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**OLDHAM COUNTY WATER DISTRICT  
SPECIFICATIONS DOCUMENT**

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**OLDHAM COUNTY  
WATER DISTRICT  
STANDARD SPECIFICATION  
FOR DEVELOPERS /  
CONTRACTORS**

**May 2007**

Note: These specifications are frequently updated. A new set of specifications, which will be the latest edition, must be requested for each project.

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SECTION 1000  
GENERAL PROVISIONS

Oldham County Water District  
PO BOX 51  
Buckner, Kentucky 40010

Revised 5-1-2007

## **SECTION 1000 - GENERAL PROVISIONS**

### **1.1 SCOPE OF WORK**

The purpose of this document is to specify high levels of quality of workmanship and materials for water system construction in the OCWD (OCWD). This specification applies to all public and private development which may initially or eventually be operated and/or managed by the OCWD.

### **1.2 DEVELOPER'S PROCESS FOR APPROVAL**

The developer must follow the following procedure in order to get approval before any work can begin:

- The developer must first submit two (2) copies of the proposed development on a 24"x36" plan sheet and a CDROM with the file in AutoCAD 2000 format. The plan sheet and the digital file are to include the lots, size of each lot, proposed zoning for each lot, intended structure and size (school - 650students, apartments - 6 plex, etc.), proposed water lines, proposed hydrant locations, any and all existing water lines running through or near the property, and any known plans for future development or phases to the current project. One map showing all planned or completed phases with connections and any existing water lines.
- Following the review of these plans by the OCWD or its representative engineer, the OCWD will contact the developer regarding any revisions required.

- The developer/contractor will be required to sign “The Receipt of and Agreement with the Specifications and the construction contract” (found in the Appendix B), and to provide the OCWD with a construction schedule or progress chart including the estimated start and completion date for all work features related to the water distribution system, as well as a certification of insurance as required in Section 1.3. At this point the OCWD will give written approval for construction to begin. **No construction will be permitted to begin until written approval is received by the contractor.**
- Any changes made to the approved plans for development which may initially or eventually be owned, operated, or maintained by the OCWD must be submitted to the OCWD in writing for approval prior to construction. Developer /contractor acknowledges that there may be charges from the District to include construction observation, the District’s reasonable supervision, and engineering, legal and accounting charges attributable to this project.
- The developer must submit a full set of construction plans to the Kentucky Division of Water (KDOW). One original KDOW approved set of plans shall be provided to the OCWD prior to construction.
- A set of plans must be submitted to and approved prior to construction by the Kentucky Natural Resources & Environmental Protection Cabinet,

Division of Water, Drinking Water Branch, 14 Reilly Road, Frankfort, Kentucky 40601.

- Developer agrees to obtain and provide, without cost to the District, all properly signed recordable easements required by the District for this construction. If Applicant(s) cannot obtain easements on property other than Applicant's, the District will obtain those easements at Developers cost. Any and all easements that will be required for any main, hydrant or valve or any property that will become OCWD's shall be recorded on OCWD's forms.
- The OCWD or an authorized representative will inspect the project installation.
- The developer's Professional Engineer is required to certify the construction and submit that certification to KDOW. The developer's Professional Engineer is additionally required to submit the certification to the OCWD.
- At the completion of the project, the contractor is required to provide OCWD with a full set of printed as-built drawings, as well as a copy on CD ROM in AutoCAD 2000 using Kentucky North State Plan Coordinates NAD 83 for datum with sub meter accuracy. The drawings are to include the pipe locations based on the center line of the road, as well as the all valves and fittings.

- Any and all deviations from the submitted construction schedule or the following specifications MUST be submitted to the OCWD in writing, and at the discretion of the OCWD approval for such deviations may be given.

### **1.3 INSURANCE REQUIRED FOR CONTRACTOR**

#### Workman's Compensation Insurance

The contractor shall take out and maintain Workman's Compensation Insurance, as required by statute, for all of his employees employed at the project site, and in case any work is sublet, for all the subcontractor's employees not otherwise insured. In case any class of employee, who is engaged in hazardous work at the project site is not protected under the Workman's Compensation Statute, the contractor shall provide adequate coverage for the protection of the employees not otherwise protected.

#### Public Liability Insurance

The contractor shall take out and maintain Public Liability (Bodily Injury and Property Damage) Insurance as shall protect him and any subcontractor performing work at the site from claims for damages because of bodily injury, including accidental death, and from claims for property damages which may arise from operation under this contract, whether such operations be by him or by any subcontractor, or by anyone directly or indirectly employed by either of them.



Liability coverage is to be written on a comprehensive general liability policy and must include (a) premise-operations, manufacturers and contractors, and owners, landlords and tenants; (b) contractors protective; (c) products completed operations; (d) contractual liability. General Liability shall also include “underground property damages by mechanical equipment” and when blasting is done coverage must be provided for the explosion hazard.

Where work on railroad right-of-way is involved, the contractor shall also be covered by Railroad Property Liability Insurance with limits of liability as required by the railroad company on whose property the work is being performed.

All comprehensive-automobile-general liability insurance policies shall include as named insured the contractor and the OCWD.

#### Minimum Insurance Limits

The minimum amounts of insurance to be furnished by and for the general contractor and for the subcontractors under this contract must be as follows:

- (a). Workmen’s Compensation – KY Statutes Employers Liability - \$100,000  
limits of liability
- (b). Comprehensive General Liability
  - Coverage A – Bodily Injury Liability
    - \$1,000,000 each occurrence
    - \$1,000,000 aggregate
  - Coverage B – Property Damage Liability

\$1,000,000 each occurrence

\$1,000,000 aggregate

(c). Comprehensive Automobile Liability

Coverage A – Bodily Injury Liability

\$300,000 each occurrence

\$1,000,000 aggregate

Coverage B – Property Damage Liability

\$300,000 each occurrence

(d). Railroad Protection Insurance – (where work to be within railroad right-of-way) Loss of Life or Injury to person - As required by Railroad Property Damage – As required by railroad.

#### **1.4 DEVELOPER'S REQUIREMENTS**

- A. The address given to the OCWD with the initial request for review of plans and specifications, is hereby designated as the place where all notices, letters, or other communications to the developer shall be mailed or delivered. The delivering at the above-named place or depositing in a postage paid wrapper directed to the above-place, in any post office box regularly maintained by the post office, or any notice, letter, or other communication to the developer, and the date of said service shall be the date of delivery or mailing. Such address may be changed at any time by an instrument in writing executed and acknowledged by the developer and delivered to the OCWD. Nothing herein contained shall be deemed

to preclude or render inoperative the service, or any notice, letter or other communication upon the developer personally.

- B. The developer shall provide a way of being reached at all times ( such as a pager or cell phone) and have a response time of 30 minutes.
- C. The developer shall notify the OCWD three working days prior to working on any weekend or Holiday.
- D. The developer is responsible for the entirety of any project work needed to extend a water line to the proposed project area. This is to include, but not be limited to,; laying the line, and final grading, seeding, and clean up.
- E. Contractor is required to flush all lines for bacteria testing. OCWD will take all bacteria testing samples on the water lines. The Contractor will be responsible for all cost accrued for bacteria testing including but not limited to the water usage, chlorine tablets, and OCWD labor and will continue to cover the cost until a testing sample meets OCWD approval. The developer shall provide the OCWD with a one week written notice prior to any and all testing.
- F. The developer shall submit in writing a request for approval to change any water line. The OCWD will give approval based on the amount of water available at the time of the request. In addition, the developer shall pay the OCWD's wholesale price for all water used in this process.

- G. The OCWD requires that all lines be capped at the completion of EACH work day.
  
- H. The developer shall be responsible for all aspects of maintenance and repair of all extensions or improvements to the distribution system for a term of one year after construction is complete and the line has been placed in service. This is to include fulfilling all utility location requests during said time. It is understood that at the termination of one year, the extensions or improvements will become the property and responsibility of the OCWD. At the point of turnover, said system shall be in acceptable condition to the OCWD. The developer shall be responsible for remedying any and all defects found in the system prior to the acceptance of the improvements by the OCWD. During the warranty period the applicant is to correct, at developers expense, any defects observed in the workmanship or materials. If immediate repairs are needed the District will make the repairs and the applicant agrees to pay the District for such.

## **1.5 REQUIREMENTS FOR DRAWINGS**

The contractor shall, **on a daily basis**, maintain one set of prints of the contract drawings marked to scale indicating the installed size, elevation and location of all equipment, structures, and concealed materials including water mains, valves, fittings, service lines, and fire hydrants, as well as other existing utilities affected by the construction or in the trench-width vicinity thereof. All changes made

during construction shall be recorded on these prints as they occur. Drawings shall give accurate dimensions to concealed materials from easily discernible permanent points and from right-of-way lines. These marked record prints shall be made readily available at all times to the OCWD, and other duly authorized personnel named in these specifications.

At the completion of the construction **“as-built” drawings** shall be submitted to the OCWD according to the following requirements.

A. As-built Submittal

1. A minimum of three (3) blue line sets of “as-built” drawings
2. A copy of the digital CAD drawings showing the “as-built” information in the most recent version of AutoCAD. Copies shall be furnished on 3.5" floppy disks and CD-ROM recordable disks . All assets (waterline, valves, fittings, meters, service connections, road crossings, hydrants, etc.) shall be located via GPS and set in Kentucky North State Plan Coordinates NAD 83 for datum with sub-meter accuracy. The drawing shall have the dimensions for the center of road to the center of the water line noted every 500ft.

B. Accompany Submittal with Transmittal Letter, in Duplicate, Containing

1. Date.
2. Project Title and Number.
3. Contractor's Name and Address.
4. Title and Number of each Record Document.

5. Certification that each Document as Submitted is Complete and Accurate.

6. Signature of Contractor, or His Authorized Representative.

C. Water Mains

1. Bends, tees, reducers and plugs not installed, per the approved plans (moved, added or deleted) due to the change in scope of the project, shall be referenced by station and offset or by measurements to a fixed object.

2. Service Information

For services not installed in accordance with the approved plans and the typical cross section, the following information shall be provided:

a. Service shall be referenced by street station or location to a fixed object.

b. Length of service installed to the curb stop and length of pigtail installed.

c. Cul-de-sac services shall be referenced by measurements between the curb stop and two (2) fixed objects.

d. Depth of service at the curb stop.

## 1.6 ACCESS FOR INSPECTION OF WORK

Representatives of the State Department of Health, the State Department for Natural Resources and Environmental Protection, local public health agencies,

and the OCWD shall at all times have full access to the project site for inspection of the work accomplished and for inspection of all materials intended for use. The contractor shall provide proper facilities for such access and inspection.

## **1.7 NOTIFICATION OF CUSTOMERS**

It is the intent of the OCWD not to interrupt service to existing customers unless absolutely necessary. When it is necessary to interrupt service, all customers affected by a shut-off shall be notified in person, or in cases where the customer cannot be contacted, by a note attached to the front door of their premises. Such notification shall be made prior to shut-off, and with the OCWD approval, allowing sufficient time, as determined by the OCWD, for the customer to draw and reserve an ample supply of water.

## **1.8 WORK ON PRIVATE PROPERTY**

- A. Private property is defined as property other than that belonging to the OCWD. Highway and railroad rights-of-way, public parks, school yards and other such properties shall be considered "private properties" for the purpose of this section.
- B. In connection with pipeline work performed on "private property", the contractor shall confine his equipment, the storage of materials and the operations of his workmen to the limits indicated on the plans, being the lands and rights-of-way provided for the project, and shall take every

precaution to avoid damage to the buildings, grounds, and facilities of the owners of private property.

- C. Fences, walls, hedges, shrubs, trees, etc., shall be carefully removed, preserved, and replaced when the construction is completed. Grassed areas shall be graded, fertilized and seeded when construction is completed and in accordance with the requirements of the Detailed Specifications. When construction is completed, the facilities and grounds of the private property owners shall be restored to as good or better than found as quickly as possible at the contractor's expense.
- D. Foundations, adjacent to where an excavation is to be made below the bottom of the foundation, shall be supported by shoring, bracing or underpinning as long as the excavation shall remain open, or thereafter if required to ensure the stability of the foundation; and the contractor shall be held strictly responsible for any damage to said foundation.
- E. Care shall be taken by the contractor to remove only the trees, brush, shrubs, etc. necessary for construction while working on private property. No such removal shall occur unless specifically approved in writing by the property owner. Copies of said written permission shall be furnished to the OCWD. All cleared and grubbed materials shall be removed from the site and disposed of according to applicable laws and regulations. Burning will be permitted only when the contractor has obtained written permission from the local regulatory agency.



- F. The contractor shall have a professional Surveyor (registered in the State of Kentucky) accurately reference all highway right-of-way markers that are destroyed or displaced by construction, and shall restore and replace all such destroyed or displaced right-of-way markers in kind accurately and complete in place. No highway right-of-way markers shall be destroyed or displaced without approval of the Kentucky Department of Transportation.

## **1.9 TRAFFIC CONTROL AND MAINTENANCE**

- A. Traffic shall be maintained on all highways and streets at all times during construction of pipelines across or along side said highways and streets. Access to all existing subdivisions and private residences shall also be kept open. Work shall be performed in accordance with applicable City, County, and state Department of Transportation guidelines. Traffic control shall include proper signing and flagging per these guidelines.
- B. Traffic shall be maintained in accordance with the Manual on Uniform Traffic Control Devices. Work shall include all labor and materials necessary for construction and maintenance of traffic control devices and markings.
- C. Traffic control shall also include all flag persons and traffic control devices such as, but not limited to, flashers, signs, barricades and vertical panels, plastic drums (steel drums will not be permitted) and cones necessary for

the control and protection of vehicular and pedestrian traffic as specified by the Manual on Uniform Traffic Control Devices.

- D. The contractor shall maintain a two-lane traveled way with a minimum lane width of 10 feet; however, during working hours, one-way traffic may be allowed at the discretion of the OCWD, provided adequate signing and flagpersons are at the location.
- E. The contractor shall fully cover with plywood any signs, either existing, permanent or temporary, which do not properly apply to the current traffic phasing, and shall maintain the covering until the signs are applicable or are removed.
- F. In general, all traffic control devices shall be placed starting and proceeding in the direction of the flow of traffic and removed starting and proceeding in the direction opposite to the flow of traffic.
- G. The contractor shall review the signing before traffic is allowed to use lane closures, crossovers, or detours, and all signing shall be approved by the OCWD before work can be started by the contractor.
- H. If traffic should be stopped due to construction operations and an emergency vehicle on an official emergency run arrives on the scene, the contractor shall make provisions for the passage of that vehicle immediately.
- I. If a funeral procession is traveling through the project area, all work is to cease for the duration of the procession.

## 1.10 PROJECT AREA MANAGEMENT

### A. Storage Facilities

The contractor shall be responsible for proper and adequate storage of all materials and equipment used on the site. Any additional off-site space required for construction purposes shall be the contractor's responsibility to obtain. Upon completion of the work, the contractor shall remove all storage facilities, surplus materials and equipment and restore the site to its original condition, or to the finished condition as required by these specifications.

### B. Cleaning

1. The contractor shall at all times keep the construction site and the surrounding area presentable to the public, and clean of rubbish caused by the contractor's operation. At completion of the work, the contractor shall remove all the rubbish, all tools, equipment, temporary work and surplus materials, from and about the premises, and shall leave the site clean and ready for use.
2. After completion of all work and before final acceptance of the work, the contractor shall thoroughly clean all equipment and materials and shall remove all foreign matter such as grease, dirt, plaster, labels, stickers, etc., from the exterior and interior of the piping, equipment and all associated fabrication.
3. All waste and excess materials shall be disposed of off the project site and at no additional expense to the OCWD. In no case shall

waste materials (any removed concrete, piping, equipment, etc.) be buried on the site. Burning is not permitted.

4. Upon completion of the project, the contractor is responsible for leaving the project site in as good as or better condition than the original. This includes site grading, landscaping, replacement of sidewalks, driveways, curbs, mailboxes, clotheslines, fences, etc. and removal of all construction debris.

C. Grading and Seeding

1. Topsoil shall not contain more than 40% clay in that portion passing a Number 10 sieve and shall contain not less than 5% or more than 20% organic matter as determined by loss on ignition of samples oven dried to constant weight at 212°F. Any cost of testing the topsoil shall be borne by the contractor.
2. Fertilizer shall be lawn or turf grade 12-12-12. Fertilizer shall be uniformly applied to all areas to be seeded at the rate of 1 pound per 100 square feet in topsoil or 2 pounds per 100 square feet in non-topsoil. The fertilizer shall be thoroughly disked, harrowed or raked into the soil to a depth of not less than 2-inches. Immediately before sowing the seed, the contractor shall rework the surface until it is a fine, pulverized, smooth seed bed, varying not more than 1 inch in 10 feet.

3. Areas seeded which are considered to be urban in character, and any area in front of a residence, shall be seeded with the following mixture: (Percentages are by weight).

40 Percent Kentucky Bluegrass (*Poa pratensis*)

40 Percent Creeping Red Fescue (*Festuca rubra*)

20 Percent Annual Ryegrass (*Lolium multiflorum*)

All areas in right-of-way or in easements adjacent to right-of-way, other than urban areas, shall be seeded with the following mixture:

30 Percent Kentucky Bluegrass (*Poa pratensis*)

50 Percent Creeping Red Fescue (*Festuca rubra*)

20 Percent Annual Ryegrass (*Lolium multiflorum*)

Immediately after the preparation and fertilization of the seed bed, the seed shall be thoroughly mixed and then evenly sown over the prepared areas at the rate of 3 pounds per 1,000 square feet for urban, right-of-way and easement areas and at a rate of 2 pounds per 1,000 square feet for all other areas. Seed shall be sown dry or hydraulically. After sowing, the area shall be raked, dragged, or otherwise treated to cover the seed to a depth of approximately 1/4-inch.

4. Mulch shall be straw reasonably free of weed, seed and any foreign materials which may affect plant growth. Other materials may be used if approved by the OCWD. Within 48 hours after any given area is seeded, mulching material shall be evenly placed

over all seeded areas at the rate of approximately 2 tons per acre, when seeding is performed between the dates of March 15 and October 15, and at the approximate rate of 3 tons per acre when seeding is performed between the dates of October 15 and March 15 of the succeeding year.

5. All seeded areas shall be carefully maintained and tended by the contractor, watering as necessary to secure a good turf. Settled areas shall be filled, graded, and reseeded. The contractor shall be responsible for the condition of the seeded areas for a period of one (1) year from the date of final acceptance.

D. Erosion Control

1. Furnish all labor, materials, and equipment required for erecting, maintaining and removing temporary erosion and sedimentation controls as shown on the drawings in the appendix and as specified herein.
2. Temporary measures shall be applied throughout the construction period to control and to minimize siltation to adjacent properties and waterways. Such measures shall include, but not be limited to, the use of berms, gravel or crushed stone, mulch, slope drains and other methods. These temporary measures shall be applied to erodible material exposed by any activity associated with the construction of the project.

3. Furnish all labor, materials, and equipment required for erecting, maintaining and removing temporary erosion and sedimentation controls as shown on the drawings in the appendix and as specified herein.
4. Temporary erosion controls include, but are not limited to grassing, mulching, seeding, watering, and reseeding on all disturbed surfaces including waste area surfaces and stockpile and borrow area surfaces; scheduling work to minimize erosion and providing interceptor ditches at those locations which will ensure that erosion during construction will be either be eliminated or maintained within acceptable limits.
5. Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits.
6. The contractor is responsible for providing and maintaining effective temporary erosion and sediment control measures during construction or until final controls become effective.
7. Baled straw is NOT to be used as a silt barrier.
8. Erosion and sedimentation controls shall be inspected weekly and after significant rain storms. Replace filter stone which is dislodged, erosion control blanket which is damaged, and make other necessary repairs.

## **1.11 SPECIFICATIONS BY REFERENCE**

Where in these specifications, reference is made to other standard specifications, such as Federal Specifications, American Standards Associates (ASA), American Society for Testing Materials (ASTM), American Water Works Association (AWWA), Kentucky Department of Transportation, etc., such specifications or parts thereof (most recent revision) as may be herein mentioned or referred to by designation, are hereby incorporated into these specifications, and shall be in full force just as though the said specifications or parts thereof referred to had been written herein.

## **1.12 STANDARDS OF WORKMANSHIP**

The contractor shall have 3 references and 3 or more years of experience. Work of all crafts and trades shall be laid out to lines and elevations as established by the contractor from the Drawings. Unless otherwise shown, all work shall be plumb and level, in straight lines and true planes, parallel or square to the established lines and levels. The work shall be accurately measured and fitted to tolerance as established by the best practices of the crafts and trades involved, and shall be as required to fit all parts of the work carefully and neatly together.

## **1.13 COMPLIANCE WITH SAFETY REGULATIONS**

The equipment items furnished shall comply with all governing federal and state laws regarding safety, including all current requirements of the Occupational Safety and Health Act (OSHA). The contractor shall be solely responsible for job



safety in accordance with all laws, regulations, methods, etc. of OSHA and the state.

**END OF SECTION**



SECTION 2000

WATER DISTRIBUTION

Oldham County Water District  
PO BOX 51  
Buckner, Kentucky 40010

Revised 5-1-2007

## **SECTION 2000 - WATER DISTRIBUTION**

### **2.1 SCOPE OF WORK**

The work to be accomplished under this section of the specifications consists of the furnishing of all labor, materials, equipment and services necessary for the construction of the water mains and appurtenances.

### **2.2 DUCTILE IRON PIPE AND FITTINGS**

- A. Ductile iron pipe shall conform to ANSI/AWWA C151/A21.51, latest revision, pressure class 350, with mechanical joints.
- B. The interior of the pipe shall be cement-mortar lined with bituminous seal coat in accordance with ANSI/AWWA C104/A21.4, latest revision. Thickness of the lining shall be as set forth in the ANSI/AWWA C104/A21.4 specification unless otherwise directed by the Engineer. The exterior of all pipe, unless otherwise specified, shall receive either coal tar or asphalt base coating a minimum of 1 mil thick.
- C. Each piece of pipe shall bear the manufacturer's name or trademark, the year in which it was produced and the letters "DI" or the word "DUCTILE". Pipe manufacturer shall furnish notarized certificate of compliance to the above AWWA or ANSI specifications.
- D. Fittings shall be pressure class 350 ductile iron and have mechanical-joints or push-on joints in accordance with ANSI/AWWA C110/A21.10,

latest revision and shall conform to the details and dimensions shown therein. Fittings shall have interior cement-mortar lining as specified hereinbefore for the pipe. Compact ductile iron fittings (3-inch thru 16-inch) meeting the requirements of ANSI/AWWA C153/A21.53, latest revision, will also be acceptable.

- E. Joints for ductile iron pipe and fittings, as described hereinbefore, shall be rubber-gasket joints and be in accordance with ANSI/AWWA C111/A21.11, latest revision. Joints shall have the same pressure rating as the pipe or fitting of which they are a part. Joints shall be installed per the manufacturer's recommendations.
- F. Provide ANSI/AWWA C110/A21.10 mechanical joint plugs and locked or restrained pipe joints. Fittings under structures shall be mechanical joint with retainer glands.

### **2.3 POLYVINYL CHLORIDE PLASTIC PIPE**

PVC plastic pipe shall conform to ASTM Specification - D2241-74 and Product Standard PS-22-70 NBS. PVC water main shall be Class 200 pipe (Standard Dimension Ratio SDR-21). Maximum length of pipe shall be 20 feet, except under roadways. Road crossings shall have a minimum pipe length of 20 feet and a maximum of 40 feet. The seal of the National Sanitation Foundation Testing Laboratory must appear on each pipe.

Pipe shall be visually inspected on the project site for proper markings which shall include manufacturer's name or trademark, nominal pipe size, pressure rating for water at 73.4 degrees F., plastic pipe material designation code (e.g. PVC 1120), standard dimension ratio, this ASTM Designation D 2241 with which the pipe complies, and the National Sanitation Foundation NSF Seal of Approval for drinking water. All mains which are to be abandoned shall be disconnected and plugged.

## **2.4 POLYETHYLENE PIPE**

- A. Polyethylene tubing, sizes 3/4-inch – 1-inch, shall be used for customer service lines.
- B. PE tubing shall be Driscopipe as manufactured by Phillips Product Company, Inc., PLEXCO as manufactured by Chevron, POLYPIPE.
- C. PE tubing shall be PE DR-9 (200 PSI) and conform to AWWA C901, ASTM F 741 with a pipe designation of PE 3408 defined per ASTM D 3035 for IPS sizes and ASTM D 2737 for CTS sizes.

## **2.5 LOCATOR WIRE**

Contractor shall furnish and install a tape 8- to 12-inches deep with all water mains. All pipes shall be laid with #8 stranded copper locator wire taped directly to the top of pipe so that the line can be located in the future. The wire shall be pulled up in all valve & meter boxes including boxes on hydrant leads.

## **2.6 FITTINGS FOR WATER MAINS**

- A. Ductile iron fittings shall be Class 350 ductile iron fittings in accordance with AWWA C110\_77 (ANSI A21.10) and shall conform to the details and dimensions shown therein. Fittings shall have mechanical joints meeting the requirements of AWWA C111\_80 (ANSI 21.11). Fittings shall have interior cement mortar lining as specified for the pipe. Compact ductile iron fittings meeting the requirements of AWWA C153 will also be acceptable.
- B. Plugs, where required, shall be ductile iron mechanical joint dished or flat plugs in accordance with AWWA C110\_77. Joints for plugs shall be restrained with the use of ductile iron mechanical joint retainer glands.
- C. Fittings shall be wrapped with polyethylene prior to pouring concrete thrust blocks.

## **2.7 COUPLINGS AND ADAPTORS**

- A. Flexible couplings shall be of the sleeve type with a middle ring, two (2) wedge shaped resilient gaskets at each end, two follower rings, and a set of steel trackhead bolts. The middle ring shall be flared at each end to receive the wedge portion of the gaskets. The follower rings shall confine the outer ends of the gaskets, and tightening of the bolts shall cause the follower rings to compress the gaskets against the pipe surface, forming a leak-proof seal. Flexible couplings shall be steel with minimum wall

thickness of the middle ring or sleeve installed on pipe being 5/16-inch for pipe smaller than 10-inches, 3/8-inch for pipe 10-inches or larger. The minimum length of the middle ring shall be 5-inches for pipe sizes up to 10-inches and 7-inches for pipe 10-inches to 30-inches. The pipe stop shall be removed. Gaskets shall be suitable for 250 PSI pressure rating or at rated working pressure of the connecting pipe. Couplings shall be harnessed and be designed for 250 PSI.

- B. Flanged adapters shall have one end suitable for bolting to a pipe flange and the other end of flexible coupling similar to that described hereinbefore. All pressure piping with couplings or adapters shall be harnessed with full threaded rods spanning across the couplings or adapters. The adapters shall be furnished with bolts of an approved corrosion resistant steel alloy, extending to the adjacent pipe flanges. Flanges on flanged adapter (unless otherwise indicated or required) shall be faced and drilled ANSI B16.1 Class 125.
- C. Flexible couplings and flanged adapters shall be as manufactured by Dresser, Rockwell, or equal, per the following, unless otherwise specified and/or noted on the Drawings:
- D. Steel couplings for joining same size, plain-end, steel, cast iron, and PVC plastic pipe.

Dresser	Rockwell
Style 138	4II

- E. Transition couplings for joining pipe of different outside diameters.

Dresser	Rockwell
Style 162 (4"-12")	413 steel (2"-24")
Style 62 (2"-24")	415 steel (6"-48")
	433 cast (2"-16")
	435 cast (2"-12")

- F. Flanged adapters for joining plain-end pipe to flanged pipe, fittings, valves and equipment.

Dresser	Rockwell
Style 127 cast (3"-12")	912 cast (3"-12")
Style 128 steel (3"-48" C.I. Pipe)	913 steel (3" and larger)
Style 128 steel (2"-96" steel pipe)	

## 2.8 GATE VALVES

- A. All gate valves shall be of the resilient seat type, iron body, non-rising stem, fully bronze mounted and suitable for water working pressures of 150 PSI. Valves shall be of standard manufacturer and of the highest quality both as to materials and workmanship. Bolts shall stainless steel.
- B. All gate valves shall be furnished with mechanical joint end connections.



- C. 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 water pressure cast on the body of the valve.
- D. Each gate valve shall be installed in a vertical position with a valve box. Gate valves set with valve boxes shall be provided with a 2-inch square operating nut and shall be opened by turning to the left (counter clockwise).
- E. All valves shall conform with the latest revision of "AWWA Standard for Gate Valves 3-inch through 48-inch for Water and Other Liquids", AWWA C509. Valves shall be as manufactured by Mueller, M & H, American Valve and Hydrant, U.S. Pipe, Kennedy or equal.
- F. NO BUTTERFLY VALVES ARE TO BE USED ON PIPES LESS THAN 14 INCHES.

## **2.9 VALVE BOXES (see WD-1)**

Valve boxes shall be of 5-1/4-inch standard cast iron, two or three piece, screw type valve box with drop cover marked "WATER". Valve boxes for gate valves shall be three piece type. Valve boxes shall be accurately centered over valve operating nut, and backfill thoroughly tamped about them. Valve box bases shall not set on the valves but shall be supported on crushed stone fill. They shall be set vertically and properly cut and/or adjusted so that the tops of boxes will be at grade in any paving, walk or road surface, and 2 - 3 inches above ground in

grass plots, fields, woods or other open terrain. Valve boxes and covers shall be as manufactured by Tyler Corporation, Opelika Foundry, Bingham & Taylor, or equal.

## **2.10 AIR RELEASE VALVES AND BOXES**

- A. Air release valves and boxes shall be installed at locations to be determined in the field by an engineer. Air release valve stems shall be connected to the main by a corporation stop and a tapping saddle. An isolation ball valve shall be furnished and installed between the air release valve and corporation stop. Valves shall be suitable for average working water pressure of 200 PSI, and be fitted with 3/16-inch orifices. Valves shall be equipped with cast iron body and cover, stainless steel float, Buna-N seat and bronze linkage.
- B. Air release valves installed on water mains shall have a 1-inch inlet. All air release valves shall be APCO No. 200-A as manufactured by Valve and Primer Corporation Schaumburg, Illinois or equal.
- C. Air release valves shall be installed at the high point of the water main and shall be connected on the main by a corporation stop with a female I.P.S. threaded outlet. The inlet pipe to the valve shall be ASTM B 43 extra strong seamless red brass pipe with I.P.S. male threaded ends.
- D. The air release valve box shall be a 4-foot diameter precast manhole barrel section with pipe cut-outs and shall be set on a concrete footer.

Care shall be taken so that barrel does not rest on the pipe. The cover shall be a 22-inch diameter cast iron frame and lid. All valves must release to atmosphere.

## **2.11 PRESSURE REDUCING VALVES**

- A. Individual (customer) pressure reducing valves shall be Watts Regulator Series 25AUB with Z3 option as manufactured by Watts Industries, Inc., North Andover, MA, or Wilkins Model 70SS as manufactured by Zurn Industries, Inc., Paso Robles, CA. The adjustable reduced pressure range shall be between 25-75 PSI at an inlet pressure up to 300 PSI. The body shall be of bronze construction, have renewable stainless steel seat, a stainless steel integral strainers, reinforced EPDM diaphragm and EPDM valve disc. The standard setting of the pressure reducing valve shall be 75 PSI. The valve shall be provided with constant flow reduction.
- B. Location of individual pressure reducing valves shall be determined by the OCWD. (unless otherwise noted individual PRV's shall be installed in a setter using an S bar type setting.)

## **2.12 HYDRANTS**

Hydrants shall be installed at the locations shown on the plans. The specific placement of the hydrants shall be determined in the field by the OCWD prior to

installation. Hydrants shall be installed in accordance the details drawing in the appendix.

A. Type "A" Flush Hydrants

1. The contractor shall furnish and install Type "A" hydrants and auxiliary gate valves where shown on the drawings. Hydrants shall conform in all respects to the most recent requirements of AWWA C502. Hydrant barrel shall have safety breakage feature above the ground line. All hydrants shall have 6-inch mechanical joint shoe connection, one (1) 5-1/4-inch main valve opening two ways (two pumper nozzles) with nozzle with rubber gasketed caps fitted with cap chains. Cap nuts are to be five (5) sided. Connection threads shall be National Standard Thread. Main valve shall have 5-1/4-inch full opening and be of the compression type opening against water pressure so that valve remains closed should barrel be broken off.
2. Hydrants shall be fully bronze mounted. Main valve shall have a threaded bronze seat ring assembly of such design that it is easily removable by unscrewing from a threaded bronze drain ring. Bronze drain ring shall have multiple ports providing positive automatic drainage as the main valve is opened or closed. Drainage waterways shall be completely bronze to prevent rust and corrosion.
3. The operating nut shall be five (5) sided bronze or bronze with a five (5) sided ductile iron cap, and mounted so that a counter

clockwise motion will open the valve. There must be cast on top an arrow and the word "Open" indicating the direction of turn to open the hydrant.

4. Operating stem shall be equipped with anti-friction thrust bearing to reduce operating torque and assure easy opening. Stop shall be provided to limit stem travel. Stem threads shall be enclosed in a permanently sealed lubricant reservoir protected from weather and the waterway with O-ring seals.
5. Hydrants shall be shop tested to 300 PSI pressure with main valve both opened and closed. Under test the valve shall not leak, the automatic drain shall function and there shall be no leakage into the bonnet.
6. Type of shoe connection shall be mechanical joint and size shall be 6 inches.
7. Hydrants shall be given two (2) coats of enamel high visibility paint with color to be selected by the OCWD.
8. Hydrants shall be Mueller Super Centurion Model A-423, or approved equal.

B. Type "B" Flush Hydrants

1. Type "B" flush type hydrants shall comply, where applicable, to AWWA Standard C-502, latest revision. Flush type hydrants shall

be of the compression type, with the main valve opening against the pressure and closing with the pressure. The main valve opening shall be 2-1/4 inch diameter. Flush type hydrants shall be of a dry barrel design.

2. Flush type hydrants shall be rated at 150 PSI water working pressure, tested at 300 pounds hydrostatic for structural soundness in the following manner; 300 pound hydrostatic test supplied from the inlet side, first with the main valve closed for the testing of the valve seat; second, with the main valve open for testing of the drain valves and the hydrant barrel.
3. Hydrants shall be constructed of ASTM A-126 Class B cast iron. The main valve of the hydrant shall be made of rubber.
4. The bottom stem threads of the main valve rods shall be fitted with a cap nut for sealing the threads away from the water.
5. Changes in size or shape of the waterway shall be accomplished by means of easy curves. Exclusive of the main valve opening, the net area of the waterway of the barrel and the foot piece at the smallest part shall not be less than 120% of that of the net opening of the main valve, except for hydrants with a 2-1/4-inch valve opening.

6. Hose and steamer caps shall be individually chained to the hydrant.
7. The operating threads of the hydrant shall be so designed as to avoid the working of any iron or steel parts against either iron or steel. The operating stem and operating nut threads shall be square or acme type.
8. Bonnet shall be weatherproof, free draining, and of a type that will maintain the operating mechanism in readiness for use under freezing conditions.
9. The operating nut shall be provided with a convenient means to afford lubrication to insure ease of operating and the prevention of wear and corrosion. Hydrants shall be of dry barrel type. Hydrant shoe shall have two (2) positive acting non-corrodible drain valves that shall drain the hydrant completely by opening when the main valve is closed, and also to close tightly when the main valve is open.
10. All like parts of hydrants of the same size and model produced by the same manufacturer shall be interchangeable.
11. Hydrants shall open by turning to the left.
12. Threads on hose and steamer nozzles shall be National Standard unless otherwise specified.



13. Operating nuts and cap nuts shall conform to National Standard unless otherwise specified.
14. Bury shall be 36-inches measuring depth from grade line to top of connecting pipe.
15. Auxiliary shut-off (isolation) gate valves shall be of the same manufacturer as the hydrant when required.
16. Hydrants with a 2-inch, 2-1/4-inch, 2-1/2-inch, or 3-inch shoe (Style 333) shall be supplied with one 2-1/2-inch hose outlet. Hydrant assembly shall include a cast iron box and cover for installation flush with grade level.
17. The inside of all hydrants shall be coated in accordance with AWWA standards except for bronze and machined surfaces. Exterior on hydrant nozzle section shall be painted hydrant red.

### **2.13 SPECIFICATIONS BY REFERENCE**

Where in these specifications, reference is made to other standard specifications, such as Federal Specifications, American Standards Associates (ASA), American Society for Testing Materials (ASTM), American Water Works Association (AWWA), Kentucky Department of Transportation (KY DOT), such specifications or parts thereof (most recent revision) as may be herein mentioned or referred to by designation, are hereby incorporated into these specifications,

and shall be in full force just as though the said specifications or parts thereof referred to had been written herein.

## **2.14 TAPPING SLEEVES AND VALVES**

- A. Tapping sleeves for connections to existing water lines shall be of the mechanical joint type stainless steel suitable for working pressures of 150 PSI and shall be Mueller No. H-304 or approved equal.
- B. Tapping valves shall be of the mechanical joint type suitable for working pressures of 150 PSI and shall be Mueller No. H-667 or approved equal.
- C. All existing water mains to be tapped shall be exposed in order to verify line sizes prior to ordering tapping sleeves and valves.

## **2.15 CUSTOMER SERVICE CONNECTIONS**

The contractor shall furnish and install the necessary piping, couplings, fittings, etc., necessary to complete the service line connection. All service connections are to be of polyethylene tubing.

### **A. Service Lines Not Crossing a Road**

Water service connections shall be made in accordance with the details shown on the drawings in the appendix and/or set forth herein.

### **B. Service Lines Crossing a County Road or City Streets**

Same as subparagraph A., except that all pipe must be push bored beneath certain paved or blacktopped city streets or county roads, unless

solid rock prevents using this method in which case, the open trench method will be used. The open trench method generally will be used on all unpaved city streets, county roads and private driveways. In general, blacktopped private driveways shall also be push bored. In all cases where lines are under traffic, a minimum cover of 36-inches shall be provided. All backfill shall be compacted by air tampers in layers no greater than 6-inch depth. Specific instructions as to the type of crossing to be installed shall be shown on the plans. All lines shall be installed in Schedule 40 casing with glue joint ends.

C. Service Lines Crossing a State Highway

Services shall be jacked or pushed under paving. If solid rock is encountered, the crossing shall be relocated to permit boring or jacking. Steel casing shall be used.

D. Service Lines Crossing a Street (including lines that will eventually have a street over them)

All service lines in new developments that will eventually have a street over them must use a 2-inch glue joint carrier pipe for crossing at every property line. When water mains are laid in conjunction with street construction, 2 inch, SDR 21 bell glue joint only (or equal or better) encasement pipes with locator wire and end caps shall be laid across the street at appropriate locations to facilitate future service connections. 3 feet of Rebar shall be installed at the end of all casing pipe buried one foot below final grade. Also a wooden 2" x 4" is required to be driven in the ground and to extend above ground by a min. of 2". The developer will be responsible for any casings left out, at their expense.

## **2.16 CORPORATION STOPS**

- A. Corporation stops, of the size required, shall be tapped directly into the water main using a tapping clamp or saddle.
- B. Corporation stops shall have AWWA C800-66 C.S. threaded inlet. Outlets shall be suitable for the type of service piping furnished and laid, and the Contractor shall verify compatibility with "iron pipe size" or "PE tubing size" service piping as required before ordering stops.
- C. Corporation stops shall be Ford Meter Box Type F1000, F1001, F1002 (as required); Mueller H-15005, H-15006, H-15008, H-15009 (as required); Hayes Series 5200, or equal.

## **2.17 METER BOXES**

The boxes shall be fabricated with notches for service piping. A cast iron meter cover shall be provided of the "small" nut, plain lid type manufactured in the United States. Minimum depth of the meter box and service pipe will be 30 inches. The box lid shall be a minimum of 6 inches above the meter. Service connections requiring pressure regulators with the meter will require larger meter boxes. Boxes shall be PVC and manufactured by Ford Meter Box Company or approved equal.

## 2.18 METER SETTERS

- A. The meter setter for water meters 1 inch or less, shall be a copper setter as shown on the standard detail drawings with double purpose ends and be 9 inches high with padlock wing. It shall be all purpose and be of sufficient height to raise meters above the bottom of the meter box. All meter setters shall have an inverted key inlet valve and shall have a dual check valve located on the outlet side of the meter setter. Meter setters shall be Ford, or equal.
- B. Two-inch meter setters shall have inverted key inlet valve and angle check outlet valve. They shall be all purpose, 15 inches high with padlock wing, and be of sufficient height to raise meters above the bottom of the meter box. Two-inch meter setters shall be Ford copper custom setters, or equal.
- C. Setters shall be installed so that the meters are centered in the meter box.
- D. The water service line shall be extended a minimum of 18 inches beyond the meter box on the customer end. The extension shall be attached to the setter as shown on Drawing WD-1 in the appendix. The end of the extension shall be capped or plugged to prevent entry of foreign material until the house connection is made.

## **2.19 WATER METERS**

Water meters shall be cold water displacement type meeting all requirements of AWWA C700-77. The meter sizes shall be 5/8-inch x 3/4-inch meters for 3/4-inch service rated at a flow of 20 GPM, 1-inch meters for 1-inch service rated at a flow of 50 GPM, and 2-inch meters for 2-inch service rated at a flow of 160 GPM. Meters shall be of frost-proof design and be rotating disk type. The meters shall be equipped with a straight-reading register recording in U.S. Gallons hermetically sealed to prevent fogging and with a removable corrosion resistant strainer screen between the outer case and measuring chamber. Register shall be equipped with a device to afford capability for accurately testing each meter according to AWWA Standards. The body case shall have the manufacturer's serial number imprinted thereon and have raised markings to indicate the direction of flow. Meters type shall be decided by OCWD on a per project basis.

## **2.20 VALVE VAULTS**

- A. Valve vault dimensions shall be as shown on the drawings. The wall slab shall be a minimum of 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 traffic load.
- B. Concrete strength shall be Type I, 4000 PSI at 28 days (85% strength prior to handling).
- C. Reinforced concrete base and top slab shall be no less than 8-inches thick and have a minimum #4 rebar placed on 6-inch centers, each way.

- D. All concrete shall conform to ACI 301 and reinforcement shall conform to ASTM A615, A616, or A617.
- E. Access hatch shall be in the size and installed in the top slab of the valve vault at the locations shown on the drawings in the appendix. Frames and covers shall be fabricated of aluminum. Fasteners shall be stainless steel. Frame shall be securely mounted over the valves. Covers shall be provided with lifting handle and safety latch to hold the cover in the 90 degree open position. Locking hasps shall be provided. Covers shall be of the checkered plate design. Access hatch shall be designed for 300 PSF live load. Hatch shall include 1-1/2-inch drain and pipe that will drain to grade.
- F. All vaults regardless of depth must have an aluminum ladder installed or Polypropylene (rebar reinforced) steps.
- G. Valve vaults may be steel or concrete. All vaults must have a steel or concrete base.

## **2.21 MASTER METER AND VAULT**

- A. The underground master meter station shall be complete when delivered and will not require internal contractor construction except to install the power service through the service conduit provided for that purpose.
- B. The underground master meter station shall be manufactured by Engineered Fluid, Inc. (EFI), Centralia, Illinois, or equivalent.

- C. The station manufacturer shall be required to affix an **UNDERWRITERS LABORATORIES (UL) LABEL** attesting to the compliance of that assembled equipment under the **PACKAGED PUMPING SYSTEMS (QCZJ)** UL Listing Category. This label shall be inclusive of the entire station with enclosure so as to demonstrate compliance with the National Electrical Code requirements for working clearances and wiring procedures. **Equipment manufactured without this third party certification label or equipment manufactured by an outside source or "brokered equipment" defined as systems not assembled on the premises of the named manufacturer by that company's employees WILL NOT be allowed.**
- D. Equipment submittals shall be bound and in a minimum of six (6) copies. The submittals shall contain a minimum of two (2) full size drawings, size 24-inch x 36-inch; one (1) each covering the master meter station and the electrical control schematic. The master meter station drawing shall be specific to this project, in at least three (3) different views, be to scale and illustrate the National Electrical Code (NEC) clearances per Section 110-26 of the Code. The submittal booklets will be complete with data sheets covering all individual components that make up the master meter station and the UL file number under which the manufacturer is listed, service department personnel statement as detailed in the specifications and be complete with the manufacturer's formal warranty policy. **The submittal booklets shall be complete with a full size photocopy of the manufacturer's combination UL/manufacturer logo UL Packaged Pumping Systems label.**
- E. The entrance manway and/or equipment hatches shall be sized to provide for the eventual removal and replacement of any component within the station without altering the station to accomplish that task.



- F. The plate steel employed throughout the capsule shall be 1/4-inch minimum thickness and meet or exceed the requirements for ASTM A-36. The structural shapes (channels and angles) shall be of the thickness/weight and shall meet or exceed the requirements for ASTM A-36. The structural rectangular or square tubing shall be of the wall gauge and shall meet or exceed the requirements for ASTM A-500 Grade B. **Field welding to complete the capsule or attach the entrance hatch will not be allowed.** The plate forming the top and bottom of the capsule shall be cold formed prior to assembly so as to form a **lap joint** with the side wall. The **lap joint** shall be continuously welded on the interior by hand and the exterior by machine to form an airtight seal. The lower side wall continuous weld shall be an average of 10-inches above the capsule floor, which removes the lower weld from incidental water impingement. Capsules without **lap joints** will not be accepted. The **lap joint** shall be in full conformance with Steel Tank Institute (STI) P-3 specifications Section 4.2.6 and Underwriters Laboratories (UL) 58 specifications for steel vessels in buried service, and the American Welding Society (AWS) Structural Welding Code, Section 9.10, for dynamically loaded structures. Any ferrous metal device passing through the capsule wall will be welded fully along its circumference or length on both sides of the capsule wall.
- G. Four (4) or more **lifting plates** of 3/8-inch minimum thickness shall be placed about the perimeter of the capsule to facilitate the lifting and handling of the station.
- H. **Interior lifting eyes** shall be placed over each piece of equipment in excess of 60 pounds in weight.

- I. The capsule will be complete with a sump. The sump shall be a minimum of 18-inches in diameter x 8-inches deep; the sump shall be provided with a 4-inch plugged outlet for gravity outflow as required.
- J. The entrance manway shall be Bilco Model MS-50 roof scuttle, with a minimum clear inside opening of 30 inches x 36 inches. The scuttle cover shall be made of 11 gauge aluminum on the exterior. The scuttle cover shall be insulated with a minimum of 1 inch of fiberglass insulation, covered and protected by an 18 gauge aluminum liner. The entry lock shall be flush mounted, in the scuttle riser, in position to be protected from the elements by the cover skirt as detailed on **Bilco Drawing 6184**. The lock will be of the pin tumbler type, dead bolt, with an inside safety release. Two (2) keys will be provided, on a key ring complete with the manufacturer's identification. No locking devices or other penetrations of the cover shall be allowed.
- K. An all aluminum access ladder will be provided. The ladder shall meet UL approval and OSHA qualifications under the Type I, Heavy Duty Specifications. The ladder will have 1-1/4-inch diameter, tempered, serrated rungs with 3-inch x 1-1/8-inch full I-Beam side rails. The uppermost ends of the side rails will be protected by plastic caps bolted into place. The complete access ladder will be bolted into place, at a minimum of two (2) points both top and bottom, so as to be easily removable to facilitate equipment maintenance.
- L. All surfaces of the entire structure shall be sandblasted equal to commercial blast cleaning (SSPC-SP6). Following grit blasting, all weldments will be pretreated by hand with brush using **Tnemec Series 69 Hi-Build Epoxoline II** coating to provide additional corrosion protection. Following the pretreatment full coating application shall take place. The full protective coating shall take place immediately after

surface preparation. The protective coating shall be Tnemec Series 69 Hi-Build Epoxoline II two-component, high solids, system formulated for high build application for protection and finishing and having excellent chemical and corrosion resistant properties. The epoxy system shall be self priming and require no intermediate coatings. The protective coating shall provide in two (2) applications a total dry mil thickness of 8.0 mils. The station manufacturer shall furnish two (2) seventeen (17) pound packaged magnesium anodes for cathodic protection. The anodes shall be buried equally spaced around the station and connected by heavy copper wire to lugs on the station provided for that purpose.

M. Piping shall be steel and conform to material specification ASTM A-53(CW) for nominal pipe size 4-inch and smaller and ASTM A-53(ERW) Grade B for nominal pipe size 5-inches and larger. Steel butt-welding fittings shall conform to material specification ASTM A-234 Grade WPB and to the dimensions and tolerances of ANSI Standards B16.9 and B16.28 respectively. Forged steel flanges shall conform to material specification ASTM A-105 Class 60 and/or ASTM A-181 for carbon steel forgings and to the dimensions and tolerances of ANSI Standards B16.5 as amended in 1992 for Class 150 and Class 300 flanges.

N. Pipe supports by minimum sizing for:

1. 8-inch and smaller piping shall be 2-inch x 3-inch x 3/16-inch wall rectangular tubing;
2. 10-inch and larger piping shall be 3-inch x 4-inch x 1/4-inch wall rectangular tubing;
3. 6-inch and larger piping shall be provided with "kick" bracing projecting fully from the underside of the pipe to the floor at an angle of no less than 15° from vertical out at a right angle to the

run of the pipe being supported. These "kick" braces shall be in addition to the vertical pipe supports called out above.

Pipe supports are to be fully welded at both end points to the pipe and steel floor where required. **Simple pipe stands made of pipe welded only at the floor and upholding a bracket with or without a threaded jack bolt or a U-bolt are not acceptable, as no lateral or transverse support is provided.**

- O. The meter vault may be constructed of precast concrete with equivalent qualifications as stated approved and only when specifications of the alternate vault have been submitted to and approved by the OCWD.

## **2.22 BORING AND JACKING**

- A. The contractor shall excavate their own pits, as they may deem necessary, and will set their own line and grade stakes which may be checked by the OCWD. Permits, as required, will be furnished or obtained by the developer, but shall be made available to the OCWD before any excavating is commenced.
- B. The boring method shall consist of pushing the pipe into the earth with a boring auger rotating within the pipe to remove the spoil.
  - 1. The boring operation shall be progressed on a 24-hour basis without stoppage (except for adding lengths of pipe) until the leading edge of the pipe has reached the receiving pit.
  - 2. The front of the pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger from

leading the pipe so that there will be no unsupported excavation ahead of the pipe.

3. The auger and cutting head arrangement shall be removable from within the pipe in the event an obstruction is encountered. If the obstruction cannot be removed without excavation in advance of the pipe, the pipe shall be abandoned in place and immediately filled with grout.
  4. The over-cut by the cutting head shall not exceed the outside diameter of the pipe by more than 1/2 inch. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe by more than approximately 1 inch, grouting or other approved methods must be used to fill such voids.
  5. The face of the cutting head shall be arranged to provide a reasonable obstruction to the free flow of soft or poor material.
  6. Any method which does not have this boring arrangement will not be permitted. Contractor's boring arrangement plans and methods must be submitted to, and approved by, the OCWD.
- C. In the event an obstruction is encountered in boring which cannot be removed and it becomes necessary to withdraw the casing and commence elsewhere, the hole from which the casing is withdrawn shall be completely backfilled with coarse sand rammed in.
- D. Insurance to be furnished by the contractor to cover this type of work shall be adequate to meet the requirements of the Railroad and/or State or

County Highway Departments. Insurance shall consist of comprehensive general liability and automobile liability insurance.

- E. Before award of the contract, the contractor shall furnish a statement of their experience of such work, or if inexperienced, shall advise the OCWD as to whom he will sublet the work and give a statement of the experience of the subcontractor, which shall be satisfactory to the OCWD.

## **2.23 CREEK CROSSING**

- A. Utility pipelines crossing water courses less than 15 feet in width.
  - 1. For crossings of water courses with erodible channels, there shall be at least 30 inches of clear cover from the natural channel bottom to the top of the pipeline. See details in appendix.
  - 2. For crossings of water courses with non-erodible channels, there shall be at least 30 inches of clear cover from the natural channel bottom to the top of the pipeline. Also, the pipeline shall be encased on all sides by at least 6 inches of concrete.
- B. Utility pipelines crossing water courses greater than 15 feet in width. Water lines shall have a minimum clear cover of 30 inches. The pipe shall be of special construction, having flexible watertight joints. 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; and the valve closest to the supply source shall be in a manhole. Permanent taps shall be made on each side of the valve

within the manhole to allow insertion of a small meter to determine leakage and for sampling purposes. Tap size shall be coordinated with OCWD.

## **2.24 EXCAVATION FOR PIPELINE TRENCHES**

- A. Trenches in which pipes are to be laid shall be excavated in open cut to the depths not to exceed an elevation permitting the pipe to be properly bedded. The excavation shall only extend to a depth that will allow for 30 inches of cover over the pipe and to a point where the optimum bedding material is achieved. Installation shall be in accordance with ANSI/AWWA C600 for ductile iron and Cast Iron O.D. (AWWA) PVC pipe or ASTM F-645 for Iron Pipe O.D. (ASTM) PVC pipe except as modified herein.
- B. All pipe should be bedded in accordance with OCWD standard drawings, 6" below the spigot and 12" above the spigot of the pipe.
- C. Excavation may be undercut to a depth below the required invert elevation that will permit laying the pipe in a bed of granular material to provide continuous support for the bottom quadrant of the pipe. When this method is used, the bedding shall be as set out in Paragraph 2.23 hereinafter.
- D. Trenches shall be of sufficient width to provide free working space on each side of the pipe and to permit proper backfilling around the pipe.  
  
ROCK TRENCHERS AND PNEUMATIC HAMMERS ARE NOT

ALLOWED UNLESS A TRENCH TWICE AS WIDE AS THE PIPE IS USED, WITH A MINIMUM WIDTH OF 40".

Deviations in specifications must have written approval from OCWD.

- E. All excavated materials shall be placed a minimum of 2 feet back from the edge of the trench.
- F. Before laying the pipe, the trench shall be opened far enough ahead to reveal obstructions that may necessitate changing the line or grade of the pipeline.
- G. The trench shall be straight and uniform so as to permit laying pipe. It shall be kept free of water during the laying of the pipe and until the pipeline has been backfilled. Dry conditions shall be maintained in the excavations until the backfill has been placed. During the excavation, the grade shall be maintained so that it will freely drain and prevent surface water from entering the excavation at all times. All water shall be pumped or drained from the excavation and disposed of in a suitable manner without damage to adjacent property or to other work.
- H. Minimum cover of 30 inches shall be provided for all pipelines.

## **2.25 PIPE BEDDING**

- A. Bedding material shall be manufactured sand free from rock.  
In no case shall pipe be supported directly on rock.



- B. In wet, yielding mucky locations where pipe is in danger of sinking below grade or floating out of line or grade, or where backfill materials are of such a fluid nature that such movements of the pipe might take place during the placing of the backfill, the pipe must be weighed or secured permanently in place by such means as will prove effective. Yielding and mucky material in subgrades shall be removed below ordinary trench depth in order to prepare a bed for the pipe. Crushed stone if necessary, shall replace poor subgrade material, shall be classified as "Special Pipe Bedding".
  
- C. Granular material for Special Pipe Bedding where required shall be Department of Transportation crushed limestone, Size #9.

## **2.26 LAYING PIPE**

- A. The laying of pipe in finished trenches shall be commenced at the lowest point so the spigot ends point in the direction of flow.
  
- B. All pipes shall be laid with ends abutting and true to line and grade. Supporting of pipes shall be as set out hereinbefore under "Pipe Bedding" and in no case shall the supporting of pipes on blocks be permitted.
  
- C. Before each piece of pipe is lowered into the trench, it shall be thoroughly inspected to insure that it is clean. Each piece of pipe shall be lowered separately. No piece of pipe or fitting which is known to be defective shall

be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe.

- D. Pipe shall not be laid on solid rock. A pad of granular material as specified in Paragraph 2.23 "Pipe Bedding", shall be used as a pipe bedding. Irregularities in subgrade in an earth trench shall be corrected by use of granular material.
  
- E. When laying of pipe is stopped for any reason, the exposed end of such pipe shall be closed with a plywood or fabricated plug fitted into the pipe bell, so as to exclude earth or other material, and precautions taken to prevent flotation of pipe by runoff into trench.
  
- F. No backfilling (except for securing pipe in place) over pipe will be allowed until inspection of the joints, alignment and grade, in the section laid has been made by the OCWD.
  
- G. All pipes must follow the following table as it pertains to deflections:

**Maximum Permissible Deflection in Laying**

**Mechanical Joint Pipe**

<u>Size Pipe</u>	<u>18 Ft. Length</u>	<u>20 Ft. Length</u>
6"	30"	30"
8"	20"	22"

10"	20"	22"
12"	20"	22"
14"	13 ½"	15"
16"	13 ½"	15"
18"	11"	--
20"	11"	--
24"	9"	--

**Maximum Permissible Deflection in Laying**

**Push-On Joint Pipe**

<u>Size Pipe</u>	<u>18 Ft. Length</u>	<u>20 Ft. Length</u>
6"	19"	21"
8"	19"	21"
10"	19"	21"
12"	19"	21"
14"	15"	17"
16"	15"	12"
18"	11"	12"

20"	11"	12"
24"	11"	12"

## 2.27 BACKFILLING PIPELINE TRENCHES

A. Backfilling of pipeline trenches shall be accomplished as shown in the details set forth hereinafter. Before final acceptance, the contractor will be required to level off all trenches or to bring the trench up to grade. The contractor shall also remove from roadways, rights-of-way and/or private property all excess earth or other materials resulting from construction. In the event that pavement is not placed immediately following trench backfilling in paved areas, the contractor shall be responsible for maintaining the trench surface in a level condition at proper pavement grade at all times. Under pavement, all trench backfill shall be in accordance with Method C. All other trench backfill shall be in accordance with Method A or B.

B. Method "A" – Backfilling in Open Terrain:

Backfilling of pipeline trenches in open terrain shall be accomplished in the following manner:

1. The lower portion of the trench, from the pipe bedding to a point of 12 inches above the top of the pipe, shall be backfilled with manufactured sand free from rock. This material shall be placed and carefully compacted to avoid displacement of the pipe.

Compaction shall be accomplished by hand-tamping or by approved mechanical methods.

2. The upper portion of the trench above the compacted portion shall be backfilled with material which is free from large rock. Incorporation of rock having a volume exceeding one-half cubic foot is prohibited. The trench backfill shall be heaped over.

C. Method "B" - Backfilling Under Sidewalks & Unpaved Driveways:

Backfilling of pipeline trenches under sidewalks and unpaved driveways shall be accomplished in the following manner:

1. The lower portion of the trench, from the pipe bedding to a point of 12 inches above the top of the pipe, shall be backfilled with manufactured sand free from rock. This material shall be placed in a manner to avoid displacement of the pipe. Compaction shall be accomplished by hand-tapping or by approved mechanical methods.
2. The middle portion of the trench, from a point of 12 inches above the top of the pipe to a point of 6-inches below the grade line, shall be backfilled with material free from rock. This material shall be placed and compacted in layers of approximately 6 inches. Water (puddling) may be used as required to obtain maximum compaction.

3. The upper portion of the trench shall be temporarily backfilled and maintained with crushed stone or gravel until such time as the sidewalk is constructed or the driveway surface is restored.
- D. Method "C" - Backfilling Under Streets, Roads, and Paved Driveways:
- Backfilling of pipeline trenches under streets, roads and paved driveways shall be accomplished in the following manner:
1. The lower portion of the trench from the pipe bedding to a point of 6 inches below the bottom of the pavement or concrete sub-slab shall be backfilled with # 9 crushed stone.
  2. The upper portion of the trench, from a point of 6 inches below the bottom of the pavement or concrete sub-slab to grade, shall be backfilled with a base course of dense graded aggregate. At such time that pavement replacement is accomplished, the excess base course shall be removed as required.
- E. Trenches outside existing sidewalks, driveways, streets, and highways shall be backfilled in accordance with Method "A". Trenches within the limits of sidewalk and unpaved driveways shall be backfilled in accordance with Method "B". Trenches within the paving limits of existing streets, highways and driveways shall be backfilled in accordance with Method "C".
- F. Before final acceptance, the contractor will be required to level off all trenches or to bring the trench up to grade. The contractor shall also

remove from roadways, right-of-ways and/or private property all excess earth or other materials resulting from construction.

- G. In the event that pavement is not placed immediately following trench backfilling in streets and highways, the contractor shall be responsible for maintaining the trench surface in a level condition at proper pavement grade at all times.

## **2.28 CONCRETE CRADLE, ANCHORS OR ENCASEMENTS**

- A. Concrete cradle, anchors or encasement of water mains and fittings shall be placed where shown on the details in the appendix, required by the specifications. Concrete shall be KY DOT Class B and shall be mixed sufficiently wet to permit it to flow under the pipe to form a continuous bed. In tamping concrete, care shall be taken not to disturb the grade or line of the pipe or injure the joints.
- B. Water mains shall have concrete thrust or "kicker" blocks at all pipe intersections and changes of direction to resist forces acting on the pipeline.
- C. All valves shall be anchored in accordance with the details on details.
- D. Encasement of PVC water mains under creeks and drainage waterways shall be constructed as shown on the details. Crushed stone for the encasement shall be Kentucky Bureau of Highways dense graded aggregate, classified as "Special Pipe Bedding".

- E. If the underwater crossing is greater than 15 feet in length, a valve with two (2) permanent taps shall be installed, in an accessible manhole, on the upstream side of the creek. These creek crossings shall also have a buried valve on the downstream side of the crossing.

## **2.29 HIGHWAY AND RAILROAD CROSSINGS**

- A. Crossing beneath state maintained roads, railroads, or other surfaces not to be disturbed shall be excavated by boring and jacking methods. In lieu of boring, tunneling may be substituted.
- B. Steel cover pipe road crossings shall be bored and/or jacked in place. All joints between lengths shall be solidly butt-welded with a smooth non-obstructing joint inside. The cover pipe shall be installed without bends. The water main pipe shall be installed after the cover pipe is in place, and shall extend a minimum of 2 feet beyond each end of the casing to facilitate making joint connections. Water main pipe shall be braced within the cover pipe using casing spacers to preclude possible flotation.
- C. At each end of the cover pipe, link seals shall be provided. Weep holes shall be provided in the closure at the lower end of the cover pipe to facilitate drainage and shall be located within the granular water main bedding material. Cover pipe shall be steel, plain end, uncoated and unwrapped, have a minimum yield point strength of 35,000 PSI and conform to ASTM A 252 Grade 2 or ASTM A 139 Grade B without



hydrostatic tests. The steel pipe shall have welded joints and be in at least 18-foot lengths.

D. Diameter for casing pipe shall be as follows:

Carrier Pipe Nominal Diameter (inches)	4	6	8	10	12	14	16	18	20	24	30
Casing Pipe Nominal Diameter (inches)	8	10	14	16	20	24	28	30	34	38	48

E. The wall thickness of the pipe shall be a minimum of 0.250 inches for highway. The cover pipe shall be coal tar epoxy coated.

## 2.30 BITUMINOUS PAVEMENT HIGHWAY, STREET AND DRIVEWAY REPLACEMENT

- A. The contractor shall replace those sections of existing roads, streets and driveways required to be removed to install the pipelines. He shall construct same to the original lines and grades and in such manner as to leave all such surfaces in fully as good or better condition than that which existed prior to the operations.
- B. Prior to trenching, the pavement shall be scored or cut to straight edges at least 12 inches outside each edge of the proposed trench to avoid unnecessary damage to the remainder of the paving. Edges of the

existing pavement shall be re-cut and trimmed to square, straight edges after the pipeline has been installed and prior to placing the new base and pavement.

- C. Backfilling of the trench shall be in accordance with Method "C" as described hereinbefore. Base course for the paving shall be dense graded crushed limestone furnished and placed in accordance with the current requirements of Section 303 of the Standard Specifications for Road and Bridge Construction of the Kentucky Department of Transportation, Bureau of Highways, 1991, to a depth of 6 inches in roads and streets and 4 inches in driveways.
- D. A subslab of reinforced concrete shall be placed for state maintained highways. The subslab shall have a minimum thickness of 6 inches. Concrete for the subslab shall be 3500 PSI.
- E. The wearing surface of roads, streets and driveways shall be plant mix bituminous concrete, furnished and placed in accordance with the current requirements of Section 402 of the Standard Specifications for Road and Bridge Construction of the Kentucky Department of Transportation, Bureau of Highways, 1991, to a depth to match existing pavement depth or a minimum of 2 inches in roads and streets and 1-1/2 inches in driveways.

### **2.31 UNPAVED DRIVEWAY (CRUSHED STONE SURFACE REPLACEMENT)**

- A. Where unpaved driveways and parking areas are disturbed during the construction work, they shall be replaced as fully as good or better condition than which existed prior to the contractor's operation.
- B. Backfilling of the pipeline trench shall be with dense graded aggregate in accordance with Method "B", of Paragraph 2.23 hereinbefore.

### **2.32 PORTLAND CEMENT CONCRETE DRIVEWAY REPLACEMENT**

- A. Whenever Portland cement concrete driveways are removed, they shall be reconstructed to the original lines and grades and in such manner as to leave all such surfaces in fully as good or better condition than existed prior to the operation.
- B. The existing concrete paving shall be sawed or cut to straight edges 12 inches outside the edges of the trench or broken out to an existing joint. The concrete pavement shall be equal to the existing pavement thickness but not less than 6 inches in thickness for driveways.
- C. Pavement shall be reinforced with 6 x 6 #10-10 wire mesh and shall be constructed with 3000 PSI concrete.

### **2.33 PRESSURE TESTING**

- A. All pressure piping shall be given a hydrostatic test to the rated working pressure of the pipe, under which leakage shall not exceed 10 gallons per 24 hours per inch of diameter per mile of pipe. Loss of water pressure during test shall not exceed 10 PSI in a 24 hour period, 5 PSI in a 10 hour period or, 0 PSI in a 4 hour period.

- B. Leakage in pipelines, when tested under pressure of 50 PSI excess of normal operating pressure, shall not exceed 10 gallons per 24 hours per inch of diameter per mile of pipe.
- C. Contractor shall furnish a recording gauge and water meter for measuring water used during leakage test and recording pressure charts during duration of test. Recording pressure charts shall be turned over to the OCWD at conclusion of tests. The pressure recording device shall be suitable for outside service, with a range from 0-200 PSIG, 24- hour spring wound clock, designed for 9-inch charts. For the contractor's information only, such pressure recording devices may be available from the Foxboro Company, Foxboro, Massachusetts; Bristol Division of ACCO, Waterbury, Connecticut; or Weksler Instruments Corporation, Freeport, New York.
- D. Pipelines shall be tested before backfilling at joints except where otherwise required by necessity or convenience.
- E. Duration of test shall be not less than 4 hours where joints are exposed and not less than 24 hours where joints are covered.
- F. Where leaks are visible at exposed joints and/or evident on the surface where joints are covered, the joints shall be laid and leakage must be minimized, regardless of total leakage as shown by test.
- G. All pipe, fittings, valves, and other materials found to be defective under test shall be removed and replaced.

- H. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with.
- I. Where nonmetallic joint compounds are used, pipelines should be held under normal operating pressure for at least three days before testing.
- J. All testing must be observed by the OCWD.

## **2.34 DISINFECTIONS OF PORTABLE WATER LINES**

- A. The new potable water lines shall not be placed in service – either temporarily or permanently – until they have been thoroughly disinfected in accordance with the following requirements.
- B. After testing, a solution of hypochlorite using HTH or equal shall be introduced into the section of the line being disinfected sufficient to insure a chlorine dosage of at least 50 ppm in the main. While the solution is being applied, the water should be allowed to escape at the ends of the line until tests indicate that a dosage of at least 50 ppm has been obtained throughout the pipe. Open and close all valves and cocks while chlorinating agent is in the piping system. The chlorinated water shall be allowed to remain in the pipe for 24 hours, after which a residual of at least 25 ppm shall be obtained. The disinfections shall be repeated until 25 ppm is obtained after which time the main shall be thoroughly flushed until the residual chlorine content is not greater than 1.0 ppm, and then

may be connected to the system. The contractor is responsible for the proper and legal disposal of highly chlorinated water flushed from the main.

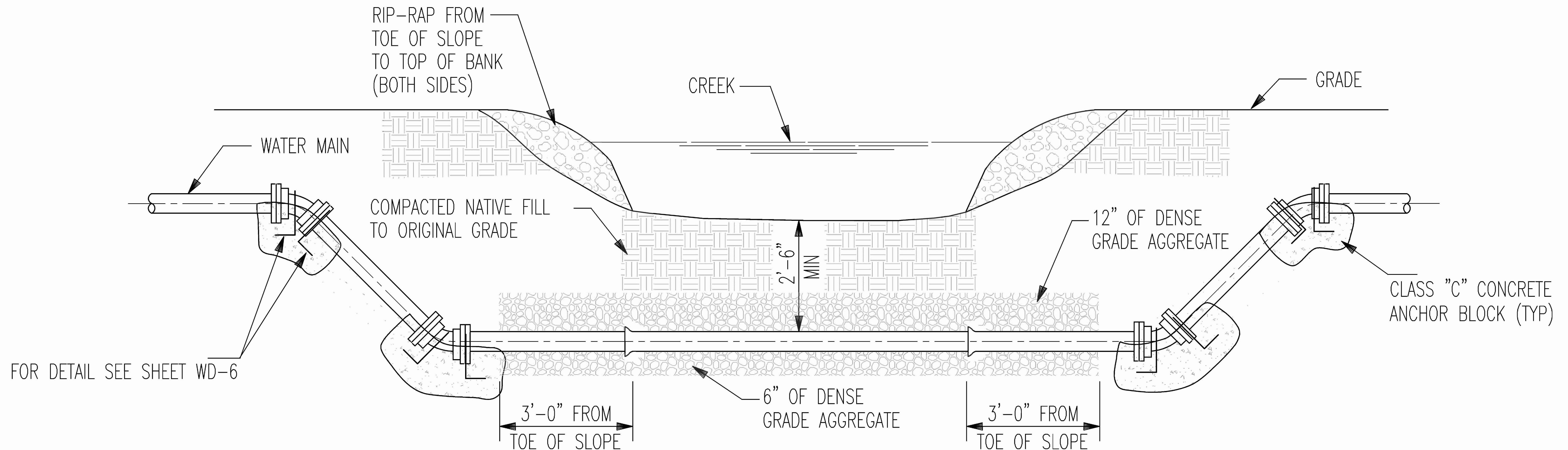
- C. The OCWD shall take samples for bacterial testing and have the samples tested by a laboratory.

**END OF SECTION**

# **APPENDIX A**

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FOR DETAIL SEE SHEET WD-6

# TYPICAL CREEK CROSSING

NTS

GRW PROJECT NO. 3237-10

OLDHAM COUNTY WATER DISTRICT  
 WATER DETAILS  
 CREEK CROSSING



GRW Engineers, Inc.  
 Engineers, Architects, Planners  
 EXINGTON LOUISVILLE NASHVILLE INDIANAPOLIS

DESIGNED: MEA	DATE:
DRAWN: MEA	SCALE: NTS
REVIEWED: SV	DWG NO. WD-4
APPROVED: SV	

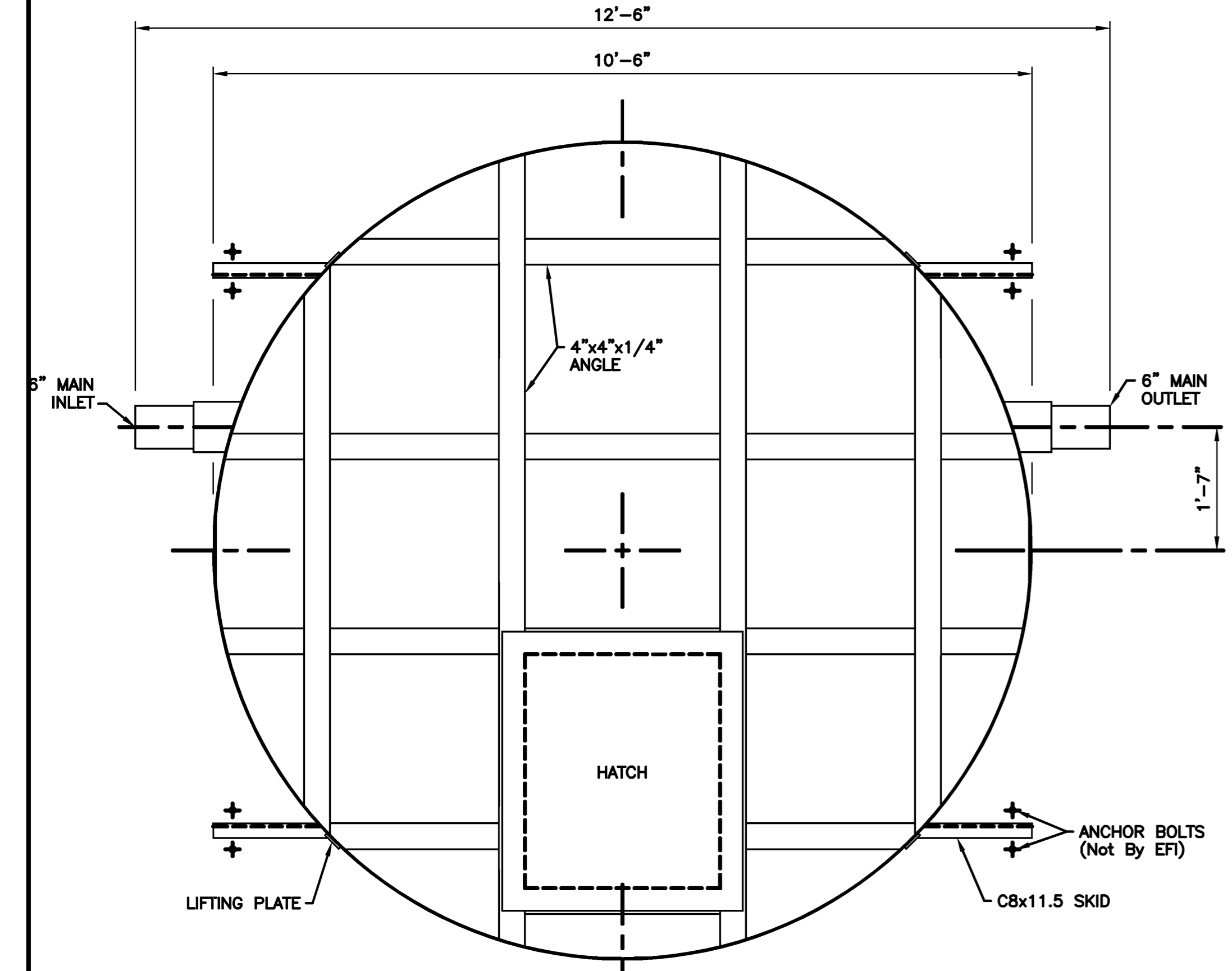
WD-4

LAST EDITED BY:

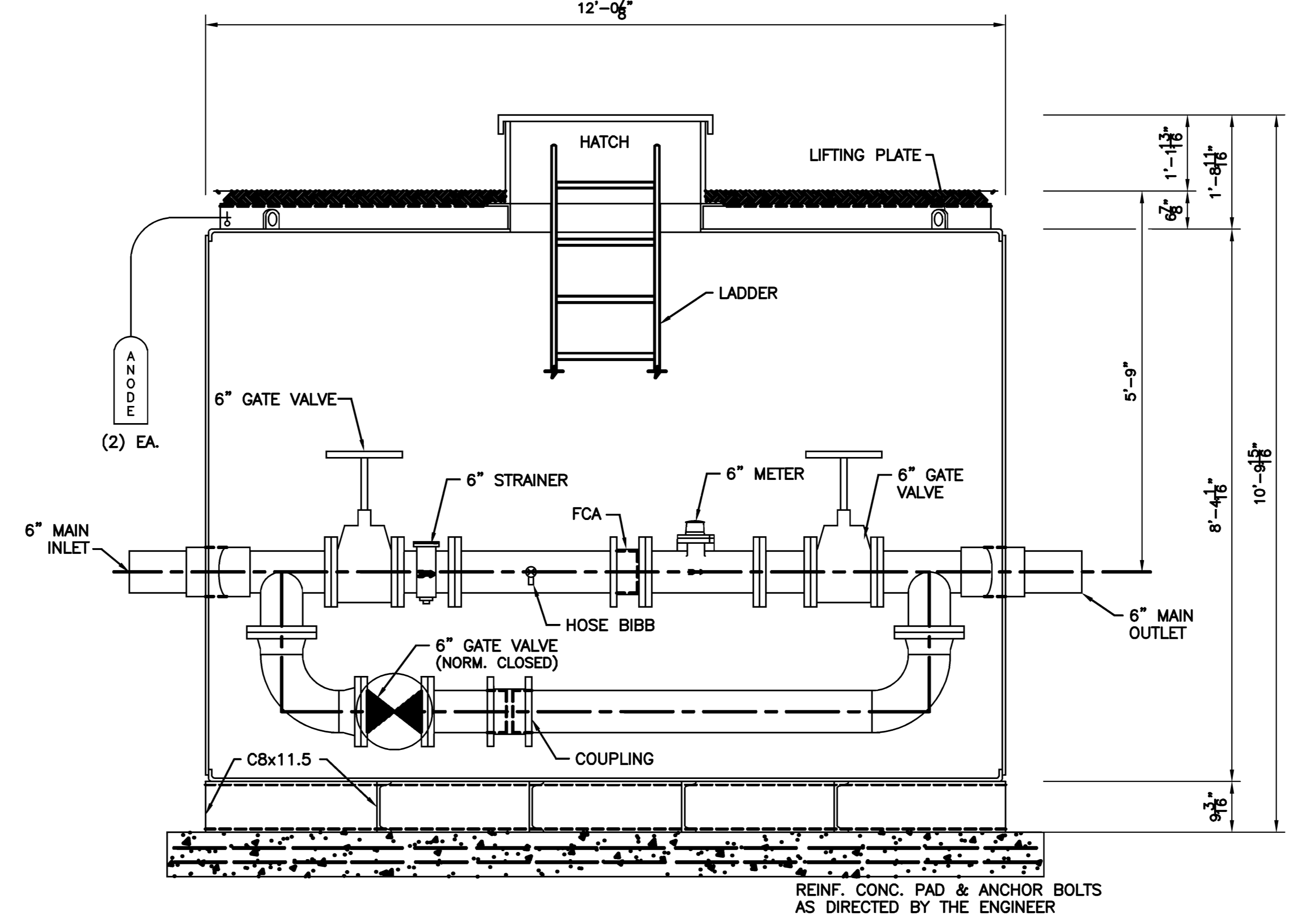


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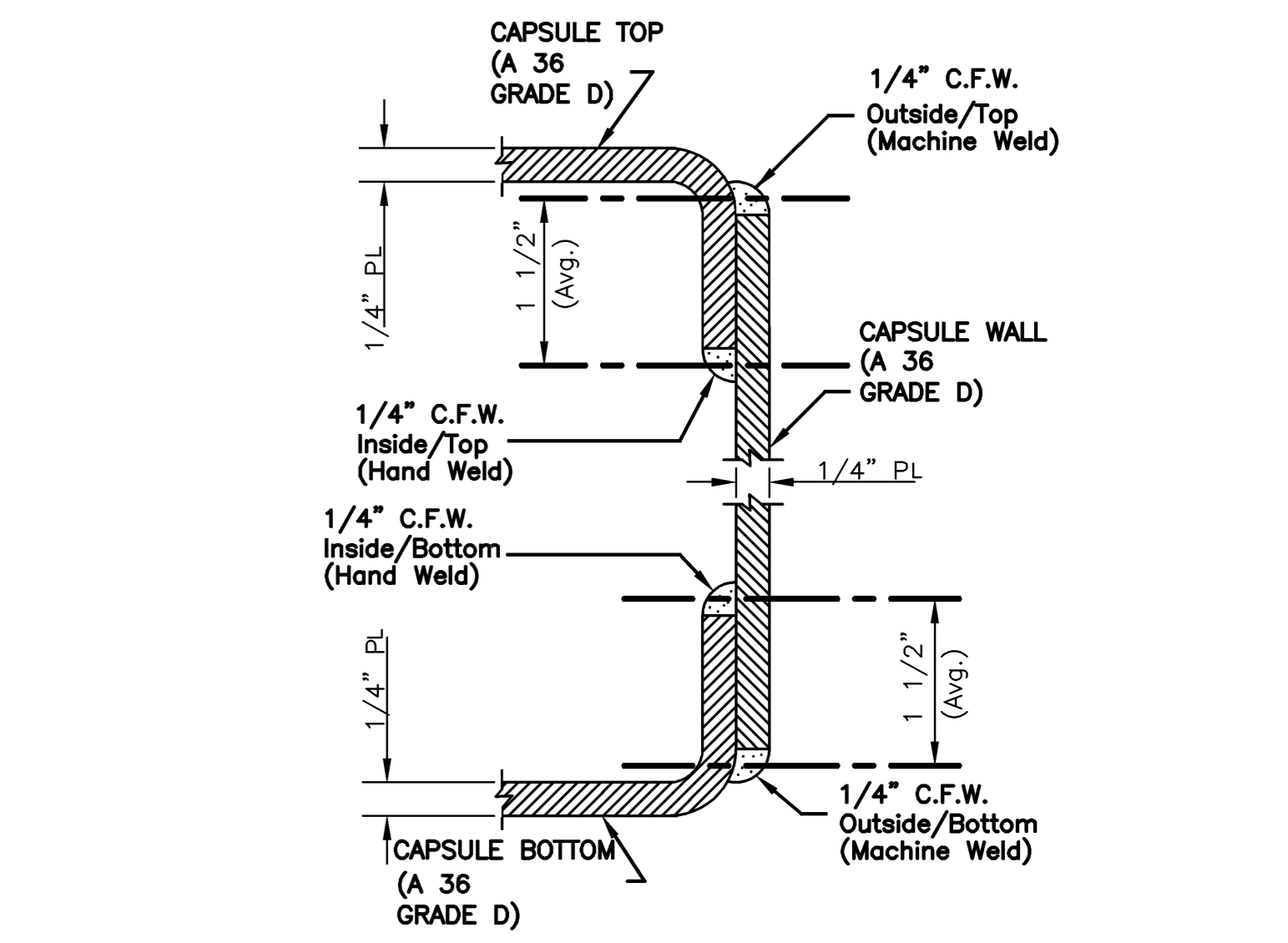
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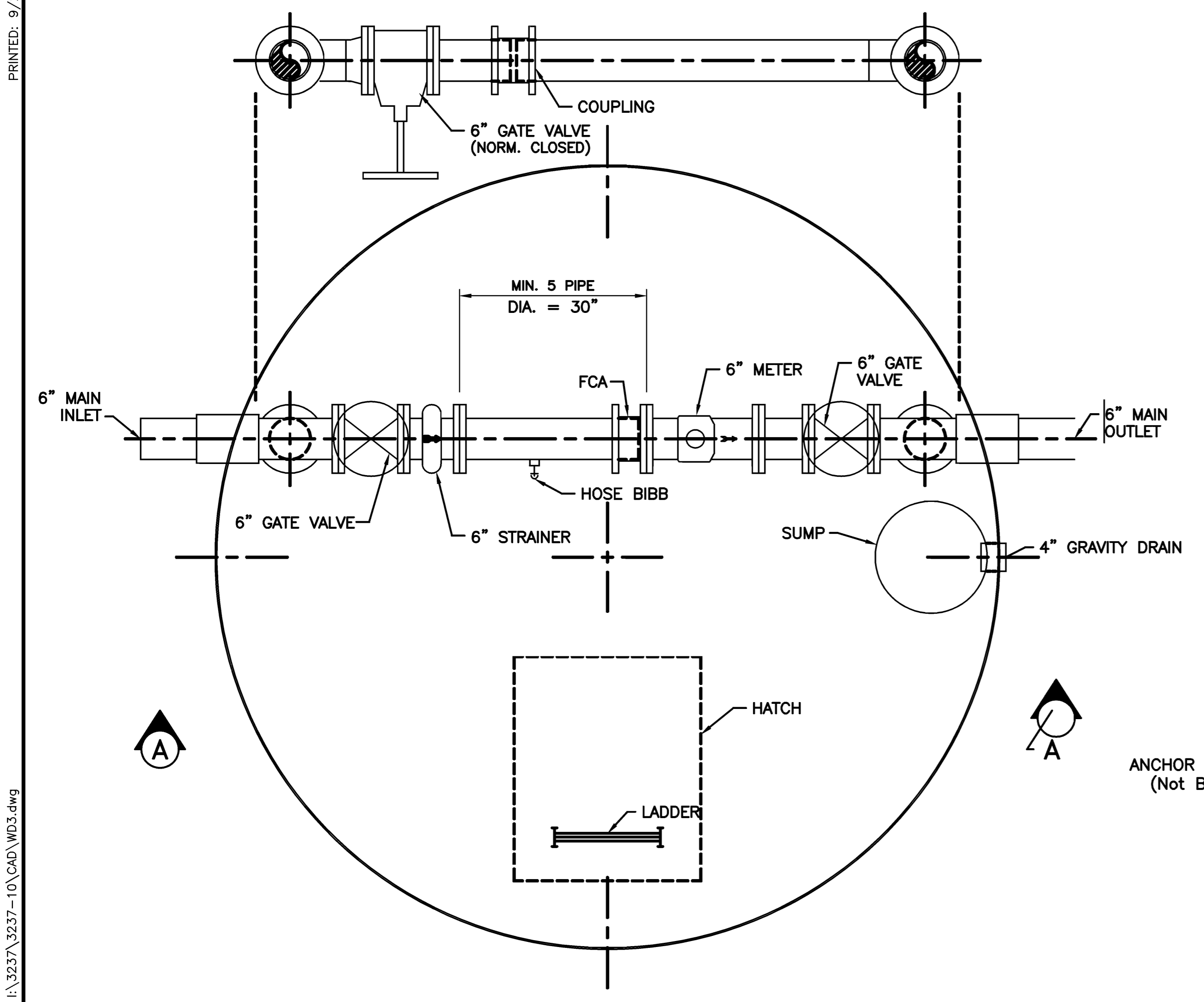
**EXTERIOR PLAN**



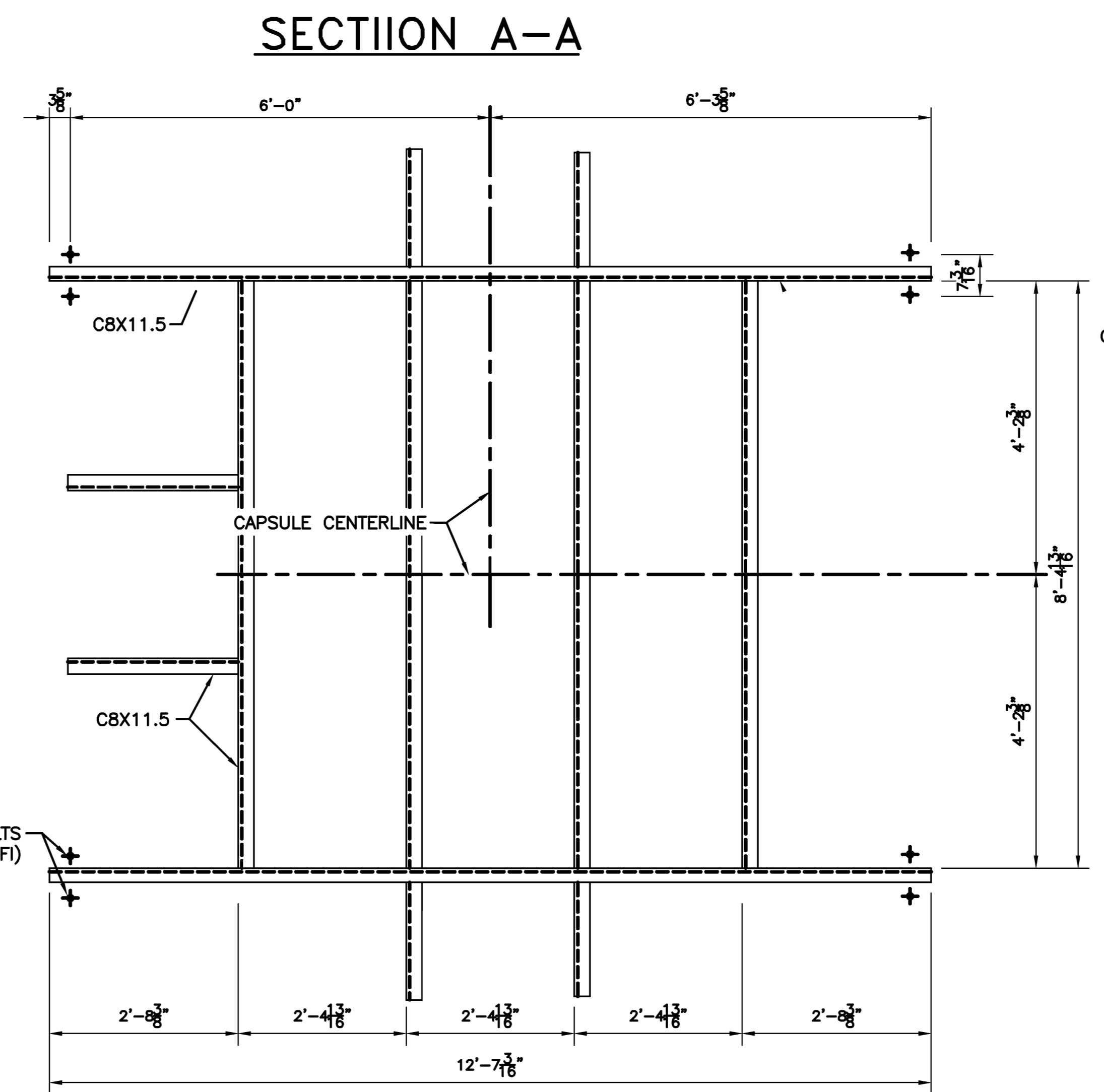
**SECTION A-A**



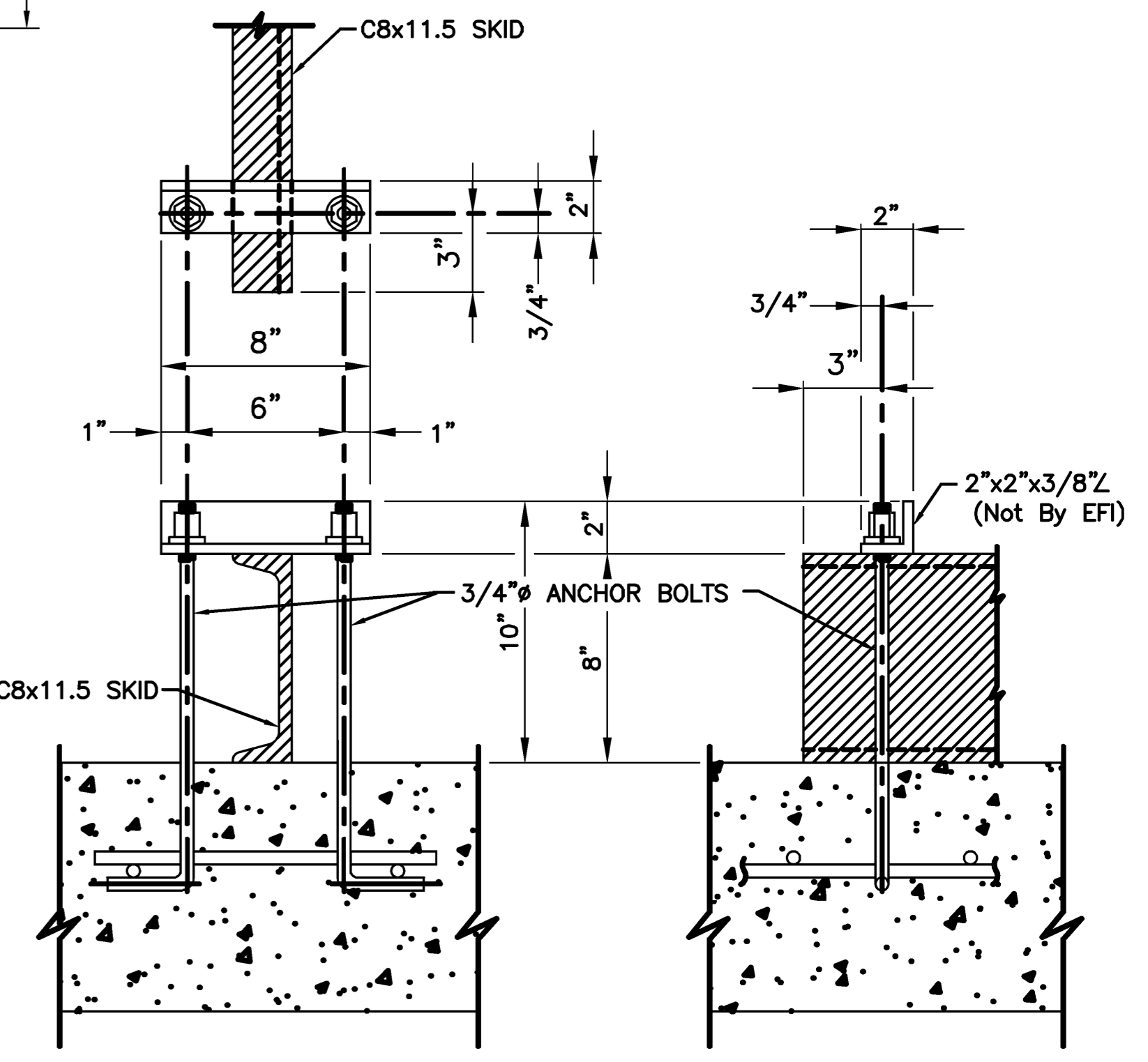
**LAP JOINT CONNECTION OF CAPSULE WALL PLATE WITH FLANGE TOP AND BOTTOM**



**INTERIOR PLAN**



**SKID PLAN**



**TYPICAL ANCHOR DETAIL**

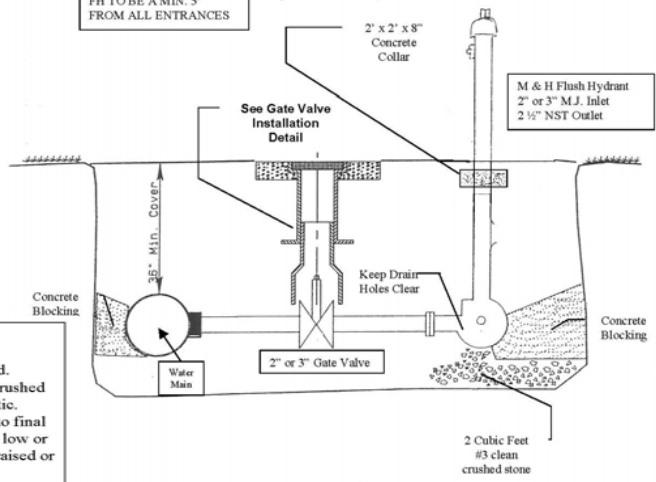
NOTE: ANCHOR CLIPS, ANCHOR BOLTS & NUTS BY INSTALLER

NOTE: FCA - FLANGED COUPLING ADAPTER  
SCALE: 3/4"=1'-0"

GRW PROJECT NO. 3237-10

<b>OLDHAM COUNTY WATER DISTRICT WATER DETAILS</b>		
<b>METER VAULT DETAILS</b>		
 <b>GRW Engineers, Inc.</b> Engineers, Architects, Planners EXINGTON LOUISVILLE NASHVILLE INDIANAPOLIS	DESIGNED: MEA	DATE:
	DRAWN: MEA	SCALE: NTS
	REVIEWED: SV	DWG. NO.
	APPROVED: SV	
	<b>WD-3</b>	

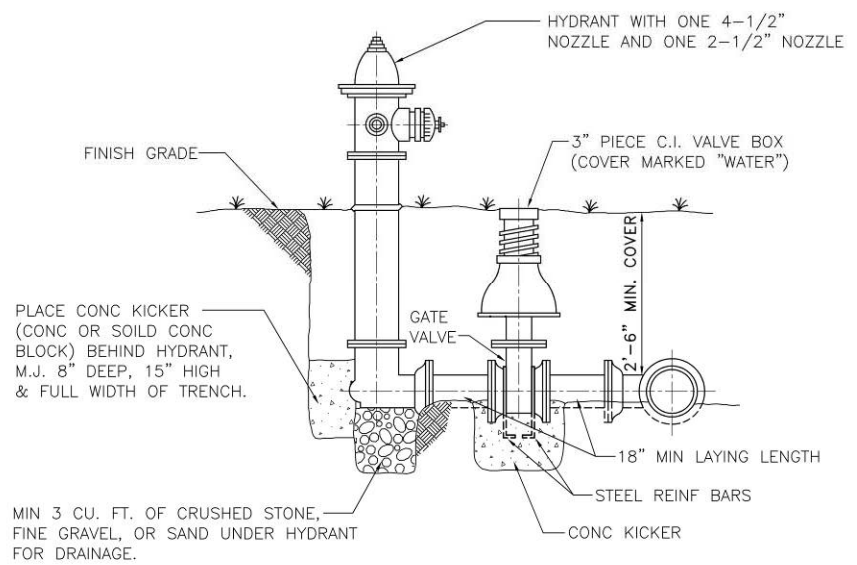
**NOTE:**  
FH TO BE A MIN. 5'  
FROM ALL ENTRANCES



- NOTES:**
1. All Fittings to be grip ringed.
  2. Gravel for drain (#3 clean crushed stone) to be covered in plastic.
  3. Hydrants must be installed to final grade. Hydrants installed to low or high will be required to be raised or lowered

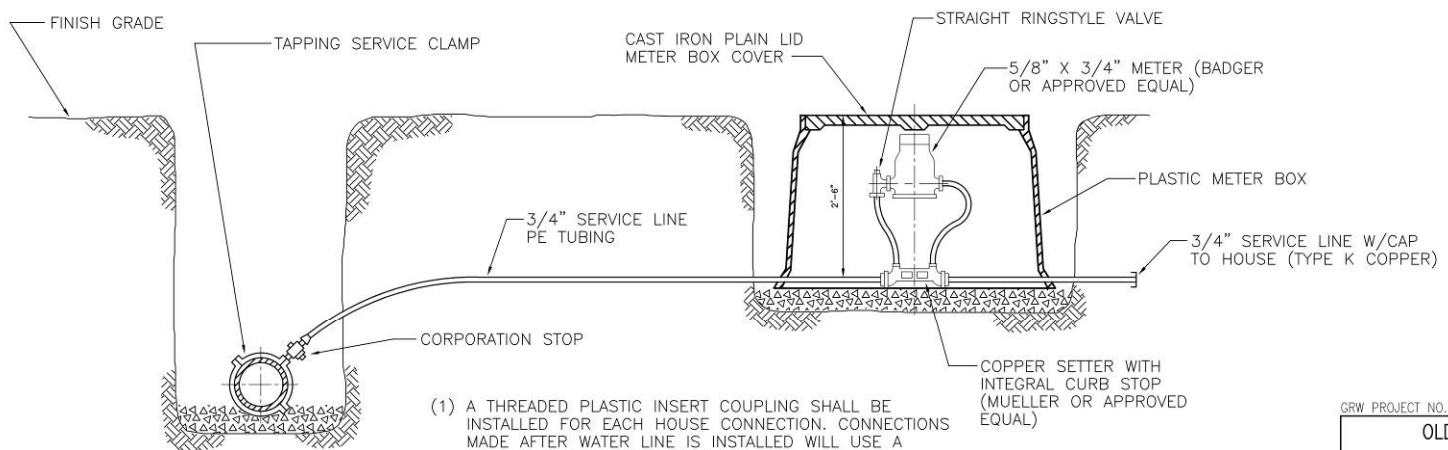
### TYPE "B" BLOW-OFF/FLUSH HYDRANT

NTS NOTE: BRANCH CONNECTION, AUXILIARY ISOLATION VALVE AND HYDRANT SHOE SHALL BE SIZED AS INDICATED IN THE SPECIFICATIONS



### TYPE "A" FLUSH HYDRANT SETTING

NTS



- (1) A THREADED PLASTIC INSERT COUPLING SHALL BE INSTALLED FOR EACH HOUSE CONNECTION. CONNECTIONS MADE AFTER WATER LINE IS INSTALLED WILL USE A TAPPING SADDLE OF PROPER SIZE, AS REQUIRED.
- (2) METERS ON "NEAR" SIDE TO BE NOT GREATER THAN 6 FEET FROM WATER MAIN WHERE WATER MAIN IS ON PRIVATE PROPERTY.

### TYPICAL SERVICE CONNECTION

NTS

GRW PROJECT NO. 3237-10

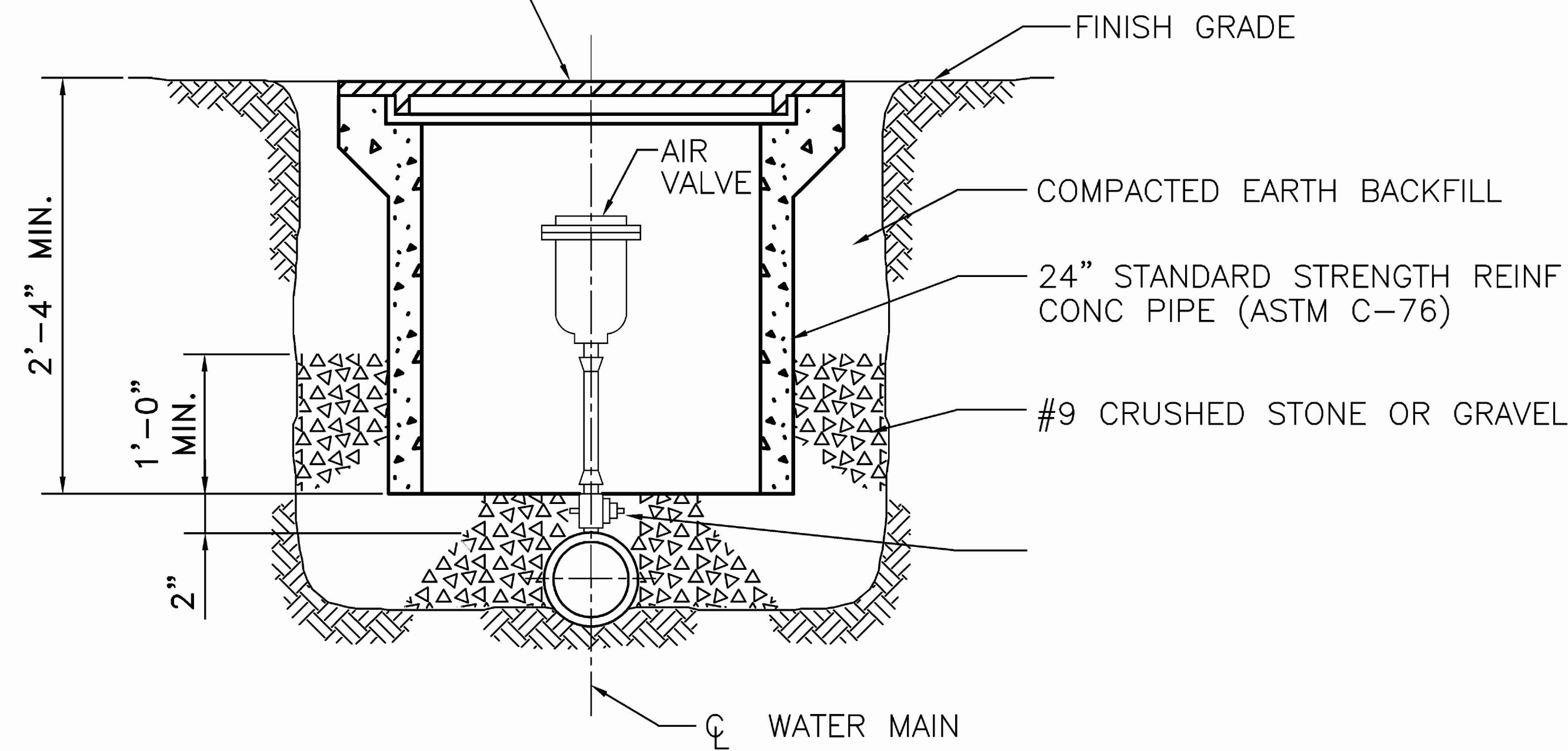
**OLDHAM COUNTY WATER DISTRICT  
WATER DETAILS**

HYDRANT & SERVICE CONNECTION DETAILS

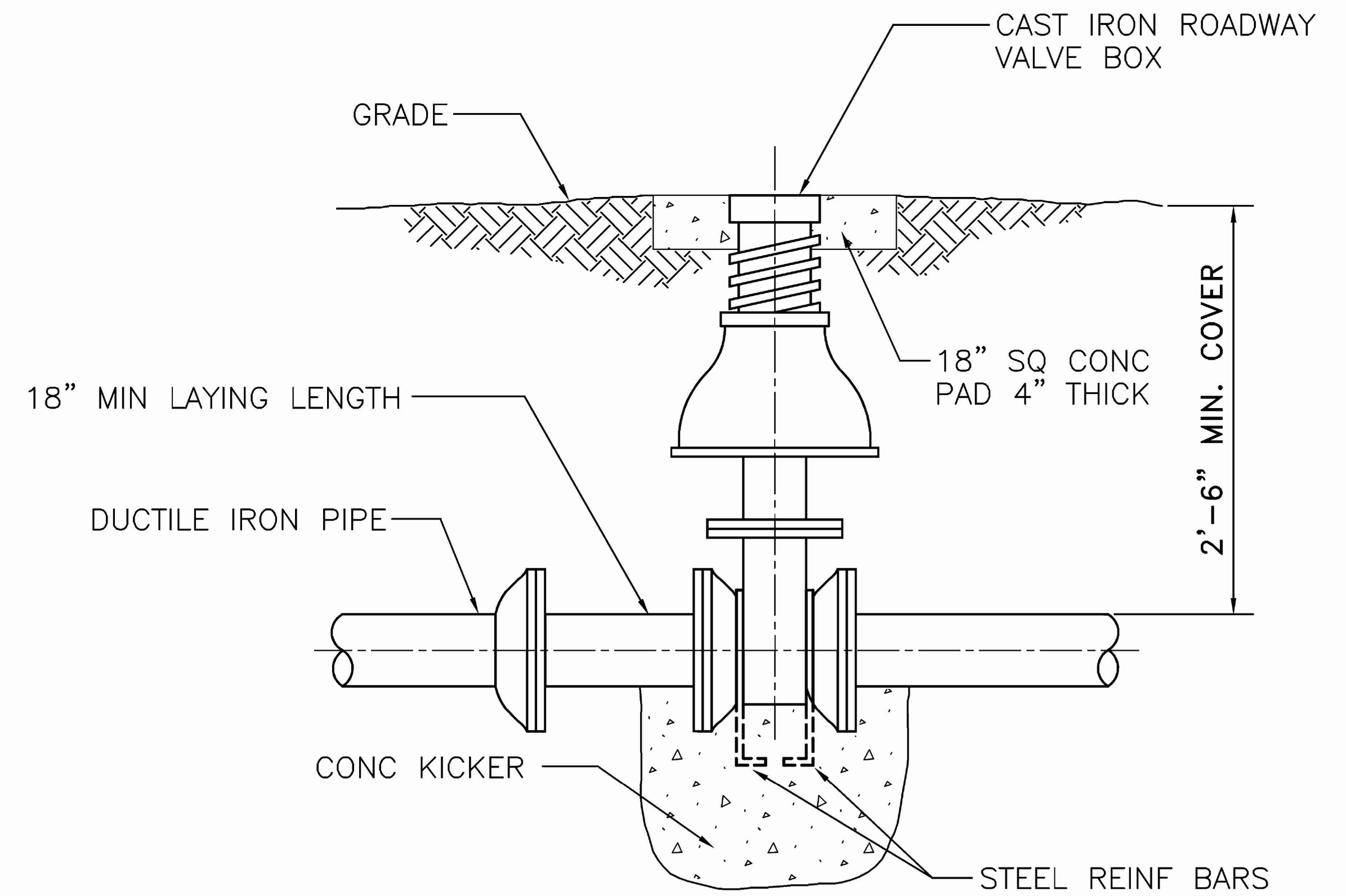
 <b>GRW Engineers, Inc.</b> Engineers, Architects, Planners KINGSTON LOUISVILLE NASHVILLE INDIANAPOLIS	DESIGNED: MEA	DATE:
	DRAWN: MEA	SCALE: NTS
	REVIEWED: SV	ENG. NO.:
	APPROVED: SV	
		<b>WD-2</b>

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ROUND DRAINAGE GRATE, NEENAH FOUNDRY CO  
SERIES R-4375-K OR APPROVED EQUAL



NOTE: WHERE THE MAIN LINE IS LOCATED IN A STREET OR ROAD THE AIR RELEASE VALVE AND BOX SHALL BE LOCATED OFF THE ROAD WHERE NOT SUBJECT TO VEHICULAR TRAFFIC AND CONNECTED TO THE MAIN BY 1" PIPING

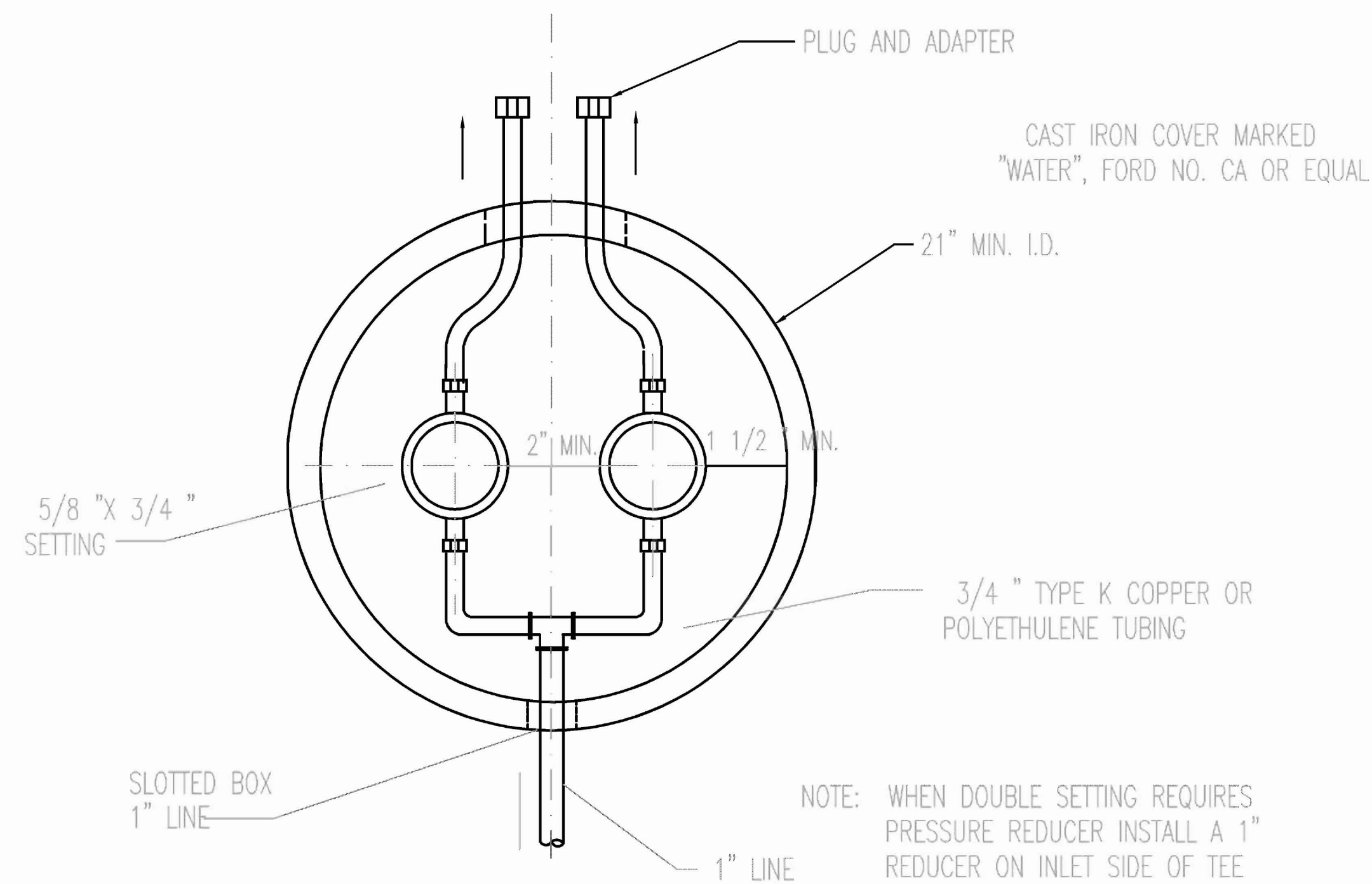


**TYPICAL VALVE SETTING**

NTS

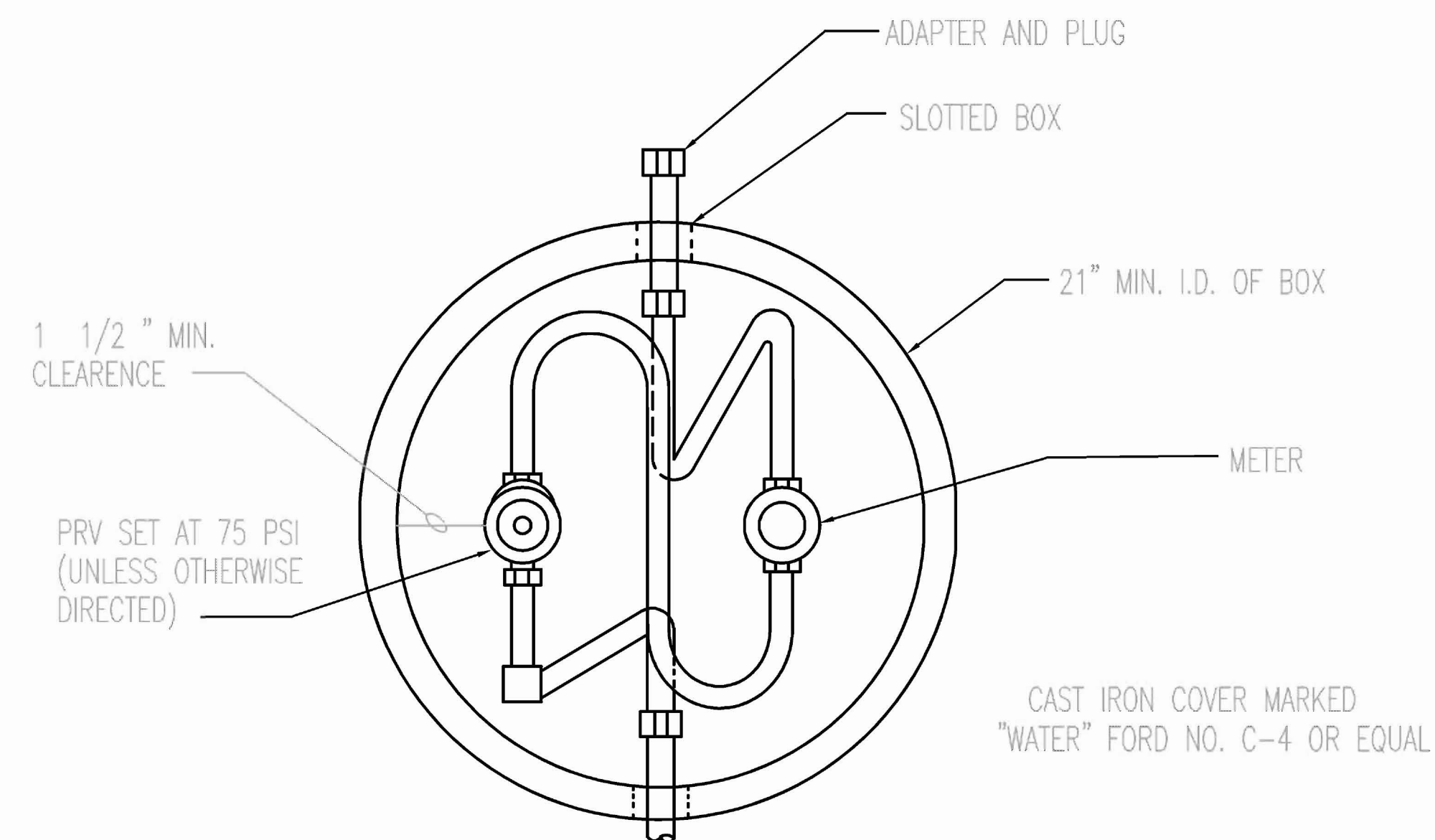
**TYPICAL AIR RELEASE VALVE SETTING**

NTS



**DOUBLE METER SETTING**

NTS



**PLAN VIEW OF TANDEM  
COPPER SETTER WITH PRESSURE  
REGULATOR ON INLET SIDE OF METER**

NTS

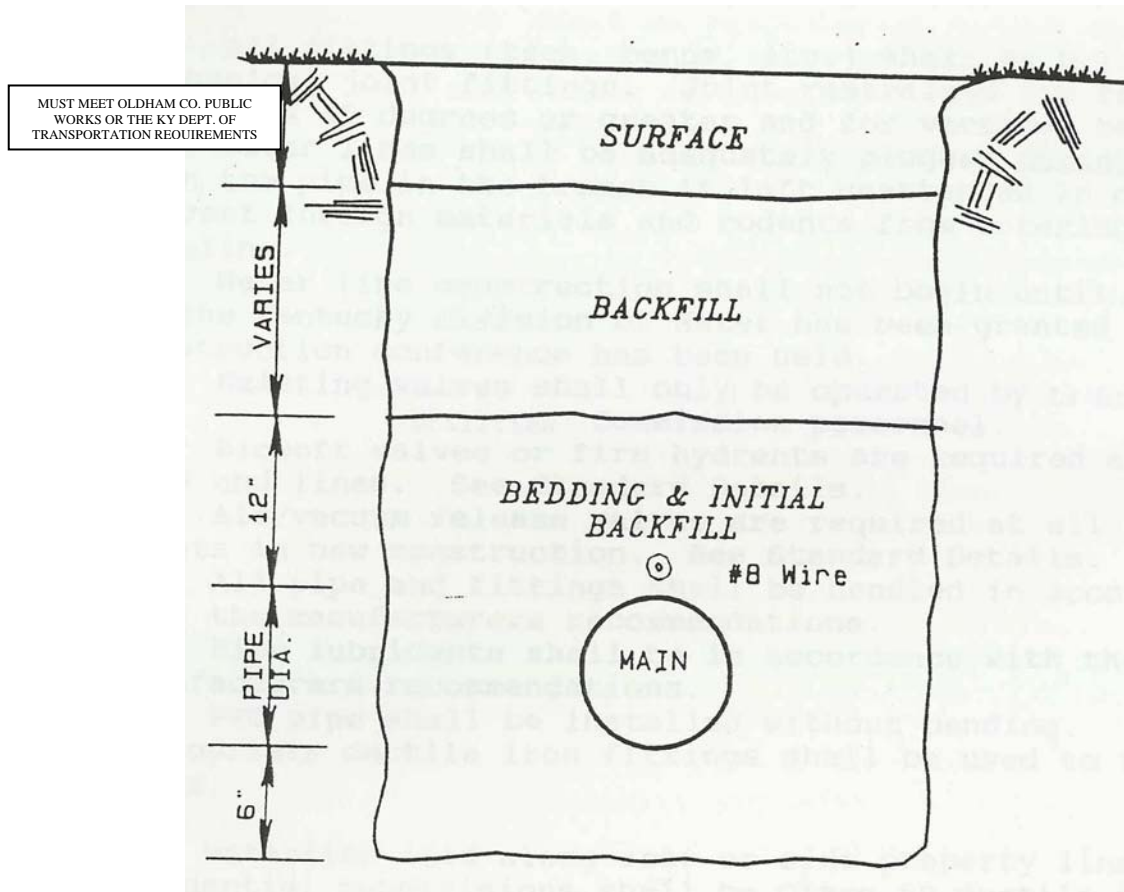
GRW PROJECT NO. 3237-10

**OLDHAM COUNTY WATER DISTRICT  
WATER DETAILS  
VALVE AND METER DETAILS**



GRW Engineers, Inc.  
Engineers, Architects, Planners  
EXINGTON LOUISVILLE NASHVILLE INDIANAPOLIS

DESIGNED: MEA	DATE:
DRAWN: MEA	SCALE: NTS
REVIEWED: SV	DWG NO.:
APPROVED: SV	WD-1



NOTE: ROCK TREANCHERS AND PNEUMATIC HAMMERS ARE NOT ALLOWED UNLESS A TRENCH TWICE AS WIDE AS THE PIPE IS USED, WITH A MINIMUM WIDTH OF 40".  
 Deviations in specifications must have written approval from OCWD.

- Surface**
1. In turf areas, clean soil with no rock over 1.5 inches in maximum dimension.
  2. Under existing or proposed pavement or sidewalk, use compacted D.G.A.
- Backfill -**
1. In turf areas, soil with no rock over 8 inches in maximum dimension.
  2. Under existing or proposed pavement or sidewalk, *jetted manufactured sand* or approved substitute or flowable fill where required.

# 8 copper tracer wire looped at all valve boxes including Fire Hydrant valve boxes.

**Bedding and Initial Backfill**

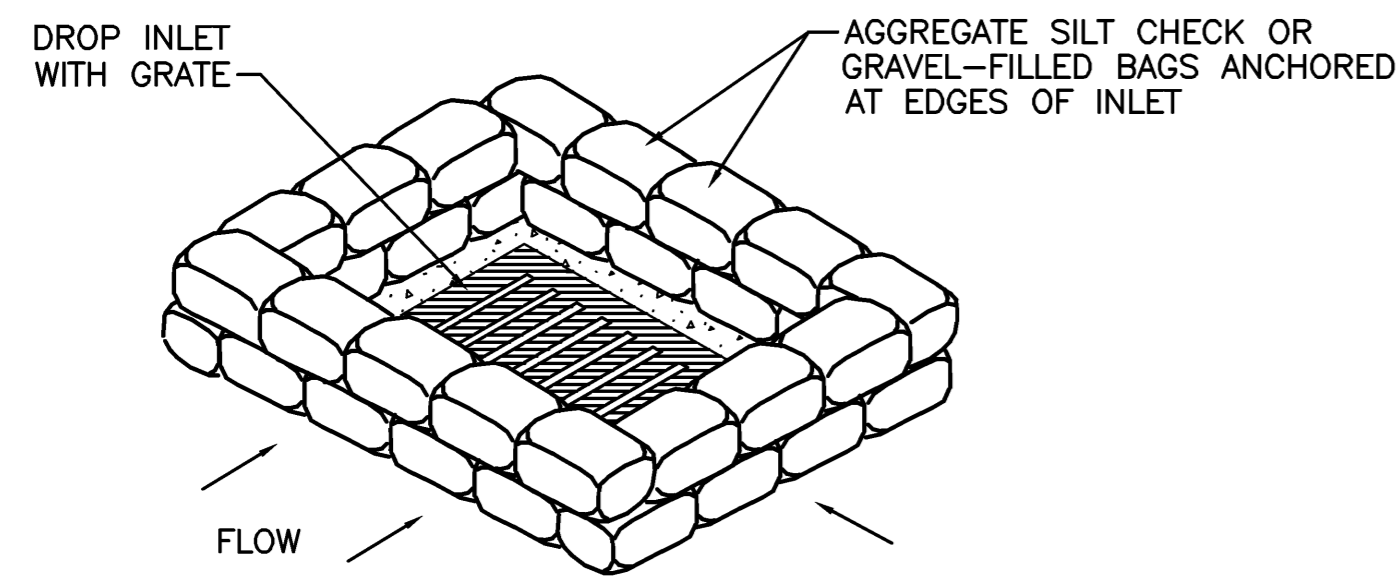
1. MANUFACTURED SAND IS REQUIRED

**STANDARD DRAWINGS**  
**OLDHAM COUNTY WATER DISTRICT**  
 PO BOX 51  
 Buckner, KY. 40010

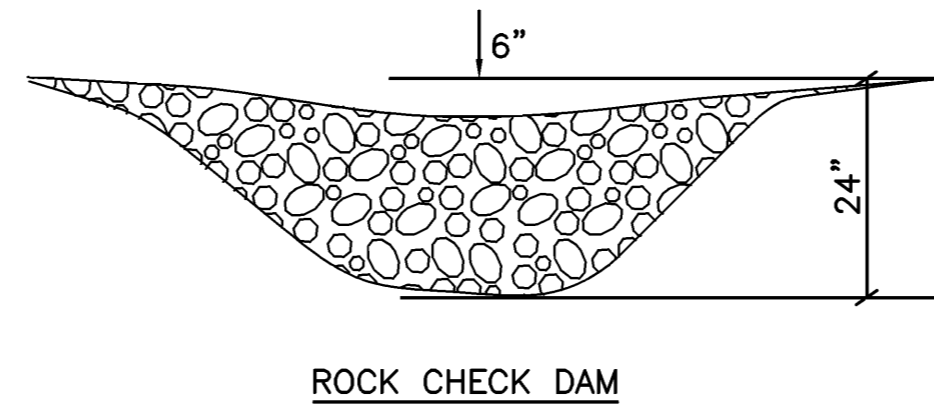


Water Line Trench  
 DATE: 12-13-2006

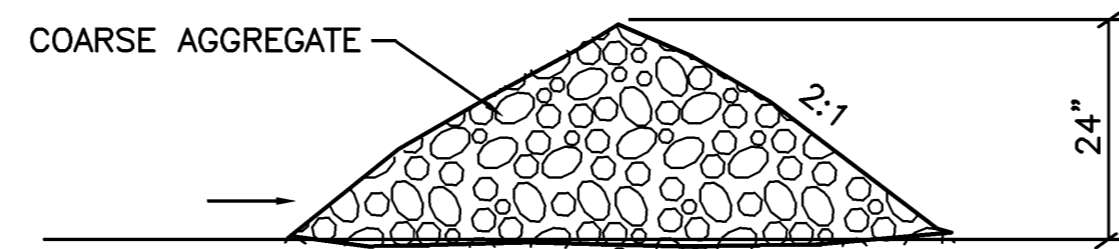




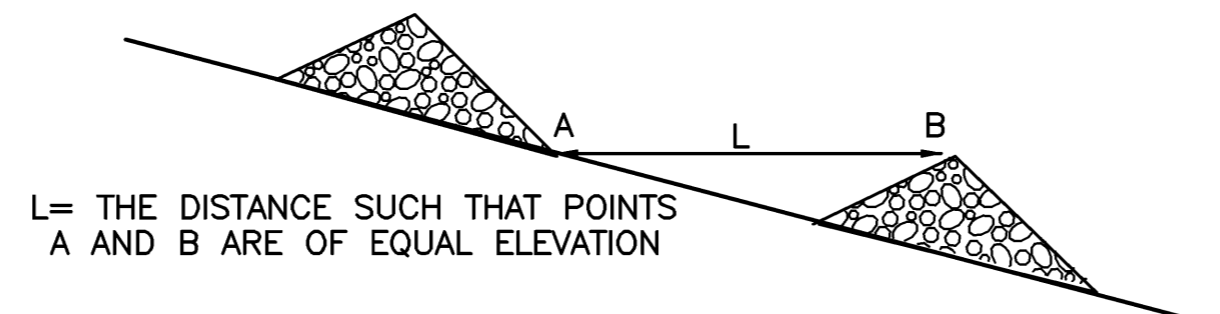
**INLET SEDIMENT FILTER**  
NTS



**ROCK CHECK DAM**



COARSE AGGREGATE



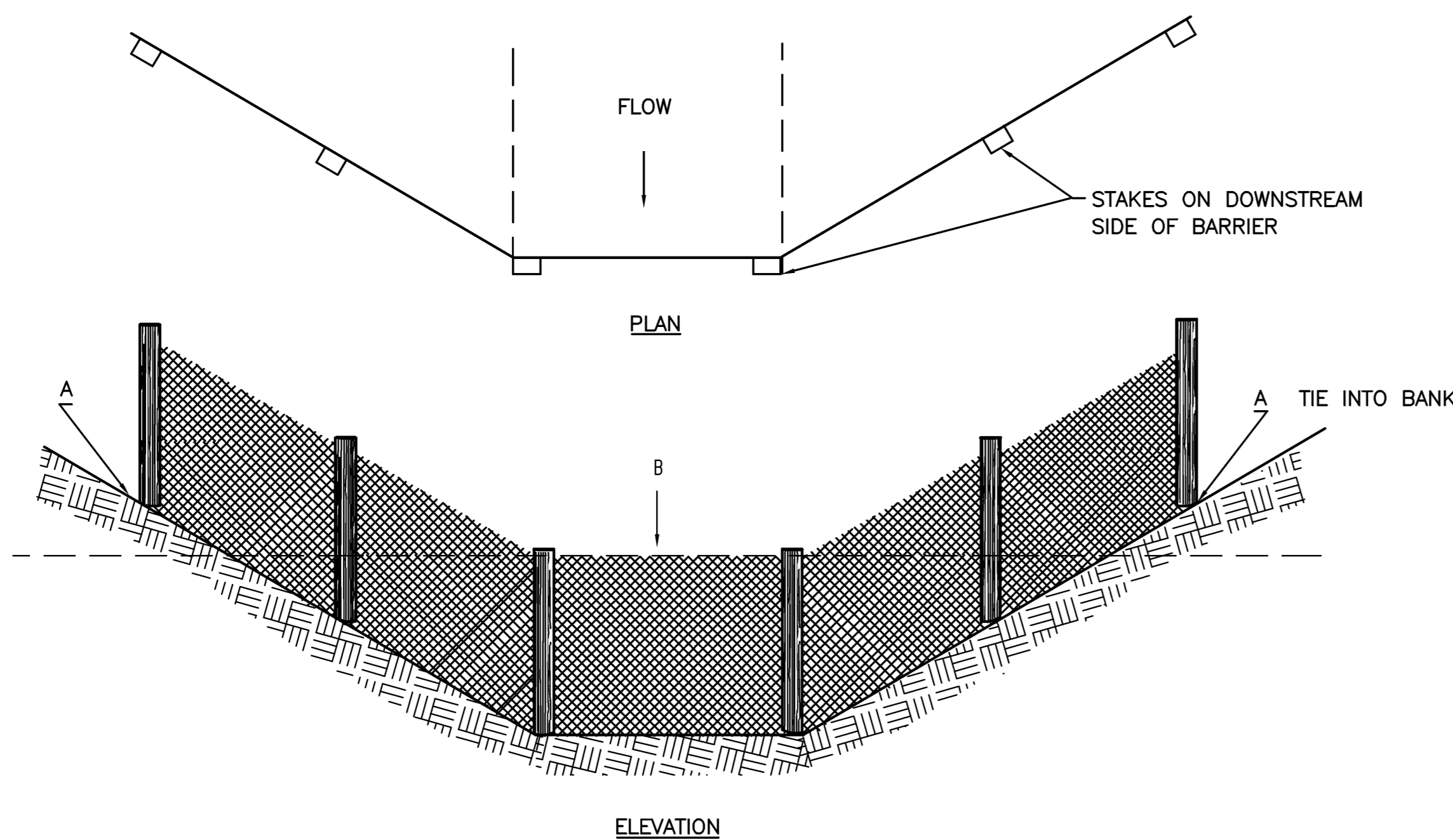
L = THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION

SPACING BETWEEN CHECK DAMS

**CHECK DAM DETAILS**

NTS

NOTE: STONE BAGS MAY BE USED FOR TEMPORARY CHECK DAMS. INSTALL IN SAME CONFIGURATION.

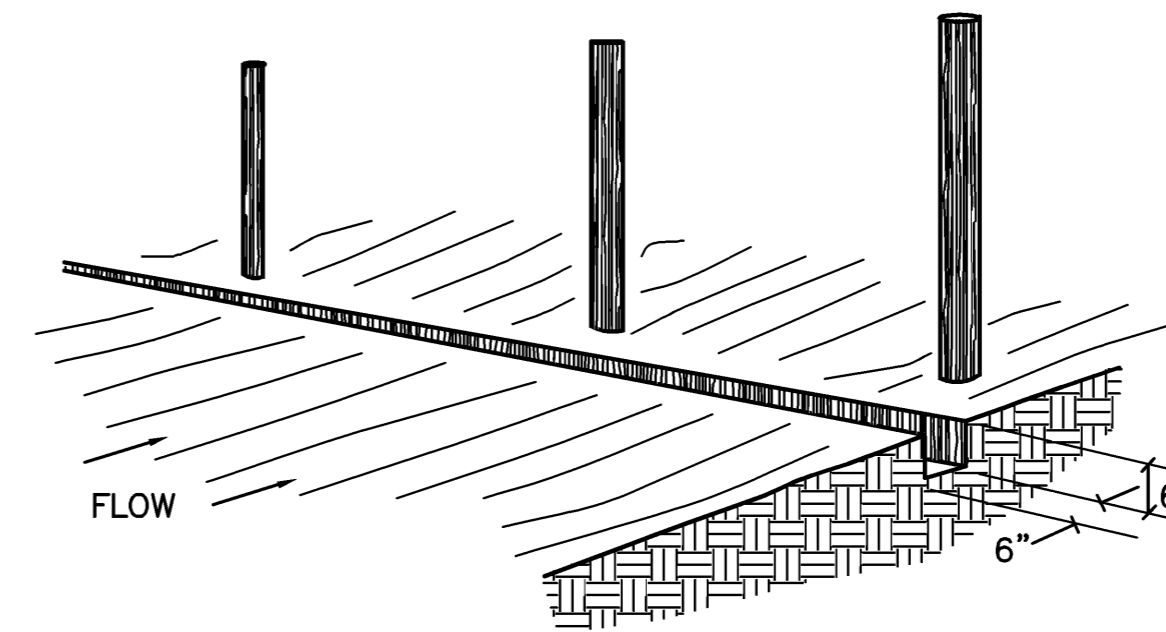


POINT A SHOULD BE HIGHER THAN POINT B

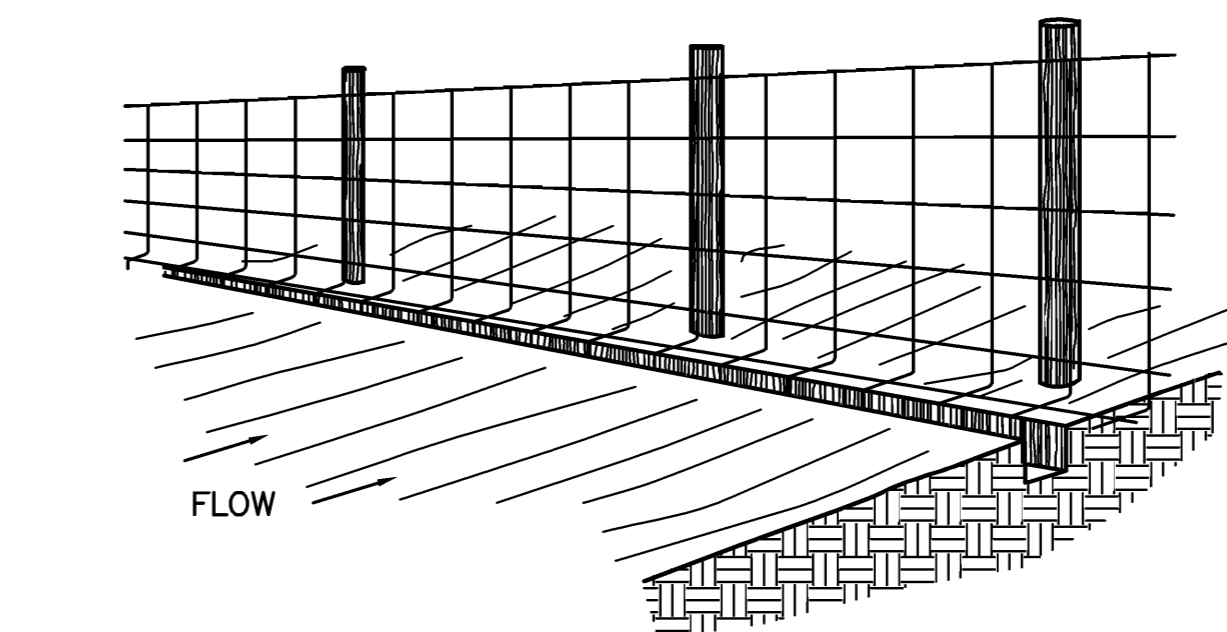
**LOW VELOCITY SWALE APPLICATION  
PLACEMENT OF FILTER BARRIER IN DRAINAGE WAY**

NTS

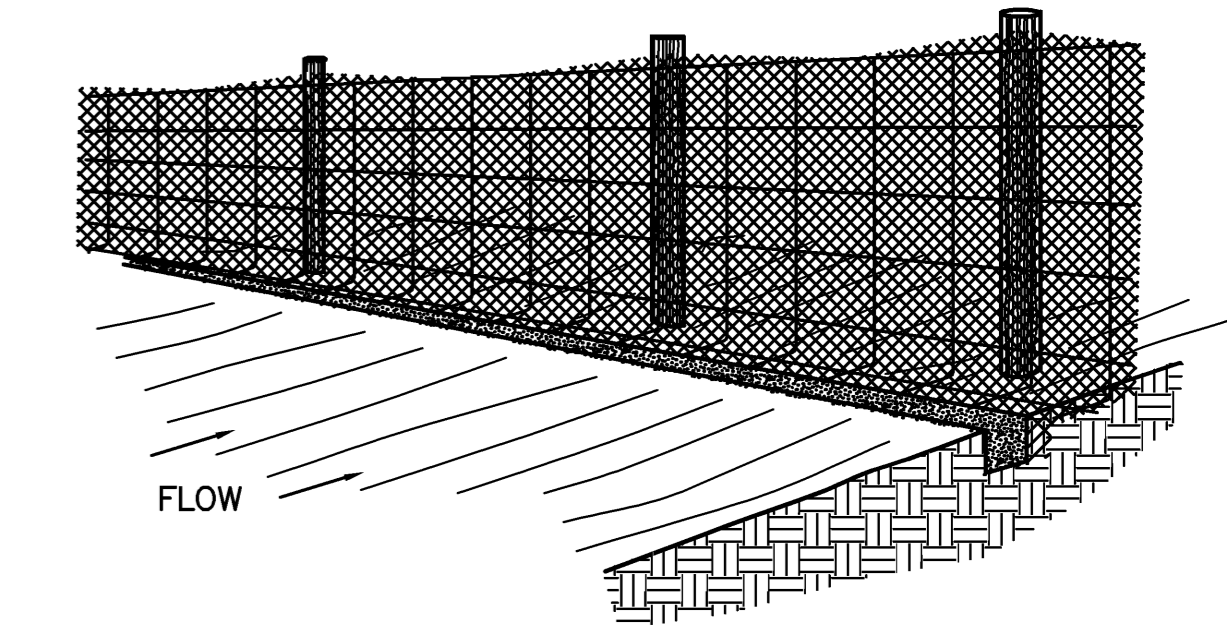
NOTE: FIBER ROLLS OR COMMERCIAL SILT CHECK PRODUCTS MAY BE USED. INSTALL IN SIMILAR MANNER. TIE EDGES INTO SIDES AND TOP OF BANK.



1. EXCAVATE A 6"X6" TRENCH BELOW BARE SOIL AREA

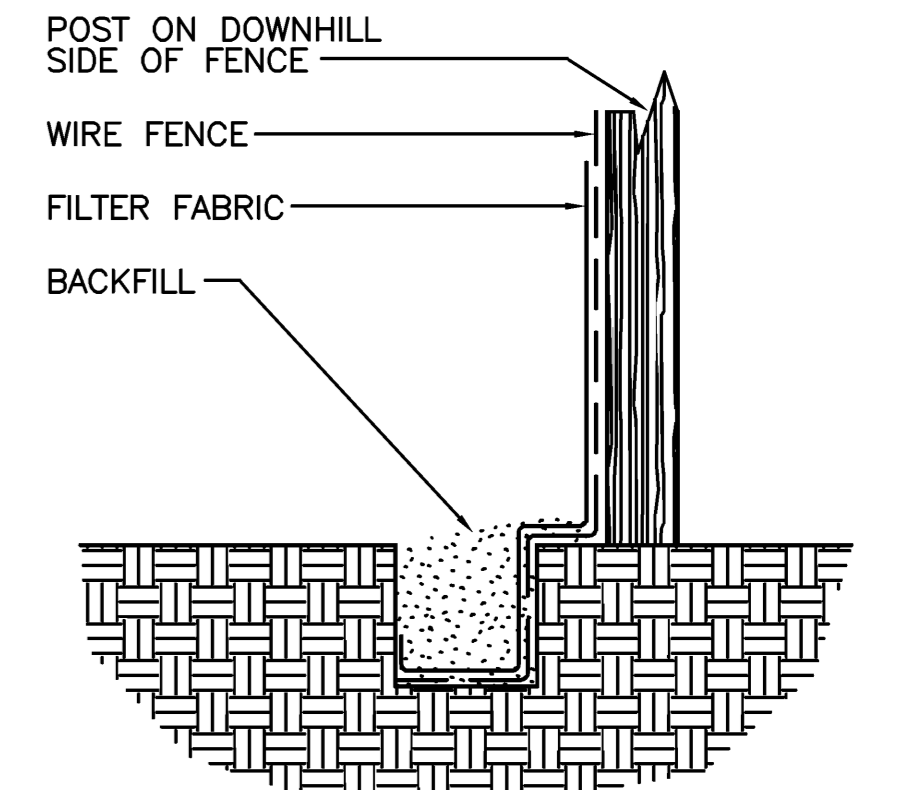


2. DRIVE STAKES (& WIRE FABRIC) IN AGAINST DOWNHILL SIDE OF TRENCH



3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH

4. BACKFILL AND COMPACT THE EXCAVATED SOIL



EXTENSION OF FABRIC AND WIRE INTO THE TRENCH

**REINFORCED SILT FENCE CONSTRUCTION PROCEDURES**

NTS

NOTE: REGULAR SILT FENCE WITHOUT WIRE FENCING TO BE INSTALLED IN SAME MANNER.

GRW PROJECT NO.

**OLDHAM COUNTY WATER DISTRICT  
WATER DETAILS  
EROSION CONTROL DETAILS**



GRW Engineers, Inc.  
Engineers, Architects, Planners

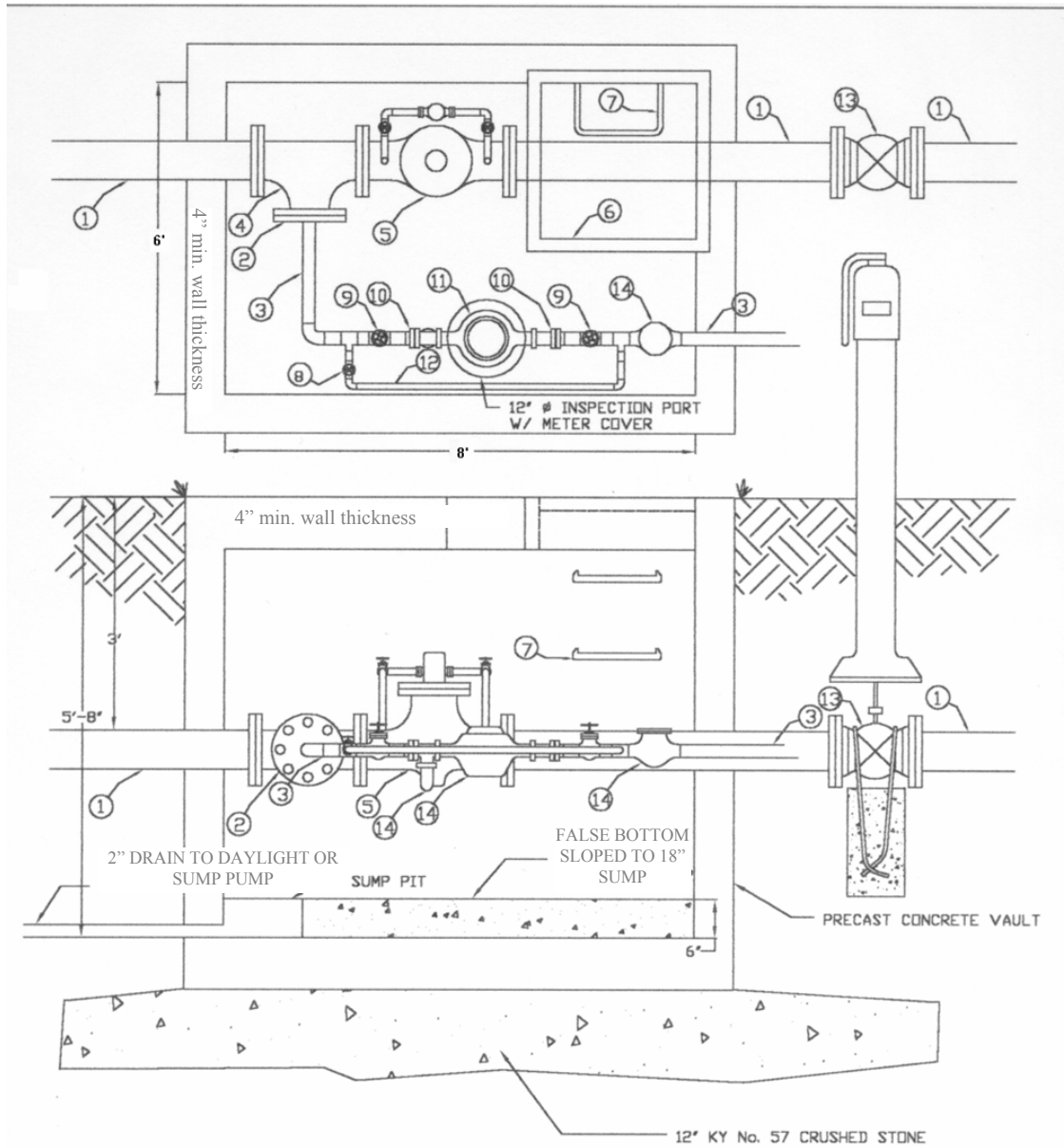
EXINGTON LOUISVILLE NASHVILLE INDIANAPOLIS

DESIGNED: MEA	DATE:
DRAWN: EA	SCALE: NTS
REVIEWED: SV	DWG NO.
APPROVED: SV	EC-1

**STANDARD DRAWINGS**  
**Oldham County Water District**  
**PO BOX 51**  
**Buckner, Ky. 40010**



Date 1-10-2007



1. DIP ( as required )
2. BLIND FLANGE ( as required )
3. PIPING ( as required ) ( core in field )
4. DI TEE ( as required )
5. DOUBLE DETECTOR CHECK VALVE
6. 24" X 24" ALUMINUM HATCH WITH LOCKING DEVICE
7. FACTORY INSTALLED STEPS OR ALUMINUM LADDER
8. IN LINE VALVE ( as required )
9. IN LINE VALVE ( as required )
10. BRASS UNION ( as required )
11. WATER METER W/STRAINER ( as required )
12. BYPASS LINE ( as required )
13. MJ GATE VALVE W/INDICATOR POST & TRUST BLOCKING
14. CHECK VALVE ( as required )

■ Box size is minimum, larger piping requires larger box.

■ All piping thru wall must be booted.

NOTE: PROVIDE APPROPRIATE SUPPORTS FOR PIPE & FITTINGS IN VAULT

# **APPENDIX B**

**RECEIPT OF AND AGREEMENT WITH THE SPECIFICATIONS**

I, \_\_\_\_\_, have received and agreed to adhere to the Specifications for Water Distribution System within the Oldham County Water District as provided by the Oldham County Water District on \_\_\_\_/\_\_\_\_/\_\_\_\_.

\_\_\_\_\_  
Contractor's signature

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contractor's Address and Phone Number