



## Westover Hills Utility Specifications

### **WARRANTY:**

Equipment or any workmanship which does not comply with established requirements of the contract and that is discovered within two (2) years of the completion of construction of the project, and acceptance by the Owner, the Contractor shall replace such defective materials or equipment, or remedy any such defective workmanship within ten (10) days after notice in writing of the existence thereof shall have been given by the Owner or Engineer. In the event of failure of the Contractor to replace any such defective materials or equipment or to remedy defective workmanship as herein provided, the Owner may replace such defective materials or equipment or remedy such workmanship as the case may be and in such event the Contractor shall pay to the Owner the cost and expense thereof.

### **TRENCH BACKFILL:**

#### Standard Backfill

Contractors will use flowable fill when repairing street excavations.

#### Alternate Backfill

In the event, that flowable fill is not available or is impractical given the specific nature of the project, a minimum density of trench backfill shall be 95% standard proctor density. The Owner reserves the right to perform unannounced compaction tests for verification and control purposes of the backfill material. Any compaction tests requested by the Owner as described above will be performed by a certified testing laboratory, chosen and paid for by the Owner. All backfill material shall be mechanically compacted. If spot tests of trench backfill compaction indicate improper compaction, the Contractor shall recompact and the backfill will be retested by the Owner at Contractor's expense.

### **PROTECTION OF TREES, PLANTS AND SOIL:**

All property along and adjacent to the Contractor's operation including lawns, yards, shrubs, trees, etc., shall be preserved or restored after completion of the work, to a condition equal to or better than existed prior to start of work.

Any trees or other landscape features scarred or damaged by the Contractor's operations shall be restored or replaced at the Contractor's expense. Trimming or pruning to facilitate the work will be permitted only by experienced workmen in an approved manner. Pruned limbs of 1" (one) diameter or larger, shall be thoroughly treated as soon as possible with a tree wound dressing.

The Contractor shall take all precautions required to prevent soil erosion during construction. If excessive erosion occurs, the Contractor shall take immediate measures to prevent further erosion and restore the disturbed surface with topsoil at completion of the work. No special payment will be made for this work.

### **M.J. DUCTILE IRON FITTINGS:**

Work and materials required for furnishing and placing mechanical joint ductile iron fittings at the locations and grades shown on the plans. Measurements for payment shall include the costs associated



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with placement of horizontal concrete blocking and polyethylene wrap as fittings as required by the plans and specifications.

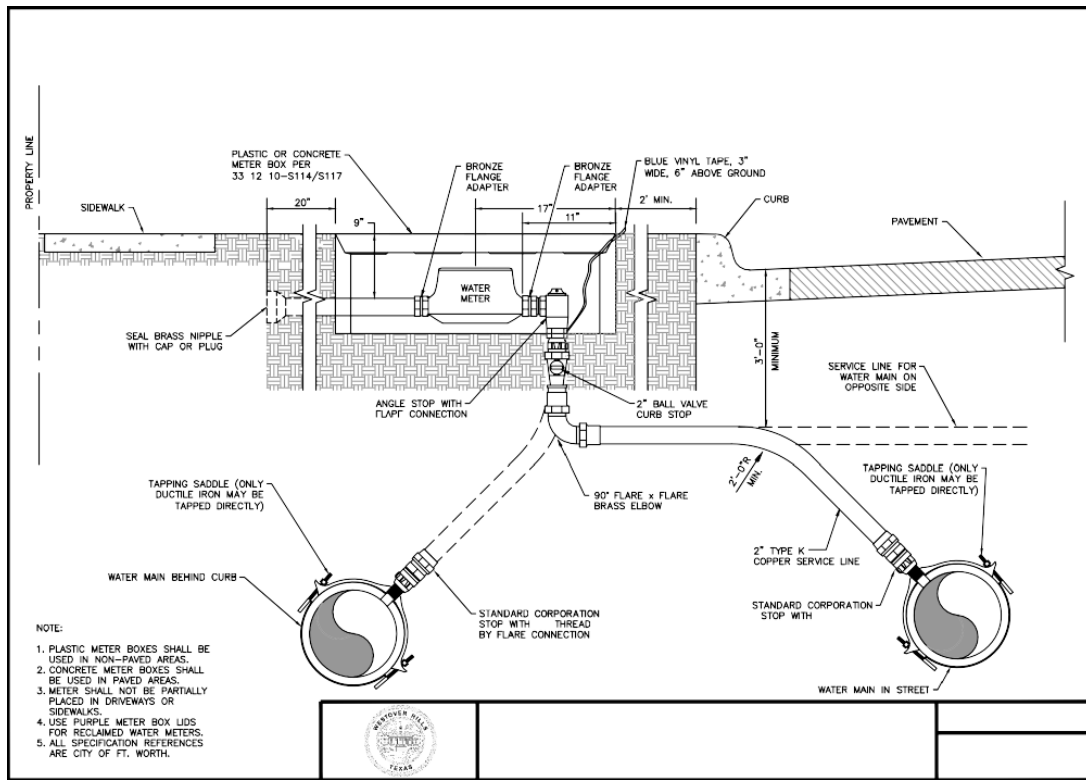
### FIRE HYDRANTS:

Work and materials required for excavation and backfill, joining furnishing and installing the fire hydrant, any fire hydrant extensions, blocking, drainage and all incidental expenses required to install the hydrant at the location shown on the plans. Fire hydrants shall be **Mueller Centurion**, or **Waterous**.

Fire hydrants shall open "**right**" (Fort Worth Specifications).

### 2" STANDARD WATER SERVICE CONNECTIONS:

This item consists of the work and materials required for excavation and backfill, furnishing, and installing water service connections that are presently serviced by water lines that are to be abandoned. Connections shall be installed to the existing meter. Measurement for payment shall include all parts and material required by the water service connection detail to connect to existing water meters, U-branches, or existing service lines. **ALL SERVICE VALVES CURB STOPS, ANGLE STOPS, CORPERATION STOPS, AS WELL AS ANY OTHER SERVICE LINE VALVE SHALL BE BALL VALVE TYPE UNLESS SPECIFICALLY APPROVED BY THE PUBLIC WORKS DIRECTOR, ENGINEER OR TOWN ADMINISTRATION.**





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### **CURB, GUTTER AND SIDEWALK REPLACEMENTS:**

This item consists of the work and materials required for removing existing concrete curb and gutter and sidewalk for water line installation and placing new concrete curb and gutter and sidewalk after the new water line is installed. Payment shall include hauling and satisfactory disposal of the concrete and other materials off the site. All concrete shall be Class A concrete having a minimum of 5 .0 sacks of cement per cubic yard and a minimum compressive strength of 3,000 psi at 28 days. Reinforcement shall conform to the details shown on the plans.

### **CONSTRUCTION SITE MANAGEMENT AND INSPECTION:**

A full time inspector/site manager shall be present at all times that construction crews are working on site. He will advise Town Administration with special situations arise that can affect Town residents. The inspector/site manager must be approved by the Town Engineer and Town Administration and will be responsible for:

1. Ensuring the project continues to move smoothly.
2. Verify all expended quantities used during the project.
3. Sign off on all project payments.
4. Ensure roads remain open and passible to all residents.
5. Verify that the project remains tidy and in a well-kept condition during construction.
6. Ensure project concludes with site clean, devices properly placed.
7. Provide daily update to Town Administration.

### **TRENCH BACKFILL AND HMAC PAVEMENT REPAIR:**

We would recommend 2" Hot Mix over 16" of low strength concrete (1000-2000 psi) over compacted subgrade. All repair areas should be neatly sawcut 6" to 12" outside of the nearest damage. The repair areas should be squared off to 5' x 5' minimum squares (rather than sprawling trench patterns). We will be glad to provide a detail for this, but I wanted to see if you have any concerns about the above described approach.

### **(Flowable Fill):**

The use of flowable fill is the standard and **PERFERRED** method to backfill a trench or excavation in the public right-of-way in the interest of preserving the public convenience or safety. All excess water and mud must be removed from the trench prior to backfilling. Any backfill placed during a rainy period or at

Following removal of any excess water and mud from the trench, the trench shall then be backfilled with flowable backfill material as follows:

Flowable Backfill material shall meet the following requirements. Flowable Backfill material, also called unshrinkable fill and slurry concrete, shall be a controlled density material consisting of cement and/or fly ash, sand and water meeting the requirements of high strength fast fix flowable fill or low strength fast fix flowable fill.



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**High strength fast fix flowable fill** (H.S. Four F) shall consist of an appropriate amount of cement (with other additives as necessary) mixed wet with mortar sand to flow and fill all voids in the excavation. This fill shall develop a minimum compressive strength of 2,160 pounds per square foot (15 psi) one hour after placement, and a 28-day compressive strength within the range of 300 psi to 500 psi. The material must be such that it can be capped in one and one-half (1.5) to two (2) hours.

**Low strength fast fix flowable fill** shall consist of an appropriate amount of cement (with other additives as necessary) mixed with mortar sand to flow and fill all voids in the excavation. This fill shall develop a compressive strength of 1120 pounds per square foot (7.8 psi) one hour after placement, and a 28-day compressive strength within the range of 25 to 100 psi. The material must be such that it can be capped in one and one-half (1.5) to two (2) hours. Any materials used shall be primarily granular, with a plasticity index less than 12 and with 100% passing a 3/4" sieve.

The flowable fill material shall be placed to the base of the pavement. Compaction testing will not be required where flowable fill is used and accepted for the trench backfill.

### **(Flexible Base):**

Where excess water cannot be prevented from entering the trench shall be considered temporary and must be removed as soon as weather permits. All backfills shall be compacted and surfaced with a minimum of one (1) inch cold mix or hot mix asphalt to improve traffic surface until permanent repair can be accomplished.

In the event, that flowable fill is not available or is impractical given the specific nature of the project, a minimum density of trench backfill shall be 95% standard proctor density. The Director reserves the right to perform unannounced compaction tests for verification and control purposes of the backfill material. Any compaction tests requested by the Director as described above will be performed by a certified testing laboratory, chosen and paid for by the Town. All backfill material shall be mechanically compacted. If spot tests of trench backfill compaction indicate improper compaction, the Contractor shall recompact and the backfill will be retested by the Director at Contractor's expense.

Work and materials required for replacing HMA pavement with 2" HMA Surface Course (Type D) and tack coat to the lines and grades required by the plans and specifications. The surface course shall be supported by a minimum of 6" of compacted flexible base. All tie-ins to existing pavement shall be along neat saw-cut lines.

1. Measurement for payment shall be on a linear foot basis and shall be limited to a maximum pavement width of 6' for water main pavement repair and 2' for service connection pavement repair. Water main pavement repair should extend to and butt up against the curb and gutter so as not to leave an old strip of asphalt between the water line and the existing curb and gutter.
2. All excess water and mud must be removed from the trench prior to backfilling. Any backfill placed during a rainy period or at other times where excess water cannot be prevented from entering



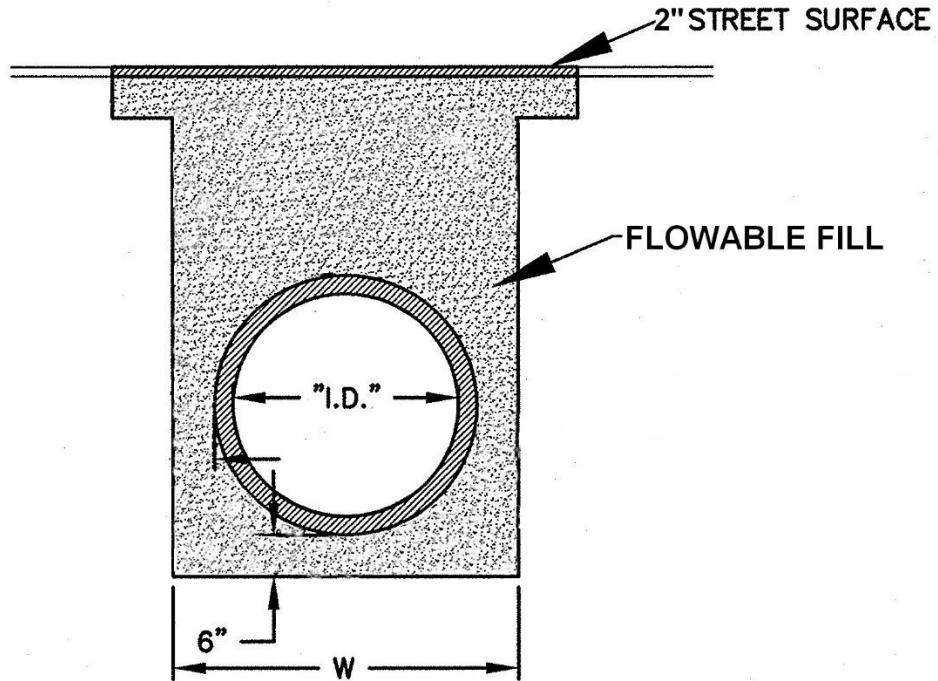
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the trench shall be considered temporary and must be removed as soon as weather permits. All backfills shall be compacted and surfaced with a minimum of one (1) inch cold mix or hot mix asphalt to improve traffic surface until permanent repair can be accomplished.

3. Following removal of any excess water and mud from the trench, the utility can be installed and bedded with granular material per utility requirements. The trench shall then be backfilled with selected materials from the excavation. Excavated material used in backfilling shall be an earth free of all hard rock, stones, or boulders, having dimensions greater than six (6) inches and frozen earth, debris and roots larger than two (2) inches. Excavated material may not be used if it is water saturated.
4. During freezing weather where repairs must be made to restore or maintain service, crush stone may be used when approved by the director for backfill. That portion of backfill, which will not support any portion of any sidewalk, driveway, or roadway, shall be placed in layers not exceeding 10 inches in depth (loose measurement) and compacted to a density comparable with the adjacent, undisturbed material. That portion of the backfill which lies more than 12 inches below any portion of any sidewalk, driveway, alley, or roadway or other pavement shall be compacted by mechanical compaction to a density of 95% of Standard Proctor density to minus 2% to plus 4% of optimum moisture of samples of the backfill material as determined by the "maximum density optimum moisture test". If hand pneumatic tampers are used, the backfill shall be placed in layers not exceeding three (3) inches and thoroughly tamped in place. 11 If heavier tampers (that is, operated by combustion engines, electric motors, or hydraulic cylinder) or mechanically driven compaction equipment are used, the thickness of the layers may be increased to a maximum of eight (8) inches provided the required density is obtained. The backfill shall be placed in uniform layers completely across the trench and compaction shall progress in an orderly and uniform manner. Utmost care must be taken in tamping in this manner to prevent damage to the conduit. All layer thicknesses shall be as measured by loose measurement.
5. In addition to the provisions above, the portion of the backfill which lies within 12 inches below any portion of any driveway or "improved" roadway shall be compacted to secure a density of not less than 98% of standard proctor density to minus 2% to plus 4% of optimum moisture of samples of the material as determined by the "maximum density optimum moisture test". The backfill material shall be moistened when required to obtain satisfactory moisture content and compaction.



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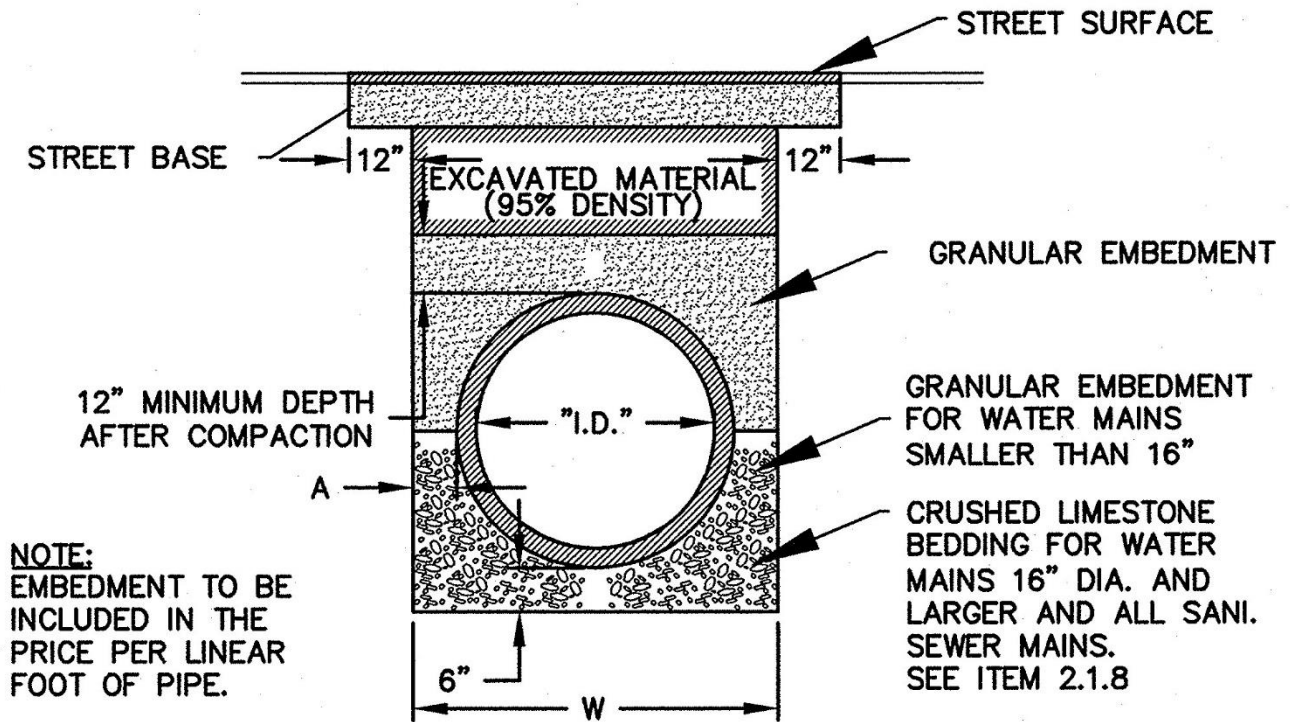


PIPE SIZE "I.D."	DITCH WIDTH "W" C.I. PIPE	DITCH WIDTH "W" PRETENSIONED	DITCH WIDTH "W" PRESTRESSED	DITCH WALL CLEARANCE "A"
2-1/2"	2'-0"	-	-	
4"	2'-0"	-	-	9.6"
6"	2'-0"	-	-	8.6"
8"	2'-0"	-	-	7.5"
10"	2'-0"	-	-	6.5"
12"	2'-2"	-	-	6"
16"	2'-6"	2'-7"	-	6"
20"	2'-10"	3'-0"	-	6"
24"	3'-2"	3'-4"	-	6"
30"	-	-	4'-6"	9"
36"	-	-	5'-0"	9"
42"	-	-	5'-7"	9"
48"	-	-	6'-2"	9"

### STANDARD BACKFILL



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20"	2'-10"	3'-0"	-	6"
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30"	-	-	4'-6"	9"
36"	-	-	5'-0"	9"
42"	-	-	5'-7"	9"
48"	-	-	6'-2"	9"

### ALTERNATE BACKFILL