



STANDARD CONSTRUCTION SPECIFICATIONS  
STANDARD DETAIL DRAWINGS  
CONSTRUCTION NOTES

JANUARY 2005

FINAL



# **STANDARD CONSTRUCTION SPECIFICATIONS STANDARD DETAIL DRAWINGS CONSTRUCTION NOTES**

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Price: \$25.00 (tax included)

Copies of these specifications may be purchased at the Elk Grove Water Service office at 9257 Elk Grove Boulevard, Elk Grove, California, 95624. Contact Elk Grove Water Service at 916-685-3556 for all mail order requests and associated fees for postage.

Specifications and standard detail drawings may be viewed and downloaded at:

[www.egws.org](http://www.egws.org)

## **PREFACE**

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All portions of these Standard Construction Specifications, which place any duty or responsibility upon personnel or agencies of Elk Grove Water Service or other public entity, are intended for use in those contracts entered into by public entities and administered by Elk Grove Water Services. Any use of these Standard Construction Specifications by any other person, persons, or entity shall not create or imply the assumption of any liability or responsibility by Elk Grove Water Service or any public entity authorized to use these Standard Construction Specifications.

Unless otherwise excluded, Section 4, inclusive of these Standard Construction Specifications, shall apply to all construction projects administered and/or inspected by Elk Grove Water Service, and to construction of private development within public rights of way or easements and for dedication or incorporation into Elk Grove Water Service facilities.

## **ELK GROVE WATER SERVICE**

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Elk Grove Water Works (EGWW) was formed in 1893 to serve water to homeowners in the unincorporated area of Sacramento County, 15 miles south of the City of Sacramento, known as the town of Elk Grove. EGWW became a privately owned company in 1906, and had remained solely owned by the Jones family until December of 1999. In December of 1999 the Florin Resource Conservation District acquired the EGWW and changed the name to Elk Grove Water Service (EGWS). EGWS is governed by Division 9 of the Public Resource Code with a Board of Directors consisting of five members.

The primary water supply source for EGWS is groundwater. Three deep wells and ten shallow wells are in operation as of January 2005. They range in output from 600-1,800 gallons per minute. Distribution system pressures ranges from a minimum of 40 pounds to a maximum of 60 pounds through normal and peak demand periods. EGWS has additional supply sources from Sacramento County Water Agency (SCWA).

EGWS currently serves approximately 12,000 residential, commercial and industrial customers, representing a population base of over 40,000. In addition, EGWS provides water for fire protection as required by Elk Grove Fire Department. EGWS has one office located at 9257 Elk Grove Blvd., Elk Grove, CA 95624. The phone number is (916) 685-3556. EGWS General Manager is Leo D. Havener, Jr.



# STANDARD CONSTRUCTION SPECIFICATIONS

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## SECTION 1. PURPOSE AND DEFINITIONS

### **1-1 PURPOSE**

The purpose of the Plan Submittal and Construction Standards is to provide standards to be applied to water system additions and improvements to be accepted by EGWS. These standards shall apply to the design, preparation, and execution/implementation of plans for construction of water supply facilities and related improvements within the EGWS service area.

### **1-2 DESIGN PRACTICE**

Any items or improvements not included in this Plan Submittal and Construction Standards shall be designed in accordance with Sacramento County Standard Construction Specifications, Elk Grove Fire Department, accepted water industry engineering practice and standards, and as reviewed/approved by Elk Grove Water Service.

### **1-3 DEFINITIONS**

Whenever the following terms or titles are used, the intent and meaning shall be as follows:

**(a) EGWS**

Shall mean the Elk Grove Water Service.

**(b) Consulting Engineer**

Shall mean any person or persons, firm, partnership or corporation legally authorized to practice civil, mechanical, or electrical engineering in the State of California.

**(c) Developer**

Shall mean any person or persons, firm, partnership, corporation, or combination thereof, financially responsible for the work involved.

**(d) Contractor**

Shall mean any person or persons, firm, partnership, corporation, or combination thereof, responsible for accomplishing the work involved.

**(e) Engineer**

Shall mean the EGWS Engineer employed or retained by EGWS to provide engineering advice and services.

**(f) Development**

Shall mean the act or process of any construction on properties as well as subdivision improvement.



**(g) Improvements**

Shall mean any water system additions and improvements to the EGWS System.

**(h) Standard Construction Specifications**

Shall mean the latest Standard Construction Specifications adopted by EGWS governing the construction of Water System Improvements.

**(i) Standard Drawings**

Shall mean those drawings included herein, approved by the EGWS, which illustrate and govern the design and construction of Water System Improvements.

**(j) As-Built Drawings**

As-built drawings shall show the exact location of all underground work. All underground components of the water system and/or sprinkler system shall be located by field measured dimensions, either from fixed structures using at least two points as a measure of distance in the North-South direction and two points as a measure of distance in the East-West direction. These points will act as survey datum control necessary to locate the new facilities.

**(k) Contract Documents**

Shall mean those documents specific to the project and construction requirements thereof, in addition to those required by EGWS Standard Construction Specifications.

**(l) Proposal**

Shall mean a project bid package.

**(m) AWWA Standard**

Shall mean the current version of the cited American Water Works Association standard.

**(n) ANSI**

Shall mean the current version of the cited American National Standards Institute standard.

**(o) USC**

Shall mean the University of Southern California Foundation for Cross Connection Control and Hydraulic Research.

**(p) ASTM**

Shall mean American Standard Testing Methods.

**(q) Improvement Plan Processing Fee Deposit**

Shall mean the deposit fee paid to EGWS by the developer at the time of plan submittal based upon the number of lots, building units or EDU's.

**(s) Sacramento County Standards**

Shall mean County of Sacramento, Public Works Agency Standard Construction Specifications, September 2001 or most recent update.

**(t) Elk Grove Community Services District/Elk Grove Fire Department (EGFD)**

Shall mean the fire agency responsible for the fire protection services within the EGWS service area.

**(u) SCWA**

Shall mean Sacramento County Water Agency.

**(v) State Specifications**

Shall mean the State of California, Department of Transportation, Standard Specifications, July 1999.

## **SECTION 2. GENERAL REQUIREMENTS**

### **2-1 PLANS BY AN APPROPRIATE ENGINEER**

All plans and specifications for improvements submitted to the EGWS shall be prepared by a Registered Consulting Engineer of the appropriate discipline of engineering applicable to the work submitted.

### **2-2 IMPROVEMENT PLAN SUBMITTAL**

Improvement plans and deposit shall be submitted and required prior to plan approval. The submittal shall consist of the following:

- (a) Two (2) sets of complete plans and specifications (on 8-1/2" x 11" single - sided white paper) and any required computations, test data, and other material requested by the EGWS Engineer.
- (b) Improvement plan processing fee per Appendix E. One copy of alterations or revisions to the submitted plans, with the corrections marked or indicated thereon, will be returned to the Consulting Engineer for corrections. Two corrected sets of plans shall be resubmitted to EGWS.

### **2-3 PLAN SHEET REQUIREMENT**

Improvement plans should be delivered to EGWS as necessary for plan checking and review. Improvement plans and drawings shall conform to the following EGWS Drafting Standard and medium requirements:

#### **(a) Paper and Scaling Requirements**

All improvement plans shall be prepared on a preferred 22" x 34" or alternatively 24" x 36" paper. Scales: horizontal 1" = 20', 40' or 50', vertical 1" = 2', 4' or 5', respectively, but only the scale, horizontal and vertical, for which the sheet was intended shall be used.

#### **(b) Drafting Standards**

All line work must be sufficiently clear, sharp and heavy to be legible on a half-size 11" x 17" format. Letters and numbers must be 1/8-inch minimum height, well formed and sharp. Numerals showing profile elevations shall not be bisected by station grid lines. Dimension lines shall be terminated by sharp solid arrowheads. Computer-aided drafting format is required, with a Compact Disk (CD) containing the AutoCAD data files for the development, suitable for incorporation into the EGWS data base.

#### **(c) Title Block**

Each sheet within the set of drawings shall have an approved title block showing the sheet title, page number, date, scale the Consulting Engineers name, signature stamp and license

number, the street address or Assessors Parcel Number (APN) and the name of the subdivision project or assessment district.

**(d) General Information Requirements**

1. The following information shall be listed on the cover or title sheet of plans, or on the first sheet if there is no title sheet:
  - a. Location Map
  - b. Index of sheets
  - c. Legend of symbols
2. In addition, the following information shall be shown on the water plan and/or the title sheet:
  - a. The entire subdivision or parcel and proposed project
  - b. EGWS boundary (if on, or adjacent to the project site) and nearby existing facilities
  - c. Street names and widths
  - d. Adjacent subdivisions, including lot lines and lot numbers
  - e. Signature blocks in the lower right hand corner of the sheet for approval by the appropriate representative of the EGWS.
3. Each set of plans shall include one letter size map (8½" x 11") depicting entire water plan.

**(e) Plan Details**

In addition to other requirements of these Construction Standards, the following details shall be shown on water plans submitted for approval.

1. Right-of-way lines, the boundaries of lots, easements, section lines and corners, land grant lines and temporary construction easements, both existing and proposed, shall be shown on the plans. All right-of-way and easement lines shall be properly dimensioned and identified.
2. Topography and Existing Utilities - All pertinent topographic features shall be shown, such as street lines, medians, driveways, curbs, sidewalks, location and size of storm and sanitary sewer lines, water lines, gas lines, telephone conduits, other underground utilities, existing structures, houses, trees, (six inches in diameter and larger) and other foliage, traffic signals, street lights and pull-boxes, underground electrical conduits, drainage ditches, utility poles, fire hydrant, retaining walls, masonry structures, and all other features of the area which may affect the design requirements. When a potential utility conflict exists, As Built evaluations of the utilities shall be verified by the Consulting Engineer. The best available information shall be used and shown to the best ability of the Consulting Engineer after coordination with the Utility providers, even if the best available information may have inherent inaccuracies.

3. Profiles - Plans shall include profiles of proposed water mains whenever the pipeline diameter will be 16 inches or greater, whenever the cover over the pipeline will be less than 36 inches or more than 6 feet where existing utilities are parallel and within 5 feet of proposed alignment. Sections shall be shown where the following occur:
  - i) Any utilities cross over proposed water mains
  - ii) Where any cross the proposed water main within five (5) feet from bottom of pipe. Profiles may also be required by EGWS for reference.

When profiles are required, the proposed pipeline shall be shown with all crossing and closely paralleling sewer, storm drains and utilities. The ground line over the pipeline shall be shown, except where pipeline is to be located within an improved street when either the street centerline or the gutter flow-line may be shown.
4. Stationing and Orientation shall be as follows unless modifications to the following have been accepted prior by EGWS:
  - i) Stationing on plan and profile shall read from left to right.
  - ii) Sacramento County Standards for stationing shall be used.
  - iii) Stationing shall increase from south to north or from west to east.
  - iv) Plans shall be arranged so that North arrow points toward the top or upper right.
5. Bench Marks - The bench marks and datum shall be clearly delineated on the plans as to location, description and elevations. The datum shall be 1929 North American Datum (U.S.G.S. or U.S.D. & G.S.). Consulting Engineers shall contact Sacramento County for location and elevation of the nearest official benchmark.
6. Special Notes and Details - Special notes shall be included to clarify the design. EGWS Standard Detail Drawings and Construction Notes may be reproduced and included within the plans.

## **2-4 APPROVED PLANS**

Two (3) sets of complete plans and specifications for all proposed improvements including any necessary dedications shall be submitted to EGWS for approval. Plans must be approved and signed by an authorized representative of EGWS prior to beginning improvement construction.

All materials shown on plans and/or used in construction shall be from the approved materials list as listed in part B of the Water Service Standards described herein. Refer to Section 2-18 for the materials approval process.

Approved plans must be resubmitted, if not constructed after twelve (12) months of date of signature approval by EGWS.

Additionally, plans will not be approved until each of the following items has been submitted as required:

- (a) Two copies of the approved development plans depicting water distribution system; the

entire water system shall be detailed on one sheet and submitted in AutoCAD R12 (or later) on Compact Disk (CD). The water system layout will include all water related facilities, streets, parcels, lot numbers etc.

- (b) All proposed water systems shall be computer modeled using the Hastaed Methods CYBERNET V.3 software program, or EGWS prior approved equal, subject to field verification of tie-ins, if required by the utility. A Compact Disk (CD) of the water system data file using AutoCAD R12, or later, should be provided before EGWS final approval. All water facilities, associated streets, parcels, etc. shall be included.
- (c) One letter size map (8-1/2" x 11") showing water system on an Elk Grove area location map.
- (d) A plat map of the subdivision with respect to the water system showing the scale and individual measurements of each lot shall.

## **2-5 FINAL ACCEPTANCE**

The following items shall be submitted prior to final acceptance of the project:

- (a) Actual construction costs of the water system paid by the developer/applicant with itemized costs for transmission mains, services, hydrants, as well as lineal feet of different sized pipe.
- (b) As-Built Drawings with specific measurements locating individual services, valves, gate valves etc. Refer to Section 2-15, of these Specifications, for additional as-built information.

## **2-6 IMPROVEMENT PLAN PROCESSING FEE & METER INSTALLATION CHARGES**

Improvement plan processing fee and meter installation charges are based on size of construction project. Refer to Appendix E, Ordinance No. 02-13-02-01, for the latest plan processing fee. Refer to Appendix F, Ordinance No. 07-18-01-01, for the latest meter charges.

## **2-7 CONTRACTORS LICENSE AND INSURANCE**

All contractors performing work on projects which are to be accepted by EGWS must be duly licensed under the laws of the State of California to perform such work. All contractors must be approved by EGWS. Contractors shall furnish proof of current license and insurance that meets or exceeds EGWS minimum insurance requirements prior to beginning work.

## **2-8 REFERENCE TO SPECIFICATIONS AND STANDARDS**

Standards referred to within this document (such as AWWA, ANSI, etc.) shall be the latest officially adopted version.

## **2-9 WORK IN CITY OF ELK GROVE AND COUNTY OF SACRAMENTO RIGHTS-OF-WAY, EASEMENTS AND WATERWAYS**

Proposed work in county rights-of-way, easements, and water ways shall conform to the requirements of the City of ~~Sacramento~~ and appropriately permits shall be obtained by the ~~Elk Grove~~

contractor, at the contractors own expense, and copies provided to the EGWS prior to start of construction.

## **2-10 COMPLIANCE WITH STATUTES**

The Contractor shall conduct all work in compliance with all existing State and Federal code laws and County and Municipal ordinances and regulations limiting or controlling the work (permitting, environmental, safety, etc.).

## **2-11 TRAFFIC CONTROL**

The Contractor shall provide EGWS with a traffic control plan prior to start of construction. The plan will identify measures in accordance with the current Caltrans Manual of Traffic Controls or as required by County, State or other permitting agencies for all work within an area accessible to public traffic.

## **2-12 SAFETY PLAN**

The Contractor shall provide EGWS with a safety plan prior to start of construction. The safety plan shall be in accordance with County, State, or other permitting agency requirements for shoring, bracing, sloping and all provisions necessary to protect workers from the hazard of caving ground for all excavations five feet or more in depth.

## **2-13 PRE-CONSTRUCTION MEETING**

Contractor will arrange a pre-construction meeting one (1) week prior to construction, and shall be responsible for location of all existing utilities. Meetings will be held at the project site with an EGWS engineering and construction service representative. Inspection schedules require a minimum of one (1) working day (24 hours). EGWS requires three (3) working days advance notice of any shut down or interruptions of normal service for installation and hook-ups. The Contractor shall have a copy of the EGWS Construction Specifications and Standard Drawing Details on-site at all times. Pre-construction meetings will not be scheduled until after all EGWS fees have been paid in full, and a complete set of construction documents have been provided to EGWS.

## **2-14 CONSTRUCTION COSTS**

The contractor shall provide EGWS with a detailed construction cost estimate for those facilities to be contributed to EGWS.

## **2-15 AS-BUILT DRAWINGS**

The Contractor shall maintain a neat and accurately marked set of record drawings. Drawings shall be subject to the inspection of an EGWS representative at all times and shall be kept current weekly with all work instructions, change orders, and construction adjustments shown thereon and initialed by the inspector.

Upon final inspection, the Contractor shall submit to EGWS, two sets of completed as-built

drawings, including a photographic Mylar transparency, sepia or reproducible vellum. As-built drawings shall show the exact location of all underground work. All underground components of the water system and/or sprinkler system shall be located by field measured dimensions, from acceptable fixed structures, including but not limited to, fire hydrants, drop inlets, man holes, street lights or others as approved by EGWS using at least one point as a measure of distance in the North-South direction and one point as a measure of distance in the East-West direction. These points will act as survey datum control necessary to locate the new facilities.

As-built plans shall clearly define the location of pertinent water supply appurtenances including but not limited to valves, blow-offs, air release valves, fire hydrants, etc.

The work will not be formally accepted until as-built drawings have been accepted by EGWS.

## **2-16 CONFLICT, ERRORS AND OMISSIONS**

Approval of plans by EGWS will not be granted that are in conflict with any California State Law, Sacramento County Code, these standards, conditions of approval, or good engineering practice, even though such errors, omissions or conflicts may have been overlooked in the EGWS review of plans.

## **2-17 OTHER AGENCY NOTIFICATIONS**

The Consulting Engineer is responsible for obtaining the approval and necessary permits from government or municipal agencies when their facilities and/or jurisdictions are involved.

## **2-18 MATERIALS APPROVAL**

At least one week prior to the pre-construction meeting, the Contractor shall furnish to EGWS for approval, data on materials to be used in constructing the new water facilities to be turned over to EGWS upon Final Acceptance, including manufactures literature, actual location of manufacturer, model number and proof of compliance with all applicable standards as requested in the proposal. Refer to the Approved Materials List in Appendix A, of these Specifications.

## **2-19 INSPECTION REQUIREMENTS**

Any improvement for which it is intended that the EGWS will assume ownership and/or maintenance responsibility shall be inspected during construction by the EGWS inspector. Each phase of construction shall be inspected and approved prior to proceeding to subsequent phases.

The Contractor shall notify EGWS two (2) days prior to the commencement of construction and shall furnish EGWS at least Twenty Four (24) hours notice when inspections are required.

EGWS Inspectors shall have access to the work at all times during its construction, and shall be furnished access and assistance for ascertaining that the materials and the workmanship are in accordance with the requirements and intent of the contract drawings and specifications. Any work constructed without inspection as provided above, except with the specific written consent or approval of EGWS, or constructed contrary to the instructions or order of EGWS or its authorized representative, must, if requested by EGWS, be uncovered for examination and properly restored at the Contractors expense.



The inspection of the work does not release the Contractor of any of his obligation to fulfill the contract as prescribed. Work and materials not meeting such requirements shall be made good and unsuitable work or material may be rejected, notwithstanding that such works or materials have been previously inspected by EGWS or that payment therefore has been included in progress estimate.

## **2-20 STANDARD CONSTRUCTION SPECIFICATIONS AND DETAIL DRAWINGS**

The Contractor shall have accessible at all times, the EGWS Standard Construction Specifications and Detail Drawings at the project site. EGWS's copy of the Standard Construction Specification and Detail Drawings will not considered accessible as conflict items arise in the field.

A copy of the Standard Construction Specifications and Detail Drawings are available at the EGWS office and may be purchased for \$25. The EGWS office is located at 9257 Elk Grove Blvd., Elk Grove, CA 95624. A copy of the Standard Construction Specifications and Detail Drawings may also be mailed upon request at the rate of \$25 plus an additional fee for shipping and handling. Contact EGWS at (916) 685-3556 for additional information.

## **SECTION 3. DOMESTIC WATER SUPPLY SYSTEM DESIGN**

### **3-1 INTRODUCTION**

Engineering design of domestic water facilities within the EGWS service area shall conform to the design standards described in the following paragraphs.

### **3-2 INTENT OF CRITERIA**

The intent of these criteria is to provide a potable water system that will be dependable and most efficiently convey the required amount of water meeting State Department of Health Services requirements throughout the distribution system with the least cost, both in construction and in maintenance. In establishing the required amount of water, the estimated maximum day demand and the estimated peak hour demand shall be used as approved by the EGWS.

### **3-3 CURRENT STANDARDS**

Pertinent and current requirements of the following agencies or standards shall be complied with. In case of conflict, the design criteria of the EGWS, as established herein, shall govern.

- (a) Environmental Protection Agency Drinking Water Regulations.
- (b) Laws and Standards of the (State of California, Department of Health Services), relating to Domestic Water Supply, and particularly therein the Standards of Minimum Requirements for Safe Practice in the Production and Delivery of Water for domestic Use, as approved by the California Section of American Water Works Association.
- (c) Standard Specifications of the County of Sacramento, Department of Public Works.
- (d) Sacramento County Code, Section 6.28, regulation the installation, operation, construction, reconstruction, and repair of well and pumps.
- (e) Title 17, Chapter V, Section 7583-7622, California Administrative Code, regarding cross-connections.
- (g) Elk Grove Fire Department requirements and Insurance Services Office Grading schedule for Municipal Fire Protection and Guide for Determination of Required Fire Flow.
- (h) California Well Standards, Department of Water Resources.
- (i) AWWA, current standards.
- (j) State of California, Department of Transportation, Construction Standards.

### **3-4 WATER SUPPLY QUALITY**

The quality of the water shall conform to the Environmental Protection Agency Drinking Water

Regulations, State of California Department of Health Services Standards and these specifications where applicable.

The water supply, treatment plant and transmission lines should be designed to handle the max day demand. The distributions systems should be designed to adequately handle the peak hourly demand or max day demand plus fire flows, whichever is greater. During peak hourly flows, storage reservoirs supply the demand in excess of max day demand.

### **3-5 WATER SUPPLY PRESSURE**

Normal operating pressures of not less than 20 psi or more than 120 psi shall be maintained at service connections to the distribution system.

### **3-6 RATE OF USE**

For typical demands to be used in proposed single family units, see the table below.

Average Day Demand	0.5 gallons per minute (gpm)
Maximum Day Demand	1.0 gpm (2.0 x Average Day Demand)
Peak Hour Demand	2.0 gpm (4 x Average Day Demand)

For developments other than single family units, the developer shall submit estimated unit demands for each different type of proposed land use.

For extension of existing systems consisting of more than 500 services, the design shall be based on records of the average rate of consumption per service on the day of maximum use. Special consideration shall be given to areas zoned for multiple housing, schools, commercial, and industrial development. New storage facilities and/or well production/ treatment facilities may be considered in meeting the proposed development demand requirements.

### **3-7 OPERATING CONDITIONS**

#### **(a) Operating Pressures**

A normal operating pressure of 20 pounds per square inch gauge (psig) shall be maintained within the EGWS system at all times.

**TABLE 3-7  
PRESSURE STANDARDS**

<b>Condition</b>	<b>Pressure Standard (psig)</b>
Normal conditions Operating pressure Service connection pressure	$\geq 20$ $\leq 120$
Hourly maximum demand conditions Operating pressure	$\geq 30$
Hourly minimum demand conditions Operating pressure	$\leq 120$ and $\geq 20$

**3-8 REQUIRED FIRE FLOWS**

Discuss with Fire Dept.

Required fire flows are to be established which meet the requirements of the Elk Grove Fire Department (EGFD) and the Uniform Fire Code (UFC). Any deviations from the UFC shall be provided in these standards and strictly enforced by EGFD.

The minimum required fire flow for single family residential water systems shall be 2,000 gallons per minute. Lesser fire flow requirements in conformance with UFC may be allowed with prior approval of EGWS, but will restrict development projects to the associated maximum allowable "Fire Area" square footage in the UFC. An increase in "Fire Area" square footage will not be allowed as a result of reduced fire flow requirements for automatic fire sprinkler systems without prior approval by EGWS. The minimum required fire flow for multi-family residential water systems shall be per UFC requirements. The minimum required fire flow for commercial/industrial water systems shall be per UFC. EGWS will provide a maximum of 3,000 gpm. Any required fire flow greater than 3,000 gpm must be provided on the project site. *(Confirmation is required from EGWS prior to planning approval regarding the availability to provide for a fire flow of 3,000 gpm)*

In addition to providing capacity to meet water use created by residential, commercial, industrial, and public demands, EGWS must be able to supply fire demand flows required by EGFD. In most cases, sizing of the transmission and distribution facilities are controlled by fire flow requirements. These minimum fire flows represent the additional flows required above the maximum day demands to meet fire protection needs. Minimum operating pressure at the fire flow location during a fire flow is 20 psig, with the minimum operating pressure in the remainder of the EGWS system of at least 30 psig.

**3-9 WELL AND PUMPING PLANT DESIGN**

All phases of well, pumping plant and treatment facility design shall be closely coordinated with, and shall be under the direction of the EGWS engineer.

All well sites shall be more than fifty (50) feet from an existing or proposed structure and more than one-hundred (100) feet of an existing or proposed sanitary sewer or storm drains.

All water well design and construction shall conform to the latest bulletin of the State of California, Department of Water Resources and Water Well Standards.

**3-10 DISTRIBUTION SYSTEM DESIGN**

Sizing of mains shall be such that the stated normal pressures and the minimum requirements for main spacing and sizing are maintained and shall conform to Section 3-11, Distribution System Layout Requirements of these Standards.

**3-11 DISTRIBUTION SYSTEM LAYOUT REQUIREMENTS**

The water system layout requirements are as follows:

**(a) Location of Water Main:**

All water mains shall be installed within public utility easements or rights-of-way.

1. Water main location shall be 4 feet from back of walk on the north or west side of the street when installation is within a 40 foot right-of-way or less. Locations other than those mentioned above must be approved by EGWS.

Discuss with group.  
Rewrite this section.

2. Water main location shall be 3 feet from lip of gutter on the north or west side of the street when installation is within a 50 foot right-of-way or greater. Locations other than those mentioned above must be approved by EGWS.

3. Minimum cover for pipe in unimproved areas shall be thirty (36) inches and a maximum cover of fifty-four (54) inches from the flow line of curb and gutter within roadways or from finish grade out of roadway areas, unless specifically set forth in the Contract Documents or shown on the Plans. Minimum cover under roadways shall be thirty-six (36) inches for PVC and AWWA C303 pipe and thirty (36) inches for ductile iron pipe.

4. Water mains to be located within easements shall be installed immediately adjacent to and behind the property line fronting on the public right-of-way. Minimum cover in open fields shall be sixty (60) inches for PVC and AWWA C303 pipe and forty-eight (48) inches for ductile iron pipe.

Make easement  
wider and eliminate  
working easements?

5. If it is necessary to install a water main within a private road, the permanent easement shall be a minimum of fifteen (15) feet in width with a five (5) foot working easement on both sides. The water main shall be centered in the easement.

6. If it is necessary to install a water main within a landscape corridor, no trees shall be planted within five (5) feet of the water main. The water main shall be centered within a fifteen (15) foot water main easement.

7. Ten (10) feet shall be the minimum horizontal distance between parallel water distribution and gravity or force sanitary sewer mains. In all instances the water main shall be one (1) foot above the sewer main. Separation may be less if it is in accordance with California State Department of Health Services requirements and approved by EGWS. Refer to Section 4-20 of these Standard Construction Specifications for additional information.

Should this only apply  
to sewer force mains?  
Check other stds.

8. When crossing a sanitary sewer force main, it shall be specified that the water distribution main be installed a minimum of one (1) foot above the sewer line and be dDuctile ironIron Pipe (DIP). The ductile iron main shall extend a minimum of ten (10) horizontal feet on each side of the force main. No joints are allowed in the water main within ten (10) feet each side of the force main.

9. In every instance where a water main is to be installed in public right-of-way or easement, the City of Elk Grove Transportation Division and/or County of Sacramento Transportation Division shall be consulted for preferred location and Elk Grove Water Services must grant approval.

10. The developer shall accept the responsibility to move, remove or abandon water

mains or service lines in conflict with improvements and re-establish service to existing customers with minimal disruption to service.

**(b) Main Layout and Sizing**

The distribution system shall be in grid form so that pressures throughout the system tend to become equalized under varying rates and locations of maximum demand. The minimum pressures and flows as specified shall govern design of the system. The following conditions are to be considered for the minimum size piping:

1. The minimum pipe size shall be eight (8) inches inside diameter. Six (6) inch distribution mains are acceptable in cul-de-sacs or courts only after the last fire hydrant at the end of any run less than 100 feet.
2. Where a water main is installed in a major thoroughfare (84 foot right-of-way or greater), or in an area zoned for industrial use, dual mains (one pipeline on each side of the street) may be required. The minimum size of pipe diameters shall be eight (8) inches on each side in residential areas. In commercial and industrial areas, the size shall be designed for the fire demand requirements.

**(c) Valves, Hydrants and Blow-Offs**

The distribution system shall be furnished with a sufficient number of valves so that no single shut-down will result in shutting down a transmission main, or necessitate the removal from service of a length of pipe greater than five-hundred (500) feet in school, commercial, industrial, or multiple-family dwelling areas or greater than eight-hundred (800) feet in other areas. In no case shall more than two fire hydrants be removed from service.

The valves shall be so located that any section of main can be shut down without going to more than three locations to close valves. Valves shall preferably be located at street intersections, at least four feet from the back of walk. If it is necessary to install valves between street intersections, they shall be located on property lines between lots.

Fire hydrants and blow-off assemblies shall be located as follows:

1. Transmission and distribution main valve actuators shall be located so that the valve boxes will be located in the center of a traffic lane or on traffic lane lines. Locations other than those mentioned above must be approved by EGWS.
2. Fire hydrants shall be connected to distribution mains only. Fire hydrants shall not be connected to transmission mains.
3. Fire hydrants shall be located to minimize the hazard of damage by traffic. They shall have a maximum normal spacing of five-hundred (500) feet measured along the street frontage in residential developments and three-hundred (300) feet in commercial developments. Within residential areas, all other hydrants shall be located on property lines between lots at a minimum distance of three (3) feet from back of walk to allow maintenance personnel access to a hydrant that has been damaged without being sprayed with water. Hydrants located at intersections shall

be installed at the curb return or within five (5) feet if a drop inlet is present.

4. A fire hydrant or four (4) inch blow-off assembly shall be installed on all permanent dead end runs including cul-de-sacs. Two (2) inch blow-off assemblies shall be used on all temporary dead end runs. Wherever possible, the blow-off assemblies shall be installed in the street right-of-way, a minimum distance of three (3) feet from the lip of gutter. In no case shall the location be such that there is a possibility of back-siphonage into the distribution system.
5. No more than three hydrants shall be placed on an eight (8) inch main between intersection lines. The minimum size main serving a fire hydrant shall be eight (8) inch diameter pipe. The pipeline connecting the hydrant to the main shall be a minimum of (6) inch diameter with a gate valve installed at the main per Standard Drawing W-2A and W-2B.
6. A four (4) inch blow-off assembly shall be installed on all permanent dead end runs including cul-de-sacs. The hydrant shall be installed three feet beyond the property line. In no case shall the location be such that there is possibility or back-siphonage into the distribution system. Type 1 hydrants in cul-de-sacs will not be permitted.

**(d) Service Lines**

Service lines from the water main to the property line or edge of easement shall be installed at the time the main is constructed. Service from mains installed in private roads shall extend one foot beyond the edge of the pavement. Service line criteria shall be as follows:

1. All water service shall be installed per Section 4-14 of these specifications.
2. The service line to an existing building shall be located so as to make the most direct connections to the existing structure.
3. Where dual water services are to be installed, a common trench is acceptable. Refer to Section 4-14 for dual water service installation requirements.
4. Normal size of a service line shall be one (1) inch diameter polyethylene pressure pipe meeting standards of AWWA C901 and in conformance with Section 4-14 of these specifications. Schools, commercial, industrial, or multiple-family units with higher demand shall be provided with larger service lines, materials subject to approval of EGWS.
5. All taps shall be made by a qualified contractor at the developer's expense and approved by EGWS. An EGWS inspector shall be present prior to beginning the tap or tie-in being made. All tapping sleeves must be approved by EGWS prior to commencing work.
6. The Contractor shall have all materials, fittings, tools, equipment and onsite appurtenances necessary to complete the connection and to repair and return to service the water line in the event of damage prior to commencing work on the tap.

Where water services are placed, a meter setter and meter box must be installed. Water meters will be purchased by the developer at time of plan approval and installed by EGWS. Once a construction permit has been released to the developer and/or contractor, notification to EGWS must be made to schedule installation of the water metes.

Refer to Standard Detail Drawing W-24, Backflow Manifold Schematic for additional information on location of backflow manifolds on irrigation and domestic services.

**(e) Fire Service Lines**

A double detector-check valve and bypass meter is required on each fire service line into a building. See Standard Detail Drawing W-10 for specifications and typical installation details.

**(f) Water Meters**

Water meters shall be installed in all residential, commercial, industrial, multi-family, and irrigation water services. Residential meters ~~and meter boxes~~ will be installed by EGWS after building permits are issued, not when water service lines are installed. Size of water meter shall not be less than the size of the service line unless approved by EGWS. See Standard Detail Drawing W-8A, W-8B, W-8C and W-8D for specifications and typical installation details.

**(g) Back-Flow Device**

Back- flow devices are required in accordance with Title 17, Chapter V, and Sections 7583-7622 of the California Administrative Code. See Standard Detail Drawing W-11 for specifications and typical installation details.

**(h) Air Release/Vacuum Valve**

Air release/vacuum valve assemblies are required at high points in distribution system as determined by EGWS. See Standard Detail Drawing W-18 and Section 4-13 of these specifications for typical installation details.

**(i) Water Pipe**

Pipe used in the construction of water distribution systems shall be either ductile iron, or PVC pipe. Ductile iron may be used only when specifically approved by EGWS. The pipe and the method of placement shall conform to Section 4 of these Standards.

Joints for PVC pipe shall be J-M Ring-Tite gasket type joint seal. Fittings shall be mechanical joint. Solvent weld joints will not be allowed. Joints for Ductile Iron pipe shall be Push-On Tyton Joint Type for pipe sizes 3"-24" for sizes 30"-36" Fastite Joint Type.

Pipes located between residential homes shall be AWWA C151 Class 350 Ductile Iron Pipe installed with six (6) inches of sand bedding and eight (8) mils of polyvinyl encasement.



Backfill with sand to six (8) inches above the top of the pipe and a six (12) inch wide detectable warning tape shall be placed eighteen (18) inches above the pipe. The pipe shall be centered within a fifteen (15) foot wide easement.

**(j) Locating Wire**

All water pipe runs shall have a No. 10 gauge solid, insulated with one-sixteenth (1/16) inch insulation, soft-drawn copper wire laid along the pipe to facilitate location of the pipe at a later date. The wire shall be stubbed up inside each valve box and be placed as shown on Standard Detail Drawing W-6. All wire connections shall be stripped to bare wire connected with brass connectors shall be wrapped twice with 10mil PVC tape. Wire extending into the valve boxes shall have a one-sixteenth (1/16) inch polyvinyl chloride insulation. The contractor shall conduct a continuity test on all locating wire splices. Installation shall be in accordance with Standard Detail Drawing W-6.

**3-12 PAYMENT**

The unit price bid per linear foot of water main of the respective size and types set forth in the Proposal shall include the furnishing of all material for construction of the water pipeline and the appurtenances and all labor, materials, and equipment necessary, bed, place and join the pipe, place thrust blocks, backfill the trench, restore the street surface, disinfect, flush and test the pipe lines, make connections to existing facilities, furnish pre-construction photographs where specified in the Contract Documents, and do all other work necessary to produce a complete and finished job in accordance with the drawings and specifications.

## SECTION 4. STANDARD CONSTRUCTION SPECIFICATIONS

### **4-1 GENERAL**

Pipe used in the construction of water distribution systems shall be Ductile Iron Pipe (DIP) as specified in Section 4-5 or Polyvinyl Chloride (PVC) as specified in Section 4-6, unless a particular type is specified on the plans and in these Standards. All pipes shall be the regular product of a firm which has successfully manufactured comparable pipe for at least three years, and approved by EGWS.

All pipe, valves, fittings, connections, and appurtenances thereto shall conform to the provisions of these specifications or as specifically set forth in these Standards. EGWS will maintain a listing of approved hydrants and water source material and fittings which establish a standard of material quality for the EGWS system. Material used shall be limited to those on this listing. Alternate material items may be added to this list upon review and/or testing by EGWS.

- (a) **Testing of Material:** All testing requirements of the ASTM and AWWA specifications shall be conducted by the pipe manufacturer or representative within the State of California and the resulting tests shall be certified by an established reputable firm operating in the testing materials field. Certification must accompany the delivery of the materials to the job site.
- (b) **Installation:** All pipe, valves, fittings, and appurtenances shall be installed in accordance with the manufacturer's recommendations and according to accepted EGWS practice. Each section of pipe and each fitting shall be thoroughly cleaned out before it is installed. All pipe, fittings, valves, etc., shall be carefully lowered into the trench by suitable tools or equipment as to prevent any damage, particularly to the pipe lining and coating. When required by the Engineer, approved slings shall be used to lower the pipe. Under no circumstances shall pipe or accessories be dropped into the trench. Each section of cast iron pipe, before lowering into the trench, shall be rung with a light hammer and examined for defects. Any defective, damaged, or unbound pipe shall be rejected and removed from the job site.

The pipe shall be laid true and uniform to line and grade, with no visible change in alignment at any joint unless curved alignment is called for on the Plans, in which case the maximum deflection at any joint shall not exceed two and one-half (2-1/2) degrees for ductile iron pipe or one-half (1/2) the manufacturer's recommended deflection, whichever is less, unless prior approval by EGWS. Deflection and bending of polyvinyl chloride pipe shall not exceed the limits described in Standard Detail Drawing W-21.

The pipe shall have a minimum cover of thirty (36) inches and a maximum cover of fifty-four (54) inches from the flow line of curb and gutter within roadways or from finish grade out of roadway areas, unless otherwise shown on Plans.

Thrust blocks of Class B concrete shall be cast-in-place at all horizontal or vertical bends of 11-1/4 degree angle or more, at all tees or crosses which will be valved or plugged in such a manner that it can act as an elbow or tee. The thrust block shall extend from the fitting to undisturbed soil, shall be kept clear of the joints, and shall be of such bearing area as to assure adequate resistance to the force to be encountered. Size of blocking shall be in

accordance with Standard Detail Drawing W-3. Restrained joints shall be used on all fire hydrant installation as shown in standard detail drawing W-2A and W-2B.

Whenever existing utilities may cause conflict with placement of thrust blocks or where maintenance of facilities may become limited, restrained joints may be used in lieu of the above required thrust blocks. Refer to Standard Detail Drawing W-19 for all restrained joints. In addition, and in lieu of the above required thrust blocks, movement may be prevented by the use of pipe collars and rods.

Whenever pipe laying is discontinued for more than one hour, the open ends of all mains and fittings shall be closed with water-tight plugs or bulkheads. The plug or bulkhead shall not be removed unless, or until, the trench is dry and the Contractor is ready to proceed with the work. Pipe shall not be laid when the condition of the trench or the weather is unsuitable or when there is the possibility of foreign material entering the pipe. All pipe joining shall be in accordance with accepted best practice and as detailed in the manufacturers installation manual, except pipe deflection shall be in accordance with requirements stated above. All joint surfaces shall be clean before joints are made. Materials used in joining the pipe shall only be that furnished with the pipe or recommended by the manufacturer.

Where necessary to properly locate valves and fittings, the pipe shall be neatly and squarely cut to length, using methods recommended by the manufacturer.

When field cuts are made in polyvinyl chloride pipe, the cut ends shall be cut square and all burrs removed from the pipe interior. The beveling of the pipe ends shall be as specified by the manufacturer. Guide marks for joining the pipe, after cutting, must be made on the pipe in accordance with the manufacturer's specifications.

On all water systems, except for systems being installed as part of new subdivision improvements, the following shall be required:

- 1) There shall be no more than a maximum of three hundred (300) feet of trench allowed to remain open in unimproved areas, excluding manhole excavations, for each operation unless otherwise authorized by EGWS. The remainder of the trench shall be backfilled and compacted, and when in streets, opened to traffic as soon as possible.
- 2) Testing, flushing, placement of first lift of paving and cleanup shall follow pipe laying and service line construction as a continual operation, or as designated by the Engineer, with the provision that these phases of work shall be completed no later than fifteen (15) working days after starting construction in any portion of the project.
- 3) No more than 3,000 linear feet of water main shall be installed before starting installations of the water services, with this approximate sequence maintained throughout the construction project.

## **4-2 TRENCH EXCAVATION**

Trench excavation shall include the removal of all materials or obstructions and the control of water as necessary to construct the work as shown or specified in the Contract. Unless otherwise shown or specified in the Contract, excavation shall be by open cut or as directed by EGWS.

Surface water shall not be allowed to enter any pipe trench and shall not be permitted to enter the existing downstream water pipe system.

- (a) **Water Pipe:** Water pipe minimum and maximum trench widths shall be as shown on Standard Detail Drawing W-14 unless otherwise shown or specified in the Contract Drawings. If trench widths at the top of the pipe are exceeded by any amount, the Contractor shall provide stronger pipe or improved bedding and backfill conditions, as approved by EGWS to meet the changed load requirements and at the Contractors expense.
- (b) **Pavement Cutting:** When in existing paved areas, the pavement shall be saw cut in neat lines. The width of the saw cut shall not be any greater than is required to properly install the pipe and not damage the edges of the pavement. Pavement shall be restored as per City of Elk Grove and/or the County of Sacramento Standard Construction Specifications.
- (c) **Shoring and Bracing:** Shoring and bracing shall follow those requirements as specified in the City of Elk Grove and/or County of Sacramento Standard Construction Specifications.
- (d) **Maximum Length of Open Trench:** At the end of each working day, there shall be no more than three-hundred (300) feet of open trench remaining open in unimproved areas. The remainder of the trench shall be backfilled and compacted, and when in streets, opened to traffic as soon as possible.
- (e) **Special Foundation Treatment:** Whenever the bottom of the trench is soft or rocky, or, in the opinion of the EGWS Inspector, otherwise unsuitable as a foundation for pipe bedding, the unsuitable material shall be removed to a minimum depth of six (6) inches and replaced with crushed rock, gravel, or sand as directed by EGWS. When the trench bottom is cobbled or of any other material which might, in the opinion of EGWS, allow loss of sand backfill, the backfill material shall be crushed rock or gravel graduated so that one hundred percent (100%) will pass the three quarter (3/4) inch sieve and not more than fifteen percent (15%) will pass the number 8 sieve. Crushed rock or gravel and sand shall conform to Section 4-4 (b) of these Standards.

## **4-3 PIPE BEDDING AND BACKFILLING OF TRENCHES**

- (a) **Pipe Bedding:** Pipe bedding shall be in accordance with these Standards, specifically Section 4-5 for Ductile Iron Pipe (DIP) and Section 4-6 for PVC pipe. Pipe bedding shall be placed on a firm layer of bedding material, and shall be bedded uniformly throughout its length.
- (b) **Initial Backfill:** Initial backfill shall be in accordance with these Standards, specifically Section 4-5 for Ductile Iron Pipe (DIP) and Section 4-6 for PVC pipe and conform to the requirements of Standard Detail Drawing W-14. Unless otherwise shown on the Plans, initial backfill for water distribution systems, including water mains, fire hydrant branch

leads, and water services, shall be sand conforming to the requirements of Section 4-4 (a) of these Specifications.

Backfill material shall be carefully placed so as not to damage or disturb the pipe. Backfill shall be placed in layers not exceeding six (6) inches in depth before compaction. Compaction shall be done by mechanical pneumatic or vibratory compaction equipment and not by ponding or jetting methods. The compacted material must achieve a relative compaction of at least ninety percent (90%) as determined by ASTM Designation: D 698.

- (c) **Trench Backfill:** Trench backfill shall consist of material placed between the initial backfill and subgrade in paved areas or to the top of the trench in unpaved areas, unless otherwise shown or specified on the plans.

- i) **Trenches greater than four (4) feet:** Backfill material may be native material excavated at the work site and placed per Standard Detail Drawing W-14. Material must be free of organic or other unsuitable materials. Rocks, stones and solid earth chunks exceeding three (3) inches in greatest dimension shall be removed from the trench backfill material.

Trench backfill shall be placed in layers not exceeding six (6) inches in depth before compaction. Until the total backfill above the top of the pipe exceeds three (3) feet, machine-placed backfill material shall not be allowed to "freefall" more than two (2) feet.

- ii) **Trenches less than four (4) feet:** Backfill material shall be imported granular material, uniformly graded Class 2 aggregate base conforming to Section 26, "Aggregate Bases", of the State Specifications. Imported granular material shall be placed in lifts not to exceed six (6) inches after compaction. Compaction requirements for imported granular material shall be the same as those for native material.

Unless otherwise shown or specified in the Contract Documents, compaction of all backfill material shall be by mechanical pneumatic or vibratory compaction equipment. Ponding and jetting methods will not be permitted, except by written permission of EGWS.

When the trench is backhoe excavated, sand backfill to six (6) inches above the pipe is required. No native material is allowed on backhoe excavated trenches.

Trench backfill shall be compacted to a relative compaction of not less than ninety percent (90%), as determined by ASTM Designation: D 1557. The top six (6) inches below the subgrade shall be compacted to a relative compaction of ninety-five percent (95%), except that trenches in easements outside the street right-of-way may be compacted to ninety percent (90%) relative compaction throughout the depth. Compaction testing outside of right-of-way, when required, will be performed and paid for by the Contractor. Costs for retesting of areas that fail to meet the required compaction will be paid for by the Contractor. Costs for all compaction testing within right-of-way will be by EGWS and coordinated with prior approved testing laboratory as specified by EGWS.

**4-4 CONSTRUCTION MATERIALS**

- (a) **Graded Sand:** Graded sand shall be free from vegetable matter, lumps, balls of clay, or adherent films of clay. The percentage of composition by weight of graded sand shall conform to the following gradations:

<b>Graded Sand Gradations</b>	
<b>Sieve Size</b>	<b>Percentage Passing by Weight</b>
9.5 mm (3/8")	100
4.75 mm (#4)	95 - 100
2.36 mm (#8)	90 - 100
1.18 mm (#16)	80 - 100
600 µm (#30)	65 - 100
300 µm (#50)	40 - 70
150 µm (#100)	0 - 30
75 µm (#200)	0 - 12

- (b) **Crushed Rock:** A uniformly graded material that is the product of crushing rock or gravel, free of organic matter, oil, alkali, or other deleterious substances, and is hard, sound and durable.

Unless otherwise specified in the Contract Documents, crushed rock shall conform to the requirements for coarse (1/2" x No. 4) crushed screenings as specified in Section 37-1.02, "Materials", of the State Specifications. Crushed rock shall have a minimum Cleanliness Value of 80 as determined by California Test Method 227.

**4-5 DUCTILE IRON PIPE (DIP)**

Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective sizes and class of ductile iron pipe, as indicated on the plans and in the Proposal.

- (a) **Specifications:** Ductile iron pipe shall conform to ANSI A21.51 (AWWA C151) for a minimum working pressure of 150 psi unless otherwise specified. Ductile iron castings shall conform to and be tested in accordance with ASTM A536. Casting grade for pipe shall be 60-42-10. Laying length shall be the manufactures standard length, normally eighteen (18) feet. Shorter lengths may be used when required for closures and proper location of special sections.

The interior surface of all ductile iron pipe shall be cement-mortar lined and seal coated in conformance with AWWA C104 and the exterior surface shall have a bituminous coating of either coal tar or asphalt base, approximately one (1) mil thick.

Fittings shall have push-on, mechanical joints or flanged ends. Four (4) inch through twelve

(12) inch fittings shall be ductile iron, fittings larger than twelve (12) inches shall be cast iron or ductile iron. All fittings shall conform to ANSI 21.10 (AWWA C110), ANSI 21.11 (AWWA C111) or AWWA C153 designed for a working pressure of 250 or 350 psi. Coating and lining requirements shall be the same as specified for pipe.

Joints shall be push-on or mechanical type and shall conform to ANSI 21.11 (AWWA C111) with rubber gaskets unless otherwise specified. Gasket lubricant shall be minimum required plus ten percent (10%).

- (b) **Installation:** Installation of ductile iron pipe and appurtenances shall conform to the manufactures recommendations and AWWA C600. The ductile iron main, fittings, and cast iron fittings shall be encased in eight (8) mil polyethylene encasement in accordance with AWWA C105.
  - 1) **Pipe Bedding:** Backfill shall conform to the requirements of Section 4-4 (a), "Graded Sand", of these Specifications. If existing soil is too porous to hold sand, a geotextile fabric placed on the trench bottom and covered with six (6) inches of sand may be used. The use of geotextile fabric must be approved by EGWS.
  - 2) **Initial Backfill:** Ductile iron distribution mains shall have graded sand backfilled to eight (8) inches above the top of the distribution main. Graded sand shall be per the requirements of Section 4-4 (a), "Graded Sand", of these Specifications. No native material will be allowed.
  - 3) **Trench Backfill:** See Section 4-3 (c), "Trench Backfill", of these Specifications.
- (c) **Joints:** Joints shall be push-on or mechanical type and shall conform to ANSI 21.11 (AWWA C111) with rubber gaskets unless otherwise specified. Gasket lubricant shall be a minimum required, plus 10 percent (10%).
- (d) **Payment:** The unit price bid per lineal foot of water main of the respective sizes and types set forth in the Proposal shall include the furnishing of all materials and appurtenances for construction of the water pipeline including but not limited to all labor, material, and equipment necessary to excavate the trench, remove all obstruction, remove and replace all utilities where necessary, bed, place and joint the pipe, place thrust blocks, backfill the trench, restore the street surface, disinfect, flush and test the pipelines, make connections to existing facilities, furnish pre-construction photographs as specified in the Contract Documents, and do all other work necessary to produce a complete and finished job in accordance with the drawings and specifications. The unit price bid shall be the average price for all mains and appurtenances of a given size.

#### **4-6 POLYVINAL CHLORIDE PIPE (PVC)**

Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective sizes and class of PVC Pipe, as indicated in the plans and in the Proposal.

- (a) **Specification:** Polyvinyl Chloride Pipe (PVC) shall conform to AWWA Standard C900, Class 150 (DR18) or AWWA Standard C905, Class 150 (DR 18-25). Outside pipe diameter shall be manufactured with Cast Iron Pipe (CIP) - Equivalent ODs and furnished in Standard

twenty (20) foot lengths.

Fittings shall be push-on or mechanical joint type, ductile iron or cast iron fittings and shall conform to ANSI 21.10 (AWWA C110) or ANSI 21.11 (AWWA C111 or AWWA C153) designed for a working pressure of 250 or 350 psi. Fittings shall be cement mortar lined and seal coated in conformance with AWWA C104 and the exterior surface shall have a bituminous coating of either coal tar or asphalt base, approximately one (1) mil thick. Fittings shall be encased in 8-mil polyethylene in accordance with ANSI A21.5 (AWWA C105).

- (b) **Installation:** Installation of PVC piping shall be in accordance with the manufactures recommendations. All runs of pipe shall have a No. 10 gauge solid, insulated, soft drawn copper wire laid along the top of the initial backfill to facilitate locating the pipe. Installation of the locating wire shall conform to Standard Drawing No. W-6. Joints shall be either integral bell and spigot joints or elastomeric gasket couplings. Solvent cement jointing shall be prohibited.
- 1) **Pipe Bedding:** Polyvinyl chloride (PVC) water distribution mains shall have ~~four~~ (6) inches of sand bedding that conforms to the requirements of Section 4-4 (a), "Graded Sand", of these Specifications. If existing soil is too porous to hold sand, four (4) inches of crushed aggregate or a geotextile fabric placed on the trench bottom and covered with four (4) inches of sand may be used. EGWS must approve the crushed aggregate and the geotextile fabric.
  - 2) **Initial Backfill:** Initial backfill for PVC water distribution main and/or ductile iron or cast iron fittings used with PVC pipe shall be sand to eight (8) inches above the top of pipe or fitting, per the requirements of Section 4-4 (a), "Graded Sand", of these Specifications. No native material will be allowed.
  - 3) **Trench Backfill:** Per the requirements of Section 4-3 (c), "Trench Backfill", of these Specifications.
- (c) **Payment:** The unit price bid per lineal foot of water main of the respective sizes and types set forth in the Proposal shall include the furnishing of all materials, and appurtenances for construction of water pipeline, including, but not limited to all labor, materials and equipment necessary to excavate the trench, remove all obstruction, remove and replace all utilities where necessary, bed, place and joint the pipe, place thrust blocks, backfill the trench, restore the street surface, disinfect, flush and test the pipelines, make connections to existing facilities, furnish pre-construction photographs as specified in the Contract Documents, and do all other work necessary to produce a complete and finished job in accordance with the drawings and specifications. The unit price bid shall be the average price for all mains and appurtenances of a given size.

#### **4-7 WATER PIPE FITTINGS**

Fittings shall have push-on mechanical joint or flanged ends. Four (4) inch through twelve (12) inch fittings shall be ductile iron; fittings larger than twelve (12) inch shall be cast iron or ductile iron. All fittings shall conform to ANSI 21.4 (AWWA C104), ANSI 21.10 (AWWA C110), ANSI 21.11 (AWWA C111), or AWWA C153 designed for a working pressure of 250 or 350 psi. Coating and



lining requirements shall be the same as specified for the pipe. Fittings shall be encased in eight (8) mil polyethylene in accordance with ANSI A21.5 (AWWA C105).

#### **4-8 REDUCED PRESSURE BACKFLOW PREVENTER**

Reduced Pressure Backflow Preventer (RPBP) devices shall be installed on all nonresidential connections. Under this item of the Proposal, the Contractor shall bid unit cost per each for furnishing and installing the reduced pressure backflow preventer as indicated on the plans and in the proposal.

Refer to Appendix C for a list of the latest backflow prevention assembly testers per the County of Sacramento and Appendix D for the latest approved list of backflow prevention devices per the County of Sacramento.

- (a) **Specification:** The reduced pressure backflow preventer shall be a complete assembly, consisting of two separate spring loaded check valves and a differential relief valve. These devices shall automatically reduce the pressure in the "zone" between the check valves.

Both check valves and the differential relief valve shall be constructed so that they may be serviced without removing the device from the line. The devices shall be rated to 175 psi working pressure. The unit shall include properly located resilient seated test cocks and tightly closing resilient seated shutoff valves at each end of the assembly.

The reduced pressure backflow preventer shall be AWWA or USC approved. Contactors may also acquire the most recent list of approved reduced pressure backflow prevention assemblies in accordance the Sacramento County Code (S.C.C.) 6.30.130. (See Appendix B), and certified backflow prevention assembly testers from the County of Sacramento Environmental Health Department.

(b) **Installation:**

1. RP to be installed aboveground, in a horizontal and level position, on the water customers side of, as close to the service connections as is practicable and no greater than five (5) feet per Standard Detail Drawing W-11 unless otherwise approved by the Health Officer.
2. RP to be installed a minimum of twelve (12) inches above finished grade and not more than thirty-six (36) inches above finished grade as measured from the bottom of the assembly, and shall be readily accessible for maintenance and testing as shown in Standard Detail Drawing W-11.
3. There shall be no outlet, tee, tap, take-off or connection of any sort, to or from the supply pipe line, between the service connection and the backflow prevention assembly.
4. RP shall be installed such that no part of the assembly will be submerged during normal operating and weather conditions.
5. The reduced pressure backflow preventer shall be installed so that flooding would

not cause the relief valve to become submerged.

6. All buried pipe shall be per the requirements for specific pipe material installation per the requirements of Section 4 of these Specifications.
- (c) **Testing:** The backflow prevention assembly shall be tested by a certified backflow prevention assembly tester at the time of installation and annually thereafter, or more often as the Health Officer may require.

#### **4-9 FIRE HYDRANT ASSEMBLIES**

Under this item of the Proposal, the Contractor shall bid a unit price per each fire hydrant assembly listed in the Proposal.

- (a) **Specification:** Fire hydrants shall be wet barrel Clow 960 meeting the requirements of AWWA Standards C503, and shall be furnished with a break off check valve.

The foot piece shall have an inlet size for connecting to pipe of not less than six (6) inches in diameter and shall be suitable for push-on, mechanical-joint, or flanged end pipe. The bury length shall be three (3) feet from the flanged breakable section to the centerline of the connecting pipe, unless otherwise shown on the drawings, or required by the topography and approved by the Engineer.

Delivery classification shall be two (2) hose and one (1) pumper nozzle, having National Standard Fire Hose Coupling Screw Threads in conformity with NFPA 194 and ANSI B26. Hose nozzles shall be for two and one half (2½) inch hoses and pumper nozzles shall be for four and one half (4½) inch hoses. The operating nuts and nozzle caps shall be National Standard pentagon dimensions, open left (counter-clockwise). Fire Hydrants shall be Clow 960.

Hydrants are to be furnished without a drain opening in the base; if manufactured with such opening, it shall be plugged.

All fire hydrants shall be furnished with two layers of factory-applied white coatings. Coatings shall be polyurethane epoxy, alkyd or epoxy base coat with acrylic top coat. Coating thickness shall be in accordance with coating manufacturer requirements. Epoxy top coats will not be allowed.

Field touch-ups of damage to coating shall be done with coating sample provided by the manufacturer, and shall be the same type and color as the factory applied coating.

- (b) **Installation:** In no case shall a fire hydrant be installed within three (3) feet of a building or any other structure that would limit access. Fire hydrants shall stand plumb with the pumper outlet facing the street. The lowest valve stem shall be twenty (20) inches minimum and twenty-four (24) inches maximum above the sidewalk or finished ground surface, whichever is higher. The four and one-half (4½) inch pumper connection shall be a maximum of one (1) foot behind finished walk or planter box, with four and one-half (4½) inch discharge facing driveway or street. A two (2) foot square concrete pad is to be set around base of hydrant, the thickness being the same as the sidewalk. Fire hydrants installation shall be in accordance with Standard Detail Drawing W-2A or W-2B.

All fire hydrant installations shall have a six (6) inch gate valve and steel lid valve box installed on the lateral from the main with concrete around the base.

- (c) **Payment:** The unit price bid for fire hydrants shall include excavation, furnishing and placing the tee in the main, the six (6) inch lateral to the hydrant, the gate valve, the fittings, and the hydrant, all as detailed on the drawings, blocking, backfill, restoration of street surfaces, and all other labor, equipment and material necessary for installing the fire hydrant in accordance with the drawings and specifications. The unit price bid shall be the average price for all fire hydrants indicated or required.
- (d) **Protection:** Fire hydrants shall be protected as shown in Standard Detail Drawing W-22. All hydrants in commercial areas shall be protected using bollards as shown in Standard Drawing W-22.

#### **4-10 FIRE PROTECTION SERVICE ASSEMBLY**

Under these items of the proposal, the Contractor shall bid a unit price per each assembly for the respective sizes of service listed in the proposal.

- (a) **Specification:** The Fire Protection Service Assembly shall include a valve, double detector check valve, and O S & Y valves.

Water valve shall be as specified in Section 4-12 and Section 4-13. Valves shall be furnished with flanged ends.

Double detector check valve shall be listed by Underwriters Laboratories, Incorporated and approved by Associated Factory Mutual.

Fire protection service assembly piping shall be flanged ductile iron Class 51 conforming to Section 4-1.

- (b) **Installation:** Valve, double detector check valve, O S & Y valves shall be installed and set in a horizontal position as shown on Standard Detail Drawing W-10, and detector check assembly shall be installed above ground.
- (c) **Payment:** The unit price bid for Fire Protection Service Assembly shall include excavation, furnishing and setting valve, detector check valve, by-pass meter, connection to the water main, piping and all necessary fittings, backfilling, restorations of surface, and furnishing all other labor, equipment and material necessary for installation of the Fire Protection Service Assembly in accordance with the manufacturer's recommendation and in a good workmanlike manner. The unit price bid shall be the average price for all assemblies of a given service size.

#### **4-11 BLOW-OFF ASSEMBLY**

Under this item of the Proposal, the Contractor shall bid a unit price per each for the blow-off assembly listed in the Proposal.

- (a) **Specification:** Permanent blow-off assemblies shall be as shown on Standard Detail Drawing W-15 or W-16. Temporary blow-offs shall be as shown on Standard Detail Drawing W-17. The location shall be such that there shall be no possibility of back-siphonage into the distribution system. Valve boxes shall conform to Sections 4-12(b) and 4-13(b) of these standards.
- (b) **Installation:** Blow-off assemblies shall be installed as shown on the Standard Drawing No. W-15, W-16 or W-17. Valve boxes and meter boxes shall be installed as specified in Sections 4-12(b), 4-13(b), 4-15(c), 4-16(c) and 4-17(c) of these Specifications.
- (c) **Payment:** The unit price bid for blow-off assemblies shall include excavation, furnishing and placing the blow-off piping, valve, and valve box, meter box, all as detailed on the drawings, blocking, backfilling, restoration of surfaces, and all other labor, equipment, and material necessary for installing the blow-off assembly in accordance with the drawings and specifications.

#### **4-12 WATER VALVES & VALVE BOXES**

Under these items of the Proposal, the Contractor shall bid a unit price for the respective sizes of water valves listed in the Proposal.

- (a) **Specifications:** Types of valves to be installed will be specified in the Contract. Unless otherwise shown on the Plans, valves provided shall open to the left (counter-clockwise), and be furnished with flange, mechanical or push-on joint. Valves shall bear the registered certification mark of the AWWA.

All installed valves shall operate smoothly with no more than twenty-five (25) ft-lbs. torque. Valves operating at torques greater than twenty-five (25) ft-lbs. require the approval of EGWS.

Valves three (3) through ten (10) inch in diameter shall be gate valves. Ten (10) inch valves may be gate or butterfly valves. Valves twelve (12) inch or larger shall be butterfly valves.

1. Gate valves will be NPS (nominal pipe size) with iron body, bronze stem nuts, glands and bushings, resilient-seated bonded or mechanically attached to the gate, non-rising stem (NRS), working water pressure of 200 psi, conforming to the requirements of AWWA Standards C509. The valve shall have a 2-inch square operating nut. Unless otherwise specified on the plans, valves shall be furnished with ends flanged or mechanical joint, using an elastomeric-gasket seal, and shall conform in dimensions and style to the pipe and/or fitting requirements. All gate valves shall be coated and lined with a two-part polyamide epoxy in accordance with AWWA Standard C550-90. Metal surfaces to be coated or lined shall be sandblasted in accordance with SSPC-SP10. Finished or bearing surfaces shall not be painted. Exposed machined surfaces shall be covered with slush grease or other readily removable protective coating before shipment.

When specifically referred to in the Contract Documents or on Plans, double disc

gate valves will be allowed. All double disc gate valves shall be iron body, bronze mounted, parallel seat, non-rising stem (NRS), open to the left (counter-clockwise), 175 psi pressure rating and conforming to the requirements of AWWA Standards C500. The valves shall have a two (2) inch square operating nut. Unless otherwise specified on the plans, valves shall be furnished with ends flanged, mechanical joint, or bell, using an elastomeric-gasket seal and shall conform in dimensions and style to the pipe and/or fitting requirements. Valves for PVC pipe shall be connected by tyton fitting or mechanical joint fittings.

2. Butterfly valves shall be iron body, rubber seated, tight-closure butterfly valve conforming to the requirements of AWWA Standards C504, Class 150B. Butterfly valves shall be rated at 150 psi working pressure and provide drip tight shut-off at 150 psi of pressure. Operating stem with manual operators shall open to the left (counter-clockwise) and provided with two (2) inch square operating nut unless otherwise specified or shown on the plans. Butterfly valves shall have flanged ends that meet the requirements of AWWA C207 Class D flanges. All valves shall be provided with manual actuators.

All butterfly valves shall be coated and lined with a two-part polyamide epoxy in accordance with AWWA Standard C550-90. Metal surfaces to be coated or lined shall be sandblasted in accordance with SSPC-SP10. Finished or bearing surfaces shall not be painted. Exposed machined surfaces shall be covered with slush grease or other readily removable protective coating before shipment.

- (b) **Valve Boxes:** Valve boxes shall be of precast concrete, and shall have a cast iron face and a cast iron traffic lid. Covers shall be marked "WATER" and shall have a loose fit in the box. Valve box riser shall be of Class 63 PVC or PVC C900 and shall fit inside of valve box without slipping. (See Standard Detail Drawing W-7) Plastic valve boxes shall have ferrous metal imbedded in the lid.
- (c) **Installation:** Gate and butterfly valves shall be set plumb, supported on a concrete base or a 2 x 8 x 12-inch redwood block, and properly fitted to the adjacent sections of main. A valve box shall be installed over each gate valve. The type of box and lid is dependent upon location, as specified herein. Valve boxes shall be set flush with the finish grade, pavement, or concrete. Where valves are placed in unimproved easement areas the valve boxes shall be set six inches above grade. Valves behind back of walk or in landscaped areas shall be marked with a "WV" stamped on the curb.
- (d) **Payment:** The unit price bid for valves shall include excavation, furnishing and setting valves and valve boxes as detailed on the drawings, backfilling, restoration of street surfaces, and furnishing all other labor, equipment and material necessary for placing the valve in accordance with the drawings and specifications. The unit price bid shall be the average price for all valves of a given size.

#### **4-13 AIR RELEASE/VACUUM VALVES**

Under this item of the Proposal, the Contractor shall bid a unit price per each for the air release/vacuum valves listed in the Proposal.

- (a) **Specification:** All valves shall be air release/vacuum type valves. The body and cover of the valve shall be cast iron unless otherwise approved by EGWS. All interior parts shall be stainless steel. Air release/vacuum valves shall be fully automatic and requiring no regular maintenance.
- (b) **Installation:** Air release/vacuum valves shall be set plum, and properly fitted to the high points on the water main. Air release/vacuum valves will be required at other locations on long stretches or pipe as shown on the Plans. A vault with adequate venting and drainage shall be provided as required. The air release/vacuum valve and all appurtenances shall be of material listed and shall be installed as shown in Standard Detail Drawing W-18.

Air release/vacuum valves shall be capable of automatically releasing accumulated air from a water system while that system is in operation and under pressure. Also, the valve shall automatically allow air to re-enter the pipeline when the internal pressure of the pipeline becomes negative due to draining of the pipeline, a power outage, pipeline break, etc.

- (c) **Payment:** The unit price bid for air release/vacuum valves shall include excavation, furnishing and placing the piping, valve, and valve box, all as detailed on the drawings, blocking, backfilling, restoration of surfaces, and all other labor, equipment, and material necessary for installing the air release/vacuum valve in accordance with the drawings and specifications.

#### **4-14 WATER SERVICE LINES**

Under this item of the Proposal, the Contractor shall bid a price per each for furnishing and installing water service lines.

- (a) **Specification:** All residential water service lines shall be one (1) inch diameter polyethylene pressure pipe meeting standards of AWWA C901, unless otherwise specified. Water service pipe material up to and including two (2) inches in diameter shall be polyethylene pressure pipe meeting standards of AWWA C901, or copper tubing, "Type K", soft tempered, meeting ASTM Designation: B 88 and AWWA C800. Polyethylene pipe shall be high density, ultra-high molecular weight and meet all applicable requirements, including testing, of Type III, Grade P33 or P34, Class C, designated as ~~PE 3408~~ in ASTM D2239 and D1248. PE4710 The polyethylene pipe shall have a minimum pressure rating of 200 psi, shall be homogeneous throughout and free of cracks, holes, foreign inclusions or other defects, shall be uniform in color, opacity, density and other physical properties. Polyethylene pipe shall be supplied with markings, at intervals of not more than five (5) feet, indicating nominal pipe size, designation, pressure class, and manufacturer's name or trademark. Polyethylene shall be manufactured to Copper Tubing Size (CTS). Installation shall be in accordance with the manufacturer's recommendation. When the size of the tap exceeds the manufacture's recommended limit for the size of the main, a special fitting shall be furnished.

All services shall be equipped with a bronze ball valve corporation stop at the main. On services up to and including two (2) inch diameter, a bronze ball valve curb stop, meter setter and meter shall be installed at the property line or easement line; on larger services a gate valve shall be furnished instead of a ball valve. Size of the corporation stop, curb stop or gate valve, meter setter, and meter shall be the same as the service line. A meter box at the property line or easement line is required for all services.

Service saddle requirements are shown on Standard Detail Drawing W-1. (McDonald C-900, or equivalent). Valve and stop risers shall be six (6) inch class 63 PVC or C-900 for services, eight (8) inch class 63 or C900 for gate valves. Service saddles, corporation stops, coupling nuts, and all appurtenances shall be bronze. Only neoprene or rubber gaskets shall be used between the saddle and the pipe. Threads for underground services line fittings shall conform to AWWA Standards C800, National Pipe Thread (N.P.T.).

- (b) **Installation:** Where curb and gutter exists, or is to be constructed concurrently with the improvements, the location of each service shall be permanently indicated by inscribing the letter "W" in the curb directly above the line when the service is perpendicular to the street centerline. Otherwise, the "W" mark for a skewed or angling service shall be placed at a right angle to the end of the service. When water services are installed in a street with existing curb, the curb mark shall be placed at the time the service is installed to assure proper location. In new subdivisions, when the services are installed before the curb is constructed, it shall be the Contractor's responsibility to establish the exact location of each service and to furnish this information to the curb and gutter subcontractor, if any, to allow for accurate placement of "W" in the curb after it is poured.

All water service shall be installed two and one half (2-1/2) feet from the side of lot line. In addition, the service line shall be no closer than seven (7) feet to electrical vaults. All water services shall have a seven (7) foot separation from street lights, fire hydrants and drop inlets where there will be conflict with proposed water service, with dimensioning as such shown on plans.

Services shall have a locating wire as specified Section 3-11, Item J.

Tapping sleeve types must be approved by an EGWS representative prior to commencing work. The water main shall be tapped at the service locations shown on the plans and construction completed by the Contractor in accordance with Standard Detail Drawing W-1. A minimum distance of eighteen (18) inches between taps must be maintained. The service line may be either laid in an open cut or placed through a hole produced by jacking or drilling. Water services to adjacent lots may be laid in a common trench, provided that a minimum center to center spacing of eighteen (18) inches is maintained, with no service behind the right-of-way less than two and one-half (2-1/2) feet from the common property line. Under no circumstances will service lines be placed in a common trench with transmission mains, fire hydrant service lines or any other utilities.

Under no circumstances shall pipe wall pieces of "plugs" be allowed to enter the distribution main when tapping. The Contractor shall be responsible to remove any "plugs" which may enter the pipe, and at the contractor's own expense. Where water service lines are installed by the open cut method, the service line trench shall be backfilled the same as the water main trench except, however, service line trenches crossing an existing street shall be backfilled with sand, to an elevation of eight (8) inches minimum over the top of the service pipe.

Applicable codes prohibiting the laying of water pipe in the same trench as the service sewer shall be rigidly enforced.

The Contractor shall also furnish the exact location of each service to the inspector per

Section 2-15 of these Specifications. The Contractor is responsible to resurvey and reestablish the end of each service before the curb and gutter is placed in lieu of the above requirements to ensure that the "W" is at an acceptable location.

- (c) **Payment:** The unit price for water services shall include all labor and materials necessary to excavate the trench, connect to the main, furnish and install the service saddle, corporation valve, piping fittings, and curb stop or gate valve, bed place and joint the pipe and fittings, backfill the trench, restore street surface, mark the curb, furnish and install a valve box, and all other works necessary to product a complete installation in accordance with the drawings and specifications. The unit price bid shall be the average price for all water services of a given size.

#### **4-15 COLD WATER METERS - TURBINE TYPE**

- (a) **Specification:** Cold-water meters shall be purchased by fees paid to EGWS. Meters shall be Invensys (Sensus) turbine type, no substitutes.
- (b) **Meter Box:** Meter boxes shall be of reinforce concrete utility box (Christy or equal) designed for the appropriate size of meter and curb stop. Meter box lid outside of the traffic area, in new subdivisions or unimproved areas shall have a reinforced concrete lid with a cast iron self-closing reading lid with a one and three quarter (1-3/4) inch pre-cast hole. Meter box for traffic service shall have a steel checker plate traffic cover. Covers shall have a loose fit in the box and shall be marked "WATER".
- (c) **Installation:** Cold-water meters shall be installed and set horizontal in accordance with the manufacturer's recommendation and as shown on Drawings W-8A, W-8B, W-8C and W-8D. A meter box shall be installed over each meter that the meter may be easily read through the reading lid of the cover. The meter box shall be installed so as to prevent undue stress form normal or traffic load on the meter, curb stop, fittings and piping.

A meter box, with appropriate lid, shall be set flush with the final finish grade, pavement or concrete.

- (d) **Payment:** The unit price bid for cold-water meter-turbine type for customer service shall include excavation, furnishing an setting meter, meter box, furnishing appropriate connections to piping and making all connections, backfilling, restoration of surface, and furnishing all other labor, equipment and material necessary for installation of the meter in accordance with the manufacture's recommendations and standard industry practice. The unit price bid shall be the average price for all meters of a given size.

#### **4-16 COLD WATER METERS – DISPLACEMENT TYPE**

- (a) **Specifications:** Cold-water meters shall be purchased by fees paid to EGWS. Meters shall be Invensys (Sensus) displacement type, no substitutes.
- (b) **Meter Box:** Meter boxes shall be of precast reinforced concrete designed for the appropriate size of meter and curb stop (Christy, Brooks or equivalent. Meter box lid shall be reinforced concrete lid with a cast iron self-closing reading lid with a one and three quarters (1-3/4) inch pre-cast hole. Covers shall have a loose fit in the box and shall be marked "WATER".



- (c) **Installation:** Cold-water meters shall be installed and set horizontally in accordance with the manufacturer's recommendation and as shown on Drawings W-8A, W-8B, W-8C and W-8D. A meter box shall be installed over each meter so the meter may be easily read through the reading lid of the cover. The meter box shall be installed in such a manner to prevent undue stress from normal or traffic load on the meter, curb stop, fittings and piping.

A meter box, with the appropriate lid, shall be set flush with the final finish grade, pavement or concrete.

- (d) **Payment:** The unit price bid for cold-water meters shall include excavation, furnishing and setting meter, meter box, furnishing appropriate connectors to piping and marking all connections, backfilling, restoration of surface, and furnishing all other labor, equipment and material necessary for installation of the meter in accordance with the manufacturers recommendation and standard industry practice. The unit price bid shall be the average price for all meters of a given type.

#### **4-17 COMPOUND METERS – COLD WATER TYPE**

- (a) **Specification:** Cold-water meters shall be purchased by fees paid to EGWS. Meters shall be Invensys (Sensus) cold water type, no substitutes
- (b) **Meter Box:** Meter box shall be of pre-cast reinforced concrete utility vault (Christy, Brooks, or equivalent), and shall have a reinforced concrete lid with a hinged cast iron self-closing reading lid and a one and three quarter ( $1\frac{3}{4}$ ) inch pre-cast hole. Meter box for traffic service shall have a steel checkered plate traffic cover with hinged self closing reading lid and a one and three quarter ( $1\frac{3}{4}$ ) inch pre-cast hole. Covers shall have a loose fit in the box and shall be sized as shown on Standard Drawing No. W-7.
- (c) **Installation:** Compound meter, valves, flange coupling adapters, piping and utility vault shall be installed by the contractor and set in a horizontally as shown on Drawings W-8A, W-8B, W-8C and W-8D.

The utility vault shall be installed with the reading lid over the meter register. The utility vault shall be installed and supported as to prevent undue stress or loading on the meter, valves, or piping.

The top of the utility vault shall be set four inches above the highest finish grade immediately surrounding the vault and supported to maintain that setting.

All buried steel or casing iron pipe shall be given a corrosion protection wrapping. Pipe shall be spirally wrapped with polyvinyl chloride or polyethylene pressure sensitive tape, applied over a suitable primer. The wrap shall have a nominal thickness of twenty (20) mils. All buried ferrous fittings and valves shall be fully wrapped with flexible 6 mil plastic sheets.

All ferrous material exteriors not buried shall be properly cleaned, primed and finished with two coats of epoxy in green metallic aluminum of six (6) mil minimum total dry film thickness. The paint system and applications shall be in accordance with the paint

- manufacturer's recommendation. No coating shall be applied to any copper-alloy surface.
- (d) **Payment:** The unit price bid for Compound Meter Assemblies shall include excavation, furnishing and setting the compound meter valves, connection to the main, piping and all necessary fittings, backfilling, restoration of surface, and furnishing all labor, equipment and material necessary for installation of the Compound Meter Assembly in accordance with these specifications, the manufacturers recommendation and all in a good workmanlike manner. The unit price bid shall be the average price for all meters of a given size.

#### **4-18 PLACING LOCATING WIRE ON WATER MAIN**

All runs of all water pipe, including services, shall have a No. 10 gauge solid, insulated, soft-drawn copper wire laid along the pipe to facilitate locating the pipe at a later date. The wire shall be stubbed up inside each valve box and be placed as shown on Drawing No. W-6. Wire extending into the valve boxes shall have a one-sixteenth (1/16) inch polyvinyl chloride insulation.

#### **4-19 CONNECTIONS TO EXISTING WATER MAINS**

Under no circumstances shall anyone other than a representative of EGWS, or authorized agency, open or close any valve in EGWS service area. Contractor shall not operate valves without prior EGWS approval where final acceptance of the project has been granted. When a water source or lateral is to be connected to an existing line, a qualified contractor approved by the EGWS, will be used at the developer's expense. An EGWS inspector shall be present prior to beginning the tap or tie in being made. All tapping sleeves must be approved by the EGWS prior to commencing work. Applications should be made to the EGWS and the required fees paid at least five working days in advance of the time the tap is to be made. All excavation and backfill, and the installation of the remainder of the water lateral or service shall be done by the Contractor.

Shutdowns shall be made only at times when there will be the least interference with consumer service. Contractor shall contact EGWS for approval of shut down times at least seventy-two (72) hours in advance of proposed shut down. Connections shall be made only after complete and satisfactory preparations for such work has been made, in order that the shutdown may be as short as possible. The Contractor shall have on site all piping, fittings, equipment and appurtenances as may be required to complete the connection. Notification to Fire Districts and to all consumers whose water source will be interrupted shall be made by the Contractor, forty-eight (48) hours prior to the scheduled shutdown.

#### **4-20 REGULATIONS RELATING TO SANITARY HAZARDS**

All construction shall conform to applicable regulations relative to safeguarding the public health, particularly the regulations relating to cross connections and basic separation standards as established by the California Administrative Code, Title 22, Chapter 16, Article 5, Water Mains and Appurtenances, Section 64630, Water Main Installation.

Ten (10) feet shall be the minimum horizontal distance between parallel water and gravity sanitary sewer mains. Pressure water mains shall be at least twelve (12) inches above sanitary sewer lines where these lines must cross. Separation distances specified shall be measured from the nearest edges of the pipelines. Water mains and sewer lines must not be installed in the same trench.

Ten (10) feet shall be the minimum horizontal distance between parallel water and sanitary sewer

force mains. When a water main crosses a sanitary sewer force main, the water main shall be as close as practical to the perpendicular and the sewer force main should be at least one (1) foot below the water line. When a new sewer force main crosses under an existing water main, all portions of the sewer force main within ten (10) feet (horizontally) of the water main shall be enclosed in a continuous sleeve. When a new water main crosses over an existing sewer force main, the water main shall be constructed of pipe materials with a minimum rated working pressure of 200 psi or equivalent pressure rating.

Prior approval from EGWS is required, when the Basic Separation Standards for the construction of sewer lines and water lines cannot be attained.

Refer to Drawings W-12 and W-13 of these standard construction specifications for utility crossings.

All water pipelines shall clear underground facilities by one (1) foot minimum unless otherwise approved by EGWS. Water mains placed under cross culverts must have one (1) foot clearance unless otherwise approved on the construction plans with specified backfill material.

No field changes shall be made that conflict with these requirements without the prior written approval of EGWS.

#### **4-21    DISENFECTION AND FLUSHING**

After all other work has been completed, and prior to placing in service, all water lines shall be completely disinfected by using the tablet method. However, if calcium hydrochloride tablets are attached to the pipe at the time of installation for purposes of sterilization, it will not be possible to flush the main prior to Disinfection. It will therefore be necessary that extreme care be exercised in keeping the pipe clean during installation. The number of calcium hydrochloride tablets used shall be in accordance with the following table, which is based on five (5) gram calcium hypochlorite tablets. The tablet method shall yield an average dose of approximately twenty-five (25) milligrams per liter. The five-gram hypochlorite tablets shall contain at least sixty-five percent (65%) available chlorine by weight. The tablet, six (6) to eight (8) to the ounce, is designed to dissolve slowly in water. These tablets shall meet the requirements of AWWA B-300 standard for hypochlorites. Because preliminary flushing cannot be exercised when using the tablets extra care must be taken during construction of the water main.

The calcium hypochlorite tablets shall be placed in each section of pipe and in hydrants, hydrant branches, and other appurtenances. They shall be attached to the top of the pipe by an adhesive. If the tablets are placed in the pipe prior to being placed in the trench then the pipe must be marked on the section to assist in keeping the tablets's position at the top of the pipe.

The adhesive shall be Permatex No. 1, or approved equal. There shall be no adhesive on the tablet except for the surface that is being used to attach the tablet to the pipe.

The number of calcium tablets required for water main disinfection is shown in the following table:

**Required No. of 5 Gram Calcium Hypochlorite Tablets**

<b>Pipe Dia.</b>	<b>Length of Pipe Section (feet)</b>				
	<b>&lt;13</b>	<b>18</b>	<b>20</b>	<b>30</b>	<b>40</b>
<b>4</b>	1	1	1	1	1
<b>6</b>	1	1	1	2	2
<b>8</b>	1	2	2	3	4
<b>10</b>	2	3	3	4	5
<b>12</b>	3	4	4	6	7
<b>16</b>	4	6	7	7	13

When the installation of the water system is completed, the water mains shall be filled with water at a velocity of less than one foot per second (1 fps). During filling, air shall be released from all high points in the line. The contractor shall provide a corporation stop at high points to provide air vents and insure that all air is released.

In addition, as the chlorinated water flows past tees and crosses, related valves and hydrants shall be operated so as to disinfect them also.

The chlorinated water shall be allowed to stand in the pipeline at least twenty-four (24hrs) hours. At the end of this period the chlorinated water shall be flushed from the line until the chlorine remaining in the line is no higher than that generally found in the existing distribution system, or less than one mg/l total residual chlorine.

Before the new water system is placed in service as part of the existing distribution system, a representative of EGWS will take the required number of samples. Temporary tie-ins used for sampling and testing shall be per EGWS Standard Detail Drawing W-5. Bacteriological examination of samples shall meet the following criteria:

- 1) Total Coliform less than 1 per 100 milliliters
- 2) Total Plate Count less than 500 bacteria per milliliter
- 3) If the initial disinfection fails to produce satisfactory samples, Disinfection shall be repeated as directed by EGWS.

The water shall also meet State and Federal drinking water standards; Title 22, California Administrative Code, and the 1986 Amendments to the Safe Drinking Water Act of 1974, as issued by the United States Environmental Protection Agency (EPA).

New water mains shall not be connected to existing distribution systems until the EGWS has determined that the new water has been disinfected.

Under no circumstances will the Contractor take samples of the water system for bacteriological examination.

**4-22 PRESSURING TESTING WATER MAIN INSTALLATIONS**

After completion of the installation, the Contractor shall test all piping to the pressure hereinafter specified. The Contractor shall furnish all material, equipment, and labor for such testing. The system may be tested as a unit or in sections as directed by the Engineer, but each unit tested shall successfully meet the requirements herein specified. Temporary tie-ins used for testing shall be per EGWS Standard Detail Drawing W-5.

The water services shall be considered as part of the main for test purposes.

In no case shall there be placement of permanent pavement prior to successful completion of the test. Joints and fittings must be backfilled to the horizontal diameter of the pipe and the pipe between joints backfilled to a depth necessary to hold the line securely during the test, but in no case less than eighteen (18) inches. Thrust blocks shall have been in place for at least thirty-six (36) hours if high-early-strength cement was used, or at least seven (7) days if standard cement was utilized.

Each section of the pipe to be tested shall be slowly filled with water, and all air shall be expelled from the pipe. The release of the air can be accomplished by opening hydrants and service line cocks at the high points of the system and the blow-offs at all dead ends. The valve controlling the admission of water into the section of pipe to be tested should be opened wide before shutting hydrants or blow-offs. After the system has been filled with water and all air expelled. The valve controlling the section to be tested shall be closed and the line remains in the condition for at least twenty-four (24) hours.

The pipe shall then be refilled, if necessary, and subjected to a pressure of at least 150 PSI, or the service pressure plus 50 pounds, whichever is greater, for two hours. The contractor shall provide necessary pump and a clean calibrated container for measurement of make-up water required to replace leakage during this two (2) hour period.

The allowable leakage in the test section shall not exceed two gallons per hour per mile per inch diameter of pipe tested.

All leaks that are found shall be immediately corrected and the system again subjected to the same test for a period of two hours.

Calcium Hydrochloride test and sanitary sewers shall be conducted by EGWS.

The Contractor shall take all necessary precautions to prevent any joints from drawing while the pipe lines and their appurtenances are being tested and shall, at his own expense, repair any damage to the pipes and their appurtenances, or to any other structures, resulting from or caused by these tests.

**4-23 WATER USED DURING CONSTRUCTION**

Water used in testing and flushing or any other construction operation that is taken from an EGWS system shall be paid for at the EGWS current construction water rate. The Contractor is

to furnish EGWS with true and accurate records of the amount of water used or EGWS shall estimate quantity used and bill accordingly.

Before drawing water from the EGWS system, the Contractor shall make an application for such service with EGWS for a permit and authorized location(s). Location(s) will be determined at the time of issuance of all construction water permits. Requests for alternate authorized location(s) can be made after the issuance of a permit by visiting EGWS during normal business hours. At no time will unauthorized construction water use be permitted. Construction water permits can be obtained at EGWS Monday through Friday from 7am to 4pm. Unauthorized use of any fire hydrant or service connection will result in a Water Misuse Fine per Ordinance No. 07-18-01-01. The permit shall be in the possession of the personnel taking the water at the time and location that water is being taken.

## **APPENDIX A**

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### **ELK GROVE WATER SERVICES APPROVED MATERIALS LIST**

**APPENDIX A****ELK GROVE WATER SERVICES  
APPROVED MATERIALS LIST**

The following is a list of materials that have been reviewed for use in EGWS facilities and found to be acceptable. This list is subject to change at the directions of the EGWS.

Project specifications may supersede the acceptability of these materials. This list is not complete but represents commonly used types. Written request for approval of material not covered on this list should be submitted to EGWS for review.

**WATER PIPE (4-INCH THROUGH 12-INCH DIAMETER)****PVC AWWA C-900 Class 150** (Tyton or mechanical joint fitting)

Certainteed  
J-M Manufacture  
Vinyl Tech  
Pacific Western

Check to see if all listed mfr's are still in existence

**~~Cast Iron~~/Ductile Iron** (Factory Cement Mortar Lined According to AWWA C-104 or Fusion Epoxy Coated)

Dayton  
Olympic  
South Bay Foundry  
Trinity Valley  
Tyler  
U.S. Pipe  
NAPPCO  
Sigma

**Gate Valves** (AWWA Approved, Cast Iron, Resilent Wedge, 12-inch diameter and larger shall be butterfly type)

American Darling  
Kennedy  
Mueller  
Waterous  
Stockham  
American AVK

**Gate Valves** (Brass) Do we use these?



Red and White 206

**Fire Hydrant**

Clow 960, Factory Painted White

**Blow Offs** (4-inch Type 1 Hydrant)

Jones Check to see what a Jones blow-off is? Are there other types? Isn't just a valve?

**Service Saddles** (Bronze with brass screw)

McDonald

Ford

Jones

Mueller

**Corporation Stops** (Bronze, I.P. tread, Brass screw)

Mueller

Jones

Ford

McDonald

**Service Tubing** (Copper)

Type K

**Curb Stops** (Ball valve, Brass Screw)

Mueller

Jones

Ford

McDonald

**Angle Meter Stop** (Brass screw)

Mueller

Jones

Ford

McDonald

**Flexible Couplings**

APAC

Smith Blair

Romac

JCM

**Valve Boxes** (Concrete, Traffic)

Christy G-5  
BES M-2

**Service Boxes** (Concrete, Traffic)

Carson  
Christy

**Valve Box Riser Material**

Class 63 Plastic,  
6-inch dia. for services  
8-inch dia. for gate valves

**Meter Boxes** (Concrete, Traffic)

Carson  
Christy

**Backflow Prevention Devices** (Reduced Pressure)

Refer to the Water Resources Division Approved List for the County of Sacramento

**Meters**

Invensys (Sensus), installed and supplied by EGWS



# STANDARD DETAIL DRAWINGS

JANUARY 2005

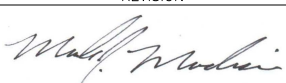
FINAL

DWG. NO.	DESCRIPTION
G-1	DRAWING INDEX
G-2	LIST OF ABBREVIATIONS
W-1	1"-2" WATER SERVICE INSTALLATION
W-2A	FIRE HYDRANT ASSEMBLY - GATE VALVE IN STREET
W-2B	FIRE HYDRANT ASSEMBLY - BEHIND SIDEWALK
W-3	THRUST BLOCK BEARING AREA
W-4	THRUST BLOCK REDUCER
W-5	TEMPORARY WATER MAIN TIE-IN CONNECTION
W-6	LOCATING WIRE FOR WATER MAINS & SERVICES
W-7	VALVE BOX & RISER INSTALLATION
W-8A	1" RESIDENTIAL METERED WATER SERVICE
W-8B	1-1/2" & 2" COMMERCIAL METERED WATER SERVICE
W-8C	3"-6" COMMERCIAL METERED WATER SERVICE
W-8D	1" IRRIGATION METERED WATER SERVICE
W-9	METER BOX PROTECTION & TEMPORARY WATER
W-10	4" & LARGER FIRE PROTECTION DETAIL
W-11	REDUCED PRESSURE-BACKFLOW PREVENTER 1" TO 2"
W-12	UTILITY CROSSING
W-13	UTILITY CROSSING UNDER EXISTING WATER MAIN
W-14	TYPICAL TRENCH SECTION
W-15	4" BLOW OFF ASSEMBLY, END OF MAIN
W-16	4" BLOW OFF ASSEMBLY, IN-LINE
W-17	2" TEMPORARY BLOW OFF ASSEMBLY
W-18	1" COMBINATION AIR/VACUUM VALVE
W-19	PIPE RESTRAINED LENGTH CHART
W-20	WATER MAIN CUT IN DETAIL (PVC & DIP)
W-21	MAXIMUM DEFLECTION FOR PVC PIPE
W-22	FIRE HYDRANT CLEARANCE AND PROTECTION REQUIREMENTS
W-23	ACCEPTABLE SEWER SERVICE TESTING DEVICE
W-24A	BACKFLOW MANIFOLD ASSEMBLY
W-24B	BACKFLOW MANIFOLD ASSEMBLY - SERVICE AREA 1
W-25	WATER MAIN CUT IN DETAIL (AC PIPE)
W-26	BACKFLOW PREVENTER PROTECTION & CLEARANCE

DWG. NO.	DESCRIPTION
W-27A	DOUBLE CHECK ASSEMBLY BACKFLOW PREVENTER 1" TO 2"
W-27B	DOUBLE CHECK ASSEMBLY BACKFLOW PREVENTER 1" TO 2" IN VALVE BOX
W-28	REDUCED PRESSURE BACKFLOW PREVENTER 3" AND LARGER
W-29	DOUBLE CHECK DETECTOR ASSEMBLY BACKFLOW PREVENTER 3" AND LARGER



## Elk Grove Water District DRAWING INDEX

		DATE: MAY 2018
		PROJECT:
REV. DATE	REVISION	DRAWN BY: B. KAMILOS
EGWD SIGNATURE		CHECKED BY: S. SHAW
		EGWD: M. MADISON

# G-1

AB	AGGREGATE BASE
AC	ASPHALTIC CONCRETE
AVB	ATMOSPHERIC VACUUM BREAKER
AWWA	AMERICAN WATER WORKS ASSOCIATION
B.O.	BLOW-OFF
BFP	BACKFLOW PREVENTER
C&G	CURB AND GUTTER
CLR	CLEAR
COMP	COMPRESSION
CU. FT.	CUBIC FEET
DF	DOUGLAS FIR
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DWG	DRAWING
EGWS	ELK GROVE WATER SERVICE
EXT	EXTENSION
F.I.P.T.	FEMALE IRON PIPE THREAD
FLG	FLANGE
GA.	GAUGE
GALV	GALVANIZED
I.D.	INSIDE DIAMETER
LG	LONG
MAX	MAXIMUM
MIN	MINIMUM
MJ	MECHANICAL JOINT
NPT	NORMAL PIPE THREAD
NTS	NOT TO SCALE
O.D.	OUTSIDE DIAMETER
OS&Y	OUTSIDE STEM AND YOKE
P.T.D.F.	PRESSURE TREATED DOUGLAS FIR
PE	PLAIN END
PL	PLATE
POJ	PUSH ON JOINT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE PIPE
REQ'D.	REQUIRED
RL	RESTRAINED LENGTH
RWD	REDWOOD

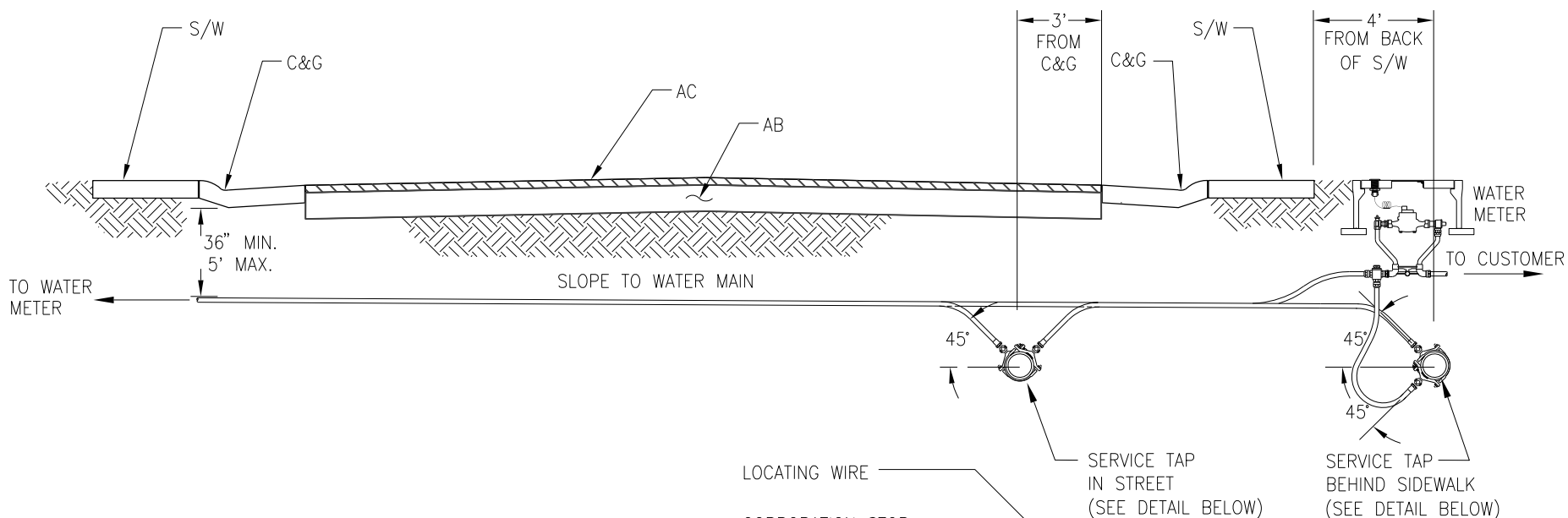
S/W	SIDEWALK
SQ.	SQUARE
STD	STANDARD
TBC	TOP BACK OF CURB
TYP	TYPICAL
U.L./F.M.	UNDERWRITERS LABORATORIES, INC. / FACTORY MUTUAL RESEARCH CORP.



## Elk Grove Water Service LIST OF ABBREVIATIONS

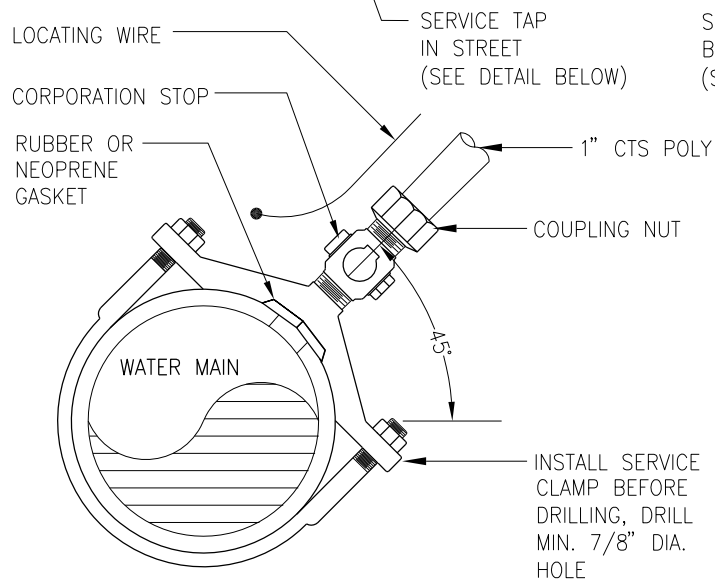
REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

**G-2**



**NOTES:**

1. INSULATED LOCATING WIRE REQUIRED ON ALL NON-METALLIC SERVICE LINES. SEE STD. DWG. W-6 FOR LOCATION. WIRE SHALL BE SECURED ALONG WATER MAIN FOR CONTINUITY.
2. SERVICE STRAPS SHALL BE SINGLE STRAP FOR SERVICES 1" AND SMALLER ALL OTHER SERVICE STRAPS TO BE DOUBLE STRAP.
3. ALL SERVICE STRAP, CORPORATION STOPS, COUPLINGS AND NUTS SHALL BE BRONZE.
4. SERVICE TAP MUST BE MADE BETWEEN 0 DEGREES AND 45 DEGREES ABOVE THE SPRINGLINE OF PIPE. FOR NEAR SIDE SERVICE TAP, WHEN WATER MAIN IS BEHIND SIDEWALK, TAP CAN BE MADE BETWEEN 0 DEGREES AND 45 DEGREES BELOW THE SPRINGLINE OF PIPE AND WILL ALSO NEED TO USE A MUELLER 300 BALL ANGLE METER VALVE AT THE CONNECTION POINT OF THE METER SETTER.



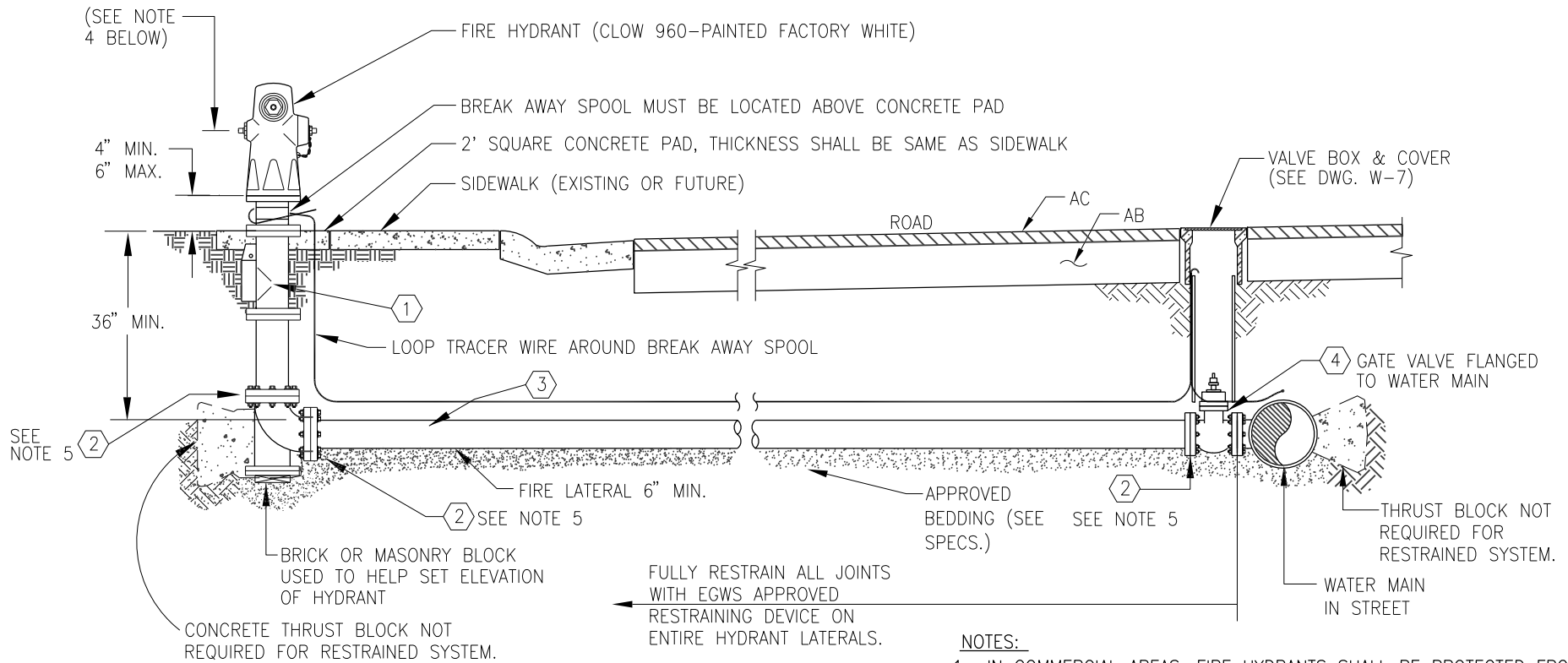
SERVICE TAP DETAIL



## Elk Grove Water Service 1"-2" WATER SERVICE INSTALLATION

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

**W-1**



**MATERIAL LIST:**

- 1 BREAKOFF CHECK VALVE ASSEMBLY
- 2 MECHANICAL JOINT RETAINER GLANDS
- 3 DUCTILE IRON PIPE SPOOL, 6" MIN. DIA.
- 4 6" FLG X MJ GATE VALVE

**NOTES:**

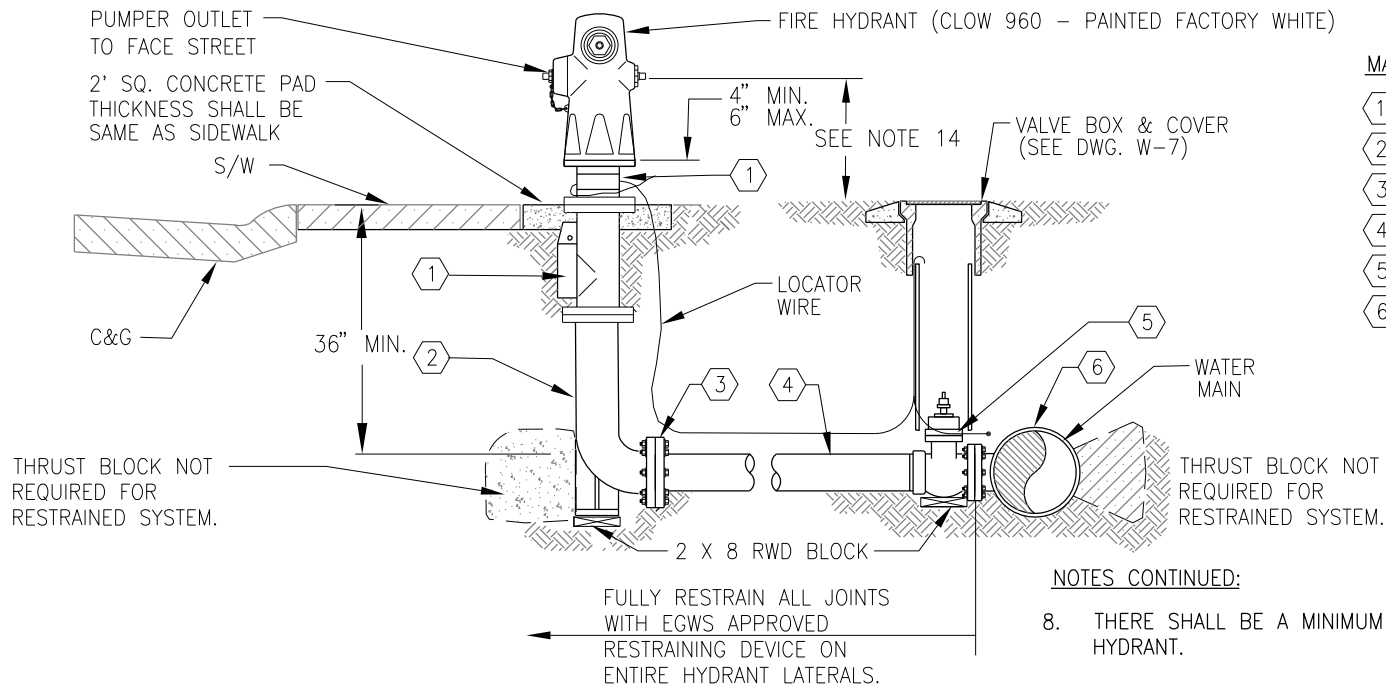
1. IN COMMERCIAL AREAS, FIRE HYDRANTS SHALL BE PROTECTED FROM VEHICULAR DAMAGE BY BOLLARDS AND ACCESSIBLE TO FIRE PROTECTION EQUIPMENT, SEE DWG. W-22.
2. TYPE OF HYDRANT SHOWN IS FOR ILLUSTRATION ONLY.
3. GATE VALVE SHALL BE FLANGED TO THE WATER MAIN.
4. LOWEST CAP NUT ON HYDRANT SHALL BE 20" MIN. AND 24" MAX. ABOVE TOP OF CONCRETE PAD.
5. THESE JOINTS SHALL BE FLANGE, OR RESTRAINED MECHANICAL JOINTS WITH EGWS APPROVED RESTRAINING DEVICE.
6. ALL METALLIC PIPES AND FITTINGS SHALL BE ENCASED WITH 8 MIL PLASTIC SO THAT NO SOIL IS IN CONTACT WITH THE PIPES AND FITTINGS.



**Elk Grove Water Service  
FIRE HYDRANT ASSEMBLY -  
GATE VALVE IN STREET**

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS: T. OUELLETTE

**W-2A**



#### MATERIAL LIST:

- ① BREAKOFF CHECK VALVE ASSEMBLY
- ② WET BARREL HYDRANT BURY
- ③ MECHANICAL JOINT RETAINER GLANDS
- ④ DUCTILE IRON PIPE SPOOL
- ⑤ 6" FLG X MJ GATE VALVE
- ⑥ FLG X MJ TEE, SEE DWG. W-20

#### NOTES CONTINUED:

- 8. THERE SHALL BE A MINIMUM OF 18" HORIZONTAL CLEARANCE AROUND HYDRANT.
- 9. WHEN PLACED ADJACENT TO CURB, HYDRANT PORT SHALL BE 24" FROM FACE OF CURB.
- 10. CONCRETE THRUST BLOCKS NOT REQUIRED FOR RESTRAINED SYSTEM.
- 11. EXTENSIONS REQUIRED FOR HYDRANT SYSTEMS SHALL BE INSTALLED TO THE MANUFACTURER'S SPECIFICATIONS, SEE DWG. W-7.
- 12. FIRE HYDRANTS SHALL BE PLACED TO PROVIDE A MINIMUM OF 5' CLEARANCE FROM DRIVEWAYS, POLES, AND OTHER OBSTRUCTIONS.
- 13. HYDRANT PUMPER PORT SHALL FACE DIRECTION OF ACCESS.
- 14. LOWEST CAP NUT ON HYDRANT SHALL BE 20" MIN. TO 24" MAX. ABOVE TOP OF CONCRETE PAD.
- 15. ALL METALLIC PIPES AND FITTINGS SHALL BE ENCASED WITH 8 MIL PLASTIC SO THAT NO SOIL IS IN CONTACT WITH THE PIPES AND FITTINGS.

#### NOTES:

- 1. IN COMMERCIAL AREAS, FIRE HYDRANTS SHALL BE PROTECTED FROM VEHICULAR DAMAGE AND ACCESSIBLE TO FIRE PROTECTION EQUIPMENT, SEE DWG. W-22.
- 2. DETAILS SHOWN FOR VALVES ON HYDRANT LATERALS SHALL ALSO APPLY TO VALVES ON MAINS.
- 3. TYPE OF HYDRANT SHOWN IS FOR ILLUSTRATION ONLY.
- 4. GATE VALVE SHALL BE FLANGE CONNECTED TO THE WATER MAIN.
- 5. BREAKAWAY SPOOL EXTENTIONS ARE NOT ALLOWED WITHOUT ENGINEERS APPROVAL.
- 6. WHEN PIPE IS SHORTER THAN 18", NO JOINTS ALLOWED. USE MECHANICAL JOINT RETAINER GLANDS. TWO 3/4" GALV. TIE RODS MAY BE USED IN LIEU OF OTHER EGWS APPROVED RESTRAINING DEVICES FOR INSTALLATIONS LESS THAN 18" LONG. TIE RODS SHALL BE COATED WITH TWO COATS BITUMASTIC.
- 7. WHEN PIPE IS LONGER THAN 18", RETAINER GLANDS NOT REQUIRED.



## Elk Grove Water Service FIRE HYDRANT ASSEMBLY - BEHIND SIDEWALK

REV. DATE  
EGWS SIGNATURE

REVISION

DATE: JULY, 2002

PROJECT: 8030.001

DRAWN BY: D. DALY

CHECKED BY: S. MYERS

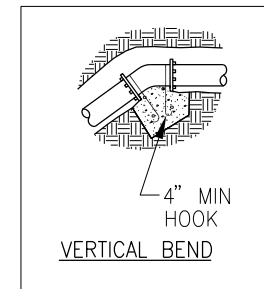
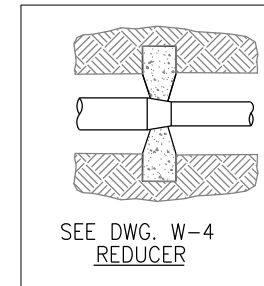
EGWS: T. OUELLETTE

# W-2B



# REQUIRED BEARING AREA - SQUARE FEET

TYPE OF FITTING		90° BEND	45° BEND	11 1/4 BEND 22 1/2 BEND	TEE OR DEAD END	TEE W/ PLUG	CROSS W/ PLUG	CROSS W/ PLUGS
TYPICAL INSULATION								
SIZE OF PIPE	4"	2	1	1	2	2	2	2
	6"	4	2	1	3	4	4	4
	8"	7	4	2	5	7	7	7
	10"	12	6	3	8	12	12	12
	12"	16	10	5	12	16	16	16



## NOTES:

- THRUST BLOCKS TO BE CONSTRUCTED OF CLASS "B" CONCRETE.
- AREAS GIVEN ARE FOR CLASS 150 PIPE AT TEST PRESSURE OF 150 P.S.I. IN SOIL WITH 2000 P.S.F. BEARING CAPACITY. INSTALLATIONS USING DIFFERENT PIPE, TEST PRESSURES, AND OR SOIL TYPES SHOULD ADJUST AREAS ACCORDINGLY, SUBJECT TO APPROVAL OF EGWS.
- THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED SOIL.
- JOINTS AND FACE OF PLUGS TO BE KEPT CLEAR OF CONCRETE.
- THRUST BLOCKS WILL BE REQUIRED FOR REDUCERS. THRUST BLOCKS FOR REDUCERS SHALL BE DESIGNED BY AN ENGINEER AND SHOWN ON THE IMPROVEMENT PLANS. (SEE DWG. W-4)
- PIPE JOINTS TO BE KEPT CLEAR OF CONCRETE.

## RODS FOR VERTICAL BENDS

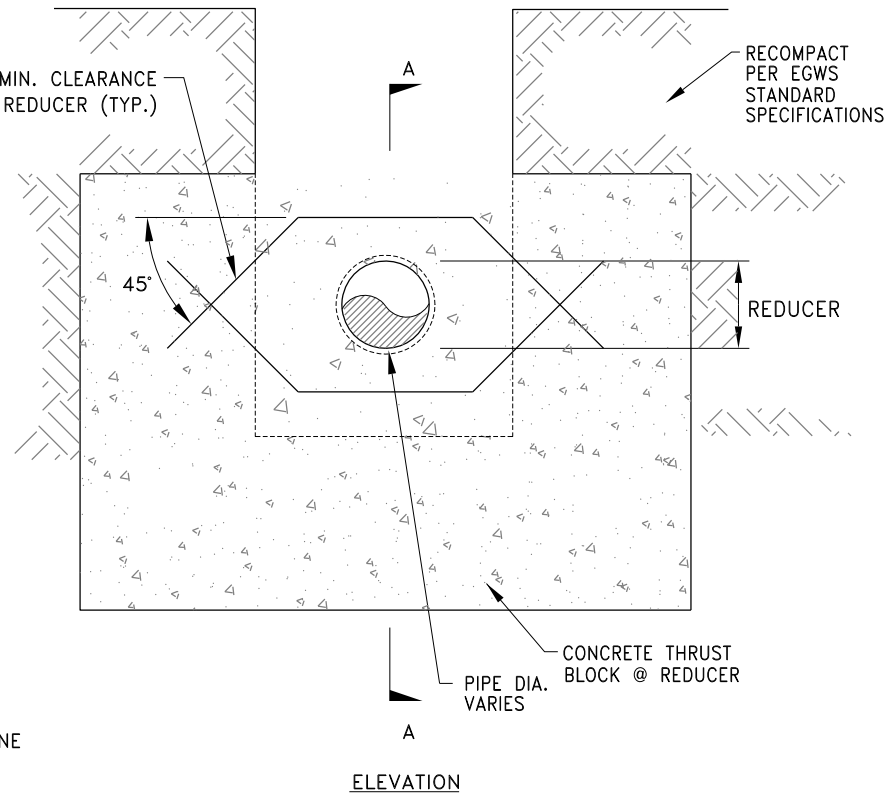
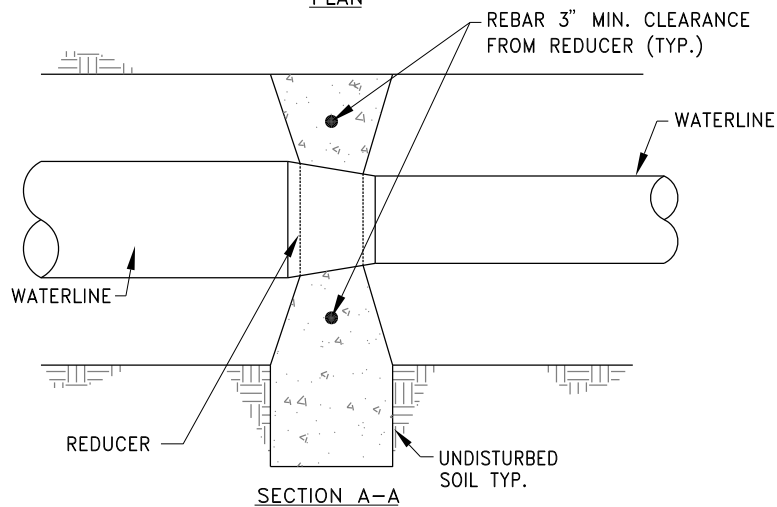
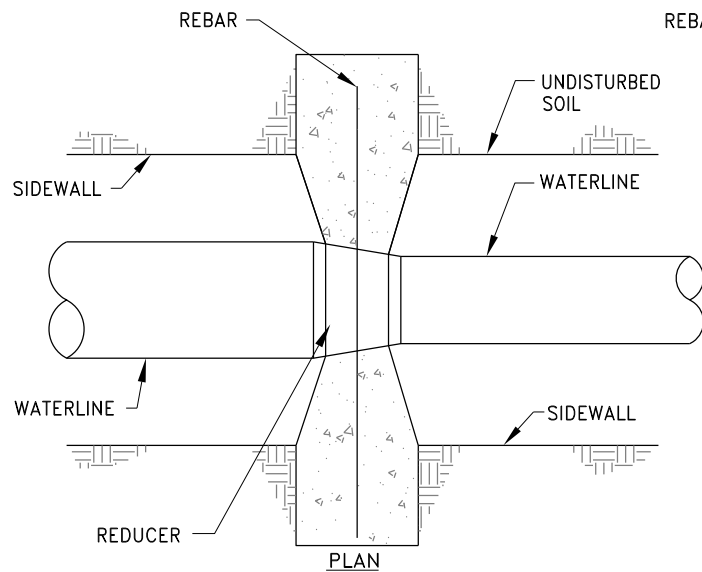
FITTING SIZE	ROD SIZE	EMBEDMENT
12" AND LESS	#6	30"
14"-16"	#8	36"



## Elk Grove Water Service THRUST BLOCK BEARING AREA

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

**W-3**



**NOTES:**

1. ALL NOTES FOR STD. DWG. W-3 EGWS FOR THRUST BLOCKS SHALL APPLY.



## Elk Grove Water Service THRUST BLOCK REDUCER

REV. DATE  
EGWS SIGNATURE

REVISION

DATE: JULY, 2002

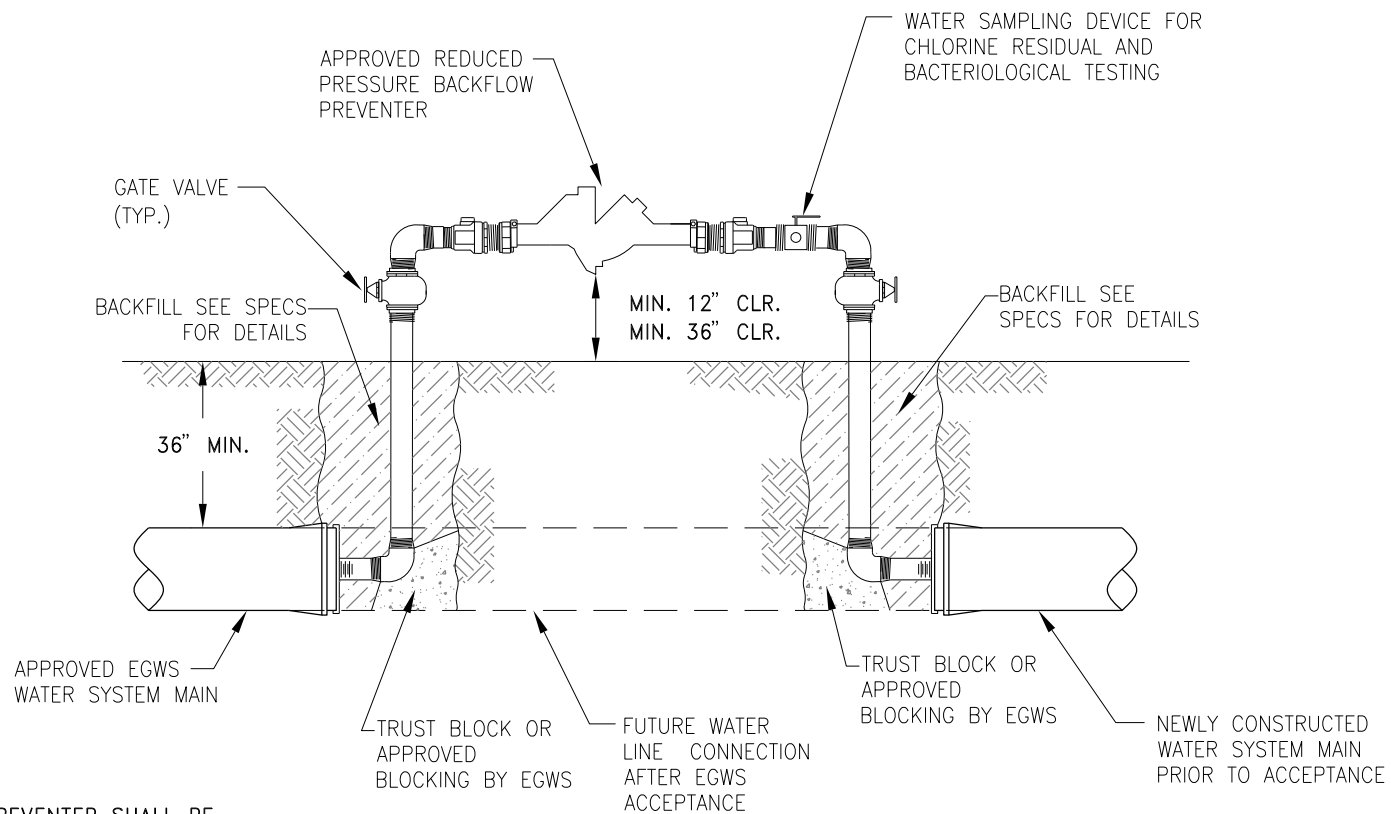
PROJECT: 8030.001

DRAWN BY: D. DALY

CHECKED BY: S. MYERS

EGWS : T. OUELLETTE

# W-4



**NOTES:**

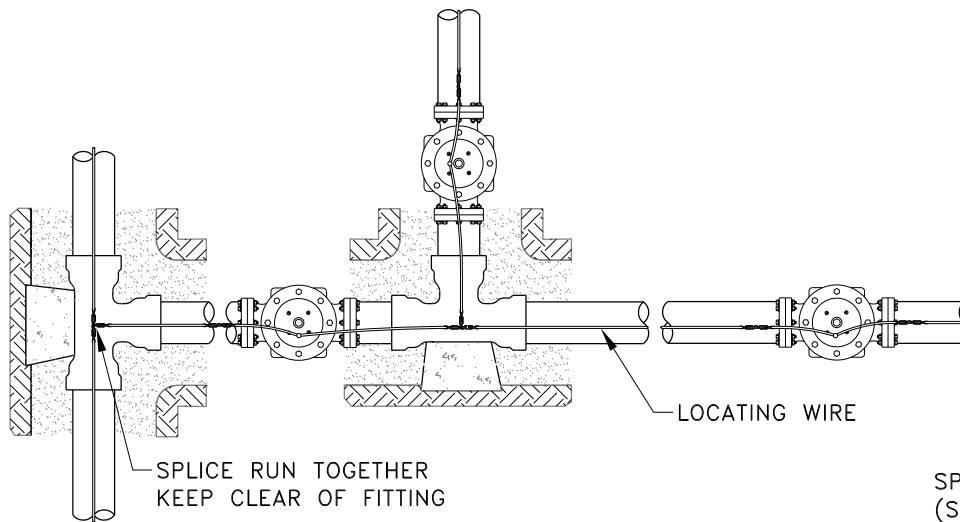
1. REDUCED PRESSURE BACKFLOW PREVENTER SHALL BE LISTED ON THE STATE OF CALIFORNIA'S DEPT. OF HEALTH SERVICES MOST RECENT LIST OF APPROVED REDUCED PRESSURE BACKFLOW PREVENTERS.



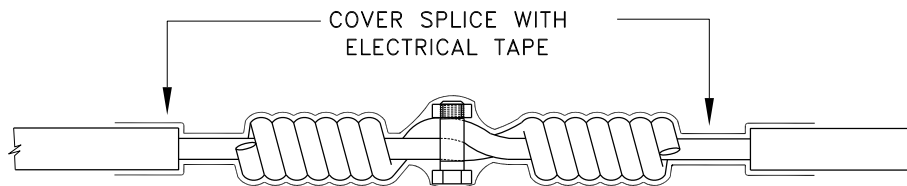
**Elk Grove Water Service  
TEMPORARY WATER  
MAIN TIE-IN CONNECTION**

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

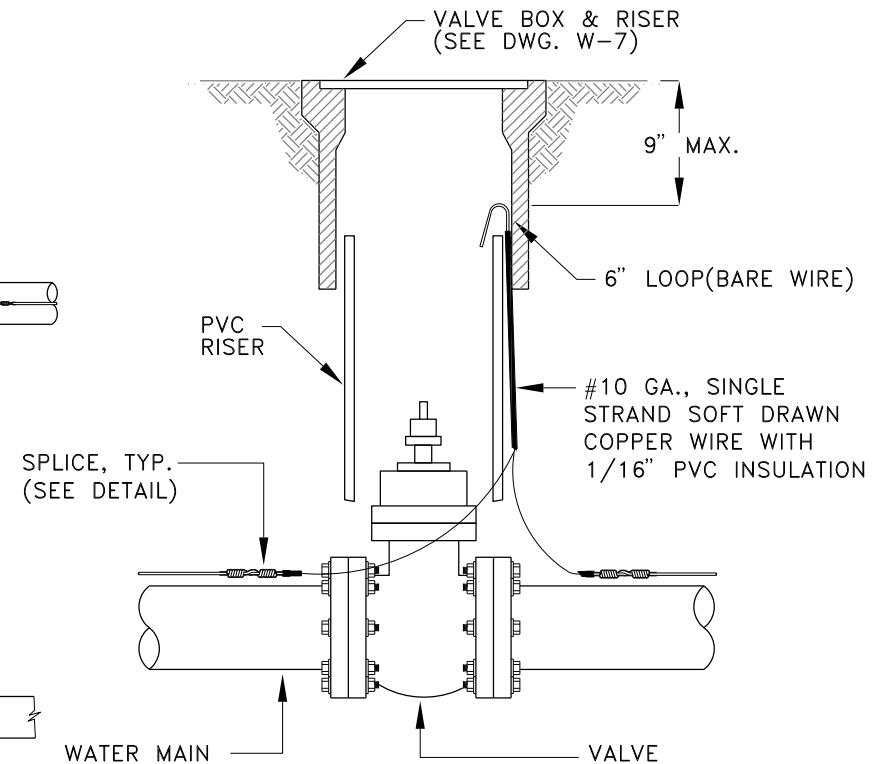
**W-5**



TYPICAL LAYOUT



SPLICE DETAIL



VALVE DETAIL

NOTES:

1. WIRE SHALL BE CONTINUOUS BETWEEN VALVE BOXES, EXCEPT AS NOTED.
2. LOCATING WIRE SHALL BE LAID ON TOP OF THE WATER MAIN, AND SHALL BE TAPED TO PIPE AT 10' MAX. INTERVALS AND AT ALL CROSSES, TEES, AND ELBOWS.

NOTES CONTINUED:

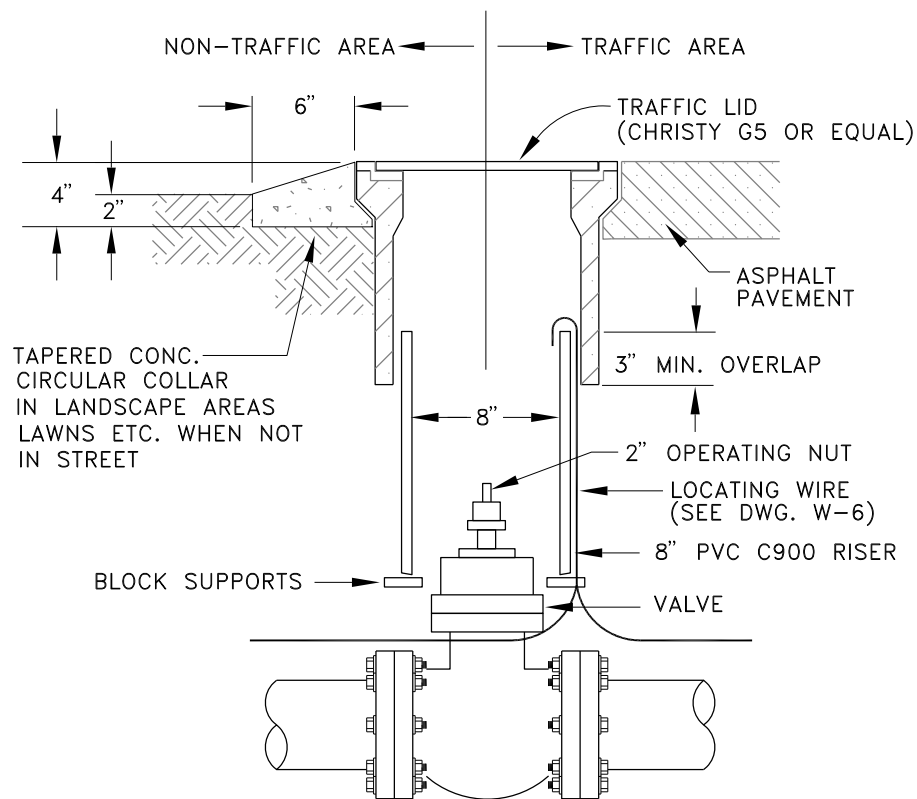
3. CONTRACTOR SHALL CONDUCT A CONTINUITY TEST ON ALL LOCATING WIRE SPLICES.
4. WIRE SHALL BE SPLICED WITH BRASS CONNECTORS UNLESS OTHERWISE SPECIFIED BY EGWS REPRESENTATIVE.



**Elk Grove Water Service  
LOCATING WIRE FOR  
WATER MAINS & SERVICES**

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

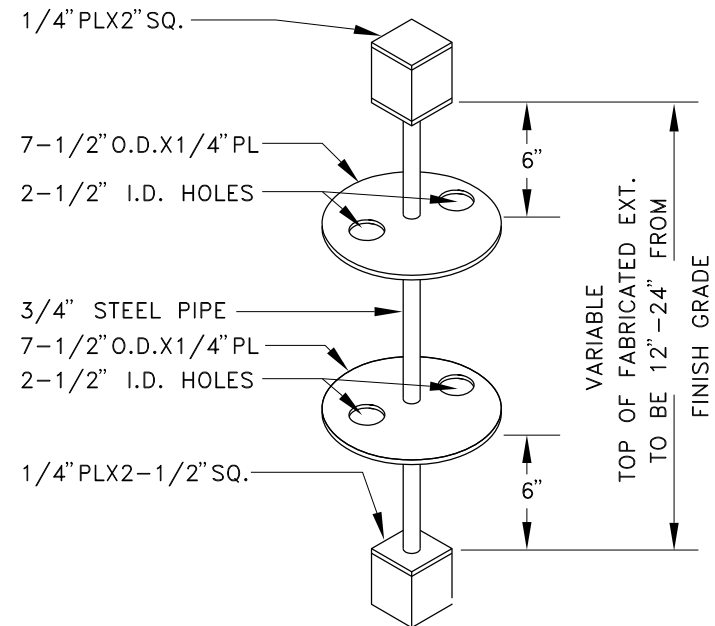
**W-6**



TRAFFIC VALVE BOX

NOTES:

1. SET VALVE BOX TO FINISHED GRADE. IN AREAS WHERE THE FINISHED GRADE HAS NOT BEEN DEFINED, PLACE 4"X4" LOCATING POST PAINTED BLUE WITHIN 1 FOOT OF VALVE BOX. POST SHALL BE 6 FEET IN LENGTH, BURIED 3 FEET.
2. VALVE BOX AND RISER TO BE SET PLUMB AND CENTERED OVER WATER VALVE NUT. DO NOT REST RISER ON VALVE.



VALVE OPERATING NUT EXTENSION  
REQUIRED WHERE VALVE NUT IS IN EXCESS OF  
30" BELOW FINISH GRADE.



Elk Grove Water Service  
**VALVE BOX & RISER  
INSTALLATION**

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

**W-7**

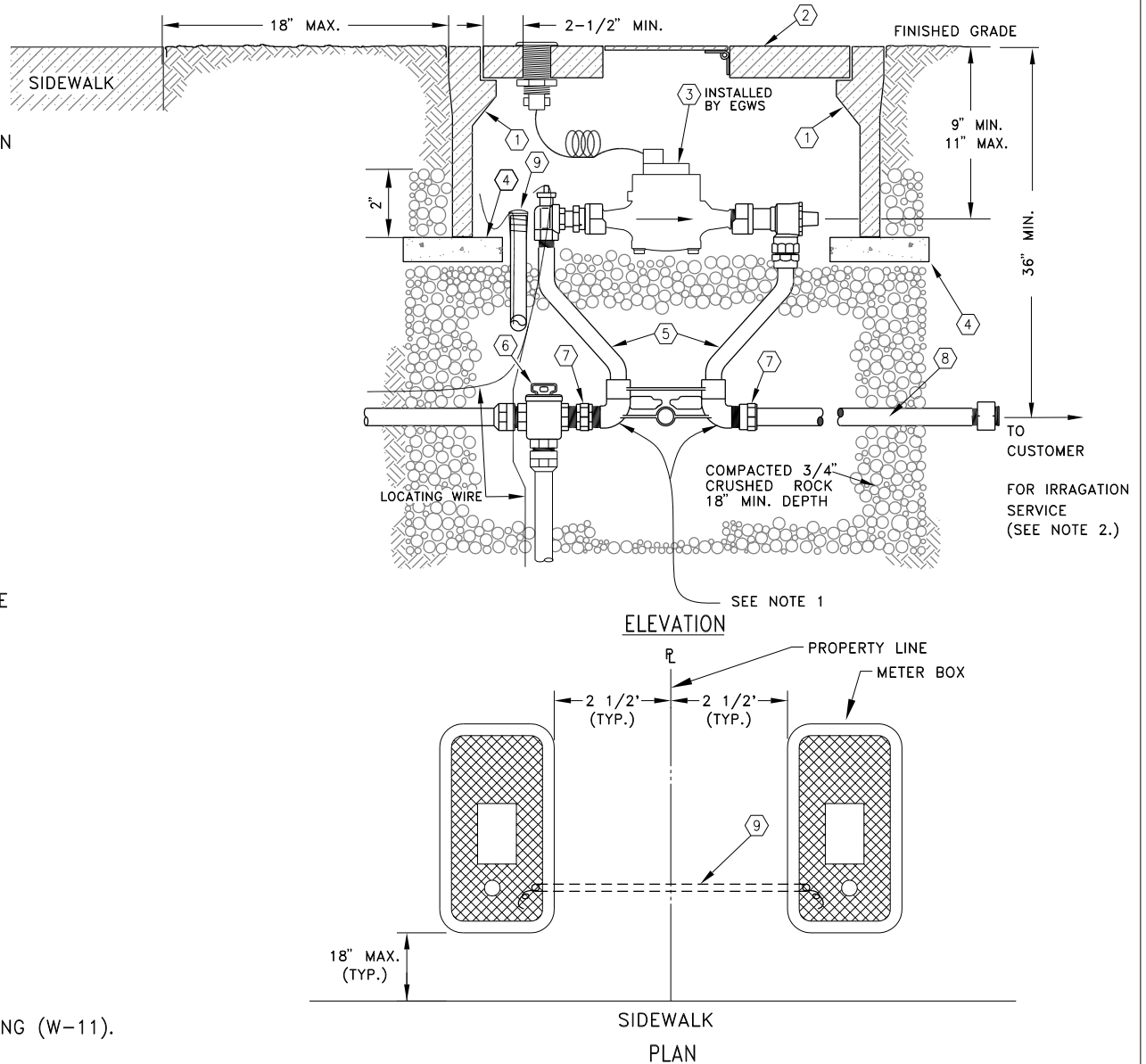
# MATERIAL LIST:

- ① REINFORCED CONCRETE UTILITY BOX (CHRISTY B30 OR EQUAL). TRAFFIC RATED, WHERE NEEDED.
- ② REINFORCED CONCRETE COVER WITH A HINGED CAST IRON LID AND A 1-3/4" PRE-CAST HOLE (CHRISTY B30G COVER OR EQUAL). TRAFFIC RATED, WHERE NEEDED.
- ③ 1" INSENSYS (SENSUS) SR II TR/PL WATER METER (100 CU. FT. REGISTER) TO BE INSTALLED BY EGWS UPON CONTRACTOR OBTAINING BUILDING PERMIT.
- ④ 3/4" TO 1"X4"X16" CONCRETE BLOCKS TO HELP LEVEL AND SUPPORT VALVE BOX. USE MINIMUM OF ONE BLOCK ON ALL FOUR SIDES OF METER BOX. COVER ANY OPENINGS OR HOLES IN UTILITY BOX WITH CONCRETE BLOCKS.
- ⑤ 1" COPPER SETTER WITH LOCKWING ANGLE METER STOP FULL PORTED BALL TYPE AND ANGLE METER DUAL CHECK VALVE MUELLER B-2404-2, OR EQUAL.
- ⑥ 1" CTS CURB STOP (COMP. BY F.I.P.T.)\*, AND 1" CTS (COMP. BY F.I.P.T.)\*. MUELLER BALL ANGLE METER VALVE - FOR SHORT SIDE SERVICES. (SEE DETAIL W-1).
- ⑦ BRONZE ADAPTER (AS REQUIRED).
- ⑧ 1" X 36" BRONZE OR TYPE K COPPER NIPPLE WITH THREADED COUPLING AND THREADED PLUG.
- ⑨ INSTALL 1" DIA. SCH. 80 CONDUIT WHEN METER BOXES ARE ADJACENT OR WITHIN 20 FT. FROM EACH OTHER. INSTALL PULL TAPE AND SEAL OPEN ENDS OF CONDUIT SECURELY WITH TAPE.

## NOTE:

1. ALL METALLIC PIPES AND FITTINGS SHALL BE ENCASED WITH 8 MIL PLASTIC SO THAT NO SOIL IS IN CONTACT WITH THE PIPES AND FITTINGS.
2. FOR RP IRRIGATION SERVICE DEVICE PLEASE SEE DRAWING (W-11).

\* COMPRESSION BY F.I.P.T. (FEMALE IRON PIPE THREADS)



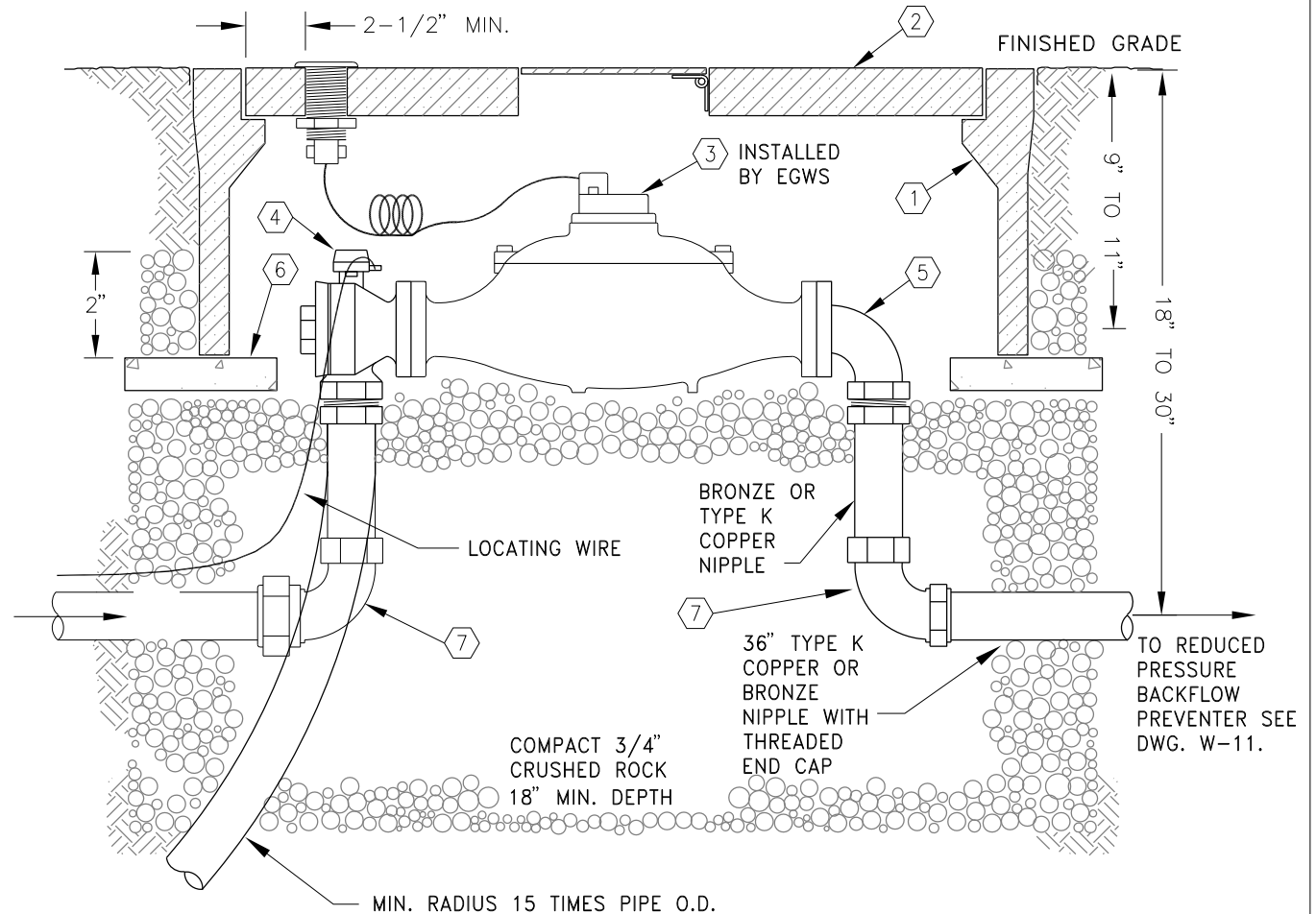
## Elk Grove Water Service 1" RESIDENTIAL & IRRIGATION METERED WATER SERVICE

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

**W-8A**

# **MATERIAL LIST:**

- ① REINFORCED CONCRETE UTILITY BOX (CHRISTY B36 FOR 1-1/2" & 2", B30 FOR 1", OR EQUAL).
- ② REINFORCED CONCRETE COVER WITH A HINGED CAST IRON LID AND A 1-3/4" PRE-CAST HOLE LOCATED OPPOSITE WATER LABEL(CHRISTY B36G COVER OR EQUAL).
- ③ 1 1/2" OR 2" INVENSYS (SENSUS) SR TR/PL WATER METER (100 CU. FT. REGISTER) TO BE INSTALLED BY EGWS UPON CONTRACTOR OBTAINING BUILDING PERMIT.
- ④ FLANGED WINGED ANGLE METER STOP WITH TEFLON COATED BALL.
- ⑤ OVAL FLANGED 90° BRONZE FITTING.
- ⑥ 3/4" TO 1"x4"x16" CONCRETE BLOCK TO HELP SUPPORT VALVE BOX, USE ONE BLOCK ON ALL FOUR SIDES OF METER BOX. COVER ANY OPENINGS OR HOLES IN THE SIDE OF THE UTILITY BOX WITH CONCRETE BLOCK.
- ⑦ BRONZE COMPRESSION BY THREADED 90° FITTING.



## **NOTE:**

1. ALL METALLIC PIPES AND FITTING THAT ARE BURIED SHALL BE ENCASED WITH 8 MIL PLASTIC SO THAT NO SOIL IS IN CONTACT WITH THE PIPES AND FITTINGS.



## **Elk Grove Water Service 1 1/2" & 2" COMMERCIAL METERED WATER SERVICE**

REV. DATE  
EGWS SIGNATURE

REVISION

DATE: JULY, 2002

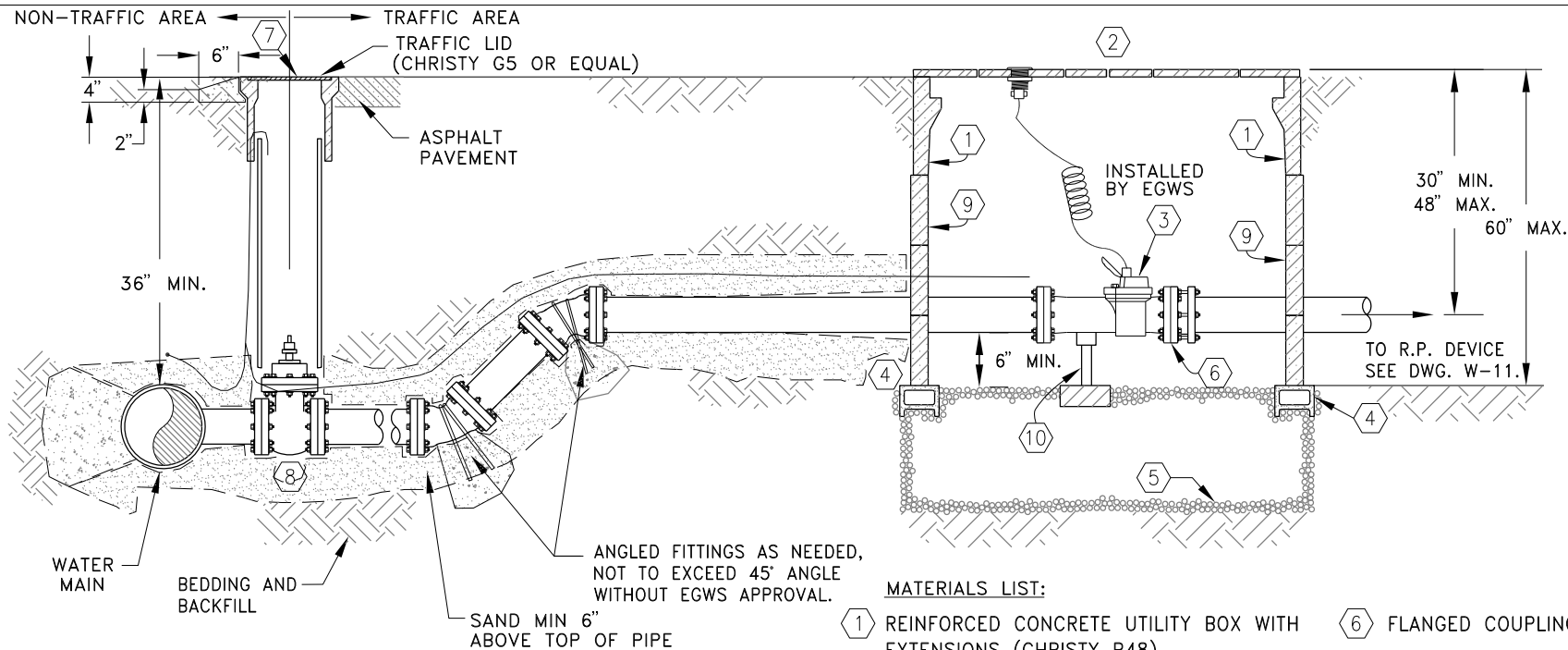
PROJECT: 8030.001

DRAWN BY: D. DALY

CHECKED BY: S. MYERS

EGWS : T. OUELLETTE

**W-8B**



#### NOTES:

1. WHEN NEEDED CONCRETE BLOCKS SHALL BE USED TO BLOCK ANY OPENING OR CUT OUT PORTIONS OF THE METER BOX NOT UTILIZED (MINIMUM OF 1" THICK BLOCK ARE REQUIRED).
2. ALL 4" TO 6" DIA. PIPE BETWEEN THE WATER MAIN AND THE METER SHALL BE DUCTILE IRON WITH POLYETHYLENE ENCASEMENT AND 6-INCHES OF SAND BACKFILL AND 6-INCHES OF SAND BEDDING. JOINTS BETWEEN MAIN AND METER SHALL BE RESTRAINED.
3. 3" PIPE SHALL BE TYPE K COPPER OR BRONZE WRAPPED WITH 8 MIL PLASTIC AND HAVE SAND BEDDING AND BACKFILL. VALVES ON 3-INCH DIAMETER PIPE SHALL HAVE BRONZE CORPORATION AND CURB VALVES WITH TEFLON COATED BALLS.
4. VALVES ATTACHED TO THE MAIN MUST HAVE FLANGED ENDS.
5. INSTALL LOCATING WIRE PER DWG. W-6.

#### MATERIALS LIST:

- 1 REINFORCED CONCRETE UTILITY BOX WITH EXTENSIONS (CHRISTY B48).
- 2 2 PIECE STEEL CHECKER PLATE W/ TWO 10" ROUND SELF-CLOSING READING LIDS AND 1-3/4" HOLE FOR TOUCH READ MODULE IN ONE READING LID (CHRISTY B48-62G COVER).
- 3 3"-6" OMNI C2 (SENSUS) WATER METER (100 CU. FT. REGISTER) TO BE INSTALLED BY EGWS UPON CONTRACTOR OBTAINING BUILDING PERMIT.
- 4 CONCRETE BLOCKS SHALL BE PLACED ALONG THE ENTIRE PERIMETER TO SUPPORT BOX.
- 5 3/4" CRUSHED ROCK SUB-BASE, 12" TO 18" DEEP, COMPACT TO 90% COMPACTION.
- 6 FLANGED COUPLING ADAPTER.
- 7 VALVE BOX AND LID(SEE W-7).
- 8 GATE VALVE, WITH BOTH ENDS FLANGED.
- 9 METER BOX EXTENSION (TYPICAL).
- 10 ADJUSTABLE PIPE SUPPORT W/BLOCKING.



## Elk Grove Water Service 3"-6" COMMERCIAL METERED WATER SERVICE

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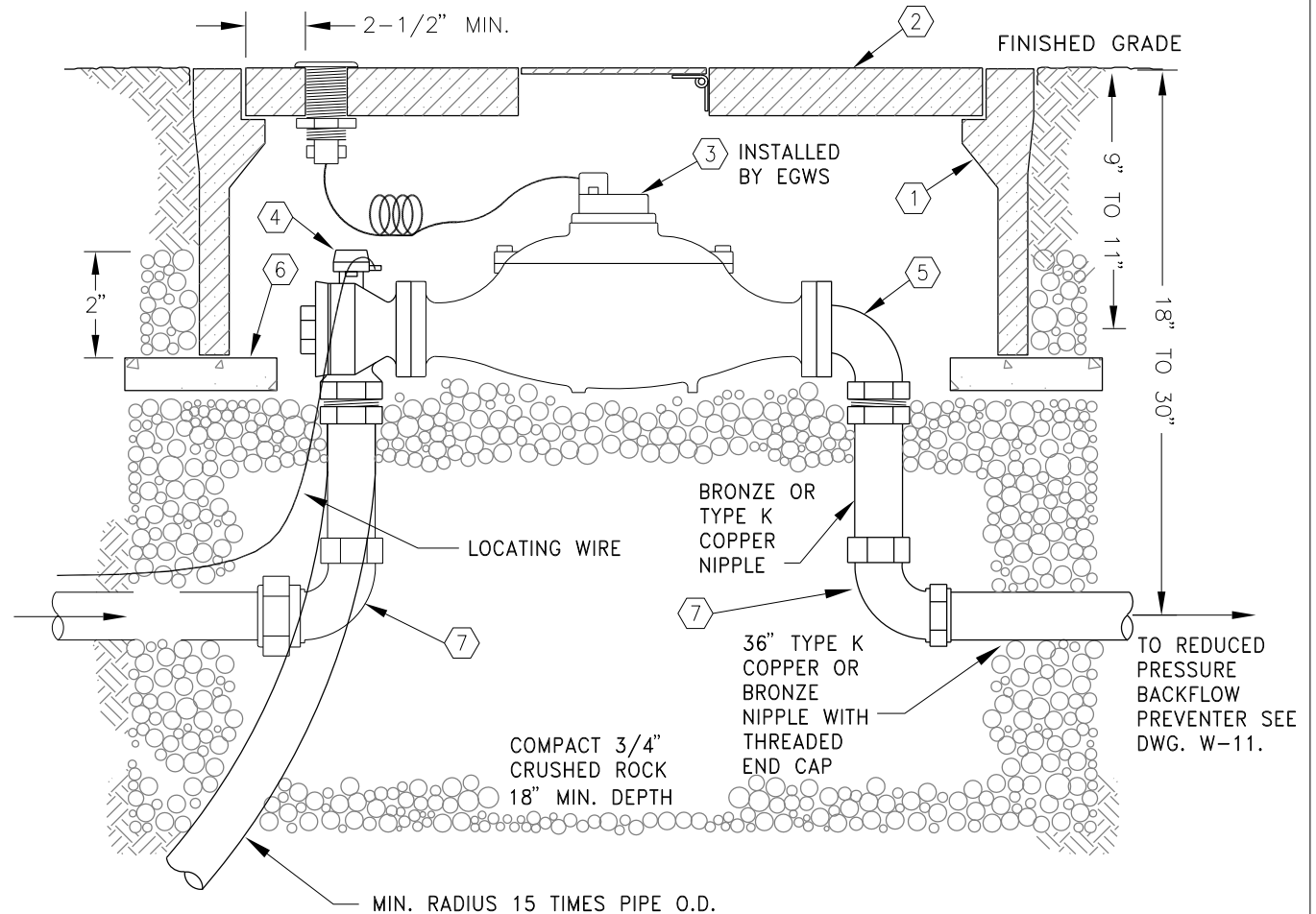
EGWS : T. OUELLETTE

# W-8C



# **MATERIAL LIST:**

- ① REINFORCED CONCRETE UTILITY BOX (CHRISTY B36 FOR 1-1/2" & 2", B30 FOR 1", OR EQUAL).
- ② REINFORCED CONCRETE COVER WITH A HINGED CAST IRON LID AND A 1-3/4" PRE-CAST HOLE LOCATED OPPOSITE WATER LABEL(CHRISTY B36G COVER OR EQUAL).
- ③ 1 1/2" OR 2" INVENSYS (SENSUS) 1 1/2" W-120 DRS OR 2" W-160 DRS TR/PL WATER METER (100 CU. FT. REGISTER) TO BE INSTALLED BY EGWS UPON CONTRACTOR OBTAINING BUILDING PERMIT.
- ④ FLANGED WINGED ANGLE METER STOP WITH TEFLON COATED BALL.
- ⑤ OVAL FLANGED 90° BRONZE FITTING.
- ⑥ 3/4" TO 1"x4"x16" CONCRETE BLOCK TO HELP SUPPORT VALVE BOX, USE ONE BLOCK ON ALL FOUR SIDES OF METER BOX. COVER ANY OPENINGS OR HOLES IN THE SIDE OF THE UTILITY BOX WITH CONCRETE BLOCK.
- ⑦ BRONZE COMPRESSION BY THREADED 90° FITTING.



## **NOTE:**

1. ALL METALLIC PIPES AND FITTING THAT ARE BURIED SHALL BE ENCASED WITH 8 MIL PLASTIC SO THAT NO SOIL IS IN CONTACT WITH THE PIPES AND FITTINGS.



## **Elk Grove Water Service 1 1/2" & 2" IRRIGATION METERED WATER SERVICE**

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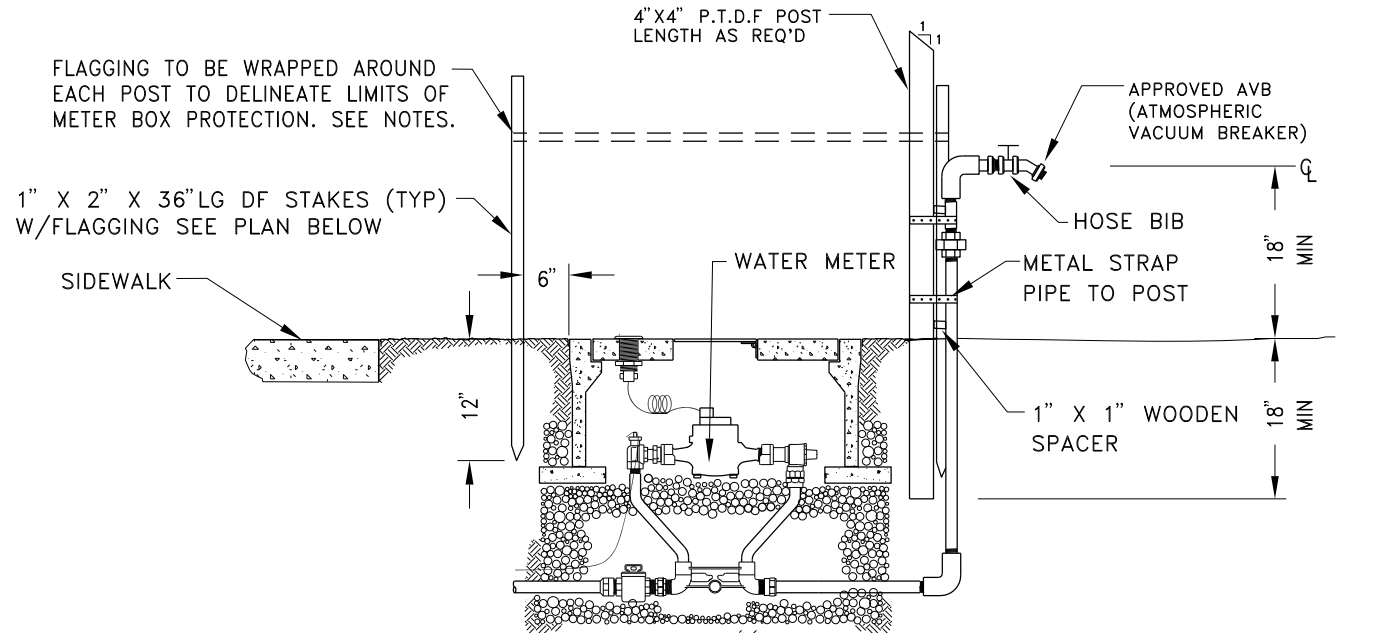
CHECKED BY: S. MYERS

EGWS : T. OUELLETTE

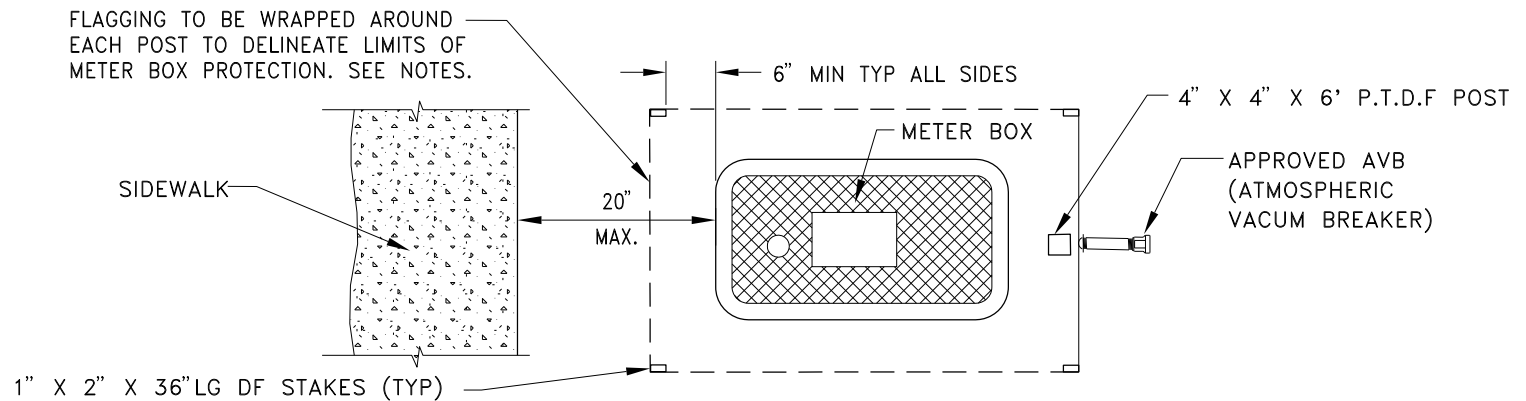
**W-8D**

**NOTES:**

1. CONTRACTOR IS RESPONSIBLE FOR REPAIR AND COSTS OF ANY DAMAGE TO METER BOXES DURING CONSTRUCTION.
2. METER BOXES SHALL BE KEPT FREE OF DEBRIS AT ALL TIMES.



**ELEVATION**



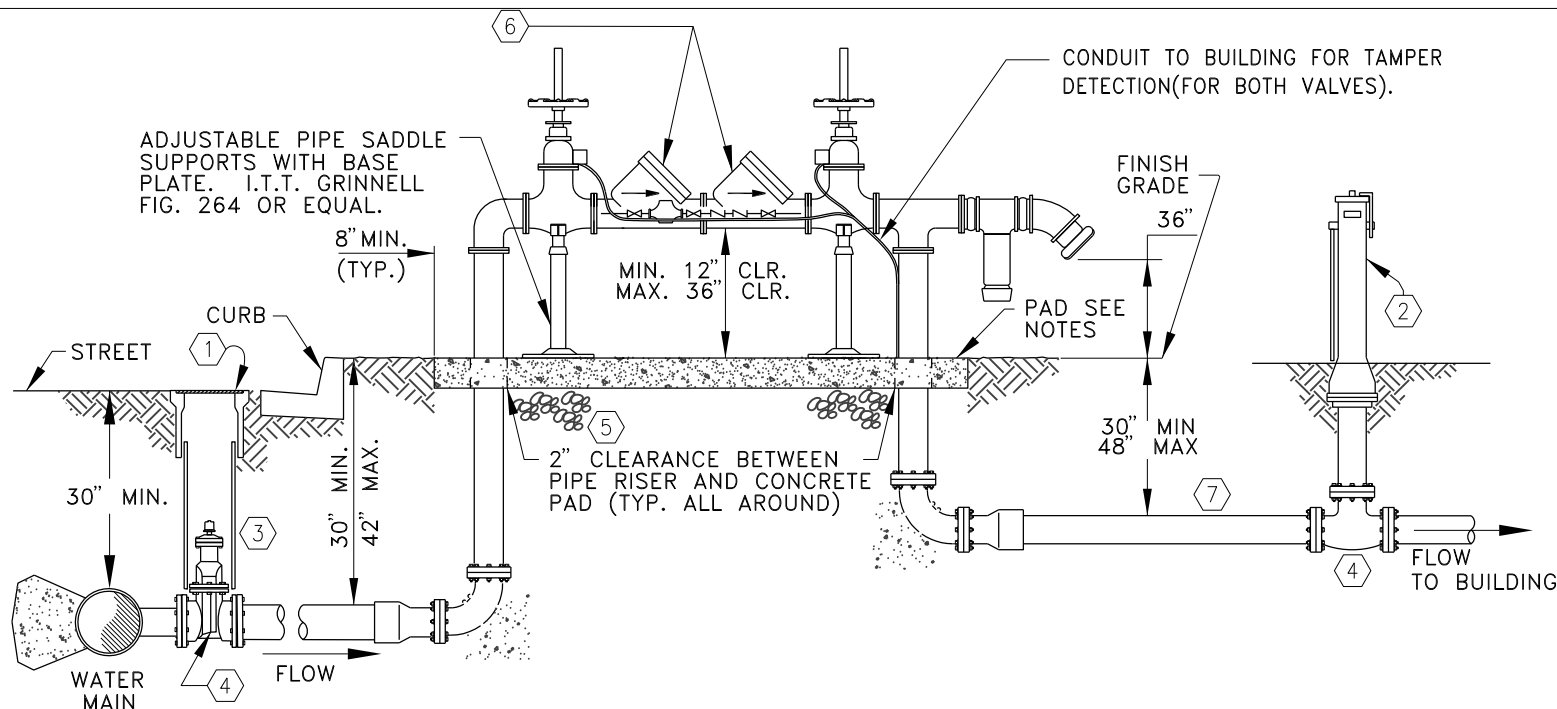
**PLAN**



**Elk Grove Water Service  
METER BOX PROTECTION  
& TEMPORARY WATER**

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		EGWS : T. OUELLETTE

**W-9**



#### NOTES:

1. INSTALL LOCATING WIRE PER STD. DWG. W-6.
2. ALL JOINTS BETWEEN MAIN AND DOUBLE DETECTOR CHECK SHALL BE FLANGED.
3. CHECK VALVE SHALL BE U.L., F.M. APPROVED.
4. ALL METALLIC PIPE AND FITTINGS SHALL BE ENCASED WITH 8 MIL POLYETHYLENE PER AWWA C105, SO THAT NO SOIL IS IN CONTACT WITH THE PIPE, FITTINGS, AND WIRE.

#### MATERIAL LIST:

- 1 VALVE BOX AND LID.(SEE STD. DWG. W-7).
- 2 FLANGED POST INDICATOR VALVE WITH BREAKAWAY LOCK. (OPTIONAL FOR A SINGLE FIRE RISER INSTALLATION.)
- 3 REINFORCED CONCRETE UTILITY BOX EXTENSIONS.
- 4 GATE VALVE, WITH BOTH ENDS FLANGED.
- 5 3/4" CRUSHED ROCK SUB-BASE, 12" TO 18" DEEP.
- 6 DOUBLE DETECTOR CHECK VALVE-TYPE AND BY PASS METER 5/8" X 3/4" SENSUS SR11 TR/PL CU. FT. REG. APPROVED BY THE FIRE DEPARTMENT AND EGWS.
- 7 DUCTILE IRON SPOOL.



## Elk Grove Water Service 4" & LARGER FIRE PROTECTION DETAIL

REV. DATE  
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REVISION

DATE: JULY, 2002

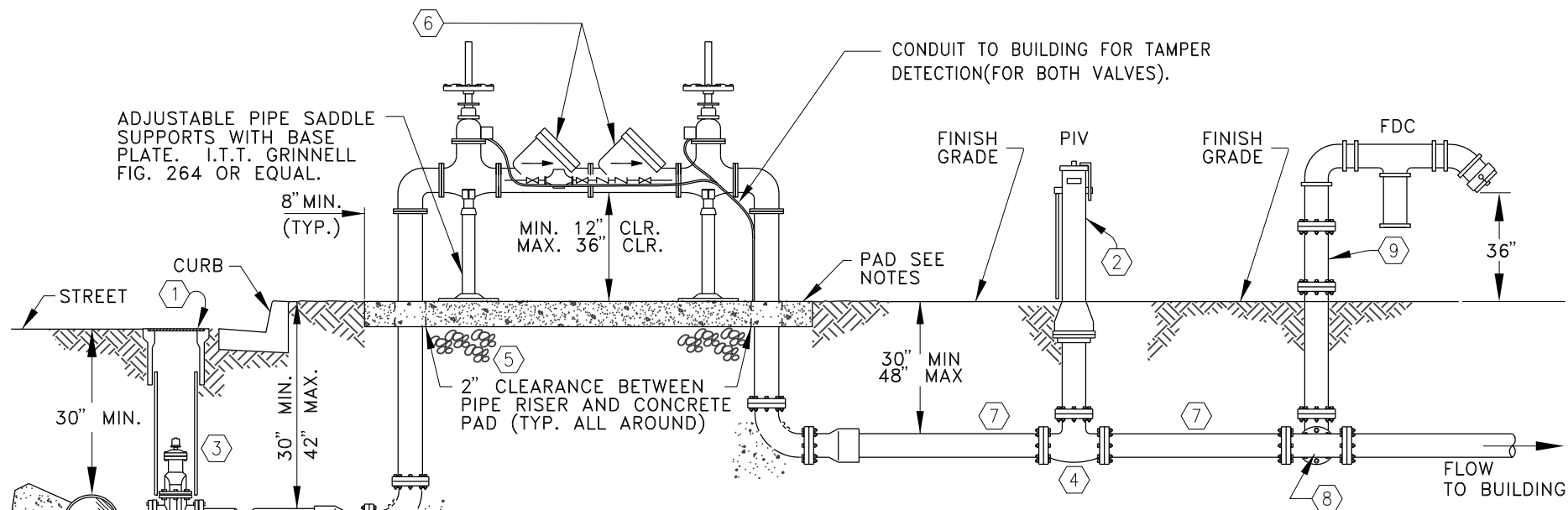
PROJECT: 8030.001

DRAWN BY: D. DALY

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EGWS : T. OUELLETTE

# W-10



# NOTES:

1. INSTALL LOCATING WIRE PER STD. DWG. W-6.
2. ALL JOINTS BETWEEN MAIN AND DOUBLE DETECTOR CHECK SHALL BE FLANGED.
3. CHECK VALVE SHALL BE U.L., F.M. APPROVED.
4. ALL METALLIC PIPE AND FITTINGS SHALL BE ENCASED WITH 8 MIL POLYETHYLENE PER AWWA C105, SO THAT NO SOIL IS IN CONTACT WITH THE PIPE, FITTINGS, AND WIRE.
5. ALL PIPING AND DEVICE SHALL BE PAINTED PER EGWS.

## MATERIAL LIST:

- 1 VALVE BOX AND LID.(SEE STD. DWG. W-7).
- 2 FLANGED POST INDICATOR VALVE WITH BREAKAWAY LOCK. (OPTIONAL FOR A SINGLE FIRE RISER INSTALLATION.)
- 3 REINFORCED CONCRETE UTILITY BOX EXTENSIONS.
- 4 GATE VALVE, WITH BOTH ENDS FLANGED.
- 5 3/4" CRUSHED ROCK SUB-BASE, 12" TO 18" DEEP.
- 6 DOUBLE DETECTOR CHECK VALVE-TYPE AND BY PASS METER 5/8" X 3/4" SENSUS SR11 TR/PL CU. FT. REG. APPROVED BY THE FIRE DEPARTMENT AND EGWS.
- 7 DUCTILE IRON SPOOL.
- 8 FLANGED TEE.
- 9 WATER CHECK VALVE.



## Elk Grove Water Service 4" & LARGER FIRE PROTECTION DETAIL (ALT. 1)

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EGWS SIGNATURE

REVISION

*[Signature]*

DATE: JULY, 2002

PROJECT: 8030.001

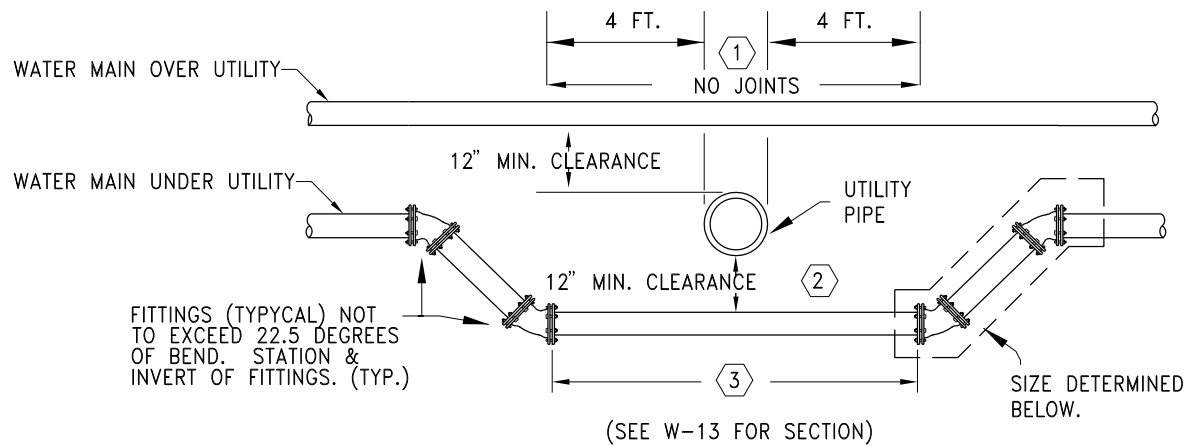
DRAWN BY: D. DALY

CHECKED BY: S. MYERS

EGWS : T. OUELLETTE

**W-10**

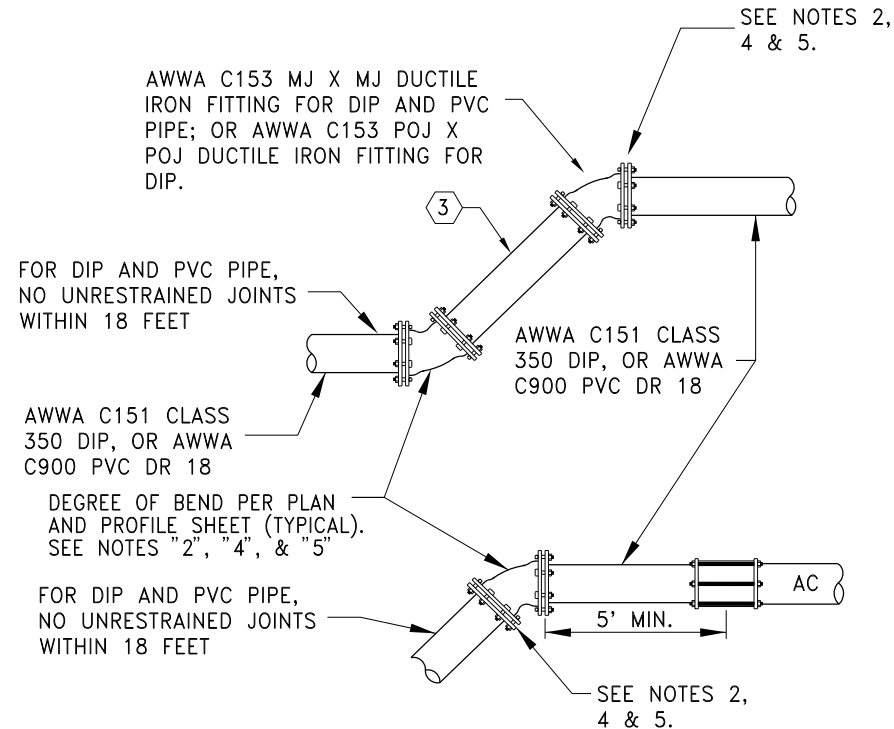




- 1 IF UTILITY BEING CROSSED IS NOT A STORM DRAIN, SEWER, OR OTHER WATER LINE, THEN THE "NO JOINT" REQUIREMENT DOES NOT APPLY.
- 2 IF THE UTILITY BEING CROSSED IS A SEWER, STORM DRAIN OR OTHER WATER LINE, THE TYPE OF PIPE MUST BE DUCTILE IRON OR AWWA C900 DR 14 PVC PIPE.
- 3 NO JOINTS ALLOWED IF LESS THAN 18 FEET. ALL JOINTS BETWEEN FITTINGS MUST BE RESTRAINED WITH EITHER OF THE METHODS DESCRIBED FOR DIP. BELL RESTRAINTS FOR PVC PIPE ARE NOT ALLOWED.

#### NOTES:

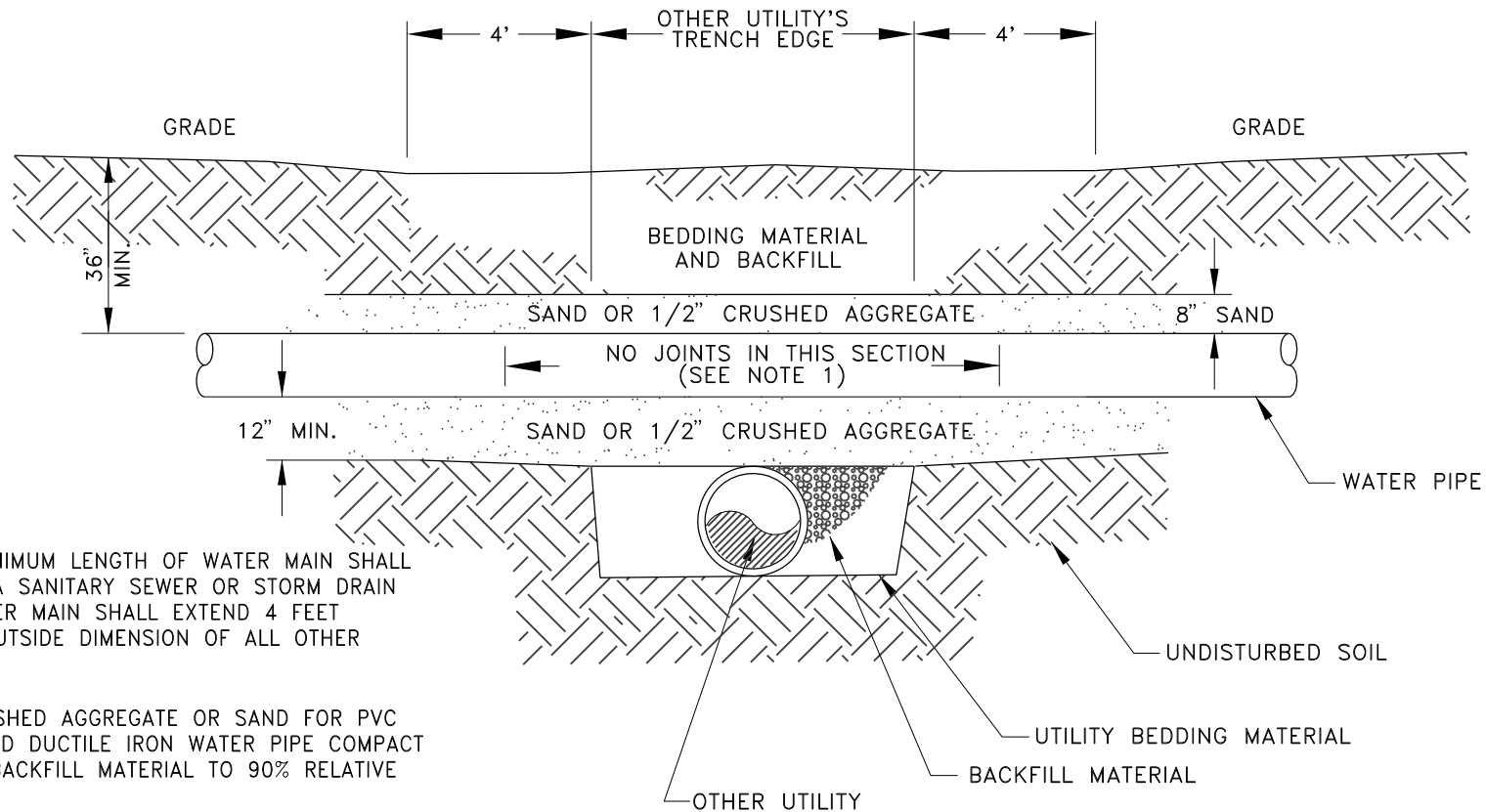
1. IF DIP IS USED, FITTINGS MAY HAVE BELL ENDS WITH U.S. PIPE FIELD LOK GASKETS FOR RESTRAINING DEVICES OR APPROVED EQUAL BY EGWS. BELL RESTRAINTS FOR PVC PIPE ARE NOT ALLOWED.
2. IF BEND IS TO EXCEED 22.5 DEGREES, THE BEND AND THE RESTRAINED LENGTH MUST BE APPROVED BY EGWS.
3. WRAP ALL DIP AND FITTINGS WITH 8 MIL. POLYETHYLENE ENCASUREMENT IN ACCORDANCE WITH AWWA C105.
4. RESTRAINING DEVICE FOR DIP: USE U.S. PIPE FIELD LOK GASKETS OR APPROVED EQUAL; FOR MJ JOINTS USE STAR PIPE PRODUCTS STARGRIP 3000, STAR PIPE PRODUCTS ALLGRIP 3600, EBAA MEGALUG 2000PV SERIES, OR APPROVED EQUAL BY EGWS.
5. RESTRAINING DEVICE FOR PVC PIPE: USE MJ FITTINGS WITH STAR PIPE PRODUCTS ALLGRIP 3600, EBAA MEGALUG 2000PV SERIES, OR APPROVED EQUAL BY EGWS.
6. SEE PLAN & PROFILE FOR RESTRAINED LENGTH AND DEGREE OF BEND.
7. THIS DETAIL IS FOR WATER PIPES 12" IN DIAMETER & SMALLER.



## Elk Grove Water Service UTILITY CROSSING

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EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS: T. OUELLETTE

# W-12



**NOTES:**

1. AN 8 FOOT MINIMUM LENGTH OF WATER MAIN SHALL EXTEND OVER A SANITARY SEWER OR STORM DRAIN PIPE. THE WATER MAIN SHALL EXTEND 4 FEET BEYOND THE OUTSIDE DIMENSION OF ALL OTHER UTILITIES.
2. USE 1/2" CRUSHED AGGREGATE OR SAND FOR PVC WATER PIPE AND DUCTILE IRON WATER PIPE COMPACT BEDDING AND BACKFILL MATERIAL TO 90% RELATIVE COMPACTION.

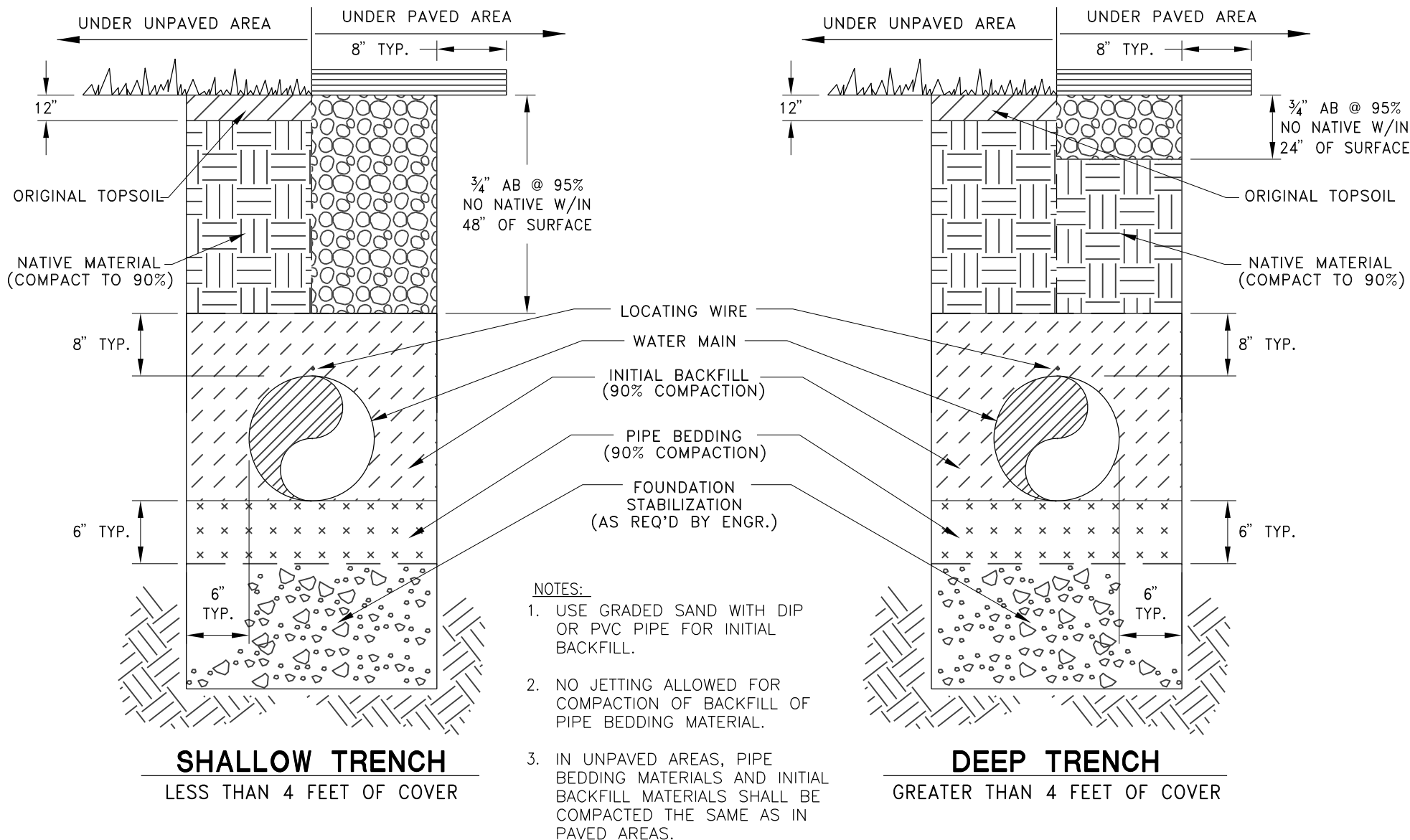


**Elk Grove Water Service  
UTILITY CROSSING UNDER  
EXISTING WATER MAIN**

REV. DATE	REVISION
EGWS SIGNATURE	<i>[Signature]</i>

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PROJECT: 8030.001
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CHECKED BY: S. MYERS
EGWS : T. OUELLETTE

**W-13**

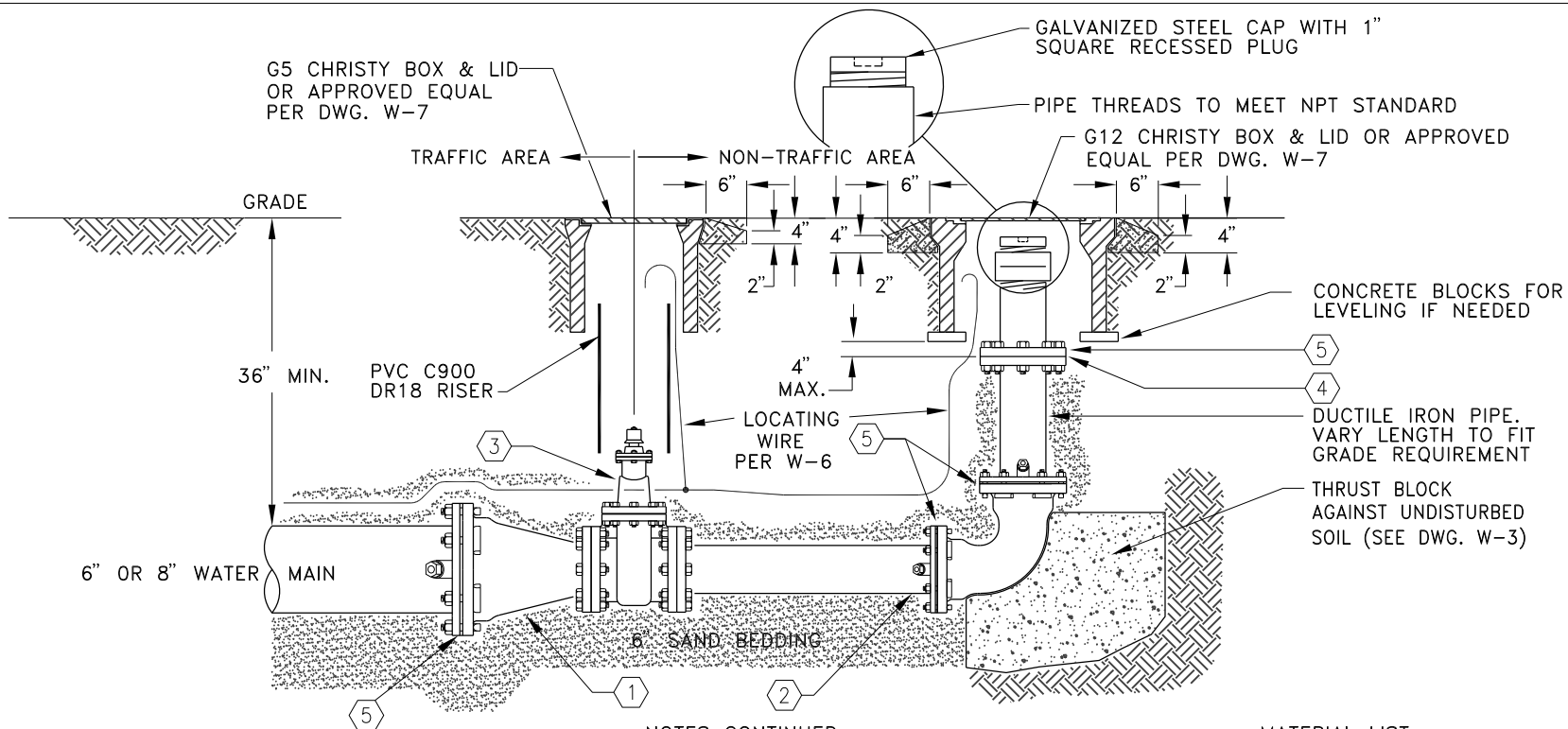


## Elk Grove Water Service TYPICAL TRENCH SECTION

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		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS: T. OUELLETTE

**W-14**





#### NOTES:

1. WRAP 4" GATE VALVE AND ALL METAL FITTINGS AND PIPE WITH 8 MIL POLYETHYLENE ENCASEMENT PER AWWA C105.
2. ALL FITTINGS SHALL HAVE A MINIMUM PRESSURE CLASS OF 200 PSI AND MEET AWWA C110 OR AWWA C153 STANDARDS.
3. PROVIDE 6 INCHES OF SAND BEDDING AND BACKFILL WITH SAND TO 6 INCHES ABOVE THE TOP OF PIPE AND FITTINGS, COMPACT TO 90% RELATIVE COMPACTION.
4. WRAP ALL GALVANIZED STEEL PIPE WITH 20 MIL OF POLYETHYLENE TAPE; DOUBLE WRAP PIPE THREADS.
5. THESE JOINTS SHALL BE RESTRAINED. TYPES OF RESTRAINED JOINTS MAY BE: (1) FLANGE, (2) MJ WITH EGWS APPROVED RESTAINING DEVICES (EBAA OR STAR PIPE PRODUCTS), OR (3) FOR D.I.P., PUSH ON JOINTS WITH U.S. PIPE FIELD-LOK GASKET OR EGWS APPROVED EQUAL.

#### NOTES CONTINUED:

6. FOR RESTRAINED LENGTH SEE DWG. W-4.
7. USE GRADED SAND FOR INITIAL BACKFILL.
8. JETTING WILL NOT BE ALLOWED FOR COMPACTION OF BACKFILL OR PIPE BEDDING MATERIAL.
9. IN UNPAVED AREAS, PIPE BEDDING MATERIAL, AND INITIAL BACKFILL MATERIALS SHALL BE COMPACTED THE SAME AS IN PAVED AREAS.

#### MATERIAL LIST:

1. 6" OR 8" MJ X 4" FL REDUCER.
2. 4" DIP SPOOL, FL X PE OR FL X FL, LENGTH AS NECESSARY TO LOCATE B.O. PER PLANS.
3. 4" FLG. X FLG. GATE VALVE.
4. INSULATING GASKET.
5. STEEL COMPANION FLANGE.



## Elk Grove Water Service 4" BLOW-OFF ASSEMBLY, END OF MAIN

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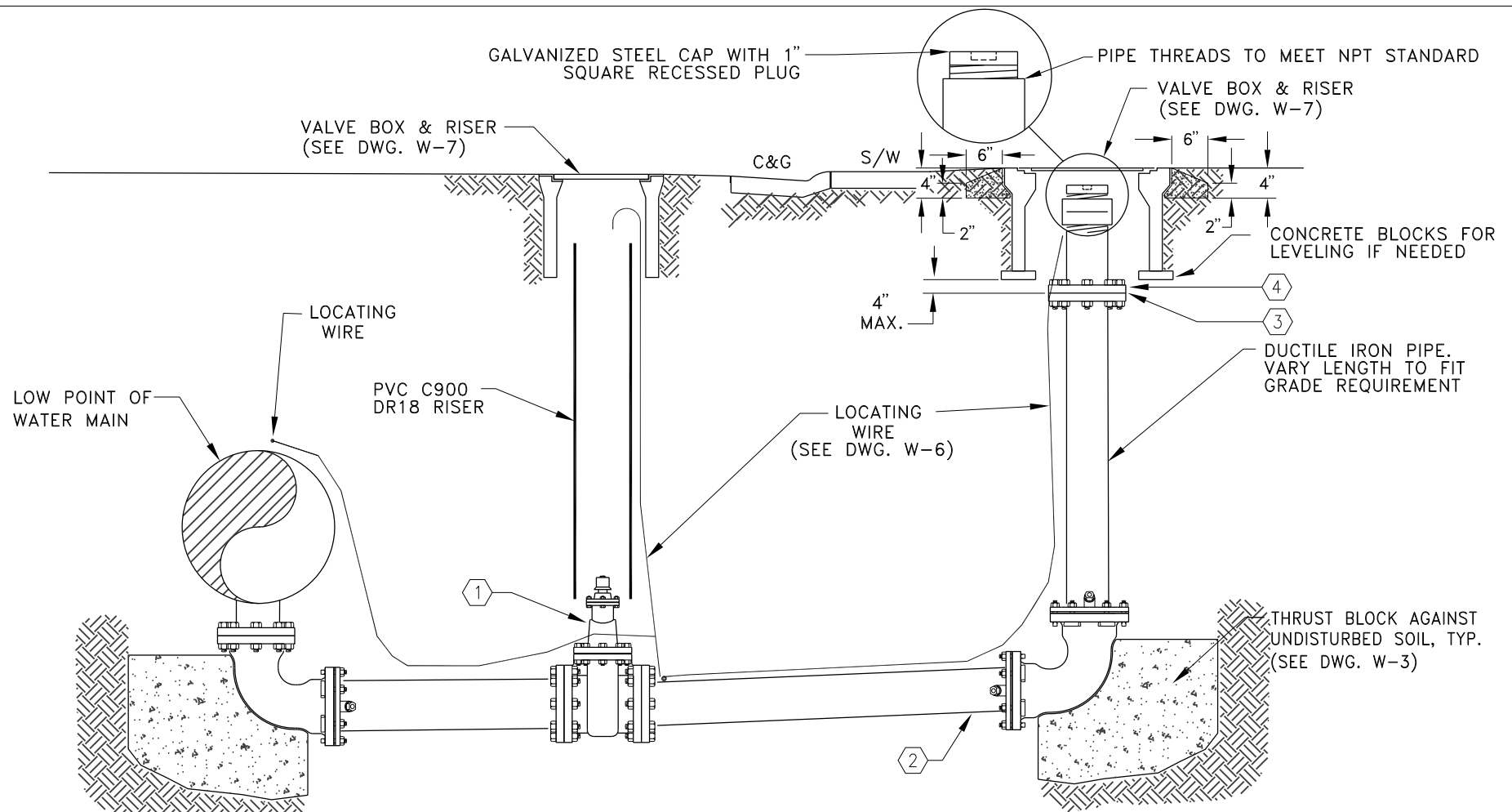
PROJECT: 8030.001

DRAWN BY: D. DALY

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EGWS : T. OUELLETTE

# W-15



**MATERIAL LIST:**

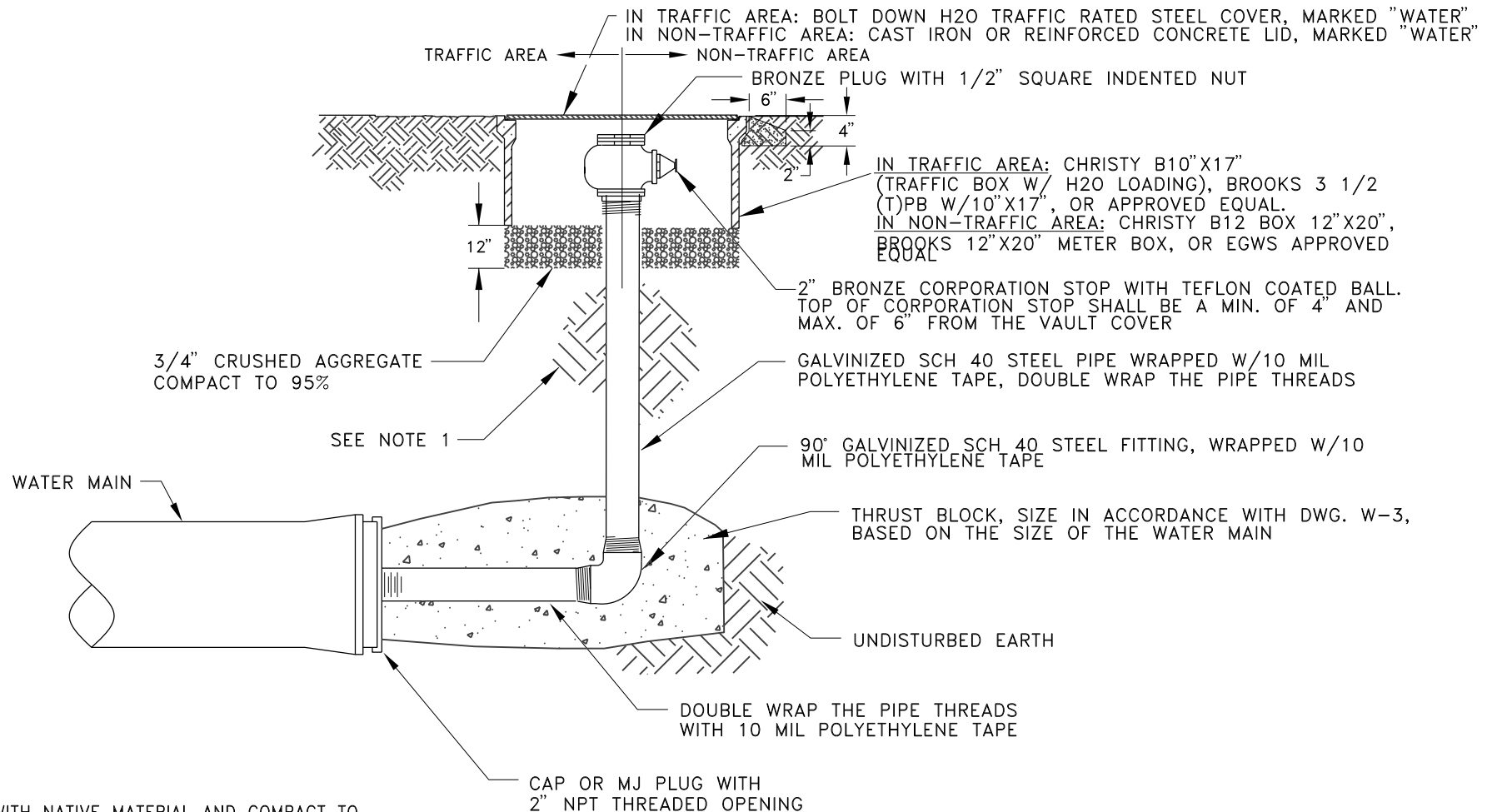
- ① 4" FLG. X FLG. GATE VALVE.
- ② 4" DUCTILE IRON FLG X PE.
- ③ INSULATING GASKET.
- ④ STEEL COMPANION FLANGE.



**Elk Grove Water Service  
4" BLOW-OFF ASSEMBLY,  
IN-LINE**

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		EGWS : T. OUELLETTE

**W-16**



**NOTES:**

1. BACKFILL WITH NATIVE MATERIAL AND COMPACT TO 80% COMPACTION. IN TRAFFIC AREAS THE BACKFILL AND COMPACTION REQUIREMENTS FOR THE ROAD SHALL GOVERN.
2. 2" TEMPORARY BLOWOFF NOT TO BE USED AT CUL-DE-SAC. (SEE DWG. W-15)



## Elk Grove Water Service 2" TEMPORARY BLOW-OFF ASSEMBLY

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		EGWS : T. OUELLETTE

**W-17**

3/16" STEEL, 6"x6" RECTANGULAR TUBE 18" HIGH WITH AN 8-1/2" CAP, SPOT WELDED AT THE TOP. CLEAN INTERIOR AND EXTERIOR OF STEEL WITH A WATER BASED CLEANER, DEVPREP 88 OR EQUAL. FACTORY APPLY 1 COAT, AT 2.0 MILS, OF TNEEC SERIES 135 EPOXY PRIMER, THEN 1 COAT, AT 2.0 MILS OF TNEEC SERIES 28 ACRYLIC TO THE CAP, TUBE, & TOP OF THE LID OF THE UTILITY BOX. COLOR TO BE HUNTER GREEN OR APPROVED EQUAL BY EGWS.

2-3/8" BOLTS, GRADE 3 WITH WASHER.

1/4" THICK STEEL LID. TACK WELD 1/4" THICK BY 1" WIDE STEEL PLATE AROUND PERIMETER OF LID SO TOP OF LID IS FLUSH W/TOP OF BOX. CUT 5"x5" SQUARE HOLE IN TOP OF LID. SQUARE HOLE TO BE CENTERED RELATIVE TO WIDTH OF LID. LID & TUBE ASSEMBLY SHALL BE PWAE118M BY PLACER WATERWORKS OR APPROVED EQUAL BY EGWS. LID SHALL BE BOLTED TO BOX.

WELD 2 LOCKING NUTS TO LID TO ACCEPT BOLTS.

1" SCHEDULE 40 GALVANIZED STEEL PIPE W/STEEL THREADED COUPLING AND 1" TO 3/4" PVC ADAPTER. OPERATOR MUST BE ABLE TO UNSCREW PVC RISER FROM COUPLING.

1" CRISPIN UL-10 COMBINATION AIR RELEASE/VACUUM VALVE OR EGWS APPROVED EQUAL

1" - 90° BRONZE FITTING (TYP)

1" - BRONZE NIPPLE (TYP)

1 1/4" X 1" BRONZE THREADED UNION

COPPER PIPE (0.182" WALL THICKNESS) PER AWWA C800 W/ PLASTIC ENCASEMENT; MAINTAIN UPWARD GRADE FROM CORP. STOP TO AIR/VACUUM COMBINATION VALVE

1" BRONZE CORP. STOP

#16 MESH BRONZE OR STAINLESS STEEL SCREEN

3/4" SCHEDULE 40 PVC

RIVIT 1"x4" SILVER COLORED NAME PLATE THAT READS "ELK GROVE WATER SERVICE" TO TUBING.

H2O TRAFFIC RATED BOX TO ACCEPT BOLT DOWN H2O RATED METAL LID. BOX SHALL HAVE A 13" X 24" INSIDE DIMENSION AS MADE BY CHRISTY, BROOKS OR APPROVED EQUAL.

6" DIAMETER PVC SLEEVE

1" BRONZE ANGLED CURB STOP BALL VALVE TYPE: JONES OR APPROVED EQUAL BY EGWS.

BACKFILL W/ SAND TO 12 INCHES ABOVE PIPE AND PLACE WARNING TAPE 12 INCHES ABOVE PIPE

1" - 90° COPPER FITTING (TYPICAL)

BRONZE SERVICE SADDLE AND BOLTS, WRAP W/ 8 MIL POLYETHYLENE ENCASEMENT

WATER MAIN

#### NOTES:

1. MAINTAIN A GRADE UPWARD FROM CORP. STOP TO AIR VALVE.
2. FLARE OR SOLDER JOINT FITTINGS AND COMPRESSION FITTINGS ARE ACCEPTABLE.
3. PROVIDE 3'X3'X3' OF 1/2" CRUSHED AGGREGATE FOR DRAINAGE AND SUPPORT UNDER VALVE, COMPACT TO 95%.
4. SEE PLAN AND PROFILE SHEETS FOR LOCATION OF VALVE BOX AND AIR VENT.
5. DETAIL NOT FOR USE IN ROADWAYS.
6. ALL COMPACTION SHALL BE PER EGWS STANDARDS CONSTRUCTION SPECIFICATIONS.



## Elk Grove Water Service 1" COMBINATION AIR/VACUUM VALVE

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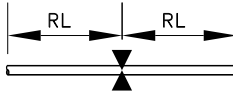
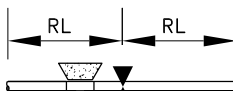
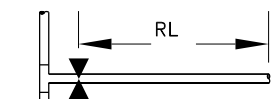
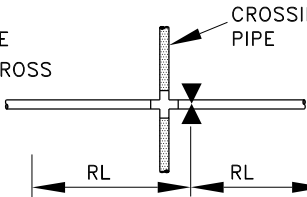
CHECKED BY: S. MYERS

EGWS: T. OUELLETTE

# W-18

**NOTES:**

1. ALL JOINTS WITHIN THE RESTRAIN LENGTH MUST BE RESTRAINED.
2. IF RESTRAIN LENGTH IS GREATER THAN 20', DUCTILE IRON PIPE WITH INSIDE THE BELL RESTRAINING DEVICES MUST BE USED FOR THE ENTIRE RESTRAINED LENGTH.
3. RESTRAIN LENGTH FOR THE TEE DESCRIBED, ASSUMES A THRUST BLOCK IS INSTALLED AT LOCATIONS SHOWN ABOVE. IF THRUST BLOCK IS NOT INSTALLED RESTRAIN LENGTH MUST BE APPROVED BY EGWS.
4. THIS CONFIGURATION IS ONLY TO BE USED IF A THRUST BLOCK CAN NOT BE POURED BEHIND THE TEE AND AGAINST UNDISTURBED SOIL.
5. JOINTS ON PIPES PERPENDICULAR (CROSSING PIPES) TO RESTRAIN LENGTH RUN, MUST BE RESTRAINED FOR A MIN. OF 4 FEET.
6. THE RESTRAIN LENGTHS ARE BASED ON A WATER PRESSURE OF 150 PSI. IF HIGHER PRESSURE OR HIGHER SURGE PRESSURES ARE ANTICIPATED, THEN THIS TABLE DOES NOT APPLY AND RESTRAIN LENGTH MUST BE APPROVED BY EGWS.

		RESTRAIN LENGTH IN FEET (RL = RESTRAINED LENGTH)															
PIPE CONFIGURATION	CROSSING PIPE SIZE	DEPTH OF 30"								DEPTH OF 60"							
		6"		8"		10"		12"		6"		8"		10"		12"	
		DIP	PVC	DIP	PVC	DIP	PVC	DIP	PVC	DIP	PVC	DIP	PVC	DIP	PVC	DIP	PVC
IN LINE VALVE 		38	24	45	31	58	38	70	46	17	17	26	24	32	30	41	38
VALVE AT TEE  (SEE NOTE 3)	6"	3	2	17	13	37	24	48	33	3	2	12	10	20	19	30	26
	8"	2	2	12	8	27	19	43	30	2	2	6	5	17	15	27	24
	10"	2	2	4	3	19	15	39	28	2	2	2	2	12	11	24	21
	12"	2	2	2	2	14	10	32	24	2	2	2	2	10	8	20	19
(SEE NOTE 4)  (SEE NOTE 5)		37	21	42	27	56	32	68	38	16	15	23	21	30	24	38	30
	6"	2	2	18	15	41	26	50	34	2	2	14	12	22	20	32	28
	8"	2	2	16	12	32	20	44	32	2	2	6	4	18	16	29	26
	10"	2	2	4	4	20	17	40	32	2	2	2	2	14	12	26	24
VALVE AT CROSS  (SEE NOTE 5)	12"	2	2	3	2	18	14	34	26	2	2	2	2	12	10	22	20



## Elk Grove Water Service PIPE RESTRAINED LENGTH CHART

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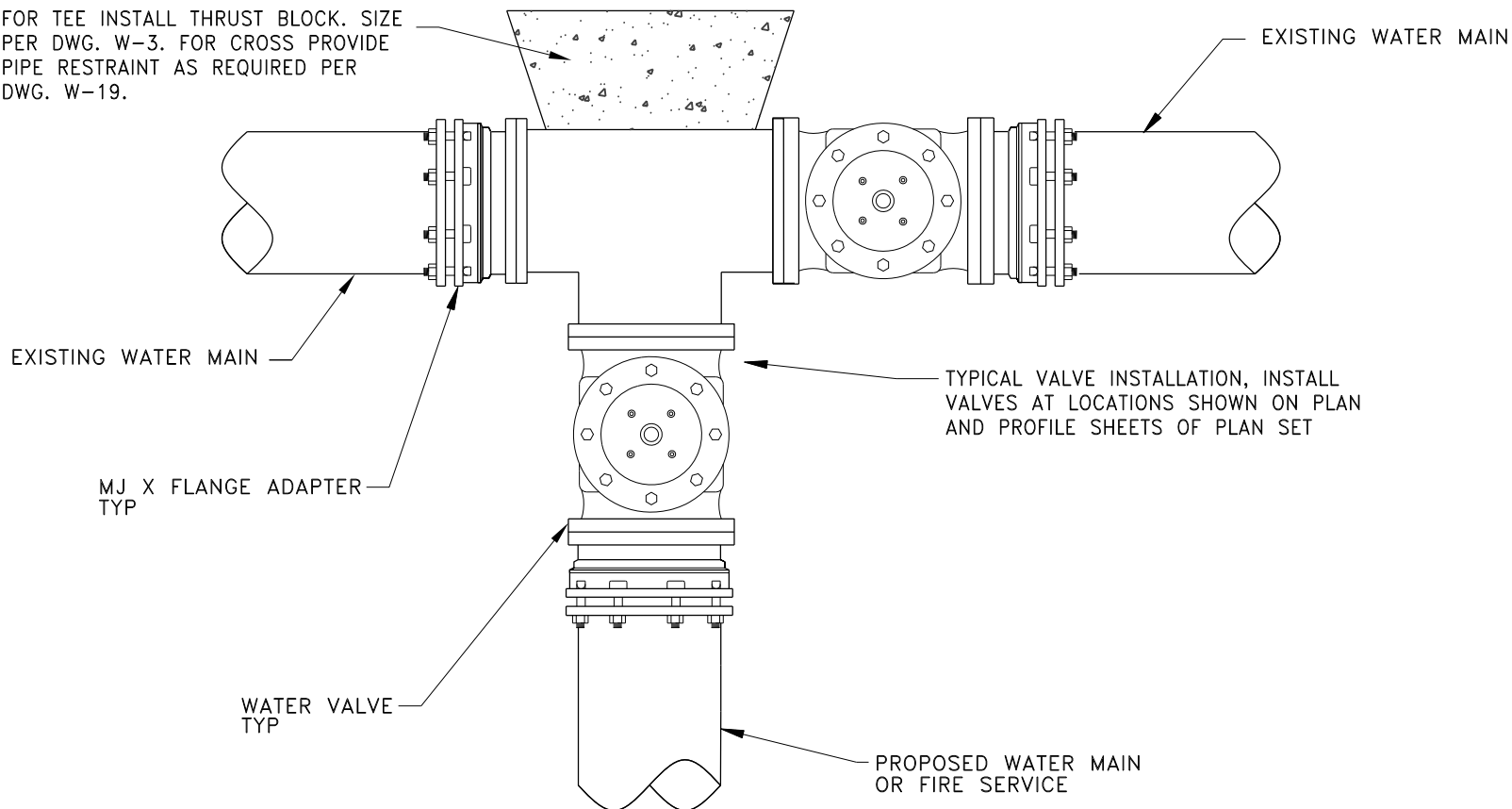
DRAWN BY: D. DALY

CHECKED BY: S. MYERS

EGWS : T. OUELLETTE

# W-19

FOR TEE INSTALL THRUST BLOCK. SIZE  
PER DWG. W-3. FOR CROSS PROVIDE  
PIPE RESTRAINT AS REQUIRED PER  
DWG. W-19.



**NOTES:**

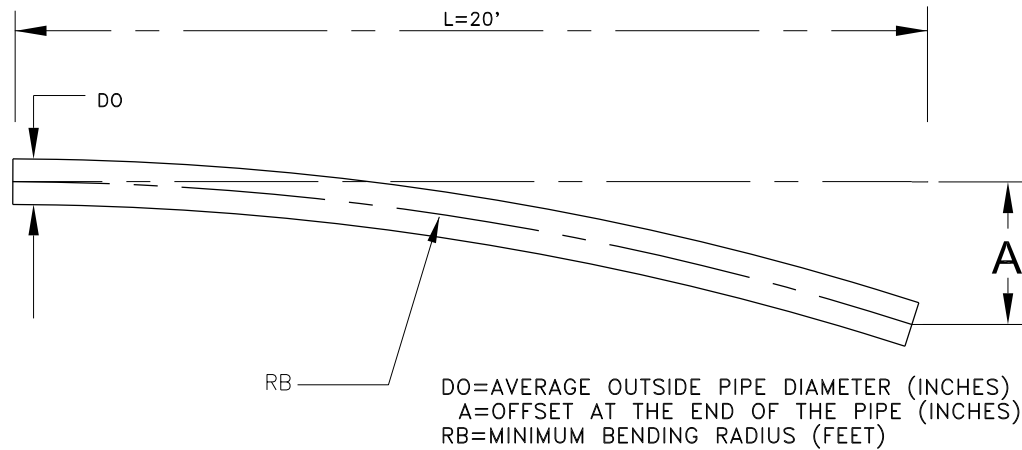
1. TEE AND MJ X FLANGE ADAPTER SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE ENCASEMENT
2. DIG SUMP UNDER CUT IN LOCATION AND PUMP ALL WATER FROM EXISTING MAIN AWAY FROM CUT IN LOCATION. DO NOT ALLOW ANY WATER TO ENTER EXISTING PIPE. CHLORINATE IN ACCORDANCE WITH EGWS STANDARDS. SPRAY EXISTING PIPE, ALL FITTINGS AND VALVES WITH A SOLUTION OF SUPER CHLORINATED WATER JUST PRIOR TO INSTALLATION.
3. PROVIDE RESTRAINT OF PIPE JOINTS AS REQUIRED.



**Elk Grove Water Service  
WATER MAIN CUT-IN DETAIL  
PVC & DIP**

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

**W-20**



MAX. DEFLECTION FOR PVC PIPE, AWWA C900 CLASS 150 DR 18

NOMINAL PIPE DIAMETER	AVERAGE OUTSIDE PIPE DIAMETER, DO	MINIMUM WALL THICKNESS	MINIMUM BENDING RADIUS, RB	OFFSET AT FREE END "A"
(INCHES)	(INCHES)	(INCHES)	(FEET)	(INCHES)
4	4.800	0.267	121	20
6	6.900	0.383	185	13
8	9.050	0.503	240	10
10	11.100	0.617	400	6
12	13.200	0.733	800	4

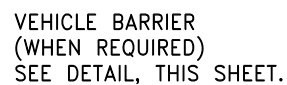
JOINT DEFLECTION OF AWWA C900 PVC PIPE IS PROHIBITED.



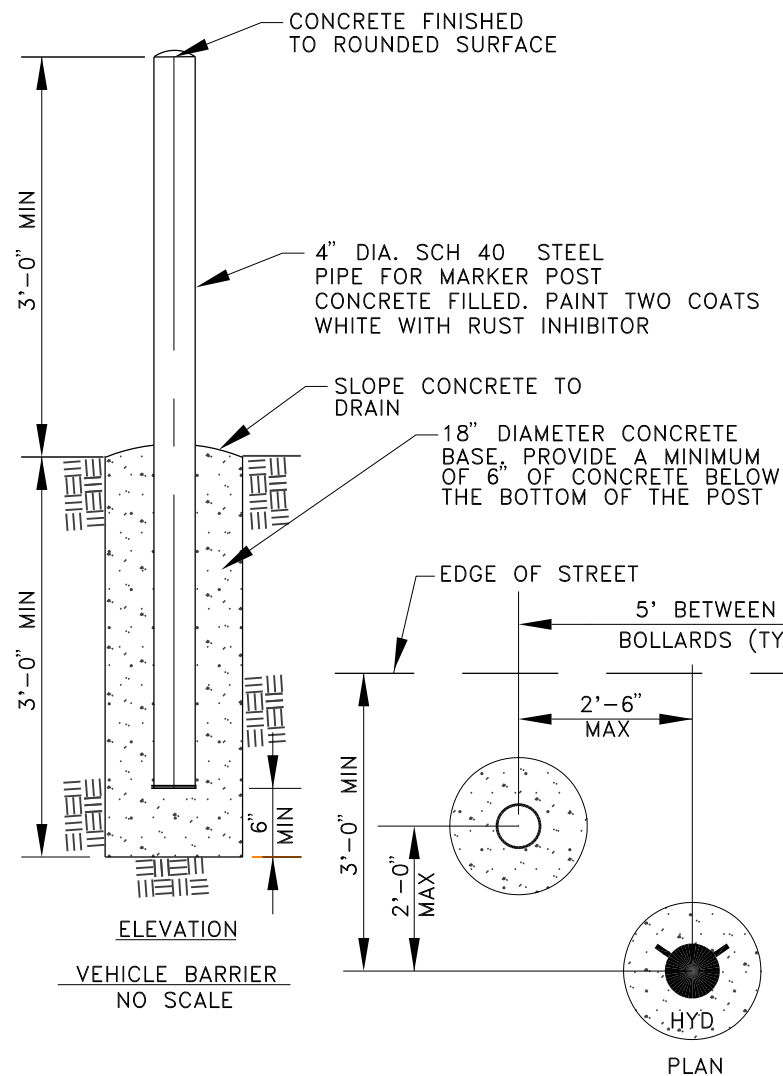
**Elk Grove Water Service  
 MAXIMUM DEFLECTION  
 FOR PVC PIPE**

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

**W-21**



1. MINIMUM EMBEDMENT INTO CONCRETE BASE SHALL BE 2'-6". THERE SHALL BE A MINIMUM OF 3'-0" ABOVE THE FINISHED CONCRETE SURFACE.
2. IF HYDRANT IS IN LANDSCAPED, CURBED PLANTER, W/5' FROM HYDRANT TO FACE CURB IN EACH DIRECTION, BOLLARDS WILL NOT BE REQUIRED.



## Elk Grove Water Service FIRE HYDRANT CLEARANCE & PROTECTION REQUIREMENTS

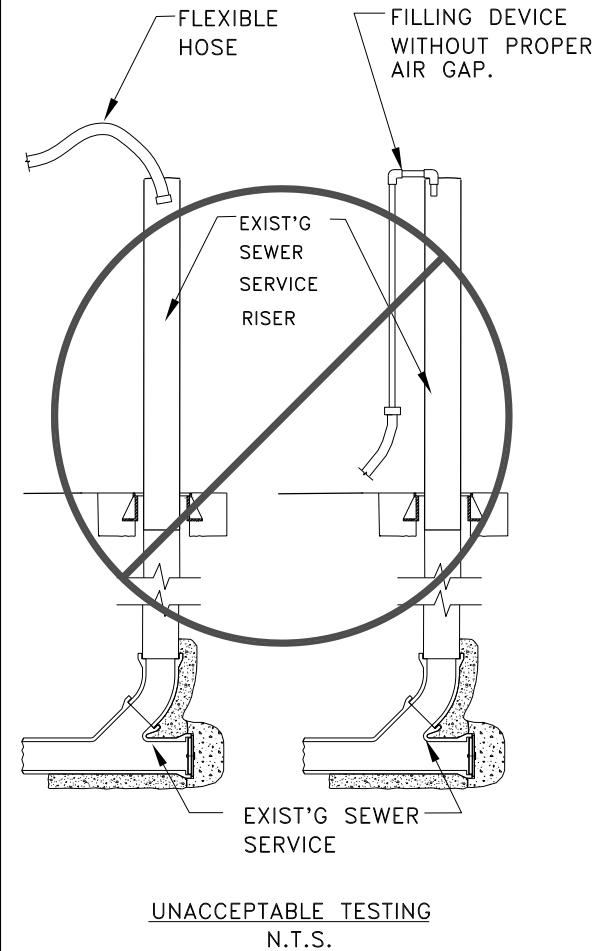
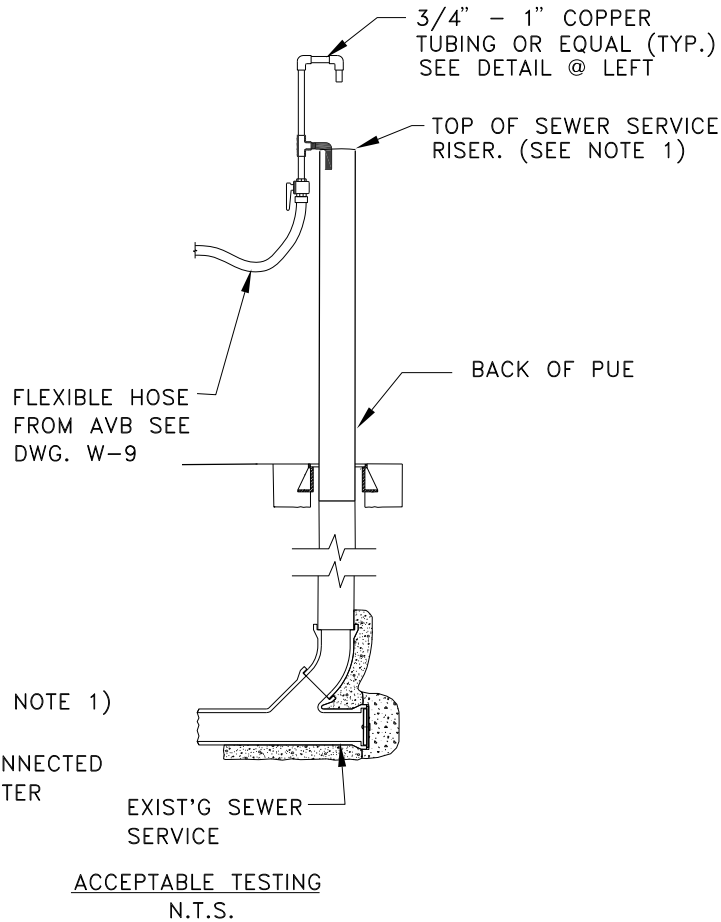
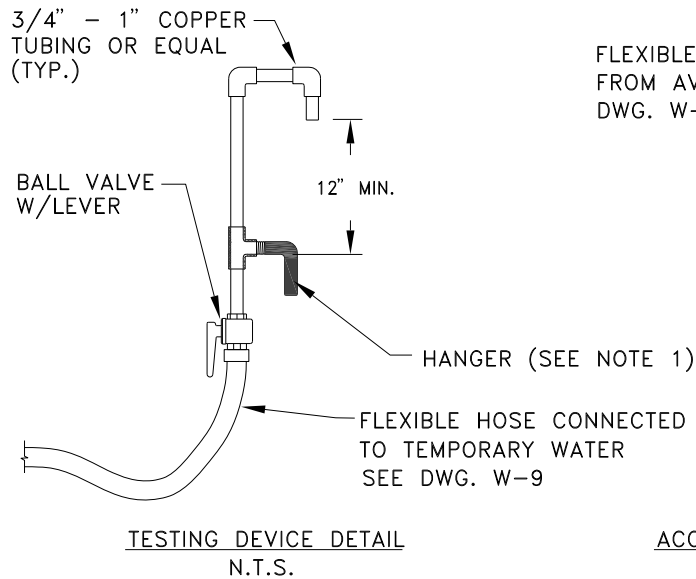
		DATE: JULY, 2002
		PROJECT: 8030.001
REV. DATE	REVISION	DRAWN BY: D. DALY
EGWS SIGNATURE		CHECKED BY: S. MYERS
		EGWS : T. QUELLETTE

W-22



**NOTES:**

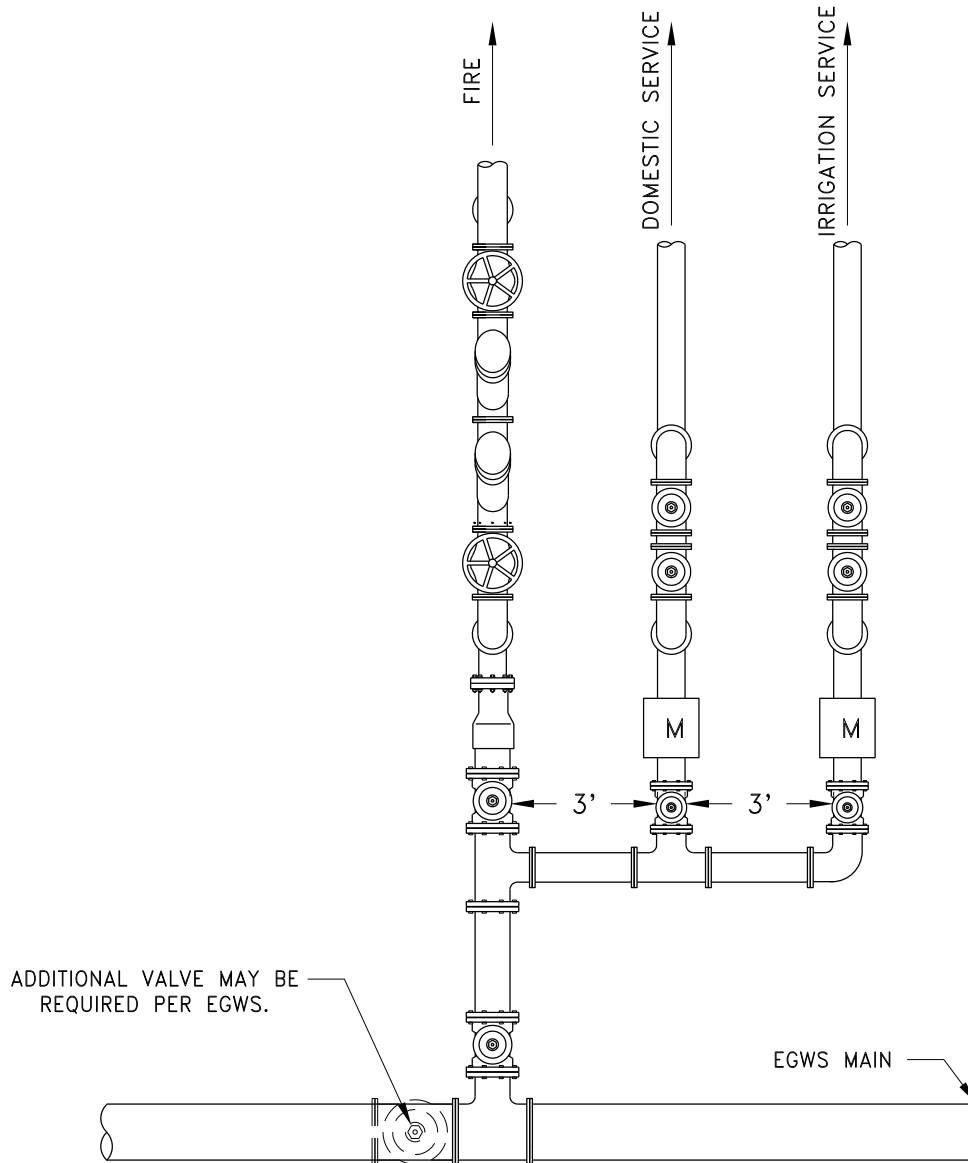
1. HANGER SHALL BE A SOLID PIECE OF STAINLESS STEEL STOCK THREADED OR WELDED TO MAKE THE CONNECTION TO THE TEST FILLING WAND. IT SHALL NOT BE CONSTRUCTED OF TUBING. THE CONTRACTOR IS RESPONSIBLE TO INSURE CROSS CONTAMINATION WILL NOT OCCUR.
2. IT IS UNACCEPTABLE TO TEST SEWER SERVICES WITH DEVICES NOT APPROVED BY EGWS. DEVICES MUST BE PROTECTED FROM CROSS CONTAMINATION. A DIRECT CONNECTION TO THE SEWER SERVICE WITHOUT THE PROPER AIR GAP IS UNACCEPTABLE.



**Elk Grove Water Service**  
**ACCEPTABLE SEWER SERVICE**  
**TESTING DEVICE**

REV.	DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE			PROJECT: 8030.001
			DRAWN BY: D. DALY
			CHECKED BY: S. MYERS
			EGWS : T. OUELLETTE

**W-23**



NOTES:

1. RESTRAIN ENTIRE MANIFOLD WITH EGWS APPROVED RESTRAINING DEVICE.
2. TAPS SHALL BE MADE SUCH THAT NO DEAD END LINES RESULT.
3. ALL LINES 3" AND LARGER SHALL BE DIP WHERE NOT UNDER A PAVED SECTION.
4. AFTER THE MANIFOLD HAS BEEN ACCEPTED, METERS SHALL BE INSTALLED BY EGWS.
5. PROVIDE A PAD WITHIN THE LIMITS OF THE BACKFLOW MANIFOLD WITH POSITIVE DRAINAGE AND A 2% MAX. SLOPE.
6. IN A BACKFLOW MANIFOLD CONFIGURATION THAT INCLUDES DOMESTIC AND IRRIGATION SERVICES, THE IRRIGATION SERVICE TAP SHALL BE DOWNSTREAM OF THE DOMESTIC SERVICE TAP.
7. PROVIDE A MINIMUM 3' SEPARATION BETWEEN BACKFLOWS IN PARALLEL.
8. PROVIDE 3' MINIMUM CLEARANCE FROM TOE OR TOP OF ANY SLOPE. NO SLOPES GREATER THAN 2:1 ADJACENT TO BACKFLOW MANIFOLD. IF THE ABOVE CRITERIA IS NOT MET, A RETAINING WALL IS REQUIRED. THE RETAINING WALL SHALL BE CONSTRUCTED OF CONCRETE OR MASONRY ONLY.
9. REFER TO STANDARD DETAIL DRAWING W-8A, 8B, 8C & W-10 FOR ADDITIONAL INFORMATION.

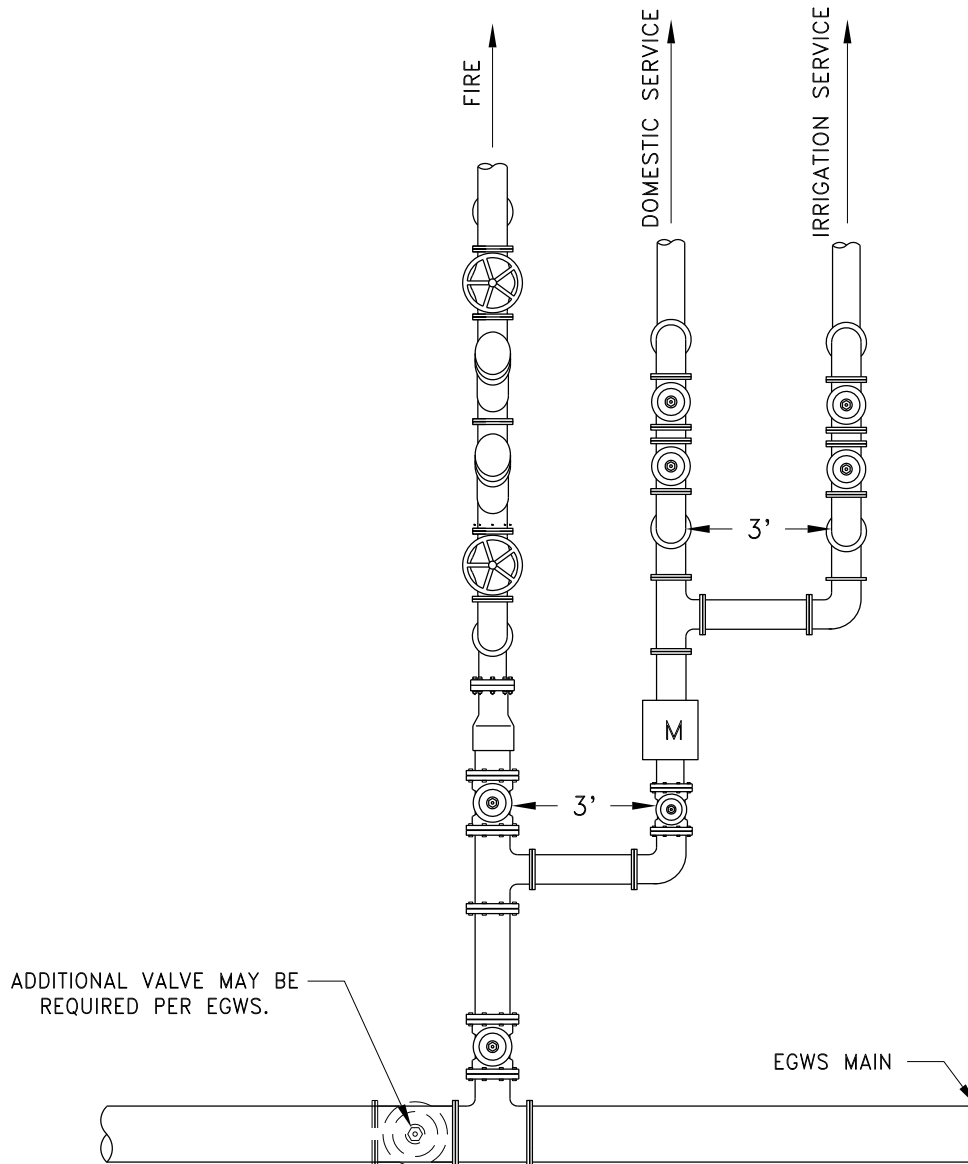


## Elk Grove Water Service BACKFLOW MANIFOLD ASSEMBLY

REV. DATE EGWS SIGNATURE <i>[Signature]</i>	REVISION
--	----------

DATE: JULY, 2002
PROJECT: 8030.001
DRAWN BY: D. DALY
CHECKED BY: S. MYERS
EGWS : T. OUELLETTE

# W-24A



NOTES:

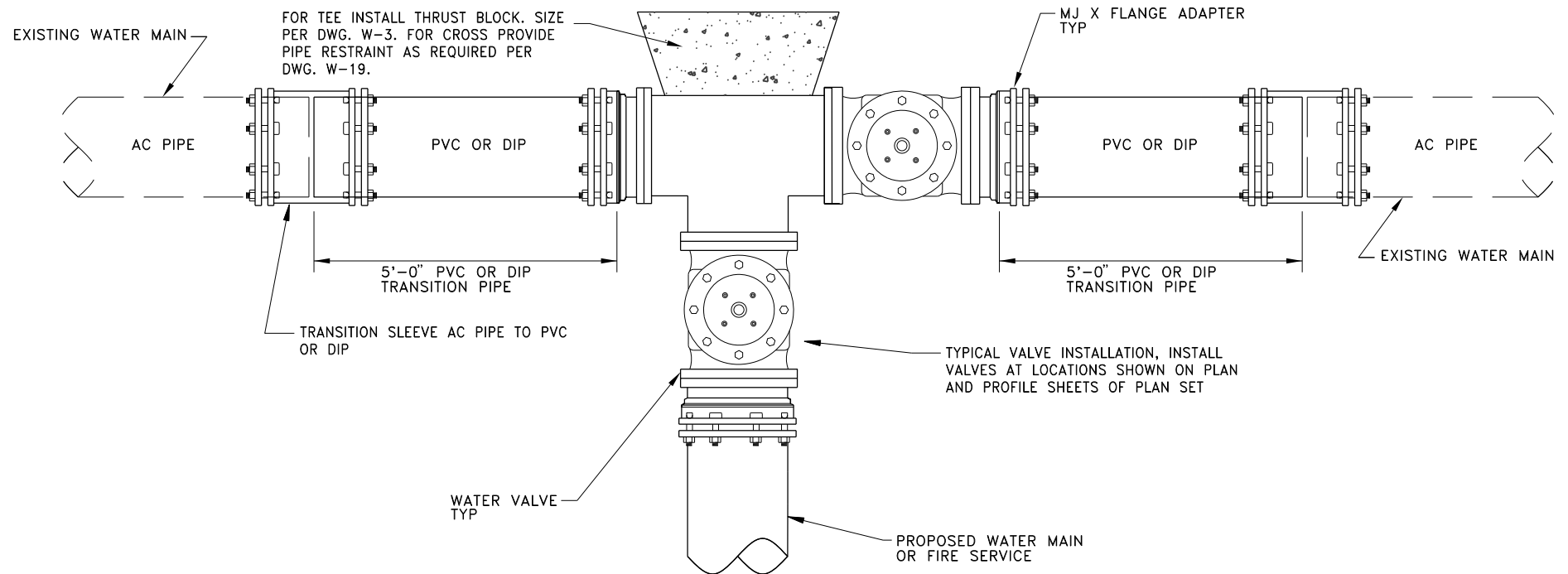
1. RESTRAIN ENTIRE MANIFOLD WITH EGWS APPROVED RESTRAINING DEVICE.
2. TAPS SHALL BE MADE SUCH THAT NO DEAD END LINES RESULT.
3. ALL LINES 3" AND LARGER SHALL BE DIP WHERE NOT UNDER A PAVED SECTION.
4. AFTER THE MANIFOLD HAS BEEN ACCEPTED, METERS SHALL BE INSTALLED BY EGWS.
5. PROVIDE A PAD WITHIN THE LIMITS OF THE BACKFLOW MANIFOLD WITH POSITIVE DRAINAGE AND A 2% MAX. SLOPE.
6. IN A BACKFLOW MANIFOLD CONFIGURATION THAT INCLUDES DOMESTIC AND IRRIGATION SERVICES, THE IRRIGATION SERVICE TAP SHALL BE DOWNSTREAM OF THE DOMESTIC SERVICE TAP.
7. PROVIDE A MINIMUM 3' SEPARATION BETWEEN BACKFLOWS IN PARALLEL.
8. PROVIDE 3' MINIMUM CLEARANCE FROM TOE OR TOP OF ANY SLOPE. NO SLOPES GREATER THAN 2:1 ADJACENT TO BACKFLOW MANIFOLD. IF THE ABOVE CRITERIA IS NOT MET, A RETAINING WALL IS REQUIRED. THE RETAINING WALL SHALL BE CONSTRUCTED OF CONCRETE OR MASONRY ONLY.
9. REFER TO STANDARD DETAIL DRAWING W-8A, 8B, 8C & W-10 FOR ADDITIONAL INFORMATION.



**Elk Grove Water Service**  
**OPTIONAL BACKFLOW MANIFOLD**  
**ASSEMBLY FOR TARIFF AREA #1**

		DATE: JULY, 2002
		PROJECT: 8030.001
REV. DATE	REVISION	DRAWN BY: D. DALY
EGWS SIGNATURE		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

**W-24B**



**NOTES:**

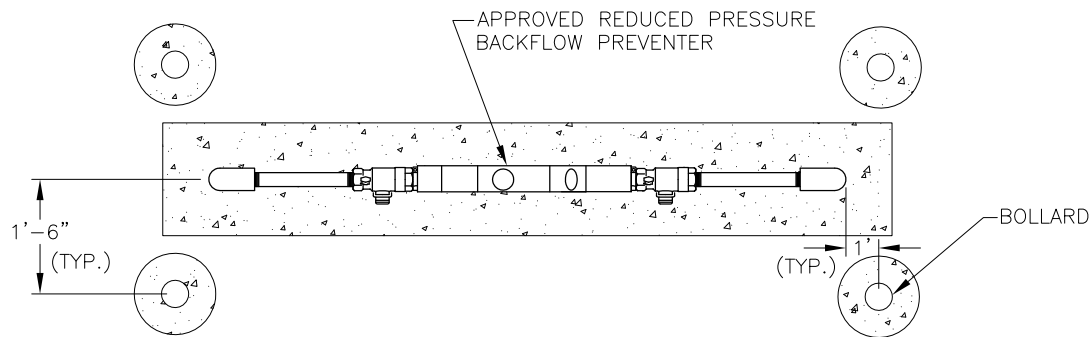
1. TEE AND MJ X FLANGE ADAPTER SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE ENCASEMENT
2. DIG SUMP UNDER CUT IN LOCATION AND PUMP ALL WATER FROM EXISTING MAIN AWAY FROM CUT IN LOCATION. DO NOT ALLOW ANY WATER TO ENTER EXISTING PIPE. CHLORINATE IN ACCORDANCE WITH EGWS STANDARDS. SPRAY EXISTING PIPE, ALL FITTINGS AND VALVES WITH A SOLUTION OF SUPER CHLORINATED WATER JUST PRIOR TO INSTALLATION.
3. PROVIDE RESTRAINT OF PIPE JOINTS AS REQUIRED.



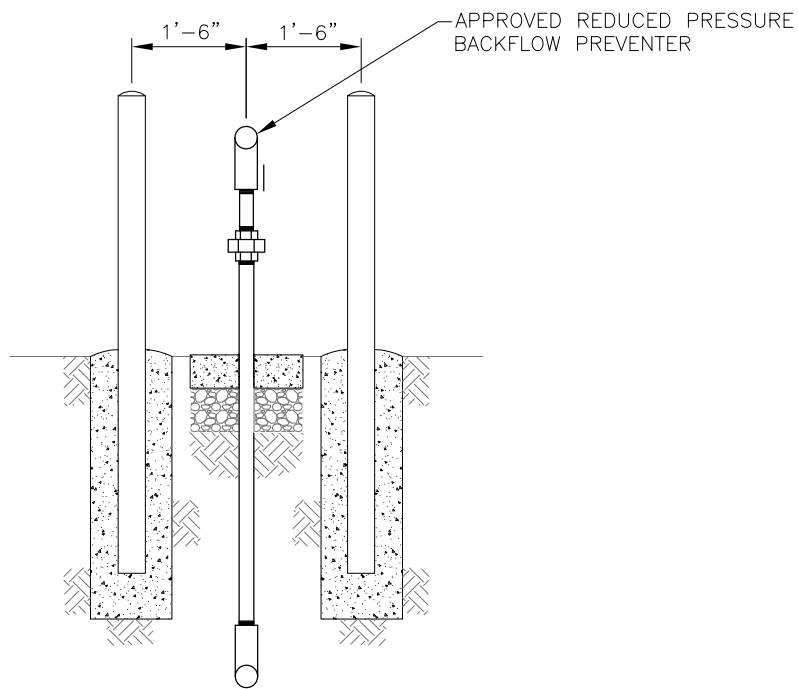
**Elk Grove Water Service  
WATER MAIN CUT-IN DETAIL  
AC PIPE**

REV. DATE	REVISION	DATE: JULY, 2002
EGWS SIGNATURE		PROJECT: 8030.001
		DRAWN BY: D. DALY
		CHECKED BY: S. MYERS
		EGWS : T. OUELLETTE

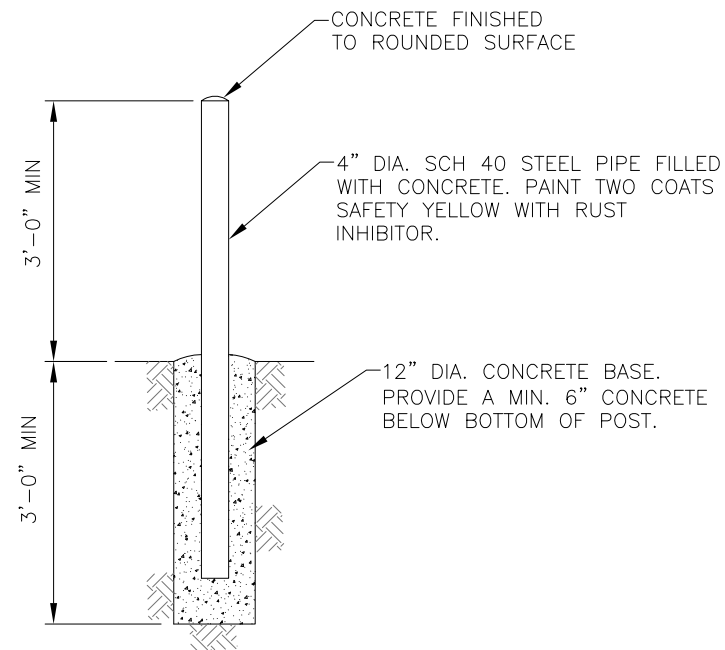
**W-25**



PLAN VIEW




ELEVATION VIEW



BOLLARD DETAIL



# Elk Grove Water District BACKFLOW PREVENTER PROTECTION & CLEARANCE

		DATE: MARCH, 2014
		PROJECT:
REV. DATE	REVISION	DRAWN BY: B. KAMILOS
EGWD SIGNATURE		CHECKED BY: S. SHAW
		EGWD: M. MADISON

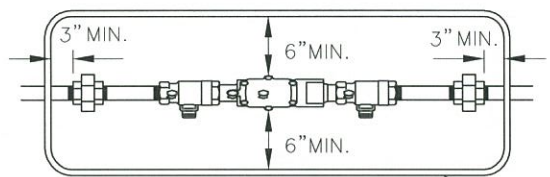
W-26



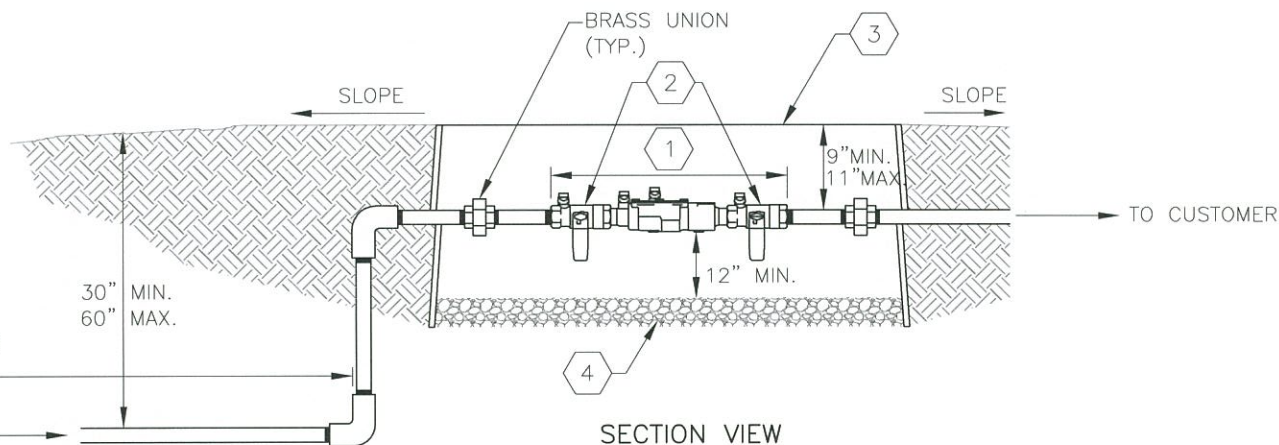
PUBLIC UTILITY EASEMENT  
PRIVATE PROPERTY

WITHIN 5' FROM  
WATER METER  
(SEE NOTE 3)

FROM WATER  
METER, SEE DWG.  
W-8B, W-8C OR  
W-8D.



PLAN VIEW



SECTION VIEW

**NOTES:**


1. DOUBLE CHECK ASSEMBLY BACKFLOW PREVENTER SHALL BE LISTED ON THE UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH'S MOST RECENT LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES.
2. ALL PIPES SHALL BE LEAD-FREE BRASS. ALL BURIED PIPES SHALL BE WRAPPED WITH 8 MIL. POLYETHYLENE ENCASEMENT OR 10 MIL. POLYETHYLENE TAPE.
3. UPON APPROVAL BY THE ELK GROVE WATER DISTRICT CROSS-CONNECTION CONTROL SPECIALIST, THE BACKFLOW PREVENTER MAY BE INSTALLED FARTHER AWAY THAN 5' FROM THE WATER METER IF EXISTING CONDITIONS NECESSITATE.

**MATERIAL LIST:**

- 1 APPROVED DOUBLE CHECK ASSEMBLY BACKFLOW PREVENTER.
- 2 BRONZE BODY, RESILIENT SEATED BALL VALVE MINIMUM WORKING PRESSURE OF 175 PSI
- 3 TWO METER BOXES STACKED ON TOP OF EACH OTHER OR OVERSIZED BOX. MUST HAVE REMOVABLE COVER. BOXES LOCATED IN TRAFFIC AREAS SHALL HAVE TRAFFIC RATED LIDS.
- 4 1/2" OR 3/4" CRUSHED ROCK, 4" MINIMUM THICKNESS, MECHANICALLY COMPACTIONED TO 95% COMPACTION.

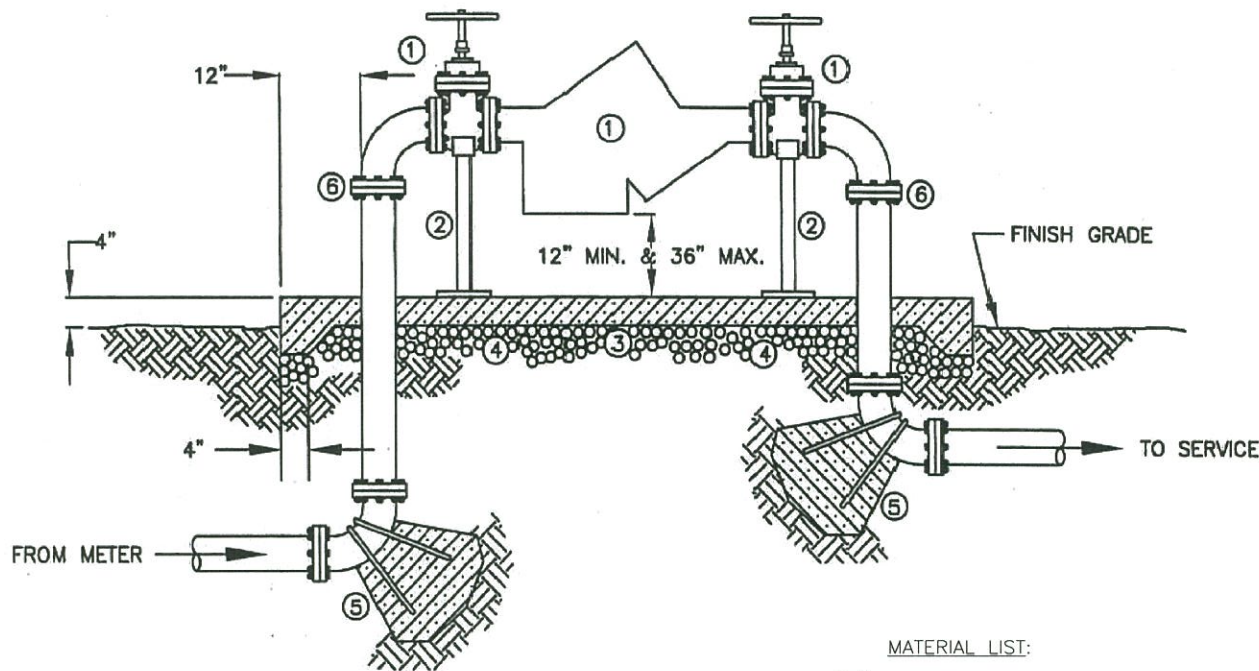


**Elk Grove Water District  
DOUBLE CHECK ASSEMBLY  
BACKFLOW PREVENTER 1" TO 2"  
IN VALVE BOX**

		DATE: MARCH, 2014
		PROJECT:
REV. DATE	REVISION	DRAWN BY: B. KAMILOS
EGWD SIGNATURE		CHECKED BY: S. SHAW
		EGWD: M. MADISON

**W-27B**





**NOTES:**

1. REDUCED PRESSURE BACKFLOW PREVENTER SHALL BE LISTED ON THE UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH'S MOST RECENT LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES.
2. PIPES SHALL BE DUCTILE IRON. ABOVE GROUND JOINTS SHALL BE FLANGED. BURIED JOINTS SHALL BE FLANGED OR RESTRAINED MF. FLANGES SHALL BE CLASS D.
3. INSTALL LOCATING WIRE PER EGWD STD. DTL. DWG. W-6.
4. ALL BURIED METAL SHALL BE WRAPPED WITH 8 MIL. POLYETHYLENE ENCASEMENT SO THAT NO SOIL IS IN CONTACT WITH METAL.

**MATERIAL LIST:**

- 1 APPROVED REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY WITH 2 RESILIENT WEDGE GATE VALVES, FLANGED, WITH HANDWHEEL OPERATORS.
- 2 PIPE SUPPORT, MIN. 2" GALVANIZED SCH 40.
- 3 4" CONCRETE SLAB - 24" WIDE WITH VARYING LENGTH.
- 4 6" CRUSHED AGGREGATE COMPACTED TO 95% COMPACTION.
- 5 THRUST BLOCK WITH #5 REBARS. WRAP THE PORTION OF THE REBAR NOT EMBEDDED IN CONCRETE WITH 20 MIL POLYETHYLENE TAPE. (SEE EGWD STD. DTL. DWG. W-3.)
- 6 FLANGE CONNECTION ONLY.



**Elk Grove Water District  
REDUCED PRESSURE BACKFLOW  
PREVENTER 3" AND LARGER**

REV. DATE  
EGWD SIGNATURE

REVISION

*[Signature]*

DATE: OCTOBER, 2014

PROJECT:

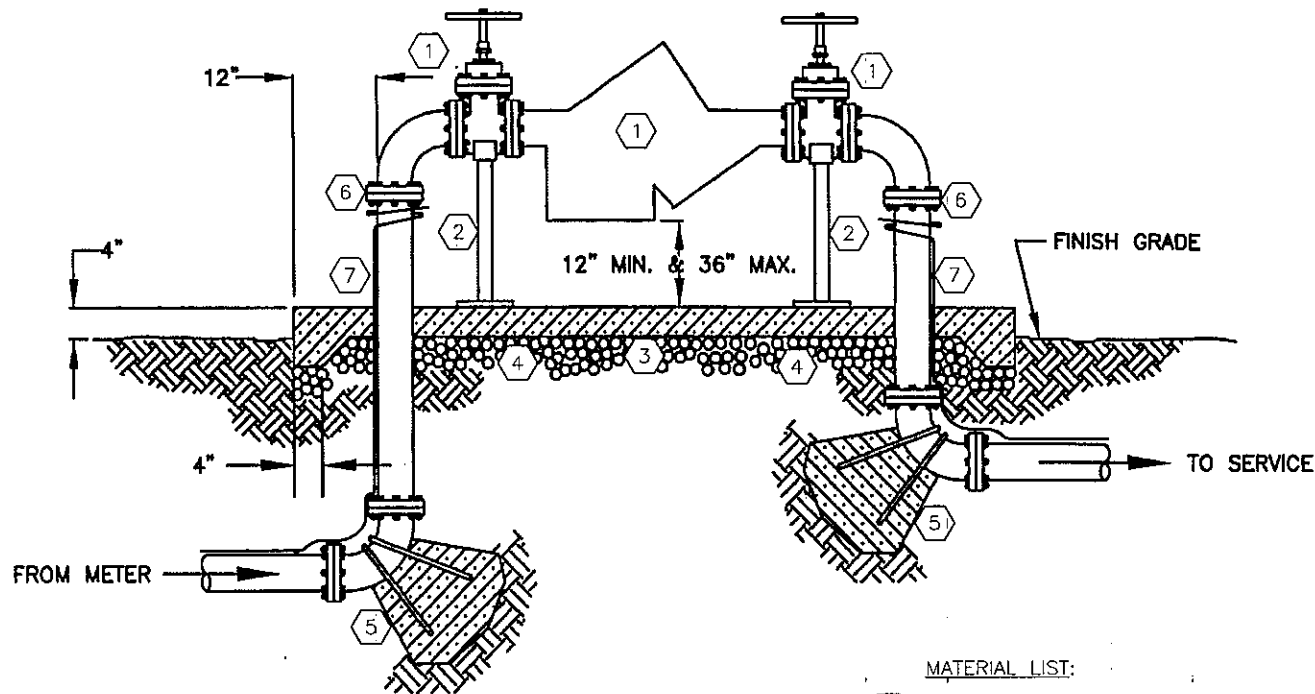
DRAWN BY: B. KAMILOS

CHECKED BY: S. SHAW

EGWD: M. MADISON

**W-28**





#### NOTES:

1. DOUBLE CHECK DETECTOR ASSEMBLY BACKFLOW PREVENTER SHALL BE LISTED ON THE UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH'S MOST RECENT LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES.
2. PIPES SHALL BE DUCTILE IRON. ABOVE GROUND JOINTS SHALL BE FLANGED. BURIED JOINTS SHALL BE FLANGED OR RESTRAINED MF. FLANGES SHALL BE CLASS D.
3. REFER TO STD. DTL. DWG. W-6 FOR LOCATING WIRE SPECS.
4. ALL BURIED METAL SHALL BE WRAPPED WITH 8 MIL. POLYETHYLENE ENCASEMENT SO THAT NO SOIL IS IN CONTACT WITH METAL.

#### MATERIAL LIST:

1. APPROVED DOUBLE CHECK DETECTOR ASSEMBLY BACKFLOW PREVENTION ASSEMBLY WITH 2 RESILIENT WEDGE GATE VALVES, FLANGED, WITH HANDWHEEL OPERATORS.
2. ADJUSTABLE PIPE SUPPORT, MIN. 2" GALVANIZED SCH 40.
3. 4" CONCRETE SLAB -- 24" WIDE WITH VARYING LENGTH.
4. 6" CRUSHED AGGREGATE COMPACTED TO 95% COMPACTION.
5. THRUST BLOCK WITH #5 REBARS. WRAP THE PORTION OF THE REBAR NOT EMBEDDED IN CONCRETE WITH 20 MIL POLYETHYLENE TAPE. (SEE EGWD STD. DTL. DWG. W-3.)
6. FLANGE CONNECTION ONLY.
7. INSTALL LOCATING WIRE AS SHOWN. STRAP LOCATING WIRE TO PIPE WITH 10 MIL PVC PIPE TAPE.



## Elk Grove Water District DOUBLE CHECK DETECTOR ASSEMBLY BACKFLOW PREVENTER 3" AND LARGER

REV. DATE  
EGWD SIGNATURE

REVISION

*[Signature]*

DATE: MAY, 2018

PROJECT:

DRAWN BY: B. KAMILOS

CHECKED BY: S. SHAW

EGWD: M. MADISON

# W-29



## CONSTRUCTION NOTES

JANUARY 2005

FINAL



Elk Grove Water Service  
9257 Elk Grove Boulevard  
Elk Grove, CA 95624  
Phone: (916) 685-3556  
Fax: (916) 685-5376

## **Elk Grove Water Service CONSTRUCTION NOTES & WATER SERVICE STANDARDS (May 16, 2005)**

### **I. CONSTRUCTION NOTES**

#### **A. General Notes:**

1. All materials, construction methods and installation of water systems shall comply with Elk Grove Water Service (EGWS) Standard Construction Specifications. Construction methods and materials not covered by EGWS Standard Construction Specifications shall conform to the City of Elk Grove Standard Construction Specifications and/or Sacramento County Standard Construction Specifications. Construction standards for installation of materials not covered by EGWS, City of Elk Grove or Sacramento County Standard Construction Specifications shall be per the manufacturer's recommendations.
2. All materials shown on plans and/or used in construction shall be from the approved materials list as described in Appendix "A" of EGWS Standard Construction Specifications. Materials deviating from the approved materials list shall be approved in writing by EGWS prior to installation.
3. Contractor will arrange a pre-construction meeting one (1) week prior to construction, and shall be responsible for location of all existing utilities. Meetings will be held at the project site with an EGWS engineering and construction service representative. Inspection schedules require a minimum of one (1) working day (24 hours) notice. The Contractor shall have a copy of the EGWS Construction Specifications and Standard Drawing Details on-site at all times. Pre-construction meetings will not be scheduled until after all EGWS fees have been paid in full, and a complete set of construction documents have been provided to EGWS.
4. EGWS requires three (3) working days (72 hours) advance notice of any shut down or interruptions of normal service for installation and hook-ups. Shut down or interruptions of normal service for installation and hook-ups to EGWS' Tariff Area No. 1 Service Area shall be required to occur on Monday's for residential areas starting no earlier than 9:00 a.m. and shall have service restored by 3:00 p.m. and on Sunday's for commercial areas starting no earlier than 10:00 p.m. and shall have service restored by the following morning (Monday) by 5:00 a.m. EGWS' Tariff Area No. 2 Service Area does not have any time constraints other than accommodating the local residents or businesses during non-peak demand periods.

5. The contractor shall provide signed and dated as-built drawings per EGWS standards. All valves shall be raised to finish grade, accessible and turned on prior to Final Acceptance. All valves located back of walk or in any landscaped areas shall require a “WV” be cut into the concrete curb for locating purposes.

## **II. WATER SERVICE STANDARDS**

### **A. Water System Notes:**

6. All water mains shall be laid in separate trenches as far as possible from near-by sewer lines; a minimum horizontal separation of ten (10) feet is required.
7. Water lines shall be placed in public right-of-way and at a minimum of thirty-six (36) inches below finished grade.
8. Water main location shall be 3 feet from lip of gutter on the north or west side of the street when installation is within a 50 foot right-of-way or greater. When installation is within a less than 50 foot right-of-way, water main location shall be four (4) feet behind the back edge of the sidewalk on the north or west side of the street. Locations for detached sidewalks or other than those mentioned above must be approved by EGWS.
9. Water services shall be two and a half (2-1/2) feet from side of the lot line. All water services shall have a seven (7) foot separation from street lights, storm drainage inlets and fire hydrants with dimensioning as such shown on plans.
10. Where dual water services are to be installed, a common trench is acceptable. Services must be at least a minimum of eighteen inches (18”) apart. At no time shall there be a service in the same trench as any water main.
11. Where water services are placed, a meter setter and meter box must be installed. Water meters will be purchased by the developer at time of plan approval and installed by EGWS. Once a construction permit has been released to the developer and/or contractor, notification to EGWS must be made to schedule installation of the water meters.
12. At no time will unauthorized construction water use be permitted. Construction water permits can be obtained at EGWS Monday through Friday from 7:00 a.m. to 4:00 p.m. Unauthorized use of any fire hydrant or service connection will result in a Water Misuse Fine per Ordinance No. 07-18-01-01.
13. All water services shall be polyethylene pipe. The pipe size shall be CTS, not IPS as indicated in the Standard Specifications.

- 14.** All water pipelines shall have a No. 10 gauge insulated copper tracer wire installed per EGWS Standard Detail Drawing W-6. Wire shall be spliced together with brass connectors and wrapped per EGWS Standard Detail Drawing W-6.
- 15.** All water pipelines shall be marked and installed with detectable water tape placed on top of the pipe initial backfill located approximately 6 inches above the top of water pipeline.
- 16.** All water pipelines shall clear underground facilities by one-foot (1') minimum unless specifically called out and approved on the construction plans with specified backfill material.
- 17.** No pipeline/fitting shall be blocked or backfilled without EGWS inspection and approval.
- 18.** Trench shall be backfilled with sand to six (6) inches above the pipe.
- 19.** All non-residential services shall have approved back-flow prevention devices installed and tested prior to service.
- 20.** Permanent blow-off assemblies shall be as shown on EGWS Standard Detail Drawing W-15 and W-16.
- 21.** Temporary blow-offs shall be as shown on EGWS Standard Detail Drawing W-17.
- 22.** Refer to EGWS Standard Construction Specifications for pressure testing, disinfection and flushing requirements. (Note: Prior to pressure testing a Construction Water Permit must be obtained by EGWS.)
- 23.** Under no circumstances shall pressure testing be performed by installing a test plate.
- 24.** Contractor shall maintain access to mainline gate valves at all times. Gate valves shall not be covered by dirt, construction material or debris.
- 25.** Under no circumstances shall anyone other than a representative of EGWS, or authorized agency, open or close any valve in EGWS service area. Contractor shall not operate valves without prior EGWS approval where occupancy of the project has been granted.
- 26.** Connections to the existing water system where the existing pipe material is asbestos cement pipe (ACP or transite), replacement of the existing pipe must extend a minimum of five feet (5') from any valve or fitting on both ends of the connection.

**B. Material List:**

- 27. All pipe four (4) inches or larger shall be C-900, Blue Brute, or Ductile Iron or prior approved equal.
- 28. All fittings shall be Tyton System or mechanical joint and wrapped, or prior approved equal.
- 29. Gate valves shall be resilient wedge type. All water mains twelve (12) inches or larger require butterfly valves.
- 30. All service valves (corporation or curb) shall be compression type. All curb stops shall be ball valves.
- 31. Saddles should be McDonald C-900, or prior approved equal. Gate valve boxes shall be Christy G-5, or prior approved equal.
- 32. Riser material shall be eight (8) inch C900 PVC for all gate valves.
- 33. Meters shall be SR2 TR/PL (Sensus) reading in 100 cubic feet, or prior approved equal. (Note: All meters shall be provided and installed by EGWS.)

**C. Hydrant Specification/Installation Notes:**

- 34. All water mains and hydrants required for new buildings shall be fully operational and capable of delivering the required fire flow protection supply prior to issuance of building permit.
- 35. All double detector check valves will be installed and tested prior to service on all fire sprinkler systems.
- 36. Hydrants shall be located a minimum of three (3) feet from any building or structure.
- 37. Hydrants shall be installed (per detail W-2A or W-2B) with the lowest valve stem twenty (20) inches (minimum) and twenty-four (24) inches (maximum) above the finished grade. The 4-½ inch pumper connection shall be a maximum of one (1) foot behind finished walk or planter box, with 4-½ inch discharge facing driveway or street.
- 38. A two (2) foot square concrete pad is to be set around base of hydrant, the thickness being the same as the sidewalk.
- 39. Hydrants shall be Clow 960 factory white.
- 40. Hydrants located in commercial areas shall be protected in accordance with Standard Construction Detail W-22.





**STANDARD CONSTRUCTION**  
**NOTES • SPECIFICATIONS • DETAIL DRAWINGS**



**STANDARD CONSTRUCTION**  
**NOTES • SPECIFICATIONS • DETAIL DRAWINGS**



**STANDARD CONSTRUCTION**  
**NOTES • SPECIFICATIONS • DETAIL DRAWINGS**



**STANDARD CONSTRUCTION**  
**NOTES • SPECIFICATIONS • DETAIL DRAWINGS**



**STANDARD CONSTRUCTION**  
**NOTES • SPECIFICATIONS • DETAIL DRAWINGS**



**STANDARD CONSTRUCTION**  
**NOTES • SPECIFICATIONS • DETAIL DRAWINGS**





2. Additional labor costs for inspection by EGWS after normal business hours or observed holidays will be subject to EGWS overtime rates and paid by the developer or applicant or deducted from the Improvement Plan Processing Fee Deposit.
3. **Three (3)** copies of the approved development plans depicting water distribution system shall be submitted prior to and required for plan approval. The entire water system shall be detailed on one sheet and submitted in an AutoCAD R12 (or later) on a 3-1/2" floppy or CD. The water system layout will include all water related facilities, streets, parcels, lot numbers etc.
4. One letter size map (8-1/2" x 11") showing water system on an Elk Grove area location map shall be submitted prior to and required for plan approval.
5. All easements shall be submitted and reviewed for acceptance prior to and required for final acceptance of the project.
7. Actual construction costs of the water system paid by the developer/applicant with itemized costs for transmission mains, services, hydrants, as well as lineal feet of different sized pipe shall be required and necessary for final acceptance of project.
8. As-Built Drawings with specific measurements locating individual services, valves, gate valves etc. shall be required and necessary for final acceptance of project.
9. Other \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Acknowledgment:**

\_\_\_\_\_  
**Developer's Signature**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Developer's Printed Name**

\_\_\_\_\_  
**Title**

\_\_\_\_\_  
**Elk Grove Water Service**

\_\_\_\_\_  
**Date**