# REQUEST FOR PROPOSALS

**FOR THE**

**CITY OF ALPENA**

**Plumbing Contracted Services**

March 2024

Prepared By:

City of Alpena
Engineering Department
208 N. First Avenue
Alpena, MI 49707
(989) 354-1730

**Request for Proposals**

The City of Alpena will receive Proposals for as needed plumbing and HVAC services in various locations throughout the City.

The City of Alpena will receive sealed proposals in the office of the City Clerk, Alpena City Hall, 208 N. First Avenue, Alpena, Michigan, 49707 until 2:00 p.m. Tuesday, March 26, 2024. The City reserves the right to reject any proposals and to waive irregularities in proposals, which may be in the best interest of the City.

Beginning on Thursday, March 7, 2024, requests for proposals may be obtained on the City of Alpena website at www.alpena.mi.us.

City of Alpena

Anna Soik

By: Anna Soik
City Clerk

## Project Outline

The City of Alpena is seeking proposals for as needed HVAC and Plumbing services. Work will include, but not be limited to the following:

- Interior reconnection of water services as part of the State of Michigan Lead and Copper requirements.
- Emergency Repairs to plumbing and mechanical services within various City Buildings
- Replacement of water and sewer services on an as needed basis.

## Proposed Work

The contractor shall perform work as directed by the engineer in accordance with the following specifications:

- All Federal State and Local requirements.
- Contractor shall be responsible for the acquiring any required permits.

When installing a water or sanitary service independent of a preapproved excavating contractor, the following will also apply:

Attached:

- Special Provision for Water Main Installation
- Special Provision for Sanitary Sewer System
- City of Alpena Standard Water Service Detail
- City of Alpena Standard Sewer Service Detail

Located on the MDOT Website

- Current MDOT Standard Provisions
- Current MDOT Specifications for Construction

It should be noted that a plumbing permit will not be required for the lead and copper project as the state has deemed that the City has control of the line up the meter or 18 inches inside of the structure and any inspection of this installation shall fall under the same premise as an infrastructure inspection.

## Coordination of Work Preformed

When necessary, primarily during the replacement of water services in accordance with the state and federal lead and copper rules, the contractor shall be responsible for coordinating and arranging for an excavation contractor from the preapproved list to compete the reconnection of the water services to the City meter inside the structures.

## Basis of Payment for Work Preformed

The contractor shall submit an itemized billing for any work performed at an hourly rate of pay. Typically, the city will provide most materials, however, in the event that the contractor must provide any materials, the City will be provided with a price breakdown to be included with the billing.

## Basis of Project Award

After reviewing the proposals, it is the intent of the City to award multiple contracts to multiple contractors. Emergency Work shall be assigned to a contractor based on first available in regard to the work to be performed. Additionally, considerations will be given to contractors who have a working understanding of the building in need of service. Contractors may reach out to the City as their schedule allows for work pertaining to the lead and copper water service replacements.

## Informational Meeting

The City will be holding an informational meeting about the project on Monday, March 18, 2024 at 9:00 a.m. at Alpena City Hall in the Council Chambers. This meeting will also be available online for those wishing to attend virtually.

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## CONTENTS OF PROPOSAL

### Submittals

Each firm shall submit the following information as part of a brief narrative with regard to their ability to undertake and complete the project. Please note that failure to attend the mandatory onsite pre-proposal meeting will make your bid ineligible.

1. A brief company overview, summary, and history should include, but not limited to, contact information, office location(s), and longevity.

2. Each proposal shall include a point of contact, who shall be responsible for ensuring the timely completion of the project to the satisfaction of the City.

3. Each proposal shall include the name and license of the primary HVAC/Plumber who will be acquiring the applicable permits when needed.

4. Each firm shall submit an hourly rate sheet for all equipment and personnel required to complete the specified work. Additionally, each contractor shall submit an estimated price for what they would consider an average water mater reconnection cost. If the contractor is also would like to be considered for services replacement, please provide and estimated cost for these items as well. This price shall not include any restoration of hard surfaces (sidewalk, asphalt, curb, driveways, etc.) but should include a price for lawn restoration as a separate price. Contractors shall also provide their overhead and profit percentages for any materials or subcontracted work performed.

5. Firms are encouraged to provide any additional information which may be beneficial in determining the ability of the firm to complete the project.

**INSURANCE REQUIREMENTS**

While working within the City Limits, on City projects, and on City Owned Property, the consultant shall conform to the following requirements.

All Bidders shall maintain, at own expense, during the term of this Contract the insurance coverage(s) where indicated by an [X]:

1. [X] **Workers Compensation Insurance**

   A. Consultant shall maintain statutory workers compensation and employer's liability insurance. Limits of Liability shall be not less than $500,000 for bodily injury by accident or $500,000 each employee for bodily injury by disease.

   B. Waiver of Subrogation – Consultant waives all rights against the City of Alpena, its agents, public officials, employees, underwriters and volunteers for recovery of damages to the extent these damages are covered by workers compensation and employer's liability insurance obtained by the Bidder.

   C. If consultant is self-insured for purposes of workers compensation, the Consultant must submit a copy of a current letter, permit, or certification issued by the appropriate state agency.

2. [X] **Commercial General Liability and Umbrella/Excess Liability Insurance**

   A. Bidder shall maintain commercial general liability (CGL), and, if necessary, commercial umbrella/excess insurance with a limit of not less than $1,000,000 each occurrence/$2,000,000 aggregate. If the CGL insurance contains a general aggregate limit, such limit shall apply separately to this project. Projects of a larger scope that could or would impact the greater population may require a CGL of $2,000,000 per occurrence and $4,000,000 aggregate. The required amount of coverage will be included in the bid specifications.

   B. CGL insurance shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, and liability assumed under an insured contract, including this contract.

   C. City of Alpena shall be included as an additional insured under the CGL and under the commercial umbrella/excess, if any. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance program afforded to the City of Alpena. *A copy of the certificate shall be provided to the City prior to the execution of the contract.* On the Additional Remarks Schedule of the certificate it shall state: "The City of Alpena is an Additional Insured on the noted policies with respect to any contract between the Named Insured and the Certificate Holder." A sample Certificate of Liability Insurance form is attached to the end of this policy.

D. Waiver of subrogation - Bidder waives all rights against the City of Alpena and its agents, public officials, employees, and volunteers to the extent these damages are covered by the CGL or commercial umbrella liability maintained pursuant to this agreement.

3. [X] **Business Auto and Umbrella/Excess Liability Insurance**

A. Bidder shall maintain business auto liability and, if necessary, commercial umbrella/excess liability insurance with a limit of not less than $1,000,000 each accident. Such insurance shall cover liability arising out of any auto, including owned, non-owned, and hired.

B. Waiver of subrogation - Bidder waives all rights against the City of Alpena and its agents, public officials, employees, and volunteers for recovery of damages to the extent these damages are covered by the business auto liability or commercial umbrella insurance obtained pursuant to this agreement.

4. [ ] **Professional Liability Insurance (*for Professional Services*)**

A. Professional shall maintain professional (Errors & Omissions) coverage with a limit of not less than $1,000,000 per loss.

B. Such insurance shall cover damages arising out of a Wrongful Act including any error, omission, or negligent act committed in the performance of professional services for the City of Alpena.

C. If coverage requested in 5 is written on a claims-made basis, the Professional warrants that any retroactive date applicable to coverage under the policy precedes the effective date of this contract; and that continuous coverage will be maintained or an extended discovery period (EDP) will be exercised for a period of 3 years beginning from the time that work under this Contract is completed. Contractor shall bear the expense of purchasing the EDP, if applicable.

A copy of the certificate shall be provided to the City prior to the execution of the contract. On the Additional Remarks Schedule of the certificate it shall state: “The City of Alpena is an Additional Insured on the noted policies with respect to any contract between the Named Insured and the Certificate Holder.”

**All the above insurance policies shall contain the following wording:**

“It is agreed that this insurance shall not be cancelled, materially changed, or non-renewed without at least a sixty (60) day written notice to the City of Alpena at their principal mailing address.”

**Insurance Company Approval and Certificates of Insurance**

Insurance Companies, additional insured endorsements, and policy forms shall be subject to the approval of the City of Alpena. Such approval shall not be unreasonably withheld. Contractor shall furnish the City Manager of the City of Alpena with certificates of insurance or a certified copy of the policy, if requested by the City Manager.

**Hold Harmless Clause**

The Contractor shall defend, pay on behalf of, and hold harmless the City of Alpena, its employees, agents, public officials, and volunteers from and against any and all losses, damages, expenses, claims, suits, and demand of whatever nature resulting from damages or injuries, including death, to any persons or property, and including any claim for losses incurred by reason of project delay, impact (soft) costs, or other intangible losses that might result from Contractor's late or defective performance, caused by or arising out of any action, omission or operation performed in connection with work attributable to the Contractor, any Sub-contractor, any Sub-subcontractor, any material men, any of their respective employees, agents, servants, or representatives; provided, however, the Contractor shall not be required to indemnify the City of Alpena, its employees, agents, public officials, and volunteers for any damages or injuries, including death, to any person or property caused solely and exclusively by the negligence of the City of Alpena, its employees, public officials, and volunteers.

**City Attorney Document Review**

William Pfeifer, City Attorney Date
(approved as to form only)

City of Alpena
Special Provision
for
**Water Main Installation**



## I. GENERAL

### A. Scope of Work

These specifications are intended to technically describe the nature of the materials, and the workmanship required to complete the project. It is the intent of these specifications to provide guidelines for the construction of public water mains complete and ready in every respect for use by the Owner. Any minor items not specifically called for in the plans and specifications, but which are clearly necessary, are to be included at no increase in the contract price. The Contractor shall supply all labor, material and equipment required for the installation and testing of water mains and appurtenances in full compliance with these Standard County Specifications and Standard Details and in compliance with the project specifications and contract drawings. In all instances project specifications, contract drawings or details shall supersede the requirements found in these specifications. All construction shall begin at a valved stub or at a pressure tapping sleeve and valve when a valved stub has not been provided. All pressure taps to existing water mains shall be made only under the supervision of the City of Alpena (354-1730) or SUEZ (354-1400). The Contractor shall have SUEZ personnel (354-1400) operate all water valves on this project.

### B. Shop Drawings

The Contractor shall be required to supply the Engineer and Owner with detailed shop drawings or certificates of compliance prior to delivery of material for a construction project. Where the item to be supplied is in conformance with these general water main specifications, certificates of compliance will be accepted by the Owner. Should shop drawings be required, the manufacturer shall supply five copies of the drawings to the Owner and Engineer, and shall not ship the material until shop drawing approval has been received from the Owner and Engineer. The Contractor shall submit all shop drawings and/or certificates to the Engineer.

The following material will require approval by the Owner prior to use on the project:

1. Pipe, fittings and joints.
2. Joint material.

3. Valves, hydrants and valve boxes.
4. Valve manholes including frames, covers, and steps.
5. Meters, couplings and appurtenances.
6. Reinforcing steel layout for all structures.

## I. CONSTRUCTION MATERIALS

### A. General

All materials or equipment supplied by the Contractor shall be new and shall be of first class ingredients and construction, designed, manufactured, and guaranteed to meet these specifications and to perform the service required. All pipe shall be clearly marked with the size, grade and/or class.

If not otherwise provided, materials or work called for shall be furnished and performed in accordance with well known and established practices and standards recognized by architects, engineers and the trades.

All materials to be incorporated in the construction of water mains shall be subject to inspection and tests as specified by ASTM, ANSI or AWWA regulations. The Owner reserves the right to subject any material supplied for a particular project to tests by an independent testing laboratory. Such tests, if scheduled, shall be paid for by Owner. The result of such test shall govern in material acceptance.

The Contractor will be required to supply the Owner with a certificate of testing or actual test results stating that the material to be used is in conformance with the specifications prior to using said material for construction.

### B. Ductile Iron Pipe

All water main piping shall be ductile iron conforming to ANSI/AWWA-C151/A21.51 with cement mortar lining in accordance with ANSI/AWWA-C104/A21.4. Water mains shall be Class 52 ductile iron pipe. Pipe joints shall be push-on type consisting of a single molded rubber gasket and shall conform to ANSI/AWWA-C111/A21.11. Mechanical joints conforming to ANSI/AWWA-C111/A21.11 are also acceptable for use. If harmful contamination is suspected, nitrile, or equal gaskets conforming to ANSI/AWWA-C111/A21.11 shall be used.

All ductile iron pipe shall be furnished with external type conductivity straps capable of withstanding 400 amps over an extended period of time. Pipe shall be strapped across all joints, fittings and valves. Use of heavy gauge wire across valves and fittings is also acceptable. Any cad-weld or grinding spots shall be coated with coal tar varnish. This shall be the only acceptable method of ensuring conductivity, bronze wedges, or any other method shall *NOT* be accepted.

C. Ductile Iron River Crossing Pipe

All river-crossing pipe shall be ductile iron conforming to ASNI A21.51 with cement mortar lining in accordance with ANSI/AWWA-C104/A21.4. Pipe joints shall be boltless ball and socket flexible type which will permit a deflection of fifteen (15) degrees without leakage. The bell, ball and retainer ring shall be cast of 70-50-05 ductile iron in accordance with the applicable requirements of ANSI A21.10. Pipe class, wall thickness, pressure rating and maximum safe tension strength shall conform to the following table:

| Nominal Pipe Size (Inches) | Thickness Class Number | Minimum Wall Thickness (Inches) | Minimum Pressure Rating (PSI) | Safe Tension (lbs)** |
|---|---|---|---|---|
| 6 | 55 | .40 | 350 | 50,000 |
| 8 | 55 | .42 | 350 | 70,000 |
| 10 | 55 | .44 | 350 | 95,000 |
| 12 | 55 | .46 | 350 | 120,000 |
| 14 | 56 | .51 | 350 | 145,000 |
| 16 | 56 | .52 | 350 | 165,000 |
| 18 | 56 | .53 | 350 | 195,000 |
| 18 | 58* | .59 | 350 | 195,000 |
| 20 | 56 | .54 | 350 | 210,000 |
| 20 | 59* | .63 | 350 | 210,999 |
| 24 | 56 | .56 | 350 | 260,000 |
| 24 | 62* | .74 | 350 | 260,000 |

* Thickness required to overcome buoyancy (empty pipe condition).
** Maximum tension that can safely be applied to a single joint when pulling pipe into position or laying it from a barge.

D. Fittings

All bends, tees, wyes and other special fittings used on the water main shall be cast iron Class 250 conforming to ANSI/AWWA-C110/A21.10 or ductile iron class 350 conforming to AWWA-C153/A21.53-94 with cement mortar lining in accordance with ANSI/AWWA-C104/A21.4. Fitting joints shall be push-on type or to ANSI/AWWA-C111/A21.11, and shall include the required conductivity devices.

E. Gate Valves

Epoxy coated (conforming to AWWA C-550), iron body resilient wedge gate valves shall be utilized. Resilient wedge gate valves shall conform to AWWA C-515 with 150 pound working pressure. Valve stems shall be high tensile strength non-rising type with double O-Ring stem seals. The valve wedge shall be ductile iron encased in a bonded-in-place styrene butadiene (SBR) elastomer covering which shall form the sealing surface and shall provide sealing in either direction. Resilient wedge gate valves shall be equal in all respects to Waterous Series 500 or American Darling Model CRS-80 resilient wedge gate valves.

All gate valves 16 inches or smaller shall be installed in the vertical position and shall open to the left (counter clockwise). Gate valves larger than 16 inches may be installed in either the vertical or horizontal position and shall be spur gear operated when installed vertically and bevel gear operated when installed horizontally. Gate valves 18 inches and larger shall be equipped with a by-pass and by-pass valve. The by-pass valve shall be of the same type as the main valve and the stem shall be in the vertical position. By-pass sizes shall be as follows:

| Main Valve Size | By-Pass Size |
|---|---|
| 18” – 30” | 4” |
| 36”- 42” | 6” |
| 48 and larger | 8” |

All gate valves shall be tested for leakage at the factory and the cost of such testing shall be merged in the cost of the valves. Any valves which leak or which show any defects shall be rejected. Certificates shall be furnished by

the valve leakage tests. Said certificates shall be submitted along with shop drawings. Every valve shall carry the name of the manufacturer.

Valve boxes shall be supplied for all buried gate type valves.

F. Fire Hydrants

This item shall include the fire hydrant, an auxiliary valve, a valve box, and connector pieces. These items shall be installed in accordance with the standard construction practices and the standard fire hydrant detail.

All fire hydrants shall be manufactured in accordance with standard AWWA C502 specifications in accordance with the latest revised edition. The hydrant shall be equipped with a minimum 5-1/4" compression type valve that assures a tight closure and prevents water from slowly seeping in the hydrant barrel. The hydrant valve can open either with the water pressure or against the water pressure. All hydrants shall be designed for 150 pounds working pressure and shall be tested to 300 pounds hydrostatically at the place of manufacture. All hydrants shall have a breakaway hydrant barrel flange at the ground line and a safety stem coupling designed to breakaway should the hydrant be subjected to a severe impact. Each hydrant shall be equipped with two 2-1/2" hose nozzles and one 4" pumper nozzle with threads conforming to the National Standard Design. Nozzle caps shall be secured to the hydrant with chains. The inlet to the hydrant shoe shall be 6".

Hydrants shall open to the left or "Counter Clockwise" with a standard 1 ½" pentagon operating nut. The hydrant valve operator mechanism shall be designed so that the operator will have a second operating means should the 1½" pentagon operating nut become inoperative. The upper operating assembly shall be weatherproof and shall have either an oil reservoir or a permanent lubrication system. Hydrants shall be delivered with the drainholes plugged by the supplier, Contractor shall verify that the drainholes are plugged prior to installation. Hydrants shall be factory painted a red in accordance with AWWA C502.

The fire hydrants shall have a minimum bury of 6'. Where field conditions dictate the use of barrel extensions to bring the tope of the hydrant to final grade plus 32 inches, the Contractor shall supply and install such extensions or order fire hydrants with a longer bury than 6'. There will be no extra compensation due to the Contractor for achieving the required final elevation

of the hydrant. The hydrant shall be placed with the pump nozzle facing the roadway unless otherwise directed by the Owner. The center line of the pumper nozzle shall be approximately 21 inches above finished grade.

Wherever possible, fire hydrants shall be anchored to water mains using restrained joints or flanged connections. Concrete thrust blocks shall be installed behind all hydrants.

The auxiliary valve shall be a 6" internal diameter resilient wedge gate valve constructed in accordance with AWWA C509 specifications. Auxiliary valves shall be mechanical joints. A cast iron curb box of 3 sectional design shall be constructed over the auxiliary valve. Curb boxes shall be buffalo pattern with a 5- ¼" shaft diameter of sufficient length to put the box at finished grade elevation. The curb box cover shall be marked "WATER".

Hydrants shall be East Jordan Water Master 5BR250, or approved equal.

G. Valve Boxes

Valve boxes shall be made of good quality cast iron and shall be of the sectional type. The lower section shall be a minimum of five (5) inches in diameter, enlarged at the base to fit around the bonnet of the valve. The upper section shall be arranged to slide or screw down over the adjoining lower section and shall be full diameter throughout. Valve boxes shall be provided with cast-iron lids or covers. Lids or covers shall be marked "WATER". The over-all length of valve boxes shall be sufficient to permit the top to be set flush with the final ground surface grade. Valve boxes shall be as manufactured by Traverse City Iron Works, Clow Corporation, or equal.

H. Services Pipes and Appurtenances

All service connections shall be in accordance with AWWA C800 for Underground Service Lines and Fittings

1. Copper Pipe

All water service connections shall be type K soft temper copper tubing conforming to ASTM B-88 and B-251. The pipe shall be marked with the manufacturer's name or trademark and an indication of the type of pipe. The outside diameter of the pipe and minimum

weight per foot shall not be less than that listed in ASTM B-251, Table 11. The copper pipe installed from the water main to the service box shall have a minimum size of 1".

2. Stops and Fittings

All corporation stops and curb stops shall be fabricated of brass or bronze alloy.

Corporation stops shall be for ductile iron water main with taper thread inlet and flared copper outlet connection. Corporations shall be Mueller Model H-15000, Ford Meter Box Co. Model F-600, or approved equal.

Curb stops shall be inverted key, ball valve or roundway type with copper to copper flared or compression connections. Curb stops shall be Mueller Model H-15204, Ford Model B-22, or equal.

3. Service Boxes

Curb stop service boxes shall be standard cast iron adjustable arch type capable of extension from a minimum length of 4'-6" to a maximum length of 6'-6". Curb boxes shall have a minimum internal diameter of 2-1/2 inches for stops 1-1/4 inches and smaller, and shall be 3 inches in diameter for stops larger than 1-1/4 inches.

All curb boxes shall be furnished with cast iron covers labeled "WATER" and all curb boxes shall be coated with a corrosion resistant material.

I. Steel Casing Pipe

Steel casing pipe shall meet the requirements of ASTM designation A-139, Grade B material, and shall be of sufficient strength to meet the loading conditions of H-20 loading for pavements and Cooper E-72 loading for railroad crossings.

Successive lengths of casing pipe shall be connected by continuous circumferential welds. Casing diameter and wall thickness shall be as specified in the following table.

| Pipe Thickness | Recommended Minimum Casing Diameter (I.D.) | Minimum Wall |
|---|---|---|
| 4” | 10” | .375 |
| 6” | 12” | .375 |
| 8” | 15” | .375 |
| 10” | 20” | .375 |
| 12” | 20” | .375 |
| 14” | 24” | .375 |
| 16” | 30” | .406 |
| 18” | 30” | .406 |
| 24” | 36” | .469 |

## II. MATERIAL TESTING

### A. General

Testing of materials to be incorporated in water main construction shall be conducted by a testing laboratory at the place of manufacture. All materials to be incorporated in water main construction shall be subject to the most current versions of Standard ASTM, USAS or AWWA Specifications as here in before referenced.

The Contractor will be required to furnish the Owner with certificates from suppliers or manufacturers certifying that materials supplied are in accordance with these specifications.

## III. CONSTRUCTION METHODS

Construction, flushing, and pressure testing shall be in accordance with the most current version of *AWWA Standard C600 for installation of Ductile-Iron Water Mains and Their Appurtenances.* All construction practices and related activities shall meet OSHA requirements.

### A. General

Where water mains are to be installed across streams or rivers the Contractor shall abide by all the requirements of State Act 347 (Soil Erosion and Sediment Control), State Act 346 (Inland Lakes and Streams), and compliance with these requirements shall be included in applicable pay items.

If at any time during excavation, the contractor encounters what he believes to be volatile organic compounds, work shall be halted immediately. The City shall be notified and the City's Environmental Contractor shall provide direction and procedures. All work shall also be in accordance with EGLE standards. Any additional work in relation to the VOC shall be at no additional cost unless otherwise specified in the contract documents or agreed upon with the City prior to dealing with the VOC.

### B. Excavation

#### 1. General

The Contractor shall perform all excavation of every description and of whatever substance encountered to the depths indicated or as otherwise specified. The excavation shall provide a minimum of six (6) feet of cover over the top of the water main as measured from finish grade. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. Excavated materials stored along the trench shall be placed in a manner that will not cause damage to trees, shrubs, fences or other property. All excavated materials not required or not suitable for backfill shall be removed and wasted as indicated on the plans or as directed by the Engineer. All excavation, except for crossing of hard surfaced streets shall be by open cut, except where otherwise

indicated on the plans or directed by the Owner in written change order. Crossing paved streets shall be accomplished by boring and jacking or by other means approved by the Owner.

2. Protection of Excavation

Grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations, and any water accumulating therein shall be removed by pumping or by other approved methods. Sheeting and shoring shall be installed as may be necessary for the protection of the work and for the safety of personnel.

3. Trench Excavation

Trenches shall be in accordance with MDOT Standard Plan R-83-C and the Trench Detail as called out on the plan sheets.

Whenever unstable soil is encountered in the trench bottom which the Engineer and Owner considers is incapable of properly supporting the pipe, such material shall be removed to the depth required and for such length as the Engineer and Owner may designate, and the trench backfilled to trench bottom grade with crushed stone or other material approved by the Owner. Required “over-depth” construction will be paid for as an extra to the contract price, but must be negotiated prior to construction and authorized in writing by the Engineer and Owner.

The excavation of the trench shall not advance more than 200 feet ahead of the pipe work, except where in the opinion of the Engineer and Owner it is necessary to drain wet ground.

The location of water mains has been selected to provide the least amount of interference with existing utilities. The Owner reserves the right to make minor variations in the alignment and grade of these mains during construction to meet any changed conditions which may be encountered, and no extra payment will be allowed the Contractor for such minor shifts in alignment and grade.

At the locations where detailed positions of underground facilities become necessary to the new construction, the Contractor shall furnish all labor and tools to either verify and substantiate the record drawing location or definitely establish the position of the facilities. The utility companies will aid in establishing the position of underground utilities at no expense to the Contractor.

Construction of service connections can be by open trench or use of hydraulically bored tunnels or other methods approved by the Owner. Service connections shall not be placed in the same trench as sewer services unless the trench is widened to provide the horizontal separation requirement required by the plumbing code.

C. Boring and Jacking

Boring and Jacking as required by the plans or by the Engineer shall be completed in full compliance with the City of Alpena specifications which, if required, are included in a separate Special Provision attached.

D. Pipe Laying

The full length of each section of underground pipe shall rest solidly upon a 4” sand cushion with recesses only to accommodate pipe bells and joints. Any pipe which has its alignment, grade or joints, disturbed after laying shall be taken up and relayed.

The interior of all pipe shall be thoroughly cleaned of all foreign matter before being installed, and shall be kept clean during laying operations. The pipe shall not be laid in water, or when trench or weather conditions are unsuitable for work. When the work is not in progress, open ends of pipe shall be securely closed so that no water, earth, rodents or other foreign substances can enter the line. Any section of pipe found to be defective, either before or after laying, shall be replaced with new pipe at no additional expense to the Owner.

When water mains in the distribution system are shown routed along streets or highways, the alignment of the water mains shall be parallel to the centerline of the road and at a distance therefrom as indicated on the

construction drawings. Where water mains are shown crossing private property, the alignment of the mains shall be located as indicated on the construction drawings, and the work shall be done within the construction easements provided by the Owner.

Ductile iron pipe shall be examined for defects while suspended in a sling prior to being lowered into place. All damaged, defective or unsound material will be rejected and shall be removed immediately from the site or destroyed. All lumps, blisters and excess coal tar coating shall be removed from the inside of the bell and outside of the spigot and these areas wire brushed and wiped clean using a dry oil-free rag. The pipe shall be cleaned of all foreign material prior to laying and no debris, tools, clothing or other materials shall be allowed in the pipe during the laying operation.
Pipe shall be laid in a dry trench with bell ends facing in the direction of laying, and shall have a minimum of five feet of cover. After placing a length of pipe in the trench, and after installing the gasket and applying the gasket lubricant, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade.

The pipe shall be secured in place with Class II material tamped under it. Pipe which does not allow a sufficient and uniform space for joints shall be removed and replaced with pipe of proper dimensions to insure such uniform space. Precautions shall be taken to prevent dirt from entering the joint space.

Whenever it is necessary to deflect pipe from a straight line either in the vertical or horizontal plane to avoid obstructions, or where long radius curves are permitted, the amount of deflection allowed shall not exceed the values shown below:

| Nominal Joint Maximum Length (Inches) | Slip-On Joint Pipe Maximum Deflection 18 Foot Length (Inches per Length) | Mechanical Deflection 18 Foot (Inches per Length) |
|---|---|---|
| 6 | 19 | 27 |
| 8 | 19 | 20 |
| 10 | 19 | 20 |
| 12 | 19 | 20 |
| 14 | 11 | 13-1/2 |
| 16 | 11 | 13-1/2 |
| 18 | 11 | 11 |
| 20 | 11 | 11 |
| 24 | 11 | 9 |
| 30 | 7-1/2 | 9 |
| 36 | 7-1/2 | 9 |

E. Handling

Ductile iron pipe shall be handled in such a manner as to insure delivery on the site and final installation in a sound, undamaged condition. Care shall be taken not to split or damage the ends of pipe, or cause injury to pipe coatings or linings. The pipe shall be loaded and unloaded using hoists in a manner so as to avoid shock or damage and shall not be dropped, skidded, or rolled against other pipe. If any part of the coating or lining is damaged, the repair thereof shall be made by the Contractor at his expense, in a manner satisfactory to the Owner.

F. Cutting Pipe

Any cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe or lining and so as to leave a smooth end at right angle to the axis of the pipe. Cutting shall be done by means of an approved type mechanical cutter or saw except that for pipe 20 inches or more in diameter, electric arc cutting using carbon or steel rod may be used. Only qualified welders shall be allowed to do this work. Flame cutting using an oxyacetylene torch shall not be allowed.

G. Jointing

1. Mechanical and Push-On Joints

Mechanical and “push-on” joints shall be installed in strict accordance with the recommendations of the joint manufacturer. Copies of such recommendations and instructions shall be furnished to the Engineer and Owner prior to starting the laying of this type of pipe and additional copies shall be available on the project at all times during construction.

H. Water Main Separation

Wherever pipe lines designated to carry potable water supplies cross or are laid less than ten (10) feet horizontally from existing or proposed drain or sewer lines, special precautions shall be taken as follows:

1. Horizontal Separation

Should conditions prevail which prevents a lateral separation of 10 feet, the water main may be laid closer than 10 feet to a storm drain or sanitary sewer only with prior written approval of EGLE. The main shall then be laid in accordance with the EGLE instructions.

2. Vertical Separation

Whenever the water main crosses house sewers, storm drains, or sanitary sewers, the pipe line shall be laid at such an elevation that the bottom of the line is at least 18 inches above the top of the drain or sewer while maintaining the required minimum 6’ of earth cover.

This minimum vertical separation shall be maintained for a distance of 8' each way of the sewer or drain being crossed. In making such crossings a full length of water main shall be centered over the sewer to be crossed so that the water main joints will be equidistant from the centerline of the sewer. Where a water main must cross under a sewer, the vertical separation of 18 inches between the bottom of the sewer and the top of the water main shall be maintained. The sewer shall be supported to prevent its settling as directed by the Engineer. The water main may be laid closer than 18 inches to a storm, sanitary or service crossing only with prior written approval of EGLE. The main shall then be laid in accordance with the EGLE instructions.

I. Incidental Items of Work

1. Connections to Existing Systems

All connections to existing water mains shall be done using pressure tapping sleeves and valves. At no time shall an existing water main be shut down to facilitate the connection of a new water main, except as approved by the Engineer.

2. Concrete Encasement

Concrete encasement for ductile iron water pipe shall be provided at locations shown on the plans or where directed by the Engineer. It shall be placed in conformance with details shown in the plans. Concrete shall have a minimum 28 day compressive strength of 3000 psi.

3. Anchorage

Mechanically restrained joints shall be used at all fittings, including, but not limited to, bends, crosses, stubs, tees, and plugs. Concrete thrust blocks may be used in accordance with the plans with prior approval and as directed by the Engineer.

Unless otherwise approved by the Owner, the Contractor shall install all fire hydrants using restrained joints. Said restraints shall tie the hydrant to the main line.

J. Service Connections

Where service connections are shown on the contract drawings or listed in the contract proposal, they shall be installed according to the following standards.

Existing or proposed service lead locations shown on Drawings are schematic only to present approximate locations, length and total number.

Contractor shall contact SUEZ to assist in locating existing service leads. SUEZ shall attempt to locate the leads by means of records and on-site investigation. Services for which and exact location cannot be determined shall be located by the contractor through contact with the home owner or by water investigation.

Unless otherwise directed by the Engineer in field, service leads shall be installed at center of vacant lots.

Each water service pipe shall be connected to the water main through a brass corporation stop. If pressure is available, the water main shall be tapped and the corporation's stops inserted under pressure. The tapping of mains shall be done in accordance with good practice. The main shall be drilled and tapped by use of a tapping machine with a combination drill and tap of the appropriate size for the connection being installed. All materials shall be disinfected prior to installation.

After tapping the main and installing the corporation stop, the tap shall be tested by turning the corporation stop on and off. A slack line consisting of 18 inches shall be left in the service connection at the water main. The service pipe shall be laid in the trench sufficiently weaving to allow not less than one (1) foot extra length in its entire length. After installing the curb stop, the connection shall be tested by turning the corporation stop on and turning the curb stop on and off. All joints shall be examined to be sure there is not leakage.

All joints of copper pipe to fittings shall be compression or flared joints. The connection shall be left with the corporation stop in the open position and the curb stop in the closed position.

Where service connections are made to a water main that is pressurized, the Contractor shall be responsible for repairing any house leads that leak and shall also be responsible for making sure that the corporation stop is open and the curb stop is closed. Any additional expense involved because of this condition shall be borne by the Contractor.

K. Valve Boxes and Manholes

1. General

This item shall include the installation of valve boxes or precast concrete manholes for valves as required on the drawings.

2. Valve Boxes

Valve boxes shall conform to the appropriate material specifications in Part B entitled “CONSTRUCTION MATERIALS”. Valve boxes shall be installed in a true and vertical position over the bonnet of the valve. The top of the valve box shall be flush with finished pavement or lawn grade, or 6” below finish road grade in gravel roads. Following final backfill and/or final grading, the Contractor shall verify that the valve can be opened and that the box is free of dirt or other debris. Valve boxes are required for all valves.

3. Valve Manholes

Contractor shall utilize valve boxes in all valve installations. In cases where a valve manhole is required, the contractor must request , in writing, and establish justification as such and the Engineer shall notify, in writing, of the authorization to use, if such is granted.

Manhole frames and covers shall be of the size shown on the plans and shall conform to the appropriate “Material Specifications”. The manhole frame shall be completely wrapped in a concrete wrap extending from the top of the cone to the top of the frame.

Manhole frames shall be set in a full bed of mortar. The Top of MH frames and covers shall be installed flush with finished pavement grade or finished lawn grade in unpaved areas, or 6” below road grade in gravel roads.

Openings for pipe inlets or outlets shall be provided in such precast units at the locations required, and shall be true to form and approximately one (1) inch larger in diameter than the outside of the pipe to provide for a mortar seal. The openings around all pipe shall be completely sealed using non-shrink cement mortar grout.

Manholes shall be provided for all valves 10 inches and larger and for 8 inch valves in paved area. All manholes shall be constructed as shown on the standard detail sheet.

L. Bedding and Backfilling

1. General

Bedding and backfill shall be in accordance with MDOT Standard Plan Trench Detail G (R-83 Series).

## IV. TESTING OF WATER MAINS

A. Hydrostatic Test

1. General

Within a reasonable length of time following pipe laying, the Contractor shall complete all work necessary to perform hydrostatic testing. Where feasible, the water main shall be tested in Sections 2500 to 3000 feet in length. The Contractor shall provide at his expense all labor, supervision, pumps, measuring devices, power, and potable water necessary for conducting the hydrostatic tests. The Contractor shall be responsible for conducting preliminary hydrostatic tests on his water mains to insure that they will sustain the required test pressures. All leaks and defects discovered during preliminary testing shall be repaired and the water mains retested. Immediately after the water mains have passed such preliminary tests, the Contractor shall contact and notify the Owner of the day, date, and time of the final hydrostatic test which shall be performed in the presence of the Owner.

2. Preparation

After the pipe has been laid and backfilled as specified, the Contractor shall fill the line, or a valved section thereof, with potable water in such a manner as to expel all air from the pipe. This may be done through fire hydrants or through corporation stops installed by the Contractor as necessary to accomplish the expulsion of all air. At the close of the test, all taps shall be satisfactorily plugged with brass plugs.

If a meter is not available to measure the volume of water, the Contractor shall pay for a minimum of five times the volume of the pipe installed or as otherwise determined by the Owner.

Use of potable water for leakage testing, disinfection, or testing shall be transmitted through a City of Alpena approved backflow prevention device per the City's cross connection control program. The Engineer shall authorize equipment prior to usage.

3. Test

All pipe laid under this contract shall be subjected to a hydrostatic pressure of 150 psi at the elevation of the highest point in the water main tested. The duration of the test shall be at least two hours, or such additional time as may be necessary to establish that the condition of the piping installation is satisfactory. Any cracked or defective pipe, fittings, valves or hydrants shall be removed and replaced with sound material at the Contractor's expense and the test repeated to the satisfaction of the Engineer and Owner.

4. Leakage

Leakage is defined as the quantity of potable water that must be supplied into a newly laid pipe, or valved section thereof, in order to maintain the specified test pressure. No pipe line installed will be accepted until the total leakage measured over the two hour period is less than required by the AWWA C600 Standard. All visible leaks must be corrected.

Should any test of pipe installed disclose leakage greater than that specified above, the Contractor shall, at his own expense, locate and

repair the points that show evidence of leakage and repeat the test until the leakage is within the specified allowance.

B. Chlorination

After satisfactory hydrostatic tests are obtained, the new water main shall be chlorinated. The disinfection shall be in accordance with the most current version of *AWWA Standards C651 and C655.* Bacteriological samples must be collected from "every 1,200 feet of new water main, plus one set from the end and at least one set from each branch." Also, *Final Flushing* from the same standard shall be followed to ensure the heavily chlorinated water does not harm the environment during flushing.

Granular chlorine or chlorine tablets shall be applied at points in accordance with AWWA Standard C651.

A slow flow of potable water shall be introduced into the main near the point of chlorine injection at a rate such that the resulting chlorine/potable water mixture will be at least 50 parts per million. An open discharge shall be maintained at the far end of the main and the introduction of chlorine solution and potable water shall continue at a constant rate until the potable water discharging at the far end shall be 50 parts per million.

As the main is filled with chlorinated potable water, each available outlet shall be tested to see that the 50 parts per million is obtained at each outlet. The chlorine treated potable water shall remain at least 24 hours and at the end of that time the chlorine residual at test points shall be at least 10 ppm. If the chlorine residual shall be less than 10 ppm at the end of 24 hours, further application shall be made and the retention period repeated until the required 10 ppm residual is obtained.

Following chlorination, all heavily chlorinated potable water shall be thoroughly flushed from the main until the replacement potable water is of the same chemical and bacteriological quality as the potable water source.

The Owner will collect potable water samples in sterile bottles containing sodium thiosulphate for bacteriological analyses. Bacteriological analysis shall be made by a State of Michigan certified laboratory and acceptable tests are negative for bacteria and as otherwise defined by AWWA C651 and

EGLE regulations. If the samples show safe results on consecutive samples collected 24 hours apart, the new pipe line is ready to be placed in service.

## V. RESTORATION OF DISTURBED FACILITIES

### A. General

All protection and restoration shall be included in the water main construction unless modified by other project specifications.

## VI. METHOD OF PAYMENT

Removal of existing water main, fittings, valves, and other appurtenances that are in the same trench as the proposed water main is required, and **shall not** be paid for separately.

These specifications include the following pay items. Additional water items may appear in the plans that may not be listed here but are governed by this specification:

| **Pay Item** | **Unit** |
|---|---|
| Water Main, DI, __ inch, Tr Det ___, Modified | Foot |
| Water Main, Rem, _____ | Foot |
| Gate Valve and Box, __ inch, Modified | Each |
| Valve, Pressure Reducing, __ inch | Each |
| Bend, DI, ___ degree, __ inch | Each |
| Cross, DI, __ inch x __ inch | Each |
| Cap, DI, __ inch | Each |
| Plug, DI, __ inch | Each |
| Reducer, DI, __ inch x __ inch | Each |
| Solid Sleeve, DI, __ inch | Each |
| Tee, DI, __ inch x __ inch | Each |
| Fittings Not Shown on Plans | Each |
| Fire Hydrant Assembly | Each |
| Fire Hydrant Assembly, Rem | Each |
| Water Service | Each |
| Connect to Existing Water Service | Each |
| Testing and Chlorination | Each |
| Connect to Existing Water Main | Each |
| Water Investigation | Each |

CITY OF ALPENA FIRE HYDRANT AND RESTRAINT

FIRE HYDRANTS MUST MEET OR EXCEED THE REQUIREMENTS OF UNDERWRITER LABORATORIES STANDARD UL 246 AND AWWA STANDARD C502 FOR DRY BARREL FIRE HYDRANTS. ALL HYDRANTS SUPPLIED MUST HAVE THE "U.L." INSIGNIA CAST ON THE HYDRANT UPPER TRAFFIC STANDPIPE.

HYDRANTS SHALL BE EQUIPPED WITH TWO 2½" HOSE NOZZLES AND ONE 4" PUMPER NOZZLE WITH NST THREADS OR AS THE PLANS SPECIFY.

ALL HYDRANTS MUST BE SUPPLIED WITH A 24" IN LENGTH FLUTED UPPER TRAFFIC STANDPIPE AND ONE FIBERGLASS HYDRANT FLAG FOR IMPROVED WINTER VISIBILITY.

BRASS NOZZLES MUST BE DESIGNED WITH BRASS LUGS AND ORING GASKET AS THE MEANS TO FORM A PRESSURE TIGHT COMPRESSION FIT WHEN ATTACHED TO THE HYDRANT BONNET. (NO THREADED IN NOZZLES ALLOWED). HYDRANTS SHALL BE SIZED FOR A BURY DEPTH OF 6' 6" FT. OR AS PLANS SPECIFY, WITH A 6" MECHANICAL JOINT INLET COMPLYING WITH ANSI A.21.11. AS JOINT RESTRAINT, ALL FIRE HYDRANTS SHALL USE EBAA IRON MEGA LUGS ON HYDRANT SHOE, BOTH SIDES OF VALVES AND ON BRANCH OF MJ TEE.

HYDRANTS MUST HAVE TWO TRAFFIC BREAKAWAY FLANGES WITH A GALVANIZED STEEL BREAKABLE STEM COUPLING LOCATED NEAR THE GROUND LINE TO MINIMIZE BARREL AND STEM DAMAGE FROM TRAFFIC IMPACT. THE OPERATING STEM MUST BE AT LEAST 1¼" IN DIAMETER.

HYDRANT OPERATING NUT MUST BE SOLID BRASS AND ATTACHED TO OPERATING STEM UTILIZING A STANDARD ACME THREAD AT 5 T.P.I (OPEN LEFT). LUBRICATION OF THE OPERATING NUT MUST BE DESIGNED TO USE FOOD GRADE GREASE ONLY. NO OIL BATH OPERATING ASSEMBLY DESIGNS ALLOWED. NO V THREADS ALLOWED FOR OPERATING STEM OR NUT. FIRE HYDRANT BOTTOM BRASS DRIP SHUT OFF MUST BE ATTACHED TO THE 1 ¼" OPERATING STEM BY MEANS OF A 1/16" DIAMETER STAINLESS STEEL DRIVE LOCK PIN. BOTTOM BRASS DRIP SHUT OFF MUST BE OF A HEAVYDUTY DESIGN TO ENABLE REMOVAL BY MEANS OF A STEM DRIVE SEAT WRENCH TOOL.

ALL FIRE HYDRANTS SHALL OPEN LEFT (COUNTER CLOCKWISE) WITH A 1½" POINT TO FLAT OPERATING NUT. THE COLOR OF THE HYDRANTS SHALL BE RED.

HYDRANT BARRELS MUST HAVE AN INSIDE DIAMETER OF AT LEAST 8 INCHES. THE MAIN VALVE SHALL BE FORMED OF SPECIALLY MOLDED RUBBER. THE VALVE ASSEMBLIES, INCLUDING SEAT AND GUIDES, SHALL BE BRASS AND MUST BE THREADED INTO A BRASS LINER IN THE HYDRANT SHOE FIRE HYDRANT BARRELS BELOW GRADE (LOWER STANDPIPE) MUST BE MADE OF DUCTILE IRON.

ALL FIRE HYDRANTS SUPPLIED SHALL BE EAST JORDAN IRON WORKS MODEL 5BR250 WATERMASTER OR EQUAL.

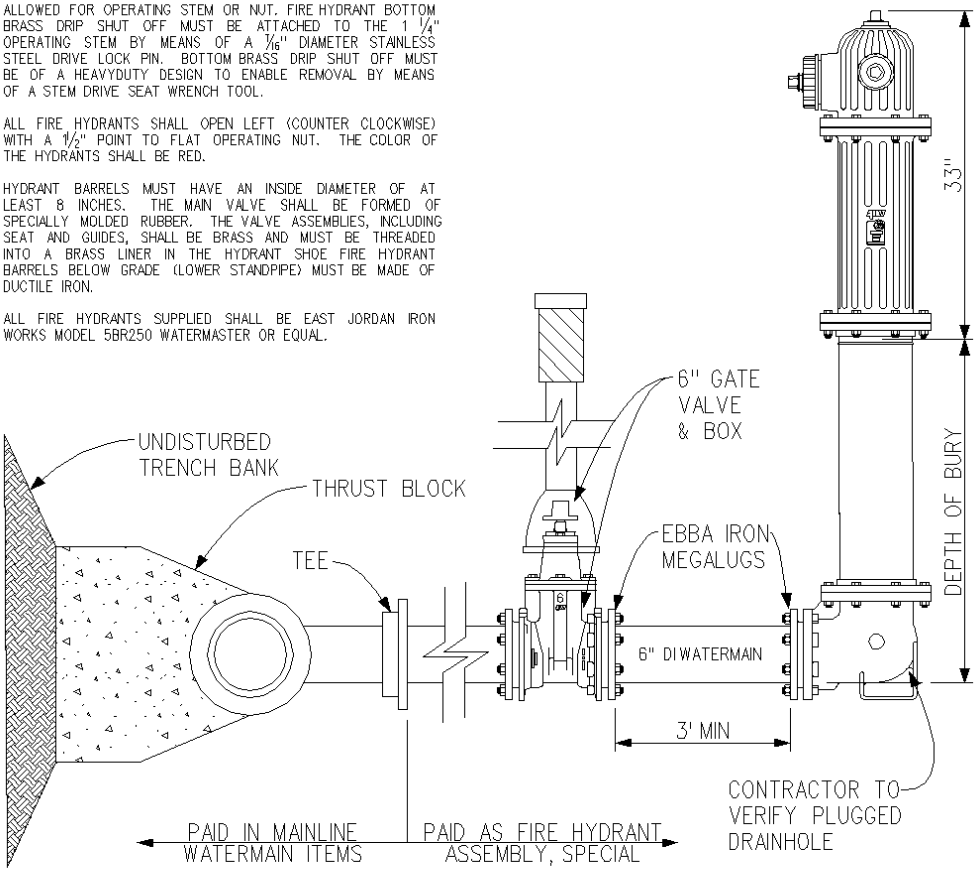
CITY OF ALPENA RESILIENT WEDGE GATE VALVE

VALVES SHALL BE RESILIENT WEDGE TYPES RATED FOR 250 P.S.I. COLD WATER WORKING PRESSURE. VALVE PERFORMANCE SHALL MEET OR EXCEED THE REQUIREMENTS OF ANSI/AWWA C509 WITH THE BODY AND BONNET MEETING THE WALL THICKNESS REQUIREMENTS OF ANSI/AWWA C153. VALVES SHALL MEET THE REQUIREMENTS OF UNDERWRITERS LABORATORIES STANDARD 262.

VALVE BODY, BONNET, SEAL PLATE, AND WEDGE CASTING SHALL BE CONSTRUCTED OF DUCTILE IRON IN ACCORDANCE WITH ASTM A536. THE WEDGE CASTING SHALL BE 100% ENCAPSULATED WITH NITRILE RUBBER. NO EPOXY COATING IS ALLOWED IN WEDGE. THIS RUBBER SHALL BE PERMANENTLY BONDED TO THE DUCTILE IRON WEDGE CASTING AND SHALL MEET ASTM D429 TESTS FOR RUBBER TO METAL BONDING.
THE STEM AND STEM NUT SHALL BE MADE FROM HIGH STRENGTH MANGANESE BRONZE, UNS ALLOY C86700. THRUST WASHERS SHALL BE LOCATED ABOVE AND BELOW THE THRUST COLLAR OF THE STEM AND SHALL BE STAINLESS STEEL. TTHERE SHALL BE TWO ORING SEALS IN THE SEAL PLATE, WHICH SHALL BE REPLACEABLEWITH THE VALVE IN THE FULL OPEN POSITION AT RATED WORKING PRESSURE. ALL GASKETS SHALL BE ORING SEALS. ORINGS SET IN A CARTRIDGE SHALL NOT BE ALLOWED.
THE BODY, BONNET, AND SEAL PLATE SHALL BE EPOXY COATED IN ACCORDANCE WITH NSI/AWWA C550.

VALVES SHALL HAVE LAYING LENGTHS AND CLEAR WATERWAY OPENINGS FOR MECHANICAL JOINT VALVES AS LISTED BELOW:

| VALVE SIZE | LAYING LENGTH | WATERWAY DIAMETER |
|---|---|---|
| 4" | 4 5/16" | 4 3/16" |
| 6" | 5" | 6 3/16" |
| 8" | 5 1/4" | 8 3/16" |
| 10" | 6 3/4" | 10 3/16" |
| 12" | 8" | 12 3/16" |
| 16" | | 16 3/16" |




# FIRE HYDRANT ASSEMBLY

City of Alpena
Special Provision
for
**Sanitary Sewer Installation**



# SANITARY SEWER SYSTEM

## I. GENERAL

### A. Work included:

Includes, but is not limited to, the furnishing of all labor, materials, and equipment necessary for:

1. Installation and testing of sanitary sewers, manholes, and appurtenances indicated on the Drawings and described in these Specifications.

2. Any other item necessary for the proper and complete performance of the system or the Work.

### B. Related work described elsewhere:

1. Related work is described in various other Sections of these Specifications.

## II. SUBMITTALS

### A. Product data:

Contractor shall submit manufacturer's test data demonstrating that materials to be used on project meet applicable ASTM, ANSI, and similar specifications.

### B. Service line witnesses:

Report locations of wyes, tees, and markers to Engineer upon completion of any 400-foot section of sewer.

### C. Leakage testing procedure:

Equipment and method: Approval required.

III. QUALITY ASSURANCE

A. General:

1. Acceptability of materials and performance shall be determined by Engineer.

B. Materials:

1. Pipes, manholes, and other system materials – certifications by Manufacturer.

C. Performance:

1. Pipe System.

a. Pressure test for leakage.

b. Light or reflected light test for alignment.

c. Plastic pipe (PVC) Go-no go test for deflection.

2. Manholes.

a. Visible inspection for leakage and workmanship.

## PRODUCTS

I. Pipe Materials

A. General:

1. Sanitary sewer pipe up to 15” size shall be of one type for the complete system:

a. Except as a specific type is required by the Drawings.

2. Other pipes shall conform to sizes and types shown on the Drawings and specified below.

a. PSM Polyvinyl chloride (PVC) sewer pipe:

Diameter: 4” – 21”; ASTM D3034 (SDR 35).
Diameter: 24" and greater; ASTM F679 (SDR 35).

b. Ductile Iron Sewer Pipe:

1. Diameter: 4”-24”; ANSI A21.50 and ANSI A21.51; Class 52

c. Class IV Reinforced Concrete Pipe:

1. Diameter: 24”-60”; ASTM C76

2. Pipe Thickness

PVC pipe shall have a wall metal thickness as follows:

| | |
|---|---|
| 4 inch pipe | 0.29 inch |
| 6 inch pipe | 0.31 inch |
| 8 inch pipe | 0.33 inch |
| 10 inch pipe | 0.35 inch |
| 12 inch pipe | 0.37 inch |
| 16 inch pipe | 0.40 inch |

The tolerance will be as allowed in the ANSI A21.51-1981.

Other pipe type wall thicknesses shall be governed by industry practices for certified pipe.

3. Cement Mortar Lining:

Cement mortar lining shall conform to ANSI Specification A21.4, except for the following items: the minimum thickness of lining shall be 1/16" and the maximum thickness of lining shall be 1/8" for all sizes of pipe furnished. Care shall be taken to insure that no mortar remains in the joint surface of the bell. If mortar is found in the joint surface of lining of greater thickness than allowed, the pipe will be returned.

4. Length of Pipe:

The minimum nominal laying length of the pipe shall be 20 feet or as determined by the pipe material as specified on the plans.

5. Outside Coating:

The outside of the pipe shall be coated with a bituminous coating of either coal, tar, or asphalt base one mil thick.

B. Joints:

PVC Pipe: ASTM D3212 Push-on type joints
(and ASTM F679 for large diameter pipes)
1. "Super Bell – Tite"
2. "Tyton"

Ductile Iron Pipe: Rubber Gasket, Bell and Spigot in accordance with ANSI/AWWA 21.11/C111

Reinforced Concrete Pipe: Joints shall conform to ASTM 443

C. Fittings:

1. Fittings shall be of the same material, have the same joints, and conform to the specifications for the type of pipe being used.

2. Transitions from one material to another shall be made only with approved adapters.

3. Wyes and tees shall be integrally pre-cast or molded to the main line portion of the unit.

III. MANHOLES

A. General - See MDOT English standard plan R-1-E Drainage Structures- "Typical Manhole" Detail. All manholes shall be in accordance with this standard plan except as modified herein.

B. Sections:

1. Cone and riser sections: ASTM C478 precast concrete units. In locations designated for watertight installations, cone section shall be furnished with 4 5/8” threaded anchor bolts.

2. Base sections: ASTM C478 precast concrete units. Bottom slab and walls shall be cast integrally.

3. Joints: ASTM C443 Rubber “O” ring.

4. Pipe to Manhole Joints: Flexible water-tight connection utilizing a rubber boot or “kor-n-seal” or equal.

C. Steps:

1. Cast iron: ASTM A48, Class Number 30, 10” deep by 10” wide, 5” tread depth, 1” by 1” tread section, with 2” rail height.

2. Plastic: Reinforced with 3/8” steel rod and dimensioned same as cast iron.

3. Steps shall have a minimum vertical spacing of 12” (max 16”).

D. Drop Connections:

1. Outside drop connections, sufficiently supported, shall be required for all connections with a 24” or greater differential between the pipe and the lowest invert.

E. Bench and Flow Channel:

1. All manholes shall have a bench on each side of flow channel where pipe diameter is less than the manhole diameter. Bench surface shall slope toward the flow channel at 4% minimum.

2. The flow channel shall conform to the shape of the pipe with the wall channel height equal to the crown of the pipe.

F. Castings:

1. Standard: East Jordan 1040A or approved equal. Casting shall have solid cover with no vent holes. (Alpena Logo is required per Special Provision “Drainage Structures and Castings” found in the contract documents)

2. Watertight: East Jordan 1040A (with watertight assembly) or approved equal, equipped with 4 7/8” holes in the frame flange. (Alpena Logo is required per Special Provision “Drainage Structures and Castings” found in the contract documents)

G. Mortar:

ASTM C270: 1 part Portland cement, 1 part lime, and 3 parts said by volume.

H. Brick:

1. Concrete: ASTM C55, Grade U-1.

2. Clay: ASTM C62, Grade SW.

I. Grade rings:

ASTM C478.

J. Concrete:

Class A. 3500 psi 28 day.

I. Waterproofing:

1. Bituminous: ASTM D449.

2. Cement: Masonry Filler.

## EXECUTION

I. EARTHWORK

All earthwork required shall be done in accordance with Sections 206.03 (structures) and 402.03 (pipe) of the 2012 Michigan Department of Transportation Standard Specifications for Construction except as modified herein.

For Flexible Pipe Installation: All references in these sections to Class II or III granular material shall be omitted. All granular material influencing the pipe or structures as determined by the trench details noted or by the engineer in field shall be in accordance with ASTM D2321 gradation (1 ½" maximum particle size).

II. LINE AND GRADE

A. Staking: The Contractor shall be responsible for ensuring the alignment and grade of the pipe are in accordance with the plans and specifications. Single Beam Laser or GPS system are the only acceptable means for ensuring alignment and grade. All staking for pipe and structures shall be included in the "Contractor Staking" item. If contractor staking is not part of the contract, all staking shall be considered included as part of the sewer work items.

Allowable drift between structures from plan or stakes.

1. Horizontal
   a. Up to 36-inch pipe: 0.20 feet.
   b. 42 inch and larger pipe – 0.40 feet.
2. Vertical
   a. None, unless specified by engineer in field

B. Separation: All water main/sewer main crossings shall have a minimum 18" vertical separation. All proposed sewer main shall be installed with a minimum 10' horizontal separation to all water main.

III. INSTALLATION

A. General:

1. Protect all materials before, during and after installation.

2. Install pipes, fittings, and appurtenances in strict accordance with manufacturer's recommendations.

***3.*** Contractor shall be responsible for the protection of all pipe, structures, and all other appurtenances from the entrance of foreign materials, including groundwater, while on site and working as well and ensuring their protection while off-site (overnight). Further, the Contractor shall not hinder the flow of existing sewers. Failure to comply will result in an initial warning from the Engineer. ***Further violations will result in a $500.00 penalty per incident per day in addition to all expenses incurred as a result of the entrance of foreign materials or hindering the sewer flows. (ie: invoices for basement clean-up resulting from a service flooding) Repeat violations are subsequent to a $1000 penalty per incident per day. The penalty(ies) shall be deducted from the next payment to the Contractor following the incident(s).***

4. Install PVC pipe in accordance with ASTM D2321. Install Ductile Iron and Concrete pipe in accordance with ASTM C12

5. Removal of water entering the excavation shall be included in the pay item "Dewatering System, Trench". If the item "Dewatering System, Trench" is not included in the original contract documents and any method of dewatering is implemented, it will not be paid for separately but will be considered as having been included in the original contract unit prices for the related item for pipe installation.

B. Placement of Pipe:

1. All pipe trenches shall be in accordance with MDOT Standard Plan R-83-B "Utility Trenches" (Trench detail as identified by pay item).

2. Highly compressible and organic soil materials found in the trench bottom shall be replaced with material as specified by ASTM D2321.

3. Bearing: Support entire length of pipe barrel evenly with extra excavation at joints.

4. Direction: Commence at outlet and proceed up grade with spigot ends pointing in direction of flow.

5. Method: Socket of pipe last laid shall be wiped clean and spigot end of pipe to be laid shall be centered and pushed home against base of socket. Pipe shall be centered to form a sewer with a uniform invert.

C. Jointing:

1. General: Solvents, adhesives, lubricants, and gaskets shall be furnished by pipe manufacturer.

2. Clay, Concrete, and Ductile Iron Pipe: Surfaces of joint shall be clean and dry before lubricant is applied. Care shall be taken in laying that pipe does not shift and that it remains in a home position after assembly.

3. PVC: Pipe manufacturer's recommendation.

D. Manholes:

1. Base section placement: Full and even bearing.

2. Joints and lift holes: Mortared finish on inside.

3. Top of casting elevation:

a. Gravel areas: 6" below surface.

b. Bituminous base course: At base course grade.

c. Final wearing surface: At finished grade. Adjustment of castings from base course grade to finished grade is incidental.

d. Ditches: 6” below ditch bottom or protruding not more than 6” above slope; as applicable.

e. Other areas: As directed by Engineer or as detailed on plan.

4. Visible leakage shall be prevented. Watertight castings required in locations subject to submergence (i.e. ditches), or otherwise shown on Drawings.

5. A manhole flow channel shall be required. Channel wall height shall be equal to the crown of the pipe. A bench is required on both sides of the flow channel and shall slope to the flow channel.

E. Service leads:

1. Locations:

a. Existing or proposed service lead locations shown on Drawings are schematic only to present approximate locations, length and total number.

b. Contractor shall contact United Water to assist in locating existing service leads. United Water shall attempt to locate the leads by means of records and on-site investigation. Services for which and exact location cannot be determined shall be located by the contractor through contact with the home owner or by sewer investigation.

c. Unless otherwise directed by the Engineer in field, service leads shall be installed at center of vacant lots.

2. Alignment: right angles to street centerline, except as specifically shown otherwise.

3. Grade: Uniform minimum of 1/8” per foot (1%).

4. Depth:
   a. Elevations at property line shown on Drawings.

   b. If Drawings are not specific, depth shall be adequate to serve existing buildings. At property line of vacant lots, mobile homes, or temporary structures, minimum depth shall be 10 feet (or maximum depth possible).

   c. In event of high groundwater risers may be required, which decision shall be made by Engineer.

5. Plugs: Plug ends air tight with standard disc.

6. Markers: Install #4 Rebar, 12” long at end of each service lead extending vertically to within 6” of ground surface.

7. Witnesses and Measurements:

   a. Wyes and Tees: Measurement to center of nearest downstream manhole. Note manhole by number shown on Drawings.

   b. Ends of service leads: 3 measurements to permanent surface features.

8. Payment: Service leads and cleanouts shall be paid as an entire unit item. The wye at the main shall be paid for in the mainline of the sanitary sewer. The entire 6" service lead length and the 4" service cleanout riser shall be placed as one item measured by each.

F. <u>Connections</u>:

1. For future use:

   a. Plug: Pipe 4” through 21” with standard disc.
   Bulkhead: Pipe 24” and larger with 8” thick brick and mortar

G. Backfilling:

1. Engineer's Approval: Backfill shall be included in price per lineal foot of pipe installed unless otherwise specified. Backfilling shall be done on sections of sewer only after such sections have been approved for backfilling by the Engineer or Inspector. Except where additional work is necessary or unless specifically allowed by the Engineer, backfilling shall be kept completed to within 100 feet of the sewer. Under no circumstances shall water be allowed to rise in unbackfilled trenches after pipe has been laid.

2. Placing Backfill: If the trench detail specified is "A" or "B" the granular material shall meet ASTM D2321 gradation (1 ½" maximum particle size) or MDOT Class IIIA, not Class III material as noted by the standard plans for trench details "A" and "B". Granular material shall be placed in layers not more than 12" in thickness, unless otherwise approved by the Engineer, and compacted to 95 percent of Maximum Unit Weight. Puddling or flooding for consolidation of backfill is not permitted.

3. Excess Material: With the exception of the volume of excavated material equal to the volume of the space occupied by the sewer appurtenances, all excavated material shall be placed in the backfill to provide for future settlements. All excess material encountered shall be removed and disposed of by the Contractor. The Contractor shall receive no extra compensation for this work.

IV. CLEANING

A. Methods:

1. Inflatable rubber ball: Place snug-fitting ball in upstream manhole of sewer and introduce water behind it. Ball shall pass through pipe with only the force of water propelling it.

2. High pressure water jet.

B. Debris:

Including that cemented or wedged, shall be removed at first available downstream manhole.

C. Final acceptance: All sewers shall be thoroughly cleaned before final acceptance. If sand, or other foreign materials in the pipe prevent testing and inspection, the Contractor shall bear all cost to remove foreign materials to facilitate testing and inspection.

V. TESTING AND INSPECTION

A. Observation: By Engineer.

B. Notification:

1. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

2. Testing: Contractor arrange with Engineer following cleaning and pretesting.

C. Equipment and manpower: Contractor provide everything required for testing.

D. Low pressure air test for leakage:

1. The air test shall be performed in accordance with ASTM F1417 for PVC and ASTM C924-89 for Concrete Pipe.

2. Required for all types of pipes.

3. Measure time interval for pressure drop from 3.5 to 2.5 psi. Compare with the table below for allowable time interval.

**SPECIFICATION TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP FOR SIZE AND LENGTH**

| Pipe Diameter (inches) | Minimum Time (min:sec) | Length for Minimum Time (ft) Length | Time for Longer (sec:ft) | Specification Time for Length Shown (min:sec) 100 ft | 150 ft | 200 ft | 250 ft | 300 ft |
|---|---|---|---|---|---|---|---|---|
| 8 | 7:34 | 298 | 1.520 L | 7:34 | 7:34 | 7:34 | 7:34 | 7:36 |
| 10 | 9:26 | 239 | 2.374 L | 9:26 | 9:26 | 9:26 | 9:53 | 11:52 |
| 12 | 11:20 | 199 | 3.418 L | 11:20 | 11:20 | 11:24 | 14:15 | 17:05 |
| 15 | 14:10 | 159 | 5.342 L | 14:10 | 14:10 | 17:48 | 22:15 | 26:42 |
| 18 | 17:00 | 133 | 7.692 L | 17:00 | 19:13 | 25:38 | 32:03 | 38:27 |

Note: If the section of line to be tested includes more than one pipe size (i.e. lateral connections), calculate the test time for each size and add the test times to arrive at the total test time for the section.

4. Contractor shall repair leaks and repeat tests until acceptable results are achieved.

E. Other leakage tests: May be required by Engineer in addition to air test.

1. Method approval of Engineer.

2. Water infiltration:

   a. Groundwater: Minimum 2 feet above high point of pipe.

   b. Allowable rate: 100 gal./inch pipe dia./mile/day.

3. Water exfiltration:

   a. Water test elevation: Minimum 2 feet above high of high point of pipe or groundwater elevation.

   b. Allowable rate: 100 gal./inch pipe dia./mile/day.

F. Deflection test for plastic pipe:

1. Go, no go gauge.

2. Allowable maximum: 5% of diameter

3. Testing shall be performed no sooner than 30 days following the proper installation and backfill.

## VII. POST CONSTRUCTION INFILTRATION

Following complete construction and prior to connection of services to the sewer, the Engineer shall have the option of requiring re-testing of any section of sewer where excessive infiltration is observed or suspected. Any of the above tests may be utilized per the Engineer's requirements.

## VIII. TV INSPECTION

The owner or the Engineer shall have the option of performing a TV inspection of any section of sewer for signs of structural damage, joint leaks, or infiltration.

## IX. CORRECTION OF DEFECTIVE WORK

In the event any of the above tests or inspections indicate defective material or installation, the Contractor shall repair and retest the section to the satisfaction of the Engineer. The use of chemical grouts shall be limited to the repair of minor joint leaks and shall not be used without the specific written approval of the Engineer. Any pipe or fitting having structural damage shall be removed and replaced. Any PVC sewer with deflection in excess of the 5.0% limitation shall be re-excavated, inspected for structural damage, rebedded, backfilled, and retested. The corrective work shall be done immediately.

X. METHOD OF PAYMENT

Removal of the existing sewer pipe and structures that are in the same trench as the proposed sanitary sewer is required and **shall not** be paid for separately.

These specifications cover the following items. Additional sanitary sewer items may appear in the plans that may not be listed here but are governed by this specification:

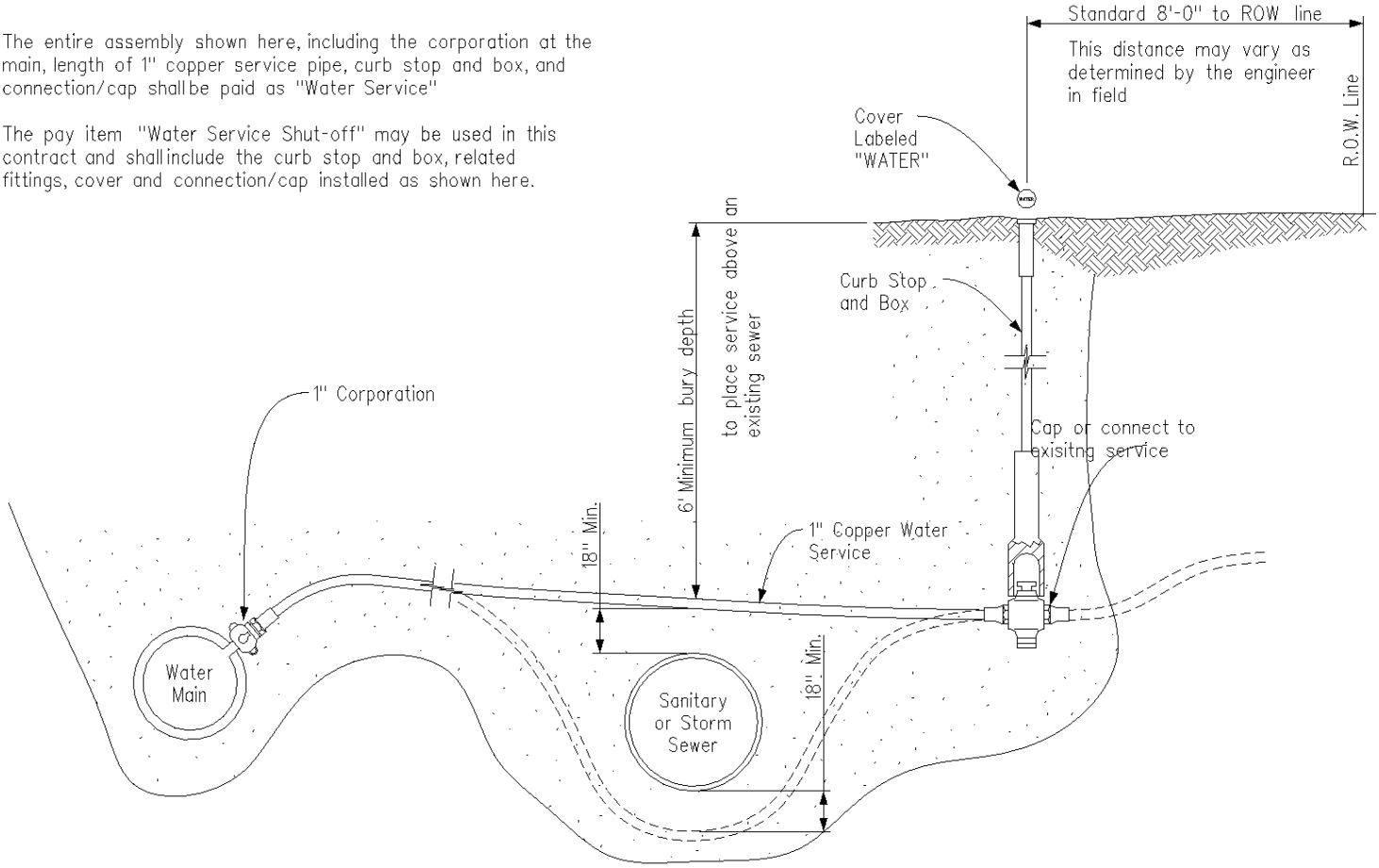
| Pay Item | Unit |
|---|---|
| Sanitary Sewer,<*material*>, __ inch, Tr Det <F or G> | Ft |
| Sewer Tap, __ inch | Ea |
| Dr Structure Tap, __ inch | Ea |
| Sanitary Sewer, Bulkhead, ___ inch | Ea |
| Sanitary Sewer, Abandon, ___ inch | Ft |
| Plug, <*material*>, __ inch | Ea |
| Sanitary Sewer Service | Ea |
| Sanitary Sewer Cleanout | Ea |
| Dr Structure, __ inch dia, with Cover and Casting, Special | Ea |
| Dr Structure, Add Depth of __ in dia, 8 feet to 15 feet | Ft |
| Dr Structure, Add Depth of __ in dia, more than 15 feet | Ft |
| Sewer Investigation | Ea |

City of Alpena
**Standard Detail**
Water Service Connection

**ALP** **1 of 1** **03/24**

The entire assembly shown here, including the corporation at the main, length of 1" copper service pipe, curb stop and box, and connection/cap shall be paid as "Water Service"

The pay item "Water Service Shut-off" may be used in this contract and shall include the curb stop and box, related fittings, cover and connection/cap installed as shown here.



City of Alpena

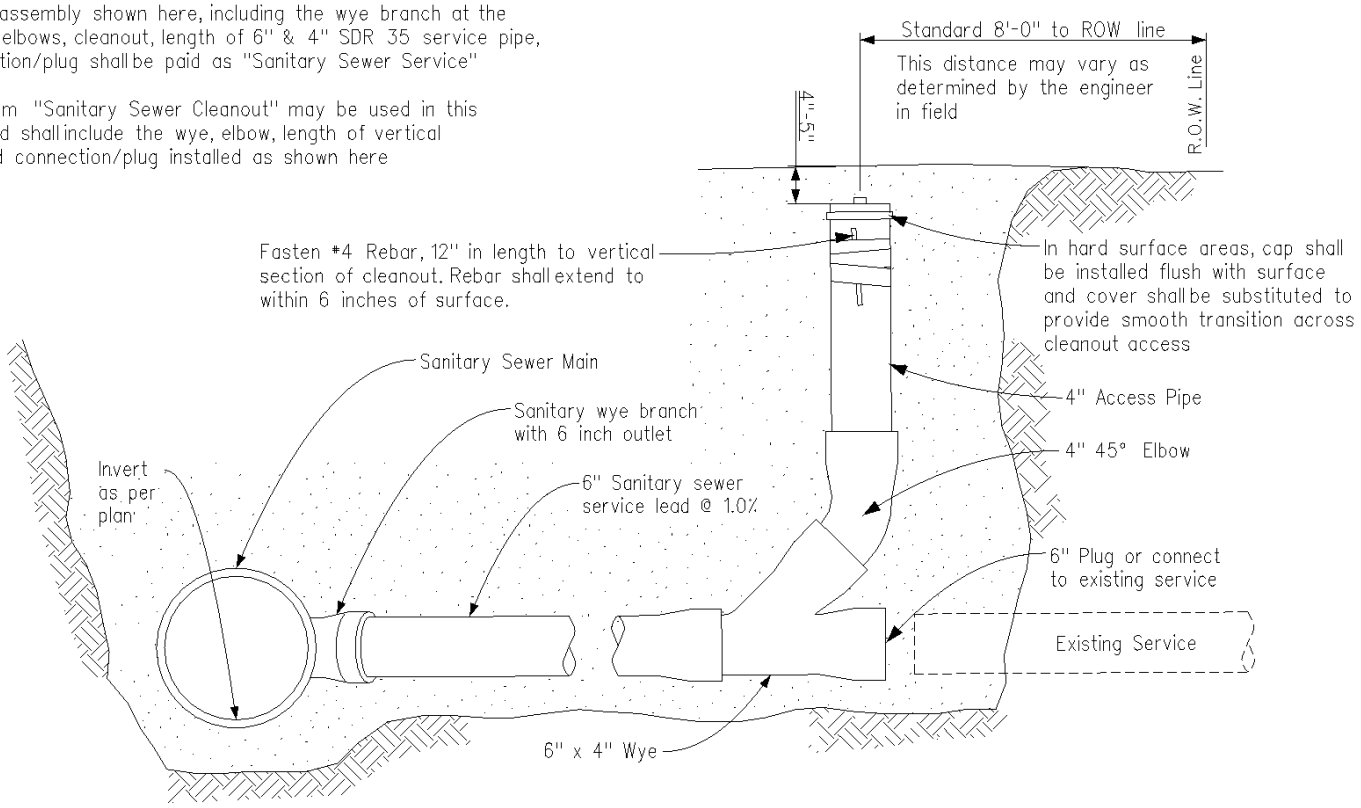
**Standard Detail**

Sanitary Sewer Service Connection

**ALP** **1 of 1** **03/24**

The entire assembly shown here, including the wye branch at the main, wyes, elbows, cleanout, length of 6" & 4" SDR 35 service pipe, and connection/plug shall be paid as "Sanitary Sewer Service"

The pay item "Sanitary Sewer Cleanout" may be used in this contract and shall include the wye, elbow, length of vertical 4" pipe, and connection/plug installed as shown here



SPECIAL PROVISION
FOR
**Safety Requirements**

**ALP** **1 of 1** **01/09**

**a. Description of Work -** While the Contractor is performing any work on or related to the project described by the specifications herein, they shall conform with all applicable occupational safety and health regulations as set forth by Federal, State, and Local agencies, especially, but not limited to MDOT, FHWA, OSHA, MIOSHA.

**b. Materials** - All materials, including, but not limited to, all safety equipment shall conform to the most current applicable standards and requirements.

**c. Construction Operations** - The Contractor shall be solely responsible for maintaining conformance with all applicable Federal, State, and Local safety requirements while performing any work for the City of Alpena as part of this contact. The City of Alpena shall not assume any responsibility, nor enforce any safety standards or requirements. The Contractor shall hold the City of Alpena harmless to any violations incurred or fines received precipitating from non-conformance with any safety regulations.

The contractor SHALL provide a typed copy of the emergency contacts for this project at the pre-construction meeting or 72 hours prior to work.

**d. Measurement and Payment** - There shall be no additional payment for conformance with safety and health regulations. Any costs for fines, safety equipment, safety materials, or safety training as specified by Federal, State, and Local agencies initially or as a result of inspections at the job site shall be borne by the Contractor.

SPECIAL PROVISION
FOR
**Permit Requirements**

**ALP** **1 of 1** **06/18**

**a. Description.** The Contractor shall be responsible for obtaining all Federal, State, and Local permits required as part of this project, whether stated or implied.

**b. Application Preparation.** Unless otherwise noted, the Contractor shall be responsible for preparing all application paperwork and any additional modifications to the Contract plan sheets as needed for permits.

**c. Cost.** The Contractor shall be solely responsible for all costs associated with making application for and obtaining permits.

**d. Permit Types.** The following permits may be required as part of this project. Checked boxes indicate permits specifically required for this project. This list may or may not be complete, it shall be the responsibility of the Contractor to determine the need for any additional permits.

☐ City of Alpena Building Permit (Through City Building Department)

☐ State of Michigan Electrical (Through City Building Department)

☒ State of Michigan Plumbing (Through City Building Department)

☐ State of Michigan Mechanical (Through City Building Department)

☐ MDEQ/Army Corps of Engineers Joint Permit

**e. Notice to Proceed.** The Engineer's Office shall receive copies of all permits secured for the project. City will not issue the Notice to Proceed until the proper permits are secured for the applicable portions of work on the project. The City may issue a partial notice to proceed, depending upon which permits are secured or in process.