH A 2' X 4' TREATED POST PROTRUDING A MINIMUM OF 14" ABOVE THE GROUND, PAINTED GREEN. SERVICE SHALL BE MARKED ON THE CURB (NEAR THE TOP) BY MEANS OF AN IMPRINT OF AN "S" AT LEAST 3" X 3".
 - ALL LATERAL SEWER CONNECTIONS THAT ARE MADE TO EXISTING SANITARY SEWER MAINS SHALL BE SADDLED AND CUTS IN PIPE SHALL BE CIRCULAR.
- C. MANHOLES:
- ALL MANHOLES SHALL BE A MINIMUM 4 FOOT DIAMETER PRECAST; ALL SHALL HAVE AN APPROVED EXTERNAL RUBBER SEAL AT THE ADJUSTING RING AND FRAME OF THE MANHOLE BARREL TO FORM A WATERTIGHT CONNECTION. APPROVED EXTERNAL SEALS AS MANUFACTURED BY CRETEX. ALL BARREL JOINTS SHALL BE SEALED WITH INFI SHIELD, WRAPID SEAL OR APPROVED EQUAL. WHEN MANHOLES ARE DEEPER THAN 15 FEET AND/OR WHEN GROUND WATER IS PRESENT, BARREL JOINTS SHALL HAVE AN EXTERNAL SEAL "MAC WRAP" AS MANUFACTURED BY MAC MAC MANUFACTURING COMPANY. ALL EXTERNAL BARREL SURFACES SHALL HAVE A WATER PROOFING COATING. COATINGS SHALL BE DOUBLE APPLIED (2 COATS) AND SHALL BE EITHER BITUMINOUS BASED OR POLYMER BASED CEMENT.
 - ALL MANHOLE INVERTS MUST BE PRE-POURED AND PIPE CONNECTIONS SEALED WITH AN APPROVED WATERTIGHT CONNECTION.
 - ALL SEWER MANHOLE LIDS SHALL BE OF THE PICKLESS TYPE, EXTRA HEAVY REGARDLESS OF LOCATIONS, STAMPED SEWER.
 - ALL CASTINGS SHALL BE OF THE EXTRA HEAVY LID AND LIDS SHALL BE OF THE PICKLESS AND SELF-SEALING TYPE.
- D. SEWER METERS:
- MONITORING FOR SEWER ONLY CHARGES - SEE METER DEPARTMENT EQUIPMENT TYPES.
- E. SANITARY SEWER CROSSING OVER WATER:
- SDR 26 WATERMAIN CLASS PIPE SHALL BE USED IN PLACE OF ENCASEMENT PIPE.
 - WATERMAIN MECHANICAL JOINTS SHALL BE RESTRAINED BY RESTRAINING RINGS "MEGA-LUG" OR EQUAL (THE TYPE TO BE COMPLIANT WITH THE PIPE USED).
 - WATERMAIN LAID ON A CURVE SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING TABLE. PIPE JOINTS ARE PERMITTED A MAXIMUM 2° ANGULAR DEFLECTION. FITTINGS SHALL BE USED FOR GREATER DEFLECTIONS.
- | NOMINAL SIZE, IN | 4 | 6 | 8 | 10 | 12 |
|------------------|-----|-----|-----|-----|-----|
| MIN. RADIUS, FT | 100 | 144 | 189 | 231 | 273 |
- F. SANITARY SEWER MAIN TEST REPORTS:
- ALL SANITARY SEWER MAINS SHALL BE LEAKAGE TESTED BY LOW PRESSURE AIR AND A PORTION OF THE MAIN DEFLECTION TESTED. ALL IN ACCORDANCE WITH ILLINOIS RECOMMENDED STANDARDS FOR SEWAGE WORKS. DEFLECTION TESTING SHALL BE PERFORMED ON THE FIRST 1200 FEET AND 10% OF THE REMAINDER WITH A MINIMUM OF 25% OF THE ENTIRE PROJECT.
 - ALL SANITARY SEWER MAINS UPON COMPLETION, SHALL BE MANDRELED 30 DAYS AFTER FINAL INSTALLATION.
 - TEST REPORTS SHALL BE FILED WITH THE WATER AND SEWER DEPARTMENT. NO CONNECTIONS OR BUILDING PERMITS WILL BE PERMITTED UNTIL ACCEPTABLE REPORTS ARE RECEIVED BY THE CITY.
 - ALL REPORTS SHALL BE SENT TO BELVIDERE WATER AND SEWER DEPARTMENT. ATTENTION: WATER AND SEWER SUPERINTENDENT, 401 WHITNEY BLVD, SUITE 200 BELVIDERE, IL 61008.
- G. SANITARY MANHOLE TEST REPORTS:
- ALL SANITARY MANHOLES SHALL BE LEAKAGE TESTED BY VACUUM TEST IN ACCORDANCE WITH ASTM C1244 AND THE ILLINOIS RECOMMENDED STANDARDS FOR SEWAGE WORKS. TEST REPORTS SHALL BE FILED WITH THE WATER AND SEWER DEPARTMENT. NO CONNECTIONS OR BUILDING PERMITS WILL BE PERMITTED UNTIL ACCEPTABLE REPORTS ARE RECEIVED BY THE CITY.
 - ALL REPORTS SHALL BE SENT TO BELVIDERE WATER AND SEWER DEPARTMENT. ATTENTION: WATER AND SEWER SUPERINTENDENT, 401 WHITNEY BLVD, SUITE 200, BELVIDERE, IL 61008.

H. MANHOLE BACKFILL FLOODING/JETTING:

- WHEN TRENCH BACKFILL IS REQUIRED, THE AGGREGATE BACKFILL MATERIAL SHALL BE COMPACTED BY MEANS OF FLOODING OR WATER JETTING. IN ADDITION TO MECHANICAL COMPACTION, COMPACTION AND FLOODING/JETTING SHALL BE REQUIRED IN LIFTS OF NO MORE THAN 16", EXCEPT FOR THE FIRST LIFT, WHICH SHALL BE 24".
- I. REPAIR OF SANITARY SEWER LINES:
- THE REPAIR OF DAMAGED SANITARY SEWER LINES SHALL BE AS FOLLOWS:
 - PVC PIPE - REPLACE DAMAGED SECTION OF SEWER WITH CITY STANDARD PVC PIPE CUT TO FIT WITH MAXIMUM 1/4" OPENING AT COUPLED JOINTS AND INSTALL A FERRECO COUPLING OR REPAIR COUPLING AT EACH END AS APPROVED BY THE CITY.
 - DIP - REPLACE DAMAGED SECTION WITH SOLD SLEEVE MECHANICAL JOINT COUPLING AT EACH END.
 - REPAIRS TO NEW LINES, NOT YET ACCEPTED BY THE CITY, SHALL BE TESTED IN ACCORDANCE WITH THESE STANDARD SPECIFICATIONS.

ABANDONMENT OF SANITARY SEWER SERVICE LATERALS:

- A. ABANDONMENT SHALL INCLUDE:
- EXCAVATION AS NEAR AS PRACTICAL TO THE EDGE OF ROAD (BUT NOT SO CLOSE AS TO POTENTIALLY UNDERCUT THE ROAD OR CURB);
 - CUTTING OF THE UPSTREAM SERVICE LATERAL PIPE;
 - INSERTION OF A SNUG FITTING PLUG OR BALL AS FAR INTO THE DOWNSTREAM SERVICE LATERAL PIPE AS POSSIBLE (BUT IN NO MEANS GETTING CLOSER THAN 5' TO THE SEWER MAIN). SAID PLUG OR BALL TO BE A TIGHT ENOUGH FIT TO PREVENT CEMENTITIOUS MATERIAL FROM GETTING TO THE SEWER MAIN;
 - FILLING THE PIPE ABOVE THE PLUG WITH FLOWABLE FILL OR HYDRAULIC CEMENT, ENSURING THAT THE PIPE IS FULL TO THE TOP FOR AT LEAST 3' OF LENGTH;
 - SAID PLUG OR BALL TO INCLUDE A TIEHIN IN THE SERVICE LATERAL PIPE TO ENSURE IT REMAINS IN PLACE DURING THE PLACEMENT OF THE CEMENTITIOUS MATERIAL AND TO HOLD THE PLUG IN PLACE FOR ALL TIME;
 - PLACEMENT OF A WATERTIGHT CAP OR PLUG AT THE UPSTREAM END (FERRECO OR CITY APPROVED EQUAL).
 - BACKFILLING THE EXCAVATION WITH AGGREGATE TRENCH BACKFILL COMPACTED IN 6" LIFTS (IN ANY AND ALL AREAS WITHIN 2' OF A PAVED SURFACE) AND COMPACTED EARTHEN MATERIALS IN ALL OTHER LOCATIONS.
- B. A PERMIT MUST BE OBTAINED FROM THE CITY PRIOR TO INITIATION OF ABANDONMENT WORK INCLUDING A BOND TO COVER ANY AND ALL DAMAGE TO PUBLIC OR PRIVATE PROPERTIES AND MATERIALS.

ADDITIONAL WATER/SEWER REQUIREMENTS:

- A. UNDERGROUND LOCATING SERVICES
- THE CONTRACTOR WILL INSTALL AN OMNI BALL DIRECTLY ON TOP OF ALL NEW WATERMAINS, FORCEMAINS, AND SEWER SERVICES; THIS IS A DEVICE USED FOR UNDERGROUND LOCATION OF PLASTIC PIPES. THERE ARE OMNI BALLS FOR WATER AND SEWER; EACH HAS A DISTINCT COLOR. THESE DEVICES ARE TO BE PURCHASED DIRECT FROM THE MANUFACTURER; THE WATER DEPT. MAY MAKE ADVANCED PURCHASES FOR THE CONTRACTOR. PROVIDED PREPAYMENT IS MADE TO THE CITY BEFORE ANY ORDER CAN BE PLACED. THE CONTRACTOR WILL PLACE THE OMNI BALL IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:
 - AT NO LESS THAN 250' INTERVALS ON ALL WATERMAINS AND FORCEMAINS, REGARDLESS OF FITTINGS OR VALVES.
 - AT ALL FITTINGS ON WATERMAIN.
 - AT THE LOW POINTS OVER THE WATERMAIN WHEN OVER 6' DEEP.
 - AT ALL SEWER SERVICES, PLACED 6' FROM PROPERTY LINE.
 - AT A DEPTH NO DEEPER THAN 3' BELOW FINISH GRADE.
 - ALL PAVEMENT CUTS SHALL HAVE APPROVAL FROM THE CITY. ALL TRENCHES SHALL BE PROPERLY BACKFILLED AT THE END OF EACH WORKING DAY UNLESS OTHERWISE APPROVED BY THE CITY. ALL PAVEMENT CUTS SHALL BE REPAIRED WITHIN MAXIMUM OF THREE DAYS FROM THE DATE THE CUT IS MADE. IF CONDITIONS DO NOT PERMIT A PERMANENT REPAIR WITHIN THE GIVEN TIME LIMIT, PERMISSION TO MAKE A TEMPORARY REPAIR MUST BE OBTAINED FROM THE CITY.

MATERIAL SUMMARY LIST:

(THE CITY OF BELVIDERE ONLY ACCEPTS AMERICAN MADE PRODUCTS)
ALL MATERIALS SHALL BE APPROVED BY CITY OF BELVIDERE WATER AND SEWER DEPARTMENT PRIOR TO INSTALLATION.

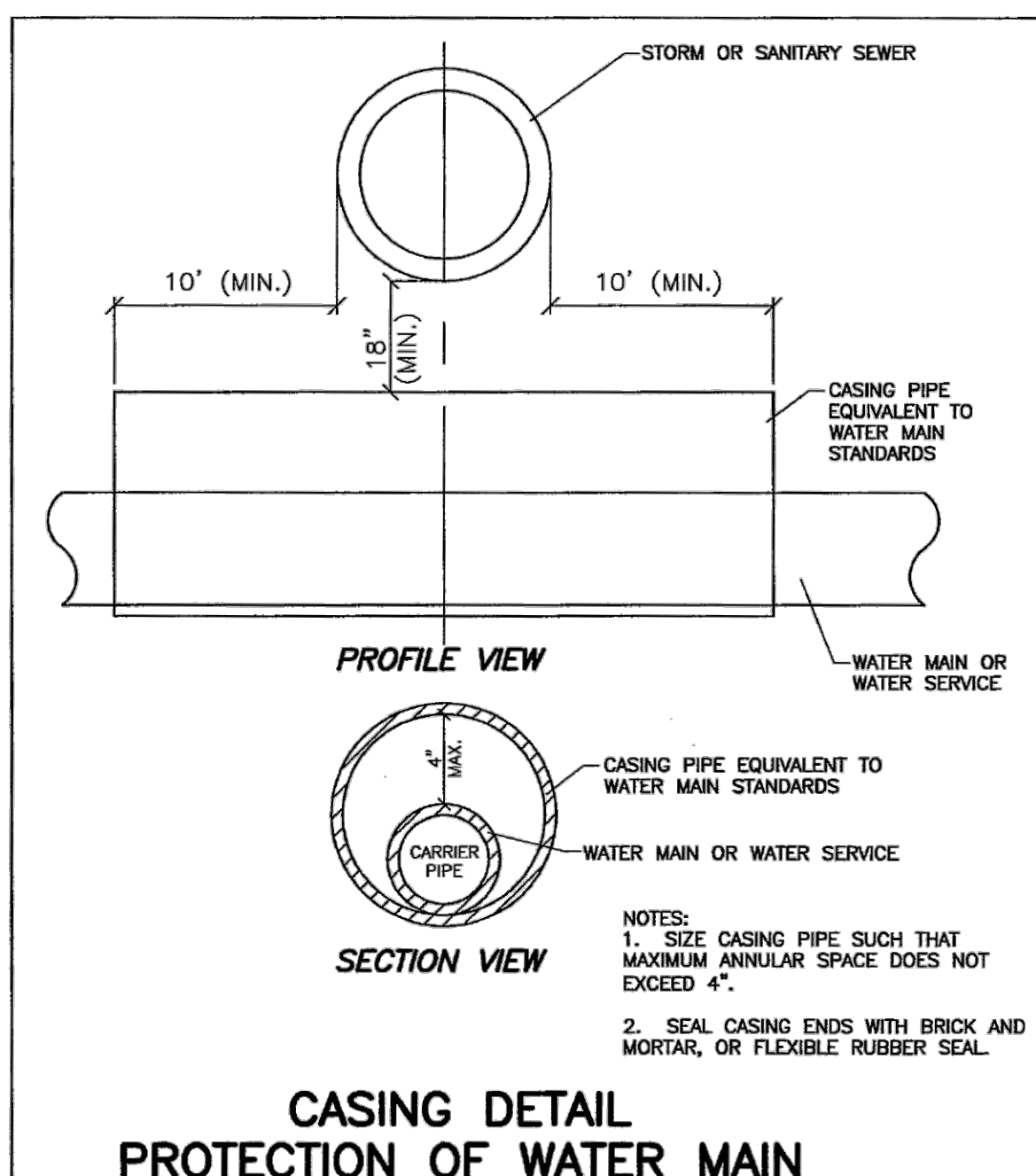
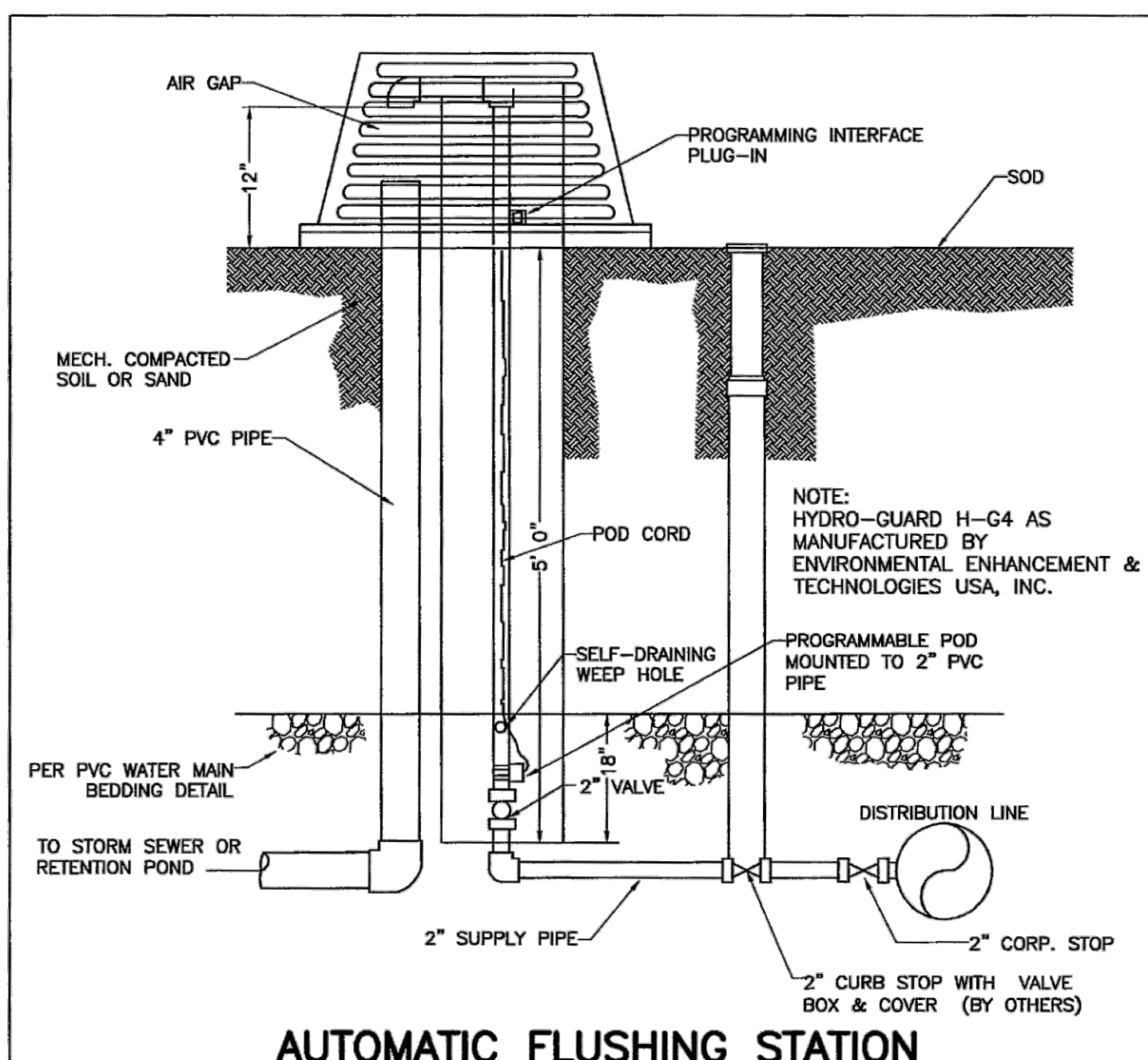
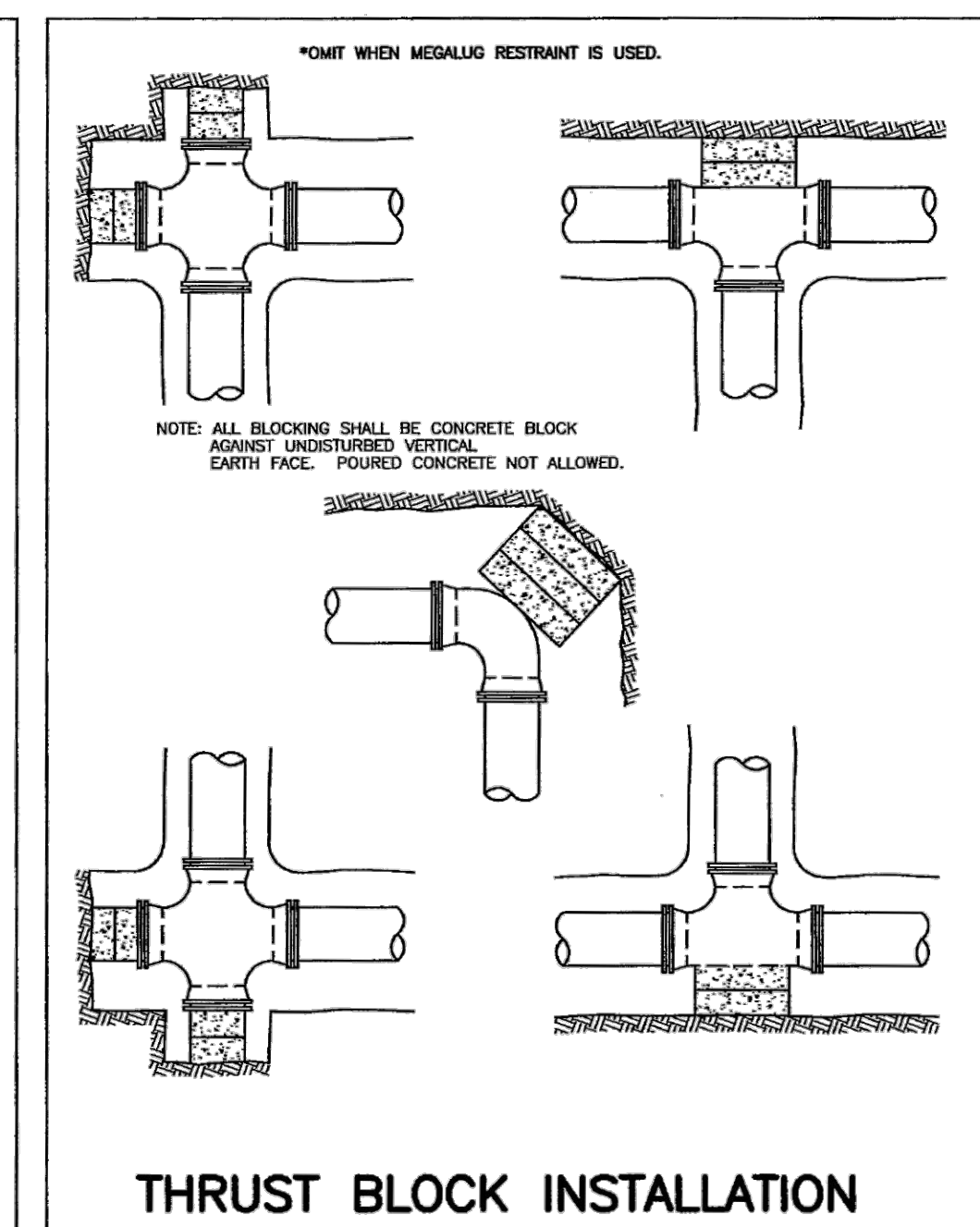
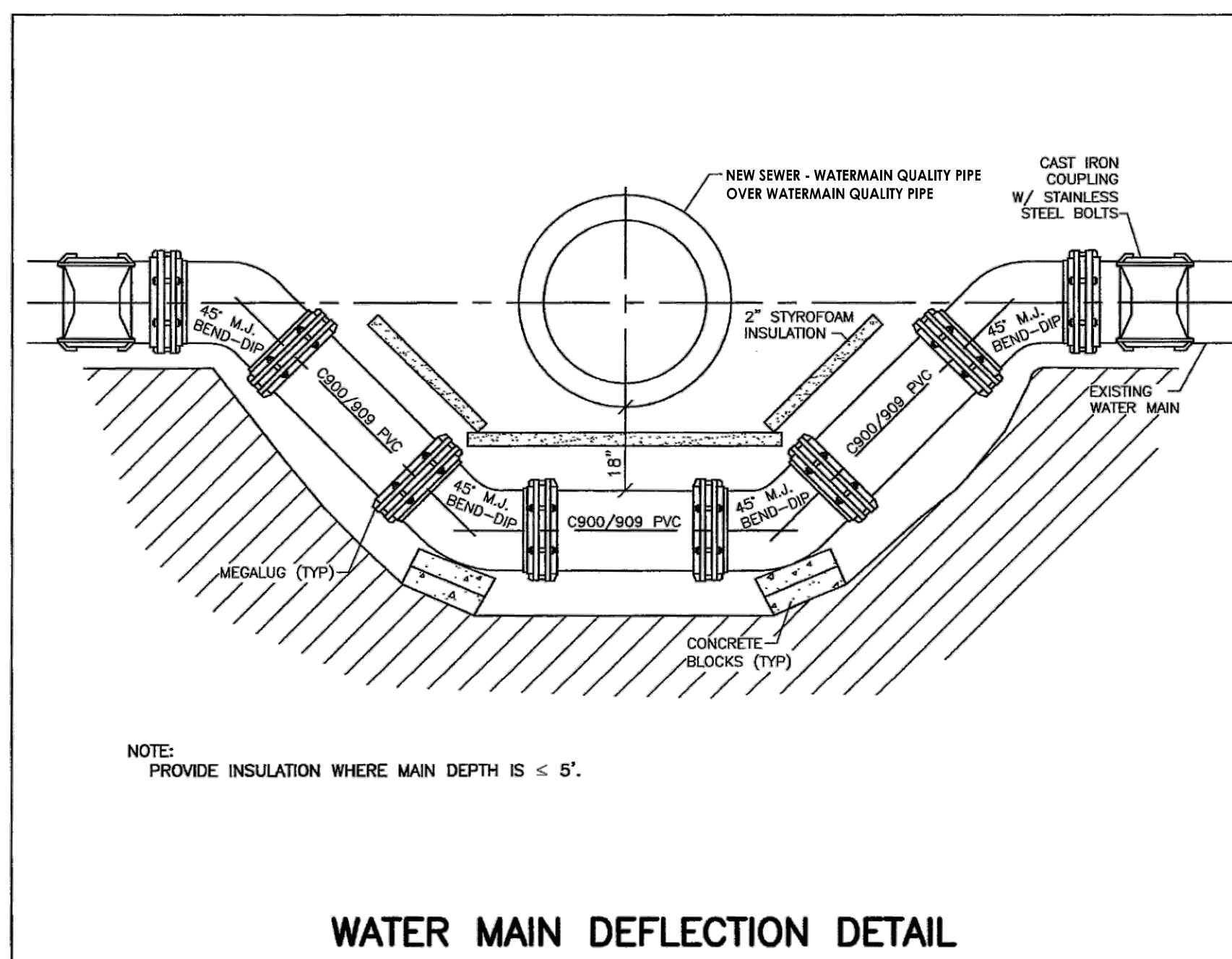
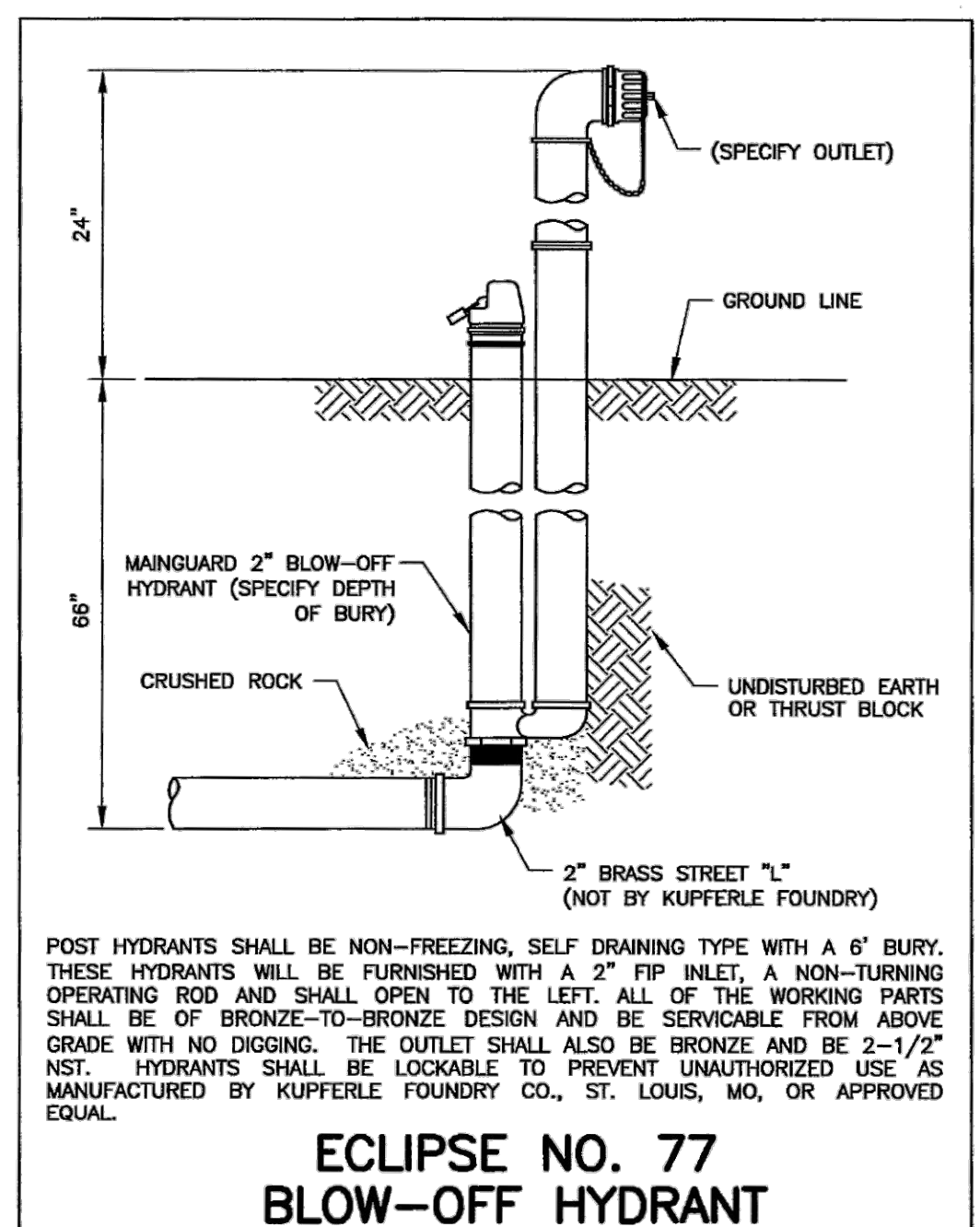
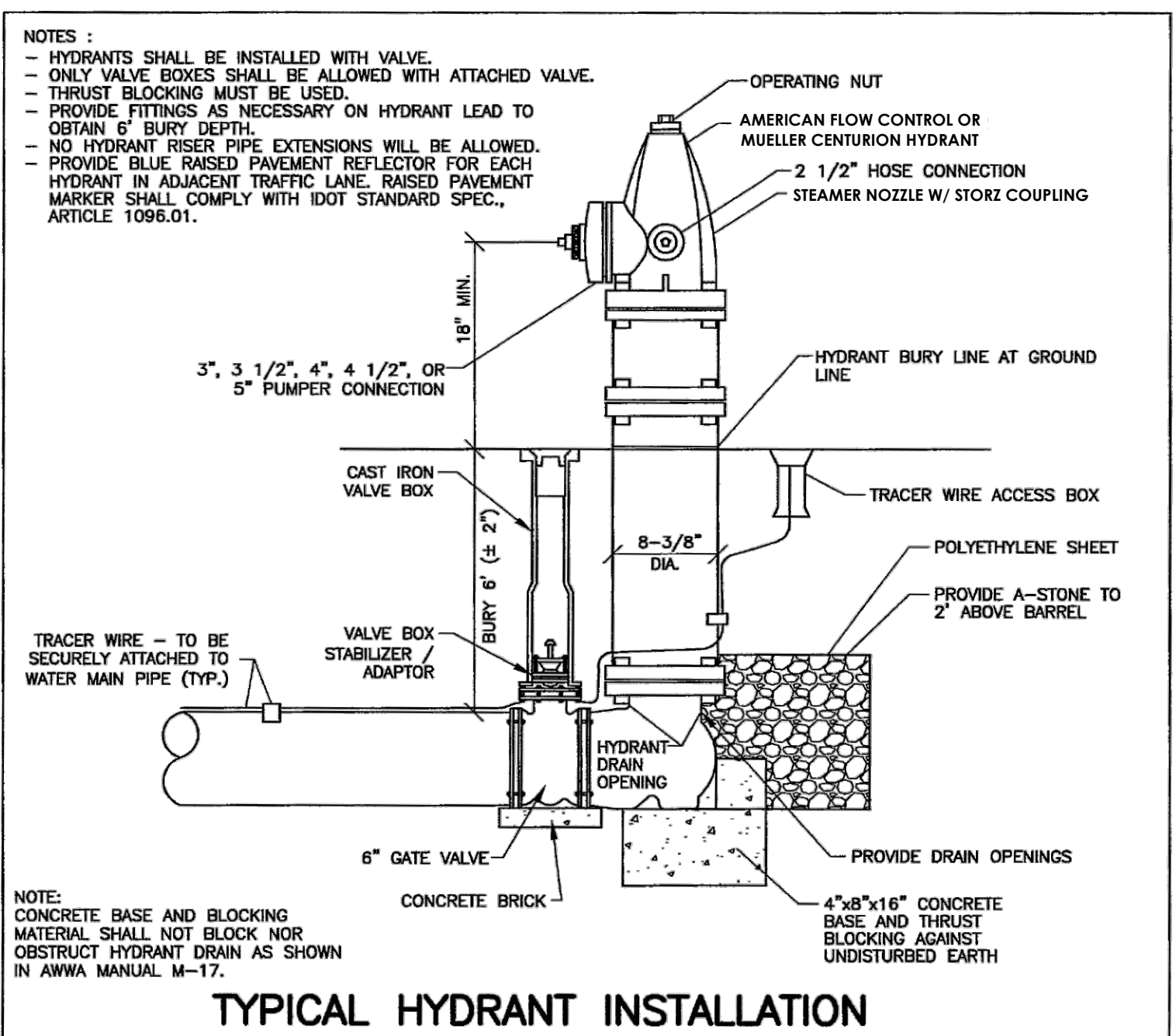
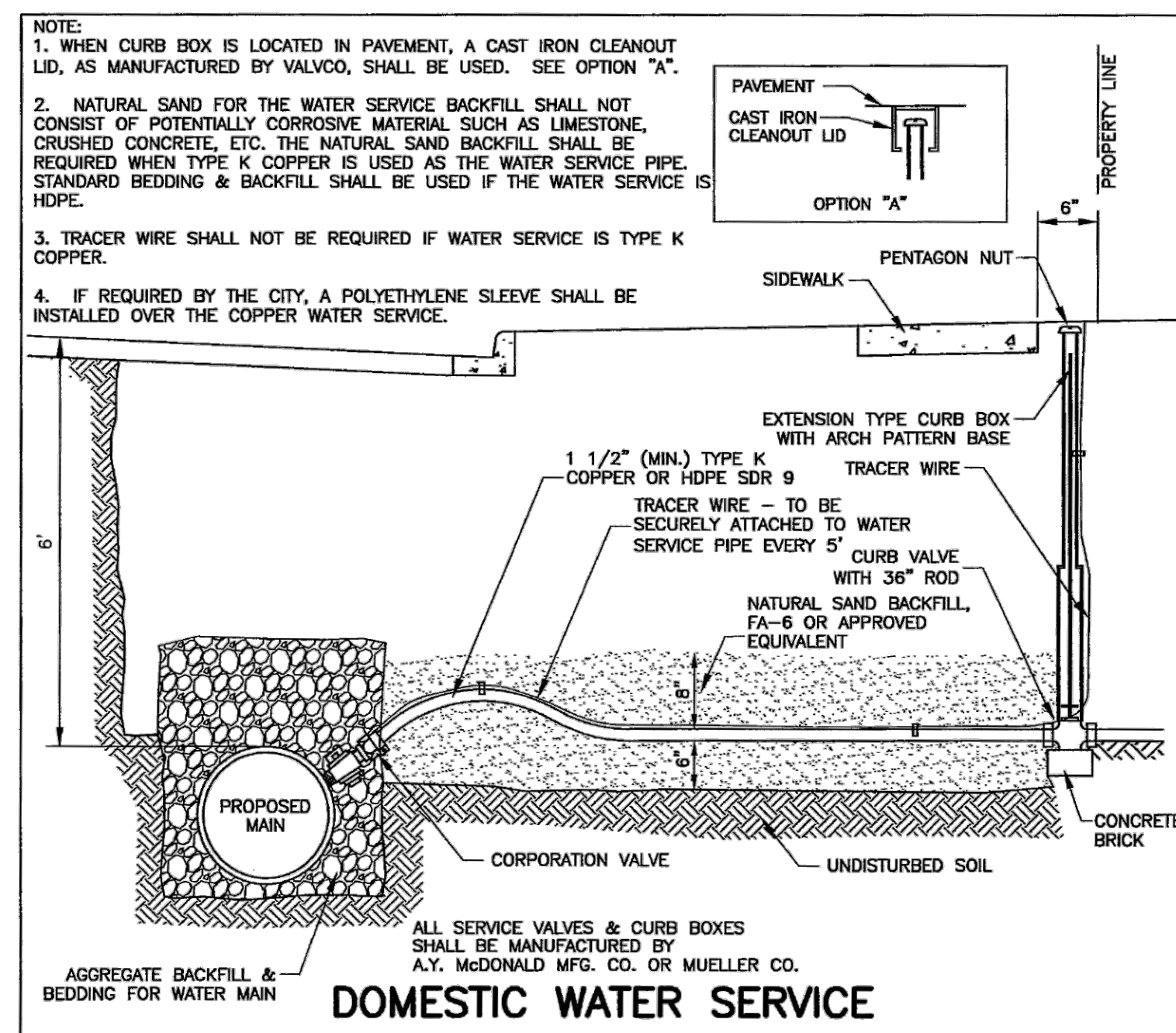
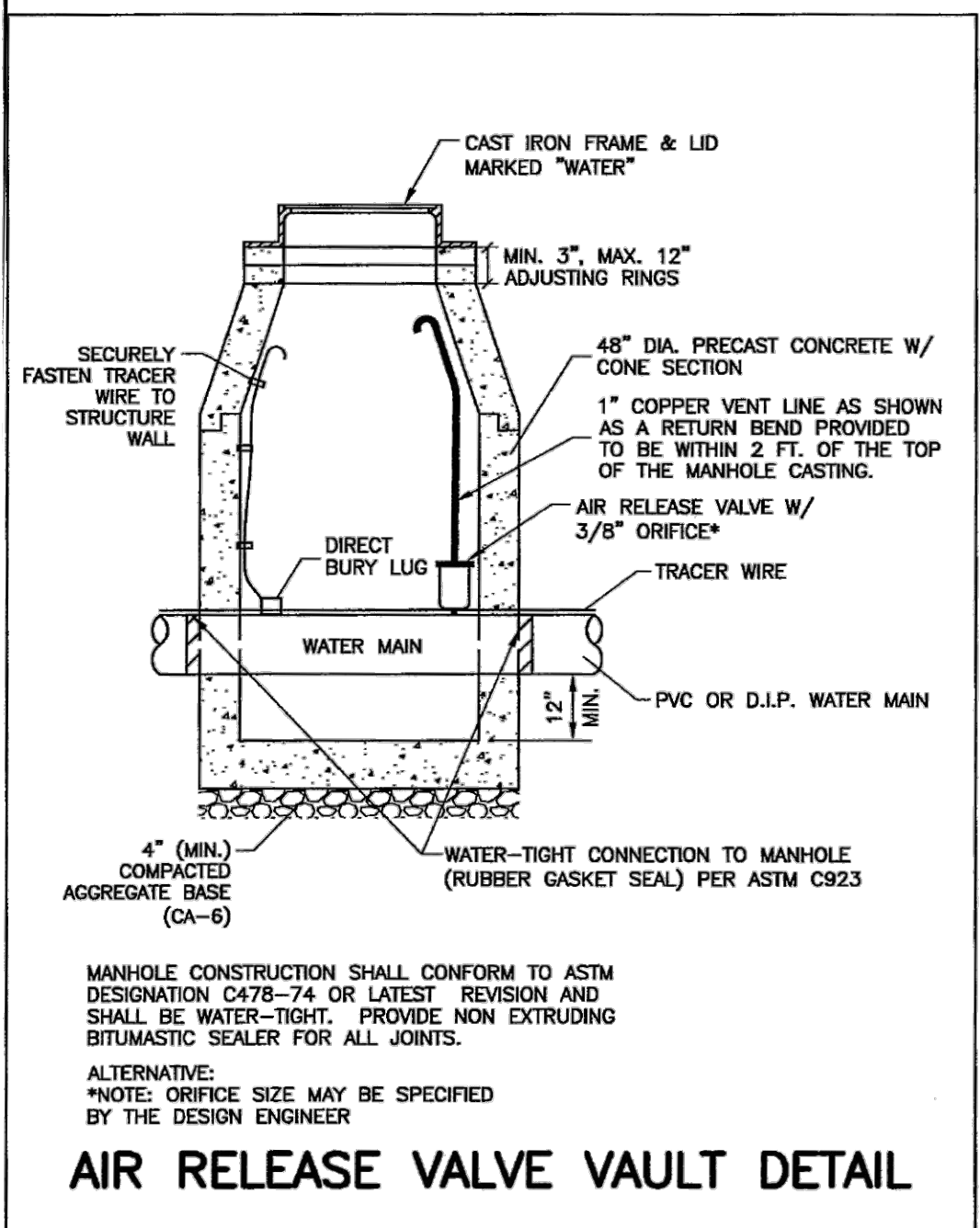
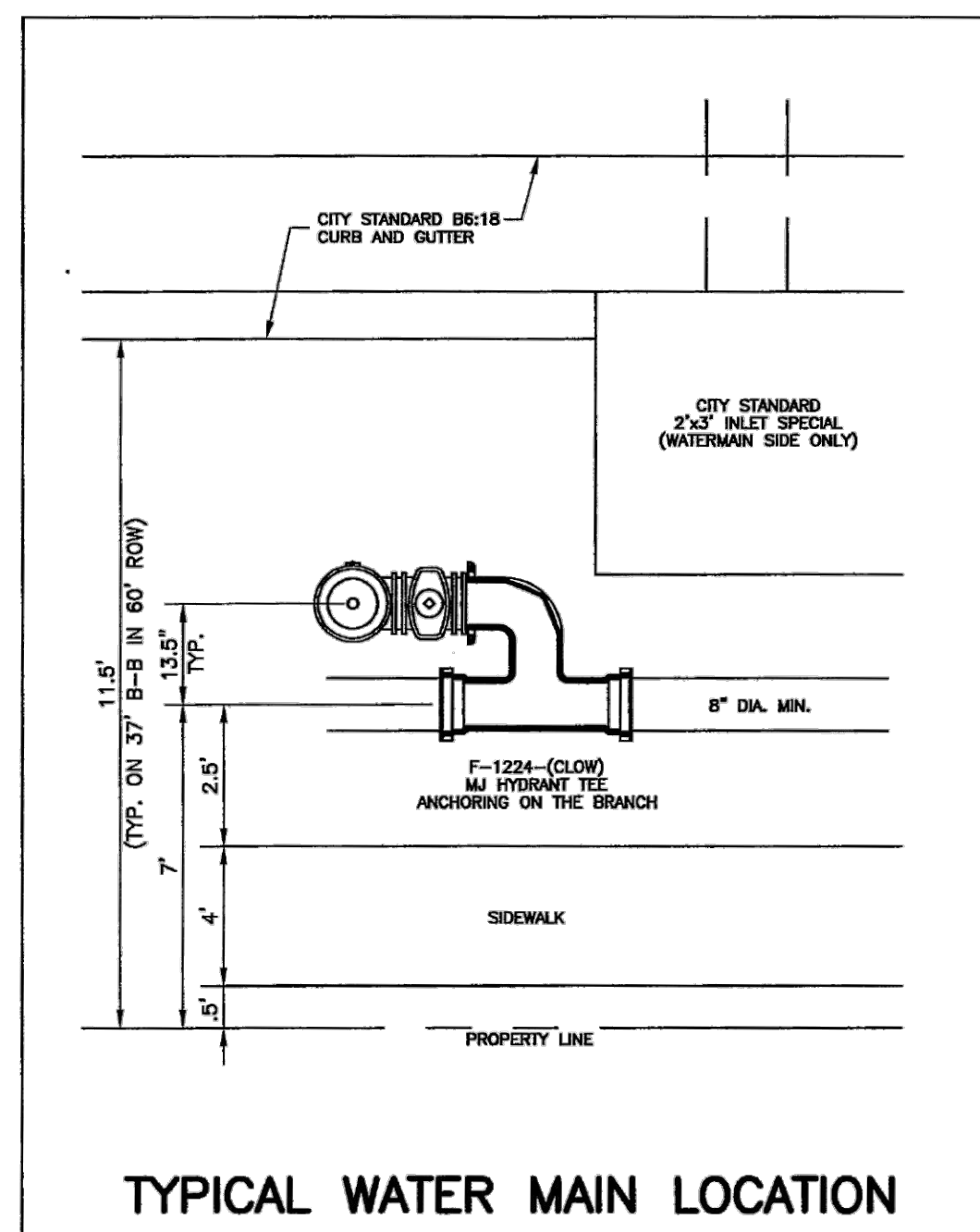
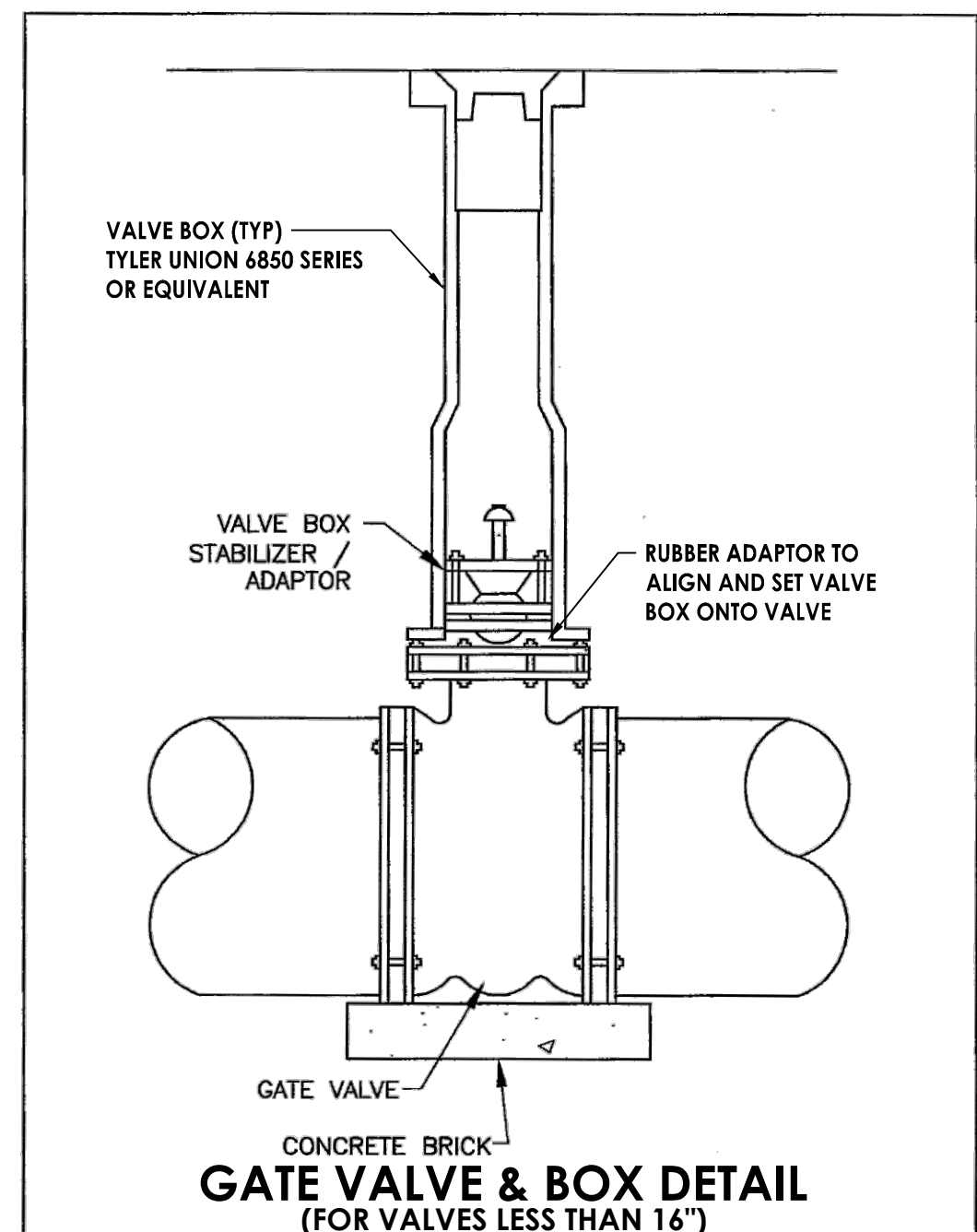
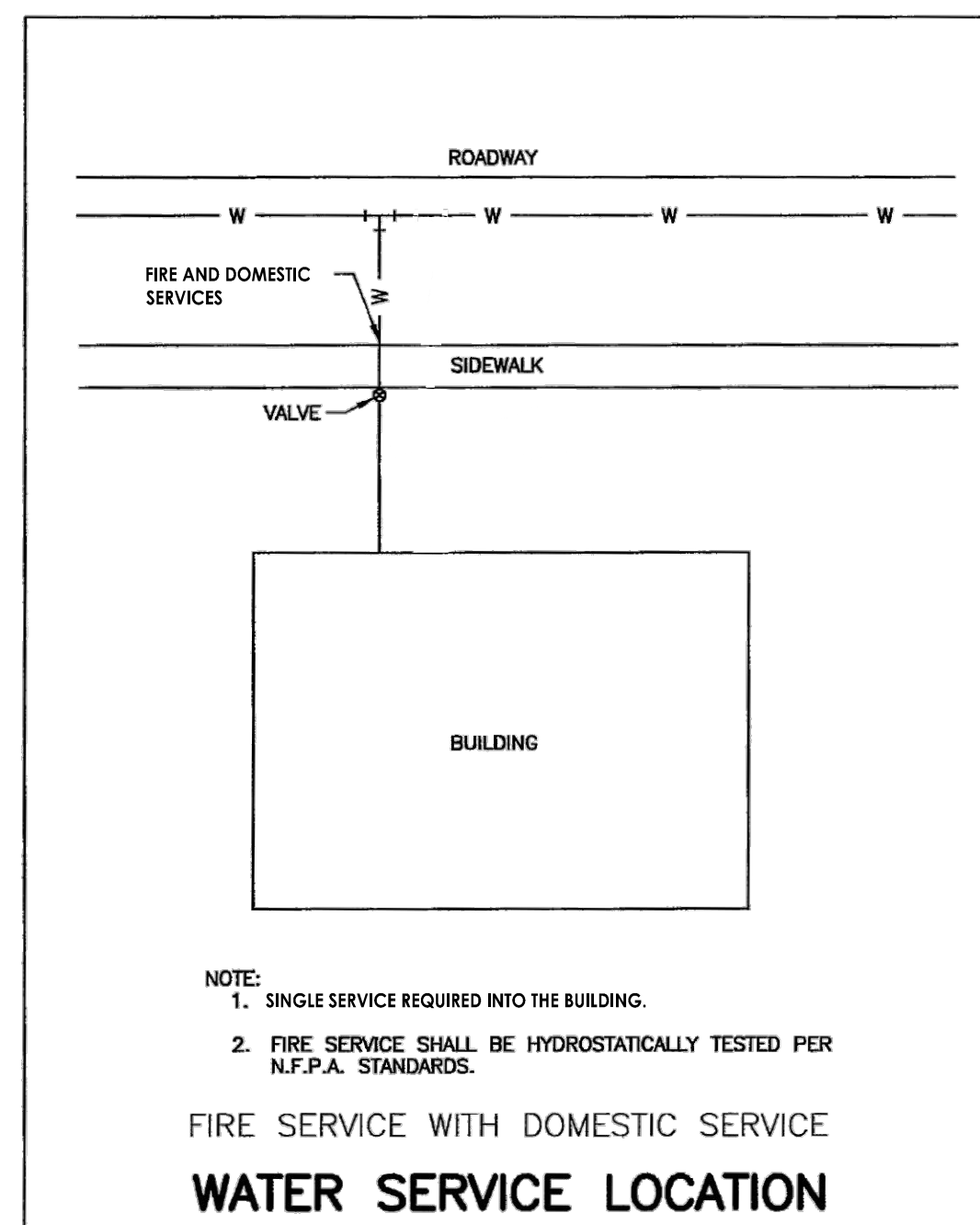
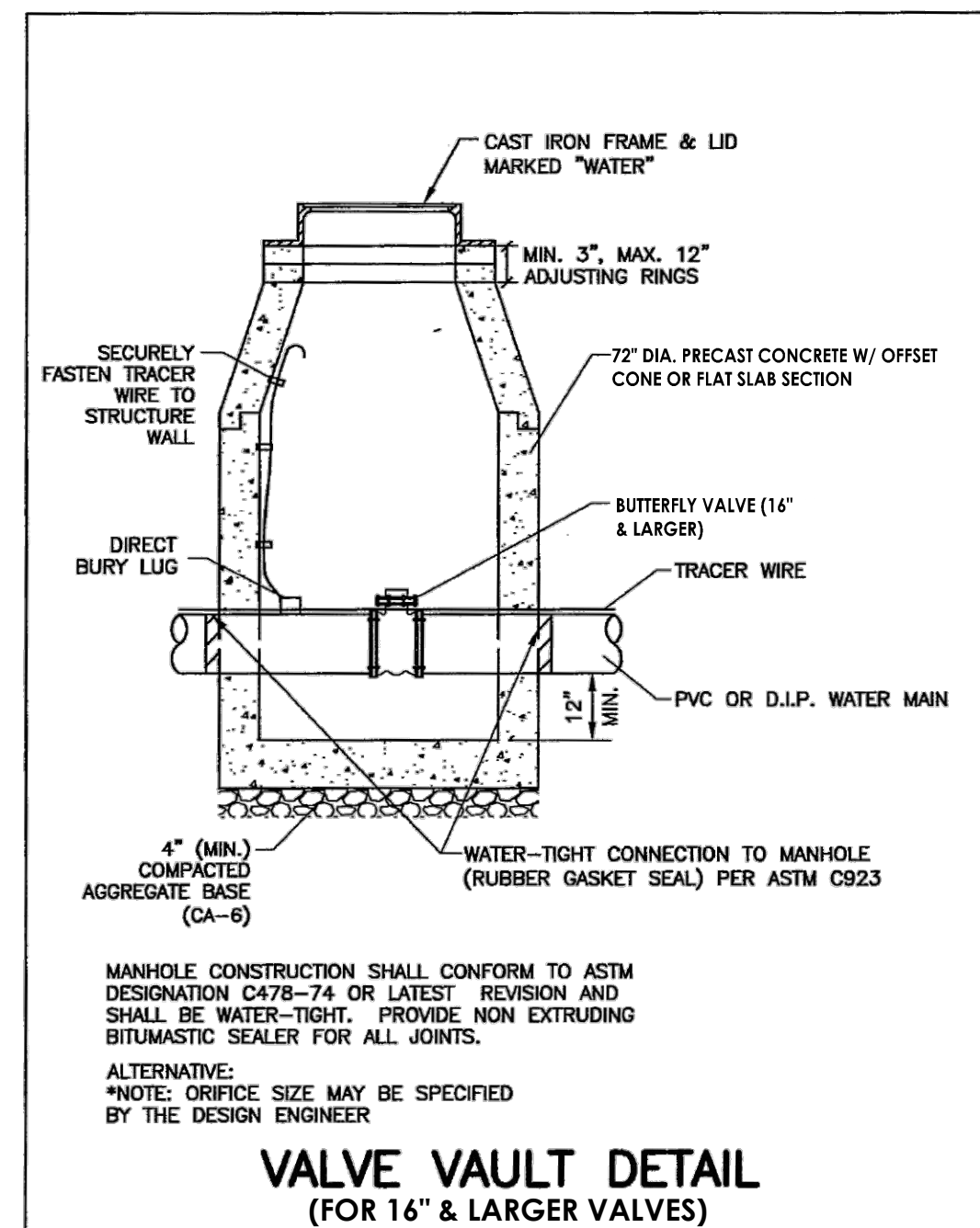
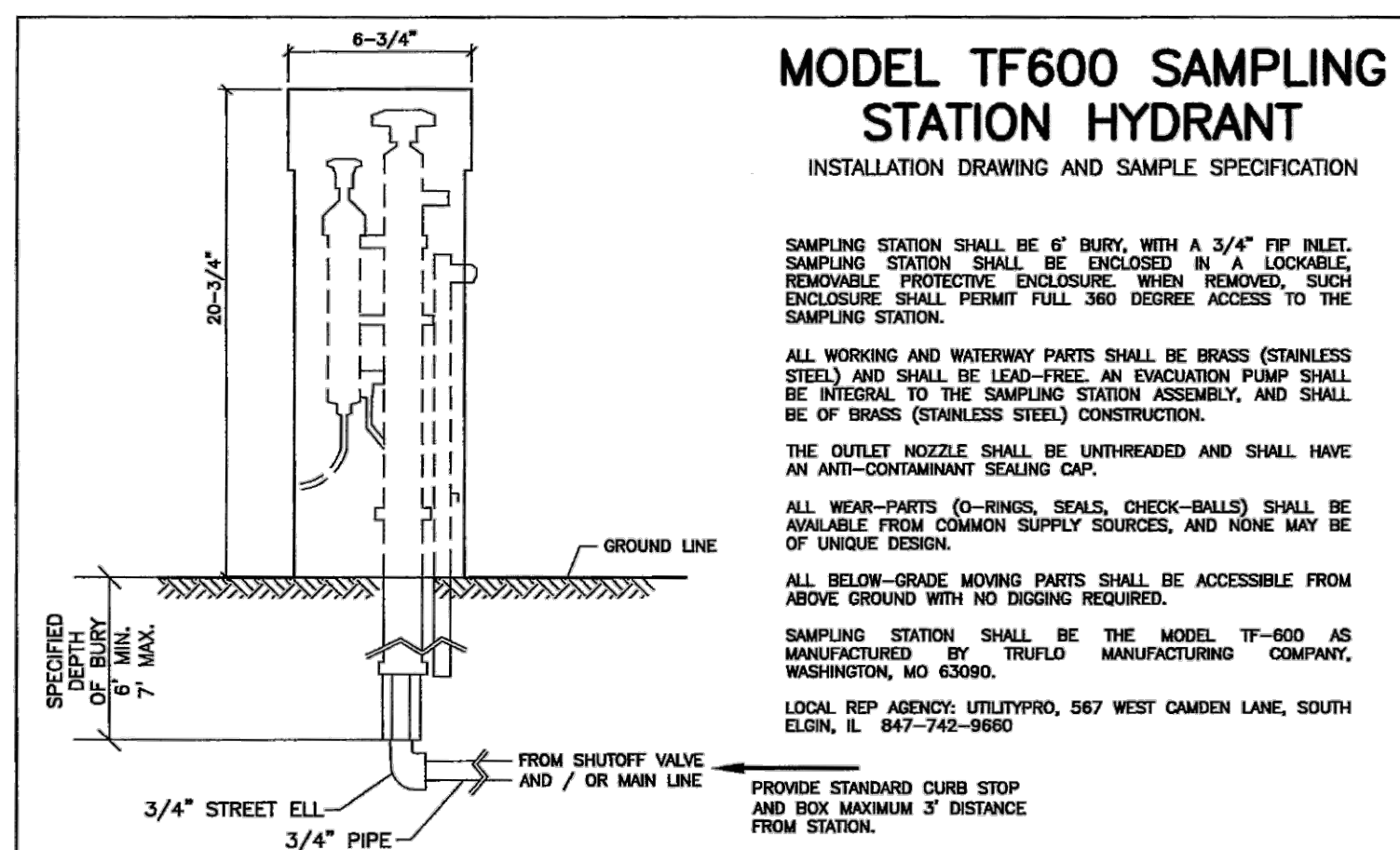
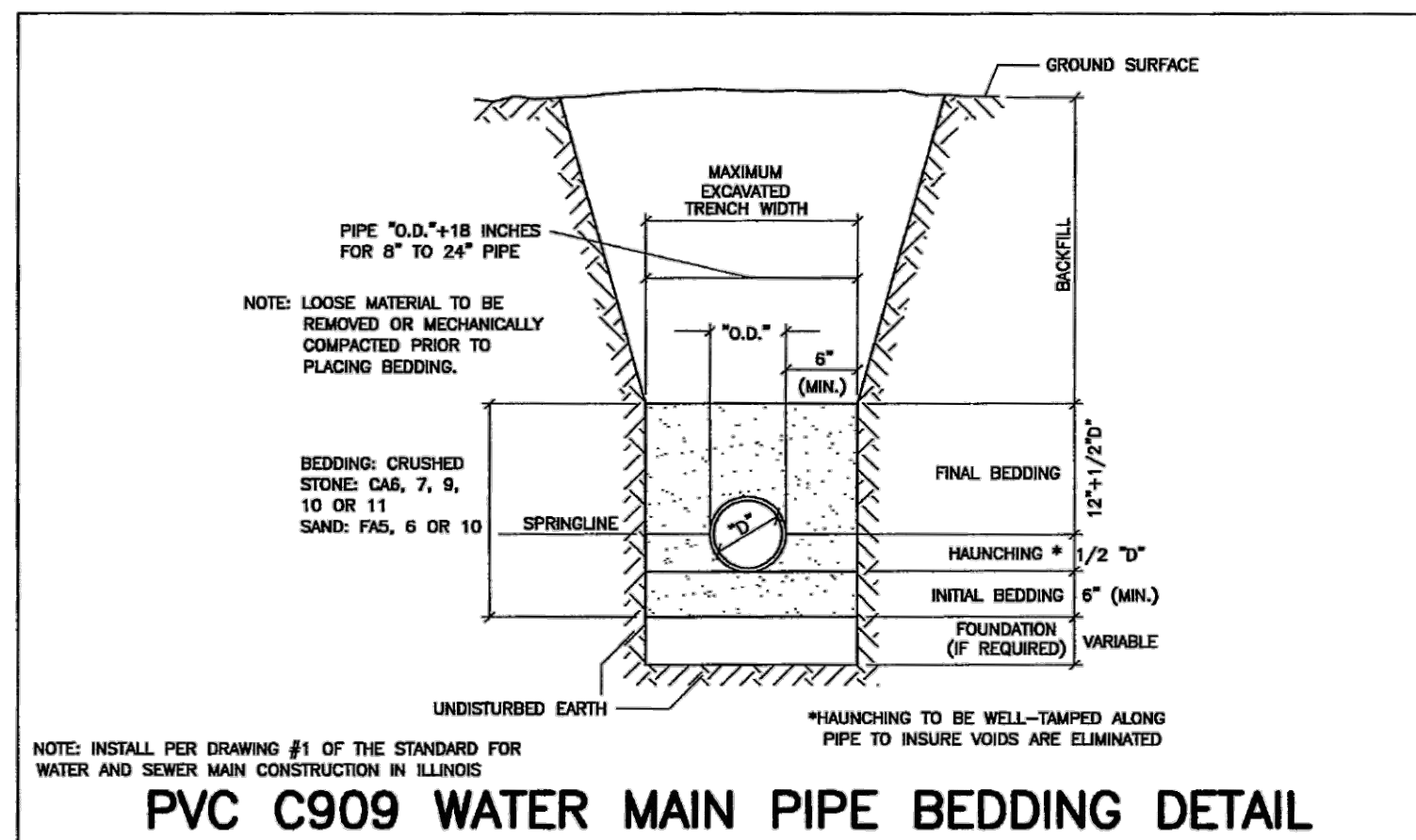
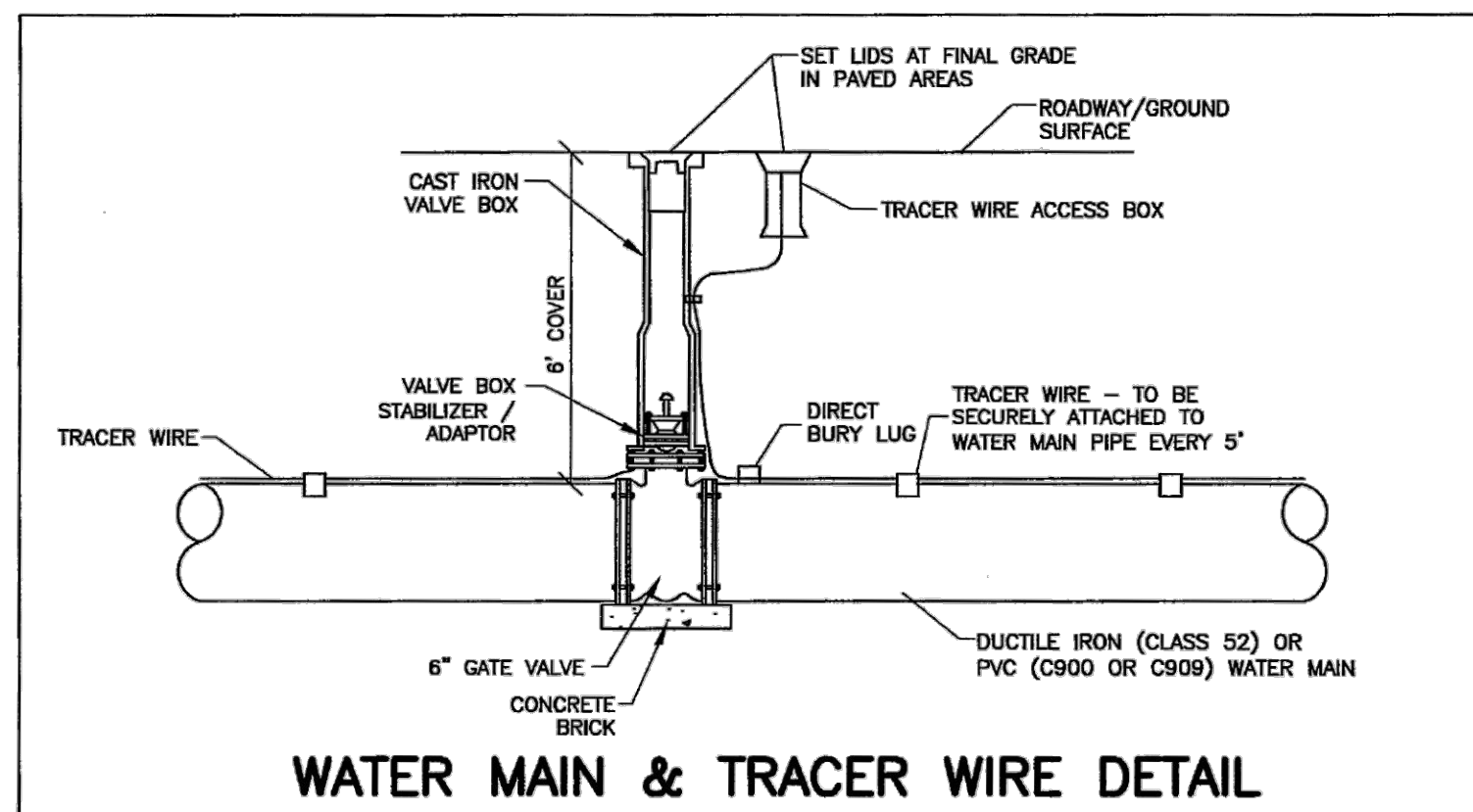
- A. WATER
- SERVICE
 - NOTE: THE CITY OF BELVIDERE WILL ONLY ACCEPT A.Y. MCDONALD, FORD, OR MUELLER BRASS.
 - TYPE K COPPER 1" OR PLASTIC 1"
 - CORPORATION STOP, A.Y. MCDONALD 4701BT ONLY, FORD BRASS, OR MUELLER BRASS EQUAL.
 - CURB STOP, A.Y. MCDONALD #6100T ONLY, WITH 36" ROD, FORD BRASS, OR MUELLER BRASS EQUAL.
 - CURB BOX, A.Y. MCDONALD #5610 WITH 5607 LID ONLY, FORD BRASS, OR MUELLER BRASS EQUAL.
 - SERVICE SADDLE FOR C909 PIPE SHALL BE SMITH BLAIR 372. ALL STAINLESS STEEL FULL CIRCUMFERENCE SADDLE.
 - MAINS
 - C909 PVC, C900 PVC, OR CLASS 52 DUCTILE UNDER MAJOR ARTERIALS. CLASS 56 DUCTILE IRON ONLY.
 - VALVES, AMERICAN FLOW CONTROL SERVICES 2500 ONLY! NO SUBSTITUTES WILL BE ALLOWED!
 - HYDRANTS, 5 1/4" SEAT DIAMETER (NO SUBSTITUTES WILL BE ALLOWED). BURY WITH STEAMER NOZZLE AND VALVE ATTACHED. AMERICAN FLOW CONTROL WATEROUS PACER, WB-67-250.
 - WITH LIMITED SPACE FOR HYDRANTS USE HYDRANT TEE (CLOW F1224 MJ OR EQUAL).
 - VALVES IN ROAD MUST USE AMERICAN FLOW TRENCH ADAPTOR BOX.
 - ALL FITTINGS MUST BE OF DUCTILE IRON (AMERICAN MADE).
 - RESTRAINTS FOR PVC AND DUCTILE PIPE WILL BE MEGA LUGS OR EQUAL AND WILL BE USED ON ALL MECHANICAL JOINTS (AMERICAN MADE).
 - SEWER
 - PIPE
 - MAINS SDR 35 ASTM D3034 PVC. PIPE BURIED OVER 12 FEET MUST BE APPROVED BY PUBLIC WORKS PRIOR TO SUBMITTAL OF CONSTRUCTION PLANS.
 - LATERALS SHALL BE OF PVC ASTM D2241 SDR 26, WATERMAIN QUALITY PIPE.
 - FORCEMAINS SHALL BE AWWA C905 OR C909 DR26 MINIMUM PIPE OR D.I.P..
 - MANHOLES
 - CASTINGS
 - WATER: EJIW 102221 FRAME WITH 1020 LID OR NEENAH MANHOLE FRAME & LID 1077.
 - SEWER: EJIW 102221 MANHOLE FRAME WITH 1020 GASKET SEAL LID OR NEENAH MANHOLE FRAME & LID 1077.
 - ALL MANHOLES MUST USE A MANHOLE ENCAPSULATION SYSTEM (FOR SEWER ONLY) AND IT MUST BE APPROVED BY THE CITY.
 - LABEL LID PER DETAIL.
 - ALL WATER METERS MUST BE PURCHASED FROM THE CITY OF BELVIDERE WATER DEPARTMENT.

GENERAL SPECIFICATIONS FOR WATER AND SEWER CONSTRUCTION

SANITARY SEWER AND WATER DETAILS

CITY OF BELVIDERE

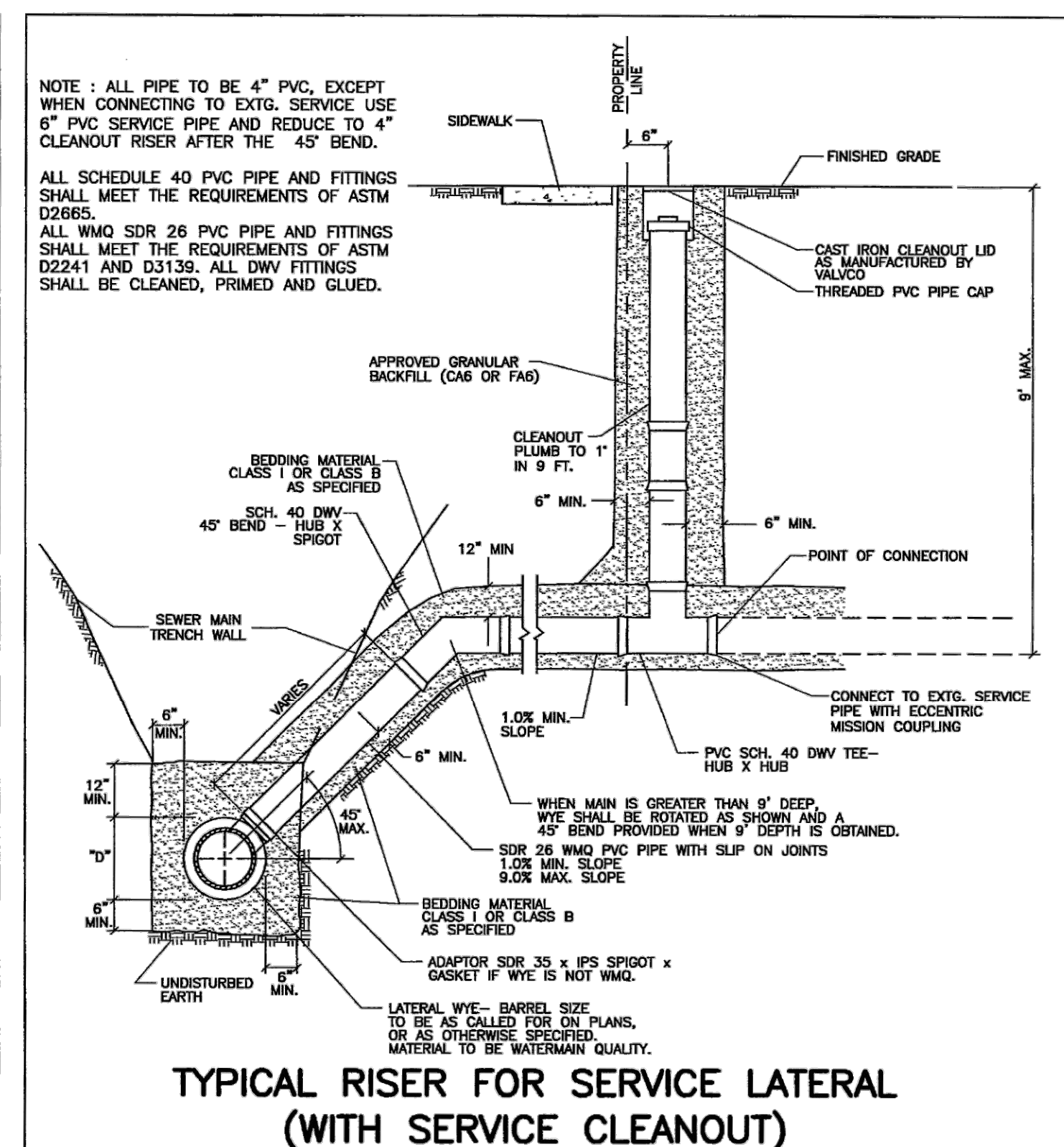
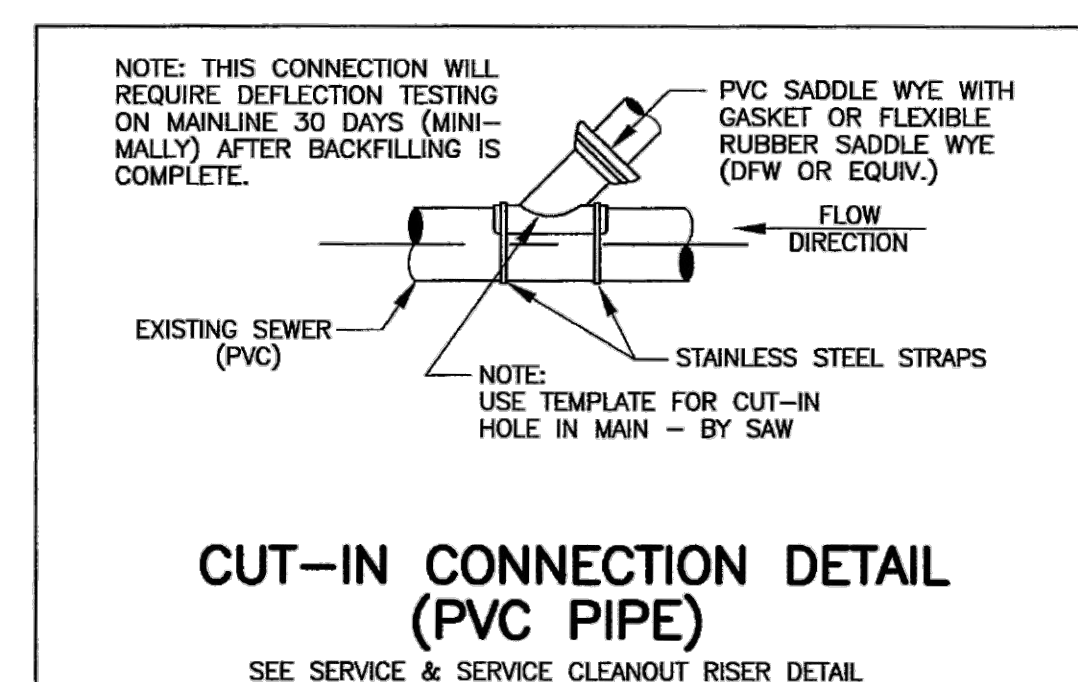
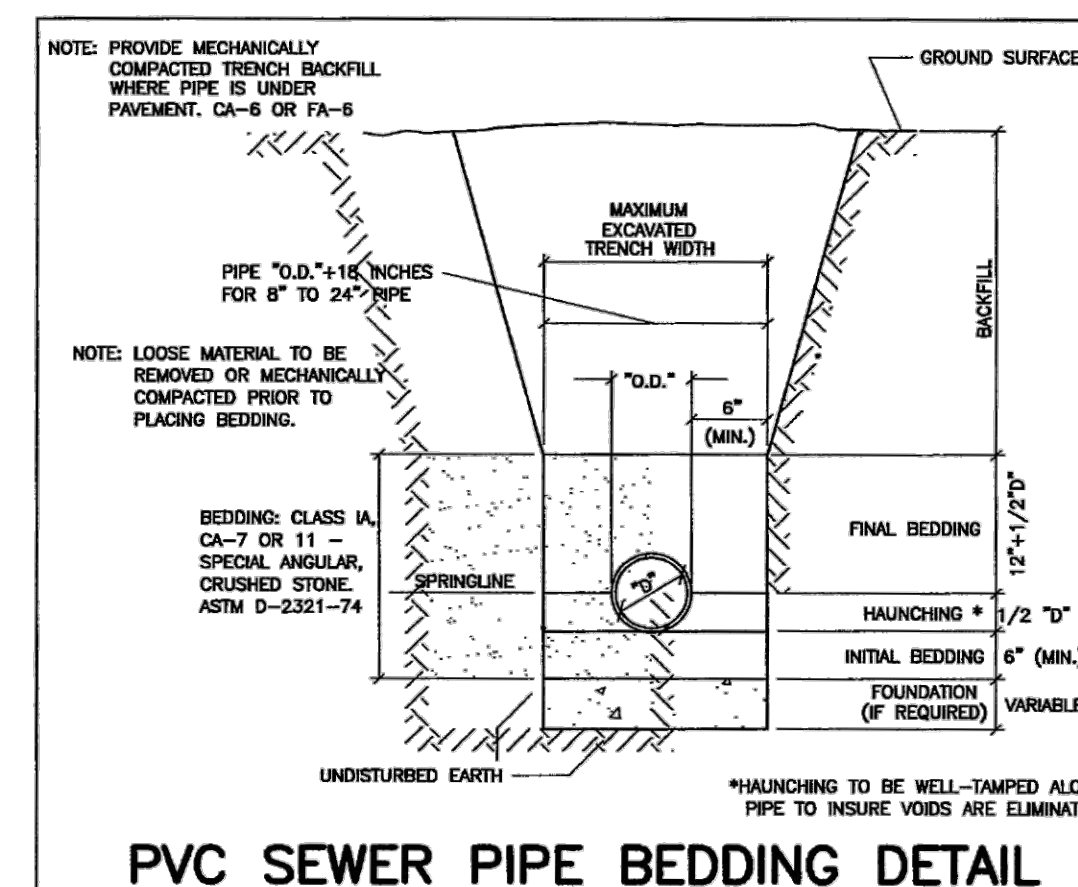
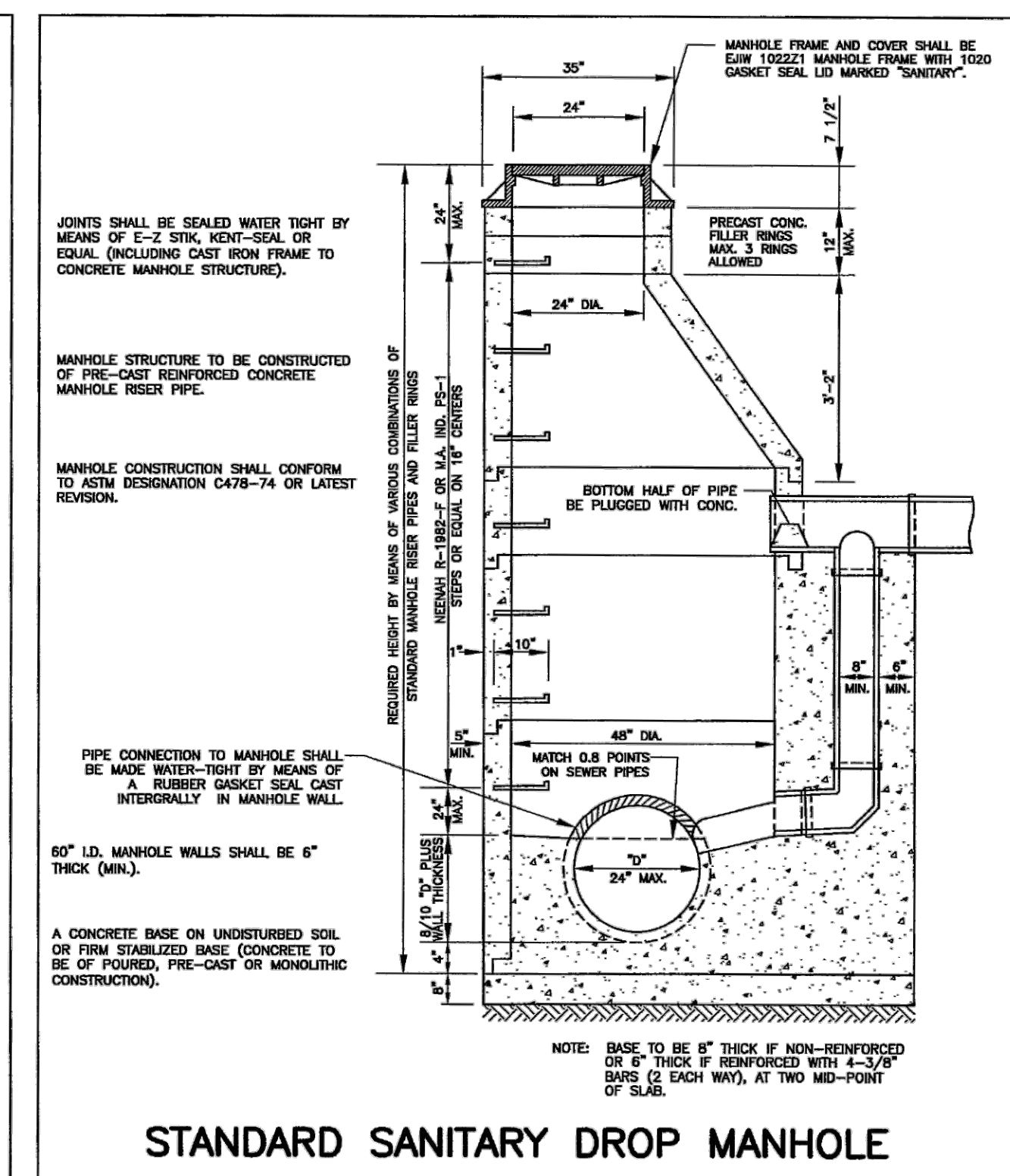
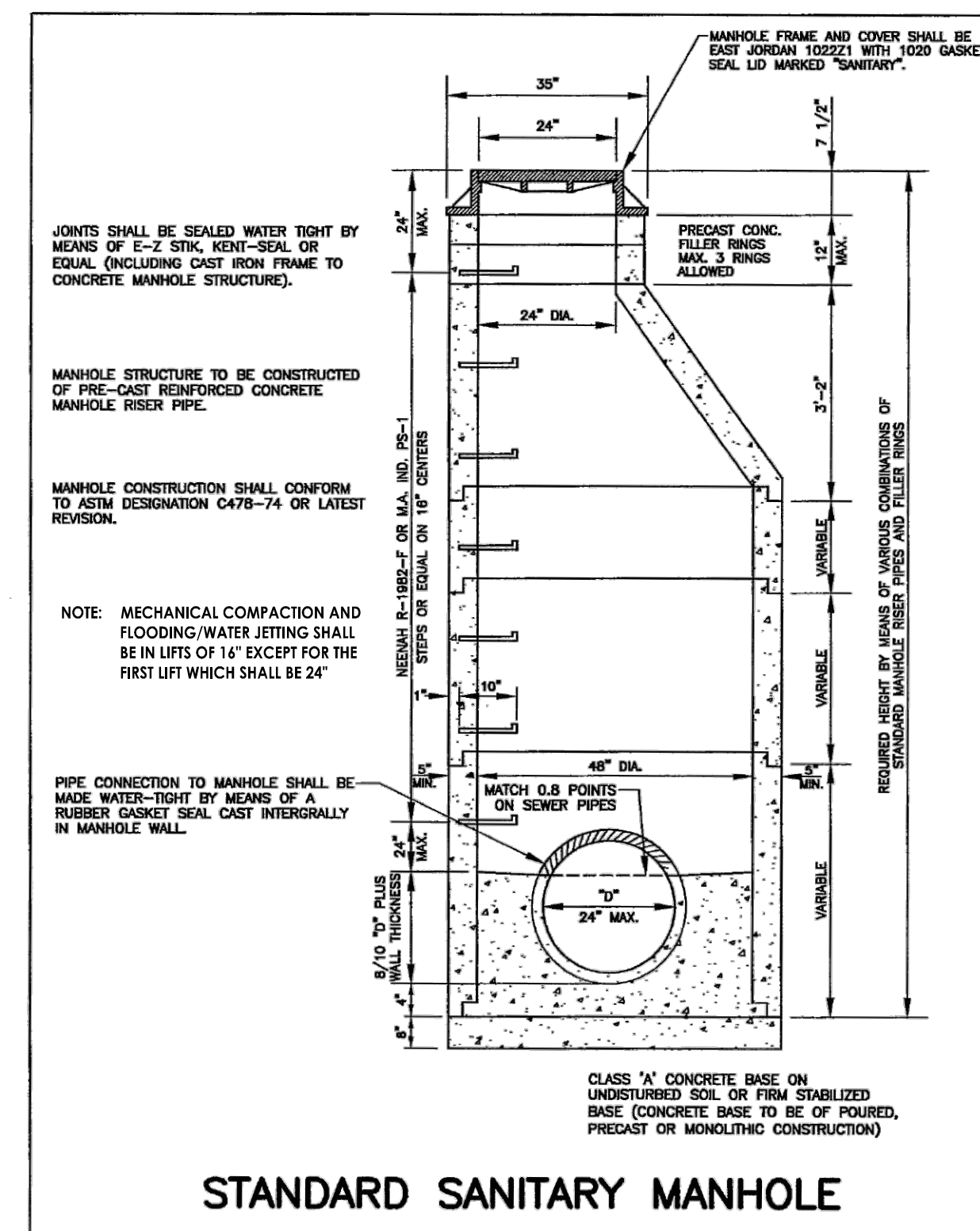
BY: D. ANDERSON	DATE: 04/19/2023
REV:	SHT. NO. 1 OF 3



SANITARY SEWER AND WATER DETAILS

CITY OF BELVIDERE

BY: J. GRIMES	DATE: 09/20/2002
NOT TO SCALE	SHT. NO. 2 OF 3
REV: 12/02/2024	



SANITARY SEWER AND WATER DETAILS

CITY OF BELVIDERE

BY: J. GRIMES	DATE: 09/20/2002
NOT TO SCALE	SHT. NO. 3 OF 3
REV: 12/02/2023	