CALL NO. 306

CONTRACT ID. 211012

JEFFERSON COUNTY

FED/STATE PROJECT NUMBER FD39 056 0146 006-007

DESCRIPTION LAGRANGE ROAD(KY-146)

WORK TYPE GRADE & DRAIN WITH ASPHALT SURFACE

PRIMARY COMPLETION DATE 11/30/2021

LETTING DATE: April 23,2021

Sealed Bids will be received electronically through the Bid Express bidding service until 10:00 am EASTERN DAYLIGHT TIME April 23,2021. Bids will be publicly announced at 10:00 am EASTERN DAYLIGHT TIME.

PLANS AVAILABLE FOR THIS PROJECT.

REQUIRED BID PROPOSAL GUARANTY: Not less than 5% of the total bid.

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PART I

SCOPE OF WORK

ADMINISTRATIVE DISTRICT - 05

CONTRACT ID - 211012

FD39 056 0146 006-007

COUNTY - JEFFERSON

PCN - DE05601462112
FD39 056 0146 006-007

LAGRANGE ROAD(KY-146) (MP 6.340) CONSTRUCT LEFT TURN LANE AT N. ENGLISH STATION FROM MP 6.340 TO MP 6.680 (MP 6.680), A DISTANCE OF 0.35 MILES.GRADE & DRAIN WITH ASPHALT SURFACE SYP NO. 05-00807.00.

GEOGRAPHIC COORDINATES LATITUDE 38:16:29.00 LONGITUDE -85:31:13.00

COMPLETION DATE(S):

COMPLETED BY 11/30/2021 APPLIES TO ENTIRE CONTRACT

CONTRACT NOTES

PROPOSAL ADDENDA

All addenda to this proposal must be applied when calculating bid and certified in the bid packet submitted to the Kentucky Department of Highways. Failure to use the correct and most recent addenda may result in the bid being rejected.

BID SUBMITTAL

Bidder must use the Department's electronic bidding software. The Bidder must download the bid file located on the Bid Express website (www.bidx.com) to prepare a bid packet for submission to the Department. The bidder must submit electronically using Bid Express.

JOINT VENTURE BIDDING

Joint venture bidding is permissible. All companies in the joint venture must be prequalified in one of the work types in the Qualifications for Bidders for the project. The bidders must get a vendor ID for the joint venture from the Division of Construction Procurement and register the joint venture as a bidder on the project. Also, the joint venture must obtain a digital ID from Bid Express to submit a bid. A joint bid bond of 5% may be submitted for both companies or each company may submit a separate bond of 5%.

UNDERGROUND FACILITY DAMAGE PROTECTION

The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. When prescribed in said directives, the contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom shall be contacted through their individual Protection Notification Center. Non-compliance with these directives can result in the enforcement of penalties.

REGISTRATION WITH THE SECRETARY OF STATE BY A FOREIGN ENTITY

Pursuant to KRS 176.085(1)(b), an agency, department, office, or political subdivision of the Commonwealth of Kentucky shall not award a state contract to a person that is a foreign entity required by KRS 14A.9-010 to obtain a certificate of authority to transact business in the Commonwealth ("certificate") from the Secretary of State under KRS 14A.9-030 unless the person produces the certificate within fourteen (14) days of the bid or proposal opening. If the foreign entity is not required to obtain a certificate as provided in KRS 14A.9-010, the foreign entity should identify the applicable exception. Foreign entity is defined within KRS 14A.1-070.

For all foreign entities required to obtain a certificate of authority to transact business in the Commonwealth, if a copy of the certificate is not received by the contracting agency within the time frame identified above, the foreign entity's solicitation response shall be deemed non-responsive or the awarded contract shall be cancelled.

Businesses can register with the Secretary of State at https://secure.kentucky.gov/sos/ftbr/welcome.aspx .

SPECIAL NOTE FOR PROJECT QUESTIONS DURING ADVERTISEMENT

Questions about projects during the advertisement should be submitted in writing to the Division of Construction Procurement. This may be done by fax (502) 564-7299 or email to kytc.projectquestions@ky.gov. The Department will attempt to answer all submitted questions. The Department reserves the right not to answer if the question is not pertinent or does not aid in clarifying the project intent.

The deadline for posting answers will be 3:00 pm Eastern Daylight Time, the day preceding the Letting. Questions may be submitted until this deadline with the understanding that the later a question is submitted, the less likely an answer will be able to be provided.

The questions and answers will be posted for each Letting under the heading "Questions & Answers" on the Construction Procurement website (www.transportation.ky.gov/contract). The answers provided shall be considered part of this Special Note and, in case of a discrepancy, will govern over all other bidding documents.

HARDWOOD REMOVAL RESTRICTIONS

The US Department of Agriculture has imposed a quarantine in Kentucky and several surrounding states, to prevent the spread of an invasive insect, the emerald ash borer. Hardwood cut in conjunction with the project may not be removed from the state. Chipping or burning on site is the preferred method of disposal.

INSTRUCTIONS FOR EXCESS MATERIAL SITES AND BORROW SITES

Identification of excess material sites and borrow sites shall be the responsibility of the Contractor. The Contractor shall be responsible for compliance with all applicable state and federal laws and may wish to consult with the US Fish and Wildlife Service to seek protection under Section 10 of the Endangered Species Act for these activities.

ACCESS TO RECORDS

The contractor, as defined in KRS 45A.030 (9) agrees that the contracting agency, the Finance and Administration Cabinet, the Auditor of Public Accounts, and the Legislative Research Commission, or their duly authorized representatives, shall have access to any books, documents, papers, records, or other evidence, which are directly pertinent to this contract for the purpose of financial audit or program review. Records and other prequalification information confidentially

disclosed as part of the bid process shall not be deemed as directly pertinent to the contract and shall be exempt from disclosure as provided in KRS 61.878(1)(c). The contractor also recognizes that any books, documents, papers, records, or other evidence, received during a financial audit or program review shall be subject to the Kentucky Open Records Act, KRS 61.870 to 61.884.

In the event of a dispute between the contractor and the contracting agency, Attorney General, or the Auditor of Public Accounts over documents that are eligible for production and review, the Finance and Administration Cabinet shall review the dispute and issue a determination, in accordance with Secretary's Order 11-004.

SPECIAL NOTE FOR RECIPROCAL PREFERENCE

RECIPROCAL PREFERENCE TO BE GIVEN BY PUBLIC AGENCIES TO RESIDENT BIDDERS

By reference, KRS 45A.490 to 45A.494 are incorporated herein and in compliance regarding the bidders residency. Bidders who want to claim resident bidder status should complete the Affidavit for Claiming Resident Bidder Status along with their bid in the electronic bidding software. Submittal of the Affidavit should be done along the bid in Bid Express.

April 30, 2018

ASPHALT MIXTURE

Unless otherwise noted, the Department estimates the rate of application for all asphalt mixtures to be 110 lbs/sy per inch of depth.

INCIDENTAL SURFACING

The Department has included in the quantities of asphalt mixtures established in the proposal estimated quantities required for resurfacing or surfacing mailbox turnouts, farm field entrances, residential and commercial entrances, curve widening, ramp gores and tapers, and road and street approaches, as applicable. Pave these areas to the limits as shown on Standard Drawing RPM-110-06 or as directed by the Engineer. In the event signal detectors are present in the intersecting streets or roads, pave the crossroads to the right of way limit or back of the signal detector, whichever is the farthest back of the mainline. Surface or resurface these areas as directed by the Engineer. The Department will not measure placing and compacting for separate payment but shall be incidental to the Contract unit price for the asphalt mixtures.

OPTION B

Be advised that the Department will control and accept compaction of asphalt mixtures furnished on this project under OPTION B in accordance with Sections 402 and 403.

KENTUCKY TRANSPORTATION CABINET
Department of Highways
DIVISION OF RIGHT OF WAY & UTILITIES

TC 62-226
Rev. 01/2016
Page 1 of 1

RIGHT OF WAY CERTIFICATION

☒ Original	☐ Re-Certification	RIGHT OF WAY CERTIFICATION	
ITEM #	**COUNTY**	**PROJECT # (STATE)**	**PROJECT # (FEDERAL)**
5-807.00	Jefferson	1100 FD39 056 9265001R	

PROJECT DESCRIPTION

Construct Turn Lane on KY 146 at MP 6.5 into the Link Developement

☐ **No Additional Right of Way Required**

Construction will be within the limits of the existing right of way. The right of way was acquired in accordance to FHWA regulations under the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended. No additional right of way or relocation assistance were required for this project.

☒ **Condition # 1 (Additional Right of Way Required and Cleared)**

All necessary right of way, including control of access rights when applicable, have been acquired including legal and physical possession. Trial or appeal of cases may be pending in court but legal possession has been obtained. There may be some improvements remaining on the right-of-way, but all occupants have vacated the lands and improvements, and KYTC has physical possession and the rights to remove, salvage, or demolish all improvements and enter on all land. Just Compensation has been paid or deposited with the court. All relocations have been relocated to decent, safe, and sanitary housing or that KYTC has made available to displaced persons adequate replacement housing in accordance with the provisions of the current FHWA directive.

☐ **Condition # 2 (Additional Right of Way Required with Exception)**

The right of way has not been fully acquired, the right to occupy and to use all rights-of-way required for the proper execution of the project has been acquired. Some parcels may be pending in court and on other parcels full legal possession has not been obtained, but right of entry has been obtained, the occupants of all lands and improvements have vacated, and KYTC has physical possession and right to remove, salvage, or demolish all improvements. Just Compensation has been paid or deposited with the court for most parcels. Just Compensation for all pending parcels will be paid or deposited with the court prior to AWARD of construction contract

☐ **Condition # 3 (Additional Right of Way Required with Exception)**

The acquisition or right of occupancy and use of a few remaining parcels are not complete and/or some parcels still have occupants. All remaining occupants have had replacement housing made available to them in accordance with 49 CFR 24.204. KYTC is hereby requesting authorization to advertise this project for bids and to proceed with bid letting even though the necessary right of way will not be fully acquired, and/or some occupants will not be relocated, and/or the just compensation will not be paid or deposited with the court for some parcels until after bid letting. KYTC will fully meet all the requirements outlined in 23 CFR 635.309(c)(3) and 49 CFR 24.102(j) and will expedite completion of all acquisitions, relocations, and full payments after bid letting and prior to AWARD of the construction contract or force account construction.

		EXCEPTION (S) Parcel #	ANTICIPATED DATE OF POSSESSION WITH EXPLANATION
Total Number of Parcels on Project	3		
Number of Parcels That Have Been Acquired			
Signed Deed	3		
Condemnation			
Signed ROE			

Notes/ Comments (Use Additional Sheet if necessary)

LPA RW Project Manager		Right of Way Supervisor	
Printed Name		Printed Name	Tom Boykin
Signature		Signature	Tom Boykin Digitally signed by Tom Boykin Date: 2019.04.16 10:36:52 -04'00'
Date		Date	4/16/2019
Right of Way Director		**FHWA**	
Printed Name		Printed Name	
Signature	DM Loy Digitally signed by DM Loy Date: 2019.04.16 10:56:52 -04'00'	Signature	
Date		Date	

UTILITIES AND RAIL CERTIFICATION NOTE

Jefferson County
No federal number available
FD 39 056 0146 006-007
Mile point: 6.305 TO 6.6.672
CONSTRUCT TURN LANE ON KY 146 (LAGRANGE ROAD) AT MILEPOINT 6.5 INTO THE LINAK DEVELOPMENT IN JEFFERSON COUNTY. (2016BOP)
ITEM NUMBER: 05-807.00

PROJECT NOTES ON UTILITIES

Please Note: The information presented in this Utility Note is informational in nature and the information contained herein is not guaranteed.

The contractor will be responsible for contacting all utility facility owners on the subject project to coordinate his activities. The contractor will coordinate his activities to minimize and, where possible, avoid conflicts with utility facilities. Due to the nature of the work proposed, it is unlikely to conflict with the existing utilities beyond minor facility adjustments. Where conflicts with utility facilities are unavoidable, the contractor will coordinate any necessary relocation work with the facility owner and Resident Engineer. The Kentucky Transportation Cabinet maintains the right to remove or alter portions of this contract if a utility conflict occurs. The utility facilities as noted in the previous section(s) have been determined using data garnered by varied means and with varying degrees of accuracy: from the facility owners, a result of S.U.E., field inspections, and/or reviews of record drawings. The facilities defined may not be inclusive of all utilities in the project scope and are not Level A quality, unless specified as such. It is the contractor's responsibility to verify all utilities and their respective locations before excavating.

The contractor shall make every effort to protect underground facilities from damage as prescribed in the Underground Facility Damage Protection Act of 1994, Kentucky Revised Statute KRS 367.4901 to 367.4917. It is the contractor's responsibility to determine and take steps necessary to be in compliance with federal and state damage prevention directives. The contractor is instructed to contact KY 811 for the location of existing underground utilities. Contact shall be made a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor shall submit Excavation Locate Requests to the Kentucky Contact Center (KY 811) via web ticket entry. The submission of this request does not relieve the contractor from the responsibility of contacting non-member facility owners, whom are to be contacted through their individual Protection Notification Center. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area. Non-compliance with these directives can result in the enforcement of penalties.

UTILITIES AND RAIL CERTIFICATION NOTE

Jefferson County
No federal number available
FD 39 056 0146 006-007
Mile point: 6.305 TO 6.6.672
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NOTE: DO NOT DISTURB THE FOLLOWING FACILITIES LOCATED WITHIN THE PROJECT DISTURB LIMITS

AT&T KY – Communications

Charter Communications – Communications

Crown Castle Network Operations – Communications

Louisville Gas and Electric Company (LG&E) – Electric

Louisville Gas & Electric (LG&E) – Natural Gas

Louisville Water Company

Windstream – Communications

The Contractor is fully responsible for protection of all utilities listed above

THE FOLLOWING FACILITY OWNERS ARE RELOCATING/ADJUSTING THEIR FACILITIES WITHIN THE PROJECT LIMITS AND WILL BE COMPLETE PRIOR TO CONSTRUCTION

AT&T KY – Communications – The Company has Aerial communication lines on the LG&E owned pole route better described below and underground communication lines running parallel to KY 146 on the south side approximately 45’ to 55’ left of the centerline.

Charter Communications (Insight/Spectrum/Time Warner) – Communications – The Company has Aerial communication lines on the LG&E owned pole route better described below and underground communication lines running parallel to KY 146 on the south side approximately 45’ to 55’ left of the centerline.

UTILITIES AND RAIL CERTIFICATION NOTE

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Crown Castle Network Operations – Communications – The Company has Aerial communication lines on the LG&E owned pole route better described below and underground communication lines running parallel to KY 146 on the south side approximately 45’ to 55’ left of the centerline.

Louisville Gas and Electric Company (LG&E) – Electric – The Company has an electric distribution pole route running parallel to KY 146 along the south side from the beginning of the project to the end of the project approximately 25’ to 65’ left of the centerline. The route has a crossing over KY 146 at Approx. STA. 23+77.8. A distribution pole route also runs parallel to N. English Station road along the southwest side approximately 15’ to 20’ left of centerline. An abandoned underground electric duct crosses KY 146 at Approx. STA. 22+50. A relocated underground electric splice exists from approximately Station 30+00 to 31+00 on the south side.

Louisville Gas & Electric (LG&E) – Natural Gas **–** The Company has underground facilities running throughout the entire project limits.

- An existing buried 16 inch gas main runs parallel to KY 146 on the south side from the beginning of the project at STA. 12+40 approximately 35 feet to 45 feet left of the centerline, thence southwest along the east side of N. English Station Road approximately 20 feet from the centerline to the end of the project limits on N. English Station Rd..
- An existing 4 inch buried gas main begins at the N. English Station project limits at STA. 98+90 on the southeast side heading northeast approximately 18 feet right of the centerline tied into a new gas regulator on the same side with a 4 inch inlet and a 4 inch outlet from Approx. STA. 98+76.00 to Approx. STA. 99+57.40, approximately 30 feet to 45 feet right of the centerline. An abandoned 4 inch gas main with a regulator inlet and outlet also exists from Approx. STA. 98+76.00 to Approx. STA. 99+57.40 approximately 20 feet to 25 feet right of the centerline. The 4 inch gas main thence ties into an 8 inch gas main at Approx. Sta. 99+60, the 8 inch main thence turns northwest and crosses N. English Station Road at Approx. STA. 99+62, continuing west along the south side of KY 146 approximately 30 feet to 45 feet south of the centerline to end of the project. An abandoned 8 inch gas main exists from Approx. STA. 22+85 to Approx. STA. 27+55 approximately 25 feet left of centerline.

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Windstream – Communications – The Company has Aerial communication lines on the LG&E owned pole route better described above and underground communication lines running parallel to KY 146 on the south side approximately 45' to 55' left of the centerline.

THE FOLLOWING FACILITY OWNERS HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE OWNER OR THEIR SUBCONTRACTOR AND IS TO BE COORDINATED WITH THE ROAD CONTRACT

Not Applicable

THE FOLLOWING FACILITY OWNERS HAVE FACILITIES TO BE RELOCATED/ADJUSTED BY THE ROAD CONTRACTOR AS INCLUDED IN THIS CONTRACT

Louisville Water Company – The Company has an existing 12 inch CLD water main running parallel to KY 146 on the north side from the beginning of the project continuing west within approximately 10 feet to 15 feet right of the centerline. The 12 inch CLD water main thence crosses KY 146 to the south at Approx. STA. 23+63.80 and continues southwest and parallel to N. English Station Rd. on the west side generally 10 feet to the left of centerline to the end of the project limits on N English Station Rd. A 12 inch DI water main tees at a 90 deg. angle from the 12 inch CLD at Approx. STA. 23+00 heading west and parallel to KY 146 within 10 feet to 25 feet left of the centerline. The existing 12 inch DI main is to be relocated by the roadway contractor from Approx. Sta. 22+75 to Approx. STA. 26+50.

Refer to the final LWCo plans.

RAIL COMPANIES HAVE FACILITIES IN CONJUNCTION WITH THIS PROJECT AS NOTED

☐ **No Rail Involvement** ☐**Rail Involved** ☒ **Rail Adjacent**

Form Revised 6/24/16

UTILITIES AND RAIL CERTIFICATION NOTE

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AREA FACILITY OWNER CONTACT LIST

1. AT&T KY
   1340 E. John Rowan Blvd
   Bardstown, KY 40004

   Scott Roche
   Office (502) 348-4528
   Cell (502) 827-4703
   SR8832@att.com

2. Charter Communications
   10168 Linn Station Road, Suite 120

   Michael York
   Cell (502) 548-1632
   Michael.York@charter.com
   Kevin Mercer
   Office (502) 357-4724
   Cell (502) 817-5055
   Kevin.Mercer@charter.com

3. LG&E KU (Electric)
   820 West Broadway
   Louisville, KY 40202
   LG&E Emergency Number (502) 589-1444
   LG&E and KU Emergency Number 1-800-331-7370

   Caroline Justice
   Office (502) 627-3708
   Caroline.Justice@LGE-KU.com

4. LG&E (Gas)
   820 West Broadway
   Louisville, KY 40202
   Gas Emergency Number (502) 589-5511
   LG&E and KU Emergency Number 1-800-331-7370

   Caroline Justice
   Office (502) 627-3708
   Caroline.Justice@LGE-KU.com

5. Louisville Water Company
   550 South Third Street
   Louisville, KY 40202

   Daniel Tegene, PE
   (502) 569-3649
   DTegene@LWCky.com

UTILITIES AND RAIL CERTIFICATION NOTE

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6. Windstream
   111 S. Main Street
   Elizabethtown, KY 42701

   James Galvin
   Office (270) 765-1818
   Cell (270) 748-9249
   James.Galvin@windstream.com

7. C.S.X. Transportation, Inc.

David Hall, KY Liaison	(502) 815-1865
Milton Holder	Crossings Cell (502) 817-2011
John Williams	Crossings Office (502) 364-1133, Cell (502) 376-8745
Joe Malandruco (Florida)	Signals (904) 245-1160

GENERAL UTILITY NOTES AND INSTRUCTIONS APPLICABLE TO ALL UTILITY WORK MADE A PART OF THE ROAD CONSTRUCTION CONTRACT

The contractor should be aware the following utility notes and KYTC Utility Bid Item Descriptions shall supersede, replace and take precedence over any and all conflicting information that may be contained in utility owner supplied specifications contained in the contract, on plans supplied by the utility owner, or any utility owner specifications or information externally referenced in this contract.

Where information may have been omitted from these notes, bid item descriptions, utility owner supplied specifications or plans; the KYTC Standard Specifications for Road and Bridge Construction shall be referenced.

PROTECTION OF EXISTING UTILITIES

The existing utilities shown on the plans are shown as best known at the time the plans were developed and are to be used as a guide only by the Contractor. The Contractor shall use all means at his disposal to accurately locate all existing utilities, whether shown on the plans or not, prior to excavation. The contractor shall protect these utilities during construction. Any damage to existing utilities during construction that are shown or not shown on the plans shall be repaired at the Contractor's expense.

PREQUALIFIED UTILITY CONTRACTORS

Some utility owners may require contractors that perform relocation work on their respective facilities as a part of the road contract be prequalified or preapproved by the utility owner. Those utility owners with a prequalification or preapproval requirement are as follows:

Louisville Water Company

The bidding contractor needs to choose a subcontractor who is a Louisville Water Company prequalified contractor in the category of 4-16 inch ductile iron water main.

The bidding contractor needs to review the above list and choose from the list of approved subcontractors at the end of these general notes as identified above before bidding. When the list of approved subcontractors is provided, only subcontractors shown on the following list(s) will be allowed to work on that utility as a part of this contract.

When the list of approved subcontractors for the utility work is not provided in these general notes, the utility work can be completed by the prime contractor. If the prime contractor chooses to subcontract the work, the subcontractor shall be prequalified with the KYTC Division of Construction Procurement in the work type of "Utilities" (I33). Those who would like to become prequalified may contact the Division of Construction Procurement at (502) 564-3500. Please note: it could take up to 30 calendar days for prequalification to be approved. The prequalification does not have to be approved prior to the bid, but must be approved before the subcontract will be approved by KYTC and the work can be performed.

CONTRACT ADMINISTRATION RELATIVE TO UTILITY WORK

All utility work is being performed as a part of a contract administered by KYTC; there is not a direct contract between the utility contractor and utility owner. The KYTC Section Engineer is ultimately responsible for the administration of the road contract and any utility work included in the contract.

SUBMITTALS AND CORRESPONDENCE

All submittals and correspondence of any kind relative to utility work included in the road contract shall be directed to the KYTC Section Engineer, a copy of which may also be supplied to the utility owner by the contractor to expedite handling of items like material approvals and shop drawings. All approvals and correspondence generated by the utility owner shall be directed to the KYTC Section Engineer. The KYTC Section Engineer will relay any approvals or correspondence to the utility contractor as appropriate. At no time shall any direct communication between the utility owner and utility contractor without the communication flowing through the KYTC Section Engineer be considered official and binding under the contract.

ENGINEER

Where the word "Engineer" appears in any utility owner specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the "Engineer" is the Kentucky Transportation Cabinet (KYTC) Section Engineer or designated representative and the utility owner engineer or designated representative jointly. Both engineers must mutually agree upon all decisions made with regard to the utility construction. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

STANDARD SPECIFICATIONS

The Contractor shall follow the Louisville Water Company *TECHNICAL SPECIFICATIONS AND STANDARD DRAWINGS FOR PIPELINE CONSTRUCTION 2008.* All work shall be performed in accordance with accepted workmanship practices and the Technical Specifications and Standard Drawings.

https://www.louisvillewater.com/sites/louisvillewater.com/files/user_uploads/Procurement%20Other/2008%20TECHNICAL%20SPECIFICATIONS%20FOR%20PIPELINE%20CONSTRUCTION%20%28Final%20Complete%203-10-2008%20Print%20PDF%29.pdf

INSPECTOR OR RESIDENT PROJECT REPRESENTATIVE

Where the word "Inspector" or "Resident Project Representative" appears in the utility specifications included in this proposal, utility owner specifications included as a part of this contract by reference or on the utility relocation plans, it shall be understood the "Inspector" or "Resident Project Representative" is the utility owner inspector and KYTC inspector jointly. The Transportation Cabinet, Section Engineer shall make all final decisions in all disputes.

NOTICE TO UTILITY OWNERS OF THE START OF WORK

One month before construction is to start on a utility, the utility contractor shall make notice to the KYTC Section Engineer and the utility owner of when work on a utility is anticipated to start. The utility contractor shall again make confirmation notice to the KYTC Section Engineer and the utility owner one week before utility work is to actually start.

UTILITY SHUTDOWNS

The Contractor shall not shut down any active and in-service mains, utility lines or services for any reason unless specifically given permission to do so by the utility owner. The opening and closing of valves and operating of other active utility facilities for main, utility line or utility service shut downs are to be performed by the utility owner unless specific permission is given to the contractor by the owner to make shutdowns . If and when the utility owner gives the contractor permission to shutdown mains, utility lines or utility services, the contractor shall do so following the rules, procedures and regulations of the utility owner. Any permission given by the utility owner to the contractor to shutdown active and in-service mains, utility lines or services shall be communicated to the KYTC Section Engineer by the utility owner that such permission has been given.

Notice to customers of utility shut downs is sometimes required to be performed by the utility contractor. The contractor may be required; but, is not limited to, making notice to utility customers in a certain minimum amount of time in advance of the shut down and by whatever means of communication specified by the utility owner. The means of communication to the customer may be; but is not limited to, a door hanger, notice by newspaper ad, telephone contact, or any combination of communication methods deemed necessary, customary and appropriate by the utility owner. The contractor should refer to the utility owner specifications for requirements on customer notice.

Any procedure the utility owner may require the contractor to perform by specification or plan note and any expense the contractor may incur to comply with the utility owner's shut down procedure and notice to customers shall be considered an incidental expense to the utility construction.

CUSTOMER SERVICE AND LATERAL ABANDONMENTS When temporary or permanent abandonment of customer water, gas, or sewer services or laterals are necessary during relocation of utilities included in the contract, the utility contractor shall perform these abandonments as part of the contract as incidental work. No separate payment will be made for service line and lateral abandonments. The contractor shall provide all labor, equipment and materials to accomplish the temporary or permanent abandonment in accordance with the plans, specifications and/or as directed by the engineer. Abandonment may include, but is not limited to, digging down on a water or gas main at the tap to turn off the tap valve or corporation stop and/or capping or plugging the tap, digging down on a sewer tap at the main and plugging or capping the tap, digging down on a service line or lateral at a location shown on the plans or agreeable to the engineer and capping or plugging, or performing any other work necessary to abandon the service or lateral to satisfactorily accomplish the final utility relocation.

STATIONS AND DISTANCES

All stations and distances, when indicated for utility placement in utility relocation plans or specifications, are approximate; therefore, some minor adjustment may have to be made during construction to fit actual field conditions. Any changes in excess of 6 inches of plan location shall be reviewed and approved jointly by the KYTC Section Engineer or designated representative and utility owner engineer or designated representative. Changes in location without prior approval shall be remedied by the contractor at his own expense if the unauthorized change creates an unacceptable conflict or condition.

RESTORATION

Temporary and permanent restoration of paved or stone areas due to utility construction shall be considered incidental to the utility work. No separate payment will be made for this work. Temporary restoration shall be as directed by the KYTC Section Engineer. Permanent restoration shall be "in-kind" as existing.

Restoration of seed and sod areas will be measured and paid under the appropriate seeding and sodding bid items established in the contract for roadway work.

BELOW ARE NOTES FOR WHEN "INST" ITEMS ARE IN THE CONTRACT MEANING THE UTILITY COMPANY IS PROVIDING CERTAIN MATERIALS FOR UTILITY RELOCATION

MATERIAL

Contrary to Utility Bid Item Descriptions, those bid items that have the text **"Inst"** at the end of the bid item will have the major components of the bid item provided by the utility owner. No direct payment will be made for the major material component(s) supplied by the utility company. All remaining materials required to construct the bid item as detailed in utility bid item descriptions, in utility specifications and utility plans that are made a part of this contract will be supplied by the contractor. The contractor's bid price should reflect the difference in cost due to the provided materials.

The following utility owners have elected to provide the following materials for work under this contract:

*(List here utility owner name(s) and specific materials that will be provided to the contractor. If there are some utility owners that will be supplying materials and others that will not, it may be prudent to also list each utility owner that will not be supplying materials for clarity of the contract. If no utility owner intends to supply materials, the following statement shall be placed here: "**No materials are being supplied by the utility owner(s). All materials are to be supplied by the contractor per bid item descriptions, utility specifications and utility plans**.")*

SECURITY OF SUPPLIED MATERIALS

If any utility materials are to be supplied by the utility owner, it will be the responsibility of the utility contractor to secure all utility owner supplied materials after delivery to the project site. The utility contractor shall coordinate directly with the utility owner and their suppliers for delivery and security of the supplied materials. Any materials supplied by the utility owner and delivered to the construction site that are subsequently stolen, damaged or vandalized and deemed unusable shall be replaced with like materials at the contractor's expense.

Standard Water Bid Item Descriptions

W AIR RELEASE VALVE This bid item description shall apply to all air release valve installations of every size except those defined as "Special". This item shall include the air release valve, main to valve connecting line or piping, manhole, vault, structure, access casting or doors, tapping the main, labor, equipment, excavation, proper backfill and restoration required to install the air release valve at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. All air release/vacuum valves on a project shall be paid under one bid item regardless of size. No separate pay items will be established for size variations. Only in the case of the uniqueness of a particular air release valve would a separate bid item be established. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

BOLLARDS This item is for payment for furnishing and installing protective guard posts at above ground utility installations. A bollard may consist of, but not limited to, a steel post set in concrete or any other substantial post material. This item shall include all labor, equipment, and materials needed for complete installation of the bollard as specified by the utility owner specifications and plans. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

NOTE: A bid code for this item has been established in standard roadway bid items and shall be used for payment of this item. The bid code is 21341ND

W CAP EXISTING MAIN This item shall include the specified cap, concrete blocking and/or mechanical anchoring, labor, equipment, excavation, backfill, and restoration required to install the cap at the location shown on the plans or as directed in accordance with the specifications. This item is not to be paid on new main installations. This pay item is only to be paid to cap existing mains. Caps on new mains are incidental to the new main. Any and all caps on existing mains shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W DIRECTIONAL BORE Payment under this item is made whenever the plans or specifications specifically show directional boring is to be utilized in order to minimize the impact of open cut for the installation of water main under streets, creeks, and etc. Payment under this item shall include the specified bore pipe, labor, and equipment. No separate payment shall be made for bore pipe installed in the bore whether used as a carrier pipe or an encasement of a separate carrier pipe. This item shall also include pipe anchors at each end of the bore when specified to prevent the creep or contraction of the bore pipe. Carrier pipe installed within a bore pipe shall be paid separately under pipe items. Payment under this item shall not be size specific and no separate bid items will be established for size variations. The bore pipe sizes to be included under this item shall be as shown on the plans and/or in the specifications. Any and all directional bores in each contract shall be paid under one directional bore bid item included in the contract regardless of size. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W ENCASEMENT CONCRETE Includes all labor, equipment, excavation, concrete, reinforcing steel, backfill, restoration, and etc., to construct the concrete encasement of the water main as shown on the plans, and in accordance with the specifications and standard drawings. Payment under this item shall be in addition to the carrier pipe as paid under separate bid items. Carrier pipe is not included in this bid item. Any and all concrete encasement shall be paid under one bid item included in the contract regardless of the size of the carrier pipe or the volume of concrete or steel reinforcement as specified in the plans and specifications. No separate bid items will be established for size variations. Measurement of pay quantity shall be from end of concrete to end of concrete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W ENCASEMENT STEEL BORED This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to bore and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The sizes of encasement to be paid under the size ranges specified in the bid items shall be as follows:

Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
Range 6 = All encasement sizes greater than 24 inches

(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.) Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W ENCASEMENT STEEL OPEN CUT This item shall include the steel encasement pipe size as specified on the plans and in the specifications, casing spacers, end seals, labor, and equipment to open cut and install the encasement in accordance with the plans and specifications, complete and ready for use. The size shall be the measured internal diameter of the encasement pipe. The size encasement to be paid under the size ranges specified in the bid items shall be as follows:

Range 1 = All encasement sizes greater than 2 inches to and including 6 inches
Range 2 = All encasement sizes greater than 6 inches to and including 10 inches
Range 3 = All encasement sizes greater than 10 inches to and including 14 inches
Range 4 = All encasement sizes greater than 14 inches to and including 18 inches
Range 5 = All encasement sizes greater than 18 inches to and including 24 inches
Range 6 = All encasement sizes greater than 24 inches

(Encasement sizes of 2 inches internal diameter or less shall not be paid separately; but, shall be considered incidental to the carrier pipe.) Payment under this bid item shall not include the carrier pipe. Carrier pipe shall be paid under a separate bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W FIRE HYDRANT ADJUST Includes all labor, equipment, excavation, materials, and backfill to adjust the existing fire hydrant using the fire hydrant manufacturer's extension kit for adjustments of 18" or less. Adjustments greater than 18" require anchoring couplings and vertical bends to adjust to grade. The Contractor will supply and install all anchor couplings, bends, fire hydrant extension, concrete blocking, restoration, granular drainage material, etc, needed to adjust the fire hydrant complete and ready for use as shown on the plans, and in accordance with the specifications and standard drawings. This also includes allowing for the utility owner inspector to inspect the existing fire hydrant prior to adjusting, contractor returning unusable fire hydrants to the utility owner warehouse and picking up a replacement hydrant. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete and ready for use.

W FIRE HYDRANT ASSEMBLY Includes all labor, equipment, new fire hydrant, isolating valve and valve box, concrete pad around valve box (when specified in specifications or plans), piping, anchoring tee, anchoring couplings, fire hydrant extension, excavation, concrete blocking, granular drainage material, backfill, and restoration, to install a new fire hydrant assembly as indicated on plans and on standard drawings compete and ready for use. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W FIRE HYDRANT RELOCATE This item includes all labor and equipment to remove the existing fire hydrant from its existing location and reinstalling at a new location. This item shall include a new isolating valve and valve box, concrete pad around valve box (when required in specifications or plans), new piping, new anchoring tee, anchoring couplings, fire hydrant extensions, concrete blocking, restoration, granular drainage material, excavation, and backfill as indicated on plans, specifications, and on standard drawings compete and ready for use. This item shall also include allowing for utility owner inspector to inspect the existing fire hydrant prior to reuse, contractor returning unusable fire hydrants to the utility owner warehouse and picking up a replacement hydrant for use, if the existing fire hydrant is determined unfit for reuse. No additional payment will be made for rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W FIRE HYDRANT REMOVE This bid item includes removal of an abandoned fire hydrant, isolating valve, and valve box to the satisfaction of the engineer. The removed fire hydrant, isolating valve and valve box shall become the property of the contractor for his disposal as salvage or scrap. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W FLUSH HYDRANT ASSEMBLY This item shall include the flushing hydrant assembly, service line, tapping the main, labor, equipment, excavation, backfill, and restoration required to install the flush hydrant at the location shown on the plans and in accordance with the specifications and standard drawings, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W FLUSHING ASSEMBLY This item shall include the flushing device assembly, service line, meter box and lid, tapping the main, labor, equipment, excavation, backfill, and restoration required to install the

flushing device at the location shown on the plans and in accordance with the specifications and standard drawings, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W LEAK DETECTION METER This item is for payment for installation of a water meter at main valve locations where shown on the plans for detection of water main leaks. The meter shall be of the size and type specified in the plans or specifications. This item shall include all labor, equipment, meter, meter box or vault, connecting pipes between main and meter, main taps, tapping saddles, casting, yoke, and any other associated material needed for installation of a functioning water meter in accordance with the plans and specifications, complete and ready for use. No separate payment will be made under any other contract item for connecting pipe or main taps. Any and all leak detection meters shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete and ready for use.

W LINE MARKER This item is for payment for furnishing and installing a water utility line marker as specified by the utility owner specifications and plans. A line marker may consist of a post or monument of whatever materials specified and shall include markings and/or signage on same as specified by plans or specifications. This item shall include all labor, equipment, and materials needed for complete installation of the marker. This item shall be paid EACH (EA) when complete.

W MAIN POINT RELOCATE This item is intended for payment for horizontal and/or vertical relocation of a short length of an existing main at the locations shown on the plans. This bid item is to be used to relocate an existing water main at point locations such as to clear a conflict at a proposed drainage structure, pipe or any other similar short relocation situation, and where the existing pipe material is to be reused. The contractor shall provide any additional pipe or fitting material needed to complete the work as shown on the plans and specifications. The materials provided shall be of the same type and specification as those that exist. Substitution of alternative materials shall be approved by the engineer in advance on a case by case basis. New polyethylene wrap is to be provided (if wrap exists or is specified in the specifications to be used). If it is necessary that the pipe be disassembled for relay, payment under this item shall also include replacement of joint gaskets as needed. Bedding and backfill shall be provided and performed the same as with any other pipe installation as detailed in the plans and specifications. Payment under this item shall be for each location requiring an existing main to be relocated horizontally or vertically regardless of pipe size or relocation length. No separate pay items will be established for pipe size variations or relocation segment length variations. Water Main Relocate shall not be paid on a linear feet basis; but, shall be Paid EACH (EA) at each location when complete and placed in service. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

W METER This item is for payment for installation of all standard water meters of all sizes 2 inches ID or less as specified on the plans. This item shall include all labor, equipment, meter, meter box, casting, yoke, and any other associated material needed for installation of a functioning water meter in accordance with the plans and specifications, complete and ready for use. This item shall include connections to the new or existing water service line. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W METER ADJUST This item includes all labor, equipment, excavation, materials, backfill, restoration, and etc., to adjust the meter casting to finished grade (whatever size exists) at the location shown on the plans or as directed in accordance with the specifications and standard drawings complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W METER RELOCATE This item includes all labor, equipment, excavation, additional fittings, disinfection, testing, restoration, and etc., to relocate the existing water meter (whatever size exists), meter yoke, meter box, casting, and etc., from its old location to the location shown on the plans or as directed, in accordance with the specifications and standard drawings complete and ready for use. The new service pipe (if required) will be paid under short side or long side service bid items. Any and all meter relocations of 2 inches or less shall be paid under one bid item included in the contract regardless of size. Each individual relocation shall be paid individually under this item; however, no separate bid items will be established for meter size variations of 2 inches ID or less. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W METER VAULT SIZE RANGE 1 OR 2 This item is for payment for installation of an underground structure for housing of a larger water meter, fittings, and valves as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or access doors, the specified meter(s) valve(s), all piping, and fitting materials associated with installing a functioning meter and vault in accordance with the plans, standard drawings, and specifications, complete and ready for use. The size shall be the measured internal diameter of the meter and piping to be installed. The size meter vault to be paid under size 1 or 2 shall be as follows:

Size Range 1 = All meter and piping sizes greater than 2 inches up to and including 6 inches
Size Range 2 = All meter and piping sizes greater than 6 inches

This item shall be paid EACH (EA) when complete. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

W METER/FIRE SERVICE COMBO VAULT This item is for payment for installation of an underground structure for housing of a water meter and fire service piping, fittings, and valves as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or access doors, the specified meter(s), valve(s), all piping, and fitting materials associated with installing a functioning meter and fire service vault in accordance with the plans and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W METER WITH PRESSURE REDUCING VALVE (PRV) This item is for payment for installation of all standard water meters with pressure reducing valves (PRV) of all sizes 2 inches ID or less as specified on the plans. This item shall include all labor, equipment, meter, PRV, meter box, casting, yoke, and any other associated material needed for installation of a functioning water meter with PRV in accordance with the plans and specifications, complete and ready for use. This item shall include connections to the new or existing water service line. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced.

This item shall be paid EACH (EA) when complete.

W PIPE This description shall apply to all PVC, ductile iron, and polyethylene/plastic pipe bid items of every size and type to be used as water main, except those bid items defined as "Special". This item includes the pipe specified by the plans and specifications, all fittings (including, but not limited to, bends, tees, reducers, plugs, and caps), tracing wire with test boxes (if required by specification), polyethylene wrap (when specified), labor, equipment, excavation, bedding, restoration, testing, sanitizing, backfill, and etc., required to install the specified new pipe and new fittings at the locations shown on the plans, or as directed, in accordance with the specifications and standard drawings complete and ready for use. No additional payment will be made for rock excavation. This bid item includes material and placement of flowable fill under existing and proposed pavement, and wherever else specified on the plans or in the specifications. This item shall include all temporary and permanent materials and equipment required to pressure test and sanitize mains including, but not limited to, pressurization pumps, hoses, tubing, gauges, main taps, saddles, temporary main end caps or plugs and blocking, main end taps for flushing, chlorine liquids or tablets for sanitizing, water for testing/sanitizing and flushing (when not supplied by the utility), chlorine neutralization equipment and materials, and any other items needed to accomplish pressure testing and sanitizing the main installation. This item shall also include pipe anchors, at each end of polyethylene pipe runs when specified to prevent the creep or contraction of the pipe. Measurement of quantities under this item shall be through fittings, encasements, and directional bores (only when a separate carrier pipe is specified within the directional bore pipe). Measurements shall be further defined to be to the center of tie-in where new pipe contacts existing pipe at the center of connecting fittings, to the outside face of vault or structure walls, or to the point of main termination at dead ends. No separate payment will be made under pipe items when the directional bore pipe is the carrier pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W PLUG EXISTING MAIN This item shall include the specified plug, concrete blocking and/or anchoring, labor, equipment, excavation, backfill, and restoration required to install the plug in an existing in-service main that is to remain at the location shown on the plans or as directed in accordance with the specifications. Any and all plugs on all existing in-service mains shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

NOTE: This utility bid item is not to be paid on new main installations or abandoned mains. This pay item is to plug existing in-service mains only. Plugs on new mains are incidental to the new main just like all other fittings.

NOTE: Plugging of existing abandon mains shall be performed and paid in accordance with Section 708.03.05 of KYTC Standard Specifications For Road And Bridge Construction and paid using Bid Code 01314 Plug Pipe.

W PRESSURE REDUCING VALVE This description shall apply to all pressure reducing valves (PRV) of every size required in the plans and specifications except those bid items defined as "Special". Payment under this description is to be for PRVs being installed with new main. This item includes the PRV as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), pit or vault, backfill, restoration, testing, disinfection, and etc., required to install the specified PRV at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, PRVs shall be restrained. PRV restraint shall be considered incidental to the

PRV and adjoining pipe. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W PUMP STATION This item is for payment for installation of pumps and an above or below ground structure for housing of the pumps. This item shall include all pumps, piping, fittings, valves, electrical components, building materials, concrete, any other appurtenances, labor, equipment, excavation, and backfill, to complete the pump station installation as required by the plans, standard drawings, and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LUMP SUM (LS) when complete.

W REMOVE TRANSITE (AC) PIPE This item shall include all labor, equipment, and materials needed for removal and disposal of the pipe as hazardous material. All work shall be performed by trained and certified personnel in accordance with all environmental laws and regulations.
Any and all transite AC pipe removed shall be paid under one bid item included in the contract regardless of size. No separate bid items will be established for size variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid LINEAR FEET (LF) when complete.

W SERVICE LONG SIDE This bid item description shall apply to all service line installations of every size bid up to and including 2 inch inside diameter, except those service bid items defined as "Special". This item includes the specified piping material, main tap, tapping saddle (if required), and corporation stop materials, coupling for connecting the new piping to the surviving existing piping, encasement of 2 inches or less internal diameter (if required by plan or specification), labor, equipment, excavation, backfill, testing, disinfection, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and ready for use. This bid item is to pay for service installations where the ends of the service connection are on opposite sides of the public roadway and the service line crosses the centerline of the public roadway as shown on the plans. The length of the service line is not to be specified. Payment under this item shall not be restricted by a minimum or maximum length. The contractor shall draw his own conclusions as to the length of piping that may be needed. Payment under this item shall include boring, jacking, or excavating across the public roadway for placement. Placement of a service across a private residential or commercial entrance alone shall not be reason to make payment under this item. Private or commercial entrances shall not be considered a public roadway in defining payment under this item. This pay item does not include installation or relocation of meters. Meters will be paid separately. No additional payment will be made for rock excavation or for special bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W SERVICE SHORT SIDE This bid item description shall apply to all service line installations of every size up to and including 2 inch internal diameter, except those service bid items defined as "Special". This item includes installation of the specified piping material of the size specified on plans, encasement of 2 inches or less internal diameter (if required by plan or specification), main tap, tapping saddle (if required), corporation stop, coupling for connecting the new piping to the surviving existing piping, labor, equipment, excavation, backfill, testing, disinfection, and restoration, at the locations shown on the plans or as directed, in accordance with the specifications and standard drawings, complete and

ready for use. This bid item is to pay for service installations were both ends of the service connection are on the same side of the public roadway, or when an existing service crossing a public roadway will remain and is being extended, reconnected, or relocated with all work on one side of the public roadway centerline as shown on the plans. The length of the service line is not to be specified and shall not be restricted to any minimum or maximum length. Payment shall be made under this item even if the service crosses a private residential or commercial entrance; but, not a public roadway.
Private or commercial entrances shall not be considered a public roadway in defining payment under this item. The contractor shall draw his own conclusions as to the length of piping that may be needed. This pay item does not include installation or relocation of meters. Meters will be paid separately. No additional payment will be made for rock excavation or for bedding required in rock excavation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W SERVICE RELOCATE This item is for the relocation of an existing water service line where a meter is not involved, and where an existing service line can easily be adjusted by excavating alongside and moving the line horizontally and/or vertically a short distance without cutting the service line to avoid conflicts with road construction. This item shall include excavation, labor, equipment, bedding, and backfill to relocate the line in accordance with the plans and specifications complete and ready for use. Payment under this item shall be for each location requiring relocation. Payment shall be made under this item regardless of service size or relocation length. No separate pay items will be established for size or length variation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W STRUCTURE ABANDONMENT This item is to be used to pay for abandonment of larger above or below ground water structures such as meter vaults, fire pits, pump stations, tanks, and etc. Payment under this time shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to water construction, (i.e., abandonment of standard water meters up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted fill or flowable fill for abandonment of the structure in place and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W STRUCTURE REMOVAL This item is to be used to pay for removal of larger above or below ground water structures such as meter vaults, fire pits, pump stations, tanks, and etc. Payment under this time shall not be limited to size or scope; however structures with connecting pipes of 2 inches or less shall not be paid under this item; but, shall be considered incidental to water construction, (i.e., removal of standard water meters up to and including 2 inches would not be paid under this item). Payment under this item shall include all labor, equipment, and compacted backfill for removal of the structure and restoration complete. No separate bid items will be established for size or structure variations. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W TAPPING SLEVE AND VALVE SIZE 1 OR 2 This item shall include the specified tapping sleeve, valve, valve box, concrete pad around valve box (when required in specifications or plans), labor, and equipment to install the specified tapping sleeve and valve, complete and ready for use in accordance with

the plans and specifications. The size shall be the measured internal diameter of the live pipe to be tapped. The size tapping sleeve and valve to be paid under sizes 1 or 2 shall be as follows:

Size 1 = All live tapped main sizes up to and including 8 inches
Size 2 = All live tapped main sizes greater than 8 inches

Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W TIE-IN This bid description shall be used for all main tie-in bid items of every size except those defined as "Special". This item includes all labor, equipment, excavation, fittings, sleeves, reducers, couplings, blocking, anchoring, restoration, disinfection, testing and backfill required to make the water main tie-in as shown on the plans, and in accordance with the specifications complete and ready for use. Pipe for tie-ins shall be paid under separate bid items. This item shall be paid EACH (EA) when complete.

W VALVE This description shall apply to all valves of every size required in the plans and specifications except those bid items defined as "Special". Payment under this description is to be for gate or butterfly valves being installed with new main. This item includes the valve as specified in the plans and specifications, polyethylene wrap (if required by specification), labor, equipment, excavation, anchoring (if any), valve box and valve stem extensions, backfill, concrete pad around valve box (if required by specification), restoration, testing, disinfection, and etc., required to install the specified valve at the location shown on the plans in accordance with the specifications and standard drawings complete and ready for use. If required on plans and/or proposed adjoining DIP is restrained, valves shall be restrained. Valve restraint shall be considered incidental to the valve and adjoining pipe. This description does not apply to cut-in valves. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W VALVE ANCHOR EXISTING This bid item is intended to pay for installation of restraint hardware on an existing valve where no restraint exists to hold the valve in place to facilitate tie-ins and other procedures where restraint is prudent. This work shall be performed in accordance with water specifications and plans. This bid item shall include all labor equipment, excavation, materials and backfill to complete restraint of the designated valve, regardless of size, at the location shown on the plans, complete and ready for use. Materials to be provided may include, but is not limited to, retainer glands, lugs, threaded rod, concrete, reinforcing steel or any other material needed to complete the restraint. Should the associated valve box require removal to complete the restraint, the contractor shall reinstall the existing valve box, the cost of which shall be considered incidental to this bid item. No separate bid items are being provided for size variations. All sizes shall be paid under one bid item. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W VALVE BOX ADJUST Includes all labor, equipment, valve box and valve stem extensions (if required), excavation, backfill, concrete pad around valve box (when specified in specifications or plans), restoration, and etc., to adjust the top of the box to finished grade complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W VALVE CUT-IN This bid description is for new cut-in valve installations of all sizes where installation is accomplished by cutting out a section of existing main. This item shall include cutting the existing pipe, supplying the specified valve, couplings or sleeves, valve box, concrete pad around valve box (when required in specifications or plans), labor, equipment, and materials to install the valve at the locations shown on the plans, or as directed by the engineer, complete and ready for use. Any pipe required for installation shall be cut from that pipe removed or supplied new by the contractor. No separate payment will be made for pipe required for cut-in valve installation. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

W VALVE VAULT This item is for payment for installation of an underground structure for housing of specific valve(s) as required by the plans and specifications. This item shall include all labor, equipment, excavation, concrete, manhole castings or doors, the specified valve(s), all piping, and fitting materials associated with installing a functioning valve vault in accordance with the plans, standard drawing, and specifications, complete and ready for use. Please refer to the Utility Company's Specifications. If the Company does not have specifications, KYTC's Specifications shall be referenced. This item shall be paid EACH (EA) when complete.

LOUISVILLE WATER COMPANY

TECHNICAL SPECIFICATIONS AND

STANDARD DRAWINGS FOR

PIPELINE CONSTRUCTION

2008

LOUISVILLE WATER COMPANY
LOUISVILLE, KENTUCKY

LOUISVILLE WATER COMPANY

TECHNICAL SPECIFICATIONS AND

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PIPELINE CONSTRUCTION

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LOUISVILLE WATER COMPANY
LOUISVILLE, KENTUCKY

GREGORY C. HEITZMAN – PRESIDENT
JAMES H. BRAMMELL – VICE PRESIDENT, CHIEF ENGINEER

LOUISVILLE WATER COMPANY
TECHNICAL SPECIFICATIONS AND STANDARD DRAWINGS
FOR PIPELINE CONSTRUCTION
2008

The Technical Specifications and Standard Drawings are provided as a technical resource for the construction of water projects managed and contracted by the Louisville Water Company. The Technical Specifications and Standard Drawings will apply to water projects with 4-inch through 20-inch pipeline sizes. All work shall be performed in accordance with accepted workmanship practices and the Technical Specifications and Standard Drawings.

The Technical Specifications and Standard Drawings revisions shall become effective immediately upon formal adoption by the Chief Engineer of the Louisville Water Company and shall supercede all former Technical Specifications and Standard Drawings for water construction. Revisions are planned on a 5 year cycle. A copy of the current edition of the Technical Specifications and Standard Drawings may be obtained from the Chief Engineer at the 550 S. Third St. office or from the LWC Resource Coordinator, Construction Inspection Services at the 4801 Allmond Ave. office.

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TECHNICAL SPECIFICATIONS FOR PIPELINE CONSTRUCTION

1. GENERAL REQUIREMENTS

1.1 Pre-construction Valve Inspection

Prior to the beginning of construction, the Contractor shall be responsible for locating and inspecting all existing valves associated with the work to be done. Specific valves and locations are shown in the table and on the valve cards which are a part of the **SUPPLEMENTARY SPECIFICATIONS**. Inspection work to be done on these valves shall be included in the Contractor's base bid, and shall consist of the following:

A. Locate the valve in the field. Valve boxes that are paved over or buried shall be uncovered and made accessible.

B. Inspect keytubes and operating nut. Keytubes shall be cleared of debris and the operating nut made accessible. Gate Keys must be placed and turned on Gate Valve Operating Nuts to ensure the functional operation of the valve. Company Inspector must be present when operating gate valves.

C. Valve boxes (round tops) and lids shall be raised to grade where necessary.

Any valve determined by the Company to be inoperative shall be excavated and repaired or replaced by the Contractor as deemed necessary by the LWC Project Manager. Unit costs shall be as submitted by the Contractor in the **BIDDER'S PROPOSAL** form.

Except in cases of emergency, the Contractor shall not operate any valve without the direct supervision of the LWC Project Manager or Company Inspector. In an emergency, the Company Inspector and Company Radio Room shall be immediately notified by the Contractor. The Company Radio Room Direct Phone Line is (502) 368-0127.

1. 2 Project Identification and Contractor Signs

The Contractor is required to install a 4 ft. x 8 ft. double–faced sign on each end of the project limits, unless on dead end roads where only one sign will be required. The sign shall be furnished by the Company and consist of a 4 ft. x 8 ft. sheet of one quarter inch (¼") corrugated plastic board. The Contractor shall supply the materials to install the sign using two (2) – four inches (4") x four inches (4") x ten feet (10') posts set in concrete anchors (eighteen inches (18") diameter and three feet (3') depth, primed and painted white.

The Contractor shall supply the materials to mount the sign to the posts using three (3) – two and one-half inches (2 ½") galvanized lag bolts with one inch (1") diameter galvanized washers on each post. A sign shall be mounted on both sides of the posts visible from traffic in both directions. The Contractor must install the signs prior to beginning any work and not remove the signs until final restoration is approved. Project Identification signs may not be required on new development projects on non-public roadways.

The Contractor is required to display LWC Contractor magnetic signs on both sides of all licensed vehicles when performing LWC project contract work. Company Inspectors will assign and collect magnetic signs on a project basis.

1.3 Traffic Control, Permits, and Regulations

1.3.1 Traffic Control

Wherever the excavation is in paving, the Contractor shall so conduct their operations that at least one lane of traffic is kept open at all times. Where the excavation is performed in an intersection, the work shall be completed in one work day, including backfilling and temporary bituminous pavement; temporary paving restoration shall be adequately maintained until permanent pavement is placed.

Traffic control shall be in accordance with the Federal Highway Administration Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) latest edition.

Traffic control on streets shall be in accordance with requirements of appropriate City or County jurisdiction.

Traffic control on County streets shall be approved by the County Engineer.

Specific signing and traffic control is incidental to this project and will be set up at the pre-construction conference with representatives from the appropriate agencies. No extra payment will be made for placement of these traffic controls.

1.3.2 Encroachment Permits

Applicable permits shall be obtained by the Company from the appropriate agency: Louisville / Jefferson County Metro Government-Metro Works, Louisville and Jefferson County Metro Parks, Bullitt County Public Works Department, Oldham County Public Works Department, and / or Kentucky Department of Highways for installing water mains in public thoroughfares. The Contractor shall coordinate their time schedule for performing this work with the LWC Project Manager in order that the appropriate authority can be notified of the progress of construction. Special attention is directed to the working hours as specified by any of these traffic control departments in their respective permit.

A minimum fourteen (14) day advance notice of the need for a permit shall be provided to the LWC Project Manager. Copies of the permit(s), along with the approved traffic control plan, shall be on-site, readily available, legible and displayed in construction vehicles used at the project site. The Contractor will be responsible for obtaining appropriate permits for Joint-Bid Projects (i.e. Kentucky Transportation Cabinet (KTC) Projects, MSD Projects, or Developer Installed Projects, etc.)

The Contractor shall submit a traffic control plan to the LWC Project Manager with the request for the permit. As a minimum, the traffic control plan shall include lanes to be blocked, “No Parking” zones to be created, parking meters to be “bagged”, method of controlling traffic, designated work hours, and proposed work schedule. Contractors must use certified traffic control devices and not deviate from the approved Traffic Control Plans unless directed by the Jurisdictional Authority and any such deviation shall be documented.

Unless specifically approved by the Permitting Agency, all roadways (including side roads) shall remain open, with traffic maintained in a safe manner. Outside the designated work hours, all travel lanes shall be temporarily restored and reopened to traffic, and all construction vehicles, equipment, and personnel removed from the roadway.

1.3.3 Crossing of Roads

With respect to all roadways, any and all water main crossings, fire hydrant crossings, and/or service crossings shall be bored, jacked, or tunneled as specified within these Contract Documents. Any alteration(s) to the above shall require written approval from both the Louisville Water Company and the Jurisdictional Authority prior to the work being performed. Any additions and/or deletions in roadway bores/jacks/tunnels from those included in the project's scope of work shall require compensation adjustment in accordance with the **BIDDER'S PROPOSAL** form's Supplementary Unit Prices (if applicable) or with **CHANGES IN THE WORK**, in the **TERMS AND CONDITIONS** (if said Supplementary Unit Prices are not applicable).

1.3.4 Parking Meter Permit

The Contractor shall arrange for and pay for a permit as required by Louisville / Jefferson County Metro Government Ordinance Title VII Traffic Code: Chapter 72: Parking Regulations for the bagging of all parking meters affected by the construction. Issuance and enforcement are administered by the Louisville / Jefferson County Metro Government. Information may be obtained at the following address. All costs shall be included in the Contractor's base bid.

Louisville / Jefferson County Metro Government
Department of Metro Works
531 Court Place
Fiscal Court Building
Louisville, Kentucky 40202

1.3.5 Soil Erosion and Sediment Control Permit

The Contractor shall abide by and shall arrange for and pay for any and all permits involving the Kentucky Division of Water regulations pertaining to erosion and sediment control requirements as administered by the Louisville and Jefferson County Metropolitan Sewer District (MSD) where required. The Contractor shall comply with the applicable provisions of KRS Chapters 220 and 224 of the State Water Pollution Control Laws and other applicable statutes relating to the prevention and/or abatement of water pollution.

Projects involving disturbed areas of more than one (1) acre shall

require the Contractor to submit a "Notice of Intent" Letter to the Kentucky Division of Water, as well as an "Erosion and Sediment Control" plan submitted to MSD for MSD's approval where required.

In any event, regardless of the size of the project, the Contractor shall: exercise every reasonable precaution at all times to prevent water pollution by the erosion and deposition of sediment in streams, lakes, and reservoirs; conduct and schedule operations so as to avoid or minimize the muddying or siltation of areas adjacent to the construction site including streets, storm sewers, vacant lots, etc.; and not leave partially completed areas of work in a manner that will contribute to erosion during the period in which work is suspended.

For each stream crossing (a "stream" being defined as a so-called blue-line stream, either solid or broken, as shown on the United States Geological Survey (USGS) quadrangle map), the Louisville Water Company shall apply for a construction permit, or for an exemption thereto, from the Kentucky Division of Water, if applicable, (see Section 1.3.6). In any event, the Contractor shall: utilize adequate and environmentally-responsible construction practices, placing silt control prior to the start of construction and maintaining it until vegetation has been established; revegetate all disturbed areas upon completion of construction; maintain at least three and one-half feet (3 ½') of cover over the top of pipe with respect to the stream bed elevation; and obtain approval from MSD where required, prior to the start of construction, of an "Erosion and Sediment Control" plan.

LWC hereby gives notice to Contractors (and, Contractors are directed to provide notice to their employees, agents, assigns and Contractor's subcontractors, their employees, agents and assigns, and Contractor's suppliers, their employees, agents and assigns on the project site) that LWC holds an Erosion Prevention Sediment Control Plan General Permit issued by MSD, pursuant to the Louisville/Jefferson County Metro Government Code of Ordinance No. 186, Series 2007 (amending Jefferson County Ordinance Chapter 159), Erosion Prevention and Sediment Control, and, that certain activities require additional Individual Site Disturbance Permits, also issued by MSD, pursuant to the Louisville/Jefferson County Metro Government Code of Ordinance No. 186, Series 2007, Erosion Prevention and Sediment Control.

Pursuant to the requirements of that General Permit where required and any required individual site disturbance permits, LWC further gives notice to Contractors of the County's Erosion Prevention and Sediment Control Ordinance. LWC hereby expressly requires Contractors, their employees, agents, and assigns and Contractor's subcontractors, their employees, agents and assigns, and Contractor's suppliers, their employees, agents and assigns on the project site to comply with the provisions of that Ordinance and all permits, General and Individual, as part of the required compliance with "any federal, state or local government statute, ordinance, regulation and law which controls or limits in any way the actions of persons working on the project and which affects the purchase, installation, or disposition of any materials related to the project" set out in **CONTRACTOR'S RESPONSIBILITIES**, in the **TERMS AND CONDITIONS**.

This Contractor responsibility for compliance with the Erosion Prevention and Sediment Control Ordinance is in addition to those set out in **CONTRACTOR'S RESPONSIBILITIES**, in the **TERMS AND CONDITIONS.**

See Standard Drawing: 4501 in Appendix of Drawings.

1.3.6 Stream – Wetland Crossing Permit

The Kentucky Division of Water (KDOW) requires a General Water Quality Certification (W.Q.C.) Permit #12 for the crossing of streams or wetlands. It is not necessary to apply for an individual General Water Quality Certification (W.Q.C.) Permit #12 unless the stream is classified as an Outstanding, Exceptional, or Cold Water stream (Special Waters) by the KDOW. Listings of streams with these classifications can be found on the KDOW webpage:
http://nrepcapps.ky.gov/special_waters/specialwaters.htm.

For subfluvial (streams and rivers) pipe crossings, a flood plain construction permit will not be required pursuant to KRS 151.250 if the following requirements of 401 KAR 4:050 Section 2 are met:

- No material shall be placed in the stream or in the flood plain of the stream to form construction pads, coffer dams, access roads, etc. during construction of pipe crossings.

- Crossing trenches shall be backfilled as closely as possible to the original contour.

- All excess material resulting from construction displacement in a crossing trench shall be disposed of outside the flood plain.

- For erodible channels, there must be at least three and one half (3.5) feet of backfill on top of all pipe or conduit (casing) points in the crossing.

- For non-erodible channels, pipes or conduits (casing) in the crossing shall be encased on all sides by at least six (6) inches of concrete with all pipe or conduit (casing) points in the crossing at least six (6) inches below the original contour of the channel.

For subfluvial (streams and rivers) pipe crossings greater than fifteen (15) feet in width:

- The water main shall be of special construction, having flexible, restrained, or welded watertight joints.

- Valves shall be provided at both ends of the water crossings so that the section can be isolated for testing or repair.

- Valves shall be easily accessible, not subject to flooding, and if closest to the supply source, be in a manhole with permanent taps made on each side of the valve to allow insertion of a small meter to determine leakage and for sampling purposes.

See Standard Drawing: 1608 in Appendix of Drawings.

1.4 Project Drawings and Specifications

1.4.1 General

The Contractor shall make available a set of record plans and specifications at the job site at all times.

1.4.2 Combined Specification

This specification discusses the installation of ductile iron pipe, PVC (polyvinyl chloride) pipe, ductile iron appurtenances, and other project specified piping and materials.

The type of pipe to be installed is specified in the **SUPPLEMENTARY SPECIFICATIONS**. The sections "PIPELINE MATERIALS", "INSTALLATION", and "SERVICE WORK" reference pipe of either type. Whenever pipe of one type is referenced, the specification pertains to this type only. When the type of pipe is not distinguished, the specification pertains to both.

1.5 Daily Materials Installed Form

The Contractor shall maintain the Daily Materials Installed forms supplied by the Company as a record of the pipe, fittings, and valves installed each day, and shall provide same to the Company Inspector daily. Pipeline materials shall be listed on the form in the same sequence as installed.

1.6 Video Recording

Prior to the start of construction, the Contractor shall provide one (1) original walking, narrative continuous video, or equal method approved by the LWC Project Manager, of any project along existing public roads, representative of the complete project area.

The video should include narration of the video footage, verbal descriptions of the locations shown, and at a speed which clearly shows the condition of all areas which could be effected by the project construction. The video recording must be acceptable to the LWC Project Manager.

2. CONDUCT OF WORK

2.1 Safety

Wherever necessary, to prevent caving during the excavating of sand, gravel, sandy soil, or other unstable material, the trench shall be adequately sheeted, braced, and drained. The trench shall be maintained in accordance with OSHA regulations so that workers may work thereon safely and efficiently and vehicular and pedestrian traffic, livestock, and animals are protected at the worksite. It is essential that the trench pumps discharge into natural drainage channels or drain toward storm drains in compliance with regulatory agency requirements.

Any excavated materials to be stockpiled, shall be piled in a manner that will not endanger personnel, property, adjacent properties and pedestrians,

and will not obstruct driveways, sidewalks, or thoroughfares. Drainage lines shall not be obstructed.

With respect the entry of and/or working within confined spaces, the Contractor shall abide by the KOSHA Standards referenced by 803 KAR 2:300 thru 2:320 for General Industry and 803 KAR 2:240 thru 2:423 for Construction Standards, plus any and all additional related regulations required by the Commonwealth of Kentucky.

For questions or concerns relating to this matter, the Contractor shall contact the KOSHA–Kentucky Occupational Safety & Health Program, (phone (502) 564-3070).

2.2 Jobsite / Work Area Cleanliness

The Contractor shall routinely and regularly remove all dirt and rubbish resulting from its operations, and shall keep the jobsite or work area neat and tidy.

When its work is complete, it shall at once remove from the premises all tools and machinery belonging to the Contractor and all rubbish in connection with the work and render the jobsite or work area clean and free from all obstructions, delivering the work at completion whole, clean, tight, and ready for use, with the grounds in a neat and presentable condition.

2.3 Cooperation

The Contractor shall cooperate with local governing agencies, Kentucky Department of Highways, the Louisville Water Company, other utilities, and other Contractors to cause as little interference as possible, to avoid inconvenience and delay, and to facilitate prompt completion of the work.

The Contractor shall make special arrangements with the Company for valving off mains in the case of each connection or change in existing mains, and will conduct the work to cause the shortest possible interruption of service.

3. SITE WORK

3.1 Utilities

3.1.1 General

The Louisville Water Company has endeavored to locate sub-surface obstructions from available records, and such structures are shown on the project drawings. The Louisville Water Company does not guarantee the accuracy of the information there shown, although it has undertaken to present available data. The project drawings do not show the size or location of services.

Wherever the Contractor deems it necessary to determine the exact location of existing pipe, valve, or other underground structures, the Contractor may make any examinations that it may determine desirable in advance of the work and no added compensation will be paid. Only in the event that the LWC Project Manager by written order directs the Contractor to make additional exploration and excavation will extra compensation be allowed.

The Contractor's attention is directed to the Kentucky 811 (811 or 1-800-752-6007), which has been established to provide accurate locations of below-ground utilities.

The Contractor shall notify the Kentucky 811 two (2) business days in advance of any construction on this project. Additional information for Kentucky 811 can be found at www.kentucky811.org.

3.1.2 Utilities In Conflict with the Pipeline

In excavating trenches and installing pipe, where any existing utilities (including water pipe, sewer pipes, inlets and drains, gas pipes, electric lines and conduits, telephone lines and conduits, cable television lines and conduits, communication – fiber optic lines and conduits, service connections from these utilities, trolley tracks used for cathodic protection, traffic signal loop detector system or street light system), cross the trench, they shall be protected, supported, and maintained in service and restored to the condition in which they were found, all at no additional cost to the Company.

Where because of location or grade, such utilities cannot be replaced to occupy their original location, they shall be changed at no additional cost to the Company and as directed by the LWC Project Manager and utility owner to accomplish their original

purpose with adequate provision for drainage over or under the pipe as circumstances require.

Where any utility facility, including service connections, is touched or endangered by the work, the utility management shall be notified by the Contractor, and the Contractor shall cooperate with the utility and pay the cost of protection and repair if damaged.

The Contractor shall protect all abandoned trolley tracks. If abandoned trolley tracks are damaged, contact Pipeline Integrity Group of Louisville Gas and Electric Company, at (502) 627-4427, prior to the repair of any cut or damaged rail. Repair, if required, shall be as directed by Louisville Gas and Electric Company.

3.1.3 Utilities Parallel to the Pipeline

Where utilities exist parallel to the water main and at a location which will interfere with its installation, they shall be handled as follows:

A. The affected utility shall be notified at least five days in advance, if possible, of the time necessary to do the work. The cost of temporary hook-up and any charges from the utility will be paid by the Contractor unless previously authorized by the Louisville Water Company.

B. Gas, sewers, telephone, or electric facilities shall be gently uncovered, and personnel from the pertinent utility must remove its facility after accomplishing a temporary hook-up to prevent loss of service. After the water main has been placed, the utility line will be reinstalled near its original location and grade by the utility personnel, and the Contractor will complete the necessary backfill.

3.1.4 Water/Sewer Main Separation

Water mains shall be installed in accordance with Kentucky Division of Water regulations and Recommended Standards for Water Works (Ten States Standards).

Water mains shall be installed at a minimum of ten feet (10’) horizontally from any existing or proposed non-storm sewer main or non-storm sewer manhole; measured from the outside diameters. ("Non-storm sewer" is defined as sanitary sewer, combined sewer,

septic tank, or subsoil treatment system.)

When crossing over or under a non-storm sewer main, the water main shall maintain one and one-half feet (1.5') vertical separation with one (1) full length of the water pipe located so that both joints of the water pipe will be as far from the non-storm sewer as possible. Special structural support for the non-storm sewer and water pipes may be required.

When ten feet (10') of horizontal separation or one and one-half feet (1.5') of vertical separation cannot be maintained, the LWC Project Manager must be notified for resolution. There shall be no deviation from the above ten feet (10') horizontal and one and one-half feet (1.5') vertical separation requirements when water pipes are crossing non-storm sewer force mains. Only in the event that the LWC Project Manager directs the Contractor by written order may changes be made to these minimum separations.

3.1.5 Water Service Line Depth and Water Service/Non-storm sewer Separation

Water service lines shall be installed at the standard depth of forty two inches (42"). Service lines crossing over or under a non-storm sewer shall maintain a minimum vertical separation of one and one-half feet (1.5').
See Standard Drawing: 1000 in Appendix of Drawings.

3.2 Laying Out the Work

The exact location of the work will be fixed by lines and elevations furnished by the LWC Project Manager on project drawings or specifications. The Contractor shall layout its own work, lines, measurements, bench marks, levels and grades, right-of-way and easement lines. The Contractor shall contact the LWC Project Manager prior to entering a property on which the pipeline is being installed in an easement to ensure that the easement has been obtained.

Unless otherwise directed by the Company Inspector, the Contractor shall complete each block of water main installation or, in the absence of intersecting streets, every 500 feet of water main installation in urban areas, every 1000 feet of water main installation in suburban / residential areas, and 1500 feet in rural areas before proceeding.
This includes chlorination, pressure testing, service work, and permanent restoration of all areas affected by the construction.

The pipelines shall be installed throughout the public rights-of-way or in

easements as indicated on the project drawings. Generally, all work must be confined to the public way or easement provided; however, the Contractor may make arrangements for more operating room at its own expense and responsibility.

The Contractor will obtain written permission for use of private property by the property owner and furnish an affidavit to the LWC Project Manager that proper arrangements are made prior to occupation of the property. Otherwise, the Contractor shall conduct its operations in a manner that will not interfere with adjacent property owners.

3.3 Stakes

The Contractor shall furnish and set all stakes necessary in laying out the location of lines and grades, shall protect all stakes by suitable guard stakes, and shall be responsible for maintenance of all stakes after set.

3.4 Temporary Contractor Facilities

3.4.1 Power

The Contractor shall arrange and pay for all power required for construction purposes.

3.4.2 Heat and Enclosures

The Contractor shall furnish at its own expense, all temporary heat and/or enclosures that may be deemed necessary.

3.4.3 Light

The Contractor shall provide and pay for temporary electric light necessary for the execution of the work. This will include all necessary wiring, fixtures, and electric bulbs. Torches or other sources of light which cause damage by fire or by smoke shall not be used.

3.4.4 Water

The Contractor shall purchase water from the Company for use in construction operations. The Contractor shall include the cost of Temporary Water Service, and cost of water purchased, in the base

bid.

3.4.4.1 Temporary Water Service

Water used by the Contractor or Company for disinfection, flushing, pressure testing, and leakage testing will be supplied by the Company.

To obtain a temporary water service meter, an application, with deposit, must be completed in Metering Services offices at 4801 Allmond Avenue between the hours 8:00am to 3:00pm Monday through Friday.

Routine questions regarding a temporary service meter or billing concerns may be directed to our Call Center, (502) 583-6610.

Use of temporary services must comply with all LWC Service Rules and Regulations. The Louisville Water Company prohibits the unauthorized use of fire hydrants and will work with law enforcement officials to pursue each incident to the extent allowed by law.

The Contractor is responsible to protect the fire hydrant meter assemblies and fire hydrant wrenches from loss and theft.
Fire hydrant meter assemblies must be dismantled when not in use to protect from theft or freezing weather. Fire hydrant wrenches shall never be left unattended on a fire hydrant.

Fire Hydrants must be turned on completely open to prevent flooding through hydrant drain holes. Flow shall be regulated by the temporary meter assembly valve. The Contractor must notify the LWC Radio Room (569-3600, ext. 2700 & 2701) of all hydrants flowed between December 1 and March 15 so the hydrant can be winterized after use to prevent freezing. Some fire hydrants have a locking device attached to prevent unauthorized use.

The Contractor shall notify the LWC Project Manager or Company Inspector 48 hours in advance of the need to use such a fire hydrant so the lock can be removed by LWC personnel.
The Contractor shall immediately notify the LWC Project Manager or Company Inspector when the fire hydrant is no longer needed so the lock can be re-installed. It is the responsibility of the Contractor to properly protect the fire hydrant meter assembly, and to ensure that proper replacement techniques be applied, including placement of gasket to prevent water loss upstream of the meter.

3.4.4.2 Water uses excluded in Temporary Water Service

Any water from a fire hydrant must be metered. In some instances, the Company Inspector may approve non-metered water use (e.g. filling the main, flushing of hyper-chlorinated or potable water where practical.)
See Standard Drawing: 3600 in Appendix of Drawings.

3.4.5 Temporary Toilets

The Contractor shall provide in the vicinity of the work at locations satisfactory to the Company, and maintain in a sanitary condition, suitable temporary toilets for the use of the workers and Company personnel.

Upon completion of the work, the temporary toilets shall be removed and the premises left in a sanitary condition. The temporary toilets shall be satisfactory to the governing Board of Health jurisdiction.

3.4.6 Temporary Fencing

The Contractor shall supply and install temporary fencing when necessary to control livestock or property owner animals requiring containment. The Contractor shall make arrangements with the property owners for removal / containment of the animals during any removal of existing fencing and placement of the temporary fencing.

3.4.7 Contractor Communications

The Contractor shall supply a communication device such as a telephone, cellphone or mobile radio at the project site to allow direct communication with the LWC Project Manager or Company Inspector.

4. PIPELINE MATERIALS

4.1 Pipe and Fittings

4.1.1 Pipe and Fittings Furnished by the Company

Pipe to be furnished by the Company for this construction shall be as specified in the **SUPPLEMENTARY SPECIFICATIONS**, either PVC

(polyvinyl chloride) pipe or cement-lined ductile iron pipe, each having push-on joints, or other materials as specified by the LWC Project Manager. Fittings will be ductile iron with mechanical joints.

4.1.2 Pipe and Fittings Furnished by the Contractor

Materials provided for "Furnish and Install" projects shall be specified in the **SUPPLEMENTARY SPECIFICATIONS** and approved by the LWC Project Manager prior to installation.

The Company Inspector shall verify all materials meet project specifications prior to installation and shall so certify in writing.

The Contractor retains ownership of all Contractor furnished materials under "Furnish and Install" contracts and materials not installed cannot be returned to the Louisville Water Company.

4.2 Furnished to the Contractor

4.2.1 Materials

All PVC (polyvinyl chloride) or ductile iron pipe, bends or elbows, reducers, adapters, restraining tie rods, sleeves, rubber gaskets and other joint materials, tee bolts and gaskets for mechanical joint and special fittings, gate valves, butterfly valves, air relief valves of all sizes and descriptions including corporation cocks, copper service lines, fittings, concrete blocks, valve boxes, casing pipe, polyethylene wrap, cleaning pigs, and fire hydrants will be furnished by the Company. The Contractor shall requisition and haul, on appropriate vehicles, these materials from the Company warehouse to the points of their respective installation.

The Contractor shall protect pipe and fittings to avoid vehicle exhaust, debris, and damage during transit from the LWC warehouse to being installed.

As referenced in the current edition of the Company's "Process for Job Site Delivery of Line Pipe" Document, a copy of which is available from the LWC Project Manager, pipe delivery from the pipe manufacturer to the jobsite is available if the Contractor makes arrangements as stated in said Document.

4.2.2 Requisition and Return of Materials

The Contractor shall requisition and return materials on the

Company provided forms or warehouse computer software program, and shall account for or promptly return all materials so requisitioned.

Any unused materials shall be returned within five (5) working days after the date of completion of the work as specified by the Company Inspector. The cost of any unused materials not returned to the warehouse by this date shall be billed to the Contractor.

Below is a list of guidelines to draw or return materials from the Company's Allmond Avenue warehouse:

A. Call (502) 569-3600, extension 3633 to make an appointment with the Warehouse. Appointments are scheduled for 30 minutes in length. Fax a copy of the materials list to the warehouse at 569-0812.

B. Appointments, including standing appointments, will be scheduled on a first-come first-served basis. Appointments are not required for emergency situations, but must be approved by the LWC Project Manager.

C. Issues and returns would be considered equal in regard to scheduling.

D. Warehouse office hours are 7:30 a.m. - 4:00 p.m., Monday thru Friday (except Company holidays). Appointments are scheduled from 8:00 a.m. - 2:00 p.m.

E. All returned material must be in the same condition as it was when issued - clean and with all accessories. Returns of dirty, corroded, and/or rusted material, and/or fittings missing accessories, or otherwise damaged shall not be accepted.

F. The Contractor shall not return cut pieces of pipe to the LWC Warehouse. Contractors shall make best use of pipe, minimize cut pieces of pipe and shall not install more than two (2) pieces of cut pipe adjacent in a straight run. Only whole – uncut pipe may be returned to the LWC Warehouse and it must be clean and in good condition.

4.2.3 Loading and Unloading Procedures

Refer to **PIPE AND PIPE APPURTENANCES FURNISHED**

BY THE COMPANY, in the **TERMS AND CONDITIONS**.

4.2.4 Equipment

For pressure and leakage testing, the Company shall issue a test pump and meter kit to the Contractor. Contractors may furnish their own test pump if equipped with a quick-connect coupling to allow placement of the Company Inspector's pressure gauge.

The Contractor is to: notify the Gate Shop (502) 569-3600, ext. 2766, at the Warehouse at least two days in advance of the day of intended use; pick up the test pump kit between the hours to 7:30 a.m. and 3:30 p.m.; have the test pump kit for 48 hours at no charge (Saturdays and Sundays are excluded from the allowed time frame); and return the test pump kit to the Gate Shop within 48 hours of pick-up.
If outstanding for more than two days, beginning on the third day, a $50.00/day rental fee will be charged to the Contractor; this fee shall be waived only if the Company Inspector notifies the Warehouse Office or the Gate Shop at the Warehouse of special circumstances.

The Contractor shall be held responsible for the test pump and all test kit contents, and shall be invoiced for all cleanup and/or repair costs. The Company does not loan or lease hoses and/or tools, including tapping machines.

4.3 Storage of PVC (Polyvinyl Chloride) Pipe

When storing PVC (polyvinyl chloride) pipe, caution should be exercised to avoid compression, damage, or deformation to the pipe, including the bell ends. Insure that the weight of the upper units does not cause deformation to the lower units. All pipe must be stored in a manner to prevent dirt, debris, foreign objects, or any other substance from entering the pipe.

5. EXCAVATION

5.1 Rock Excavation

5.1.1 Definition of Rock

Rock, for the purpose of this contract, shall mean boulders, pieces of concrete or masonry exceeding 300 pounds in weight, and solid ledge rock (usually limestone) which, in the opinion of the LWC Project Manager, requires: drilling and blasting; wedging and blasting; wedging, sledging, or barring; or breaking up with a

power operated tool for its removal. All rock shall be Unclassified. Unclassified rock shall mean any rock which has to be removed for construction and the cost of removal shall be included in the base bid price.

5.1.2 Trench Dimensions

Trench rock excavation shall be based on a trench width of eighteen inches (18") wider than the nominal diameter of the pipe, equally spaced at nine inches (9") on each side of the pipe and a trench depth of six inches (6") below the outside bottom of the pipe.

5.2 Rock Soundings

The Louisville Water Company does not know or pretend to know, nor does it undertake to state, the nature of all materials which will be necessary to excavate, in order to construct the work contemplated herein. The Contractor is advised to perform rock soundings or subsurface investigations where feasible on all projects prior to bid.

The Contractor shall assume all risks arising from, or out of, the nature of all forms of materials necessary to be excavated, except as otherwise specified.

5.3 Rock Blasting Requirements

All blasting for excavations shall be conducted by a blaster licensed in the State of Kentucky in compliance with provisions of KRS 351 and KAR 803 and 805. Blasting will be permitted only after securing the approval of the LWC Project Manager and only when proper precautions are taken for the protection of persons or property. Any damage caused by blasting, including damaged or raised pavement, shall be repaired by the Contractor at their expense.

The Contractor shall abide by all Federal, State, and Local laws and regulations regarding the storage and use of blasting materials (KRS 351 and KAR 803 and 805). The hours of blasting will be fixed by the LWC Project Manager. A blasting log must be kept and a copy furnished to the Company.

5.4 Excavation in Streets and Parking Areas

5.4.1 Procedure

Wherever the excavation is in paving, whether in the streets or in

parking lots, the Contractor shall so conduct their operations that at least one lane of traffic is kept open at all times. Where the excavation is performed in a traveled lane, the trench shall be made safe during non-working hours by installing backfill and temporary bituminous pavement, backfill and concrete subbase, or plates (see "Plating" Section 5.4.3).

Where the excavation is performed in an intersection, the work shall be completed in one work day, including backfilling and temporary bituminous pavement. Temporary paving restoration shall be adequately maintained until permanent pavement is placed.

Traffic warning signs shall be placed and maintained on the streets being crossed, in accordance with the applicable agency as described in "Traffic Control" (Section 1.3.1).

5.4.2 Twelve-Inch (12") Cutback Requirement

The Contractor shall make two pairs of straight paving cuts of uniform width: the first pair being along the edges of the anticipated trench location, to be performed prior to excavating the pipe trench; and the second pair being along the anticipated twelve-inch (12") cutback locations, to be performed upon completion of trench backfill placement up to the subbase bottom elevation and prior to subbase placement.

Sawcuts shall be of sufficient penetration of the pavement base to insure straight edges during pavement removal. Irregular edges shall be sawcut to provide straight edges at a uniform width.

Twelve-Inch (12") Cutback Requirement is not required when backfilling the trench with flowable fill (Controlled Low Strength Cementitious Material).

5.4.3 Plating

5.4.3.1 Traveled Lanes

In traveled lanes, the Contractor shall provide plates recessed flush with the pavement for any excavation and trenches must be backfilled to subbase prior to placing plates. Any lane that is open to the traffic at any time during the day is defined as a traveled lane.

5.4.3.2 Non-Traveled Lanes

In non-traveled lanes, the Contractor shall also provide recessed plates where required by the LWC Project Manager and as described in the **SUPPLEMENTARY SPECIFICATIONS**. Otherwise, for non-traveled lanes and parking lots, surface mounted plates, properly secured to pavement, shall be provided.

Recessed and surface mounted plates shall have a minimum thickness of one inch (1") and shall be placed on a minimum bearing area of one foot of pavement bordering the perimeter of the excavation.

All plates, whether or not in a traveled lane, are to have 45-degree beveled edges along the entire perimeter. All plates must have readily identifiable markings to reflect Contractor ownership.

All plates are to be recessed from November 1st thru March 31st, so as to minimize the potential hazards to snow removal vehicles.

If plates are unable to be recessed and must be pinned due to other utility encumbrances, the appropriate Road Maintenance Agency must be notified immediately.
See Standard Drawing: 4000 and 4100 in Appendix of Drawings.

5.5 Trenching

5.5.1 General

The Contractor shall make all excavations for pipe, blow-off connections, valves and vaults, etc. which may be required for this project. All excavations shall be backfilled or plated overnight with open pipe ends plugged or capped.

5.5.2 Alignment and Grade

The trench shall be excavated to the alignment and depth required and only so far in advance of pipe installation as the Company Inspector shall permit. All pipe shall be installed and maintained to the lines and grades shown on the project drawings.

5.5.3 Trench Width

The trench width shall be as narrow as practicable to permit the pipe to be installed and jointed properly with a minimum of nine inches (9") of separation between outside of the pipe and each

sidewall of the trench. Trench width must allow for the backfill to be placed and compacted around the pipe. Vertical trench sides are desired where the nature of the excavated material and depth of trench will permit.

A trench width of eighteen inches (18”) plus nominal pipe diameter shall be the pay width for any items of work for which compensation is made where trench width is a factor in computing the value of work done.

5.5.4 Trench Depth

The pipe trench shall be excavated to such depth as to provide for six inches (6") of depth under and a minimum forty-two inches (42") of cover over the outside of the pipe barrel. Unless otherwise specified, the trench shall have a flat bottom conforming to this grade. The trench bottom shall be so excavated at the bells, so that the barrel of the pipe will have a bearing for its full length.

Any part of the trench excavated below grade (grade being six inches (6”) under the pipe) shall be backfilled to grade with the same backfill material used to bed the pipe or other material approved by the LWC Project Manager, and compacted to ninety percent of Modified Proctor as required in "BACKFILLING PROCEDURES AND TAMPING" (Section 7).

Unstable soil material shall be excavated from the trench, removed from the site, and backfilled and compacted as described above.

Depth of cover beyond that required above shall be provided where indicated on the project drawings with no additional compensation.

The pipe trench shall not be excavated to exceed five feet (5’) of cover over the outside of the pipe barrel under normal conditions unless indicated on the project drawings.

Variations from these required depths will be allowed only on written authority from the LWC Project Manager.

5.5.5 Minimum Clearances

Boulders, large stones, and rock (including shale) shall be removed to provide a clearance of at least six inches (6”) below all parts of the pipe, valves, or fittings and to provide a clear width of at least nine inches (9") on each side of all pipe and appurtenances.

Bell holes of ample dimension shall be dug to permit jointing to be made properly and to insure that the pipe is evenly supported throughout in length rather than on bells or couplings.

5.5.6 Contaminated Soil

In the event the Contractor suspects encountering contaminated soil (i.e., soils containing asbestos, PCBs, petroleum products, hazardous waste, radioactive material, and/or any other substance that presents a potential danger to persons or property exposed thereto), the Contractor shall take the following steps:

- immediately secure the work site to prevent access by unauthorized personnel;
- notify the Kentucky Department for Environmental Protection, if reportable, (reportable is when an actual spill or release of a hazardous material occurs or when there appears to be a threat of severe environmental harm), at (502) 564-2380 or 1-800-928-2380;
- immediately notify "Emergency Response" at 911;
- immediately stop all work in the vicinity of the contaminated soil, and notify the Company Inspector, the LWC Project Manager or the Company Radio Room at 569-3600 ext. 2700 or 2701; or 368-0127
- follow the instructions from the Kentucky Department for Environmental Protection for disposal of excavated soils which are contaminated.
- water lines installed or replaced in areas of organic contamination or in areas within 200 feet of underground or petroleum storage tanks or petroleum pipelines require ductile iron or other non-permeable materials and shall be used in all portions of the water line installation or replacement as approved by the LWC Project Manager.
- resume work on unaffected elements of the project.

5.5.7 Preservation of Landscape

In lawn, parks, and private property, the existing sod may, at the Contractor's option, be stripped and rolled to be saved and re-laid, or replaced with new sod of equal quality as existing. See

"RESTORATION" (Section 11).

If trenching machines are used, care shall be taken to avoid damage to trees or existing structures above or below ground.

Trees and shrubs shown on the project drawings and labeled "PROTECT, DO NOT DAMAGE" are to be protected from any damage both above and below ground, and the property owner is to receive full remuneration for any damage. Trees at other locations shall not be damaged or removed without explicit instructions from the LWC Project Manager and owner or agency responsible therefore.

The project drawings may call for certain shrubs and trees in private roadways or easements to be transplanted until operations are completed and replaced in their original location or replaced with new stock.

5.5.8 Preservation of Historical Construction Materials

When historical construction materials (such as cobblestones, large brick, granite blocks, limestone, or other large stone building blocks used in the course of pavement, curbs, and sidewalks) are encountered in public streets or alleys, they shall be replaced with like material. The Contractor may request a waiver when this is not possible from the LWC Project Manager for approval.

5.5.9 Preservation of Boundary Monuments

Contractors shall be responsible for the location and protection of any boundary monuments locating property lines, property corners or right-of-way lines within project limits. If any monuments are removed or disturbed during construction, the Contractor will be responsible for replacement of the monuments by a Professional Land Surveyor of the State of Kentucky.

5.5.10 Archaeological

Contractors shall immediately stop work, if during the prosecution of work; they encounter any unidentified archaeological artifacts, skeletal remains, abandoned cemeteries or burial grounds within the work area and immediately notify the LWC Project Manager or

Company Inspector.

6. INSTALLATION

6.1 Handling Pipe and Appurtenances

6.1.1 General

Proper equipment, tools, and facilities satisfactory to the LWC Project Manager shall be provided and used by the Contractor for the safe and convenient progression of the work. Slings used in handling the pipe shall be made of non-abrasive materials such as nylon. Chains or any sharp abrasive material shall not be used to lift or move pipe. Pipe fittings, valves, and other accessories shall at all times be handled with care to avoid damage.

The method of handling, hauling, and placing pipe in the trench shall be such as in no way will injure or damage the ductile iron pipe and coating or the PVC (polyvinyl chloride) pipe. All damage to pipe and/or appurtenances shall be paid for by the Contractor.

In loading and unloading, pipe shall be lifted in such manner as to avoid shock. Under no circumstances shall they be dropped. Forklifts' forks or other tools and equipment shall not be inserted into the barrels of pipe, valves or other fittings to lift or move them.

6.1.2 PVC (polyvinyl chloride) Pipe

When handling PVC (polyvinyl chloride) pipe, the Contractor shall avoid abrasion damage and gouging or cutting by metal surfaces or rocks, and any stressing of bell joints and damage of bevel ends.

Avoid severe impact, particularly in subfreezing temperatures. In subfreezing temperatures, caution is advised in handling to prevent impact damage.

6.2 Installing Pipe and Appurtenances

6.2.1 General

All pipe installation shall be done under the supervision of an

experienced superintendent who will be constantly on the job to supervise the installation of all pipe and making of all joints.

All pipe, fittings, and valves shall be carefully lowered into the trench, piece by piece, in such a manner as to prevent damage.

Unless shown otherwise on the project drawings, PVC (polyvinyl chloride) and Ductile Iron pipe joints will be rubber ring gasketed bell end type.

The Contractor shall furnish all equipment and materials necessary to make all joints completely assembled, except as described in "Furnished to the Contractor" (Section 4.2).

All pipe shall require a six inch (6”) undercut and a six inch (6”) compacted depth layer of backfill to insure proper bedding for the pipe. These requirements are described in the sections "Trenching" and "BACKFILLING PROCEDURES AND TAMPING" (Sections 5.5 and 7, respectively).

The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign material at all times. All pipe shall be clean and kept clean.

The exposed ends of pipe in the trench shall be closed by a suitable plug at all times when pipe installation is not actually in progress.

Pipe collars furnished by the Company may be used in areas under pavement where future service tapping locations are identifiable and required. Pipe collars shall have weep holes in the bottom section to allow drainage from the pipeline.

6.2.2 PVC (Polyvinyl Chloride) Pipe

All PVC (polyvinyl chloride) pipe installation shall be in accordance with AWWA Manual No. M23 "PVC Pipe - Design and Installation", unless otherwise specified herein.

Wherever either horizontal or vertical curves or angles are shown on the project drawings, or found to be needed, appropriate ductile iron bends shall be used with PVC (polyvinyl chloride) pipe.

Under no circumstances will the bending of PVC pipe be allowed.

Backfilling procedures and mechanical tamping of backfill material shall be strictly adhered to as specified in the "BACKFILLING PROCEDURES AND TAMPING" (Section 7) of these specifications.

6.2.3 Ductile Iron Pipe

All ductile iron pipe installation shall be in accordance with the current edition of AWWA Standard Specification C600, "AWWA Standard for Installation of Ductile Iron Water Main and Their Appurtenances", unless otherwise specified herein.

Wherever either horizontal or vertical curves or angles are shown on the project drawings, or found to be needed, appropriate ductile iron bends shall be used with ductile iron pipe.

When installing ductile iron pipe, joint openings not exceeding four degrees (4º) will be allowed.

Backfilling procedures and mechanical tamping of backfill material shall be strictly adhered to as specified in the "BACKFILLING PROCEDURES AND TAMPING" (Section 7) of these specifications.

Maximum Deflection for Full Length Ductile Iron Pipe @ 4 degrees
(Push -on Joint Pipe)

Pipe Size (inches)	Maximum Offset (inches)	Maximum Offset (inches)	Approx. Radius of Curve Produced by Succession of Joints (feet)	Approx. Radius of Curve Produced by Succession of Joints (feet)
	Pipe Length = 18 ft.	Pipe Length = 20 ft.	Pipe Length = 18 ft.	Pipe Length = 20 ft.
4 in.- 20 in.	15 in.	16 in.	255 ft.	285 ft.

6.3 Boring and Tunneling

When boring is required, the Contractor shall use a boring tool of the proper size to form a tunnel for the purpose of installing the pipe from one excavation to the other without disturbing the surface. Steel casing pipe shall be provided to the Contractor by the Louisville Water Company. Where such methods are used, a plug or suitable closure shall be inserted in the end of the pipe to exclude any earth from the inside of said pipe.

Where it is necessary to cut the paved surfaces to accomplish the above boring beyond the limits of the excavation necessary to make the tap, the cost of making such pavement repairs shall be borne by the Contractor.

When the boring of trees is required as specified on the project drawings or specifications, the Contractor shall be responsible for the survival of the trees disturbed by the installation for a period of two (2) years after final contract payment for the project.

Whenever water main is to be installed through casing pipe, the water main shall be ductile iron pipe with restrained joints. Steel casing pipe and ductile iron restrained in the pipe, both to be installed by the Contractor, will be furnished by the Louisville Water Company at its Allmond Avenue warehouse.

When ductile iron restrained-joint pipe is installed in casing pipe, casing runners shall be used to prevent damage during installation and to provide long term support. Pipe shall not rest on bells. Casing runners shall provide sufficient height between bell joint and casing wall and should be fastened securely to the pipe.

Unless otherwise stated in the **BIDDER'S PROPOSAL** form and/or the **SUPPLEMENTARY SPECIFICATIONS**, there shall be three (3) casing runners for each typical 18-foot pipe length, to be placed at the 3-foot, 9-foot, and 15-foot locations. Ends of casing pipes must be grouted or End Seals installed to prevent debris and seepage from entering the casing pipe and extend a minimum of five (5) feet beyond the edge of pavement.

Pipe may be installed in the casing using winch-drawn cable or jacking. Exercise care to avoid damage to the pipe, bell joints, and polywrap.

For ease of installation, use a lubricant such as flax soap or drilling mud between casing runners and casing. Do not use petroleum products such as oil or grease.

Any rock encountered in the construction of bore pits and/or receiving pits shall be unclassified.

If voids shall develop or if the excavation is greater than the outside

diameter of the casing pipe or tunnel liner by more than approximately one inch (1”), they shall be filled by pressure grouting. In the case where sections of casing pipe are field welded in order to meet the plan requirements, the Contractor shall weld the casing pipe fully around the entire circumference of the casing pipe and make the casing pipe available for weld inspection prior to installation of the water main.

All interior weld beads or slag shall not extend more than 3/32 inch from the interior pipe face.
See Standard Drawing: 1500 in Appendix of Drawings.

6.4 Mechanical and Push-on Joint Assembly

6.4.1 General

All rubber-gasket joints for Ductile Iron pipe shall be made in accordance with the current edition of AWWA Standard Specifications C111 "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings", as recommended by the manufacturer, and as described in the following Sections: 6.4.2; 6.4.3; and 6.4.4.

All rubber-gasket joints for PVC (polyvinyl chloride) pipe shall be made in accordance with the current edition of AWWA Standard Specification C900 "Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch Through 12-inch, for Water Distribution", as recommended by the manufacturer, and as described in the following Sections: 6.4.2; 6.4.3; and 6.4.4.

6.4.2 Mechanical Joint

The inside of the bell and the outside spigot end shall be thoroughly cleaned to remove oil, grit, excess coating, and other foreign matter from the joint, and then painted with a manufacturers approved lubricant.

The ductile iron gland shall then be slipped on the spigot end of the pipe with the lip extension of the gland toward the joint. The rubber gasket shall be painted with the lubricant and placed on the spigot end with the thick edge toward the gland. The entire section of pipe shall be pushed forward to seat the spigot end in the bell.

The gasket shall then be pressed into place within the bell with care being taken so that the gasket shall be evenly located around the entire joint.

The ductile iron gland shall then be moved along the pipe into

position for bolting, all of the bolts inserted, and the nuts screwed up tightly, with the fingers. Nuts spaced 180 degrees apart shall be tightened alternately, in order to produce an equal pressure on all parts of the gland.

The torque applied for various sizes of bolts shall be as follows:

Mechanical Joint Bolt Torque Table:

5/8"	45-60 ft.-lbs
3/4"	75-90 ft.-lbs
1"	100-120 ft.-lbs
1-1/4"	120-150 ft.-lbs

Any mechanical joint restraints or gripper rings shall be retightened to Bolt Torque Table specifications no sooner than thirty (30) minutes after initial tightening.

6.4.3 Push-on Joint

The inside of the bell and the outside of the spigot end shall be thoroughly cleaned to remove oil, grit, excess coating, and other foreign matter. If placement of the gasket occurs in the field, the circular rubber gasket shall be flexed inward and inserted in the gasket recess of the bell socket. A thin film of gasket lubricant shall be applied to the spigot end of the pipe.

Lubricant shall be applied evenly over the entire surface requiring lubrication, but avoid using an excess amount. Use only lubricant supplied by the pipe manufacturer. Failure to do so may promote bacterial growth or damage to the gaskets or the pipe.

Correct alignment of the pipe is essential for ease of assembly. The spigot end of the pipe shall be entered into the socket with care to keep the joint from contacting the ground.

The PVC (polyvinyl chloride) pipe shall be inserted into the bell or coupling by application of firm and steady pressure by hand or by block assembly until the spigot end slips through the gasket. PVC pipe shall be assembled by hand or with the use of bar and block. The spigot end of the pipe is marked by the manufacturer to indicate the correct depth of insertion. Over-insertion (over-belling) of the pipe shall not be permitted and can cause rolled gaskets, split bells, failure of hydrostatic pressure test, and damage to previously assembled joints.

Ductile iron pipe joints shall be completed by forcing the spigot

end to the bottom of the socket using a pry bar, backhoe, jack-type tool, or other device approved by the LWC Project Manager. Field cut pipe shall be insertion depth marked and end beveled before assembly to assure that the spigot end is inserted to the full depth of the joint.

6.4.4 Field-Cut Pipe

Push-On Assembly: Field-cut ductile iron or PVC (polyvinyl chloride) pipe requires a square cut for proper assembly of mechanical joint or push-on joint. It is recommended that the pipe be marked around its entire circumference prior to cutting to insure a square cut.

The end shall be beveled by using a beveling tool, rasp or grinder as appropriate to assemble the push-on joint. Round-off any sharp edges on the leading edge of the bevel. Reinstall depth mark using original mark by manufacturer as a guide.

Mechanical Joint Assembly: When field-cut PVC (polyvinyl chloride) pipe is to be inserted into a mechanical joint end, the bevel shall not be reinstalled. The above-stated requirements for a square cut, rounding off sharp edges, and establishing a correct-depth marker shall be performed.

6.5 Tie-ins to Existing Mains

The Contractor shall install the necessary pipe and fittings for the connections to the existing mains, as shown on the project drawings, and shall make the connections complete, ready-for-use.

It is imperative that the sequence of work involving an interruption of service be such that all operations be completed and the new pipeline ready to be connected prior to shutting off existing mains that are serving customer connections. Except for filling of the main, tie-ins shall not be accomplished until the main has passed pressure testing and disinfection.

All pipe, fittings and materials installed for tie-ins or taps not exposed to pipeline dechlorination shall be disinfected with an adequate chlorine solution.

When connections to existing pressurized PVC water mains are to be made with a tapping sleeve and gate valve, the tapping sleeve and gate shall be installed a minimum distance of twenty–four inches (24”) from any fitting end or pipe end.

The Contractor shall make that tap only after a hydrostatic pressure test of 125 psi is applied for fifteen (15) minutes with no leakage to the tapping sleeve and gate valve assembly. Before cutting an existing main under pressure, the Contractor shall ensure the adjacent existing valve and fittings are sufficiently secure.

The Contractor shall be responsible to provide the tapping coupon to the Company Inspector. The Contractor shall be responsible for a minimum advance notification of forty–eight (48) hours to the Company Inspector to make connections to existing mains.

The Contractor shall be responsible to make up to three (3) connection attempts in situations due to circumstances outside of their control such as inoperable valves or unavailable LWC personnel assistance.

Subsequently, water mains abandoned in-place shall be capped at all open ends as shown on the project drawings or as directed by the LWC Project Manager.

6.6 Transition of Pipe Materials (Ductile Iron Pipe and PVC Pipe)

All pipe material transitions (locations where ductile iron pipe is connected to PVC (polyvinyl chloride) pipe or vice versa) shall be made at a ductile iron fitting (tee, valve, coupler, sleeve, bend reducer, etc.).
The joining of pipe ends by inserting the spigot to bell of different pipe materials will not be allowed.

6.7 Removal of Asbestos-Cement (AC or Transite) Pipe

Any required cutting or tapping of asbestos-cement pipe shall be performed by qualified Louisville Water Company personnel, and shall be in compliance with all OSHA requirements. Pieces of asbestos concrete resulting from the work shall be double bagged, placed in a rigid container and disposed of in an approved landfill. This work shall be coordinated by the Contractor through the Company Inspector.

6.8 Setting Cast Iron Valves and Fittings

Valves, air valves, blow offs, and drains shall be assembled, and joints made up, both flanged and mechanical joint, as indicated on the project drawings. Valves twelve inches (12") and larger on ductile iron pipe, all valves on PVC (polyvinyl chloride) pipe, and all reducers must be anchored by coated and deformed reinforcing bars, as detailed per LWC Standard Drawing 1400, wrapped around each end of the valve or reducer, and cast in a cast-in-place concrete anchor block under each valve.

The weight of each valve shall be supported by solid pre-cast concrete bricks. Bricks should not be removed prior to concrete placement. Cast-in-place concrete shall then be poured up to the bottom of the valve. In no instance shall the weight of the valve be supported by the adjacent pipe.

If PVC pipe is used with iron fittings, the weight of each fitting shall be supported by a two feet (2') x two feet (2') width x one foot (1') depth cast-in-place concrete support block; rod anchorage is required at vertical bends which require the placement of the thrust block under the fitting.

The concrete support block shall bear against undisturbed earth, as shall the other above-mentioned types of concrete blocking.

The LWC Project Manager shall have the authority to direct the Contractor to add line valves if they are needed to facilitate the project and/or to keep service outages to an absolute minimum. In cases where the water main must be put into service as soon as possible, very early strength concrete can be specified by the LWC Project Manager for thrust restraint.
See Standard Drawing: 1400 in Appendix of Drawings.

6.9 Polyethylene Wrap for Ductile Iron Pipe and Fittings

Polyethylene wrap shall be installed in accordance with the current edition of AWWA Standard Specification C105 (ANSI A21.5) for American National Standard for Polyethylene Encasement, unless otherwise specified herein.

Polyethylene wrap will be furnished by the Company in 500 foot rolls. The Contractor shall cut the roll in tubes 2 feet (2’) longer than the standard length of pipe. Each tube shall be slipped over the length of ductile iron pipe, with centering to allow a one foot overlap on each adjacent pipe section. After the lap is made, slack in the tubing shall be taken up for a snug fit, and the overlay shall be secured with polyethylene tape. Each length of ductile iron pipe shall receive two separate polyethylene wraps as described above.

Ductile iron pipe shall not be wrapped for more than 5 days in advance of placement into the trench. Pipe to be wrapped shall include ductile iron and ductile iron restrained-joint pipe and iron fittings.

Odd shaped appurtenances such as valves, tees, fittings, and other ferrous metal pipeline appurtenances shall be wrapped by using a flat sheet of

polyethylene. Wrapping shall be done by placing the sheet under the appurtenances and bringing it up around the item to be wrapped. Seams will be made by bringing the edges together, folding twice, and taping down. Each appurtenance shall receive two separate polyethylene wraps as described above.

Care will be taken when backfilling to prevent damage to the polyethylene wrapping. Sections of wrapping having cuts, tears, punctures, or other damage shall be repaired or replaced.

PVC (polyvinyl chloride) pipe requires no polyethylene wrap.

AWWA Standards for installing polyethylene wrap and manufacturers' recommended methods for installing polyethylene wrap are available for review at the office of the Louisville Water Company's Resource Coordinator, Construction Inspection Services, 4801 Allmond Avenue.
See Standard Drawing: 1200 A-C in Appendix of Drawings.

6.10 Installation of Tracing Wire and Identification Ribbon for PVC Pipe

The Contractor shall install insulated #12 solid copper wire along with the PVC pipe. This wire shall be installed directly over the water main.

At each and every valve: the wire shall be directly connected to one of the valve joint bolts, and shall extend upward along the outside of the keytube but inside the round top frame. The wire shall be looped upward along the outside of the keytube to maintain the wire continuity. This wire shall be taped securely to the top of the pipe at the midpoint and bell of each section of pipe.

The wire shall also be connected to each end of the water main. The tracing wire shall be wrapped once around each copper or ductile iron service line. The wire shall be stripped of insulation and connected or wrapped with each valve, and service line.

Along with this wire, the Contractor shall also install a thin identification ribbon. Under paved or unpaved surfaces, this ribbon shall be installed eighteen inches (18”) below the surface or finished grade and directly over the water main. Both wire and ribbon shall be supplied by the Louisville Water Company.

6.11 Cast Iron Frames and Lids

The Contractor shall set all cast iron frames and lids for valves, air valves, and vaults. These frames and lids shall be set to grade and maintained in the proper position for the duration of the period covered by this contract.

Cast iron frames and lids shall be removed on all discontinued vaults, and surfaces shall be restored in accordance with the appropriate requirements of the sections "BACKFILLING PROCEDURES AND TAMPING" and "RESTORATION" (Sections 7 and 11, respectively).
All out-of-ground cast iron frames and lids shall be returned to the Allmond Avenue warehouse.

6.12 Valve Boxes

Standard valve boxes consisting of keytubes, extension pipes, and round tops and lids shall be furnished by the Company and installed on all valves by the Contractor. These boxes shall be centered about the operating nuts, shall be vertical, shall be set to grade, shall be placed and maintained in the proper position, and shall be free of dirt or other matter for the duration of the period covered by this contract.

Styrofoam collars or polywrap tape may be placed around each valve box before placement of concrete and in such a manner to allow the valve box to be raised to grade without demolishing the concrete subbase.

Valve extensions shall be placed on gate valves operating nuts to reach not less than two feet (2’) or more than three feet (3’) of ground elevation. Valve extensions may be welded together to reach the appropriate length. Valve extensions are available at the LWC warehouse.

Cast iron screw type (two (2) piece Buffalo style) valve box, round top, and cover may be required in areas of vehicular traffic per project drawings.

In areas of bituminous pavement, round top shims shall be furnished by the Company and installed by the Contractor under the round tops. The shims shall be installed after the subbase has cured, and before placement of the bituminous pavement.

Round tops and lids on all valves that are to be abandoned shall be removed and returned to the Allmond Avenue warehouse. The keytube shall be filled and surfaces restored in accordance with the appropriate requirements of the sections "BACKFILLING PROCEDURES AND TAMPING" and "RESTORATION" (Sections 7 and 11, respectively).

6.13 Plugging Ends of Pipe

When work is stopped at the end of a day, a cast iron plug shall be installed in place in the open end of the pipe to maintain a water tight seal. If trench water or debris enters the pipeline, it shall be removed from the pipe before work proceeds. Permanent plugs or caps shall be inserted where shown on the project drawings, and shall be securely braced as shown on the thrust anchor details included on the detail sheet of the project drawings. Plastic tape over pipe ends will only be permitted on non-standard / oversized pipe with Company Inspector approval.

6.14 Thrust Anchors, Counterweights, and Restrained-Joint Hardware

The Contractor shall install concrete thrust anchors or counterweights (3,500 psi concrete) at all bends (11¼, 22½, 45, and 90 degrees), reducers, tees, offsets, gate valves and plugs to withstand maximum test pressure. The Contractor shall provide all labor and material to construct the thrust anchors, piers, and counterweights, for all fittings, both horizontal and vertical. These concrete thrust anchors shall be minimum dimensions and size as indicated on the thrust anchor schedule shown on the detail sheet in the project drawings.

If field conditions prevent standard concrete thrust anchors placement as shown detailed in project drawings, the LWC Project Manager must approve any modification. Concrete thrust anchors in solid rock trenches may be modified with LWC Project Manager approval.

The Company Inspector may require forming (plywood or steel) in order to properly locate and position concrete thrust anchors. Company-supplied restrained-joint hardware is not intended to be used in lieu of concrete thrust anchors and counterweights. Such hardware is to be used ONLY when it is necessary to return a water main to service immediately, as when making tie-ins or at the specific instructions of the Company.

Whenever restrained-joint hardware is used to restrain fittings, the Contractor must also pour a concrete thrust block. In no instances, shall restrained-joint hardware alone be accepted as a permanent thrust restraint. See Standard Drawing: 1400 in Appendix of Drawings.

7. BACKFILLING PROCEDURES AND TAMPING

7.1 General

In general, trench dimensioning and backfill materials shall be as follows: six inches (6”) of vertical clearance with the bottom of the trench, and the subsequent layered placement of pit run sand, DGA or manufactured sand

bedding along the bottom of the pipe; nine inches (9”) of horizontal clearance with each side of the trench, and the subsequent layered placement of pit run sand, DGA, or manufactured sand backfill along each side of the pipe; the layered placement of pit run sand, DGA, or manufactured sand to the elevation of twelve inches (12”) above the crown of the pipe; and, if in a lawn area, the remainder of the backfill to be common (but acceptable) fill, or, if in a paved and/or a to-be-paved area, the remainder of the backfill to be the layered placement of pit run sand, DGA, manufactured sand, #57 stone or flowable fill up to the bottom elevation of the respective pavement restoration scheme.
All bedding and backfill material shall be uniform and continuous for the entire trench excavation limits.

The total depth of cover (i.e., the vertical distance from crown-of-pipe to ground/pavement surface) shall be at least forty-two inches (42”). The cost of applicable backfill material, backfilling, and required tamping shall be covered in the base bid as shown on the **BIDDER'S PROPOSAL** form.

All backfill (except flowable fill) shall be properly compacted by pneumatic, vibratory, or other approved compaction equipment. A backhoe bucket is not an approved compaction device. Degree of compaction shall be at least ninety percent (90%) of Modified Proctor (ASTM D-1557), and the compaction effort shall be performed in a uniform and consistent manner. The Company reserves the right to conduct compaction testing and such testing will not relieve the Contractor of any future warranty responsibilities. When instructed by the LWC Project Manager, the Contractor shall excavate backfilled material to a particular grade for testing. Backfilled areas which do not pass this test shall be excavated and re-compacted until they meet compaction specifications. Areas excavated for testing shall be re-compacted in accordance with this compaction specification. The cost of this work shall be included in the base bid.

Appropriate and sufficient backfill material shall be furnished by the Contractor to replace material deemed unsatisfactory by the LWC Project Manager or the Company Inspector.

Unsatisfactory material includes unsuitable soil as described in "FINAL BACKFILLING" (Section 7.6) and frozen or exceptionally wet backfill material, and may include backfill material excavated for testing purposes or backfill material excavated for failure to meet compaction requirements.
See Standard Drawing: 4300 in Appendix of Drawings.

7.2 Acceptable Backfill Materials

7.2.1 Pit Run Sand (Natural Sand)

Pit Run Sand is sand resulting from the natural degradation of rock and shall meet the material and gradation requirements of Section 804 Fine Aggregates of the current edition of the Kentucky Department of Highways "Standard Specifications for Road and Bridge Construction".

7.2.2 Dense Graded Aggregate (Kentucky DGA or Indiana #73)

Dense Graded Aggregate shall meet the material and gradation requirements of Section 805 Coarse Aggregates of the current edition of the Kentucky Department of Highways "Standard Specifications for Road and Bridge Construction".

7.2.3 Flowable Fill (Controlled Low Strength Cementitious Material).

Flowable fill, a quick-setting, cementitious, self-compacting, shrinkless fill material, may only be used with the prior written approval of the LWC Project Manager.
The mix design must be approved prior to placement by the LWC Project Manager. The 28-day compression strength of said fill shall not exceed 150 psi, and the minimum strength shall be 25 psi. The mix shall include sand, cement, fly ash with water not included as part of the volume mix. Fly ash shall have a ph value of no less than 7.0 and no greater than 12.5. The pipe shall be enveloped with pit run sand, manufactured sand or dense graded aggregate and backfilled in accordance with "Initial Backfilling" (Section 7.5).

7.2.4 Manufactured Sand (Kentucky 3/8" Manufactured Sand)

Manufactured Sand shall be the material resulting from the crushing and classification by screening, or otherwise, of rock and gravel. Manufactured Sand shall be washed and contain no fine particles and or dust.

The Contractor shall be responsible for all dust control associated with the use of Manufactured Sand. Manufactured Sand shall meet the material and gradation requirements of Section 804.08 Pipe Bedding of the current edition of the Kentucky Department of Highways "Standard Specifications for Road and Bridge Construction".

7.2.5 Kentucky #57 Stone (or Indiana #8 Stone)

Kentucky #57 Stone shall not be used as bedding or initial backfilling for pipe. Kentucky #57 Stone shall meet the material and gradation

requirements of Section 805 Course Aggregates of the current edition of the Kentucky Department of Highways “Standard Specifications for Road and Bridge Construction”.

7.2.6 Kentucky #3 Stone (or Indiana # 2 Stone)

Kentucky #3 Stone shall only be used for Fire Hydrant Drainage Pits. (See Section 9.2 Drainage Pit). Kentucky #3 Stone shall meet the material and gradation requirements of Section 805 Coarse Aggregates of the current edition of the Kentucky Department of Highways “Standard Specifications for Road and Bridge Construction”.

7.2.7 By-product of trench rock excavator

The by-product of trench rock excavator equipment may be acceptable for pipe bedding and/or backfill material if prior written approval is granted by the LWC Project Manager.

The LWC Project Manager must review the material and be assured of the compaction ability of the material. The Contractor must wash the material thoroughly (i.e., no dust particles); and to sieve the material thoroughly so that no individual rock pieces exceed sieve size of one inch (1”) (25.0mm).

7.3 Un-Acceptable Backfill Materials

Un-washed Manufactured sand, Black sand (coal or coke by-products), slag, or foundry by-products will not be allowed as pipe bedding and / or backfill material.

7.4 Bedding

For the entire length of the trench, the excavation shall provide a six inch (6”) space below the pipe, which shall be placed and firmly compacted with approved backfill materials, pit run sand, manufactured sand or Dense Graded Aggregate, as specified by the Kentucky Transportation Cabinet Department of Highways Standard Specification for Road and Bridge Construction, (latest edition) “Fine Aggregates” or "Coarse Aggregates," to form a bedding for the pipe.

The bedding shall be excavated at bells, valves, and fittings so the barrel of the pipe will have a bearing for its full length.
See Standard Drawing: 4300 in Appendix of Drawings.

7.5 Initial Backfilling

Initial backfill should occur as soon as possible after the installation of pipe, so as to prevent the pipe from shifting. After the pipe has been placed on the bedding, pit run sand or Dense Graded Aggregate, shall be deposited in the trench by mechanical equipment and distributed in six inch (6”) layers on both sides of the pipe for the full width of the trench, the trench width having nine inches (9”) of horizontal clearance along each side of the pipe.

The pit run sand or Dense Graded Aggregate shall be tamped in six inch (6”) layers and thoroughly compacted under the centerline and on each side of the pipe. Backfill shall be placed and tamped to a height of at least twelve inches (12") above the top of the pipe.
See Standard Drawing: 4300 in Appendix of Drawings.

7.6 Final Backfilling

When not under paved surfaces or surfaces where paving is intended, the remainder of the trench shall be backfilled with soil free from brush or vegetative matter, rocks larger than fist-size, pieces of concrete larger than fist-size, cinders, or any other matter which could prevent proper consolidation.

When under paved surfaces or surfaces where paving is intended, the remainder of the trench shall be backfilled for the full depth with pit run sand, Dense Graded Aggregate, or #57 stone as specified by the Kentucky Department of Highways Standard Specification for Road and Bridge Construction, (latest edition) “Fine Aggregates” or "Coarse Aggregates." At pavement crossings, this pavement backfill shall extend five feet (5') beyond each end of the paving or proposed paving.

Whether under paved or unpaved surfaces, the final backfill shall be tamped by pneumatic or other approved tamping equipment in successive layers of six inches (6”) or less in height to finish grade or pavement restoration as required.

If Hydra-Hammer or Hoe-Pack type compactors are approved by the LWC Project Manager, compaction shall be performed in successive layers eighteen inches (18”) or less in height to finish grade or pavement restoration. Backfill must be a minimum of two feet (2’) above the water main before Hydra-Hammer or Hoe-Pack type compactors may be used. Water jetting will not be allowed except by written approval by the LWC

Project Manager.

The total depth of cover (i.e., the vertical distance from crown-of-pipe to ground/pavement surface) shall be at least forty two inches (42”) and no more than fifty-four inches (54”) unless approved prior to installation by the LWC Project Manager.
See Standard Drawing: 4300 in Appendix of Drawings.

8. PLACING WATER MAIN IN SERVICE

8.1 General

After a section of main has been properly installed and valved, the main shall be filled, disinfected, pig cleaned, flushed, and pressure and leakage tested before being placed in service.

The Contractor shall provide adequate personnel to assist the Company Inspector on site for placing the water main in service.
The cleaning pig shall be inserted into the pipeline at the time of installation. Pipe soap shall not be applied directly to cleaning pigs. Pigs shall be supplied by Louisville Water Company.

Disinfection, cleaning, and flushing of the water main must result with subsequent water samples passing all Louisville Water Company water quality tests.

8.2 Filling and Disinfection of the Water Main

8.2.1 Filling of the Water Main

The main shall be chlorinated prior to beginning the pigging operation and shall be filled from downstream of the pig. Contractors must use Temporary Service Meters for filling mains to account for water usage and backflow prevention.

The main shall be filled with hyperchlorinated water for at least 24-hours prior to the beginning of flushing operations.

When the disinfection method is granular calcium hypochlorite (HTH or equal), the granular calcium hypochlorite (HTH or equal) must be applied into each section of pipe during installation and prior to filling the water main. See Section 8.2.2.

When the pipe is filled, air shall be expelled through fire hydrants, air valves, or flushing connections.

All flushing connections, fill connections, and discharge connections shall be installed by the Contractor at locations indicated on the project drawings or as directed by the LWC Project Manager or Company Inspector if a fire hydrant or service connection cannot be utilized.

If not specified to be furnished by the Company, particular components of flushing/discharge hardware shall be furnished by the Contractor.

8.2.2 Disinfection of the Water Main

New or relocated water mains shall be disinfected in accordance with the requirements of the Kentucky Division of Water, Natural Resources and Environmental Cabinet and AWWA Standard C651 upon completion of construction and before being placed in service.

The method to be used to achieve these requirements will be application of chlorine or chlorine compounds (calcium hypochlorite granules - HTH or equal) to each pipe length at the time of installation, or liquid sodium hypochlorite or other LWC Project Manager approved method.

The Contractor shall supply granular calcium hypochlorite or sodium hypochlorite as needed. Granular calcium hypochlorite shall conform to ANSI / AWWA B300 and contain a minimum of 65% per cent available chlorine by weight and be stored in a cool, dry, and dark environment to minimize its deterioration.

Granular calcium hypochlorite must meet NSF /ANSI Standard 60 requirements. Certified Manufacturers are listed on the NSF Product and Service Listings internet site at: http://www.nsf.org/Certified/PwsChemicals/Listings.asp?ChemicalName=Calcium+Hypochlorite&

Sodium hypochlorite liquid shall conform to ANSI / AWWA B300 and contain a minimum of 15% per cent available chlorine by volume and the storage conditions and time must be controlled to minimize deterioration.

Sodium hypochlorite liquid must meet NSF /ANSI Standard 60 requirements. Certified Manufacturers are listed on the NSF Product and Service Listings internet site at: http://www.nsf.org/Certified/PwsChemicals/Listings.asp?ChemicalName=Sodium+Hypochlorite&

The Contractor shall equally apply calcium hypochlorite granules (HTH or equal) throughout the entire section of pipeline during the installation or sodium hypochlorite to produce a concentration of at least fifty (50) ppm and a residual of at least twenty-five (25) ppm at the end of 24 hours, to be followed by thorough flushing; this is in compliance with 401 KAR 8:150 "Disinfection and Filtration", Sections 4(1) and 4(2).

The following amounts of calcium hypochlorite granules (HTH or equal) or sodium hypochlorite liquid (@ 12.5 %), per 100 linear feet of pipeline, should produce fifty (50) ppm of chlorine:

Amount of Granular Chlorine (HTH OR EQUAL) or Sodium Hypochlorite per 100 Linear Feet of Pipeline:

Pipe Size	Weight of Granular Chlorine (HTH or equal)	Volume of Granular Chlorine (HTH or equal)	Volume of Sodium Hypochlorite @12.5% solution
4"	0.75 ounce	1/8 cup	0.031 gallons
6"	1.50 ounces	1/4 cup	0.072 gallons
8"	2.75 ounces	3/8 cup	0.126 gallons
12"	6.00 ounces	7/8 cup	0.286 gallons
16"	10.75 ounces	1-1/2 cups	0.501 gallons
20"	16.75 ounces	2-1/2 cups	0.787 gallons

After the disinfection procedure has begun, the Contractor shall tag-out and not operate any valves, including those newly installed, without consent and presence of the LWC Project Manager or Company Inspector.

The Contractor shall perform the chlorination under the complete control of the LWC Project Manager or Company Inspector.

8.3 Pig Cleaning and Flushing the Water Main

8.3.1 Pig Cleaning the Water Main

When beginning the pigging operation, after opening the downstream (outlet) valve, the valve upstream of the pig shall be opened allowing the pig to move at approximately one (1) foot per second (FPS).

Hyperchlorinated water shall be discharged through the end of the pipeline from which the pig shall be removed in accordance with the requirements of Section 8.4, “DISCHARGE OF HYPERCHLORINATED WATER”.

8.3.2 Flushing the Water Main

With respect to flushing, the Company's standard operating procedure is as follows. The flushing assembly is to be checked-out from the Company's meter shop by the Contractor with an initial meter reading taken and shall be returned by same after flushing operations have been completed.

The meter/check valve portion of the flushing assembly is not to be installed until after the completion of pigging operations (so as to protect the meter/check valve from internal damage caused by debris). Upon the completion of pigging operations and prior to the start of flushing operations, the meter/check valve is to be installed.

The Contractor is to supply a two inch (2”) hose to be used during flushing operations. Upon the completion of flushing operations, a final meter reading will be taken when returned to the Company’s meter shop.

No flushing device, blow-off, or air relief valve shall be directly connected to any non-storm sewer, storm sewer, or storm drain, and shall be located at a distance greater than ten (10) feet from any non-storm sewer.
See Standard Drawing: 1601, 1602, and 1603 in Appendix of Drawings.

8.4 Discharge of Hyperchlorinated Water

Discharge of hyperchlorinated water can be directed to combined or sanitary sewer facilities only after the LWC Project Manager has received approval from the Permit Section Supervisor of the Louisville and

Jefferson County Metropolitan Sewer District or jurisdictional sewer agency authority. Flushing outside the Louisville and Jefferson County Metropolitan Sewer District service area shall be in accordance with Kentucky Division of Water requirements.

The Contractor shall provide 72 hours notice to the LWC Project Manager of intended discharge of hyperchlorinated water. In locations where discharge of hyperchlorinated water is restrictive, LWC Project Managers may approve tanker truck transportation for disposal at other sites. If the discharge of hyperchlorinated water can not be to a combined or sanitary sewer, the hyperchlorinated water shall be neutralized to a chlorine concentration of less than 0.019 ppm (mg/L) before discharge to a storm drain or onto the ground surface in a manner which will not violate 401 KAR 5:031 Surface Water Standards.

The Contractor shall be responsible for all chlorinated water disposal (neutralized to acceptable levels per regulations prior to release) and adherence to "LWC Best Management Practice & Procedures on Chlorinated Water Disposal" and 401 KAR 5:031 and 401 KAR 8:020. Contractor disposal methods must have LWC Project Manager approval.

The Company shall furnish all dechlorination hardware necessary for the dechlorination operation. The Contractor will be responsible to furnish hoses and fittings required for the flushing operation.

The LWC Project Manager or Company Inspector shall reserve the right to postpone the dechlorination operation in the event of an anticipated major rain event.

The LWC Project Manager shall reserve the right to dechlorinate water with calcium thiosulfate (Captor), sodium bisulfate, or other approved method supplied by the Company.

8.5 Pressure and Leakage Test

Before the hydrostatic test is begun, the Contractor shall: backfill all pipe; provide all temporary and permanent thrust anchor blocking; and install taps for releasing air at all points of highest elevation where no fire hydrant or flushing connection has been installed. All valves within the test area shall be fully open including valves on fire hydrant supply pipes.

It shall be the Contractor's responsibility to locate and repair any and all leaks that may develop.

The water main (ductile iron and PVC) and appurtances shall be discharged of hyperchlorinated water, flushed and filled with potable

water prior to performing the pressure and leakage test.

The water main shall then be subject to a hydrostatic pressure of 200 PSI for ductile iron pipe, 200 PSI for PVC DR-14, and 150 PSI for PVC DR-18 or at a pressure specified by the LWC Project Manager at the lowest point along the section being tested for a period of two (2) hours with the test pressure not dropping more than 5 PSI during the test. At elevated sections of the pipeline the minimum test pressure shall be 75% of the hydrostatic test pressure.

In conjunction with the hydrostatic test, a leakage test shall be conducted at the same pressure and for the same period of time.

The Contractor may furnish a test pump if approved by the Company Inspector. The test pump must be equipped with a quick-connect coupling to allow the connection of the Company Inspector's pressure gauge.

The leakage allowed will be as given by the following table. All of this testing shall be accomplished in the presence of the LWC Project Manager or Company Inspector.

Allowable Leakage per 1000 feet of Ductile Iron or PVC Pipeline in gallons/hour. (Average Test Pressure @ 200 PSI for Ductile Iron and PVC DR-14 or 150 PSI for PVC DR-18)

Pipe Diameter(inches)	4"	6"	8"	12"	16"	20"
D.I. or PVC - DR14 Leakage @ 200 PSI (gallon/hour)	0.38	0.57	0.76	1.15	1.53	1.91
PVC – DR 18 Leakage @ 150 PSI (gallon/hour)	0.33	0.50	0.66	0.99	1.32	1.66

All pipe, fittings, and other materials found to be defective under test shall be removed and replaced. These tests shall be repeated until satisfactory to the LWC Project Manager and Company Inspector. All visible leaks shall be repaired regardless of the amount of leakage.

The required testing apparatus, consisting of a gasoline motor driven pump, valves, pressure gauge, meter, test pump hose, and connections, shall be picked up and returned to the Company yard, the day the test is to be run.

The Contractor shall be responsible for all phases of testing the water

main.

8.6 Coliform Monitoring

The water main shall be placed in service only after coliform monitoring (sampling and analysis) applicable to the line does not show the presence of coliform. If coliform is detected, repeat flushing of the line and coliform monitoring. If coliform is still detected, repeat disinfection and flushing as if the line has never been disinfected. Continue the described process until monitoring does not show the presence of coliform. The presence or absence of total coliform monitored by sampling and analysis as needed shall be determined for new, cleaned, repaired or relocated water line(s).

Water samples shall be taken within 1200 feet of each connection point to existing lines, at one (1) mile intervals, and at dead ends without omitting any branch of the new, cleaned, repaired or relocated water line(s).

Sample bottles shall be clearly identified with a unique project identification note and delivered to the LWC Water Quality Laboratory. The test results will be submitted to the cabinet (KDOW) on a monthly basis, no later than the 10^{th} day of the following month. These results will include chlorine residual and total coliform negative results.

8.7 Air Relief Valves

Air relief valves or hydrants shall be placed at necessary high points in water mains where air can accumulate. The Contractor shall install air relief valves at all locations as identified on project plans. Additional air relief valves that may be required by the LWC Project Manager or Company Inspector will be compensated as described in **CHANGES IN THE WORK**, in the **TERMS AND CONDITIONS**.

Corporation stops for air relief valves shall be installed with tapping saddles to minimize pig damage when pig cleaning the pipe line.

8.7.1 Automatic Air Relief Valves

Where practical, the open end of an air relief pipe from automatic valves shall be extended a minimum distance of one foot (1') above grade and provided with a screened, downward-facing elbow.

Automatic air relief valves shall not be installed in situations where the flooding of the manhole or chamber may occur.
See Standard Drawing: 1603 in Appendix of Drawings.

8.7.2 Manual Air Relief Valves

The open end of an air relief pipe from a manually operated valve shall be extended to the top of the pit and provided with a screened, downward-facing elbow if drainage is provided for the manhole.

Use of manual air relief valves is recommended wherever possible.
See Standard Drawing: 1602 in Appendix of Drawings.

8.8 Leak Detection By-Pass Meter at Underwater Crossings

Leak Detection By-Pass Meters are required at all underwater crossings which are greater than fifteen feet (15') in width.

Water main valves shall be installed at both sides of the water crossing so that section can be isolated for testing or repair. The valves and meter vault shall be easily accessible and not subject to flooding. The valve closest to the supply source shall have permanent taps on each side to allow the installation of a meter to determine leakage and for sampling purposes.
See Standard Drawing: 1608 in Appendix of Drawings.

9. FIRE HYDRANT

9.1 Materials and Installation

The fire hydrant installation shall consist of the following items, and shall be as shown on the detail sheet of project drawings.

The field location of fire hydrants shall be approved by the Company's Inspector prior to installation. Fire hydrants shall be installed to allow proper drainage. Fire hydrants located on project drawings in areas of poor drainage shall contact the LWC Project Manager or Company Inspector for movement to a suitable location.

The fire hydrant anchor tee and gate valve shall be installed as the main is installed. A tapping sleeve and gate valve shall be installed if the main is in service. Fire hydrant supply pipe (pipe, fittings, gate valve, and fire hydrant) must be secured to the water main for proper thrust restraint. All joints in the fire hydrant supply pipe (between fire hydrant and the main to which it is connected) shall be installed using a restrained joint method.

The fire hydrant supply pipe shall be ductile iron pipe, in all cases, regardless of the type of main being connected to. The fire hydrant supply pipe shall be a minimum diameter of six (6) inches and connected to a main with a minimum diameter of six (6) inches.

The fire hydrant shall be that furnished by the Company, designed for proper depth of bury, shall have a drain hole, and shall be so installed that the barrel will properly drain.

The fire hydrant shall be set plumb, and shall have the pumper nozzles set facing perpendicular to the curb. The bottom of the break-away flange bolts shall be located from two inches (2”) to five inches (5”) above finished grade, with the center of the nozzle eighteen inches (18") to thirty inches (30") above finished grade.

The fire hydrant shall be set to established grade, with the center of the barrel two feet (2’) back of the face of the curb line (eighteen inches (18”) behind the back edge of the curb for rolled curbs) or as directed, or in the absence of a curb approximately five feet (5’) to fifteen feet (15’) from the edge of the pavement, no more than fifteen feet (15’) from a hard traveled surface, in accordance with governing fire department ordinances and accessible to the fire department. The base of the fire hydrant shall be set on a precast concrete block. The back of the elbow shall be well anchored against undisturbed earth by means of precast concrete blocks.

Two layers of polyethylene wrapping shall be installed from the fire hydrant anchor tee to the base elbow of the fire hydrant, including the fire hydrant valve, connecting pipe, and thrust restraints. The wrapping shall not impede the drain holes located near the bottom of the fire hydrant barrel.

Fire hydrant barrel extension kits shall not be used for new fire hydrant installations unless approved by the Company Inspector prior to requisitioning from the LWC Warehouse. No more than one (1) fire hydrant barrel extension kit shall be used on an existing fire hydrant when raising is required. All fire hydrant barrel extension kits must be installed in the presence of a Company Inspector.

Fire hydrant wrenches shall never be left unattended on a fire hydrant.

Fire Hydrants must be turned on completely open to prevent flooding through hydrant drain holes. Flow shall be regulated by the temporary meter assembly valve. The Contractor must notify the LWC Radio Room (569- 3600, ext. 2700 & 2701) of all hydrants flowed between December 1 and March 15 so the hydrant can be winterized after use to prevent freezing.

Some fire hydrants have a locking device attached to prevent unauthorized use. The Contractor shall notify the LWC Project Manager or Company Inspector 48 hours in advance of the need to use such a fire hydrant so the lock can be removed by LWC personnel. The Contractor shall immediately notify the LWC Project Manager or Company Inspector when the fire hydrant is no longer needed so the lock can be re-installed.

The Contractor shall notify the Company Inspector of any "Out of Service" fire hydrants. "Out of Service" fire hydrant tags shall be placed on the nozzle of all inoperable or "Out of Service" fire hydrants.

The Contractor shall paint fire hydrants after installation at the Company Inspector's request to cover scraped or chipped areas on the fire hydrant. Fire hydrant paint will be supplied by the LWC Warehouse. Fire hydrant attachment number labels shall not be painted over.

Fire hydrant attachment number labels shall be installed by Company personnel.
See Standard Drawing: 2000 in Appendix of Drawings

9.2 Drainage Pit

Whenever a fire hydrant is set, a drainage pit shall be excavated below each fire hydrant elbow and filled compactly with washed #3 stone under and around the elbow of the fire hydrant and to a level of two feet (2') above the base of the elbow. Dimensions of the pit shall be three (3) ft. long x three (3) ft. wide x four (4) ft. deep, with the pit centered about the barrel of the fire hydrant. Once the fire hydrant is installed and prior to filling the pit with washed #3 stone, the fire hydrant shall be pressurized, the drains flushed and then depressurized to ensure that the fire hydrant drains properly.

The top of the entire drainage pit shall be covered with geotextile fabric (four (4) fire hydrant blankets) before backfilling. Before this dry well (drainage pit) is covered with backfill, the Contractor shall notify the Company Inspector in order that each drainage system may be inspected.

Fire hydrant drainage pits shall not be connected to or located within ten (10) feet of non-storm sewers, storm sewers, or storm drains.
See Standard Drawing: 2000 in Appendix of Drawings

9.3 Removal of Fire Hydrants

Fire hydrants that are discontinued, abandoned or replaced shall be

removed and returned with caps to the Allmond Avenue Warehouse. Surfaces shall be restored in accordance with Section 11: "RESTORATION".

9.3.1 Removal of Fire Hydrants on Active Water Mains

All discontinued Fire Hydrants shall be abandoned by turning off the Fire Hydrant connecting valve, excavating and removing the Fire Hydrant either by disconnecting and removing both the supply and Fire Hydrant at the Fire Hydrant gate valve or by removing the Fire Hydrant from the supply at the elbow of the Fire Hydrant.

If the supply pipe is removed from the gate valve, the gate valve shall be turned off and a mechanical joint plug installed on the gate valve.

If the fire hydrant is removed from the supply pipe at the elbow, a mechanical joint cap shall be installed on the abandoned Fire Hydrant supply pipe.

If a Mechanical Joint Cap will not fit on the fire hydrant supply pipe, the supply pipe may be sealed with concrete.

9.3.2 Removal of Fire Hydrants on Abandoned Water Mains

Fire hydrants which are abandoned with the water main, in lieu of removal by excavation and with approval of the LWC Project Manager, the fire hydrant may be cut off no less than one foot (1') below finished grade, the abandoned barrel filled with concrete, the fire hydrant gate valve turned off, round top and lid removed, and keytube filled with concrete.

10. SERVICE WORK

10.1 Notification of Customers

Notification of customers is the Contractor's responsibility with coordination of LWC Personnel. It is the intent of the Company not to interrupt service to existing customers, unless absolutely necessary. When it is necessary to interrupt service, all customers affected by shut-off shall be notified in person, or in cases where the customer cannot be contacted, by a LWC notification tag attached to the front door of their premises by the Contractor.

Such notification shall be made twenty-four hours prior to shut-off and with Company approval, allowing sufficient time for the customer to draw and reserve an ample supply of water. Notification tags are available from the Company.

10.2 Service Installation - General

A service installation is defined to include all work necessary to install the copper tubing or pipe and all related items from the main to the property line. The installation shall include, the following: tapping of the main; installing the corporation stop or gate valve; service line tubing or pipe; meter vault; cast iron frame and lid; water meter assembly; backfilling and restoring of paved and unpaved surfaces and flushing. Installation may require reconnection to existing service lines.

Excavation, backfilling, and restoring paved and unpaved surfaces shall be done in accordance with "Service Excavation at Main" (Section 10.12).

All taps in water mains shall be made by the Contractor, and corporation stops shall be inserted by means of a tapping machine in such manner that will permit continued conditions of water flow and pressure within these mains. The Contractor shall use care in inserting and tightening the corporation stop, and shall reimburse the Company for any damage or expense caused by any of their activities under this contract.

Wet tapping of water mains shall be required on all pipe.

10.3 Small Service Installation - Two Inches (2”) and Smaller

During installation of corporation stops, the corporation stop shall not be turned using a pipe wrench. The corporation stop must be turned using an smooth jaw, adjustable crescent type wrench or open end wrench.
Special care shall be observed in handling the copper tubing so as not to kink, mash, or otherwise damage it. No such damaged tubing shall be installed. No bend shall be made in the tubing with a radius less than four inches (4”). Where under pavement, tubing shall be installed continuously and in one piece without intermediate joints or couplings except at the terminals and except where the continuous length to be installed exceeds one hundred feet (100') for 3/4" and 1" sizes.

All intermediate and terminal joints for 3/4" and 1" sizes of copper tubing shall be the flared type or compression type, using the proper tools for the sizes of tubing and types of fittings involved.

Service connections shall be installed so that the outlet is at an angle of 45° above the horizontal. A bend in the service line shall be provided to ensure flexibility and to accommodate the effects of loads.

Tubing shall extend from the meter setting assembly to the property line and thoroughly flushed for one (1) minute prior to connection to the

customer service line.

For Double Setter meters the tail pipes of a service installation (where two meters are to be installed in one vault), shall be installed parallel for their entire length and at least eight inches (8") apart, and in no event shall they cross one another.

Long services are defined as services to meters on the opposite side of the street of the water main to which it is connected and shall be bored or jacked under pavements unless an open cut is approved by the LWC Project Manager.

The Contractor must verify the service size with the LWC Project Manager or Company Inspector where any service length is greater than one hundred feet (100').

Short services are defined as services to meters on the same side of the street as the water main to which it is connected.
See Standard Drawings: 3002, 3003, 3004, 3400, 3401, 3403, 3404, 3420, 3430, 3200, and 3202 in Appendix of Drawings

10.3.1 Tapping Ductile Iron –Pressure Class 350 Pipe for Small Service Installation - Two Inches (2") and Smaller

In the location where Ductile Iron –Pressure Class 350 Pipe will be tapped, the pipe shall be wrapped with three (3) layers of polyethylene compatible tape completely around the pipe to cover the area where the tapping machine and chain is mounted. The tap shall install the corporation stop directly through the tape and polywrap.

After the tap is completed on mains with polyethylene wrap, the Contractor shall repair and replace the polyethylene wrap to completely cover the main and corporation stop in accordance with the details in the Appendix of Drawings.

The service line shall be flushed for two (2) minutes through the meter stop before connecting to the meter. Once the corporation stop has been turned on, and prior to backfilling, the corporation barrel set nut may need to be securely tightened to prevent leakage.

The corporation stop and a minimum distance of three feet (3') of the copper service line shall be wrapped with polytape.

For ductile iron pipe Pressure Class 350 service outlets shall be made per the table below:

Service Installation Guide for Pressure Class 350 Ductile Iron Pipe

Pipe Size (inches)	Tap Size (inches)				
	¾	1	1 ½	2	>2
4"	tap	saddle	saddle	saddle	Requires Tapping
6"	tap	tap	saddle	saddle	Sleeve or Fitting
8"	tap	tap	saddle	saddle	" "
12"	tap	tap	saddle	saddle	" "
16"& 20"	tap	tap	tap	tap	" "

All direct taps require the installation of 2 to 3 layers of 3-mil thread sealant tape on the corporation stop. This guide is based on either a direct tap method or tapping saddle using an AWWA standard taper thread Corporation Stop.

See Standard Drawings: 3002, 3003, 3004, 3400, 3401, 3403, 3404, 3420, 3430, 3200, 3202 and 3804 in Appendix of Drawings

10.3.2 Tapping PVC Pipe for Small Service Installation - Two Inches (2") and Smaller

For PVC (polyvinyl chloride) pipe, service outlets of three quarter inch (3/4") through two inches (2") shall be made with a tapping saddle.

Tapping saddle bolts shall be tightened with a torque wrench according to the saddle manufacturers' torque recommendations.

When installing a service to PVC, the Contractor shall use a shell cutter that is designed for DR14 (pressure class 200, AWWA C900) or DR18 (pressure class 150, AWWA C900) and one that will remove the material and retain the coupon. No twist drills will be

allowed. The cutting tool must be sharp and without damage. The coupon must be delivered to the Company Inspector.

When tapping the PVC pipe under pressure, the pipe temperature shall be between 32° and 90° F.

The taps shall be located a minimum of twenty-four inches (24”) from the joint of the PVC pipe, and, if installing more than one tap in one length of PVC pipe, the taps shall be staggered and a minimum of eighteen inches (18”) apart, measured longitudinally. Taps shall not be made in an area of PVC pipe that shows damage.

The service line shall be flushed for two (2) minutes through the meter stop before connecting to the meter. Once the corporation stop has been turned on, and prior to backfilling, the corporation barrel set nut may need to be securely tightened to prevent leakage.

Tapping sleeves shall be assembled according to the manufacturers' instructions and must be supported independently of PVC pipe by precast concrete blocks during the tapping operation. The support shall be left in place, filling any voids such that the pad is bearing against undisturbed earth, and thrust blocks behind tapping sleeves shall be used as with other fittings.

When a service tap is made on a PVC water main, No. 12 copper tracer wire will be connected to the No. 12 copper tracer wire on the main and then wrapped, with insulation removed, around the copper service line or affixed to the tapping saddle.
See Standard Drawings: 3002, 3003, 3004, 3400, 3401, 3403, 3404, 3420, 3430, 3200, and 3202 in Appendix of Drawings

10.3.3 Tapping Ductile Iron Class 54 & 56 Pipe and Cast Iron Pipe for Small Service Installation - Two inches (2”) and smaller

For ductile iron pipe Class 54 & 56 and cast iron pipe, service outlets of three quarter inch (3/4") through two inches (2") shall be made by direct tapping.

All direct taps require the installation of 2 to 3 layers of 3-mil thread sealant tape on the corporation stop. This guide is based on either a direct tap method or tapping saddle using an AWWA standard taper thread Corporation Stop.

In direct tapping of iron pipe, the tap threads must match the

corporation stop's AWWA threads. The pipe and corporation stop shall be examined to insure acceptability for direct tapping.

In the location where Ductile Iron Class 54 & 56 Pipe will be tapped, the pipe shall be wrapped with three (3) layers of polyethylene compatible tape completely around the pipe to cover the area where the tapping machine and chain is mounted.
The tap shall install the corporation stop directly through the tape and polywrap.

After the tap is completed on mains with polyethylene wrap, the Contractor shall repair and replace the polyethylene wrap to completely cover the main and corporation stop in accordance with the detail in the Appendix of Drawings.

The service line shall be flushed for two (2) minutes through the meter stop before connecting to the meter. Once the corporation stop has been turned on, and prior to backfilling, the corporation barrel set nut may need to shall be securely tightened to prevent leakage.

The corporation stop and a minimum distance of three feet (3') of the copper service line shall be wrapped with polytape.
See Standard Drawings: 3002, 3003, 3004, 3400, 3401, 3403, 3404, 3420, 3430, 3200, 3202, and 3804 in Appendix of Drawings

10.4 Large Service Installation – Larger than Two Inches (2")

Service outlets of larger than two inches (2") shall be made with a ductile iron tee or stainless steel or ductile iron tapping sleeve and gate as directed by LWC Project Manager or Company Inspector on new ductile iron or PVC pipe. There shall be no tapping of same size on same size pipe with tapping sleeve and gate, a tee must be installed.

Long services are defined as services to meters on the opposite side of the street of the water main to which it is connected and shall be bored or jacked under pavements unless an open cut is approved by the LWC Project Manager. The Contractor must verify the service size with the LWC Project Manager or Company Inspector where any service length is greater than one hundred feet (100'). Short services are defined as services to meters on the same side of the street as the water main to which it is connected.

10.4.1 Tapping Ductile Iron –Pressure Class 350 Pipe for Large Service Installation - Larger than Two Inches (2")

Service outlets of larger than two inches (2") shall be made with a ductile iron tee or stainless steel or ductile iron tapping sleeve and gate valve as directed by LWC Project Manager or Company Inspector on ductile iron – Pressure Class 350 pipe.

There shall be no tapping of same size on same size pipe with tapping sleeve and gate, a tee must be installed.

After the tap is completed on mains with polyethylene wrap, the Contractor shall repair and replace the polyethylene wrap to completely cover the main and fittings in accordance with the detail in the Appendix of Drawings.

The service line shall be flushed for two (2) minutes through the meter stop before connecting to the meter.
See Standard Drawings: 3203 and 3601 in Appendix of Drawings

10.4.2 Tapping PVC Pipe for Large Service Installation – Larger than Two Inches (2”)

Service outlets of larger than two inches (2") shall be made with a ductile iron tee or stainless steel or ductile iron tapping sleeve and gate valve as directed by LWC Project Manager or Company Inspector on PVC (polyvinyl chloride) pipe.

There shall be no tapping of same size on same size pipe with tapping sleeve and gate, a tee must be installed.

When installing a service to PVC, the Contractor shall use a shell cutter that is designed for DR14 (pressure class 200, AWWA C900) or DR18 (pressure class 150, AWWA C900) and one that will remove the material and retain the coupon. No twist drills will be allowed. The cutting tool must be sharp and without damage. The coupon must be delivered to the Company Inspector.

When tapping the PVC pipe under pressure, the pipe temperature shall be between 32° and 90° F. The taps shall be located a minimum of twenty-four inches (24") from the joint of the PVC pipe. Taps shall not be made in an area of PVC pipe that shows damage.

Tapping sleeves shall be assembled according to the manufacturers' instructions and must be supported independently of PVC pipe by precast concrete blocks during the tapping operation. The support shall be left in place, filling any voids such

that the pad is bearing against undisturbed earth, and thrust blocks behind tapping sleeves shall be used as with other fittings.

When a service tap is made on a PVC water main, No. 12 copper tracer wire will be connected to the No. 12 copper tracer wire on the main and then wrapped, with insulation removed, around the service line gate valve and extend to the top of the keytube.

The service line shall be flushed for two (2) minutes through the meter stop before connecting to the meter.
See Standard Drawings: 3203 and 3601 in Appendix of Drawings

10.4.3 Tapping Ductile Iron Class 54 & 56 Pipe and Cast Iron Pipe for Large Service Installation – Larger than Two Inches (2”)

Service outlets of larger than 2" shall be made with a ductile iron tee or stainless steel or ductile iron tapping sleeve and gate valve on existing ductile iron Class 54 & 56 pipe and Cast Iron Pipe. There shall be no tapping of same size on same size pipe with tapping sleeve and gate, a tee must be installed.

After the tap is completed on mains with polyethylene wrap, the Contractor shall repair and replace the polyethylene wrap to completely cover the main and fittings in accordance with the detail in the Appendix of Drawings.

The service line shall be flushed for two (2) minutes through the meter stop before connecting to the meter.
See Standard Drawings: 3203 and 3601 in Appendix of Drawings

10.5 Setting Meter Vaults

Meter vaults shall be set either to the existing grade, or as indicated on the service order or to the grade given by a stake card. Earth shall be firmly tamped by pneumatic, vibratory or other approved compaction device and backfilled per Section 7: “BACKFILLING PROCEDURES AND TAMPING” around the vault and cover, the lid locked in and the meter setting centered in the middle of the vault and at the proper depth below grade, as shown on the drawing in the Appendix of Drawings.

Meter vaults shall not be installed in areas subject to vehicular traffic if avoidable. When directed to be installed in areas subject to vehicular traffic, the meter vault shall be of the heavy duty concrete type with heavy

duty frame and cover.
See Standard Drawings: 3002, 3003, 3004, 3400, 3401, 3403, 3404, 3420, 3430, 3200, 3202, 3203, and 3601 in Appendix of Drawings

10.6 Pressure Regulators (Pressure Reducing Valves)

When directed by the LWC Project Manager, the Contractor shall install a pressure regulator (pressure reducing valves).
See Standard Drawings: 3003, 3004, 3401, and 3202 in Appendix of Drawings

10.7 Leak Testing the Service

After the complete service has been installed and before any joints are covered, the corporation stop shall be opened, the entire length of the service filled with water and each joint observed by the Contractor for leaks.

Any leaks so found shall be immediately repaired. After the service has been observed by the Company Inspector to be watertight throughout its length, the meter stop shall be shut off, and the backfilling started.
The corporation barrel set nut may need to be securely tightened to prevent leakage.

The Contractor shall leave the corporation stop fully open and the meter angle stop fully closed upon completion of the testing.

10.8 Relocate Service

Relocating a service is defined to include installing a complete new service to an existing customer, including a new tail pipe, discontinuing the old service at the main (in the event the existing main is to remain active), abandoning the old meter vault, and returning the old meter, cover and cast iron frame to the Louisville Water Company's Allmond Avenue Yard.

Concrete meter vaults and heavy duty frame and covers shall be used in driveways, parking lots, and other areas of vehicular traffic.

Service installation shall be done in accordance with “Small Service Installation (Section 10.3) and Large Service Installation (Section 10.4). Excavation, backfilling, and restoring of surfaces shall be done in accordance with "Service Excavation at Main" (Section 10.12). Abandoning the old meter vaults shall be done in accordance with "Backfill Meter Vault" (Section 10.13).

Contractors shall be responsible to make at least two (2) attempts when connecting the tailpiece to a customer's galvanized service line. The second attempt shall be limited to a maximum of three feet (3') beyond the property line or to any property improvement which would require excessive restoration. If the second attempt is unsuccessful, the Contractor shall immediately contact the Company Inspector, obtain a representative sample of the deteriorated line and provide a temporary service connection to the customer.
See Standard Drawing: 3440 in Appendix of Drawings

10.9 Renew Service

Renewing a service is defined to include installing a new copper service line from the existing main or new main to the meter stop, and a new copper tail pipe from the meter stop to the property line or the joint where the tail pipe connects to the customer service line (whichever is shorter) and shall include, the following: excavation; boring or jacking of copper tubing or pipe; installing corporation stop; tapping saddle or tapping sleeve and gate valve at the main; installing all tubing and/or pipe and all associated fittings; frame and cover; and backfilling and restoring of all surfaces.

Service installation shall be done in accordance with "Small Service Installation" (Section 10.3) and "Large Service Installation" (Section 10.4). The Contractor shall discontinue the old service in accordance with "Discontinue Service" (Section 10.11). All lead service lines shall be renewed in accordance with "Cutting Lead Pipe" (Section 10.16) and "Flushing of Lead Services" (Section 10.17) unless otherwise instructed on the project drawings.

Excavation, backfilling, and restoring of surfaces shall be done in accordance with "Service Excavation at Main" (Section 10.12). The LWC Project Manager has estimated the number of services to be renewed, and these are shown on the project drawings.

Contractors shall be responsible to make at least two (2) attempts when connecting the tailpiece to a customer's galvanized service line. The second attempt shall be limited to a maximum of three feet (3') beyond the property line or to any property improvement which would require excessive restoration. If the second attempt is unsuccessful, the Contractor shall immediately contact the Company Inspector, obtain a representative sample of the deteriorated line and provide a temporary service connection

to the customer.
See Standard Drawing: 3441 in Appendix of Drawings

10.10 Transfer Service

Transferring a service is defined to include installing a length of service line, as require, to reconnect an existing copper service to the existing main or new main, and shall include, the following: excavation; boring or jacking of copper tubing or pipe; installing corporation stop; tapping saddle or tapping sleeve and gate valve at the main; installing all tubing and/or pipe and all associated fittings; and backfilling and restoring of all surfaces.

Service installation shall be done in accordance with “Small Service Installation” (Section 10.3) and “Large Service Installation” (Section 10.4). The Contractor shall discontinue the old service in accordance with “Discontinue Service” (Section 10.11).

When a lead or galvanized tail pipe is encountered, the tail pipe from the meter stop to the property line or joint where the tail pipe connects to the customer service line (whichever is shorter) shall be replaced with a copper service line.

All lead service lines shall be transferred in accordance with “Cutting Lead Pipe” (Section 10.16) and “Flushing of Lead Services” (Section 10.17) unless otherwise instructed on the project drawings.

Excavation, backfilling, and restoring of surfaces shall be done in accordance with "Service Excavation at Main" (Section 10.12). The LWC Project Manager has estimated the number of services to be transferred, and these are shown on the project drawings.

Contractors shall be responsible to make at least two (2) attempts when connecting the tailpiece to a customer’s galvanized service line. The second attempt shall be limited to a maximum of three feet (3’) beyond the property line or to any property improvement which would require excessive restoration. If the second attempt is unsuccessful, the Contractor shall immediately contact the Company Inspector, obtain a representative sample of the deteriorated line and provide a temporary service connection to the customer.
See Standard Drawing: 3442 in Appendix of Drawings

10.11 Discontinue Service

Discontinuing a service is defined to include excavating a service line at a water main that is to remain active, turning off the corporation stop

(ferrule), disconnecting and plugging the service line, backfill the meter vault, and restoring all surfaces.

Driven ferrules, which are not threaded onto the main, will require water main shutdown, removal, and installation of a wrap-around repair band. Driven ferrules can be expected on most lead services.

Excavating, backfilling, and restoring of surfaces shall be done in accordance with "Service Excavation at Main" (Section 10.12). Abandoning the old meter vaults shall be done in accordance with "Backfill Meter Vault" (Section 10.13). The LWC Project Manager has estimated the number of services to be discontinued, and these are shown on the project drawings.

Service vaults abandoned as a result of abandoning an existing main shall be site-restored by the Contractor as required in "Backfill Meter Vault" (Section 10.13).
See Standard Drawing: 3442 in Appendix of Drawings.

10.12 Service Excavation at Main

The excavation at the water main shall be made in accordance with “Twelve-Inch (12”) Cutback Requirement” (Section 5.4.2), and “Trenching” (Section 5.5) as appropriate to the type of surface. Backfilling and restoration shall be in accordance with “BACKFILLING PROCEDURES AND TAMPING” (Section 7) and “RESTORATION” (Section 11) as appropriate to the type of surface.

Contractor shall be responsible for all remedial work due to service excavations as required in the section “WARRANTY” (Section 12).

10.13 Backfill Meter Vault

Meter vaults on all discontinued or relocated services shall be abandoned by removing the old meter, cast iron frame and cover, and any existing curb stop lids, and filling the void to existing grade with backfill and surface material, appropriate to the type surface. Unpaved areas shall be backfilled to grade with topsoil and restored in accordance with "RESTORATION" (Section 11).

Sidewalks shall be backfilled with pit run sand or DGA, and repaved in accordance with "RESTORATION" (Section 11). Parking lots, driveways, and other areas subject to vehicular traffic shall be backfilled using DGA, and restored in accordance with "Twelve-Inch (12”) Cutback Requirement" (Section 5.4.2), "BACKFILLING PROCEDURES AND TAMPING" (Section 7), and "RESTORATION" (Section 11) found in

this specification.

All meters and cast iron frames and lids shall be returned to the Allmond Avenue warehouse. Contractor shall be responsible for all remedial work due to discontinuation of meter vaults as required in the section "WARRANTY" (Section 12).

10.14 Potential Shock Hazard

Due to electrical grounding of some electrical services to metal water service lines, the potential for electrically charged water service lines and/or water meters exists.
The Contractor shall check each service for electric potential before working on the service. Any electrically-charged water service shall immediately be brought to the attention of the Company Inspector.

10.15 Cutting Lead Pipe

When the cutting of pipe made of lead is required, the pipe shall be cut with a shear device, such as Reed Ratchet Shears or similar device, as approved by the LWC Project Manager. Sawing of lead pipe shall not be allowed. All lead material shall be removed before it is connected.

10.16 Flushing of Lead Services

Flushing of renewed lead services shall be conducted immediately after the renewed service is reconnected at maximum flow. Flushing shall be continued for a minimum of sixty (60) minutes.
The Contractor shall be responsible for supplying all hoses, fixtures, and couplings needed to perform the lead service flush.

The Contractor shall identify, on a daily basis, those services that will require renewal on the following workday. Residences requiring lead service renewals shall be investigated to determine if an outside spigot is available and functioning properly. The Contractor shall notify the Company Inspector when an outside spigot is not available or not properly functioning in order for the Company Inspector to contact the customer.

Services that cannot be flushed externally by the Contractor or internally by the customer at the time of the renewal, may be renewed, but shall be left in the “off” position immediately after the renewal is completed. The Contractor shall immediately notify the Company Inspector when any service is turned “off” in order for the Company Inspector to notify the Company Radio Room.

10.17 Lead Service Renewal Notification

"Lead Service Renewal" notices shall be supplied by the Company and distributed by the Contractor to all properties in which a lead service was renewed or replaced.

11. RESTORATION

11.1 General

Repaving over the completed trench shall be done by the Contractor, who shall furnish all materials required. Repaving shall match the original paving in type, shall be first class in all respects, and shall comply with specifications covering the type of paving to be restored as issued by the authority over the thoroughfare involved.

The restoration of parking lots and driveways serving commercial and/or public establishments shall comply with the specifications of the respective authority having jurisdiction over the abutting right-of-way.

Except for parking lots, driveways, and sidewalks, each individual pavement restoration shall have a Company-supplied pavement marker installed by the Contractor.

All sawcuts shall be straight and perpendicular to the driveway / roadway. Restoration shall be made with the same type material and finish that is removed. Street restoration shall be as specified in the detail for Backfill and Pavement Restoration in accordance with the Appendix of Drawings, pending the jurisdiction of said street, included in these specifications.
Permanent restoration of driveway, sidewalks, and street intersections shall be completed by the Contractor within ten working days after backfilling of trench is complete. If restorations are not completed, the Company may, at its option, have the repairs made by others and deduct those costs from the amount owed to the Contractor.

The Contractor is to take whatever measures are necessary to keep all traveled surfaces free of dirt, mud, or other material during all non-working hours. Unless otherwise approved by the LWC Project Manager, no excavated material shall be placed on the paved surface or any other areas near the trench; the excavated material shall be placed directly from the trench to the haul truck. The Contractor shall provide adequate dust control and follow all governing regulations applicable to the work.

A maximum of 1,500 lineal feet shall be disturbed at one time prior to

final grade. Restoration of the area is required before the Contractor is permitted to proceed.

11.2 Bituminous Paved Surfaces (Asphalt)

All bituminous pavement cuts are to be restored in accordance with the permanent pavement restoration detail as shown in the Appendix of Drawings.

Pavement cuts are to be uniform width and straight sawed edges. An approved joint sealer is to be used to seal all joints between new and existing pavement. In the event asphalt plants have closed for the season, the Contractor shall maintain all pavement cuts with temporary bituminous pavement, until is becomes possible to permanently restore the pavement. Bituminous concrete pavement used for permanent pavement restoration shall have a minimum temperature of 225°F as measured when discharging from the truck.

Particular care is to be taken that existing pavement surfaces within the right-of-way are not scarred or otherwise damaged by equipment. Planking or other protective devices are to be used at all times to prevent damage to paved surfaces from tracked equipment.

In the event the paved surfaces damaged by work on this project, resurfacing is to be required as follows:

1) If scarring or other damage is continuous, resurfacing is to be likewise continuous, and is to consist of one and one-half inches (1 ½") Class A bituminous surfaces extending to the edge of damaged lane.

   The edge of the damaged pavement shall be edge keyed, with the resurfaced section being flush with the undisturbed adjacent pavement surface, allowing roadway surface drainage not to be obstructed.

2) If scarring or other damage is determined to be intermittent, individual or paved patches may be permitted, and are likewise to consist of Class A bituminous surface, extending to the edge of the damaged lane.

3) All damage to the edge of pavement shall require the removal of and base repair of a minimum of two feet (2') in addition to the maximum width of the damage. The longitudinal edge is to be a uniform width with straight sawed edges. The lane is then to be milled a minimum of five feet (5') in width with a two inch (2") minimum asphalt overlay.

There will be no skip milling allowed and the minimum length will be determined in the field by the Company Inspector or LWC Project Manager.

All joint sealant material shall be: hot-applied, non-water-based, and produced by a competent and reputable manufacturer. Store-bought items shall not be allowed. Sand shall be placed to prevent tracking.

11.3 Asphalt Materials and Construction Methods

The composition of the bituminous asphalt (bituminous concrete) pavement and method of construction shall be in accordance with the Kentucky Transportation Cabinet Department of Highways (KTCDOH) Standard Specifications for Road and Bridge Construction (latest edition). A copy of these specifications is on file with the Louisville Water Company's Resource Coordinator, Construction Inspection Services, 4801 Allmond Avenue.

11.4 Concrete Paved Surfaces (Portland Cement Concrete)

All concrete used for structural purposes (such as thrusts blocks, road subbase, sidewalks, etc.) shall be produced at a concrete plant, delivered by a ready-mix concrete truck or mobile mixer (metered) concrete truck. Only concrete used for miscellaneous purposes (such as vault floor pad, end plugs for mains to be abandoned-in-place, etc.) is allowed to be that of an on-site bag mix.

All cuts in concrete driveways and sidewalks are to be replaced from construction joint to construction joint, using minimum 3500 psi concrete. When a section of sidewalk at a street intersection is to be replaced in the Louisville / Jefferson County Metro Government jurisdiction a wheel chair ramp is to be installed in accordance with the Appendix of Drawings.

For pipeline installation work, all concrete curbs or curb and gutter which are damaged are to be entirely removed and replaced in kind between existing joints. Stone base material shall be placed and compacted under any disturbed area with the curb replacement with the same type stone base material and compaction as removed. Base material shall extend a minimum of eighteen (18) inches beyond the back of the curb. Install one-half inch (1/2”), pre-molded expansion joint material between new and existing concrete. Concrete shall be a minimum 3500 psi concrete.

For service line installation work, concrete curbs or curb and gutter which

are saw cut (typically four inch (4)" in width) are to be replaced in kind and have additional saw cutbacks one foot (1') to each side of the initial cut (4"cut). If either of the additional one foot (1') saw cutbacks fall within two feet (2') of an existing pavement joint, the entire section shall be removed and replaced to the existing joint. Stone base material shall be placed and compacted under any disturbed area with the curb replacement with the same type stone base material and compaction as removed.

Base material shall extend a minimum of eighteen (18) inches beyond the back of the curb. Install one-half inch (1/2"), pre-molded expansion joint material between new and existing concrete. Concrete shall be a minimum 3500 psi concrete.

Particular care is to be taken that existing pavement surfaces within the right-of-way are not scarred or otherwise damaged by equipment. Planking or other protective devices are to be used at all times to prevent damage to paved surfaces from tracked equipment.
See Standard Drawing: 4410 in Appendix of Drawings

11.5 Concrete Materials and Construction Methods (Portland Cement Concrete)

All concrete used on this project and as shown on the project drawings shall have a 28-day minimum compression strength of 3,500 pounds per square inch (psi). The proportions and construction requirements for the concrete shall be as listed in the Kentucky Transportation Cabinet Department of Highways (KTCDOH) Standard Specifications for Road and Bridge Construction (latest edition).
See Standard Drawings: 4000, 4100 and 4400 in Appendix of Drawings

11.6 Unpaved Surfaces

All drainage structures (such as pipe, head or wing walls, channels, flumes, and culverts), fences, signs, etc., public or private, which are damaged or removed by this Contractor, shall be repaired or replaced in kind to the satisfaction of the owner. All open ditches shall be restored to their present cross sections, depths, and slopes, and dressed and graded to provide permanent adequate drainage to present connecting ditches or culverts equal to the original drainage systems except where specifically indicated on the project drawings.

The Contractor shall replace all surface material including landscaping, shrubbery, fences, or other disturbed surfaces, to a condition at least equal to that before the work began, furnishing all labor and materials.

The grassed area disturbed by the work under this contract, whether by

the Contractor or by any subcontractor, within or adjacent to the right-of-way of any state, county, city or other thoroughfare, public or private (except as required below), now in grass shall be shaped, seeded, and mulched in accordance with KTCDOH Standard Specifications for Road and Bridge Construction (latest edition).

Seed mixture shall be Mixture No. 1 as described in Seed Mixtures for Permanent Seeding. Acceptance of Seeding Section shall be amended to disallow compensations for any corrective seeding required by the LWC Project Manager.

All work fronting residential lots now in grass shall be shaped and seeded in accordance with KTCDOH Standard Specifications for Road and Bridge Construction (latest edition), but shall be amended to include removal of all rock from the sod bed. A minimum of six inches (6") of top soil being free of rock shall be placed prior to final restoration.

Reseeded areas that are located within ditches or on other sloped ground of 2:1 slopes or greater shall be covered with erosion control netting secured with pins or stakes, or prefabricated matting containing mulch, seed and fertilizer. All ditch lines in residential lots shall be covered with erosion control netting secured with pins or stakes, or prefabricated matting containing mulch, seed and fertilizer.

A maximum of 1,500 lineal feet shall be disturbed at one time prior to final grade. Restoration of the area is required before the Contractor is permitted to proceed.

Certain areas as approved by the LWC Project Manager or shown on the project drawings shall be sodded. Unless otherwise approved by the LWC Project Manager, no excavated material shall be placed on any paved roadway surface.
See Standard Drawing: 4300 in Appendix of Drawings.

11.7 Site Clean Up

Surplus pipeline materials, equipment, tools, and temporary structures shall be removed by the Contractor, and all dirt, rubbish and excess earth from excavations shall be hauled and disposed by the Contractor, all in a manner satisfactory to the Company.

The Contractor shall leave the site in presentable shape at least comparable with the condition in which it was before the construction began and in compliance with all restoration provisions of this

specification.

12. **WARRANTY**

The provisions governing work covered by warranty are contained in **WARRANTIES**, in the **TERMS AND CONDITIONS**.

13. ADDITIONAL CONTRACT DEFINITIONS, and ABBREVIATIONS

13.1 Additional Contract Definitions

Right-of-Way – A general term denoting land, property, or interest therein, usually in a strip, acquired for or devoted to a street, highway, or other public improvement.

Service Line – Any pipe, line, or conduit used or to be used to provide water service from a water main to the property line joint. A water service line shall be owned and maintained by the Company from the tap at the water main to the property line, edge of easement, or property line joint, whichever is closer to the water main.

Non-storm sewers – Sanitary sewer, combined sewer, septic tank, or subsoil treatment system.

Stone Classifications: Equivalencies:

Kentucky # 3 = Indiana # 2
Kentucky # 57 = Indiana # 8
Kentucky # 9 = Indiana # 3/8 pea
Kentucky D.G.A. = Indiana # 73

Structures – Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, endwalls, sewers, service pipes, septic tanks, lateral fields, foundation drains, fences, swimming pools, and other features which may be encountered in the work and not classified herein.

Supplemental Project Drawings – Drawings included in the Plans to specify construction details.

Underground Facility – means any item which shall be buried or placed below ground for use in connection with the storage or conveyance of water, sewage, electronic, telephone or telegraph communications, electric

energy, oil, gas or other substances, and shall include pipes. Sewers, conduits, cables, valves, lines, wires, manholes, appurtenances, attachments and those portions of poles and their attachments below ground.

Utility – Pipe lines, conduits, ducts, transmission lines, overhead or underground wires, railroads, storm drains, sanitary sewers, irrigation facilities, street lighting, traffic signals, and fire alarm systems, and appurtances of public utilities and those of private industry, businesses or individuals solely for their own use or use of their customers which are operated or maintained in, on, under, over or across public right-of-way or public or private easement.

Water Main – Mains of three (3) inch and larger diameter, together with all appurtenances, any necessary valves, fire hydrants, and associated materials receiving potable water and distributing it to individual customers.

13.2 Abbreviations**:**

ANSI – American National Standards Institute
ASTM – American Society of Testing Materials
AWWA – American Water Works Association
C – Temperature in degree Celsius
CFS – Cubic Feet Per Second
CI – Cast Iron
DEG - º - Degree
DGA – Dense Graded Aggregate
DI – Ductile Iron
F – Temperature in degree Fahrenheit
FPS – Feet Per Second
FT – ‘ - Feet
HTH – Dry Chlorine (Calcium Hypochlorite)
IN – “ - Inch
KAR – Kentucky Administrative Regulations
KDOW – Kentucky Division of Water
KOSHA – Kentucky Occupational Safety and Health Association
KRS – Kentucky Revised Statutes
KTC – Kentucky Transportation Cabinet
KTCDOH - Kentucky Transportation Cabinet Department of Highways
MJ – Mechanical Joint
MSD – Louisville and Jefferson County Metropolitan Sewer District
MUTCD – Manual on Uniform Traffic Control Devices for Streets and Highways
OSHA – Occupational Safety and Health Administration
PCB – Polychlorinated Biphenyls (toxic chemicals)

PPM – Parts per Million
PSF – Pounds per Square Foot
PSI – Pounds per Square Inch
PVC – Polyvinyl Chloride
USGS – United States Geological Survey
VHS - Video Cassette Format (Vertical Helix Scan)
WQC – Water Quality Certification
% - per cent
@ - at
/ - per
= - equals

13.3 Technical References

Section:

1.6.1 Federal Highway Administration, Part VI (6) of the Manual on Uniform Traffic Control Devices (MUTCD).
1.6.4 Louisville / Jefferson County Metro Government Ordinance: Title VII (7), Traffic Code: Chapter 72 Parking Regulations.
1.6.5 KRS-220, 224 Soil Erosion and Sediment Control
Jefferson County Ordinance, Chapter 159, Erosion Prevention and Sediment Control
1.6.6 Kentucky Division of Water- General Water Quality Certification, Permit #12.
2.2 KOSHA – 803 KAR 2:300 – 2:320; 803 KAR 2:240 – 2:423
3.2.4 Recommended Standards for Water Works (Ten States Standards) 2003 Edition
5.3 Blasting Regulations: KRS 351 and KAR 805.
6.2.2 PVC Pipe – Design and Installation AWWA Manual No. M-23
6.2.3 AWWA Standard Specification C 600 – Installation of Ductile Iron Water Mains and Their Appurtenances.
6.4.1 AWWA Standard Specification C 111 – Rubber–Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
AWWA Standard Specification C 900 – Polyvinyl Chloride (PVC) Pressure Pipe, 4”-12” for Water Distribution.
6.7.1 AWWA Standard Specification C 105 – Polyethylene Encasement for Ductile-Iron Pipe Systems.
7.1. ASTM D-1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

7.4 Kentucky Transportation Cabinet – Department of Highways – Standard Specification for Road and Bridge Construction.
8.2.2 401 KAR 8:150 –sections 4 (1) and 4 (2) Disinfection and Filtration.
8.3 Louisville Water Company Best Management Practice and

Procedures on Chlorinated Water Disposal, December, 2001.

14. TECHNICAL DESIGN AND CONSTRUCTION STANDARDS

1 GENERAL DESIGN REQUIREMENTS

1.1 The Utility shall establish and maintain Technical Design and Construction Standards for all water main projects reviewed and constructed under the Agreed Order.

1.2 The Utility shall ensure that the plans and specifications for each project meet or exceed all Technical Design and Construction Standards.

1.3 The Professional Engineer of Record shall ensure the plans and specifications for each project meet or exceed these Technical Design and Construction Standards.

1.4 Hydraulics

1.4.1 The utility shall define existing and potential customer peak demand in the hydraulic analysis.

1.4.2 The hydraulics analysis shall demonstrate the proposed water main projects can be flushed at least two and one half (2.5) feet per second (fps), while keeping system pressure above twenty (20) pounds per square inch (psi) within the pressure zone of the proposed project.

1.4.3 The hydraulic analysis shall demonstrate the proposed water main project maintains thirty (30) psi under peak demand.

1.4.4 The hydraulic analysis shall demonstrate that the proposed water main project does not drop ground level pressure in any part of the pressure zone below twenty (20) psi under all conditions of flow.

1.4.5 Pressure greater than or equal to thirty (30) psi shall be available on the discharge side of all water meters.

1.5 Hydrants

1.5.1 Fire hydrants shall only be installed on new or existing water mains designed to carry fire flows. The water main supplying the hydrant must have a diameter greater than or equal to six (6) inches and provide sufficient capacity to meet the required fire flow. (LWC Technical Specifications Section 9.1)

1.5.2 An auxiliary valve shall be installed in all hydrant supply pipes. (LWC Technical Specifications Section 9.1)

1.5.3 Hydrant drains shall not be connected to any sanitary sewer, combined sewer, septic tank or subsoil treatment system (hereinafter "non-storm sewer") or any storm sewer or storm drain, and shall be located at a distance greater than ten (10) feet from any non-storm sewer. (LWC Technical Specifications Section 9.2)

1.6 Water Main Valves

1.6.1 Water mains shall have a sufficient quantity of valves so that customer inconvenience and sanitary hazards will be minimized during repairs.

1.6.2 Urban areas as determined by the Utility shall include a valve spacing distance of less than or equal to five hundred feet (500') for commercial service areas and less than or equal to one thousand feet (1,000') for residential service areas. Valves should be located at roadway intersections where practical.

1.6.3 Rural areas as determined by the Utility shall include a valve spacing distance of less than one (1) mile. Valves should be located at roadway intersections where practical.

1.7 Blow-Off or Flushing Connections

1.7.1 For water mains that dead end, a fire hydrant or blow-off shall be required at the end of each six (6) inch or larger diameter water main and a flush hydrant or blow-off

shall be required at the end of each water main that is less than six (6) inches in diameter.

1.7.2 Each blow-off, fire hydrant, or flush hydrant shall be sized so that velocity of greater than or equal to two and one half (2.5) feet per second (fps) can be achieved in the water main served by the blow-off or hydrant during flushing.

1.7.3 Flushing devices, blow-offs, or air relief valve shall not be connected to any non-storm sewer or any storm sewer or storm drain, and shall be located at a distance greater than ten (10) feet from any non-storm sewer. Chambers, pits, or manholes containing valves, blow-offs, meters, or other such appurtenances shall not be directly connected to any non-storm sewer or any storm sewer or storm drain. Such chambers, pits, or manholes shall be drained to absorption pits underground or to the surface of the ground where they are not subject to flooding by surface water. (LWC Technical Specifications Section 8.3.2)

1.8 Air Relief Valves

1.8.1 Air relief valves or hydrants shall be installed at high points in water mains, where air can accumulate. Automatic air relief valves shall not be used in situations where manhole or chamber flooding may occur. (LWC Technical Specifications Section 8.7, 8.7.1 & 8.7.2)

1.8.2 The open end of an air relief pipe from automatic valves shall be extended a distance of greater than or equal to one (1) foot above grade and provided with a screened, downward facing elbow or shall be an equivalent standard as determined by the best professional judgment of the Utility. The pipe from a manually operated valve shall be extended to the top of the pit. (LWC Technical Specifications Section 8.7.1 & 8.7.2)

1.9 Bedding and Backfill

A continuous and uniform bedding shall be provided in the trench for all buried pipe. Backfill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. Stones found in the trench shall be removed for a depth greater than or equal to six (6) inches

below the bottom of the pipe. (LWC Technical Specifications Section 7.1)

1.10 Minimum Depth

All water mains shall be covered to a depth equal to or greater than forty-two (42) inches to prevent freezing. (LWC Technical Specifications Section 7.1)

1.11 Thrust Blocks

All tees, bends, plugs, and hydrants shall be provided with reaction blocking, tie rods, or joints designed to prevent movement. (LWC Technical Specifications Section 6.14 & 9.1)

1.12 Disinfection and Coliform Monitoring

1.12.1 New or relocated water mains shall be thoroughly disinfected in accordance with 401 KAR Chapter 8:150 Section 4 (1) upon completion of construction and before being placed into service. To disinfect the new or relocated water mains, the Utility shall use chlorine or chlorine compounds (disinfectants) in such amounts as to produce an initial disinfectant concentration of at least fifty (50) ppm and a residual disinfection of greater than or equal to twenty-five (25) ppm at the end of twenty-four (24) hours. Follow the water main disinfection with thorough flushing and place the water main into service if, and only if, coliform monitoring applicable to the water main does not show the presence of coliform. If coliform is detected, repeat flushing of the water main and coliform monitoring. If coliform is still detected, repeat disinfection and flushing as if the water main has never been disinfected. Continue the described process until monitoring does not show the presence of coliform. (LWC Technical Specifications Section 8.2.2 & 8.6)

1.12.2 The presence or absence of total coliform monitored by sampling and analysis shall be determined for the new or relocated water main(s) as needed. Take samples at connection points to existing water mains at one (1) mile intervals and at dead ends, without omitting any branch of the new or relocated water main. Sample bottles shall be clearly identified as “special” construction tests. (LWC Technical Specifications Section 8.6)

1.12.3 For new construction projects, the distribution system, using the most expedient method, shall maintain coliform test results. (LWC Technical Specifications Section 8.6)

1.12.4 Chlorinated water resulting from disinfection of project components shall be disposed in a manner which will not violate 401 KAR 5:031. (LWC Technical Specifications Section 8.4)

1.13 Pressure Testing and Leak Detection

The presence or absence of leaks monitored by physical testing shall be determined in all types of installed pipe as needed. Pressure testing and leakage testing shall be in accordance with the latest edition of AWWA Standard C600. (LWC Technical Specifications Section 8.5)

1.14 Water Main Construction and Material Standards

1.14.1 Installation of water mains and appurtenances shall meet or exceed AWWA standards or manufacturer recommendations.

1.14.2 Pipes, fittings, valves, fire hydrants, and appurtenances shall meet or exceed the latest standards issued by the AWWA, ASTM, or NSF (if such standards exist). PVC and Polyethylene piping used must be certified to ANSI/NSF Standard 61.

1.15 Sewer Crossings and Separation

1.15.1 For the purpose of this standard, “non-storm sewer” is defined as any of the following: sanitary sewer, combined sewer, septic tank, or subsoil treatment system. (LWC Technical Specifications Section 3.1.4)

1.15.2 Water mains shall be laid a horizontal distance of greater than or equal to ten (10) feet horizontally from any existing or proposed non-storm sewer. The horizontal distance shall be measured from outside diameter of the water main to outside diameter of the non-storm sewer. (LWC Technical Specifications Section 3.1.4)

1.15.3 In cases where the Utility determines it is not practical to maintain a ten (10) foot separation, water mains may be

installed closer to a non-storm sewer provided that a variance is obtained from the Cabinet's Division of Water and maintained with the project records. (LWC Technical Specifications Section 3.1.4)

1.15.4 No deviation from the ten (10) foot separation is allowed if the non-storm sewer is a force main (sewer under pressure). (LWC Technical Specifications Section 3.1.4)

1.15.5 When water mains and non-storm sewers cross:

1.15.5.1 Water mains shall be laid such that there shall be a vertical distance of greater than or equal to eighteen (18) inches between the water main and non-storm sewer. The vertical distance shall be measured from the outside diameter of the water main to the outside diameter of the non-storm sewer line. (LWC Technical Specifications Section 3.1.4)

1.15.5.2 One (1) full length of the water pipe shall be located so that both joints of the water pipe will be as far from the non-storm sewer as practical as determined by the Utility. (LWC Technical Specifications Section 3.1.4)

1.15.5.3 Special structural support for the water and non-storm sewer may be required. (LWC Technical Specifications Section 3.1.4)

1.15.6 No water pipe shall pass through or come in contact with any part of a non-storm sewer manhole. (LWC Technical Specifications Section 3.1.4)

1.16 Water Mains Near Areas with Organic Contamination

If water mains are installed or replaced in areas of organic contamination or in areas within two hundred (200) feet of underground or petroleum storage tanks, ductile iron or other non-permeable materials shall be used in all portions of the water main installation or replacement. (LWC Technical Specifications Section 5.5.6)

1.17 Asbestos-Cement Pipe (Transite Pipe)

If the existing water main to be tapped is asbestos-cement pipe, then the contractor shall conform to OSHA regulations governing the handling of hazardous waste during the process of tapping the asbestos-cement pipe. Pieces of asbestos-cement pipe resulting from the tap shall be double bagged, placed in a rigid container, and disposed of in an approved landfill. (LWC Technical Specifications Section 6.7)

1.18 Subfluvial Pipe Crossings

1.18.1 For subfluvial pipe crossings, a floodplain construction permit will not be required pursuant to KRS 151.250 if the following requirements of 401 KAR 4:050 Section 2 are met:

1.18.1.1 No material may be placed in the stream or in the flood plain of the stream to form construction pads, coffer dams, access roads, etc. during construction of pipe crossings.

1.18.1.2 Crossing trenches shall be backfilled as closely as possible to the original contour.

1.18.1.3 All excess material resulting from construction displacement in a crossing trench shall be disposed of outside the flood plain.

1.18.1.4 For erodible channels, there shall be at least thirty (30) inches of backfill on top of all pipe or conduit points in the crossing.

1.18.1.5 For nonerodible channels, pipes or conduits in the crossing shall be encased on all sides by at least six (6) inches of concrete with all pipe or conduit points in the crossing at least six (6) inches below the original contour of the channel. (LWC Technical Specifications Section 1.3.6)

1.18.2 For subfluvial pipe crossings greater than fifteen (15) feet in width:

1.18.2.1 The pipe shall be of special construction having flexible, restrained, or welded watertight joints, and

1.18.2.2 Valves shall be provided at both ends of water crossings so that the section can be isolated for testing or repair. Valves shall be easily accessible and not be subject to flooding.

1.18.2.3 Permanent taps or other provisions to allow insertion of a small meter to determine leakage and obtain water samples shall be made on each side of the valve closest to the supply source.
(LWC Technical Specifications Section 1.3.6)

1.19 Cross Connections

Cross connections shall not be allowed in accordance with 401 KAR 8:020.
401 KAR 8:020 (2) Cross-connections prohibited. All cross-connections shall be prohibited. The use of automatic devices, such as reduced pressure zone back flow preventers and vacuum breakers, may be approved by the cabinet in lieu of proper air gap separation. A combination of air gap separation and automatic devices shall be required if determined by the cabinet to be necessary due to the degree of hazard to public health. Every public water system shall determine if or where cross-connections exist and shall immediately eliminate them.

1.20 Project Approvals, Record Retention and Management requirements and stipulations under this Agreed Order are as follows:

1.20.1.1 All water main projects reviewed by the Utility require the preparation of plans and specifications stamped by a licensed Kentucky Professional Engineer (P.E.) who shall be the Engineer of Record for an individual project.

1.20.1.2 All water main projects submitted to the Utility for review shall be documented as reviewed

and approved or denied by the Utility's Designated Plans Reviewer for the project.

1.20.1.3 All water main projects that the Utility designs internally or has designed by a contractor shall include plans and specifications stamped by a licensed Kentucky Professional Engineer (P.E.) who shall be the Engineer of Record for an individual project, and shall be reviewed and approved or denied by the Utility's Designated Plans Reviewer for the project.

1.20.1.4 All revisions to water main project plans previously approved by the Utility under the coverage of this Agreed Order shall be reviewed and approved or denied by the Utility's Designated Plans Reviewer for the project.

1.20.1.5 During construction, a set of Utility approved plans and specifications shall be available at the job site at all times. All work shall be performed in accordance with the Utility approved plans and specifications.

1.20.1.6 The Utility shall certify the water main projects has been constructed and tested in accordance with the approved plans and specifications. The Utility shall document and maintain a record of the certification of the project consistent with the recordkeeping requirements as stated in the Agreed Order.

1.20.1.7 The Utility shall define a project approval period not to exceed twelve (12) months, during which time the project construction shall begin.

1.20.1.8 Coverage under this Agreed Order does not relieve the Utility from the responsibility of obtaining any other approvals, permits, licenses required by the Cabinet and other state, federal and local agencies.

1.20.1.9 Project files and documentation, including water main project plans, location map, engineering calculations, and hydraulic information demonstrating regulatory compliance shall be

retained for a period of not less than five (5) years from the completion of the project (in-service date).

2 Qualifications For Cabinet's Division of Water Agreed Order Projects

2.1 The Cabinet's Division of Water Agreed Order Projects will be limited to projects that meet the criteria identified in this section. Projects not meeting these qualifications shall be submitted to the Cabinet's Division of Water for review and approval.

2.1.1 The water system shall have a valid Agreed Order.

2.1.2 Projects with an overall length less than ten thousand (10,000) contiguous feet shall qualify. Two (2) or more adjoining projects shall be considered one (1) project for the purposes of this requirement.

2.1.3 Projects consisting of water mains greater than or equal to three (3) inches in diameter or less than or equal to twelve (12) inches in diameter shall qualify. Additionally, circulating two (2) inch water main projects of less than five hundred (500) feet shall qualify if future extension from the line will not occur and if the Utility determines that the two (2) inch line will benefit the overall system hydraulics and / or drinking water quality.

2.1.4 Projects qualifying for review and approval by the Utility may include water main projects with valves and / or hydrants as part of the design. However, projects, including those less than ten thousand (10,000) total linear feet, that include new construction or installation of treatment plants, storage tanks, chemical or pressure booster pumping stations, shall be reviewed by the Cabinet for final determination.

2.1.5 The water demand for the project shall not cause the Utility to exceed eighty-five (85) % of its rated or operational design capacity.

2.1.6 Projects funded in part or in full by the State Revolving Fund (SRF) or Congressional Special Appropriation Grants (SPAP)

shall not qualify for review and approval by the Utility under the terms and conditions of this Agreed Order.

2.1.7 Projects under the jurisdiction of any regulating agency or funding agency other than the Kentucky Division of Water (external agencies), which in any way conflict with any regulatory process or funding process of these external agencies, shall not qualify for review and approval by the Utility under the terms and conditions of this Agreed Order.

2.1.8 The Utility is not authorized to approve any project that impacts any outstanding state resource water, outstanding national resource water, exceptional water, or cold water aquatic habitat as specified by 401 KAR Chapter 5.

2.1.9 Upon completion, projects shall meet all drinking water quality standards as set forth in 401 KAR Chapter 8.

2.1.10 The project meets all of the Technical Design and Construction Standards of the Cabinet's Division of Water Agreed Order and does not require any variances or deviations from the Technical Design and Construction Standards of the Cabinet's Division of Water Agreed Order.

APPENDIX OF STANDARD DRAWINGS FOR PIPELINE CONSTRUCTION

Standard Drawing Number	
	Section 1: General Requirements
4501	Creek Crossings With Concrete Cap (Sect. 1.3.5)
	Section 3: Site
1000	Typical Utility Location Profiles (Sect.3.1)
3600	Typical Temporary Service From Fire Hydrant (Sect. 3.4.4 & 3.4.4.1)
	Section 6: Installation
1500	Steel Casing Pipe and Casing Runners (Sect. 6.3)
1400	Typical Cast-in-Place Thrust Anchors (Sect.6.8 & 6.14)
1200 A-C	Methods for Installing and Restoring Polyethylene Wrap (Sect. 6.9)
	Section 7: Backfilling Procedures And Tamping
4300	Common Backfill and Lawn Restoration (Sect. 7.1, 7.4, 7.5, 7.6 & 11.6)
	Section 8: Placing Water Main In Service
1601	Typical 2" Blow-off and Flushing Connection (Sect. 8.3.2)
1602	Typical 1" Manual Air Valve (For mains up to 20") (Sect. 8.3.2, 8.7 & 8.7.2)
1603	Typical Combined 2" Automatic and Manual Air Valve (For mains 16" and larger) (Sect. 8.3.2, 8.7 & 8.7.1)
1608	Leak Detection By-Pass Meter for Underwater Crossings (Sect. 1.3.6 & 8.8)
	Section 9: Fire Hydrant
2000	Typical Fire Hydrant Installation (Sect. 9)
	Section 10: Service Work
3804	Method for Tapping Polyethylene Encased Pipe (Sect. 10.3.1 & 10.3.3)
3002	Typical Copper Service 1" and Smaller (Sect.10.3, 10.3.1, 10.3.2, 10.3.3 & 10.5)
3003	Typical 1" Copper Service With Pressure Reducing Valve (Sect.10.3, 10.3.1, 10.3.2, 10.3.3, 10.5 & 10.6)
3004	Typical 3/4" Copper Service With Pressure Reducing Valve (Sect.10.3, 10.3.1, 10.3.2, 10.3.3, 10.5 & 10.6)
3400	Typical Double 1" Domestic/Irrigation Copper Service (Sect. 10.3, 10.3.1, 10.3.2, & 10.3.3)
3401	Typical Double Domestic/Irrigation 1" Copper Service With Pressure Reducing Valve (Sect. 10.3, 10.3.1, 10.3.2, 10.3.3, 10.5 & 10.6)
3403	Typical ¾" Irrigation Retro Fit Copper Service (Sect. 10.3, 10.3.1, 10.3.2, 10.3.3, & 10.5)
3404	Typical 1" Tandem 2-Way Domestic Copper Service (Sect. 10.3, 10.3.1, 10.3.2, 10.3.3, & 10.5)
3420	Typical 1" 3-Way Domestic Copper Service (Sect. 10.3, 10.3.1, 10.3.2, 10.3.3, & 10.5)

3430 Typical 1” 4-Way Domestic Copper Service (Sect. 10.3, 10.3.1, 10.3.2, 10.3.3, & 10.5)
3200 Typical 1-1/2" or 2" Copper Service (Sect. 10.3, 10.3.1, 10.3.2, 10.3.3 & 10.5)
3202 Typical 1-1/2" or 2" Copper Service With Pressure Reducing Valve (Sect. 10.3, 10.3.1, 10.3.2, 10.3.3, 10.5 & 10.6)
3203 Typical Ductile Iron Domestic Service 4" and Larger (Sect. 10.4, 10.4.1, 10.4.2, 10.4.3, & 10.5)
3601 Typical Fire Protection Service 4" and Larger (Sect. 10.4, 10.4.1, 10.4.2, 10.4.3 & 10.5)
3440 Relocate Service (Sect.10.8)
3441 Renew Service (Sect. 10.9)
3442 Transfer Service (Sect.10.10) and Discontinue Service (Sect.10.11)
3805 Service Sleeve Installation Detail (Sect.10)

Section 11: Restoration

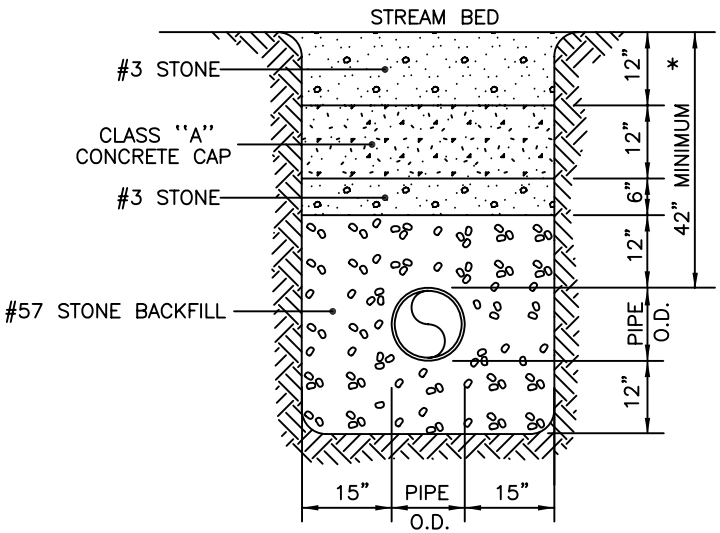
4000 State of Kentucky Backfill and Paving Restoration (Sect. 11)
4100 Metro Louisville/Jefferson County Backfill and Paving Restoration (Sect. 11)
4400 Sidewalk/Backfill Detail (Sect. 11)
4410 Concrete Curb and Gutter Restoration Detail (Sect. 11.4)

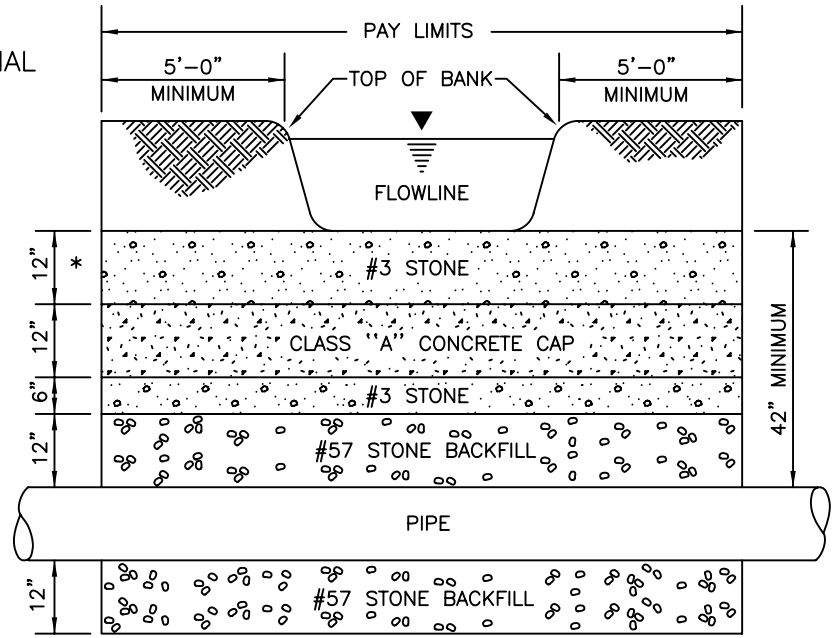
Other:

4600 Typical Master Meter Detail
5005 Valve Status Marker

*THE TOP 12" TO BE #3 STONE OR OTHER SELECT MATERIAL APPROVED BY THE KENTUCKY DIVISION OF WATER.

TYPICAL SECTION





TYPICAL PROFILE

STREAM CROSSING CONDITIONS

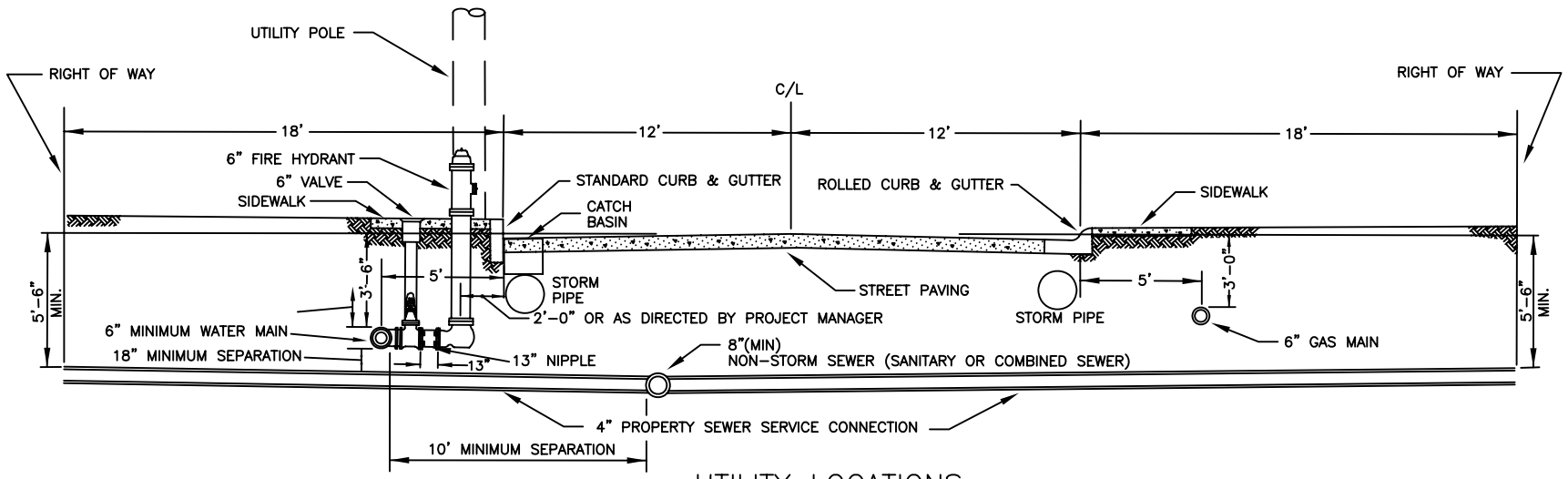
1. COMPLY WITH SECTION 1.3.5, SOIL EROSION AND SEDIMENT CONTROL.
2. THIS DETAIL APPLIES ONLY TO BLUE-LINE STREAMS, AS SHOWN ON THE PERTINENT USGS QUADRANGLE MAP.
3. MANAGEMENT CONSTRUCTION PRACTICES MUST BE USED AT ALL TIMES DURING CONSTRUCTION. ADEQUATE SILT CONTROL MUST BE PLACED PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
4. REVEGETATE ALL DISTURBED GRASSY AREAS ON THE STREAM SLOPES. SOD STAKES MAY BE REQUIRED TO SECURE SOD ON THE STREAM BANKS.
5. MAINTAIN AT LEAST 3.5' OF BACKFILL AT THE STREAM CROSSING FROM THE TOP OF PIPE TO THE ORIGINAL STREAM BED ELEVATION.
6. OBTAIN APPROVAL FROM THE METROPOLITAN SEWER DISTRICT PRIOR TO THE START OF THE STREAM CROSSING WHEN CONSTRUCTION IS UNDER THEIR JURISDICTION.
7. TO BE PAID PER LINEAL FOOT OF CONCRETE CAP.
8. THRUST BLOCKING SHALL BE CONSTRUCTED AT ALL BENDS.

LOUISVILLE WATER COMPANY
550 S. 3RD STREET • LOUISVILLE, KENTUCKY 40202 • (502) 569-3600
GREGORY C. HEITZMAN – PRESIDENT
JAMES H. BRAMMELL – VICE PRESIDENT/CHIEF ENGINEER

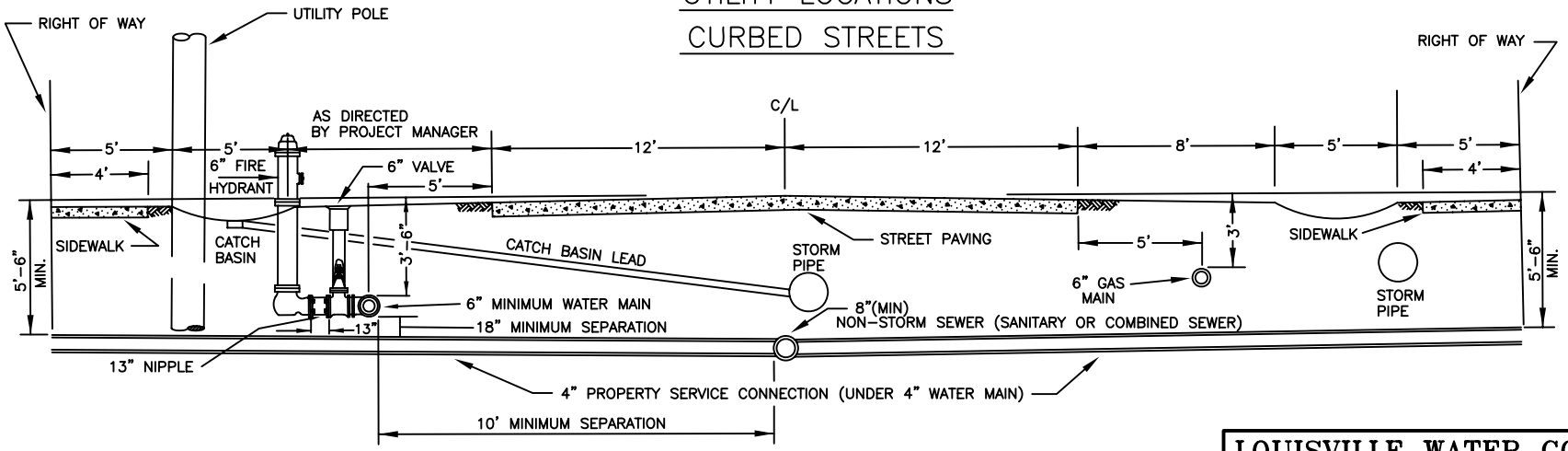
STANDARD DRAWING

CREEK CROSSING WITH CONCRETE CAP

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	4501	SHEET	1 OF 1



UTILITY LOCATIONS
CURBED STREETS

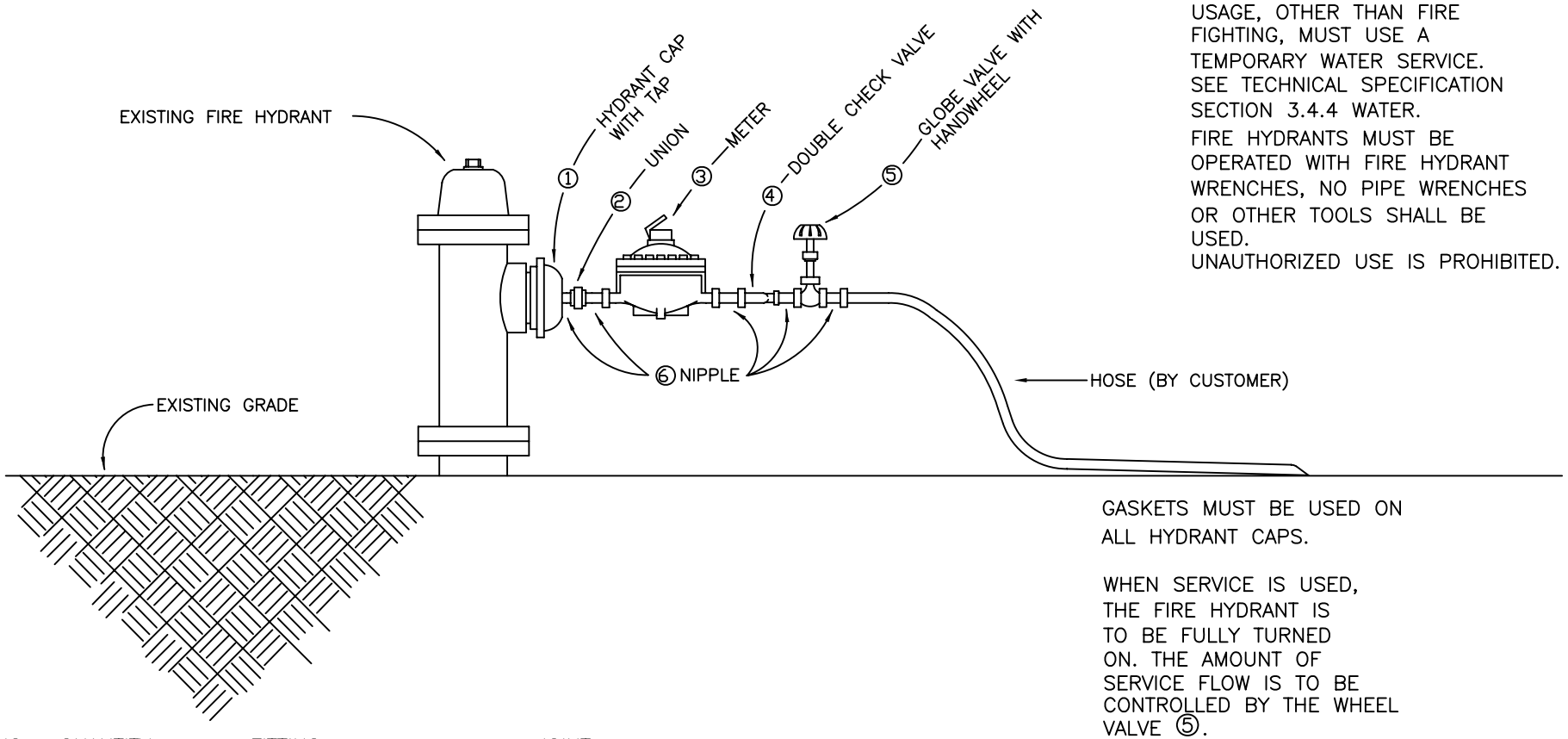


UTILITY LOCATIONS
WITHOUT CURBED STREETS

LOUISVILLE WATER COMPANY
550 S. 3RD STREET • LOUISVILLE, KENTUCKY 40202 • (502) 569-3600
GREGORY C. HEITZMAN – PRESIDENT
JAMES H. BRAMMELL – VICE PRESIDENT/CHIEF ENGINEER

STANDARD DRAWING
TYPICAL
UTILITY LOCATION PROFILES

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1000	SHEET	1 OF 1



NOTES :

ALL FIRE HYDRANT USAGE, OTHER THAN FIRE FIGHTING, MUST USE A TEMPORARY WATER SERVICE. SEE TECHNICAL SPECIFICATION SECTION 3.4.4 WATER.

FIRE HYDRANTS MUST BE OPERATED WITH FIRE HYDRANT WRENCHES, NO PIPE WRENCHES OR OTHER TOOLS SHALL BE USED.

UNAUTHORIZED USE IS PROHIBITED.

GASKETS MUST BE USED ON ALL HYDRANT CAPS.

WHEN SERVICE IS USED, THE FIRE HYDRANT IS TO BE FULLY TURNED ON. THE AMOUNT OF SERVICE FLOW IS TO BE CONTROLLED BY THE WHEEL VALVE ⑤.

NO.	QUANTITY	FITTING	JOINT	SERVICE SIZES 3/4"	SERVICE SIZES 1-1/2"
①	1	Hydrant Cap w/Gasket	Female Threaded	4"x3/4"	4"x1-1/2"
	1	& Tap	Female Threaded	3/4"	1-1/2"
②	1	Union	Female Threaded	3/4"	1-1/2"
③	1	Meter	Flanged	3/4"	1-1/2"
④	1	Check Valve	Female Threaded	3/4"	1-1/2"
⑤	1	Globe Valve W/Handwheel	Female Threaded	3/4"	1-1/2"
⑥	5	Nipple	Inlet-Male Threaded Outlet-Male Threaded	3/4"	1-1/2"

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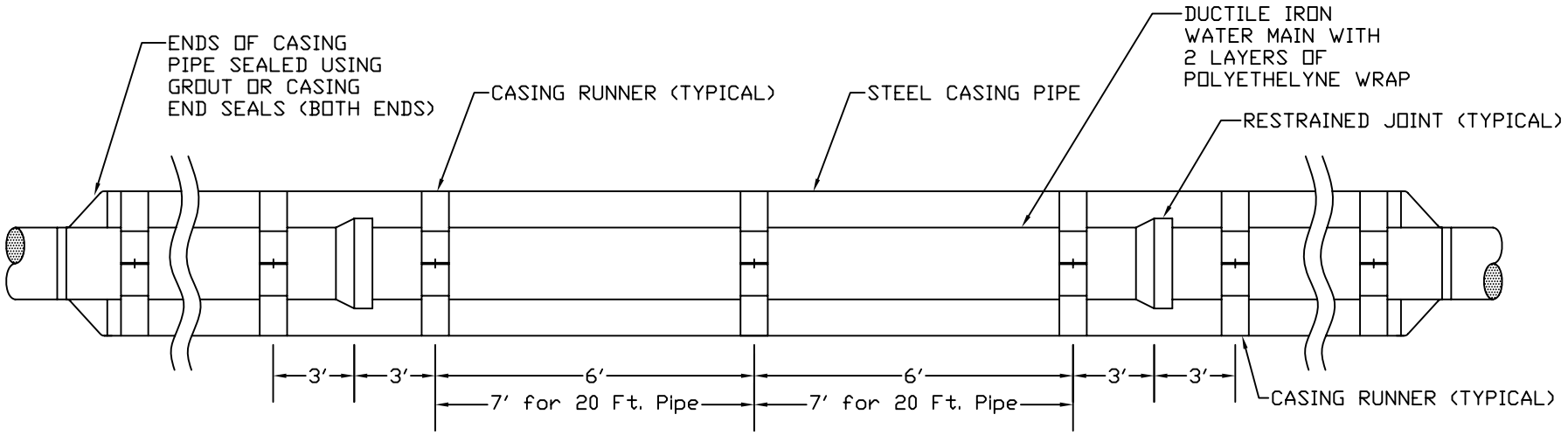
JAMES H. BRAMMELL – VICE PRESIDENT/CHIEF ENGINEER

STANDARD DRAWING

TYPICAL TEMPORARY SERVICE FROM FIRE HYDRANT 3/4" OR 1-1/2"

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3600	SHEET	1 OF 1



TYPICAL RUNNER SPACING
(PER 18 FT. PIPE LENGTH)

NOTES:
1) STEEL CASING TO EXTEND A MINIMUM OF FIVE (5) FEET BEYOND THE EDGE OF PAVEMENT.
2) THREE (3) CASING RUNNERS PER EACH PIPE LENGTH (MINIMUM). WITH ONE CASING RUNNER WITHIN 3 FT. OF EACH PIPE END.
3) WATER MAIN SHALL HAVE RESTRAINED JOINTS WITHIN CASING PIPE. (SEE SECT. 6.3)

CASING PIPE SIZES		
WATER MAIN PIPE SIZE (INCHES)	CASING PIPE SIZE (INCHES)	CASING THICKNESS (INCHES)
4	12	0.375
6	16	0.375
8	16	0.375
12	20	0.375
16	24	0.375
20	30	0.500

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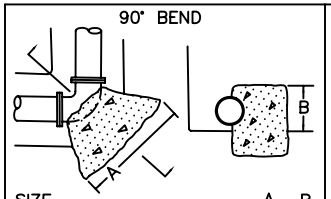
STANDARD DRAWING

STEEL CASING PIPE AND CASING RUNNERS

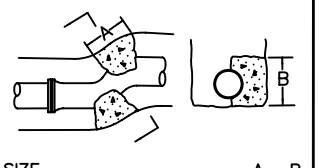
DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1500	SHEET	1 OF 1

90° BEND



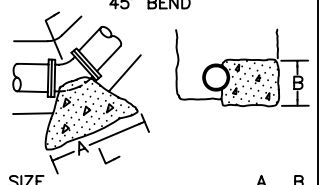
SIZE	A	B
4",6",8", & 12"	5'	3'
16"	6'-3"	3'-9"
20"	7'-6"	4'

HORIZONTAL OFFSET



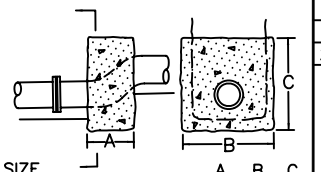
SIZE	A	B
4",6",8", & 12"	2'	2'
16"	2'-6"	2'-6"
20"	3'	3'

45° BEND



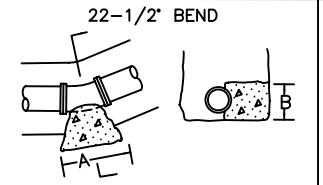
SIZE	A	B
4",6",8", & 12"	4'-6"	2'
16"	5'-9"	2'-6"
20"	6'-6"	3'

VERTICAL OFFSET



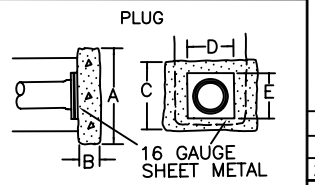
SIZE	A	B	C
4",6",8", & 12"	2'	4'	4'
16"	3'	6'	4'
20"	3'-6"	7'	4'-6"

22-1/2° BEND



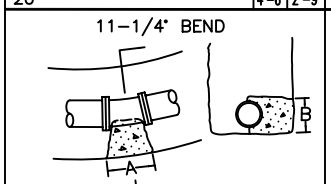
SIZE	A	B
4",6",8", & 12"	3'	1'-6"
16"	3'-9"	2'
20"	4'-6"	2'-9"

PLUG



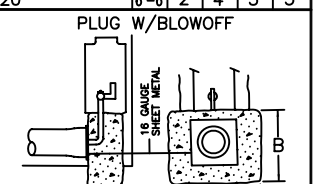
SIZE	A	B	C	D	E
4",6",8", & 12"	4'	9"	3'	2'	2'
16"	5'	1'-3"	4'	2'-6"	2'-6"
20"	6'-6"	2'	4'	3'	3'

11-1/4° BEND



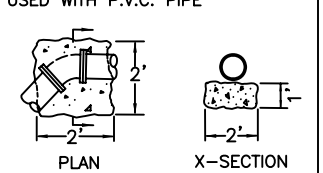
SIZE	A	B
4",6",8", & 12"	2'-6"	1"
16"	3'	1'-6"
20"	4'	2'-3"

PLUG W/BLOWOFF

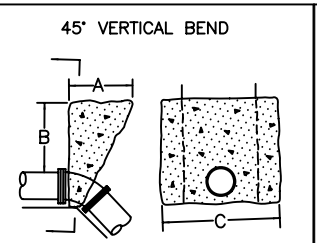


SIZE	A	B	C
4",6",8", & 12"	4'	3'	1'-6"
16"	5'	4'	2'
20"	6'	5'	2'-6"

TYPICAL CONCRETE SUPPORT BLOCK UNDER ALL FITTINGS USED WITH P.V.C. PIPE

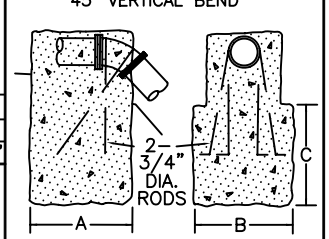


45° VERTICAL BEND



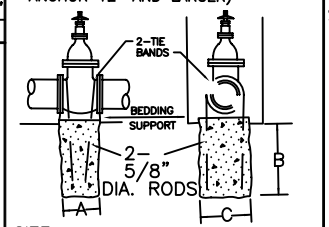
SIZE	A	B	C
4",6",8", & 12"	3'	3'	5'
16"	3'-9"	3'-9"	6'
20"	5'	4'	7'

45° VERTICAL BEND



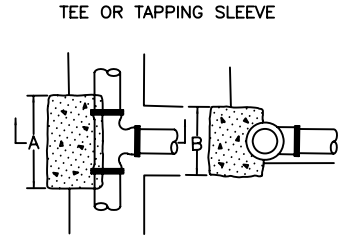
SIZE	A	B	C
4",6",8", & 12"	4'	4'	4'
16"	5'	5'	5'
20"	6'	6'	6'

GATE VALVE (IF PVC, THEN ANCHOR ALL SIZES.) (IF DI PIPE, THEN ANCHOR 12" AND LARGER)



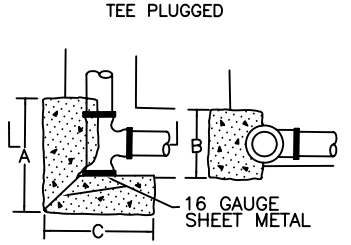
SIZE	A	B	C
4",6",8", & 12"	1'-6"	3'	2'
16"	2'	3'-9"	2'-6"
20"	2'-6"	4'	3'

TEE OR TAPPING SLEEVE



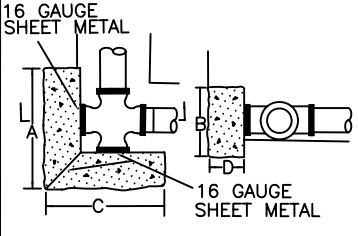
SIZE	A	B
4",6",8", & 12"	4'	3'
16"	5'	3'-9"
20"	6'	4'-6"

TEE PLUGGED



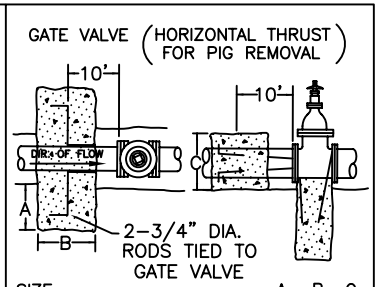
SIZE	A	B	C
4",6",8", & 12"	4'	3'	4'-6"
16"	5'	3'-9"	5'-6"
20"	6'	4'-6"	6'

CROSS PLUGGED



SIZE	A	B	C	D
4",6",8", & 12"	4'-6"	3'	4'-6"	1'-6"
16"	5'	3'-6"	5'	2'
20"	6'	4'	6'	3'

GATE VALVE (HORIZONTAL THRUST FOR PIG REMOVAL)



SIZE	A	B	C
4",6"	1'	2'	2'
8"	1'	2'	2'
12"	2'	2'	2'
16"	2'	3'	2'

NOTE:

(1) ALL DUCTILE AND GRAY IRON PIPE AND APPURTENANCES SHALL BE DOUBLE POLYWRAPPED.

(2) CARE SHALL BE TAKEN TO AVOID DAMAGING POLYWRAP. ANY DAMAGE OR TORN POLYETHYLENE WRAP MUST BE REPAIRED WITH POLYETHYLENE TAPE AND ADDITIONAL POLYETHYLENE WRAP IF NECESSARY TO PROVIDE TWO (2) LAYERS OF PROTECTION.

(3) CONCRETE THRUST ANCHORS MUST BE ALLOWED TO CURE, OR PROTECTED AS APPROVED BY THE PROJECT MANAGER, BEFORE BACKFILLING.

(4) ALL CONCRETE SHALL BE 3,500psi FROM A COMMERCIAL PLANT, OR SHALL BE AN ON-SITE MIXTURE PREVIOUSLY APPROVED AT THE PRECONSTRUCTION CONFERENCE.

(5) ALL FITTINGS INVOLVED WITH PVC PIPE SHALL HAVE A CONCRETE SUPPORT BLOCK, IN ADDITION TO THE PERTINENT THRUST BLOCK.

(6) ALL REDUCERS ARE TO BE ANCHORED, THE ANCHOR DIMENSIONS SHOWN IN THE "GATE VALVE" DRAWING SHALL APPLY; USE THE LARGER OF THE TWO REDUCER DIMENSIONS AS THE DICTATING DIMENSION.

(7) SIZING OF THRUST ANCHORS ASSUME AN ALLOWABLE SOIL BEARING CAPACITY OF 3,000 PSF.

(8) REINFORCING STEEL USED IN THRUST RESTRAINT SHALL BE GRADE 60 AND EPOXY COATED.

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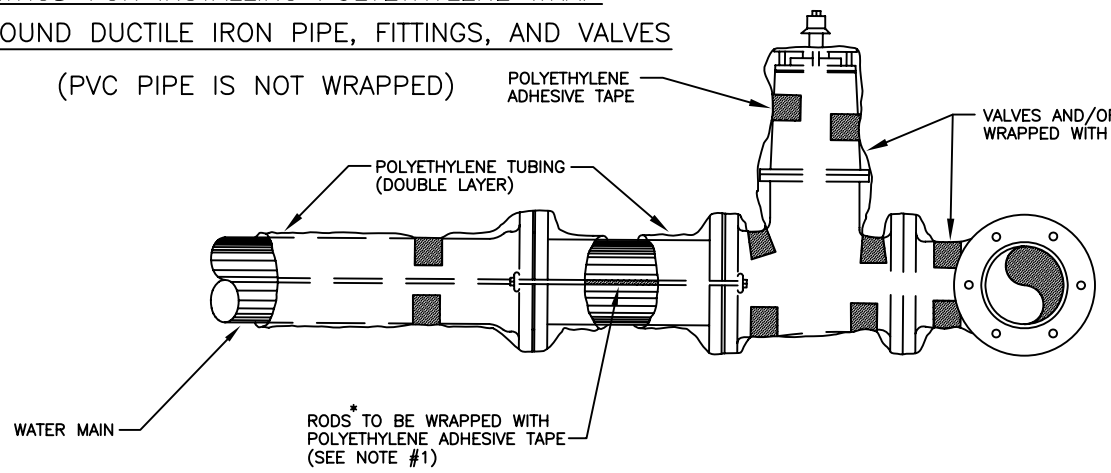
STANDARD DRAWING

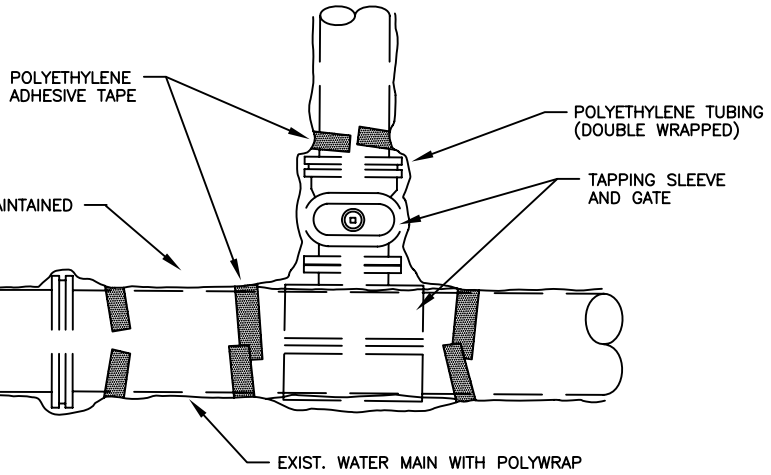
TYPICAL CAST-IN-PLACE THRUST ANCHORS

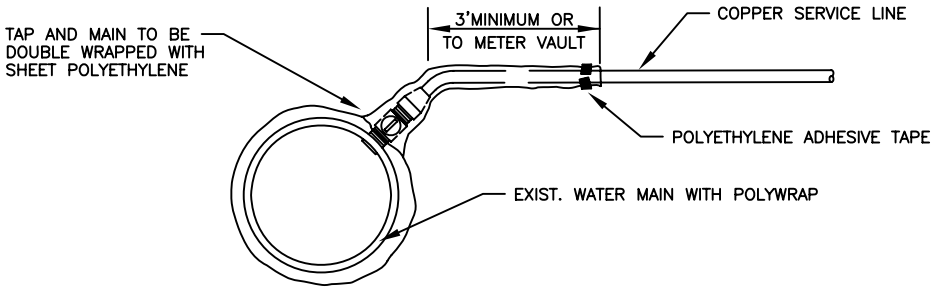
DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1400	SHEET	1 OF 1

METHOD FOR INSTALLING POLYETHYLENE WRAP AROUND DUCTILE IRON PIPE, FITTINGS, AND VALVES

(PVC PIPE IS NOT WRAPPED)







METHOD FOR RESTORING POLYETHELENE WRAP WHEN TAPPING WATER MAINS

NOTES:

1) *RODS USED FOR THRUST RESTRAINT ARE TO BE USED ONLY AS TEMPORARY THRUST RESTRAINT. THRUST ANCHORS MUST BE POURED FOR ALL FITTINGS AS DETAILED IN THE STANDARD SPECIFICATIONS. MECHANICAL RESTRAINT MAY BE USED IN PLACE OF RODS AT THE DISCRETION OF THE PROJECT MANAGER.

2) ANY DAMAGE OR TORN POLYETHYLENE WRAP MUST BE REPAIRED WITH POLYETHYLENE ADHESIVE TAPE AND ADDITIONAL POLYETHYLENE WRAP IF NECESSARY TO PROVIDE TWO (2) LAYERS OF PROTECTION.

3) PIPE SHALL NOT BE WRAPPED FOR MORE THAN FIVE (5) DAYS IN ADVANCE OF PLACEMENT INTO THE TRENCH.

4) ALL DUCTILE IRON TEES, VALVES AND FITTINGS ON PVC PIPE SHALL BE DOUBLE WRAPPED WITH POLYETHYLENE AND ENDS FASTENED SECURELY ON PVC PIPE.

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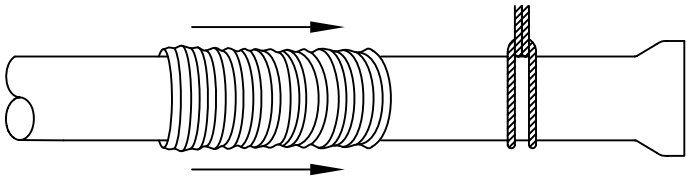
STANDARD DRAWING

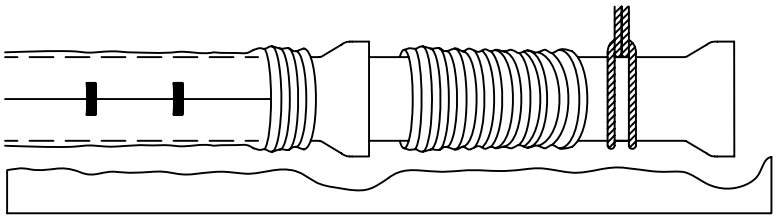
METHODS FOR INSTALLING AND RESTORING POLYETHYLENE WRAP

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1200–A	SHEET	1 OF 3



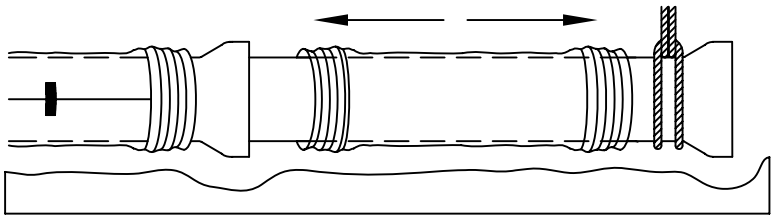
STEP 1.

CUT A SECTION OF POLYETHYLENE TUBE APPROXIMATELY TWO FEET LONGER THAN THE PIPE SECTION. REMOVE ALL LUMPS OF CLAY, MUD, CINDERS, OR OTHER MATERIAL THAT MIGHT HAVE ACCUMULATED ON THE PIPE SURFACE DURING STORAGE. SLIP THE POLYETHYLENE TUBE AROUND THE PIPE, STARTING AT THE SPIGOT END. BUNCH THE TUBE ACCORDIAN–FASHION ON THE END OF THE PIPE. PULL BACK THE OVERHANGING END OF THE TUBE UNTIL IT CLEARS THE PIPE END.



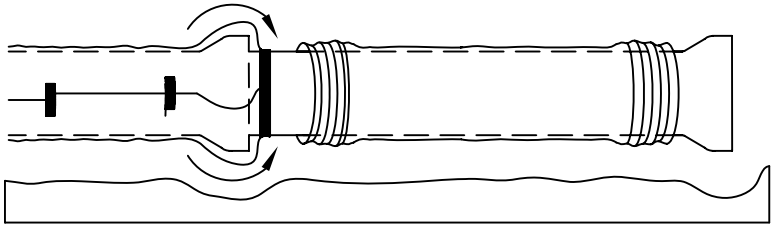
STEP 2.

DIG A SHALLOW BELL HOLE IN THE TRENCH BOTTOM AT THE JOINT LOCATION TO FACILITATE INSTALLATION OF THE POLYETHYLENE TUBE. LOWER THE PIPE INTO THE TRENCH AND MAKE UP THE PIPE JOINT WITH THE PRECEDING SECTION OF PIPE.



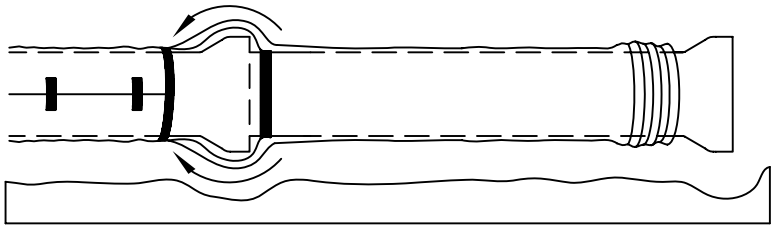
STEP 3.

MOVE THE CABLE TO THE BELL END OF THE PIPE AND LIFT THE PIPE SLIGHTLY TO PROVIDE ENOUGH CLEARANCE TO EASILY SLIDE THE TUBE. SPREAD THE TUBE OVER THE ENTIRE BARREL OF THE PIPE. NOTE: MAKE SURE THAT NO DIRT OR THE BEDDING MATERIAL BECOMES TRAPPED BETWEEN THE WRAP AND THE PIPE.



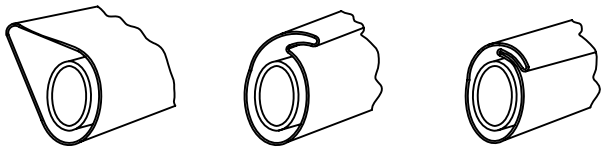
STEP 4.

MAKE THE OVERLAP OF THE POLYETHYLENE TUBE BY PULLING BACK THE BUNCHED POLYETHYLENE FROM THE PRECEDING LENGTH OF PIPE AND SECURING IT IN PLACE. NOTE: THE POLYETHYLENE MAY BE SECURED IN PLACE BY USING TAPE, STRING, OR ANY OTHER MATERIAL CAPABLE OF HOLDING THE POLYETHYLENE ENCASEMENT SNUGLY AGAINST THE PIPE.



STEP 5.

OVERLAP THE SECURED TUBE END WITH THE TUBE END OF THE NEW PIPE SECTION. SECURE THE NEW TUBE END IN PLACE.



STEP 6.

TAKE UP THE SLACK IN THE TUBE ALONG THE BARREL OF THE PIPE TO MAKE A SNUG, BUT NOT TIGHT, FIT. FOLD EXCESS POLYETHYLENE BACK OVER THE TOP OF THE PIPE.

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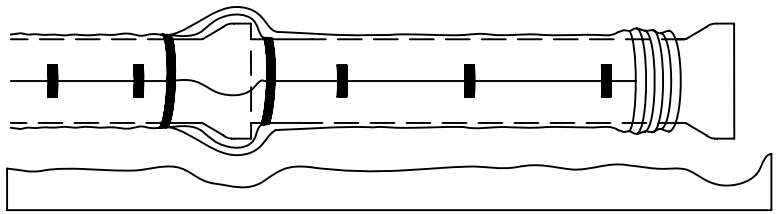
STANDARD DRAWING

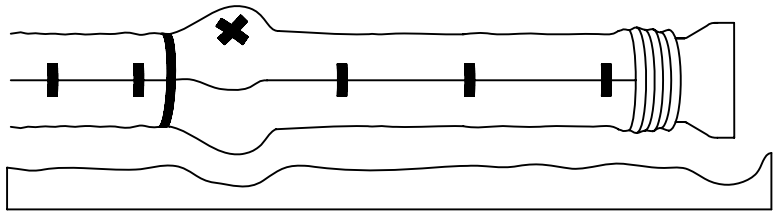
METHODS FOR INSTALLING AND RESTORING POLYETHYLENE WRAP

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1200–B	SHEET	2 OF 3



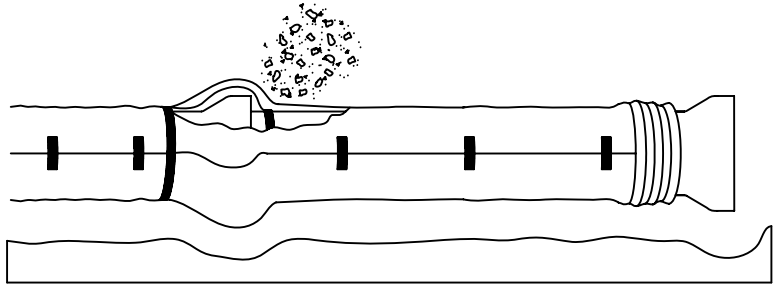
STEP 7.

SECURE THE FOLD AT SEVERAL LOCATIONS ALONG THE PIPE BARREL (APPROXIMATELY EVERY THREE FEET).



STEP 8.

REPAIR ALL SMALL RIPS, TEARS, OR OTHER TUBE DAMAGE WITH ADHESIVE TAPE. IF THE POLYETHYLENE IS BADLY DAMAGED, REPAIR THE DAMAGED AREA WITH A SHEET OF POLYETHYLENE AND SEAL THE EDGES OF THE REPAIR WITH ADHESIVE TAPE.



STEP 9.

CAREFULLY BACKFILL THE PIPE ACCORDING TO THE AWWA C600 STANDARD FOR BACKFILL PROCEDURE. TO PREVENT DAMAGE DURING BACKFILLING, ALLOW ADEQUATE SLACK IN THE TUBE AT THE JOINT. BACKFILL SHOULD BE FREE OF CINDERS, ROCKS, BOULDERS, NAILS, STICKS, OR OTHER MATERIALS THAT MIGHT DAMAGE THE POLYETHYLENE. AVOID DAMAGING THE POLYETHYLENE WHEN USING TAMPING DEVICES.

TABLE FOR MINIMUM FLATTENED POLYETHYLENE TUBE WIDTHS

NOMINAL PIPE SIZE (INCHES)	RECOMMENDED POLYETHYLENE FLAT TUBE WIDTH (INCHES)
4	24
6	24
8	24
12	30
16	36
20	48

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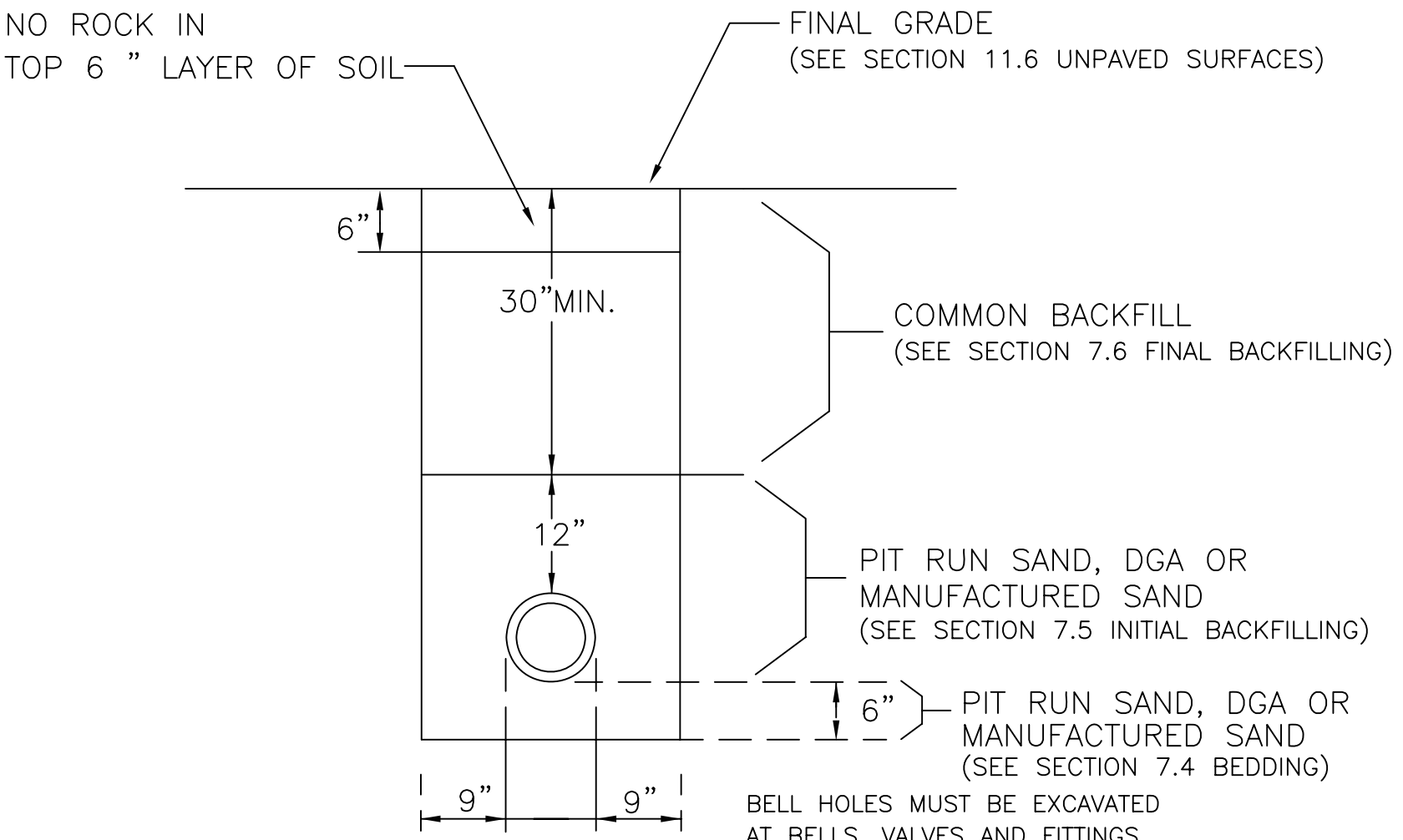
STANDARD DRAWING

METHODS FOR
INSTALLING AND RESTORING
POLYETHYLENE WRAP

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1200–C	SHEET	3 OF 3



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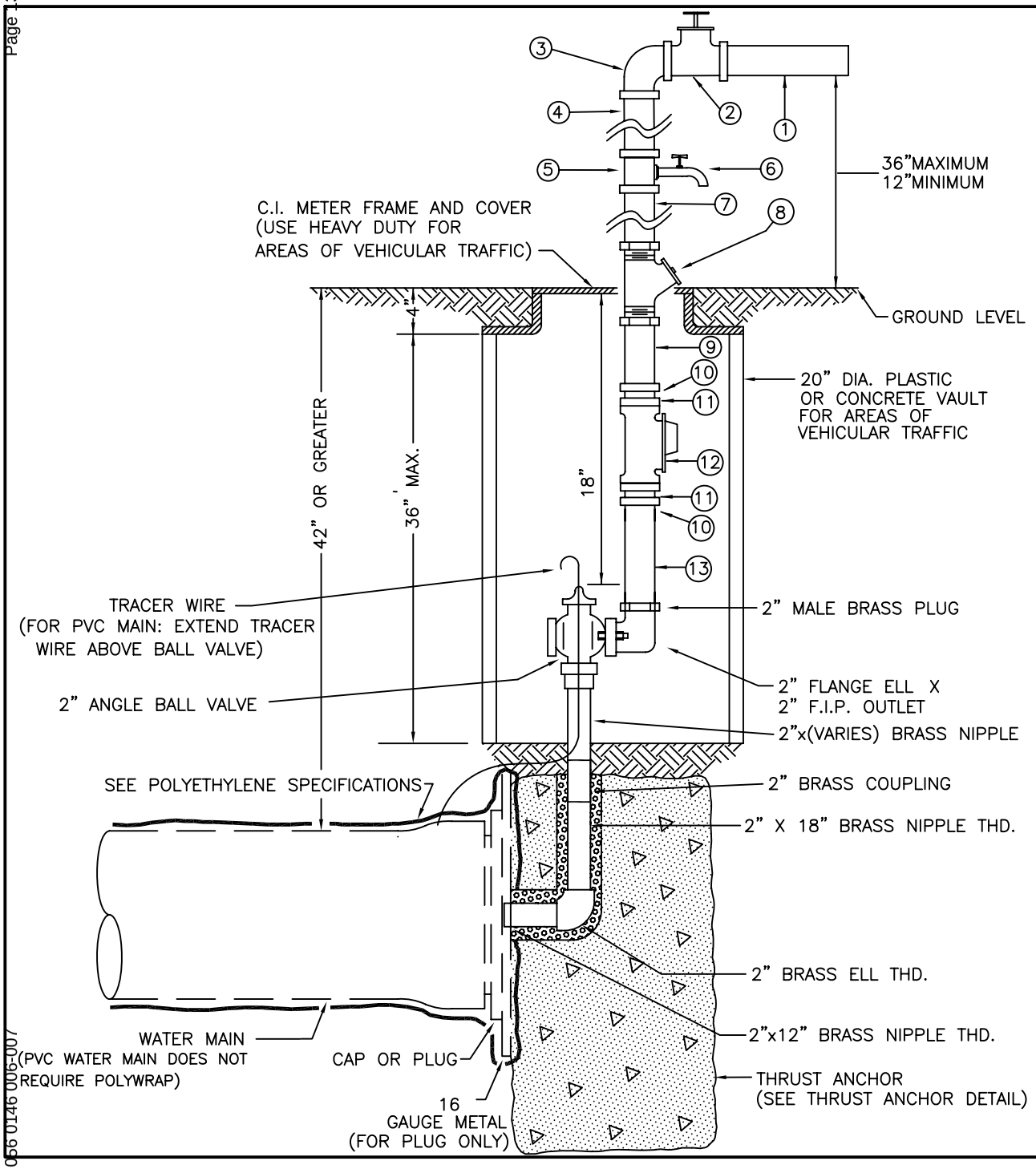
STANDARD DRAWING

COMMON BACKFILL AND LAWN RESTORATION

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	4300	SHEET	1 OF 1



TEMPORARY FLUSHING ASSEMBLY
FURNISHED BY LWC METER SHOP.

(1)	2"X6" BRASS NIPPLE THD*
(2)	2" GATE VALVE*
(3)	2" 90° ELL BRASS THD*
(4)	2"X6" BRASS NIPPLE THD*
(5)	2"X1" TEE WITH 1"X3/4" BUSHING*
(6)	3/4" BRASS SPIGOT WITH 1/2" OUTLET*
(7)	2"X12" BRASS NIPPLE THD*
(8)	2" DUAL CHECK VALVE*
(9)	2"X3" BRASS NIPPLE THD*
(10)	2"X1-1/2" BRASS REDUCER*
(11)	1-1/2" MIP X FLG*
(12)	1-1/2" TURBINE METER*
(13)	2"X6" BRASS NIPPLE THD*

CAUTION: DO NOT CONNECT PRESSURE TEST EQUIPMENT TO TEMPORARY FLUSHING ASSEMBLY!

NOTE:

1-1/2" TURBINE METER AND 2" DUAL CHECK VALVE ARE TO BE INSTALLED AFTER PIGGING OPERATIONS. A 2" HOSE IS TO BE USED DURING ALL FLUSHING OPERATIONS.

NOTE:

8" AND LARGER WATER MAINS MAY REQUIRE LARGER THAN A 2" FLUSHING OUTLET TO MEET THE KDOW 2.5 F.P.S. FLUSHING REGULATION.

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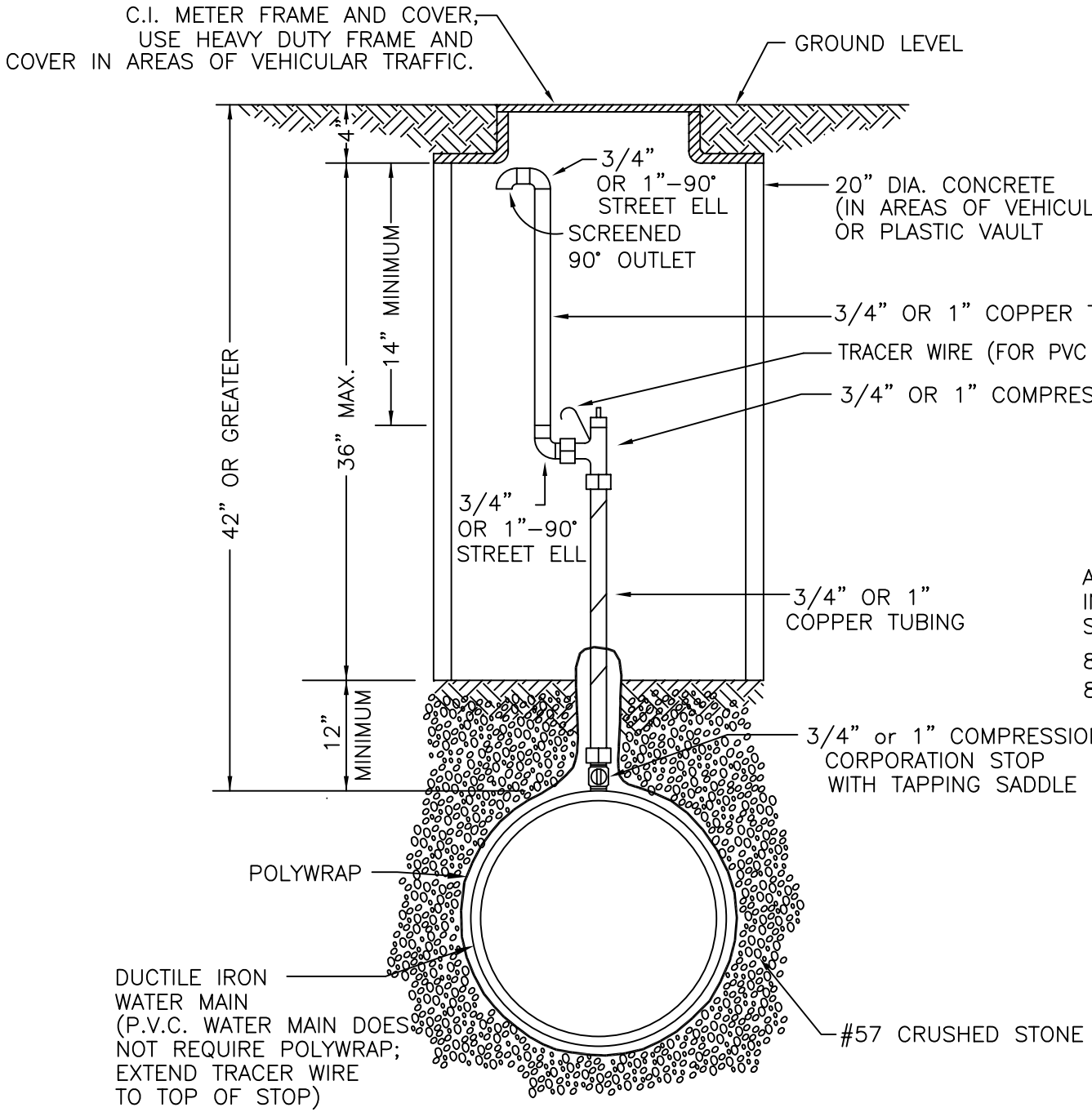
STANDARD DRAWING

TYPICAL 2" BLOW-OFF AND FLUSHING CONNECTION

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1601	SHEET	1 OF 1



AIR VALVES SHALL NOT BE INSTALLED IN LOCATIONS SUBJECT TO FLOODING. SEE SECTIONS:

8.7 AIR RELIEF VALVES

8.7.2 MANUAL AIR RELIEF VALVES

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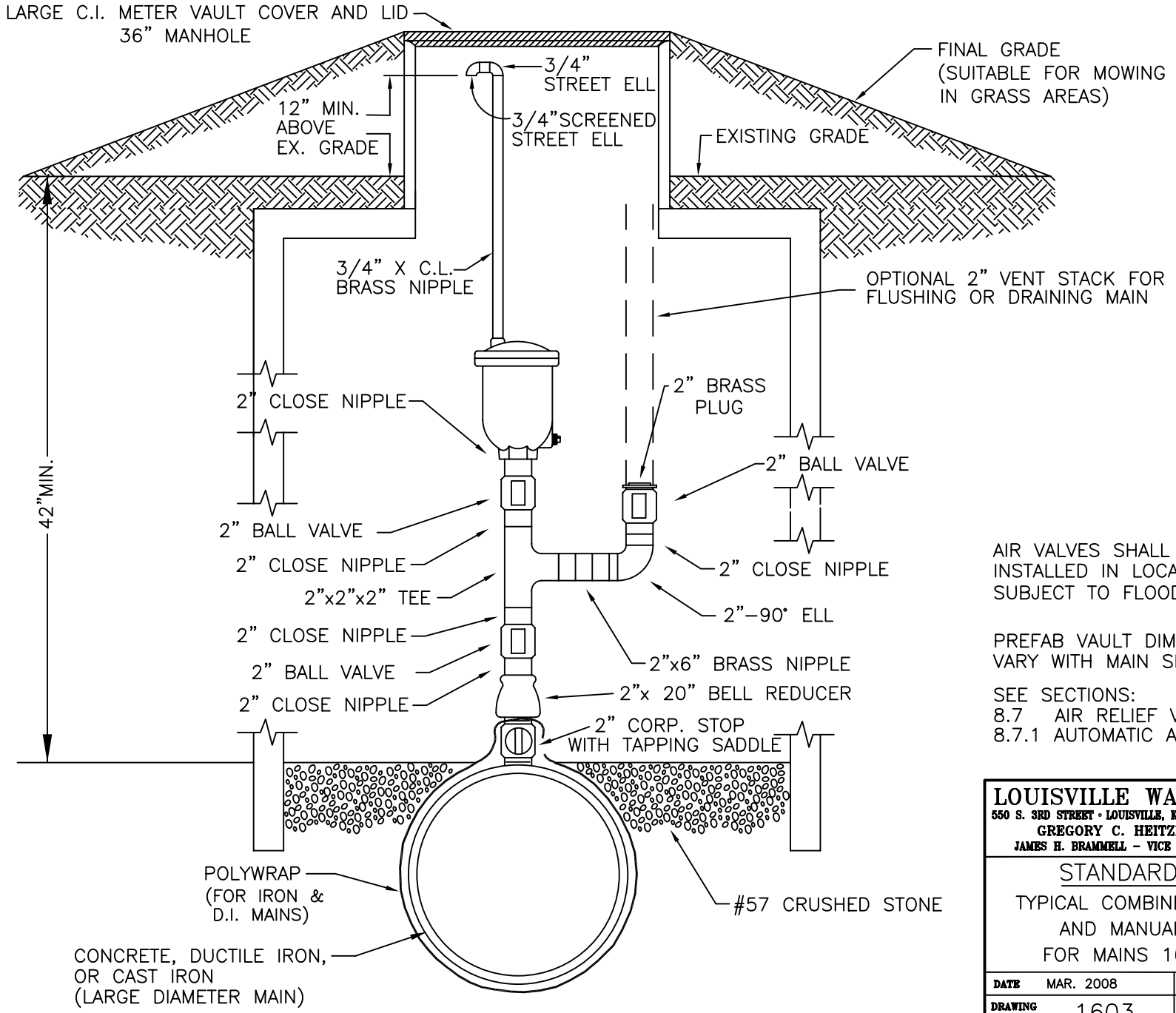
STANDARD DRAWING

TYPICAL 3/4" OR 1" MANUAL AIR VALVE (FOR MAINS UP TO 20")

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1602	SHEET	1 OF 1



AIR VALVES SHALL NOT BE INSTALLED IN LOCATIONS SUBJECT TO FLOODING.

PREFAB VAULT DIMENSIONS VARY WITH MAIN SIZE

SEE SECTIONS:
8.7 AIR RELIEF VALVES
8.7.1 AUTOMATIC AIR RELIEF VALVES

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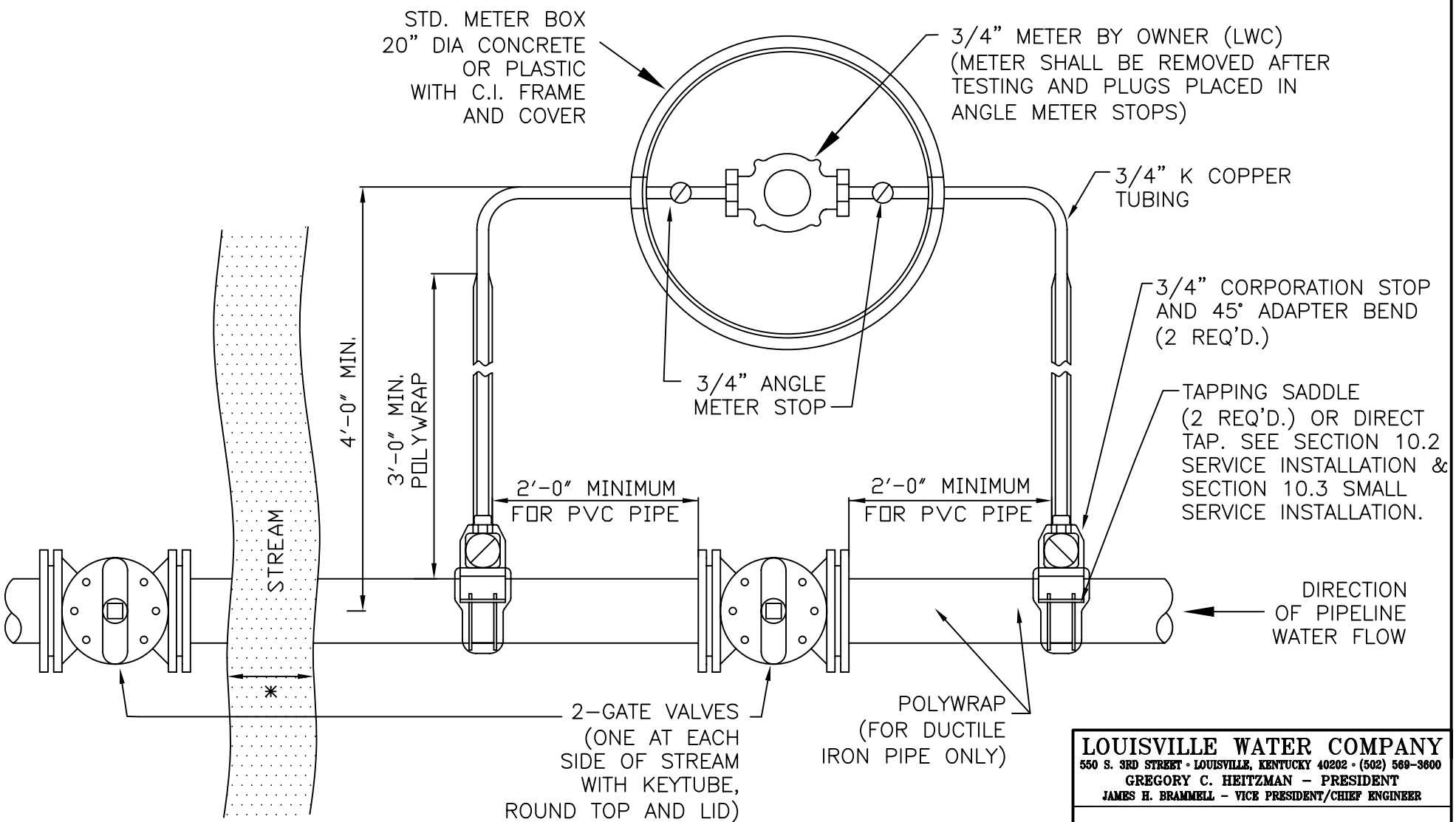
STANDARD DRAWING

TYPICAL COMBINED 2" AUTOMATIC AND MANUAL AIR VALVE FOR MAINS 16" AND LARGER

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1603	SHEET	1 OF 1



* LEAK DETECTION BY-PASS METER IS REQUIRED IF UNDERWATER CROSSING IS GREATER THAN 15 FT. SEE SECTION 8.8.

LEAK DETECTION BY-PASS METER FOR UNDERWATER CROSSINGS

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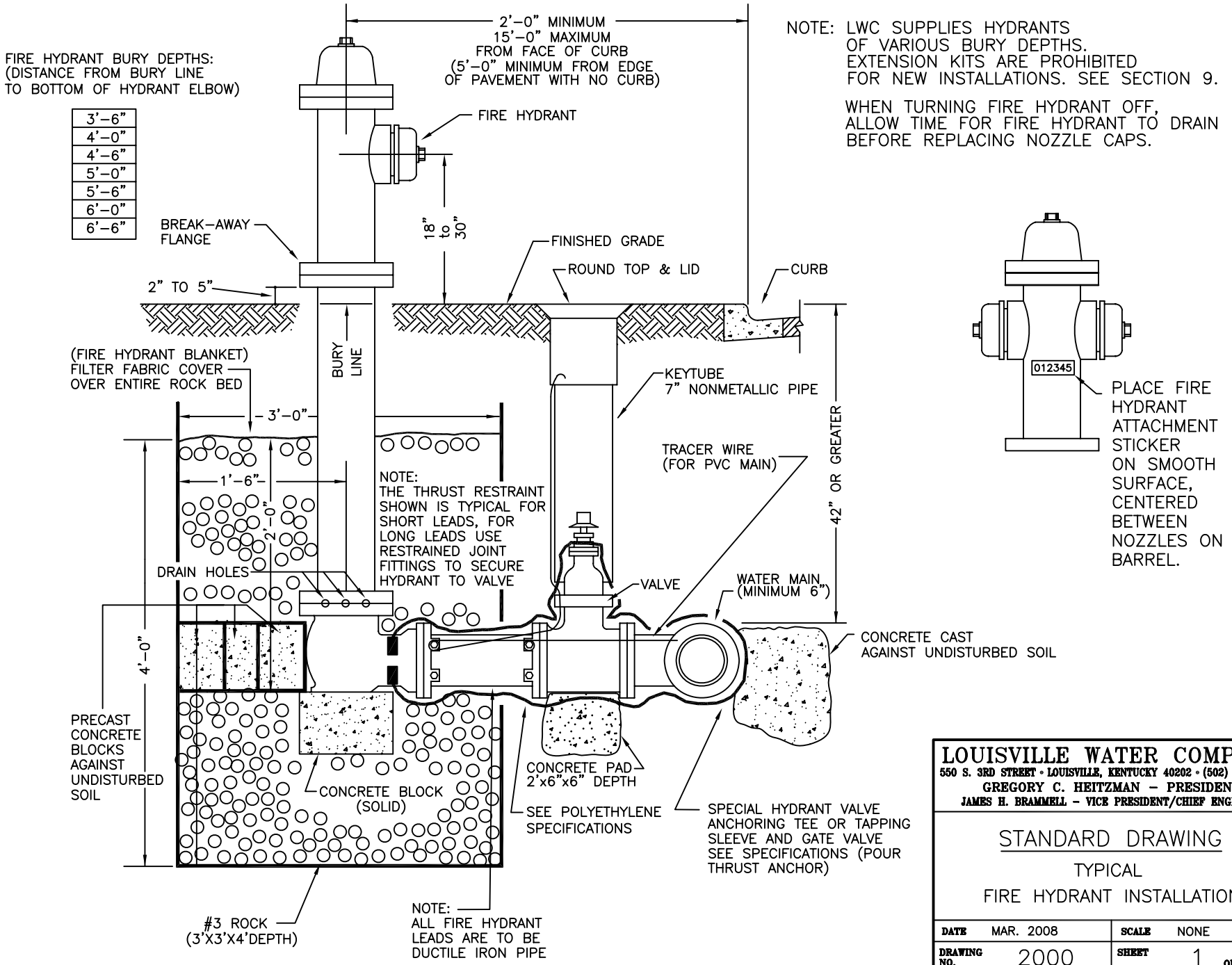
STANDARD DRAWING
LEAK DETECTION
BY-PASS METER

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	1608	SHEET	1 OF 1



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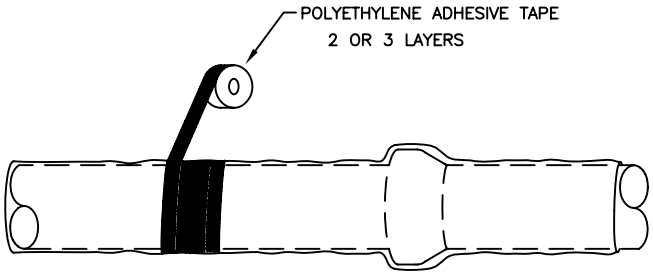
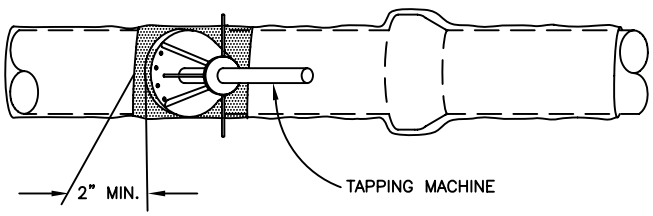
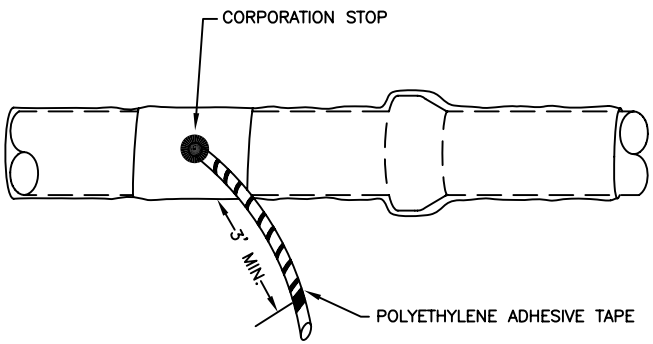
STANDARD DRAWING

TYPICAL
FIRE HYDRANT INSTALLATION

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	2000	SHEET	1 OF 1







OPENINGS FOR BRANCHES, SERVICE TAPS, BLOW OFFS, AIR VALVES, AND SIMILAR APPURTENANCES SHALL BE MADE BY :

1.) WRAPPING 2 OR 3 LAYERS OF POLYETHYLENE ADHESIVE TAPE COMPLETELY AROUND THE PIPE TO COVER THE AREA WHERE THE TAPPING MACHINE AND CHAIN WILL BE MOUNTED, EXTENDING A MINIMUM OF 2" BEYOND THE MOUNTING SURFACE.

2.) MOUNT THE TAPPING MACHINE ON THE PIPE AREA COVERED BY THE TAPE. MAKE THE TAP AND INSTALL THE CORPORATION STOP DIRECTLY THROUGH THE TAPE AND POLYETHYLENE.

3.) INSPECT THE ENTIRE CIRCUMFERENTIAL AREA FOR DAMAGE AND MAKE ANY NECESSARY REPAIRS WITH TAPE.

4.) ON HOUSE SERVICES, TO MINIMIZE THE POSSIBILITY OF DISSIMILAR METAL CORROSION AT SERVICE CONNECTIONS, WRAP THE CORPORATION STOP AND A MINIMUM CLEAR DISTANCE OF THREE (3) FEET OF THE COPPER SERVICE WITH POLYETHYLENE ADHESIVE TAPE.

5.) SEE SECTION 10.3.1 & 10.3.3

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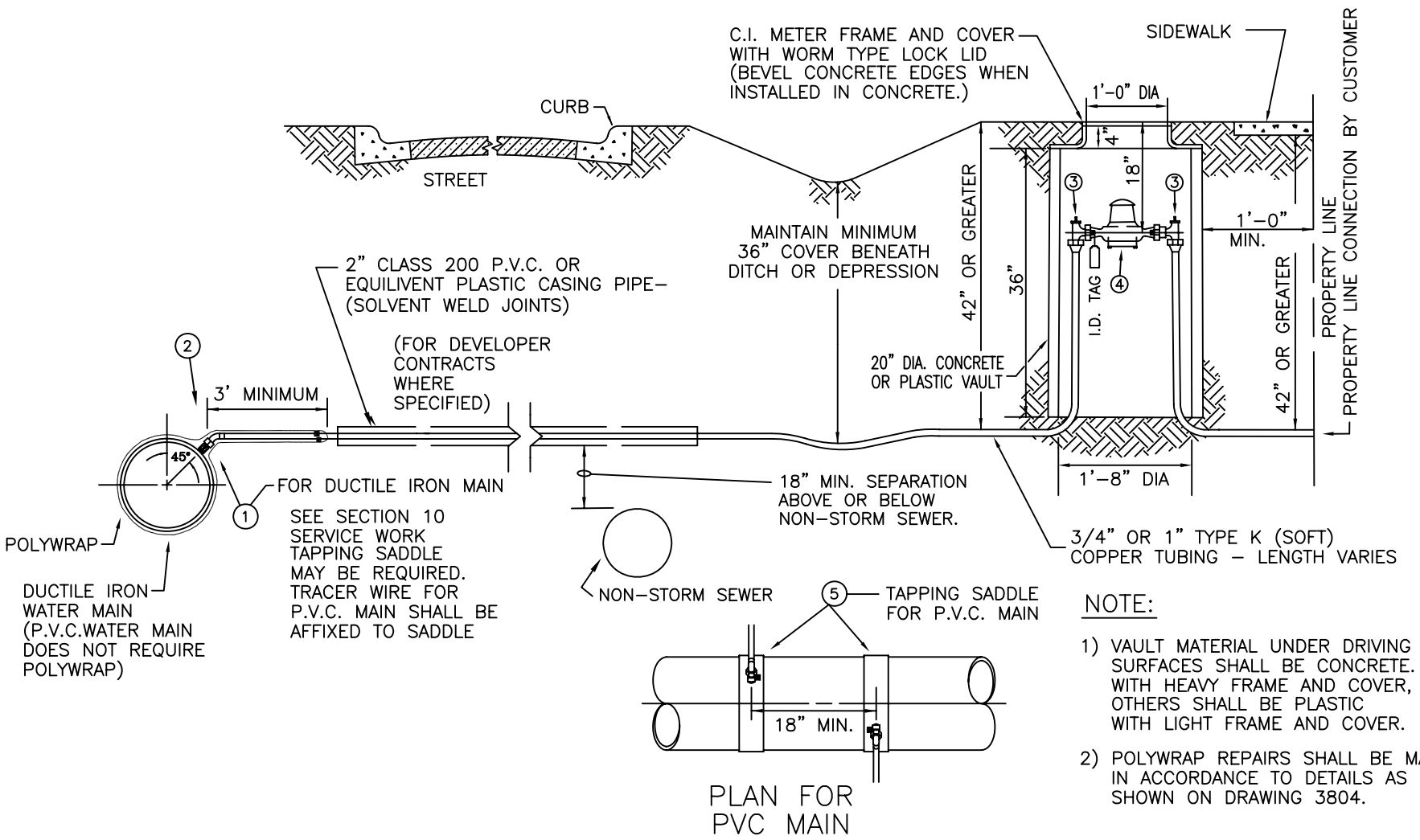
STANDARD DRAWING
METHOD FOR TAPPING POLYETHYLENE ENCASED PIPE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3804	SHEET	1 OF 1



PLAN FOR PVC MAIN

NOTE:

1) VAULT MATERIAL UNDER DRIVING SURFACES SHALL BE CONCRETE. WITH HEAVY FRAME AND COVER, OTHERS SHALL BE PLASTIC WITH LIGHT FRAME AND COVER.

2) POLYWRAP REPAIRS SHALL BE MADE IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING 3804.

TYPICAL COPPER SERVICE 1" AND SMALLER

NO.	QTY	FITTING	JOINT	SERVICE SIZES 3/4"	1"
				3/4"	1"
(1)	1	Corporation Stop	Inlet-Male Thread (Tapered)	3/4"	1"
			Outlet-Male Thread	3/4"	1"
(2)	1	Adapter Bend	Inlet-Female Thread	3/4"	1"
		(45° OR 90°)	Outlet-Female Compression	3/4"	1"
(3)	2	Angle Meter Stop	Female Compression	3/4"	1"
			Female Thread	3/4"	1"
(4)	1	Meter	Male Thread	3/4"	1"

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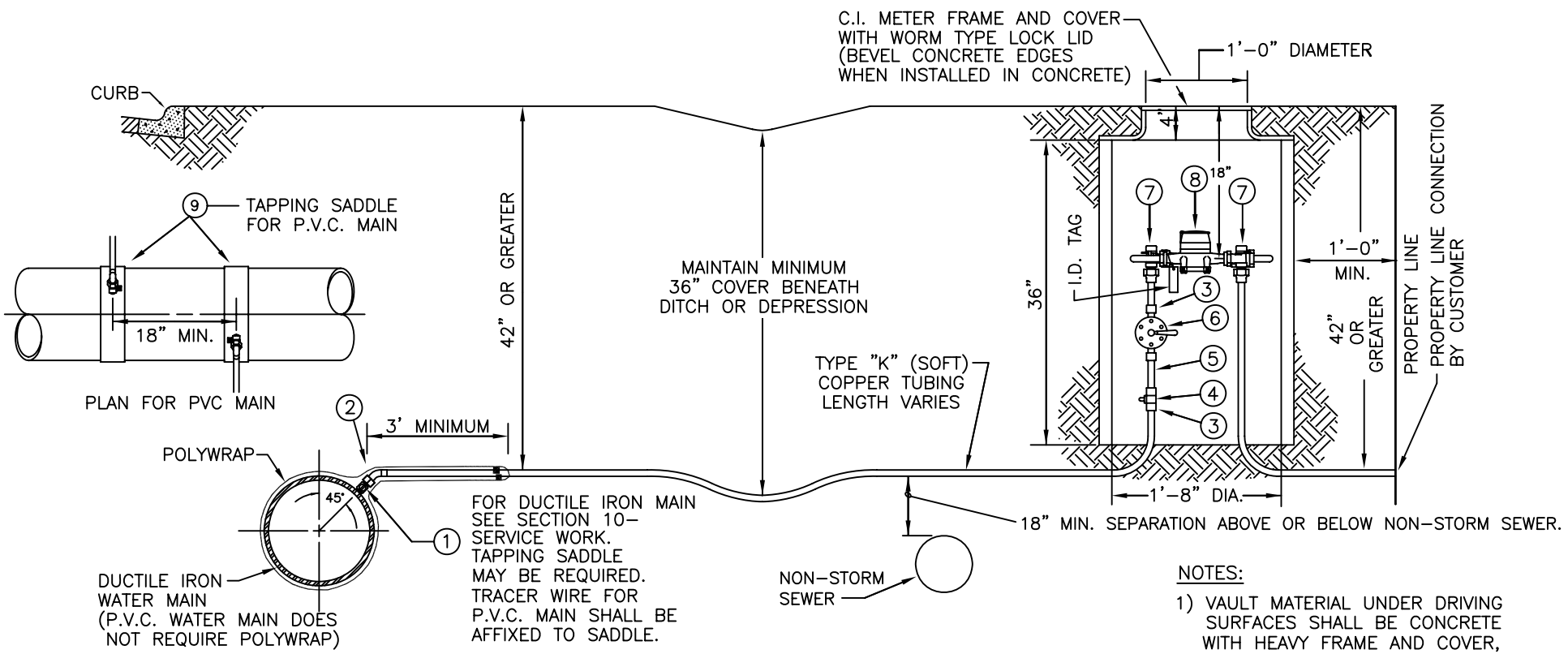
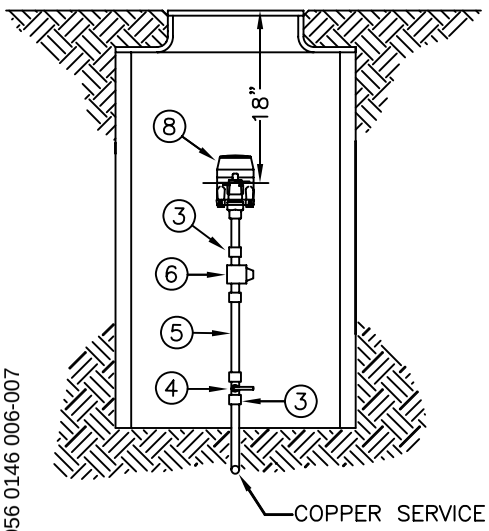
STANDARD DRAWING

TYPICAL COPPER SERVICE 1" AND SMALLER

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3002	SHEET	1 OF 1





TYPICAL 1" COPPER SERVICE
WITH PRESSURE REDUCING VALVE

NO.	QTY	FITTING	JOINT	SIZE
1	1	Corporation Stop	Inlet-Male Thread (Tapered)	1"
			Outlet-Male Thread	1"
2	1	Adapter Bend (45° OR 90°)	Inlet-Female Thread	1"
			Outlet-Female Compression	1"
3	2	Adapter	Female Compression	1"
			Male Thread	1"
4	1	Ball Valve w/ Handle	Female Thread	1"
5	1	Brass Nipple	Male Thread	1"
6	1	Pressure Reducing Valve	Female Thread	1"
7	2	Angle Meter Stop	Female Compression	1"
			Female Thread	1"
8	1	Meter	Meter Thread	1"

NOTES:

1) VAULT MATERIAL UNDER DRIVING SURFACES SHALL BE CONCRETE WITH HEAVY FRAME AND COVER, OTHERS SHALL BE PLASTIC WITH LIGHT FRAME AND COVER.

2) POLYWRAP REPAIRS SHALL BE MADE IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING 3804.

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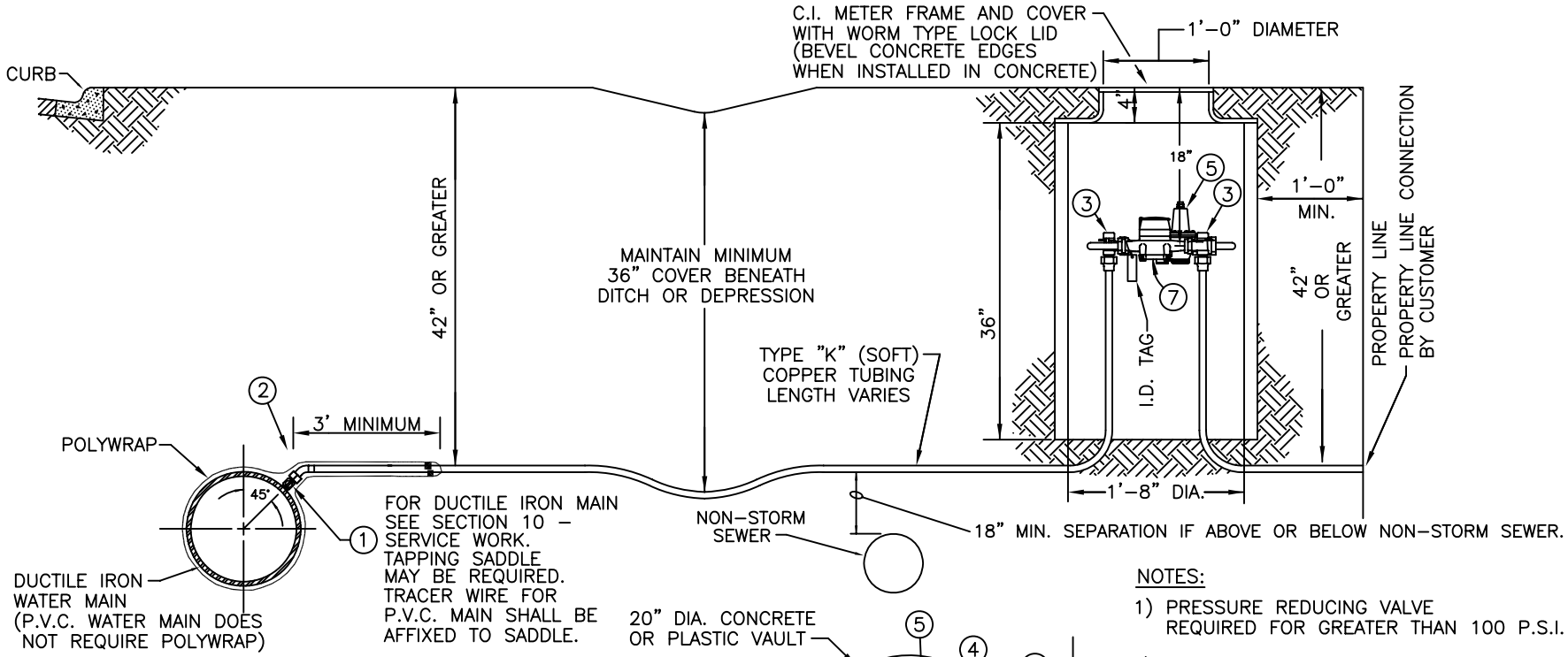
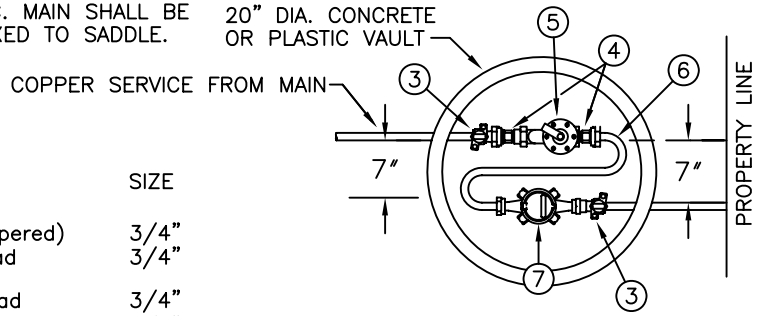
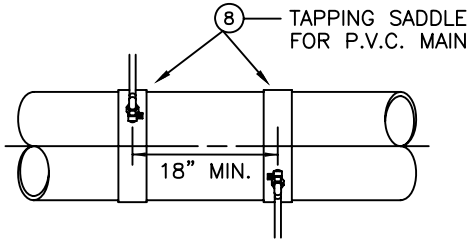
STANDARD DRAWING

TYPICAL 1" COPPER SERVICE
WITH PRESSURE REDUCING VALVE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3003	SHEET	1 OF 1







PLAN FOR PVC MAIN

TYPICAL 3/4" COPPER
WITH PRESSURE REDUCING VALVE

NO.	QTY	FITTING	JOINT	SIZE
①	1	Corporation Stop	Inlet–Male Thread (Tapered) Outlet–Male Thread	3/4" 3/4"
②	1	Adapter Bend (45° OR 90°)	Inlet–Female Thread Outlet–Female Compression	3/4" 3/4"
③	2	Angle Meter Stop	Female Compression Female Thread	3/4" 3/4"
④	2	Adapter For Pressure Regulator	Male Thread	3/4"
⑤	1	Pressure Regulator	Female Thread	3/4"
⑥	1	S–Tube	Female Thread	3/4"
⑦	1	Meter	Male Thread	5/8" x 3/4" (or 3/4")

NOTES:

1) PRESSURE REDUCING VALVE REQUIRED FOR GREATER THAN 100 P.S.I.
2) VAULT MATERIAL UNDER DRIVING SURFACES SHALL BE CONCRETE. WITH HEAVY FRAME AND COVER, OTHERS SHALL BE PLASTIC WITH LIGHT FRAME AND COVER.
3) POLYWRAP REPAIRS SHALL BE MADE IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING 3804.

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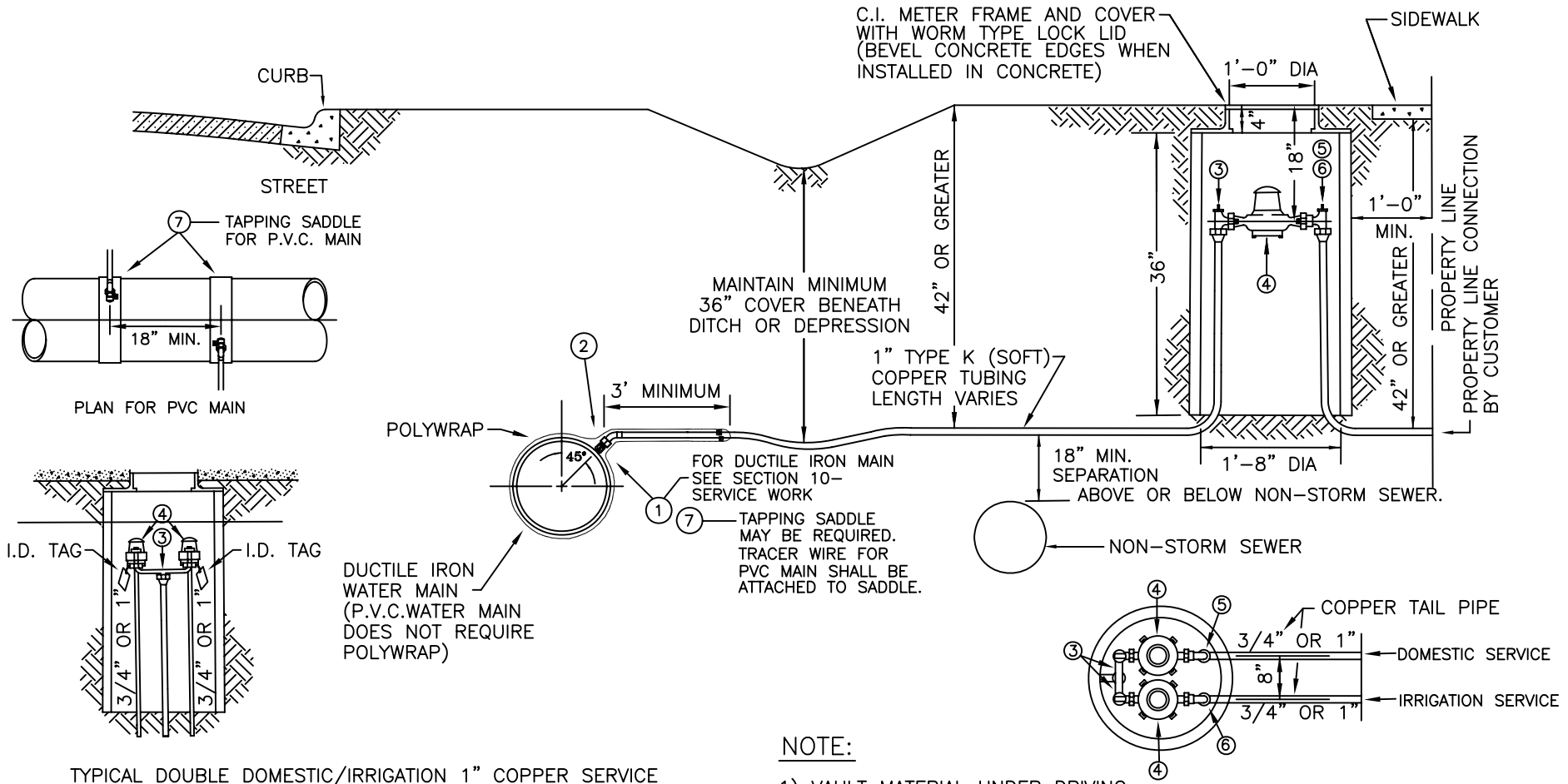
STANDARD DRAWING

TYPICAL 3/4" COPPER SERVICE WITH PRESSURE REDUCING VALVE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3004	SHEET	1 OF 1



TYPICAL DOUBLE DOMESTIC/IRRIGATION 1" COPPER SERVICE

NO.	QTY	FITTING	JOINT	SIZE
①	1	Corporation Stop	Inlet–Male Thread (Tapered)	1"
			Outlet–Male Thread	1"
②	1	Adapter Bend (45° OR 90°)	Inlet–Female Thread	1"
			Outlet–Female Compression	1"
③	1	Branch Piece, with 2 Angle Meter Stops	Inlet–Female Compression	1"
			Outlet–Female Compression	3/4"
④	2	Meter	Male Thread	3/4"
⑤	1	Angle Meter Stop	Female Thread	3/4"
			Female Compression	3/4" or 1"
⑥	1	Angle Check Valve (Irrigation Service Only)	Female Thread	3/4"
			Female Compression	3/4" or 1"

NOTE:

1) VAULT MATERIAL UNDER DRIVING SURFACES SHALL BE CONCRETE WITH HEAVY FRAME AND COVER, OTHERS SHALL BE PLASTIC WITH LIGHT FRAME AND COVER.

2) POLYWRAP REPAIRS SHALL BE MADE IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING 3804.

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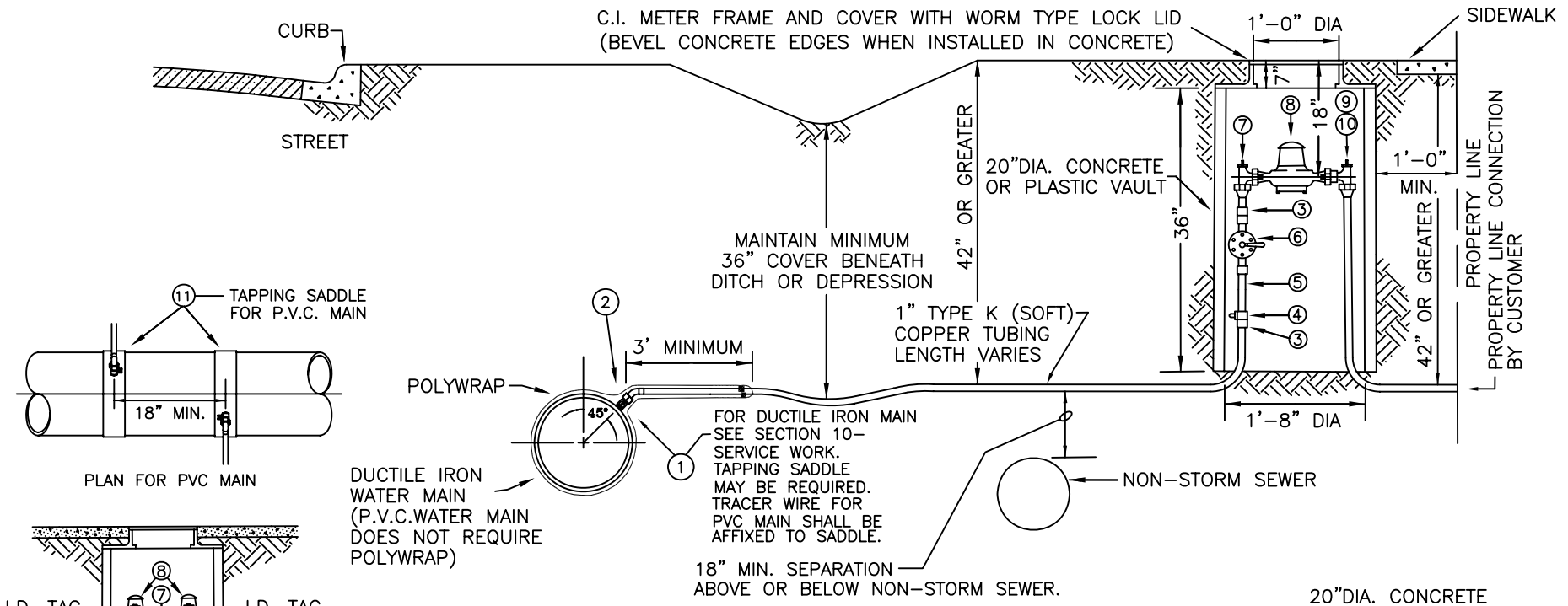
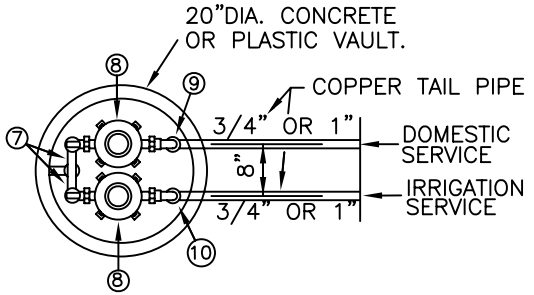
STANDARD DRAWING

TYPICAL DOUBLE 1" DOMESTIC/IRRIGATION COPPER SERVICE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3400	SHEET	1 OF 1





TYPICAL DOUBLE DOMESTIC/IRRIGATION 1" COPPER SERVICE WITH PRESSURE REDUCING VALVE

NO.	QTY	FITTING	JOINT	SIZE
①	1	Corporation Stop	Inlet–Male Thread (Tapered) Outlet–Male Thread	1" 1"
②	1	Adapter Bend (45° OR 90°)	Inlet–Female Thread Outlet–Female Compression	1" 1"
③	2	Adapter	Female Compression Male Thread	1" 1"
④	1	Ball Valve w/ Handle	Female Thread	1"
⑤	1	Brass Nipple	Male Thread	1"
⑥	1	Pressure Reducing Valve	Female Thread	1"
⑦	1	Brand Piece with 2 Angle Meter Stop	Inlet–Female Compression Outlet–Female Thread	1"
⑧	2	Meter	Male Thread	3/4"
⑨	1	Angle Meter Stop	Female Thread Female Compression	3/4" 3/4" or 1"
⑩	1	Angle Check Valve (Irrigation Service Only)	Female Thread Female Compression	3/4" 3/4" or 1"

NOTE:

1) VAULT MATERIAL UNDER DRIVING SURFACES SHALL BE CONCRETE WITH HEAVY FRAME AND COVER, OTHERS SHALL BE PLASTIC WITH LIGHT FRAME AND COVER.

2) POLYWRAP REPAIRS SHALL BE MADE IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING 3804.

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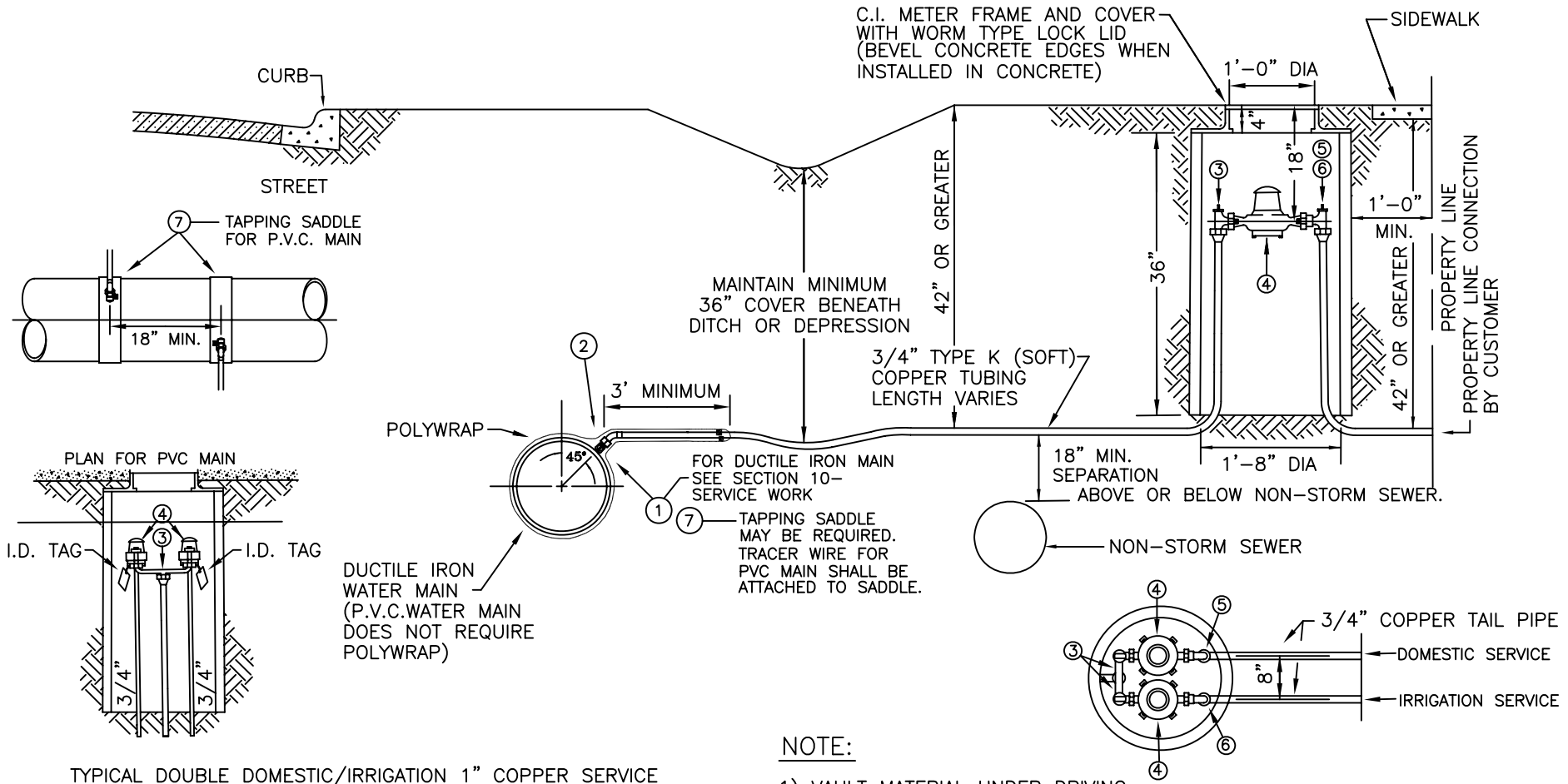
STANDARD DRAWING

TYPICAL DOUBLE 1" DOMESTIC/IRRIGATION COPPER SERVICE WITH PRESSURE REDUCING VALVE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3401	SHEET	1 OF 1



TYPICAL DOUBLE DOMESTIC/IRRIGATION 1" COPPER SERVICE

NO.	QTY	FITTING	JOINT	SIZE
①	1	Corporation Stop	Inlet–Male Thread (Tapered)	3/4"
			Outlet–Male Thread	3/4"
②	1	Adapter Bend (45° OR 90°)	Inlet–Female Thread	3/4"
			Outlet–Female Compression	3/4"
③	1	Branch Piece, with 2 Angle Meter Stops	Inlet–Female Compression	3/4" x 3/4"
			Outlet–Female Compression	3/4"
④	2	Meter	Male Thread	3/4"
⑤	1	Angle Meter Stop	Female Thread	3/4"
			Female Compression	3/4"
⑥	1	Angle Check Valve (Irrigation Service Only)	Female Thread	3/4"
			Female Compression	3/4"

NOTE:

1) VAULT MATERIAL UNDER DRIVING SURFACES SHALL BE CONCRETE WITH HEAVY FRAME AND COVER, OTHERS SHALL BE PLASTIC WITH LIGHT FRAME AND COVER.

2) POLYWRAP REPAIRS SHALL BE MADE IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING 3804.

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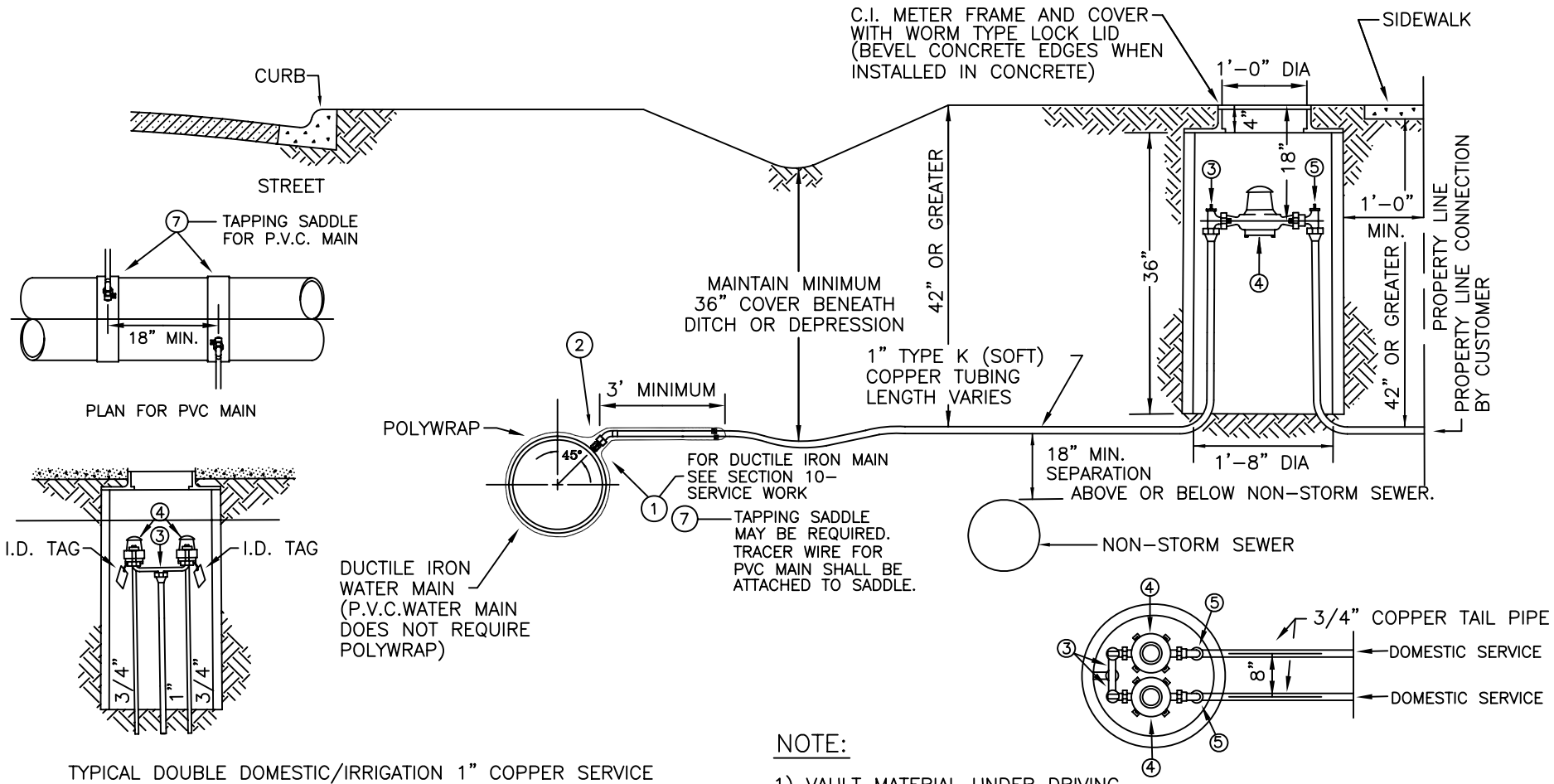
STANDARD DRAWING

TYPICAL 3/4" IRRIGATION RETRO FIT COPPER SERVICE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3403	SHEET	1 OF 1



TYPICAL DOUBLE DOMESTIC/IRRIGATION 1" COPPER SERVICE

NO.	QTY	FITTING	JOINT	SIZE
①	1	Corporation Stop	Inlet–Male Thread (Tapered)	1"
			Outlet–Male Thread	1"
②	1	Adapter Bend (45° OR 90°)	Inlet–Female Thread	1"
			Outlet–Female Compression	1"
③	1	Branch Piece, with 2 Angle Meter Stops	Inlet–Female Compression	1" x 3/4"
			Outlet–Female Compression	3/4"
④	2	Meter	Male Thread	3/4"
⑤	2	Angle Meter Stop	Female Thread	3/4"
			Female Compression	3/4"

NOTE:

1) VAULT MATERIAL UNDER DRIVING SURFACES SHALL BE CONCRETE WITH HEAVY FRAME AND COVER, OTHERS SHALL BE PLASTIC WITH LIGHT FRAME AND COVER.

2) POLYWRAP REPAIRS SHALL BE MADE IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING 3804.

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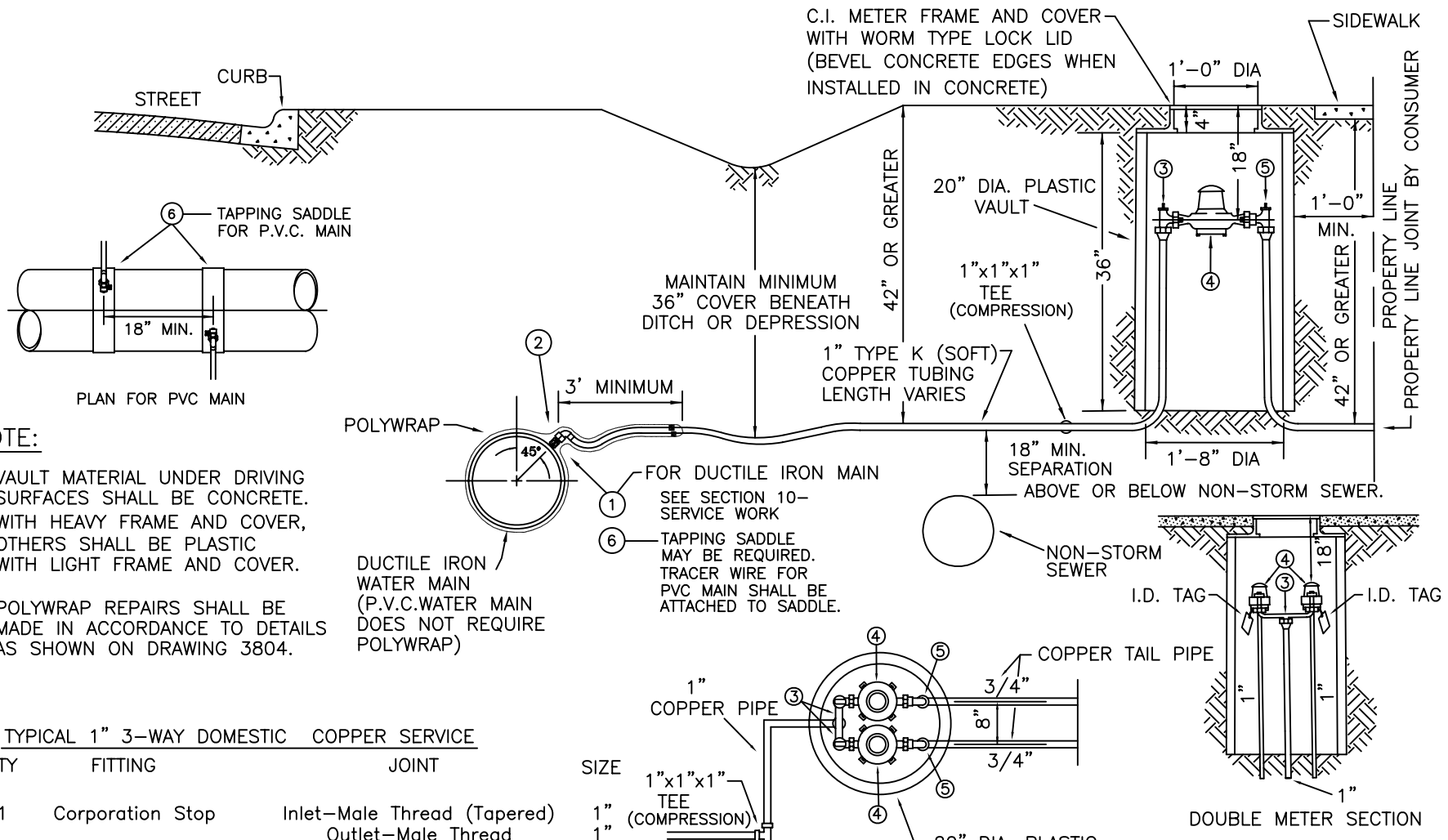
STANDARD DRAWING

TYPICAL 1" TANDEM 2–WAY DOMESTIC COPPER SERVICE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3404	SHEET	1 OF 1



NOTE:

1) VAULT MATERIAL UNDER DRIVING SURFACES SHALL BE CONCRETE. WITH HEAVY FRAME AND COVER, OTHERS SHALL BE PLASTIC WITH LIGHT FRAME AND COVER.

2) POLYWRAP REPAIRS SHALL BE MADE IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING 3804.

TYPICAL 1" 3-WAY DOMESTIC COPPER SERVICE

NO.	QTY	FITTING	JOINT	SIZE
①	1	Corporation Stop	Inlet-Male Thread (Tapered)	1"
			Outlet-Male Thread	1"
②	1	Adapter Bend (45° OR 90°)	Inlet-Female Thread	1"
			Outlet-Female Compression	1"
③	1	Branch Piece, with 2 Angle Meter Stops	Inlet-Female Compression	1"x3/4"
			Outlet-Female Compression	3/4"
④	3	Meter	Male Thread	3/4"
⑤	3	Angle Meter Stop	Female Thread	3/4"
			Female Compression	3/4"
⑥	1	Angle Meter Stop	Female Thread	3/4"
			Female Compression	1"

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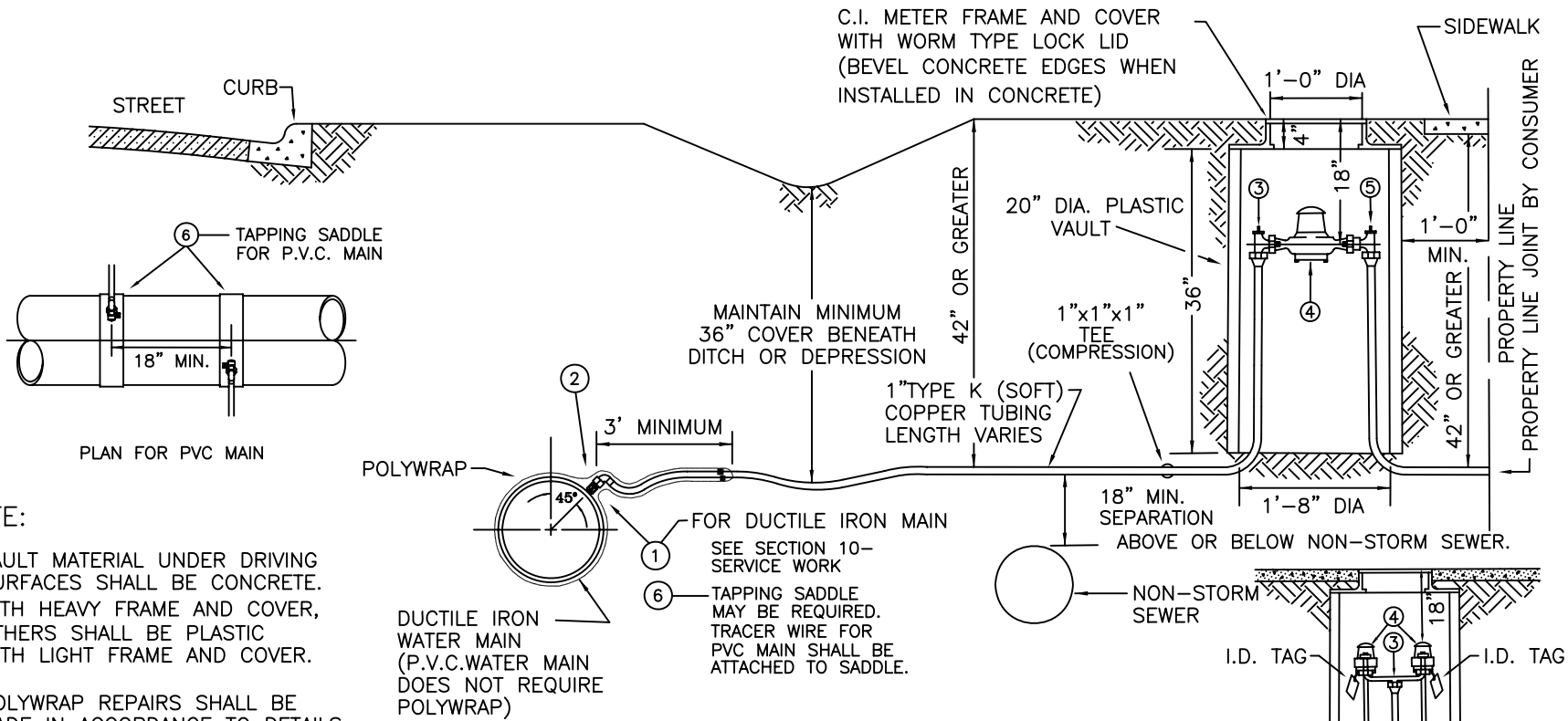
STANDARD DRAWING

TYPICAL 1" 3-WAY DOMESTIC COPPER SERVICE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3420	SHEET	1 OF 1



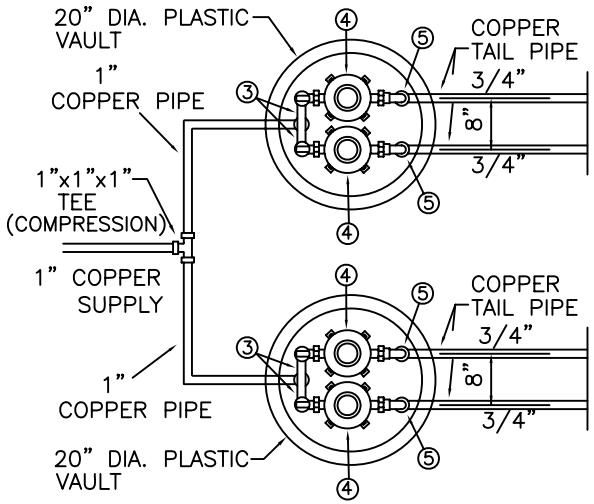
NOTE:

1) VAULT MATERIAL UNDER DRIVING SURFACES SHALL BE CONCRETE. WITH HEAVY FRAME AND COVER, OTHERS SHALL BE PLASTIC WITH LIGHT FRAME AND COVER.

2) POLYWRAP REPAIRS SHALL BE MADE IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING 3804.

TYPICAL 1" 4-WAY DOMESTIC COPPER SERVICE

NO.	QTY	FITTING	JOINT	SIZE
①	1	Corporation Stop	Inlet-Male Thread (Tapered) Outlet-Male Thread	1" 1"
②	1	Adapter Bend (45° OR 90°)	Inlet-Female Thread Outlet-Female Compression	1" 1"
③	2	Branch Piece, with 2 Angle Meter Stops	Inlet-Female Compression Outlet-Female Compression	1"x3/4" 3/4"
④	4	Meter	Male Thread	3/4"
⑤	4	Angle Meter Stop	Female Thread Female Compression	3/4" 3/4"



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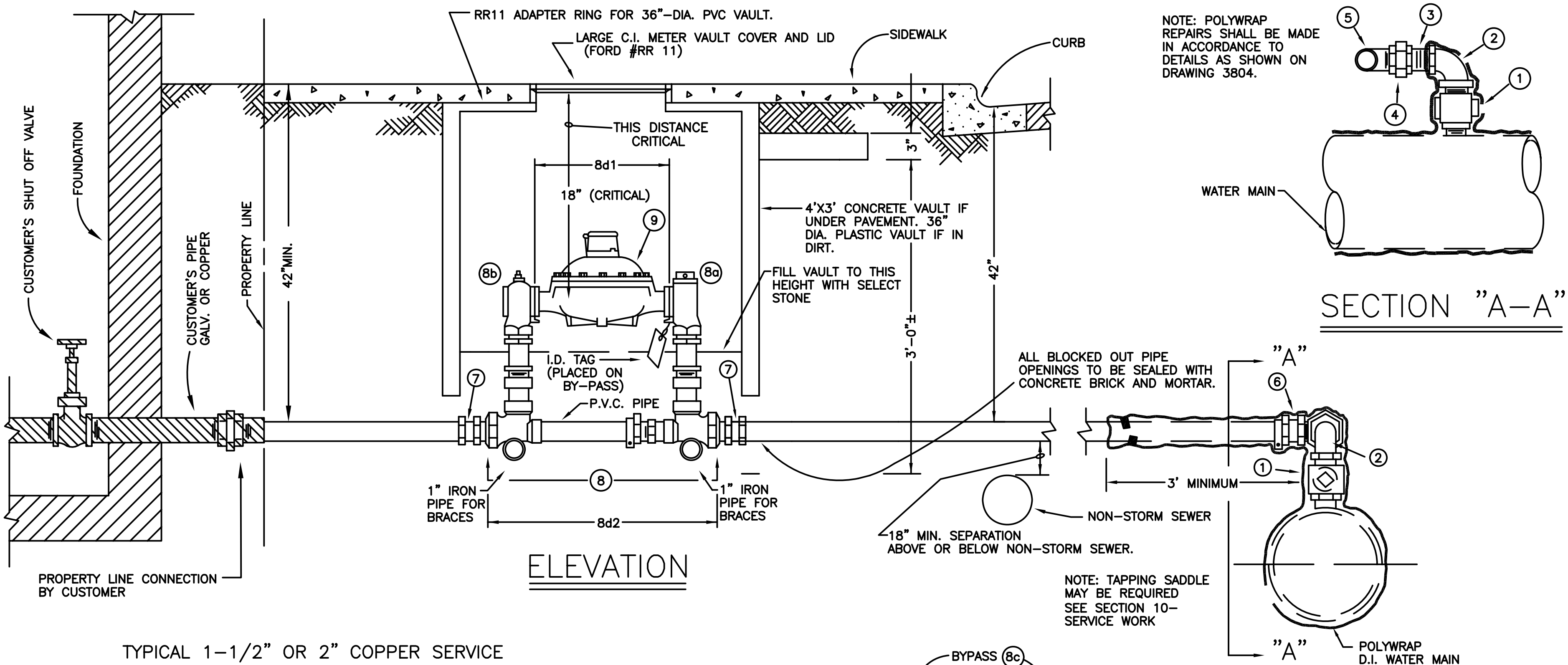
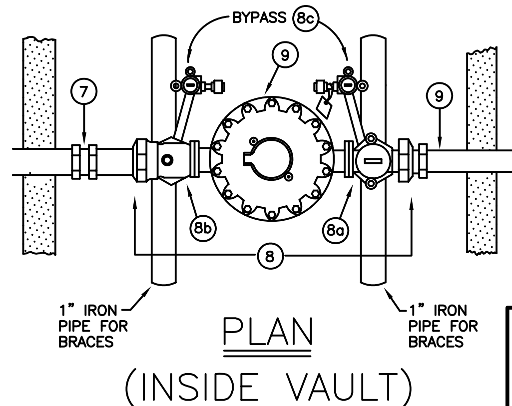
STANDARD DRAWING

TYPICAL 1" 4-WAY DOMESTIC COPPER SERVICE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3430	SHEET	1 OF 1





TYPICAL 1-1/2" OR 2" COPPER SERVICE

NO.	QTY	FITTING	JOINT	SERVICE SIZES 1-1/2"	2"
1	1	Corporation Stop	Inlet-Male Thread (Tapered) Outlet-Male Thread	1-1/2" 2"	2" 2-1/2"
2	1	Brass Reducing Ell	Inlet-Female Thread Outlet-Female Thread	2" 1-1/2"	2-1/2" 2"
3	1	Brass Nipple (close)	Male Thread	1-1/2"	2"
4	1	Brass Union	Female Thread	1-1/2"	2"
5	1	Brass Street Ell	Male Thread	1-1/2"	2"
6	1	Compression Coupling	Female Thread Female Compression	1-1/2" 1-1/2"	2" 2"
7	2	Adapter	Female Compression Male Thread	1-1/2" 1-1/2"	2" 2"
8	1	Meter Setter	Female Thread	1-1/2"	2"
8a		Angle Meter Stop			
8b		Angle Check Valve			
8c		By-Pass 1"			
8d1				13-3/8"	17-3/8"
8d2				22"	27-1/8"
9	1	Meter	Male Thread	1-1/2"	2"

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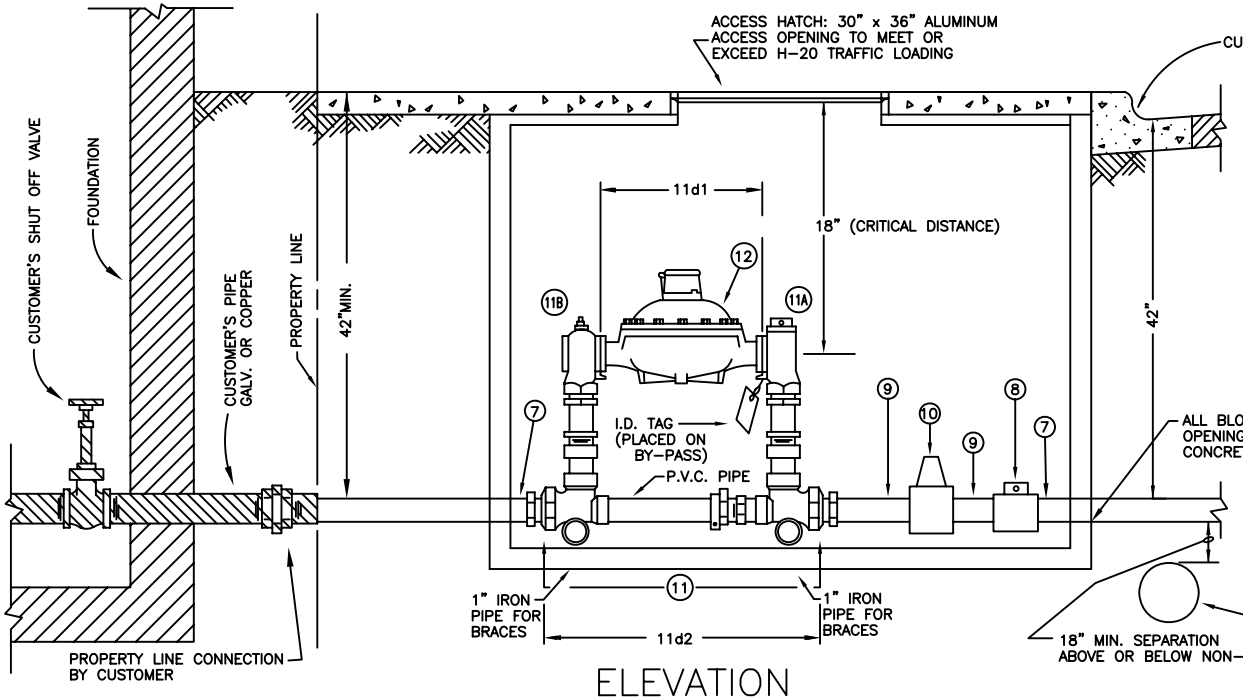
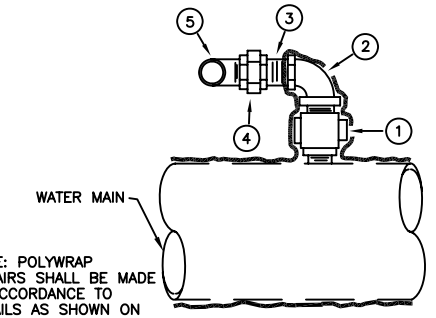
STANDARD DRAWING
TYPICAL 1-1/2" OR 2" COPPER SERVICE

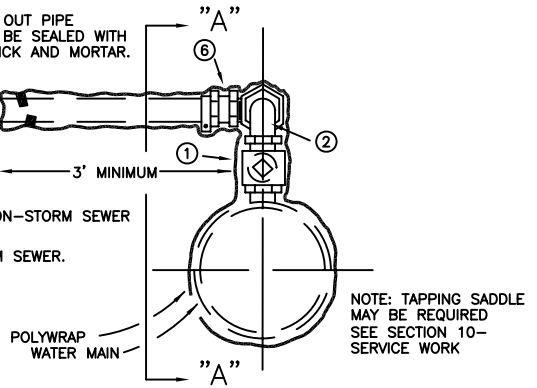
DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3200	SHEET	1 OF 1



ELEVATION

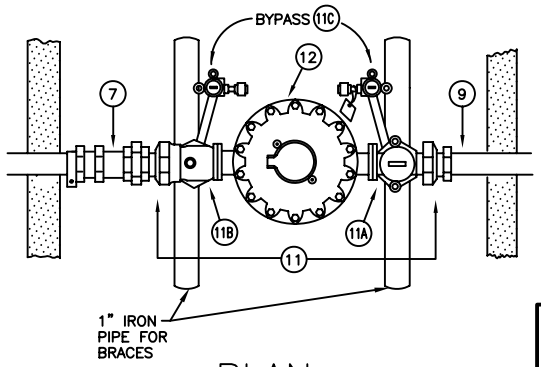


SECTION "A-A"



TYPICAL 1-1/2" OR 2" COPPER SERVICE WITH PRESSURE REDUCING VALVE

NO.	QTY	FITTING	JOINT	SERVICE SIZES 1-1/2"	2"
1	1	Corporation Stop	Inlet-Male Thread (Tapered)	1-1/2"	2"
			Outlet-Male Thread	2"	2-1/2"
2	1	Brass Reducing Ell	Inlet-Female Thread	2"	2-1/2"
			Outlet-Female Compression	1-1/2"	2"
3	1	Brass Nipple (close)	Male Thread	1-1/2"	2"
4	1	Brass Union	Female Thread	1-1/2"	2"
5	1	Brass Street Ell	Male Thread	1-1/2"	2"
6	1	Compression Coupling	Female Thread	1-1/2"	2"
			Female Compression	1-1/2"	2"
7	2	Adapter	Female Compression	1-1/2"	2"
			Male Thread	1-1/2"	2"
8	1	Curb Stop	Female Thread	1-1/2"	2"
9	2	Brass Nipple (x6)	Male Thread	1-1/2"	2"
10	1	Pressure Reducing Valve	Female Thread	1-1/2"	2"
11	1	Meter Setter	Female Thread	1-1/2"	2"
11a		Angle Meter Stop			
11b		Angle Check Valve			
11c		By-Pass 1"			
11d1				13-3/8"	17-3/8"
11d2				22"	27-1/8"
12	1	Meter	Male Thread	1-1/2"	2"



PLAN
(INSIDE VAULT)

INTERIOR VAULT DIMENSIONS (MINIMUM)
LENGTH = 76"
WIDTH = 36"
HEIGHT = 48"

ACCESS HATCH AND VAULT MUST MEET OR EXCEED H-20 TRAFFIC LOADING DESIGN CRITERIA.

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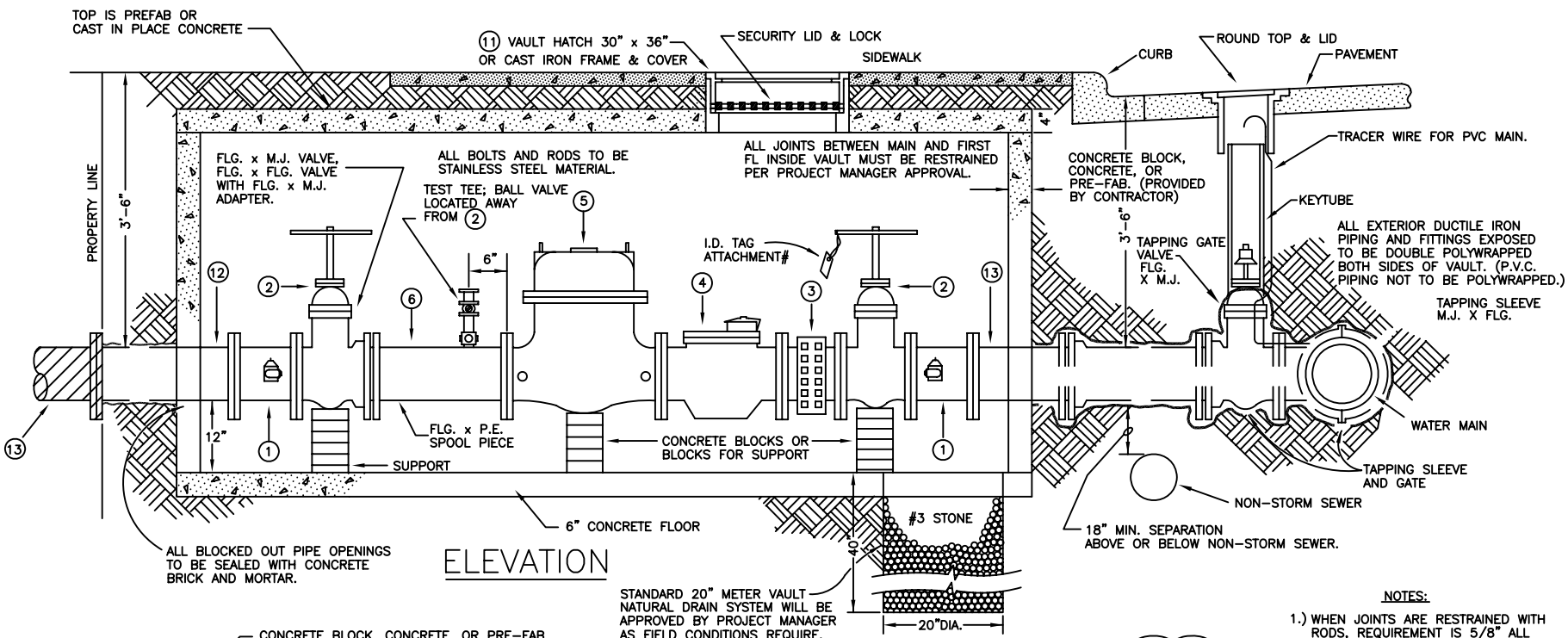
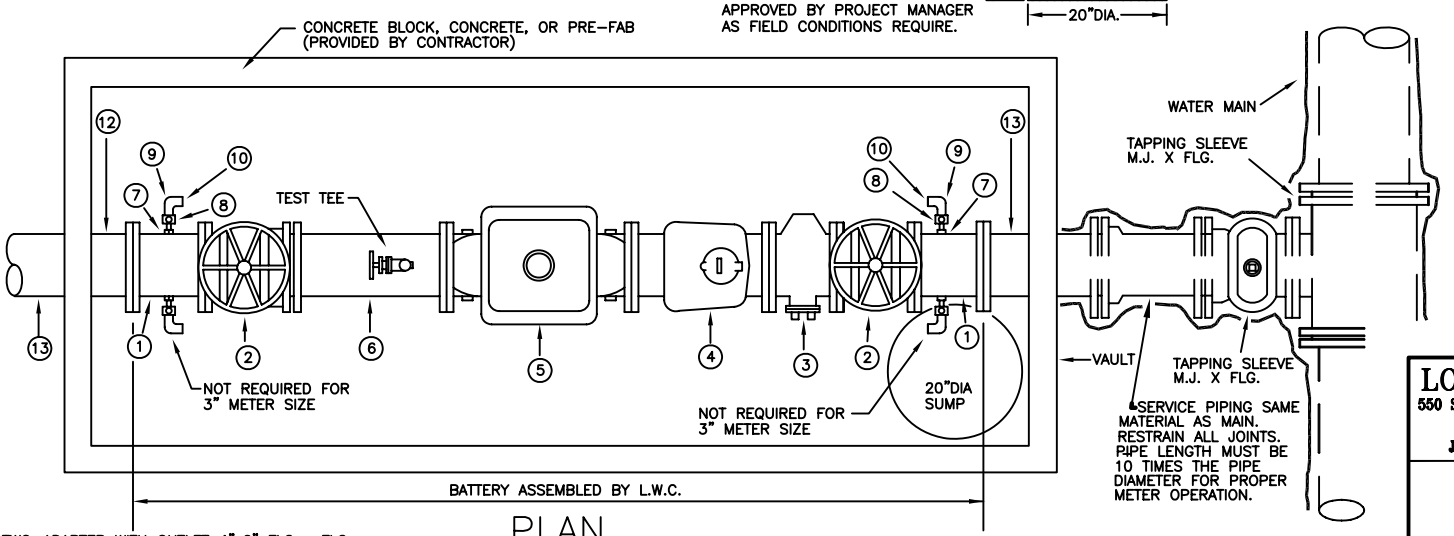
STANDARD DRAWING
TYPICAL 1-1/2" OR 2" COPPER SERVICE WITH PRESSURE REDUCING VALVE

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3202	SHEET	1 OF 1



ELEVATION



PLAN

NOTES:

1.) WHEN JOINTS ARE RESTRAINED WITH RODS, REQUIREMENT IS 5/8" ALL THREAD ROD (STAINLESS STEEL) WITH A MINIMUM OF TWO RODS PER JOINT.

2.) RESTRAIN ALL JOINTS BETWEEN THE MAIN AND THE ADAPTER FLANGE JOINT THAT'S INSIDE THE VAULT.

3.) IF ANY PORTION OF THE SERVICE PIPING IS ENCASED, THEN THE ENTIRE LENGTH OF SERVICE PIPING SHALL BE DUCTILE IRON WITH RESTRAINED JOINTS.

4.) ACCESS HATCH AND VAULT MUST MEET OR EXCEED H-20 TRAFFIC LOADING DESIGN CRITERIA. CAST IRON FRAME & COVER REQUIRED IN AREAS OF VEHICULAR TRAFFIC.

5.) COMPOUND METER INSTALLATIONS SAME AS TURBINE METERS.

(1) TWO-ADAPTER WITH OUTLET 4"x6" FLG x FLG
(1A) TWO-ADAPTER, REDUCING W/OUTLET 4"x3" FLG x FLG
(2) TWO-GATE VALVE, WHEEL FLG x FLG
(3) ONE-STRAINER, FLG x FLG
(4) ONE-METER, FLG x FLG
(5) ONE-CHECK VALVE, FLG x FLG
(6) ONE-SPOOL PIECE WITH 2" BALL VALVE ASSEMBLY (MALE THREAD) FLG x FLG x FEMALE THREAD MALE
(7) TWO OR FOUR-NIPPLE, MALE THREAD
(8) TWO OR FOUR-STOP OR VALVE, MALE THREAD
(9) TWO OR FOUR-STREET ELL, MALE THREAD
(10) TWO OR FOUR-PLUG, MALE THREAD
(11) ONE-VAULT HATCH-30" x 36"
(12) TWO-ADAPTER-FLG. x MJ OR FLG. x P.E.
(13) CUSTOMER PIPING

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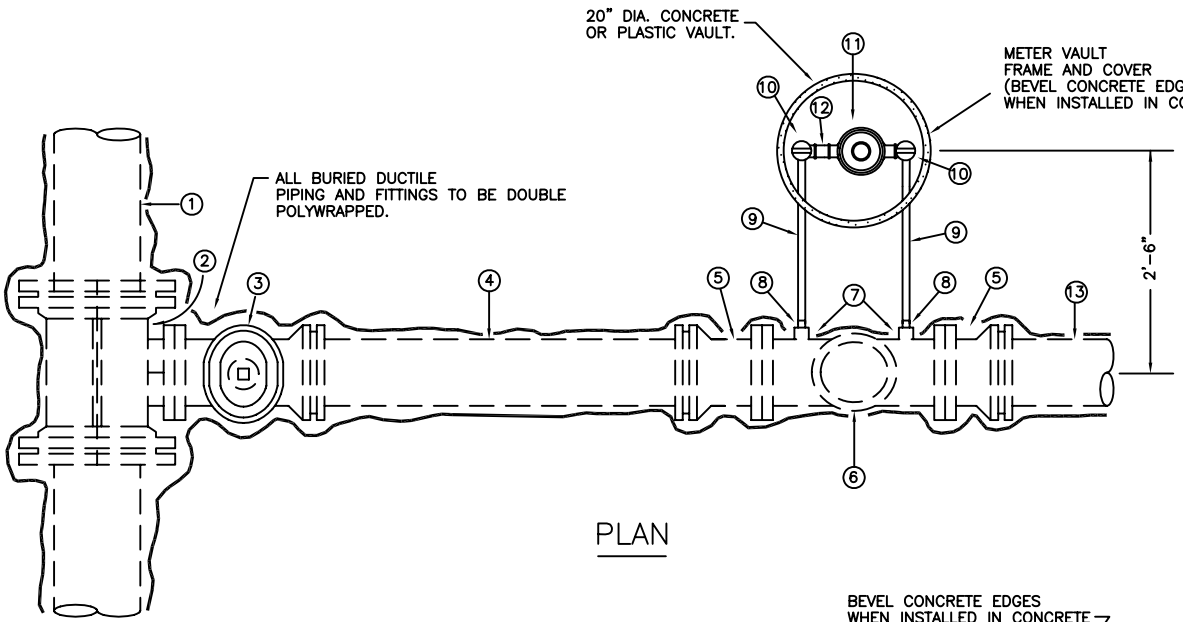
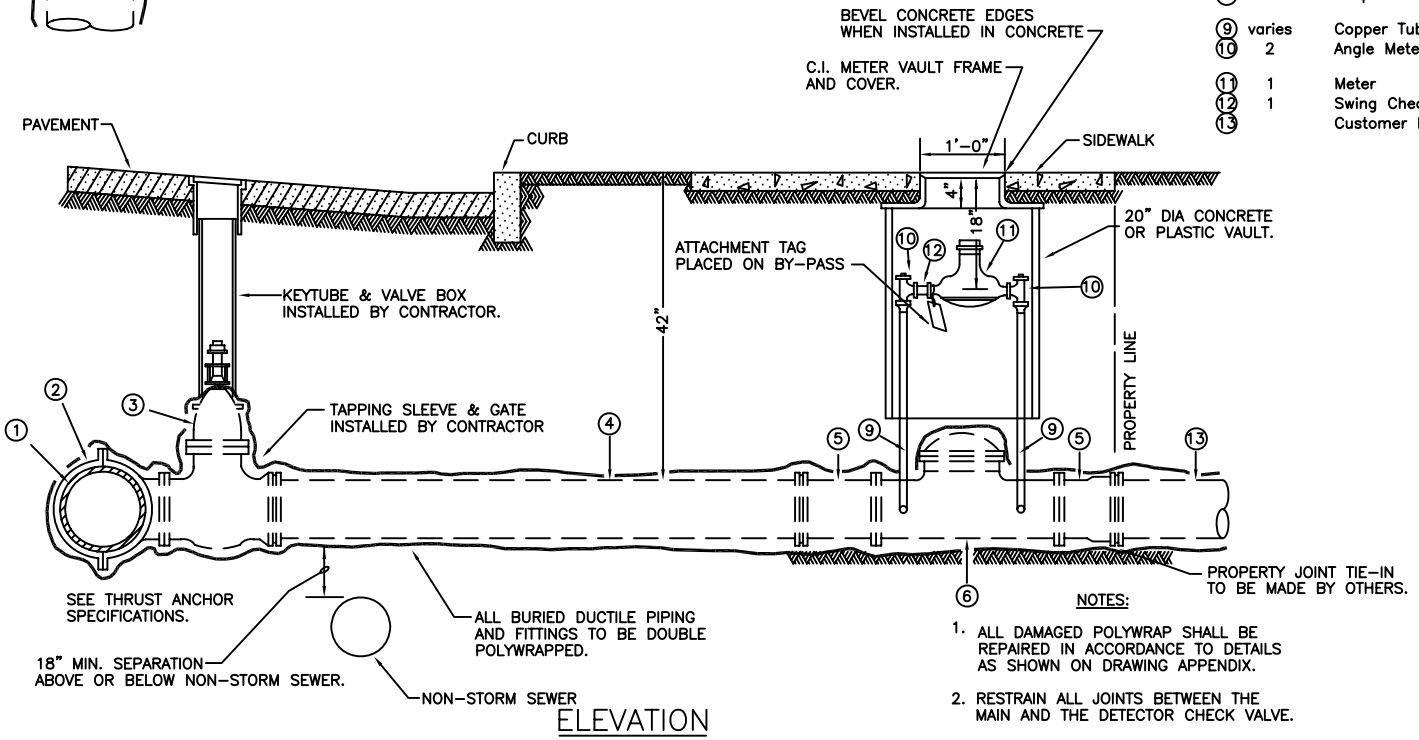
STANDARD DRAWING
TYPICAL DUCTILE IRON DOMESTIC SERVICE 4" AND LARGER

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3203	SHEET	1 OF 1



PLAN



ELEVATION

TYPICAL FIRE PROTECTION SERVICE 4" OR LARGER

NO.	QTY	FITTING	JOINT	FIRE SERVICE SIZES 4"	6"
①	—	Main in Street	Varies	—	—
②	1	Tapping Sleeve	Flange	4"	6"
③	1	Tapping Gate Valve	Flange x MJ (restrained)	4"	6"
④	varies	D.I. Service Piping	MJ / B & S (restrain all joints up to check valve)	4"	6"
⑤	2	Adapter	Flange X MJ or PE	4"	6"
⑥	1	Detector Check Valve	Flange	4"	6"
⑦	2	Bushing	Male Thread Female Thread	1" 3/4"	1-1/2" 3/4"
⑧	2	Adapter	Male Thread Female Compression	3/4"	3/4"
⑨	varies	Copper Tubing	Female Compression	3/4"	3/4"
⑩	2	Angle Meter Stop	Female Compression Female Thread	3/4" 3/4"	3/4" 3/4"
⑪	1	Meter	Male Thread	3/4"	3/4"
⑫	1	Swing Check Valve	Female Thread	3/4"	3/4"
⑬		Customer Piping			

NOTES:

1. ALL DAMAGED POLYWRAP SHALL BE REPAIRED IN ACCORDANCE TO DETAILS AS SHOWN ON DRAWING APPENDIX.
2. RESTRAIN ALL JOINTS BETWEEN THE MAIN AND THE DETECTOR CHECK VALVE.
3. IF ANY PORTION OF THE ④ PIPING IS ENCASED, THEN THE ENTIRE LENGTH OF ④ PIPING SHALL BE DUCTILE IRON.

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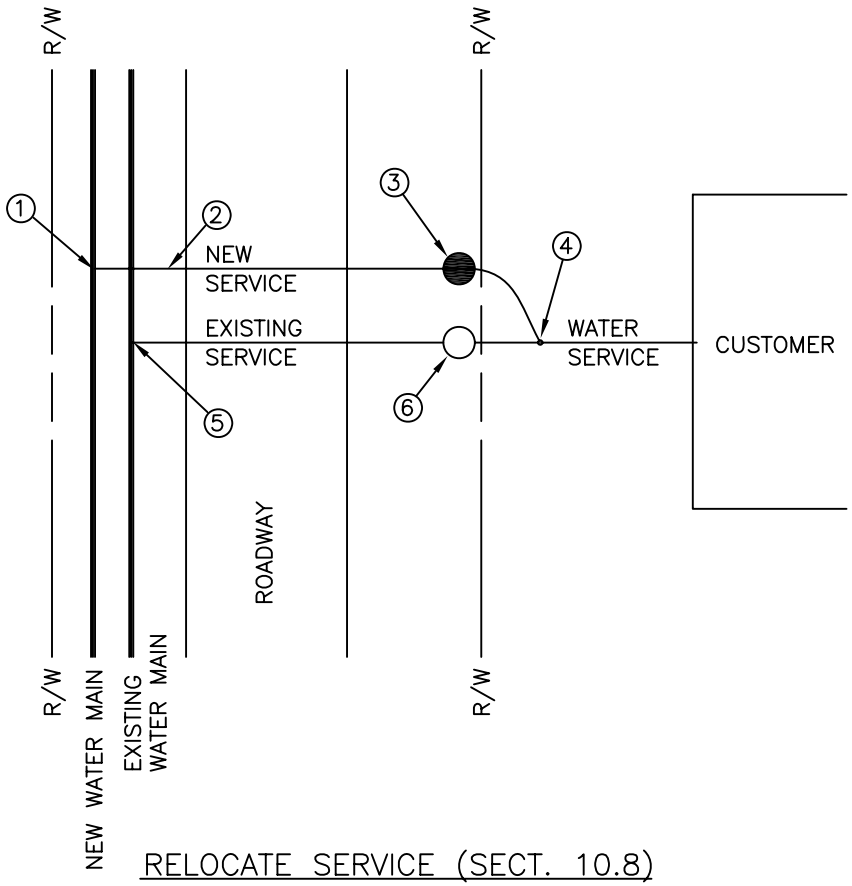
STANDARD DRAWING

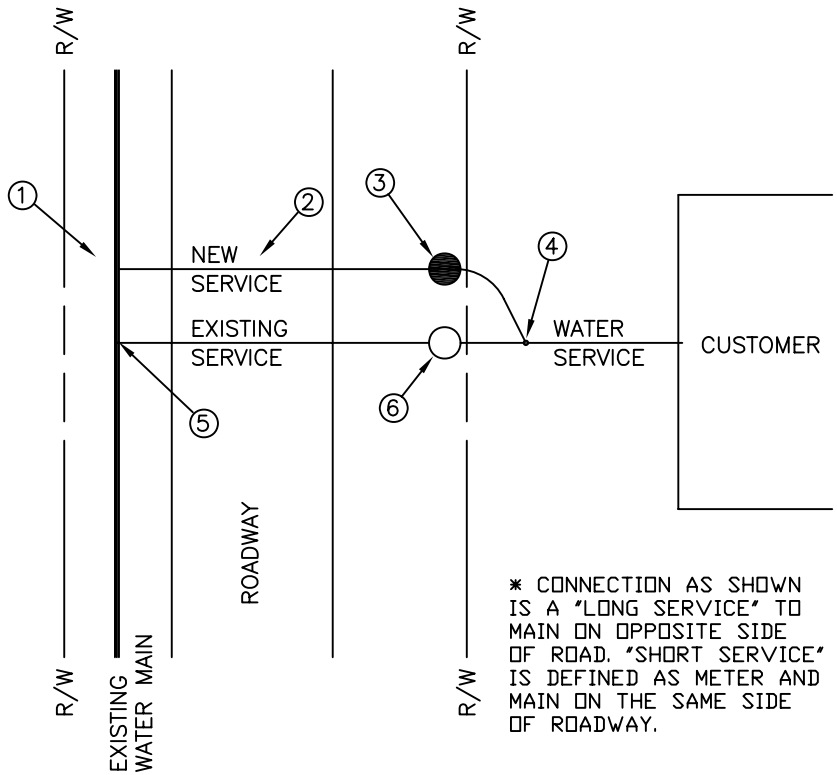
TYPICAL FIRE PROTECTION SERVICE 4" AND LARGER

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3601	SHEET	1 OF 1



RELOCATE SERVICE (SECT. 10.8)

WITH CONNECTION TO NEW WATER MAIN *



RELOCATE SERVICE (SECT. 10.8)

WITH CONNECTION TO EXISTING WATER MAIN *

LEGEND

○ = EXISTING METER VAULT

● = NEW METER VAULT

NOTES:

① INSTALL CORPORATION STOP ON NEW MAIN.

② INSTALL NEW SERVICE LINE.

③ INSTALL METER, VAULT, FRAME AND LID. CONCRETE METER VAULTS WITH HEAVY FRAME AND COVER SHALL BE INSTALLED IN AREAS OF VEHICULAR TRAFFIC.

④ INSTALL TAIL PIECE AND TIE-IN TO CUSTOMER SERVICE LINE.

⑤ DISCONTINUE OLD SERVICE AT EXISTING WATER MAIN. DRIVEN FERRULES MUST BE REMOVED AND REPAIR BAND INSTALLED AT TAP IF MAIN WILL REMAIN ACTIVE. (SEE SECT. 10.11)

⑥ ABANDON OLD METER VAULT, RETURN METER AND CAST IRON FRAME & COVER TO ALLMOND AVENUE, BACKFILL METER VAULT (SEE SECT.10.13)

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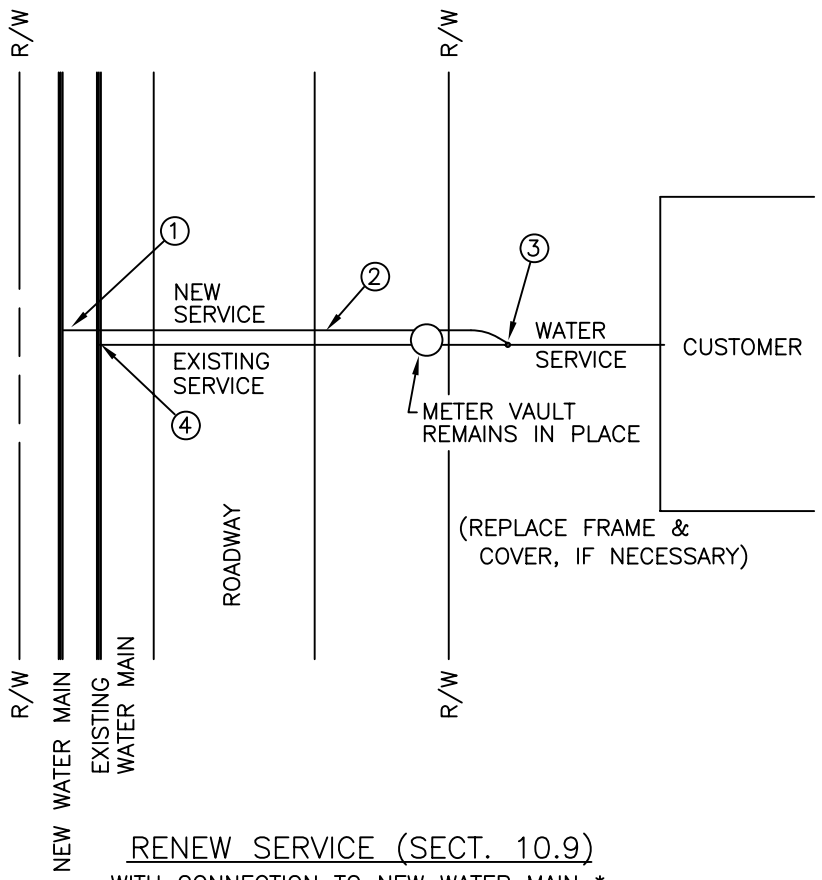
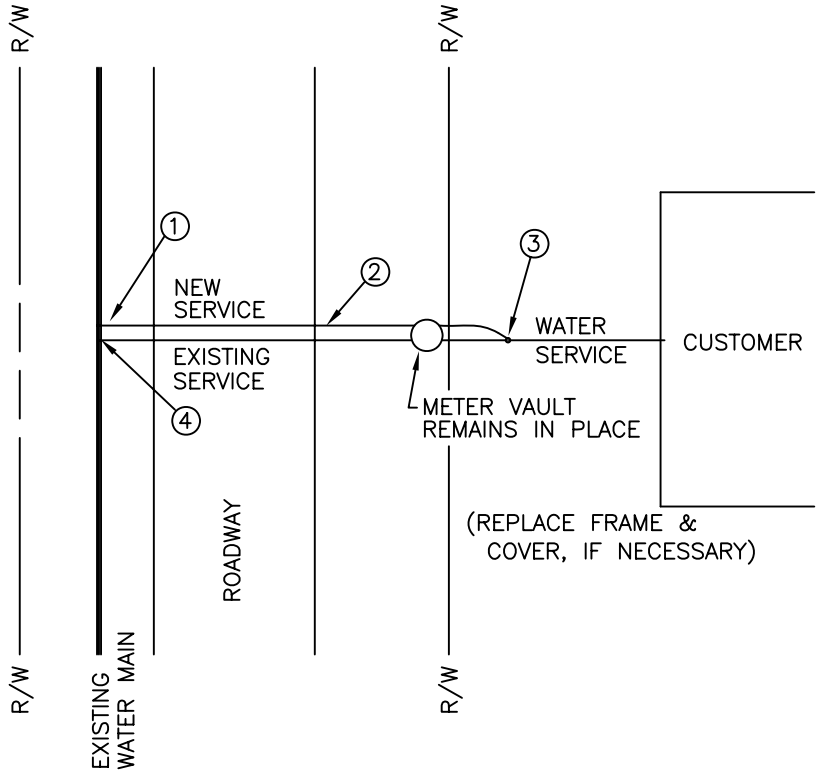
STANDARD DRAWING

RELOCATE SERVICE (SECT. 10.8)

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3440	SHEET	1 OF 1



RENEW SERVICE (SECT. 10.9)
WITH CONNECTION TO NEW WATER MAIN *



RENEW SERVICE (SECT. 10.9)
WITH CONNECTION TO EXISTING WATER MAIN *

* CONNECTIONS AS SHOWN ARE A "LONG SERVICE" TO MAIN ON OPPOSITE SIDE OF ROAD. "SHORT SERVICE" IS DEFINED AS METER AND MAIN ON THE SAME SIDE OF ROADWAY.

LEGEND

◯ = EXISTING METER VAULT

NOTES:

① INSTALL CORPORATION STOP ON MAIN.

② INSTALL NEW SERVICE LINE TO EXISTING METER STOP.

③ INSTALL TAIL PIECE AND TIE–IN TO CUSTOMER SERVICE LINE.

④ DISCONTINUE OLD SERVICE AT EXISTING WATER MAIN. DRIVEN FERRULES MUST BE REMOVED AND REPAIR BAND INSTALLED AT TAP IF MAIN WILL REMAIN ACTIVE.

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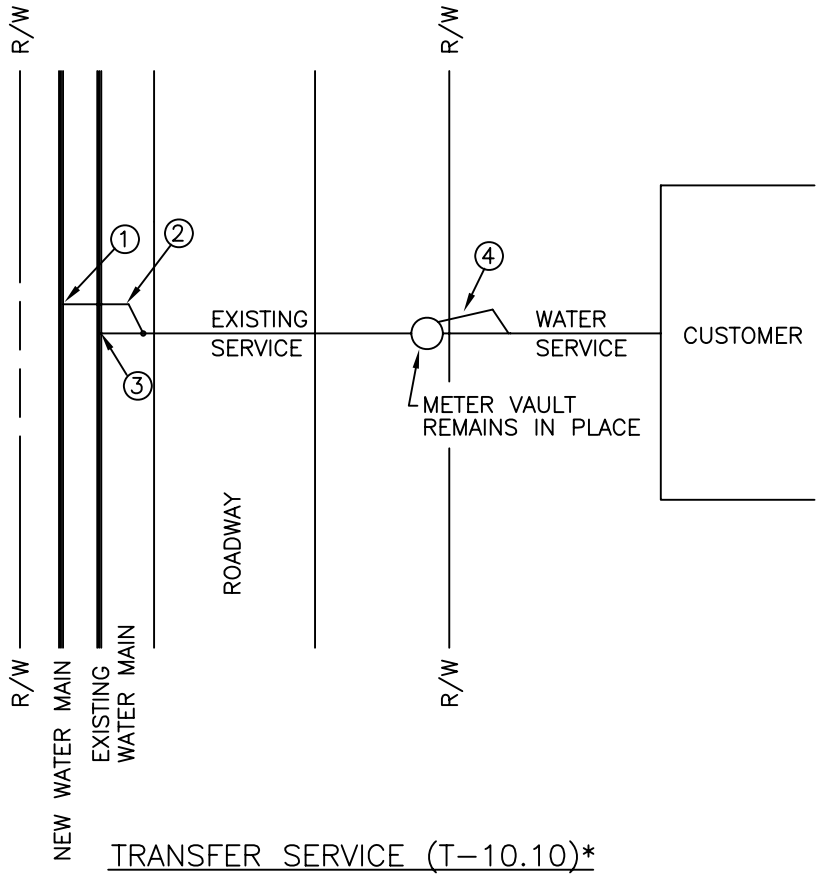
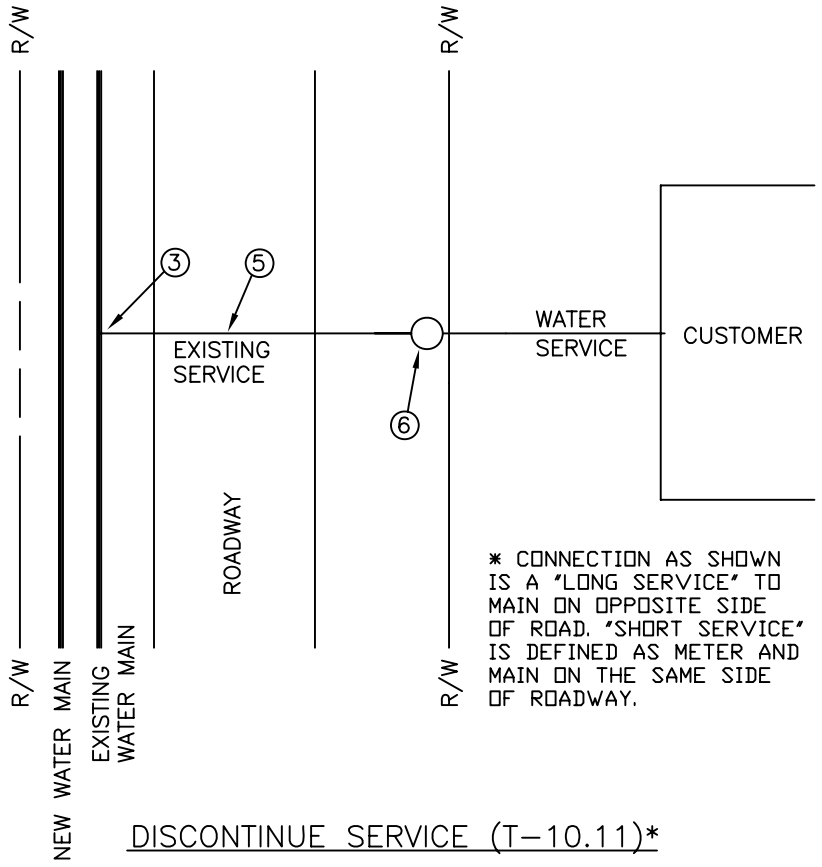
STANDARD DRAWING

RENEW SERVICE (SECT. 10.9)

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3441	SHEET	1 OF 1



TRANSFER SERVICE (T–10.10)*



DISCONTINUE SERVICE (T–10.11)*

LEGEND

○ = EXISTING METER VAULT

● = NEW METER VAULT

NOTES:

① INSTALL CORPORATION STOP ON NEW MAIN.

② INSTALL NEW SERVICE LINE FROM NEW MAIN AND TIE–IN TO EXISTING SERVICE LINE. (AS REQUIRED)

③ DISCONTINUE OLD SERVICE AT EXISTING WATER MAIN. DRIVEN FERRULES MUST BE REMOVED AND REPAIR BAND INSTALLED AT TAP IF MAIN WILL REMAIN ACTIVE.

④ REPLACE TAIL PIECE WHEN EXISTING SERVICE LINE IS LEAD.

⑤ DISCONNECT & PLUG SERVICE LINE.

⑥ ABANDON OLD METER VAULT, RETURN METER AND CAST IRON FRAME & COVER TO ALLMOND AVENUE, BACKFILL METER VAULT (SEE SECT. 10.13)

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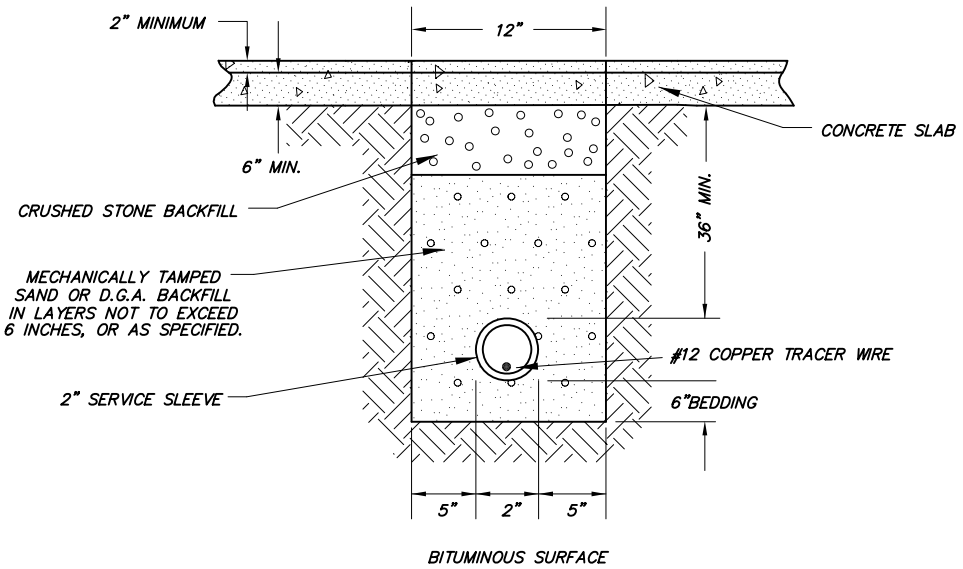
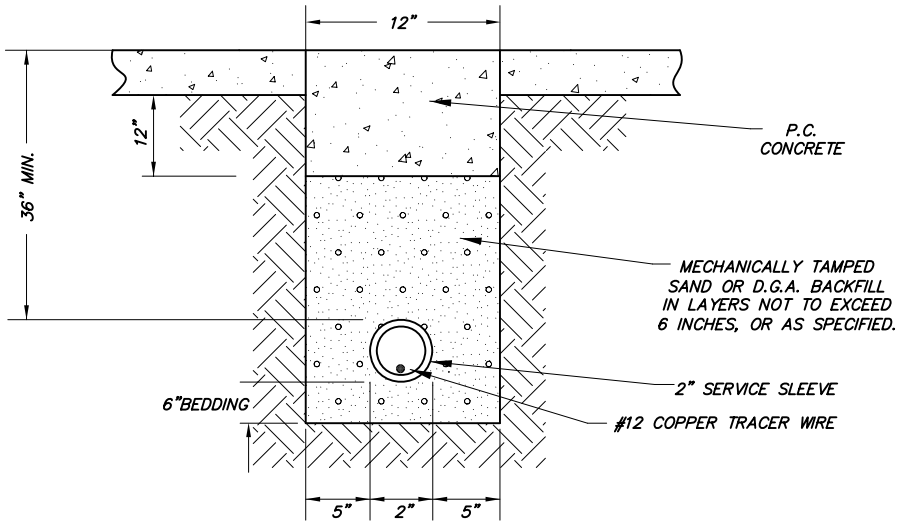
STANDARD DRAWING

TRANSFER SERVICE (SECT. 10.10)
DISCONTINUE SERVICE (SECT. 10.11)

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3442	SHEET	1 OF 1



BITUMINOUS SURFACE



CONCRETE PAVEMENT

SERVICE SLEEVE INSTALLATIONS

IN ORDER TO AVOID CURB AND PAVEMENT CUTS DURING SERVICE INSTALLATIONS, THE FOLLOWING PROCEDURES HAVE BEEN ESTABLISHED FOR NEW DEVELOPMENT PROJECTS:

- SERVICE SLEEVES ARE TO BE INSTALLED BY THE DEVELOPER'S WATER MAIN INSTALLATION CONTRACTOR AS SHOWN ON THE PLANS. LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE; THE CONTRACTOR SHALL COORDINATE EXACT SERVICE SLEEVE LOCATIONS WITH THE DEVELOPER OR THEIR REPRESENTATIVE.
- WHEN THE SERVICE SLEEVES ARE SUPPLIED BY THE DEVELOPER, L.W.C. WILL ADJUST THE DEVELOPER'S PROJECT MATERIAL COSTS TO REFLECT DEVELOPER–DOCUMENTED SLEEVE MATERIAL COST.
- SLEEVES MUST BE INSTALLED AT 36" COVER, AND ALIGNED SO THAT FUTURE INSTALLATION OF SERVICE PIPING CAN BE ACCOMPLISHED WITHOUT PAVEMENT, OR CURB CUTS. SLEEVES MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY BENDS OR OBSTRUCTIONS.
- ALL SERVICE SLEEVES MUST EXTEND AT LEAST 2 FEET BEYOND THE BACK OF CURBS, WITH SEALED ENDS MARKED BY ABOVE–GRADE P.V.C. PIPE, TRACER WIRE OR OTHER MARKER ACCEPTABLE TO L.W.C.
- ALL SLEEVES MUST HAVE #12 COPPER TRACER WIRE INSTALLED THROUGH EACH SLEEVE AND THE TRACER WIRE MUST BE CONNECTED TO THE WATER MAIN. (FOR P.V.C. PIPE, THE TRACER WIRE IN THE SLEEVE MUST BE CONNECTED TO THE WIRE ON THE P.V.C. PIPE AND FOR DUCTILE IRON PIPE, THE TRACER WIRE MUST BE CONNECTED TO THE D.I. PIPE).

EXPEDITED SERVICE INSTALLATION REQUESTS

- FOR LOTS WHERE THE DEVELOPER PREFERS TO REQUEST EXPEDITED SERVICE INSTALLATIONS PRIOR TO FINAL PAVING, THE CONTRACTOR SHALL NOTIFY THE DEVELOPER WHEN THE WATER LINES HAVE PASSED PRESSURE AND L.W.C. LAB TESTING AND ADVISE THEM TO MAKE APPLICATION TO L.W.C. FOR THOSE SERVICES.
- AFTER APPLICATIONS HAVE BEEN MADE AND AT LEAST TWO WEEKS PRIOR TO PAVING, THE CONTRACTOR SHALL NOTIFY L.W.C. INSPECTOR WHEN THEY PLAN TO PAVE AND REQUEST EXPEDITED SERVICE INSTALLATION FOR THOSE SERVICES.
- L.W.C. INSPECTOR WILL NOTIFY L.W.C. SERVICE INSTALLATION SUPERVISOR THAT EXPEDITED INSTALLATION HAS BEEN REQUESTED, AND PROVIDE DATE THE CONTRACTOR HAS ADVISED PAVING IS PLANNED.

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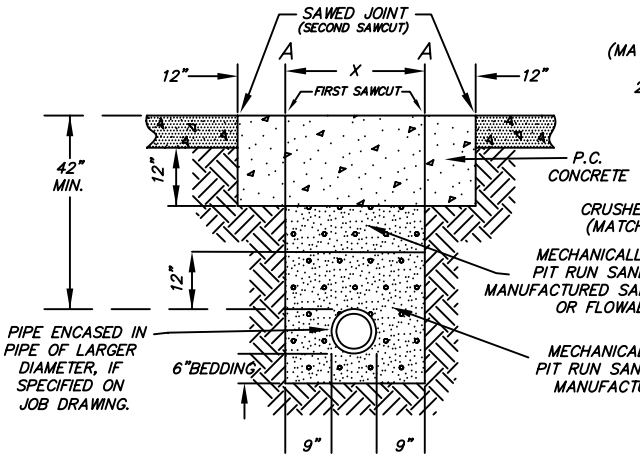
STANDARD DRAWING

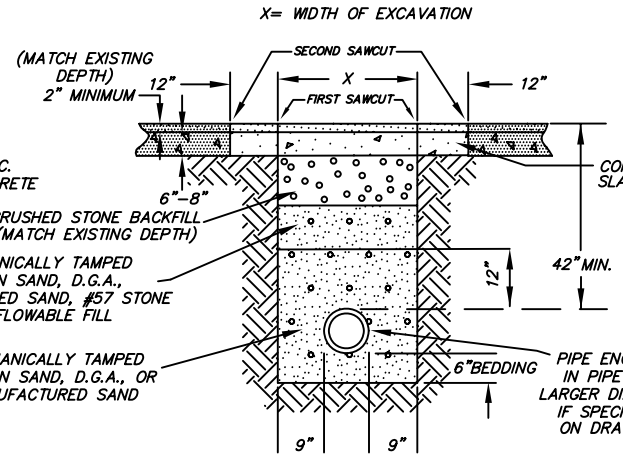
SERVICE SLEEVE INSTALLATION DETAIL

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	3805	SHEET	1 OF 1

NOTE: FROM POINTS "A" (CONCRETE PAVEMENT) TO NEAREST JOINT OR BREAK IN PAVEMENT MUST BE SIX(6) FEET OR MORE. IF LESS THAN 6, REMOVE PAVEMENT TO JOINT OR BREAK AND REPLACE ENTIRE SLAB. CONCRETE SLAB UNDER BITUMINOUS SURFACE TO EXTEND 12 INCHES ON EACH SIDE OF TRENCH.

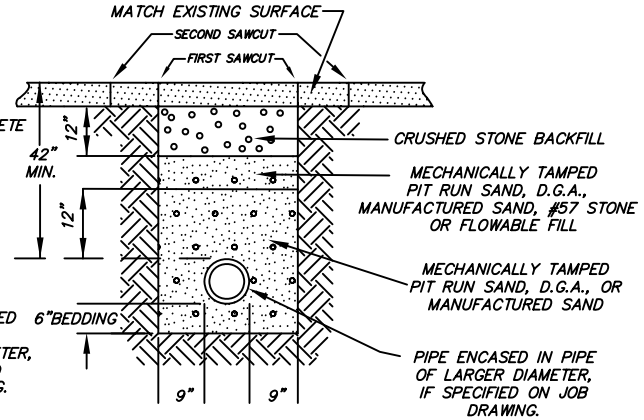


CONCRETE PAVEMENT



BITUMINOUS SURFACE 2"+

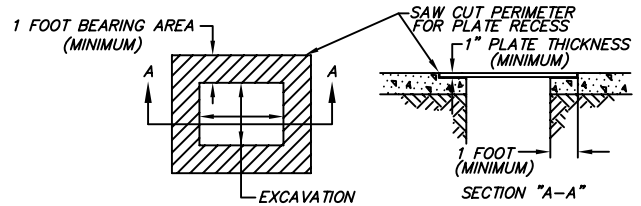
(12" CUTBACK IS NOT REQUIRED WHEN FLOWABLE FILL IS USED)



BITUMINOUS SURFACE LESS THAN 2" AND TRAFFIC BOUND MACADAM

(12" CUTBACK IS NOT REQUIRED WHEN FLOWABLE FILL IS USED)

NOTE: REPLACE CONCRETE PAVEMENT WITH NEW PAVEMENT SAME THICKNESS OF EXISTING PAVEMENT + 12". REPLACE BITUMINOUS PAVEMENT WITH SAME TYPE AND DEPTH AS EXISTING PAVEMENT.



TYPICAL RECESSED PLATE

NO SCALE

STATE OF KENTUCKY SPECIFICATIONS

1. INITIAL BACKFILL SHALL BE PIT RUN SAND, DENSE-GRADED AGGREGATE, OR MANUFACTURED SAND MECHANICALLY COMPACTED PER SECTION 7: BACKFILLING PROCEDURES AND TAMPING.
2. CONTRACTOR WILL BE HELD RESPONSIBLE DURING THE ENSUING 5 YEARS FOR PROPER BACKFILLING AND REPLACEMENT OF SURFACE DURING THE 5 YEAR PERIOD AFTER THE DATE OF THE FINAL CONTRACT PAYMENT. ANY PAVEMENT SETTLEMENT SHALL BE IMMEDIATELY REPAIRED IN AN APPROVED MANNER AT THE EXPENSE OF THE CONTRACTOR.
3. BACKFILLING UP TO BOTTOM OF SUBBASE ELEVATION SHALL BE COMPLETED PRIOR TO SECOND PAIR OF SAWCUTS AND EXCAVATION FOR THE ADDITIONAL 12" OF CONCRETE ON EACH SIDE OF THE TRENCH.
4. DILUTE SS1H (OR OTHER APPROVED TACK COAT MATERIAL) SHALL BE APPLIED AT THE RATE OF 0.1 GAL. PER SQUARE YARD OVER THE CONCRETE BASE. ALLOW SUFFICIENT TIME FOR IT TO "BREAK" BEFORE THE FINISHED BITUMINOUS CONCRETE IS PLACED, AND SEAL ALL JOINTS SECURELY AFTER PAVING.

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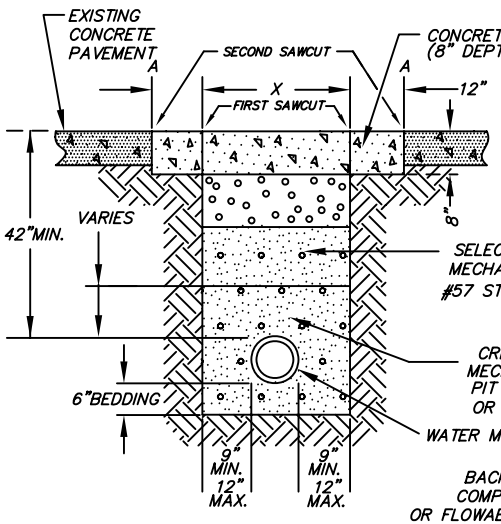
JAMES H. BRAMMELL – VICE PRESIDENT/CHIEF ENGINEER

STANDARD DRAWING

STATE OF KENTUCKY
BACKFILL AND PAVING
RESTORATION

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	4000	SHEET	1 OF 1

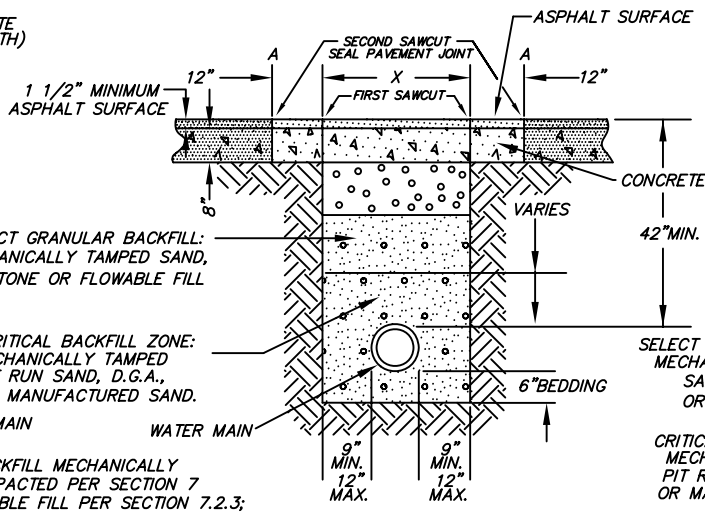
NOTE: FROM POINTS "A" (CONCRETE PAVEMENT) TO NEAREST JOINT OR BREAK IN PAVEMENT MUST BE FOUR (4) FEET OR MORE. IF LESS THAN 4 REMOVE PAVEMENT TO JOINT OR BREAK AND REPLACE ENTIRE SLAB. CONCRETE SLAB UNDER BITUMINOUS SURFACE TO EXTEND 12" ON EACH SIDE OF TRENCH.



CONCRETE PAVEMENT

(12" CUTBACK IS NOT REQUIRED WHEN FLOWABLE FILL IS USED)

SEE KTC SPECIFICATION FOR SPECIAL PROVISIONS SECTION 76 PAGES 1–12 FOR PAVEMENT REPAIRS.

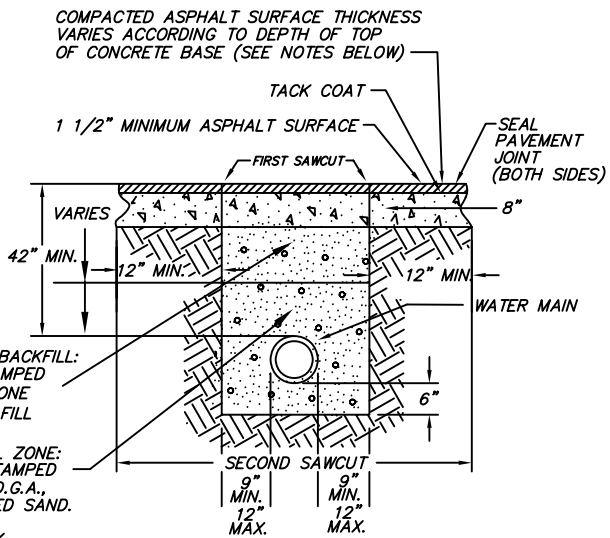


BITUMINOUS SURFACE

NEW ASPHALT SHALL BE A MINIMUM OF 1 1/2" THICK

(12" CUTBACK IS NOT REQUIRED WHEN FLOWABLE FILL IS USED)

NOTE: THE CONCRETE BASE SHALL BE FLOAT FINISHED OR BROOMED OR LIGHTLY RAKED AFTER FLOATING TO A UNIFORM GRADE.

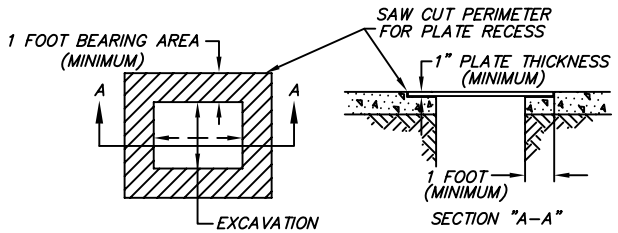


BASE OTHER THAN CONCRETE HAVING AN ASPHALT SURFACE

(12" CUTBACK IS NOT REQUIRED WHEN FLOWABLE FILL IS USED)

NOTE: THE CONCRETE BASE SHALL BE FLOAT FINISHED OR BROOMED OR LIGHTLY RAKED AFTER FLOATING TO A UNIFORM GRADE.

1. CRITICAL BACKFILL ZONE SHALL CONSIST OF MECHANICALLY TAMPED PIT RUN SAND, DENSE–GRADED AGGREGATE, OR MANUFACTURED SAND.
2. SELECT GRANULAR BACKFILL SHALL CONSIST OF NO. 57 STONE OR SAND. THE NO. 57 STONE SHALL BE PLACED IN 6" LOOSE LIFTS AND MECHANICALLY COMPACTED. THE SAND BACKFILL MAY BE FLUSHED AND JETTED OR MECHANICALLY COMPACTED BY VIBRATORY METHODS TO 95% DENSITY. IN ROADWAY EMBANKMENT SITUATIONS WHEN SAND BACKFILL IS UTILIZES, COMPACTED EARTH SHALL BE PLACED IN THIS ZONE WITHIN 5 FEET (HORIZONTAL DISTANCE) OF THE EMBANKMENT SLOPE.
3. BACKFILLING UP TO BOTTOM OF SUBBASE ELEVATION SHALL BE COMPLETED PRIOR TO SECOND PAIR OF SAWCUTS AND EXCAVATION FOR THE ADDITIONAL 12" OF CONCRETE ON EACH SIDE OF THE TRENCH, UNLESS FLOWABLE FILL IS USED.
4. PLATES MUST BE SECURED AND/OR RECESSED AT ALL TIMES.
5. CONCRETE CAP MUST BE PLATED UNTIL CONCRETE REACHES STRENGTH REQUIREMENTS (MINIMUM 3500 PSI)
6. DILUTE SS1H (OR OTHER APPROVED TACK COAT MATERIAL) SHALL BE APPLIED AT THE RATE OF 0.1 GAL. PER SQUARE YARD OVER THE CONCRETE BASE. ALLOW SUFFICIENT TIME FOR IT TO "BREAK" BEFORE THE FINISHED BITUMINOUS CONCRETE IS PLACED, AND SEAL ALL JOINTS SECURELY AFTER PAVING.
7. PAVEMENT JOINTS SHALL BE SEALED WITH AN APPROVED JOINT SEALER AFTER PLACEMENT OF THE BITUMINOUS CONCRETE SURFACE. SEE SECTION 11.2 AND 11.3.
8. CONTRACTOR WILL BE HELD RESPONSIBLE DURING THE ENSUING 5 YEARS FOR PROPER BACKFILLING AND REPLACEMENT OF SURFACE. DURING THE 5 YEAR PERIOD AFTER THE DATE OF THE FINAL CONTRACT PAYMENT, ANY PAVEMENT SETTLEMENT SHALL BE IMMEDIATELY REPAIRED IN AN APPROVED MANNER AT THE EXPENSE OF THE CONTRACTOR.



TYPICAL RECESSED PLATE

NO SCALE

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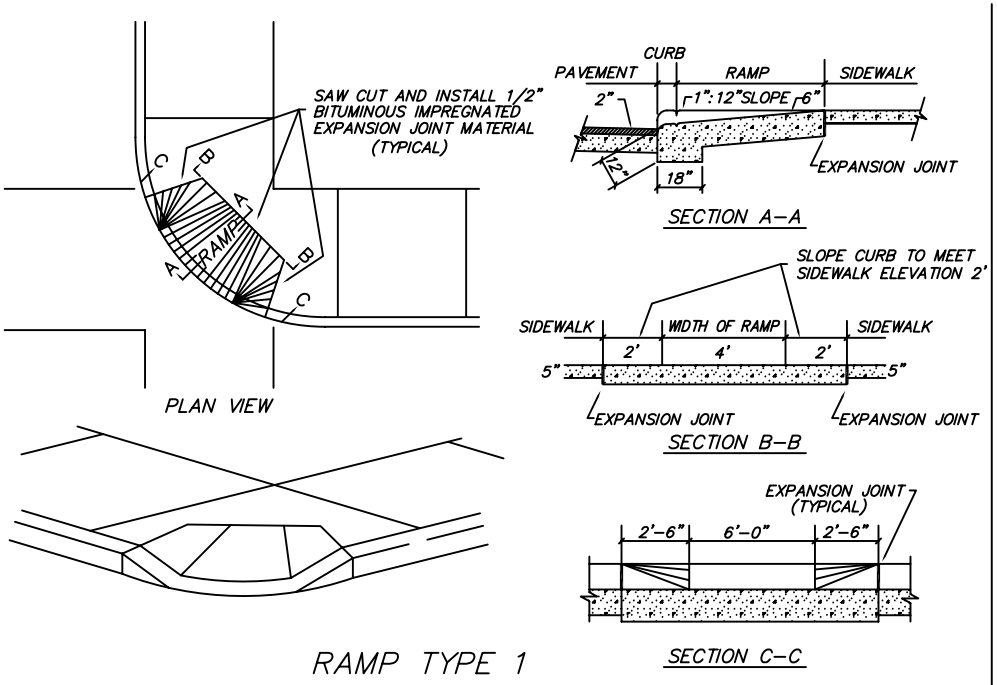
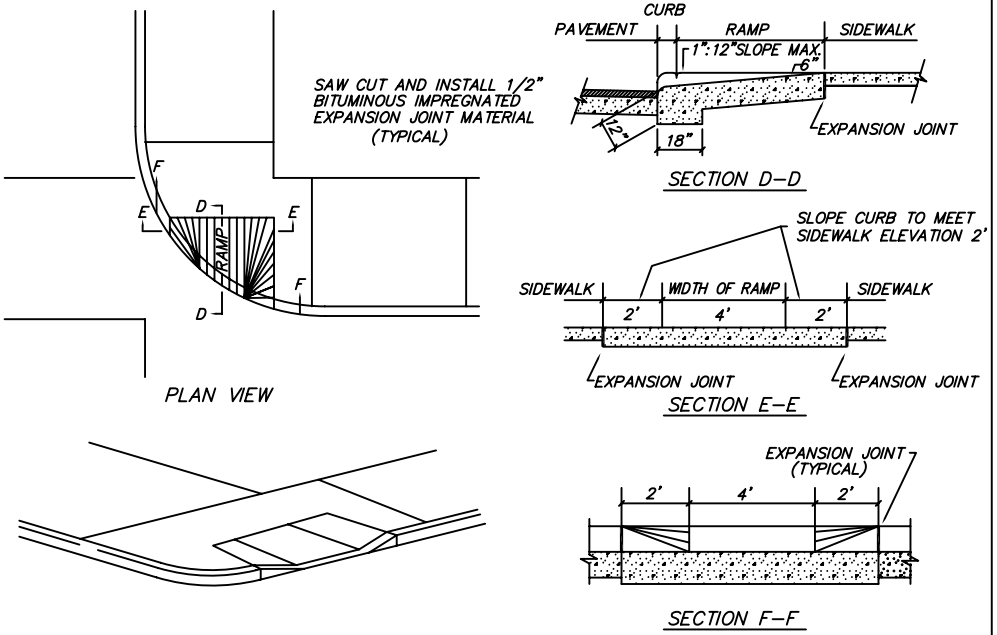
STANDARD DRAWING

LOUISVILLE–JEFFERSON COUNTY METRO BACKFILL AND PAVING RESTORATION

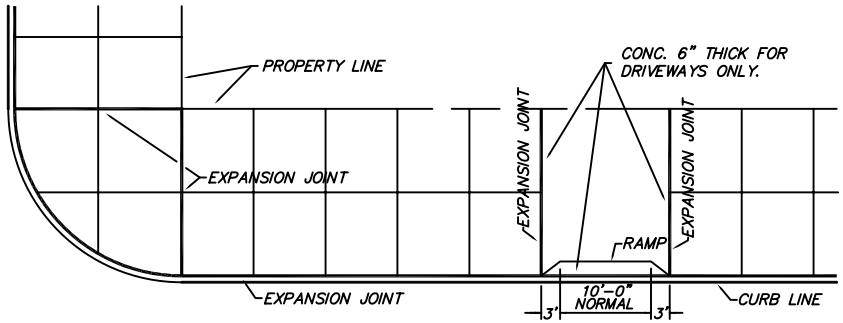
DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	4100	SHEET	1 OF 1



RAMP TYPE 1

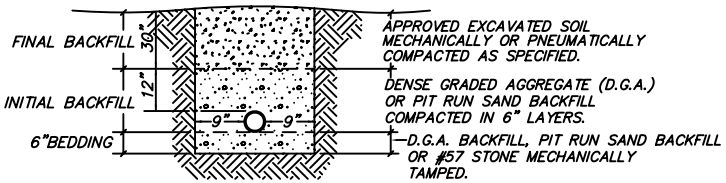


RAMP TYPE 2

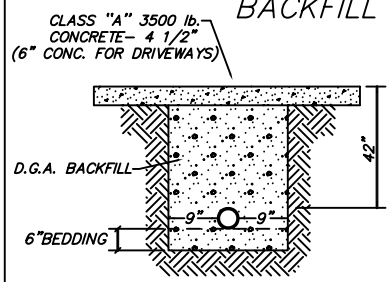


PLAN OF SIDEWALK AND DRIVEWAY–FULL WIDTH

NOTES:
ALL SIDEWALKS SHALL BE 5"THICK. ALL DRIVEWAYS SHALL BE 6" THICK.
ALL CONCRETE SHALL BE CLASS "A"(3500 lb. CONCRETE). WOOD FLOAT FINISH FOR ALL WORK. AN APPROVED TYPE OF LIQUID CURING COMPOUND WILL BE PERMITTED. EXPANSION JOINTS ACROSS THE LINE OF THE WALK SHALL BE SPACED NOT MORE THAN 50' APART. EXPANSION JOINTS PARALLEL TO THE LINE OF WALK WILL BE REQUIRED AT THE BACK OF CURB FOR FULL WIDTH WALKS. AT DRIVEWAYS, EXPANSION JOINTS SHALL BE USED ON BOTH SIDES AGAINST THE SIDEWALK. OTHER JOINTS DETERMINED BY THIS LOCATION. AT DRIVEWAYS AND ENTRANCE WALKS ACROSS GRASS PLOTS, AN EXPANSION JOINT SHALL BE USED AT BACK OF CURB.
ALL EXPANSION MATERIAL SHALL BE APPROVED NON–EXTRUDING PREFORMED STRIPS 1/2" THICK. BLOCKS SHALL BE MARKED OR SCORED IN SUITABLE SIZED BLOCKS, BUT NOT LESS THAN 4' OR MORE THAN 6' ON A SIDE.
CONTRACTION JOINTS (PLANES OF WEAKNESS) SHALL BE AT EVERY THIRD BLOCK AND SHALL BE CUT AT LEAST 1 1/2" IN DEPTH (IN LIEU OF A SCORE). AT BACK OF WALK, TERRACE SHALL BE HAND TRIMMED OR FINISHED TO A 1 TO 1 SLOPE OR FLATTER.
ALL SIDEWALK AND DRIVEWAY CONSTRUCTION IN THE PUBLIC WAYS OF THE CITY OF LOUISVILLE SHALL CONFORM WITH THE REQUIREMENTS ON THIS SHEET UNLESS OTHERWISE APPROVED IN WRITING BY THE CHIEF ENGINEER. MINIMUM WIDTH OF SIDEWALK SHALL BE 5' EXCEPT WITH PERMISSION OF CHIEF ENGINEER.



BACKFILL NOT UNDER PAVEMENT



BACKFILL UNDER SIDEWALK

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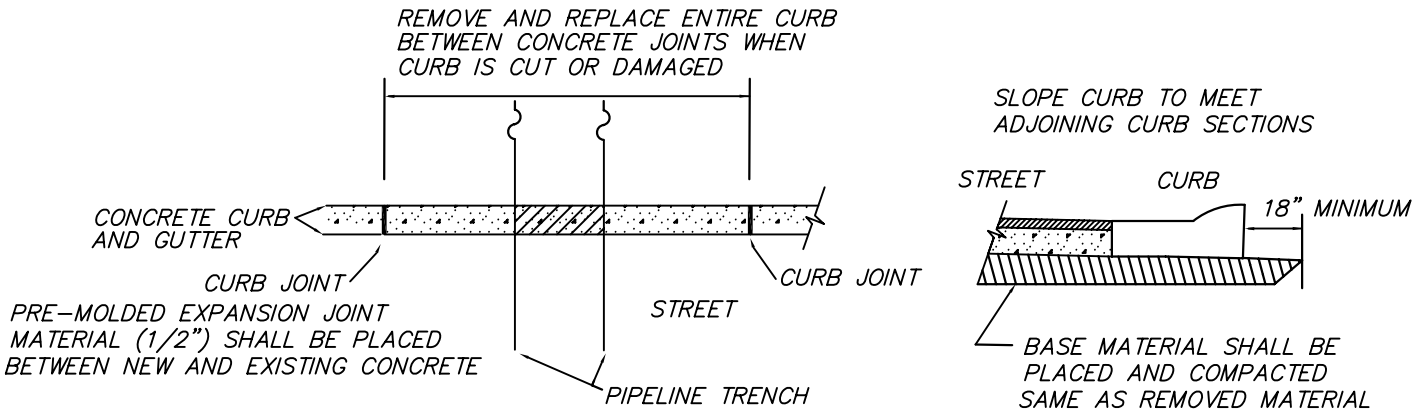
STANDARD DRAWING

SIDEWALK/BACKFILL DETAIL

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	4400	SHEET	1 OF 1



PLAN VIEW

SECTION

CURB RESTORATION FOR PIPELINE INSTALLATION

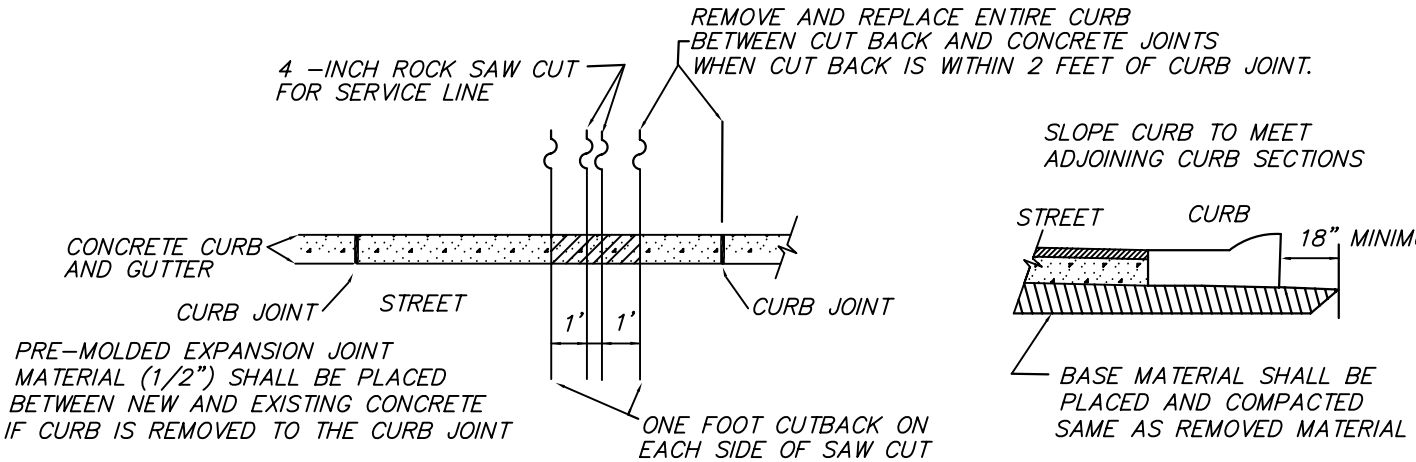
NOTES:

ALL CONCRETE SHALL BE A MINIMUM CLASS "A" (3500 lb. CONCRETE).

AN APPROVED TYPE OF LIQUID CURING COMPOUND WILL BE REQUIRED ON CONCRETE.

EXPANSION JOINT MATERIAL SHALL BE USED BETWEEN CURB JOINTS AND CURBS AND ADJOINING SIDEWALKS.

ALL EXPANSION MATERIAL SHALL BE APPROVED NON-EXTRUDING PREFORMED STRIPS (1/2" THICK).



PLAN VIEW

SECTION

CURB RESTORATION FOR SERVICE LINE INSTALLATION

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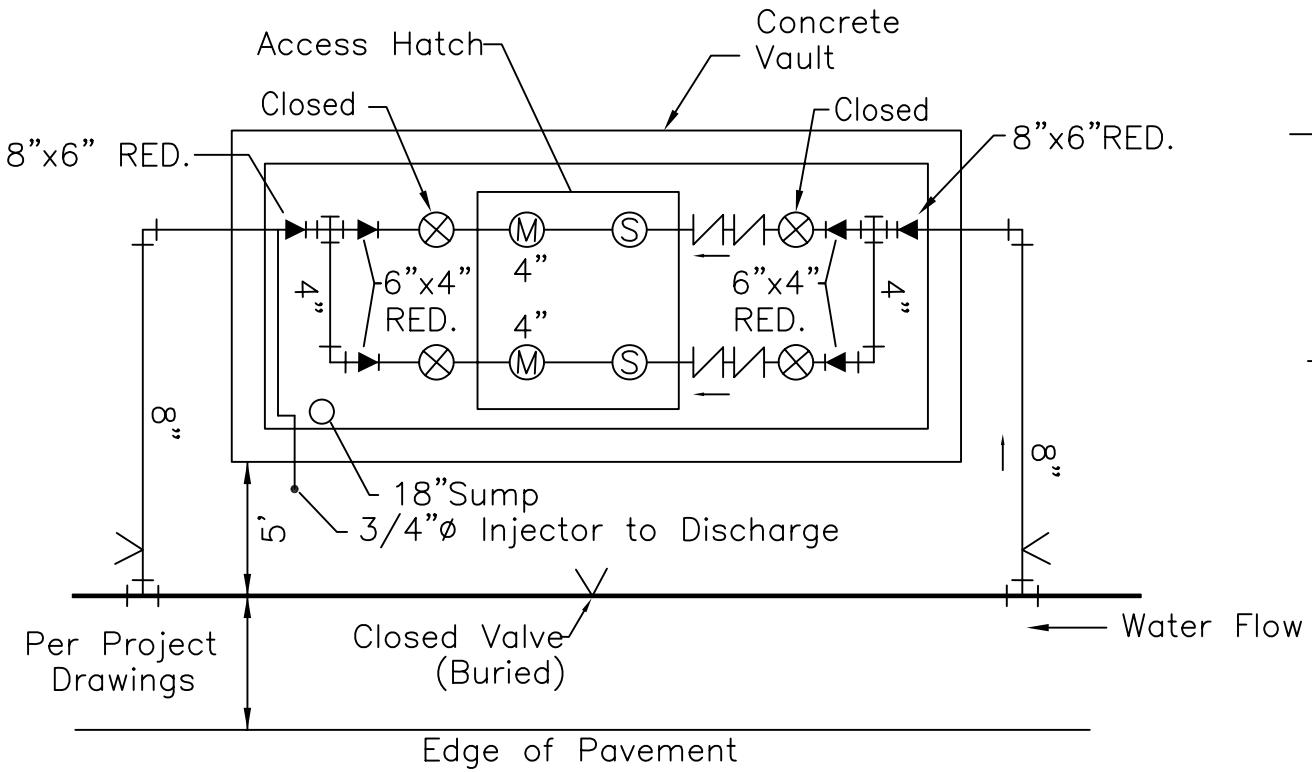
STANDARD DRAWING

CONCRETE CURB AND GUTTER
RESTORATION DETAIL

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	4410	SHEET	1 OF 1



Double Check

Strainer

Turbine Meter

Wheel Gate Valve

Line Valve

Reducer

MASTER METER LAYOUT

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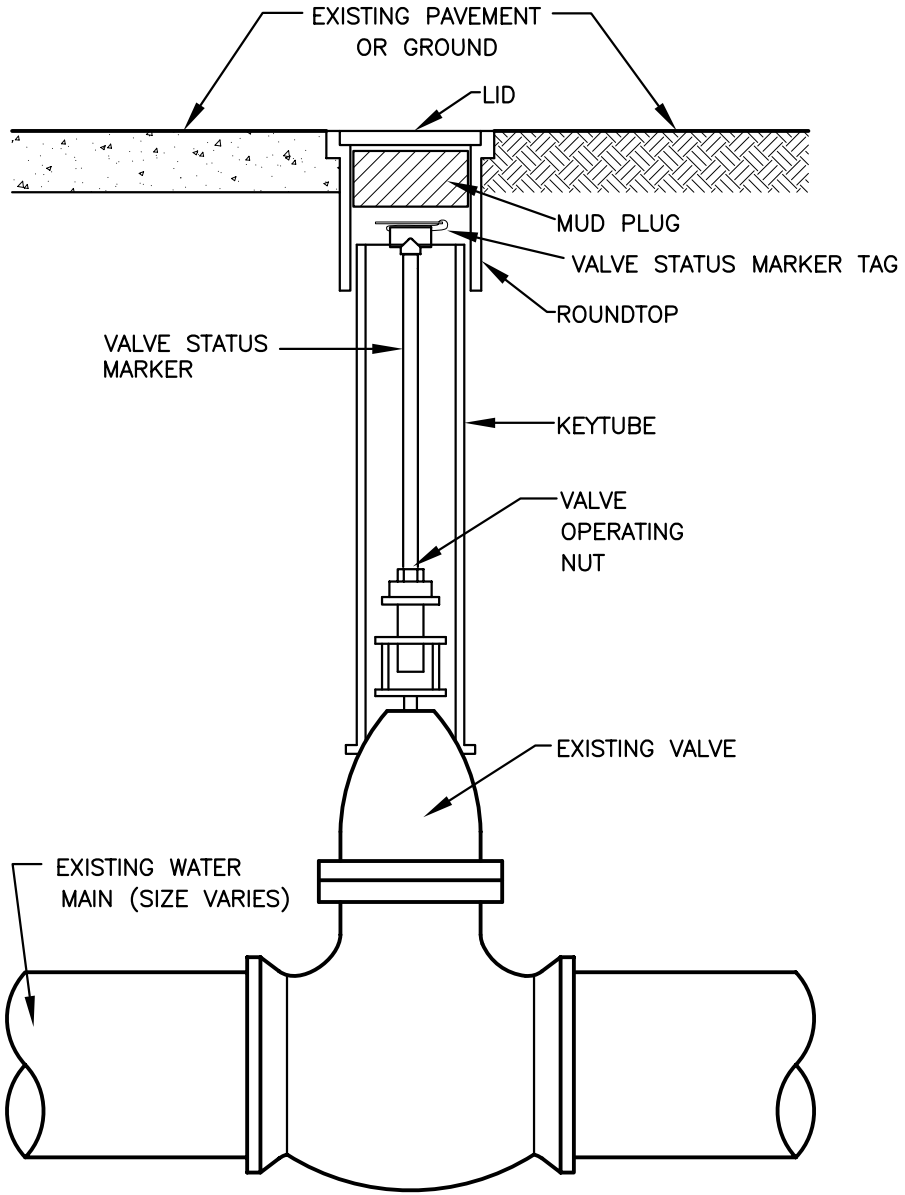
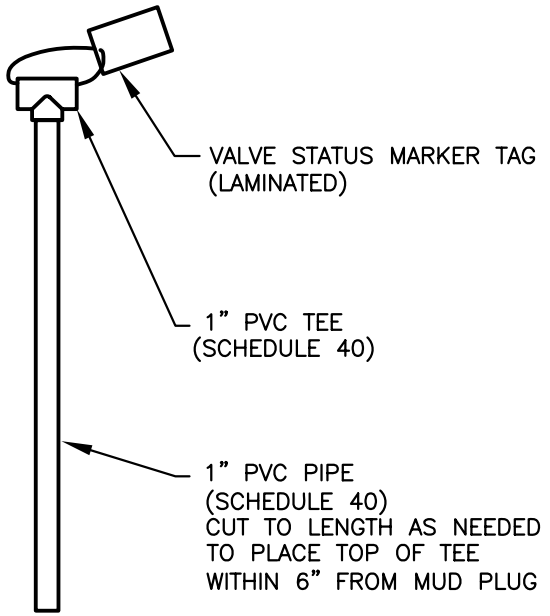
STANDARD DRAWING

TYPICAL MASTER METER DETAIL

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	4600	SHEET	1 OF 1



VALVE STATUS MARKER
IN PLACE (TYPICAL)



VALVE STATUS MARKER

TYPICAL MARKER TAG NOTES:

"PRESSURE PLANE BOUNDARY VALVE – DO NOT OPEN"

"CLOSED VALVE – DO NOT OPEN"

"LEFT HAND OPEN"

"TEMPORARY CONSTRUCTION –CLOSED VALVE: CONTACT LWC RADIO ROOM OR INSPECTION"

"VALVE PARTIAL OPEN # TURNS"

CONTACT PROJECT MANAGER OR COMPANY INSPECTOR FOR APPROVAL BEFORE OPERATING ANY VALVE.

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STANDARD DRAWING

VALVE STATUS MARKER

DATE	MAR. 2008	SCALE	NONE
DRAWING NO.	5005	SHEET	1 OF 1

KENTUCKY TRANSPORTATION CABINET
COMMUNICATING ALL PROMISES (CAP)

Item No. 5 - 807 **County:** Jefferson **Route:** 0 **Project Manager:** KAMERYN UNDERWOOD

12/30/20

CAP #	Date of Promise	Promise made to:	Location of Promise:	CAP Description
1	12/30/20	District 5 Right-of-Way	Parcel 8	Road Contractor to give 2 weeks notice to property owner before beginning work to allow owner time to remove stones around the driveway.
2	12/30/20	District 5 Right-of-Way	Parcel 8	Property owner can retain possession of the drainage pipe under driveway when it is replaced by road contractor. The property owner grants permission for contractor to place the drainage pipe on their property, just past the right-of-way line.
3	12/30/20	District 5 Right-of-Way	Parcel 8	The light post in the temporary easement will not be removed.

PART II

SPECIFICATIONS AND STANDARD DRAWINGS

SPECIFICATIONS REFERENCE

Any reference in the plans or proposal to previous editions of the *Standard Specifications for Road and Bridge Construction* and *Standard Drawings* are superseded by *Standard Specifications for Road and Bridge Construction, Edition of 2019* and *Standard Drawings, Edition of 2020.*

SUPPLEMENTAL SPECIFICATIONS

The contractor shall use the Supplemental Specifications that are effective at the time of letting. The Supplemental Specifications can be found at the following link:

http://transportation.ky.gov/Construction/Pages/Kentucky-Standard-Specifications.aspx

1I

SPECIAL NOTE FOR PORTABLE CHANGEABLE MESSAGE SIGNS

This Special Note will apply when indicated on the plans or in the proposal.

1.0 DESCRIPTION. Furnish, install, operate, and maintain variable message signs at the locations shown on the plans or designated by the Engineer. Remove and retain possession of variable message signs when they are no longer needed on the project.

2.0 MATERIALS.

2.1 General. Use LED Variable Message Signs Class I, II, or III, as appropriate, from the Department's List of Approved Materials.

Unclassified signs may be submitted for approval by the Engineer. The Engineer may require a daytime and nighttime demonstration. The Engineer will make a final decision within 30 days after all required information is received.

2.2 Sign and Controls. All signs must:

1) Provide 3-line messages with each line being 8 characters long and at least 18 inches tall. Each character comprises 35 pixels.
2) Provide at least 40 preprogrammed messages available for use at any time. Provide for quick and easy change of the displayed message; editing of the message; and additions of new messages.
3) Provide a controller consisting of:
   a) Keyboard or keypad.
   b) Readout that mimics the actual sign display. (When LCD or LCD type readout is used, include backlighting and heating or otherwise arrange for viewing in cold temperatures.)
   c) Non-volatile memory or suitable memory with battery backup for storing pre-programmed messages.
   d) Logic circuitry to control the sequence of messages and flash rate.
4) Provide a serial interface that is capable of supporting complete remote control ability through land line and cellular telephone operation. Include communication software capable of immediately updating the message, providing complete sign status, and allowing message library queries and updates.
5) Allow a single person easily to raise the sign to a satisfactory height above the pavement during use, and lower the sign during travel.
6) Be Highway Orange on all exterior surfaces of the trailer, supports, and controller cabinet.
7) Provide operation in ambient temperatures from -30 to + 120 degrees Fahrenheit during snow, rain and other inclement weather.
8) Provide the driver board as part of a module. All modules are interchangeable, and have plug and socket arrangements for disconnection and reconnection. Printed circuit boards associated with driver boards have a conformable coating to protect against moisture.
9) Provide a sign case sealed against rain, snow, dust, insects, etc. The lens is UV stabilized clear plastic (polycarbonate, acrylic, or other approved material) angled to prevent glare.
10) Provide a flat black UV protected coating on the sign hardware, character PCB, and appropriate lens areas.
11) Provide a photocell control to provide automatic dimming.

1I

12) Allow an on-off flashing sequence at an adjustable rate.
13) Provide a sight to aim the message.
14) Provide a LED display color of approximately 590 nm amber.
15) Provide a controller that is password protected.
16) Provide a security device that prevents unauthorized individuals from accessing the controller.
17) Provide the following 3-line messages preprogrammed and available for use when the sign unit begins operation:

/KEEP/RIGHT/⇒⇒⇒/
/KEEP/LEFT/⇐⇐⇐/
/LOOSE/GRAVEL/AHEAD/
/RD WORK/NEXT/**MILES/
/TWO WAY/TRAFFIC/AHEAD/
/PAINT/CREW/AHEAD/
/REDUCE/SPEED/**MPH/
/BRIDGE/WORK/***0 FT/
/MAX/SPEED/**MPH/
/SURVEY/PARTY/AHEAD/
/MIN/SPEED/**MPH/
/ICY/BRIDGE/AHEAD/ /ONE LANE/BRIDGE/AHEAD/
/ROUGH/ROAD/AHEAD/
/MERGING/TRAFFIC/AHEAD/
/NEXT/***/MILES/
/HEAVY/TRAFFIC/AHEAD/
/SPEED/LIMIT/**MPH/
/BUMP/AHEAD/
/TWO/WAY/TRAFFIC/

*Insert numerals as directed by the Engineer.
Add other messages during the project when required by the Engineer.

2.3 Power.

1) Design solar panels to yield 10 percent or greater additional charge than sign consumption. Provide direct wiring for operation of the sign or arrow board from an external power source to provide energy backup for 21 days without sunlight and an on-board system charger with the ability to recharge completely discharged batteries in 24 hours.

3.0 CONSTRUCTION. Furnish and operate the variable message signs as designated on the plans or by the Engineer. Ensure the bottom of the message panel is a minimum of 7 feet above the roadway in urban areas and 5 feet above in rural areas when operating. Use Class I, II, or III signs on roads with a speed limit less than 55 mph. Use Class I or II signs on roads with speed limits 55 mph or greater.

Maintain the sign in proper working order, including repair of any damage done by others, until completion of the project. When the sign becomes inoperative, immediately repair or replace the sign. Repetitive problems with the same unit will be cause for rejection and replacement.

Use only project related messages and messages directed by the Engineer, unnecessary messages lessen the impact of the sign. Ensure the message is displayed in either one or 2 phases with each phase having no more than 3 lines of text. When no message is needed, but it is necessary to know if the sign is operable, flash only a pixel.

When the sign is not needed, move it outside the clear zone or where the Engineer directs. Variable Message Signs are the property of the Contractor and shall be removed from the project when no longer needed. The Department will not assume ownership of these signs.

4.0 MEASUREMENT. The final quantity of Variable Message Sign will be

1I

the actual number of individual signs acceptably furnished and operated during the project. The Department will not measure signs replaced due to damage or rejection.

5.0 PAYMENT. The Department will pay for the Variable Message Signs at the unit price each. The Department will not pay for signs replaced due to damage or rejection. Payment is full compensation for furnishing all materials, labor, equipment, and service necessary to, operate, move, repair, and maintain or replace the variable message signs. The Department will make payment for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
02671	Portable Changeable Message Sign	Each

Effective June 15, 2012

SPECIAL NOTE FOR BARCODE LABEL ON PERMANENT SIGNS

1.0 DESCRIPTION. Install barcode label on sheeting signs. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction, current edition.

2.0 MATERIALS. The Department will provide the Contractor with a 2 inch x 1 inch foil barcode label for each permanent sheeting sign. A unique number will be assigned to each barcode label.

The Contractor shall contact the Operations and Pavement Management Branch in the Division of Maintenance at (502) 564-4556 to obtain the barcode labels.

3.0 CONSTRUCTION. Apply foil barcode label in the lower right quadrant of the sign back. Signs where the bottom edge is not parallel to the ground, the lowest corner of the sign shall serve as the location to place the barcode label. The barcode label shall be placed no less than one-inch and no more than three inches from any edge of the sign. The barcode must be placed so that the sign post does not cover the barcode label.

Barcodes shall be applied in an indoor setting with a minimum air temperature of 50°F or higher. Prior to application of the barcode label, the back of the sign must be clean and free of dust, oil, etc. If the sign is not clean, an alcohol swab shall be used to clean the area. The area must be allowed to dry prior to placement of the barcode label.

Data for each sign shall include the barcode number, MUTCD reference number, sheeting manufacturer, sheeting type, manufacture date, color of primary reflective surface, installation date, latitude and longitude using the North American Datum of 1983 (NAD83) or the State Plane Coordinates using an x and y ordinate of the installed location.

Data should be provided electronically on the TC 71-229 Sign Details Information and TC 71-230 Sign Assembly Information forms. The Contractor may choose to present the data in a different format provided that the information submitted to the Department is equivalent to the information required on the Department TC forms. The forms must be submitted in electronic format regardless of which type of form is used. The Department will not accept PDF or handwritten forms. These completed forms must be submitted to the Department prior to final inspection of the signs. The Department will not issue formal acceptance for the project until the TC 71-229 and TC-230 electronic forms are completed for all signs and sign assemblies on the project.

4.0 MEASUREMENT. The Department will measure all work required for the installation of the barcode label and all work associated with completion and submission of the sign inventory data (TC 71-229 and TC 71-230).

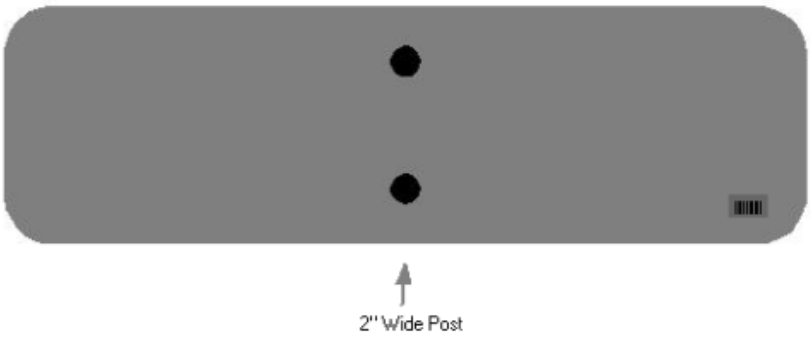
The installation of the permanent sign will be measured in accordance to Section 715.

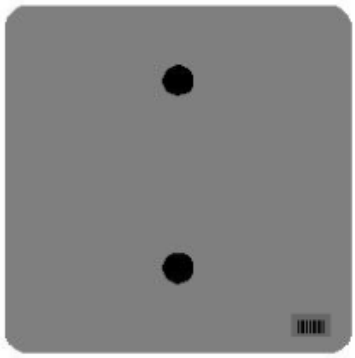
5.0 PAYMENT. The Department will make payment for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
24631EC	Barcode Sign Inventory	Each

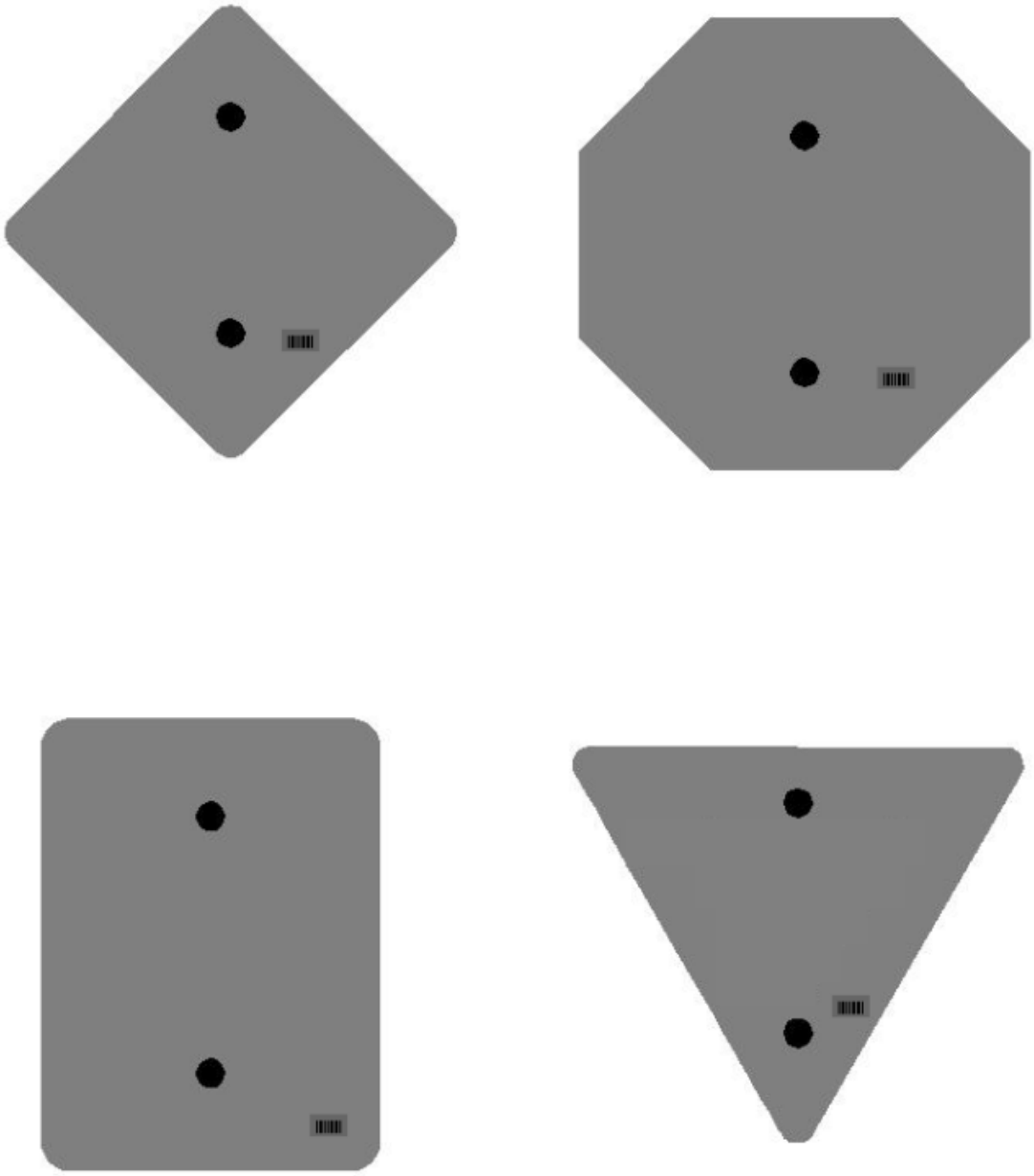
The Department will not make payment for this item until all barcodes are installed and sign inventory is complete on every permanent sign installed on the project. The Department will make payment for installation of the permanent sign in accordance to Section 715. The Department will consider payment as full compensation for all work required under this special note.

One Sign Post

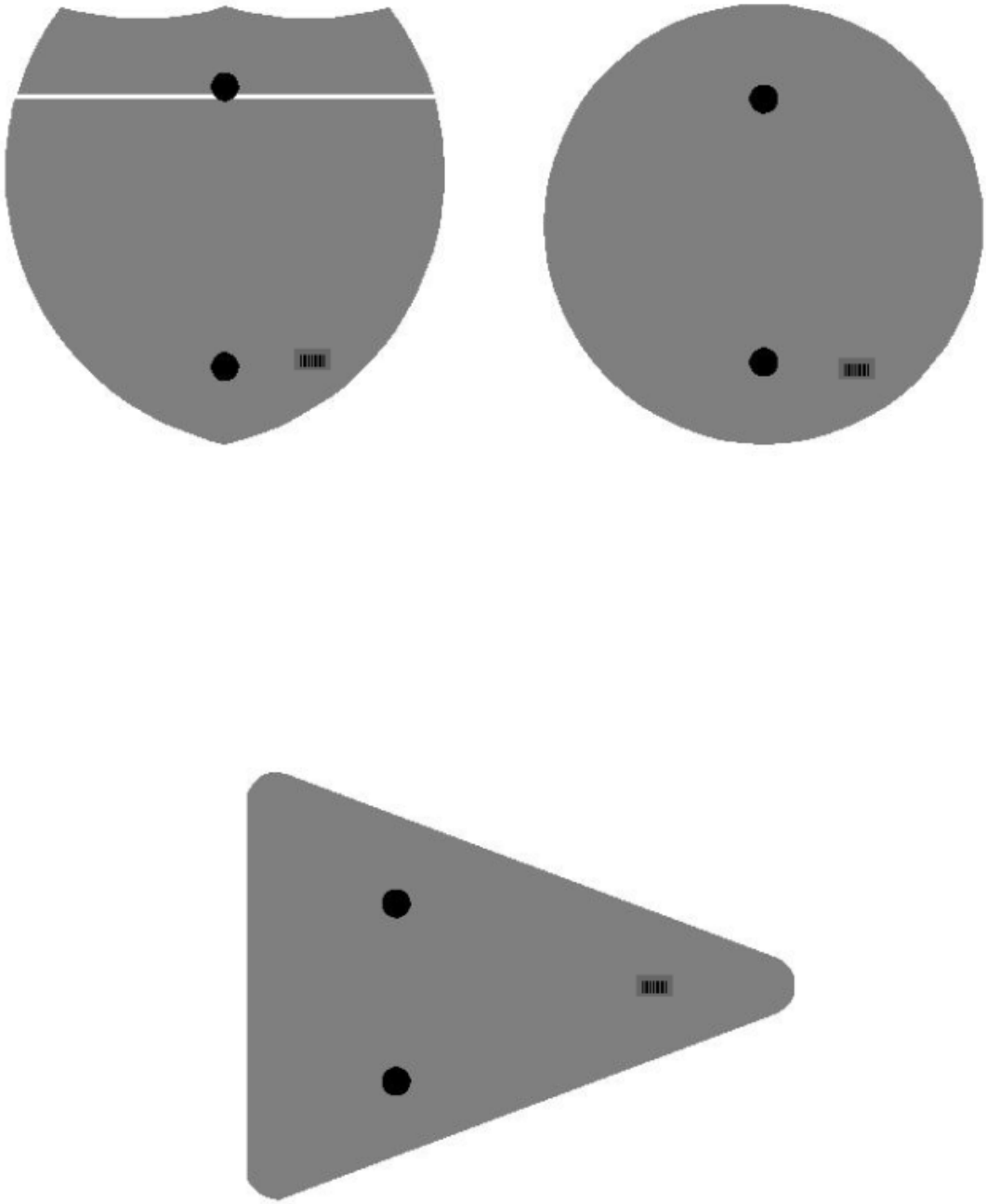




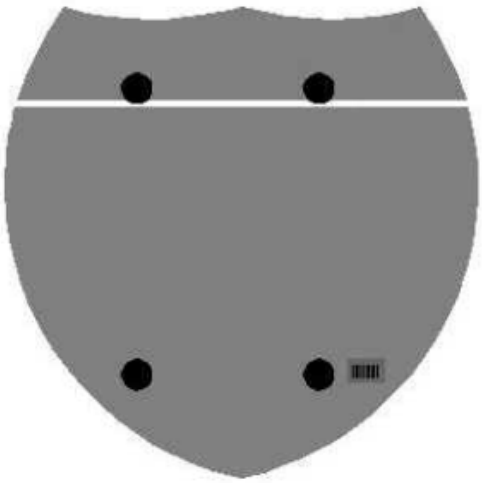
One Sign Post



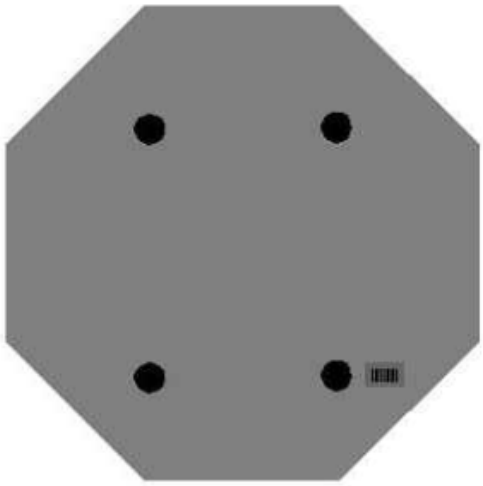
One Sign Post



Double Sign Post

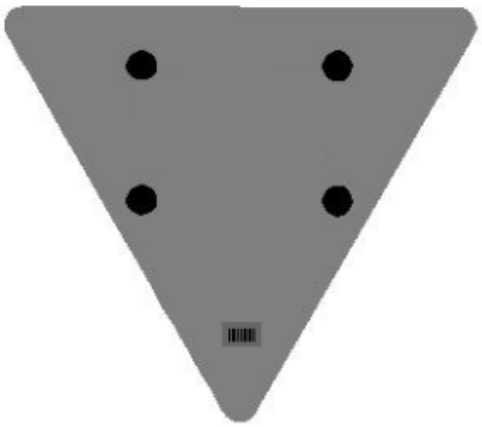


Interstate
Shield



48" Stop

2 Post Signs



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SPECIAL NOTE FOR LONGITUDINAL PAVEMENT JOINT ADHESIVE

1. DESCRIPTION. This specification covers the requirements and practices for applying an asphalt adhesive material to the longitudinal joint of the surface course of an asphalt pavement. Apply the adhesive to the face of longitudinal joint between driving lanes for the first lane paved. Then, place and compact the adjacent lane against the treated face to produce a strong, durable, waterproof longitudinal joint.

2. MATERIALS, EQUIPMENT, AND PERSONNEL.

2.1 Joint Adhesive. Provide material conforming to Subsection 2.1.1.

2.1.1 Provide an adhesive conforming to the following requirements:

Property	Specification	Test Procedure
Viscosity, 400 ° F (Pa·s)	4.0 – 10.0	ASTM D 4402
Cone Penetration, 77 ° F	60 – 100	ASTM D 5329
Flow, 140 ° F (mm)	5.0 max.	ASTM D 5329
Resilience, 77 ° F (%)	30 min.	ASTM D 5329
Ductility, 77 ° F (cm)	30.0 min.	ASTM D 113
Ductility, 39 ° F (cm)	30.0 min.	ASTM D 113
Tensile Adhesion, 77 ° F (%)	500 min.	ASTM D 5329, Type II
Softening Point, ° F	171 min.	AASHTO T 53
Asphalt Compatibility	Pass	ASTM D 5329

Ensure the temperature of the pavement joint adhesive is between 380 and 410 °F when the material is extruded in a 0.125-inch-thick band over the entire face of the longitudinal joint.

2.2. Equipment.

2.2.1 Melter Kettle. Provide an oil-jacketed, double-boiler, melter kettle equipped with any needed agitation and recirculating systems.

2.2.2 Applicator System. Provide a pressure-feed-wand applicator system with an applicator shoe attached.

2.3 Personnel. Ensure a technical representative from the manufacturer of the pavement joint adhesive is present during the initial construction activities and available upon the request of the Engineer.

3. CONSTRUCTION.

3.1 Surface Preparation. Prior to the application of the pavement joint adhesive, ensure the face of the longitudinal joint is thoroughly dry and free from dust or any other debris that would inhibit adhesion. Clean the joint face by the use of compressed air.

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Ensure this preparation process occurs shortly before application to prevent the return of debris on the joint face.

3.2 Pavement Joint Adhesive Application. Ensure the ambient temperature is a minimum of 40 ^{o} F during the application of the pavement joint adhesive. Prior to applying the adhesive, demonstrate competence in applying the adhesive according to this note to the satisfaction of the Engineer. Heat the adhesive in the melter kettle to the specified temperature range. Pump the adhesive from the melter kettle through the wand onto the vertical face of the cold joint. Apply the adhesive in a continuous band over the entire face of the longitudinal joint. Do not use excessive material in either thickness or location. Ensure the edge of the extruded adhesive material is flush with the surface of the pavement. Then, place and compact the adjacent lane against the joint face. Remove any excessive material extruded from the joint after compaction (a small line of material may remain).

3.3 Pavement Joint Adhesive Certification. Furnish the joint adhesive's certification to the Engineer stating the material conforms to all requirements herein prior to use.

3.4 Sampling and Testing. The Department will require a random sample of pavement joint adhesive from each manufacturer's lot of material. Extrude two 5 lb. samples of the heated material and forward the sample to the Division of Materials for testing. Reynolds oven bags, turkey size, placed inside small cardboard boxes or cement cylinder molds have been found suitable. Ensure the product temperature is 400°F or below at the time of sampling.

4. MEASUREMENT. The Department will measure the quantity of Pavement Joint Adhesive in linear feet. The Department will not measure for payment any extra materials, labor, methods, equipment, or construction techniques used to satisfy the requirements of this note. The Department will not measure for payment any trial applications of Pavement Joint Adhesive, the cleaning of the joint face, or furnishing and placing the adhesive. The Department will consider all such items incidental to the Pavement Joint Adhesive.

5. PAYMENT. The Department will pay for the Pavement Joint Adhesive at the Contract unit bid price and apply an adjustment for each manufacturer's lot of material based on the degree of compliance as defined in the following schedule. When a sample fails on two or more tests, the Department may add the deductions, but the total deduction will not exceed 100 percent.

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Pavement Joint Adhesive Price Adjustment Schedule						
Test	Specification	100% Pay	90% Pay	80% Pay	50% Pay	0% Pay
Joint Adhesive Referenced in Subsection 2.1.1						
Viscosity, 400 ° F (Pa•s)			3.0-3.4	2.5-2.9	2.0-2.4	≤1.9
ASTM D 3236	4.0-10.0	3.5-10.5	10.6-11.0	11.1-11.5	11.6-12.0	≥ 12.1
Cone Penetration, 77 ° F			54-56	51-53	48-50	≤ 47
ASTM D 5329	60-100	57-103	104-106	107-109	110-112	≥ 113
Flow, 140 ° F (mm) ASTM D 5329	≤ 5.0	≤ 5.5	5.6-6.0	6.1-6.5	6.6-7.0	≥ 7.1
Resilience, 77 ° F (%) ASTM D 5329	≥ 30	≥ 28	26-27	24-25	22-23	≤ 21
Tensile Adhesion, 77 ° F (%) ASTM D 5329	≥ 500	≥ 490	480-489	470-479	460-469	≤ 459
Softening Point, ° F AASHTO T 53	≥ 171	≥ 169	166-168	163-165	160-162	≤ 159
Ductility, 77 ° F (cm) ASTM D 113	≥ 30.0	≥ 29.0	28.0-28.9	27.0-27.9	26.0-26.9	≤ 25.9
Ductility, 39 ° F (cm) ASTM D 113	≥ 30.0	≥ 29.0	28.0-28.9	27.0-27.9	26.0-26.9	≤ 25.9

Code	Pay Item	Pay Unit
20071EC	Joint Adhesive	Linear Foot

May 7, 2014

PART III

EMPLOYMENT, WAGE AND RECORD REQUIREMENTS

TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

LABOR AND WAGE REQUIREMENTS
APPLICABLE TO OTHER THAN FEDERAL-AID SYSTEM PROJECTS

I. APPLICATION

1. These contract provisions shall apply to all work performed on the contract by the contractor with his own organization and with the assistance of workmen under his immediate superintendence and to all work performed on the contract by piecework, station work or by subcontract. The contractor's organization shall be construed to include only workmen employed and paid directly by the contractor and equipment owned or rented by him, with or without operators.

2. The contractor shall insert in each of his subcontracts all of the stipulations contained in these Required Provisions and such other stipulations as may be required.

3. A breach of any of the stipulations contained in these Required Provisions may be grounds for termination of the contract.

II. NONDISCRIMINATION OF EMPLOYEES

AN ACT OF THE KENTUCKY
GENERAL ASSEMBLY TO PREVENT
DISCRIMINATION IN EMPLOYMENT
KRS CHAPTER 344
EFFECTIVE JUNE 16, 1972

The contract on this project, in accordance with KRS Chapter 344, provides that during the performance of this contract, the contractor agrees as follows:

1. The contractor shall not fail or refuse to hire, or shall not discharge any individual, or otherwise discriminate against an individual with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, national origin, sex, disability or age (forty and above); or limit, segregate, or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee, because of such individual's race, color, religion, national origin, sex, disability or age forty (40) and over. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor shall not print or publish or cause to be printed or published a notice or advertisement relating to employment by such an employer or membership in or any classification or referral for employment by the employment agency, indicating any preference, limitation, specification, or discrimination, based on race, color, religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, except that such a notice or advertisement may indicate a preference, limitation, or specification based on religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, when religion, national origin, sex, or age forty (40) and over, or because the person is a qualified individual with a disability, is a bona fide occupational qualification for employment.

3. If the contractor is in control of apprenticeship or other training or retraining, including on-the-job training programs, he shall not discriminate against an individual because of his race, color, religion, national origin, sex, disability or age forty (40) and over, in admission to, or employment in any program established to provide apprenticeship or other training.

4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The contractor will take such action with respect to any subcontract or purchase order as the administrating agency may direct as a means of enforcing such provisions, including sanctions for non-compliance.

Revised: January 25, 2017

EXECUTIVE BRANCH CODE OF ETHICS

In the 1992 regular legislative session, the General Assembly passed and Governor Brereton Jones signed Senate Bill 63 (codified as KRS 11A), the Executive Branch Code of Ethics, which states, in part:

KRS 11A.040 (7) provides:

No present or former public servant shall, within six (6) months following termination of his office or employment, accept employment, compensation, or other economic benefit from any person or business that contracts or does business with, or is regulated by, the state in matters in which he was directly involved during the last thirty-six (36) months of his tenure. This provision shall not prohibit an individual from returning to the same business, firm, occupation, or profession in which he was involved prior to taking office or beginning his term of employment, or for which he received, prior to his state employment, a professional degree or license, provided that, for a period of six (6) months, he personally refrains from working on any matter in which he was directly involved during the last thirty-six (36) months of his tenure in state government. This subsection shall not prohibit the performance of ministerial functions, including but not limited to filing tax returns, filing applications for permits or licenses, or filing incorporation papers, nor shall it prohibit the former officer or public servant from receiving public funds disbursed through entitlement programs.

KRS 11A.040 (9) states:

A former public servant shall not represent a person or business before a state agency in a matter in which the former public servant was directly involved during the last thirty-six (36) months of his tenure, for a period of one (1) year after the latter of:

a) The date of leaving office or termination of employment; or
b) The date the term of office expires to which the public servant was elected.

This law is intended to promote public confidence in the integrity of state government and to declare as public policy the idea that state employees should view their work as a public trust and not as a way to obtain private benefits.

If you have worked for the executive branch of state government within the past six months, you may be subject to the law's prohibitions. The law's applicability may be different if you hold elected office or are contemplating representation of another before a state agency.

Also, if you are affiliated with a firm which does business with the state and which employs former state executive-branch employees, you should be aware that the law may apply to them.

In case of doubt, the law permits you to request an advisory opinion from the Executive Branch Ethics Commission, 3 Fountain Place, Frankfort, Kentucky 40601; telephone (502) 564-7954.

Revised: January 27, 2017

Kentucky Equal Employment Opportunity Act of 1978

The requirements of the Kentucky Equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) shall apply to this Contract. The apparent low Bidder will be required to submit EEO forms to the Division of Construction Procurement, which will then forward to the Finance and Administration Cabinet for review and approval. No award will become effective until all forms are submitted and EEO/CC has certified compliance. The required EEO forms are as follows:

- EEO-1: Employer Information Report
- Affidavit of Intent to Comply
- Employee Data Sheet
- Subcontractor Report

These forms are available on the Finance and Administration's web page under ***Vendor Information, Standard Attachments and General Terms*** at the following address: **https://www.eProcurement.ky.gov**.

Bidders currently certified as being in compliance by the Finance and Administration Cabinet may submit a copy of their approval letter in lieu of the referenced EEO forms.

For questions or assistance please contact the Finance and Administration Cabinet by email at **finance.contractcompliance@ky.gov** or by phone at 502-564-2874.

EMPLOYEE RIGHTS
UNDER THE FAIR LABOR STANDARDS ACT

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

FEDERAL MINIMUM WAGE
$7.25 PER HOUR
BEGINNING JULY 24, 2009

OVERTIME PAY

At least 1½ times your regular rate of pay for all hours worked over 40 in a workweek.

CHILD LABOR

An employee must be at least **16** years old to work in most non-farm jobs and at least **18** to work in non-farm jobs declared hazardous by the Secretary of Labor.

Youths **14** and **15** years old may work outside school hours in various non-manufacturing, non-mining, non-hazardous jobs under the following conditions:

No more than

- **3** hours on a school day or **18** hours in a school week;
- **8** hours on a non-school day or **40** hours in a non-school week.

Also, work may not begin before **7 a.m.** or end after **7 p.m.**, except from June 1 through Labor Day, when evening hours are extended to **9 p.m.** Different rules apply in agricultural employment.

TIP CREDIT

Employers of "tipped employees" must pay a cash wage of at least $2.13 per hour if they claim a tip credit against their minimum wage obligation. If an employee's tips combined with the employer's cash wage of at least $2.13 per hour do not equal the minimum hourly wage, the employer must make up the difference. Certain other conditions must also be met.

ENFORCEMENT

The Department of Labor may recover back wages either administratively or through court action, for the employees that have been underpaid in violation of the law. Violations may result in civil or criminal action.

Employers may be assessed civil money penalties of up to $1,100 for each willful or repeated violation of the minimum wage or overtime pay provisions of the law and up to $11,000 for each employee who is the subject of a violation of the Act's child labor provisions. In addition, a civil money penalty of up to $50,000 may be assessed for each child labor violation that causes the death or serious injury of any minor employee, and such assessments may be doubled, up to $100,000, when the violations are determined to be willful or repeated. The law also prohibits discriminating against or discharging workers who file a complaint or participate in any proceeding under the Act.

ADDITIONAL INFORMATION

- Certain occupations and establishments are exempt from the minimum wage and/or overtime pay provisions.
- Special provisions apply to workers in American Samoa and the Commonwealth of the Northern Mariana Islands.
- Some state laws provide greater employee protections; employers must comply with both.
- The law requires employers to display this poster where employees can readily see it.
- Employees under 20 years of age may be paid $4.25 per hour during their first 90 consecutive calendar days of employment with an employer.
- Certain full-time students, student learners, apprentices, and workers with disabilities may be paid less than the minimum wage under special certificates issued by the Department of Labor.

For additional information:

1-866-4-USWAGE

(1-866-487-9243) TTY: 1-877-889-5627

WHD U.S. Wage and Hour Division

WWW.WAGEHOUR.DOL.GOV

U.S. Department of Labor | Wage and Hour Division

WHD Publication 1088 (Revised July 2009)

PART IV

INSURANCE

Refer to
Kentucky Standard Specifications for Road and Bridge Construction,
current edition

PART V

BID ITEMS

211012

PROPOSAL BID ITEMS

Report Date 3/24/21

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00003		CRUSHED STONE BASE	2,319.00	TON		$	
0020	00008		CEMENT STABILIZED ROADBED	2,076.00	SQYD		$	
0030	00100		ASPHALT SEAL AGGREGATE	15.40	TON		$	
0040	00103		ASPHALT SEAL COAT	1.80	TON		$	
0050	00190		LEVELING & WEDGING PG64-22	162.00	TON		$	
0060	00214		CL3 ASPH BASE 1.00D PG64-22	861.00	TON		$	
0070	00356		ASPHALT MATERIAL FOR TACK	4.60	TON		$	
0080	00388		CL3 ASPH SURF 0.38B PG64-22	434.00	TON		$	
0090	02542		CEMENT	990.00	TON		$	
0100	02677		ASPHALT PAVE MILLING & TEXTURING	202.00	TON		$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0110	00078		CRUSHED AGGREGATE SIZE NO 2	1.00	TON		$	
0120	02014		BARRICADE-TYPE III	3.00	EACH		$	
0130	02200		ROADWAY EXCAVATION	2,282.00	CUYD		$	
0140	02429		RIGHT-OF-WAY MONUMENT TYPE 1	4.00	EACH		$	
0150	02432		WITNESS POST	4.00	EACH		$	
0160	02545		CLEARING AND GRUBBING 0.8 ACRES	1.00	LS		$	
0170	02562		TEMPORARY SIGNS	143.00	SQFT		$	
0180	02585		EDGE KEY	57.00	LF		$	
0190	02607		FABRIC-GEOTEXTILE CLASS 2 FOR PIPE	96.00	SQYD	$2.00	$	$192.00
0200	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		$	
0210	02671		PORTABLE CHANGEABLE MESSAGE SIGN	2.00	EACH		$	
0220	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		$	
0230	02690		SAFELOADING	3.40	CUYD		$	
0240	02701		TEMP SILT FENCE	1,835.00	LF		$	
0250	02704		SILT TRAP TYPE B	2.00	EACH		$	
0260	02707		CLEAN SILT TRAP TYPE B	2.00	EACH		$	
0270	02726		STAKING	1.00	LS		$	
0280	05952		TEMP MULCH	387.00	SQYD		$	
0290	05963		INITIAL FERTILIZER	.10	TON		$	
0300	05964		MAINTENANCE FERTILIZER	.10	TON		$	
0310	05985		SEEDING AND PROTECTION	1,537.00	SQYD		$	
0320	05992		AGRICULTURAL LIMESTONE	1.00	TON		$	
0330	06510		PAVE STRIPING-TEMP PAINT-4 IN	7,000.00	LF		$	
0340	06514		PAVE STRIPING-PERM PAINT-4 IN	7,594.00	LF		$	
0350	06568		PAVE MARKING-THERMO STOP BAR-24IN	10.00	LF		$	
0360	06569		PAVE MARKING-THERMO CROSS-HATCH	4,848.00	SQFT		$	
0370	06574		PAVE MARKING-THERMO CURV ARROW	8.00	EACH		$	
0380	06589		PAVEMENT MARKER TYPE V-MW	12.00	EACH		$	
0390	06591		PAVEMENT MARKER TYPE V-BY	83.00	EACH		$	
0400	20071EC		JOINT ADHESIVE	1,835.00	LF		$	
0410	20550ND		SAWCUT PAVEMENT	1,835.00	LF		$	

211012

PROPOSAL BID ITEMS

Report Date 3/24/21

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0420	21289ED		LONGITUDINAL EDGE KEY	1,835.00	LF		$	
0430	23274EN11F		TURF REINFORCEMENT MAT 1	21.00	SQYD		$	
0440	24631EC		BARCODE SIGN INVENTORY	4.00	EACH		$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0450	00440		ENTRANCE PIPE-15 IN	39.00	LF		$	
0460	00461		CULVERT PIPE-15 IN	15.00	LF		$	
0470	00462		CULVERT PIPE-18 IN	4.00	LF		$	
0480	00491		CULVERT PIPE-18 IN EQUIV DUE TO THE LOW COVER, THE REINFORCED CONCRETE ELLIPTICAL PIPE SHALL BE A CLASS H	86.00	LF		$	
0490	01000		PERFORATED PIPE-4 IN	1,745.00	LF		$	
0500	01010		NON-PERFORATED PIPE-4 IN	10.00	LF		$	
0510	01020		PERF PIPE HEADWALL TY 1-4 IN	1.00	EACH		$	
0520	01432		SLOPED BOX OUTLET TYPE 1-15 IN	4.00	EACH		$	
0530	01433		SLOPED BOX OUTLET TYPE 1-18 IN	1.00	EACH		$	
0540	02220		FLOWABLE FILL	25.00	CUYD		$	
0550	24575ES610		HEADWALL SLOPED & MITERED CONCRETE -- FOR 18" EQUIV. PIPE	2.00	EACH		$	

Section: 0004 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0560	06406		SBM ALUM SHEET SIGNS .080 IN	15.00	SQFT		$	
0570	06407		SBM ALUM SHEET SIGNS .125 IN	36.00	SQFT		$	
0580	06410		STEEL POST TYPE 1	48.00	LF		$	

Section: 0005 - WATERLINE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0590	14019		W FIRE HYDRANT ASSEMBLY	1.00	EACH		$	
0600	14021		W FIRE HYDRANT REMOVE	1.00	EACH		$	
0610	14030		W METER RELOCATE	5.00	EACH		$	
0620	14031		W METER VAULT	5.00	EACH		$	
0630	14039		W PIPE DUCTILE IRON 12 INCH	200.00	LF		$	
0640	14062		W PIPE PVC 12 INCH	255.00	LF		$	
0650	14074		W PLUG EXISTING MAIN	3.00	EACH		$	
0660	14090		W TAPPING SLEEVE AND VALVE SIZE 2	2.00	EACH		$	
0670	14097		W TIE-IN 12 INCH	3.00	EACH		$	
0680	14108		W VALVE 12 INCH	1.00	EACH		$	
0690	14152		W SERV COPPER SHORT SIDE 3/4 IN	5.00	EACH		$	
0700	14158		W BLOWOFF ASSEMBLY 6 IN	1.00	EACH		$	

PROPOSAL BID ITEMS

211012

Page 3 of 3

Report Date 3/24/21

Section: 0006 - DEMOBILIZATION &/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0710	02569		DEMOBILIZATION	1.00	LS		$	