ONSET FIRE DISTRICT

WATER DEPARTMENT

GENERAL PROCEDURES, CONSTRUCTION SPECIFICATIONS & MATERIAL SPECIFICATIONS

Revised 10/13/21

I. GENERAL

All requests for water main extensions shall be treated in accordance with the most recent versions of AWWA Manuals and Standards, the ***Guidelines for Public Water Systems*** of the Massachusetts Department of Environmental Protection, the Massachusetts Plumbing Code, the policies of the Massachusetts Board of State Examiners of Plumbers and Gas Fitters and the Water District's Specifications as set forth herein.

1. Extensions Requiring New Road Construction:

An applicant proposing to construct a new water distribution system that is a part of a project that must be reviewed and approved by any municipal body (i.e., Planning Board, Site Review Board, etc.) shall provide the following:

a. Pre-Submittal

The District or a Town department will require a determination of the water system's "ability to serve" the demand associated with the new water main. All new water main installations must be looped, no dead-end mains will be accepted. To make this determination, the District will require the owner (or owner's representative) to provide the following preliminary information, at a minimum: a utility plan with water main sizes; site map with location of any underground storage tanks, fuel storage areas, hazardous material storage areas and drainage infrastructure; an anticipated project timeline; anticipated average and maximum domestic water demands; anticipated fire suppression requirements; fire flow test reports; contact information, for the owner and owner's representatives, and any other information that would facilitate the District's engineer's ability to evaluate the impact of the proposed project on the existing system and to generate an ability to serve letter. The owner is responsible for all costs associated with conducting the evaluation and generating the letter report.

b. Submittals

Three (3) printed sets of complete plans and specifications and one (1) electronic copy shall be sent to the District Superintendent or his/her designee. The documents shall show plan and profile of the proposed water main, right-of-way boundaries, other utilities, structures and any other physical or topographical features relevant to the installation and maintenance of the water main. A cover letter shall also be submitted with the plans and specifications giving a description of the project and construction sequence, the anticipated project timeline and any other relevant information.

c. Review

Once received, the District's goal is to review the plans within thirty (30) days after receipt. Initial written comments will be issued to the applicant and/or engineer within this period. During this review, it may be necessary to have a design meeting between the District and project engineers. That determination will be made on a case by case basis. Any required changes must be incorporated on the drawings and resubmitted. The owner is responsible for all costs associated with conducting the plan review.

d. Approval

After all District comments and recommended revisions have been incorporated into the design, the District will issue a letter of design approval to the developer or agent. This letter will also detail all the other administrative requirements pertinent to the project including but not limited to developing a main extension estimate detailing the required construction deposit, main extension contract, easement acquisition, project scheduling, special conditions, and impact fees. The owner is responsible for all fees and costs associated with construction oversight by District employee or contractor.

e. Final plans for construction

After final approval by the municipal reviewing authority, a final set of signed plans shall be submitted to the District. Additionally, an electronic version of the plans shall also be submitted (in a format acceptable to the District).

2. Extensions On Existing Roadways:

An inquiry (primarily from an individual(s) for a property on an existing road beyond the end of an existing main) that is not part of the process outlined under *Section 1* above shall be handled as follows:

Upon request by a prospective customer for a main extension, the District will review the requested main extension to determine if it is routine or complex. If routine, the District will prepare an estimate at no cost to the proposed customer. If the District determines that the main extension is complex, the District will advise the proposed customer and, based on the District's actual cost, prepare a preliminary estimate of the costs of the proposed main extension, along with a fee estimate for preparing a detailed estimate and preliminary design. Should the proposed customer wish to proceed with the main extension request, the proposed customer must pay the fee for a detailed estimate and preliminary design. Upon receipt of payment, the District will proceed to perform the necessary fieldwork, engineering and design and produce a detailed estimate of the cost of the main extension. **All new water main installations must be looped, no dead-end mains will be accepted.**

The following construction specifications are intended to apply to **ALL** new construction, both public and private. For the purposes of ensuring overall proper workmanship and compliance to these specifications, the District makes no distinction between extensions that are to be owned and maintained by the District, and private extensions installed to serve commercial, industrial or multi-unit type projects.

II. PRE-CONSTRUCTION

1. All administrative work must be completed prior to receiving authorization to proceed. Including, but not limited to forwarding a deposit to the District for the amount shown in the Design Approval Letter or the Main Extension Estimate, providing a suitable easement if applicable, and signing the Main Extension Contract. A minimum of 30 days shall be allowed for completing this work.

2. A listing of all material and material suppliers will be submitted to the District for approval prior to the pre-construction meeting.

3. A pre-construction meeting shall be held between the District and the contractor/owner prior to breaking ground or mobilization.

4. The District shall be given the opportunity to inspect all materials before installation and shall notify the contractor/owner prior to installation if material is defective or does not comply with District specifications.

5. Before construction is allowed to begin, stakes showing the finish roadway grades shall be placed a minimum of 50 feet apart for the entire length of the proposed project. Stakes, pins, or other suitable markers shall be placed on the right-of-way line at sufficient points to ensure proper alignment of the water main. Said vertical and horizontal field information will be inspected and approved by the District prior to startup.

6. Blasting:

It is the responsibility of the contractor to familiarize themselves with any applicable municipal ordinance governing blasting activity. All applicable local or state regulations in effect shall be adhered to.

7. All required permits (road opening, environmental, dig safe, etc.) are the responsibility of the contractor/owner.

III. LOCATION

1. Pipe shall be installed so that top of pipe will be 5 feet below finished grade. Any variation on this standard must have prior approval by the District. It shall be the contractor's responsibility and expense to verify (by test hole) the cover of the main at any location questioned by the District.

2. The pipe shall be located horizontally so that it will be 12-1/2 feet inside the right-of-way line or as otherwise directed by the District. Case by case determinations will be made by the District for other conditions.

3. Unless specifically allowed by the District in writing, the water main shall not be installed within 10 feet horizontally of any other underground utility line, including but not limited to sewer, gas, power, telephone and cable TV. Lateral utility crossings shall be reviewed by the District on a case by case basis and will be installed as specified below.

- **a.** Parallel Installation - Water mains shall be laid at least 10 feet horizontally from any existing or proposed gravity sanitary or storm sewer, septic tank, or subsoil treatment system. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10-foot separation, it is permissible to install a water main closer to a sewer. However, the water main must be laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer, and a sleeve for the water line must be used.
- **b.** Crossings - Water mains crossing sewers shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. It is preferred that the water main cross above the sewer. At crossing, one full length of water pipe shall be located so both joints will be as far from the sewer as possible, the water line will be sleeved, and the sewer materials shall be water works grade 150 psi pressure rated pipe meeting latest AWWA standards and shall be pressure tested to ensure water tightness. Special structural support for the water and sewer pipes may be required, as well as special materials for construction and connecting devices.
- **c.** Sewer Manholes - No water pipe shall pass through or come in contact with any part of a sewer manhole.

4. Lateral phone and cable TV crossings shall be encased in Schedule 40 PVC conduit within 10 feet of the water main in all directions.

5. Any electric utility lines within 10 feet of the water main, whether or not a lateral crossing, will be encased in conduit.

IV. INSTALLATION

1. All water mains shall be installed in accordance with the final approved plans. There will be **no dead-end mains allowed**, any variation to the plans must have prior approval in writing by the District.

2. Pipe, fittings, valves, hydrants, and associated appurtenances shall be installed in accordance with the latest American Water Works Association Standards and as directed herein.

3. Fittings and hydrants shall be blocked for horizontal and/or vertical movement in accordance with American Water Works Association Standards.

4. All main line gate boxes, service gate boxes and blow-off appurtenances shall be properly installed and raised to grade at the completion of paving or grading operations. Any gate box found to be improperly installed or not raised to grade at any point prior to the end of the one year warrantee period will be the responsibility (and cost) of the contractor to repair.

5. If the water main should be laid across an area where there is or will be a culvert, the trench dimensions and cross-section detail must have prior approval by the District if it varies from the approved drawings. The use of insulation may be required for some design applications.

6. The trench will be kept dewatered during pipe installation. Every effort shall be made to avoid any situation where groundwater or surface water runoff is allowed to enter the main. The District reserves the right to issue a stop work order upon a project if this situation cannot be controlled.

7. Every effort and precaution must be undertaken to prevent the introduction of any foreign material (insects, rodents or other animals, sediment, organic material, etc.) from entering the pipeline, either before construction or during installation. Each pipe section shall be visibly inspected on the inside and outside prior to lowering into the trench. Failure to follow proper housekeeping during installation will result in a stop work order or rejection of the pipe system.

8. If required by District, all fittings (tees, bends, solid sleeve couplings, end caps, valves etc.) shall be wrapped with a minimum 6 mil polyethylene sheeting and securely taped before backfilling.

9. The main shall have a separate service line and tap/tee for each fire service, each domestic service and each fire hydrant.

10. Tracer wire must be installed on all non-metal water mains and services. All trace wire and trace wire products shall be domestically manufactured in the U.S.A and shall have HDPE insulation intended for direct bury, color coated per APWA standard for the specific utility being marked. The tracer wire should be placed in the same orientation to all installed pipe. Using a spacer, tape the tracer wire to the pipe every 8-10 feet in the three o'clock position. Use waterproof and corrosion-proof wire connectors. Non locking friction fit, twist on or taped connectors are prohibited.

11. All trace wire termination points must utilize an approved trace wire access box (above ground access box or grade level/in-ground access box as applicable), specifically manufactured for this purpose. All grade level/in-ground access boxes shall be appropriately identified with “water” cast into the cap and be color coded. A minimum of 2 ft. of excess/slack wire is required in all trace wire access boxes after meeting final elevation. All trace wire access boxes must include a manually interruptible conductive/connective link between the terminal(s) for the trace wire connection and the terminal for the grounding anode wire connection. Grounding anode wire shall be connected to the identified (or bottom) terminal on all access boxes.

12. Install color coded warning tape one foot above the pipe. Follow the APWA uniform color code

V. BEDDING

1. Enough bedding is needed to place 6 inches under pipe and to fill both sides of the trench to a compacted elevation of 6 inches above top of pipe.

2. Bedding material shall be granular sand meeting the following requirements: 100 percent passing a 2-inch sieve Greater than 75 percent passing a # 4 sieve Less than 5 percent passing a # 200 mesh sieve

VI. BACKFILL

1. The remaining depth of trench will be backfilled with material suitable to the District representative on the job. The following material may not be used for trench backfill: organic material, blasted or hammered ledge*****, rocks over 6 inches in diameter and peat-type material.

2. No backfill material which is frozen shall be placed in the trench.

3. Road subgrade gravel and paving shall conform to the requirements of the design drawings, Town or State Highway Departments.

4. **Trench Compaction:**

   Compaction of backfill material shall be done in 12-inch maximum lifts achieving 95% proctor, or in accordance with the specifications and requirements of the State or Municipality responsible for the street or highway involved (whichever is the more stringent). Under no circumstance shall the District authorize the start of construction for any water main without a pre-approved compaction plan in place.

   The District reserves the right to hire an independent testing firm, at the expense of the contractor or owner, to verify compliance to the approved compaction plan.

VII. MISCELLANEOUS

1. A watertight plug will be inserted into the open end of the end pipe or fitting in the trench during all pipe installation, as well as any period when the trench is unattended for any length of time.

2. All excess material and debris resulting from the trenching will be removed from the job site, and the surface of the road or right-of-way will be left at the same elevation and in the same condition existing prior to construction. *****

***** For existing roadways, a restoration plan will be prepared and approved by the District prior to construction. The plan will include details regarding pre and post construction pavement cutting, replacement paving details, housekeeping during construction and post construction restoration.

3. Properly mark through the use of flares, signs and barricades any open or soft trench. The contractor shall be responsible for the public's safety at all times by using accepted safety precautions and aids during the course of the work.

4. In the interest of safety, the trench is to be widened if the District's representative or inspector requests it.

5. It is understood that District personnel working on a project may be called away for emergency work, or previously scheduled work, and that the contractor will not be paid extra for any down time for labor or equipment. The contractor will provide the District with a minimum 24-hour notice prior to starting or resuming pipe installation. The District reserves the right to request that sections of trench remain open for inspecting.

6. All service installations must be inspected by Department personnel or designee prior to backfilling.

7. The Contractor installing the water pipes, lines and fittings will be responsible for the maintenance of that water line for a period of one year from the first time the water line is accepted and goes into service. This responsibility will also include assuming proper final adjustment for all gate boxes prior to and after any paving or grading operations occurring during this period.

8. The Contractor is responsible for the proper final adjustment of all gate boxes, existing and new, prior to and after any paving or grading operations occurring within one year of any water work being done.

9. The contractor shall be familiar with and shall accept full responsibility for compliance with all federal, state and local safety regulations.

10. The District will, at the Owner's cost, fill, test and disinfect the new water lines. It is The District's goal to accommodate the contractor's schedule and perform needed tests in a timely manner. The District, however, will not be responsible for any downtime or delay associated with an inability to meet the contractor's and/or project's schedule.

11. The contractor shall not operate any water related appurtenances, including but not limited to valves, hydrants and service lines, without a District representative present.

12. The contractor shall be responsible for developing as-built information during construction. The contractor shall supply to the District copies of all field notes, ties, as-built details or other information relating to the installation of the main. The format and scope of the information tracked shall be coordinated and approved by the District inspector. Failure to provide field information in a timely manner may be cause for not accepting the waterline.

13. The cost and fees associated with inspections shall be borne by the contractor or owner.

VIII. MATERIAL SPECIFICATIONS

The following material section is intended to apply to ALL new construction, both public and private. For the purposes of ensuring overall proper workmanship and compliance to these specifications, the District makes no distinction between extensions that are to be owned and maintained by the District, and private extensions installed to serve commercial, industrial or multi-unit type projects.

1. **Bolts and Nuts**
   Cor-Ten Steel T bolts for M/J fittings in hot soil areas: #316 stainless steel for flange fittings; D.I. regular T bolts all other areas, Grade 5 bolts A307B heavy head bolt/heavy duty nuts.

2. **Valve Boxes**
   North American made Tyler, Mueller, Bibby or EJP; standard style - 3 basic component; cover marked WATER. 5-foot bury 5-1/4 slide type top section; belled base section 47 inches long.

3. **Service Boxes/Foot Pieces**
   North American made Tyler, Mueller, Bibby or EJP; 2 ½ inch x 47" Service Box Base Slide with centering rod guide, Buffalo style. Install Service Box Base Ext. Screws as necessary.

4. **Curb Stops (Ball Valves)**
   Curb Stops and Service Brass must be brass and conform to AWWA Standard C-800 (latest revision) **Open Left**. Manufacturers: Ford, Mueller, MacDonald and Cambridge (Pack Joint or female iron pipe). **Inverted key curb stops are not acceptable.**

5. **Corporation Stops (Ball Valves)**
   Must be brass and conform to AWWA Standard C-800 (latest revision) **Open Left.**
   Manufacturers: Ford, Mueller, MacDonald and Cambridge
   AWWA taper thread (CC) inlet by Pack-Joint outlet for copper/CTS plastic.

6. **Service Saddles * (does not apply to polyethylene pipe systems)**
   - **a.** Bronze Saddles with 1 single large wide strap. Outlet tapped with either AWWA taper (C.C.) or AWWA I.P. thread (F.I.P.T.). For use on AC pipe, cast iron or ductile iron pipe and C900 PVC pipe
   - **b.** Nylon/epoxy coated D.I. body with 1 single large wide strap. ¾ inch to 2-inch service size - AWWA taper thread (CC) outlet thread.
   - **c.** Brass Saddles for IPS & C-900 PVC Pipe allowed. AWWA taper thread (CC) outlet thread.

   * PVC pressure fittings for SDR-21 Class 200 pipe are **NOT ALLOWED**
   Manufacturers: Ford, Romac, Rockwell, Mueller, Smith-Blair.

7. **Service Brass/Misc. Brass**
   ½ inch to 2-inch Ford, Mueller, MacDonald and Cambridge. No flare on copper tubing, **Open Left.**

8. **Fittings: Bends, Tees, Solid Sleeves*, ****

Ductile iron – **U.S. made M/J compact Class 350 cement-lined C-153.**
* solid sleeves shall be long body only.
** IPS sized PVC pressure fittings for SDR-21 Class 200 pipe are **NOT ALLOWED**.
AWWA C-900 PVC pressure fittings are **NOT ALLOWED.

9. **Cut-in Sleeves**
   M/J Clow #349 or Mueller #840.

10. **Valves M/J**
    a. **Cut-in valves: OPEN LEFT**
       Clow Resilient Wedge #F-6111 open Left w/stainless steel nuts/bolts
       Mueller Resilient Wedge #C-2360-44 open Left w/stainless steel nuts/bolts
       American Flow Control (AFC) Model 2500 Ductile Iron Gate Valve open Left w/stainless steel nuts/bolts.

    b. **Tapping valves: OPEN LEFT**
       Clow Resilient Wedge #F-6114 open Left w/stainless steel nuts/bolts
       Mueller Resilient Wedge #T-2360-16 open Left w/stainless steel nuts/bolts
       American Flow Control (AFC) Model 2500 Ductile Iron Gate Valve open Left w/stainless steel nuts/bolts.

    c. **Gate valves: OPEN LEFT**
       Clow Resilient Wedge #F-6100 open Left w/stainless steel nuts/bolts
       Mueller Resilient Wedge #T-2360-20 open Left w/stainless steel nuts/bolts
       American Flow Control (AFC) Model 2500 Ductile Iron Gate Valve open Left w/stainless steel nuts/bolts.

    d. **Butterfly valves*: OPEN LEFT**
       Mueller Lineseal III Pratt Ground Hog
       *Note: Factory epoxy coated inside and out

11. **Tapping Sleeves**:
    M/J: Clow #F-5205 or Mueller H-842 for all sizes Stainless steel sleeves acceptable all sizes. Must meet or exceed ASTM A-240, 304 gauge. Ductile Iron face flange not acceptable. Must be all stainless.

12. **Fire Hydrants:**
    Must have two 2½" side nozzles and one – 4½" pumper nozzle.
    Mueller Super Centurion 250, A-423, **Open Left**.
    Cap & operating nut 1-1/2" pentagon.

13. **Mechanical Joint Restraints**
    EBBA IRON "Megalug". ROMAC Industries "RomaGrip".

14. D.I. Pipe

2-inch through 12-inch: Class 52 double-cement-lined. Push-on joint.
16 inch through 20 inch: Class 51 double-cement-lined. Push-on joint or approved equal.
Manufacturers: Atlantic States, U.S. Pipe, Griffin

15. PVC Pipe

1-1/2 inch through 3-inch: SDR 21 Class 200, steel O.D. *
4-inch through 12-inch: C-900 DR-18 Class 150, D.I. O.D.**
14-inch through 20-inch: C-905 DR-18, 235 psi pressure rating.**
* IPS sized PVC pressure fittings for SDR-21 Class 200 pipe are **NOT ALLOWED**.
** AWWA C-900 PVC pressure fittings are **NOT ALLOWED**.

16. Polyethylene Pipe and Accessories

Polyethylene pipe systems are acceptable on private property, after the curb stop. Any proposed use of polyethylene pipe must be pre-approved by the Water District. Polyethylene pipe must be wrapped with tracer wire.

17. Tracer Wire

All trace wire shall have HDPE insulation intended for direct bury. #12 AWG Copper Clad Steel, High Strength with minimum 450 lb. break load, with minimum 30 mil HDPE insulation thickness.