

**ITEM #1303198A            HYDRANT (WATER MAIN)**  
**ITEM #1303201A            RELOCATE HYDRANT (COMPLETE)**  
**ITEM #1303189A            RESET EXISTING FIRE HYDRANT**

**Description**

- A.     The work required consists of the furnishing of all labor, equipment, appliances and materials and in performing all operations in connection with furnishing and installing new fire hydrants and the relocation of fire hydrant assemblies at the locations and to the details indicated and/or as directed by the Engineer including all pipe, fittings, valves and accessories, connections to other piping and structures, and testing of assemblies.

**Materials**

- A.     Ductile iron pipe and fittings shall be ductile iron pipe manufactured in accordance with AWWA C151, latest revision, thickness Class 52 per AWWA C150, latest revision. Fittings shall be ductile iron rated at 250 psi conforming to AWWA C110, latest revision. Ductile iron pipe and fittings shall be provided with a double thickness of cement-mortar lining conforming to AWWA C104, latest revision. The cement-mortar lining shall be seal coated. Exterior surfaces of pipe and fittings shall be given a standard bituminous coating of coal-tar or asphalt of 0.04" minimum thickness. Joints for ductile iron pipe shall be rubber gasket push-on type, while fittings shall have mechanical joints with retainer glands. Pipe and fitting joints shall conform to AWWA C110 and C111, latest revision. All pipe, pipe, fittings, accessories and appurtenances shall be new and unused.
- B.     All bolts, nuts, rods, and miscellaneous connecting pieces not provided with an approved factory coating shall be given two (2) coats of bitumastic 50 after installation.
- C.     Crushed stone shall consist of clean, hard, durable, crushed rock and shall be satisfactorily free from fine sand, silt or rock flour. Crushed stone shall be uniformly graded 3/4" washed stone and conforming to ASTM Designation: D693, latest revision.
- D.     Hydrant Tees shall be ductile iron and must provide positive restraint to mechanical joint valves/fittings attached to the branch. Shall include all accessories, nuts & bolts. Shall be corten or ductile iron, high strength, low alloy steel per ANSI/AWWA A21.11/C-111. Must be North American made.

- E. Hydrants shall be of the “dry barrel fire hydrant” post, compression shut-off type and shall conform to AWWA Specification C 502, latest revision and to the additional requirements specified herein.
1. Hydrants shall conform to the following specifications:
    - a. Type of hydrant: Traffic type
    - b. Bury depth: 5 feet
    - c. Open **RIGHT**.
    - d. Number of hose and pumper outlets:
      1. Two – 2-1/2” inch hose outlets
      2. One 4-1/2” pumper outlet
    - e. Type of outlet nozzle threads:
      - 2-1/2” hose nozzle with National Standard Thread
      - 4-1/2” steamer nozzle with the following thread specifications:
        - O.D. Thread. . . . . 5.420"
        - Pitch Diameter. . . . . 5.276"
        - Root Diameter. . . . . 5.132"
        - 6 Threads per inch
    - f. Size of hydrant (nominal diameter of main valve opening): 5-1/4”
    - g. Size of inlet connection: 6”
    - h. Type of inlet connection; Mechanical joint with retainer gland
    - i. Direction of operating nut opening rotation: Right
    - j. Size of operating nut: National standard 1-1/2” Pentagon
    - k. Dry top construction.
    - l. Break-away flange and couplings.
    - m. Bronze to Bronze valve and valve seat
    - n. 5 1/4 A Valve opening
    - o. Red Base, Yellow Bonnet
    - p. NSF 61 Certified
    - q. Stem seal type: O-ring
    - r. Nozzles shall be furnished with caps and chains
  2. Hydrants shall conform to the torque requirements specified in AWWA Specification C502, latest revision, regardless of bury length.
  3. The opening between the wrench nut and top of the hydrant bonnet shall be protected from rain and dirt by an acceptable means (dry top construction).
  4. Hydrant top section shall receive two shop coats of primer conforming to the requirements of Section 4.2 of AWWA Specification C502, latest revision. Second primer coat is to be red in color. Hydrants shall receive two field coats of red paint meeting the acceptance of the owner.

5. For purposes of standardization, hydrants shall be Model No. B-62B as manufactured by American Darling Valve, Birmingham, Alabama; Super 200, Model No. A423, as manufactured by Mueller Company, Decatur, Illinois; or Guardian Model K-81A as manufactured by Kennedy.

### **Construction Methods**

- A. All new pipe shall have cast on it or stamped on it by means of a hand die stamp, the manufacturer's name or mark, and the year in which the pipe was cast. Also, the weight, thickness, class and sampling period shall be painted on each pipe. All pipe, fittings, hydrants and accessories shall be carefully inspected by the Contractor for damage before relocation and all defective, unsound or damaged materials shall be rejected. The Engineer will make such additional inspection he deems necessary and the Contractor shall furnish all necessary assistance for such inspection.
- B. No pipe joints shall be covered in any way until the joints have been inspected.
- C. Proper implements, tools and facilities, satisfactory to the Engineer shall be provided by the Contractor for the proper and satisfactory execution of the work.
- D. The Contractor shall coordinate new installation and relocation work with and in accordance, to the City of Meriden Water Department.
- E. The interior of pipe, valves, hydrants and fittings shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations.
- F. The trench bottom and bedding shall be shaped and compacted to give substantially uniform unyielding circumferential support to the lower quarter of pipe and valves along their entire length. Bell holes shall be excavated so that after placement only the barrel of the pipe receives bearing pressure from the trench bottom.
- G. Hydrant assemblies, including all pipe, fittings, and accessories shall be installed in conformance with the AWWA Specification C600, latest revision, and the additional requirements specified herein.
- H. Ductile iron pipe shall be cut only by means of abrasive saws, hack saws, wheel type cutters, or milling type cutters. The use of "squeeze" type pipe cutters, cutting torches, diamond points, and dog chisels will not be permitted. This work shall be done by the Contractor in a manner satisfactory to the Engineer and only experienced men shall be engaged thereon. Flame cutting of pipe by means of an oxyacetylene torch shall not be allowed.
- I. Jointing of mechanical joints, fittings, and valves shall be provided in accordance with the printed recommendations of the pipe manufacturer and as specified. The mechanical joint fittings, specials, and valves shall be suitable for jointing with the

pipe with which they are used and the Contractor shall provide, at no additional expense to the Owner, all necessary adapters for the proper jointing of pipe, pipe fittings, specials, and valves. The last 8" outside of the spigot and inside of the bell of mechanical-joint shall be thoroughly cleaned to remove oil, grit, excess coating, and other foreign matter from the joint.

- J. When assembling the joint it is essential that the gland be brought into place and bolts tightened in a manner to insure the maintaining of the same space between the gland and the face of the flange at all points around the socket. The range of bolt torque in making the joints shall be as recommended by the manufacturer of the mechanical joints. Overstressing of bolts will not be permitted; if effective sealing is not obtained at the recommended maximum bolt torque, the joint shall be disassembled, thoroughly cleaned and reassembled.
- K. Hydrants and appurtenances, including thrust blocks, shall be installed as detailed on the contract drawings. Hydrants shall be set straight and true on a firm base. Bury depth shall be as required to maintain 5 feet of cover on the hydrant branch pipe. The above ground portion of each new hydrant shall be covered with a burlap bag until it is accepted and ready for use.
- L. The Contractor shall remove each existing hydrant assembly using methods that will not damage the assembly. The Contractor shall furnish and install tie rods and clamps and concrete thrust blocks as necessary to ensure existing facilities are properly secured prior to removing hydrant assembly. The Contractor shall exercise care in the removal of these facilities. Any existing facilities damaged by the Contractor due to operations shall be replaced with new facilities, meeting these material specifications, by the Contractor with no separate payment for these items. Removed hydrant assemblies shall be brushed, cleaned, transported to the City of Meriden Water Division yard on Parker Avenue in Meriden and stacked there at a location suitable to the Owner. Hydrants may be re-used upon approval of Water Division.
- M. A new hydrant shall be installed as detailed on the contract drawings and as noted in these specifications.
- N. Existing facilities (gate valves and piping) which are deemed unserviceable by the Engineer, shall be removed and properly disposed of and replacement facilities shall be furnished and installed by the Contractor with payment provided per the appropriate bid items for such work. Existing fire hydrants with associated valves when necessary, shall be relocated as shown on the contract drawings or as directed by the Engineer.
- O. A solid sleeve shall be used for connection to the existing branch pipe and new 6" ductile iron pipe shall be installed as necessary so the hydrant may be relocated behind the new curb line. The existing 6" gate valve and ductile iron piping shall

remain unless otherwise directed by the Engineer. The Contractor shall furnish and install tie rods and clamps and concrete thrust blocks as necessary to ensure facilities are properly secured prior to removing hydrant assembly. The Contractor shall exercise care in the removal and resetting of these facilities. Any existing facilities damaged by the Contractor due to operations shall be replaced with new facilities, meeting these material specifications, by the Contractor with no separate payments for these items.

- P. Reset shall consist of use of hydrant extension kit or 45 degree bends to achieve change of grade only.

#### Hydrostatic Testing

- A. Test for leakage shall be conducted on all portions of completed water pipelines and appurtenances and all methods and procedures for performing the testing of water mains shall be subject to the acceptance of the Engineer. Unless otherwise permitted, the testing shall be conducted with partial backfilling over the barrel of any new pipe, between new pipes, pipe fittings, valves and appurtenances of the section. Interiors of all pipe shall be cleaned of all dirt and foreign materials. The water pipelines may be tested in convenient sections acceptable to the Engineer.
- B. Testing of water mains shall conform to the requirements of Section 4 of the AWWA Specification C 600, latest revision, except as herein specified. The test pressure shall be a minimum of 200 psi or 50% above working pressure, which ever is greater, for at least a two-hour duration. Maximum allowable leakage shall be as specified by the Engineer for the appropriate pipe diameter. Test results shall be accurate to within 0.1 of a gallon.
- C. Testing of water mains shall be performed by the Contractor at their expense as witnessed by the Engineer. Notarized records of the test results shall be submitted by the Contractor to the Engineer. In case the specified rate of leakage for the portion of the pipeline being tested is exceeded, the Contractor shall find and repair the leaks and the pipelines shall be retested repeatedly if necessary, by the Contractor, until the required conditions are met, at no additional expense to the Owner.

#### Disinfecting Hydrant Assemblies

- A. All portions of completed water mains and appurtenances are to be disinfected. Disinfection shall be in conformance with AWWA Specification C601, latest revision. In particular, the Contractor shall follow all of the disinfection procedures of Section 9-“Disinfection Procedures When Cutting Into or Repairing Existing Mains” of AWWA Specifications C601, unless otherwise directed by the Engineer.

- B. The Contractor shall be responsible for satisfactory disposal of all flushing water and chlorinated water at no additional expense to the Owner.
- C. After the mains have been flushed clean, samples of the water contained in the mains shall be arranged by the Contractor to be taken by a City-approved testing laboratory for bacterial analysis. Only after the analysis of the samples are approved by the City shall the mains be made part of the water system. In the event that positive reports of contamination are received, the Contractor shall flush and rechlorinate the mains as many times as may be necessary to obtain approved results.
- E. The Contractor shall be required to take samples and have testing performed by an approved testing laboratory for a minimum of the following items:
  - 1. Total Coliform
  - 2. Standard Plate Count
  - 3. Gross Hydrocarbons
  - 4. Volatile Organics
- E. The Contractor shall take the required water samples after completion of flushing and disinfecting of the water mains as directed by the Owner. The Contractor shall be responsible for coordination and delivery of the samples to the approved testing laboratory. The Contractor shall also bear the costs of all water quality testing and analysis expenses by the approved laboratory. The Owner may also require additional testing if deemed necessary, at no additional expense to the Owner.
- F. The Contractor shall submit an affidavit of compliance to the Owner. The affidavit of compliance shall be the bacteriological test results certifying the water sampled from the water main to be free of coliform bacteria contamination.
- G. Disinfection not required for Reset or Relocation items.

**Method of Measurement**

- A. Remove, relocate and reset hydrant assemblies will be measured for payment as a unit per each, complete in place and accepted by the Owner.
- B. Fire hydrants shall be measured as units, complete in place, regardless of bury depth as measured from, but not including the tee in the water main to the end of the excavation.
- C. Thrust blocks, retainer glands, testing, disinfection, and joint restraint shall not be measured for payment.

**Basis of Payment**

- A. Hydrant assemblies removed and relocated or reset shall be measured for payment at the contract unit price bid per each, for “Relocate Hydrant (Complete)” or “Reset Hydrant (Complete), which price and payment shall include ductile iron pipe, joint restraint, thrust blocks, pipe bedding and drain material, testing and disinfection, protection of utilities, and all labor, tools, equipment and incidentals necessary to complete the work as specified, indicated and as directed by the Owner.
  
- B. New fire hydrant installations shall be paid for at the contract unit price each for “Fire Hydrant” (Water Main) which price shall include the hydrant, ductile iron pipe, valve and valve box, joint restraint, thrust blocks, pipe bedding and drain material, testing and disinfection, protection of utilities, and all labor, tools, equipment and incidentals necessary to complete the work as specified, indicated and as directed by the Owner.

<u>Pay Item</u>	<u>Pay Unit</u>
Hydrant (Water Main)	Each
Relocate Hydrant (Water Main)	Each
Reset Hydrant (Water Main)	Each