

Introduced by _____

First Reading _____

Second Reading _____

Ordinance No. _____

Council Bill No. B 328-13

AN ORDINANCE

authorizing a contract with Consolidated Public Water Supply District No. 1 of Boone County, Missouri for replacement of a waterline along Scott Boulevard as part of the Scott Boulevard Phase 2 roadway improvement project; and fixing the time when this ordinance shall become effective.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. The City Manager is hereby authorized to execute a contract with Consolidated Public Water Supply District No. 1 of Boone County, Missouri for replacement of a waterline along Scott Boulevard as part of the Scott Boulevard Phase 2 roadway improvement project. The form and content of the contract shall be substantially in the same form as set forth in "Attachment A" attached hereto.

SECTION 2. This ordinance shall be in full force and effect from and after its passage.

PASSED this _____ day of _____, 2013.

ATTEST:

City Clerk

Mayor and Presiding Officer

APPROVED AS TO FORM:

City Counselor

WATERLINE REPLACEMENT CONTRACT
(Scott Boulevard Phase 2)

THIS CONTRACT, made and entered into this ____ day of _____, 2013, by and between the CITY OF COLUMBIA, MISSOURI, a municipal corporation, herein after called "CITY," and CONSOLIDATED PUBLIC WATER SUPPLY DISTRICT NO. 1 OF BOONE COUNTY, MISSOURI, a Missouri public corporation, hereinafter called "DISTRICT:"

W I T N E S S E T H:

WHEREAS, the CITY has prepared plans for Road Improvements to be made in the Scott Boulevard road right-of-way (herein "Road Improvements"); and

WHEREAS, in connection with the aforesaid Road Improvements the parties desire to agree to the provisions contained herein in regard to replacing, relocating and abandoning portions of the existing waterlines of the DISTRICT.

NOW, THEREFORE, in consideration of the respective covenants of the parties and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the undersigned do hereby mutually agree as follows:

1. REPLACEMENT: That in connection with making the aforesaid Road Improvements the CITY shall at CITY'S expense perform the following work:

a) Relocate the existing six inch (6") waterline of the DISTRICT starting at the MKT Trail and extending southerly to Brushwood Lake Road; and

b) Install a new eight inch (8") waterline commencing at Brushwood Lake Road and extending southerly to the South edge of Mill Creek; and

c) Install appropriate disconnect devices at the East end and West end of the six inch (6") waterline of the DISTRICT which is to be abandoned on the South side of Brushwood Lake Road extending from

Scott Boulevard westerly to the existing six inch (6") waterline of the DISTRICT which runs in a north-south direction; and

d) Install appropriate disconnect devices at the ends of the waterlines of the DISTRICT which are to be abandoned extending from Brushwood Lake Road in a southerly direction to Mill Creek; and

e) Install appropriate disconnect devices where the existing two inch (2") waterline of the DISTRICT is to be abandoned on the South side of Vawter School Road extending from Scott Boulevard in an easterly direction to the existing water meter of the DISTRICT located at 3900 Vawter School Road, Columbia, Missouri.

The aforesaid work shall be performed in accordance with the plans attached hereto as Exhibit "A" and in accordance with the specifications attached hereto as Exhibit "B."

2. EASEMENTS: That concurrently with the execution of this Contract, CITY shall execute and deliver to DISTRICT the original copy of the Waterline Easement attached hereto as Exhibit "C" and made a part hereof.

That before commencing the aforesaid work, CITY shall procure execution of the original copy of each of the Easement for Utility Purposes attached hereto as Exhibit "D," Exhibit "E," Exhibit "F," Exhibit "G" and Exhibit "H" and record the same in the office of the Recorder of Deeds of Boone County, Missouri. CITY agrees that it will not execute any document terminating or amending any of the aforesaid easements before the work specified herein has been completed without the prior written consent of DISTRICT.

3. INSPECTION: CITY agrees to give to DISTRICT not less than seventy-two (72) hours prior written notice of CITY'S intention to perform work in replacing the aforesaid waterlines and DISTRICT shall have the right to have a representative present to inspect the replacement work as the same is being done.

4. DISTRICT COST: That the CITY shall pay to DISTRICT all engineering fees, attorney fees and other reasonable costs and expenses incurred by DISTRICT in connection with the matters referred to herein and CITY shall pay said amount to DISTRICT upon being furnished with an itemized list of said costs and expenses,

except concurrently herewith CITY shall pay to DISTRICT the sum of \$20,000.00 as partial payment of said costs and expenses and except the total amount of said costs and expenses shall not exceed the sum of \$35,000.00.

5. WATER SERVICE DISRUPTION: CITY agrees that in performing the aforesaid work CITY will perform said work in such a manner as to minimize the disruption of water service to the customers of the DISTRICT.

6. WATERLINE TESTING: DISTRICT will furnish water to the aforesaid waterlines in connection with flushing and testing said waterlines in accordance with the rules and regulations of the Missouri Department of Natural Resources.

7. OWNERSHIP: That upon completion of the aforesaid work in accordance with the provisions contained herein the aforesaid replaced waterlines shall be deemed transferred to and become the waterlines of the DISTRICT.

8. CORRECTIVE WORK: CITY shall promptly give DISTRICT written notice of when the Scott Boulevard project has been completed. CITY shall repair or replace at CITY'S expense any defective work or materials installed under this Contract which arise or become apparent within one (1) year after the completion of the aforesaid Road Improvements and in addition CITY shall perform such backfilling work, erosion control work and cleanup work which the DISTRICT determines is needed within one (1) year after the Road Improvements have been completed. CITY agrees to indemnify and hold DISTRICT harmless from any loss or damage arising out of or resulting from the failure of the CITY to perform when due its obligations under this paragraph provided that DISTRICT notifies CITY of such loss or damage within one (1) year of completion of the Scott Boulevard project.

9. ENFORCEMENT IN EQUITY: It is agreed that in the event of any controversy concerning the rights or obligations of the parties hereto under this contract, such rights or obligations may be enforceable in law or in equity, or both; provided however, such remedies shall be cumulative and not exclusive, and shall be in addition to any other remedies which the parties may have.

10. LITIGATION EXPENSES: In the event of any litigation between the parties in regard to the provisions of this contract, the prevailing party in said

litigation shall have the right to recover from the other party all reasonable litigation expenses including a reasonable attorney fee.

11. JURISDICTION AND VENUE: The jurisdiction and venue of any dispute under the terms of this contract shall be in the Circuit Court of Boone County, Missouri.

12. SUCCESSORS AND ASSIGNS: This contract shall be binding upon the parties hereto and their successors and assigns.

IN WITNESS WHEREOF, the parties have hereunto executed this contract the day and year first above written.

CITY:

CITY OF COLUMBIA, MISSOURI

BY: _____
MIKE MATTHES, City Manager

ATTEST:

SHEELA AMIN, City Clerk

APPROVED AS TO FORM:

NANCY THOMPSON, City Counselor

DISTRICT:

CONSOLIDATED PUBLIC WATER SUPPLY
DISTRICT NO. 1 OF BOONE COUNTY,
MISSOURI

BY: Jerome Glascock
JEROME GLASCOCK, President

ATTEST:

Janet Sears
JANET SEARS, Clerk

STATE OF MISSOURI)
) SS.
COUNTY OF BOONE)

On this _____ day of _____, 2013, before me appeared MIKE MATTHES, to be personally known, who, being by me duly sworn, did say that he is the City Manager of the City of Columbia, Missouri, and that the seal affixed to the foregoing instrument is the corporate seal of the City and that this instrument was signed and sealed on behalf of the City by authority of its City Council and the City Manager acknowledged this instrument to be the free act and deed of the City.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in Columbia, Missouri, the day and year first above written.

Notary Public

My commission expires:

STATE OF MISSOURI)
) SS.
COUNTY OF BOONE)

On this 28th day of October, 2013, before me appeared JEROME GLASCOCK, to me personally known, who, being by me duly sworn, did say that he is the President of CONSOLIDATED PUBLIC WATER SUPPLY DISTRICT NO. 1 OF BOONE COUNTY, MISSOURI, a Missouri public corporation, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors and the said President acknowledged said instrument to be the free act and deed of said corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in Columbia, Missouri, the day and year first above written.



Notary Public

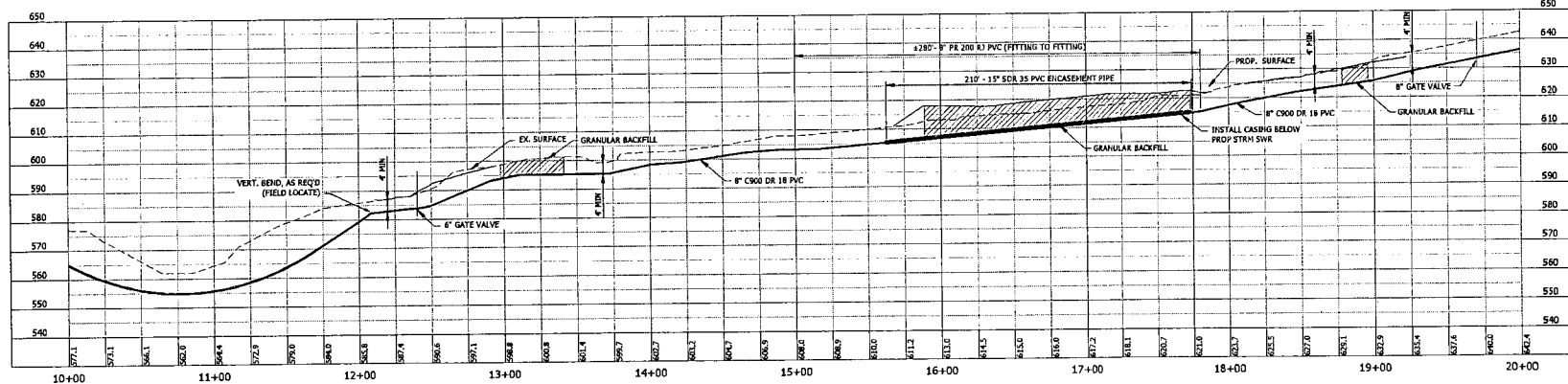
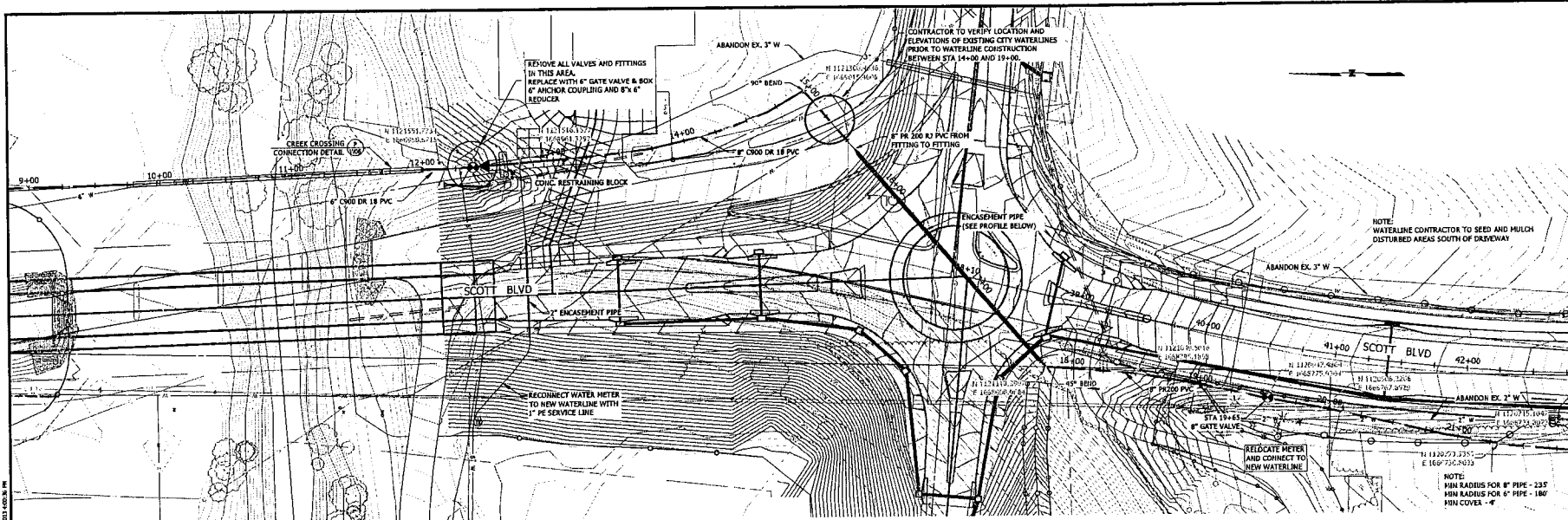
My commission expires:

3-21-2014



I hereby certify that the above expenditure is within the purpose of the appropriation to which it is charged, Account No. 440-8800-528.49-90, C00319, and that there is an unencumbered balance to the credit of such appropriation sufficient to pay therefor.

John Blattel, Finance Director



WATERLINE STATIONING

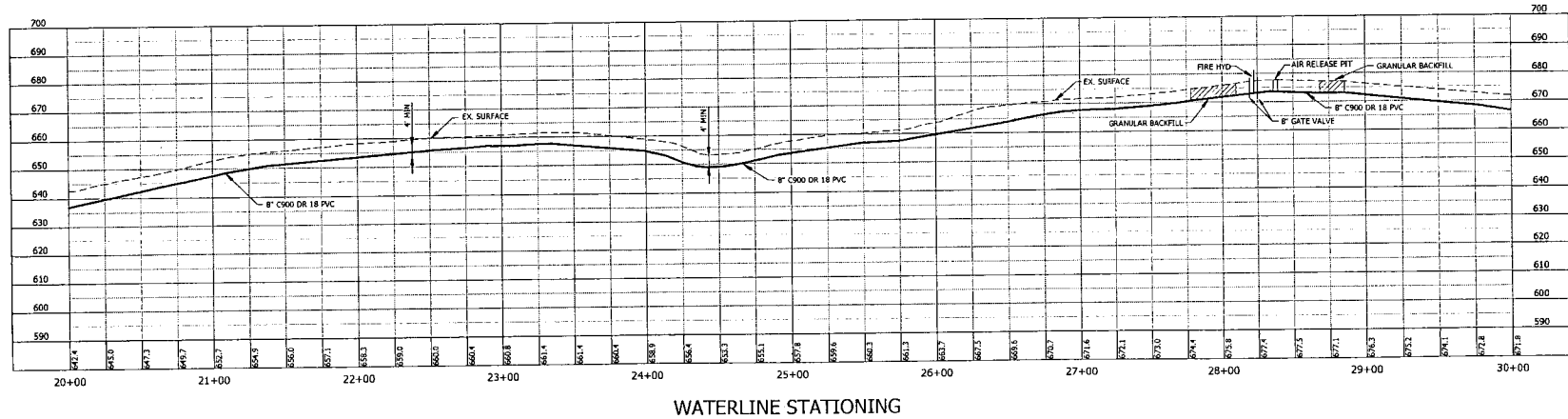
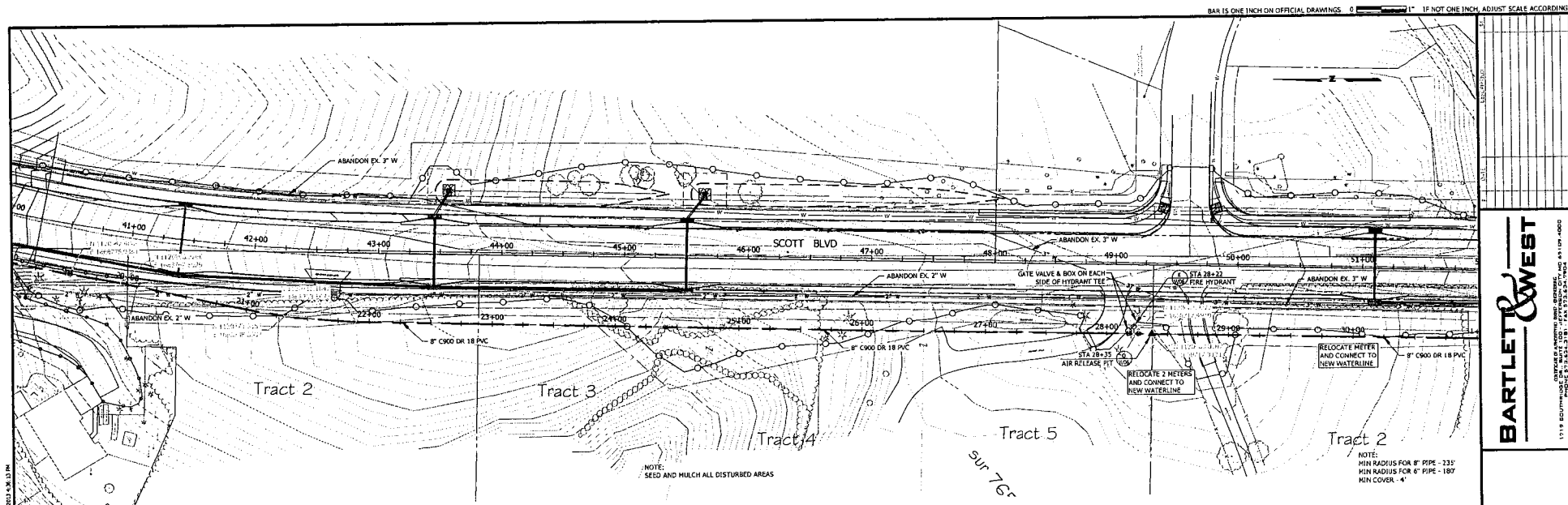
BARTLETT & WEST

WATERLINE PLAN & PROFILE
STA 10+00 - 20+00

SCOTT BLVD PH 2 WATERLINE REPLACEMENT
PROJECT NO. 2009-045
CPWSD NO. 1 OF BOONE COUNTY, MO



DESIGNED BY: KA
DRAWN BY: KA
APPROVED BY: KA
DATE: AUG 2011
DRAWING NO: WO
SHEET NO: 2 of 2



BARTLETT & WEST

WATERLINE PLAN & PROFILE
STA 20+00 - 30+00

SCOTT BLVD PH 2 WATERLINE REPLACEMENT
PROJECT NO. 2009-046

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| SEALED DATE: | 8-1 |
| DESIGNED BY: | |
| DRAWN BY: | |
| APPROVED BY: | |
| DESIGN PROJ: | 16965 |
| DATE: | AUG 2 |
| DRAWING NO: | WC |
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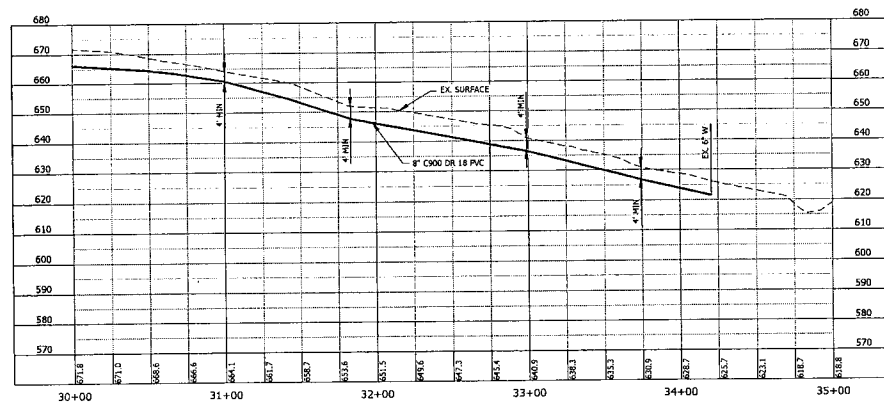
DESIGNED BY:

APPROVED BY

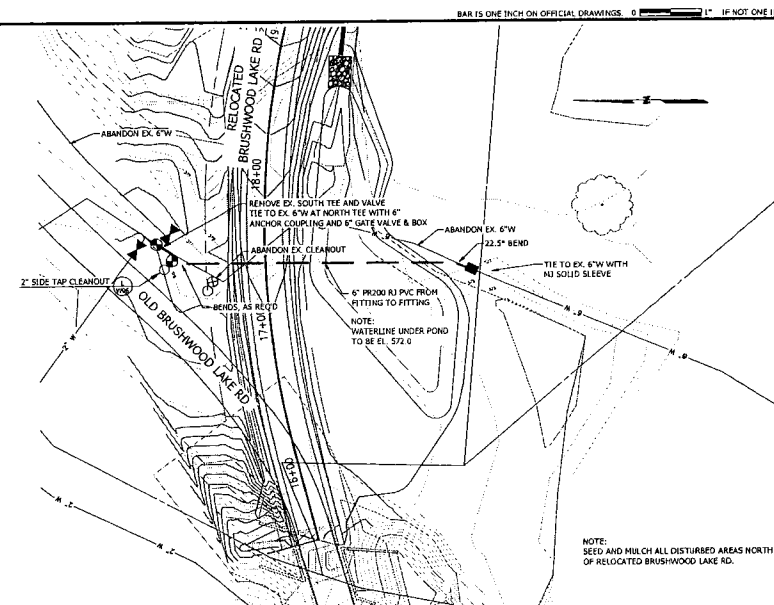
DESIGN PROJ

DATE _____
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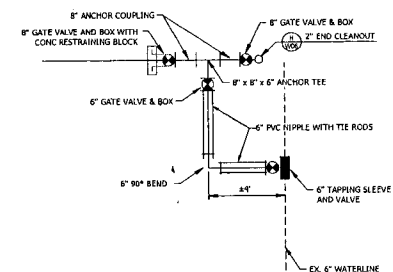
SHEET 1 OF 1



WATERLINE STATIONING



DETAIL 4.1



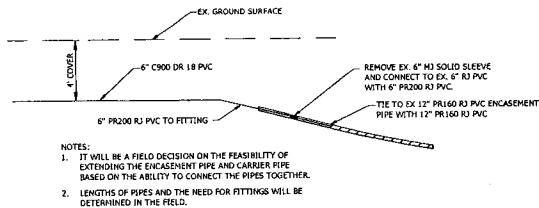
WATERLINE PLAN & PROFILE
STA 20+00 - 30+00

**SCOTT BLVD PH 2 WATERLINE REPLACEMENT
PROJECT NO. 2009-046**

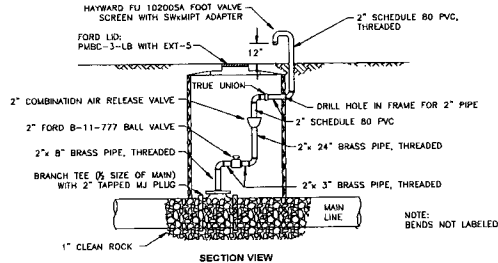
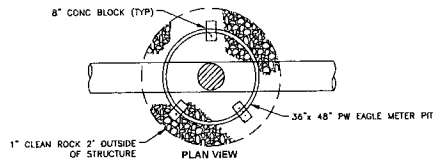


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| SEALED DATE: | 8- |
| DESIGNED BY: | |
| DRAWN BY: | |
| APPROVED BY: | |
| DESIGN PROJ. | 16965 |
| DATE: | AUG |
| DRAWING NO: | W |
| SHEET NO. | 4 of |

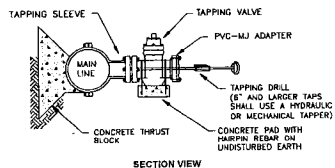




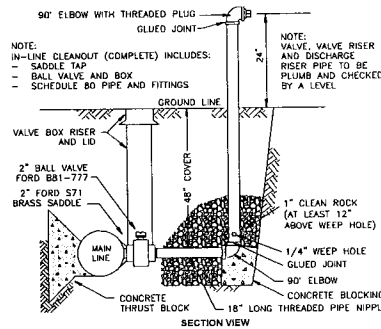
CREEK CROSSING CONNECTION DETAIL (P)



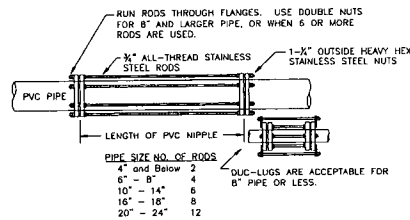
AIR RELEASE PIT DETAIL (Q)



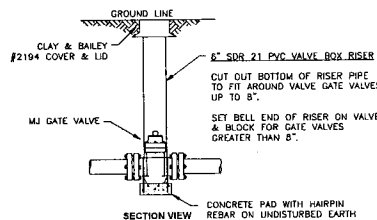
TAPPING SLEEVE AND VALVE ASSEMBLY (R)



2" SIDE TAP CLEANOUT DETAIL (L)

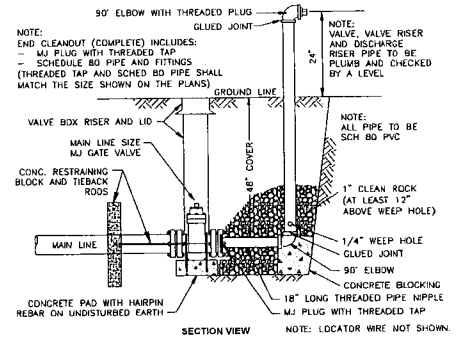


TIEBACK ROD DETAIL (M)

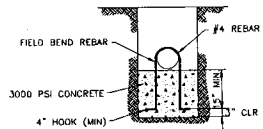


- GENERAL NOTES:
- ANCHOR COUPLING OR PVC PIPE WITH TIEBACK RODS WILL BE REQUIRED BETWEEN VALVE AND FITTINGS.
 - WRAP VALVE AND JOINTS WITH VISQUEEN.
 - VALVE AND RISER SHALL BE PLUMB AND CHECKED BY A LEVEL.

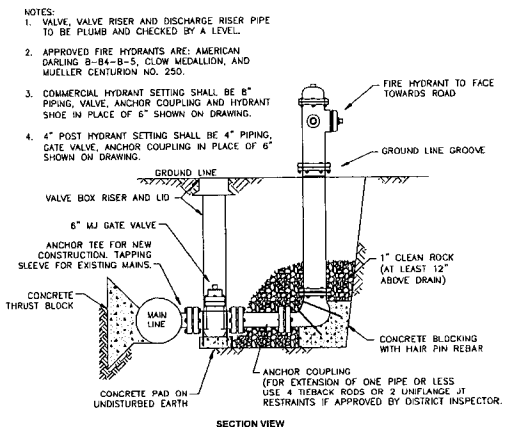
GATE VALVE AND BOX DETAIL (N)



TYPICAL END CLEANOUT DETAIL (H)



HAIRPIN REBAR SECTION (J)



FIRE HYDRANT ASSEMBLY DETAIL (K)

SECTION 02512

CPWSD WATERLINE CONSTRUCTION

1. GENERAL

1.1 SCOPE

The work included in these specifications consists of the construction of a new water system. The work consists of the complete and satisfactory construction, testing and sterilization of the system, ready for use as shown and specified. Construction plans indicate all work that is to be performed.

The work includes the furnishing of all materials, tools, and equipment to install new water pipe, fittings, valves, valve covers, hydrants, meters and all incidental and miscellaneous work necessary to complete the project.

1.2 SUBMITTALS

Contractor shall submit to the District for review all materials proposed for the project, including pipe, valves, fire hydrants, fittings, and other items. Gravel, concrete, asphalt and seeding does not have to be submitted, but will be approved by the District Inspector prior to installation.

2. TRENCH EXCAVATION & BACKFILL

2.1 CONSTRUCTION STAKING

The Contractor by or under the direct supervision of a Registered Land Surveyor in the State of Missouri will stake water lines, hydrants, structures, etc. shown on the drawings. Service meter pits and service connections to mains will be field determined by the District Inspector.

2.2 SITE PREPARATION

- A. Contractor shall remove trees, bushes, tree stumps, roots, debris, and other vegetation, as required for installations.
- B. Contractor shall remove pavement, road surfacing, junk and structures.
- C. Contractor shall mark adjacent property, fences, trees, and structures that are to be protected.
- D. All salvageable materials, as determined by the District Inspector, shall be set aside for District pickup. All non-salvageable materials shall be removed from the site and properly disposed by Contractor.

2.3 UNDERGROUND UTILITY LOCATIONS

The Contractor shall comply with Sec. 319.015 - 319.050 RS MO and shall proceed with caution in the excavation and preparation of the trench so that the exact location of underground structures, both known and unknown, may be determined, and he shall be held responsible for the repair of such structures when broken or otherwise damaged because of carelessness on his part.

The actual location of existing utilities is the sole responsibility of the Contractor. Those shown on the plans are given to call particular attention to areas of special concern. Contractor shall contact one call (1-800-DIG-RITE), as well as individual utilities as necessary to insure all utilities are located in the field prior to construction.

2.4 SEPARATION OF WATER MAINS, SANITARY SEWERS AND STORM SEWERS

A. General

The following factors should be considered in providing adequate separation prior to trench excavation as required by Missouri Department of Natural Resources:

1. Materials and type of joints for water and sewer pipes.
2. Soil conditions.
3. Service and branch connections to the water main and sewer line.
4. Compensating variations in the horizontal and vertical separations.
5. Space for repair and alterations of water and sewer pipes.
6. Off-setting of pipes around manholes.

B. Parallel Installation

Water mains shall be laid at least 10 feet horizontally from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten-foot separation, the District may allow deviation on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer and on either case, at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer. In areas where the recommended separations cannot be obtained, either the waterline or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing.

C. Crossings

Water mains crossing sewers shall be laid to provide a minimum vertical clear distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. At crossings, the full length of water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required. In areas where the recommended separations cannot be obtained, either the waterline or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing no less than ten feet on both sides of the crossing.

D. Exception

The Department of Natural Resources must specifically approve any variance from the requirements of this Section, Subsections B and C, above, when it is impossible to obtain the specified separation distances.

E. Force Mains

There shall be at least a ten-foot horizontal separation between water mains and sanitary sewer force mains, and they shall be placed in separate trenches. There shall be an 18-inch vertical separation at crossings as required in this Section, Subsection C. In areas where these separations cannot be obtained, either the waterline or the sewer line shall be encased in a continuous joint-less pipe.

F. Sewer Manholes

No waterline shall be located closer than 10 feet to any part of a sewer manhole.

G. Disposal Facilities

No waterline shall be located closer than 25 feet to any on-site wastewater disposal facility, agricultural waste disposal facility, or landfill.

2.5 PIPE TRENCH EXCAVATION

A. Excavation Method

The Contractor shall use a backhoe or excavator to dig the trench. A trencher type excavation machine may be used as approved by the District. In yards with sod or turf type surfaces, the operator shall take special care and remove excavated materials without removing additional turf beyond the trench.

B. Depth of Pipe

Minimum depth of cover over pipe shall be forty-eight inches (48") as measured from the final ground level to the nearest surface of the pipe. Greater depths will be required to make smooth transitions at points of abrupt changes in the ground surface. Extra depths may be required under highways, railroads, and streams. These extra depth conditions will conform to the requirements as shown on the drawings, and as required by other agencies involved.

C. Trench Width

The width of the trench shall be ample to permit the pipe to be laid and jointed properly, and the backfill to be placed and compacted as specified. Trenches shall be of such extra width, when required, as will permit the convenient placing of timber supports, sheeting and bracing and handling of fittings. Minimum trench widths are shown on the plans.

D. Shoring

Open cut trenches shall be sheeted and braced as required by any governing federal or state law, municipal ordinances, and as may be necessary to protect life, property, or the work. Where sheeting and bracing are used, the trench width shall be increased accordingly. Trenches shall be kept free from water and pipe shall not be laid in water or on soggy material.

Temporary support, adequate protection, and maintenance of all underground and surface structures, drains, sewers, and other obstructions encountered in the progress of the work shall be furnished by the Contractor at his expense and under the direction of his Engineer. Any structures that have been disturbed shall be restored upon completion of the work.

E. Removal of Pavement

The Contractor shall remove pavement and road surfaces as a part of the trench excavation, and the amount removed shall depend upon the width of trench specified for the installation of the pipe and the width and length of the pavement area required to be removed for the installation of valves, specials, manholes, or other structures. The width of pavement removed along the normal trench for the installation of the pipe shall not exceed the width of the trench specified by more than 6" on each side of the trench. The width and lengths of the area of pavement removed for the installation of appurtenances shall be equivalent to those for the associated pipeline or 6" wider than the appurtenance (whichever is greater). Wherever, in the opinion of the District Inspector, existing conditions make it necessary or advisable to remove additional pavement, the Contractor shall remove it as directed by the District Inspector and shall receive extra compensation therefore, provided such additional work is not shown in the drawings or specified. The Contractor shall use such methods, such as drilling, chipping, or sawing as will assure the breaking of the pavement along straight lines. The face of the remaining pavement shall be approximately vertical.

F. Protection of Property

All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Roadway gutters shall be kept clear or other satisfactory provisions made for street drainage. Natural watercourses shall not be obstructed.

Trees, shrubbery, fences, poles, and all other property and surface structures shall be protected unless their removal is shown on the drawings or authorized by the District Inspector. When it is necessary to cut roots and tree branches, such cutting shall be done under the supervision and direction of the District Inspector.

G. Stream Crossing

When crossing watercourses greater than 15 feet in width, the following shall be provided per Missouri Department of Natural Resources:

1. Flowing Streams

- a) Restrained joint pipe shall be used for open cut crossings and encased in a welded steel casing. Restrained joint pipe shall be used for bored crossings.
- b) Valves shall be provided at both ends of water crossings so that the section can be isolated for testing or repair; the valves shall be easily accessible and should not be subject to flooding; a Water Sampling Station shall be installed at the valve closest to the supply source in an accessible location.
- c) Water Sampling Stations shall have permanent taps on each side of the valve to allow insertion of a small meter to determine leakage and for sampling purposes.
- d) The stream crossing pipe or casing shall extend at least 15 feet beyond the upper edge of the stream channel on each side of the stream.

2. Intermittent Flowing Streams

- a) Restrained joint pipe shall be used for all stream crossings;
- b) The pipe shall extend at least 15 feet beyond the upper edge of the stream channel on each side of the stream.

3. Culverts and Ditches

Waters lines under ditches, outflows of culverts, and other places which have or could exhibit severe cutting or erosion shall be encased as indicated in the drawings. Encasement shall be placed at such points as located on the drawings. The Engineer or District Inspector may require additional locations to be encased. Extra compensation will be allowed for such additional work.

H. Barricades, Guards, & Safety Provisions

To protect persons from injury and to avoid property damage, adequate barricades, construction signs, torches, red lanterns, and guards, as required shall be placed and maintained during the progress of the construction work and until it is safe for traffic to use the highway. All material piles, equipment, and pipe that may serve as obstructions to traffic shall be enclosed by fences or barricades and shall be protected by proper lights when the visibility is poor. Safety rules and regulations of local authorities shall be observed.

I. Maintenance of Traffic & Closing of Streets

The Contractor shall carry on the work in a manner that will cause the least interruption in traffic and may close to through travel not more than two consecutive blocks, including the cross street intersected. The Contractor shall provide suitable bridging over the trench where traffic must cross open trenches.

The Contractor shall post suitable signs indicating that a street is closed and necessary detour signs for the proper maintenance of traffic. All signage will meet the Manual of Uniform Traffic Control Devices (MUTCD). Adequate signage will be required in the Work Zone.

2.6 BEDDING

A. General

The bedding material shall be placed in the bottom of the trench prior to placement of the pipe. The bedding below the pipe shall provide continuous and uniform bearing for the pipe except at the bell or joints at which a hole shall be dug to prevent the end from bearing. From the bottom of the trench to a depth of one foot above the top of the pipe, the trench bedding shall be placed around the pipe by shovel slicing or other means so that voids are eliminated. Bedding material around the pipe shall be thoroughly tamped to provide uniform and continuous bearing. The material shall be consolidated to 90% Standard Proctor. The Contractor shall use special care in placing bedding material to avoid damage or movement of the pipe. Frozen material will not be allowed for bedding.

B. Poor Soil

Where the bottom of the trench at subgrade is found to be unstable or to include ashes, cinders, refuse, vegetable or other organic material, or large pieces or fragments of inorganic material that will not provide adequate long term support, the Contractor shall excavate any such unsuitable material. Replaced material in the overdig area shall be thoroughly compacted with acceptable earth excavation or granular material, as approved by the District Inspector.

C. Rock

Rock ½ inch or larger shall be not be used in the bedding.

2.7 BACKFILLING

A. General

Backfill material shall be placed above the pipe bedding to the top of the trench with excavated material. The backfill shall be neatly rounded over the trench to a sufficient height to allow for settlement to grade after consolidation to make the earth surface conform as nearly as possible to the original condition. Backfilling material shall be deposited in the trench for its full width on each side of the pipe, fittings, and appurtenances simultaneously. Backfilling by machine methods will be allowed, if overseen by laborers to watch for rock, improper backfill material, and damage to pipe.

The replacement of backfill material into the trench shall be accomplished by running equipment parallel to the trench. The process of running equipment perpendicular to the trench to push backfill into the trench is prohibited.

Laborers following behind the backfill operation shall be using a shovel to remove remaining small amounts of earth from turf so that the work areas (not the trench area) will be restored to their original condition the day the excavation occurs.

The Contractor may backfill with excavated material where backfill material is not indicated on the drawings or specified. If excavated material is unsuitable for backfill as determined by the District Inspector, the Contractor shall provide approved material to backfill the trench.

If the excavated material consists of sand or loam or clay which has been excavated in a manner to eliminate lumps or clods (e.g. excavation by a trenching machine), the trench may be backfilled by means of a road grader or similar device, which will gently roll the material into the trench by multiple passes parallel to the trench.

Where additional trench settlement occurs, refilling shall be required to bring the surface to conform to the adjacent ground.

B. Backfill under Permanent Pavement

Where the excavation is made through permanent pavements, curbs, driveways, or sidewalks, or where such pavements are undercut, the entire trench shall be backfilled to the subgrade of the pavement with sand or granular backfill material. Backfill shall be compacted to 90% of the maximum Standard Proctor for the material. Backfill in trench shall not exceed 8" lifts.

C. Backfill under Private Gravel Drives

Walks and driveways consisting of broken stone, gravel, slag, or cinders shall be backfilled and compacted with suitable excavated material. If excavated material is not suitable or as directed by the District Inspector, the trench shall be backfilled and compacted with 1" surface rock. The top 12" of backfill shall match the existing aggregate.

D. Backfilling around Structures

Compacted backfill will be required around valve boxes, fire hydrants and other items, which project to ground, surface to insure continuity of proper alignment.

E. Backfilling in Freezing Weather

Backfilling will not be allowed in freezing weather except as approved by the District Inspector. No fill shall be made where the material already in the trench is frozen, and in no instances shall frozen material be used in the backfill.

F. Excess Excavated Material

Excess excavated materials from trenches located in open fields shall be uniformly distributed within the construction limits. Excess excavated materials within streets, driveways, parkways, highways and roads not required for backfilling or grading shall be removed from the site.

3. PIPE, JOINTS AND FITTINGS

3.1 GENERAL

- A. Each pipe shall be clearly marked indicating thickness class, net weight of pipe without lining, and name of manufacturer. The Certificate of Conformance shall in effect state the material is PVC 1120 and meets the requirements of ASTM D2241-65 or latest revision thereof.
- B. The same type of joint shall be used throughout the project for a particular type of pipe, unless otherwise specified.
- C. Pipe shall be installed according to the manufacturer's recommendations and these specifications.

3.2 REFERENCES

| | |
|--|----------------------|
| Gray Iron Castings for Valves, Flanges and Pipe Fittings | ANSI/ASTM A126 |
| Rigid Poly Vinyl Chloride (PVC) Compounds | ANSI/ASTM D1784 |
| Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings | ANSI/ASTM D2564 |
| Ductile Iron and Gray-Iron fittings | ANSI/AWWA C110 |
| Elastomeric Seals (gaskets) for Joining Plastic Pipe | ASTM F477, D3139 |
| Polyvinyl Chloride (PVC) Pressure Pipe | ANSI/AWWA C900, C905 |
| Standard for Molecular Oriented Polyvinyl Chloride | AWWA C909 |
| Practice for Making Solvent-Cemented Joints with Poly-Vinyl Chloride (PVC) Pipe and Fittings | ASTM D2855 |

3.3 PIPE

| | |
|------------------------------|--|
| A. Ductile Iron Pipe | ANSI/AWWA C150/A21.50; C151/A21.51; C115/A21.15 Class 50, except as otherwise specified; cement lined and sealed meeting ANSI/AWWA C104/A21.4. |
| B. PVC Pipe | ASTM 2241 IPS pressure rated pipe, AWWA C900, AWWA 905, AWWA 909, Schedule 40 & 80 meeting ASTM D 1785 NSF Standard 14 and CSA Standard B137.3 |
| C. PVC Restrained Joint Pipe | ASTM D2241, C900RJ, or C905RJ |
| Integral Bell | Machining matching grooves in the pipe and coupling or bell with a nylon spline inserted into the groove. Couplings may be used, only as approved by the District Inspector. |
| D. Polyethylene Service Pipe | ASTM D2239 and PE 3408, SDR-7 pressure rated for 200 psi |
| Service Line Size | 3/4" size short side connection to meter 1" size under roadways to meter 2" size under roadways to double meters |
| E. Copper Pipe | ASTM B88 "Type K" with no splice under pavement. |
| Coupling | |
| Copper to Copper | Ford pack joint |
| PE to Copper | Ford pack joint with stainless steel insert |
| PVC to Copper | Schedule 80 PVC Nipple 12 inches long inserted into the pack joint and the other end is coupled with a standard PVC rubber ring coupling. |
| F. Brass Pipe | ASTM B43 for red brass pipe |

3.4 CASING PIPE

| | |
|-------------------------|---|
| PVC Pipe | |
| 8 inch through 15 inch | SDR 26 per ASTM D3034, or ASTM 2241 |
| 18 inch through 27 inch | ASTM F789 PS 115, or equivalent pipe stiffness. |
| Joint | Bell and spigot meeting ASTM D3212 if open cut construction, or restrained joint pipe if bored. |
| Rubber Gasket | ASTM F477. Solvent weld or non-gasket friction joints are not acceptable. |

Steel Pipe

| | |
|----------------|--|
| Yield Strength | 35,000 psi conforming to ASTM A53-B |
| Thickness | As defined in the project requirements or authorizing permit agency |
| Length | Random lengths of pipe may be used, but all ends must be V grooved-butt welded around the complete perimeter to adjacent pipe. |
| Welds | Water tight and equal to or stronger than pipe |

HDPE Pipe

| | |
|-------|---|
| | PE 3608/4710 DR 11 High Density Polyethylene meeting ASTM F 714, AWWA C906 |
| Size | DIPS or IPS are acceptable based on the required clearance of the casing spacer, carrier pipe size and required minimum clearance as defined in this specification section. |
| Joint | ASTM D 3261 Heat Fusion in conformance to PPI-TR-2. Remove excess material (burrs) on outside of pipe. Remove inside burrs. |

Fusible PVC Pipe

| | |
|-------|---|
| | Fusible pipe to meet AWWA C900 and AWWA C905 based on pipe size |
| Pipe | ASTM 2241 or ASTM D1785, as applicable. |
| Size | As shown on the plans, or acceptable size based on the required clearance of the casing spacer, carrier pipe size and required minimum clearance as defined in this section. |
| Joint | Butt-fused heated joint, as required by manufacturer and in conformance to PPI-TR-2. Burst test of fused sections per ASTM D1599. Remove excess material (burrs) on inside of pipe. |

3.5 PIPE JOINTS

A. General

The coupling-joint system shall have been tested and approved by the National Sanitation Foundation and certification of said approval shall be submitted.

Pipe ends shall be clean and smooth. Pipe lengths shall be such that a space is left between pipe ends of not less than ¼ inch or more than 1 inch. Pipe shall have a ring painted around the spigot end in such a manner as to allow field checking of setting depth of pipe in socket.

If manufacturer's design is such that excessive homing of pipe is detrimental, then two rings shall be required to meet tolerances. Contractor shall back pipe up to maintain position required.

The manufacturer shall furnish drawings of the joint and gasket. The dimensions of the bell, socket, and plain end shall be in accordance with the manufacturer's standard design dimensions and tolerances. Such dimensions shall be gauged at sufficiently frequent intervals to assure dimensional control and satisfactory joint assembly.

No contaminated material or any material capable of supporting prolific growth of microorganisms shall be used for sealing joints. Packing material shall be handled in such a manner as to avoid contamination. Packing materials must conform to AWWA Standards.

B. PVC Pipe Joints

| | |
|---------------|--|
| Push-on Joint | ASTM Spec D3139. Bell end shall have tapered socket to create an interference type fit, as defined in ASTM D2672 |
| Gasket | Elastomeric Seals meeting ASTM F-477 |

C. Ductile Iron Pipe Joints

| | |
|--------------------------|--|
| Mechanical Joint | ANSI/AWWA C111/A21.11. Mechanical joint ductile iron fittings shall be used for all pipe sizes greater than 2". Oversize (transition) gasket for use in ductile iron fittings will be acceptable |
| Push-on Joint | ANSI/AWWA C111/A21.11, except gaskets shall be neoprene or other synthetic rubber. Natural rubber will not be acceptable. |
| Restrained Push-On Joint | Pipe with restrained push-on joint shall be capable of being deflected to 4° after assembly for pipes 12" in diameter and smaller. US Pipe TR Flex, Griffin Snap-Lok or approved equal. |
| Flange | ANSI/AWWA C110/A21.10, C115/A21.15, ANSI B16.1, B16.5 |
| Steel Flange | U.S. Pipe "Flange-Type" ASTM C207 |
| Bolt | ASTM A307 chamfered or rounded ends projecting ¼ to ½ inch beyond outer face of nut. |
| Nut | ASTM A307 hexagonal, ANSI B18.2, heavy semi-finished pattern |
| Gasket | ANSI/AWWA C111/A 21.11 and ASTM D1330, Grade I, red rubber, ring type, 1/8 inch thick; or U.S. Pipe "Flange-Tyte" 1/8 inch thick. |
| Packing Material | Yarning or packing material shall consist of molded or tubular rubber rings. |

D. Uni-Flange Pipe Restraint

| | |
|----------------------|---------------------------------------|
| PVC Pipe Barrel | Ford Meter Box Co., Series UFRCS 1300 |
| PVC Pipe Bell Joints | Ford Meter Box Co., Series UFRCS 1390 |

| | |
|--|---|
| E. Ductile Iron Lugs | ASTM A 536 for ¾" rods. |
| 3.6 FITTINGS | |
| A. Ductile Iron Fittings | |
| General | ANSI/AWWA C110/A21.10, and to be compact type meeting ANSI/AWWA C153/A 21.53; 350 psi rated Cement lined and sealed meeting ANSI/AWWA C104/A21.4, and bituminous coating for outside pipe per manufacturer's standard. |
| Sleeves/Adapters | |
| DI to DI | Mechanical joint solid sleeve |
| DI to Steel or galvanized | Mechanical joint solid sleeve with sleeve size changed to accommodate pipe OD. |
| DI to IPS | Mechanical joint solid sleeve with PVC transition gasket. |
| IPS to Steel | Mechanical joint solid sleeve |
| AC to IPS | Hymax 2000 as manufactured by Total Pipe Solutions, Inc. |
| Anchor Coupling | Fast Fabricators, Inc. or equal. |
| Tapped Fitting | Threaded, tapered. Used on tees and plugs. |
| B. Brass Fittings | Ford Brass Fittings meeting ASTM B-62 |
| Polyethylene To Brass | Ford Fitting - stab type compression fitting with Reverse Taper |
| C. Plastic Fittings | |
| PR 200 (< 4" size) | ASTM D 3139 NSF approved and marked, and used only with Water District approval. |
| Schedule 40 & 80 Solvent Weld Threaded End Gasket Bell | ASTM D1784 ASTM D2467 ASTM D2464 ASTM D3139 |
| D. Tapping Saddle | |
| To Ductile Iron Pipe | Ductile iron with stainless steel wrap-around and rubber sealing gasket; 250 psi pressure rating |
| To Ductile Iron Pipe with Corp Stop | Ford Ductile Iron Saddle F202 |
| To PVC Pipe | Ford Brass Saddle S71 for all sizes |
| To PE Pipe | Ford Brass Saddle S41 |
| E. Tapping Sleeve | |
| Material | Type 304 Stainless Steel |

| | |
|--------------|---|
| MJ outlet | One-piece casting having a plain end and a mechanical joint gland TIG and MIG welded a full 360 degrees; Type 304 Stainless Steel Flange. |
| Gasket | Mechanical Joint Outlet Gasket, Branch Sealing Gasket, and Complete Circle Gasket attached to the sleeve at the factory. |
| Drop-In Bolt | Square Neck Track-Head bolts with a minimum of two (2) longer starter bolts. Minimum quantity of drop-in bolts and mechanical joint outlet bolts per outlet diameter shown below. |

| Outlet Diameter (inch) | Drop-In Bolts (Quantity) | MJ Outlet Bolts (Quantity) |
|---------------------------|-----------------------------|-------------------------------|
| 2 | 8 | 2 |
| 3 | 8 | 4 |
| 4 | 10 | 4 |
| 6 | 10 | 6 |
| 8 | 16 | 6 |
| 10 - 12 | 20 | 8 |
| 14 - 16 | 36 | 12 |

F. Polyethylene Wrap

| | |
|---------------|---|
| Material | 8-mil thick Class C (Black) conform to ANSI/AWWA C105 |
| Adhesive Tape | 2 inches wide and plastic backed, capable of bonding securely to metal surfaces and/or polyethylene material. |

4. VALVES, STRUCTURES and APPURTENANCES

4.1 VALVES

| | |
|-----------------|---|
| Gate Valve | Encapsulated Wedge non-rising stem; triple "O" Ring Seal and conforming to AWWA Specification C509. |
| Joint | Mechanical joint with 200 psi design working pressure and have resilient seats. |
| Operator | 2" square operating nut opening counter clockwise. |
| Coatings | Protective epoxy interior coating according to AWWA C550. |
| Setting | Set vertical and in true alignment where shown on plans and construction details |
| Butterfly Valve | Mechanical joint Rubber-Seated Butterfly Valves M & H style 450 & 4500 conforming to AWWA C504, or equal. |
| Operator | Horizontal hex shaft, underground operator with 2" nut; closure turns similar to like size gate valve |

| | |
|------------------|---|
| Coatings | Protective epoxy interior coating according to AWWA C550. |
| Ball Valve | Ford B-87, Ford B11 and Ford B-81 with C87 pack joint, or equal. |
| Body | There shall be top and port O ring seals, and top anti-friction washer and bottom low friction plastic bearing insert with screwed ends |
| Operator | Tee head with removable plug for in-line repair. |
| Optional Body | Bronze body with Tee head, double O ring stem seals, molded Buna N rubber port seals and ball seats, full round opening ball with screwed ends. |
| Corporation Stop | Ford F1100 meeting AWWA Specification C800-55. Corporation stops for service lines shall be size 3/4" x 3/4", unless otherwise specified. |

4.2 VALVE BOX

| | |
|------------|---|
| Riser Pipe | 6" PR 200 PVC |
| Cover | Clay and Bailey No. 2194 cover and ring |

4.3 FIRE HYDRANT

Fire hydrants shall be American Darling B-84-B-5, Clow Medallion, or Mueller Centurion No. 250. Hydrant shall be self-draining, non-rising stem, nozzle threads meeting National American Standard Fire Hose Specs with caps and no chains.

Fire hydrants shall be factory applied red paint, have operating threads that are sealed and lubricated, the 1½" pentagonal operating nut shall open counterclockwise.

Hydrants shall be set for standard pipe burial depth unless shown otherwise on the plans. The hydrant gate valve and barrel shall be vertical and plumb.

4.4 AUTOMATIC FLUSHING UNIT

Automatic flushing unit shall be Kupferle 9400-A or approved equal, and shall be constructed and meet the requirements as shown in the construction details.

4.5 CLEANOUT

Cleanouts shall be constructed as shown in the details. All cleanouts shall be connected to a gate or ball valve; have proper thrust blocking, be self-draining with weep hole and rock; the riser shall be set plumb and left approximately 2' above ground, where practical.

Temporary cleanouts for testing shall be constructed of the material and size of the new water line for purposes of pigging the line. Once completed the cleanout piping will be removed.

4.6 AIR RELEASE VALVE

Air release valves shall be installed in pits as shown on the plans. The air release valve shall be a combination air valve Model D-040 as manufactured by A.R.I., Model 202 as manufactured by Val-Matic or approved equal.

4.7 SERVICE METER & PIT

| | |
|------------|---|
| Pit Setter | Ford Plastic PFBHC-248-18-28 for ¾" service (short-set) Ford Plastic PFBHC-288-18-28 for 1" service (road crossings) |
| Dimensions | 18" inside diameter, 30" pit depth |
| Lid | Ford 2380-01-1012 |
| Ring | Ford 2210-01-6050 |
| Meter | Neptune Model T10 AMR |

5. INSTALLATION

5.1 PIPES, FITTINGS, AND STRUCTURES

Pipe shall be of sizes indicated on the drawings and laid to the lines indicated thereon, in accordance with these specifications

Pipe interiors shall be thoroughly cleaned of all foreign matter before lowering into trench.

All pipe, fittings, valves, hydrants, and accessories shall be carefully lowered into the trench with suitable equipment in a manner that will prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.

All ductile iron materials shall be wrapped in a polyethylene encasement.

A. Pipe Placement

Each section of pipe shall rest upon the pipe bedding for its full length with recesses excavated at joints. Bell holes for pipe 8 inches and larger shall be excavated by hand. Any length that has had its line, grade or joint disturbed after laying shall be taken up and relaid. Under no circumstances shall pipe be laid in water nor when trenches or weather conditions are unsuitable for such work, unless otherwise directed by the District Inspector. Any section of pipe already laid but found damaged or defective shall be replaced with new pipe at no additional expense to the Owner. Any pipe that has floated shall be re-laid, or as directed by the District Inspector.

Pipe shall be cut square by the aid of miter box, when field cutting pipe. The cut end which will be inserted into a socket shall be beveled with a milled curved-tooth flat file or other approved device. A factory pipe end shall be used as a guide to determine the bevel. Mark a stop guide on the pipe by use of a pencil or crayon to provide visual observation for proper insertion depth.

A rubber gasket shall be placed in the annular recess of the pipe or fitting socket with a lubricant that is water-soluble, non-toxic, non-objectionable in taste and odor, non-supportive of bacteria growth, and have no deterioration effect on the PVC or rubber gaskets. Lubricant containers shall be labeled with the trade name or trademark of lubricant manufacturer or pipe manufacturer. The lubricant shall be suitable for use in potable water. It shall be delivered to the job in enclosed containers and shall be kept clean.

The plain end adjoining pipe shall be thrust into the pipe socket, compressing the gasket uniformly around the pipe to form a positive seal. The gasket and the annular recess shall be so designed and shaped that the gasket is locked in place against displacement as the joint is assembled. Details of the joint design and assembly shall be in accordance with the joint manufacturer's standard practice.

Pipe may be furnished with a socket as an integral part of each piece of pipe or a coupling type socket with rubber gasket on each side may be provided. Ends of pipe intended to be inserted into a socket shall be factory beveled.

Pipe shall be kept clean after placement in the trench. Precautions shall be taken to protect pipe interiors, fittings, and valves against contamination. Pipe delivered for construction shall be strung so as to minimize entrance of foreign material. When pipe laying is not in progress, as, for example, at the close of the day's work, all openings in the pipeline shall be closed by water tight-plugs. Joints of all pipe in the trench shall be completed before work is stopped. Enough backfill shall be placed over the pipe to prevent flotation. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.

Dirt entering the pipe that will not be removed by the flushing operation, as deemed by the District Inspector, shall be cleaned and swabbed with a 5 per cent hypochlorite disinfection solution, as necessary.

B. Pipe Joint Deflections

Maximum angular joint deflection is shown in the table. Fittings are required if the pipe deflection is exceeded.

Maximum Allowable Bending Radius and Joint Deflection for PVC Pipe

| Pipe Type | Pipe Size (in) | Minimum Laying Radius (foot) | Offset per 20 ft Section of Pipe (Inch) |
|----------------|----------------|------------------------------|---|
| ASTM 2241 | 2 | 50 | 47 |
| | 3 | 75 | 32 |
| | 4 | 95 | 25 |
| | 6 | 140 | 17 |
| | 8 | 180 | 13 |
| | 10 | 225 | 11 |
| | 12 | 270 | 9 |
| AWWA C900/C905 | 4 | 125 | 19 |
| | 6 | 180 | 13 |
| | 8 | 235 | 10 |
| | 10 | 290 | 8 |
| | 12 | 345 | 7 |

The following table shall be used in determining the minimum radii for restrained joint pipe used in open cut and directional boring installations.

Maximum Allowable Bending Radius and Joint Deflection for PVC Restrained Pipe

| Pipe Type | Pipe Size | Minimum Laying Radius (foot) | % Change in Pitch per 10' |
|-------------------------|-----------|------------------------------|---------------------------|
| All PVC and Fusible PVC | 2 | 75 | 7.6 |
| | 3 | 100 | 5.7 |
| | 4 | 125 | 4.6 |
| | 6 | 200 | 2.9 |
| | 8 | 250 | 2.3 |
| | 10 | 300 | 1.9 |
| | 12 | 375 | 1.5 |

The minimum bending radii for HDPE pipe is based on the dimension ratio (DR) as follows:

| Minimum Bend Ratio for HDPE Pipe | |
|-------------------------------------|----------------------------|
| Dimension Ratio (DR) | Bend Ratio (α) |
| 9 | 20 |
| 11 | 25 |
| 13.5 | 25 |
| 17 | 27 |
| 21 | 27 |
| 26 | 34 |

Minimum Radius = α times Pipe OD in feet

5.2 POLYETHYLENE WRAP (POLYWRAP)

Ductile iron pipe, fittings, valves, valve boxes and appurtenances shall be encased in 8-mil thick polyethylene according to ANSI/AWWA C105/A21.5. Although the polyethylene encasement should prevent contact between the pipe and surrounding backfill and bedding material, it is not intended to be completely airtight or watertight.

All lumps of clay, mud, cinders, or other materials that might be on the pipe surface should be removed prior to installation of the polyethylene encasement. Care should be taken to prevent soil or bedding material from becoming trapped between the pipe and the polyethylene.

The polyethylene film should be fitted to the contour of the pipe to affect a snug, but not tight, encasement with minimum space between the polyethylene and the pipe. Sufficient slack should be provided in contouring to prevent stretching the polyethylene when bridging irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene during backfilling operations. Overlaps and ends should be secured with polyethylene-compatible adhesive tape, tape at least every 4 feet.

For installation below the water table, both ends of the polyethylene tube shall be sealed as thoroughly as possible by wrapping circumferentially with adhesive tape or strapping at each joint overlap.

5.3 LOCATOR WIRE

| | |
|---------------------|--|
| Wire | Kris-Tech Wire PE-45 #12, or approved equal solid blue wire. |
| Splices/Connections | Kris-Tech Splice Kit 3M-DBR-Part Number – 054007-09964. |

Locator wire shall be in at least 1,500-foot rolls and installed in such a manner to keep splices to a minimum. Rolls of 500 feet are only acceptable on jobs of less than 500 feet in length. Splices shall ONLY be made in valve boxes or locator wire splicing boxes.

Locator wire shall be taped to the top of all pipe installed including service lines. Locator wire at valve boxes shall be taped to the outside of the riser pipe; a hole or slot cut into the riser pipe to bring the wire into the pipe; and, enough wire spooled in the valve box to extend 24" outside the valve box.

Locator wire installation and signal loss shall be included under the 1-year pipe and workmanship warranty.

5.4 TAPPING SLEEVES

The branch opening shall be larger in diameter than nominal to allow the use of a full-size cutter. All welding shall be passivated to return the welded stainless steel to its original corrosion resistant state. There shall be no paper or plastic adhesive labels attached to the tapping sleeve, any information appearing on the sleeve shall be stenciled. The tapping sleeve shall be factory hydrostatically tested on pipe to verify proper fit and weld integrity with zero leakage allowed. The tapping sleeve shall be air tested to 50 psi prior to making the tap.

5.5 TAPPING SADDLES

If tapping saddles are installed on pipe containing polywrap, first place 3 wraps of polyethylene adhesive tape around pipe and then tap through tape and poly film. Repair any damage to wrap with tape and extra film as per ANSI/AWWA C105/A21.5. Remove material where saddle gasket touches pipe adjacent to hole.

After tap has been made, wrap & tape service line to 3 feet from main line and encase saddle with wrap & tape to 1 foot each sidesaddle on main line. Protect saddle & service line in this fashion regardless of whether main line has been encased with polywrap. Use sintered teflon pipe dope or TFE tape on all screw threads. Any saddle placed on ductile iron pipe shall be poly wrapped and taped to 1 foot each side of saddle.

When using a 2" Ford Ball Corp with pack joint on outlet, use sintered teflon pipe dope or TFE tape on all screw threads from main line.

5.6 TIEBACK RODS

A. General

Tieback rods are required wherever the continuity of restraint has been made discontinuous by use of a coupling. Tieback rods shall be used to hold assemblies together, such as at a tee which has a valve located on one or various sides, and at other locations where pipe restraint is required to prohibit movement.

Tieback rods shall be stainless steel all-thread 3/4" diameter rods with stainless steel 1-1/4" outside heavy hex nuts on both sides of fittings, bolt holes, etc. Use of more or larger tiebacks will be indicated on plans, if required. The number of rods is dependent upon the pipe size and the normal operating water pressure in the line.

The Water District will determine the normal operating water pressure. Operating pressure is normally less than 160 psi.

| Number of Tie-back Rods vs. Pipe Size | | |
|--|--------------------|----------|
| Pipe Size | Operating Pressure | |
| | ≤160 psi | >160 psi |
| 4" & Smaller | 2 | 2 |
| 6" - 8" | 4 | 6 |
| 10" - 14" | 6 | 8 |
| 16" - 18" | 8 | 10 |

B. Installation

The rods shall be run through the bolt holes in fittings, valves, etc. Both sides of all flanges shall be bolted. Double nuts are required for pipe sizes that are 8" and larger, or require more than 4 rods. Where possible, use an Anchor Style Fitting on one end when a group of fittings occurs at one location.

Ductile iron lugs may be used for assemblies up to and including 8" pipe size.

Rods may be slightly bowed to traverse around the body of some devices. Rods may be added which hook into said holes so that rods may remain straight. Anchor straps, socket clamp assemblies, etc. may be used by the contractor in his normal procedures.

When installing tieback rods with concrete reaction blocks adjust nuts after concrete has set.

C. Exceptions

1. In cases where tieback rods require lengths greater than 4', uni-flange pipe restraints may be used, as directed by the District Inspector.
2. When piping is mounted on prefabricated skids, connection of piping to skids may be used in lieu of tieback rods.

5.7 CONCRETE THRUST BLOCKING

Concrete thrust blocking shall be used at all bends, tees, end caps, and at other locations requiring pipe restraints. Thrust blocks must be placed against undisturbed earth.

Thrust blocks shall be constructed of 3,000 psi commercial redi-mix concrete with a slump no greater than 6-inch.

Prior to pouring concrete, polyethylene wrap shall be placed around valves, fittings, bolts and all-thread rods to keep concrete separated from pipe and fittings. Duct tape to hold plastic in place may be used. Water District to approve thrust blocking forms prior to placement of concrete.

A. Horizontal Thrust Blocks

The bearing area is the face dimension that is located against unexcavated earth on the back side of the trench. The height and width face dimensions shall be established in the field meeting the bearing area shown in the table in the plans. The centerline of the face dimensions shall be located at the centerline of the pipe in both the horizontal and vertical directions.

When fittings and valves have been connected by tieback rods to form one continuous unit, the entire aggregated system may be treated as one for the purpose of concrete thrust blocking. The contractor may reduce concrete reaction blocking requirements, as approved by the District Inspector.

B. Vertical Thrust Blocks

The concrete required to restrain vertical bends is shown in the table on the plans.

C. Concrete Restraining Blocks

Concrete restraining blocks, sometimes called a deadman or cross blocking, shall be anchored to a valve or fitting with the same size and number of tieback rods as defined for tieback rods.

D. Reinforcing Steel

| | |
|---------------------------|--|
| Reinforcing steel bars | ASTM A 615 or A 706 Grade 60 deformed billet steel |
| Welded Wire Reinforcement | ASTM A 185 and be furnished in sheets |
| Tie Wire | 16 gauge minimum, soft annealed |

6. PIPE BORING

6.1 GENERAL REQUIREMENTS

Borings shall meet all requirements set forth by the permit issued by the appropriate jurisdiction. Contractor shall obtain necessary permits and do all work in accordance with their requirements.

6.2 CASING AND SPACER DATA

The Contractor shall submit shop drawings for the casing pipe and spacers. The spacer shall be sized to ensure that the bell of the carrier pipe does not touch the casing. The casing shall have at least a 1-1/2" clearance between the outside diameter of pipe with the casing spacer attached and the casing pipe. Contractor's supplier shall show compatibility of casing size with spacer design.

| SPACER DATA | | |
|-------------|-------------------|--------------|
| Pipe Size | Max. Skid Spacing | Spacer Width |
| (inch) | (feet) | (inch) |
| 4 | 4½ | 6 |
| 6 | 6 | 6 |
| 8 | 7 | 8 |
| 10 | 8½ | 8 |
| 12 | 9½ | 8 |

A. Spacer Materials

Totally non-metallic constructed of preformed sections of high-density polyethylene. Spacers shall be ISO 9002 certified for strength and quality. RACI casing spacers are the only approved brand.

B. End Seal

1/8" synthetic rubber wrap around with 1/2" stainless steel banding straps. Advanced Products Model AW has been approved.

C. Lubrication

Flux soap or drilling mud.

D. Installation

Casing spacers shall have a minimum number of projections around the circumference totaling the number of diameter inches.

Casing spacers shall be fastened tightly to the carrier pipe so that the spacers do not move during installation with double backed tape. Tool recommended for installation by the manufacturer shall be used during installation. Lubricate the spacers at time of installation.

6.3 CASING INSTALLATION

Casings may be installed by boring or open cut methods as is required. Casing shall be installed as boring equipment removes material from hole. Contractor may use larger casing size, but shall be responsible for any related modifications as a result.

Joining procedures must be such that concentricity of the entire completed casing will be maintained, and that the line and grade of the carrier pipe will be continuously straight. A full

circle must be seen to prove that the casing is concentric from end to end by the lamping method of inspection.

The burial depth of the carrier pipe inside the casing shall be 48" below the lowest level of surface being crossed, except as specifically shown on the plans or defined by the governing jurisdiction. The casing may be lowered to avoid vertical bends.

The entire casing shall be installed and inspected before any pipe is inserted into the casing.

Contractor shall complete bore before other work is started so that slight misalignments in connecting pipes can be adjusted.

6.4 PVC CARRIER PIPE INSTALLATION IN CASING

1. All carrier pipes shall have restrained joints.
2. Pipe may be installed by using drawn cable or jacking. The force used to install the pipe must spread over the pipe end on which it bears, by use of a flat piece of wood or other similar force sustaining material.
3. No less than twenty foot long sections of pipe shall be used to minimize the number of joints within the casing.
4. It will be unnecessary to use restrained joint pipe if the casing is shorter than the carrier pipe. Also, the pipe may be laid directly on the casing without the use of spacers.
5. On 4" and larger pipes, a MJ sleeve, a fitting or valve shall be installed on either side of the casing.
6. On pipes smaller than 4", a PVC repair style coupling may be installed on either side of the casing, in lieu of a ductile iron sleeve.
7. Bores under roadways and creeks where encased or not shall have two separate strands of locator wire attached to the waterline that runs from isolation valves on either side of the bore as terminal points for the extra wire.

6.5 DIRECTIONAL BORING

A. General Requirements

Directional bores shall be completed using a directional boring machine supplied with an output signal to allow the Contractor to track the location of the drill head at all times. Size of drilling equipment shall be adequate for the job, but not grossly oversized such that an undue amount of thrust or torque is placed on the carrier pipe. Drilling fluids shall be selected for the site specific soil and ground water conditions. Confine free flowing (escaping) slurry or drilling fluids at the ground surface during pullback or drilling to prevent damage or hazardous conditions in surrounding areas. Remove all residual slurry from the surface and restore the site to pre-construction conditions. Fully repair any and all bore/relief pits constructed, including vacuuming drilling fluids and compacting disturbed earth.

All pipelines provided in the restrained joint area shall be installed to a minimum depth of 6 feet under creeks and 10 feet under river crossings, unless shown otherwise on the plans. All work associated with installing restrained joint pipe in the designated areas and, if crossing wetlands, creeks, rivers, streams or other waterways, shall conform to all permit requirements and to State and federal regulations.

Restrained joint areas depicted on the drawings are not to be considered exact and represent the general length of the restrained joint pipe. The actual length of the restrained joint area will be determined in the field by the District Inspector, and may differ from that shown on the drawings.

B. Execution

A pilot hole shall be bored first, with an angle of entry not to exceed 20% grade from the horizontal, and proceed under the obstacle being crossed while maintaining the required soil. The pilot hole shall extend to the point of exit no shallower than 8 feet from the surface on a grade not to exceed 20%, unless shown otherwise on the Plans. The carrier pipe shall be restrained joint PVC pipe, unless otherwise shown on the Plans.

The carrier pipe shall be assembled on the exit side of the bore, and installed by back reaming in the reverse direction. Deviations from this method shall be approved by the District Inspector. The pull section shall be adequately supported during pullback. Pipe should not drag on the ground. Above-ground pipe assembly shall be checked for suitability of installation before pullback. The borehole shall be reamed to approximately 1.2 times the outside diameter of the carrier pipe. Use sufficient drilling fluids and monitor pullback pressure to detect any problems before heaving of the bore path surface occurs. Maintain the minimum cover required as shown on the plans.

A swivel shall be used when back reaming to prevent rotational torque (torsion) on the carrier pipe. Carrier pipe to be capped as necessary to prevent drilling fluids from entering.

Provide long-body transition couplings and reducers as necessary to complete the connection to the adjoining pipe. The Contractor shall provide the required depth of cover over the pipe upon tying in the restrained joint pipe with the adjoining pipeline.

All bore/relief pits constructed including vacuuming drilling fluids shall be backfilled.

C. Installation Alignment Record Data

Trace bore path by interpretation of electronic signals sent by a monitoring device. If a District Inspector is present, identify the cutting head location after each push to confirm that the bore will meet the proper horizontal and vertical alignments.

In addition to the electronic locator of the drill head, the Contractor shall keep a record of the location after each rod push. Data shall include the following, as appropriate:

| | |
|--------------|---------------|
| Rod | number |
| Length | foot |
| Depth | foot |
| Offset (L/R) | foot |
| Pitch | percent grade |

Submit to the Engineer a print out of the bore path for accurately determining the boring profile and to exhibit that sufficient cover was achieved during the bore. The bore path printout must be submitted prior to final pay request

7. TESTING OF PIPELINE

7.1 FIELD INSPECTION

The Engineer may perform various tests at times that he deems necessary, including pressure tests with his own equipment. Joints may be cut out of the pipeline for inspection and testing. This does not imply that indiscriminate cutting of joints will be allowed. Pipe may be cut at such times to facilitate such tests and the Contractor shall perform such cuts and repairs as requested.

Pipes, fittings, valves, hydrants, and accessories shall be inspected for defects prior to placement into the trench. Any defective, damaged, or unsound material shall be repaired or shall be removed from the site.

7.2 WATER FOR TESTING

It is the Contractor's responsibility to provide the water for testing. With District approval, Contractor may tap an existing waterline with the proper tapping materials to obtain water at the site. Upon completion of the need for water, Contractor will remove all connecting pipe to the corporation stop and close the corporation stop fully.

7.3 LINE CLEANING

To insure that lines are clean prior to disinfection, a polyethylene pig swabbing device shall be run through the line. The pig shall be sized for the specific size of the pipe, and shall be provided by the Contractor. The Contractor may do the line cleaning in segments as suits his construction methodology. The pipe segments shall be subdivided to facilitate practical lengths of line cleaning, or as directed by the Water District.

Contractor shall install and remove all temporary connections and devices required to insert the pig, provide adequate water for flushing, and removal of the pig upon completion.

The cleaning of some lines may be waived if the District Inspector feels that the pipe installed is clean and free of foreign matter.

7.4 DISINFECTING NEW WATER MAINS

Disinfection of Water Mains shall be in accordance with the latest edition of AWWA C651.

A. Flushing Requirements

The main shall be flushed with potable water prior to disinfection until discolored water, mud, and debris are eliminated. The flushing velocity should be at least 2.5 ft/sec. The rate of flow required to produce this velocity in various diameters is shown in the table below. No site for flushing should be selected unless it has adequate drainage.

| Pipe Size | Flow Required to Produce 2.5 fps Velocity |
|-----------|---|
| In. | gpm |
| 4 | 100 |
| 6 | 220 |
| 8 | 390 |
| 10 | 610 |
| 12 | 880 |

B. Forms of Chlorine for Disinfection

1. Liquid Chlorine

Inject with a solution feed chlorinator and a water booster pump. Use an experienced operator and follow the instructions of the chlorinator manufacturer.

2. Calcium Hypochlorite (Dry)

Dissolve in water to a known concentration in a drum and pump into the pipeline at a metered rate.

3. Sodium Hypochlorite (Solution)

Dilute in water to desired concentration and pump into the pipeline at a metered rate.

C. Disinfection by Continuous Feed Method of Chlorine Application

This method is suitable for general application. Water from the existing distribution system or other approved sources of supply shall be made to flow at a constant, measured rate into the pipeline. The water shall receive a dose of chlorine, fed at a constant, measured rate. The two rates shall be proportioned so that the chlorine concentration in the water in the pipe is maintained at a minimum of 50 mg/L available chlorine.

To assure that a proper concentration is maintained, the chlorine residual should be measured at regular intervals in accordance with the procedures described in the current edition of "Standard Methods and AWWA M12-Simplified Procedures for Water Examination".

The amount of chlorine residual required for each 100 ft of pipe of various diameters is shown on the table below. Solutions of 1 per cent chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. The latter solution requires approximately 1 lb of calcium hypochlorite in 8.5 gal of water.

Chlorine Required to Produce 50 mg/L
Concentration in 100 ft of Pipe

| Pipe Size | 100 percent Chlorine | 1 percent Chlorine Solutions |
|-----------|-------------------------|------------------------------------|
| (Inch) | (Lbs) | (Gal) |
| 4 | 0.027 | 0.33 |
| 6 | 0.061 | 0.73 |
| 8 | 0.108 | 1.30 |
| 10 | 0.170 | 2.04 |
| 12 | 0.240 | 2.88 |

During the application of the chlorine, valves shall be manipulated to prevent the treatment dosage from flowing back into the line supplying the water. Chlorine application shall not cease until the entire main is filled with the chlorine solution. The chlorinated water shall be retained in the main for at least 24 hr, during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. At the end of this 24 hr period, the treated water shall contain no less than 25 mg/L chlorine throughout the length of the main.

D. Final Flushing

After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the system, or less than 1 mg/L. Chlorine residual determination shall be made to ascertain that the heavily chlorinated water has been removed from the pipeline. De-chlorination of heavily chlorinated water shall be completed in accordance with AWWA C651 with de-chlorinating chemicals.

E. Bacteriologic Testing

At least twenty-four (24) hours after final flushing, bacteriologic sample(s) shall be collected from the end of the line, or other points as required by the District Inspector, and tested for bacteriologic quality and shall show the absence of coliform organisms. The samples collected shall be delivered by Contractor to a certified laboratory within 24 hours of obtaining the samples.

If the number and frequency of samples is not prescribed by the public health authority having jurisdiction, at least one sample shall be collected from chlorinated supplies where chlorine residual is maintained throughout the new main. In the case of mains exceeding 3000 ft, it is desirable that samples be collected midway along the length of the line as well as at its end. If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory samples have been obtained. When the samples are satisfactory, the main may be placed in service.

Two consecutive passing tests are required to demonstrate successful disinfection. The Contractor shall re-chlorinate the pipeline segment that is being tested after three bacteriological tests have failed.

Contractor shall incur all costs of sampling and supplying the District with a copy of test results.

7.5 DISINFECTION AFTER CONNECTION/REPAIR TO EXISTING WATERLINES

The procedures outlined in this section apply primarily when mains are wholly or partially dewatered. Leaks or breaks that are repaired with clamping devices while the mains remain full of water under pressure present little danger of contamination and require no disinfection.

A. Trench Chlorination

When an old line is opened, either by accident or by design, the excavation will likely be wet and badly contaminated from nearby sewers. Liberal quantities of hypochlorite applied to open trench areas will lessen the danger from contamination.

B. Swabbing with Hypochlorite Solution

The interior of all pipe and fittings used in making the repair (particularly couplings and tapping sleeves) shall be swabbed with a 5 per cent hypochlorite solution before they are installed.

C. Slug Method for Chlorination

In addition to the procedures above, a section of main in which the break is located shall be isolated, all service connections shut off, and the section flushed. The pipeline will be chlorinated with a highly concentrated dosage as high as 500 mg/L with the contact time reduced to at least 30 minutes.

D. Flushing

Flushing shall be started as soon as the repairs are completed and continued until discolored water is eliminated. The line shall be flushed from both directions, as directed by the District Inspector.

E. Bacteriological Testing

Bacteriologic samples shall be taken at the end of the line in the direction of flow.

7.6 LEAKAGE TESTING

A. Preparation of Waterline

Contractor shall perform a hydrostatic test of the new waterline. Prior to the test, Contractor shall verify that test section is fully isolated, and that all air has been expelled from the pipeline to the satisfaction of the District Inspector. This may be accomplished by means of air relief valves, blow-off valves, hydrants or other means. If required, taps shall be made at high points where air relief valves are not called for on the plans. Such taps shall be plugged after testing is complete. Corporation stops should be installed before this test, if possible.

B. Equipment

Contractor shall provide all necessary water, piping, pumps, gauges (face divisions of 2 psi or

less) and fittings for testing.

C. Testing Pressure

Generally, the test pressures for PR 200 PVC and PR 250 PVC are 160 psi and 200 psi, respectively. District Inspector will verify lowest elevation within the section of piping to be tested, and determine the test pressure and the testing location. Apply a test pressure equal to the design pressure of the pipeline at the lowest point of the alignment. After the specified pressure has been reached, the pump shall be stopped and all pipe, fittings, valves, hydrants, joints, and appurtenances examined for leaks.

Any visible leaks shall be repaired. After visible leaks are repaired, the pipeline shall be refilled with water and re-pressurized to the design pressure of the pipeline. This pressure shall be maintained for a period of four hours.

D. Allowable Leakage

A container of water shall be attached to the distribution line in a manner to allow the water in the container to flow into the pressurized lines. Water loss in the container shall be measured after the test and acceptability of the line shall be based on the following formula for a leakage allowance of 10.5 gallons per inch diameter per mile per day:

$$L = \frac{NxDx\sqrt{P}}{74,000}$$

Where: L = Allowable Leakage in gallons per hour
 N = Number of joints in line being tested
 D = Nominal pipe diameter in inches
 P = Average test pressure in psi

| Allowable Leakage per 1000 ft in gal per hr | | | | |
|---|------------------|------|------|------|
| Test Pressure (psi) | Pipe Size (inch) | | | |
| | 4 | 6 | 8 | 12 |
| 150 | 0.34 | 0.50 | 0.65 | 0.95 |
| 160 | 0.35 | 0.51 | 0.67 | 0.99 |
| 180 | 0.37 | 0.54 | 0.71 | 1.05 |
| 200 | 0.39 | 0.57 | 0.75 | 1.10 |
| 220 | 0.41 | 0.60 | 0.78 | 1.16 |

8. SITE RESTORATION

8.1 CLEAN UP

Final cleaning up shall be completed as soon as practical. All surplus water main materials furnished by the Contractor and all tools and temporary structures shall be removed from the site by the Contractor. All dirt, rubbish, and excess earth from the excavation shall be hauled to a dump provided by the Contractor and the construction site left clean to the satisfaction of the Engineer or District Inspector. All surplus water main materials furnished by the Owner and delivered to the site by the Contractor shall be removed and delivered by the Contractor to a location designated by the Owner. All surplus water main material furnished and delivered by the Owner shall be removed by the Owner.

Brush and trees removed from right-of-way easement for water line installation shall be removed from property or burnt, unless in accordance with District Policy the landowner has given Water District a written request for brush to be piled and left for landowners use.

The District Inspector may require the Contractor to rework the cleanup immediately in areas where neglect is causing a nuisance. The Engineer or District Inspector shall be the sole judge of nuisance. Nuisance may result from a lack of improper workmanship at the time of pipe installation, or due to forces of nature after pipe has been installed. The notice shall be in writing and the re-cleanup shall be accomplished in 2 weeks from said notice. Cleanup, so notified to be done and remaining undone after 2 weeks may be hired done by others and the cost deducted from monies due the Contractor.

If any pavement, trees, shrubbery, fences, poles, or other property and surface structures have been damaged, removed, or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the Contract Documents, state laws, municipal ordinances, or the specific direction of the Engineer or District Inspector, or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor. These damaged items shall be replaced, repaired or restored to a condition equal to that before the work began.

All completed lines shall be returned as nearly as possible to the original condition, including seeding or sodding, as necessary.

The Contractor shall restore all pavement, sidewalks, curbing, gutters, shrubbery, fences, poles, or other property and surface structures removed or disturbed as a part of the work to a condition equal to that before the work began, and shall furnish all incidental labor and materials. No permanent pavement shall be restored unless the condition of the backfill is such as to properly support the pavement, and until approved by the Engineer or District Inspector. There will be no extra compensation for this work unless identified in the pay items.

8.2 REVEGETATION

A. Grading and Base Preparation

Earthwork shall conform to the lines and grades as shown on the plans. Grading shall provide positive drainage and a neat appearance conforming to the surrounding area. The area shall be tilled by disking or harrowing and all clods, lumps, etc. broken to a size to allow future mowing. Broken concrete, rubble, stones, roots, debris or other unsuitable material shall be removed. All disturbed areas shall be finished with at least 2-inches of topsoil.

B. Fertilizer and Lime

Fertilizer shall be a standard commercial 12-12-12 product which, when applied at the proper rate, will supply the quantity of total nitrogen (N), available phosphoric acid (P₂O₅), and soluble potash (K₂O), as specified. Submittals shall be provided for approval on all fertilizer used on the project. Material may be accepted on the basis of bag label analysis or supplier's certification.

Fertilizer Application Rates:

| | |
|--------------------|----------------------|
| Temporary seeding | 400 pounds per acre. |
| Permanent Seeding: | |
| Lawn Area | 200 pounds per acre |
| Non-Lawn Area | 300 pounds per acre |

Lime shall be applied in Non-Lawn areas at a rate of 50 pounds per 1,000 sq feet or as determined by a soil test.

C. Sodding

Lawns established in zoysia grass that are stripped of vegetation will be replaced with zoysia sod. Seeding will not be permitted.

D. Seeding

Contractor shall seed only when soil and climatic conditions are such as to insure plant growth. Submittals shall be provided for approval on all grass seeds used on the project. Seed shall meet all requirements of the Missouri Seed Law for 99% Pure 85% germination.

4. Till the area that is to be seeded to at least 3 inches deep. Remove foreign materials, plants, roots, stones, and debris from the disturbed area. Add suitable material to areas that settled excessively.
5. Spread 2 inches of topsoil over the area. Rake until the surface is smooth and level with the surrounding ground
6. Apply fertilizer at least one week before seeding. Work the fertilizer into the topsoil.
7. Apply the following permanent grass seed mix at the specified rate.

| <u>Lawn Area</u> | <u>Rate</u> | <u>Non-Lawn Area</u> | <u>Rate</u> |
|--------------------|-------------|----------------------|-------------|
| Falcon IV or Major | 200 lb/ac | Bromegrass | 30 lb/ac |
| Oats * | 100 lb/ac | K-31 Fescue | 200 lb/ac |
| | | Winter Wheat | 100 lb/ac |

* Other quick growing seed may be approved for use.

The Contractor shall be responsible for the growth of the seeded area. Any portion of the seeded area that is not in good growing condition at the end of thirty (30) days shall be reseeded as specified above.

E. Mulch

Apply mulch over the seeded areas at a rate of 1 ton per acre. The vegetative mulch shall be cereal straw from stalks of oats, rye, wheat, or barley. The straw shall be free of prohibited weed seeds as stated in the Missouri Seed Law, and shall be relatively free of all other noxious and undesirable seeds. The straw shall be clean and bright, relatively free of foreign material, and be dry enough to spread properly.

All mulch shall be distributed evenly over the area to be mulched within 24 hours following the seeding operation. Following the mulching operation, precautions shall be taken to prohibit foot or vehicular traffic over the mulched area. Any mulch which is displaced shall be replaced at once, but only after the work preceding the mulching which may have been damaged as a result of the displacement has been acceptably repaired.

Mulch placed on embankments steeper than 2-1/2:1 will need to be tacked or punched in.

Mulch is intended to reduce erosion during rain events. In the event there is too little mulch or heavy rains occur, whereby the seeded area erodes resulting in rivulets and other irregularities of the ground surface, the area will be re-graded with added topsoil, and a re-application of fertilizer, seed and mulch.

END OF SECTION

CPWSD NO 1 MEASUREMENT AND PAYMENT

1. MEASUREMENT AND METHOD OF PAYMENT

- A. Pipeline
 - 1. Measurement: Linear Feet (lf) measured without deduction for space occupied by valves and fittings.
 - 2. Item Includes: Trenching, bedding, pipe installation, locator wire, backfilling, compaction, pipe, gaskets, polyethylene wrap, joint restraints, site preparation, tree and brush removal, traffic control, rough grading, site restoration, except seeding.
 - 3. This item also includes: installation and removal of all temporary structures, and other items necessary for purposes of cleaning, pressure testing and chlorinating of the waterlines.
- B. Gate Valve
 - 1. Measurement: Each (ea)
 - 2. Item Includes: Valve, mechanical joint valve setting, valve box riser and lid, and installation.
- C. Pipe Fitting
 - 1. Measurement: Each (ea) for tees, bends, reducers, anchor couplings, sleeves, uni-flange joint restraint, and other fittings not included in other pay items.
 - 2. Item Includes: All necessary materials and labor for a complete installation of the fitting. This item includes work related to connections to
- D. Air Release Pit
 - 1. Measurement: Each (ea)
 - 2. Item Includes: All piping and fittings necessary to install the air release valve structure and equipment as shown on the Plans. Tee and rock will be paid for separately.
- E. Fire Hydrant
 - 1. Measurement: Each (ea)
 - 2. Item Includes: Fire hydrant, setting the fire hydrant to proper grade and plumb. Connection to main by an anchor tee or tee, gate valve and box, clean rock, and concrete thrust blocking with hairpin rebar for a complete installation per construction detail will be paid for separately.
- F. Cleanout
 - 1. Measurement: Each (ea)
 - 3. Item Included: All schedule 80 piping, elbows, threaded plug, brass saddle and tapping of line, ball valve, and all labor necessary to install the cleanout as shown on the Plans.
 - 4. Gate valve, tee, rock, and concrete thrust blocking with rebar will be paid for separately
- G. Connect to 12" Encasement Pipe and 6" Waterline Pipe at Creek
 - 1. Measurement: Each (ea)
 - 2. Item Includes: Connection to existing pipes as shown on the details.

- H. Connect to Existing Waterlines
1. Measurement: Lump Sum (ls)
 2. Item Includes: Cut-in connection to existing waterlines as shown on the plans complete with all work related to making the connection to the existing pipe, field cutting and removing of pipe, furnishing and installing the end cap on pipe to be abandoned; notification to customers that water will be shut off; and coordination with Water District in turning off isolation valves. Wet taps are not included in this pay item.
- I. Water Service Line
1. Measurement: Linear Feet (lf)
 2. Items Included for Open-Cut Installation: Pipe, fittings for connections to pipes, locator wire, trenching, bedding, installation, backfilling, and compaction. Aggregate backfill material will be paid for separately.
 3. Items Included for Bored Installation: Pipe, locator wire, boring, casing, installation, backfilling, and compaction of disturbed areas. Excavation will be unclassified.
 4. 2" encasement pipe footage will be paid separately from the 1" water service line. The 1" water service line will be paid from the connection at the main to the meter connection.
- J. Relocate Water Meter
1. Measurement: Each (ea)
 2. Item Includes: Removal of the complete meter set from its existing location and installing a new meter pit setter (provided by Owner) at a new location; all fittings necessary to tap the new water line; connect the new water service to the meter pit setter; and connect the meter to the existing service line to the house. Service line piping will be paid for separately.
- K. Reconnect Water Meter
1. Measurement: Each (ea)
 2. Item Includes: All fittings necessary to tap new water line and reconnect service line to existing service line going to the meter, or reconnect service line directly at the meter pit setter. Service line pipe will be paid for separately. If a new meter pit setter is required, it will be provided by the District.
- L. Rock Trench Excavation
1. Measurement: Cubic Yards (cy) to the nearest 0.1 cy, as measured in the field.
 2. Item Includes: Open cut rock excavation methods required to remove rock from the trench, and removal of the rock from the project area.
- M. Granular Material
1. Measurement: Tonnage (ton) to the nearest 0.01 ton from truck haul tickets of rock delivered to site.
 2. Item Includes: All items necessary for the hauling to the site and placement of rock for trench backfill under roads, gravel road surface restoration, and at structures.
- N. Concrete Thrust Blocking
1. Measurement: Cubic Yards (cy) to the nearest 0.1 cy from truck tickets delivered to site.
 2. Item Includes: Concrete, forming, tie rods and rebar for restraining blocks, hairpin rebar for valves, concrete blocking for bends, end caps, other fittings, pipe encasement, and other structures requiring concrete.

O. Construction Staking

1. Measurement: Lump Sum (LS)
2. Item Includes: Furnishing all employees, equipment, tools, stakes and other material required to stake out the waterline in a manner satisfactory to the District Inspector, and re-stake when stakes are lost or destroyed for any reason.

P. Seed and Mulch

1. Measurement: Linear Foot (lf)
2. Item Includes: Fine grading, topsoil, and multiple applications of seed, fertilizer, and mulch, as needed to restore vegetation with full ground cover.

END OF SECTION

CONSOLIDATED PUBLIC WATER SUPPLY DISTRICT NO. 1 OF BOONE COUNTY, MISSOURI

1500 North Seventh Street
Columbia, Missouri 65201

WATER LINE EASEMENT

KNOW ALL PERSONS BY THESE PRESENTS:

That on this _____ day of _____, 2010, THE CITY OF COLUMBIA, a Municipal Corporation of the State of Missouri, hereinafter referred to as GRANTOR (herein so styled, whether one or more), for and in consideration of the sum of Ten Dollars \$10.00 and other valuable consideration, paid and delivered by CONSOLIDATED PUBLIC WATER SUPPLY DISTRICT NO.1 of Boone County, Missouri, hereinafter referred to as the Grantee, organized under the laws of the State of Missouri; the receipt of which is hereby acknowledged, hereby Grants, Bargains, Sells and Conveys to said Grantee the perpetual easement and right to enter upon the lands of Grantor situated in the County of Boone, State of Missouri, described as follows:

A STRIP OF LAND TWENTY FEET (20') IN WIDTH ACROSS THE WEST PART OF A TRACT OF LAND DEEDED TO THE CITY OF COLUMBIA; SAID TRACT BEING IN THE LOCATED IN THE SOUTHWEST QUARTER (SW ¼) OF SECTION 28, TOWNSHIP 48 NORTH, RANGE 13 WEST, IN THE CITY OF COLUMBIA, BOONE COUNTY, MISSOURI.

and to initially and at all times thereafter erect, construct, install, lay, operate, survey, inspect, maintain, repair, rebuild, upgrade, replace, enlarge, remove and patrol on over or under said lands, and in and upon all streets, roads, or highways abutting said lands one or more pipes of any size for the transmission of water, and all appliances necessary in connection therewith, including but not limited to water meter pits, water meters, water meter yokes, water valves, air release valves, water pressure regulators, detection wires and fire hydrants, together with the perpetual right to go in and upon said land for said purposes. The water line easement hereby granted shall be:

Twenty (20) feet in width ten (10) feet on both sides of the following described centerline:

Starting at the southwest corner of a survey as recorded in Book 3011 at Page 99 of the Boone County Records at a point S.84°52'55"E., 11.82 feet from the west line of said section; thence along the south line of said survey, said line also being the north Right-of-Way line of the MKT trail, S.84°52'55"E., 31.81 feet to the POINT OF BEGINNING; thence leavings said line S.1°42'45"W., 32.50 feet; thence along a non-tangent curve to the left having a radius of 236.00 feet a distance of 46.30 feet (the chord of said curve having bearing and distance of S.7°26'20"E., 46.23 feet); thence S.16°41'20"E., 74.90 feet; thence along a non-tangent curve to the right having a radius of 200.00 feet a distance of 53.00 feet (the chord of said curve having bearing and distance of S.9°32'00"E., 52.85 feet); thence S.1°56'05"E., 228.00 feet; thence S.5°32'35"E., 221.50 feet; thence S.1°47'25"E., 287.38 feet to the END of said strip on the north line of BCFPD Subdivision as recorded in Plat Book 34 at Page 108 at a point S.85°17'25"E., 26.02 feet from the northwest corner of Lot 1 of said Plat.

The area of said strip is 0.43 acres.

To have and to hold said easement and rights unto said Grantee forever.

EXHIBIT C

Notary Public

EASEMENT FOR UTILITY PURPOSES

KNOW ALL PERSONS BY THESE PRESENTS:

THAT THE UNDERSIGNED Linda Riegle Cooperstock, Trustee of the Linda Riegle Cooperstock Living Trust, of Boone County, Missouri, hereinafter referred to as Grantor(s), on this _____ day of _____, 20____ in consideration of the sum of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, does or do hereby Grant, Bargain, and Sell to THE CITY OF COLUMBIA, MISSOURI, a municipal corporation, herein City or Grantee (Grantee's mailing address is: P.O. Box 6015, Columbia, MO 65205), its successors and assigns, both individually and as Trustee for the use and benefit of the "Benefited Parties" described below herein, hereinafter called Grantees, a utility easement with the right, privilege and authority to erect, construct, install, lay, operate, survey, inspect, maintain, repair, rebuild, replace and remove utility lines and utility facilities, including but not limited to water mains, power transmission lines, sanitary sewer lines and all other public utilities, and all necessary appurtenances to make said utilities complete and usable, over, under, across, and upon the following described real estate situated in Boone County, Missouri, to-wit:

Project: Scott Boulevard Phase II (32-07-07)

Ordinance #:

LEGAL DESCRIPTION

An irregular shaped parcel of land over and across the east part of a tract of land described in a quit-claim deed in Book 3147 at Page 85, said tract being Tract 1 of the survey as recorded in Book 765 at Page 714, all of the Boone County Records; situate in the northeast quarter (1/4) of the northeast quarter (1/4) of the northeast quarter (1/4) of Section 32, Township 48 North, Range 13 West, Boone County, Missouri; said parcel being described as follows:

Starting at the northeast corner of said Tract 1, also being the northeast corner of said Section 32; thence along the east line of said Tract 1, also being the east line of said Section 32, S.1°27'00"W., 66.69 feet to the southerly line of a permanent street easement granted this date, the POINT OF BEGINNING; thence continuing along said east line S.1°27'00"W., 61.49 feet to the north corner of a permanent street easement granted this date; thence along the west line of said easement along a non-tangent curve to the left having a radius 1,543.50 feet a distance of 171.01 feet (the chord of said curve having bearing and distance of S.11°35'40"W., 170.92 feet) to the south line of said tract; thence along said line N.88°36'50"W., 20.15 feet; thence leaving said line along a non-tangent curve to the right having a radius of 1,563.50 feet a distance of 238.12 feet (the chord of said curve having bearing and distance of N.12°41'35"E., 237.89 feet) to the southerly line of said easement; thence along said line

EXHIBIT D

along a non-tangent curve to the right having a radius of 66.00 feet a distance of 5.26 feet (the chord of said curve having bearing and distance of S.45°57'55"E., 5.26 feet) to the POINT OF BEGINNING and containing 4,223 inclusive of 2,856 square feet of unspecified Boone County easement in the Report of Commissioners as recorded in Book 392 at Page 203 of said Boone County Records.

The "Benefited Parties" referred to above herein shall be deemed to mean any public corporation, any public entity, any public water supply district, any utility cooperative, and any utility company regulated by the Missouri Public Service Commission, and said Benefited Parties shall have the right to use the easement area for the aforesaid purposes.

The parties agree that in the event the City or a Benefited Party installs utility lines or utility facilities in the above described easement area, such installation shall not materially interfere with any preexisting utility lines or utility facilities installed in the easement area by the City or a Benefited Party and that the provisions of this paragraph may be enforced by proceedings in law or in equity, or both, and in any said legal proceedings the prevailing party shall have the right to recover from the other party or parties all reasonable litigation expenses, including a reasonable attorney fee.

The parties agree that this easement may not be terminated or amended without the prior written consent of THE CITY OF COLUMBIA, MISSOURI and each Benefited Party which has any utility lines or utility facilities located in the easement area at the time of the proposed termination or amendment.

Grantor agrees that it will not erect any building or structure on the easement area or permit the installation of any obstruction on the easement area which will interfere with the construction, placement, operation and maintenance of utility lines and facilities in the easement area.

THE CITY OF COLUMBIA, MISSOURI and/or any Benefited Party shall have the right to trim, clear, cut and remove from the easement area any tree, brush, shrub, plant or other object of any kind which in the reasonable judgment of said party may interfere with the installation and/or maintenance of utility lines and utility facilities in the easement area.

The Grantor covenants, subject to liens and encumbrances of record at the date of this easement, they are the owners of the above described land and have the right and authority to make and execute this agreement. Said Grantor hereby conveys according to the terms and provisions of the trust agreement and pursuant to the powers conferred by said agreement and states that the trust agreement remains in full force and effect at this time and that the same has not been amended or revoked.

WITNESS our hands the day and year first written above.

Linda Riegle Cooperstock, Trustee of the
Linda Riegle Cooperstock Living Trust

STATE OF MISSOURI)
) SS.
COUNTY OF BOONE)

On this _____ day of _____, 20__ before me personally appeared Linda Riegle Cooperstock, Trustee of the Linda Riegle Cooperstock Living Trust, to me known to be the person or persons described in and who executed the foregoing instrument, and acknowledged that he or she or they executed the same as his or her or their free act and deed for the purposes therein stated.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at my office in _____, Missouri, the day and year first above written.

Notary Public

EASEMENT FOR UTILITY PURPOSES
(BY INDIVIDUALS)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT THE UNDERSIGNED, Brian Christensen and Tonya Christensen, husband and wife, of Boone County, Missouri, hereinafter referred to as Grantor(s), on this _____ day of _____, 20____ in consideration of the sum of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, does or do hereby Grant, Bargain, and Sell to THE CITY OF COLUMBIA, MISSOURI, a municipal corporation, herein City or Grantee (Grantee's mailing address is: P.O. Box 6015, Columbia, MO 65205), its successors and assigns, both individually and as Trustee for the use and benefit of the "Benefited Parties" described below herein, hereinafter called Grantees, a utility easement with the right, privilege and authority to erect, construct, install, lay, operate, survey, inspect, maintain, repair, rebuild, replace and remove utility lines and utility facilities, including but not limited to water mains, power transmission lines, sanitary sewer lines and all other public utilities, and all necessary appurtenances to make said utilities complete and usable, over, under, across, and upon the following described real estate situated in Boone County, Missouri, to-wit:

Project: Scott Boulevard Phase II & III (32-02-02)
Parcel: 16-700-32-00-001.04

A four (4) sided parcel of land across the east part of a tract of land described in a trustee's deed in Book 751 at Page 997, said tract being Tract 2 of a survey as recorded in Book 751 at Page 76, both of the Boone County Records; situate in the northeast quarter of Section 32, Township 48 North, Range 13 West, Boone County, Missouri; said parcel being described as follows:

Starting at the northeast corner of said tract; thence along the north line of said tract N.88°32'25"W., 42.10 feet to the POINT OF BEGINNING at the northwest corner of the permanent street easement granted this date; thence leaving said line along the west line of said easement S.1°16'05"W., 496.60 feet to the south line of said tract at the southwest corner of said easement at a point N.84°09'30"W., 40.64 feet from the southeast corner of said tract; thence along said line N.84°09'30"W., 20.06 feet; thence leaving said line N.1°16'05"E., 495.07 feet to the north line of said tract; thence along said line S.88°32'25"E., 20.00 feet to the POINT OF BEGINNING and containing 9,917 square feet.

The "Benefited Parties" referred to above herein shall be deemed to mean any public corporation, any public entity, any public water supply district, any utility cooperative, and any utility company regulated by the Missouri Public Service Commission, and said Benefited Parties shall have the right to use the easement area for the aforesaid purposes.

The parties agree that in the event the City or a Benefited Party installs utility lines or utility facilities in the above described easement area, such installation shall not materially interfere with any preexisting utility lines or utility facilities installed in the easement area by the City or a Benefited Party and that the provisions of this paragraph may be enforced by proceedings in law or in equity, or both,

EXHIBIT E

and in any said legal proceedings the prevailing party shall have the right to recover from the other party or parties all reasonable litigation expenses, including a reasonable attorney fee.

The parties agree that this easement may not be terminated or amended without the prior written consent of THE CITY OF COLUMBIA, MISSOURI and each Benefited Party which has any utility lines or utility facilities located in the easement area at the time of the proposed termination or amendment.

Grantor agrees that it will not erect any building or structure on the easement area or permit the installation of any obstruction on the easement area which will interfere with the construction, placement, operation and maintenance of utility lines and facilities in the easement area.

THE CITY OF COLUMBIA, MISSOURI and/or any Benefited Party shall have the right to trim, clear, cut and remove from the easement area any tree, brush, shrub, plant or other object of any kind which in the reasonable judgment of said party may interfere with the installation and/or maintenance of utility lines and utility facilities in the easement area.

IN WITNESS WHEREOF, the said Grantor(s) has or have hereunder set his or her or their hand(s) this _____ day of _____, 20____.

Brian Christensen

Tonya Christensen

STATE OF MISSOURI)
) SS.
COUNTY OF BOONE)

On this _____ day of _____, 20____ before me personally appeared **Brian Christensen and Tonya Christensen, husband and wife**, to me known to be the person or persons described in and who executed the foregoing instrument, and acknowledged that he or she or they executed the same as his or her or their free act and deed for the purposes therein stated.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at my office in _____, Missouri, the day and year first above written.

Notary Public

EASEMENT FOR UTILITY PURPOSES
(BY INDIVIDUALS)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT THE UNDERSIGNED Eric W. Kurzejeski and Lori S. Kurzejeski, husband and wife, of Boone County, Missouri, hereinafter referred to as Grantor(s), on this _____ day of _____, 20____ in consideration of the sum of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, does or do hereby Grant, Bargain, and Sell to THE CITY OF COLUMBIA, MISSOURI, a municipal corporation, herein City or Grantee (Grantee's mailing address is: P.O. Box 6015, Columbia, MO 65205), its successors and assigns, both individually and as Trustee for the use and benefit of the "Benefited Parties" described below herein, hereinafter called Grantees, a utility easement with the right, privilege and authority to erect, construct, install, lay, operate, survey, inspect, maintain, repair, rebuild, replace and remove utility lines and utility facilities, including but not limited to water mains, power transmission lines, sanitary sewer lines and all other public utilities, and all necessary appurtenances to make said utilities complete and usable, over, under, across, and upon the following described real estate situated in Boone County, Missouri, to-wit:

Project: Scott Boulevard Phase II & III (32-02-02)
Parcel: 16-700-32-00-001.07

A four (4) sided parcel of land across the east part of a tract of land described in a warranty deed in Book 1273 at Page 864, said tract being part of Tract 1B of a survey as recorded in Book 866 at Page 187, both of the Boone County Records; situate in the northeast quarter of Section 32, Township 48 North, Range 13 West, Boone County, Missouri; said parcel being described as follows:

Starting at the northeast corner of said tract; thence along the north line of said tract N.84°09'30"W., 40.64 feet to the POINT OF BEGINNING at the northwest corner of the permanent street easement granted this date; thence along the west line of said easement S.1°16'05"W., 103.76 feet to the south line of said tract at a point N.87°57'25"W., 40.19 feet from the southeast corner of said tract; thence along said line N.87°57'25"W., 20.00 feet; thence leaving said line N.1°16'05"E., 105.09 feet to the north line of said tract; thence along said line S.84°09'30"E., 20.06 feet to the POINT OF BEGINNING and containing 2,088 square.

The "Benefited Parties" referred to above herein shall be deemed to mean any public corporation, any public entity, any public water supply district, any utility cooperative, and any utility company regulated by the Missouri Public Service Commission, and said Benefited Parties shall have the right to use the easement area for the aforesaid purposes.

The parties agree that in the event the City or a Benefited Party installs utility lines or utility facilities in the above described easement area, such installation shall not materially interfere with any preexisting utility lines or utility facilities installed in the easement area by the City or a Benefited Party and that the provisions of this paragraph may be enforced by proceedings in law or in equity, or both,

EXHIBIT F

and in any said legal proceedings the prevailing party shall have the right to recover from the other party or parties all reasonable litigation expenses, including a reasonable attorney fee.

The parties agree that this easement may not be terminated or amended without the prior written consent of THE CITY OF COLUMBIA, MISSOURI and each Benefited Party which has any utility lines or utility facilities located in the easement area at the time of the proposed termination or amendment.

Grantor agrees that it will not erect any building or structure on the easement area or permit the installation of any obstruction on the easement area which will interfere with the construction, placement, operation and maintenance of utility lines and facilities in the easement area.

THE CITY OF COLUMBIA, MISSOURI and/or any Benefited Party shall have the right to trim, clear, cut and remove from the easement area any tree, brush, shrub, plant or other object of any kind which in the reasonable judgment of said party may interfere with the installation and/or maintenance of utility lines and utility facilities in the easement area.

IN WITNESS WHEREOF, the said Grantor(s) has or have hereunder set his or her or their hand(s) this _____ day of _____, 20____.

Eric W. Kurzejeski

Lori S. Kurzejeski

STATE OF MISSOURI)
) SS.
COUNTY OF BOONE)

On this _____ day of _____, 20__ before me personally appeared **Eric W. Kurzejeski and Lori S. Kurzejeski, husband and wife**, to me known to be the person or persons described in and who executed the foregoing instrument, and acknowledged that he or she or they executed the same as his or her or their free act and deed for the purposes therein stated.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at my office in _____, Missouri, the day and year first above written.

Notary Public

EASEMENT FOR UTILITY PURPOSES
(BY INDIVIDUALS)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT THE UNDERSIGNED, Richard R. Webel and Connie J. Webel, husband and wife, of Boone County, Missouri, hereinafter referred to as Grantor(s), on this _____ day of _____, 20____ in consideration of the sum of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, does or do hereby Grant, Bargain, and Sell to THE CITY OF COLUMBIA, MISSOURI, a municipal corporation, herein City or Grantee (Grantee's mailing address is: P.O. Box 6015, Columbia, MO 65205), its successors and assigns, both individually and as Trustee for the use and benefit of the "Benefited Parties" described below herein, hereinafter called Grantees, a utility easement with the right, privilege and authority to erect, construct, install, lay, operate, survey, inspect, maintain, repair, rebuild, replace and remove utility lines and utility facilities, including but not limited to water mains, power transmission lines, sanitary sewer lines and all other public utilities, and all necessary appurtenances to make said utilities complete and usable, over, under, across, and upon the following described real estate situated in Boone County, Missouri, to-wit:

Project: Scott Boulevard Phase II & III (32-02-02)
Parcel: 16-700-32-00-001.05

An irregular shaped parcel of land across the east part of a tract of land described in a warranty deed in Book 859 at Page 171 and a warrant deed in Book 765 at Page 996, said tract being Tracts 3, 4 and 5 of a survey as recorded in Book 765 at Page 714, all of the Boone County Records; situate in the northeast quarter of the northeast quarter of Section 32, Township 48 North, Range 13 West, Boone County, Missouri; said parcel being described as follows:

Starting at the northeast corner of said tract; thence along the north line of said tract N.88°32'55"W., 41.70 feet to the POINT OF BEGINNING at the northwest corner of the permanent street easement granted this date; thence along the west line of said easement S.1°33'40"W., 418.36 feet; thence continuing along said line S.1°16'05"W., 130.73 feet to the south line of said tract at a point N.88°32'25"W., 42.10 feet from the southeast corner of said tract; thence along said line N.88°32'25"W., 20.00 feet; thence leaving said line N.1°16'05"E., 130.71 feet; thence N.1°33'40"W., 418.37 feet to the north line of said tract; thence along said line S.88°32'55"E., 20.00 feet to the POINT OF BEGINNING and containing 10,982 square.

The "Benefited Parties" referred to above herein shall be deemed to mean any public corporation, any public entity, any public water supply district, any utility cooperative, and any utility company regulated by the Missouri Public Service Commission, and said Benefited Parties shall have the right to use the easement area for the aforesaid purposes.

The parties agree that in the event the City or a Benefited Party installs utility lines or utility facilities in the above described easement area, such installation shall not materially interfere with any preexisting utility lines or utility facilities installed in the easement area by the City or a Benefited Party

EXHIBIT G

and that the provisions of this paragraph may be enforced by proceedings in law or in equity, or both, and in any said legal proceedings the prevailing party shall have the right to recover from the other party or parties all reasonable litigation expenses, including a reasonable attorney fee.

The parties agree that this easement may not be terminated or amended without the prior written consent of THE CITY OF COLUMBIA, MISSOURI and each Benefited Party which has any utility lines or utility facilities located in the easement area at the time of the proposed termination or amendment.

Grantor agrees that it will not erect any building or structure on the easement area or permit the installation of any obstruction on the easement area which will interfere with the construction, placement, operation and maintenance of utility lines and facilities in the easement area.

THE CITY OF COLUMBIA, MISSOURI and/or any Benefited Party shall have the right to trim, clear, cut and remove from the easement area any tree, brush, shrub, plant or other object of any kind which in the reasonable judgment of said party may interfere with the installation and/or maintenance of utility lines and utility facilities in the easement area.

IN WITNESS WHEREOF, the said Grantor(s) has or have hereunder set his or her or their hand(s) this _____ day of _____, 20__.

Richard R. Webel

Connie J. Webel

STATE OF MISSOURI)
) SS.
COUNTY OF BOONE)

On this _____ day of _____, 20__ before me personally appeared **Richard R. Webel and Connie J. Webel, husband and wife**, to me known to be the person or persons described in and who executed the foregoing instrument, and acknowledged that he or she or they executed the same as his or her or their free act and deed for the purposes therein stated.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at my office in _____, Missouri, the day and year first above written.

Notary Public

EASEMENT FOR UTILITY PURPOSES
(BY INDIVIDUALS)

KNOW ALL PERSONS BY THESE PRESENTS:

THAT THE UNDERSIGNED Majed Dweik and Cathy Dweik, husband and wife, of Boone County, Missouri, hereinafter referred to as Grantor(s), on this _____ day of _____, 20____ in consideration of the sum of Ten Dollars (\$10.00) and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, does or do hereby Grant, Bargain, and Sell to THE CITY OF COLUMBIA, MISSOURI, a municipal corporation, herein City or Grantee (Grantee's mailing address is: P.O. Box 6015, Columbia, MO 65205), its successors and assigns, both individually and as Trustee for the use and benefit of the "Benefited Parties" described below herein, hereinafter called Grantees, a utility easement with the right, privilege and authority to erect, construct, install, lay, operate, survey, inspect, maintain, repair, rebuild, replace and remove utility lines and utility facilities, including but not limited to water mains, power transmission lines, sanitary sewer lines and all other public utilities, and all necessary appurtenances to make said utilities complete and usable, over, under, across, and upon the following described real estate situated in Boone County, Missouri, to-wit:

Project: Scott Boulevard Phase III (32-02-02)

Parcel: 16-700-32-00-001.00

An irregular shaped parcel of land across the east part of a tract of land described in a warranty deed in Book 2910 at Page 4, said tract being part of Tract 2 of a survey as recorded in Book 765 at Page 714, both of the Boone County Records; situate in the northeast quarter of the northeast quarter of the northeast quarter of Section 32, Township 48 North, Range 13 West, Boone County, Missouri; said parcel being described as follows: Starting at the northeast corner of said tract; thence along the north line of said tract N.88°36'50"W., 30.10 feet to the POINT OF BEGINNING at the northwest corner of the permanent street easement granted this date; thence leaving said north line and along the west line of said easement along a non-tangent curve to the left having a radius of 1,543.50 feet a distance of 187.70 feet (the chord of said curve having bearing and distance of S.4°56'10"W., 187.58 feet); thence continuing along said line S.1°33'40"W., 97.91 feet to the south line of said tract at a point N.88°32'55"W., 41.70 feet from the southeast corner of said tract; thence along said south line N.88°32'55"W., 20.00 feet; thence leaving said line N.1°33'40"E., 97.93 feet; thence along a curve to the right having a radius of 1,563.50 feet a distance of 187.64 feet (the chord of said curve having bearing and distance of N.4°53'30"E., 187.53 feet) to the north line of said tract; thence along said line S.88°36'50"E., 20.15 feet to the POINT OF BEGINNING and containing 5,712 square feet.

The "Benefited Parties" referred to above herein shall be deemed to mean any public corporation, any public entity, any public water supply district, any utility cooperative, and any utility company regulated by the Missouri Public Service Commission, and said Benefited Parties shall have the right to use the easement area for the aforesaid purposes.

EXHIBIT H

The parties agree that in the event the City or a Benefited Party installs utility lines or utility facilities in the above described easement area, such installation shall not materially interfere with any preexisting utility lines or utility facilities installed in the easement area by the City or a Benefited Party and that the provisions of this paragraph may be enforced by proceedings in law or in equity, or both, and in any said legal proceedings the prevailing party shall have the right to recover from the other party or parties all reasonable litigation expenses, including a reasonable attorney fee.

The parties agree that this easement may not be terminated or amended without the prior written consent of THE CITY OF COLUMBIA, MISSOURI and each Benefited Party which has any utility lines or utility facilities located in the easement area at the time of the proposed termination or amendment.

Grantor agrees that it will not erect any building or structure on the easement area or permit the installation of any obstruction on the easement area which will interfere with the construction, placement, operation and maintenance of utility lines and facilities in the easement area.

THE CITY OF COLUMBIA, MISSOURI and/or any Benefited Party shall have the right to trim, clear, cut and remove from the easement area any tree, brush, shrub, plant or other object of any kind which in the reasonable judgment of said party may interfere with the installation and/or maintenance of utility lines and utility facilities in the easement area.

IN WITNESS WHEREOF, the said Grantor(s) has or have hereunder set his or her or their hand(s) this _____ day of _____, 20____.

Majed Dweik

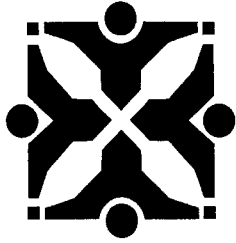
Cathy Dweik

STATE OF MISSOURI)
) SS.
COUNTY OF BOONE)

On this _____ day of _____, 20__ before me personally appeared **Majed Dweik and Cathy Dweik, husband and wife**, to me known to be the person or persons described in and who executed the foregoing instrument, and acknowledged that he or she or they executed the same as his or her or their free act and deed for the purposes therein stated.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at my office in _____, Missouri, the day and year first above written.

Notary Public



Source: Public Works

Agenda Item No:

To: City Council
From: City Manager and Staff

Council Meeting Date: November 4, 2013

Re: Waterline Replacement Contract with Consolidated Public Water Supply District No. 1 - Scott Boulevard Phase 2 (Brookview Terrace to Vawter School Road)

EXECUTIVE SUMMARY:

Staff has prepared for Council consideration legislation authorizing a waterline replacement contract with Consolidated Public Water Supply District No. 1 (CPWSD #1) in connection with the Scott Boulevard Phase 2 road improvement project.

DISCUSSION:

In connection with the Scott Boulevard Phase 2 project, CPWSD #1 plans to relocate the existing 6" waterline starting at the MKT Trail and extending southerly to Brushwood Lake Road, and a new 8" waterline commencing at Brushwood Lake Road and extending southerly to the south edge of Mill Creek. City staff and representatives of CPWSD #1 have negotiated an agreement under which the City would replace the waterline as part of the Scott Boulevard Phase 2 project in accordance with plans and specifications prepared by CPWSD #1 engineers. The City will pay all costs incurred by the district with an initial payment of \$20,000.00. Itemized costs will be provided with a not to exceed maximum payment of \$35,000.00. The City would repair or replace, at City's expense, any defective work or materials that become apparent within one year after completion of the Scott Boulevard Phase 2 project.

FISCAL IMPACT:

The cost to reimburse CPWSD #1 for engineering fees, attorney fees and other reasonable costs and expenses is not to exceed \$35,000.00. The City will pay costs associated with the relocation/replacement of the waterline estimated at \$165,000.00, from the Scott Boulevard Phase 2 capital project account. No budget amendment is needed.

VISION IMPACT:

<http://www.gocolumbiamo.com/Council/Meetings/visionimpact.php>

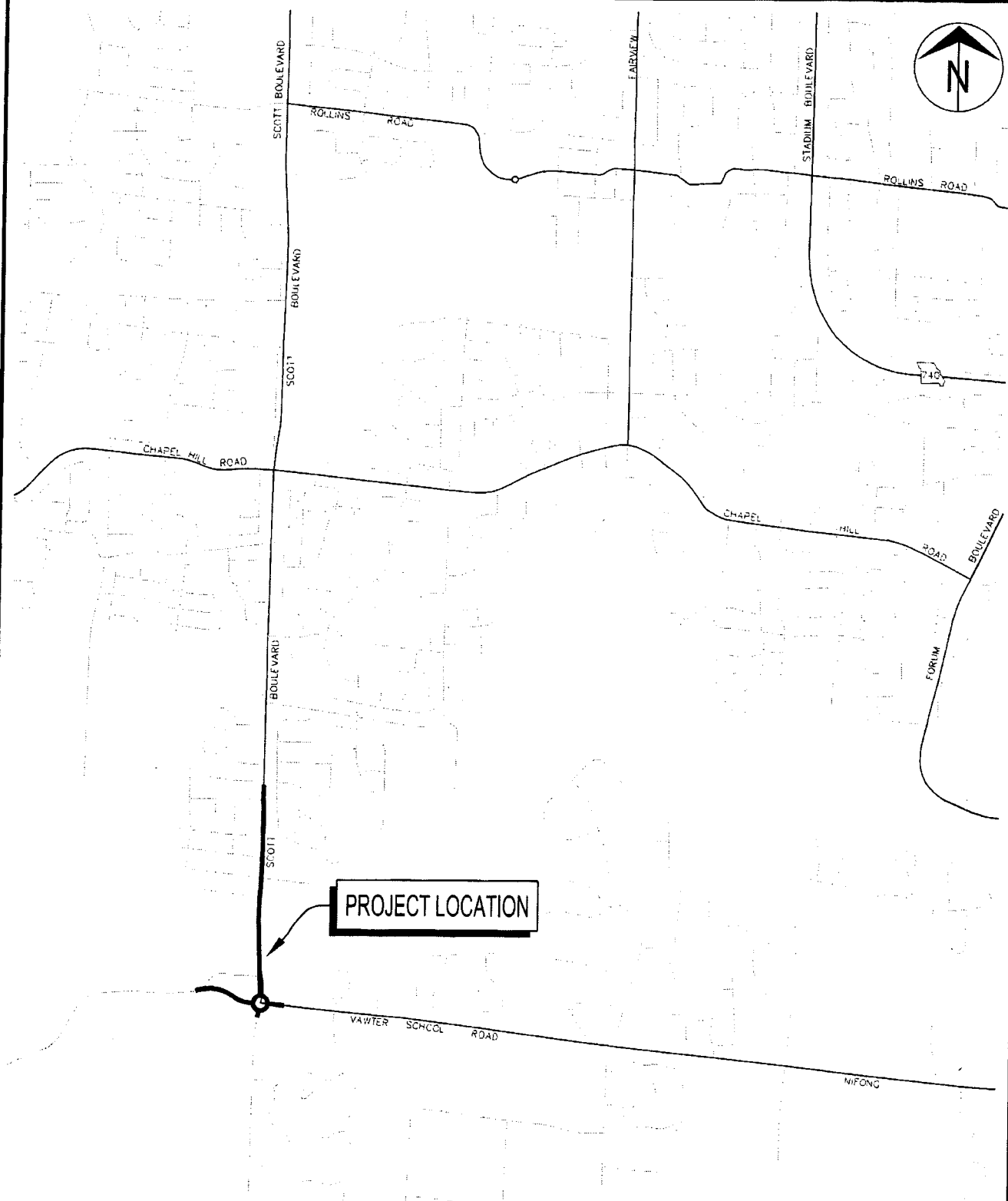
A network of safe roadways in and around the City will provide sustainable, efficient mobility to vehicular travel and other modes in a complimentary manner.

Maximize the capacity of existing roadway systems by having the City and County adopt and implement programs for traffic signal optimization, intersection improvements, turn lanes, effective access management, and etc.

SUGGESTED COUNCIL ACTIONS:

Passage of the ordinance authorizing a waterline replacement contract with Consolidated Public Water Supply District No. 1 in connection with the Scott Boulevard Phase 2 road improvement project.

| FISCAL and VISION NOTES: | | | | | |
|--|----------------|---|----|---|------------|
| City Fiscal Impact Enter all that apply | | Program Impact | | Mandates | |
| City's current net FY cost | \$912,541.00 | New Program/ Agency? | No | Federal or State mandated? | No |
| Amount of funds already appropriated | \$5,918,781.00 | Duplicates/Epands an existing program? | No | Vision Implementation impact | |
| Amount of budget amendment needed | \$0.00 | Fiscal Impact on any local political subdivision? | No | Enter all that apply: Refer to Web site | |
| Estimated 2 year net costs: | | Resources Required | | Vision Impact? | Yes |
| One Time | \$200,000.00 | Requires add'l FTE Personnel? | No | Primary Vision, Strategy and/or Goal Item # | #13 |
| Operating/ Ongoing | \$0.00 | Requires add'l facilities? | No | Secondary Vision, Strategy and/or Goal Item # | #13.3/13.4 |
| | | Requires add'l capital equipment? | No | Fiscal year implementation Task # | |



PROJECT LOCATION



City of Columbia, Missouri
Department of Public Works

Scott Blvd - Phase II Location Map

Scale: 1"=2000' Dwn: J.L.H. Date: 1/3/13