COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMMISSION

In the Matter of:

FOREST CREEK, LLC COMPLAINANT	)	
VS.	)	**CASE NO. 2011-00297**
JESSAMINE SOUTH ELKHORN WATER DISTRICT	)	
DEFENDANT	)	

FOREST CREEK, LLC'S COMPLIANCE WITH THE PUBLIC SERVICE COMMISSION'S ORDER OF MAY 27, 2015

Comes Forest Creek, LLC, by counsel, and for its Compliance with the Public Service Commission's Order of May 27, 2015, states as follows:

1. Six (6) complete copies of the exhibits to the Settlement Agreement and Release are attached hereto.
2. Forest Creek's Answers to the Commission's questions set forth in Appendix A are provided below:

APPENDIX A

1. Was Forest Creek aware of, and have an opportunity to participate in, all of the negotiations that resulted in the Settlement Agreement and Release?

ANSWER: Yes.

2. Did Forest Creek sign the Settlement Agreement and Release and fully support each and every provision contained therein?

ANSWER: Yes.

3. Are there any provisions in the Settlement Agreement and Release that Forest Creek does not understand, or that Forest Creek objects to or takes issue with?

ANSWER: No.

4. Were any considerations of any kind offered, or were any promises made, other than what is expressly set forth in the Settlement Agreement and Release, to induce Forest Creek to negotiate and sign the Settlement Agreement and Release?

ANSWER: No.

5. Are you aware of any reason why the Commission should not adopt and approve the Settlement Agreement and Release in its entirety?

ANSWER: No.

Respectfully submitted,

Robert C. Moore
Hazelrigg & Cox, LLP
415 West Main Street, 1st Floor
P. O. Box 676
Frankfort, KY 40602-0676
Counsel for Forest Creek, LLP

CERTIFICATE OF SERVICE

I hereby certify that the foregoing was served by first class mail, postage prepaid, this the 1st day of June, 2015, to, Hon. Bruce E. Smith, **BRUCE E. SMITH LAW OFFICES, PLLC,** 201 South Main Street, Nicholasville, Kentucky 40356.

Robert C. Moore

WATER PURCHASE AGREEMENT

This contract for the sale and purchase of water is entered into as of this the 6th day of November, 2006, between **City of Wilmore**, a Kentucky Municipal Corporation, East Main Street, Wilmore, Kentucky 40390, hereinafter referred to as "Seller" and the **Jessamine South Elkhorn Water District**, 107 South Main Street, Nicholasville, Kentucky 40356, hereinafter referred to as the "Purchaser".

WITNESSETH:

Whereas, the Purchaser is organized and established under the provisions of KRS Chapter 74 of the Laws of the Commonwealth of Kentucky for the purpose of constructing and operating a water supply distribution system serving water users within the area described as the Northwest Service Area and to accomplish this purpose, the Purchaser will require a supply of treated water, and

Whereas, the Seller owns and operates a water supply distribution system with a capacity currently capable of serving the present customers of the Seller's system and the water users to be served by the said Purchaser, and

Whereas, by Ordinance No. 556-06 enacted on the 5th day of June, 2006, by the Seller, the sale of water to the Purchaser in accordance with the provisions of the said Ordinance was approved, and the execution of this contract by the Mayor, and attested by the City Clerk, was duly authorized, and

Whereas, by Wilmore City Council action on November 6, 2006, the "Water Purchase Agreement" dated June 5, 2006 was amended as reflected by the wording of this Contract, and

Whereas, by motion of the Board of Commissioners of the Purchaser, enacted on the 6 day of DECEMBER, 2006, the purchase of w

accordance with the terms set forth in this contract were approved, and the execution of this contract by the Chairman, and attested by the Secretary was duly authorized.

NOW THEREFORE, in consideration of the foregoing and the mutual agreements hereinafter set forth,

A. The Seller Agrees:

1. To furnish the Purchaser at the point of delivery, during the term of this contract or any renewal or extension thereof, potable treated water meeting applicable purity standards of the Public Service Commission and Division of Water, Kentucky Department of Natural Resources in such quantity as may be required by the Purchaser, but not to exceed an average of 600,000 gallons per day.

2. That water will be furnished at a reasonable constant pressure calculated at 60 PSI from an existing 12 inch main supply at a point located on said existing 12" main that spans from Luce Center Water Tower northerly to the Veterans Center Water Tower. If a greater pressure than that normally available at the point of delivery is required by the Purchaser, the cost of providing such greater pressure shall be borne by the Purchaser. Emergency failures of pressure or supply due to main supply line breaks, power failure, flood, fire and use of water to fight fire, earthquake or other catastrophe shall excuse the Seller from this provision for such reasonable period of time as may be necessary to restore service.

3. The Developer will furnish and install, and the Seller will operate and maintain at its own expense at point of delivery, the necessary metering equipment, including a meter house or pit, and required devices of standard type for properly measuring the quantity of water delivered to the Purchaser and to calibrate such metering equipment whenever requested by the Purchaser but not more frequently than once every six months.

(12) months. A meter registering not more than two percent (2%) above or below the test shall be deemed to be accurate.

The previous readings of any meter disclosed by test to be inaccurate shall be corrected for the months previous to such test, and extending back to the previous accuracy test, in accordance with the percentage of inaccuracy found by the latest test. If any meter fails to register for any period, the amount of water furnished during such period shall be deemed to be the amount of water delivered in the corresponding period immediately prior to the failure, unless Seller and Purchaser agree upon a different amount. The metering equipment shall be read on the last Friday of each month. An appropriate official of the Purchaser at all reasonable times shall have access to the meter for the purpose of verifying its readings.

4. To furnish the Purchaser at the above address not later than the first day of each month, with an itemized statement of the amount of water furnished the Purchaser during the preceding month.

B. <u>The Purchaser Agrees</u>:

To pay the Seller per the readings obtained from the master meter, not later than the twelfth day of each month, for water delivery in accordance with the following schedule of rates:

a. $8.57 for the first 2000 gallons, which amount shall also be the minimum rate per month.

b. $5.29 per 1000 gallons for water in excess of 2000 gallons but less than 5000 gallons.

c. $4.69 per 1000 gallons for water in excess of 5000 gallons but less than 10,000 gallons.

d. $4.27 cents per 1000 gallons for water in excess of 10,000 gallons

C. It is further mutually agreed between the Seller and Purchaser as follows:

1. That this contract shall extend for a term of forty (40) years from the date of the initial delivery of any water as shown by the first bill submitted by the Seller to the Purchaser and, thereafter may be renewed or extended for such term, or terms, as may be agreed upon by the Seller and Purchaser.

2. That the Seller will, at all times, operate and maintain its system in an efficient manner and will take such action as may be necessary to furnish the Purchaser with quantities of water required by the Purchaser. Temporary or partial failures to deliver water shall be remedied with all possible dispatch. In the event of an extended shortage of water, or the supply of water available to the Seller is otherwise diminished over an extended period of time, the supply of water to Purchaser's customers shall be reduced or diminished in the same ratio or proportion as the supply to Seller's customers is reduced or diminished.

3. That the provisions of this contract pertaining to the schedule of rates to be paid by the Purchaser for water delivery are subject to modification, in the same manner and rate as Seller's other customers within the corporate limits of the City of Wilmore. Any increase or decrease in rates shall be based on a demonstrable increase or decrease in the costs of performance hereunder. Other provisions of this contract may be modified or altered by mutual agreement expressed in writing and duly adopted by the parties.

4. That this contract is subject to such rules, regulations or laws as may be applicable to similar agreements in this State and the Seller and Purchaser will collaborate in obtaining such permits, certificates, or the like, as may be required to comply therewith.

5. That in the event of any occurrence rendering the Purchaser incapable of performing under this contract, any successor of the Purchaser, whether the result of legal process, assignment, or otherwise, shall succeed to the rights of the Purchaser hereunder.

In witness whereof, the parties hereto, acting under the authority of their respective governing bodies, have caused this contract to be duly executed in four (4) counterparts, each of which shall constitute an original.

Seller: City of Wilmore

By: Harold L. Rainwater

Harold L. Rainwater, Mayor

Per Ordinance No. 556-06
Date: November 6, 2006

Attest:

Colleen Brandenburg
City Clerk

Purchaser: Jessamine South Elkhorn Water District

By: L. Nicholas Strong

L. Nicholas Strong, Chairman

Per Motion Dated: 12-6-06

Attest:

George Dale Robinson
Secretary

PUBLIC SERVICE COMMISSION
OF KENTUCKY
EFFECTIVE
2/18/2007
PURSUANT TO 807 KAR 5:011
SECTION 9 (1)

By _____
Executive Director

JESSAMINE SOUTH ELKHORN WATER DISTRICT

117 South Main Street
Nicholasville, Kentucky 40356
(859) 881-0589

❖❖❖❖❖

Standard Specifications and Standard Details for Proposed Watermain Extensions

❖❖❖❖❖

Prepared By:

HORNE ENGINEERING, INC.
Engineers - Land Surveyors - Planners
216 South Main Street
Nicholasville, Kentucky 40356
Phone: (859) 885-9441

2002

DIVISION 0
CONTRACTOR REQUIREMENTS

SECTION 00700

GENERAL CONDITIONS

PART 1 - GENERAL

1.01 PURPOSE

A. The purpose of this document is to provide information and guidance to developers, contractors, and design engineers in the construction of water facilities that shall be owned or connected to Jessamine South Elkhorn Water District. This document shall be adhered to in its entirety.

B. A separate document that outlines the fees and procedures to connect to the system can be obtained at the Jessamine South Elkhorn Water District's office, 117 South Main Street, Nicholasville, KY 40356.

C. See Division 1 for additional general requirements.

1.02 DEFINITIONS

OWNER: Jessamine South Elkhorn Water District.

CONTRACTOR: Any developers, contractors, or other entity constructing water line extensions to be owned by Jessamine South Elkhorn Water District.

ENGINEER : Home Engineering, Inc.

1.03 OBLIGATION OF THE CONTRACTOR

The Contractor shall perform and complete the work to the satisfaction of the OWNER and in accordance with these specifications. The CONTRACTOR shall conduct his work to minimize interference with public and private business and traffic. The CONTRACTOR shall, at his own expense wherever necessary or required, provide barricades, flagmen, maintain lights, and take other precautions as may be necessary to protect life, property, adjacent building and structures. The CONTRACTOR shall be liable for all damages and injuries received or sustained by any person, persons or property in consequence of any neglect in safeguarding the work or by any act of neglect or misconduct by the CONTRACTOR or agents of the CONTRACTOR, subcontractors, employees or workmen.

The CONTRACTOR shall be responsible to contact all utilities to ascertain whether or not any utilities are present in the proposed pipeline area. Further, the CONTRACTOR shall be responsible to take all steps necessary to protect all utilities from damage. Should damage occur, the CONTRACTOR shall immediately take steps to minimize disruption and shall cause all necessary repairs to be made. Further, the CONTRACTOR shall indemnify the OWNER of any and all liabilities and legal action to so defend.

1.04 COOPERATION

Cooperation with the OWNER concerning construction activities is required.

1.05 DEFECTIVE MATERIAL AND WORKMANSHIP

Material not in accordance with this document or defective work may be rejected ENGINEER or OWNER. Failure by the OWNER to reject defective work shall not b construed as an acceptance of same.

1.06 NOTIFICATION

The CONTRACTOR shall give the OWNER or OWNER'S representative a minimur of 24 hours notice before starting construction.

1.07 INSPECTION

The OWNER or OWNER'S representative shall be present during construction. I addition to periodic inspection, a final inspection will be made by the OWNER o OWNER'S representative. A punchlist inspection shall be conducted and the fina inspection will be made prior to acceptance of any facilities and only after a construction is complete. As part of the final inspection, the OWNER shall be provide a complete set of "As-built" plans. All vaults, valve boxes, meter pits and the like sha be cleaned of dirt, mud, and other foreign matter. The CONTRACTOR shall provid the labor as required to complete the punchlist prior to final inspection. Access to the construction site and construction records shall be provided at all times to inspectors

1.08 EXISTING UTILITIES

Special precautions shall be taken by the CONTRACTOR to avoid damage to ex overhead and underground utilities.

Where existing utilities and appurtenant structures, either underground o aboveground, are encountered, they shall not be disturbed unless necessary. In such case, the utilities shall be replaced in as good or better condition than found and the utility company shall be notified prior to disturbance.

The CONTRACTOR or his representatives, shall bear the entire responsibility for locating, avoiding, and repairing damaged existing utilities.

1.09 CONFLICTING UTILITIES

All buried, potentially conflicting, utility lines or other facilities shall be exposed to determine requirements for maintaining required clearances prior to excavation. Where clearances cannot be obtained by minor vertical adjustments in planned grades, the CONTRACTOR shall notify the OWNER or OWNER's representative prior to proceeding.

1.10 WATER MAIN, GRAVITY SEWER AND FORCE MAIN CLEARANCE

A. Water mains shall be separated by a minimum horizonal distance of ten feet when constructed parallel to gravity sewers or sewage force mains. For gravity sewers, approval may be granted on a case-by-case basis by the Kent

Division of Water where such a clearance is not practical. In this case, the waterline must be located a minimum of 18" above the top of the sewer pipe and on undisturbed trench bottom, or in a separate trench on either side of the gravity sewer. This deviation is not allowed for force mains.

B. Water mains crossing sewers or force mains shall have an out-to-out vertical clearance of 18" and a full length of water pipe shall be located to maximize joint distance from the sewer or force main. Where it is impractical to obtain such clearance, approval may be granted on a case-by-case basis if the water main is encased for a distance of ten feet either side of the force line and has a minimum clearance of six inches. Encasement may be PVC pipe and shall be approved by the ENGINEER.

1.11 SAFETY AND SUPERVISION OF WORK

A. The CONTRACTOR shall have total responsibility for safety on the construction site, including maintaining safe work procedures and methods. At no time will the ENGINEER or OWNER assume such responsibility, nor shall they direct or supervise the CONTRACTOR's personnel, subcontractors, or suppliers.

B. Inspection services provided by the OWNER are to monitor if the work is completed in conformance with the drawing and specifications. The inspector's presence in no way relieves the CONTRACTOR of safety and supervision responsibilities; nor conformity with drawings and specifications; no making the OWNER or ENGINEER as insurer of the CONTRACTOR'S performance.

1.12 PERMITS, EASEMENTS, AND RIGHTS-OF-WAY

The CONTRACTOR shall make application for, obtain, and pay fees for all licenses, permits, easements, and rights-of-way, including railroad permits (where applicable). The CONTRACTOR shall be required to comply with all State and municipal ordinances, laws and/or codes which may apply to same.

1.13 CONTRACTOR'S CERTIFICATION

A. The CONTRACTOR shall certify, upon completion of project construction, that all work was completed in accordance with drawings and specifications, bearing OWNER'S approval.

1.14 WARRANTY

The CONTRACTOR shall warrant the material and workmanship for a period of one hear from the date of acceptance by the OWNER.

- END OF SECTION -

DIVISION 1
GENERAL REQUIREMENTS

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 WORK INCLUDED

Shop drawings, descriptive literature, product data and samples (when samples are specifically requested) for all manufactured or fabricated items shall be submitted by the CONTRACTOR to the ENGINEER for examination and review in the form and in the manner required by the ENGINEER. All submittals shall be furnished in at least six (6) copies and shall be checked and reviewed by the CONTRACTOR shall indicate his approval before submission to the ENGINEER. The review of such Drawings by the ENGINEER shall not be construed as a complete check, but will indicate only that the general method of construction and detailing is satisfactory. Review of such Drawings will not relieve the CONTRACTOR of the responsibility for any errors which may exist as the CONTRACTOR shall be responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all Work.

1.02 RELATED SECTIONS

A. General Conditions

1.03 DEFINITIONS

A. The term "submittals" shall mean Shop Drawings, manufacturer's drawings, catalog sheets, brochures, descriptive literature, diagrams, schedules, calculations, material lists, performance charts, test reports; office and field samples, and items of similar nature which are normally submitted for the ENGINEER's review for conformance with the design concept and compliance with the Contract Documents.

1.04 GENERAL CONDITIONS

A. Review by the ENGINEER of Shop Drawings or submittals of material and equipment shall not relieve the CONTRACTOR from the responsibilities of furnishing same of proper dimension, size, quality, quantity, material and all performance characteristics to efficiently perform the requirements and intent of the Contract Documents. Review shall not relieve the CONTRACTOR from responsibility for errors of any kind of the Shop Drawings. Review is intended only to assure conformance with the design concept of the project and compliance with the information given in the Contract Documents.

B. Review of Shop Drawings shall not be construed as releasing the CONTRACTOR from the responsibility of complying with the Specifications.

1.05 GENERAL REQUIREMENTS FOR SUBMITTALS

A. Shop Drawings:

1. Shop drawings shall be prepared by a qualified detailer. Details sh be identified by reference to sheet and detail numbers shown Contract Drawings. Where applicable, show fabrication, layout, settir and erection details.

2. Shop Drawings are defined as original Drawings prepared by tl CONTRACTOR, subcontractors, suppliers, or distributors performir Work under this Contract. Shop Drawings illustrate some portion of tl Work and show fabrication, layout, setting, or erection details equipment, materials, and components. The CONTRACTOR sha except as otherwise noted, have prepared the number of review copie required for his distribution plus two (2) which will be retained by tl ENGINEER. Shop Drawings shall be folded to an approximate size 8 ½ " x 11" and in such a manner that the title block will be located the lower right-hand comer of the exposed surface.

B. Product data shall include manufacturer's standard schematic drawinc modified to delete information, which is not applicable to the project, and sha be supplemented to provide additional information applicable to the projec Each copy of descriptive literature shall be clearly marked to identify pertiner information as it applies to the project.

C. Where samples are required, they shall be adequate to illustrate ma equipment, or workmanship, and to establish standards by which comple Work is judged. Provide sufficient size and quantity to clearly illustrat functional characteristics of product and material, with integrally related part and attachment devices, along with a full range of color samples.

D. All submittals shall be referenced to the applicable item, section and divisior of the Specifications, and to the applicable Drawing(s) or Drawing schedule(s)

E. The CONTRACTOR shall review and check submittals, and shall indicate his review by initials and date.

F. If the submittals deviate from the Contract Drawing and/or Specifications, the CONTRACTOR shall advise the ENGINEER, in letter of transmittals of the deviation and the reasons therefore. All changes shall be clearly marked on the submittal with a bold red mark. Any additional costs for modifications shall be bome by the CONTRACTOR.

G. In the event the ENGINEER does not specifically reject the use of material or equipment at variance to that which is shown on the Drawings or specified, the CONTRACTOR shall, at no additional expense to the OWNER, and using methods reviewed by the ENGINEER, make any changes to structures, piping controls, electrical work, mechanical work, etc., that may be necessary to accommodate this equipment or material. Should equipment other than on which Design Drawings are based be accepted by the ENGINEER, Sh Drawings shall be submitted detailing all modification Work and equipment changes made necessary by the substituted item.

H. Additional information on particular items, such as Special Drawings, schedules, calculations, performance curves, and material details, shall be provided when specifically requested in the Technical Specifications.

I. Submittals for al electrically operated items (including instrumentation and controls) shall include complete wiring diagrams showing leads, runs, number of wires, wire size, color coding, all terminations and connections, and coordination with related equipment.

J. Equipment Shop Drawings shall indicate all factory or shop paint coatings applied by suppliers, manufacturers, and fabricators; the CONTRACTOR shall be responsible for insuring the compatibility of such coating with the field-applied paint products and systems.

K. Fastener specifications of manufacturer shall be indicated on Equipment Shop Drawings.

L. Where manufacturer's brand names are given in the Specifications for building and construction materials and products, such as grout, bonding compounds, curing compounds, masonry cleaners, waterproofing solutions, and similar products, the CONTRACTOR shall submit names and descriptive literature f such materials and products he proposes to use in the Contract.

M. No material shall be fabricated or shipped unless the applicable Drawings or submittals have been reviewed by the ENGINEER and returned to the CONTRACTOR.

N. All bulletins, brochures, instructions, parts lists, and warranties packaged with and accompanying material and products delivered to and installed in the project shall be saved and transmitted to the OWNER through the ENGINEER.

1.06 CONTRACTOR RESPONSIBILITIES

A. Verify field measurements, field construction criteria, catalog numbers and similar data.

B. Coordinate each submittal with requirements of Work and of Contract Documents.

C. Notify ENGINEER, in writing at time of submission, of deviation in submittal from requirements of Specifications and Drawings.

D. Begin no work, and have no material or products fabricated or shipped which require submittal review until return of submittals with ENGINEER's stamp and initials or signature indicating review.

- END OF SECTION -

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED SECTIONS

A. Section 01300 - Submittals.

1.02 MAINTENANCE OF DOCUMENTS

A. Maintain at jobsite, one copy of:

1. Contract Drawings.
2. Specifications.
3. Addenda.
4. Reviewed Shop Drawings.
5. Change Orders.
6. Other modifications to Contract.

B. Store documents in approved location, apart from documents used fo construction.

C. Provide files and racks for storage of documents.

D. Maintain documents in clean, dry, legible condition.

E. Do not use record documents for construction purposes.

F. Make documents available at all time for inspection by ENGINEER anc OWNER.

1.03 MARKING DEVICES

Provide colored pencil or felt-tip marking pen for all marking.

1.04 RECORDING

A. Label each document "PROJECT RECORD" on 2-inch high printed letters.

B. Keep record documents current.

C. Do not permanently conceal any work until required information has recorded.

D. Contract Drawings: legibly mark to record actual construction:

1. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.

2. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.

3. Field changes of dimension and detail.

4. Changes made by Change Order of field order.

5. Details not on original Contract Drawings.

E. Specifications and Addenda: legibly mark up each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actual installed.

2. Changes made by Change Order or field order.

3. Other matters not originally specified.

1.05 SUBMITTAL

A. At completion of project, deliver record documents to ENGINEER.

B. Accompanying submittal with transmittal letter, in duplicate, containing:

1. Date.

2. Project title and Contract number.

3. CONTRACTOR's name and address.

4. Title and sheet number of each record document.

5. Certification that each document as submitted is complete and accurate.

6. Signature of CONTRACTOR or his authorized representative.

- END OF SECTION -

SECTION 01730

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Compile product data and related information appropriate for OWNER maintenance and operation of equipment furnished under the Contrac Prepare operation and maintenance data as specified.

B. Instruct OWNER's personnel in the maintenance and operation of equipme and systems as outlined herein.

C. In addition to maintenance and operations data, the manufacturer's printe recommended installation practice shall also be included. If not part of th operations and maintenance manual, separate written installation instructior shall be provided, serving to assist the CONTRACTOR in equipmer installation.

1.02 RELATED REQUIREMENTS

A. Section 01300 - Submittals.

B. General Conditions.

1.03 OPERATION AND MAINTENANCE MANUAL

A. Every piece of equipment furnished and installed shall be provided witl complete operation and maintenance manual. These shall be detailed ir instructions to the OWNER'S personnel. They shall be attractively bound fo the OWNER'S records.

B. The manuals shall be submitted to the ENGINEER for review as to adequac and completeness and upon acceptance, provide six (6) copies each.

1.04 FORMS OF SUBMITTALS

A. Prepare data in the form of an instructional manual for use by OWNER'S personnel.

B. Format:

1. Paper size: 8 ½ " x 11".

2. Data: Manufacturer's printed data, or neatly typewritten.

3. Drawings:

(a) Provide reinforced punched binder tab, bind with text.

(b) Fold large drawings to the size of the data pages where feasible.

(c) For flow or piping diagrams that cannot be detailed on the standard size drawings, a larger, appropriate size drawing may be submitted.

4. Provide tab sheet for each separate product, or each piece of operating equipment.

(a) Provide typed description of product, and major component parts of equipment.

(b) Provide indexed tabs.

5. Cover: Identify each volume with types or printed title "OPERATIONS AN MAINTENANCE MANUAL". List:

(a) Title of project.

(b) Identify separate equipment as applicable.

(c) Identify general subject matter covered in the manual.

C. Binders:

1. Commercial quality, durable and cleanable, 3-hole, post type binders with adequate capacity and with oil and moisture resistant hard covers.

2. When multiple binders are used, correlate that data into related consistent grouping.

3. Labeled on the front cover and spline of each binder shall be the name of the Plant, the CONTRACTOR, Number and Volume Number.

1.05 CONTENT OF MANUAL

A. Neatly typewritten table of contents for each volume, arranged in systematic order.

1. CONTRACTOR, name of responsible principal, address and telephone number.

2. A list of each equipment required to be included, indexed to the content of the volume.

3. List, with each equipment, the name, address and telephone number of:

(a) Supplier of equipment.

(b) Subcontractor or installer.

(c) Maintenance contractor, as appropriate.

(d) Identify the area of responsibility of each.

(e) Local source of supply parts and replacement.

4. Identify each product by product name and other identifying sym set forth in Contract Documents.

B. Equipment Data:

1. Include only those sheets which are pertinent to the specific equipmen references to other sizes and type or models of similar equipment sha be deleted or lined out.

2. Annotate each sheet to:

(a) Clearly identify the specific equipment or part installed.

(b) Clearly identify the data applicable to the installation.

(c) Provide a parts list for all new equipment items, with catalo numbers and other data necessary for ordering replacemer parts.

(d) Delete references to inapplicable information.

C. Drawings:

1. Supplement equipment data with drawings as necessary to cle illustrate:

(a) Relations of component parts of equipment and systems.

(b) Control and flow diagrams.

2. Coordinate drawings with information in project record documents t assure correct illustrations of completed installation.

3. Do not use project record documents as maintenance drawings.

D. Written text, as required to supplement equipment data for th particula installation:

1. Organize in a consistent format under separate headings for differen procedures.

2. Provide a logical sequence of instruction for each procedure.

E. Copy of each warranty, bond, and service contract issued: Provide informatior sheet for OWNER'S personnel.

1. Proper procedures in the event of failure.

2. Instances which might affect the validity of warranties or bonds.

F. These manuals shall be delivered to the ENGINEER at the same time that the equipment to which it pertains is delivered to the site. The manuals must be approved by the ENGINEER before final payment on the equipment is made.

1.06 MAINTENANCE AND LUBRICATION SCHEDULES

A. The CONTRACTOR'S attention is directed to the General Conditions and Section 01300 for all requirements relative to the submission of Shop Drawings for the mechanical equipment. For all mechanical and electrical equipment furnished, the CONTRACTOR shall provide a list including the equipment name, address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained. In addition, a maintenance and lubrication schedule for each piece of equipment shall be submitted along with Shop Drawings. Submission shall be in six (6) copies. The lubrication schedule shall include the types of lubricant required for each scheduled item.

- END OF SECTION -

SECTION 01749

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Compile specified warranties and bonds.

B. Compile specified service and maintenance contracts.

C. Co-execute submittals when required.

D. Review submittals to verify compliance with Contract Documents.

1.02 RELATED REQUIREMENTS (AS APPLICABLE)

A. Warranty bond.

B. Performance and payment bonds.

C. Guaranty.

D. General warranty of construction.

E. Warranties and bonds required for specific products: as listed in othe Specification sections.

1.03 WARRANTY BOND

Warranty bond shall be issued upon acceptance by OWNER per Section 00618

1.04 WARRANTY BONDS OR CORPORATE GUARANTEES IN LIEU OF EXPERIENCE RECORD

A. When specifically requested in the products and installation general provisions of a Specification section for a particular piece of equipment of product, a record of five (5) years of successful full-scale operation shall be from existing facilities utilizing the equipment or product specified, in an application simila to the application intended for this project.

B. The manufacturer shall certify in writing to the CONTRACTOR that it has the required record of successful full-scale operation. This certification shall be submitted by the CONTRACTOR with his construction materials and/or equipment data list. In the event the manufacturer cannot provide the five (5) year certification of experience to the CONTRACTOR, the CONTRACTOR furnish within thirty (30) days after the notice of award, a warranty bond c. corporation guarantee from the equipment manufacturer written in the name of the CONTRACTOR and acceptable to the OWNER. The warranty bond or

corporate guarantee shall be kept in fore for five (5) years from the date of substantial completion of the Contract, less the number of years of experience the manufacturer may be able to certify to the ENGINEER. As a minimum, the bond or guarantee shall be in force for one (1) year after the date of substantial completion of the Contract. The warranty bond shall be written in an amount equivalent to the manufacturer's quotation, the CONTRACTOR'S installation cost plus 100 per cent (100%). The warranty bond or corporate guarantee will assure the OWNER that, in the judgement of the ENGINEER, the equipment does not perform its specified function, the CONTRACTOR shall remove the equipment and install equipment that will perform the specified function and the work by the CONTRACTOR shall be paid for by the warranty bond or corporate guarantee.

1.05 SUBMITTALS REQUIREMENTS

A. Assemble warranties, bonds, and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Furnish two(2) original signed copies.

C. Table of Contents: neatly typed, in orderly sequence. Provide complete information for each item:

1. Product, equipment, or Work item.

2. Manufacturer name, address and telephone number

3. Supplier name, address and telephone number.

4. CONTRACTOR name, address and telephone numb

5. Scope.

6. Date of beginning of warranty, bond, or service and maintenance contract.

7. Duration of warranty, bond, or service and maintenance contract.

8. Provide information for OWNER'S personnel:

(a) Proper procedure in case of failure

(b) Instances that might affect the validity of warranty or bond.

1.06 FORM OF SUBMITTALS

A. Prepare in duplicate packets.

B. Format:

1. Size 8 ½ " x 11", punch sheets for 3-ringed binder: fold larger sheets to fit into binders.

2. Cover: identify each packet with typed or printed title "WARRANTI AND BONDS". List:

(a) Title of the project.

(b) Date of project.

(c) CONTRACTOR name, address and telephone number.

C. Binders: commercial quality, 3-ring, with durable and cleanable plastic cove

1.07 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service duri progress of construction: submit documents within ten (10) days aft inspection and acceptance.

B. Otherwise, make submittals within ten (100 days after date of substanti completion, prior to final request for payment.

C. For items of work, where acceptance is delayed materially beyond the date substantial completion, provide updated submittal within ten (10) days aft acceptance, listing the date of acceptance as the start of the warranty perio

1.08 SUBMITTALS REQUIRED

Submit warranties, bonds, and service and maintenance contracts as specified respective sections of the Specifications. Additionally, the CONTRACTOR shall warrant ... entire Contract, including all concrete, paving, building, plumbing, HVAC, mechanical an electrical equipment to be free from defects in design and installation for one (1) year from th date of startup. In the event a component fails to perform as specified or is proven defectiv in service during the warranty period, the CONTRACTOR shall repair the defect without co to the OWNER.

- END OF SECTION -

SECTION 01750

SPARE PARTS AND MAINTENANCE MATERIALS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Spare parts and maintenance materials for routine maintenance and minor repairs shall be provided for indicated equipment items as specified in the respective technical sections of these Specifications.

PART 2 - PRODUCTS

2.01 SPARE PARTS

B. Required spare parts to be provided are listed in the following equipment Specifications:

1. **(Project specific and shall be determined by OWNER)**
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

C. Parts shall be coated to protect them from a moist atmosphere. All spare parts shall be plainly tagged, marked for identification and reordering, and shall be delivered properly boxed. Required identification includes (but is not limited to):

1. Name, address and telephone number of the manufacturer of equipment.
2. Name of the unit for which the part is intended.
3. Name of the spare part.
4. Name address and telephone number of the supplier of the spare part.
5. Manufacturer's catalogue and part number.

6. Precautionary information.

7. Any other identifying information deemed appropriate.

D. All spare parts for a single equipment item shall be crated together containers suitable for handling with hoisting equipment and designed f prolonged storage and stenciled to identify contents.

E. Where oil or grease lubricated equipment is concerned, sufficient oil or greas of types recommended by the equipment manufacturer shall be supplied f one (1) years's operations.

PART 3 - EXECUTION

3.01 SPARE PARTS

A. The CONTRACTOR shall furnish and deliver the spare parts to the OWNEI at such time as the OWNER may direct but prior to Contract expiration date Furnish to the ENGINEER for record purposes a list of spare parts delivered t the OWNER.

3.02 LUBRICATION

A. THE CONTRACTOR shall make suitable provision for the proper lubrication c all equipment furnished under this Contract. Accessible grease fittings shall b provided where required. A supply of oil, grease, and other lubricants of quality, as recommended by the manufacturer of the equipment, shall furnished. Lubricants shall be furnished in there original, unopened containers in sufficient quantity for initial fillings and for at least one (1) year of operation

-END OF SECTION -

DIVISION 2
SITE WORK

SECTION 02225

EXCAVATING, BACKFILLING, AND COMPACTING FOR UTILITIES

PART I - GENERAL

1.01 SUMMARY

A. Excavating of trenches.

B. Bedding of pipe.

C. Backfilling trenches.

1.02 RELATED SECTIONS

A. Section 02610 - Pipe and Fillings. PART 2-PRODUCTS

PART 2 - PRODUCTS

2.01 BEDDING AND BACKFILLING STONE

A. Crushed Stone material shall conform to the Kentucky Bureau of Highways Standard Specifications.

B. Bedding Stone: No. 9 Crushed Stone.

C. Backfill Stone: No. 9 Crushed Stone and DGA as specified hereinafter.

PART 3- EXECUTION

3.01 GENERAL REQUIREMENTS

A. Trenching may be accomplished by means of a backhoe, trenching machine or by hand depending on the construction area. At the Contractor's option, trenching by a trenching machine or by backhoe is acceptable except as noted below:

1. Where the pipe line parallels a state highway and is being installed within the limits of the shoulder, a trenching machine must be used whenever practicable.

2. Where the pipe line is being constructed close to other utilities, structures, building, or large trees, and it is reasonable to anticipate possible damage from the use of a backhoe, then trenching shall be made by hand methods.

B. Clearing - All trees, stumps, bushes, shrubbery, and abandoned concrete or masonry structures within the limits of the trench shall be removed by the Contractor and disposed of in a manner satisfactory to the land owner and in accordance with federal, state, and local regulations.

C. Bracing and Sheeting - In areas of unstable soils, bracing and sheeting shall be

provided to adequately protect the workers during pipe line installation.

1. All requirements of the Occupational Safety and Health Act (OSHA) shall be met during trenching and backfill operations.

2. When sheeting and bracing are required, the trench width shall not be less than specified herein. As backfill is placed, the sheeting shall be withdrawn in increments not exceeding one (1) foot and the void left by the withdrawn sheeting shall be filled and compacted.

3. The Engineer will not be responsible for determining requirements for bracing or sheeting.

D. Excavated materials shall be piled in a manner that will not endanger the Work and will avoid obstructing driveways and sidewalks. Gutters shall be kept clear or other satisfactory provisions made for street drainage.

E. No trenching for water line installation shall take place until all final site regrade work for roads, driveways, storm water channels, etc., has been completed.

3.02 TRENCHING

A. General:

1. The Contractor shall perform all excavation of every description and of whatever substances encountered, including clearing over the pipe line route. All excavations for the pipe line shall be open-cut except at paved city and county roads, state and federal highways, railroads and blacktop or concrete driveways which shall be bored unless otherwise approved by Engineer. Banks of excavations shall be kept as nearly vertical as possible.

2. Trench widths at the top of the pipe shall not be less than or greater than that given in the following table:

ALLOWABLE TRENCH WIDTHS

Pipe Diameter (inches)	Minimum Width (inches)	Maximum Width (inches)
4&less	16	28
6	18	30
8	20	32
10	22	34
12	24	36
14	26	38
16	28	40
18	30	42
20	32	44

B. Trench Depth:

1. The trench shall be excavated to a depth sufficient to provide 36 inches of cover over the pipe in non-traffic areas and 36 inches in traffic areas. In addition, excavation shall be carried to a minimum of six (6) inches below pipe grade in rock.

2. When it is necessary to install a pipe line below a roadway ditch, it shall be provided with a minimum of 36 inches of cover unless otherwise approved by Engineer.

C. All excavation will be unclassified. Unclassified excavation shall include all material encountered during excavation of trench to proper depth and width. It includes the removal of all shale, limestone, hardpan, soil, pavements, and solid rock and any other material which may be encountered in the trench.

D. Blasting for excavation will be permitted only when proper precautions are taken for the protection of persons and property. Any damage caused by the blasting shall be repaired by the Contractor at his expense. The Contractor's methods of blasting and procedure shall conform to federal, state, and local laws and municipal ordinances. The Engineer will not be responsible, nor direct in any way, blasting practices of the Contractor.

3.03 WATER PIPE BEDDING

A. The trench shall be excavated to a depth to allow a minimum of 36 inches cover over the top of the pipe.

B. Bedding material, in earth excavation areas, free from rocks, debris, or other foreign material may be used.

C. Bedding material, in rock excavation or vehicular traffic (including driveways) areas, shall be No. 9 Crushed Stone. The trench shall be overexcavated six (6) inches and filled with No. 9 Crushed Stone prior to laying pipe. In no case shall pipe be laid on solid or blasted rock.

D. Bedding material shall be placed from bottom of pipe in earth excavation, and from six (6) inches below bottom of pipe in rock excavation, to the centerline (springline) of the pipe. Bedding shall be compacted in layers not to exceed six (6) inches.

E. When the subgrade is found to be unstable or to include ashes, cinders, refuse, organic material, or other unsuitable material, such material shall be removed to the depth ordered by the Engineer and replaced under the directions of the Engineer with clean, stable backfill material. When the bottom of the trench or the subgrade is found to consist of material that is unstable to such a degree that, in the judgement of the Engineer it cannot be removed, a foundation for the pipe and/or appurtenance shall be constructed using piling, timber, concrete, or other materials at the direction of the Engineer.

3.04 WATER PIPE BACKFILLING

A. Initial backfill:

1. Initial backfill is defined as the material placed from the centerline (springline) of the pipe to 12 inches above the top of the pipe.

2. Initial backfill, in earth excavation areas, free from rocks, debris, or other foreign materials may be used.

3. Initial backfill, in rock excavation or vehicular traffic (including driveways) areas shall be No. 9 Crushed Stone.

B. Final backfill:

1. Final backfill is defined as the material placed from a point 12 inches above the top of the pipe to the original surface.

2. Final backfill, in earth excavation areas, free from rocks, debris, or other foreign materials may be used.

3. Final backfill, in rock excavation shall be excavated material free of large stones or rock fragments. No stone or fragment shall exceed four (4") inches in any dimension..

4. Final backfill, in vehicular traffic (including driveways) areas shall be No. 9 Crushed Stone up to the subgrade of vehicular traffic surface courses. See Sections 02507, 02510, or 02520 for specifications of surface courses.

-END OF SECTION -

SECTION 02507

CRUSHED STONE PAVING

PART 1 - GENERAL

1.01 SUMMARY

Crushed stone paving course, compacted.

1.02 REFERENCES

ASTM 033 - Aggregate for Concrete.

1.03 TESTS

Gradation of stone material will be performed in accordance with ASTM 033.

PART 2- PRODUCTS

2.01 MATERIALS

Crushed stone shall conform to ASTM C33, Type Dense Grade Aggregate (DGA), Type No. 57, Type No.2, and No. 610.

PART 3- EXECUTION

3.01 FIELD QUALITY CONTROL

A. Verify compacted subgrade.

B. Verify gradients and elevations of base are correct.

C. Beginning of installation means acceptance of existing conditions.

3.02 PLACING AND COMPACTING STONE PAVING

A. Spread stone material over prepared base to a total compacted thickness of 8 inches or as noted on the plans.

B. Stone shall be placed in two 4-inch lifts. The bottom lift shall be No. 2 stone, graded and compacted. The top lift shall be DGA placed and compacted to a total thickness as indicated.

C. Level surfaces to elevations and gradients indicated.

D. Adequately compact placed stone materials.

E. Add water to assist compaction. With an excess water condition, rework topping and aerate to reduce moisture content.

F. DGA material shall be machine pugged at the quarry, meeting moisture and gradation requirement of the Department of Highways.

- END OF SECTION -

SECTION 02510

ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.01 SUMMARY

A. Provide asphalt concrete paving for following applications and prepared subbase and compacted base.

1. Roads.
2. Parking areas.
3. Driveways.
4. Walkways.
5. Curbs.

B. Provide striping for parking, roadway, and handicapped markings.

1.02 SUBMITTALS

Submit to Engineer product data and test reports for approval.

1.03 QUALITY ASSURANCE

Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2- PRODUCTS

2.01 MATERIALS

A. Prime coat: Cut-back asphalt.

B. Tack coat: Emulsified asphalt.

C. Asphalt cement: AASHTO M226 and as required by local authorities.

D. Aggregate: Crushed stone.

E. Traffic paint: Quick-drying chlorinated-rubber alkyd type, color as approved.

F. Wheelstops: Precast concrete of uniform color and texture with steel stakes.

PART 3- EXECUTION

3.01 NEW PAVEMENT INSTALLATION

A. Asphalt/aggregate Mixture: Comply with local Kentucky Department of Highways Standard Specifications for Highways and Bridges. Class as required by loading and use.

B. Remove loose material from compacted subbase. Proof roll and check for ar requiring additional compaction. Report unsatisfactory conditions in writing.

C. Apply prime coat to prepared subbase. Apply tack coat to previous laid work and adjacent in-place concrete surfaces.

D. Place asphalt concrete at minimum temperature of 225° F in strips not less than 10 feet wide overlapping previous strips. Complete entire base course before beginning surface course.

E. Construct curbs to dimensions indicated or if not indicated to standard shapes. Provide tack coat between curb and pavement.

F. Begin rolling when pavement can withstand weight of roller. Roll while still hot to obtain maximum density and to eliminate roller marks.

C. Provide four (4) inch lane and striping paint in uniform, straight lines. Provide wheelstops where indicated and securely dowel into pavement. Protect work from traffic and damage.

H. Test in-place asphalt work for thickness and smoothness. Remove and replace defective work and patch to eliminate evidence of patching. Provide the following minimum thickness and smoothness unless otherwise greater thickness is required on the Drawings:

1. Subbase course: 4-inch No. 2 stone and 4-inch DGA.
2. Base course: 2-1/2-inch.
3. Surface course: 1-1/2-inch
4. Surface course smoothness: Plus or minus 1/8-inch in 10 feet. No ponding of water is acceptable.

3.02 REPLACEMENT PAVEMENT FOR UTILITIES

A. Sections of pavement shall be replaced as required to install the pipelines. Disturbed pavement shall be constructed to original lines and grades as detailed on the Drawings and in such manner as to leave all surfaces in fully as good or better condition than that which existed prior to these operations.

B. Prior to trenching, the pavement shall be scored or cut to straight edges along each side of the proposed trench to avoid unnecessary damage to the remainder of the paving. Edges of the existing pavement shall be recut and trimmed as necessary to square, straight edges after the pipe has been installed and prior to placement of the concrete trench cap.

C. Trenches shall be backfilled with No. 9 Crushed Stone up to the concrete cap.

D. Asphalt surface course shall be one course construction in accordance with applicable provisions of the Kentucky Department of Highways Standard Specifications, Section 402.

1. Placement and compaction of surface course shall be in accordance with Section 402 of the Kentucky Department of Highways Standard Specifications. Minimum surface course thickness after compaction shall be two (2) inches.

- END OF SECTION -

SECTION 02520

PORTLAND CEMENT CONCRETE PAVING

PART I - GENERAL

1.01 SUMMARY

A. Provide Portland cement concrete paving at following locations and prepared subbase and compacted base.

1. Driveways and vehicular entrances.
2. Walkways.
3. Curbs.

1.02 SUBMITTALS

Submit to Engineer product data, mix design, mock-ups, and test reports for approval.

1.03 QUALITY ASSURANCE

Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2- PRODUCTS

2.01 MATERIALS

A. Concrete mix design: Conform to specific mixes in Section 03300 as required for sidewalks, curbs, and vehicular ways.

B. Exposed aggregate paving:

1. Aggregate to match approved sample.
2. Retarder.

C. Reinforcing: 6 x 6, 1.9 x 1.9 welded flat wire mesh and ASTM A36 deformed steel bars.

D. Joints: Preformed joint fillers/sealers.

E. Finish:

1. Paving: Fine bristled stiff broom.
2. Exposed aggregate finish: Match approved sample.
3. Imprinting: Tools and hardeners by Bomanite Corp.
4. Curbs: Steel form finish, sponge float.

F. Minimum Thickness - Replacement to match existing or minimum, whichever is greater.

1. Driveways - 6 inches.
2. Vehicular entrances - 8 inches.
3. Roads - 12 inches.
4. Walkways - 4 inches.
5. Curbs - 6 inches.

PART 3- EXECUTION

3.01 INSTALLATION

A. Proof roll subbase and check for unstable areas. Report unsatisfactory conditions in writing. Correct any soft or unstable areas.

B. Comply with concrete section for concrete mix, testing, placement, joints, tolerances, curing, repairs, and protection.

-END OF SECTION -

SECTION 02607

PRECAST CONCRETE VAULT

PART 1 - GENERAL

1.01 SUMMARY

Contractor shall furnish all materials, labor, and equipment to install precast concrete vault as shown on drawings or specified herein.

1.02 RELATED SECTIONS

A. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.

B. Section 02610 - Pipe and Fittings.

C. Section 02642 - Water Valves and Accessories.

PART 2 - PRODUCTS

2.01 PRECAST CONCRETE VALVE VAULT

A. Dimensions: Inside dimensions as shown on drawings.

B. Concrete Strength: Type I, 4000 psi at 28 days (85% strength prior to handling).

C. Wall Slabs: Minimum six (6) inches thick, minimum square inches of steel per vertical foot of wall shall be 0.0025 times the longest vault wall dimension, in inches, with strength to support H20 traffic loading.

D. Top and Bottom Slabs:

1. H20 traffic loading - per vault manufacturer; but in no case shall top and bottom slabs be less than eight (8) inches thick and have minimum #4 rebar placed on 6-inch centers, each way.
2. Non-traffic loading - Minimum top and bottom slab thickness of eight (8) inches with #4 rebar placed on 12-inch centers, each way.

E. Steel Reinforcement: Minimum steel reinforcement shall be as noted in Articles C and D of this paragraph (2.01). Minimum yield strength of reinforcement shall be 60,000 psi. Steel reinforcement shall have two (2) inch clearance to slab edge.

F. Conformance: Concrete shall conform to ACI 301. Reinforcement shall conform to ASTM A615, A616, orA617.

G. Manufacturer: Cloud Precast or approved equal.

C. Manufacturer: Cloud Precast or approved equal.

2.02 ACCESS HATCH

Access hatch shall be the size indicated and installed in the top slab of the valve vault at the locations shown on the drawings. Frames and covers shall be fabricated of aluminum. Fasteners shall be stainless steel. Covers shall be provided with lifting handle and safety latch to hold the cover in the 90° open position. Locking hasps shall be provided. Covers shall be of the checkered plate design. Access frame and cover shall be Model KD as manufactured by the Bilco Company, New Haven, CT, or approved equal. Frame and cover shall be located at sidewall centered over steps.

2.03 STEPS

Polypropylene (rebar reinforced) steps shall be cast-in-place in the vault wall beneath the hatch. Rebar reinforcement shall extend a minimum of 1-3/8 inches beyond slab's steel mat.

2.04 DRAIN

The vault shall be manufactured with a four inch diameter floor drain located in the low corner fitted with a metal grate cover. Vault shall be installed to drain to low corner at a maximum pitch of 1/8 inch/foot. The drain shall be piped to daylight or dry well. Drains piped to daylight shall be equipped with rodent screen and flap closure.

Where location makes drain installation impracticable a sump pit and pump shall be utilized.

2.05 PIPES AND VALVES

Pipe is specified in Section 02610. Valves are specified in Section 02642.

PART 3- EXECUTION

3.01 INSTALLATION

Vault shall be handled and installed in accordance with manufacturer's recommendations.

-END OF SECTION -

SECTION 02608

MANHOLES

PART 1 - GENERAL

1.01 SUMMARY

The Contractor shall furnish all labor, material, and equipment necessary to construct manholes for sanitary and/or storm sewers, including steps, frames, and covers, together with all appurtenances as shown and detailed on the Drawings and specified herein. Manhole materials shall be precast concrete as noted on the Drawings.

1.02 RELATED SECTIONS

A. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.

B. Section 03300 - Cast-in-Place Concrete.

1.03 DEFINITIONS

A. Standard Manhole: A standard manhole is defined as any manhole that is greater than 4 feet in depth, as measured from the invert of the manhole base at its center to the top (rim) of the manhole cover.

B. Shallow Manhole: A shallow manhole is defined as any manhole that is 4 feet or less in depth, as measured in the preceding sentence.

PART 2- PRODUCTS

2.01 CONCRETE MANHOLES - GENERAL

A. Manholes shall conform in shape, size, dimensions, materials, and other respects as shown on the Drawings or specified herein.

B. All concrete manholes shall have precast reinforced concrete developed bases. No other type of base will be allowed. Invert channels shall be factory constructed when the base is made. Sloping invert channels shall be constructed whenever the difference between the inlet and outlet elevation is 2 feet or less.

C. The concrete manhole walls (barrels and cones) shall be precast concrete sections. The top of the cone shall be built of reinforced concrete adjustment rings to permit adjustment of the frame to meet the finished surface. Minimum strength of the concrete for the precast sections shall be 4,000 psi at the time of shipment.

D. For concrete manholes, the inverts of the developed bases shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent, within the manhole, to the centerlines of adjoining pipelines.

E. For concrete manholes, the cast-iron frames and covers shall be the standard frame and cover as indicated on the Drawings and specified herein.

F. Manholes shall be manufactured by Cloud Precast, or approved equal.

2.02 PRECAST CONCRETE SECTIONS

A. Precast concrete sections and appurtenances shall conform to the ASTM Standard Specifications for Precast Reinforced Concrete Manhole Sections, Designation C478, latest revision, with the following exceptions and additional requirements.

B. The base section shall be monolithic for 4-foot diameter manholes. Manholes with diameter of 5 feet or larger shall have base slab.

C. The wall sections shall be not less than 5 inches thick.

D. Type II cement shall be used except as otherwise permitted.

E. Joints between sections shall be made watertight through the use of rubber 0-ring gaskets or rubber profile gaskets such as Forsheda 138. Gaskets shall conform to the ASTM Standard C-443, latest revision. Rope mastic or butyl mastic sealant shall be installed per manufacturer's direction.

F. Butyl mastic sealant shall be installed between the concrete cone section, any cast iron adjusting sections or rings, and cast iron frame.

2.03 CONCRETE MANHOLE - FRAMES AND COVERS

A. The Contractor shall furnish all cast iron manhole frames and covers conforming to the Drawings or as specified herein.

B. The castings shall be of good quality, strong, tough, evengrained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.

C. All casting shall be thoroughly cleaned and subject to a careful hammer inspection.

D. Castings shall be at least Class 25 conforming to the ASTM Standard Specifications for Gray Iron Casting, Designation A48, latest revision.

E. Unless otherwise specified, manhole covers shall be 22-3/4 inches in diameter, weighing not less than 350 pounds per frame and cover. Manhole covers shall set neatly in the rings, with contact edges machined for even bearings and tops flush with ring edge. They shall have sufficient corrugations to prevent slipperiness. The covers shall have two (2) pick holes about 1-1/4 inches wide and 1/2 inches deep with 3/8-inch undercut all around. Covers shall not be perforated. Frames and covers shall be J.R. Hoe and Sons, Mc-350, or approved equal.

F. All covers shall be marked, in the center in large letters "SANITARY SEWER" or "STORM SEWER", as applicable.

2.04 MANHOLE STEPS (CONCRETE MANHOLES)

Manholes steps shall be the polypropylene plastic type reinforced with a 1/2" diameter deformed steel rod. The step shall be 10-3/4" wide and extend 5-3/4" from the manhole wall. Steps shall line up over the downstream invert of the manhole. The steps shall be embedded into the manhole wall a minimum of 3-3/8 inches. Steps shall be uniformly spaced at 12-inch to 16-inch intervals.

PART 3- EXECUTION

3.01 FABRICATION - PRECAST SECTIONS

A. Manhole sections shall contain manhole steps accurately positioned and embedded in the concrete when the section is cast.

B. Sections shall be cured in an enclosed curing area and shall attain a strength of 4,000 psi prior to shipment.

C. No more than two (2) lift holes or inserts may be cast or drilled in each section.

D. Flat slab tops shall have a minimum thickness of 6 inches and reinforcement in accordance with ASTM C478.

E. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the precast sections.

F. Acceptance of the sections will be on the basis of material tests and inspection of the completed product and test cylinders if requested by the Engineer.

C. Cones shall be precast sections of similar construction.

3.02 SETTING PRECAST MANHOLE SECTIONS

A. Precast-reinforced concrete manhole sections shall be set so as to be vertical and with sections and steps in true alignment.

B. Rubber gaskets, rope mastic or butyl mastic sealant shall be installed in all manhole joints in accordance with the manufacturer's recommendations.

C. All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose or concrete grout.

3.03 ADJUSTING MANHOLE FRAMES AND COVERS TO GRADE

A. Except where shown on the Drawings, the top of the precast concrete eccentric cone of a standard manhole or the top of the flat slab of a shallow manhole shall terminate 4 inches below existing grade in an unpaved non-traffic area except in a residential yard and 13 inches below existing grade in a paved or unpaved traffic area and in a residential yard. The remainder of the manhole shall be adjusted to the required grade as described hereinafter in paragraphs B and C of this article.

B. When a manhole is located in an unpaved non-traffic area other than in a residential yard, the frame and cover shall be adjusted to an elevation 3 inches to 5 inches above the existing grade at the center of the cover. If field changes have resulted in the installed manhole invert elevation to be lower than the invert elevation shown on the Drawings, the adjustment to an elevation of 3 inches to 5 inches above existing grade shall be accomplished by the use of precast concrete or cast iron adjusting rings. If field changes have resulted in the completed manhole invert to be greater than the invert shown on the Drawings and the cover higher than 5 inches above existing grade, then the top of the eccentric cone, when used, or the top of the barrel section, when used, shall be trimmed down so that the manhole cover, after installation, is no greater than 5 inches above existing grade at the center of the cover. The area around the adjusted frame and cover shall be filled with the required material, sloping it away from the cover at a grade of 1 inch per foot.

C. When a manhole is located in a bituminous, concrete, or crushed stone traffic area, or in a residential yard, the frame and cover shall be adjusted to the grade of the surrounding area by the use of precast concrete or cast iron adjusting rings. The adjusted cover shall conform to the elevation and slope of the surrounding area. If field changes have resulted in the installed manhole invert elevation to be so much higher than the invert elevation shown on the Drawings that the top of the eccentric cone, when used, or the top of the flat slab, when used, is less than the thickness of the frame and cover 7 inches from the grade of the surrounding area, then the top of the cone or barrel section shall be trimmed down enough to permit the cover, after installation, to conform to the elevation and slope of the surrounding area. After installation, the inside and outside surfaces of the precast concrete adjusting rings shall receive a waterproofing bitumastic coating.

1. The Contractor shall coordinate elevations of manhole covers in paved streets with the Owner. If resurfacing of the street in which sewers are laid is expected within two (2) months, covers shall be set 1-1/2 inches above the existing pavement surface in anticipation of the resurfacing operations.

3.04 ADJUSTING SECTIONS

Only clean adjusting sections shall be used. Each adjusting section shall be laid in a bead of butyl mastic sealant and shall be thoroughly bonded

3.05 SETTING MANHOLE FRAMES AND COVERS

A. Manhole frames shall be set with the tops conforming to the required elevations set forth hereinbefore. Frames shall be set concentric with the top of the concrete and in a full bead of butyl mastic sealant so that the space between the top of the masonry and the bottom flange of the frame shall be completely watertight.

B. Manhole covers shall be left in place in the frames at all times, except when personnel is actually in the manhole.

- END OF SECTION -

SECTION 02610

PIPE AND FITTINGS

PART 1 - GENERAL

1.01 SUMMARY

A. The Contractor shall furnish all labor, material, and equipment necessary to install water piping and appurtenances as shown on the drawings and specified herein.

B. This section describes several types of pipe which may or may not apply to the current project. Selected pipe materials will be identified on the drawings.

1.02 RELATED SECTIONS

A. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.

B. Section 02642 - Water Valves and Accessories.

C. Section 02630 - Casing Pipe.

D. Section 02675 - Disinfection of Water Distribution Systems.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Pipe and accessories shall be unloaded at the point of delivery, hauled to, and distributed at the site of the project by Contractor in such a manner to avoid damage to the materials. Whether moved by hand, skidways, or hoists, materi shall not be dropped or bumped against pipe or accessories already on the grou or against any other object.

B. In distributing material at the construction site, each piece shall be unloaded as near the installation point as possible.

C. Pipe shall be handled in such a manner as to avoid damage to the ends. When such damaged pipe cannot be repaired to the Engineer's satisfaction, it shall be replaced at the Contractor's expense. The interior of all pipe and accessories shall be kept free from dirt and foreign matter at all times. The interior of all pipe and accessories shall be checked for dirt and debris and, if necessary, thoroughly cleaned before use in the project.

PART 2- PRODUCTS

2.01 DUCTILE IRON PIPE AND FITTINGS

A. Scope: This article covers the design and manufacture of ductile iron centrifugally cast in metal molds and ductile iron fittings.

B. Specific Requirements: Ductile iron pipe shall be furnished cement lined unless otherwise noted on the drawings or in other sections of these specifications. Ductile iron pipe shall be furnished with rubber gasket push-on joints except as may otherwise be noted on the drawings or in difficult working areas and approval of the Engineer.

1. Pressure class shall be 350 psi for pipe sizes 20 inches or smaller and pressure class 250 psi for pipe sizes larger than 20 inches for mechanical and push-on joint pipe.

2. Thickness design of ductile iron shall conform in all aspects to the requirements of ANSI/AWWA C150/A 21.50 latest revision.

3. Manufacture and testing of ductile iron pipe shall conform in all aspects to the requirements of ANSI/AWWA C151/A 21.51 latest revisions.

4. Cement mortar lining with bituminous seal coat shall conform to the requirements of ANSI/AWWA C104/A 21.4, latest revision for cement-mortar lining for ductile iron pipe, gray iron pipe, and fittings for water. Bituminous outside coating shall be in accordance with ANSI/AWWA C151/A 21.51 for pipe and ANSI/AWWA CI 10/A 21.10 for fittings.

5. Fittings and gaskets for mechanical and push-on joint ductile and cast iron pipe shall conform to the latest revisions of ANSI/AWWA 0110/A 21.10 for mechanical and push-on joint fittings, ANSI/AWWA C111/A 21.11 for gaskets, and ANSI/AWWA CI 53/A 21.53 for mechanical and push-on joint compact fittings. Mechanical and push-on joint fittings shall have pressure class rating of 350 psi for sizes 20 inches and smaller and 250 psi for sizes larger than 20 inches.

6. All ductile and cast iron fittings shall be ductile iron grade 80-60-03 in accordance with ASTM A339-55.

7. Flanged ductile iron pipe shall conform to the latest revisions of ANSI/AWWA C115/A 21.15. Bolt pattern of flange shall be in accordance with ANSI/AWWA C115/A 21.15 (which is equivalent to ASME/ANSI B16.1, Class 125 flange bolt pattern). Pipe shall have pressure class 250 rating. Gaskets shall be synthetic rubber ring gaskets with a thickness of 1/8 inch. Nuts and bolts shall be in accordance with ASME/ANSI B18.2.1, ASMEIANSI B18.2.2, ASME/ANSI B1.1, and ASTM A307.

8. Flanged fittings shall conform to the latest revisions of ANSI/AWWA C110/A 21.10 or ANSI/AWWA CI 53/A 21.53 (compact fittings). Gaskets shall be in accordance with ANSI/AWWA 0111/A 21.11. Fittings shall have pressure class rating of 250 psi. Bolt pattern of flange shall be in accordance with ANSI/AWWA 0115/A 21.15 (which is equivalent to ASME/ANSI B16.1, class 125 flange bolt pattern).

9. Restrained joint pipe and fittings shall be a boltless system equal to "Field-Lok" restraining gaskets or "TRFLEX Joint" as manufactured by U.S. Pipe & Foundry Company.

10. Ball and socket restrained joint pipe and fittings shall be a boltless system equal to USIFLEX manufactured by U.S. Pipe & Foundry Company or FLEX-LOK manufactured by American Pipe Company. Pipe shall have a working pressure rating of 250 psi and have a maximum joint deflection of 15°. Nominal laying lengths shall be in range of 18 feet 6 inches to 20 feet 6 inches.

11. Manufacturers: Pipe shall be as manufactured by U.S. Pipe & Foun Company, Clow, American Cast Iron Pipe Company, or equal.

12. Marking: Pipe or fitting shall have the ANSI/AWWA standard, pressure (or thickness) class, diameter, DI or ductile noted, manufacturer, and country and year where cast on the outside of the body.

2.02 CAST IRON PIPE AND FITTINGS

A. Scope: This article covers the design and manufacture of cast iron pipe centrifugally cast in metal molds and cast iron fittings for pipe sizes two inch (2") through sixty inch (60").

B. Specific Requirements: Cast iron pipe shall be centrifugally cast in metal molds and shall be furnished cement lined unless otherwise noted on the drawings or in other sections of the specifications. Cast iron pipe shall be furnished with rubber-gasket push-on joints except as may otherwise be noted on the drawings or in difficult working areas and approval of the Engineer.

1. Thickness class shall be class 50 for all pipe sizes.

2. Thickness design of cast iron shall conform in all aspects to t requirements of ANSI-AWWA 0101 latest revision.

3. Manufacture and testing of cast iron pipe centrifugally cast in metal molds shall comply with the requirements of the National Standard Institute and American Waterworks Association designation A21.6/AWWA 0106 latest revisions.

4. Cement mortar lining with bituminous seal coat shall conform to the requirements of ANSI/AWWA 0104/A 21.4, latest revision for cement-mortar lining for ductile iron pipe, gray iron pipe, and fittings for water. Bituminous outside coating shall be in accordance with ANSI/AWWA 0151/A 21.51 for pipe and ANSI/AWWA 0110/A 21.10 for fittings.

5. Fittings and gaskets for mechanical and push-on joint ductile and cast iron pipe shall conform to the latest revisions of ANSI/AWWA 0110/A 21.10 for mechanical and push-on joint fittings, ANSI/AWWA 0111/A 21.11 for gaskets, and ANSI/AWWA 0153/A 21.53 for mechanical and push-on joint compact fittings. Mechanical and push-on joint fittings shall have pressure class rating of 350 psi for sizes 20 inches and smaller and 250 psi for sizes larger than 20 inches.

6. All ductile and cast iron fittings shall be ductile iron grade 80-60-03 in accordance with ASTM A339-55.

7. Cast iron pipe and fittings should only be used when specifically noted on the drawings or ductile iron is not available in certain sizes.

2.03 PVC (POLYVINYL CHLORIDE) PIPE

A. Scope: This article covers the design and manufacture of PVC 1120 manufactured of CLASS 12454-B or CLASS 12454-C (cell classification) resin material with a hydrostatic-design-basis (HDB) rating of 4,000psi at 73.4 degree F (23 degree C).

B. Specific Requirements: PVC pressure pipe shall be furnished, constructed of materials and to the specifications of this section. The types of PVC pipe permitted for use on the project will be as noted on the drawings. The selected pipe will be designated either as PVC (ASTM) or PVC (AWWA) followed by an appropriate pressure rating or dimension ratio (DR or SDR).

1. PVC (ASTM) Pipe:

   a. PVC (ASTM) pipe shall be designed, manufactured, and tested to conform with the latest revision of ASTM D-2241, ASTM D-1784, and ASTM D-2672.
   b. Rubber gasketed joints shall conform to ASTM D-3139. The gaskets for the PVC pipe joint shall conform to ASTM F-477 and D-1869. Gaskets shall be integral bell joints with rubber O-ring seals.
   c. PVC (ASTM) pipe shall be furnished as SDR 17 for 250 psi or SDR 21 for 200 psi.

2. PVC (AWWA) Pipe:

   a. PVC (AWWA) pipe shall be designed, manufactured, and tested to conform with the latest revision of AWWA 0900 for pipes sizes 12 inches and smaller and AWWA 0905 for pipes sizes 14 inches and larger.
   b. Pipe shall have cast iron pipe equivalent ODs.
   c. Rubber gasketed joints shall conform to ASTM D-3139. The gaskets for the PVC pipe joint shall conform to ASTM F-477 and D-1869.
   d. PVC (AWWA) pipe shall be furnished as SDR 18 and 14 for Class 150 psi and 200 psi, respectively.

C. Rubber gasket joints shall provide adequate expansion to allow for a 50°change in temperature on one length of pipe. Lubrication for rubber connected couplings shall be water soluble, non-toxic, be non-objectionable in taste and odor and have no deteriorating affect on the PVC or rubber gaskets and shall be as supplied by the pipe manufacturer.

D. Standard laying lengths shall be 20 feet ± for all sizes. At least 95 percent of the total footage of pipe of any class and size shall be furnished in standard lengths, the remaining 5 percent in random lengths. Random lengths shall not be less than 10 feet long. Each standard and random length of pipe shall be tested to four times the class pressure of the pipe for a minimum of five (5) seconds. The integral bell shall be tested with the pipe.

E. PVC Pipe shall be NSF approved for potable water service and manufactured in accordance with ASTM standards.

F. All pipe and couplings shall bear identification markings that will remain legible during normal handling, storage, and installation, which have been applied in manner what will not reduce the strength of the pipe or the coupling or otherwise damage them. Pipe and coupling markings shall include the nominal size and OD base, material code designation, dimension ratio number, ASTM or AWWA Pressure Class, ASTM or AWWA designation number for this standard, manufacturer~s name or trademark seal (mark) of the testing agency that verified the suitability of the pipe material for potable-water service. Each marking shall be applied at intervals of not more than five (5) feet for the pipe and shall be marked on each coupling.

G. Fittings shall be ductile iron in accordance with Article 2.01 of this section. No PVC fittings are allowed.

PART 3- EXECUTION

3.01 LAYING DEPTHS

Water pipe shall be laid with a minimum cover of 36 inches unless otherwise noted on drawings.

3.02 PIPE SPACING

Water mains shall be laid at least 10 feet horizontally from any existing or proposed sewer. A sewer is defined as any conduit conveying fluids other th potable water. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot separation, this office may allow deviation on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer. This deviation will not be allowed for force mains.

Water mains crossing sewers shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. At crossings, one full length of the water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required.

3.03 THRUST BLOCKING

A. Concrete: Concrete thrust blocking shall be installed as shown on drawings.

B. Hydrants:

The bowl of each hydrant shall be well braced against a sufficient area of unexcavated earth at the end of the trench with concrete blocking, and it shall be tied to the pipe as shown on drawings.

1. Thrust restraint design pressure shall be equal to the test pressure.

C. Fittings:

All plugs, caps, tees, and bends shall be restrained and shall also be provided with thrust blocking.

D. Restraint Materials:

Thrust Blocking: Vertical and horizontal blocking shall be made of concrete having a compressive strength of not less than 3,500 psi after 28 days. Blocking shall be placed between solid ground and the fitting to be anchored; the area of bearing on the pipe and on the ground in each instance shall be that shown or directed by the Engineer. The blocking shall, unless otherwise shown or directed, be located to contain the resultant thrust force and allow the pipe and fitting joints to be accessible for repair

3.04 PIPE INSTALLATION

A. Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be lowered carefully into the trench by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to water line materials and protective coatings and linings. Under no circumstances shall water line materials be dropped or dumped into the trench. The trench should be dewatered prior to installation of the pipe.

B. The Contractor shall secure from the manufacturer an installation guide for the pipe being used. The Contractor shall in all cases adhere to the recommended installation procedures of the manufacturer except where those given herein are more stringent. The more stringent requirements shall be met.

1. Examination of Material - All pipe fittings, valves, hydrants, and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Engineer who may prescribe corrective repairs or reject the materials.

2. Pipe Ends - All lumps, blisters, and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit, or any foreign material before the pipe is laid.

3. Pipe Cleanliness - Foreign material shall be prevented from entering the pipe while it is being placed in the trench. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.

4. Pipe Placement - As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The

pipe shall be secured in place with approved backfill material. All jointing of pipe shall occur in the trench. In no case shall the pipe be jointed on the ground and lowered into the trench.

5. Pipe Plugs - At times when pipe laying is not in progress, the open ends of pipe shall be closed by a water tight plug or other means approved by the Engineer. The plug shall remain in place until the trench is pumped completely dry. Care must be taken to prevent pipe floatation should the trench fill with water.

C. All dead-end lines must be provided with a fire hydrant or a blow-off assembly per plan and/or detail.

D. At high points in water mains where air can accumulate, provisions shall be made to remove the air by means of automatic air relief valves.

E. Water lines within a 200 foot radius of oil or gasoline lines, underground storage tanks, petroleum storage tanks or pumping stations shall be constructed of ductile iron pipe. Pipe joint materials which are resistant to permeation of the petroleum products shall be used within the 200 foot radius.

F. Underwater crossing:

For underwater crossings for water surface greater than 15 feet in width, the following shall be provided:

1. The pipe shall be of special construction, per stream encasement detail.

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

3. Stream meter assembly shall be installed at indicated gate valve as shown per detail.

3.05 JOINT ASSEMBLY

A. Push-On Joints:

Push-on joints are to be assembled as follows:

1. Thoroughly clean the groove and bell socket and insert the gasket, making sure that it faces the proper direction and that it is correctly seated.

2. After cleaning dirt or foreign material from the plain end, apply lubricant in accordance with the pipe manufacturer's recommendations.

3. Be sure that the plain end is beveled; square or sharp edges may damage or dislodge the gasket and cause a leak. When pipe is cut in the field

bevel the plain end with a heavy file or grinder to remove all sharp edges. Push the plain end into the bell of the pipe. Keep the joint straight while pushing. Make deflection after the joint is assembled.

4. Small pipe can be pushed into the bell socket with a long bar. Large pipe requires additional power, such as a jack or lever puller. The supplier may provide a jack or lever pullers. A timber header shall be used between the pipe and jack to prevent damage to the pipe. Homing by backhoe bucket shall not be used unless approved by Engineer.

B. Mechanical Joints:

Mechanical joints are to be assembled as follows:

1. Wipe clean the socket and plain end. The plain end, socket, and gasket should be washed with a soap solution to improve gasket seating.

2. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end of the pipe.

3. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly.

4. Push the gland toward the bell and center it around the pipe with the gland lip against the gasket.

5. Align bolt holes and insert bolts with bolt heads behind the bell flange, and tighten opposite nuts to keep the gland square with the socket. Make deflection after joint assembly but before tightening the bolts.

6. Tighten the nuts in accordance with the manufacturer's recommendation and the following table:

MECHANICAL JOINTS - BOLT TORQUES	
Bolt Diameter (inches)	**Torque (feet - pound)**
5/8	45-60
3/4	75-90
1	86-100
1-1/4	105-120

3.06 PIPE CUTTING

Cutting of pipe for the insertion of valves, fittings or closure pieces shall be done in a neat workmanlike manner without creating damage to the pipe, linings, or coatings and in strict accordance to manufacturer's recommendation.

3.07 ASBESTOS CONCRETE MAIN TAPPING

During the process of tapping the asbestos concrete main, the contractor s! conform to OSHA regulations governing the handling of hazardous waste. Piece of asbestos concrete resulting from the tap shall be double bagged, placed in a rigid container, and disposed of in an approved landfill.

3.08 TESTING

A. After the pipe has been laid, all newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure test. In addition, a leakage test shall be conducted and may be concurrent with the pressure test.

B. Pressure Test:

1. Test pressure shall be equal to the pipe classification, i.e; class 200 equals a test pressure of 200 psi. The testing shall be conducted for an uninterrupted continuous period of twenty (24) four hours.

2. Each valved section of pipe shall be filled with water slowly and the specified test pressure, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer.

3. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not loca at all high points, the Contractor shall install corporation cocks at suc points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged, or left in place at the discretion of the Engineer.

4. All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, or valves that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated until it is satisfactory to the Engineer.

1.05 The watermain as constructed shall be tested between valved sections, but in no case shall the length of test section exceed 3500 feet. If so, the contract at no additional to the Owner, shall install an inline valve in order to reduce the test section to 3500' or less.

1.06 The Contractor shall furnish for the pressure testing a battery operated chart pressure gauge fitted with a continuous 24-hour, 8" diameter pressure recording chart. Such recording device shall be attached to the test section at a place and method approved by Engineer and shall remain in place and protected throughout the test period.

1.07 Pressure and leakage test shall not be commenced until all installation (i.e; fire hydrants, meter services, air-release assemblies, etc.) have be completed. All appurtenances shall be active and subject to the pressure/leakages tests.

C. Leakage Test:

1. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to re-establish the specified test pressure at the end of a twenty (24) four hour period after the air in the pipeline has been expelled and the pipe has been filled with water.

2. The pipe may be tested concurrently with the pressure test. No pipe installation will be accepted if the leakage is greater than that allowed in the following formula:

   $L = S \times D \times 5gal$

   Where:

   L = the allowable leakage (gallons)
   S = length of pipe tested ()feet
   D = nominal diameter of the pipe (inches)

3. When hydrants are in the test section, the test shall be made against the closed hydrant, with the hydrant gate-valve open.

4. Acceptance shall be determined on the basis of allowable leakage. If any pipe has leakage greater than allowed, the Contractor shall, at his own expense, locate and repair the defective material until the leakage is within the specified allowance.

5. All visible leaks are to be repaired regardless of the amount of leakage.

6. All appurtenances, such as meter services, air-release assemblies, stream meters, PRV vaults, etc. shall be opened and subjected to the pressure/leakage test.

- END OF SECTION -

SECTION 02630
CASING PIPE

PART 1 - GENERAL

1.01 GENERAL

Contractor shall provide all labor, materials, and equipment to construct, complete and in place, the casing pipe at the locations shown on the drawings.

1.02 RELATED SECTIONS

A. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.

B. Section 02610 - Pipe and Fittings.

PART 2- PRODUCTS

2.01 STEEL CASING PIPE

A. Casing pipe shall be steel (unless otherwise shown on the drawings), plain end, conforming to AWWA Specification C-200, latest revision. Steel for casing pipe shall have a minimum yield strength of 35,000 psi. Casing pipe shall neither be coated or wrapped. The inside diameter of the casing pipe shall be a minimum of 4 inches greater than the outside diameter of the carrier pipe joint or coupling.

B. The minimum wall thickness shall be in accordance with the following table:

STEEL CASING PIPE WALL THICKNESS		
Casing Diameter (inches)	Minimum Wall Thickness Under Railroads (inches)	Minimum Wall Thickness All Other Uses (inches)
16 and under	0.250	0.250
18	0.281	0.281
20 and 22	0.312	0.281
24	0.344	0.312
26	0.375	0.344
28	0.406	0.375
30	0.438	0.406
32	0.469	0.438
34and36	0.500	0.469

2.02 PIPELINE SPACERS

A. Pipeline spacers and accessories such as nuts and bolts shall be constructed of polyethylene and/or stainless steel. Other materials will not be accepted.

B. Carrier pipes installed inside casing pipes shall be centered throughout the length of casing pipe. Centering shall be accomplished by the installation of polyethylene pipeline spacers attached to the carrier pipe in such a manner as to prevent the dislodgement of the spacers as the carrier pipe is pulled or pushed through the casing pipe. Spacers shall be of such dimensions to provide: full supportive load capacity of the pipe and contents; of such thickness to allow installation and/or removal of the pipe; and to allow no greater than 1/2 inch movement of the carrier pipe within the cover pipe after carrier pipe is installed.

C. Spacers shall be located immediately behind each bell and at a maximum spacing distance as follow:

Carrier Pipe Diameter (inches)	Maximum Spacing (feet)
2-2-1/2	4
3-8	6
10-26	8
28	9
30	8

D. The materials and spacing to be used shall be accepted by the Engineer prior to installation. The polyethylene pipeline spacers shall be manufactured by Pipeline Seal and Insulator, Inc. (PSI), Raci Spacers, Inc., Advanced Products & Systems, Inc., or approved equal. Installation shall be in accordance with manufacturer's recommendations.

2.03 SEALING

After installation of the carrier pipe within the casing pipe, the ends of the casing shall be sealed in the following manner. An Ethylene Propylene Diene Monomer (EPDM) elastomeric membrane shall be wrapped around the end of the casing pipe in three layers and securely bound to the casing and the carrier pipe barrel with stainless steel bands. The EPDM membrane shall be 0.045 inches thick and have a tear resistance of 125 pounds/inches. The membrane shall be manufactured by Carlisle Tire & Rubber Company, Firestone Industrial Products Company, or an approved equal.

PART 3- EXECUTION

3.01 BORE AND JACK

A. Where designated on the drawings, crossings beneath state maintained roads, railroads, or other surfaces shall not be disturbed and are to be installed by boring and jacking of steel casing pipe followed by installation of the carrier pipe within the casing pipe. The Contractor shall provide a jacking pit, bore through the earth, and/or rock, jack the casing pipe into proper line and grade and then install the carrier pipe within the casing pipe.

B. The approach trench shall be large enough to accommodate one section of casing pipe, the jacks and blocking. The Contractor shall furnish and use adequate equipment to maintain the line and grade.

C. In no case shall the bore pit or exit ditch face be closer than six (6') feet from any pavement surface.

3.02 OPEN CUT

Where designated on drawings, the Contractor shall open the trench under the direction of the Engineer and install the casing pipe and complete the bedding, backfilling, and paved surface restoration as specified elsewhere herein.

3.03 DAMAGE

The cost of repairing damage which is caused by boring or open cutting the trench under a highway or railroad shall be borne by the Contractor.

- END OF SECTION -

SECTION 02642

WATER VALVES AND ACCESSORIES

PART 1 — GENERAL

1.01 SUMMARY

The Contractor shall furnish all labor, material, and equipment necessary to install valves together with all appurtenances as shown and detailed on the drawings and specified herein.

1.02 RELATED SECTIONS

A. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.

B. Section 02610- Pipe and Fittings.

1.03 SUBMITTALS

A. Complete shop drawings of all valves and appurtenances shall be submitted to the Engineer in accordance with the requirements of Section 01300.

B. The manufacturer shall furnish the Engineer two (2) copies of an affidavit stating that the valve and all materials used in its construction conform to the applicable requirements of the latest revision of the applicable AWWA Standard, and that all tests specified therein have been performed and that all test requirements have been met.

C. The Engineer shall be furnished two (2) copies of affidavit that the 'Valve Protection Testing" has been done and that all test requirements have been met.

D. The Engineer shall be furnished with two (2) copies of affidavit that inspection, testing, and rejection are in accordance with the latest revision of the applicable AWWA Standard.

PART 2— PRODUCTS

2.01 GATE VALVES

A. All gate valves shall be of the resilient seat type in accordance with the latest revision of AWWA C509 Standard. The valve body, bonnet, and gate castings shall be ductile iron. The valve shall have a non-rising stem (NRS), fully bronze mounted with 0-ring seals. Valve body and bonnet, inside and out, shall be fully coated with fusion bonded epoxy coating in accordance with AWWA C550 Standard. Valves shall have a rated working pressure of 200 psi.

B. Gate valves for buried service shall be furnished with mechanical joint end connections, unless otherwise shown on the drawings or specified herein. The end connection shall be suitable to receive ductile iron or PVC pipe.

C. Gate valves for meter pits, pump stations, stream crossing meters or other installations as shown on the drawings shall be furnished with flanged joint and connections, outside screw and yoke and handwheel operator. The gate valve shall have the direction of opening cast on the rim of the handwheel and provided with chain and lock.

D. All gate valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working pressure cast on the body of the valve.

E. Buried service gate valves shall be provided with a 2-inch square operating nut and shall be opened by turning to the left (counterclockwise). For valves having a burial depth in excess of 48", the valve shall be equipped with an extension such that the operating nut is 24" below the lid of the gate-valve box.

F. Buried service gate valves shall be installed in a vertical position with valve box as detailed on the drawings. They shall be set vertically and properly adjusted so that the cover will be in the same plane as the finished surface of the ground or street.

G. Valves shall be those manufactured by Mueller, M & H Valve Company, American, or approved equal.

2.02 CHECK VALVES

A. General: Check valves shall be all iron body bronze mounted, full opening swing type. Valve clapper shall swing completely clear of the waterway when valve is full open, permitting a "full flow" through the valve equal to the nominal pi diameter. They shall comply with AWWA Standard 0-508 latest revision. The valves shall be M & H Valve Company, Anniston, AL, Valve Type 159-Lever Weight, or approved equal.

B. Rating: Check valves shall be rated at 200 psi water working pressure, 350 psi hydrostatic test for structural soundness (2-inch through 12-inch) and 150 psi water working pressure and 300 psi hydrostatic test (sizes 14-inch through 30-inch). Seat tightness at rated working pressure shall be in accordance with valves shown in AWWA Standard 0509 for gate valves and fully conform to AWWA C508.

C. End Configurations: Check valves shall be furnished with 125-pound ANSI flanges ends with accessories.

D. Materials: All cast iron shall conform to ASTM A126 Class B. Castings shall be clean and sound without defects that will impair their service. No plugging or welding of such defects will be allowed. Clappers shall be all bronze for sizes through 4-inch and cast iron, neoprene faced for sizes 6-inch and larger. Hinge pins shall be 18-8 stainless steel rotating in bronze plugs. Bolts shall be electro-zinc plated steel with hex heads and hex nuts in accordance with ASTM A307 and A563, respectively.

E. Design: Check valves shall be constructed to permit top entry for comple removal of internal components without removing the valve from the line. Gland shall be 0-rings, 2-inch to 12-inch sizes and conventional in 14-inch to 30-inch

sizes. Check valves shall be equipped with adjustable outside lever and weight to accomplish faster closing and to minimize slamming effect. All valves 14-inch and larger shall have extended hinge pins for future addition of levers and springs required. Valves shall be suitable for installation in either horizontal or vertical position.

F. Painting: The inside and outside of all valves, together with the working parts except bronze and machined surfaces, shall be coated in accordance with the latest revision of AWWA 0550 Standard.

G. Marking: Marking shall be in accordance with AWWA 0508 and shall include size, working pressure, and cast arrow to indicate direction of flow, name of manufacturer, and year of manufacture.

2.03 SILENT CHECK VALVES

A. Silent check valves 3 inches and larger shall be iron body, bronze mounted with a stainless steel spring and Buna-N-Resilient seating. The valves shall be APCO Series 600 globe style or approved equal. The valve plug shall be brass and center guided at both ends with a through integral shaft and spring loaded.

B. Valves shall be designed for a water working pressure of 200 psi.

C. The seat and plug shall be replaceable manually in the field.

D. The flow area through the valve body shall be equal to or greater than the cross-sectional area of the equivalent pipe length.

E. Valves shall be capable of operating in either a horizontal or vertical position.

2.04 ELECTRIC CHECK VALVE

A. Operation: The pump control valve shall minimize pump starting and stopping surges by placing the pump "on line" and taking it "off line" slowly. The controls shall consist of adjustable independent opening and closing speed control valves, a cam operated limit switch, a three-way solenoid valve with a manual operator, and a two-way solenoid valve for power failure quick closure.

B. Design:

1. The pump control valve shall be flanged globe body, fully bronze mounted, external pilot operated, with free floating piston (operated without springs diaphragm, or levers), single seat with seat bore equal to size of valve.
2. The minimum travel of the piston shall be equal to 25 percent of the diameter of the seat and for true alignment (to correct lateral thrust and stem binding) the piston shall be guided above and below the seat a distance equal to no less than 75 percent of the diameter of the seat. The piston shall be cushioned and so designed as to insure positive closure.
3. The piston shall carry a contoured cushion device that will cause a gradual change in flow area as the valve approaches the seat. This cushion device

must move with the piston to minimize head loss when the valve is fully opened.

4. The valve shall be packed with resilient seating to insure tight closure and prevent metal to metal friction and seating; furnished with indicator rod, to show position of opening of the piston, and pet-cocks for attachment to valve body for receiving gauges for testing purposes.
5. The design shall be such that repairs and dismantling internally of main valve may be made without its removal from the line.
6. The installation shall incorporate the emergency close (or power-failure quick close) feature. This uses a second solenoid pilot valve to bypass the normal slow closing speed control valve on power outage to close the valve quickly (but still at a controlled rate).

C. Physical and Chemical Properties:

1. The 125-pound and 250-pound flanged assemblies shall conform to A.S.A. standards for flange thickness and drilling and wall thickness of body and caps. The valve shall be constructed of first class grey iron free from cold shuts, defective or spongy spots, and conforming to ASTM Specification A-126 Class B.
2. The bronze parts shall conform to ASTM specification B-62.

D. Test: The test before shipment may be witnessed by a representative of the Engineer for simulated field conditions and a cold hydrostatic test of at least 100 percent above the maximum pressure for which the valve is to operate.

E. Painting: All iron castings shall be coated on all sides with fusion bonded epoxy coating in accordance with AWWA 0550 Standard.

F. Manufacturer: The valve shall be Model 42 WARS Pump Control Valve as manufactured by the Ross Valve Mfg. Co., Inc., or approved equal.

2.05 BUTTERFLY VALVES (NON-BURIED)

A. For Valves 4-inch or Larger: The butterfly valves shall be DeZurik AWWA C504 series (or approvable equal), lug style, resilient seat, cast iron body and disk, stainless steel seating edge (ring) and shaft, Chloroprene seat, class 150B, and furnished with a manual handwheel actuator.

B. For Valves 3-inch or Smaller: The butterfly valves shall be DeZurik BGS series (or approvable equal), lug style, resilient seat, cast iron body and EPDM seat, stainless steel seat ring and shaft, ductile iron nickel plated disc, class 150, and furnished with a manual lever actuator.

C. Valves shall be fully coated, inside and out, with fusion bonded epoxy in accordance with the latest revision of AWWA 0550 Standard.

2.06 BUTTERFLY VALVES (BURIED)

For Valves 4-inch through 24-inch: The butterfly valve shall be DeZurik or M&H Valve Company AWWA C504 series (or approvable equal), mechanical joint, resilient seat, cast iron body and disk, stainless steel shaft and seating edge (ring), Chloroprene seat, Class 150B, cast iron housing with 2-inch operator nut in vertical position for use with a valve box. The valve shall be fully coated, inside and out, with fusion bonded epoxy in accordance with the latest revision of AWWA C550 Standard.

2.07 TAPPING VALVES

A. All tapping valves shall be of the resilient seat, gate valve type in accordance with the latest revision of AWWA C509 Standard. The valve body, bonnet, and gate castings shall be cast iron. The valve shall have a non-rising stem (NRS), fully bronze mounted with 0-ring seals. Valve body and bonnet, inside and out, shall be fully coated with fusion bonded epoxy coating in accordance with AWWA C550 Standard. Valves shall have a rated working pressure of 200 psi.

B. Valve shall be furnished with ANSI B16.1 flanged end with centering ring on tapping side. Outlet side shall be mechanical joint. All valves through 12 inches shall mate all sleeves through 12-inch outlet regardless of manufacturer.

C. All cast iron shall conform to ASTM A126, Class B. Castings shall be clean and sound without defects that will impair their service. No plugging or welding of such defects will be allowed. Bolts shall be electric-zinc plated steel with hex heads and hex nuts in accordance with ASTM A-307 and A-563.

D. Stems shall be manganese bronze having a minimum tensile strength of 60,000 psi, a minimum yield of 20,000 psi. NRS stem collars shall be cast integral with them and machined to size. The housing for the valve stem collar shall be machined. All thrust bearing shall be incorporated as required, to optimize operating torques. NRS valves shall be furnished with two (2) o-ring stem seals located above the thrust collar and one (1) below. O-rings shall be set in grooves in the stem. The o-ring grooves shall not be less than the root diameter of the stem threads.

Gates for valve shall be totally encapsulated in rubber, be field replaceable and provide a dual seal on the mating body seat. Valve shall be capable of installation in any position with rated sealing in both directions. Rubber sets of specially compounded SBR materials shall be utilized and be capable of sealing even under conditions of normal wear. The valve body shall have integral guide engaging lugs in the gate in a tongue-and-groove manner, supporting the gate throughout the entire open/close travel.

E. Tapping valves shall be capable of making taps by using any cutter not less than 1/4-inch smaller than nominal pipe size.

F. All tapping valves shall have the name or monogram of the manufacturer, the year the valve casting was made, the size of the valve, and the working pressure cast on the body of the valve.

G. Tapping valves shall be provided with a 2-inch square operating nut and shall be opened by turning to the left counterclockwise.

H. Tapping valves shall be installed in a vertical position with valve box as detailed on the drawings. They shall be set vertically and properly adjusted so that the cover will be in the same plane as the finished surface of the ground or street.

I. Valves shall be those manufactured by Mueller, M & H Valve Company, American, or approved equal.

2.08 AIR RELEASE VALVES

A. The air release valves shall be the size noted on the drawings and equal to Valmatic Model 38 as manufactured by Valmatic Valve and Manufacturing Corp.

B. The valves shall be in accordance with ANSI/AWWA C512.

C. The valves shall be of the type that automatically exhausts large quantities of air during the filling of a system and allows air to re-enter during draining or when a vacuum occurs. Valves shall be constructed of cast iron body and cover, stainless trim, and float with a Buna-N seat for positive seating.

D The baffle shall be ductile iron and shall protect float from direct impact of air and water. The seat shall slip fit into the baffle or cover and lock in place without any distortion. The float and baffle assembly shall be shrouded with a water diffuser. The float shall be stainless steel center guided for positive seating and be rated at 1,000 psi non-shock service.

E. The discharge orifice shall be fitted with a double-acting throttle device to regulate and restrict air venting.

F. All parts of the valves and the operating mechanisms shall be made of non-corrodible materials.

2.09 COMBINATION PRESSURE REDUCING/PRESSURE SUSTAINING VALVE (PRV/PSV)

A. The valve shall maintain a constant downstream pressure regardless of fluctuations in demand. When the upstream pressure lowers to a pre-set minimum the valve shall throttle to maintain a constant inlet pressure.

B. The valve shall be a hydraulically operated, diaphragm-actuated, globe pattern valve. It shall contain a resilient, synthetic rubber disc, having a rectangular cross-section, contained on three and one-half sides by a disc retainer and forming a tight seal against a single renewable seat. The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. Packing glands and/or stuffing boxes are not permitted, and there sha" be no pistons operating the valve or pilot controls. All necessary repairs shall b possible without removing valve from the line.

C. The pressure reducing pilot control shall be a direct-acting, adjustable, spring-loaded, normally open diaphragm valve, which closes when downstream pressure exceeds the spring setting. The pressure sustaining pilot control shall be a direct-acting, adjustable, spring-loaded, normally closed diaphragm valve which opens when upstream pressure exceeds the spring setting.

D. Valve shall have a cast iron body with bronze trim.

E. Pressure reducing range shall be 30 psi to 300 psi and pressure sustaining range shall be 20 psi to 200 psi.

F. Valve shall be fully coated with fusion bonded epoxy in accordance with AWWA C550 Standard.

G. The valve shall be similar to a Model 92G-01 Combination Pressure Reducing, Pressure Sustaining Valve (globe style) as manufactured by Cla-Val Co.

2.10 PRESSURE SUSTAINING VALVE (PSV)

A. The valve shall maintain a constant downstream pressure regardless of fluctuations in demand. When the upstream pressure lowers to a pre-set minimum the valve shall throttle to maintain a constant inlet pressure.

B. The valve shall be a hydraulically operated, diaphragm-actuated, globe pattern valve. It shall contain a resilient, synthetic rubber disc, having a rectangular cross-section, contained on three and one-half sides by a disc retainer and forming a tight seal against a single renewable seat. The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. Packing glands and/or stuffing boxes are not permitted, and there shall be no pistons operating the valve or pilot controls. All necessary repairs shall be possible without removing valve from the line.

C. The pressure sustaining pilot control shall be a direct-acting, adjustable, spring-loaded, normally closed diaphragm valve which opens when upstream pressure exceeds the spring setting.

D. Valve shall have a cast iron body with bronze trim.

E. Pressure sustaining range shall be 20 psi to 200 psi.

F. Valve shall be fully coated with fusion bonded epoxy in accordance with AWWA C550 Standard.

G. The valve shall be similar to a Model 730 Pressure Sustaining Valve (globe style) as manufactured by Bermad.

2.11 PRESSURE REDUCING VALVE (PRV)

A. The valve shall automatically reduce a higher inlet pressure to a steady lower downstream pressure regardless of changing flow rate and/or varying inlet pressure. The main valve and pilot valve shall close drip-tight when downstream pressure exceeds the pressure setting of the control pilot.

B. The valve shall include a check feature that will close the valve when pressure reversal occurs. The closing of valve shall be accomplished by transmitting downstream pressure to the main valve cover chamber.

C. The valve shall be a hydraulically operated, diaphragm-actuated, globe pattern valve. It shall contain a resilient, synthetic rubber disc, having a rectangular cross-section, contained on three and one-half sides by a disc retainer and forming a tight seal against a single renewable seat. The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. Packing glands and/or stuffing boxes are not permitted, and there shall be no pistons operating the valve or pilot controls. All necessary repairs shall be possible without removing valve from the line.

D. The pressure reducing pilot control shall be a direct-acting, adjustable, spring loaded, normally open diaphragm valve, which closes when downstream pressure exceeds the spring setting.

E. Valve shall have a cast iron body with bronze trim.

F. Upstream adjustment range shall be 20 psi to 300 psi and downstream adjustment range 30 psi to 300 psi.

G. Valve shall be fully coated with fusion bonded epoxy in accordance with AWWA C550 Standard.

H. The valve shall be similar to a Model 90G-01 Pressure Reducing Valve (globe style) as manufactured by Cla-Val Co.

2.12 ELECTRIC CONTROL VALVE

A. Operation: The electric control valve shall operate independent of valve differential pressure. The double-chambered diaphragm actuator always has full differential pressure to develop maximum power and immediate reaction. Upper control chamber operates on 3-way control principle. A 3-way solenoid valve alternately applies upstream pressure to tightly close the main valve and vent pressure to the atmosphere to open widely the main valve. Main valve shall be normally open. Solenoid valve shall close main valve when energized.

B. Design: The main valve shall consist of a wide, Y-pattern body, hydrodynamically designed with semi-straight flow; a double-chambered diaphragm actuator, hydraulically operated. The body shall have a single removable seat with full-flow opening, free of bottom stem guide, and a resilient seat for drip-tight closing. The valve diaphragm actuator contains two defined control chambers that can be removed as one distinct assembly. The actuator includes the separating partition. Valve shall be rated for 175 psi working pressure.

C. Materials: Main valve and actuator shall be cast iron in accordance with ASTM A126, Class B. Main valve trim and pilot control system shall be cast bronze or brass in accordance with ASTM B62 or ASTM B21, respectively. Diaphragm shall be nylon reinforced neoprene and seals shall be Buna-N.

D. Electrical: Solenoid valve shall be 120 volt, single phase, NEMA 4 enclosed with heavy duty coil with class H insulation.

E. Accessories: Electric control valve shall be equipped with a large control filter, a v-port throttling plug, a valve position indicator, and a mechanical closure and flow adjuster.

F. Painting: Main valve shall be fully coated on all sides with fusion bonded epoxy in accordance with AWWA C550 Standard.

G. Marking: Main valve marking shall include size, working pressure, flow direction, name of manufacturer, and year of manufacture.

H. Manufacturer: The electric control valve shall be Model 710 as manufactured by Bermad, or approved equal.

2.13 SURGE ARRESTOR VALVES

A. Function:

1. The surge arrestor valve shall open quickly at a predetermined over-pressure to dissipate surge and close slowly after restoration of normal pressure. Plus, open quickly at a pre-determined under-pressure setting, remain open for a suitable time period to dissipate surge, and then slowly close. Plus, open quickly on electrical power failure, remain open for a suitable time period to dissipate surge and then slowly close.
2. Needle valves shall be furnished to provide independent and adjustable control of the main valve opening and closing speed.
3. The valve shall be completely piped ready for installation.

B. Description:

1. The main valve shall operate on the differential piston principle such that the area on the underside of the piston is no less than the pipe area, and the area on the upper surface of the piston is of a greater area than the underside of the piston.
2. The valve piston shall be guided on its outside diameter by long stroke stationary Vee ports which shall be downstream of the seating surface to minimize the consequences of throttling. Throttling shall be done by the valve Vee ports and not the valve seating surfaces.
3. The valve shall be capable of operating in any position and shall incorporate only one flanged cover at the valve top from which all internal parts shall be accessible. There shall be no stems, stem guides, or spokes within the waterway. There shall be no springs to assist the valve operation.

C. Construction:

1. The valve body shall be of cast iron ASTM A-126 with flanges conforming to the latest ANSI Standards. The valve shall be extra heavy construction throughout. The valve interior trim shall be bronze B-62 as well as the main valve operation.
2. The valve seals shall be easily renewable while no diaphragm shall be permitted within the main valve body.
3. All controls and piping shall be of non-corrosive construction.
4. A visual valve position indicator shall be provided for observing the valve position at any time.

D. Manufacturer: The valve shall be Model 735 as manufactured by Bermad, Model 6700-D (globe) or 6600-D (angle) as Manufactured by Golden Anderson, or approvable equal.

2.14 ALTITUDE VALVES

A. Single Acting (one direction):

1. Function: The single acting altitude valve shall be a one-way valve of the delayed opening, non-throttling type that controls the high and low water level in a standpipe as shown on the drawings. The valve shall assume either a fully open or fully closed position and shall be able to control a water level change of a minimum of five (5) feet and a maximum of 50 feet between closing and opening points. Opening and closing points shall be adjustable.
2. Description: The altitude valve shall be a hydraulically operated, pilot controlled, diaphragm type globe valve. The valve shall be single seated and shall have a resilient disc for tight closure. Small changes in storage tank level shall cause an immediate action of the pilot control. The control

system shall consist of a main valve and pilot valve to control the reservoir level. The opening and closing rates of the valve shall be adjustable to prevent surges and line shock. The valve shall be provided complete with all piping and appurtenances necessary for operation, including a valve position indicator, a pilot valve strainer, and a 3/4-inch minimum brass or copper pressure sensing line. The entire valve and control assembly shall be readily accessible and easily removable, and its design shall be such that repairs to the main valve can be made without its removal from the line.

3. Construction: Valve body and trim shall be bronze or cast-iron conforming to ASTM B62, ASTM B61, or ASTM A126 Class B, respectively. Ends shall be Class 125 according to ANSI B16.1 and flanged. The valve shall be Class 125 with a pressure rating of 175 psi. All iron castings shall be fully coated on all sides with fusion bonded epoxy in accordance with AWWA 0550 Standard.

4. Manufacturer: Altitude valve shall be model 30R-AWR, figure 29A, as manufactured by Ross Valve Manufacturing Company; Model 210-3 as manufactured by CLA-VAL Company; or equal

B. Double Acting (two directions):

1. Function: The double acting altitude valve shall be a two-way valve of the delayed opening, non-throttling type that controls the high water level in a tank as shown on the drawings. The valve shall assume either a fully open or fully closed position and shall be able to control a water level change of a minimum of five (5) feet and a maximum of 50 feet between closing and opening points. The closing point shall be adjustable and the opening point shall be non-adjustable and activates when the distribution pressure drops one (1) to four (4) feet below the closing point.

2. Description: The altitude valve shall be a hydraulically operated, pilot controlled, diaphragm type globe valve. The valve shall be single seated and shall have a resilient disc for tight closure. Small changes in storage tank level shall cause an immediate action of the pilot control. The control system shall consist of a main valve and pilot valve to control the reservoir level. The opening and closing rates of the valve shall be adjustable to prevent surges and line shock. The valve shall be provided complete with all piping and appurtenances necessary for operation, including a valve position indicator, a pilot valve strainer, and a 3/4-inch minimum brass or copper pressure sensing line. The valve shall have a factory installed "vacuum break" line on the control circuit. The entire valve and control assembly shall be readily accessible and easily removable, and its design shall be such that repairs to the main valve can be made without its removal from the line.

3. Construction: Valve body and trim shall be bronze or cast-iron conforming to ASTM B62, ASTM B61, or ASTM A126 Class B, respectively. Ends shall be Class 125, according to ANSI B16.1 and flanged. The valve shall be Class 125 with a pressure rating of 175 psi. All iron castings shall be fully coated on all sides with fusion bonded epoxy in accordance with AWWA C550 Standard.

4. Manufacturer: Altitude valve shall be model 40R-DAWR, figure 33A, as manufactured by Ross Valve Manufacturing Company; Model 210-02 manufactured by CLA-VAL Company; or equal.

2.15 VALVE BOXES

A. Each buried stop and valve shall be provided with a suitable valve box. Boxes shall be of the adjustable, telescoping, heavy-pattern type with the lower and upper parts of cast iron. They shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve.

B. The upper or sliding section of the box shall be provided with a flange having sufficient bearing area to prevent undue settlement. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve and rest on the valve bonnet.

C. The boxes shall be adjustable through at least six (6) inches vertically without reduction of the lap between sections to less than four (4) inches.

D. The inside diameter of boxes for valves shall be at least 4-1/2 inches, and the lengths shall be as necessary for the depths of the valves or stops with which the boxes are to be used.

E. Covers for valves shall be close fitting and substantially dirt-tight and marked "WATER."

F. The top of the cover shall be flush with the top of the box rim.

G. Valve boxes shall be manufactured by Muller, Accer Cast, Inc., or approved equal.

2.16 TAPPING SLEEVES

A. Tapping sleeves shall be cast iron and capable of containing pressure within the full volume of the sleeve. Sleeve shall be mechanical joint suitable for use with ductile iron or PVC pipe.

B. Sleeve shall be rated at 200 psi working pressure through 12-inch size and 150 psi for sleeves 14-inch through 24-inch.

C. Flanged throat section of mechanical joint sleeves through 12-inch size shall conform to MSS SP6O Standard. For throat sections larger than 12 inches, flanged section shall mate valves of same manufacture as sleeves.

D. All cast iron shall conform to ASTM A126; Class B. Castings shall be cleaned and sound without defects that will impair their service. No plugging or welding of such defects will be allowed. Bolts, nuts, and gaskets shall be in accordance with mechanical joint requirements of AWWA 0111.

E. Tapping sleeves shall be capable of withstanding their rated pressure without

leakage past the side gaskets and end gaskets of the sleeve. Sleeves shall be supplied with split end gaskets and two-piece glands. Side flange rubber gaskets shall butt against the rubber end gaskets to make a watertight seal. Side and end bolts shall be of a T-head design. The throat flange shall be designed to center the tapping valve to the sleeve. Tapping sleeve shall be equipped with a test plug.

F. Tapping sleeves shall be fully coated with fusion bonded epoxy coating in accordance with AWWA 0550 Standard.

G. Sleeves shall be marked with the name of the manufacturer and size (run x branch).

H. Tapping sleeve shall be manufactured by Mueller, M & H Valve Company, or approved equal.

2.17 COMPOUND WATER METER

A. Master meter shall be a compound meter in the size noted on the drawings.

B. Meter shall be in accordance with AWWA 0702.

C. Meter shall meet the following specifications:

Typical Operating Range (100%±1.5%)	1-700 GPM
Low Flow Registration	1/2 GPM
Maximum Continuous Flow	500 GPM
Pressure Loss at Maximum Continuous Flow	6 PSI at 500 GPM
Pressure Loss at Crossover	6 PSI
Minimum Crossover Accuracy	95%
Maximum Operating Pressure	150 PSI
Maximum Operating Temperature	120°F
Meter Flanges	Round flanges, Class 150
Register	Straight reading, single register, sealed magnetic drive standard. Remote reading units optional.
Total Flow	100,000,000 gallons
Registration	100 gallons/sweep hand revolution

Low Flow	10,000,000 gallons
Registration	10 gallons/sweep hand revolution
Housing	Cast bronze
Nose Cone and Straightening Vanes	Thermoplastic
Rotor	Thermoplastic
Rotor and Valve Casing	Thermoplastic
Rotor Spindle, Bearing, and Endstone	Ceramic
Measuring Chamber and Disc	Thermoplastic
High Flow Valve	Thermoplastic
High Flow Swing Weight	Cast bronze
Triggers	Stainless steel
Magnets	Ceramic and alnico
Register Lens	Glass/thermoplastic
Register Housing and Cover	Thermoplastic
Trim	Stainless steel

D. Meter shall be equal to the Recordall as manufactured by Badger Meter or Neptune Tru/Flo as manufactured by Schlumberger Industries.

2.18 TURBINE WATER METER

General:

1. The turbine type water meters provided for the project shall be of single manufacturer. The meter manufacturer shall have a minimum of five (5) years of experience in the design and manufacture of turbine water meters of equal size and quality to those specified.
2. Water meter shall meet or exceed the latest requirements of AWWA 0701 for Class II turbine type, magnetic drive, flanged meter tube with 150 psi working pressure.
3. Water meters provided for this project shall be Neptune as manufactured by Schlumberger Industries or approved equal.

B. Components:

1. Meter tube shall be flanged cast bronze. The internal and external of the meter tube and meter head shall be free of any casting flaws or sharp corners or burrs. The meter tube shall have manufacturer's name, meter size, AWWA Class II, and flow arrow cast into both sides. Meter tubes shall offer minimum obstruction to the flow. Four-inch and 6-inch meters shall be furnished with 1-inch NPT coupling on outlet side.
2. Meter head shall be connected to the tube by means of gasket sealed connection with stainless steel bolts. The meter shall be designed for easy removal of water wetted parts from the tube for inspection or repair without having to remove the complete tube. Water wetted meter components that are permanently attached to the tube or meter head will not be accepted. The meter head shall incorporate a sealed stainless steel flow adjusting vane for recalibration. The vane shall be set at the factory, capped, and sealed to prevent unauthorized adjustment.
3. Measuring chamber shall be removable from the meter head. The drive mechanism shall be directly coupled to the rotor by mean of gears. The gearbox shall be integral with the outlet housing and shall be designed to facilitate easy replacement of gears.
4. Rotor shall be permanently attached to the rotor shaft and shall rotate on an axis that is parallel to the direction of the water flow through the pipe. The rotor shall be resistant to normal corrosion and deformity due to high flow velocities, and shall be directly coupled to the gear train.
5. Bearings for the rotor shaft dual out-board graphite bearings, position to provide uniform loading of the rotor. Dual thrust bearings shall handle flows in both forward and reverse directions. All bearings must be field replaceable.
6. Totalizer shall be a six-digit, straight reading type with a 3-inch diameter, 100 division dial, and center sweep test hand to permit timing for an accurate determination of flow rate. The totalizer shall be equipped with a leak detector hand to indicate very low flow. The totalizer shall read in units of gallons per day and shall be magnetically driven and equipped with change gears to facilitate easy change of registration without removing pressure from the line. The totalizer shall be encased in an o-ring sealed bonnet made of cast bronze.

C. Quality Control: Volumetric testing of all meters must be performed and approved prior to shipment. The complete head assembly must be accurately tested in the same pipe size and same tube that the meter will be mounted in. The test shall be minimum, intermediate, and maximum AWWA flow ranges of the meter. The amount of water used to conduct the test must be left on the totalizer. Prior to shipping, a tag shall be attached to the meter showing the totalizer reading after the test. A copy of the certified accuracy test record must be furnished to the Owner at no charge.

2.19 ULTRASONIC FLOW METER (FOR POTABLE WATER)

A. The flowmeter shall be of the ultrasonic clamp on, transit-time and provide indicating, totalizing, and transmitting of liquid flow rate in full pipes.

1. The operational specifications shall be accuracy +/- 0.5 percent of velocity or +/- 0.05 FPS.

B. The meter shall operate on the following pipe materials: carbon steel, stainle steel, mortar-lined ductile iron, copper, aluminum, cast iron, FRP, ASB, and PVC.

1. The meter shall be programmable for use on all pipe schedules and diameters one (1) inch through 90 inches using the same hardware and electronics.
2. The instrument shall be of the Auto Zero type. There will be no requirement to stop or alter flow during installation.
3. The ultrasonic flowmeter shall measure flow rates in clean liquids with a velocity span of +/- 0 to 50 feet per second in pipe sizes of one (1) to 90 inches.

C. The meter shall have four (4) outputs which can be programmed for signal loss, reverse flow, totalizer pulses, or over scale functions.

D. The electronics shall be provided in a NEMA-4X enclosure with viewing window for reading indicators with door closed.

E. The 4-20 mA output shall be proportional to flow rate. The maximum, resistive load shall be 600 OHMS and current limited.

F. The meter shall have a 4-20 mA input for display locally in scalable units of measure.

C. Unit to have a built-in microprocessor to provide capability for:

1. Adapting instrument hardware to existing piping and flow conditions.
2. Automatically calculating transducer spacing.
3. Programming the scale factor.
4. Programming the low flow cut-off.
5. Selecting English or Metric units.
6. Automatic speed of sound calculation of measured fluid.
7. Bi-directional totalization with selectable resolution.
8. Displaying, in percent, 4-20 mA inputs from external sources.
9. Flow output selection in GPM, GPH, MOD, and FPS (or metric equivalent).
10. Adjustable damping from 1 to 99 seconds.
11. LCD indication or flow diagnostics to include a "fault' status.
12. Section of zero functions:

    a. Auto zero under flow conditions.
    b. Set zero when flow can be stopped.
    c. Zero operate for fast response.

13. Storage of data for up to eight pipes with recall capability.

H. The transmitter shall be wall mounted in meter vault.

I. A remote flow rate indicator/totalizer terminal shall be provided. It shall be panel mounted in the MTU located in the laboratory. (The MTU is provided as part of Specification Section 13400). A 4-20 mA analog output signal proportional to the flow rate shall be included for connection to the remote flow indicator/totalizer

J. The flowmeter shall be equal to TYME-FLYTE ISTT by POLYSONICS.

2.20 STRAINER FOR METERS

Strainer for meters shall be installed upstream of meter at location shown on the drawings. In no case shall there be less than a minimum of five (5) pipe diameters of straight unobstructed pipe upstream of strainer. Strainer body and cover shall be bronze in sizes 2-inch through 6-inch and cast iron in sizes 8-inch and 10-inch. Strainer plate and cover bolts shall be stainless steel. Strainer shall be rated for 150 psi working pressure and be equal to the Neptune Turbine Strainer manufactured by Schlumberger Industries.

2.21 FLEXIBLE JOINT

Flexible joint shall be in size as shown on the drawings and equal to the Standard Spool Type Expansion Joint manufactured by Metraflex Company. Flexible joint carcass shall be 2 arch and constructed by Chlorobutyl and polyester with bias-ply tire cord reinforcement and rated for working pressure shown in table. Flexible joint shall have integral rubber flange with ductile iron retaining ring. Flexible joint shall have 3 control rods. Flanges shall be 150-pound strength.

Joint Size (Inches)	Joint Length (inches)		Pressure Rating (psi)		Gusset Plate Thickness (inches)	Rod Diameter (inches)
	1-Arch	2-Arch	2-Rods	3-Rods		
2	6	10	200	200	3/8	5/8
21/2	6	10	200	200	3/8	5/8
3	6	10	200	200	3/8	5/8
4	6	10	200	200	3/8	5/8
5	6	10	200	200	3/8	5/8
6	6	10	140	200	1/2	5/8
8	6	10	140	190	1/2	3/4
10	8	12	140	190	3/4	7/8
12	8	12	140	190	3/4	1
14	8	12	85	130	3/4	1
16	8	12	65	110	3/4	11/8
18	8	12	65	110	3/4	11/8
20	8	12	65	110	3/4	11/8
24	10	14	65	100	1	11/4

2.22 COUPLING ADAPTER

A. The pipe couplings shall be of a gasketed, sleeve-type with diameter to properly fit the pipe. Each coupling shall consist of one (1) steel middle ring of thickness and length specified, two (2) steel followers, two (2) rubber-compounded wedge section gaskets and sufficient track-head steel bolts to properly compress the gaskets. Field joints shall be made with this type of coupling. The middle ring and followers of the coupling shall be true circular sections free from irregularities, flat spots, or surface defects. They shall be formed from mill sections with the follower-ring section of such design as to provide confinement of the gasket. After welding, they shall be tested by cold expanding a minimum of one (1) percent beyond the yield point. The coupling bolts shall be of the elliptic-neck, track-head design with rolled threads. Couplings shall have longitudinal restraint with locking pins. The manufacturer shall supply information as to the recommended torque to which the bolts shall be tightened. All bolt holes in the followers shall be oval for greater strength. The gaskets of the coupling shall be composed of a crude or synthetic rubber base compounded with other products to produce a material which will not deteriorate from age, from heat, or exposure to air under normal storage conditions. It shall also possess the quality of resilience and ability to resist cold flow of the material so that the joint will remain sealed and tight indefinitely when subjected to shock, vibration, pulsation, and temperature or other adjustments of the pipe line. The couplings shall be assembled on the job in a manner to insure permanently tight joints under all reasonable conditions of expansion, contraction, shifting and settlement, unavoidable variations in trench gradient, etc.

B. Nuts and bolts shall be in accordance with AWWA C111.

C. Couplings shall be shop primed and field painted in accordance with Division 9 (or one coat of coal tar epoxy if not specified in Division 9).

D. Compression couplings shall be equal to Style 38 manufactured by Dresser. Flanged couplings shall have flanges in accordance with AWWA C207 and be equal to Style 128 manufactured by Dresser.

2.23 PRESSURE GAUGES

A. Pressure gauges shall have cast brass cases with bourdon tubes and precision rotary movements of bronze, nickel, or other material suitable to the environment in which they will be located. Dials shall be 4-1/2 inches in diameter with a pressure range of 0 to 300 psi. Provide female quick coupler for connection to corporation stop. Each gauge shall be provided with snuffer.

B. Corporation stops shall be similar to Ford Products and shall have iron pipe thread with pack joint connection outlets. Provide male quick coupler for attachment to pressure gauge.

2.24 FIBERGLASS LINE MARKER

A. General:

1. Design: The continuous fiberglass reinforced composite line marker (CUM375) shall be a single piece marker capable of simple, permanent installation by one person using a manual driving tool. The CUM-375 upon proper installation shall resist displacement from wind and vehicle impact forces. The CUM-375 shall be of a constant flat "T" cross-sectional design with reinforcing support ribs incorporated longitudinally along each edge to provide sheeting protection and structural rigidity. The bottom end of the marker shall be pointed for ease of ground penetration.

2. Material: The CUM-375 marker shall be constructed of a durable, UV resistant, continuous glass fiber and marble reinforced, thermosetting composite material which is resistant to impact, ozone, and hydrocarbons within a service temperature range of -40° F to +140° F.

3. Workmanship: The CUM-375 marker shall exhibit good workmanship and shall be free of burns, discoloration, cracks, bulges, or other objectionable marks which would adversely affect the marker's performance or serviceability.

4. Marking: Each CUM-375 shall be permanently marked "Water Valve Below" or "Water Main Below" and include "Before Digging Call 859-881-0589". The letters shall be a minimum of two (2) inches in height. A black line shall be stamped horizontally across the front of the marker near the bottom to indicate proper burial depth as shown in the standard detail.

B. Physical and Mechanical Requirements:

1. Dimensions: The CUM-375 marker shall conform to the shape and overall dimensions shown in the standard detail.

2. Mechanical Properties: The CUM-375 shall have the minimum mechanical properties as follows:

Property	ASTM Test Method	Minimum Value
Ultimate Tensile Strength	D-638	50,000 psi
Ultimate Compressive Strength	D-638	45,000 psi
Specific Gravity	D-792	1.7
Weight % Glass Reinforcement	D-2584	50%
Barcol Hardness	D-2583	47

3. Color Fastness: The CUM-375 shall be pigmented throughout the entire cross-section so as to produce a uniform color which is an integral part of the material. Ultraviolet resistant materials shall be incorporated in the construction to inhibit fading or cracking of the delineator upon field exposure.

4. Vehicle Impact Resistance: The Carsonite CUM-375 marker shall be capable of self-erecting and remain functional after being subjected to a series of ten head on impacts by a typical passenger sedan at 35 miles per hour. The CUM-375 shall retain a minimum of 60 percent of its sheeting.

C. Reflectors:

1. The reflector shall be of impact resistant, pressure sensitive retro-reflective sheeting which shall be subject to approval by the Engineer. The sheeting shall be grade "High Intensity" and of appropriate color to meet MUTCD requirements.

2. Mounting: The retro-reflective sheeting shall consist of a minimum of a 3-inch wide strip placed a maximum of two (2) inches from the top of the post unless otherwise specified.

PART 3 EXECUTION

3.01 INSTALLATION

A. Valves shall be installed as staked out, with the approval of the Engineer in the positions indicated on the drawings consistent with conveniences of operating the handwheel or wrench. All valves shall be carefully erected and supported in their respective positions free from all distortion and strain on appurtenances during handling and installation.

B. All material shall be carefully inspected for defects in workmanship and material, all debris and foreign material cleaned out of valve openings and seats, all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness.

C. Valves and other equipment which do not operate easily or are otherwise defective shall be repaired or replaced at the Contractor's expense.

D. Valves shall not be installed with stems below the horizontal.

E. Valves shall be set plumb and supported adequately in conformance with the instructions of the manufacturer. Valves mounted on the face of concrete shall be shimmed vertically and grouted in place. Valves in the control piping shall be installed so as to be easily accessible.

hooks shall be provided for each valve to enable the chains to be hooked so as not to interfere with personnel traffic.

G. Valves shall be provided with extension stems where required for convenience of operation. Extension stems shall be provided for valves installed underground and elsewhere so that the operating wrench does not exceed six (5") feet in length and the operating nut is not greater than 24" below the gate-valve box lid.

H. A permanent type gasket of uniform thickness shall be provided between flanges of valves and sluice gates and their wall thimble.

Wall thimbles shall be accurately set in the concrete walls so that the gates can be mounted in their respective positions without distortion or strain.

J. Floorstand operators and stem guides shall be set so that the stems shall run smoothly in true alignment. Guides shall be anchored firmly to the walls. Distances from the centerlines of gates to the operating level or base of floorstand shall be checked by the Contractor and adjusted if necessary to suit the actual conditions of installation.

3.02 PAINTING

A. Valves shall be factory primed and fully coated, inside and out, with fusion bonded epoxy in accordance with the latest revision of AWWA 0550 Standard, if valve is available in this coating.

B. Other painting is specified in Division 9.

- END OF SECTION -

SECTION 02665

DOMESTIC WATER SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

Contractor shall furnish all labor, materials, and equipment to install water service piping and appurtenances, including tapping saddle, corporation stop, meter, meter setter, meter box with lid, pressure reducing valve (PRV) (if required), and service line as shown on drawings and specified herein.

1.02 RELATED SECTIONS

A. Section 02225 - Excavating, Backfilling, and Compacting for Utilities.

B. Section 02610 - Pipe and Fittings.

C. Section 02675 - Disinfection of Water Distribution Systems.

PART 2- PRODUCTS

2.01 METERS

A. Meters shall be 5/8 inch by 3/4 inch unless noted otherwise on the drawings. Meters shall be first-line quality of the manufacturer. The latest requirements of the AWWA Specifications 0-700 shall be complied with, except in cases of conflict with these Specifications. Any type or make of meter offered must have been manufactured and marketed in the U.S. for at least five (5) years or more.

B. Main Cases - The main case shall be high grade waterworks bronze, with hinged, single lid cover and raised characters cast on them to indicated the direction of flow. Each meter must have the manufacturer's serial number stamped on the lid. They must have a working pressure of 150 psi. Standard cast iron frost bottom meters shall be furnished. Non-ferrous strainers shall be provided which fit tightly against the main case.

C. Measuring Chambers - The measuring chamber shall be of 85-5-5-5 bronze alloy composition and stainless steel or monel trimmed. The chamber shall be of the two piece design, equipped with a disc made of hard rubber and as near to the specific gravity of water as possible. Discs shall be of the three piece design of the thrust roller type.

D. Registers - The register shall be straight reading U.S. gallon type. The register unit shall be completely encased and hermetically sealed, and driven by permanent magnets. There shall be a test index circle, divided into 100 equal parts, and shall have a red center sweep test hand. Registers shall be guaranteed by the manufacturer for a period of at least fifteen (15) years.

E. Manufacturers - Meters shall be, Sensus SR. (No substitution)

2.02 METER COPPER SETTERS

Meter setters shall be copper setter, riser type, horizontal inlet and outlet multipurpose coupling for copper pipe. They shall be 5/8-inch by 3/4-inch single or tandem or size as indicated, Ford or Mueller with ASSE dual check and brace eye, or equal.

2.03 PRESSURE REDUCING VALVE (IF REQUIRED)

A. Pressure reducing valves for water service shall be single seated for dead-end or continuous service. Size 3/4-inch shall have bronze bodies with screwed ends. The cup packing and valve seat shall be of high grade leather; the diaphragm of nylon-inserted neoprene. Valve shall have bronze strainer. The valves shall be Mueller H-900b, Wilkins #600, Watts Regulator Series US #35130, or approved equal.

B. Each valve shall have an adjustable pressure range of 60-125 psi and is to be set at 90 psi. These regulators shall be installed on the inlet side of the service meter using tandem coppersetter. Burying of the PRV or installing in separate meter box will not be permitted.

2.04 POLYETHYLENE SERVICE LINE

A. Polyethylene flexible pipe for sizes 3/4-inch through 1-inch water service piping shall be PE 3408, SDR-9, OD Base for 200 psi working pressure at 73.4° F, meeting latest edition of ASTM Specification D 2737 for material. Pipe shall be copper tubing sizes (CTS).

B. Pipe shall meet all applicable provisions of the Commercial Standards and shall bear the National Sanitation Foundation (NSF) seal of approval.

C. Fittings shall be standard bronze fittings in copper tubing sizes and manufactured by Ford or Mueller.

2.05 COPPER SERVICE LINE

A. Copper service pipe shall be seamless copper tubing for water service, Type K meeting the latest edition of ASTM Specification B88.

B. Fittings shall be standard bronze fittings in copper tubing sizes and manufactured by Ford or Mueller.

2.06 METER BOX

A. Meter box shall be a polyvinyl chloride (PVC) or polyethylene (PE) box 18 inches in diameter x 30 inches deep (inside dimensions) and include a cast iron meter pit cover. The box shall be able to withstand 1,200 pounds compression. The box shall be used for both single and tandem setters. The meter box shall be equal to the MS Meter Box by Mid-States Plastics.

B. The cast iron meter pit cover shall be equal to the 18-inch meter box cover, Model H-10816, as manufactured by the Mueller Company, or approved equal.

2.07 SADDLES

Saddles shall be brass equal to the Ford S70 Series or Mueller H13000 Series.

2.08 CORPORATION STOP

A. Corporation stops shall be used with copper pipe (or polyethylene service pipe in copper pipe sizes) with flare type connections to connect to saddle around pipe. Stops shall be Mueller Model H-1500, Ford F-1000 or approved equal.

B. Corporation stops shall be factory tested to 200 psi to be compatible with the pipes in which they are installed.

2.09 CURB STOP (IF REQUIRED)

A. Ball Curb Valve: Ball curb valve shall be used with copper service pipe with compression type connections. Ball curb valve shall be installed at location shown on customer service connection detail in the drawings. Ball curb valve shall be equal to Mueller 300, Model B-25209.

B. Curb Box: Curb box shall be cast iron with lid (including locking nut) marked "water." Curb box shall be slide type and installed over the ball curb valve. Curb box shall be equal to Tyler 6505 Series, Item 92-D.

PART 3- EXECUTION

3.01 TESTING OF METERS

Contractor shall provide copies of certified tests by manufacturer of all meters provided in project.

3.02 INSTALLATION OF METER SETTINGS

Meter settings shall include meter box and lid, meter, coppersetter, corporation stop, plus service line and adapter on the customer's side of meter. (This latter item is to prevent the customer or his plumber from disarranging or loosening the meter after the Contractor has already set the meter in its proper position.) Meter shall be set as close to the right-of-way fence as practicable inside the right-of way. No meter shall be set outside the right-of-way unless prior approval has been obtained from the Engineer or his representative. Meters shall be set in a workmanlike manner with backfill neatly compacted in place. In yards, pastures and other grassed areas, top of meter box will be 1/2 inch above grade.

3.03 INSTALLATION OF PRESSURE REDUCING VALVES

Pressure reducing valves will be installed for individual meter settings where shown on drawings. Installation shall be by tandem setter per detail drawing.

3.04 INSTALLATION OF SERVICE LINES

A. Service Lines Not Crossing a Road:

Service line shall be installed at locations shown on drawings and at a minimum depth of 30 inches.

B. Service Lines Crossing a Road:

Service line shall be jacked or pushed under paved roads and driveways. Open-cut may be used on all unpaved roads and driveways. In all cases the service line shall have a minimum cover of 30 inches. All backfill in paved areas shall be full depth crushed stone.

C. When noted on the drawings, the service line crossings shall be threaded through a galvanized steel or PVC casing pipe which shall be jacked or pushed under paved surfaces.

3.05 RECONNECTION OF EXISTING METERS

Where indicated on the plans, existing meters shall be disconnected from the existing water main and reconnected to the new water main. In the event that the water main from which meters are to be disconnected is to remain in service, corporation stops on the original service taps of the disconnected meters shall be located, excavated, and turned off to complete the disconnection.

3.06 RELOCATION OF EXISTING METERS

Where indicated on the plans, existing meter settings shall be disconnected from existing service lines, relocated where indicated and reconnected to the new service line. This work shall include matching type/diameter service line, new meter, meter box and lid, copper setter and reconnecting to existing service line. Compression couplings with inserts shall be used to reconnect flexible (plastic) service line and sweat joints used for copper service line.

3.07 INSPECTION AND TESTING

All service connection shall be pressure tested simultaneously with the watermain to demonstrate their conformance with the specified operational capabilities and any deficiencies shall be corrected, device replaced or otherwise made acceptable to the Engineer.

- END OF SECTION -

SECTION 02675

DISINFECTION OF WATER DISTRIBUTION SYSTEMS

PART 1 - GENERAL

1.01 STERILIZATION

A. General:

It is the intent of this section to present essential procedures for disinfecting new and repaired water mains. The section is simultaneously patterned after AWWA C651. The basic procedure comprises:

1. Preventing contaminating materials from entering the water mains during construction or repair and removing by flushing materials that may have entered the water main.

2. Disinfecting any residual contamination that may remain.

3. Determining the bacteriologic quality by laboratory test after disinfection.

B. Preventive Measures During Construction:

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

   If dirt, that, in the opinion of the ENGINEER, will not be removed by the flushing operation (Article 1.01-C.) enters the pipe, the interior of the pipe shall be cleaned and swabbed as necessary, with a five percent (5%) hypochlorite disinfecting solution.

2. Packing Materials and Joints - No contaminated material or any material capable of supporting prolific growth of micro-organisms shall be used for sealing joints. Packing material shall be handled in such a manner as to avoid contamination. Where applicable, packing materials must conform to AWWA standards. Packing material for cast iron pipe must conform to AWWA C600. Yarning or packing material shall consist of molded or tubular rubber rings, or treated paper. Materials such as jute or hemp shall not be used. The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water. It shall be delivered to the job in enclosed containers and shall be kept clean.

C. Preliminary Flushing:

No site for flushing should be chosen unless it has been determined that drainage is adequate at the site. The main shall be flushed prior to disinfection, except when the tablet or granular methods are used (Articles 1.01 -E.3. and 1.01 -E.4.). It

is required that the flushing velocity be 2.5 ft/sec. or greater. The rate of flow required to produce this velocity in various diameters is shown in the following table:

REQUIRED OPENINGS TO FLUSH PIPELINES (40-psi Residual Pressure)				
Flow Required to Produce 2.5 ft/sec.		Minimum Outlet Size		
Pipe Size (in)	Flow Rate (gpm)	Flushing Pipe Size (in)	Hydrant Nozzle	
			Number	Size (in)
4	100	1	1	2½
6	220	1½	1	2½
8	390	2	1	2½
10	610	3	1	2½
12	880	3	2	2½
14	1,200	4	2	2½
16	1,565	4	2	2½
18	1,980	6	2	2½

D. Form of Chlorine for Disinfection:

The most common forms of chlorine used in the disinfecting solutions are liquid chlorine (gas at atmospheric pressure), calcium hypochlorite tablets, calcium hypochlorite granules, and sodium hypochlorite solutions.

1. Liquid Chlorine Use - Liquid chlorine shall be used only when suitable equipment is available and only under the direct supervision of a person familiar with the physiological, chemical, and physical properties of this element and who is properly trained and equipped to handle any emergency that may arise. Introduction of chlorine gas directly from the supply cylinder is unsafe and shall not be permitted.

   Note: The preferred equipment consists of a solution fed chlorinator in combination with a booster pump for injecting the chlorine gas water mixture into the main to be disinfected. Direct feed chlorinators are not recommended because their use is limited to situations where the water pressure is lower than the chlorine cylinder pressure.

2. Hypochlorites

   a. Calcium Hypochlorite - Calcium hypochlorite contains seventy percent (70%) available chlorine by weight. It is either tabular or granular in form. The tablets, 6-8 to the ounce, are designed to

dissolve slowly in water. Calcium hypochlorite is packaged in containers of various types and sizes ranging from small plas' bottles to 100 pound drums.

A chlorine-water solution is prepared by dissolving the granules in water in the proportion requisite for the desired concentration.

b. Sodium Hypochlorite - Sodium hypochlorite is supplied in strengths from five and one-quarter percent (5.25%) to sixteen percent (16%) available chlorine. It is packaged in liquid form in glass, rubber, or plastic containers ranging in size from one (1) quart bottles to five (5) gallon carboys. It may also be purchased in bulk for delivery by tank truck.

The chlorine water solution is prepared by adding hypochlorite to water. Product deterioration must be reckoned with in computing the quantity of sodium hypochlorite required for the desired concentration.

E. Methods of Chlorine Application:

Upon completion of construction, disinfection shall be strictly in accordance with the procedure designated in the State Regulations, which reads as follows:

"A water distribution system, including storage distribution tanks, repaired portion of existing systems, or all extensions to existing systems, shall be thoroughly disinfected before being placed into service. A water distribution system shall disinfect with chlorine or chlorine compounds, in amounts as to produce a concentration of at least fifty (50) ppm and a residual of at least twenty-five (25) ppm at the end of twenty-four (24) hours and the disinfection shall be followed by a thorough flushing."

1. Continuous Feed Method - This method is suitable for general application.

a. Water from the existing distribution system or other approved sources of supply shall be made to flow at a constant, measured rate into the newly laid pipe line. The water shall receive a dose of chlorine, also fed at a constant, measured rate. The two rates shall be proportioned so that the chorine concentration in the water in the pipe is maintained at a minimum of 50 mg/L available chlorine. To assure that this concentration is maintained, the chlorine residual should be measured at regular intervals in accordance with the procedures described in the current edition of Standard Methods and AWWA M12--Simplified Procedures for Water Examination.

Note: In the absence of a meter, the rate may be determined either by placing a pitot gauge at the discharge or by measuring the time to fill a container of known volume.

Solutions of one percent (1%) chlorine may be prepared with sodium hypochlorite or calcium hypochlorite. The latter solution

requires approximately one (1) pound of calcium hypochlorite in eight and five-tenths (8.5) gallons of water. The following table gives the amount of chlorine residual required for each 100 feet of pipe of various diameters:

CHLORINE REQUIRED TO PRODUCE 50 *mg/L* CONCENTRATION IN 100 FT. OF PIPE (By Diameter)		
Pipe Size (in)	100 Percent Chlorine (lb)	1 Percent Chlorine Solutions (gal)
4	0.027	0.33
6	0.061	0.73
8	0.108	1.3
10	0.170	2.04
12	0.240	2.88

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

2. Slug Method - This method is suitable for use with mains of large diameter for which, because of the volumes of water involved, the continuous feed method is not practical.

a. Water from the existing distribution system or other approved source of supply shall be made to flow at a constant, measured rate (see Article 1.01-E.1.a.) into the newly laid pipe line. The water shall receive a dose of chlorine also fed at a constant, measured rate. The two rates shall be proportioned so that the concentration in the water entering the pipe line is maintained at no less than 300 mg/L. The chlorine shall be applied continuously and for a sufficient period to develop a solid column or "slug" of chlorinated water that will, as it passes along the line, expose all interior surfaces to a concentration of at least 300 mg/L for at least three (3) hours. The application shall be checked at a tap near the upstream end of the line by chlorine residual measurements.

b. As the chlorinated water flows past tees and crosses, related valves and hydrants shall be operated as to disinfect appurtenances.

3. Tablet Method - Tablet disinfection is best suited to short extension (up to 2,500 feet) and smaller diameter mains (up to 12 inches). Because the preliminary flushing step must be eliminated, this method shall be used only when scrupulous cleanliness has been exercised. It shall not be used if trench water or foreign material has entered the main or if the water is below 5 degrees C (41 degrees Fahrenheit). This method may only be used at the express written consent of the Engineer, prior to the beginning of the test.

a. Placement of Tablets - Tablets are placed in each section of pipe and also in hydrants, hydrant branches, and other appurtenances. They shall be attached by an adhesive, except for the tablets placed in hydrants and in the joints between the pipe sections. All the tablets within the main must be at the top of the main. If the tablets are fastened before the pipe section is placed in the trench, their position should be marked on the section to assure that there will be no rotation. When placing tablets in joints, they are either crushed and placed on the inside annular space, or, if the type of assembly does not permit, they are rubbed like chalk on the butt ends of the sections to coat them with calcium hypochlorite.

The adhesive may be Permatex No. 1 or any alternative approved by the ENGINEER of the purchaser. There shall be no adhesive on the tablet except on the broad side next to the surface to which the tablet is attached. The following table gives the number of hypochlorite tablets required for various pipe diameters and lengths:

NUMBER OF 5G HYPOCHLORITE TABLES REQUIRED FOR DOSE OF 50 mg/L

Length of Pipe (ft)	Pipe Diameter					
	2	4	6	8	10	12
13 or less	1	1	2	2	3	5
18	1	1	2	3	5	6
20	1	1	2	3	5	7
30	1	2	3	5	7	10
40	1	2	4	6	9	14

b. Filling and Contact - When installation has been completed, the main shall be filled with water at a velocity of less than 1 foot per second. This water shall remain in the pipe for at least twenty-four (24) hours.

Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water.

4. Granule Method - Granular disinfection may only be used in the same instances when tabular disinfection can be used; that is, it may be used if the pipes and appurtenances are kept clean and dry during construction.

a. Placement of Granules - Granules of calcium hypochlorite shall be placed during construction at the upstream end of the first section of pipe, at the upstream end of each branch main, and at 500-ft intervals.

Note: These granules cannot be used on solvent-welded plastic or on screwed-joint pipe because of the danger of fire or explosion from the reaction of the joint compounds with the calcium hypochlorite.

The following table gives the ounces of hypochlorite granules required for various pipe diameters:

OUNCES OF CALCIUM HYPOCHLORITE GRANULES TO BE PLACED AT BEGINNINGS OF MAIN AND AT 500-ft INTERVALS

Pipe Diameter (in.)	Calcium Hypochlorite Granules (oz.)
4	0.5
6	1.0
8	2.0
12	4.0
16 and larger	8.0

b. Filling and Contact - When installation has been completed, the main shall be filled with water at a velocity of less than 1 foot per second. This water shall remain in the pipe for at least twenty-four (24) hours. If the water temperature is less than 41° F (5° C) the water shall remain in the pipe for at least forty-eight (48) hours.

Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water.

F. Final Flushing:

After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration in the water is no higher than that generally prevailing in the system, or less than 1 mg/L. Chlorine residual determination shall be made to ascertain that the heavily chlorinated water has been removed from the pipe line.

F. Bacteriologic Tests:

New or repaired water distribution lines shall not be placed into service u... bacteriological samples taken at the points specified in 401 KAR 8:150 section 4(2) are examined and are shown to be negative following disinfection.

1. After final flushing, and before the water main is placed in service, a sample or samples shall be collected from the end of the line and tested for bacteriologic quality and shall show the absence of coliform organisms. If the number and frequency of samples is not prescribed by the public health authority having jurisdiction, at least one sample shall be collected from chlorinated supplies where a chlorine residual is maintained throughout the new main. From unchlorinated supplies at least two samples shall be collected at least twenty-four (24) hours apart.

2. Samples for bacteriologic analysis shall be collected in sterile bottles treated with sodium thiosulphate. No hose or fire hydrant shall be used in collection of samples. A suggested sampling tap consists of a standard corporation cock installed in the main with a copper tube gooseneck assembly. After samples have been collected, the gooseneck assembly may be removed, and retained for future use.

H. Repetition of Procedure - If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory samples have been obtained. The tablet method cannot be used in these subsequent disinfection. When the bacteriological sample tests indicate that disinfection has been effective, the main may be placed in service.

Procedure After Cutting Into or Repairing Existing Mains - The procedures outlined in the Article apply primarily when mains are wholly or partially dewatered. Leaks or breaks that are repaired with clamping devices while the mains remain full of water under pressure present little danger of contamination and require no disinfection.

1. Trench "Treatment" - When an old line is opened, either by accident or by design, the excavation will likely be wet and may be badly contaminated from nearby sewers. Liberal quantities of hypochlorite applied to open trench areas will lessen the danger from such pollution. Tablets have the advantage in such a situation because they dissolve slowly and continue to release hypochlorite as water is pumped from the excavation.

2. Main Disinfection - The following procedure is considered as a minimum that may be used.

   a. Swabbing with Hypochlorite Solution - The interior of all pipe and fittings used in making the repair (particularly couplings and tapping sleeves) shall be swabbed with five percent (5%) hypochlorite solution before they are installed.

   b. Flushing - Thorough flushing is the most practical means of removing contamination introduced during repairs. If valving and hydrant locations permit, flushing from both directions is

recommended. Flushing shall be started as soon as the repairs are completed and continued until discolored water is eliminated.

c. Slug Method - Where practicable, in addition to the above procedures, a section main in which the break is located shall be isolated, all service connections shut off, and the section flushed and chlorinated as described in Article 2.5.2, except that the dose may be increased to as much as 500 mg/L, and the contact time reduced to as little as one-half (1/2) hour. After chlorination, flushing shall be resumed and continued until discolored water is eliminated.

3. Sampling - Bacteriologic samples shall be taken after repairs to provide a record by which the effectiveness of the procedures used can be determined. If the direction of flow is unknown, samples shall be taken on each side of the main break.

J. Residual Disinfection — A minimum free chlorine residual of 0.2 ppm must be maintained throughout the distribution system. If this residual cannot be maintained, booster chlorination facilities must be provided. If chloramination is used, a minimum combined residual of 0.5 ppm must be maintained throughout the distribution system.

K. Chlorine Storage — The chlorine storage room shall be provided with separate switches for the fan and lights located outside. The ventilating fan is to be installed near floor level, with a capacity of one complete air change per minute. Panic hardware shall also be provided on chlorine room doors.

1.02 NOTIFICATION AND REPORTING

A. Contractor shall notify OWNER so they can contact radio station to announce boil water advisory for affected service area until lab results show safe water.

B. Contractor shall prepare report within 48 hours of break that includes time, location, chlorine residuals, lab results, etc. OWNER shall maintain reports in file.

C. If repairs cause water to be off more than 8 hours, Contractor must notify the OWNER so they can contact Division of Water.

D. Contractor shall notify OWNER if loss of service exceeds 4 hours, and/or affects 10% of OWNER's customers, or 500 customers, whichever is less, so that OWNER can contact the Public Service Commission.

- END OF SECTION -

SECTION 02835

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 SUMMARY

A. The Contractor shall furnish and erect the chain link fence and gates as indicated on the drawings and as herein specified.

B. The chain link fence shall have a top rail and bottom tension wire, and three (3) strands of barbed wire projecting outward at the top.

C. The chain link fence materials and installation shall meet or exceed the standards of the Chain Link Fence Manufacturers Institute, New York, NY, except as otherwise specified in this Section. Fence materials shall meet or exceed Federal Specification RR-F-191H/GEN for fencing, wire, and post metal (gates, chain link fence fabric, and accessories), and shall conform to the ASTM Standard Specifications hereinafter noted.

D. Fence framework, fabric, and accessories.

E. Excavation for post bases.

F. Concrete anchorage for posts and center drop for gates.

C. Manual gates and related hardware.

1.02 RELATED SECTIONS

Section 03300 - Cast-in-Place Concrete.

1.03 REFERENCES

A. ANSI/ASTM A123: Zinc (hot galvanized) coating of products fabricated from rolled, pressed, and forged steel shapes, plates, bars, and strips.

B. ANSI/ASTM F567: Installation of chain link fence.

C. ASTM A120: Pipe, steel, black and hot-dipped zinc-coated (galvanized) welded and seamless, for ordinary uses.

D. ASTM C94: Ready-mix concrete.

E. FS RR-F-191: Fencing, wire, post, and metal.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in commercial quality chain link fencing with two (2) years of experience.

B. Installation: ANSI/ASTM F567.

1.05 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01300.

B. Include plan layout, grid, spacing of components, gates, accessories, fittings, hardware, anchorages, and schedule of components.

C. Submit manufacturer's installation instructions under provisions of Section 01300.

PART 2-PRODUCTS

2.01 MATERIALS

A. All ferrous metal fittings, posts, fence, and gate framework, and all accessories shall be galvanized with a heavy coating of 2.0 ounces pure zinc spelter per square foot of surface area to be coated using the hot-dip process. Thinner zinc coatings and electro-galvanizing will not be used as a substitute for the specified hot-dip galvanized finish.

B. All fabrication and welding shall be done before hot-dip galvanizing. All welding shall conform to the American Welding Society standards.

C. The chain link fence fabric shall be galvanized steel chain link fabric conforming to ASTM Standard Specification for zinc-coated steel chain link fence fabric, Designation A392-74, with Class 2 zinc coating (2.0 ounces of zinc per square foot of uncoated wire surface). The fabric shall be woven in 2-inch mesh from No. 9 gage wire in a 7-foot width with barbed salvages top and bottom.

D. The barbed wire shall be galvanized steel barbed wire consisting of two (2) strands of twisted No. 12 1/2-gage wires with 4-point barbs spaced 3 inches apart and conforming to ASTM Standard Specification of zinc-coated (galvanized) steel barbed wire, Designation A121-77, with Class 3 zinc coating (minimum of 0.80 ounces of zinc per square foot of uncoated wire surface for No. 12 1/2-gage wire).

E. The tension wire shall be No. 7 gage coil spring steel wire with galvanized finish having minimum of 0.80 ounces of zinc coating per square foot of uncoated wire surface.

F. Tie wires for fastening fence fabric to line posts and rails shall be not less than No. 6 gage aluminum wire.

G. Line posts shall be 2-3/8 inches outside diameter steel pipe weighing not less than 3.65 pounds per foot, or 1-7/8 inches high carbon steel H-beams weighing not less than 2.70 pounds per foot.

H. End, corner, and pull posts shall be 2-7/8 inches outside diameter steel pipe weighing not less than 5.79 pounds per foot, or 2-1/2 inches square steel tube weighing not less than 5.14 pounds per foot, or 3-1/2 inches roll-formed steel corner section weighing not less than 5.14 pounds per foot.

I. Gate posts for gate leaves up to and including 6-foot wide, shall be 2-7/8 inches outside diameter steel pipe weighing not less than 5.79 pounds per foot or 3-1/2

inches by 3-1/2 inches roll-formed, steel corner section weighing not less than 5.7 pounds per foot.

J. Gate posts for gate leaves over 6 feet wide, including 13 feet wide, shall be 4 inches outside diameter steel pipe weighing not less than 9.10 pounds per foot.

K. Top railings and railing for top, middle, and bottom braces between terminal posts and adjacent line posts shall be 1-5/8 inch outside diameter steel pipe weighing not less than 2.27 pounds per foot, or 1-5/8 inches by 1-1/4 inches, 14 gage roll-form section.

L. Diagonal truss braces between terminal and adjacent line posts and for gate framework shall be 3/8-inch diameter steel rod.

M. Barbed wire support arms shall project outward from the top of the posts at 45 degrees and shall be capable of withstanding a 200-pound downward pull on the outermost end of arm, without failure. The arms shall have provision for the attachment of three (3) strands of evenly spaced barbed wire. Arms shall be integral with post top weather caps having holes for the passage of the top rail at intermediate posts.

N. Fittings shall be heavy duty malleable iron or pressed steel of suitable size to produce strong construction.

O. Stretcher bars for attaching fabric to terminal posts such as end, corner, pull, or gate posts and gate frames shall be flat bars with minimum cross-section dimensions of not less than 1/4-inch by 3/4-inch. The stretcher bars shall be the full height of the fabric and shall be secured with bar bands of not less than 11 gage sheet steel, spaced approximately 15 inches on centers and bolted with 3/8-inch diameter bolts.

P. Gate framework shall be 1-7/8 inches outside diameter steel pipe weighing not less than 2.72 pounds per foot.

Q. If bolted or riveted corner fittings are not used, the gate frame shall be hot-dip galvanized after welding.

R. Gate hinges shall be of heavy pattern of adequate strength for the gate size, with large bearing surfaces for clamping or bolting in position.

S. The gates shall be provided with a suitable latch accessible from both sides and with provision for padlocking.

T. Double leaf swing gates shall have a center bolt, center stop, and automatic backstops to hold leaves in open position.

U. Gate padlocks shall have laminated plate cases, hardened steel shackles, and keyed cylinders. Padlocks shall be No. 5 manufactured by Master Lock Company. The padlocks shall be furnished with two (2) keys each and keyed on the project master key system.

2.02 CONCRETE MIX

Concrete shall be in accordance with Division 3.

2.03 FINISHES

A. Galvanized: ANSI/ASTM A123; 1.8 ounce per square foot coating.

B. Accessories: Same finishing as framing and fabric.

PART 3- EXECUTION

3.01 INSTALLATION

A. The fence and gates shall be erected by skilled mechanics.

B. Post spacing shall be uniform with maximum spacing of 10 feet in fences erected along straight lines. All posts shall be placed plumb and centered in the concrete foundation.

C. Post foundations in earth shall be concrete cylinders with a minimum diameter of 12 inches, crowned two (2") inches at grade to shed water, and shall not be less than 36 inches deep in the ground. Posts shall be set in the full depth of the concrete foundations except for last 3 inches of concrete under the posts.

D. If foundation holes are excavated in peat or other unstable soil, the Engineer shall be notified for determination of suitable construction precautions.

E. If solid rock is encountered without overburden of soil, posts shall be set into the rock a minimum depth of 12 inches for line posts and 18 inches for terminal posts. Post holes shall be at least one (1) inch greater in diameter than the post, and the grout shall be thoroughly worked into the hole so as not to leave voids, and shall be crowned at the top to shed water. Where solid rock is covered by an overburden, the total setting depths shall not exceed the depths required for setting in earth, and the posts shall be grouted into the rock as described.

F. Any change in direction of the fence line of 20 degrees or more shall be considered corners. Pull posts shall be used at any abrupt change in grade.

G. Maximum area of unbraced fence shall not exceed 1,500 square feet.

H. Terminal posts shall be braced to adjacent posts with horizontal brace rails and diagonal truss rods brought to proper tension so that posts are plumb. Diagonal truss rods shall be affixed to post by bands and "J" fitting. Bending of truss rod into end of horizontal pipe will not be permitted.

There shall be no loose connections or sloppy fits in the fence framework. The fence framework shall withstand all wind and other forces due to the weather.

J. Fabric shall be stretched taut and tied to posts, rails, and tension wires with the bottom edge following the finished grade not more than two (2) inches above the grade. The fabric shall be installed on the security side (outside) of the fence and shall be anchored to the framework so that the fabric remains in tension after pulling force is released. The fabric shall be attached to line posts with ties spaced at not more than 15-inch intervals and to rails and braces at no more than 24-inch intervals.

The fabric shall be attached to the tension wire with hog ring ties on 24-inch centers.

K. Three (3) strands of barbed wire shall be installed on each extension arm of the line fence at the top of each gate. The wires shall be pulled taut and fastened at each support.

L. Gates shall be installed plumb, level, and secure for the full width of the opening and the hardware adjusted for smooth operation. Provide concrete center drop to foundation depth and drop rod retainers at center of double gate openings.

- END OF SECTION -

SECTION 02935

SEEDING AND SODDING

PART 1 —GENERAL

1.01 GENERAL

The Contractor shall furnish all labor, materials, and equipment to regrade construction areas to original contours or regrade contours shown on drawings, fertilize and lime, seed or sod, and return all disturbed areas to their original or regrade contour and condition.

PART 2— PRODUCTS

2.01 LIME AND FERTILIZER

Four (4) tons of agricultural limestone per acre and 2 tons per acre of fertilizer with a 10-10-10 analysis shall be uniformly applied and incorporated into soil.

2.02 SEED

A mixture of fifty percent (50%) bluegrass, forty percent (40%) perennial rye and ten percent (10%) redtop shall be sowed at the rate of thirty (30) pounds per acre. The seed shall have a minimum of ninety percent (90%) germination and a maximum of one percent (1%) weeds.

2.03 SOD

Sod shall be thirty percent (30%) to fifty percent (50%) bluegrass and fifty percent (50%) to seventy percent (70%) Falcon Fescue.

PART 3— EXECUTION

3.01 FINAL GRADING

A. Upon completion of backfill, the construction area shall be regraded roughly to original or regrade contours. The top six (6) inches of the regrade must be free from rocks and other deleterious material. All rock shall be picked up and disposed of at a designated place approved by Owner.

B. Any and all settled areas must be brought to grade and restored to as near original conditions as possible prior to final acceptance of the project by the Owner.

3.02 SEEDING AND SODDING

A. Preparation of Seed Bed - Where the area to be seeded is not sufficiently pulverized to provide a good seedbed, the seedbed will be prepared by pulverizing the soil to a depth of four (4) inches with a disk harrow, drag harrow, spike toothed harrow or similar tool immediately prior to seeding. Lime and fertilizer shall be applied prior to preparing seed bed and incorporated into the soil.

B. Seeding - The seed shall be raked or cultipacted into the ground to a depth of no greater than1/4-inch.

C. Mulching - All seeded areas shall be covered with a straw mulch placed to uniform depth of 1-1/2 inches loose.

D. Sodding - The sod bed shall be prepared, fertilized and limed similar to those areas to be seeded. Then the sod shall be placed in accordance with Section 528.3.4 of the Standard Specifications for Road and Bridge Construction of the Kentucky Department of Transportation.

E. Maintenance - Contractor is to take all necessary steps as required to maintain the seed and/or sodded areas so as to ensure an acceptable stand of grass at the conclusion of one full growing season. Any areas not meeting acceptability, shall be redone.

- END OF SECTION -

DIVISION 3

CONCRETE

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cast-in-place concrete.

B. Floors and slabs on grade.

C. Control, expansion, and contraction joint devices associated with concrete work, including joint sealants.

D. Equipment pads, thrust blocks, and miscellaneous.

1.02 RELATED SECTIONS

A. Section 02520 - Portland Cement Concrete Paving.

1.03 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ACI 302 - Guide for Concrete Floor and Slab Construction.

C. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.

D. ACI 305R - Hot Weather Concreting.

E. ACI 306R - Cold Weather Concreting.

F. ACI 308 - Standard Practice for Curing Concrete.

G. ACI 318 - Building Code Requirements for Reinforced Concrete.

H. ASTM C33 - Concrete Aggregates.

I. ASTM C94 - Ready-Mixed Concrete.

J. ASTM C150 - Portland Cement.

K. ASTM C260 - Air Entraining Admixtures for Concrete.

L. ASTM C494 - Chemical Admixtures for Concrete.

M. ASTM C618 - Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

N. ASTM 0948 - Test Method for Dry and Wet Bulk Density, Water Absorption and Apparent Porosity of Thin Sections of Glass-Fiber-Reinforced Concrete.

O. ASTM D994 - Preformed Expansion Joint Filler for Concrete (Bituminous Type).

P. ASTM D11 90 - Concrete Joint Sealer, Hot-Poured Elastic Type.

Q. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

P. ASTM DI 752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.04 DEFINITIONS

A. BEAM: A horizontal structural member, usually set between columns or other vertical components.

B. COLUMN: A vertical structural member, transferring loads from beams and other horizontal components to the building foundations.

C. CONSTRUCTION JOINT: A joint where two successive placements of concrete meet; where reinforcement is not interrupted.

D. CONTRACTION (CONTROL) JOINT: A formed, sawed, or tooled groove in concrete to create a weakened plane to encourage shrinkage or movement cracking to occur at the joint.

E. EXPANSION JOINT: A separation joint between two concrete components of the structure, to allow differential movement where expansion is likely to exceed contraction. This joint continues through the building structure.

F. FORMWORK: Temporary wood, steel, or prefabricated glass fiber falsework used to contain wet concrete until final set commences.

C. FORM TIES: Metal tension anchors to space formwork and maintain dimensional stability during placement of wet concrete.

H. GRADE BEAM: A horizontal structural member, usually spanning between vertical pile or caisson foundations or spread footings.

I. GROUT (NON SHRINK GROUT): A cementious or epoxy based mix used to fill the gap created between bearing components or baseplates and the building foundation or other supporting element.

U. JOINT FILLER: A compressible material placed in concrete control joints, usually at the perimeter of slabs on grade. This material is compressible and expandable to fill the joint space under joint movement conditions.

K. ONE WAY SLAB: A floor or roof slab that transfers loads in one direction only and requires structural support only at opposing bearing edges.

L. PILE CAP: A concrete pad, usually square or rectangular in shape, placed over the top of a pile or caisson foundation, to transfer loads from the building structural frame to the foundation.

M. REINFORCEMENT: Usually deformed steel bars or wire mesh placed within wet concrete to increase tensile strength of the structural concrete member and to assist in resisting shrinkage cracking.

N. RETAINING WALL: A structural vertical exterior concrete wall, unrestrained at the top, used to retain soil or other material of dissimilar elevation.

O. STIRRUP: A formed device of reinforcing steel bar, shaped to a square or rectangular hoop, used to tie bar reinforcement into a cage configuration, for purposes of resisting buckling of the concrete member.

P. STRUT: A structural member used to restrict other structural components from movement.

Q. TIES: A soft annealed steel wire used to bind bar reinforcement, placed perpendicular to each other.

R. THRUST BLOCK: A subgrade concrete structure placed surrounding large water main elbows and tees to resist movement of the pipe caused by water hammer.

S. VAPOR RETARDER: A sheet material placed under interior slabs on grade to arrest the movement of moisture within a building enclosure assembly.

1.05 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.

B. Product Data: Provide data for proprietary materials and items, including forming accessories, admixtures, patching compounds, preformed joints, curing compounds, and others if requested by Engineer.

C. Shop drawings for reinforcing detailing and fabrication.

D. Laboratory test reports for concrete materials and mix design test.

E. Material certificates in lieu of material laboratory test reports when permitted by Engineer.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301.

B. Place concrete in accordance with ACI 304.

C. Acquire cement and aggregate from same source for all work.

D. Conform to ACI 305R when concreting during hot weather.

E. Conform to ACI 306R when concreting during cold weather.

PART 2- PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: Clean and not detrimental to concrete.

2.02 ADMIXTURES

A. Air Entrainment: ASTM C260.

B. Chemical: ASTM C494; Type A - Water Reducing, Type D - Water Reducing and Retarding, Type E - Water Reducing and Accelerating, Type F - Water Reducing, High Range, and Type C - Water Reducing, High Range, and Retarding.

C. Fly Ash: ASTM C618, Type F.

2.03 ACCESSORIES

A. Bonding Agent: Polymer resin emulsion, Polyvinyl Acetate, Latex emulsion, or two-component modified epoxy resin.

B. Vapor Retarder: 8 mil thick clear polyethylene film.

0. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

2.04 JOINT DEVICES AND FILLER MATERIALS

A. Joint Filler: ASTM D1752; Closed cell polyvinyl chloride or molded vinyl foam, resiliency recovery of 95 percent if not compressed more than 50 percent of original thickness. Asphalt impregnated fiberboard may be used with Engineer's approval.

B. Construction Joint Devices: Integral galvanized steel, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at six (6) inches, ribbed steel spikes with tongue to fit top screed edge.

C. Sealant: Cold applied two part liquid neoprene. Use concrete color.

2.05 CONCRETE PROPORTIONING AND DESIGNING MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Engineer for preparing and reporting proposed mix designs.

1. Do not use the same testing agency for field quality control testing.
2. Limit use of fly ash to not exceed 25 percent of cement content by weight.

B. Submit written reports to Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until proposed mix designs have been reviewed by Engineer.

C. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules:

1. 4000 psi, 28-day compressive strength; water-cement ratio, 0.44 maximum (non air-entrained), 0.35 maximum (air-entrained).
2. 3500 psi, 28-day compressive strength; water-cement ratio, 0.58 maximum (non air-entrained), 0.46 maximum (air-entrained).
3. 2500 psi, (Lean concrete, if used) 28-day compressive strength; water-cement ratio, 0.67 maximum.

D. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:

1. Subjected to freezing and thawing: W/C 0.45.
2. Subjected to deicers/watertight: W/C 0.40.
3. Subjected to brackish water, salt spray, or deicers: W/C 0.40.

E. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs, and sloping surfaces: Not more than three (3) inches.
2. Reinforced foundation system: Not less than one (1) inch and not more than three (3) inches.
3. Concrete containing high-range water-reducing admixture (superplasticizer): Not more than eight (8) inches after adding admixture to site-verified 2-to-3-inch slump concrete.
4. Other concrete: Not more than four(4) inches.

F. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Engineer before using in work.

2.06 ADMIXTURES

A. Use water-reducing admixture or high-range water-reducing admixture (superplasticized) in concrete, as required, for placement and workability.

B. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50°F (10°C).

C. Use high-range water-reducing admixture in pumped concrete, architectural concrete, concrete required to be watertight, and concrete with water-cement ratios below 0.50.

D. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result

in a concrete at point of placement having total air content with a tolerance of plus or minus 1½ percent within the following limits:

1. Concrete structures and slabs exposed to freezing and thawing; deicers, chemicals, or hydraulic pressure:

   a. 4.5 percent (moderate exposure); 5.5 percent (severe exposure) for 1 ½ inch maximum aggregate.

   b. 4.5 percent (moderate exposure); 6.0 percent (severe exposure) for 1-inch maximum aggregate.

   c. 5.0 percent (moderate exposure); 6.0 percent (severe exposure) for 3/4-inch maximum aggregate.

   d. 5.5 percent (moderate exposure); 7.0 percent (severe exposure) for ½ -inch maximum aggregate.

2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent.

E. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

PART 3- EXECUTION

3.01 EXAMINATION

A. Verify site conditions.

B. Verify requirements for concrete cover over reinforcement. Where not shown, use minimum as specified in ACI 318.

C. Verify that anchors, plates, reinforcements, and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

3.02 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

B. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

C. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304.

B. Notify Engineer minimum 24 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, and formed construction and contraction joints are not disturbed during concrete placement.

D. Install vapor retarder under interior slabs on grade only where space is inhabite Lap joints minimum six (6) inches and seal watertight by taping edges and ends.

E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum six (6) inches and seal watertight.

F. Separate slabs on grade from vertical surfaces with 1/4 to 3/8 inch joint filler.

C. Extend joint filler from bottom of slab to within about 1/4 inch of finished slab surface. Conform to Section 07900 for finish joint sealer requirements.

H. Install preformed metal tongue and groove joint devices, if used, in accordance with manufacturer's instructions.

I. Apply sealants in joint devices in accordance with Section 07900.

J. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

K. Place concrete continuously between predetermined expansion, control, and construction joints.

L. Do not interrupt successive placement; do not permit cold joints to occur.

M. Saw cut control joints within 24 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.

N. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 feet.

3.04 CONCRETE FINISHING

A. Provide formed concrete surfaces to be left exposed with smooth rubbed finish as scheduled in this Section. Other formed concrete surfaces to be left exposed to get rough form finish (see ACI 301).

B. Finish concrete floor surfaces in accordance with ACI 301.

C. Steel trowel surfaces of building slabs which are to be exposed.

D. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 minimum, but not less than indicated on drawings.

3.05 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure concrete in accordance with ACI 301 and ACI 308. Cure concrete for seven (7) days minimum after placement.

3.06 FIELD QUALITY CONTROL

A. Provide free access to work and cooperate with appointed firm.

B. Submit proposed mix design of each class of concrete to testing firm and Engineer for review prior to commencement of work.

C. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

D. Four concrete test cylinders will be taken for every 75 or less cubic yards of each class of concrete placed.

E. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.

F. One slump test will be taken for each set of test cylinders taken.

3.07 PATCHING

A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

C Patch imperfections in accordance with ACI 301.

3.08 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details dimensions, tolerances, or specified requirements.

B. Repair or replacement of defective concrete will be determined by the Engineer.

C. Do not patch, fill, tough-up, repair or replace exposed concrete except upon express direction of Engineer for each individual area.

3.09 SCHEDULE - CONCRETE TYPES AND FINISHES

A. Below grade footings: 3500 psi.

B. Thrust blocks: 3500 psi.

C. All other concretes: 4000 psi

D. Finishes:

1 Formed surfaces:

a. Not exposed: Remove fins and repair obvious defects.

b. Exposed to view: Patch tie holes and defects, and remove fins. Give smooth rubbed finish.

2. Unformed surfaces:

a. All surfaces to have floated finish unless noted.

b. Troweled finish: Building floor slabs and similar structures.

c. Broom finish: All exposed floor areas, sidewalks, and steps subject to foot traffic and likely to be wet should have a broom finish,

- END OF SECTION -

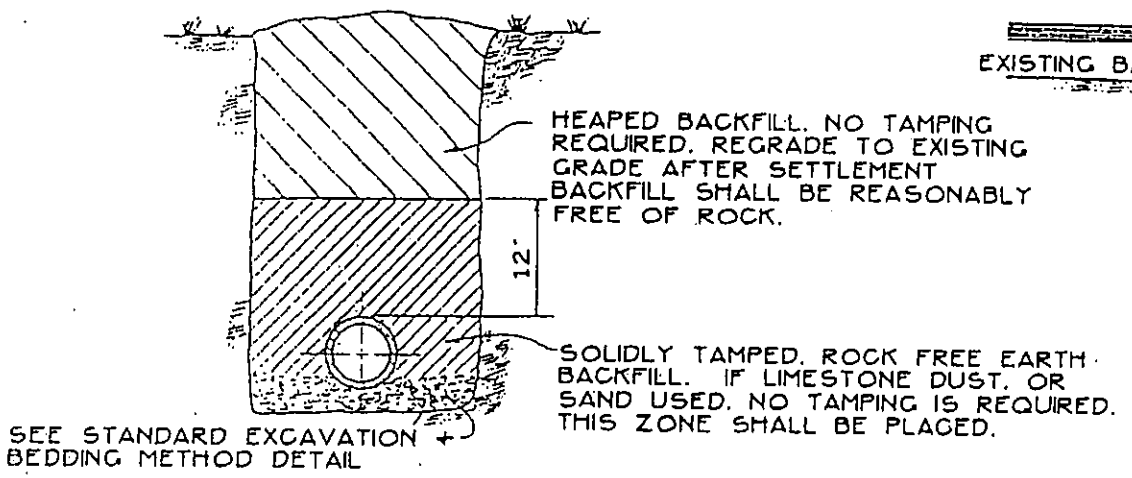
STANDARD CONSTRUCTION DETAILS

For

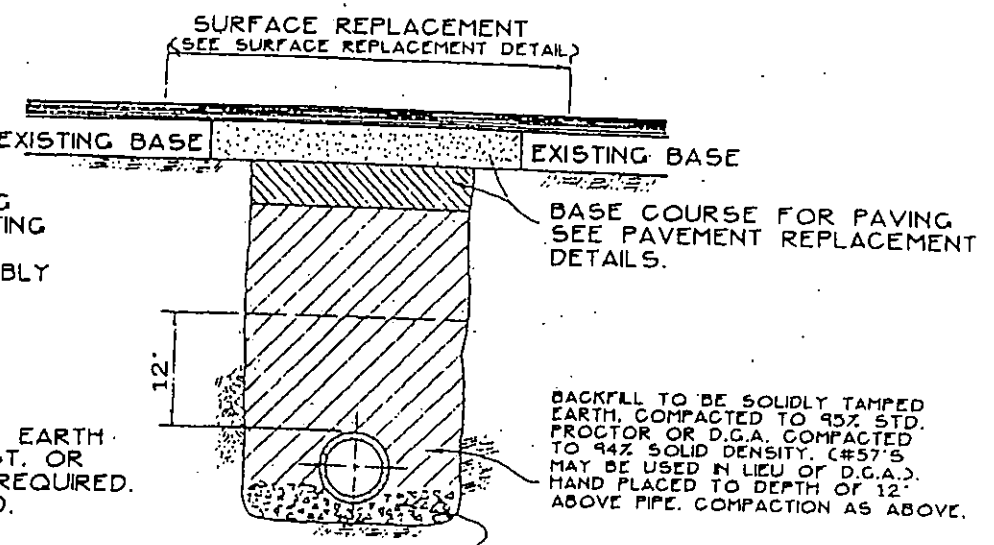
Jessamine South Elkhorn Water District
117 South Main Street
Nicholasville, Kentucky 40356
(859) 881-0589

By:

HORNE ENGINEERING, INC.
Engineers - Land Surveyors - Planners
216 South Main Street
Nicholasville, Kentucky 40356
Phone: (859) 885-9441

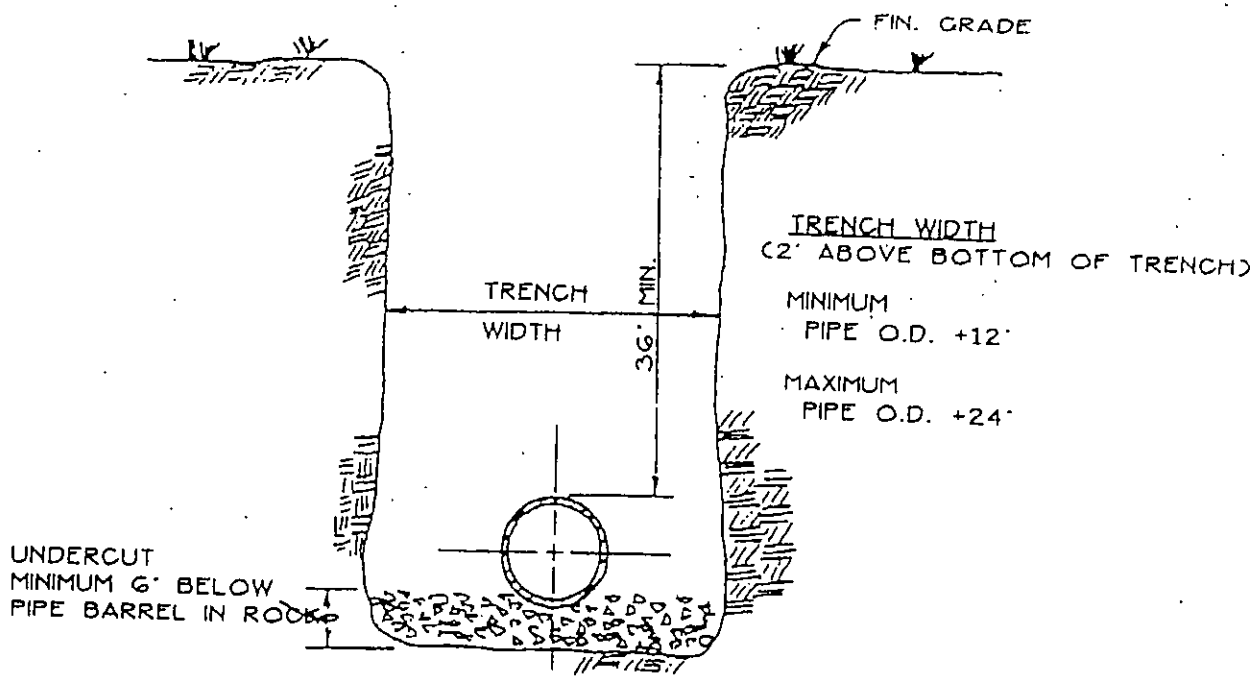


METHOD "A"



METHOD "C"

Backfilling



TRENCH BOTTOM SHALL PROVIDE A MINIMUM OF 6" OF UNDISTURBED SOIL. IF SOLID ROCK OCCURS LESS THAN SIX INCHES THEN UNDERCUT TO 6" AND USE SOLID ROCK BEDDING PROCEDURE.

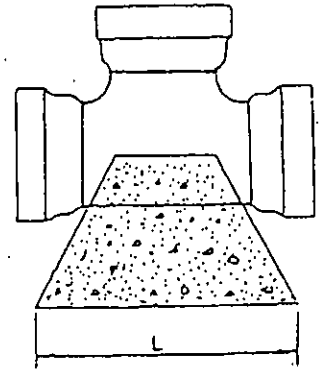
Standard Excavation & Bedding Method

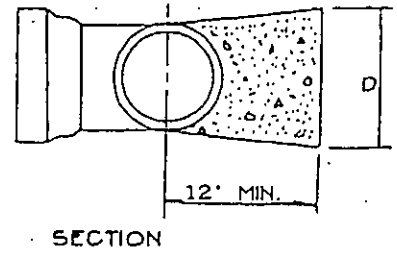
NOT TO SCALE

SD-2

VERTICAL BENDS + STRAIGHT PIPES							
SIZE	2"	3"	4"	6"	8"	10"	12"
D	10"	12"	12"	18"	18"	24"	24"
L	12"	18"	18"	30"	30"	36"	36"

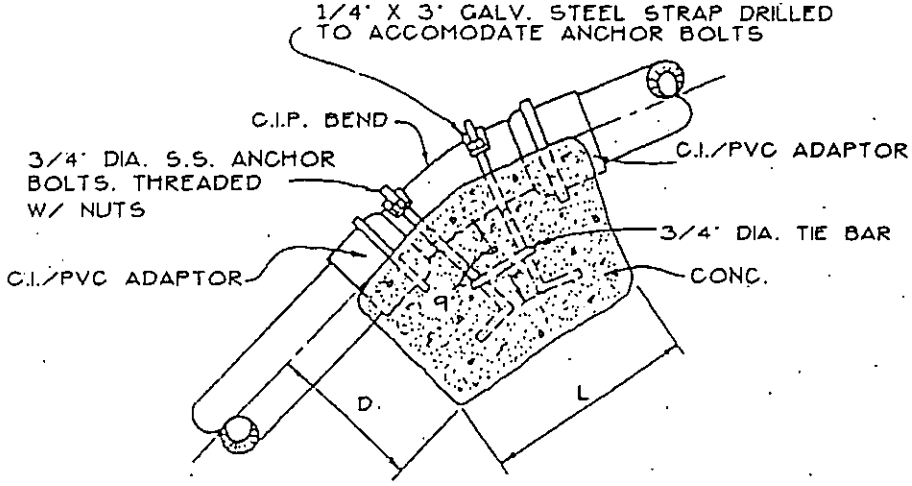
TEES							
SIZE	2"	3"	4"	6"	8"	10"	12"
D	12"	12"	12"	24"	24"	36"	36"
L	12"	12"	20"	36"	36"	48"	48"



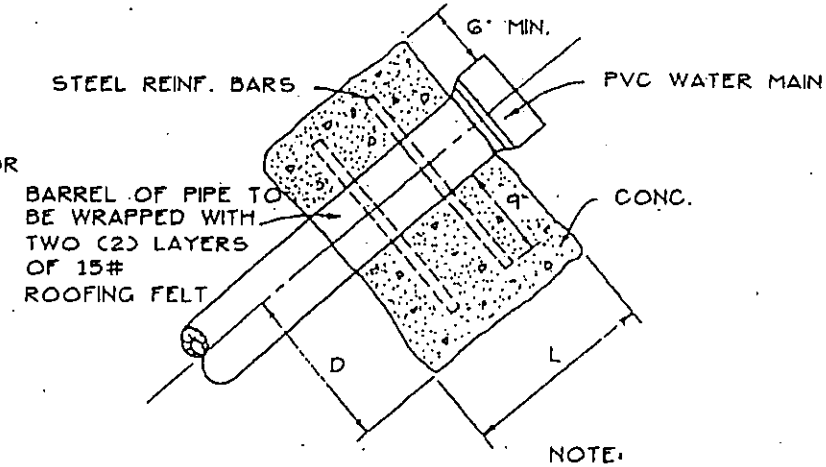


SECTION

TEE



VERTICAL BEND



STRAIGHT PIPE

NOTE:
DEPTH 'D' MAY BE GREATER THAN SPECIFIED TO ALLOW WORKING SPACE. PIERS MUST BE PLACED AGAINST UNDISTURBED EARTH.
TO BE USED ON GRADES EXCEDING 15% FOR 50 FEET OR MORE. ALL METAL IN CONTACT WITH SOIL TO BE STAINLESS OR NON CORROSIVE. ONE ANCHOR REQUIRED FOR EACH JOINT OF PIPE.

Concrete Anchor Blocks

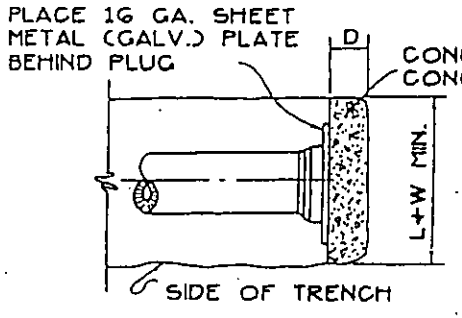
NOT TO SCALE

PLUGS							
SIZE	2"	3"	4"	6"	8"	10"	12"
D	6"	6"	6"	6"	6"	6"	6"
L+W	14"	16"	18"	24"	30"	36"	42"

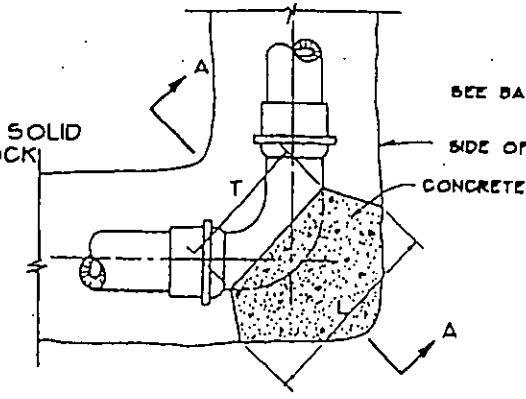
(45°) EIGHTH BENDS							
SIZE	2"	3"	4"	6"	8"	10"	12"
D	6"	6"	6"	6"	6"	6"	6"
L	12"	14"	16"	24"	30"	30"	36"
T	10"	12"	14"	16"	16"	18"	18"

(90°)QUARTER BENDS							
SIZE	2"	3"	4"	6"	8"	10"	12"
D	6"	6"	6"	12"	12"	18"	18"
L	21"	24"	27"	36"	36"	42"	48"
T	10"	12"	14"	16"	20"	24"	24"

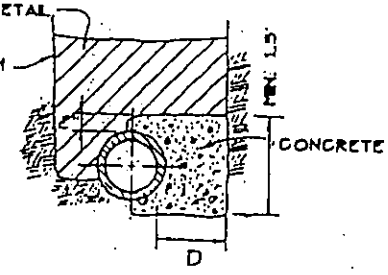
NOTE:
DEPTH 'D' MAY BE GREATER THAN SPECIFIED TO ALLOW WORKING SPACE. PIERS MUST BE PLACED AGAINST UNDISTURBED EARTH. TO BE USED ON GRADES EXCEDING 15% FOR 50 FEET OR MORE. ALL METAL IN CONTACT WITH SOIL TO BE STAINLESS OR NON CORROSIVE. ONE ANCHOR REQUIRED FOR EACH JOINT OF PIPE.



PLUGS



45° & 90° BENDS

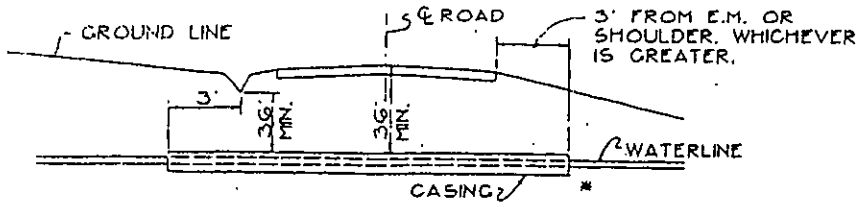


SECTION A-A

Concrete Thrust Blocks

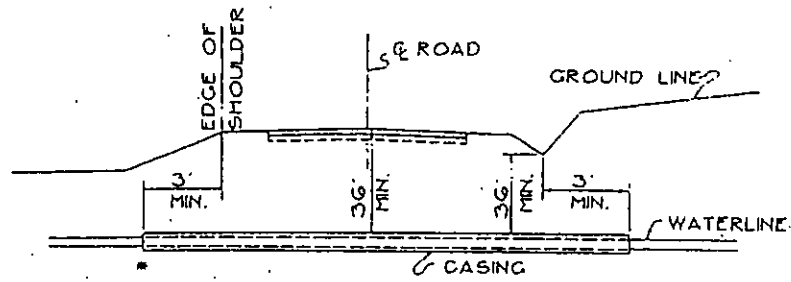
NOT TO SCALE

SD-4

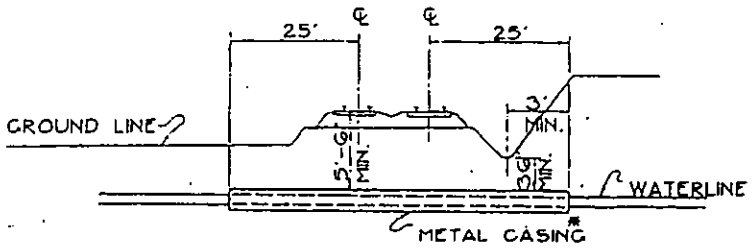


BORE + CASE OR TRENCH WITH SLEEVE W/ BACKFILL METHOD 'C'. PAVEMENT AS PER DETAIL.

TYPICAL COUNTY ROAD CROSSING



TYPICAL STATE + FEDERAL ROAD CROSSING



NOTE: CASING PIPE TO BE INSTALLED AS PER SECTION 5.2. SPECIFICATIONS FOR PIPE LINES CONVEYING NON-FLAMMABLE SUBSTANCES OF THE A.R.E.A. MANUAL FOR RAILROAD ENGINEEERING REGARDING METHOD OF INSTALLATION + MATERIALS

TYPICAL RAILROAD CROSSING

NOTE: ALL PIPES INSTALLED IN CASINGS REQUIRE CASING INSULATORS TO BE INSTALLED AT A MINIMUM OF 2 PER PIPE JOINT. INSULATORS

*CASING PIPE ENDS TO BE SEALED WITH NEOPRENE GASKET WITH STAINLESS STEEL BANDS.

CASING PIPE SIZES		
CARRIER PIPE SIZE	CASING PIPE SIZE	WALL THICKNESS *METAL
4"	8"	0.250
6"	10"	0.250
8"	12"	0.250
10"	14"	0.250

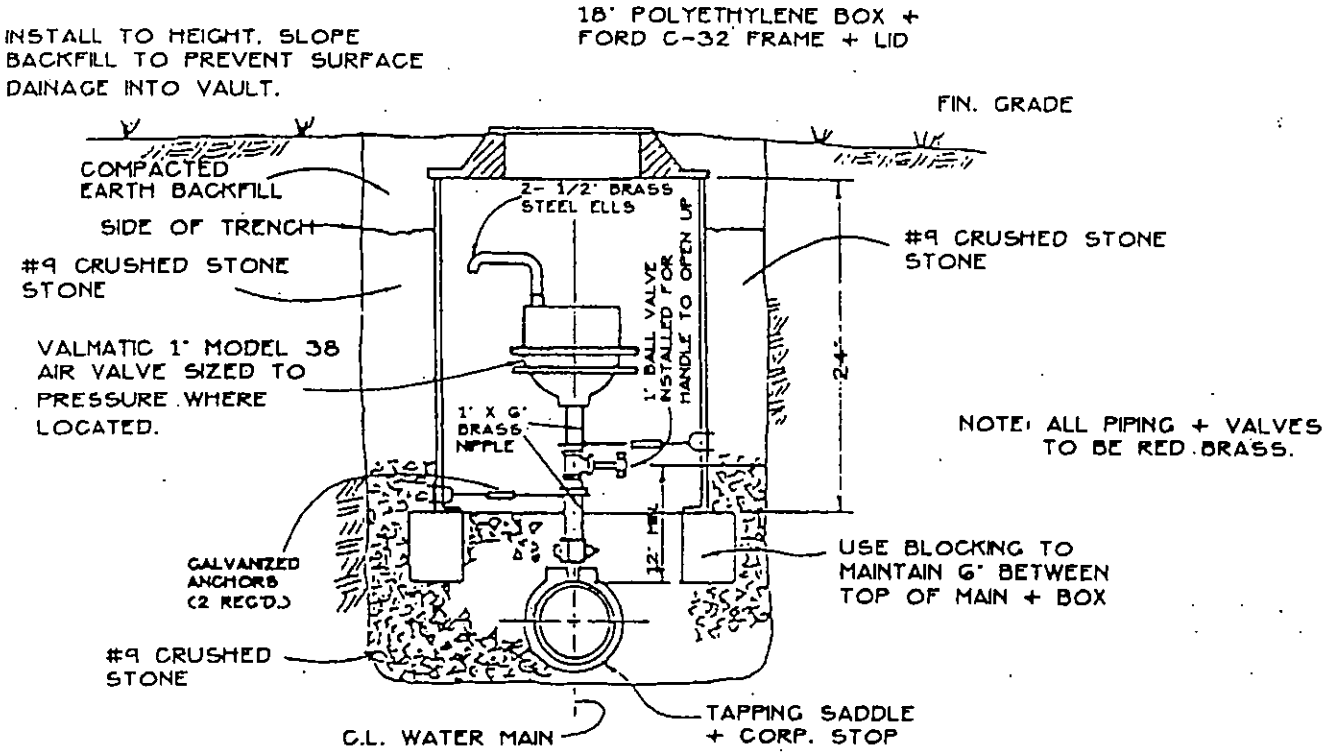
*MINIMUM YIELD STRENGTH OF 35,000 P.S.I. NO ALTERNATE ALLOWED FOR RAILROAD CROSSING.

Road Casing Details

NOT TO SCALE

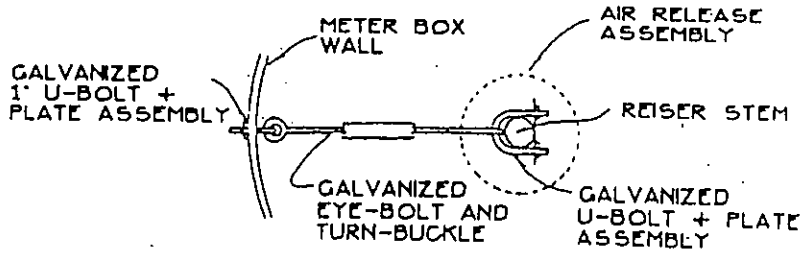
NOTE: AIR VALVE TO BE ANCHORED AS PER DETAIL HEREON.

NOTE: ALL AIR RELEASE ASSEMBLIES WHICH FALL WITHIN PASTURE OR CULTIVATED FIELDS SHALL BE LOCATED UNDER OR NEAR A FENCE LINE. MAIN LINE TAP SHALL BE MADE AT HIGH POINT AND IF NECESSARY POLY TUBING LAID AT POSITIVE GRADE TO AIR RELEASE ASSEMBLY.



TYPICAL AIR VALVE SETTING

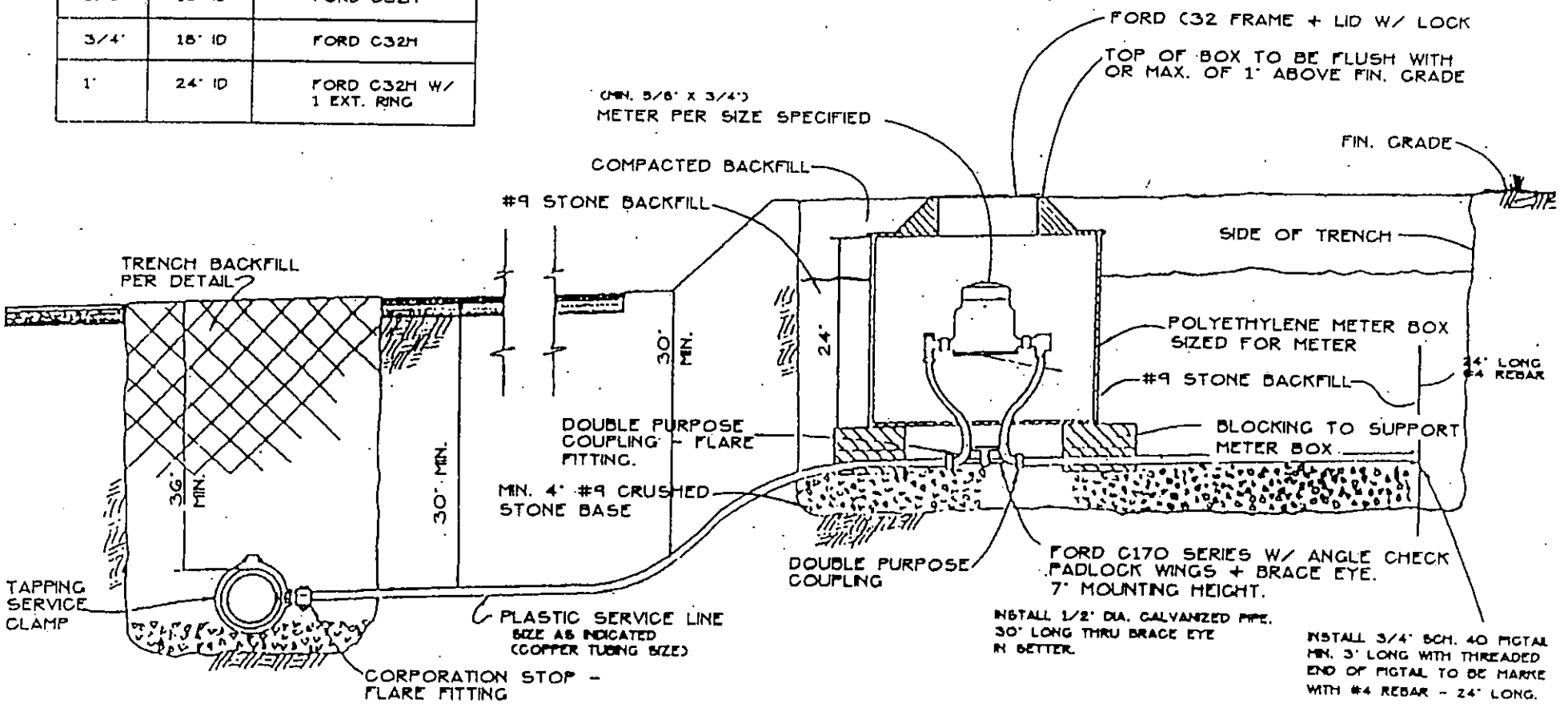
NOT TO SCALE



Air Valve Setting
Galvinized Anchor Detail
(2 Required each installation)
Not to scale

6D-6

METER SIZE	BOX DIA.	METER LID
5/8"	18" ID	FORD C32H
3/4"	18" ID	FORD C32H
1"	24" ID	FORD C32H W/ 1 EXT. RING

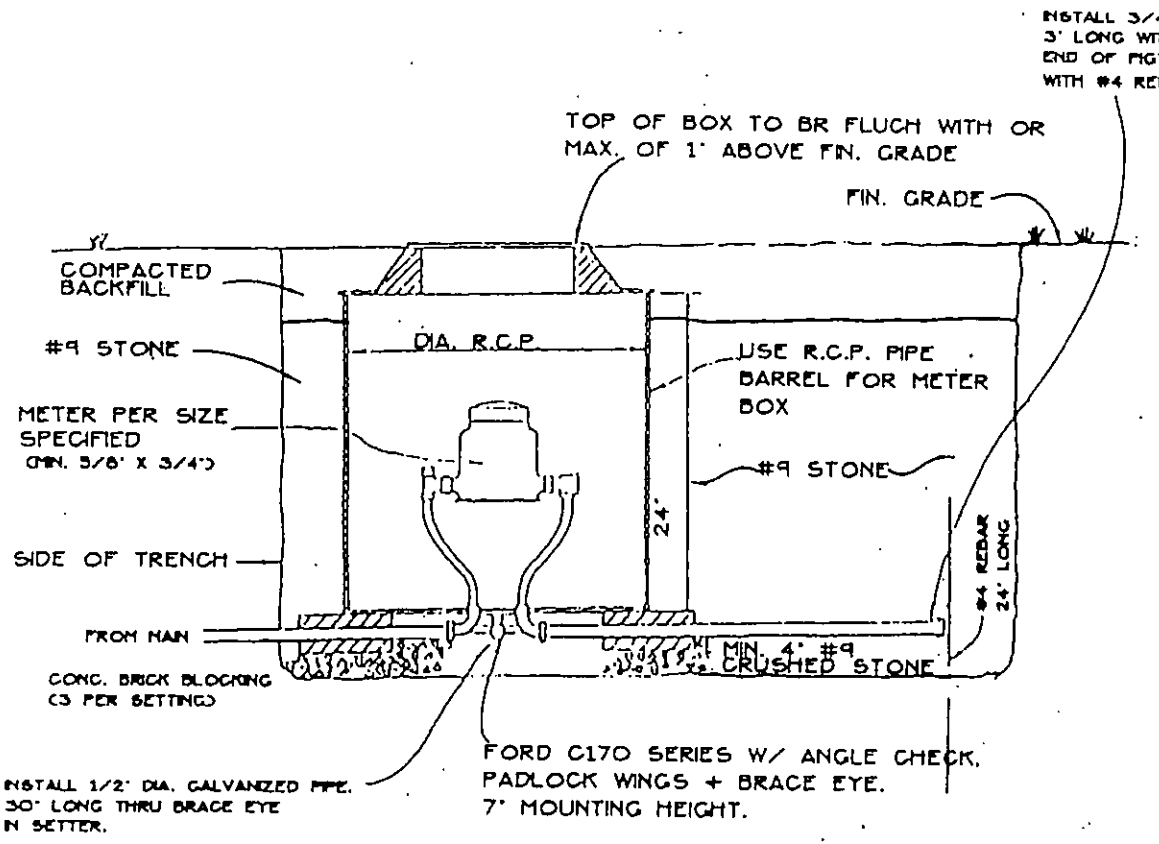


TYPICAL SERVICE CONNECTION

5/8" THRU 1" - NON-TRAFFIC BEARING

NOT TO SCALE

CN-7



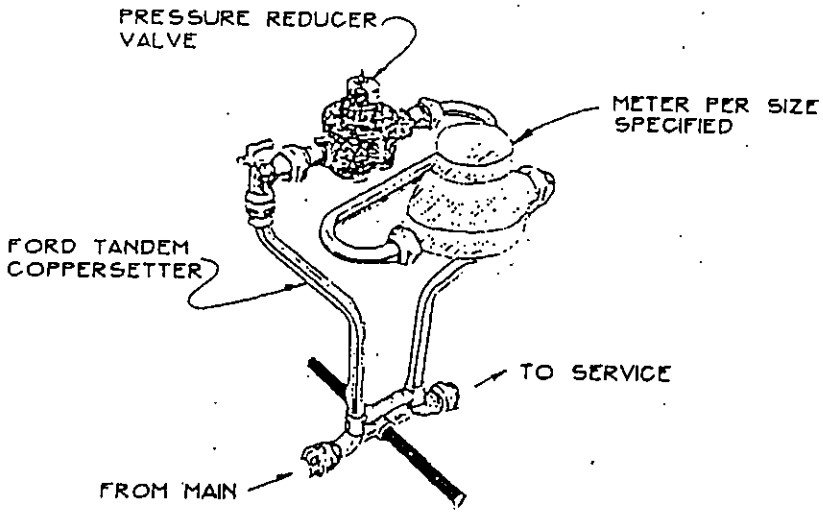
METER SIZE	BOX DIA.	METER LID
5/8"	18" ID	FORD C32H
3/4"	18" ID	FORD C32H
1"	24" ID	FORD C32H W/ 1 EXT. RING

TYPICAL METER INSTALLATION

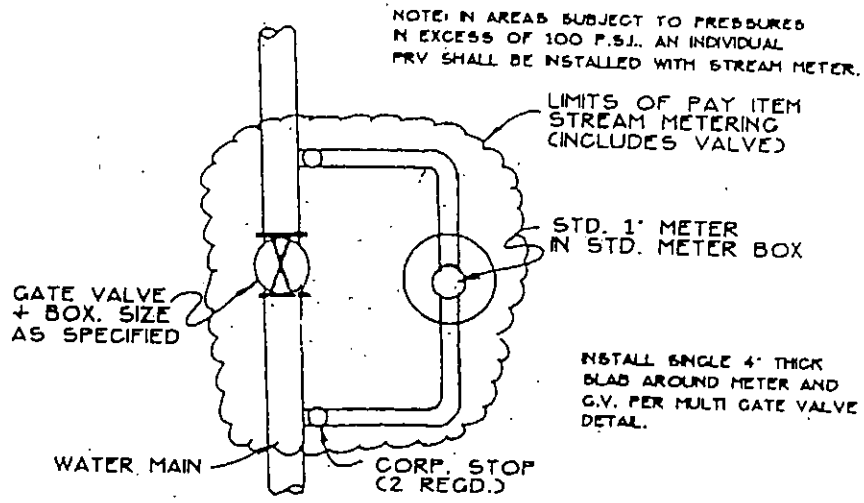
5/8" THRU 1" - NON-TRAFFIC BEARING

NOT TO SCALE

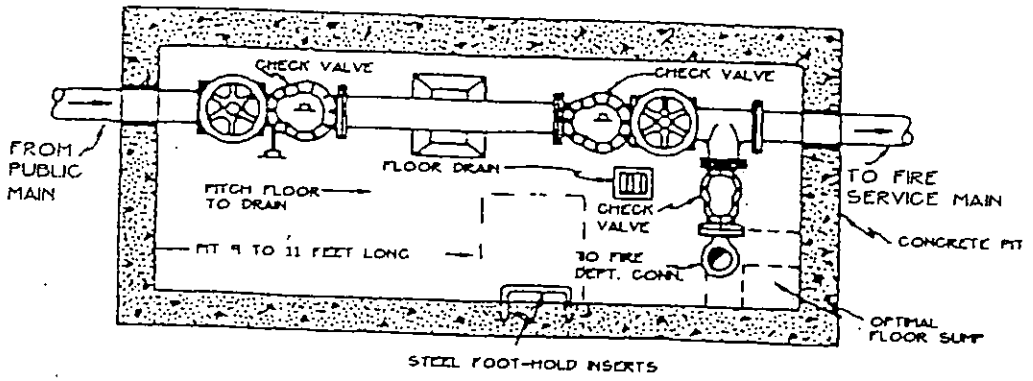
SD-8



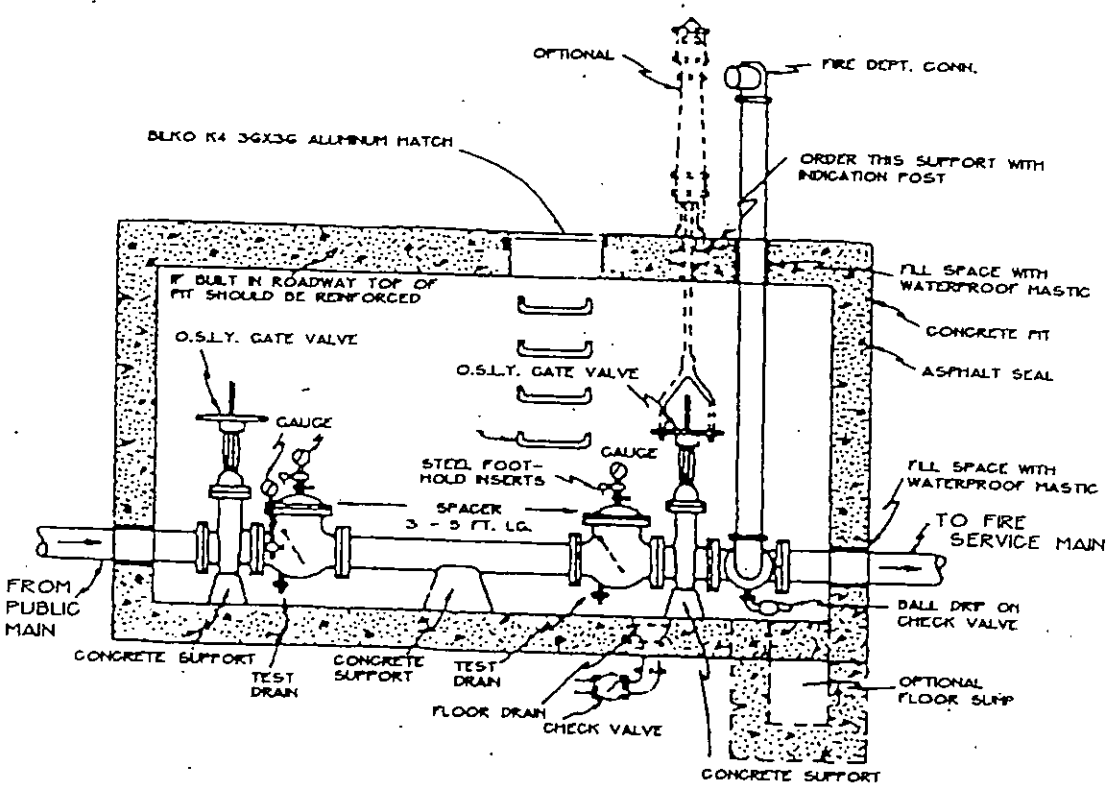
Typical Meter Installation with Pressure Reducer Valve



Stream Metering Installation



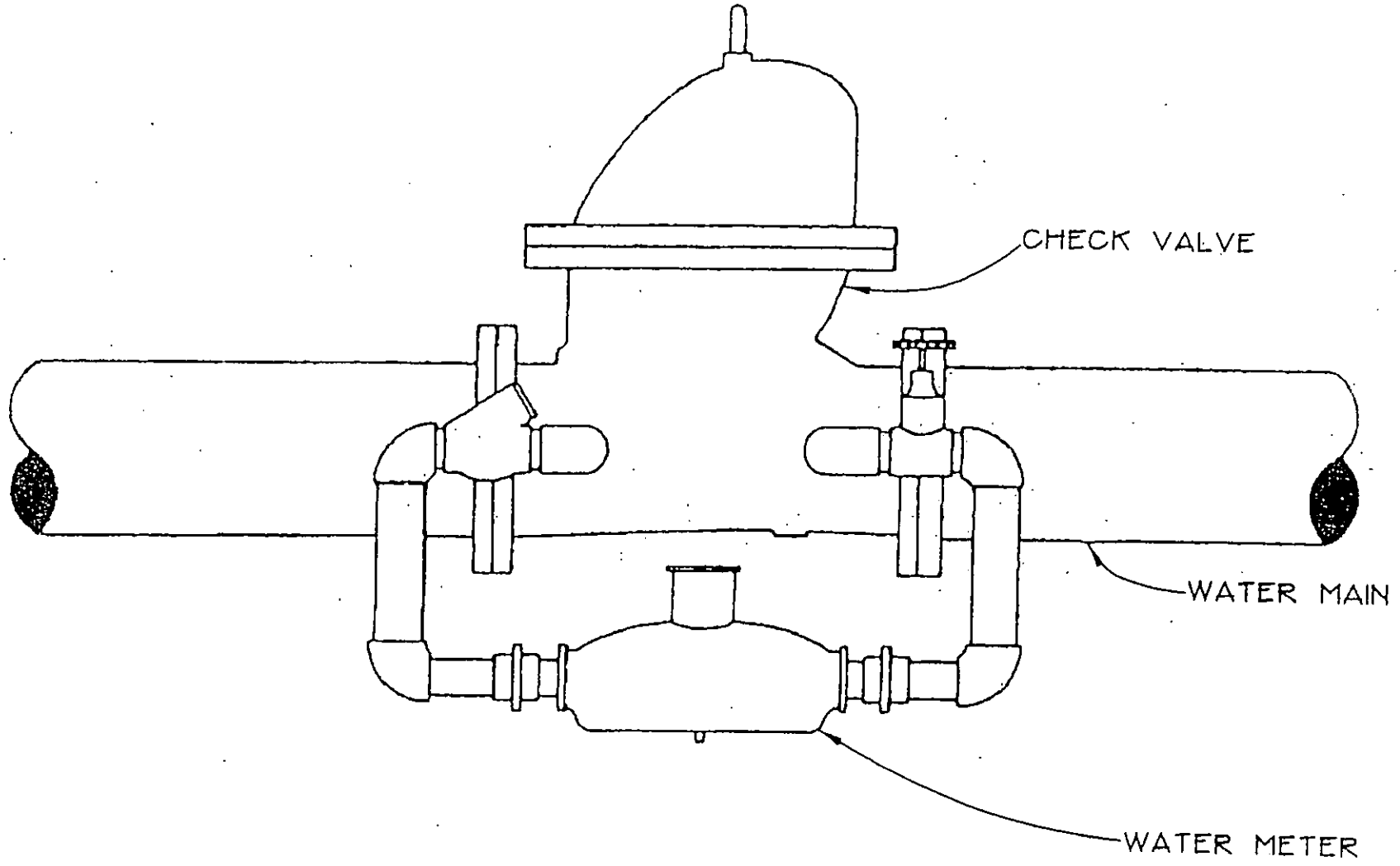
PLAN
NO SCALE



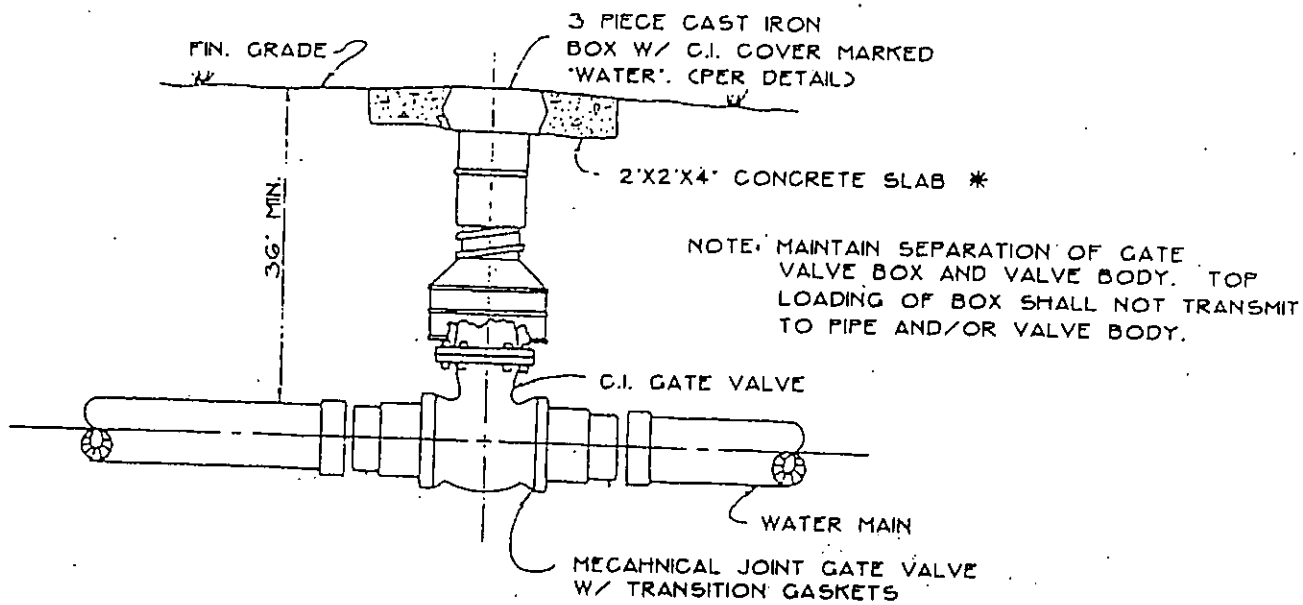
SECTION
NO SCALE

DETECTION CHECK VALVE DOUBLE

SD-10



DETAIL OF DETECTION CHECK METER



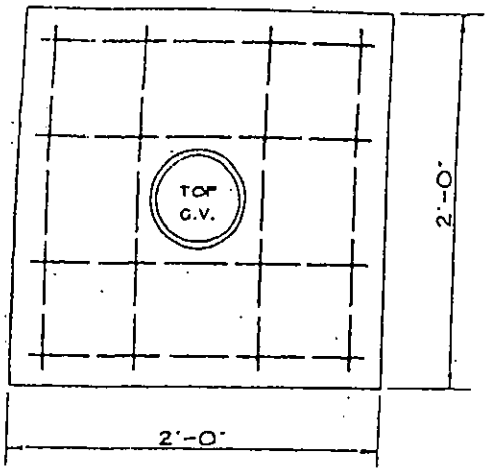
Typical Gate Valve Setting

NOT TO SCALE

* ALTERNATE:

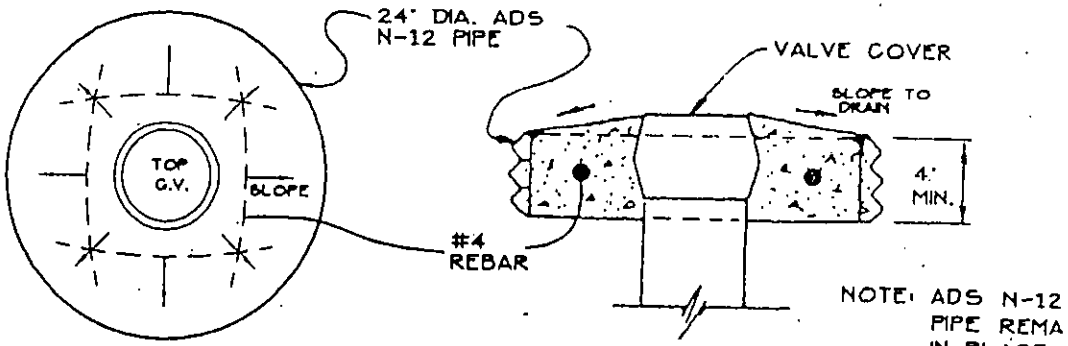
GATE VALVE SLAB MAY BE FORMED BY 4" SEGMENT OF 24" DIAMETER ABS N-12 PIPE.

SD-12



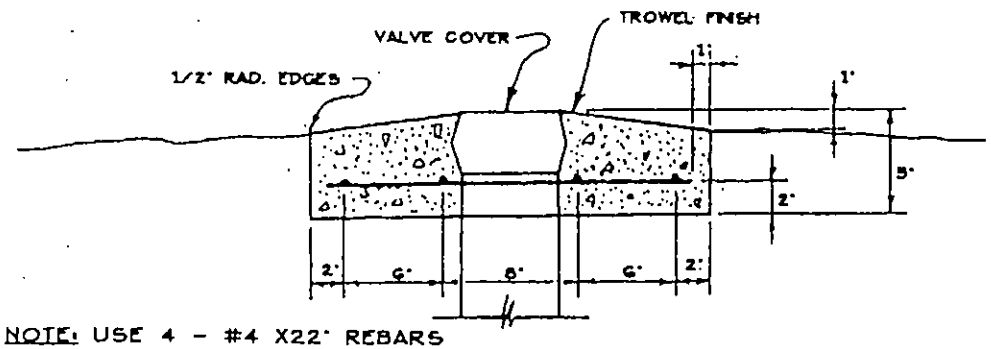
PLAN

ALL SLABS IN TRAFFIC AREAS SHALL HAVE 1/2" REBARS AT 6" O/C E/W.



NOTE: ADS N-12 PIPE REMA IN PLACE

ALTERNATE CONSTRUCTION NON TRAFFIC AREA



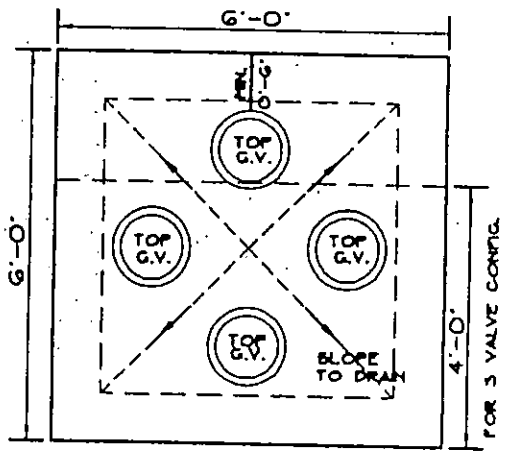
NOTE: USE 4 - #4 X22" REBARS EACH WAY

SECTION

TRAFFIC AREA

NOTES

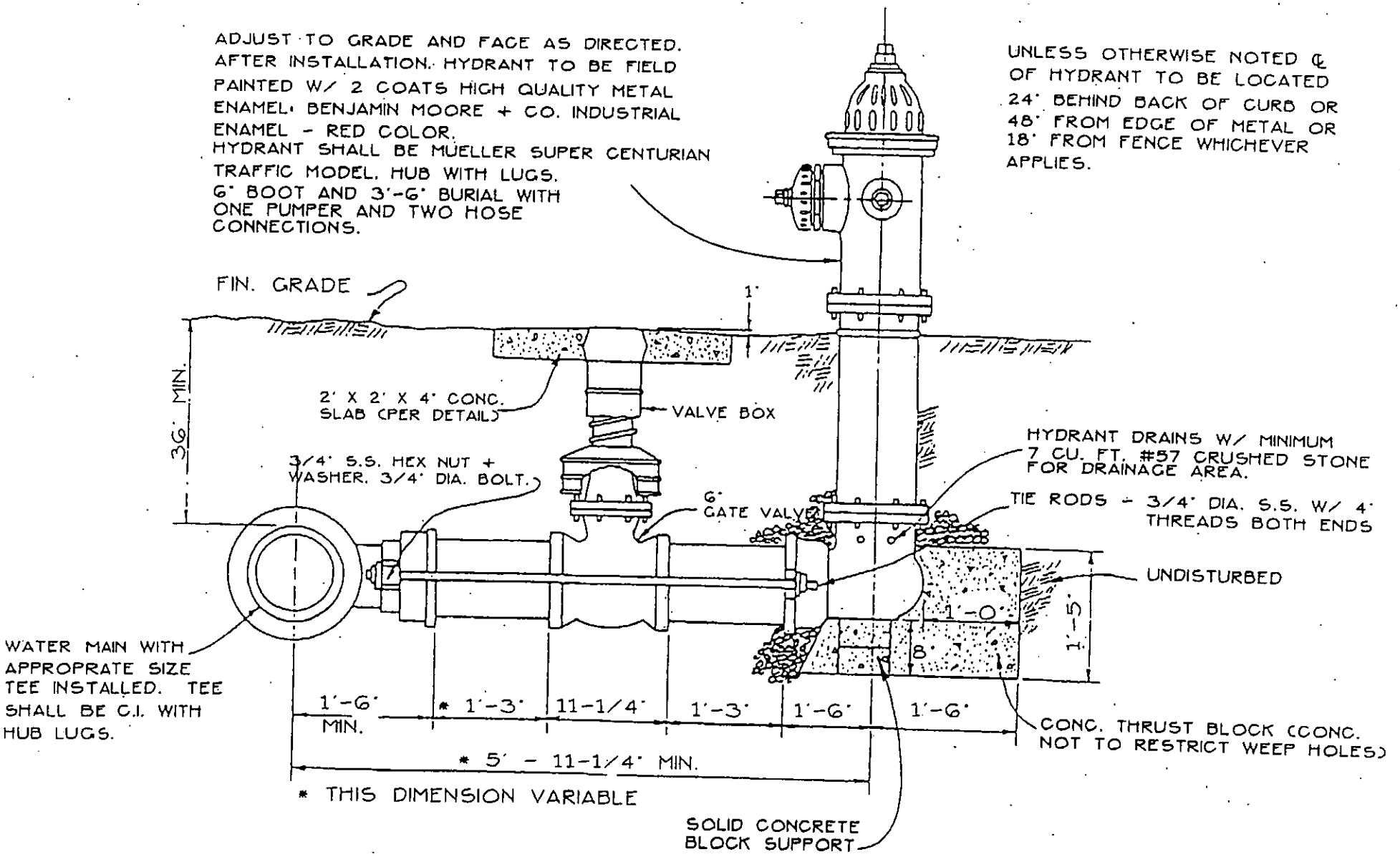
1. SLAB SHALL BE POURED ON A FIRM. UNYIELDING FOUNDATION. ANY SETTLEMENT OF SLAB SHALL REQUIRE REMOVAL. COMPACTION AND REPLACEMENT.
2. BACKFILL AREA UNDER GATE VALVE PAD WITH #9 STONE FROM FIRM FOUNDATION TO BOTTOM OF GATE VALVE PAD.
3. VALVE BOX SHALL BE CONSTRUCTED TO LINE AND GRADE TO MATCH FINAL GRADE - EITHER EXISTING OR PROPOSED OF AREA.



TYPICAL 4(3) VALVE ARRANGEMENT AT CROSS-CONNECTIONS (+ TEES)
NOT TO SCALE

NOTE: ANY VALVE LOCATED WITHIN 10' OF A FITTING IS TO BE RODDED TO THE FITTING.

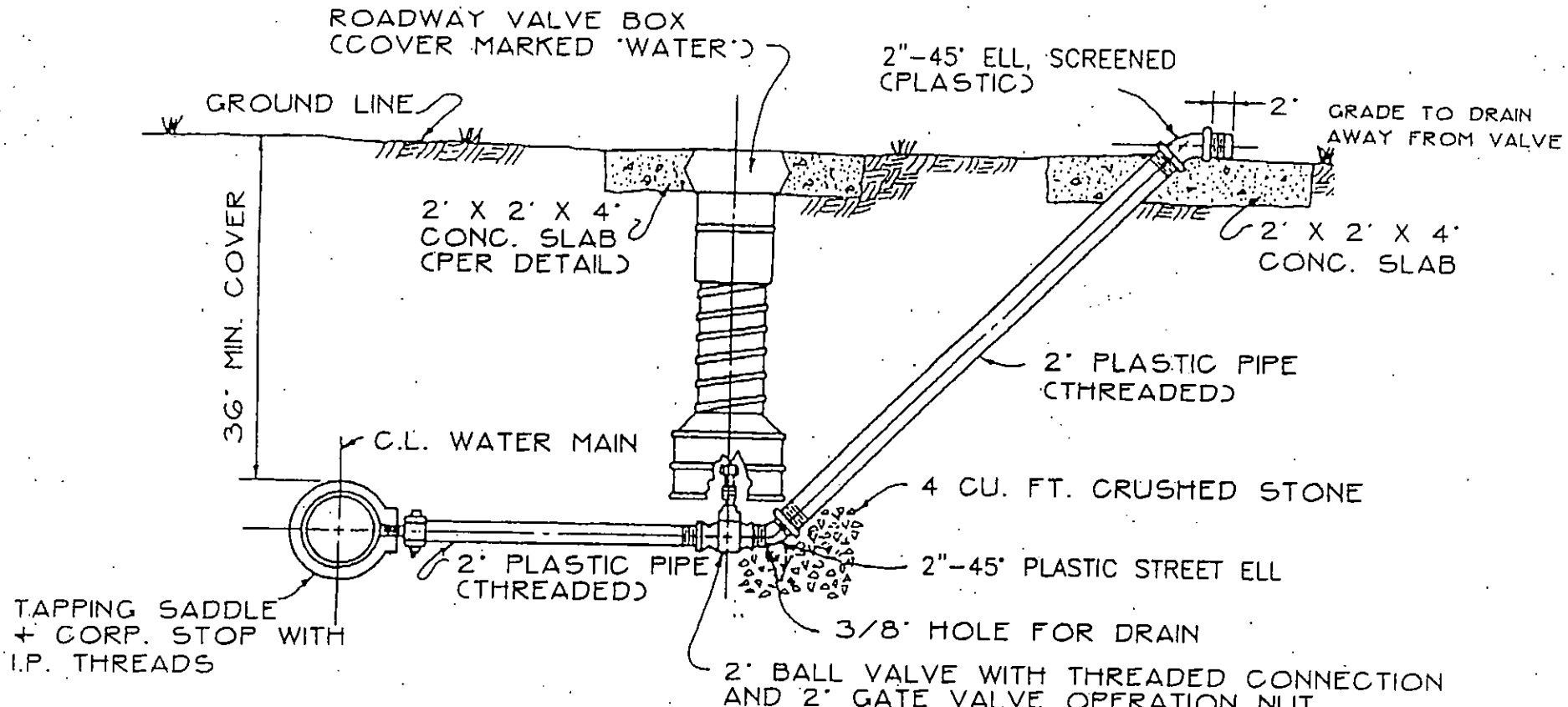
CD - 3 VALVE BOX PAD DETAILS



FIRE HYDRANT VALVE + VALVE BOX

NOT TO SCALE

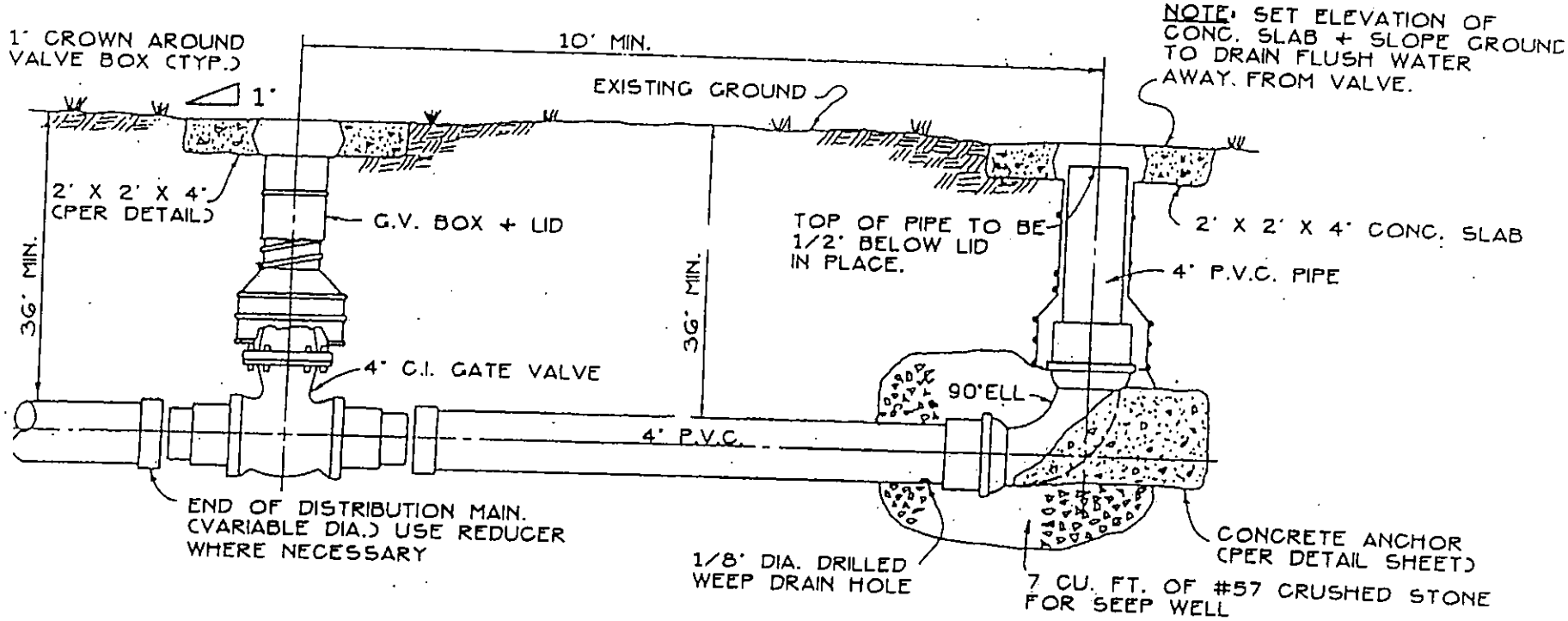
SD-14



NOTE: ALL 2" PIPE BENDS, VALVES AND CONNECTIONS TO BE I.P. THREADS.

Typical Blow-off

NOT TO SCALE

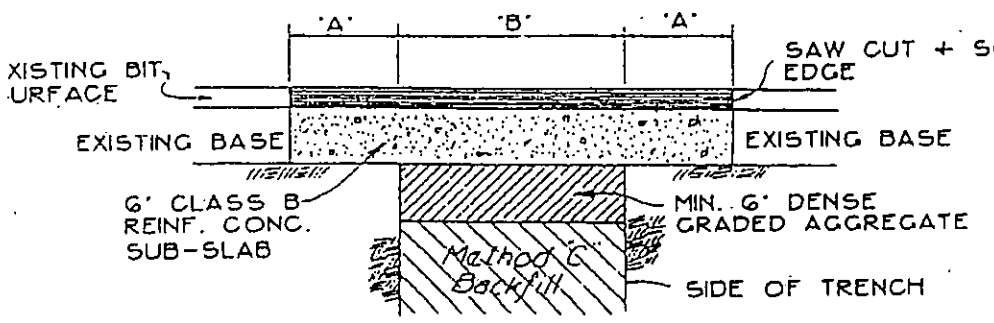


Line Termination Blow-off

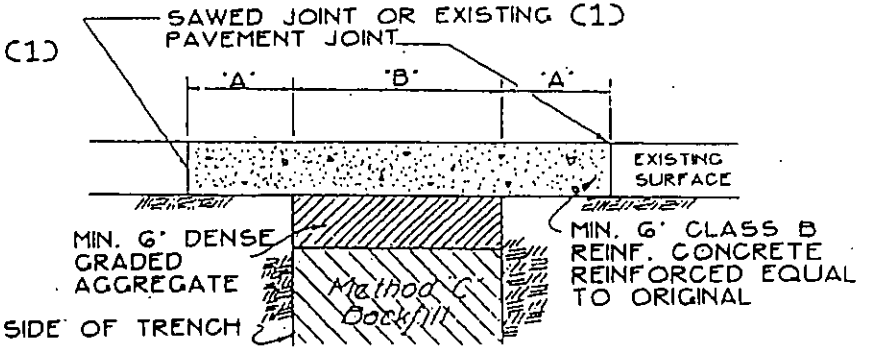
NOT TO SCALE

SD-16

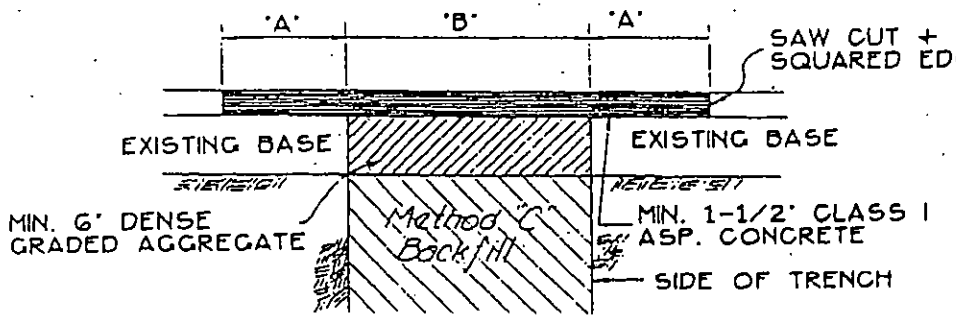
HEAVY DUTY SURFACE REPLACEMENT



BITUMINOUS



CONCRETE



LIGHT DUTY BITUMINOUS

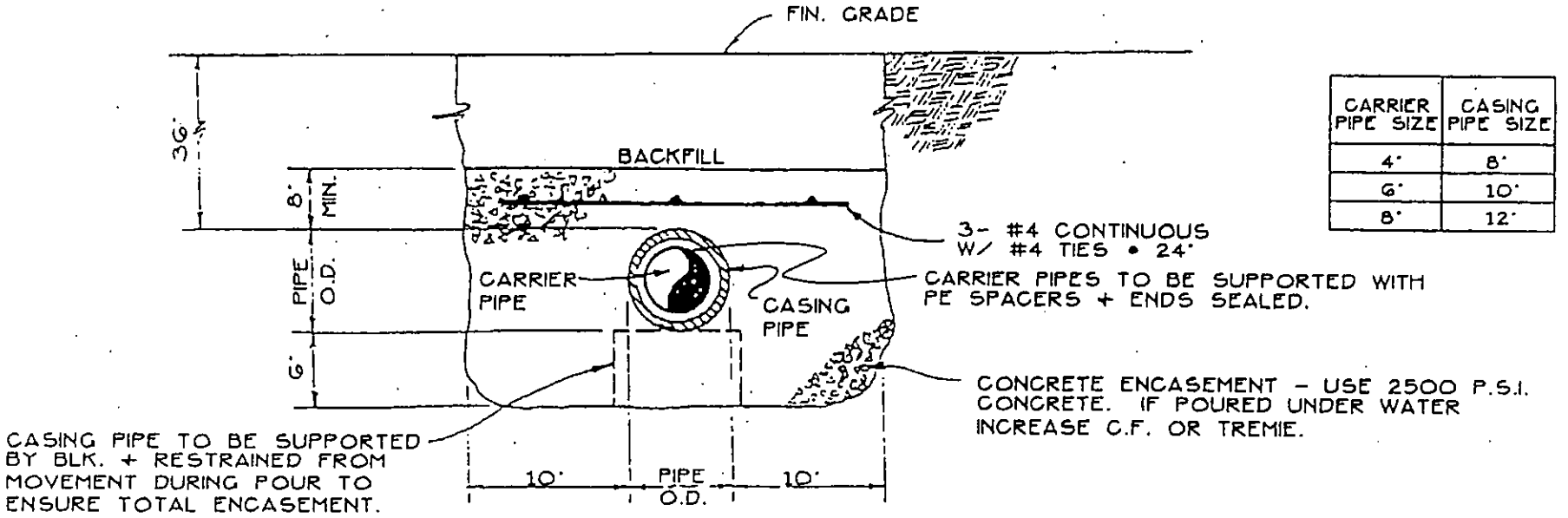
ROADWAY	PAVEMENT REPLACEMENT TYPE
FEDERAL HIGHWAY	HEAVY DUTY
STATE HIGHWAY	HEAVY DUTY
COUNTY (PAVED)	HEAVY DUTY
COUNTY (UNPAVED)	LIGHT DUTY
DRIVEWAYS + ACCESS	LIGHT DUTY

MINIMUM REPLACEMENT WIDTH SCHEDULE			
PIPE SIZE	MIN. 'A'	MIN. 'B'	MIN. PAVEMENT REPLACEMENT
4" THRU 12"	12"	24"	4'-0"
14" THRU 18"	12"	30"	4'-6"
20" THRU 24"	12"	36"	5'-0"
26" THRU 36"	12"	48"	6'-0"

(1) DIMENSIONS SHOWN ARE MINIMUM. IF SURFACE EDGES ARE BROKEN WIDTH SHALL BE INCREASED AND EACH SIDE MAINTAINED PARALLEL.

PAVEMENT REPLACEMENT

NOT TO : LE

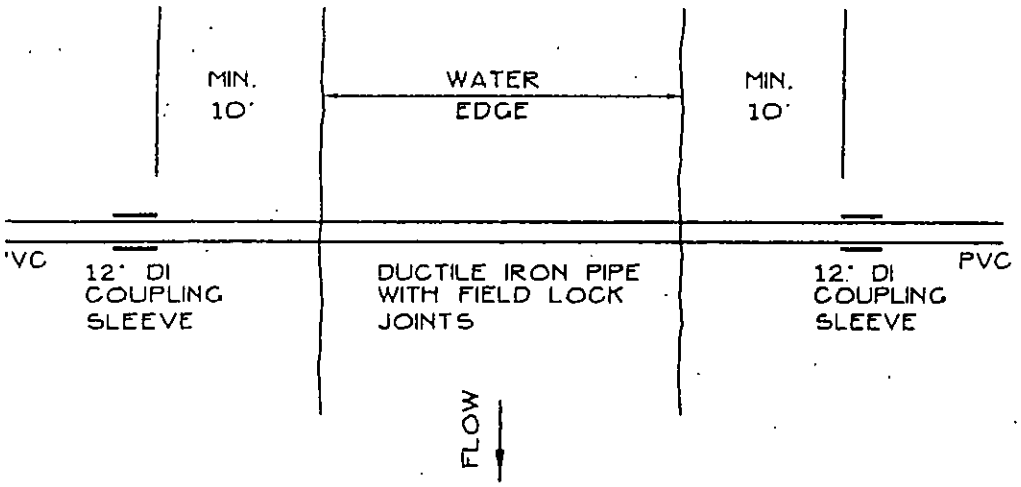


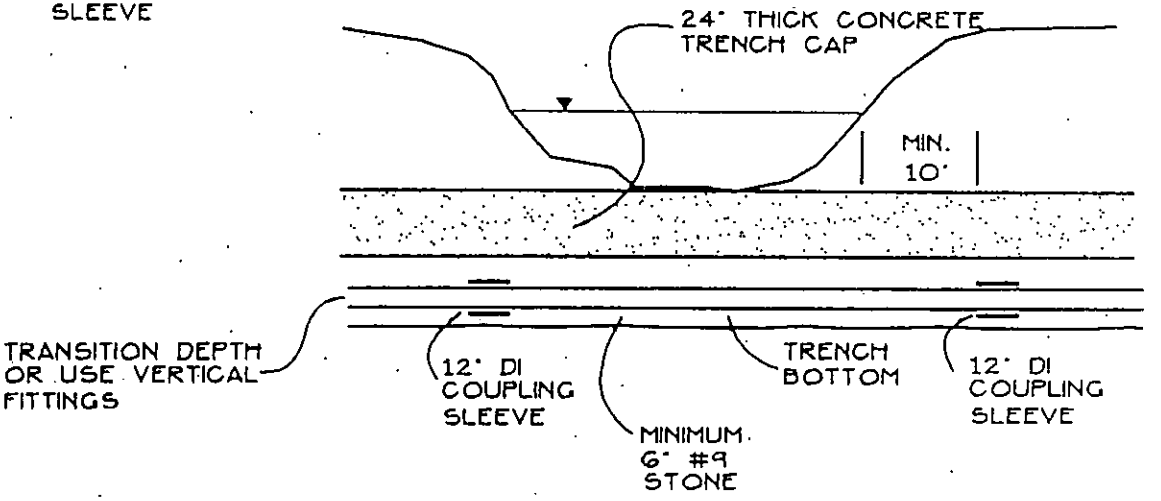
CARRIER PIPE SIZE	CASING PIPE SIZE
4"	8"
6"	10"
8"	12"

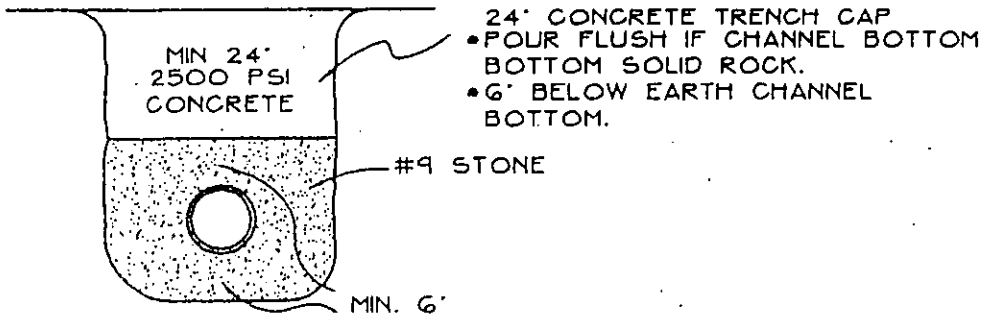
Typical Concrete Encasement

NOT TO SCALE

D-13







TYPICAL STREAM CROSSING

NOT TO SCALE

SD-19

SITE SPECIFIC AGREEMENT/MULTIPLE PHASE (WILMORE)
RE: (PROJECT NAME)

This Site Specific Agreement (the "Agreement") is made and entered into C1_____ ____, 200_, by and between the CITY OF WILMORE, Kentucky, 335 East Main Street, Wilmore, Kentucky 40390, hereinafter "WILMORE"; JESSAMINE-SOUTH ELKHORN WATER DISTRICT, hereinafter "JSEWD"; and C2, hereinafter C4.

WITNESSETH:

WHEREAS, C4 owns real estate located in Jessamine County, Kentucky, as more particularly described in Exhibit "1" and as shown on the Site Plan in Exhibit "2", attached hereto (the "Property"); and

WHEREAS, the parties acknowledge that there is limited sanitary sewer capacity available; and

WHEREAS, conditioned upon C4's compliance with and subject to the terms and conditions of this Agreement, JSEWD and WILMORE are willing to provide sanitary sewer service to the Property.

NOW, THEREFORE, for and in consideration of the premises, the mutual undertakings and agreements herein contained and assumed, C4, JSEWD and WILMORE hereby covenant and agree as follows:

1. ***Sewer Capacity.*** The parties agree that the sanitary sewer capacity needed to provide service to the Property shall not exceed C5 gallons per day (average daily flow) for sewage collection and conveyance.

2. ***Agreement to Serve.*** Conditioned upon C4's full compliance with the WILMORE Ordinances, and the rules and regulations of JSEWD and Jessamine County relating to operation and use of the sanitary sewer system, as may be amended from time to time, (all entities' regulations hereinafter referred to as the "Code") and subject to the terms and conditions of this Agreement, upon the completion of the construction of the sanitary sewer facilities by C4, JSEWD and WILMORE agree to permit connection of the sanitary sewer facilities installed by C4 to the existing facilities of WILMORE and JSEWD, if any, and to provide sanitary sewer utility service to the Property. C4 expressly agrees that the constructed sanitary sewer facilities shall be conveyed to JSEWD upon completion of construction and approval for acceptance. Although it is expressly acknowledged by C4 that JSEWD may require that there be connections to the Property sanitary sewer system provided to adjoining properties, C4 expressly agrees that it shall not make any agreements with (relative to capacity reservation or otherwise) or permit any adjoining property owner access to or use of the sanitary sewer to be constructed without the prior written authorization from JSEWD.

Notwithstanding the conditions which must be met herein before C4 can convey the sanitary sewer infrastructure being constructed hereunder to JSEWD and before JSEWD will accept such conveyance, JSEWD may, upon the exercise of its sole and unfettered discretion which may not be compelled by any party hereto, permit taps to the sanitary sewer infrastructure being constructed if, and only if, the following conditions are present:

(1) The sanitary sewer line to which the proposed tap is to be made is tested and fully operational;

(2) The sanitary and storm sewer project to be constructed hereunder is substantially completed;

(3) A punch list has been generated and given to C4 which has an agreed upon timeline for completion;

(4) C4 agrees to permit an adjoining development, which has been completed and conveyed to JSEWD to connect to C4's substantially completed infrastructure; and

(5) C4 posts a subdivision bond or verifies that a subdivision bond is already in place to guarantee completion of the punch list.

C4 hereby agrees to fully indemnify and hold JSEWD completely harmless from all loss, costs and expense, including attorneys fees and court costs, which JSEWD may sustain by reason of the exercise of it discretion pursuant to this literary paragraph.

It is understood and agreed by the parties that this Agreement shall in no way constitute, nor shall be construed to be, a reservation of sanitary sewer treatment capacity for C4 by JSEWD or WILMORE. C4 shall have the right to develop the Property in C6A phases. Each phase must be consecutively completed within C6 days of each other from the date this Agreement is executed. Furthermore, the parties hereto agree that in the event C4 fails to complete all requirements under this Agreement as scheduled above, then, and in such event, this agreement shall automatically expire and become a nullity, but only as to facilities not under construction.

3. ***Connection Fees.*** C4 agrees to pay the sum approved by the Kentucky Public Service Commission, and, in addition, the amount of Wilmore sewer connection fees provided in the Code to JSEWD ("Connection Fees"). Said Fees are in consideration for the sewage collection, conveyance and treatment by JSEWD and WILMORE. The Connection Fee shall be paid upon the issuance of a letter of acceptance by JSEWD to C4 pursuant to Section 5(a) for connection to the Property's sanitary sewer system or any part thereof.

4. ***Additional Fees.*** In addition to the Connection Fees heretofore referenced, C4 agrees to pay the following additional charges and fees (the "Additional Fees"):

(a) C4 shall have paid all reasonable charges assessed by JSEWD and WILMORE for plan review, construction inspection, testing, and other services of JSEWD in any way related to the sanitary sewer system. A schedule for the rates to be charged in connection with these services are attached hereto as Exhibit "3".

(b) C4 shall pay all sanitary sewer use fees ("Sewer User Fee") as provided in the Code. The Sewer User Fee is generally based on water consumption and C4 agrees to have the local water company which provides water to the Property, or any part thereof, provide duplicate billings to JSEWD, P.O.Box 731, Nicholasville, Kentucky 40340-0731. JSEWD will calculate and bill C4 for the Sewer User Fees which shall be due and payable as set forth in the Code. All unpaid Sewer User Fees shall be subject to a late penalty and interest as set forth in the Code. Further, JSEWD shall be entitled to recover all its costs of collection of same, including reasonable attorney fees.

(c) If required, C4 shall pay a surcharge for odor control chemicals on a monthly or less frequent basis as determined by JSEWD.

(d) Pre-treatment permit fees/ extra strength fees (when applicable) shall be paid to WILMORE.

5. *Lien To Secure Payment of Connection Fees and Additional Fees.* JSEWD shall have a lien against the Property to secure the payment of all Connection Fees and Additional Fees, interest, penalties and the costs of collection, including reasonable attorney fees. The lien shall attach to the Property, or applicable part thereof, as the Connection Fees and/or Additional Fees become past due without necessity of filing any lien statement by JSEWD.

6. *Sanitary Sewers.* To induce JSEWD and WILMORE to provide sanitary sewer service to the Property,C4 agrees to construct, according to the plans and specifications approved by JSEWD and WILMORE as reflected in Exhibit "4" , all on site and off-site installations and facilities required by WILMORE to connect to the existing facilities of WILMORE and JSEWD, if any, to provide sanitary sewer service to the Property, including but not limited to all equipment, fixtures, pumps, lines, mains, manholes, lift stations, pumping stations, laterals, service connections, and to obtain appurtenances thereto together with all real property, easements and rights of way as necessary. The foregoing improvements may be referred to as the "Improvements" and Exhibit "4" may be referred to as the "Plans".

If the Improvements will require a pump station, the peak discharge into the JSEWD and/or WILMORE gravity system shall be specified by JSEWD. Design of the pump station shall include a meter capable of recording all flow discharging from the pump station. Odor control facilities shall be constructed as directed by JSEWD. If any pump stations are classified as "temporary" on the Plans, C4 will, at its own cost and secured by a bond or a letter of credit,

connect to the gravity line as same becomes available and shall remove such "temporary" pump stations.

7. ***Procedures for the Property Sewer System.*** C4 agrees that the design and construction of the Improvements shall be subject to and in accordance with the Code and all administrative regulations, rules, practices and procedures of WILMORE, Jessamine County and JSEWD relating to the Improvements and the following requirements, whether or not these requirements are contained in the foregoing ordinances, regulations, administrative rules, practices and procedures:

(a) During construction of the Improvements, Jessamine County, JSEWD and WILMORE shall have the right to inspect such installations, including but not limited to the materials, equipment, piping, and connections to determine compliance with the approved Plans. C4 shall also provide JSEWD and WILMORE with monthly written certifications by C4's engineer that all construction is in full compliance with the approved Plans and any applicable permits or other requirements.

(b) At least seven (7) days prior to final inspection by JSEWD and WILMORE of any phase, C4 shall provide JSEWD with two (2) sets of mylars of the "as-built" plans, prepared by C4's engineer, showing the location of all installations related to the Improvements as constructed. C4 shall provide JSEWD two (2) copies of the recorded subdivision plat of the Property and two (2) copies (DVD and inspection log) of a TV inspection of the sanitary sewer system. In addition, all of the foregoing copies and plans shall be provided at the appropriate times to JSEWD in electronic form.C4 shall also deliver to JSEWD, seven (7) days prior to final inspection, its engineer's certification and test results of the Improvements.

(c) Upon completion of construction of the Improvements for each phase, C4's engineer shall deliver a signed certificate of completion to JSEWD certifying to JSEWD and WILMORE that the construction is completed, that the construction has been completed in accordance with all permits, approved Plans, and any applicable legal requirements, and as constructed it will function for the purpose for which it was designed. C4 shall provide proof satisfactory to JSEWD that all contractors, sub-contractors, materialmen and laborers have been paid in full. Upon receipt of all of the above, payment of all fees, a deed of conveyance of the sanitary sewer system, and final inspection by JSEWD of the Property sanitary sewer system, a letter of acceptance of the Property sanitary sewer system shall be delivered to C4 by JSEWD . No connection of any building located on the Property to the sanitary sewer system shall occur prior to the issuance of said letter of acceptance.

8. ***Use of Property Sanitary Sewer System.*** The use of the Property sanitary sewer system shall be subject to full compliance with the Code. All connections of any building constructed on the Property, or any part thereof, to the Property sanitary sewer system shall require a tap-on permit, inspection and approval by the JSEWD. Any connection of a building to the Property sanitary sewer system without a tap-on permit, inspection and approval may result in immediate disconnection by JSEWD.

9. ***Representation and Warranties of C4.*** In order to induce JSEWD and WILMORE to enter into this Agreement, C4 hereby represents and warrants to JSEWD and WILMORE as follows:

(a) C4 is duly organized, validly existing, and in good standing under the laws of the Commonwealth of Kentucky. C4 has all requisite power and authority to enter into and perform the obligations contemplated by this Agreement. The execution and delivery of this Agreement and the performance of the obligations contemplated hereby have been duly authorized by all necessary action on the part of C4. This Agreement has been duly executed and delivered by C4 and constitutes the legal, valid and binding obligation of C4 enforceable against it in accordance with its terms.

(b) The execution and delivery of this Agreement does not, and the performance of the obligations contemplated herein will not conflict with or result in any violation of, or default under any provision of, C4's organizational documents, or any other agreement to which C4 is a party.

(c) C4 covenants to obtain, any consent, approval or authorization of any third party required in connection with C4's execution and delivery of this Agreement or the performance by C4 of the obligations contemplated herein has been obtained.

(d) C4 has good, valid and marketable title to the Property, free and clear of all liens, encumbrances, leases, restrictions, or other agreements except as referenced on the permitted exceptions attached hereto and incorporated herein as Exhibit "5".

(e) C4 warrants that the Improvements will be constructed and installed in accordance with the Plans and that all materials, supplies and equipment incorporated into the work will be new and free from any and all defects, whether latent or patent, in workmanship. When and if the first phase is completed and accepted by JSEWD, C4 shall post a bond or letter of credit which guarantees the completion of all remaining phases hereunder. The amount of the bond or letter of credit shall be 125% of JSEWD's estimate of the cost of completion. C4 agrees to repair and replace, at its own expense, all of the work which may prove to be defective, for a period of

three (3) year after the date of acceptance by JSEWD, relative to each phase of the sanitary sewer system. The aforementioned time period shall be secured by a bond or letter of credit posted in favor of JSEWD by C4 which bond or letter of credit shall not be released without the prior written approval of WILMORE and JSEWD.

(f) There are no: (i) Hazardous Materials (as defined below) located on the Property or which have been released into the environment; or discharged, placed or disposed of at on or under the Property in violation of any Environmental Laws (defined below); (ii) underground storage tanks which have been located on or under the Property.

The term "Hazardous Materials" means and includes, without limitation:

(i) Those substances included within the definitions of "hazardous substances", "hazardous materials", "toxic substances" or "solid waste" in any of the Environmental Laws (defined below);

(ii) Those substances listed in the U. S. Department of Transportation Table or amendments thereto (49 CFR 172.101) or by the U.S. Environmental Protection Agency (or any successor agency) as hazardous substances (40 CFR Part 302 and any amendments thereto);

(iii) Those other substances, materials and wastes which are or become classified as hazardous or toxic by any such law, regulation or ordinance; and

(iv) Any material, waste or substance which is any of the following: (A) asbestos-containing material; (B) polychlorinated biphenyls; (C) radon gas; (D) urea formaldehyde foam insulation; (E) petroleum, petroleum product or derivation thereof; (F) designated or listed as a "hazardous substance" pursuant to section 311 or section 307 of the Clean Water Act (U.S.C. section 1251 at set seq.); (G) explosive; or (H) radioactive.

(v) The term "Environmental Laws" means all federal laws, state and local environmental, land use, zoning, health, chemical use, safety and sanitation laws, statutes, ordinances and codes related to the protection of the environment and government and/or governing the use, storage, treatment, generation, transportation, processing, handling, production or disposal of Hazardous Materials in the rules, regulations, policies, guidelines, interpretations, permits, decisions, orders and directives or federal, state, and local governmental agencies and authorities with respect thereto.

(g) C4 is designated as the party that is responsible for compliance with all erosion/sediment control measures(Best Management Practices) during construction.

(h) That neither JSEWD, nor WILMORE have made any representation or guarantee that any sanitary sewer capacity has been reserved for the undeveloped portion of C4's property as described in Exhibit "1" or otherwise and that the capacity approved is for the area to be served as described in Exhibit "2".

10. *Easement.* C4 hereby grants to JSEWD, subject to the terms of this Agreement, the right to maintain and operate the sanitary sewer system. C4 agrees to provide a note on any subdivision plat related to the Property referencing dedication of the sanitary sewer system to JSEWD which reads that it is specifically subject to the terms and conditions of this Agreement. Upon request, C4 further agrees to execute and deliver a separate deed of easement or encroachment permit in a form reasonably acceptable to JSEWD, in its sole discretion, for all facilities, on-site and off-site, related to the portions of the sanitary sewer system, for which JSEWD will accept dedication and conveyance except for pump stations and access routes thereto, which, upon request, C4 agrees to convey in fee simple absolute to JSEWD by deed in a form acceptable to JSEWD, in its sole discretion. C4 hereby further agrees that the foregoing grant includes the right of ingress and egress to any part of the Property for the purpose of maintenance and operation of the sanitary sewer system. C4 and JSEWD agree to assign to WILMORE a right of access and ingress and egress to the sanitary sewer system and to the Property.

11. *Mortgage Liens.* Mortgagees, if any, holding prior liens on the Property, or any part thereof, shall be required to subordinate their rights to the rights of JSEWD under this Agreement and the easement dedication herein contemplated.

12. *Notices.* All notices, demands or requests provided for or permitted to be given pursuant to this Agreement must be in writing. All notices, demands and requests to be sent to either party shall be deemed to have been properly given or served by personal delivery or by depositing same in the United States mail, addressed to such party, postage paid and registered or certified with return receipt requested at the following address:

City of Wilmore
Department of Public Works
Glass Mill Road
Wilmore, Kentucky 40390

With copy to: Mayor, City of Wilmore
City Hall
335 East Main Street
Wilmore, Kentucky 40390

Chairman, Jessamine-South Elkhorn Water District
P.O. Box 731
Nicholasville, KY 40340-0731

With copy to: Bruce E. Smith, Esq.
201 South Main Street
Nicholasville, KY 40356

C2
C3

13. ***Indemnification.*** C4 shall indemnify and reimburse JSEWD and WILMORE for any and all claims, losses, liabilities, damages (including without limitation, fines, penalties, criminal or civil judgments and settlements), costs (including without limitation, court costs); and expenses (including without limitation, attorneys, engineers and accountants fees), (hereinafter "Loss" or "Losses") suffered or incurred by JSEWD and WILMORE, as a result of, or with respect to or arising from (a) any breach or inaccuracy of any representation or warranty of C4 herein; (b) any breach of or noncompliance by C4 with any covenant or agreement of C4 contained in this Agreement; (c) any negligent or wrongful act of the ^C4, its agents, employees, affiliates; and (d) Hazardous Materials or underground storage tanks that are located on or under the Property.

14. ***Compliance with Law.*** C4 agrees to comply with all federal, state and local laws, statutes, ordinances, regulations, and requirements. C4 agrees that the Property is subject to the Code and all regulations, administrative rules, practices and procedures of WILMORE and JSEWD relating to sanitary sewer management systems as set forth herein and agrees to fully comply with same.

15. ***Exhibit Incorporation by Reference.*** Exhibits 1, 2, 3, 4 and 5 attached hereto are hereby incorporated by reference as if set out fully herein.

16. ***Binding Effect, Assignment.*** This Agreement shall be binding upon and inure to the benefit of the parties hereto, their successors, assigns, transferees, tenants, heirs, and personal representatives. C4's rights hereunder shall not be assignable to any other person, except by a deed of conveyance whereby the Property, or a part thereof, is conveyed to such person.

17. ***Cost and Attorney's Fees.*** JSEWD and WILMORE shall be entitled to recover all costs and reasonable attorney fees incurred connected with the collection of Monthly Fees, Additional Fees or any other fees.

18. ***Amendment/Waiver.*** No modification, termination, assignment or amendment of this Agreement may be made, except by written agreement. Failure by either party to insist

upon strict performance of any covenant, duty, agreement or condition in this Agreement or to exercise any right or remedy or a breach thereof shall not constitute a waiver of any breach or any such covenant, agreement, term or condition. Any party hereto, by notice and only by notice as provided in this Agreement, may, but shall be under no obligation to, waive any of its rights or any conditions to its obligations hereunder, or any duty, obligation or covenant of any other party hereto. No waiver shall affect or alter this Agreement but each and every covenant, agreement, term and condition of this Agreement shall continue in full force and effect with respect to any other then existing or subsequent breach thereof.

19. ***Covenants Running with Land.*** C4, and its successors in title agree that all portions of the Property, whether designated as separate lots or otherwise, shall be required to comply with the terms of this Agreement and shall use the Improvements in accordance with the terms of this Agreement, which covenant shall be deemed a "Covenant Running with the Land", and reference shall be made to this Agreement, on any plat of the Property or any part thereof.

20. ***Undertakings.*** The parties will act reasonably when undertaking any submittal, review, approval, acceptance, or inspection required under this Agreement, provided, however, with respect to any review, approval, acceptance, or inspection of JSEWD or WILMORE which would be required under the law had the Property been located entirely in Wilmore, the standard practices of WILMORE shall be deemed reasonable. Further by review, approval, acceptance or inspection, the JSEWD and WILMORE shall not assume responsibility for design, construction or installation of the Improvements and shall in no way be deemed to waive any rights available to JSEWD and WILMORE related to defects, omissions or failures in design, construction or installation.

21. ***Governing Law.*** This Agreement has been entered into and shall be interpreted under and governed by the laws of the Commonwealth of Kentucky, Further, the parties agree that any litigation related to the terms of this Agreement shall be brought in the Jessamine Circuit Court, Nicholasville, Kentucky and the parties acknowledge that venue shall be proper in such court.

If any court of proper jurisdiction finds or construes any provision contained herein to be unenforceable or invalid, then, and in that event, such finding or construction shall not invalidate the entire Agreement.

22. ***Captions.*** The captions of each section herein are for convenience only and shall not affect the construction hereof.

23. ***Multiple Copies.*** This Agreement may be signed in multiple copies, each of which shall be considered an original and entire document.

24. ***Entire Agreement.*** This Agreement contains the entire agreement and understanding between the parties hereto and incorporates and supercedes all oral agreements and understandings and it shall not be changed or supplemented unless done in a writing signed by all parties hereto.

IN WITNESS WHEREOF the parties have caused this document to be executed on the date and year first written.

CITY OF WILMORE, KENTUCKY

ATTEST:

_____
CITY CLERK

BY: _____
ITS:MAYOR

C2

_____
WITNESS

BY: _____
NAME: C7
ITS: C8

JESSAMINE-SOUTH ELKHORN WATER DISTRICT

ATTEST:

_____
SECRETARY

BY: _____
ITS: CHAIRMAN

PUBLIC SERVICE COMMISSION
OF KENTUCKY
EFFECTIVE
9/3/2008
PURSUANT TO 807 KAR 5:011
SECTION 9 (1)
By _____
Executive Director

AMENDED SEWER SYSTEM EVALUATION AGREEMENT

THIS CONTRACT is made on November ___2013, by and between Forest Creek, LLC of 207 Golf Club Drive, Nicholasville, Kentucky 40356 (hereinafter "Forest Creek") and the Jessamine-South Elkhorn Water District, a Kentucky rural water and sewer district created under KRS Chapter 74, of 802 South Main Street, Nicholasville, Kentucky 40356 (hereinafter "JSEWD");

W I T N E S S E T H:

WHEREAS, JSEWD is a duly organized and operating entity offering sewage collection services in a defined area of Jessamine County;

WHEREAS, Forest Creek is proposing to develop a parcel of real estate (Forest Brook – 458.60 acres) for residential and golf course purposes which is more commonly known as Forest Brook Subdivision and located north and west of the intersection of Murphy's Lane and US 68 ("Development"); and

WHEREAS, Forest Creek desires to initiate the process to obtain sewage collection services with JSEWD for the Development and JSEWD desires to explore the possibility of providing such services and seeking approval for the treatment of such sewage by the City of Wilmore (hereinafter "Wilmore");

NOW, THEREFORE, for and in consideration of the mutual covenants contained herein, Forest Creek and JSEWD agree as follows:

1. Subject to the submission of the information listed on the Checklist attached hereto and identified as Exhibit "A" and the execution of a Memorandum of Understanding by Wilmore with JSEWD, JSEWD will execute a Site Specific Agreement for the provision of sanitary sewer service to the Development.

2. Forest Creek shall pay all legal, administrative, engineering or other costs incurred by JSEWD associated with the consideration of the provision of such services under this contract, and such costs shall be paid to JSEWD as billed.

3. Forest Creek shall provide all of the information listed on the attached Checklist (Ex. "A") to GRW Engineering, Inc. ("GRW") who is designated as and shall act as JSEWD's representative.

4. Forest Creek shall abide by the policy, procedures, rules and requirements of Wilmore and JSEWD in the design and construction of the proposed sewage collection system and the proposed storm sewer system for the Development. Forest Creek's engineer, Vision Engineering, Inc., shall complete and submit the plans to construct the on-site and off-site sanitary and storm sewer infrastructure for the entire Development subject to the review and approval of Wilmore and GRW and subject to GRW's inspection of construction.

5. JSEWD agrees that upon receipt of all of the information from Forest Creek, as reflected on the Checklist, that it will forward same to Wilmore.

6. Forest Creek acknowledges the existence and the possible future execution of a Site Specific Agreement with JSEWD and Wilmore substantially similar to that attached hereto as Exhibit "B". Forest Creek agrees that such Site Specific Agreement, in substantially the same form as that which is attached, will be signed by JSEWD if Wilmore approves the provisions of sewer service.

7. Forest Creek acknowledges that no construction of the sanitary sewer system or the storm sewer system shall commence prior to the issuance of a construction permit by the Kentucky Division of Water and the signing of a Site Specific Agreement with JSEWD and Wilmore. Forest Creek further acknowledges that JSEWD and Wilmore shall have the right to

enter upon the Development from time to time to inspect and monitor the proposed systems, if approved. Forest Creek further agrees that Wilmore and GRW may halt construction of the sanitary sewer system at any time if it is discovered that Forest Creek or its contractors are deviating from the approved plans and specifications. Any changes to the construction plans and specifications for the storm sewer system are subject to the prior written approval of GRW.

8. Forest Creek agrees acknowledges that it shall have to pay all fees of JSEWD and Wilmore relative to the sanitary sewer system, including but not limited to all permit fees, tap fees and connection fees, if a system is approved for the Development.

9. Forest Creek acknowledges that the proposed sanitary sewer system, which may be constructed, shall be conveyed to JSEWD and that JSEWD will retain the complete and final authority to determine the future extension and use of such system by third parties, if constructed.

10. Forest Creek acknowledges and agrees that if the project is approved, it will construct a storm sewer system for the Development in accordance with the terms of the Site Specific Agreement and subject to inspection by Wilmore during and after construction. Forest Creek also agrees that Wilmore shall have the right to halt construction of the storm sewer system at any time it is discovered that Forest Creek or its contractors are deviating from the construction plans and specifications. Any changes to the constructions plans and specifications for the storm sewer system are subject to the prior written approval of Wilmore. Forest Creek agrees that upon satisfactory completion of the storm sewer system, it will dedicate same to Wilmore.

.11. This writing constitutes the entire agreement thus far between the parties hereto superceding all prior oral discussions and understandings. Furthermore, this writing shall not be changed or supplemented unless done in writing and signed by both parties.

"JSEWD"

WITNESS DATE

CHAIRMAN DATE

"FOREST CREEK, LLC"

WITNESS DATE

MEMBER DATE

MEMBER DATE

BEING ALL OF THE MEMBERS

g:\...USEWD\\Forest Creek LLC\Settlement\ SSEA Amendment

EXHIBIT A

Sewer System Evaluation Agreement

1. General graphic and written description of the proposed sanitary sewer collection system for the project. Including but not: limited to:

   a. Enlarged 7 1/2' quad sheet (1"=200') outlining the project area and the limits of the drainage basin(s) in which the project is located.

   b. General location of proposed and existing pump stations, if required.

   c. Location of proposed connection to existing sewer force main and/or gravity lines.

   d. General description of the proposed use and zones of the project area.

   NOTE: The final location and type (i.e., gravity or force) of connection to the existing system shall be determined by the District.

2. Preliminary calculations as to maximum sewage flow at each connection.

   NOTE: Under District's adopted policy, applicant is to design and size piping and/or wet well to serve his proposed development as well as the entire drainage basin upstream of his project.

3. Time schedule for planning/engineering, construction and completion of the project.

4. Anticipated date of application for KDOW construction permit.

5. Identify any requirement for pretreatment or grease traps.

EXHIBIT
"A"

PUBLIC SERVICE COMMISSION
OF KENTUCKY
EFFECTIVE
9/3/2008
PURSUANT TO 807 KAR 5:011
SECTION 9 (1)
By _____
Executive Director

SITE SPECIFIC AGREEMENT/MULTIPLE PHASE (WILMORE)
RE: (PROJECT NAME)

This Site Specific Agreement (the "Agreement") is made and entered into C1_____ ____, 200_, by and between the CITY OF WILMORE, Kentucky, 335 East Main Street, Wilmore, Kentucky 40390, hereinafter "WILMORE"; JESSAMINE-SOUTH ELKHORN WATER DISTRICT, hereinafter "JSEWD"; and C2, hereinafter C4.

W I T N E S S E T H:

WHEREAS, C4 owns real estate located in Jessamine County, Kentucky, as more particularly described in Exhibit "1" and as shown on the Site Plan in Exhibit "2", attached hereto (the "Property"); and

WHEREAS, the parties acknowledge that there is limited sanitary sewer capacity available; and

WHEREAS, conditioned upon C4's compliance with and subject to the terms and conditions of this Agreement, JSEWD and WILMORE are willing to provide sanitary sewer service to the Property.

NOW, THEREFORE, for and in consideration of the premises, the mutual undertakings and agreements herein contained and assumed, C4, JSEWD and WILMORE hereby covenant and agree as follows:

1. ***Sewer Capacity.*** The parties agree that the sanitary sewer capacity needed to provide service to the Property shall not exceed C5 gallons per day (average daily flow) for sewage collection and conveyance.

2. ***Agreement to Serve.*** Conditioned upon C4's full compliance with the WILMORE Ordinances, and the rules and regulations of JSEWD and Jessamine County relating to operation and use of the sanitary sewer system, as may be amended from time to time, (all entities' regulations hereinafter referred to as the "Code") and subject to the terms and conditions of this Agreement, upon the completion of the construction of the sanitary sewer facilities by C4, JSEWD and WILMORE agree to permit connection of the sanitary sewer facilities installed by C4 to the existing facilities of WILMORE and JSEWD, if any, and to provide sanitary sewer utility service to the Property. C4 expressly agrees that the constructed sanitary sewer facilities shall be conveyed to JSEWD upon completion of construction and approval for acceptance. Although it is expressly acknowledged by C4 that JSEWD may require that there be connections to the Property sanitary sewer system provided to adjoining properties, C4 expressly agrees that it shall not make any agreements with (relative to capacity reservation or otherwise) or permit any adjoining property owner access to or use of the sanitary sewer to be constructed without the prior written authorization from JSEWD.

EXHIBIT
"B"

PUBLIC SERVICE COMMISSION
OF KENTUCKY
EFFECTIVE
9/3/2008
PURSUANT TO 807 KAR 5:011
SECTION 9 (1)
By Stephanie Stumbo
Executive Director

Notwithstanding the conditions which must be met herein before C4 can convey the sanitary sewer infrastructure being constructed hereunder to JSEWD and before JSEWD will accept such conveyance, JSEWD may, upon the exercise of its sole and unfettered discretion which may not be compelled by any party hereto, permit taps to the sanitary sewer infrastructure being constructed if, and only if, the following conditions are present:

(1) The sanitary sewer line to which the proposed tap is to be made is tested and fully operational;

(2) The sanitary and storm sewer project to be constructed hereunder is substantially completed;

(3) A punch list has been generated and given to C4 which has an agreed upon timeline for completion;

(4) C4 agrees to permit an adjoining development, which has been completed and conveyed to JSEWD to connect to C4's substantially completed infrastructure; and

(5) C4 posts a subdivision bond or verifies that a subdivision bond is already in place to guarantee completion of the punch list.

C4 hereby agrees to fully indemnify and hold JSEWD completely harmless from all loss, costs and expense, including attorneys fees and court costs, which JSEWD may sustain by reason of the exercise of it discretion pursuant to this literary paragraph.

It is understood and agreed by the parties that this Agreement shall in no way constitute, nor shall be construed to be, a reservation of sanitary sewer treatment capacity for C4 by JSEWD or WILMORE. C4 shall have the right to develop the Property in C6A phases. Each phase must be consecutively completed within C6 days of each other from the date this Agreement is executed. Furthermore, the parties hereto agree that in the event C4 fails to complete all requirements under this Agreement as scheduled above, then, and in such event, this agreement shall automatically expire and become a nullity, but only as to facilities not under construction.

3. *Connection Fees.* C4 agrees to pay the sum approved by the Kentucky Public Service Commission, and, in addition, the amount of Wilmore sewer connection fees provided in the Code to JSEWD ("Connection Fees"). Said Fees are in consideration for the sewage collection, conveyance and treatment by JSEWD and WILMORE. The Connection Fee shall be paid upon the issuance of a letter of acceptance by JSEWD to C4 pursuant to Section [illegible] hereof [illegible] the Property's sanitary sewer system or any part thereof.

4. *Additional Fees.* In addition to the Connection Fees heretofore referenced, C4 agrees to pay the following additional charges and fees (the "Additional Fees"):

(a) C4 shall have paid all reasonable charges assessed by JSEWD and WILMORE for plan review, construction inspection, testing, and other services of JSEWD in any way related to the sanitary sewer system. A schedule for the rates to be charged in connection with these services are attached hereto as Exhibit "3".

(b) C4 shall pay all sanitary sewer use fees ("Sewer User Fee") as provided in the Code. The Sewer User Fee is generally based on water consumption and C4 agrees to have the local water company which provides water to the Property, or any part thereof, provide duplicate billings to JSEWD, P.O.Box 731, Nicholasville, Kentucky 40340-0731. JSEWD will calculate and bill C4 for the Sewer User Fees which shall be due and payable as set forth in the Code. All unpaid Sewer User Fees shall be subject to a late penalty and interest as set forth in the Code. Further, JSEWD shall be entitled to recover all its costs of collection of same, including reasonable attorney fees.

(c) If required, C4 shall pay a surcharge for odor control chemicals on a monthly or less frequent basis as determined by JSEWD.

(d) Pre-treatment permit fees/ extra strength fees (when applicable) shall be paid to WILMORE.

5. ***Lien To Secure Payment of Connection Fees and Additional Fees.*** JSEWD shall have a lien against the Property to secure the payment of all Connection Fees and Additional Fees, interest, penalties and the costs of collection, including reasonable attorney fees. The lien shall attach to the Property, or applicable part thereof, as the Connection Fees and/or Additional Fees become past due without necessity of filing any lien statement by JSEWD.

6. ***Sanitary Sewers.*** To induce JSEWD and WILMORE to provide sanitary sewer service to the Property,C4 agrees to construct, according to the plans and specifications approved by JSEWD and WILMORE as reflected in Exhibit "4" , all on site and off-site installations and facilities required by WILMORE to connect to the existing facilities of WILMORE and JSEWD, if any, to provide sanitary sewer service to the Property, including but not limited to all equipment, fixtures, pumps, lines, mains, manholes, lift stations, pumping stations, laterals, service connections, and to obtain appurtenances thereto together with all real property, easements and rights of way as necessary. The foregoing improvements may be referred to as the "Improvements" and Exhibit "4" may be referred to as the "Plans".

If the Improvements will require a pump station, the peak discharge into the JSEWD and/or WILMORE gravity system shall be specified by JSEWD. Design of the pump station shall include a meter capable of recording all flow discharging from the pump station. Odor control facilities shall be constructed as directed by JSEWD. If any pump stations are classified as "temporary" on the Plans, C4 will, at its own cost and secured by a bond or a letter of credit,

connect to the gravity line as same becomes available and shall remove such "temporary" pump stations.

7. ***Procedures for the Property Sewer System.*** C4 agrees that the design and construction of the Improvements shall be subject to and in accordance with the Code and all administrative regulations, rules, practices and procedures of WILMORE, Jessamine County and JSEWD relating to the Improvements and the following requirements, whether or not these requirements are contained in the foregoing ordinances, regulations, administrative rules, practices and procedures:

(a) During construction of the Improvements, Jessamine County, JSEWD and WILMORE shall have the right to inspect such installations, including but not limited to the materials, equipment, piping, and connections to determine compliance with the approved Plans. C4 shall also provide JSEWD and WILMORE with monthly written certifications by C4's engineer that all construction is in full compliance with the approved Plans and any applicable permits or other requirements.

(b) At least seven (7) days prior to final inspection by JSEWD and WILMORE of any phase, C4 shall provide JSEWD with two (2) sets of mylars of the "as-built" plans, prepared by C4's engineer, showing the location of all installations related to the Improvements as constructed. C4 shall provide JSEWD two (2) copies of the recorded subdivision plat of the Property and two (2) copies (DVD and inspection log) of a TV inspection of the sanitary sewer system. In addition, all of the foregoing copies and plans shall be provided at the appropriate times to JSEWD in electronic form.C4 shall also deliver to JSEWD, seven (7) days prior to final inspection, its engineer's certification and test results of the Improvements.

(c) Upon completion of construction of the Improvements for each phase, C4's engineer shall deliver a signed certificate of completion to JSEWD certifying to JSEWD and WILMORE that the construction is completed, that the construction has been completed in accordance with all permits, approved Plans, and any applicable legal requirements, and as constructed it will function for the purpose for which it was designed. C4 shall provide proof satisfactory to JSEWD that all contractors, sub-contractors, materialmen and laborers have been paid in full. Upon receipt of all of the above, payment of all fees, a deed of conveyance of the sanitary sewer system, and final inspection by JSEWD of the Property sanitary sewer system, a letter of acceptance of the Property sanitary sewer system shall be delivered to C4 by JSEWD . No connection of any building located on the Property to the sanitary sewer system shall occur prior to the issuance of said letter of acceptance.

8. ***Use of Property Sanitary Sewer System.*** The use of the Property sanitary sewer system shall be subject to full compliance with the Code. All connections of any building constructed on the Property, or any part thereof, to the Property sanitary sewer system shall require a tap-on permit, inspection and approval by the JSEWD. Any connection of a building to the Property sanitary sewer system without a tap-on permit, inspection and approval may result in immediate disconnection by JSEWD.

9. ***Representation and Warranties of C4.*** In order to induce JSEWD and WILMORE to enter into this Agreement, C4 hereby represents and warrants to JSEWD and WILMORE as follows:

(a) C4 is duly organized, validly existing, and in good standing under the laws of the Commonwealth of Kentucky. C4 has all requisite power and authority to enter into and perform the obligations contemplated by this Agreement. The execution and delivery of this Agreement and the performance of the obligations contemplated hereby have been duly authorized by all necessary action on the part of C4. This Agreement has been duly executed and delivered by C4 and constitutes the legal, valid and binding obligation of C4 enforceable against it in accordance with its terms.

(b) The execution and delivery of this Agreement does not, and the performance of the obligations contemplated herein will not conflict with or result in any violation of, or default under any provision of, C4's organizational documents, or any other agreement to which C4 is a party.

(c) C4 covenants to obtain, any consent, approval or authorization of any third party required in connection with C4's execution and delivery of this Agreement or the performance by C4 of the obligations contemplated herein has been obtained.

(d) C4 has good, valid and marketable title to the Property, free and clear of all liens, encumbrances, leases, restrictions, or other agreements except as referenced on the permitted exceptions attached hereto and incorporated herein as Exhibit "5".

(e) C4 warrants that the Improvements will be constructed and installed in accordance with the Plans and that all materials, supplies and equipment incorporated into the work will be new and free from any and all defects, whether latent or patent, in workmanship. When and if the first phase is completed and accepted by JSEWD, C4 shall post a bond or letter of credit which guarantees the completion of all remaining phases hereunder. The amount of the bond or letter of credit shall be 125% of JSEWD's estimate of the cost of completion. C4 agrees to repair and replace, at its own expense, all of the work which may prove to be defective for a period of

three (3) year after the date of acceptance by JSEWD, relative to each phase of the sanitary sewer system. The aforementioned time period shall be secured by a bond or letter of credit posted in favor of JSEWD by C4 which bond or letter of credit shall not be released without the prior written approval of WILMORE and JSEWD.

(f) There are no: (i) Hazardous Materials (as defined below) located on the Property or which have been released into the environment; or discharged, placed or disposed of at on or under the Property in violation of any Environmental Laws (defined below); (ii) underground storage tanks which have been located on or under the Property.

The term "Hazardous Materials" means and includes, without limitation:

(i) Those substances included within the definitions of "hazardous substances", "hazardous materials", "toxic substances" or "solid waste" in any of the Environmental Laws (defined below);

(ii) Those substances listed in the U. S. Department of Transportation Table or amendments thereto (49 CFR 172.101) or by the U.S. Environmental Protection Agency (or any successor agency) as hazardous substances (40 CFR Part 302 and any amendments thereto);

(iii) Those other substances, materials and wastes which are or become classified as hazardous or toxic by any such law, regulation or ordinance; and

(iv) Any material, waste or substance which is any of the following: (A) asbestos-containing material; (B) polychlorinated biphenyls; (C) radon gas; (D) urea formaldehyde foam insulation; (E) petroleum, petroleum product or derivation thereof; (F) designated or listed as a "hazardous substance" pursuant to section 311 or section 307 of the Clean Water Act (U.S.C. section 1251 at set seq.); (G) explosive; or (H) radioactive.

(v) The term "Environmental Laws" means all federal laws, state and local environmental, land use, zoning, health, chemical use, safety and sanitation laws, statutes, ordinances and codes related to the protection of the environment and government and/or governing the use, storage, treatment, generation, transportation, processing, handling, production or disposal of Hazardous Materials in the rules, regulation, policies, guidelines, interpretations, permits, decisions, orders and directives or federal, state, and local governmental agencies and authorities with respect thereto.

(g) C4 is designated as the party that is responsible for compliance with all erosion/sediment control measures(Best Management Practices) during construction.

(h) That neither JSEWD, nor WILMORE have made any representation or guarantee that any sanitary sewer capacity has been reserved for the undeveloped portion of C4's property as described in Exhibit "1" or otherwise and that the capacity approved is for the area to be served as described in Exhibit "2".

10. *Easement.* C4 hereby grants to JSEWD, subject to the terms of this Agreement, the right to maintain and operate the sanitary sewer system. C4 agrees to provide a note on any subdivision plat related to the Property referencing dedication of the sanitary sewer system to JSEWD which reads that it is specifically subject to the terms and conditions of this Agreement. Upon request, C4 further agrees to execute and deliver a separate deed of easement or encroachment permit in a form reasonably acceptable to JSEWD, in its sole discretion, for all facilities, on-site and off-site, related to the portions of the sanitary sewer system, for which JSEWD will accept dedication and conveyance except for pump stations and access routes thereto, which, upon request, C4 agrees to convey in fee simple absolute to JSEWD by deed in a form acceptable to JSEWD, in its sole discretion. C4 hereby further agrees that the foregoing grant includes the right of ingress and egress to any part of the Property for the purpose of maintenance and operation of the sanitary sewer system. C4 and JSEWD agree to assign to WILMORE a right of access and ingress and egress to the sanitary sewer system and to the Property.

11. *Mortgage Liens.* Mortgagees, if any, holding prior liens on the Property, or any part thereof, shall be required to subordinate their rights to the rights of JSEWD under this Agreement and the easement dedication herein contemplated.

12. *Notices.* All notices, demands or requests provided for or permitted to be given pursuant to this Agreement must be in writing. All notices, demands and requests to be sent to either party shall be deemed to have been properly given or served by personal delivery or by depositing same in the United States mail, addressed to such party, postage paid and registered or certified with return receipt requested at the following address:

City of Wilmore
Department of Public Works
Glass Mill Road
Wilmore, Kentucky 40390

With copy to: Mayor, City of Wilmore
City Hall
335 East Main Street
Wilmore, Kentucky 40390

Chairman, Jessamine-South Elkhorn Water District
P.O. Box 731
Nicholasville, KY 40340-0731

With copy to: Bruce E. Smith, Esq.
201 South Main Street
Nicholasville, KY 40356

C2
C3

13. ***Indemnification.*** C4 shall indemnify and reimburse JSEWD and WILMORE for any and all claims, losses, liabilities, damages (including without limitation, fines, penalties, criminal or civil judgments and settlements), costs (including without limitation, court costs); and expenses (including without limitation, attorneys, engineers and accountants fees), (hereinafter "Loss" or "Losses") suffered or incurred by JSEWD and WILMORE, as a result of, or with respect to or arising from (a) any breach or inaccuracy of any representation or warranty of C4 herein; (b) any breach of or noncompliance by C4 with any covenant or agreement of C4 contained in this Agreement; (c) any negligent or wrongful act of the ^C4, its agents, employees, affiliates; and (d) Hazardous Materials or underground storage tanks that are located on or under the Property.

14. ***Compliance with Law.*** C4 agrees to comply with all federal, state and local laws, statutes, ordinances, regulations, and requirements. C4 agrees that the Property is subject to the Code and all regulations, administrative rules, practices and procedures of WILMORE and JSEWD relating to sanitary sewer management systems as set forth herein and agrees to fully comply with same.

15. ***Exhibit Incorporation by Reference.*** Exhibits 1, 2, 3, 4 and 5 attached hereto are hereby incorporated by reference as if set out fully herein.

16. ***Binding Effect, Assignment.*** This Agreement shall be binding upon and inure to the benefit of the parties hereto, their successors, assigns, transferees, tenants, heirs, and personal representatives. C4's rights hereunder shall not be assignable to any other person, except by a deed of conveyance whereby the Property, or a part thereof, is conveyed to such person.

17. ***Cost and Attorney's Fees.*** JSEWD and WILMORE shall be entitled to recover all costs and reasonable attorney fees incurred connected with the collection of the Monthly Fees, Additional Fees or any other fees.

18. ***Amendment/Waiver.*** No modification, termination, assignment or amendment of this Agreement may be made, except by written agreement. Failure by either party to insist

upon strict performance of any covenant, duty, agreement or condition in this Agreement or to exercise any right or remedy or a breach thereof shall not constitute a waiver of any breach or any such covenant, agreement, term or condition. Any party hereto, by notice and only by notice as provided in this Agreement, may, but shall be under no obligation to, waive any of its rights or any conditions to its obligations hereunder, or any duty, obligation or covenant of any other party hereto. No waiver shall affect or alter this Agreement but each and every covenant, agreement, term and condition of this Agreement shall continue in full force and effect with respect to any other then existing or subsequent breach thereof.

19. ***Covenants Running with Land.*** C4, and its successors in title agree that all portions of the Property, whether designated as separate lots or otherwise, shall be required to comply with the terms of this Agreement and shall use the Improvements in accordance with the terms of this Agreement, which covenant shall be deemed a "Covenant Running with the Land", and reference shall be made to this Agreement, on any plat of the Property or any part thereof.

20. ***Undertakings.*** The parties will act reasonably when undertaking any submittal, review, approval, acceptance, or inspection required under this Agreement, provided, however, with respect to any review, approval, acceptance, or inspection of JSEWD or WILMORE which would be required under the law had the Property been located entirely in Wilmore, the standard practices of WILMORE shall be deemed reasonable. Further by review, approval, acceptance or inspection, the JSEWD and WILMORE shall not assume responsibility for design, construction or installation of the Improvements and shall in no way be deemed to waive any rights available to JSEWD and WILMORE related to defects, omissions or failures in design, construction or installation.

21. ***Governing Law.*** This Agreement has been entered into and shall be interpreted under and governed by the laws of the Commonwealth of Kentucky, Further, the parties agree that any litigation related to the terms of this Agreement shall be brought in the Jessamine Circuit Court, Nicholasville, Kentucky and the parties acknowledge that venue shall be proper in such court.

If any court of proper jurisdiction finds or construes any provision contained herein to be unenforceable or invalid, then, and in that event, such finding or construction shall not invalidate the entire Agreement.

22. ***Captions.*** The captions of each section herein are for convenience only and shall not affect the construction hereof.

23. ***Multiple Copies.*** This Agreement may be signed in multiple copies, each of which shall be considered an original and entire document.

24. ***Entire Agreement.*** This Agreement contains the entire agreement and understanding between the parties hereto and incorporates and supercedes all oral agreements and understandings and it shall not be changed or supplemented unless done in a writing signed by all parties hereto.

IN WITNESS WHEREOF the parties have caused this document to be executed on the date and year first written.

CITY OF WILMORE, KENTUCKY

ATTEST:

_____
CITY CLERK

BY: _____
ITS:MAYOR

C2

_____
WITNESS

BY: _____
NAME: C7
ITS: C8

JESSAMINE-SOUTH ELKHORN WATER DISTRICT

ATTEST:

_____
SECRETARY

BY: _____
ITS: CHAIRMAN

PUBLIC SERVICE COMMISSION
OF KENTUCKY
EFFECTIVE
9/3/2008
PURSUANT TO 807 KAR 5:011
SECTION 9 (1)
By _____
Executive Director

AGREEMENT

THIS AGREEMENT is made and entered into this 7th day of May, 2015, by and between the City of Wilmore (hereinafter "Wilmore"), a municipal government duly created and existing pursuant to the provisions of Kentucky Revised Statutes and the Jessamine-South Elkhorn Water District (hereinafter "Water District"), a water district duly created and existing pursuant to the provisions of Kentucky Revised Statutes Chapter 74.

WITNESSETH:

WHEREAS, the parties to this Agreement mutually agree that the citizens of Wilmore and Jessamine County are best served by the most efficient and environmentally sound wastewater collection and treatment system; and

WHEREAS, the parties to this Agreement support sound Regional Planning and joint utilization of public infrastructure and services; and

WHEREAS, the parties to this Agreement support efficient and cost effective provision of governmental services; and

WHEREAS, the parties to this Agreement support sound environmental planning; and

WHEREAS, the City of Wilmore, in the document entitled "201 Wastewater Facilities Plan for The City of Wilmore, Kentucky", a plan for the orderly and efficient collection and treatment of wastewater to serve area growth and depicted portions of Jessamine County outside the corporate limits of Wilmore that are potentially within the Wilmore treatment plant service area; and

WHEREAS, Wilmore updated its, 201 Plan (New Facilities Plan), pursuant to KRS Chapter 224A and 401 KAR 5:006 approved by the Wilmore City Council; and

WHEREAS, The 2004 Comprehensive Plan adopted by the Jessamine County/City of Wilmore Joint Planning Commission on October 12, 2004 indicates that urban type residential (i.e.; R-1, R1V, R-2, etc.) should occur in areas accessible to public sewers; and

WHEREAS, it can be expected that there will be re-zoning requests and development pressures within and on the outside fringe of Wilmore's 201 Planning Area; and

WHEREAS, both parties do hereby agree and concur that it is in the best interest of the citizenry of Wilmore and Jessamine County that such development occurs on public sewer so that the health and welfare of the citizens of Wilmore and Jessamine County may be protected; and

WHEREAS, the Jessamine Fiscal Court by Resolution duly adopted and of record in Fiscal Court Order Book 28, Page 626, has designated the Water District as the proper agency to provide sewage disposal services in the Service Area described herein, with arrangements as permitted by law to be made between Wilmore and the Water District for the treatment of sewage; and

WHEREAS, the Water District, by Resolution, duly adopted on August 9, 1995, resolved pursuant to KRS 74.407 to provide for a sewer system within its territorial boundaries and adjoining areas, which includes the Service Area described herein; and

WHEREAS, the Water District has received approval from the Kentucky Division of Water for its regional Facilities Plan pursuant to KRS Chapter 224 and 401 KAR. 5:006 and said plan states that the Water District should be the operator of systems to provide sewer systems to the service area; and

WHEREAS, the Water District has determined that sewage generated in the Service Area, as described hereinafter, should be treated by Wilmore at its Wastewater Treatment Plant or other facility, instead of in a wastewater treatment facility constructed and owned by the Water District; and

WHEREAS, the Water District has determined treatment of sewage by Wilmore generated in the Service Area would be in the best interest of the residents of the Service Area;

NOW, THEREFORE, for and in consideration of the mutual promises and obligations made and exchanged in this Agreement, Wilmore and the Water District (hereinafter collectively referred to as the "Parties") agree as follows:

1. **DEFINITIONS**. For purposes of this Agreement the following terms and phrases shall have the following meanings:

a) "Clean water" includes but is not limited to storm water, surface water, ground runoff, subsurface drainage, sump pit water, roof runoff, cooling water or unpolluted industrial process water.

b) "Connections to Wilmore's sewer system" means connections made directly to Wilmore's existing sewer system.

c) "Infiltration" means water other than wastewater that enters a sewer system from the ground through means such as defective pipes, pipe joints, connections, manholes, or by any other means.

d) "Inflow" means water other than wastewater that enters a sewer system from means such as roof leaders, yard drains, area drains, drains from springs or swampy areas, openings in manhole covers, cross connections with storm sewers, catch basins, cooling towers, storm waters, source runoff, street wash waters, drainage, or any other source which directs rainwater into the sewer system.

e) "Excessive infiltration and inflow" means a high groundwater or rainfall induced sewage flow rate in all or any portion of the Water District's sewer lines exceeding either:

[1] 300 gallons per capita per day based on the maximum flow received during a twenty-four (24) hour period exclusive of industrial flow; or

[2] More than 150 gallons per capita per day based on the annual average of daily flows for the most recent twelve (12) months exclusive of industrial flow.

f) "Service Area" means all that area within the territorial boundary of the Jessamine South Elkhorn Water District that is outside the corporate limits (2005) of the City of Nicholasville and City of Wilmore.

g) "Sewage" means the water carried human or animal wastes, including septic effluent, from residences, buildings, or other places, together with industrial wastes or underground, surface, storm or other water, as may be present, but does not include septic solid waste or sewer sludge.

h) "Sewer line" means sewer lines, pump stations, force mains and other constructions or devices used for collecting, transporting, pumping, measuring or disposing of sewage.

i) "Sewer system" means, individually and collectively, the network of sewer lines, pump stations, force mains and other constructions or devices that discharge into a wastewater treatment plant.

j) "Wastewater treatment plant" means a facility owned and operated by a public body used for the treatment and disposal of sewage.

2. **WILMORE'S OPTION TO TREAT.** Whether or not Wilmore treats sewage generated by a specific property, shall be left to Wilmore's discretion, and this Agreement shall not be construed as the assumption by Wilmore of an obligation to treat the sewage of any applicant under this Agreement.

Provided, however, no property in the Service Area shall be permitted to connect to Wilmore's sewer system if:

a) Inadequate capacity exists in Wilmore's existing sewer lines at the time the property applies for connection (including capacity that will be required for approved Wilmore development plans), based upon Wilmore's duly adopted and printed engineering standards, procedures, manuals, and policies in effect at the time of application, and plans to finance and construct new sewer lines or to replace or improve existing sewer lines have not been approved by Wilmore; or

b) The sewage treatment plant's average daily flows equal or exceed 85% of the treatment plant's permitted average daily design capacity. In such case the remaining treatment plant capacity shall be exclusively reserved for City of Wilmore

development needs, and no additional properties in the Service Area shall be permitted to connect to Wilmore's sewer system until such time as the treatment plant's treatment capacity has been expanded.

3. **CONSTRUCTION COSTS**. The Water District agrees that the developer and/or applicant shall pay all costs related to construction of sewer lines and appurtenances necessary to transport sewage from the applicant's project to Wilmore's sewer system. The Water District agrees to cause the applicants to pay all easement acquisition, engineering, legal, construction, and other costs of any kind, related to improving, upgrading, up-sizing, or expanding Wilmore's existing network of sewer lines, pump stations, force mains and other constructions or devices that discharge into a wastewater treatment plant, if such is necessary to transport sewage from the applicant's project to Wilmore's treatment plant.

4. **SITE SPECIFIC SERVICE AGREEMENTS**. The Water District agrees to give Wilmore written notice of the proposed connection of any property to Wilmore's sewer system a minimum of one (1) month before an application for a KDOW Construction permit is filed for the property, to allow Wilmore sufficient time to review available sewer line and treatment plant capacity, inflow and infiltration conditions, and to allow sufficient time to draft a proposed site specific service agreement. The Parties agree that no property shall connect to Wilmore's sewer system until Wilmore and the Water District have entered into a site specific service agreement with the appropriate person or entity having legal authority to enter into an agreement affecting the property (hereinafter referred to as "Developer"). Wilmore agrees that it shall approve all site specific service agreements if:

a) Technical aspects of the planned sanitary sewer lines, and other infrastructure elements of the development meets or exceeds Wilmore's duly adopted and printed infrastructure requirements existing at the time of submittal for similar Wilmore developments in existence at the time of submittal. Wilmore shall rely on its staff and may retain other outside consultant for such determination; and

b) The terms and conditions of the site specific service agreement fully comply with the terms and conditions set forth in this Agreement.

The parties agree, however, that Wilmore may withhold approval of any site specific service agreement if the Water District has failed to eliminate excessive infiltration and inflow. Wilmore may require the site specific service agreement to include any term or condition that it usually and normally requires in its duly adopted and printed regulations for sanitary sewer lines and other infrastructure elements of any similar development in Wilmore, and shall include the following:

[1] Detailed plans, construction specifications, timelines for connection, and agreement on the specific amount of treatment capacity requested of Wilmore to provide service to the property;

[2] An agreement by the Developer to pay the full cost of sewer service to the property, including but not limited to design and construction costs, plan review fees, Wilmore's consultant fees, legal fees, inspection fees and incidental service fees, including general contract administration and emergency services. Also, the Developer shall agree that any tap-on fees, extra strength sewer charges, sewer use fees, and any and/or all fees normally charged by Wilmore to its customers shall be paid by the end user of the system or the Developer;

[3] An agreement by the Developer that all sewer facilities on the property shall be designed, constructed, and inspected, warranted, certified, bonded, or assured according to Wilmore's duly adopted and printed engineering standards, manuals, procedures, and policies in effect at the time of construction, which would be applicable to similar developments in Wilmore.

[4] An agreement by the Developer to fully comply with Wilmore's pretreatment ordinance, as the same may be amended from time to time.

5. **OWNERSHIP OF FACILITIES AND PERMITS**. The Parties agree that legal title to all sewer lines eight (8) inches in diameter or greater, all force mains and all pumping stations and appurtenances (i.e., chemical feed equipment) downstream from the connection to Wilmore's sewer system, shall be vested in the Water District in a document recorded in the Jessamine County Clerk's Office. All easements obtained by the Water District shall grant Wilmore full access to the aforementioned improvements. The Parties further agree that individual property owners, property owner associations, private developers, and other persons or entities shall have no ownership interest in such lines or pump stations. The Water District agrees that it and/or sewer applicant shall have sole responsibility and Wilmore shall have no responsibility for obtaining all federal, state or local sanitary sewer permits required to operate and maintain sewer lines owned by the Water District. The Water District further agrees to obtain a Kentucky Intermunicipal Operational permit issued pursuant to 401 KAR 5:005.

6. **SEWAGE PRETREATMENT**. The Water District agrees to comply and to require its agents, developers, and customers to comply with Wilmore's pretreatment

ordinances in Wilmore's Ordinance # 481-99, Sewer Use Ordinance, as the same may be amended from time to time. The Parties agree that Wilmore shall have sole authority to issue pretreatment permits to an applicant and to establish pretreatment standards and requirements which shall be the same as those established for users in the City of Wilmore. Furthermore, the Parties agree that Wilmore shall have the right and responsibility for assessment of an extra strength treatment surcharge against the permitted applicants.

The Parties agree that any property in the Service Area subject to Wilmore's pretreatment ordinances which applies for or receives sanitary sewer service may be required to construct a sewer system access "test" manhole and Wilmore shall be provided a full access easement to the manhole in a document recorded in the Jessamine County Clerk's Office. The manhole shall be located outdoors; it shall not be gated; and Wilmore's full and immediate access at all times to the manhole shall not be restricted by the Water District, its agents, Developers, or customers. If requested by Wilmore, the Water District agrees to require the Developers or its customers to install an acceptable wastewater flow measuring device.

7. **CLEAN WATER DISCHARGES**. The Water District agrees to prohibit its customers from discharging through sump pumps, roof drains, ditches or other drains, or any other source, any clean water to any sewer line, and further agrees that it shall take any and all steps reasonable or necessary to prevent or disconnect any such discharge sources.

8. **INFILTRATION AND INFLOW.** If requested by Wilmore, the Water District agrees to require the Developers or its customers to install wastewater flow measuring devices as required by the site specific service agreements approved by Wilmore, pursuant to Section 4 above, capable of accurately recording and documenting actual sewage flows into Wilmore's sewer system. Wilmore and the Water District shall determine the point of location of each such measuring device. If installed, the Water District agrees to require the Developers or its customers to pay all costs related to purchase and installation of the measuring devices.

Should Wilmore elect not to require installation of measuring devices on new installations and construction, this shall not prevent Wilmore from requiring installation, by the Water District, of measuring devices at a later time if Wilmore presents evidence that shows excessive infiltration or inflow.

If such installed measuring devices records excessive infiltration or inflow, as defined by Section 1.e herein, Wilmore shall provide written notice by certified mail to the Water District. Upon receipt of such notice, the Water District agrees to fully comply with 401 KAR 5:005, Section 9(4) (5) (6) and (7).

If the Water District has not eliminated excessive infiltrations and inflow within eighteen (18) months after Wilmore's notice to the Water District, Wilmore may deny further connections to Wilmore's sewer system.

Within sixty (60) days of written demand from Wilmore, such written demand shall be given after the above stated eighteen (18) months, a treatment plant capacity

surcharge shall be accessed against the Water District. The surcharge shall be Wilmore's regular sewer user fee at the per gallon rate specified in Ordinance # 500-00, as amended from time to time, for the actual infiltration and inflow amount.

9. **SEWER USER FEES.** The Water District agrees to pay to Wilmore sewer user fees as set forth in the Ordinances (Ordinance # 500-00, Rev: 1/22/01), as the same may be amended from time to time. The user fees shall be calculated based upon the monthly water use of all of the Water District's sewer service customers within the service area, for which Wilmore provides sewage treatment. As specified in Wilmore's Ordinances, an extra strength treatment surcharge may be added by Wilmore, and the Water District shall add to the customer's bill for any month in which Wilmore's sampling shows that the sewage discharge exceeds specified parameters for suspended solids, ammonia, nitrogen, or biochemical oxygen demand, or other parameters as the ordinance is amended from time to time.

The monthly sewer user fees shall be charged by Wilmore directly to the Water District on a single invoice each month, and shall be paid by the Water District directly to Wilmore each month by the due date specified on the invoice.

To facilitate sewer user fee billing and unless Wilmore provides water service, the Water District shall provide Wilmore a printout showing the water use by each sewer customer in the Service Area and a monthly statement of the total chargeable water use for sewer customers served hereunder. The printout shall show each customer's name, water service account number, service address, meter reading for the month, and

volume of water use for the month. Wilmore shall have the right of reasonable access to Water District records for the purpose of auditing individual water consumption figures furnished by the Water District, and the Water District shall have reasonable access to Wilmore records for purpose of auditing the accuracy of Wilmore charges to the Water District.

The Water District agrees that Wilmore shall have the right to periodically adjust sewer user and other fees it charges all customers within Wilmore and the customers served hereunder, and it agrees to pay such revised rates. Wilmore agrees to give the Water District, its agents, developers, or customers the same advance notice of such fee increases as is provided to other Wilmore customers.

10. **FAILURE TO PAY**. The Water District agrees that if it or its agents, the developers, or its customers fail to pay any costs, fees, user fee, surcharge fee, or other fee or cost of any kind provided for in this Agreement, Wilmore may pursue any available equitable or legal remedy, and shall be entitled to recover all reasonable costs of collection, including reasonable attorneys fees and court costs, and additionally, may prohibit any future connections of properties to its sewer system, or after thirty (30) days written notice to the Water District, or its agents, the Developers, or its customers, disconnect any such nonpaying customers from Wilmore's sewer system. Likewise Wilmore agrees that if it, or its agents, fail to comply with its obligations hereunder, the Water District may pursue any available equitable or legal remedy, and shall be entitled to recover all reasonable costs of enforcement, including reasonable attorney's fees and court costs from Wilmore.

11. **DIVERSION OF FLOWS.** The Parties also agree that the Water District in its sole and absolute discretion may divert sewage flows from properties served hereunder from an existing connection to Wilmore's system to another publicly owned treatment plant facility in Jessamine County, but such diversion shall not serve as the basis for any claim against Wilmore, by the Water District, for a refund of any past payments under this Agreement, nor shall it create any grounds for a claim by Wilmore, financial or otherwise, against the Water District.

12. **NOTICE PROVISIONS.**

All notices required under this Agreement shall be by certified mail directed to:

To City of Wilmore:

Office of the Mayor
City of Wilmore
335 East Main Street
Wilmore, KY 40390

and

Director of Utilities
City of Wilmore
335 East Main Street
Wilmore, KY 40390

To the Water District:

Chairperson
Jessamine-South Elkhorn Water District
107 South Main Street, PO Box 731
Nicholasville, KY 40356

13. **GOVERNING LAW.** This Agreement has been entered into in Jessamine County, Kentucky, and shall be interpreted under and governed by the laws of the

Commonwealth of Kentucky. The Parties agree that any litigation related to the terms of this Agreement shall be brought in the Jessamine Circuit Court, Nicholasville, Kentucky, and the Parties acknowledge that venue shall be proper in such court.

14. **DURATION AND TERMINATION.** The duration of this Agreement shall be for a term of forty (40) years, or for such longer term as may be necessary to comply with the terms of any loan, grant or bond issue which the Water District obtains or receives for the purpose of constructing, operating or maintaining its sewer lines. This Agreement shall be automatically renewed for a like term unless the Parties give a written agreement to terminate.

This Agreement may be terminated at any time upon mutual written agreement of the Water District and Wilmore, but termination of the Agreement shall not provide the basis for a claim by the Water District against Wilmore for a refund of any past payment of any sums to Wilmore under this Agreement, nor shall it create a basis for any claim by Wilmore, financial or otherwise, against the Water District.

15. **SUCCESSORS AND ASSIGNS.** This Agreement shall be binding on Wilmore, the Water District, and their respective successors and assigns.

16. **SEVERABILITY**. In the event any provision of this Agreement shall be held invalid or unenforceable by any court, or by the Public Service Commission or other administrative body of competent jurisdiction, such holding shall not invalidate and render unenforceable all other provisions herein, except to the extent of any obligations that remain outstanding.

17. **INTERPRETATION.** Wilmore and the Water District agree that both have participated in the drafting and negotiation of this Agreement and this Agreement shall

not be interpreted against either party by virtue of having participated in such drafting and negotiation.

18. **CAPTIONS.** The captions of this Agreement are for convenience only and are not to be construed as part of the Agreement, nor as defining, nor limiting in any way the scope of the provisions herein.

19. **ENTIRE AGREEMENT.** This Agreement supersedes all previous sewer agreements, oral or written, between Wilmore and the Water District, and represents the entire agreement between the Parties. No other agreements or representations, oral or written, have been made by Wilmore or the Water District. This Agreement may not be altered, modified, or amended, except in a writing properly executed and approved by Wilmore and the Water District.

IN WITNESS WHEREOF, the Parties hereto have caused their authorized respective signatures to be affixed hereto by their proper officers duly authorized, all as of the day and year first above written.

JESSAMINE - SOUTH ELKHORN WATER DISTRICT

By: _____
L. Nicholas Strong
ITS: Chairman

ATTEST: John P. Blankenship

Pursuant to Resolution Agenda

Passed 11/1/05

_____
Secretary

CITY OF WILMORE

By: _____

ITS: Mayor

ATTEST: _____

Pursuant to Resolution 11-2005

Passed November 7, 2005

_____

City Clerk

Q:\ProjectDir\Jsewd\WO3504\COW-JSEWD-SewerAgmt(2005).doc

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMMISSION

In the Matter of:

FOREST CREEK, LLC COMPLAINANT	)	
VS.	)	CASE NO. 2011-00297
JESSAMINE SOUTH ELKHORN WATER DISTRICT	)	
DEFENDANT	)	

JOINT MOTION OF FOREST CREEK, LLC AND THE JESSAMINE-SOUTH ELKHORN WATER DISTRICT TO DISMISS, WITH PREJUDICE, THE ABOVE- STYLED ACTION

Come the parties, Forest Creek, LLC (hereinafter "Forest Creek"), and Jessamine-South Elkhorn Water District (hereinafter "Water District"), by counsel, and for their Joint Motion to Dismiss, with Prejudice, the claims asserted in the above-styled action, state as follows:

1. On August 5, 2011, Forest Creek filed its Complaint against the Water District.
2. On or about May 12, 2105, Forest Creek and the Water District entered into the attached Settlement Agreement and Release (exhibits excluded) whereby the parties agreed to enter into this Joint Motion to Dismiss, with Prejudice, the above-styled case pending before the Public Service Commission and to release the claims asserted in the above-styled case.
3. Based upon the parties' entry into the attached Settlement Agreement and Release dated May 12, 2015, the parties hereby request the Public Service Commission to Dismiss, with Prejudice, the above-styled case.

Respectfully submitted,

Bruce E. Smith via email authorization

Bruce E. Smith
Bruce E. Smith Law Offices, PLLC
201 South Main Street
Nicholasville, Kentucky 40356
Counsel for Jessamine-South
Elkhorn Water District

/Robert C. Moore

Robert C. Moore
Hazelrigg & Cox, LLP
415 West Main Street, 1st Floor
P. O. Box 676
Frankfort, KY 40602-0676
Counsel for Forest Creek, LLP

CERTIFICATE OF SERVICE

I hereby certify that the foregoing was served by first class mail, postage prepaid, this the 19th day of May, 2015, to, Hon. Bruce E. Smith, **BRUCE E. SMITH LAW OFFICES, PLLC,** 201 South Main Street, Nicholasville, Kentucky 40356.

/Robert C. Moore
Robert C. Moore

COMMONWEALTH OF KENTUCKY
JESSAMINE CIRCUIT COURT
CIVIL ACTION NO. 10-CI–1394
DIVISION II

JESSAMINE-SOUTH ELKHORN WATER DISTRICT — PLAINTIFF

V. **AGREED ORDER OF DISMISSAL, WITH PREJUDICE**

FOREST CREEK, LLC AND, PUBLIC SERVICE COMMISSION OF KENTUCKY — DEFENDANTS

* * * * * * * * *

The Court having considered the Motion to Enter Agreed Order of Dismissal, with Prejudice, filed by the Plaintiff, Jessamine-South Elkhorn Water District, and the Defendants, Forest Creek, LLC, and the Public Service Commission of Kentucky, and being otherwise sufficiently advised, states as follows:

IT IS HEREBY ORDERED that the above-styled action and the claims made in said action are dismissed with prejudice, with each party to bear its own court costs and attorneys fees.

SO ORDERED, this the ___ day of _____, 2015.

_____
Judge, Jessamine Circuit Court

HAVE SEEN AND AGREED:

_____
Hon. John N. Billings, Esq.
Billings Law Firm, PLLC and
Legal Consulting Group, Ltd. Co.
111 Church Street, Suite 200
Lexington, Kentucky 40507
Counsel for Defendant Forest Creek, LLC

Hon. Bruce E. Smith
BRUCE E. SMITH LAW OFFICES, PLLC
201 South Main Street
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Counsel for Plaintiff, Jessamine-South Elkhorn Water Districtc

Hon. Ann Ramser
Public Service Commission
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P.O. Box 615
Frankfort, Kentucky 40602
Counsel for Intervenor Public Service Commission