SECTION 8
WATER SUPPLY SYSTEMS

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8-1 INTRODUCTION: These Improvement Standards govern the design of all water systems intended for operation and maintenance by the County of Sacramento and the Sacramento County Water Agency. The County of Sacramento provides wholesale and retail water service to certain areas through the Sacramento County Water Agency.

8-2 INTENT OF WATER SYSTEM IMPROVEMENT STANDARDS: The intent of these water system Improvement Standards is to provide a water system that reliably and safely conveys water at a reasonable capital cost and to provide water systems that minimize operation and maintenance costs.

8-3 DEFINITIONS: When the following terms or titles are used in these water system Improvement Standards or in any document or instrument where these Standards govern, the intent and meaning shall be as herein defined:

- AWWA: American Water Works Association.
- SIPS: Site Improvement and Permits Section of the County Engineering Division of the Office of Development and Code Services.
- Non-potable Water: water that does not meet the standards for drinking water but does not originate from sewage. For County purposes considered as a type of recycled water.
- Potable Water: drinkable water.
- Raw Water: ground water or surface water, prior to treatment.
- Reclaimed Water: tertiary treated water that meets the requirements of Title 22, Chapter 3 Regulations of the California Administrative Code.
- Recycled Water: non-potable or reclaimed water.
- SCWA: Sacramento County Water Agency.
- Water Agency: Sacramento County Water Agency.
- Water Supply: Planning, Development, Design, and Water Operation and Maintenance sections of the Department of Water Resources of the County of Sacramento.
- Water System: potable water, raw water, and recycled water systems.

8-4 APPLICABLE STANDARDS: Items not addressed in these Improvement Standards shall be designed in accordance with accepted engineering practices and in accordance with the latest editions of the following:

- Standard Construction Specifications of the County of Sacramento.

- Title 4 and Title 5 of the Sacramento County Water Agency Code where applicable within zones of the Water Agency.
- Laws, codes, and standards of the State of California relating to domestic water supply.
- Rules and Regulations for Recycled Water Use and Distribution, County of Sacramento.
- Laws, codes, and regulations of the State of California relating to water use, conservation, and water efficient landscapes.
- Title 22, Chapter 3 of the Regulations of the California Administrative Code.
- American Water Works Association Standards and Manuals of Water Supply Practice.
- California Uniform Fire Code.

8-5 IMPROVEMENT AND LANDSCAPE PLAN SUBMITTAL: Improvement plans for developments that will be served retail or wholesale water by the Water Agency shall be reviewed by Water Supply. Improvement plans shall meet the requirements of Section 2 – General Requirements, of these Improvement Standards. The initial submittal of improvement plans shall be made to SIPS in accordance with the table below. SIPS will route plans to Water Supply. Subsequent resubmittals of improvement plans for projects in the unincorporated County area shall be delivered to SIPS. Subsequent resubmittals of improvement plans for projects in a City shall be delivered directly to Water Supply. PDF's and hardcopies shall be submitted in accordance with the table below.

Landscape plans for developments that will be served retail or wholesale water by the Water Agency, either potable or recycled, shall be reviewed by Water Supply and by the County or City department having jurisdiction. The following types of landscape projects shall be submitted for review and approval: parks, landscape corridors, residential street frontage, commercial, industrial, apartment, school, and street improvement projects. Irrigation systems required by Water Supply to use recycled water shall comply with all requirements of the latest edition of "Rules and Regulations for Recycled Water Use and Distribution, County of Sacramento". Landscape plans shall be formatted for 22-inch by 34-inch or 24-inch by 36-inch paper sizes. The initial submittal of landscape plans associated with a civil improvement plan, for which there is an existing charge account established at SIPS for the improvement plan, shall be submitted directly to Water Supply as well as subsequent resubmittals, and the charges for plan checking and inspection will be charged to the improvement plan account. The initial submittal of all other landscape plans shall be made to SIPS. After establishment of a charge account for plan checking and applicable construction inspection, SIPS will route the plans to Water Supply. PDF's and hardcopies shall be submitted in accordance with the table in this Section titled "Delivery of Plans".

PDF Standards:

1. PDFs shall be compatible and readable with Adobe Acrobat X or the most recent published Acrobat version.
2. Requirements:
    a. PDF/A format.
    b. 300 dpi minimum (higher is better).
    c. Less than 2 MB per sheet.
    d. No layers or embedded fonts.
    e. If plotted from CAD, combine all layers.
    f. Rotate all sheets so that the top of the page is at the top of the display screen.
    g. Scanned PDFs are not acceptable for either the initial approved plan or the record drawings. Scanned PDFs are acceptable for plan revisions only.
3. Plan revisions shall be made in the CAD and displayed on the PDF, except that minor text revisions may be made with other methods but later corrected in CAD for the Record Drawings.
4. All features shall be drawn to scale using decimal feet as units.
5. All layers and comments shall be flattened, and pages shall fit the screen.
6. If you have a low-resolution version and a high-resolution version, the high-resolution version shall be submitted.
7. Files shall not be locked or password protected.
8. Shall not require additional software or plug-ins to be read and navigated, and shall be text-searchable.
9. Shall not include embedded JavaScript such as animated gifs, movies, or HTML. Submissions with embedded JavaScript will be automatically rejected due to the potential security risks.

DELIVERY OF PLANS (Delivery Location / PDFs / Quantity of Hard-Copy Sets)					
	INITIAL PLAN SUBMITTAL	PLAN RE-SUBMITTAL	APPROVED PLAN	APPROVED PLAN REVISION	RECORD PLAN
	Deliver To: (Quantity)	Deliver To: (Quantity)	Deliver To: (Quantity)	Deliver To: (Quantity)	Deliver To: (Quantity)
IMPROVEMENT PLANS					
PROJECTS IN THE UNINCORPORATED COUNTY AREA	SIPS (PDF's)	SIPS (PDF's)	SIPS (3 sets* and PDF's)	SIPS (3 sets* and PDF's)	Supervising County Inspector (PDF's)
PROJECTS IN A CITY	SIPS** (PDF's)	Water Supply (PDF's)	SIPS** (3 sets*). Water Supply (PDF's)	SIPS** (3 sets*). Water Supply (PDF's)	Supervising County Inspector (PDF's)
LANDSCAPE PLANS***					
ASSOCIATED WITH AN IMPROVEMENT PLAN THAT HAS AN ACTIVE SIPS CHARGE ACCOUNT	Water Supply (PDF's)	Water Supply (PDF's)	Water Supply (3 sets* and PDF's)	Water Supply (3 sets* and PDF's)	Supervising County Inspector (PDF's)
OTHER LANDSCAPE PLANS	SIPS** (PDF's)				
* Full-size hard-copy plan sets.					
** SIPS services are limited to (1) establishment of the charge account for plan checking and construction inspection, and (2) distribution of the delivered plans to the applicable County departments.					
*** Delivery location and number of sets for landscape plans that contain sewer service or major drainage, or that are subject to County Drainage fees or review by other County departments, shall be in accordance with "Improvement Plans" above.					

A completed SCWA Water Service Request and Cross Connection Control Questionnaire shall be submitted to Water Supply for all projects except single-family residential projects. A separate questionnaire shall be submitted for each building. Facility design information shall be provided as required on the form, including design flows for consumptive use and fire sprinklers. The questionnaire shall be stamped by a licensed engineer or a licensed architect. Completed questionnaires shall be included with the first or second plan submittal, and shall

be approved prior to approval of a plan. Water Supply will provide the questionnaire upon request.

8-6 APPROVAL OF IMPROVEMENT AND LANDSCAPE PLANS: All improvement and landscape plans to be served by the Water Agency shall be approved and signed by an authorized representative of the Water Agency.

A. Improvement Plans -- The following shall occur before the improvement plans can be approved:

- All comments made by Water Supply regarding the improvement plans shall be addressed.
- Two sets of landscape plans shall be submitted to Water Supply. Alternatively, in lieu of submission of landscape plans, a letter and diagram prepared and stamped by a licensed landscape architect shall be submitted with the following information: (1) the water demand and meter sizes, with calculations, (2) a diagram showing the boundaries of the area to be served, street crossing sleeves, and the location of service connections, water meters, and reduced pressure principle backflow devices, (3) a delineation of areas to be served by potable and/or recycled water. It is essential that meters are sized and located properly prior to improvement plan signing to preclude the need to relocate meters in the future. Irrigation services, meters, and backflow devices shall be shown on the improvement plans.
- The Fire Department shall approve and sign the improvement plans.
- The location of all wells in use and all abandoned wells shall be shown on the grading plan. A note shall be placed on the plans indicating that wells shall be properly destroyed in accordance with the requirements of the Sacramento County Environmental Management Department. The note shall also instruct the contractor to call Sacramento County Environmental Management Department at 875-8400 for inspection of the well destruction.
- If the project is within the water supply service area of the Water Agency, the applicable water development fees shall be paid. Development fees for Zone 40 and Zone 50 shall be in accordance with Schedule A of Title 4 of the Sacramento County Water Agency Code and with the development fee programs in effect for sub-areas within Zone 40. Fees shall be paid at SIPS.
- Well and treatment plant sites shall be approved by Water Supply. Purchase agreements for well, treatment plant, and storage sites, where required by the conditions of approval, shall be executed by the property owners and delivered to Water Supply. Well site and treatment plant site assessment reports shall be submitted to Water Supply.

- Water easements shall be submitted, reviewed, and pre-approved for content by Water Supply, and executed recordable easements delivered to Water Supply. If documentation is required by Water Supply to substantiate an easement signer's authority to convey easements on behalf of a property owner, the documentation shall be provided and approved.

B. Landscape Plans -- Water Supply will review landscape plans for the following items:

- The proper water delivery pressure shall be stated, starting at the transmission main, in accordance with Section 8-10 of these Standards.
- The location and size of irrigation services, meters, and backflow devices shall match the approved improvement plans.
- An irrigation schedule shall be included in the plans listing the following minimum information: all control valves shown on the plans, the demand at each control valve in gpm, and the cumulative total run time of each control valve in minutes on the maximum day. A scheduling buffer consisting of a minimum 20% factor of safety shall be incorporated in the sizing of an irrigation service.
- The designed watering window shall not exceed (i.) the limits of the water efficiency codes and regulations of the jurisdiction in which the project is located and (ii.) the limits of Stage 1 of the SCWA Water Shortage Contingency Plan (refer to www.SCWA.net).
- The controllers shall be programmed so that flows do not exceed the maximum allowable flow for the meter size stipulated in Section 8-16.D.
- No trees shall be planted within 8 feet of a water main, service, or appurtenance, measured centerline to centerline.
- Landscape plans using recycled water for the water source shall (1) be consistent with the latest edition of "Rules and Regulations for Recycled Water Use and Distribution, County of Sacramento", and (2) be designed such that continuously pressurized irrigation lines upstream of control valves shall meet the horizontal and vertical separation requirements from potable water lines required in Section 64572 of the California Code of Regulations.
- A signature block for the Water Agency shall be provided on a landscape plan with the label "Approval for SCWA Water Fees and Meter Size Only", "Sacramento County Water Agency", and a space for the date. If a landscape plan includes recycled water irrigation, the signature block for the Water Agency shall instead be provided with the label "Approval for Fees, Meter Size, and Recycled Water Requirements Only", "Sacramento County Water Agency", and a space for the date.

- The SIPS charge account order number for plan checking and applicable construction inspection shall be listed on the cover sheet.

Landscaping projects subject to these Improvement Standards shall not be constructed prior to landscape plan approval by the Water Agency.

C. Delivery of Approved Improvement and Landscape Plans -- After approvals have been obtained and prior to the start of construction, hard-copy plan sets and PDF's shall be delivered to the location and in the quantity listed in the table above. Of the hard-copy sets delivered to SIPS, SIPS will route three sets to the Supervising County Inspector at County Construction Management and Inspection Division (CMID).

8-7 IMPROVEMENT PLAN REVISION: All plan revisions that affect a water system to be maintained and operated by the Water Agency shall be approved and signed by an authorized representative of Water Supply prior and then approved by SIPS or the City and prior to construction of the revision. Revisions shall normally be made in the CAD and displayed in the PDF's. If a revision replaces a drawing, the original approved drawing shall remain in the PDF set with an "X" through it.

After approvals have been obtained and prior to the start of construction, hard copies and PDF's shall be delivered to the location and in the quantity listed in the table above. Of the hard-copy sets delivered to SIPS, SIPS will route three sets to the Supervising County Inspector at County Construction Management and Inspection Division (CMID.

8-8 CONNECTION PERMITS AND FEES: A water connection permit shall be obtained for each connection to the water system. Contact Water Supply for information concerning Water Agency fees.

8-9 WATER SUPPLY QUALITY: The quality of the potable water supplied by the Water Agency will conform to the Environmental Protection Agency Drinking Water Act, and the State of California Drinking Water Standards.

8-10 WATER SUPPLY PRESSURE: Water supply pressures shall be designed as follows:

A. Potable Water -- Normal operating pressure in water transmission mains shall be 40 psi minimum to 90 psi maximum. Normal operating pressure in water distribution mains shall be 35 psi minimum to 90 psi maximum. The minimum pressure for domestic services, fire services, and irrigation services shall be 35 psi at the point where the service line connects to a

distribution main. During periods of maximum day domestic demand plus fire demand, the pressure shall not be less than 20 psi at the location of the fire flow and no less than 10 psi elsewhere in the distribution system.

B. Recycled Water -- Recycled water distribution systems shall be designed to maintain a minimum pressure of 40 psi at the service connection.

8-11 WATER DEMAND: For the design of water distribution systems serving single family residential areas, assume the water demand is 1 gallon per minute per residential connection (maximum day demand) plus fire flow. For the design of water distribution systems serving commercial areas, water demand shall be determined in accordance with industrial standards and in consultation with the Water Agency.

8-12 FIRE FLOWS: Required fire flows shall be determined by the adopted California Uniform Fire Code, the fire protection district having jurisdiction, and the County of Sacramento. Water distribution systems shall be designed to provide max day demand plus the required fire flow to each hydrant while maintaining 20 psi or greater residual pressure at the hydrant. A note shall be included on the water plan sheet stating the design fire flow for the distribution system.

The water distribution system for single family residential water areas is designed for 1,500 gpm. This will meet requirements for homes up to 3,600 square feet of combustible area, including garages and porches. Homes larger than 3,600 square feet of combustible area are a special condition and may require increased fire flows with larger mains. Required fire flows are 1,750 gpm for homes from 3,600 to 4,800 square feet of combustible area and 2,000 gpm for homes from 4,800 to 6,200 square feet or more of combustible area, or as required by the local Fire Department.

The minimum fire flow required by the adopted California Uniform Fire Code for commercial/industrial water systems is 1,500 gpm. For all new commercial/industrial projects the Water Agency shall require a distribution system designed for 3,000 gpm. Larger buildings or projects may require fire flows up to 4,000 gpm and may require water system upgrades or private supplemental water supplies.

8-13 WELLS, TREATMENT PLANT AND STORAGE FACILITY DESIGN: Water Supply will either design or provide design oversight for the construction of wells, treatment plants, booster pumping plants, and storage facilities for Water Agency use.

In general, all developments shall have a minimum of two sources of water. If adequate elevated or ground level storage is provided, a single source of water system may be acceptable upon approval by Water Supply and the local fire district.

Sites for the above water facilities shall be provided when required by the conditions of approval for a project.

Sites for wells shall meet the following criteria:

1. Sites shall meet the requirements of the Environmental Health Division of the County Environmental Management Department, and the Division of Drinking Water of the State Water Resources Control Board.

2. Sites shall conform to the requirements of Standard Drawing 8-19. Special provisions in the form of prohibitions, restrictions, and special construction may be required on adjacent properties and improvements.

3. In general, a minimum horizontal separation of 1000 feet shall be maintained between existing wells of any type and new municipal wells. The Water Agency may require a greater minimum horizontal separation in certain aquifers. If less separation is proposed, a hydrogeologic study shall be provided to evaluate the influence on and by other wells. The study shall be approved by Water Supply.

4. Sites shall be located to minimize the length of raw water mains.

5. Sites shall abut a paved street with a minimum 30 feet frontage.

6. Where possible, well sites shall be bordered by open space, such as parks or school sites. If such open space does not exist, well sites shall be bordered by commercial space.

7. Well sites shall be fenced with 6-foot split face masonry walls; other fencing solutions are subject to the approval of the Director.

8. Sites shall be provided with a 20-foot commercial driveway, a water service, a storm drain stub sized for the well capacity, and all underground facilities and dry utility provisions necessary for future 480-Volt 3-phase 250-300 Amp SMUD electric service with a 4 ft. x 6 ft. x 4 ft. SMUD vault with two 4-inch conduits stubbed beyond the PUE.

9. See Standard Drawing 8-19 for additional requirements.

The applicant shall provide Water Supply with information necessary to verify that proposed well sites and treatment plant sites comply with the setbacks recommended by the Environmental Health Division of the County Environmental

Management Department, and the Division of Drinking Water of the State Water Resources Control Board. The information shall consist of copies of existing environmental site assessment reports for all properties within 1000 feet of proposed well sites and treatment plant sites. If reports are not available, the applicant shall procure the services of a qualified firm, acceptable to Water Supply, to prepare a site assessment report providing the necessary information.

A preliminary hydro-geologic and sanitary assessment, including exploratory test hole drilling and evaluation, shall be performed for each proposed well site. If the results are not acceptable to Water Supply, alternate well site locations shall be provided and evaluated as above until acceptable results are obtained. When well sites are required by the conditions of approval, improvement plans shall not be approved until acceptable results are obtained and acceptable sites provided for all well sites. Sufficient time shall be provided for this process to be completed prior to plan approval.

8-14 TRANSMISSION MAIN DESIGN: Technical specifications and details for water transmission mains will be prepared by Water Supply and given to the consultant to be included with the improvement plans.

Transmission mains shall be designed to provide a minimum of 3,000 gpm at distribution main connection points. In order to minimize connections to the transmission main, distribution main connections to the transmission main shall be provided at one-quarter mile intervals beginning one-eighth mile from section corners or arterial intersections as approved by Water Supply. Distribution main connections shall be 12 inches in diameter, with valves, and shall extend to the edge of pavement. A minimum of one valve shall be located on the transmission main at distribution main connection points. Under no circumstances shall fire hydrants or water services be directly connected to a transmission main. If hydrants or services are needed, a distribution main shall be included in the improvement plan.

A. Transmission Main Design Plan Requirements:

1. The transmission mains shall be shown in full plan and profile views, including valves, air relief/vacuum valve assemblies, blow-off assemblies, all other appurtenances, and restrained joint lengths. Normally, restrained joint lengths shall be shown on the profile.

2. A water plan sheet shall be included as part of the improvement plans, showing locations of valves, fire hydrants, existing water lines, air release/vacuum valves, blow off valves, water services, and water quality sampling stations. The water plan shall also indicate driveways, electroliers, and storm drain inlets. The scale of the water plan shall normally be 1 inch = less than or equal to 100 feet and as necessary to fit the water plan onto a single sheet and

legibly show the water facilities and call outs. If water facilities scaled at 1 inch = 100 feet cannot fit onto a single sheet, the water plan may be shown on multiple sheets.

3. Details of transmission mains crossing other utilities or unusual alignments shall be provided if deemed necessary by Water Supply.

4. Stationing and elevations of all tees, crosses, bends, air release/vacuum valves, end-of-line blow-offs, temporary blow-offs, in-line blow-off valves, locating wire stations, and shut off valves not at a tee or cross shall be called-out in the profile view of the improvement plan sheets. Stationing for restrained joint lengths shall be called out. Elevations shall be called out at all changes in pipe elevation. Certain standard drawings require installation of gate valves as part of the construction of a water transmission main appurtenance. Each of those gate valves shall be shown on the plan view with the use of the correct valve symbol.

5. Water construction notes shall be numbered. The number of a note shall not vary within a plan set. The notes applicable to a drawing shall be listed on that drawing. The water plan shall include a complete list of all water construction notes.

6. Standard Drawings 8-21A and 8-21B shall be included in the plan set. The purpose is to provide contractors access to information required for them to (1) properly design temporary jumpers for flushing and disinfecting mains sized for 3.0 feet per second flushing velocity, (2) with a reduced-pressure principle backflow prevention assemblies approved by the State, and (3) preventing flow through that backflow device exceeding the maximum rated flow listed in AWWA C511.

B. Transmission Main Location -- All transmission mains shall be installed within public rights-of-way or water easements.

1. Water transmission mains shall be located on the north or west side of a street. Water transmission mains shall be located in the middle of a lane or if there is a bike lane, 4 feet from the lip of gutter. The transmission main and valve actuators shall be located so that the valve boxes will not be within normal traffic wheel paths or on traffic lane lines. A deviation from these criteria may be allowed if approved by Water Supply in consultation with other affected utility providers.

2. Water transmission mains shall not be located within landscape corridors or medians, unless approved by Water Supply as a result of irresolvable conflicts with other utilities.

3. Water Transmission Main Separation – The minimum separation distances set forth below shall be measured from the nearest outside edge of each pipe barrel, utility, or encasement, unless otherwise noted.

    a. New water transmission mains shall be installed at least 10 feet horizontally from any parallel pipeline conveying sewage or hazardous fluids such as fuels, industrial waste, and wastewater sludge.

    b. New water transmission mains shall be installed at least 5 feet horizontally from any parallel pipeline conveying storm drainage, recycled water, or raw water (see subsection "d."). New water transmission mains shall be installed at least 12 inches above the pipeline when within 10 feet horizontally of said pipeline.

    c. The minimum horizontal separation between a water transmission main and any other wet or dry utility not specifically listed in this section shall be 5 feet (see subsection "d.").

    d. Where sufficient space is available, as determined by Water Supply, the minimum horizontal separation between a water transmission main and a wet or dry utility not covered in subsection "a." shall be 10 feet measured centerline-to-centerline. If there is not enough space to obtain this separation, the horizontal separation shall be as great as practical, but not less than the minimum horizontal separation listed in subsections "b." and "c.".

    e. At crossings, the minimum vertical separation between a water transmission main and a wet or dry utility shall be 12 inches. Crossings shall be made as close to 90 degrees as practical, but in no case less than 45 degrees. Bored crossings shall have a minimum vertical separation of 18 inches from the outer surface of the casing.

    f. If crossing a pipeline conveying sewage, hazardous fluids, storm drainage, or recycled water, a new water transmission main shall be installed at least 12 inches above the pipeline.

No connection joints shall be made in the water transmission main within 8 feet horizontally of said pipeline.

g. New water transmission mains shall not be installed within 100 feet horizontally of the nearest edge of any sanitary landfill, wastewater disposal pond, or hazardous waste disposal site, or within 25 feet horizontally of the nearest edge of any cesspool, septic tank, sewage leach field, seepage pit, underground hazardous material storage tank, or groundwater recharge project site.

Separation shall comply with Section 64572 "Water Main Separation" of the California Code of Regulations. That separation may vary if approved by both the State Water Resources Control Board and by Water Supply.

4. Minimum Cover: Minimum cover depth shall be measured from gutter flowline (existing, new, or future) to top of pipe. Normal minimum cover under roadways shall be 48 inches and as necessary to provide (a.) a minimum of 12 vertical inches between the top of the main and the bottom of the street subgrade scarification zone, and (b.) sufficient main depth for air release/vacuum valve lateral runs to be installed beneath the street subgrade scarification zone. A minimum cover of 36 inches for C900/C905 PVC pipe, C200 steel pipe, and C303 concrete cylinder pipe, and 30 inches for C151 ductile iron pipe may be allowed in special circumstances if approved by Water Supply.

5. Minimum cover in open fields shall be 60 inches for C900/C905 PVC pipe and C303 concrete cylinder pipe, and 48 inches for C151 ductile iron pipe.

6. Transmission mains shall not be located under portland cement concrete pavements or decorative AC unless approved by Water Supply. If it is necessary to locate a transmission main under a concrete or decorative AC pavement, valves, fittings, and connections shall be located outside of the decorative area and pipe under the decorative area shall be restrained Class 350 ductile iron.

7. Railroad undercrossings shall normally be in steel casings with cathodic protection on the casing.

8. Mains shall not be located under structures such as bridges and box culverts. If the project will construct bridges or box culverts to the ultimate roadway width, water mains shall cross above ground attached to the side of the structure. Structures shall be designed

accordingly. If the ultimate width is not being constructed with the project, water mains shall cross underground routed outside and around of the ultimate footprint of the structure. A 20-foot-wide water pipeline easement shall be dedicated for the portion outside of the right of way. Structure attachments and underground crossings shall be included in the environmental impact analysis. Additional environmental permitting and other associated costs shall be at the applicant's expense.

9. Connections to existing transmission main stubs shall be designed to align the new main horizontally with the existing stub for at least the first 15 feet. Do not design bends or valves within that 15 feet, just straight pipe. This is necessary to both provide the space required for temporary jumpers and to minimize fit-up problems for the final tie-in.

10. If the location of a tie-in to an existing main is within a street with too much traffic for the local jurisdiction to allow a lane closure for the 2–3-week time period during which the above-ground temporary jumper must remain in place, then the plans shall include a requirement for the contractor to perform a separate tie-in and installation sequence solely for the street crossing. The street crossing sequence shall result in the SCWA water system being extended out of the street and into property on which the primary above-ground jumper can be installed for purpose of testing, flushing, and disinfecting the rest of the project water improvements.

C. Transmission Main Layout and Sizing -- The transmission main system location and size shall conform to the master water supply plans of the Water Agency. The maximum degree of bend for elbow fittings shall be 45 degrees for horizontal bends and 22.5 degrees for vertical bends, unless approved by Water Supply.

D. Transmission Main Pipe Restraint -- Pipes shall be restrained from movement as a result of thrust on the fittings and valves of the water transmission main system. Thrust restraint shall be provided at all valves, bends, reducers, tees, crosses, and dead ends.

Restrained Joints -- Restrained joints shall be used to resist thrust at fittings and valves 14 inches in diameter and larger, at valves 12 inches in diameter and less, and at fittings 12 inches in diameter and less in thrust configurations not covered in Standard Drawing 8-3A.

If the type of pipe within a restrained joint length is restricted to ductile iron or to another specific pipe type, it shall be called out.

The Standard Drawings for lateral water appurtenances include the necessary requirements for joint restraint and pipe type for the construction of the appurtenance.

Water distribution main stub-outs for future extension that are installed with water transmission mains shall be restrained over the full length of the stub.

Calculations: calculations for restrained joint lengths shall comply with the most recent editions (currently the third editions) of AWWA Manuals M41 and M23 -- Chapter 8 "Thrust Restraint Design for Ductile-Iron Pipe" of AWWA Manual M41 "Ductile-Iron Pipe and Fittings", and Chapter 11 "Design for Thrust Restraint" of AWWA Manual M23 "PVC Pipe – Design and Installation". Be advised that many popular electronic restraint calculators do not use the AWWA methodology.

The calculator available on the website of the Ductile Iron Pipe Research Association (dipra.org) uses AWWA methodology. The following parameters (or stricter) may be used in the DIPRA software: Laying Condition – "Type 4"; Soil Designation – "Good Sand & Gravel"; Design Pressure – "150 psi"; "Polywrapped". Valves shall be treated as bi-directional dead ends. Factor of Safety – "1.5" for dead ends and tee branches; Factor of Safety -- "1.0" for inline valves not at tees or crosses, for valves at crosses, and for valves on tee runs. The DIPRA software may also be used to calculate restraints for C900 PVC pipe by using the parameters for polywrapped DIP.

E. Transmission Main Pipe Type and Pipe Deflection -- Pipes 18 inches and less in diameter may be AWWA C151 ductile iron or AWWA C900/C905 polyvinyl chloride. Pipes 20 through 30 inches in diameter shall be AWWA C151 ductile iron. Pipes 36 through 60 inches in diameter shall be AWWA C151 ductile iron unless approved by the Water Agency. Pipes 36 through 60 inches in diameter may be AWWA C200 steel pipe or AWWA C303 concrete cylinder pipe if the use of the transmission main is such that it will not be subject to future tapping or cut-in's as determined by the Water Agency. Pipes 64 inches and more in diameter shall be AWWA C200 steel pipe or AWWA C303 concrete cylinder pipe.

For ductile iron pipe without restrained joints, deflection at joints shall not exceed 2.5 degrees for 36-inch and smaller pipe and 2.0 degrees for 42-inch and larger pipe. A fitting shall be used if joint deflections exceed these limits.

For ductile iron pipe with restrained joints, deflection at joints shall not exceed: 2.5 degrees for 12-inch and smaller pipe, 2.0 degrees for 16-inch and 18-inch pipe, 1.25 degrees for 20-inch and 24-inch pipe, 1.0 degrees for

30-inch pipe, 0.75 degrees for 36-inch pipe, and 0.25 degrees for 42-inch and larger pipe. A fitting shall be used if joint deflections exceed these limits.

Joint deflection of polyvinyl chloride pipe is not allowed. Bending of polyvinyl chloride pipe shall not exceed the limits described in Standard Drawing 8-9B.

F. C200 Steel and C303 Concrete Cylinder Transmission Mains -- Improvement plans and specifications shall require the contractor to hire an independent testing firm (subject to approval by the Water Agency) to provide certified welding inspections, confined space inspections, and the specialty inspections listed below for the project. The scope of inspection shall be (a) delivery acceptance inspection of all pipe and fittings, (b) inspection of all field welds with the use of magnaflux or penetrating dye method, and (c) inspection and testing of all exterior coatings and patching prior to backfilling and inspection and testing of all interior linings, patching, and pipe cleaning after completion of backfilling.

G. Transmission Main Cathodic Protection Systems -- Cathodic protection systems shall not be provided unless required by Water Supply.

Cathodic protection systems shall be designed with a 50-year life. Buried lateral cable runs shall be in concrete-encased conduit with a minimum of 48 inches of cover. Test stations shall be located in non-traffic areas and shall be extra heavy duty, vandal resistant, and tamper resistant.

The location of all anode beds, lateral cable runs, and test stations shall be shown to scale on the civil plan and profile sheets and shall be called out by station and offset from road centerline on either the plan view or profile.

H. Transmission Main Water System Appurtenances -- Transmission main appurtenance requirements on the improvement plans shall be as follows:

1. Valves shall be spaced no greater than 1300 feet apart and shall be located so that any section of the main can be shut down without going to more than three locations to close valves. Normally, three valves shall be placed where mains cross and two valves where mains tee. Each section of pipeline between crosses or tees shall have a minimum of one valve. Valves at intersections shall be located within the curb returns and set as close to minimum pipe depth as possible. Valves shall be placed on the end of temporary transmission main dead ends that are longer than 330 feet. On temporary dead ends shorter than 330 feet, valves shall be placed at the tee or cross. Valves 8 inches in diameter and smaller shall be gate valves. Ten-inch valves may be gate or butterfly valves.

Valves larger than 10 inches in diameter shall be butterfly valves. Butterfly valve symbols shall indicate on which side of the pipe to install the offset right-angle gear drive valve operator. Operators shall be located as near as possible to center of lanes or lane lines. No more than one butterfly valve operator shall be located in a single quadrant of a tee or cross.

2. Air release/vacuum valve assemblies shall be required at high points on the transmission main as determined by Water Supply. Transmission mains shall require a 2-inch air release vacuum valve. See Standard Drawing 8-14B for specifications and typical installation details.

   In streets with roadside ditches, provide profile views of ARV lines and boxes. ARV boxes shall be located beyond the ditch. ARV lines shall not daylight in the ditch crossing.

3. Temporary blow-offs shall be provided on stub-outs. Temporary blow-offs shall be sized for 3.0 feet per second flushing velocity. Minimum sizes shall be 4 inch for 12 inch mains, 6 inch for 16 inch and 18 inch mains, and 8 inch for 20 inch and 24 inch mains.

4. Permanent blow-offs shall be provided at dead ends. Permanent blow-offs shall be 4 inches in diameter for lines up to 24 inches in diameter and 6 inches in diameter for lines larger than 24 inches in diameter.

5. In-line blow-off valves shall be required at low points on the water transmission main as determined by Water Supply. In-line blow-off valves shall be 4 inches in diameter for water lines up to 24 inches in diameter and 6 inches in diameter for water lines larger than 24 inches in diameter.

   In streets with roadside ditches, provide profile views of blow-off lines and boxes. When possible, blow-off valves and boxes shall be located beyond the ditch.

6. Locating wire stations shall be placed on transmission mains when the distance between valves and/or permanent and in-line blow-offs exceeds 600 feet. See Standard Drawing 8-4B for specifications and typical installation details.

8-15 DISTRIBUTION MAIN DESIGN: In general, water distribution systems shall be looped, with two points of connection to water sources, separated by a minimum of one valve and an adequate separation distance approved by Water Supply. Sizing

of distribution mains shall be such that the normal pressures stated in Section 8-10 and the minimum requirements stated below for distribution main spacing and sizing are attained.

The Hazen-Williams formula shall be used in the hydraulic study of the system, using a "C" value of 125 for cement-lined pipe, polyvinyl chloride pipe, and ductile iron pipe. Velocity in distribution mains shall not exceed 7 feet per second at peak hour or 10 feet per second conveying fire flow. Unit head loss shall not exceed 5 feet per 1,000 feet. The unit head loss does not apply to fire flow.

A Hardy-Cross hydraulic analysis of any proposed distribution system shall be supplied to Water Supply. The analysis shall comply with the requirements of Sections 8-10, 8-11, and 8-12.

A. Distribution Main Design Plan Requirements:

1. All public distribution mains, including those on commercial and apartment projects, shall be shown in plan and profile. Profile sheets shall include the portion of the plan area being profiled, placed above the profile and vertically aligned with the profile. Restrained joint lengths shall be shown. Normally, restrained joint lengths shall be shown on the profile. Stub-outs for future extension, hydrant laterals, fire service laterals, and 3-inch and larger water service laterals shall be shown in plan and profile, except that the profiles may be omitted if (a) the design profile is straight, (b) finish grades over the lengths of the stubs and laterals are provided, and (c) there are no crossings, ditches, or embankments.

2. A water plan sheet shall be included as part of the improvement plans, showing locations of valves, fire hydrants, existing water lines, air release/vacuum valves, blow off valves, water services, fire services, and water quality sampling stations. The water plan shall also indicate driveways, electroliers, and storm drain inlets. The scale of the water plan shall normally be 1 inch = less than or equal to 100 feet and as necessary to fit the water plan onto a single sheet and legibly show the water facilities and call outs. If water facilities scaled at 1 inch = 100 feet cannot fit onto a single sheet, the water plan may be shown on multiple sheets.

3. Details of distribution mains crossing other utilities or unusual alignments shall be provided if deemed necessary by Water Supply.

4. Stationing of all tees, crosses, bends, hydrants, 3 inch or larger water services, fire services, air release/vacuum valves, in line blow-off valves, end-of-main blow-off valves, and shut off valves not at a tee or cross shall be called out in the profile view of the improvement

plan sheets. Stationing for restrained joint lengths shall be called out. Elevations shall be called out at all changes in pipe elevation. With the exception of single-family residential services, the size of all connections to the main and the specific fitting required shall be called out on the profile. Certain standard drawings require installation of gate valves as part of the construction of a water appurtenance. Each of those gate valves shall be shown on the plan view with the use of the correct valve symbol, except that above-ground gate valves in backflow prevention assemblies shall not be shown.

5. Commercial, industrial, and multi-family improvement plans with a water easement shall have a note that states, "Utilities shall not be located within water easement(s) except for crossings made as close to perpendicular to the water main as practical".

6. All plans shall include the most recent version of the standard SCWA Water Notes. The most recent version of the standard SCWA Recycled, Raw, and Landscape Water notes shall also be included as necessary. Water Supply will provide the notes upon request.

7. Water construction notes shall be numbered. The number of a note shall not vary within a plan set. The notes applicable to a drawing shall be listed on that drawing. The water plan shall include a complete list of all water construction notes.

8. Standard Drawings 8-21A and 8-21B shall be included in the plan set. The purpose is to provide contractors access to information required for them to (1) properly design temporary jumpers for flushing and disinfecting mains sized for 3.0 feet per second flushing velocity, (2) with a reduced-pressure principle backflow prevention assemblies approved by the State, and (3) preventing flow through that backflow device exceeding the maximum rated flow listed in AWWA C511.

9. Trees: the centerline of trees shown on approved planning exhibits shall be taken into account and shown if mains or water appurtenance laterals are routed in landscape areas. No main or water appurtenance shall be within 8 feet of trees, measured centerline to centerline.

10. Decorative Pavements: plans shall clearly show the location and limits of decorative pavements and colored concrete pavements and call them out.

B. Distribution Main Location -- All water distribution mains shall be installed within public rights-of-way or easements.

1. The centerline of the water distribution main shall be located 3 feet from the lip of the gutter on the northerly or westerly side of the street. A deviation from these criteria may be allowed if approved by Water Supply in consultation with other affected utility providers.

2. Water easements for water mains and lateral appurtenances shall have a minimum width of 15 feet. The water main and appurtenances shall be centered in the easement. Signed easements shall be provided to the Water Agency prior to plan approval. Normally, the easement area shall not contain the following items: structures, footings, light standards, parallel sidewalks, fences, roof overhangs, parallel utilities (crossings are O.K.), parallel curbs or gutters, parking stalls, bioswales, or parallel ditches.

3. If it is necessary to install a water distribution main within a landscape corridor, no trees shall be planted within 8 feet of the water main, water services, or water appurtenances, measured centerline to centerline. The water distribution main shall be centered within a 15-foot-wide water easement. The landscape plans for the corridor shall be submitted prior to approval of the improvement plans.

4. If a water distribution main is required to be installed between residential homes, the pipe material shall be Class 350 ductile iron pipe. The minimum depth shall be 4 feet to top of pipe and the center of the main shall be centered within a 15-foot-wide water easement.

5. Water Distribution Main Separation:

   The minimum separation distances set forth below shall be measured from the nearest outside edge of each pipe barrel, utility, or encasement, unless otherwise noted.

   a. New water distribution mains shall be installed at least 10 feet horizontally from any parallel pipeline conveying sewage or hazardous fluids such as fuels, industrial wastes, and wastewater sludge.

   b. New water distribution mains shall be installed at least 5 feet horizontally from any parallel pipeline conveying recycled water or raw water (see subsection “e.”). New water distribution mains shall be installed at least 12 inches above

the pipeline when within 10 feet horizontally of said pipeline.

c. New water distribution mains shall be installed at least 4 feet horizontally from any parallel pipeline conveying storm drainage (see subsection "e."). New water distribution mains shall be installed at least 12 inches above the pipeline when within 10 feet horizontally of said pipeline.

d. The minimum horizontal separation between a water distribution main and any other wet or dry utility not specifically listed in this section shall be 5 feet (see subsection "e.").

e. Where sufficient space is available as determined by Water Supply, the minimum horizontal separation between a water distribution main and a wet or dry utility not covered in subsection "a." shall be 10 feet measured centerline-to-centerline. If there is not enough space to obtain this separation, the horizontal separation shall be as great as practical, but not less than the minimum horizontal separation listed in subsections "b.", "c.", and "d.".

f. At crossings, the minimum vertical separation between a water distribution main and a wet or dry utility shall be 12 inches. Crossings shall be made as close to 90 degrees as practical, but in no case less than 45 degrees. Bored crossings shall have a minimum vertical separation of 18 inches from the outer surface of the casing.

g. If crossing a pipeline conveying sewage, hazardous fluids, storm drainage, or recycled water, a new water distribution main shall be installed at least 12 inches above the pipeline. No connection joints shall be made in the water distribution main within 8 feet horizontally of said pipeline.

h. New water distribution mains shall not be installed within 100 feet horizontally of the nearest edge of any sanitary landfill, wastewater disposal pond, or hazardous waste disposal site, or within 25 feet horizontally of the nearest edge of any cesspool, septic tank, grease trap, sewage leach field, seepage pit, underground hazardous material storage tank, or groundwater recharge project site.

Separation shall comply with Section 64572 "Water Main Separation" of the California Code of Regulations. That separation

may vary if approved by both the State Water Resources Control Board and by Water Supply.

6. Distribution mains shall not be located under portland cement concrete or decorative AC pavements unless approved by Water Supply. If it is necessary to locate a distribution main under a concrete or decorative AC pavement, valves, fittings, and connections shall be located outside of the decorative area and pipe under the decorative area shall be restrained Class 350 ductile iron.

7. Minimum Cover: Minimum cover depth shall be measured from gutter flowline (existing, new, or future) to top of pipe. Normal minimum cover under roadways shall be 36 inches and as necessary (a.) to provide a minimum of 6 vertical inches between the top of the main and the bottom of the street subgrade scarification zone, (b.) to ensure that gate valve stems are a minimum of 6 inches below the street subgrade, and (c.) to provide sufficient main depth for air release/vacuum valve lines to be installed beneath the street subgrade scarification zone. A minimum cover of 30 inches for ductile iron pipe may be allowed if approved by Water Supply. When not avoiding other utilities, mains shall have a maximum depth of 60 inches unless otherwise approved by Water Supply. Mains installed in easements between residences shall have a minimum cover of 48 inches.

8. Water distribution mains not conforming to Items 1 through 4 above may be approved by Water Supply in consultation with other affected utility providers.

9. Mains shall not be located under structures such as bridges and box culverts. If the project will construct bridges or box culverts to the ultimate roadway width, water mains shall cross above ground attached to the side of the structure. Structures shall be designed accordingly. If the ultimate width is not being constructed with the project, water mains shall cross underground routed outside and around of the ultimate footprint of the structure. A 20-foot-wide water pipeline easement shall be dedicated for the portion outside of the right of way. Structure attachments and underground crossings shall be included in the environmental impact analysis. Additional environmental permitting and other associated costs shall be at the applicant’s expense.

10. Connections to existing distribution main stubs shall be designed to align the new main horizontally with the existing stub for at least the first 15 feet. Do not design bends or valves within that 15 feet, just straight pipe. This is necessary to both provide the space required

for temporary jumpers and to minimize fit-up problems during the final tie-in.

11. If the location of a tie-in to an existing main is within a street with too much traffic for the local jurisdiction to allow a lane closure for the 2–3-week time period during which the above-ground temporary jumper must remain in place, then the plans shall include a requirement for the contractor to perform a separate tie-in and installation sequence solely for the street crossing. The street crossing sequence shall result in the SCWA water system being extended out of the street and into property on which the primary above-ground jumper can be installed for purpose of testing, flushing, and disinfecting the rest of the project water improvements.

C. Distribution Main Layout and Sizing -- The distribution system, whenever possible, shall be in grid form so that pressures throughout the system tend to become equalized under varying rates and locations of maximum demand, and to provide system redundancy. The minimum pressures and flows as specified in Sections 8-10, 8-11, and 8-12 shall govern the design of the system. The following conditions are to be considered for the distribution system design:

1. Mains shall be sized as necessary to deliver the required fire flow. In general, the minimum pipe size for looped systems shall be 8 inches in diameter in areas requiring 1500 gpm fire flow, and 10 inches in diameter in areas requiring 3000 gpm fire flow.

2. Dead end runs without a hydrant may be 6 inches in diameter. Dead end runs with a hydrant and hydrant laterals shall be sized to meet fire flow requirements.

3. The maximum degree of bend for elbow fittings shall be 45 degrees for horizontal bends and 22.5 degrees for vertical bends, unless approved by Water Supply.

D. Distribution Main Pipe Restraint -- Pipes shall be restrained from movement as a result of thrust on the fittings and valves of the water system. Thrust restraint shall be provided at all valves, bends, reducers, tees, crosses, and dead ends.

Restrained Joints -- Restrained joints shall be used to resist thrust at valves. Restrained joints shall also be used to resist thrust at fittings in thrust configurations not covered in Standard Drawing 8-3A.

If the type of pipe within a restrained joint length is restricted to ductile iron or to another specific pipe type, it shall be called out.

The Standard Drawings for lateral water appurtenances include the necessary requirements for joint restraint and pipe type for the construction of the appurtenance.

Water distribution main stub-outs for future extension shall be restrained for the length necessary for a dead end or the length of the stub, whichever is shorter.

Calculations: calculations for restrained joint lengths shall comply with the most recent editions (currently the third editions) of AWWA Manuals M41 and M23 -- Chapter 8 "Thrust Restraint Design for Ductile-Iron Pipe" of AWWA Manual M41 "Ductile-Iron Pipe and Fittings", and Chapter 11 "Design for Thrust Restraint" of AWWA Manual M23 "PVC Pipe – Design and Installation". Be advised that many popular electronic restraint calculators do not use the AWWA methodology.

The calculator available on the website of the Ductile Iron Pipe Research Association (dipra.org) uses AWWA methodology. The following parameters (or stricter) may be used in the DIPRA software: Laying Condition – "Type 4"; Soil Designation – "Good Sand & Gravel"; Design Pressure – "150 psi"; "Polywrapped". Valves shall be treated as bi-directional dead ends. Factor of Safety – "1.5" for dead ends and tee branches; Factor of Safety -- "1.0" for inline valves not at tees or crosses, for valves at crosses, and for valves on tee runs. The DIPRA software may also be used to calculate restraints for C900 PVC pipe by using the parameters for polywrapped DIP.

E. Distribution Main Pipe Type and Pipe Deflection -- Pipe used in the construction of water distribution systems shall be AWWA C151 ductile iron or AWWA C900 PVC. For ductile iron pipe, deflection at joints shall not exceed 2.5 degrees as described in Standard Drawing 8-9A. Pipe deflections greater than 2.5 degrees shall require a fitting. Joint deflection of PVC pipe is not allowed. Bending of PVC pipe shall not exceed the limits described in Standard Drawing 8-9B.

F. Abandonment of Existing Distribution Mains, Services, and Appurtenances -- Existing water mains, stubs, services, and appurtenances that are no longer required for service shall be abandoned as required by Water Supply. Abandonment shall be mandatory, even in new pavements, because of the necessity to remove potential sources of stagnate water and the associated potential contamination from the water system. This requirement does not apply to private water facilities that are outside the limits of ROW, PUE, and water easements.

8-16 DISTRIBUTION MAIN WATER SYSTEM APPURTENANCES: Water system appurtenances include valves, fire hydrants, water service lines, water meters, back-flow devices, air release/vacuum valve assemblies, and blow-off valves.

A. Valves:

1. A valve shall be placed on the distribution main at the connection point to a transmission main.

2. Valves shall be spaced a maximum of 500 feet apart. In residential areas, valves shall be spaced such that no single shut-down will result in shutting down more than 15 services.

3. Valves shall be spaced so that in no case shall more than two fire hydrants be removed from service by a shut-down.

4. Valves shall be located so that any section of main can be shut down without going to more than three locations to close valves.

5. Valves at intersections shall be located within the curb returns and set as close to minimum pipe depth as possible. A minimum of three valves shall be placed at crosses and two valves at tees.

6. If it is necessary to install valves between street intersections, they shall be located on property lines between lots.

7. Each section of pipeline between crosses or tees shall have a minimum of one valve.

8. At distribution main stub-outs for future extension, a valve shall be located on the stub line at the tee or cross.

9. Valves 8 inches in diameter and smaller shall be gate valves. Ten-inch valves may be gate or butterfly valves. Valves larger than 10 inches in diameter shall be butterfly valves. The depth of the water line shall be adjusted to locate the stem of gate valves a minimum of 6 inches below the street subgrade. Butterfly valve symbols shall indicate on which side of the pipe to install the offset right-angle gear drive valve operator. Operators shall be located as near as possible to the center of lanes or lane lines. No more than one butterfly valve operator shall be located in a single quadrant of a tee or cross.

B. Fire Hydrants and End-of-Line Blow-off Assemblies -- Fire hydrants and End-of-Line blow-off assemblies shall comply with the requirements of this section, the local fire district, and Water Supply. Fire hydrants and end-of-line blow-off assemblies shall be located as follows:

1. Fire hydrants shall be connected to distribution mains only. Fire hydrants shall not be connected to transmission mains.

2. Fire hydrants shall be placed at street intersections wherever possible and located to minimize the hazard of damage by traffic. Hydrants shall have a maximum normal spacing of 500 feet measured along the street frontage in residential developments, and a maximum normal spacing of 300 feet within commercial developments, or closer if deemed necessary by the local fire district. Hydrants located at intersections shall be installed at the curb return. Within residential areas, all other hydrants shall be located on property lines between lots. See Standard Drawings 8-2A and 8-2B for specifications and typical installation details. In areas with separated sidewalks, hydrants shall normally be located behind the curb as required by the local fire district.

3. A fire hydrant or 4-inch blow-off assembly shall be installed on all permanent dead-end runs including cul-de-sacs. If the local fire district requires a hydrant at the end of a dead-end run, then a blow-off assembly is not required. Wherever possible, the blow-off assemblies shall be installed in street right-of-way a minimum distance of 3 feet from the lip of gutter. In no case should the location be such that there is a possibility of back-siphon into the distribution system. For specifications and typical installation details see the Standard Drawing 8-13 series.

C. Water Service Lines -- Provide separate water services to each parcel and separate water services to each building. Service lines from the water distribution main to the meter shall be installed at the time the main is constructed. For specifications and typical installation details see the Standard Drawing 8-6 series, Drawing 8-1, and Drawing 8-20.

Service line design shall be in accordance with the following:

1. General: Water service lines shall normally have the following minimum separations measured center-to-center: 10 feet from a sanitary service, 3 feet from a fire hydrant, and 5 feet from an electrolier. Water service lines shall be a minimum of 3 feet from an edge of a storm drain inlet. Minimum separation from dry utilities shall be as required by Standard Drawing 8-20.

2. Single-Family Detached Residences Service Lines: Services shall be located on the side of the lot opposite the driveway. Service lines to corner lots shall normally be located at or near a curb return at the side of the lot closest to a main. Service line location relative to property lines and dry utilities shall comply with Standard Drawing 8-20.

3. Fire sprinkler service to single-family detached residences and to each unit of a duplex shall normally be delivered by the domestic metered service line. The fire sprinkler service shall branch off of a service line downstream of the meter box assembly and outside of the PUE. A reduced pressure backflow prevention assembly shall be provided on the service line unless the sprinkler piping inside the residence is designed to connect to a remotely located water closet with a minimum one-half-inch outlet to ensure routine purging of water in the system.

   Other types of residences and buildings shall be provided with a separate fire service that has a separate connection to the water main.

4. The size of a standard single-family residential service line shall be 1.5 inches in diameter, with a 1-inch water meter. The size of a single-family residential service line for lots 30,000 square feet and larger, and for homes with a combined fire/domestic flow exceeding 50 gpm, shall be 1.5 inches in diameter, with a 1.5-inch water meter.

5. For all other services, the design domestic demand and the design maximum-day irrigation demand shall be calculated and submitted to Water Supply. Separate service lines and meters shall be provided for domestic and irrigation services if either (a.) the sum of the two numbers exceeds 50 gallons per minute, or (b.) the size of the irrigated landscape exceeds 5,000 square feet.

6. The normal minimum size of a commercial service line shall be 1.5 inches in diameter. Commercial, industrial, multi-family units, schools, parks, and landscape projects with higher water demands shall be provided with larger services, subject to approval by Water Supply.

7. Parks and landscape projects with non-irrigation water uses (bathrooms, fountains, water play, etc.) shall be provided with separate service lines and meters for domestic and irrigation services. Except that a single service may be used if the only non-irrigation demand is for drinking fountains.

8. Service lines shall be designed without bends when possible. For 2-inch and smaller services, if a bend is necessary, the bend shall be shown on the plan as a curve to indicate bending of the polyethylene pipe service line.

D. Water Meters -- Water meters shall be installed on all residential, commercial, industrial, multi-family, school, park, and irrigation water services. Except as noted in Section 8-16.C.4, the size of the water meter shall be the same size as the service line between the main and meter unless approved by Water Supply. The maximum allowable design flow shall be in accordance with the following:

METER SIZE (inches)	METER TYPE	MAXIMUM ALLOWABLE DESIGN FLOW* (gpm)
1	Positive Displacement	25
1.5	Floating Ball Technology Compound	50
2	Floating Ball Technology Compound	80
3	Floating Ball Technology Compound	220
4	Floating Ball Technology Compound	390
6	Floating Ball Technology Compound	880
* Not including fire sprinkler flow.		

See the Standard Drawing 8-6 series for the required meter model and typical installation details.

The maximum allowable combined design flow for meters conveying water for both consumptive use and fire sprinklers shall be the meter manufacturer's published maximum flow rate for the meter model and the maximum flow rate recommended by AWWA for the meter type, whichever is less.

Meter box assemblies for single-family residential services shall be installed by the contractor installing facilities shown on the improvement plan at the time the water service lines are installed, except for the water

meter itself and the Flexnet radio unit which shall be installed by the home builder. The water meter and Flexnet radio unit shall be installed prior to any water use from the water service line. The home builder shall contact SCWA at WRWaterMeters@saccounty.gov for meter inspection within 24 hours of installation.

All other meter box assemblies shall be installed by the improvement plan contractor at the time the water service lines are installed, including the water meter, unless approved by Water Supply. See the Standard Drawing 8-6 series for specifications and typical installation details.

After construction, at no time shall water flow through a water service absent a water meter.

E. Fire Service Double Check-Detector Backflow Prevention Assembly -- A double check-detector backflow prevention assembly with bypass meter shall be required on each fire service line into a building. The size shall (i.) not be less than the size of the fire service lateral and (ii.) be sufficiently large so that the maximum rated flows listed in AWWA C510 are not exceeded at any time. Flow rates required for flushing new sprinkler lines and for acceptance and periodic testing of fire pumps shall be accounted for in sizing the valve. See Standard Drawing 8-7 for specifications and typical installation details.

F. Back Flow Devices -- Back-flow devices are required in accordance with Title 17, Chapter V, and Sections 7583-7622 of the California Administrative Code.

1. Double Check-Detector Backflow Prevention Assembly -- A double check-detector backflow prevention assembly shall be required at each connection of a private water main to the public distribution system. The size shall (i.) not be less than the size of the service lateral and (ii.) be sufficiently large so that the maximum rated flows listed in AWWA C510 are not exceeded at any time. Flow rates required for flushing new sprinkler lines and for acceptance and periodic testing of fire pumps shall be accounted for in sizing the assembly. See Standard Drawing 8-8C for specifications and typical installation details.

2. Reduced-Pressure Principle Backflow Prevention Assembly -- A reduced-pressure principle backflow prevention assembly shall be required on the following services: commercial, industrial, school, park, irrigation, multi-family residential buildings, and services to any parcel or premises served water from a private well. The size shall (i.) not be less than the size of the service lateral and (ii.) be sufficiently large so that the maximum rated flows listed in AWWA

C511 are not exceeded at any time. See Standard Drawings 8-8A, 8-8B, and 8-8C for specifications and typical installation details.

G. Air Release/Vacuum Valve Assemblies -- Air release/vacuum valve assemblies shall be required at high points in a distribution system as determined by Water Supply. Distribution mains shall require a 1-inch air release vacuum valve. See Standard Drawing 8-14A for specifications and typical installation details.

In streets with roadside ditches, provide profiles of ARV lines and boxes. ARV boxes shall be located beyond the ditch. ARV lines shall not daylight in the ditch crossing.

H. Blow-off Valves -- Blow-offs valves shall be required as specified in this section.

1. Temporary Blow-off Valve -- Temporary blow-offs shall be provided on all stub-outs. Temporary blow-offs shall be sized for 3.0 feet per second flushing velocity. Minimum sizes shall be 3 inch for 6 inch and 8 inch mains and 4 inch for 12 inch mains. See Standard Drawings 8-12A and 8-12B for specifications and typical installation details.

2. End of Main Blow-off Valve – A 4-inch blow-off valve shall be required at the permanent end of water mains. See Standard Drawing 8-13A for specifications and typical installation details.

3. Cul-De-Sac Blow-off Valve -- A 4-inch blow-off valve shall be required at the end of a water main in a cul-de-sac, except in the case that the line ends in a fire hydrant. The blow-off gate valve shall be located 2 feet past the last water service connection. See Standard Drawing 8-13B for specifications and typical installation details.

4. In-Line Blow-off Valve -- A 4-inch in-line blow-off valve shall be required at low points in the water distribution main as approved by Water Supply. See Standard Drawing 8-13C for specifications and typical installation details.

   In streets with roadside ditches, provide profile views of blow-off lines and boxes. When possible, blow-off valves and boxes shall be located beyond the ditch.

I. Locating Wire Stations -- Locating wire stations shall be placed on distribution mains when the distance between valves and/or permanent and in-line blow-offs exceeds 600 feet. See Standard Drawing 8-4B for specifications and typical installation details.

J. Water Sample Stations – Water sample stations shall be provided at the rate of not less than one for every 500 new and existing units and at locations required by Water Supply. Water sample stations shall normally be located within a streetscape in a PUE. Alternate locations may be approved by Water Supply. Water Supply will provide typical installation details upon request. A water sample station shall consist of a 1-inch water service terminated inside a G-5 valve box with a 1-inch curb stop.

8-17 RECYCLED WATER TRANSMISSION AND DISTRIBUTION MAIN DESIGN: Recycled water facilities may be required by the Water Agency for use in specified areas as determined by Water Supply. Design flows and demands for recycled water systems shall be determined by the Water Agency. The design of recycled water transmission mains and distribution mains shall comply with the design requirements for potable water transmission mains and distribution mains with the following special provisions:

1. Recycled water mains shall be located on the south and east side of a street. A deviation from these criteria may be allowed if approved by Water Supply in consultation with other affected utility providers.

2. Recycled Water Main Separation -- Separation between recycled water mains and potable water mains and raw water mains shall comply with Section 64572 "Water Main Separation" of the California Code of Regulations. Separation may vary if approved by both the State Water Resources Control Board and by Water Supply.

3. To avoid cross connection of the potable and recycled water systems, recycled water facilities shall be clearly marked through appropriate coloring of pipe materials and above ground appurtenances.

4. All above ground facilities shall be marked with a sign to caution against drinking water from the recycled water system. All signs shall be made and placed in such a manner as to become a permanent part of the facility or appurtenance. Park sites, large turf areas, and other publicly used areas may require warning signs of the appropriate size as determined by Water Supply or other regulatory agencies. See Standard Drawing 8-16 for specifications and installation details.

5. Recycled water services shall not be equipped with a back flow device.

6. Recycled water main plans shall include the standard SCWA Recycled Water Notes as provided by Water Supply.

8-18 RAW WATER TRANSMISSION MAIN DESIGN: Raw water transmission main facilities may be required by the Water Agency for use in specified areas as determined by Water Supply. Design flows and demands for raw water systems shall be determined by the Water Agency. The design of raw water transmission mains shall comply with the design requirements for potable water transmission mains with the following special provisions:

1. Raw water transmission mains shall be located on the north and west side of a street.

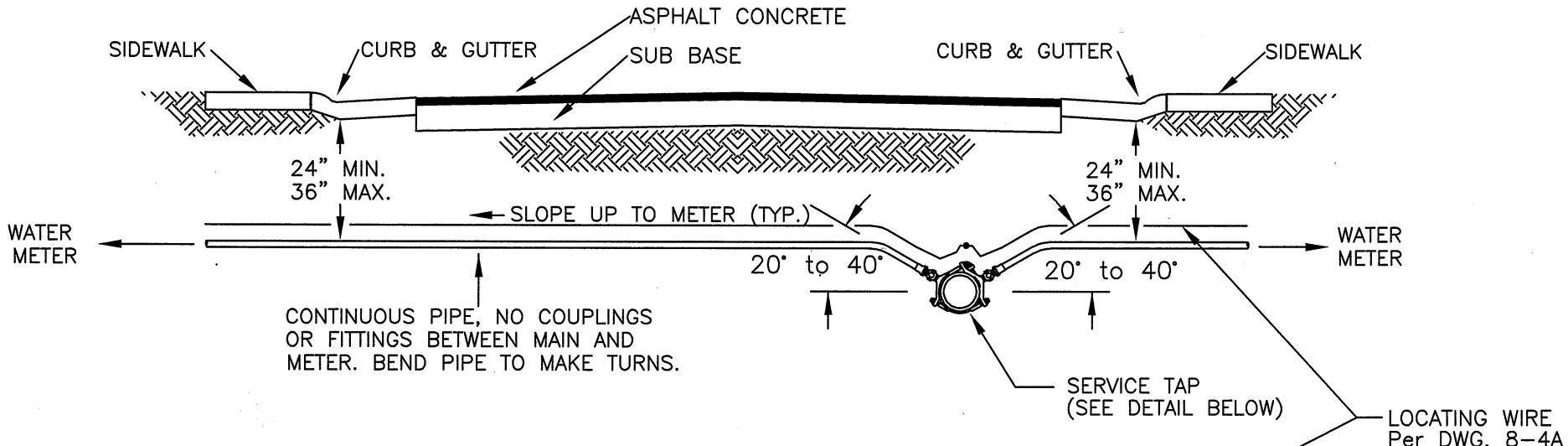
2. Raw Water Transmission Main Separation -- Separation shall comply with the requirements for "supply lines" in Section 64572 "Water Main Separation" of the California Code of Regulations. Separation may vary if approved by both the State Water Resources Control Board and by Water Supply.

3. Raw water plans shall include the standard SCWA Raw Water Notes as provided by Water Supply.

8-19 RECORD PLANS: Record Drawings shall be in accordance with Section 2-11 "Record Plans" of these Improvement Standards and shall also include the following water facility information:

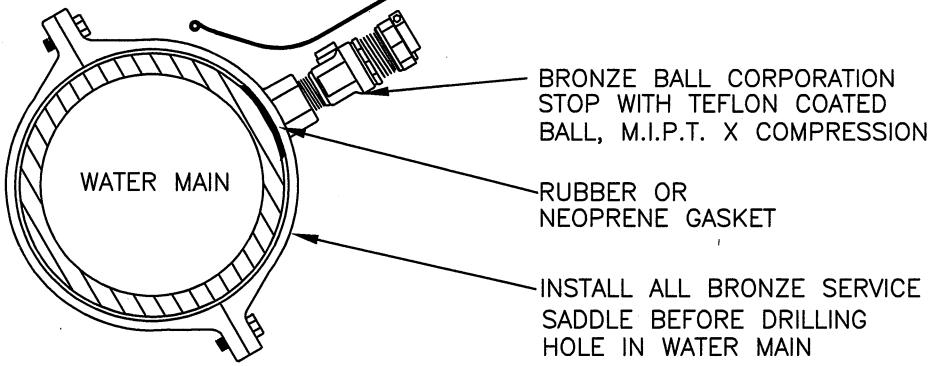
1. The notation "Record Drawing" conspicuously stamped on each sheet.
2. The record information for changes to locations and stationing, and for changes to plan and profile of mains, pipes, valves, fittings, air release/vacuum valves, blow-off assemblies, hydrants, and water services.
3. Field-surveyed as-built top-of-pipe elevations at all ends of water mains equipped with a temporary blow-off valve or end blind flange.
4. The pipe type and class of the water pipe installed at every location, clearly notated on each sheet, with the station of transitions between pipe types marked and notated.

Record Drawings shall be approved by Water Supply prior to final acceptance of the project.



NOTES:

1. CORPORATION STOP, METER CURB STOP AND WATER SERVICE LINE SHALL BE THE SAME SIZE.
2. SERVICE SADDLES SHALL BE A BRONZE SINGLE WIDE STRAP FOR PVC PIPE AND A BRONZE DOUBLE STRAP FOR DUCTILE IRON PIPE. BRONZE 'U' BOLTS MAY BE USED ON CAST IRON AND DUCTILE IRON WATER MAINS.
3. SERVICE SADDLES, CORPORATION STOPS, COUPLING NUTS, BOLTS, AND ALL APPURTENANCES SHALL BE BRONZE.
4. SERVICE TAP SHALL BE MADE BETWEEN 20 DEGREES TO 40 DEGREES ABOVE THE SPRING LINE OF THE PIPE.
5. SERVICE TAPS SHALL BE SPACED A MINIMUM OF 18" APART ON THE WATER MAIN AND SHALL BE A MINIMUM OF 24" FROM PIPE JOINTS.
6. INSULATED LOCATING WIRE SHALL BE PROVIDED ON ALL SERVICE LINES, PER DRAWING 8–4A. WIRE SHALL BE CONNECTED TO LOCATING WIRE ALONG WATER MAIN FOR CONTINUITY.
7. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.



SERVICE TAP DETAIL

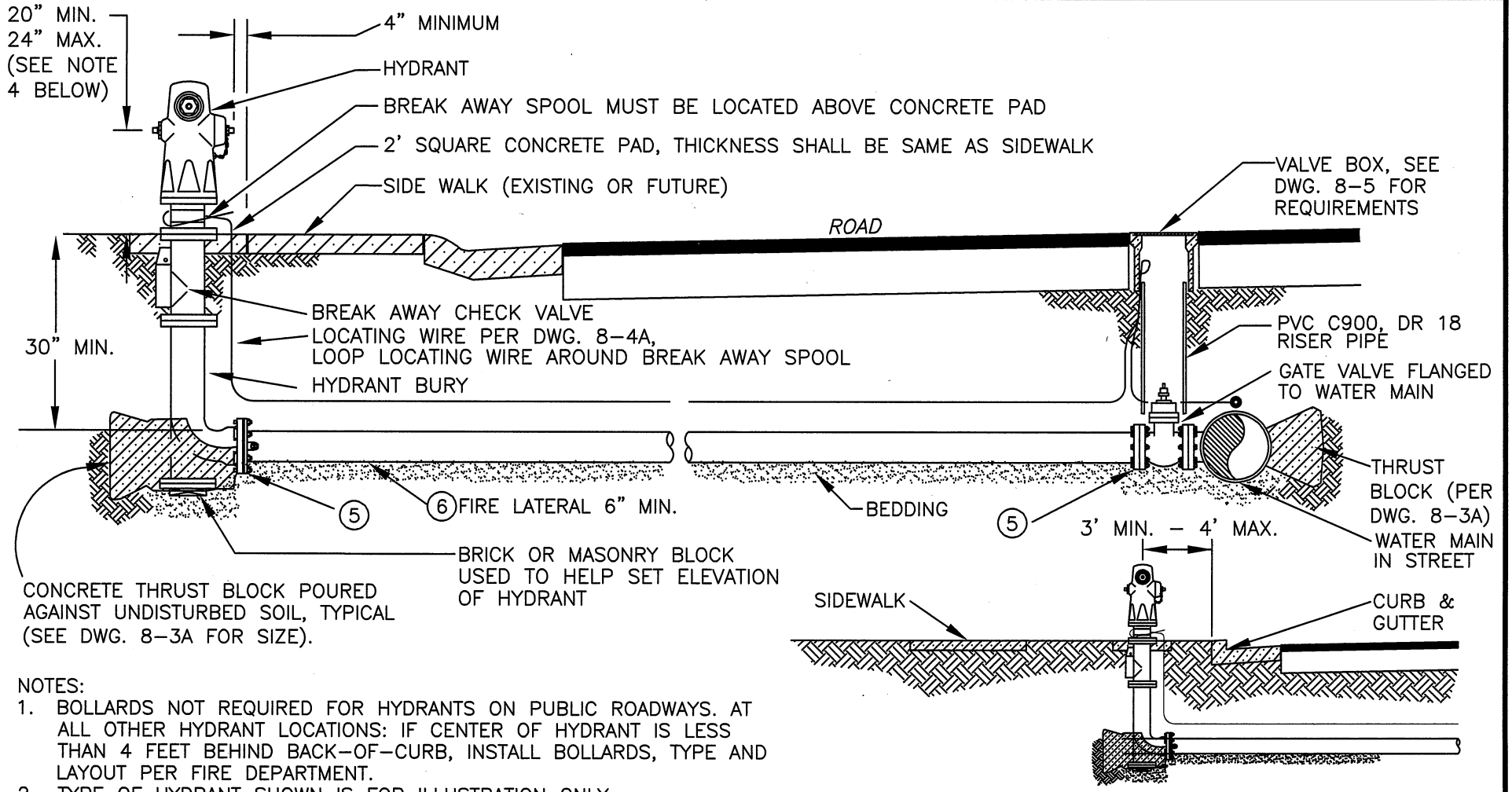
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

1"-2" WATER SERVICE INSTALLATION

SCALE: NONE
DATE: 09/24

8-1



HYDRANT LOCATION AT SEPARATED SIDEWALK

NOTES:

1. BOLLARDS NOT REQUIRED FOR HYDRANTS ON PUBLIC ROADWAYS. AT ALL OTHER HYDRANT LOCATIONS: IF CENTER OF HYDRANT IS LESS THAN 4 FEET BEHIND BACK-OF-CURB, INSTALL BOLLARDS, TYPE AND LAYOUT PER FIRE DEPARTMENT.
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. TO 24" MAX. ABOVE TOP OF CONCRETE PAD.
5. THESE JOINTS MAY BE FLANGED OR RESTRAINED MECHANICAL JOINT WITH AN APPROVED RESTRAINED DEVICE.
6. FIRE LATERAL: RESTRAIN ALL JOINTS. DUCTILE IRON PIPE, C900 PVC PIPE ALLOWED IF RUN IS LESS THAN ONE PIPE LENGTH AND INSTALLED WITHOUT PVC-TO-PVC JOINTS.
7. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

DIRECTOR, DEPARTMENT OF WATER RESOURCES

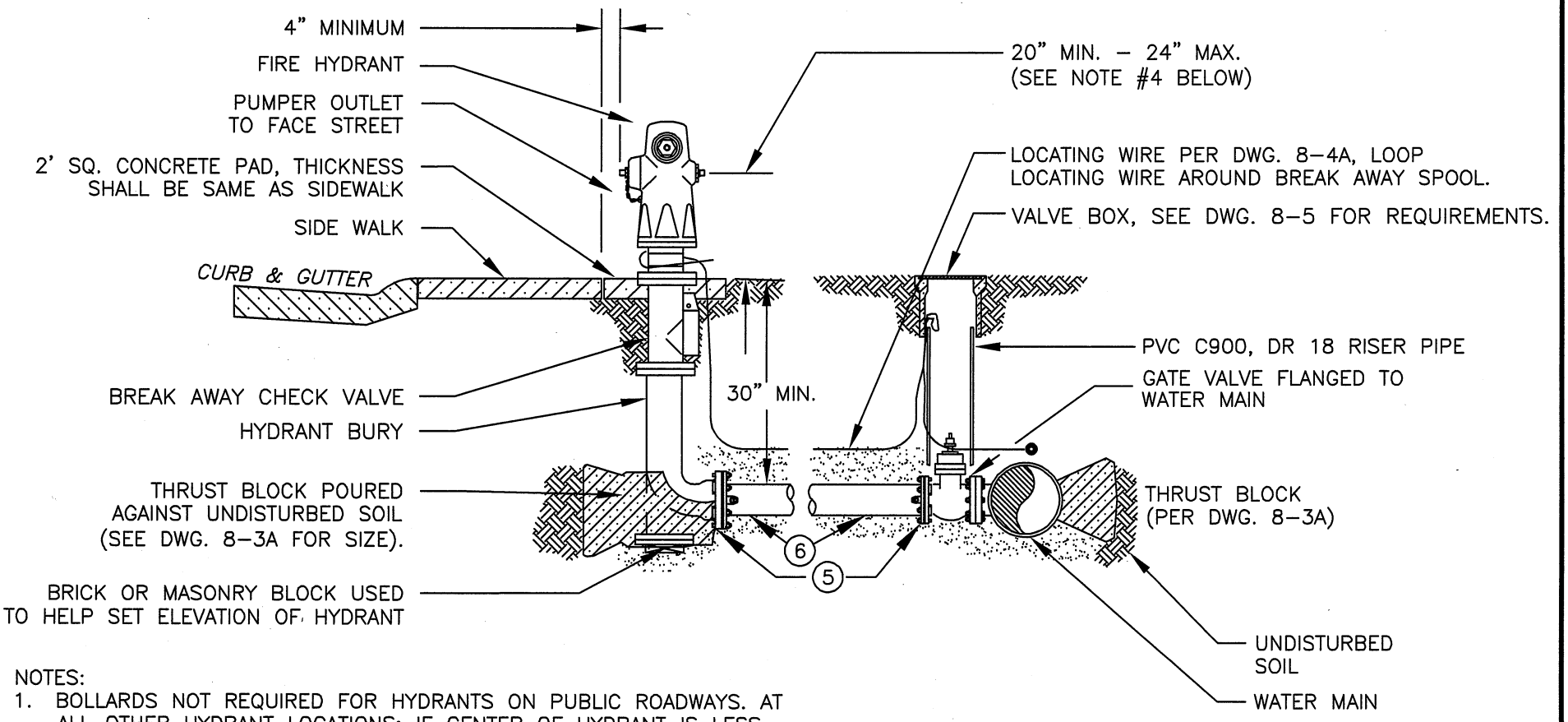
COUNTY OF SACRAMENTO

FIRE HYDRANT INSTALLATION

WATER MAIN IN STREET

SCALE: NONE
DATE: 09/24

8-2A



NOTES:

1. BOLLARDS NOT REQUIRED FOR HYDRANTS ON PUBLIC ROADWAYS. AT ALL OTHER HYDRANT LOCATIONS: IF CENTER OF HYDRANT IS LESS THAN 4 FEET BEHIND BACK-OF-CURB, INSTALL BOLLARDS, TYPE AND LAYOUT PER FIRE DEPARTMENT.
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. TO 24" MAX. ABOVE TOP OF CONCRETE PAD.
5. THESE JOINTS MAY BE FLANGED OR RESTRAINED MECHANICAL JOINT WITH AN APPROVED RESTRAINED DEVICE.
6. FIRE LATERAL: RESTRAIN ALL JOINTS. DUCTILE IRON PIPE; C900 PVC PIPE ALLOWED IF RUN IS LESS THAN ONE PIPE LENGTH AND INSTALLED WITHOUT PVC-TO-PVC JOINTS.
7. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

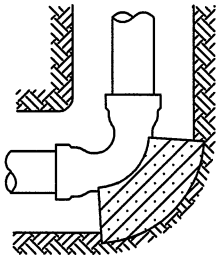
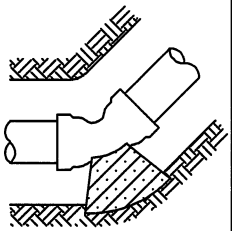
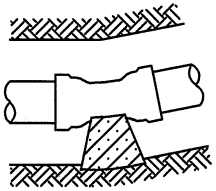
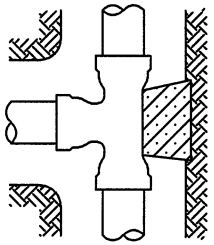
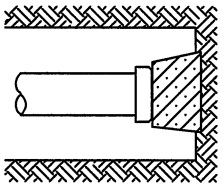
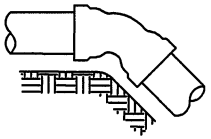
FIRE HYDRANT INSTALLATION

WATER MAIN NOT IN ROADWAY

SCALE: NONE
DATE: 09/24

8-2B

REQUIRED BEARING AREA IN TOTAL SQUARE FEET

TYPE OF FITTING		90° BEND	45° BEND	11-1/4° BEND 22-1/2° BEND	TEE	DEAD END	VERTICAL DOWN BEND
TYPICAL INSTALLATION						 SEE NOTE 5	
SIZE OF PIPE	4"	2	1	1	2	2	THRUST BLOCKS NOT ALLOWED. USE RESTRAINED JOINTS WITH RESTRAINED LENGTH PER PLANS AND WATER NOTES.
	6"	4	2	1	3	3	
	8"	7	4	2	5	5	
	10"	12	6	3	8	8	
	12"	16	10	5	12	12	

NOTES

1. THRUST BLOCKS SHALL BE CONSTRUCTED OF MINIMUM 5-SACK CONCRETE.
2. BEARING AREAS GIVEN ARE FOR TEST PRESSURES OF 150 PSI IN SOIL WITH MINIMUM 2,000 PSF BEARING CAPACITY. IF TEST PRESSURE IS HIGHER OR SOIL BEARING CAPACITY IS LOWER, THRUST BLOCK SIZE SHALL BE RE-DESIGNED & APPROVED BY THE WATER UTILITY.
3. THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED SOIL. IF THIS CANNOT BE DONE, USE RESTRAINED JOINTS TO RESIST THRUST OVER RESTRAINED LENGTHS APPROVED BY THE WATER UTILITY.
4. PIPE JOINTS SHALL BE KEPT CLEAR OF CONCRETE.
5. FOR DEAD ENDS: INSTALL TEMPORARY BLOW OFF PER DWG. 8-12.

DIRECTOR, DEPARTMENT OF WATER RESOURCES

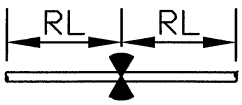
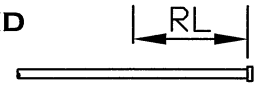
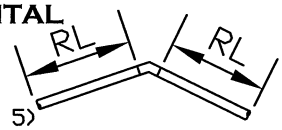
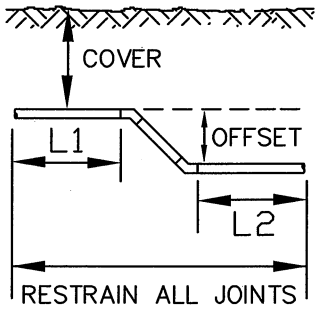
COUNTY OF SACRAMENTO

THRUST BLOCK BEARING AREA

SCALE: NONE
DATE: 09/24

8-3A

RESTRAINED LENGTH IN FEET

PIPE CONFIGURATION		30" COVER AND GREATER								60" COVER AND GREATER							
		DIP				PVC				DIP				PVC			
RL = RESTRAINED LENGTH		6"	8"	10"	12"	6"	8"	10"	12"	6"	8"	10"	12"	6"	8"	10"	12"
NA = PVC PIPE NOT ALLOWED IN RESTRAINED LENGTH, USE ONLY DUCTILE IRON.																	
IN LINE VALVE 		46	59	71	83	NA				24	31	38	45	NA			
DEAD END W/O THRUST BLOCK (SEE NOTE 5) 		69	88	107	125	NA				36	47	57	67	NA			
HORIZONTAL BEND (SEE NOTE 5) 	11.25°	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	22.5°	6	6	7	8	6	6	7	8	6	6	6	6	6	6	6	6
	45°	9	12	14	16	9	12	14	16	6	6	7	9	6	6	7	9
VERTICAL DROP OR RISE  OFFSET =1.5–3.4 FT.	11.25°	L1	10	14	17	21	10	14	17	NA	6	6	7	9	6	6	7	9
		L2	6	6	6	6	6	6	6		6	6	6	6	6	6	6	6
	22.5°	L1	25	33	41	48	NA				12	17	21	25	12	17	NA	
		L2	7	9	11	13					6	6	6	6	6	6		
OFFSET ≥ 3.5 FT.	11.25°	L1	7	9	11	12	NA				6	6	6	7	NA			
		L2	6	6	6	6					6	6	6	6				
	22.5°	L1	23	31	38	45	NA				10	14	18	22	10	14	18	NA
		L2	6	7	9	11					6	6	6	6	6	6	6	
TEE, CROSS & ASSOCIATED VALVES		PIPE RESTRAINT REQUIRED. SEE RESTRAINED LENGTHS SHOWN ON PLANS. (SEE NOTE 2)															

***** RESTRAINED LENGTHS SHOWN ON THE PLANS SUPERSEDE THIS TABLE *****

NOTES:

1. ALL JOINTS WITHIN THE RESTRAINED LENGTH SHALL BE RESTRAINED. NO JOINTS WITHIN 6 FEET OF FITTINGS, UNLESS OTHERWISE SPECIFIED.
2. RESTRAINED LENGTHS ARE REQUIRED AT TEES AND CROSSES. IF NOT SPECIFIED ON THE PLANS, RESTRAINED LENGTHS SHALL BE DESIGNED BY THE CIVIL ENGINEER OF RECORD AND APPROVED BY THE WATER UTILITY.
3. RESTRAINING DEVICES FOR MJ'S: FOR DUCTILE IRON USE EBAA MEGALUG 1100, STAR PIPE PRODUCTS STARGRIP 3000, OR SIGMA ONE–LOK SLDE; FOR PVC PIPE USE EBAA 2000PV, STAR PIPE PRODUCTS STARGRIP 4000, OR SIGMA ONE–LOC SLCE.
4. RESTRAINING DEVICES FOR PUSH–ON JOINTS: FOR DUCTILE IRON USE U.S. PIPE FIELD LOK GASKETS, U.S. PIPE TR FLEX PIPE, OR APPROVED EQUAL; RESTRAINED PVC PUSH–ON JOINTS NOT ALLOWED, USE DUCTILE IRON PIPE ONLY FOR RESTRAINED PUSH–ON JOINTS.
5. FOR DEAD ENDS AND HORIZONTAL BENDS ONLY: IF A THRUST BLOCK IS INSTALLED BEHIND THE FITTING IN ACCORDANCE WITH DWG. 8–3A, RESTRAINED JOINTS NOT REQUIRED UNLESS OTHERWISE SPECIFIED.
6. RESTRAINED LENGTHS ARE BASED ON 150 PSI TEST PRESSURE. IF HIGHER PRESSURES OR HIGHER SURGES ARE ANTICIPATED, THIS TABLE SHALL NOT APPLY AND RESTRAINED LENGTHS SHALL BE DESIGNED BY THE CIVIL ENGINEER OF RECORD AND APPROVED BY THE WATER UTILITY.

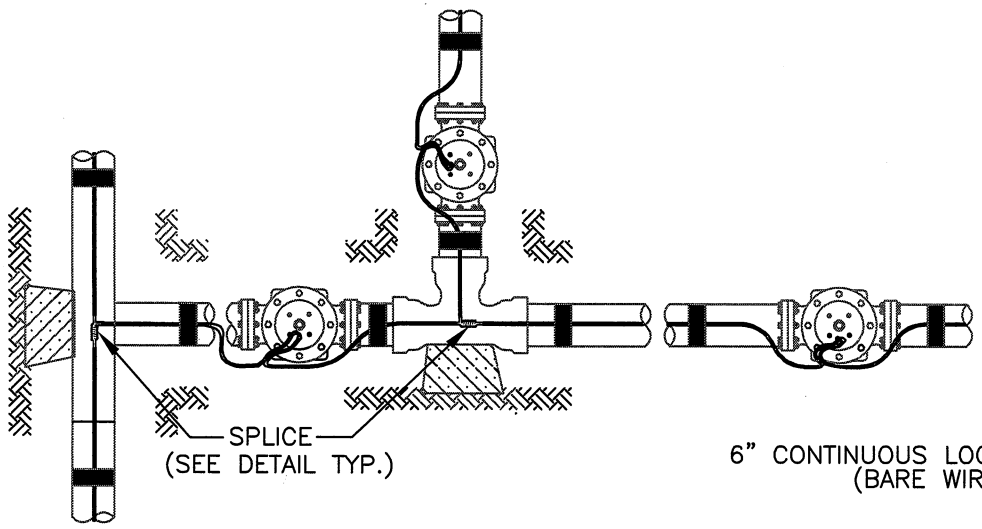
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

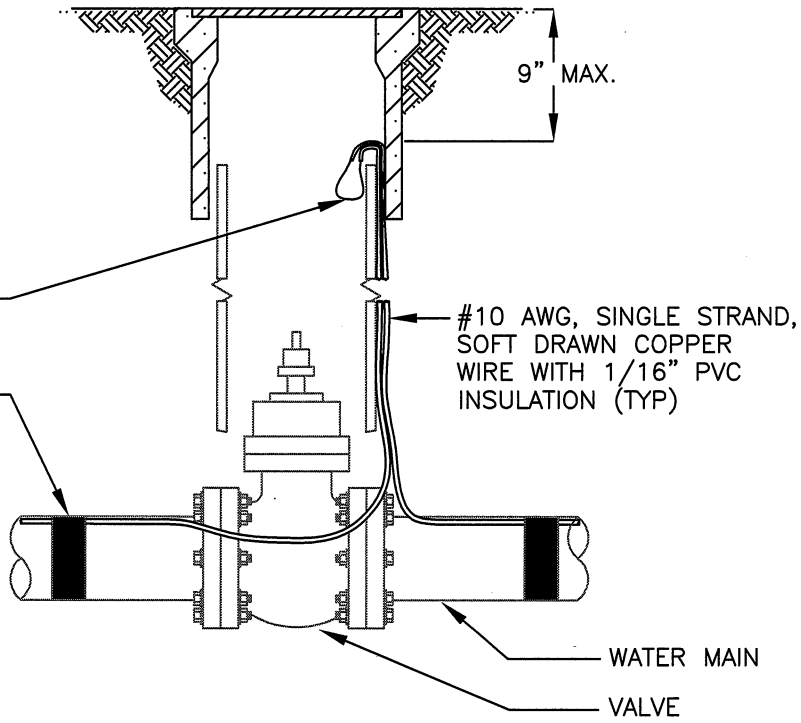
PIPE RESTRAINED LENGTH

SCALE: NONE
DATE: 09/24

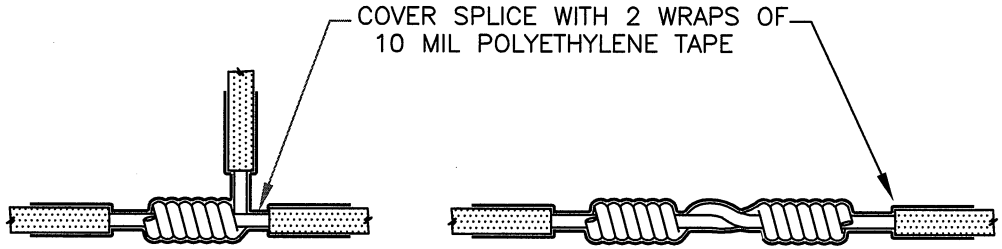
8-3B



TYPICAL LAYOUT



VALVE DETAIL



SPLICE DETAIL
(TEE SPLICE)

SPLICE DETAIL
(BUTT SPLICE)

NOTES:

1. WIRE SHALL BE CONTINUOUS, EXCEPT WHERE SPLICES ARE REQUIRED AT TEES, CROSSES, AND CONNECTIONS TO EXISTING LOCATING WIRES.
2. LOCATING WIRE SHALL BE LAID ON TOP OF THE WATER MAIN, AND SHALL BE TAPED TO IT OR THE POLYETHYLENE ENCASEMENT AT 10' INTERVALS AND TAPED AT ALL FITTINGS. TAPE SHALL BE 10 MIL POLYETHYLENE.
3. CONTINUITY TESTS SHALL BE PERFORMED ON EACH SPLICE PRIOR TO BACKFILL, AND ON THE FULL WIRE SYSTEM AFTER IT IS FINISHED.
4. **ALL SPLICES SHALL BE SOLDERED AND TAPED.**

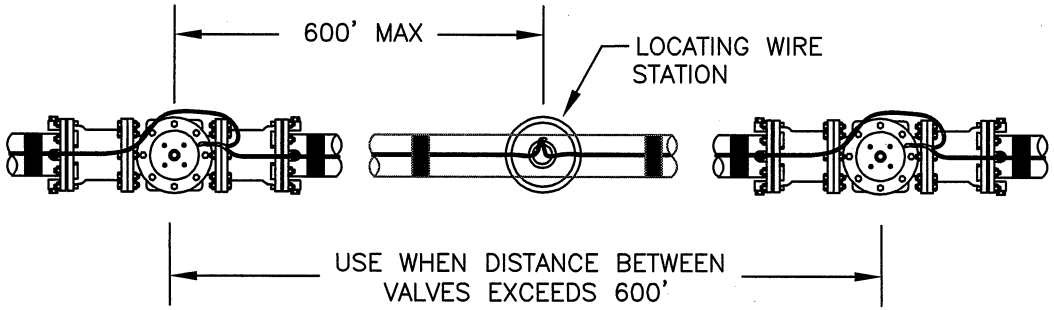
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

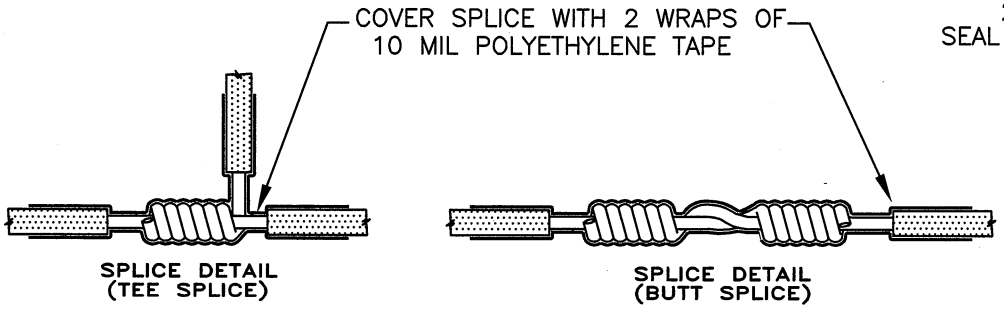
LOCATING WIRE FOR WATER MAINS AND SERVICES

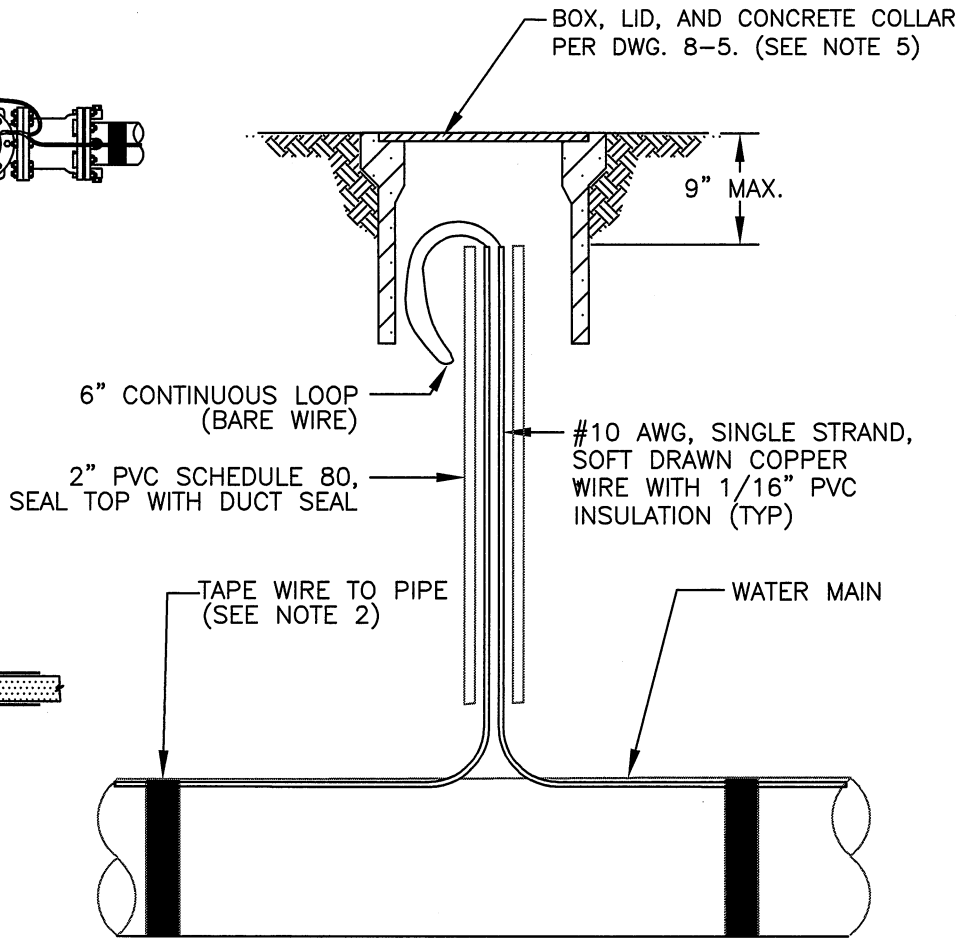
SCALE: NONE
DATE: 09/24

8-4A



TYPICAL LAYOUT





LOCATING WIRE STATION

NOTES:

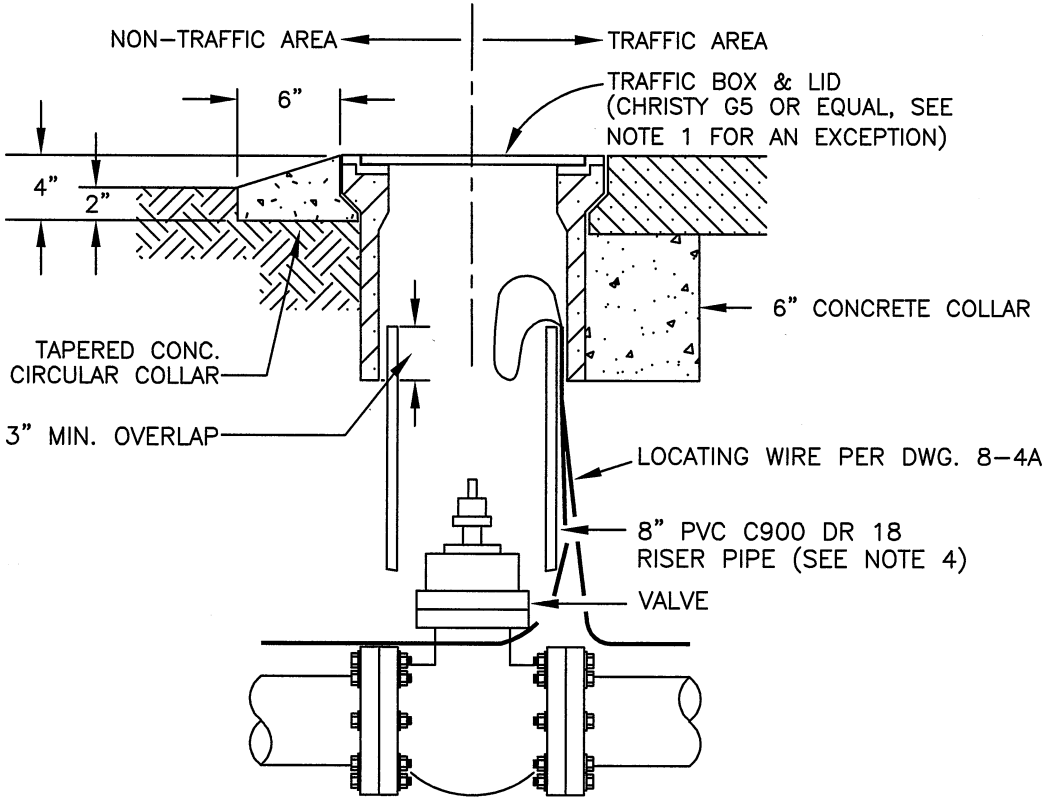
1. WIRE SHALL BE CONTINUOUS, EXCEPT WHERE SPLICES ARE REQUIRED AT TEES AND CROSSES.
2. LOCATING WIRE SHALL BE LAID ON TOP OF THE WATER MAIN, AND SHALL BE TAPED TO IT OR THE POLYETHYLENE ENCASEMENT AT 10' INTERVALS AND TAPED AT ALL FITTINGS. TAPE SHALL BE 10 MIL POLYETHYLENE.
3. CONTINUITY TESTS SHALL BE PERFORMED ON EACH SPLICE PRIOR TO BACKFILL, AND ON THE FULL WIRE SYSTEM AFTER IT IS FINISHED.
4. **ALL SPLICES SHALL BE SOLDERED AND TAPED.**
5. LABELING AND COATING OF BOX AND LID SHALL COMPLY WITH THE REQUIREMENTS OF DWG. 8-5.

DIRECTOR, DEPARTMENT OF WATER RESOURCES

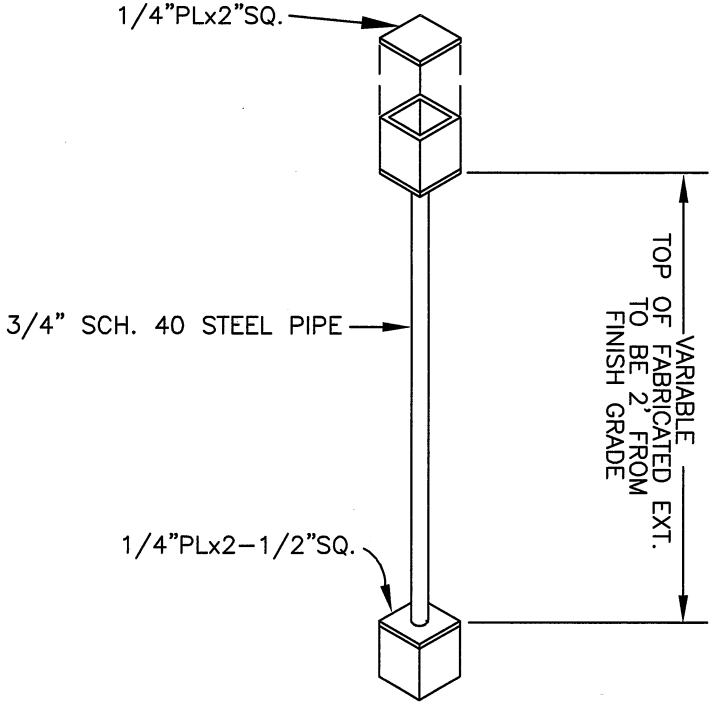
COUNTY OF SACRAMENTO

LOCATING WIRE STATION

SCALE: NONE DATE: 09/24	8-4B



TRAFFIC VALVE BOX



VALVE OPERATING NUT EXTENSION

REQUIRED WHERE VALVE NUT IS IN EXCESS OF 10 FEET BELOW FINISH GRADE.

NOTES:

1. BOXES IN MAJOR ROADS (ULTIMATE PLANNED WIDTH ≥ 70 FT BOC TO BOC) SHALL BE CHRISTY G5VP BOLT–DOWN LID AND BOX, OR EQUAL.
2. VALVE BOX AND RISER SHALL BE SET PLUMB AND CENTERED OVER WATER VALVE NUT.
3. SET VALVE BOX TO FINAL FINISH GRADE. IN AREAS WHERE FINISH GRADE HAS NOT BEEN DEFINED, PLACE 4"X4" LOCATING POST WITHIN 1 FOOT OF VALVE BOX. POST SHALL BE 6 FEET IN LENGTH AND BURIED 3 FEET. PAINT POST BLUE FOR POTABLE WATER, PURPLE FOR RECYCLED AND NONPOTABLE WATER,GREEN FOR RAW WATER.
4. RISER PIPE SHALL BE BLUE OR WHITE FOR POTABLE WATER, WHITE FOR RAW WATER, OR PURPLE FOR RECYCLED AND NONPOTABLE WATER. FOR RAW WATER ONLY: PAINT BOX INTERIOR & TOP 1 FT. OF RISER GREEN.
5. LIDS SHALL BE LABELED WITH CAST OR BEAD WELDED LETTERS: "WATER" FOR POTABLE, "RECYCLED WATER" FOR RECYCLED AND NONPOTABLE WATER, "RAW WATER" FOR RAW WATER.
6. RECYCLED AND NONPOTABLE WATER: TOP OF FRAME AND COVER SHALL BE COATED PURPLE PRIOR TO INSTALLATION PER STANDARD SPECIFICATIONS.
7. LIDS SHALL NOT BE INTERCHANGED INTO DIFFERENT MAKE OR MODEL BOXES.

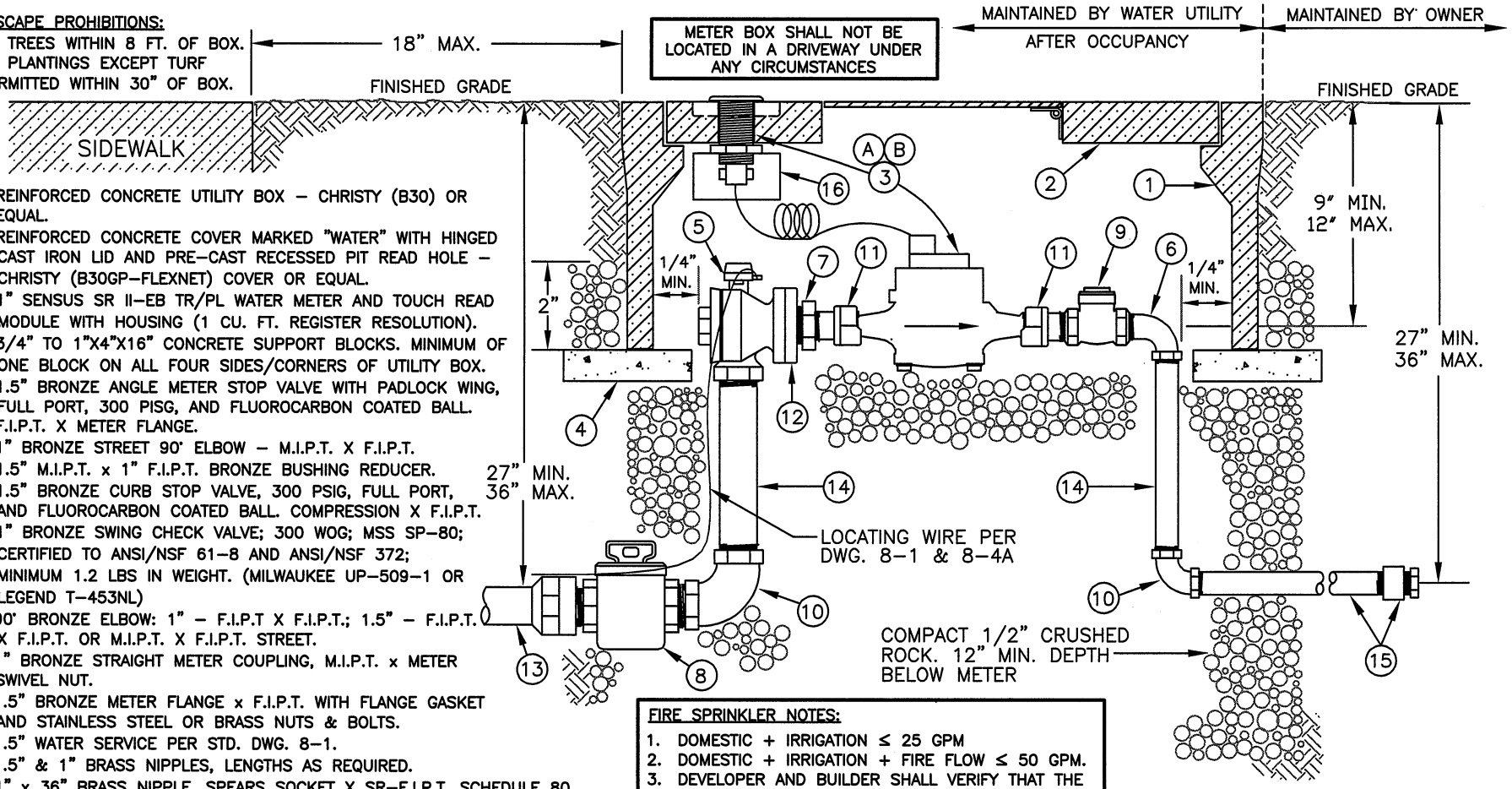
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

VALVE BOX INSTALLATION AND OPERATING NUT EXTENSION

SCALE: NONE DATE: 09/24	8-5

LANDSCAPE PROHIBITIONS:
1. NO TREES WITHIN 8 FT. OF BOX.
2. NO PLANTINGS EXCEPT TURF PERMITTED WITHIN 30" OF BOX.



① REINFORCED CONCRETE UTILITY BOX – CHRISTY (B30) OR EQUAL.
② REINFORCED CONCRETE COVER MARKED "WATER" WITH HINGED CAST IRON LID AND PRE-CAST RECESSED PIT READ HOLE – CHRISTY (B30GP-FLEXNET) COVER OR EQUAL.
③ 1" SENSUS SR II-EB TR/PL WATER METER AND TOUCH READ MODULE WITH HOUSING (1 CU. FT. REGISTER RESOLUTION).
④ 3/4" TO 1"X4"X16" CONCRETE SUPPORT BLOCKS. MINIMUM OF ONE BLOCK ON ALL FOUR SIDES/CORNERS OF UTILITY BOX.
⑤ 1.5" BRONZE ANGLE METER STOP VALVE WITH PADLOCK WING, FULL PORT, 300 PISG, AND FLUOROCARBON COATED BALL. F.I.P.T. X METER FLANGE.
⑥ 1" BRONZE STREET 90° ELBOW – M.I.P.T. X F.I.P.T.
⑦ 1.5" M.I.P.T. x 1" F.I.P.T. BRONZE BUSHING REDUCER.
⑧ 1.5" BRONZE CURB STOP VALVE, 300 PSIG, FULL PORT, AND FLUOROCARBON COATED BALL. COMPRESSION X F.I.P.T.
⑨ 1" BRONZE SWING CHECK VALVE; 300 WOG; MSS SP-80; CERTIFIED TO ANSI/NSF 61-8 AND ANSI/NSF 372; MINIMUM 1.2 LBS IN WEIGHT. (MILWAUKEE UP-509-1 OR LEGEND T-453NL)
⑩ 90° BRONZE ELBOW: 1" – F.I.P.T X F.I.P.T.; 1.5" – F.I.P.T. X F.I.P.T. OR M.I.P.T. X F.I.P.T. STREET.
⑪ 1" BRONZE STRAIGHT METER COUPLING, M.I.P.T. x METER SWIVEL NUT.
⑫ 1.5" BRONZE METER FLANGE x F.I.P.T. WITH FLANGE GASKET AND STAINLESS STEEL OR BRASS NUTS & BOLTS.
⑬ 1.5" WATER SERVICE PER STD. DWG. 8-1.
⑭ 1.5" & 1" BRASS NIPPLES, LENGTHS AS REQUIRED.
⑮ 1" x 36" BRASS NIPPLE, SPEARS SOCKET X SR-F.I.P.T. SCHEDULE 80 COUPLING WITH PVC PLUG.
⑯ M520M SENSUS FLEXNET RADIO UNIT, FURNISHED AND INSTALLED BY HOME BUILDER.

NOTES:
A. THE CONTRACTOR INSTALLING FACILITIES SHOWN ON THE IMPROVEMENT PLANS SHALL INSTALL ALL ITEMS ON THIS DRAWING (EXCEPT ITEMS 3 AND 16) AND SHALL INSTALL A METER IDLER PIPE IN PLACE OF THE METER. IDLER PIPE MATERIAL SHALL BE BRASS OR SCHEDULE 80 PVC AND SUPPLIED BY A WATER MATERIAL SUPPLIER. (SEE NOTE B)
B. THE HOME BUILDER SHALL FURNISH AND INSTALL ITEMS 3 (WATER METER) AND 16 (FLEXNET UNIT) PRIOR TO ANY USE OF WATER FROM PARCEL SERVICE LINE.
C. HOME BUILDER SHALL CONTACT SCWA AT WRWATERMETERS@SACCOUNTY.GOV FOR METER INSPECTION WITHIN 24 HOURS OF METER INSTALLATION.
D. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

FIRE SPRINKLER NOTES:
1. DOMESTIC + IRRIGATION ≤ 25 GPM
2. DOMESTIC + IRRIGATION + FIRE FLOW ≤ 50 GPM.
3. DEVELOPER AND BUILDER SHALL VERIFY THAT THE FLOW AND PRESSURE REQUIRED BY THEIR FIRE SPRINKLER DESIGN CAN BE DELIVERED BY THE WATER SYSTEM AND WATER SERVICE BASED ON THE WATER UTILITY'S LATEST MODELED PEAK-HOUR SCENARIO.
4. PASSIVE-PURGE SPRINKLER DESIGN MANDATORY.

DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

1.5" RESIDENTIAL WATER SERVICE WITH 1" WATER METER

SCALE: NONE
DATE: 09/24

8-6A-1

(1) REINFORCED CONCRETE UTILITY BOX (CHRISTY B36) OR EQUAL.

(2) REINFORCED CONCRETE COVER MARKED "WATER" WITH A HINGED CAST IRON LID AND A PRE-CAST RECESSED PIT READ HOLE - (CHRISTY B36G-FLEXNET) OR EQUAL.

(3) SENSUS OMNI C^2 TR/PL WATER METER AND TOUCH READ MODULE WITH HOUSING (1 CU. FT. REGISTER RESOLUTION).

(4) FLANGED WINGED ANGLE METER STOP VALVE WITH TEFLON COATED BALL.

(5) OVAL FLANGED 90° BRONZE ELBOW 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 90° ELBOW, THREADED.

(8) BRONZE 90° ELBOW, THREADED OR COMPRESSION.

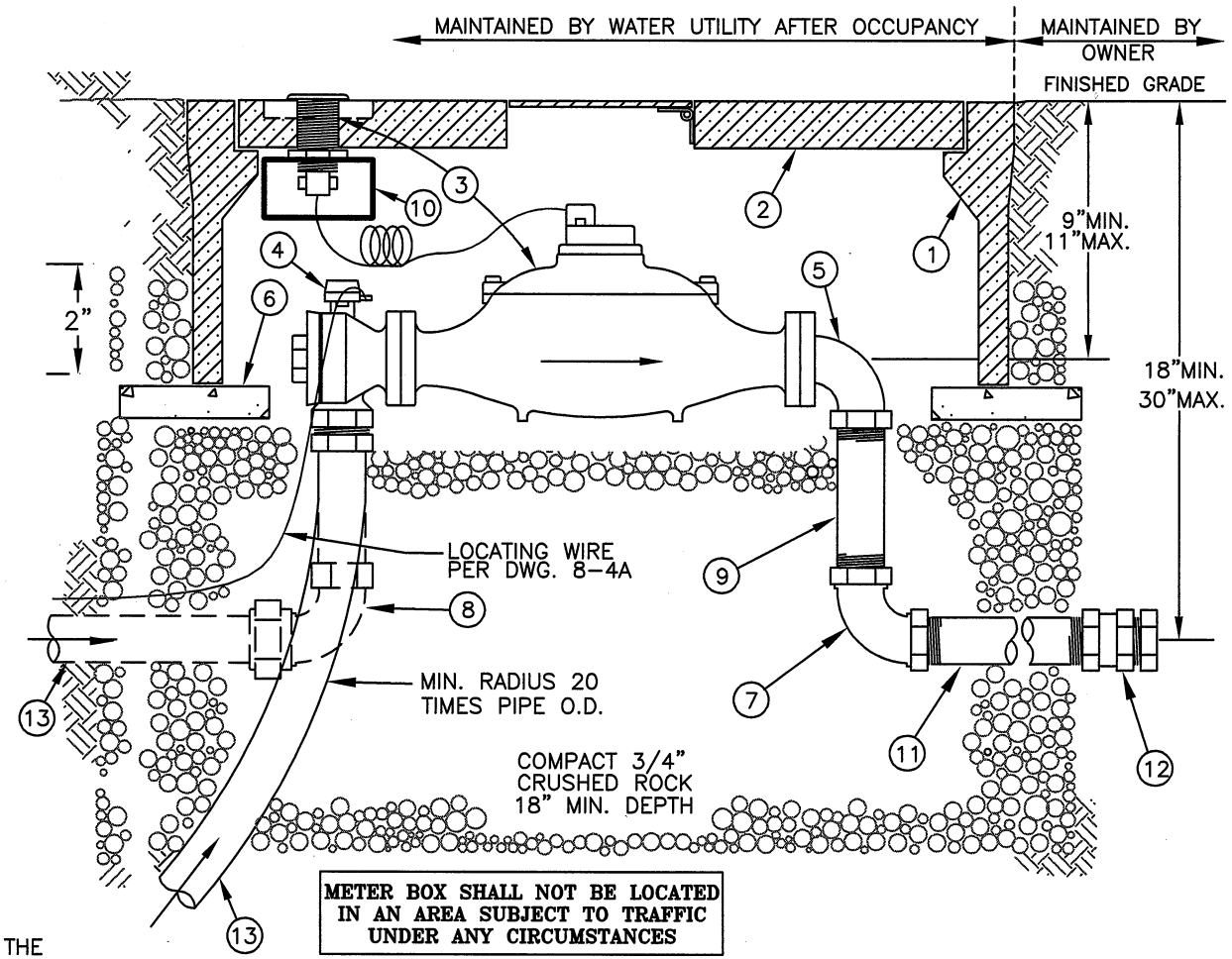
(9) BRASS NIPPLE, LENGTH AS REQURED

(10) M520M SENSUS FLEXNET RADIO UNIT, FURNISHED AND INSTALLED BY CONTRACTOR.

(11) 36" BRASS NIPPLE.

(12) BRASS COUPLING WITH BRASS M.I.P.T. PLUG.

(13) WATER SERVICE LINE PER STD. DWG. 8-1, WITH TWO CONFIGURATION OPTIONS.



NOTES:

A. THE CONTRACTOR INSTALLING FACILITIES SHOWN ON THE IMPROVEMENT PLANS SHALL INSTALL ALL ITEMS ON THIS DRAWING.

B. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

C. RECYCLED AND NONPOTABLE SERVICES: BOX SHALL HAVE A PURPLE POLYETHYENE FACE RING, READING LID SHALL BE LABELED "RECYCLED WATER" WITH BEAD WELDED OR ENGRAVED LETTERS, AND TOP OF THE COVER SHALL BE COATED PURPLE PER STANDARD SPECIFICATIONS.

D. SIZE OF SERVICE LINE, PIPING, AND FITTINGS SHALL BE THE SAME SIZE AS METER.

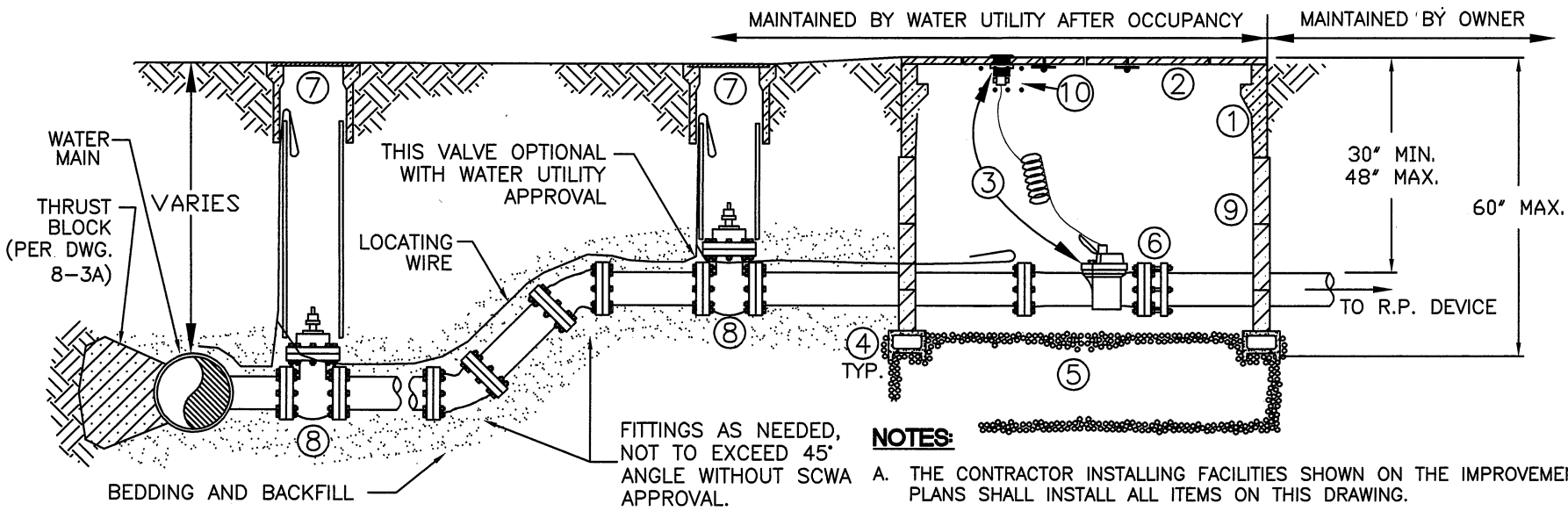
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

1-1/2" OR 2" COMMERCIAL METERED WATER SERVICE

SCALE: NONE
DATE: 09/24

8-6B



NOTES:

A. THE CONTRACTOR INSTALLING FACILITIES SHOWN ON THE IMPROVEMENT PLANS SHALL INSTALL ALL ITEMS ON THIS DRAWING.

B. PIPE BETWEEN WATER MAIN AND METER SHALL BE DUCTILE IRON. JOINTS BETWEEN MAIN AND METER SHALL BE RESTRAINED. RESTRAINING DEVICES SHALL BE APPROVED BY THE WATER UTILITY.

C. INSTALL LOCATING WIRE PER DWG. 8-4A.

D. CONCRETE BLOCKS SHALL BE USED TO BLOCK ANY OPENING OR CUT-OUT PORTIONS OF THE METER BOX NOT UTILIZED (MINIMUM 1" THICK BLOCK).

E. SIZE OF SERVICE LINE, PIPING, AND FITTINGS SHALL BE THE SAME SIZE AS METER.

F. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

G. RECYCLED AND NONPOTABLE SERVICES: COVER SHALL BE LABELED "RECYCLED WATER" WITH BEAD WELDED LETTERS AND TOP OF COVER SHALL BE COATED PURPLE PER STANDARD SPECIFICATIONS.

(1) REINFORCED CONCRETE UTILITY BOX WITH EXTENSIONS (CHRISTY B48).

(2) 2 PIECE GALVANIZED 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 PIT READ COVER).

(3) SENSUS OMNI C^2 TR/PL METER AND TOUCH READ MODULE WITH HOUSING (1 CU. FT. REGISTER RESOLUTION).

(4) CONCRETE BLOCKS SHALL BE PLACED ALONG THE ENTIRE PERIMETER TO SUPPORT BOX.

(5) 3/4" CRUSHED ROCK, 12" TO 18" DEEP, COMPACTED.

(6) FLANGED COUPLING ADAPTER, EPOXY COATED WITH STAINLESS STEEL HARDWARE.

(7) VALVE BOX, SEE DWG. 8-5 FOR REQUIREMENTS.

(8) GATE VALVE, BOTH ENDS FLANGED.

(9) METER BOX EXTENSION (TYPICAL).

(10) M520M SENSUS FLEXNET RADIO UNIT, FURNISHED AND INSTALLED BY CONTRACTOR.

METER BOX SHALL NOT BE LOCATED IN AN AREA SUBJECT TO TRAFFIC UNDER ANY CIRCUMSTANCES

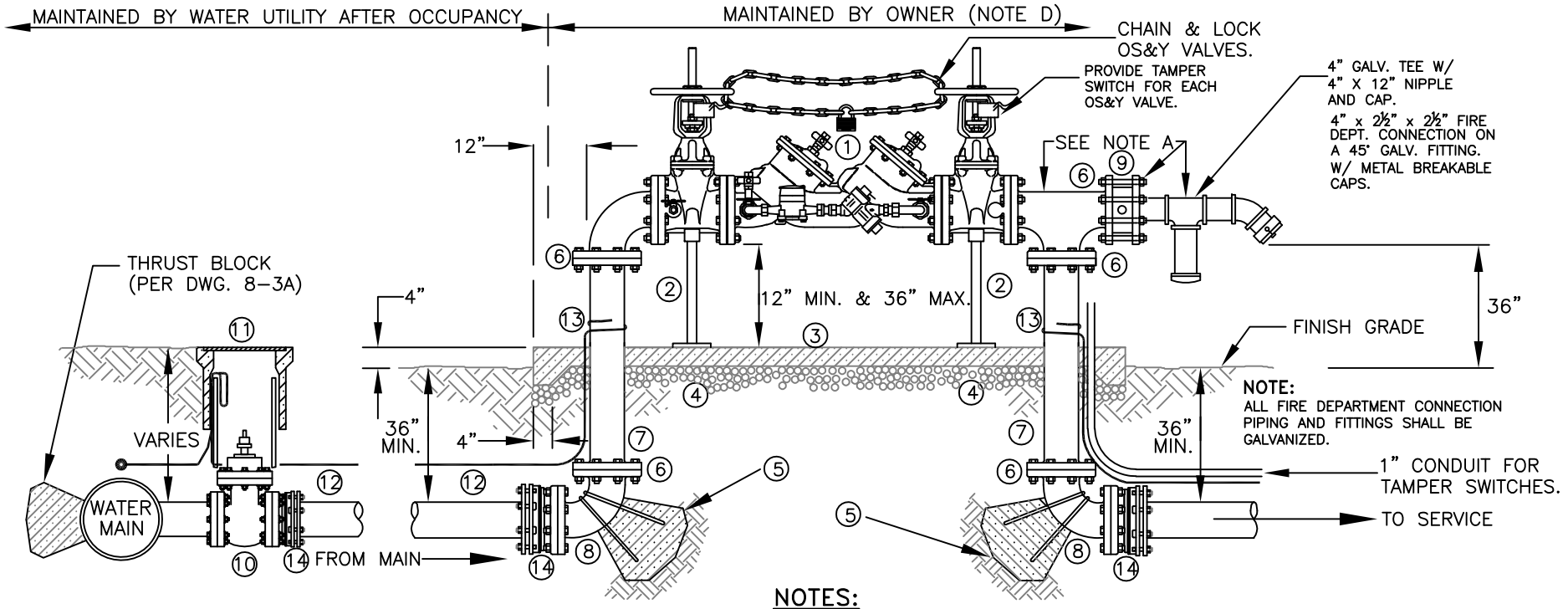
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

3" TO 6" WATER SERVICE & METER INSTALLATION

SCALE: NONE
DATE: 09/24

8-6C



① DOUBLE CHECK DETECTOR ASSEMBLY FL x FL W/ OS&Y VALVES FL x FL.
② PIPE SUPPORT, 2" GALVANIZED SCH 40 AT MINIMUM.
③ 4" CONCRETE SLAB – 24" WIDE WITH VARYING LENGTH.
④ 6" OF CRUSHED AGGREGATE COMPACTED TO 95% COMPACTION.
⑤ THRUST BLOCK (PER DWG. 8-3A) WITH #5 REBARS. WRAP THE PORTION OF THE REBAR THAT IS NOT EMBEDDED IN THE CONCRETE WITH 20 MIL POLYETHYLENE TAPE.
⑥ FLANGED CONNECTION ONLY.
⑦ FLANGE X FLANGE DUCTILE IRON SPOOL PER AWWA C115. WRAP WITH TWO LAYERS OF 20 MIL TAPE AT SLAB PENETRATION.
⑧ FLANGE X FLANGE 90° ELBOW, DUCTILE IRON.
⑨ WAFER CHECK VALVE.
⑩ GATE VALVE, FLANGE X FLANGE.
⑪ VALVE BOX, SEE DWG. 8-5 FOR REQUIREMENTS.
⑫ DUCTILE IRON PIPE, PUSH ON JOINTS. RESTRAIN WITH U.S. PIPE FIELD LOK GASKETS OR APPROVED EQUAL.
⑬ LOCATING WIRE PER DWG. 8-4A. LOOP WIRE AROUND PIPE AT TOP OF SLAB.
⑭ FLANGE X MJ ADAPTER. RESTRAIN MJ WITH EBAA MEGALUG 1100 OR APPROVED EQUAL.

NOTES:

DOUBLE CHECK DETECTOR ASSEMBLY SHALL BE APPROVED BY THE STATE OF CALIFORNIA DIVISION OF DRINKING WATER AND BE ON THE MOST RECENT LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES.
(www.emd.saccounty.gov/EC/Pages/CrossConnection.aspx)
(www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Publications.shtml)
(fccchr.usc.edu/list.html)

A. IF SPECIFICALLY CALLED OUT ON THE PLANS, DO NOT PROVIDE FIRE DEPARTMENT CONNECTION. IN THAT CASE, INSTALL FL X FL 90° ELBOW INSTEAD OF FL X FL TEE.
B. PIPE SHALL BE DUCTILE IRON. FLANGES SHALL BE CLASS D.
C. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.
D. BYPASS DETECTOR ASSEMBLY SHALL BE MAINTAINED IN OPERABLE CONDITION AT ALL TIMES BY OWNER.
E. PROVIDE INSULATED COVER PER STANDARD SPECIFICATIONS 41-9.

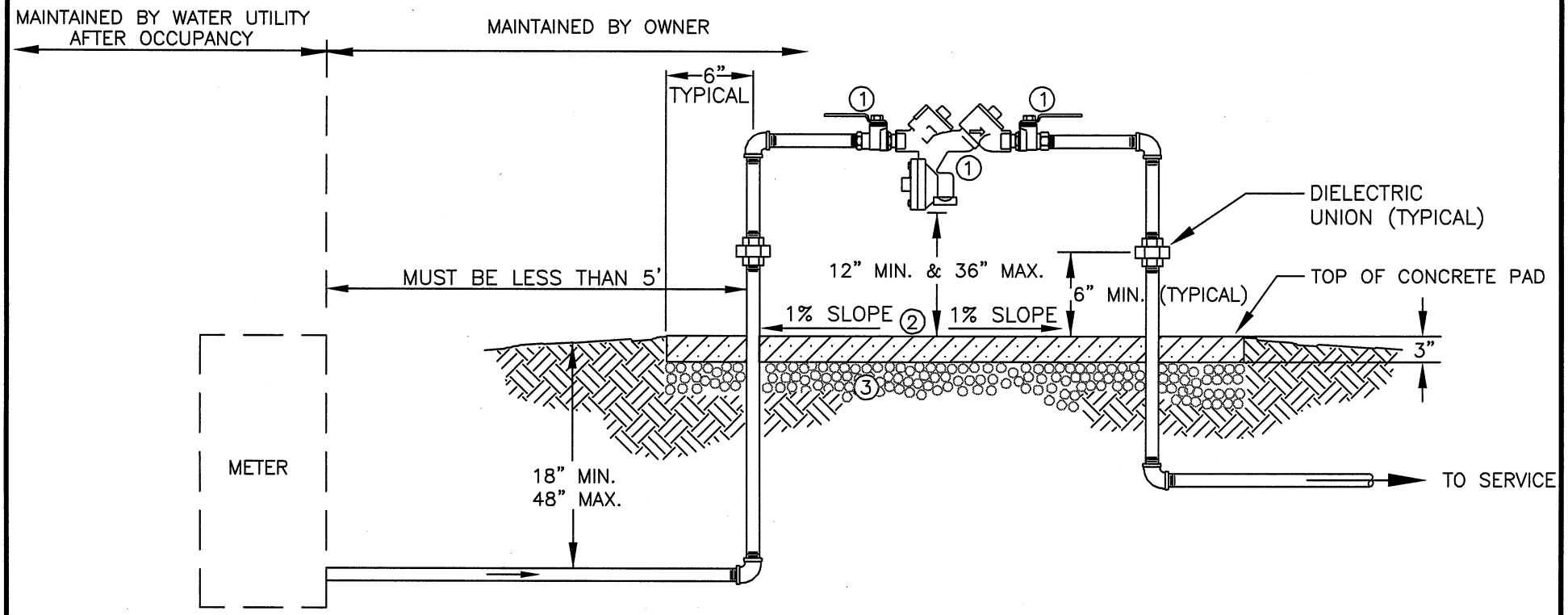
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

FIRE PROTECTION DETAIL

SCALE: NONE
DATE: 09/24

8-7



NOTES:

A. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL BE APPROVED BY THE STATE OF CALIFORNIA DIVISION OF DRINKING WATER AND BE ON THE MOST RECENT LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES. (www.emd.saccounty.gov/EC/Pages/CrossConnection.aspx) (www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Publications.shtml) (fccchr.usc.edu/list.html)

B. ALL PIPE SHALL BE GALVANIZED SCHEDULE 40 STEEL, TYPE K COPPER, OR BRASS. BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE WRAP OR 10 MIL POLYETHYLENE TAPE SO THAT NO SOIL IS IN CONTACT WITH METAL.

C. GALVANIZED PIPE SHALL HAVE ANODE BAG PER COUNTY CODE SECTION 16.24.100. INSTALL DIELECTRIC COUPLING OR FITTING BETWEEN DISSIMILAR METALS.

① REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY, WITH 2 BRONZE RESILIENT SEATED BALL VALVES MINIMUM WORKING PRESSURE 175 PSI.

② 3" SLAB – 18" WIDE WITH VARYING LENGTH

③ 1/2" OR 3/4" CRUSHED ROCK, 4" MINIMUM THICKNESS, MECHANICALLY COMPACTED TO 95% COMPACTION.

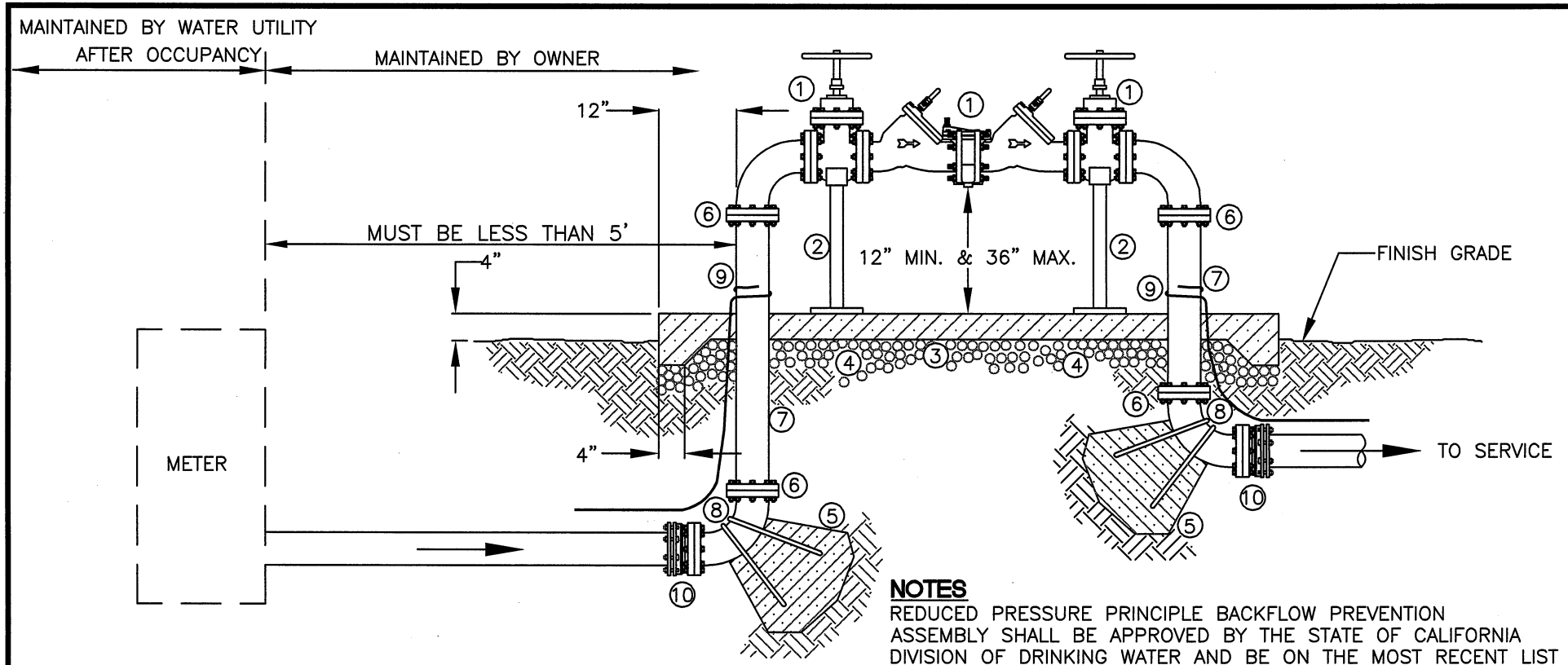
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

REDUCED PRESSURE BACKFLOW PREVENTER 1" TO 2"

SCALE: NONE
DATE: 09/24

8-8A



① REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY FL x FL, WITH 2 RESILIENT WEDGE GATE VALVES FL x FL 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 (PER DWG. 8–3A) WITH #5 REBARS. WRAP THE PORTION OF THE REBAR NOT EMBEDDED IN CONCRETE WITH 20 MIL POLYETHYLENE TAPE .
⑥ FLANGE CONNECTION ONLY.
⑦ FLANGE X FLANGE DUCTILE IRON SPOOL PER AWWA C115. WRAP WITH 2 LAYERS 20 MIL TAPE AT SLAB PENETRATION
⑧ FLANGE X FLANGE 90° ELBOW, DUCTILE IRON.
⑨ LOCATING WIRE PER DWG. 8–4A. LOOP WIRE AROUND PIPE AT TOP OF SLAB.
⑩ FLANGE X MJ ADAPTER, RESTRAINED.

NOTES

REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL BE APPROVED BY THE STATE OF CALIFORNIA DIVISION OF DRINKING WATER AND BE ON THE MOST RECENT LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES.
(www.emd.saccounty.gov/EC/Pages/CrossConnection.aspx)
(www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Publications.shtml)
(fccchr.usc.edu/list.html)

A. PIPE SHALL BE DUCTILE IRON. FLANGES SHALL BE CLASS D.

B. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL. POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

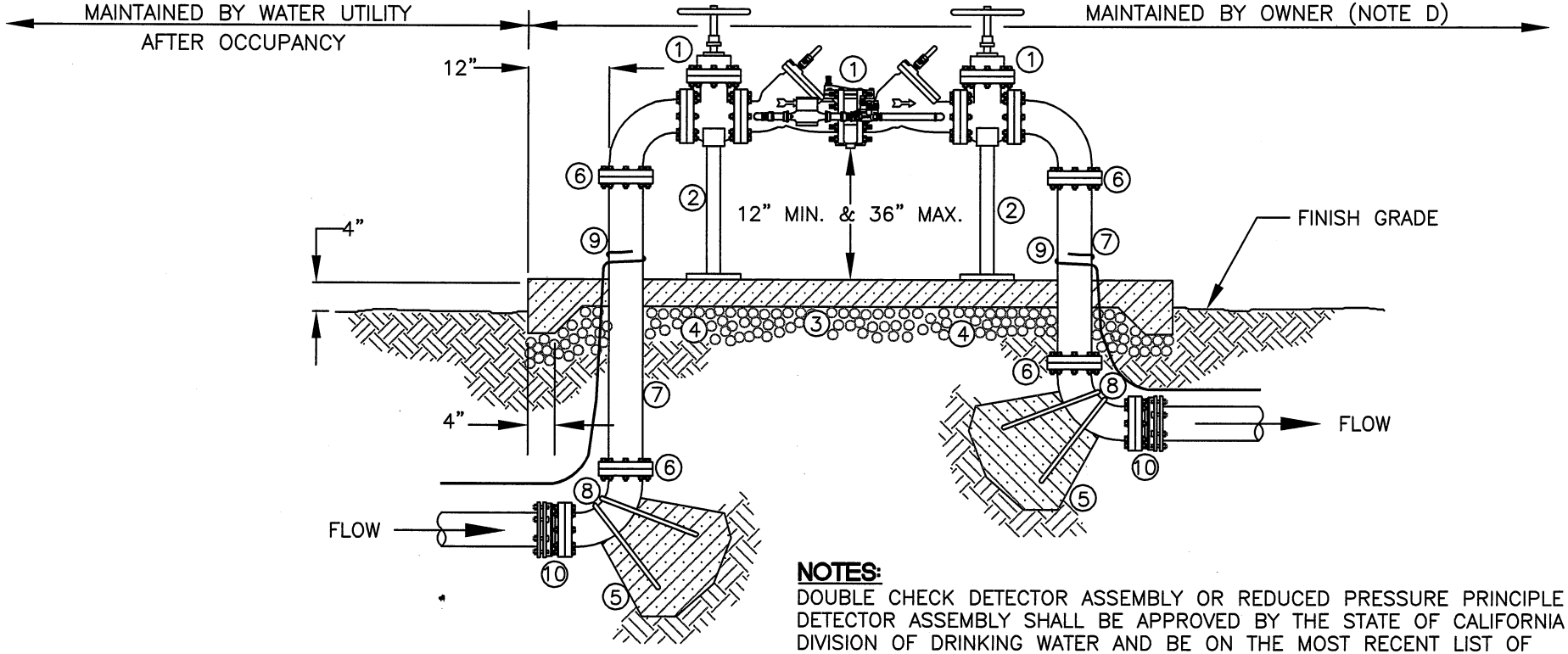
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

REDUCED PRESSURE BACKFLOW PREVENTER 3" AND LARGER

SCALE: NONE
DATE: 09/24

8-8B



① DOUBLE CHECK DETECTOR ASSEMBLY OR RP PRINCIPLE DETECTOR ASSEMBLY FL x FL. TYPE AS CALLED OUT ON PLANS, WITH 2 RESILIENT WEDGE GATE VALVES FL x FL 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 (PER DWG. 8–3A) WITH #5 REBARS. WRAP THE PORTION OF THE REBAR NOT EMBEDDED IN CONCRETE WITH 20 MIL POLYETHYLENE TAPE.

⑥ FLANGE CONNECTION ONLY.

⑦ FLANGE X FLANGE DUCTILE IRON SPOOL PER AWWA C115. WRAP WITH 2 LAYERS 20 MIL TAPE AT SLAB PENETRATION.

⑧ FLANGE X FLANGE 90° ELBOW, DUCTILE IRON.

⑨ LOCATING WIRE PER DWG. 8–4A. LOOP WIRE AROUND PIPE AT TOP OF SLAB.

⑩ FLANGE X MJ ADAPTER, RESTRAINED

NOTES:

DOUBLE CHECK DETECTOR ASSEMBLY OR REDUCED PRESSURE PRINCIPLE DETECTOR ASSEMBLY SHALL BE APPROVED BY THE STATE OF CALIFORNIA DIVISION OF DRINKING WATER AND BE ON THE MOST RECENT LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES.

(www.emd.saccounty.gov/EC/Pages/CrossConnection.aspx)
(www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Publications.shtml)
(fccchr.usc.edu/list.html)

A. PIPE SHALL BE DUCTILE IRON. FLANGES SHALL BE CLASS D.
B. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL. POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.
C. PROVIDE TAMPER SWITCHES AND CHAIN LOCK IF REQUIRED BY FIRE DEPARTMENT.
D. BYPASS DETECTOR ASSEMBLY SHALL BE MAINTAINED IN OPERABLE CONDITION AT ALL TIMES BY OWNER.
E. PROVIDE INSULATED COVER PER STANDARD SPECIFICATIONS 41–9.

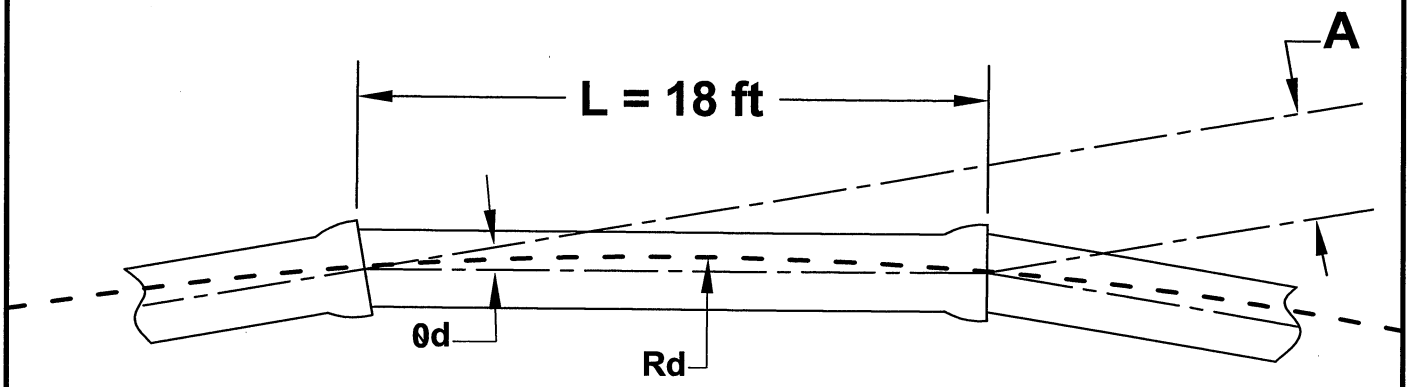
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

DOUBLE CHECK DETECTOR OR RP PRINCIPLE DETECTOR 6" AND LARGER

SCALE: NONE
DATE: 09/24

8-8C



0d = Maximum joint deflection angle (degrees)

A = Offset at the end of the pipe (inches)

Rd = Minimum radius of curve produced by succession of joints (feet)

MAXIMUM JOINT DEFLECTION FOR DUCTILE IRON PIPE						
	UNRESTRAINED JOINTS			RESTRAINED JOINTS		
Size Of Pipe (inches)	Maximum Deflection Angle, "0d" (degrees)	Minimum Radius, "Rd" (feet)	Offset At Free End, "A" (inches)	Maximum Deflection Angle, "0d" (degrees)	Minimum Radius, "Rd" (feet)	Offset At Free End, "A" (Inches)
4	2.5	400	10	2.5	400	10
6	2.5	400	10	2.5	400	10
8	2.5	400	10	2.5	400	10
10	2.5	400	10	2.5	400	10
12	2.5	400	10	2.5	400	10
14	2.5	400	10	2.0	500	8
16	2.5	400	10	2.0	500	8
18	2.5	400	10	2.0	500	8
20	2.5	400	10	1.25	800	5
24	2.5	400	10	1.25	800	5
30	2.5	400	10	1.00	1100	4
36	2.5	400	10	0.75	1400	3
42	2.0	500	8	0.25	4000	1

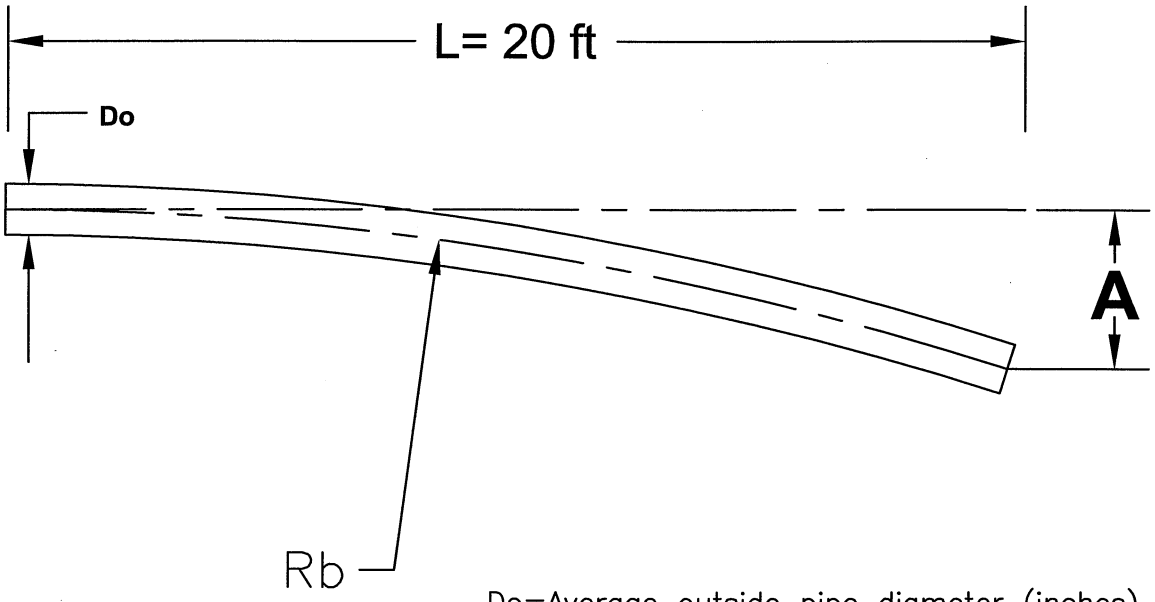
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

MAXIMUM DEFLECTION FOR DUCTILE IRON PIPE

SCALE: NONE
DATE: 09/24

8-9A



Do=Average outside pipe diameter (inches)
A=Offset at the end of the pipe (inches)
Rb=Minimum bending radius (feet)

MAXIMUM BENDING DEFLECTION FOR PVC PIPE				
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)
AWWA C900 CLASS 150 DR 18				
4	4.800	0.267	120	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	3
AWWA C905 CLASS 235 DR 18				
14	15.300	0.850	1500	2
16	17.400	0.967	1500	2
18	19.500	1.083	1500	2

JOINT DEFLECTION OF AWWA C900 & C905 PVC PIPE IS PROHIBITED.

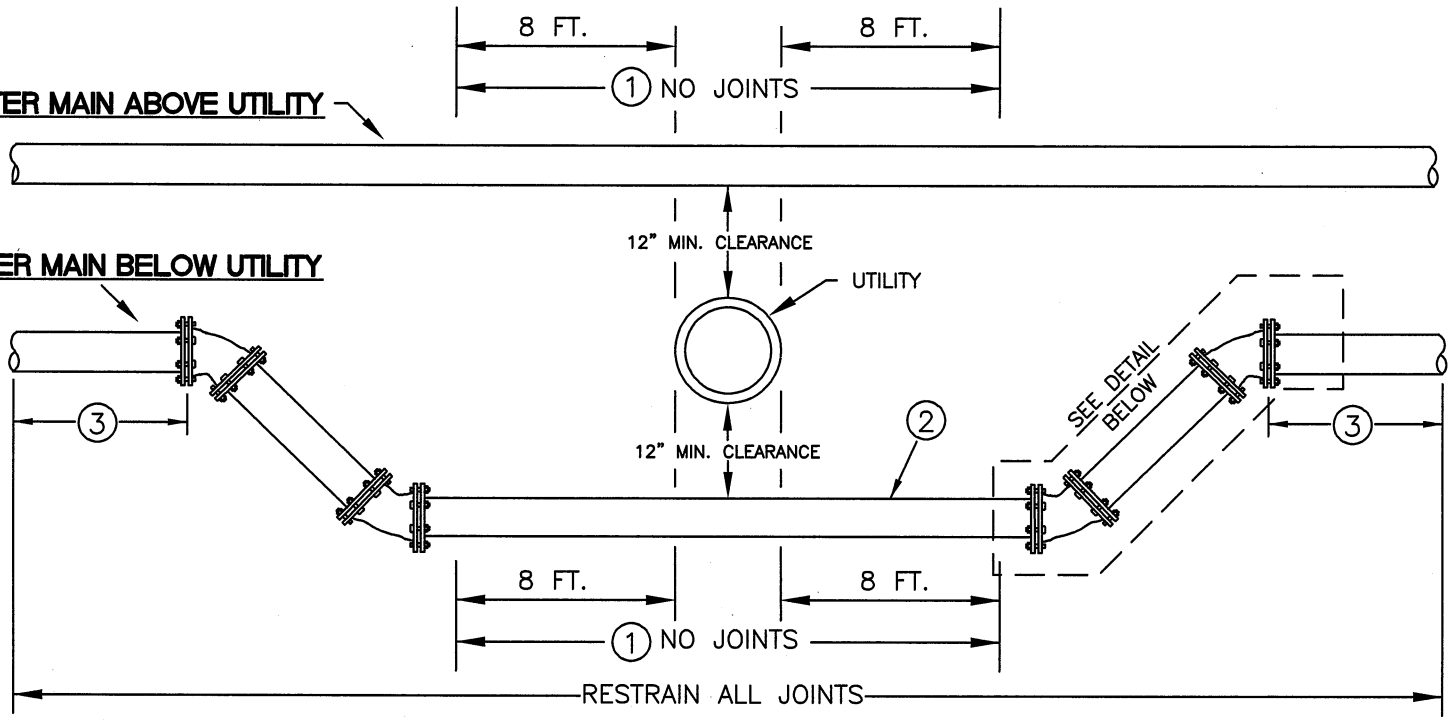
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

MAXIMUM DEFLECTION FOR PVC PIPE

SCALE: NONE
DATE: 09/24

8-9B



1. THE "NO JOINTS" RESTRICTION APPLIES ONLY TO NEW WATER PIPE INSTALLED ABOVE OR BELOW STORM DRAINAGE, SEWER, RECYCLED WATER, OR HAZARDOUS FLUIDS (SEE NOTE A).

2. IF SUBJECT TO THE "NO JOINTS" RESTRICTION, MINIMUM LENGTH SHALL BE 16 FT. + OUTER DIAMETER OF UTILITY.

3. MINIMUM PER 8-3B, UNLESS OTHERWISE CALLED OUT ON PLANS SIGNED BY WATER UTILITY. IF PIPE IS EXISTING, REMOVE AND REPLACE WITH CLASS 350 DIP.

LEGEND:

DIP = DUCTILE IRON PIPE
MJ = MECHANICAL JOINT
PVC = POLYVINYL CHLORIDE PIPE
POJ = PUSH ON JOINTS

NOTES:

A. APPLICABILITY: (1) DETAIL APPLIES TO 12" & SMALLER WATER MAINS; (2) PER 2008 CALIFORNIA WATER REGULATIONS, NEW POTABLE WATER MAINS SHALL NOT BE INSTALLED BELOW STORM DRAINAGE, SEWER, RECYLCED WATER, OR HAZARDOUS FLUIDS. WRITTEN APPROVAL FROM CALIFORNIA DIVISION OF DRINKING WATER SHALL BE RECEIVED BY WATER UTILITY PRIOR TO INSTALLATION OF NON-COMPLIANT WATER MAINS. ADDITIONAL DESIGN REQUIREMENTS WILL APPLY.

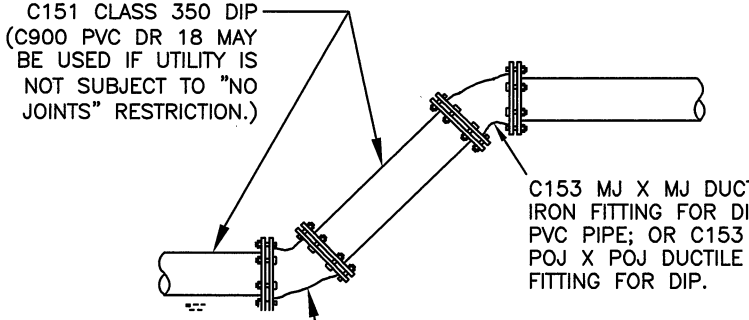
B. BENDS SHALL NOT EXCEED 22.5° OF BEND UNLESS OTHERWISE SPECIFIED ON PLANS SIGNED BY THE WATER UTILITY.

C. RESTRAINING DEVICES FOR MJ'S: FOR DUCTILE IRON USE EBAA MEGALUG 1100, STAR PIPE PRODUCTS STARGRIP 3000, OR SIGMA ONE-LOK SLDE; FOR PVC PIPE USE EBAA 2000PV, STAR PIPE PRODUCTS STARGRIP 4000, OR SIGMA ONE-LOK SLCE.

D. RESTRAINING DEVICES FOR PUSH-ON JOINTS: FOR DUCTILE IRON USE U.S. PIPE FIELD LOK GASKETS, U.S. PIPE TR FLEX PIPE, OR APPROVED EQUAL; RESTRAINED PVC PUSH-ON JOINTS NOT ALLOWED, USE DUCTILE IRON PIPE ONLY FOR RESTRAINED PUSH-ON JOINTS.

E. INSTALL LOCATING WIRE PER 8-4A.

F. ALL BURIED METAL SHALL BE ENCASED WITH AWWA C105 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.



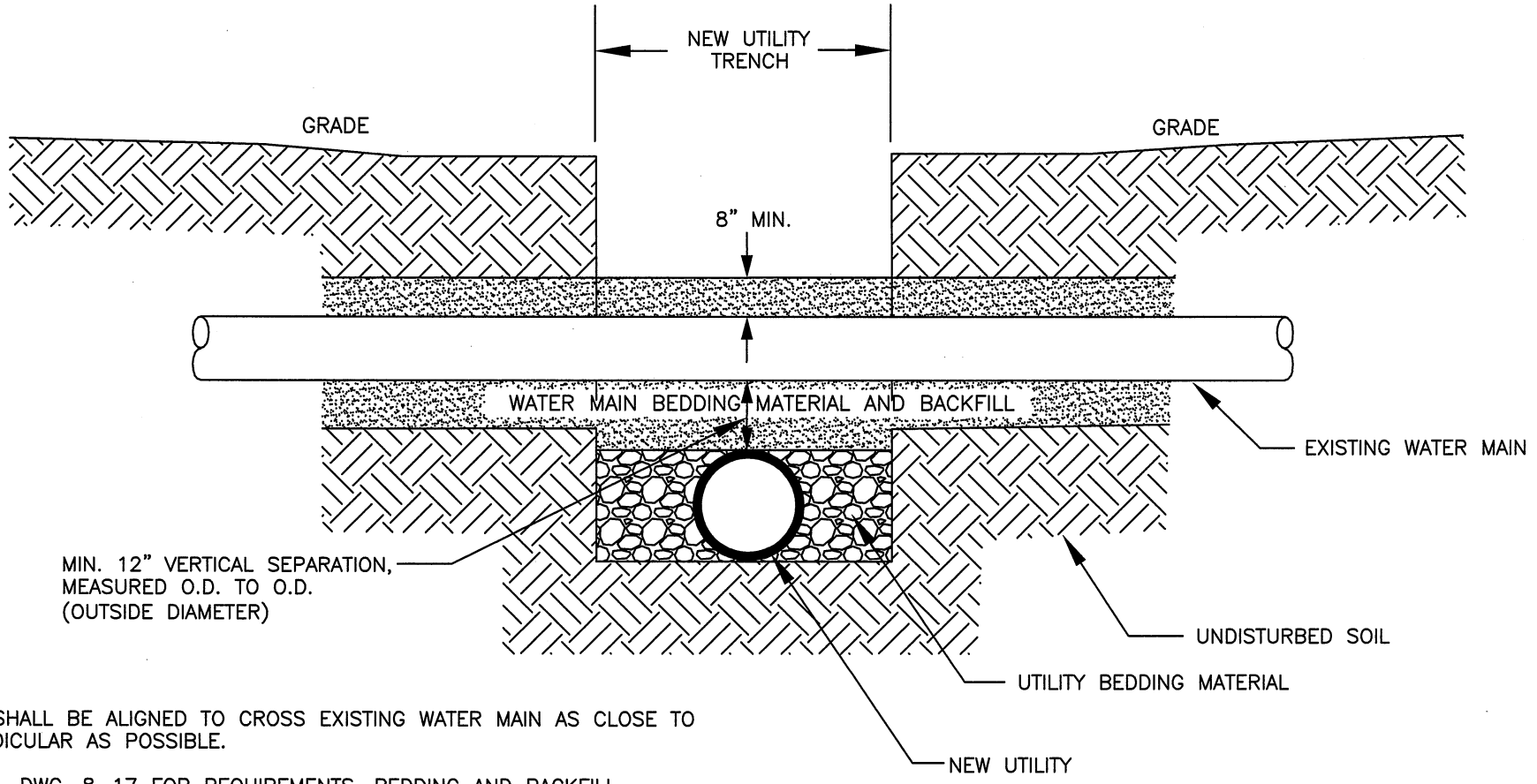
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

UTILITY CROSSING

SCALE: NONE
DATE: 09/24

8-10



NOTES:

1. UTILITY SHALL BE ALIGNED TO CROSS EXISTING WATER MAIN AS CLOSE TO PERPENDICULAR AS POSSIBLE.

2. SEE STD. DWG. 8–17 FOR REQUIREMENTS. BEDDING AND BACKFILL MATERIAL SHALL BE GRADED SAND. COMPACT TO 90%.

3. REPAIR OR REPLACE EXISTING LOCATING WIRE, POLYETHYLENE ENCASEMENT, AND UNDERGROUND MARKING TAPE.

4. FOR EXISTING ASBESTOS CEMENT (ACP) WATER MAINS:
PRIOR TO EXCAVATION OF NEW UTILITY TRENCH, EXCAVATE AND REMOVE EXISTING ACP 5 TO 10 FEET BEYOND THE PLANNED TRENCH LIMITS OF NEW UTILITY TO AN EXISTING ACP JOINT AND REPLACE WITH CLASS 350 DUCTILE IRON PIPE (DIP) USING TRANSITION COUPLINGS (SMITH–BLAIR OMNI 442 WITH 12–INCH SLEEVE AND S.S. HARDWARE). WRAP DIP AND COUPLINGS WITH 8 MIL POLYETHYLENE AND BACKFILL WITH CLSM 6 INCHES UNDER DIP TO SPRINGLINE WITHIN 5 FEET OF ACP. BACKFILL REST OF PIPE ZONE WITH SAND. COMPLY WITH WRITTEN REQUIREMENTS OBTAINED FROM THE WATER UTILITY FOR THE REPLACEMENT.

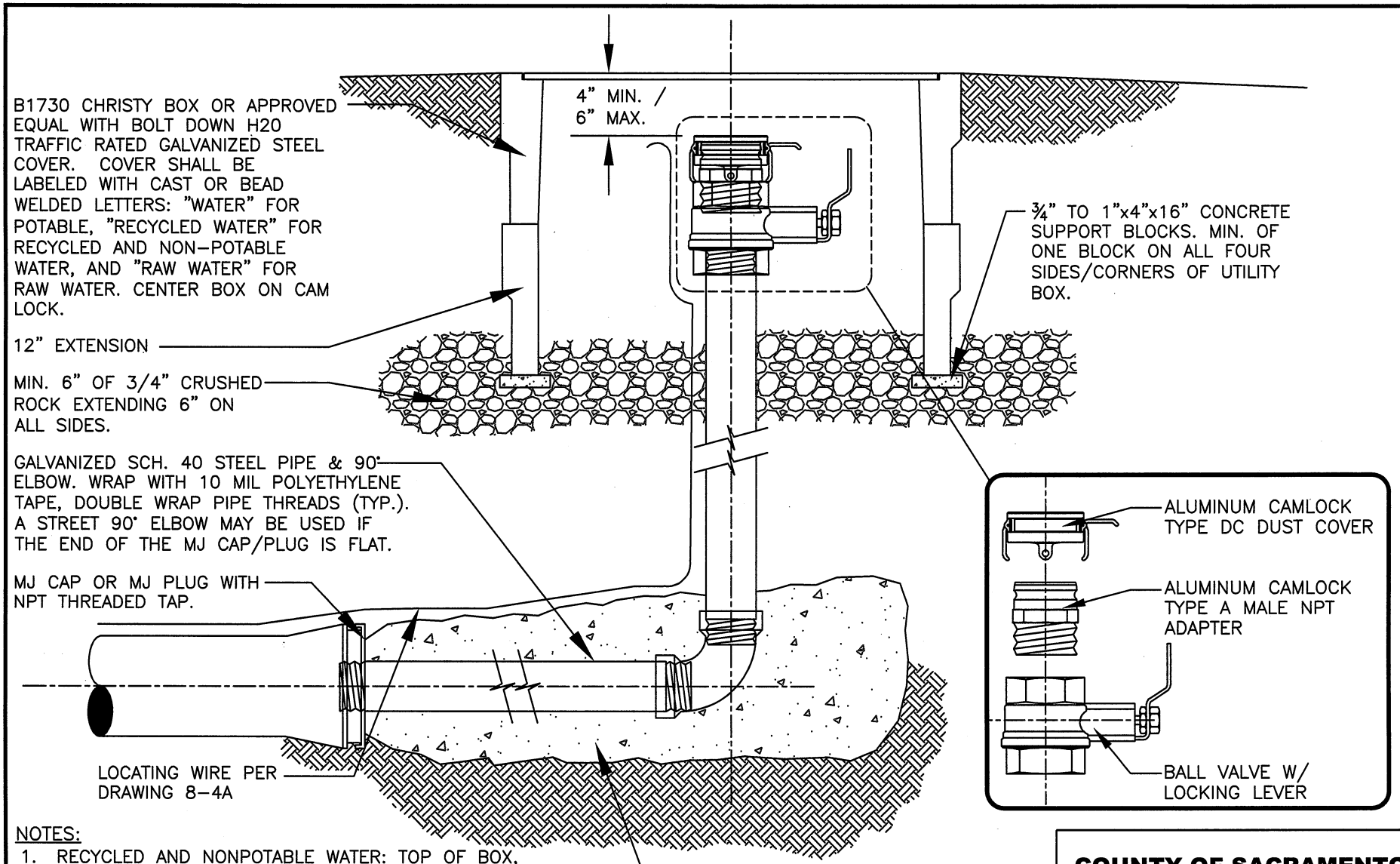
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

UTILITY CROSSING UNDER EXISTING WATER MAIN

SCALE: NONE
DATE: 09/24

8-11



NOTES:

1. RECYCLED AND NONPOTABLE WATER: TOP OF BOX, FRAME, AND COVER SHALL BE COATED PURPLE PRIOR TO INSTALLATION PER STANDARD SPECIFICATIONS – 41.22.04.
2. AT THE CONTRACTOR'S OPTION, A LARGER SIZE BLOW-OFF ASSEMBLY PER DWG. 8-12B MAY BE SUBSTITUTED. IF SUBSTITUTED, SHOW ON THE RECORD DRAWINGS.

DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

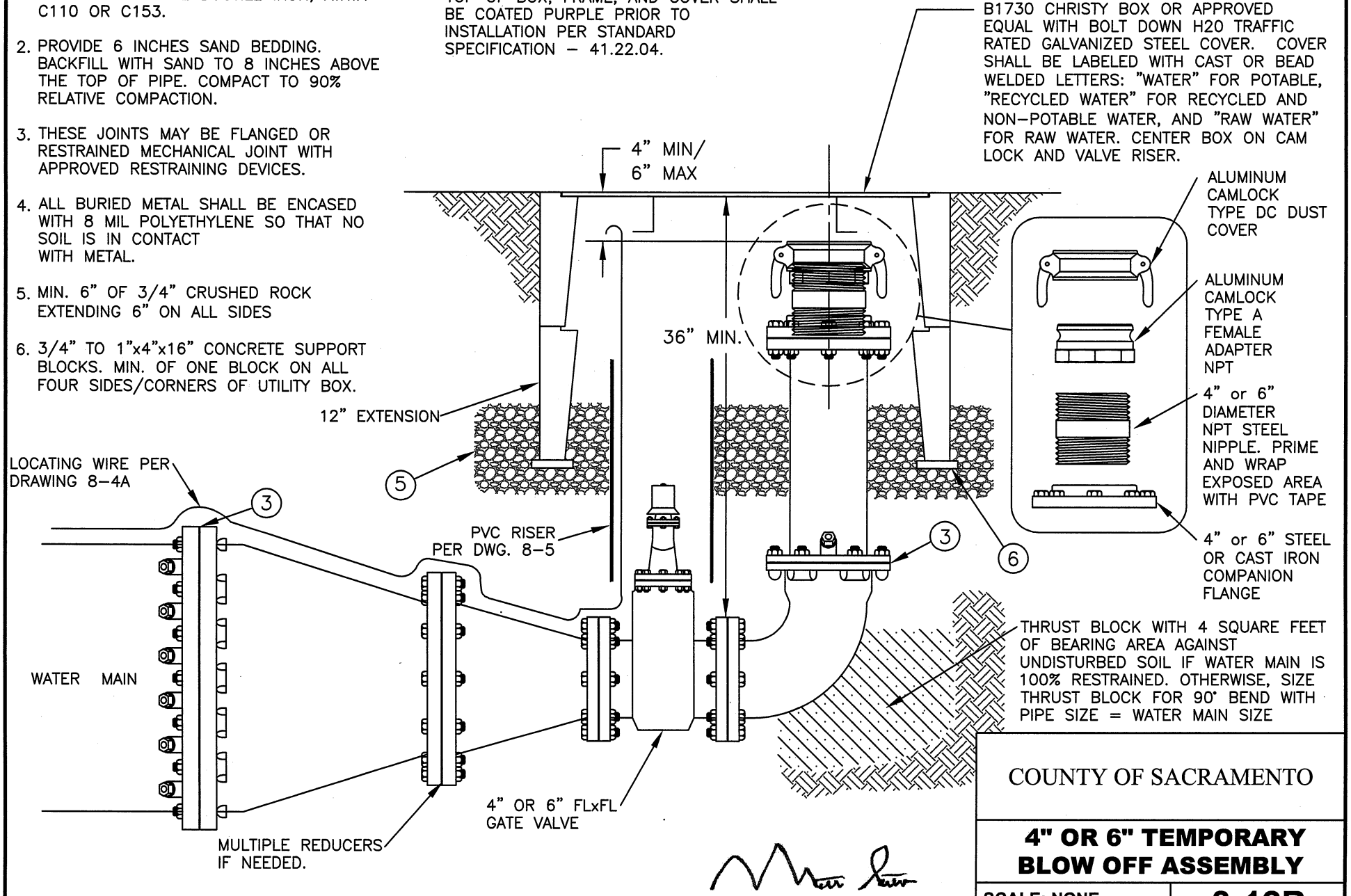
2" OR 3" TEMPORARY BLOW OFF ASSEMBLY

SCALE: NONE
DATE: 09/24

8-12A

NOTES:

1. FITTINGS SHALL BE DUCTILE IRON, AWWA C110 OR C153.
2. PROVIDE 6 INCHES SAND BEDDING. BACKFILL WITH SAND TO 8 INCHES ABOVE THE TOP OF PIPE. COMPACT TO 90% RELATIVE COMPACTION.
3. THESE JOINTS MAY BE FLANGED OR RESTRAINED MECHANICAL JOINT WITH APPROVED RESTRAINING DEVICES.
4. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.
5. MIN. 6" OF 3/4" CRUSHED ROCK EXTENDING 6" ON ALL SIDES
6. 3/4" TO 1"x4"x16" CONCRETE SUPPORT BLOCKS. MIN. OF ONE BLOCK ON ALL FOUR SIDES/CORNERS OF UTILITY BOX.
7. RECYCLED AND NON-POTABLE WATER: TOP OF BOX, FRAME, AND COVER SHALL BE COATED PURPLE PRIOR TO INSTALLATION PER STANDARD SPECIFICATION – 41.22.04.



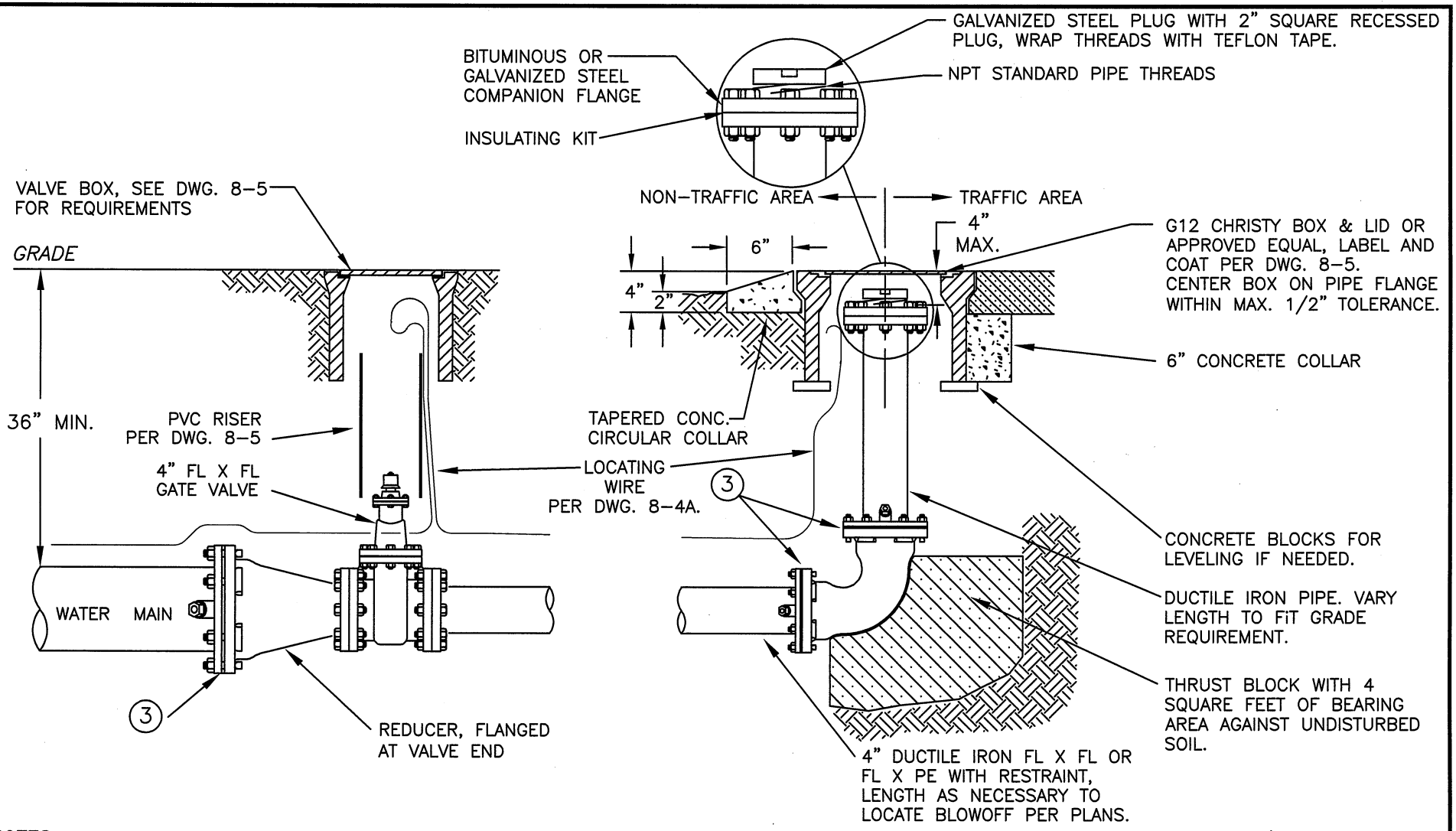
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

4" OR 6" TEMPORARY BLOW OFF ASSEMBLY

SCALE: NONE
DATE: 09/24

8-12B



NOTES:

1. FITTINGS SHALL BE DUCTILE IRON, AWWA C110 OR C153.
2. PROVIDE 6 INCHES SAND BEDDING. BACKFILL WITH SAND TO 8 INCHES ABOVE THE TOP OF PIPE. COMPACT TO 90% RELATIVE COMPACTION.
3. THESE JOINTS MAY BE FLANGED, RESTRAINED MECHANICAL JOINT WITH APPROVED RESTRAINING DEVICES, OR PUSH-ON WITH U.S. PIPE FIELD-LOK GASKETS OR APPROVED EQUAL.
4. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

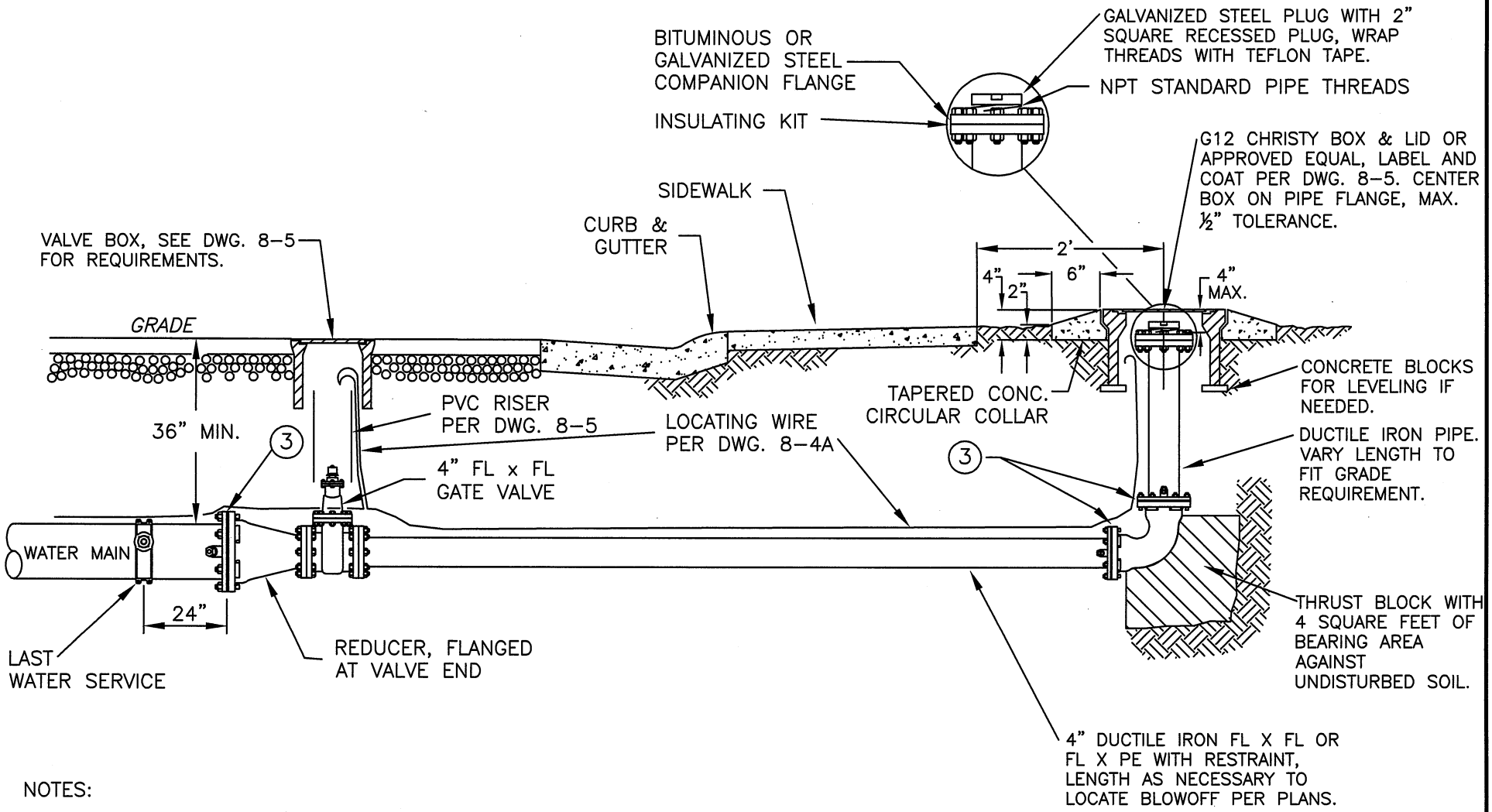
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

4" BLOW OFF ASSEMBLY AT END OF MAIN

SCALE: NONE
DATE: 09/24

8-13A



NOTES:

1. FITTINGS SHALL BE DUCTILE IRON, AWWA C110 OR C153.
2. PROVIDE 6 INCHES SAND BEDDING. BACKFILL WITH SAND TO 8 INCHES ABOVE THE TOP OF PIPE. COMPACT TO 90% RELATIVE COMPACTION.
3. THESE JOINTS MAY BE FLANGED, RESTRAINED MECHANICAL JOINT WITH APPROVED RESTRAINING DEVICES, OR PUSH-ON WITH U.S. PIPE FIELD-LOK GASKETS OR APPROVED EQUAL.
4. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

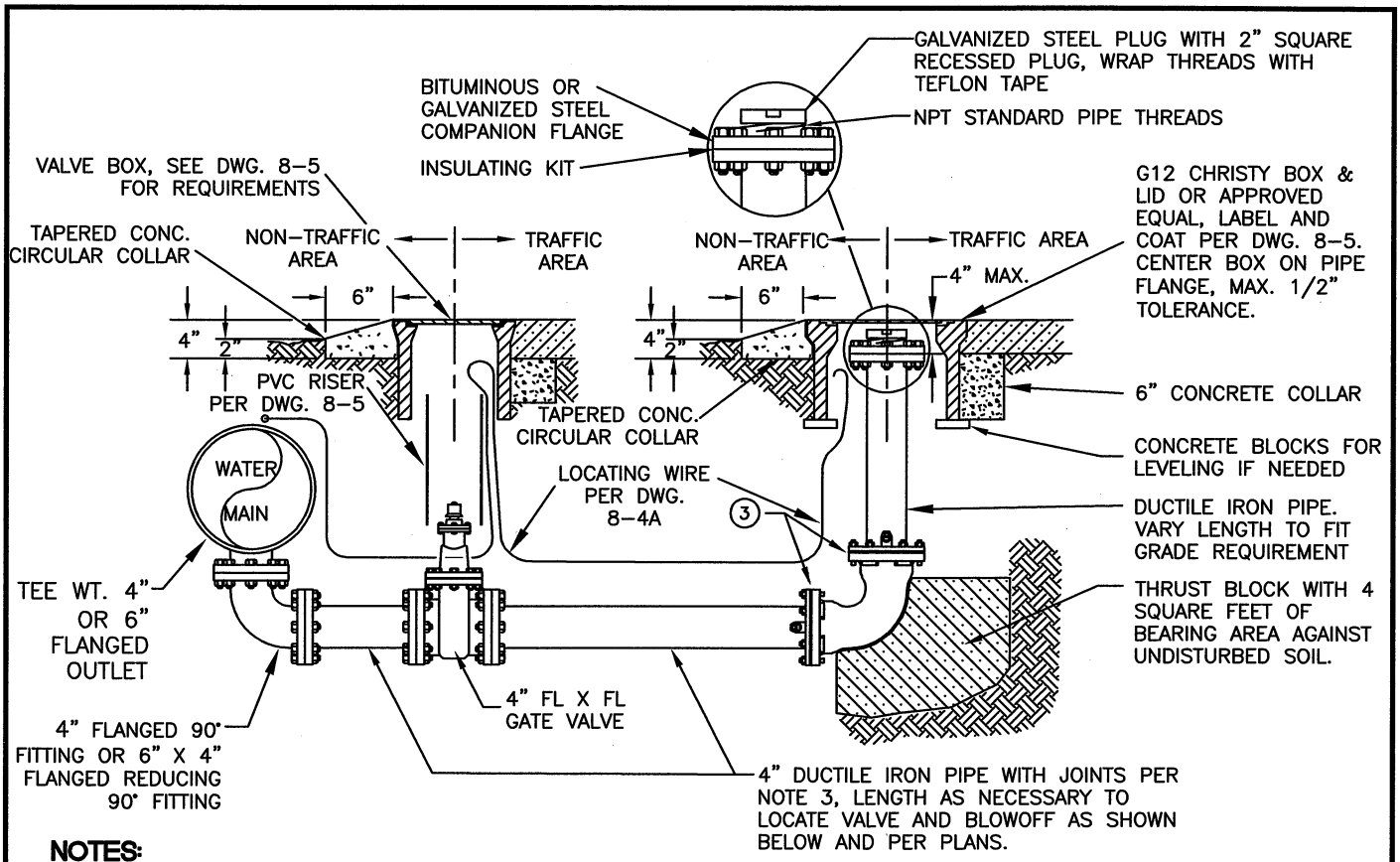
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

4" BLOW OFF ASSEMBLY AT END OF CUL-DE-SAC

SCALE: NONE
DATE: 09/24

8-13B



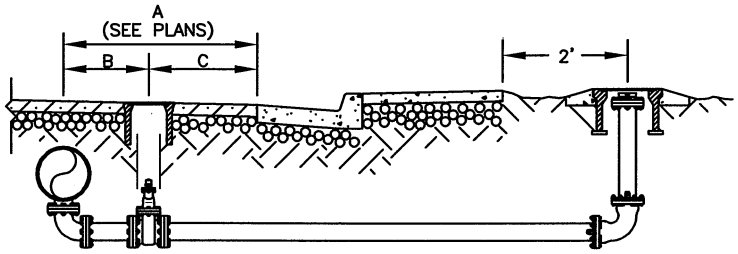
NOTES:

1. FITTINGS SHALL BE DUCTILE IRON, AWWA C110 OR C153.
2. PROVIDE 6 INCHES SAND BEDDING. BACKFILL WITH SAND TO 8 INCHES ABOVE THE TOP OF PIPE. COMPACT TO 90% RELATIVE COMPACTION.
3. JOINTS MAY BE FLANGED, RESTRAINED MECHANICAL JOINT WITH APPROVED RESTRAINING DEVICES, OR PUSH-ON WITH U.S. PIPE FIELD-LOK GASKETS OR APPROVED EQUAL.
4. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.
5. RECYCLED AND NONPOTABLE WATER: THE TOP SURFACES OF BOXES AND LIDS SHALL BE COATED PURPLE PRIOR TO INSTALLATION PER STANDARD SPECIFICATIONS.

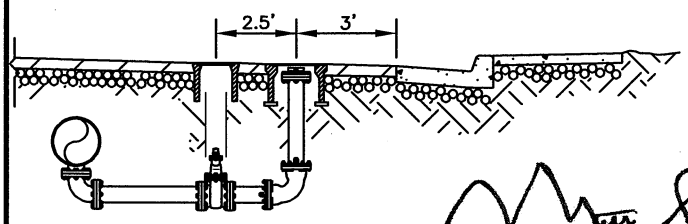
UNLESS OTHERWISE SPECIFIED ON THE PLANS, LOCATION OF VALVE AND BLOW-OFF BOX SHALL CONFORM TO THE FOLLOWING:

A (SEE PLANS)	B	C
3'	1.5'	1.5'
4'	2.5'	1.5'
≥5'	AS REQ'D	3'

STANDARD BLOW-OFF



BLOW-OFF IN ROADWAY
(ALLOWED IF CALLED OUT ON PLANS)



DIRECTOR, DEPARTMENT OF WATER RESOURCES

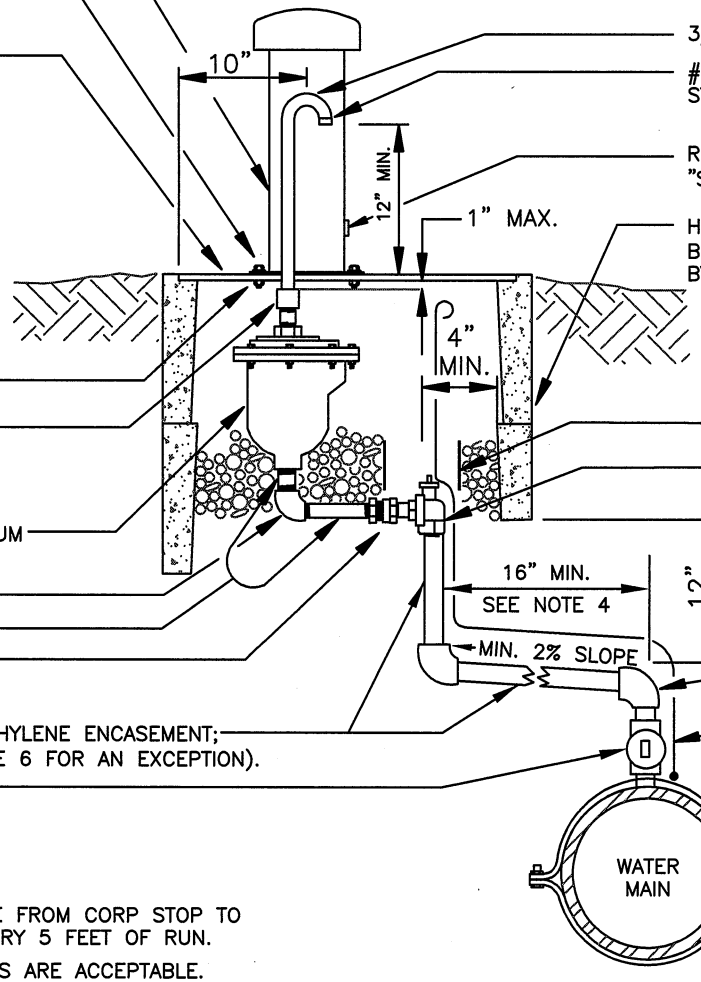
COUNTY OF SACRAMENTO

4" IN-LINE BLOW-OFF ASSEMBLY

SCALE: NONE
DATE: 09/24

8-13C

CLEAN INTERIOR AND EXTERIOR SURFACES OF LID AND TUBE WITH DEVPREP 88 OR EQUAL, THEN COAT ALL SURFACES, NUTS AND BOLTS W/ DEVOE BAR-RUST 233H EPOXY UNDERCOAT, 2-3MILS, COLOR GRAY; THEN APPLY 2 COATS OF DEVOE ACRYLIC 1.5 MILS TO 2.0 MILS, EACH. COLOR SHALL BE HUNTER GREEN FOR POTABLE WATER AND RAW WATER; PURPLE FOR RECYCLED AND NONPOTABLE WATER.



3/16" STEEL, 6"x6" SQUARE TUBE 18" HIGH WITH AN 8-1/2" CAP, SPOT WELDED AT THE TOP.

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 SHALL BE BOLTED TO BOX. LID SHALL BE LABELED WITH BEAD WELDED LETTERS: "RECYCLED WATER" FOR RECYCLED AND NONPOTABLE WATER; "RAW WATER" FOR RAW WATER; AND UNLABELED FOR POTABLE WATER. LID & TUBE ASSEMBLY SHALL BE PWAE118M BY PLACER WATERWORKS OR EQUAL APPROVED BY THE WATER UTILITY.

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 SCWA APPROVED EQUAL.

1"- 90° BRONZE FITTING (TYP)

1"- BRASS NIPPLE (TYP)

1 1/4" X 1" BRONZE THREADED BUSHING

COPPER PIPE, TYPE K PER AWWA C800 w/ POLYETHYLENE ENCASEMENT; CONTINUOUS PIPE, NO JOINTS PERMITTED (SEE NOTE 6 FOR AN EXCEPTION).

1" BRONZE BALL CORP. STOP WITH TEFLON COATED BALL.

3/4" SCHEDULE 40 PVC

#16 MESH BRONZE OR STAINLESS STEEL SCREEN

RIVET 1" X 4" STAINLESS STEEL NAME PLATE THAT READS "SACRAMENTO COUNTY WATER" TO TUBING.

H20 TRAFFIC RATED BOX TO ACCEPT BOLT DOWN 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 ANGLE METER STOP BALL VALVE WITH TEFLON COATED BALL: JONES OR EQUAL APPROVED BY THE WATER UTILITY.

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

1"- 90° COPPER FITTING (TYPICAL)

LOCATING WIRE PER DWG. 8-4A

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

NOTES:

1. MAINTAIN A MIN 2% CONTINUOUS UPWARD SLOPE FROM CORP STOP TO AIR VALVE. INSPECTOR SHALL VERIFY SLOPE EVERY 5 FEET OF RUN.
2. FLARE, SOLDER JOINT, OR COMPRESSION FITTINGS ARE ACCEPTABLE.
3. PROVIDE 3' X 3' X 3' OF 1/2" CRUSHED AGGREGATE FOR DRAINAGE AND SUPPORT UNDER VALVE, COMPACT TO 95%.
4. SEE PLANS FOR LOCATION INFORMATION. UNLESS OTHERWISE SPECIFIED, LOCATE BOX 2' BEHIND SIDEWALK.
5. BOX SHALL NOT BE INSTALLED IN LOCATIONS SUBJECT TO TRAFFIC.
6. IF IT IS NECESSARY TO RELOCATE AN EXISTING INSTALLATION THAT IS UNDER EXISTING PAVEMENT: NEW COPPER PIPE MAY BE JOINED TO EXISTING COPPER PIPE WITH A MUELLER 110 H-15403 CONNECTOR.

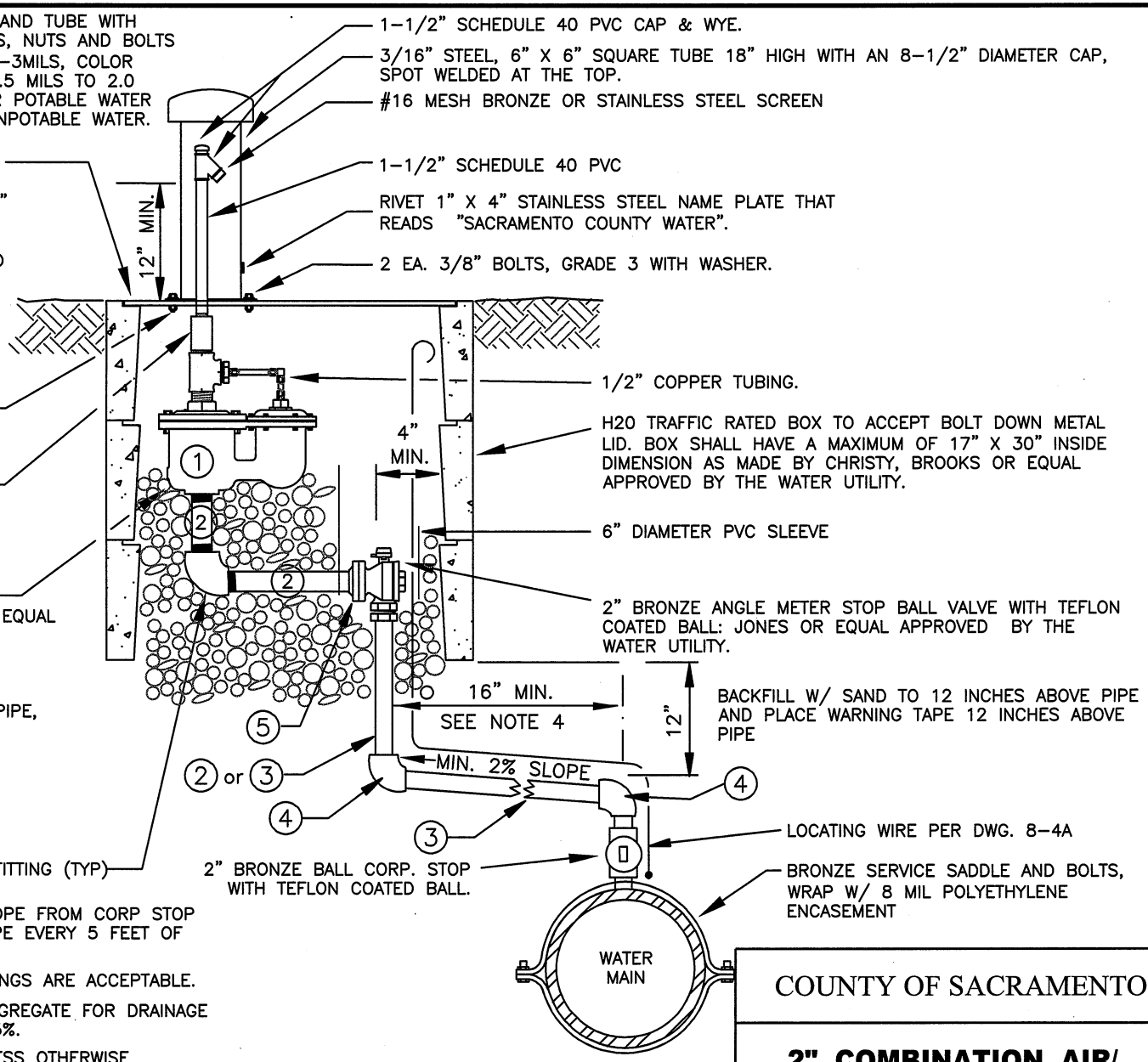
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

1" COMBINATION AIR/ VACUUM VALVE

SCALE: NONE
DATE: 09/24

8-14A



NOTES:

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2. FLARE, SOLDER JOINT, OR COMPRESSION FITTINGS ARE ACCEPTABLE.
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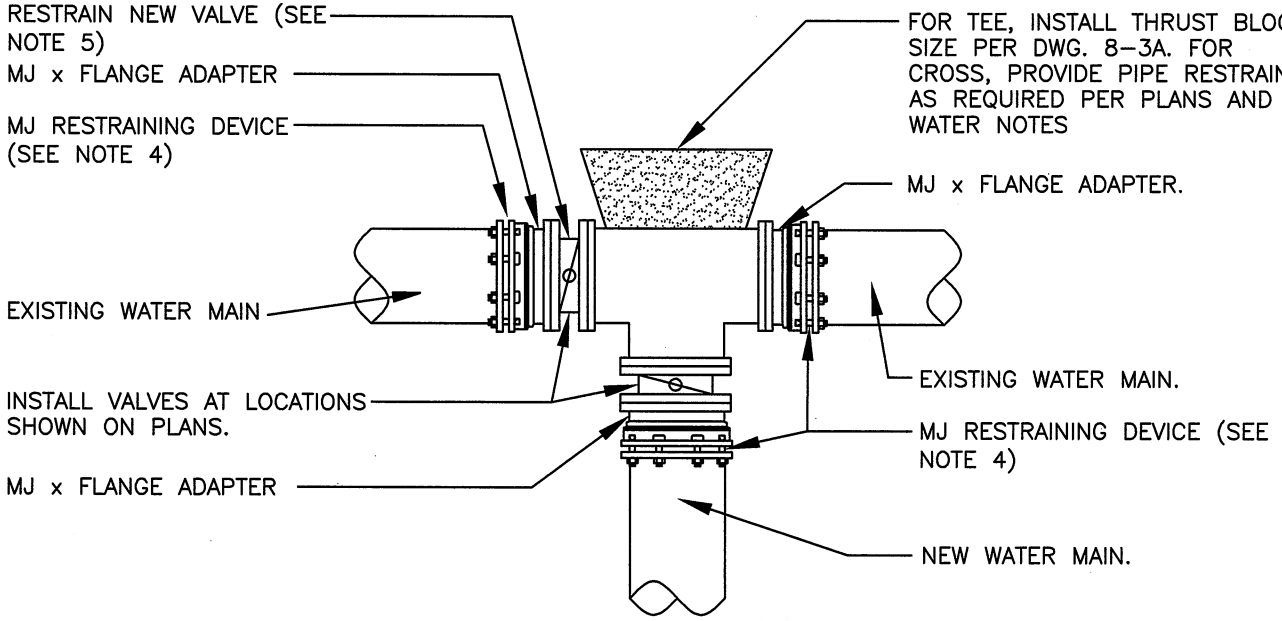
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

2" COMBINATION AIR/ VACUUM VALVE

SCALE: NONE
DATE: 09/24

8-14B



NOTES:

1. APPLICABILITY: THIS DETAIL SHALL BE USED WHEN (A) THE PLANS REQUIRE BOTH A NEW CONNECTION AND NEW IN-LINE VALVE IN AN EXISTING MAIN, OR WHEN (B) CALLED OUT ON THE PLANS.
2. DIG SUMP UNDER THE CUT AND PUMP ALL WATER FROM EXISTING MAIN AWAY FROM CUT-IN LOCATION. DO NOT ALLOW ANY WATER TO ENTER EXISTING PIPE. SPRAY EXISTING PIPE, ALL FITTINGS AND VALVES WITH A SOLUTION OF SUPER CHLORINATED WATER JUST PRIOR TO INSTALLATION.
3. RESTRAIN ALL JOINTS.
4. RESTRAINING DEVICES FOR MJ'S: FOR DUCTILE IRON USE EBAA MEGALUG 1100, STAR PIPE PRODUCTS STARGRIP 3000, OR SIGMA ONE-LOK SLDE; FOR PVC PIPE USE EBAA 2000PV, STAR PIPE PRODUCTS STARGRIP 4000, OR SIGMA ONE-LOK SLCE.
5. RESTRAIN NEW IN-LINE VALVE WITH A CONCRETE ANCHOR BLOCK PER A DESIGN APPROVED BY THE WATER UTILITY. SUBMIT DESIGN TO WATER UTILITY FOR REVIEW AND APPROVAL.
6. CONNECT NEW LOCATING WIRE TO EXISTING LOCATING WIRE PER DWG. 8-4A.
7. FOR EXISTING ASBESTOS CEMENT (ACP) WATER MAINS: REMOVE EXISTING ACP 5 TO 10 FEET BEYOND EACH SIDE OF CUT-IN TO AN EXISTING ACP JOINT AND REPLACE WITH CLASS 350 DIP USING TRANSITION COUPLINGS (SMITH-BLAIR OMNI 442 WITH 12-INCH SLEEVE AND S.S. HARDWARE). PLACE CLSM 6-INCHES UNDER DIP TO SPRINGLINE WITHIN 5 FEET OF ACP.
8. BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.

FIT UP PROCEDURE:

1. CAREFULLY MEASURE AND CUT A SECTION FROM THE EXISTING WATER MAIN 1/4" LARGER THAN THE COMBINED MAKE UP OF THE FITTINGS AND GASKETS.
2. BOLT UP THE ASSEMBLY WITH THE EXCEPTION OF THE MJ X FL ADAPTERS.
3. LOOSELY BOLT THE MJ ADAPTERS TO THE ENDS OF THE PIPE. TWO-HOLE THE FLANGES AND LEAVE THE MJ BOLTS SNUG.
4. DROP IN THE FLANGED TEE AND VALVE ASSEMBLY AND SUPPORT THE VALVE WITH BLOCKS.
5. INSTALL THE BOTTOM TWO FLANGE BOLTS (THIS WILL SECURE THE GASKET IN PLACE WHILE ADJUSTMENTS ARE MADE TO THE MJ ADAPTERS).
6. ADJUST EVERYTHING LEVEL AND TO GRADE AND INSTALL ALL OF THE BOLTS AND NUTS ON THE FLANGES AND TIGHTEN.
7. TIGHTEN THE BOLTS FOR THE MJ GLANDS.
8. LASTLY, TIGHTEN THE MJ RESTRAINING BOLTS.

DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

WATER MAIN CUT - IN

SCALE: NONE DATE: 09/24	8-15

NOTES:

1. 6"x12" ALUMINUM SHEET ALLOY 6061–T6 0.080" GAUGE, ROUNDED CORNERS (1" RADIUS).
2. LETTER HEIGHT & SYMBOL SIZE SHALL BE PROPORTIONAL TO SIGN SIZE.
3. THE BACKGROUND SHALL BE WHITE. THE LETTERING SHALL BE PURPLE, THE GRASS GREEN, AND THE WATER BLUE.
4. LETTERING AND SYMBOL SHALL BE PRESSURE SENSITIVE VINYL. CLEAR COAT ENTIRE SIGN ONCE LETTERING AND SYMBOLS ARE ATTACHED.
5. 1"x1" SQUARE STEEL POST PAINTED WHITE TO MATCH SIGN BACKGROUND. CAP OFF POST AND FINISH CLEAN. PROVIDE REBAR AT END FOR CONCRETE INSTALLATION AT 24" DEPTH.
6. $\frac{5}{16}$"ø x 4–1/2" ZINC PLATED CARRIAGE BOLT WITH VANDAL PROOF NUTS. PAINT WHITE TO MATCH SIGN.

WHEN MOUNTING ON WALLS OR CHAIN LINK FENCE, PROVIDE 1/4 INCH HOLES IN ALL FOUR CORNERS.

3" x 4–1/2" PRESSURE SENSITIVE DECALS ARE REQUIRED FOR IRRIGATION CONTROLLERS AND OTHER ABOVE GROUND FACILITIES REQUIRING A WARNING SIGN. WHEN CONDITIONS AND/OR FACILITY CHARACTERISTICS RENDER THESE SPECIFICATIONS INAPPROPRIATE, ALTERNATIVE SIGNING SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE WATER UTILITY.

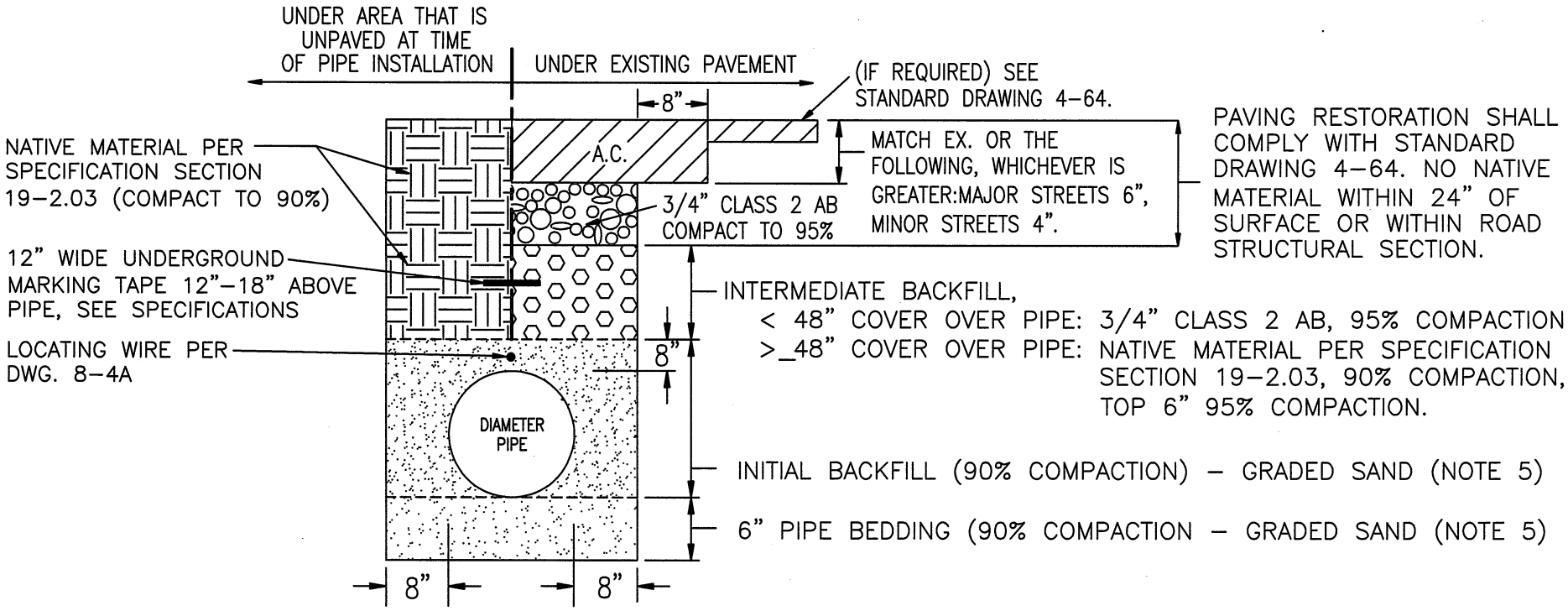
SIGN, LETTER HEIGHTS, & SYMBOL SIZE SHOWN ARE IN REQUIRED PROPORTIONS

DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

RECYCLED WATER SIGN

SCALE: NONE DATE: 09/24	8-16



NOTES:

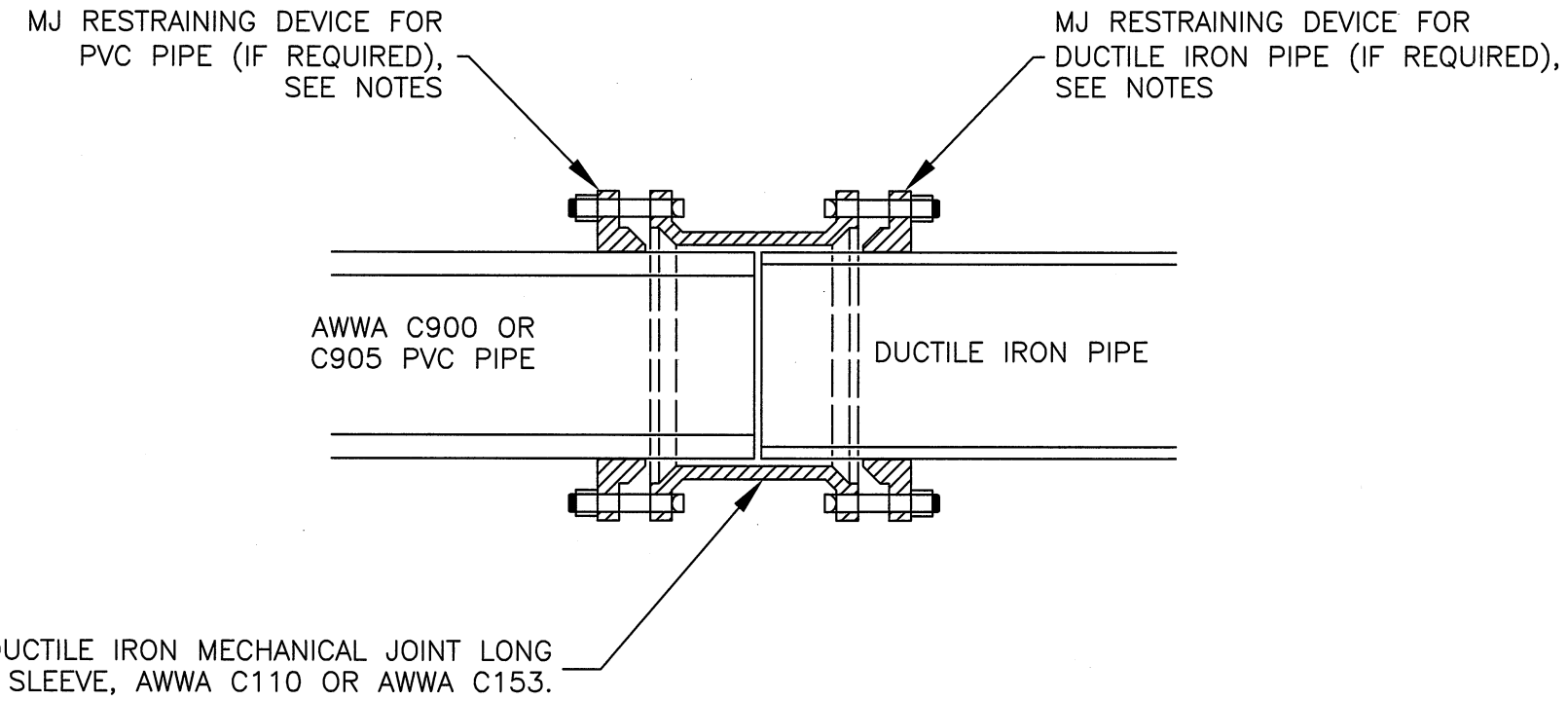
1. SEE THE COUNTY OF SACRAMENTO STANDARD CONSTRUCTION SPECIFICATIONS, IMPROVEMENT STANDARDS, AND THE PROJECT WATER NOTES FOR REQUIREMENTS.
2. 6" & 8" DIMENSIONS SHALL INCLUDE DISTANCE BETWEEN PIPE BELL AND TRENCH WALL.
3. EXCAVATION, BEDDING, AND BACKFILL SHALL COMPLY WITH STANDARD SPECIFICATION SECTION 19.
4. COORDINATE COMPACTION TESTS WITH RESIDENT ENGINEER.
5. PIPE BEDDING AND INITIAL BACKFILL REQUIREMENTS ARE THE SAME FOR BOTH TYPES OF TRENCHES.
6. IF USED, BATCH-PLANT BASED TRENCH BACKFILL MATERIAL USED IN PLACE OF NATIVE MATERIAL SHALL BE CLSM WITH A 28-DAY COMPRESSIVE STRENGTH OF NOT MORE THAN 125 PSI.

DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

TRENCH DETAIL

SCALE: NONE DATE: 09/24	8-17



NOTES:

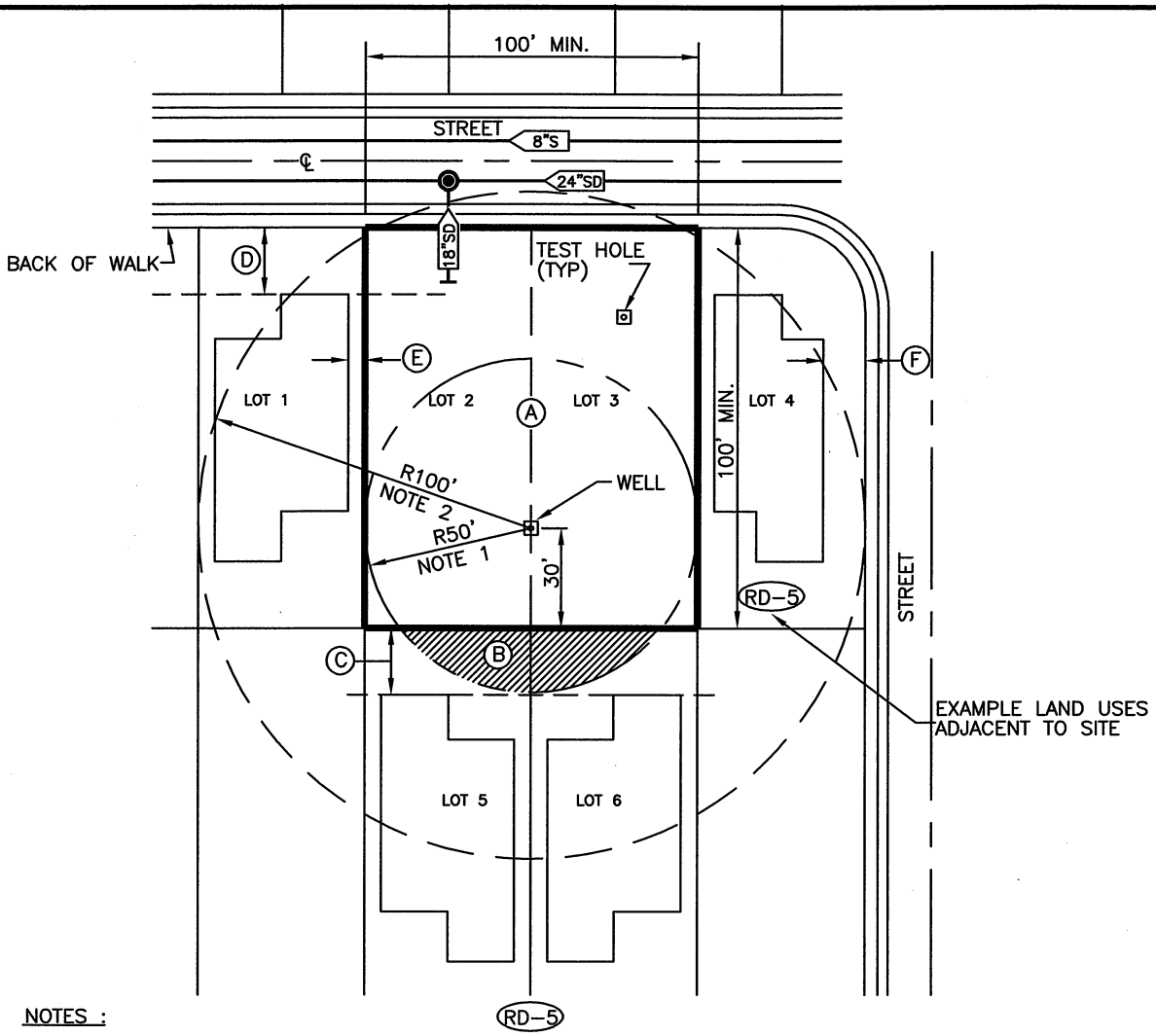
1. THIS DETAIL SHALL BE USED AT ALL IN–LINE TRANSITIONS BETWEEN PVC PIPE AND DUCTILE IRON PIPE.
2. TRANSITIONS SHALL BE LOCATED OUTSIDE OF RESTRAINED AREAS, UNLESS APPROVED BY THE WATER UTILITY.
3. TRANSITIONS LOCATED WITHIN RESTRAINED AREAS SHALL BE RESTRAINED. RESTRAINING DEVICE FOR THE PVC PIPE SIDE SHALL BE EBAA 2000PV, STAR PIPE PRODUCTS STARGRIP 4000, OR SIGMA ONE–LOK SLCE. RESTRAINING DEVICE FOR THE DUCTILE IRON PIPE SIDE SHALL BE EBAA MEGALUG 1100, STAR PIPE PRODUCTS STARGRIP 3000, OR SIGMA ONE–LOK SLDE.
4. RESTRAINING DEVICES NOT REQUIRED IF TRANSITION IS NOT IN A RESTRAINED AREA.
5. ALL BURIED METAL SHALL BE ENCASED WITH 8 MIL POLYETHYLENE SO THAT NO SOIL IS IN CONTACT WITH METAL.
6. <u>FOR EXISTING ASBESTOS CEMENT (ACP) WATER MAINS:</u> CONNECT NEW WATER MAINS TO EXISTING ACP WITH SMITH–BLAIR OMNI 442 TRANSITION COUPLINGS, WITH 12–INCH SLEEVE AND S.S. HARDWARE.

DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

TRANSITION SLEEVE

SCALE: NONE DATE: 09/24	8-18



NOTES :

1. 50' RADIUS PRIMARY DRINKING WATER SOURCE PROTECTION ZONE: NO SEWER, STORMWATER, OR INDUSTRIAL LINES; NO LATERAL LINES; NO HOUSE FOUNDATIONS.
2. 100' RADIUS SECONDARY DRINKING WATER SOURCE PROTECTION ZONE: NO SEWER OR STORMWATER MAINS; NO DRAINAGE CHANNELS.
3. 200' SETBACK REQUIRED FROM FORCE MAINS (SEWER, STORMWATER, INDUSTRIAL), UNDERGROUND FUEL TANKS, SEPTIC TANKS, LEACH LINES, AND STABLES.
4. 500' SETBACK REQUIRED FROM PETROLEUM PIPELINES.
5. MINIMUM WELL LOT SIZE IS 100' X 100'. EXAMPLE RD-5 LOT SIZE TAKEN AS 50' X 120'.
6. ANY STRUCTURE(S) PROPOSED WITHIN THE SPECIAL PROVISION AREA ARE SUBJECT TO REVIEW AND APPROVAL BY THE WATER UTILITY FOR COMPLIANCE WITH THE DRINKING WATER SOURCE PROTECTION SETBACKS.
7. CONTACT THE WATER UTILITY FOR SPECIFIC INFORMATION ON A CASE-BY-CASE BASIS.
8. WELL SITES SHALL BE PROVIDED WITH A WATER SERVICE, A STORM DRAIN STUB SIZED FOR WELL CAPACITY (TYP. 1500 GPM), A 480V 3-PHASE 250-300 AMP ELECTRIC SERVICE WITH 4'X6'X4' VAULT AND 2 EA. 4" CONDUITS STUBBED INTO SITE PAST PUE, AND A 20-FOOT COMMERCIAL DRIVEWAY.
9. RAW WATER MAIN SHALL BE STUBBED INTO SITE PAST PUE AS PART OF DEVELOPMENT PLAN.

LEGEND :

- (A) WELL SITE IS TWO LOTS (TYPICAL)
- (B) SPECIAL PROVISION AREA
- (C) 20' MINIMUM SETBACK, REAR YARD.
- (D) 20' MINIMUM SETBACK, FRONT YARD.
- (E) 5' MINIMUM SETBACK, SIDE YARD.
- (F) 12.5' MINIMUM SETBACK, SIDE STREET YARD.

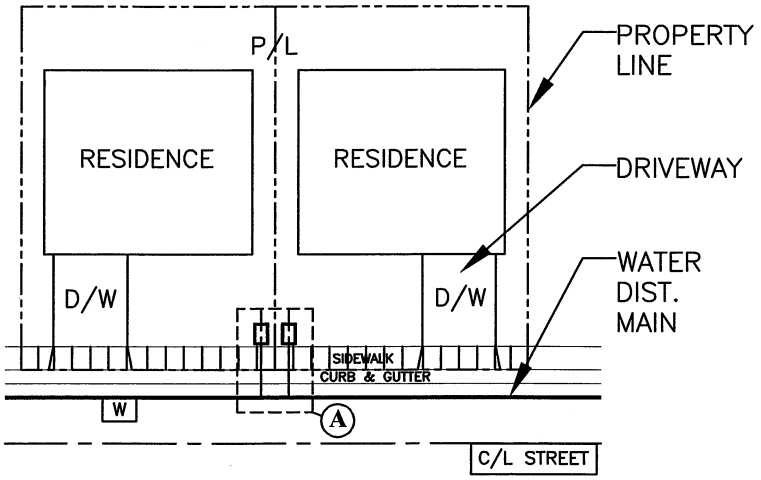
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

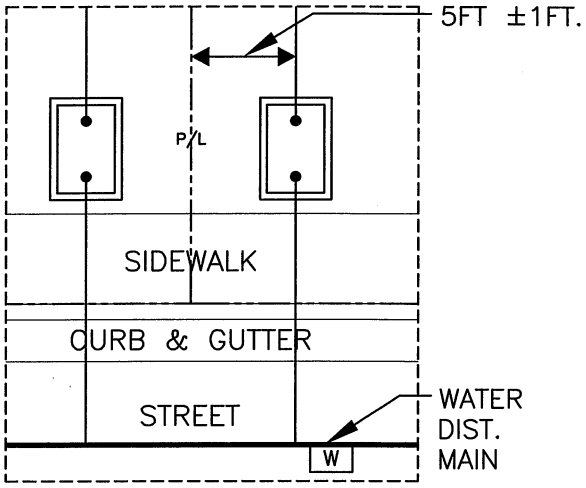
TYPICAL WELL SITE

SCALE: NONE
DATE: 09/24

8-19



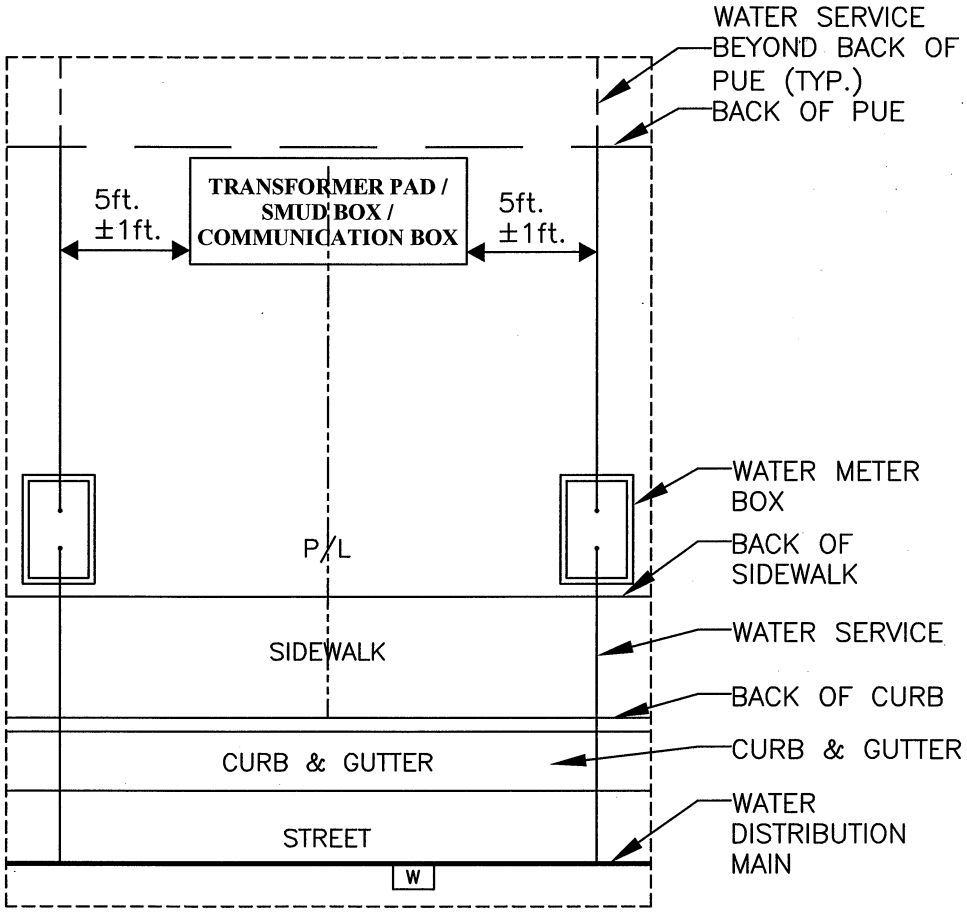
OVERVIEW



(A) STANDARD LOCATION

NOTES:

1. PRIOR TO INSTALLING WATER SERVICES, CONTRACTOR SHALL OBTAIN THE LATEST APPROVED JOINT UTILITY PLAN FROM THE DEVELOPER'S DRY UTILITY DESIGN CONSULTANT.
2. THE DRY UTILITY DESIGN CONSULTANT SHALL PROMPTLY PROVIDE LATEST EDITIONS INCLUDING SMUD "TRENCH INTENT" DRAWINGS UPON REQUEST.
3. WATER SERVICES SHALL BE INSTALLED IN THE "STANDARD LOCATION" UNLESS OTHERWISE SPECIFIED ON THE IMPROVEMENT PLANS OR ON THIS STANDARD DRAWING.



AT TRANSFORMER / SMUD BOX / COMMUNICATIONS BOX

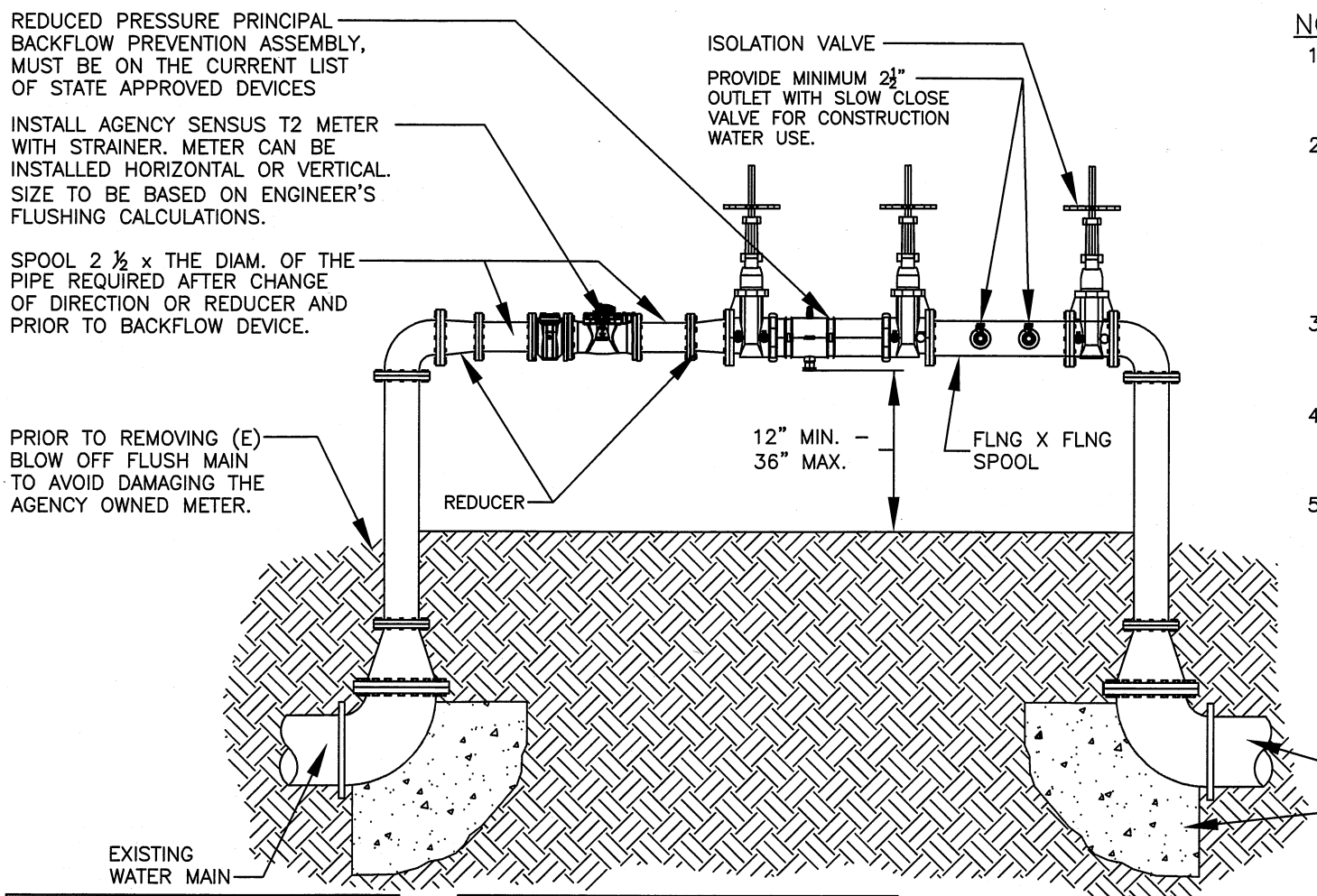
DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

RESIDENTIAL WATER SERVICE LOCATION

SCALE: NONE
DATE: 06/25

8-20



NOTES:

1. ALL PIPING SHALL BE AWWA C151 DIP OR SCHEDULE 40 GALVANIZED THREADED PIPE.
2. SUPPLY ALL PARTS EXCEPT METER. AGENCY WILL SUPPLY THE METER. SCHEDULE A DATE AND TIME FOR METER INSTALL AND AGENCY STAFF WILL DELIVER THE METER TO THE SITE FOR CONTRACTOR INSTALLATION.
3. WHEN JUMPER IS TO BE REMOVED NOTIFY AGENCY FOR AGENCY TO TAKE POSSESSION OF METER.
4. INSTALL (3) TEMPORARY PIPE STANDS WITH A 2x2 FOOTING TO SUPPORT THE JUMPER ASSEMBLY.
5. METER AND ISOLATION VALVE MAY BE PLACED ON THE VERTICAL LEGS DUE TO SPACE CONSTRAINTS. SEE STANDARD DRAWING 8–21B TO CONSTRUCT JUMPER IN A U–PATTERN TO SHORTEN THE FINAL TIE–IN PIPE.

Reduced Pressure Principle Backflow Preventers

Size, (inch)	Maximum Allowable Flowrate, (gpm) [1]
3	320
4	500
6	1,000
8	1,600
10	2,300
12	3,000

1. Maximum Flowrate (AWWA C511).

Water Pipe Flushing Flowrate

Size, (inch)	Inside Diameter, (inch) [1]	Required Flushing Rate, (gpm) [2]
4	4.2	130
6	6.3	290
8	8.4	520
10	10.5	810
12	12.5	1,150
16	16.6	2,020
20	20.7	3,150
24	24.8	4,520

1. Ductile Iron Pipe: Class 350, Cement Lined.
2. Minimum Velocity 3-feet per second (fps) (AWWA C651).

DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

TEMPORARY JUMPER WITH HORIZONTAL METER

SCALE: NONE
DATE: 06/25

8-21A

NOTES:

1. ALL PIPING SHALL BE AWWA C151 DIP OR SCHEDULE 40 GALVANIZED THREADED PIPE.
2. SUPPLY ALL PARTS EXCEPT METER. AGENCY WILL SUPPLY THE METER. SCHEDULE A DATE AND TIME FOR METER INSTALL AND AGENCY STAFF WILL DELIVER THE METER TO THE SITE FOR CONTRACTOR INSTALLATION.
3. WHEN JUMPER IS TO BE REMOVED NOTIFY AGENCY FOR AGENCY TO TAKE POSSESSION OF METER.
4. INSTALL (3) TEMPORARY PIPE STANDS WITH A 2x2 FOOTING TO SUPPORT THE JUMPER ASSEMBLY.

Reduced Pressure Principle Backflow Preventers	
Size, (inch)	Maximum Allowable Flowrate, (gpm) [1]
3	320
4	500
6	1,000
8	1,600
10	2,300
12	3,000
1. Maximum Flowrate (AWWA C511).	

Water Pipe Flushing Flowrate		
Size, (inch)	Inside Diameter, (inch) [1]	Required Flushing Rate, (gpm) [2]
4	4.2	130
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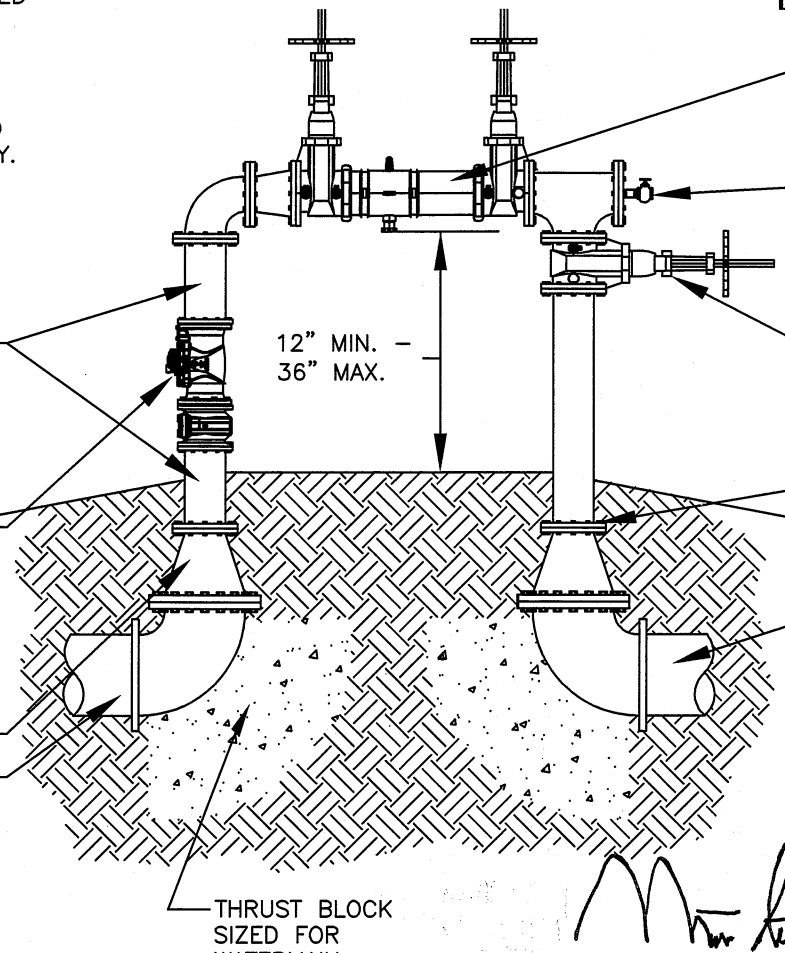
20	20.7	3,150
24	24.8	4,520



REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTION ASSEMBLY, MUST BE ON THE CURRENT LIST OF STATE APPROVED DEVICES

PROVIDE MINIMUM 2" OR 2½" OUTLET WITH SLOW CLOSE VALVE FOR CONSTRUCTION WATER USE/ CHLORINE INJECTION PORT.

ISOLATION VALVE

FLNG X MJ

NEW WATER MAIN

SPOOL 2 ½ x THE DIAM. OF THE PIPE REQUIRED AFTER CHANGE OF DIRECTION OR REDUCER AND PRIOR TO BACKFLOW DEVICE.

INSTALL AGENCY SENSUS T2 METER WITH STRAINER. METER CAN BE INSTALLED HORIZONTAL OR VERTICAL. SIZE TO BE BASED ON ENGINEER'S FLUSHING CALCULATIONS.

REDUCER FLNG x FLNG

PRIOR TO REMOVING (E) BLOW OFF FLUSH MAIN TO AVOID DAMAGING THE AGENCY OWNED METER.

THRUST BLOCK SIZED FOR WATERMAIN

DIRECTOR, DEPARTMENT OF WATER RESOURCES

COUNTY OF SACRAMENTO

TEMPORARY JUMPER WITH VERTICAL METER

SCALE: NONE
DATE: 06/25

8-21B