VALLEY WATER DISTRICT

PIERCE COUNTY, WASHINGTON

CONDITIONS AND STANDARDS
FOR
CONSTRUCTION OF DEVELOPER EXTENSIONS

2023 EDITION

ADOPTED BY RESOLUTION NO. 2023-06

DATE: September 2023

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EXTENSIONS TO THE WATER SYSTEM

SECTION ONE:

EXTENSIONS TO THE WATER SYSTEM

1. METHOD OF EXTENSIONS

Extensions (a) may be constructed by the District and financed by means of assessments against the property benefited within the limits of the Utility Local Improvement District formed for this purpose; or (b) may be constructed by the property owner or Developer in accordance with these regulations. **No extension of the District's system by property owner or Developer will be permitted until all applications and permits required hereunder have been approved by the District and all provisions of the District's regulations concerning such extensions have been fulfilled.**

2. ANNEXATION

Territory adjacent to the District's water service area which is not already served by another water utility may be annexed in accordance with State law. If the property is abutting the District's boundary annexation to the District shall be mandatory. Information regarding annexation procedures will be furnished upon request.

3. PROCEDURAL NOTES

a. Pre-Design Stage

i. Availability of Water
At the time that the preliminary proposal is submitted to the District, a letter requesting the availability of water should be submitted to the District for approval. A map showing the area to be served should accompany this request. The Developer must execute the Application for Developer Extension Agreement, pay the Deposit and provide preliminary plans.

ii. Developer Extension Agreement
Prior to the installation of water mains, a "Developer Extension Agreement" must be signed by the Developer, and approved by the District (see form in Section 6). The Agreement should be accompanied by an application fee in the amount a set forth by current District Resolution.

b. Design Stage

i. Developer's Engineered Design
After the Developer Extension Agreement is signed, the Developer should authorize his consulting engineer to proceed with design and furnish the District four (4) full-size copies of the preliminary drawings, as well as

electronic versions in PDF form. The plans are to be prepared in accordance with the District Standards. The design will be reviewed by the District and its Engineer, and comments will be provided for correction by the Developer's engineer. A design plan checklist is included in Section 6. After review and approval by all applicable agencies the Developer's engineer shall provide (4) full-size copies of the final water system extension design (as well as electronic versions in PDF form) to the District for final approval.

ii. Pressure-Reducing Stations

At areas where excessive pressure exists (in excess of 80 pounds per square inch) or will exist as a result of the extension design, the Developer is responsible for the installation of individual pressure reducing valves, or a "regional" PRV station. The District will have sole and exclusive discretion in the determination of need for said PRV station(s). The Developer should assume that in most instances a PRV station will be required where excessive pressure exists.

iii. Cost Breakdown

The Developer shall furnish the District with a detailed cost break-down showing the total anticipated cost of the water extension construction for this development.

iv. Contractor Performance Bond

After the plans are complete and approved by the District, the Developer, if he wishes, may call for bids for the work described herein. If a contractor not previously experience with the District is selected by the Developer, he should notify the District immediately upon his selection so that the District may review his qualifications to perform this contract. It is required that the Developer secure a Performance Bond (for work within Public Rights-of-Way) guaranteeing the completion of this work and payment of bills (see form in Section 6). It is required that Washington State licensed and bonded contractors be employed by the Developer. The Project will not be accepted until the work is considered to reach final completion in accordance with the District Standards.

v. Permitting

The Developer shall coordinate and secure all necessary permits required for the work, the cost of which shall be paid for by the Developer. In the event that the District is required to apply for and obtain permits, the Developer shall assist the District with all required information, including but not limited to: contractor contact and business information, contractor bonding and insurance, temporary traffic control plans, etc. All costs associated with permits that the District must obtain for the developer extension project shall be paid for by the Developer.

c. Construction Stage

i. District Conditions and Standards

The District's currently adopted "conditions and Standards for Extensions to the District Water System" herein also referred to as "Conditions and Standards" shall be in the possession of all Developer Contractors employed on the Developer's project construction sites. It is the responsibility of the Developer and his contractor to familiarize themselves with the conditions and Standards prior to starting work. On all construction work the Developer is responsible to the District for performance of all required work and any advice given by the District is just that, and the Developer shall be responsible for directing his contractor. Nothing contained herein or advice given by the District or its agents shall relieve the Developer form his responsibility for conformance with the approved plans and specifications or the District's conditions and Standards or the Standard Specifications herein referenced.

ii. District Inspection Process

During the progress of the work, the District shall be kept informed and inspection will be required prior to backfilling pipe and covering other major phases of construction. The District will determine the amount of inspection required and the Developer shall pay all costs of inspection. The Developer shall give the District 24 hours' notice of any required inspections.

iii. Off-Site Easements

Executed copies of required off-site easements shall be delivered to the District prior to the preconstruction conference.

iv. Pre-Construction Site Conditions

To ensure proper water main installation, the Developer's contractor shall prepare all affected areas of the site to the correct subgrade elevation before commencing work on the water utility extension.

v. Pre-Construction Meeting

After the award of the Contract and before proceeding with any work on the job, the Developer shall hold a preconstruction conference with all concerned parties at the District office (or other approved location) at least five business days before work on the extension(s) commences. The Developer shall arrange for the conference and for the attendance of concerned parties. Any work that is performed without proper notification of the District may be summarily rejected.

vi. AHJ Water Service Inspection

Water service lines on private property (outside of District's easement) shall be inspected by the Authority Having Jurisdiction (AHJ) prior to water service activation. Coordinate with AHJ. Developer shall provide written documentation of acceptance prior to filing.

vii. Filling, Disinfection, and Flushing

After completing the installation of water mains, hydrants, services, and other appurtenances, the system shall be filled, disinfected, and then flushed. No hydrostatic pressure testing shall occur until flushing is complete.

viii. Pressure and Purity Testing

Pressure testing shall take place after the system has been flushed of super-chlorinated water, but before the purity test has been performed. Purity testing shall only take place after the pressure test has been performed. The Developer shall reimburse the District for all costs incurred by the District in conducting purity testing, to include costs of the testing laboratory.

ix. "As-Builts"

After completion of the work, the Developer shall furnish the District final "As-Built" drawings for District review and approval (see Section 5).

x. On-Site Easements

After completion of the work, the Developer shall furnish the District permanent executed and recorded on-site easements that are necessary or applicable to this installation (see form in Section 6). The easements shall be a minimum fifteen (15) feet in width and be exclusively reserved for the District's use.

xi. Bill of Sale

After completion of the work, the Developer shall promptly sign a Bill of Sale deeding these improvements to the District (see form in Section 6).

xii. Maintenance Bond/Assignment of Funds

The Developer shall furnish to the District a Maintenance Bond and/or "Assignment of Funds" guaranteeing materials and workmanship for a period of two years from the date of final project acceptance by the District (see form in Section 6). The bond will be in the amount of 10% of the total project cost (items deeded to District) as identified in the Bill of Sale or $2,000.00, whichever amount is greater. The District must review and approve of any bond or assignment.

xiii. Fees

All fees shall be paid before meters will be provided by the District. This includes cut-in fees, engineering fees, inspection fees, testing fees,

permitting fees, and any other fees that might be applicable to this development.

xiv. Conditional Final Acceptance Punch List
Once all of the tasks listed above are complete, the Developer shall request a site inspection where the District will prepare a punch list of items remaining for Conditional Final Acceptance. The Contractor and Developer are encouraged to attend the inspection walk-through. The District will determine which work items (if any) can remain incomplete upon Conditional Final Acceptance. Typical items which may be allowed to wait until after Conditional Final Acceptance for completion include final lift of asphalt paving, final adjustment of valve boxes, installation of back-ordered items, and any other special-case scenarios approved by the District.

xv. Conditional Final Acceptance
After the Developer has completed all the items from the Conditional Final Acceptance Punch List, he shall request a site inspection from the District. Once the District determines that all the required items are complete, the District will recommend Conditional Final Acceptance to its Board.

xvi. Meter Connection and Backflow Testing
Upon Conditional Final Acceptance, the Developer may request meter installation from the District and pay connection and facility charges. The District will perform the installation of all purchased meters. For all meter connections that require downstream backflow prevention, the Developer shall hire a qualified tester to inspect the device(s) and prepare a testing report. The report shall be provided to the District within five business days of meter installation, or the District may opt to lock or remove the meter(s).

xvii. Final Acceptance Punch List
After the Developer has completed all the final remaining work items, he shall request a site inspection where the District will prepare a punch list of items remaining for Final Acceptance. The Developer and his Contractor are encouraged to attend the inspection walk-through.

xviii. Final Acceptance
After the Developer has completed all the items from the Final Acceptance Punch List, he shall request a site inspection from the District. Once the District determines that all the required items are complete, the District will recommend Final Acceptance to its Board. Upon Final Acceptance, the District will reimburse the Developer for all unused funds deposited in its account. The Developer may also terminate his Performance Bond at this point since the Maintenance Bond will have been initiated.

d. Post-Construction Stage

i. Warranty Period
During the two-year period after Final Acceptance, the Developer shall repair or replace any work related to the water main extension that is found the be faulty or deficient.

ii. Termination of Maintenance Bond/"Assignment of Funds"
Upon completion of the Warranty Period, the Developer may terminate his Maintenance Bond/"Assignment of Funds".

4. INFORMATION FOR PLAN PREPARATION

Prior to plan preparation by an Engineer licensed in the State of Washington, the Developer shall submit four (4) copies of his plat, road plan, storm drainage plans and plans for any other underground utilities. Minimum scale shall be 1" = 50'. Any revisions in plans or installed water mains caused by revisions in such plans shall be carried out at the sole expense of the Developer.

a. Scope of the Work

i. Work Performed by Developer: Furnishing and installing all water mains, fittings, valves, blocking, fire hydrants, meter setters, blow-offs, air and vacuum relief assemblies and other appurtenances as required by the District. Notifying the District 48 hours in advance to allow the District time to notify their customers of shut offs. It shall be required that the streets have been rough graded to the approved grade. The water mains shall be placed at such a depth that a 36" minimum cover from finished grade is maintained for all mains 10" or less and a 42" minimum cover from finished grade is maintained for mains over 10". A maximum depth of 60" cover shall be maintained for all pipe diameters, unless specified otherwise by the District. The trenches shall be backfilled so that there will be no settlement as a result of this construction.

ii. Work Performed by Developer (only under District supervision):

(a) Filling pipes and flushing.
(b) Pressure testing.
(c) Purity testing (District to perform).
(d) Tie-ins to existing District system.
(e) Fire flow testing.

b. Site of the Work

As shown on the Contract Drawings.

c. Contract Time and Damages

As specified by Developer and approved by the District.

d. List of Drawings

As furnished by the Developer and as required by the District.

5. PERMITS REQUIRED (CONTRACTOR/DEVELOPER TO OBTAIN UNLESS OTHERWISE SPECIFICALLY NOTED)

a. State of Washington Permit and Bond for all work in existing State rights-of-way.

b. Pierce County Permit and Bond for Road Restoration for all work in existing County rights-of-way.

c. Any other permits as required (railroad, shorelines, wetlands, etc.).

6. NOTIFICATION REQUIRED

a. Operations Manager and/or his designated representatives seven (7) days prior to starting construction or any excavation.

b. Operations Manager and/or his designated representative two (2) days prior to any cut-in.

c. Operations Manager and/or hi designated representative seven (7) days prior to final inspection and acceptance.

d. Provide coordination with any other contractors or utilities which may be affected by the extension construction, including proper notification of the "one-call" locating service prior to construction.

e. Complete the work, including clean-up, to the point where the work complies with the plans and specifications, and is ready for acceptance by the District within the time limit provided.

f. The Developer shall notify the District of any water shutdown at least 2 days in advance of scheduled shut-down to allow the District time to notify their customers.

g. Provide verbal notification to Operations Manager and/or his designated representatives for all other inspection work required.

7. REVIEW AND APPROVAL FEES

The fee for service shall be on a time and expense basis. The Developer will be invoiced for actual costs incurred in the project review and approval process by the District, plus an additional 20% to cover administrative and accounting costs. The District will not give final approval of the improvements or allow meter connections until all fees are paid. Review and approval fees for Developer Extensions cover the following:

a. Pre-hearing conference with Operations Manager and/or his designated representative on schematic drawings, as may be required/desired by the Developer and/or District.

b. Review of final design by Operations Manager and/or his designated representative of extensions granted preliminary approval.

c. Inspection and approval of the work in progress.

d. Inspection and approval of pressure tests.

e. Review and approval of Record Drawings.

f. Taking and submitting water samples for bacteriological test as required by the Department of Health.

g. Legal review as necessary.

h. Other work necessary to assure compliance with District standards.

8. CONNECTION FEE CHARGE

The District presently has a connection fee charge for new water services. These fees are as currently established by the District Board of commissioners, and must be paid prior to meter installation and activation of the water service.

9. REIMBURSEMENT AGREEMENT

The District may enter into an agreement for reimbursement with the Developer, upon request, for those properties that can be served from the construction of a water extension that are not a party to this Agreement. The reimbursement will be in accordance with the current policies of the District.

All review(s), approval(s), and fees associated therewith, as may be required or solicited by the District in regard to planning, design, and/or construction of said extension, modification, connections, or revisions to the District system shall be assessed to the developer/proponent and such reasonable costs shall be promptly paid to the District upon

receipt of said billing by the District prior to permits and/or approvals being granted by the District as may be applicable.

10. FINAL DRAWINGS REQUIRED OF CONTRACTOR

(See Standards for "As-Built" Drawings/Section 5). "As-Built" drawings specifically noting approved material changes, route changes, locations and depths are required. A minimum of four (4 sets of Blue-line drawings, One (1) set of original mylars, and an electronic copy shall be provided to the District before final acceptance of the work by the District. These drawings shall be clearly marked as "As-Built" and shall contain all field changes and shall be signed by the Developer's licensed Engineer. The Developer, in addition, shall provide the applicable local fire Authority Having Jurisdiction (AHJ) with the required as-built records and shall file a "Construction Report for Public Water System Projects" with the Department of Health, if required. Developer to provide written verification/evidence of same. When an "approved set of Plans and these Specifications are in conflict, these Specifications included herein or made part by reference shall take precedence.

SECTION 2

GENERAL CONDITIONS OF CONSTRUCTION

SECTION TWO:

GENERAL CONDITIONS OF CONSTRUCTION

1. DEFINITIONS

a. "Concerned Parties." Those persons, companies, or agencies designated by the District as required to attend the pre-construction conference.

b. "Commissioners." The "Commissioners" of the Valley Water District or their authorized representative.

c. "Contract Documents." The contract document shall consist of the following and in case of conflicting provisions, the first mentioned shall have precedence; unless otherwise approved by the District:

(1) Developers Agreement for Water Main Extensions
(2) Change Orders (if District approved)
(3) Addenda
(4) Conditions and Standards of Extensions to the District Water System
(5) Standard Specifications (WSDOT Standard specifications)
(6) Plans (approved by District)
(7) Standard Details (WSDOT)

These documents shall form the Contract.

d. "Contractor." The person or firms employed by the Developer to do any part of the Work, all of whom shall be considered agents of the Developer.

e. "Design." The preparation of the Plans for the extension to the District's water distribution system.

f. "Developer." The party having an agreement with the District to cause the installation of water works improvements, to become a part of the District's water system upon completion and acceptance and includes the Developer's agents.

g. "Developer's Engineer." The engineering firm, and that firm's representatives, retained by Developer to design the Plans for the Work and which shall be considered agent of the Developer.

h. "District." Valley Water District, Pierce County, Washington, a municipal corporation, existing under and by virtue of the laws of the State of Washington.

i. "District Engineer or Engineer". The engineer employed by the District or the engineering firm, and that firm's representatives retained by the District to act as the Engineer for the work.

j. "Extension(s)." The water system to be constructed according to this agreement and connected to the District's water distribution and/or sewer collection system and transferred to the District for operation and maintenance.

k. "Maintenance Bond." A bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington, guaranteeing that the Developer will repair any defect found in the work within two years of the date of formal acceptance of the work by the District.

l. "Otherwise Specified", or "As Specified". The directions contained in the Plans, Special Specifications, if any, and otherwise as given by the District incident to the performance of the Work other than in these General Specifications.

m. "Operations Manager." The District's duly appointed Operations Manager.

n. "Performance Bond." A bond furnished by the Developer and written by a corporate body qualified to write surety in the State of Washington, guaranteeing that the work performed within public rights-of-way will be completed in accordance with the plans and specifications.

o. "Plans or Construction Drawings." District approved drawings, including reproductions thereof, of the work to be done as an extension to the District's water distribution system, prepared by an Engineer licensed in the State of Washington.

p. "Specifications." The directions, provisions, and requirements approved by the District Board of commissioners for the performance of the work and for the quantity and quality of materials.

q. "Standard Specification." All work shall conform to the latest edition of The Standard Specification for Road, Bridge and Municipal Construction prepared by the Washington State department of Transportation and the Washington State Chapter of American Public Works Association, and current amendments thereto, except as may be specifically modified herein.

r. "Supervisor." The Developer's appointed lead point of contact for the Work.

s. "Work." The labor or materials or both, superintendence, equipment, transportation, and other facilities necessary to complete the Contract.

2. PURPOSE

Valley Water District of Pierce County, Washington, as a municipal corporation, is responsible to the public for insuring that water mains are constructed in accordance with currently accepted standards for public work. The requirements imposed upon developers and contractors are intended by the District as a contract with the Developer, which incorporated minimum standards prerequisite to acceptance of the Work by the District as part of its water distribution system. Privately constructed extensions will not be permitted to connect to the District's system unless the Work is performed and paid for in accordance with this Agreement.

3. AUTHORITY OF DISTRICT

The District shall have authority to approve, reject or require changes in Plans designed by Developer's Engineer; to require such changes in the Plans during the course of work; to inspect the work; to stop work to insure compliance with the approved Plans and Specifications; to reject non-conforming work and materials; and to decide questions which may arise in the execution of the Work. The District shall have the authority to impose fines for violation of District policies adopted pursuant to resolution.

4. DEVELOPER TO BE INFORMED

The Developer shall keep fully informed regarding the nature, quality and extent of the work to be done, and if in doubt, to secure specific instructions from the District.

The Developer shall keep a competent supervisor on the Work during its progress who shall represent the Developer, and to whom instructions may be given as though to the Developer. The Supervisor shall be familiar with the Plans and Specifications and shall promptly report to the District any error, inconsistency or omission which may be discovered.

The Developer shall enforce discipline and good order among its employees and shall not employ on the Work any unfit person or anyone not skilled in the work assigned. Employees or agents of the Developer who may impair the quality of the construction shall be removed from the Work upon the written request of the District.

5. PLANS AND SPECIFICATIONS ACCESSIBLE

One copy of the Plans and Specifications shall be constantly accessible on the job.

6. FINAL INSPECTION

All material and completed work are subject to final inspection and testing by the District to determine whether the Work complies with the Plans and Specifications.

7. "AS-BUILT" DRAWINGS

The Developer will maintain "As-Built" information about the project as it is constructed. The drawings shall be made available to the District upon completion of the project in the form of "As-Built" records.

8. OWNERSHIP OF PLANS:

The originals of all "As-Built" Plans prepared by Developer's Engineer shall be delivered to the District as a condition of and prior to acceptance of the project, and shall become the property of the District. Neither Developer nor Developer's Engineer shall have any rights of ownership, copyright, trademark or patent in the Plans.

9. QUALITY OF MATERIALS AND WORKMANSHIP

All materials shall be new, and workmanship and materials shall be of the highest quality commonly used. The Developer shall furnish satisfactory evidence as to the kind and quality of materials.

10. MATERIAL AND EQUIPMENT LIST

The Developer shall file a material and equipment list with the District prior to the pre-construction conference, including the quantity, manufacturer and model number, acceptability under any specified inspections and/or tests required by AWWA specification, if applicable, of material and equipment to be installed as part of the Work. The District will reject materials and equipment which do not conform to District specifications and the approved Plans.

11. DETERMINATION OF "AS EQUAL"

The District and its Engineer shall be the sole judge whether supplies or material qualify "as equal" substitutions under the Plans and specifications.

12. OMISSIONS AND DISCREPANCIES

Minor items of work or materials omitted from Plans and Specifications prepared by the District's Engineer, or Developer's Engineer, but clearly inferable therefrom and called for by good practice, shall be provided and/or performed by the Developer. In case of doubt, the District's decision shall be determinative.

13. INSPECTION AND TESTS

All work shall be subject to inspection by the District. The District shall have access to the Work at all times, and the Developer shall provide proper facilities for such access and inspection. The Developer shall make reasonable tests of the Work at the Developer's

expense upon the District's request. Whenever work must be specifically tested or inspected for compliance with public regulations, or with the Plans and Specifications, the Developer shall give the District reasonable notice of the readiness of the Work for such test or inspection. The District will make reasonable efforts to perform all inspections within 24 hours of notification by the Developer. Work shall not be covered up without consent of the District, or it must be uncovered for inspection at the Developer's expense. Such inspections and tests shall not relieve the Developer of any of its responsibilities under this Agreement.

The presence or absence of a District inspector on any job is discretionary with the District, and neither presence nor absence of a District inspector will relieve the Developer of responsibility to obtain the construction results specified in this agreement.

The District is not a safety expert, and is not engaged in that capacity whenever performing inspections and tests. The authority of the District to perform inspection and tests shall not relieve the Developer of its responsibility for safety, as specified in 33.

14. COMPLIANCE WITH PUBLIC AUTHORITY

The Work shall conform to the regulations of each public authority with jurisdiction over the manner and quality of performance of the Work. Construction in public roads or rights-of-way shall conform to the standards and requirements of the governmental agency having jurisdiction, and to the requirements of the franchise or permit therefore.

The Developer shall be responsible for ascertaining the requirements of each public authority and the franchises and permits.

The Developer shall be responsible for coordinating construction activity with all interested parties and agencies.

15. CROSS-CONNECTION CONTROL

Developer shall comply with all government and District rules and regulations governing cross-connections. Developer shall install and maintain backflow prevention devices required by the District as required for "conditional acceptance" of the extension(s) by the District. All non-residential service connections shall be provided with the appropriate double check valve assemblies, or reduced pressure backflow assemblies per the Standard Details in Section 4, as required per the District's cross-connection control regulations. The Developer shall provide the District with a passing backflow testing report for each required service within 5 business days after meter installed, or the District may opt to lock or remove the meter(s).

16. PRE-CONSTRUCTION CONFERENCE

The Developer shall hold a pre-construction conference with all concerned parties at the District office, online or at a location agreed upon by both the District and the Contractor, at least five business days before work on the extension(s) commences. The Developer shall arrange for the conference and for the attendance of concerned parties.

17. PRE-CONSTRUCTION PHOTOS

Pre-construction photos acceptable to the District shall be submitted to the District at the pre-construction meeting for portions within the rights-of-way.

18. PERMITS

The Developer shall not hold a pre-construction conference until all necessary permits have been issued by public authority and are in District possession. The Developer shall pay the cost of obtaining all required permits, and shall reimburse the District for all costs incurred by the District for permits, inspection fees and other charges imposed by public authority because of the Work. The Developer shall be responsible for assuring compliance with the requirements of all permits, franchises, and licenses.

19. SURVEY CONTROL

The Developer shall provide all property corners and street centerline stakes, and shall provide reasonable and necessary opportunities and facilities for setting points and making measurements. The Work shall not commence until the Developer has made provision to establish such points necessary for the Work. The Work shall conform to such points and instructions. The Developer shall preserve bench marks, reference points and stakes, and, in case of destruction, shall be charged for any resulting expense and shall be responsible for any errors that may be caused by their absence or disturbance.

20. RESTORATION OF IMPROVEMENTS

All existing improvements removed or disturbed during the Work shall be restored to their original condition, or as modified by the Contract Documents. A signed release from the affected property owner will be required. All restoration shall be made at Developer's expense to the condition of the area prior to construction.

Whenever restoration of existing improvements will be necessary, the Developer shall provide photographs before and after construction acceptable to the District.

21. ACCESS

Bridging (steel plating) shall be provided across private driveways and roadways whenever trenches are open to avoid interference with normal traffic flow.

22. SPECIFICATIONS INCORPORATED BY REFERENCE

Where any standard specifications are referenced or included by reference herein, the latest issue and/or amendment thereto published as of the date of the Developer Extension Agreement shall be incorporated into the contract. Should a conflict exist between the approved design drawings and any standard specifications or details referenced herein, the District will determine which will prevail.

23. USE OF COMPLETED PORTIONS

The District may take possession of and use any completed or partially completed portions of the Work. Possession and use shall not constitute acceptance of any of the Work.

24. EXISTING UTILITIES OR OBSTRUCTIONS

a. Preparation of Plans by District Engineer

Existing utilities and obstructions are shown on the Drawings so far as known to the District Engineer and the District. The information is not guaranteed and is provided only for such value as it may have. Incomplete or erroneous information shall not be the cause of claim against the District Engineer or the District and shall not relieve the Developer of responsibility for repairing any damage caused to such utilities during performance of the Work.

b. Preparation of Plans by Developer Engineer

The District will provide to the Developer any known information it may have regarding its existing utilities and obstructions. The information is not guaranteed but is provided only for such value as it may have. Incomplete or erroneous information shall not be the cause of claim against the District Engineer or the District and shall not relieve the Developer of responsibility for repairing any damage caused to such utilities during performance of the Work.

c. Notification of Utilities

The Developer shall contact all utilities and determine whether existing utilities and obstructions exist. The Developer shall reimburse the District for damage to the property of the District or damage to property of others for which the District is liable caused by the Developer and for other expenses, including reasonable attorneys' fees and court costs incurred by the District because of such damage. Whenever the Developer fails to repair or restore existing improvements damaged by its contractor within 72 hours of notice, the District may order the work done by others and all costs incurred shall be paid by the Developer; provided that if the District determines an emergency exists, it may notify the Developer who shall

immediately commence repair or restoration work, or it may make repairs or restoration at the Developer's expense.

25. CLEANUP

The construction site shall be kept clear during the Work. Before the Work shall be considered complete, the Developer shall clean out ditches filled during the Work; replace damaged surfacing; remove surplus materials, trash and brush; repair all damages; and otherwise leave the job in a neat and orderly condition. Dust control shall be provided during the Work and during cleanup. The Developer shall keep existing roads and streets adjacent to or within the limits of the project open to and maintained in a good and safe condition for traffic at all times. The Developer shall remove, on a daily basis, any deposits or debris which accumulates on the roadway surface as a result of construction operations. Removal shall be performed on a more frequent basis should the District determine that such removal is necessary.

26. PUBLIC HAZARD OR INCONVENIENCE

If performance of the Work results in hazard or inconvenience to the public, then the District may make necessary correction, and the Developer shall reimburse the District for expense incurred. The Developer shall also reimburse the District for the expense incurred in complying with any order of public authority lawfully made with respect to the Work during the performance of the Work or within two years after acceptance of the Work.

27. PROTECTION OF WORK AND PROPERTY

The Developer shall exercise due care to protect property and the Work and shall supervise the project to ensure the contractor exercises such care. The Developer shall be solely responsible for any loss or damage to property or the Work occurring prior to the completion of and acceptance of the Work by the District.

28. ROYALTIES AND PATENTS

Developers shall pay all royalties and license fees and defend all suits or claims for infringement of any patent rights and shall save the District harmless on account thereof, unless a particular process or the product of a particular manufacturer is specified by the District and the Developer or its Contractor are unaware that the process or article is an infringement of a patent.

29. OTHER WORK

The District may have other concurrent work or projects in the vicinity that might affect the Work. The Developer shall afford reasonable opportunity to other contractors for introduction and storage of their materials and performance of their work. The Work and other contracts shall be properly coordinated.

30. CONTRACTORS

Only contractors licensed and bonded with the State of Washington shall install extensions; a copy of the license shall be provided to the District. Developer shall submit in writing not less than fifteen (15) days before the pre-construction conference, the name(s), address(es) and telephone number(s) of all contractors and subcontractors the Developer proposes to use in doing the Work. If the District disapproves, then it shall notify Developer within ten (10) days. Nothing contained in this agreement shall create any contractual rights between the District and any person or firm employed to do the Work.

31. TRAFFIC MAINTENANCE AND PROTECTION

All work shall be performed with due regard for the safety and convenience of the public and in a manner that minimizes interference with automotive and pedestrian traffic. Flagging personnel, barricades, signs and traffic control shall be furnished as required by appropriate agency. Emergency vehicle shall be provided access at all times.

Prior to commencement of construction, the Developer shall be required to furnish a traffic plan to Pierce County, WSDOT, or other agency if applicable.

All lane closures shall be approved by Pierce County, WSDOT, or other applicable authority prior to construction. Any approved lane closures will not be permitted prior to 8:30 a.m. (local time) and not after 3:30 p.m. (local time) without prior written District approval.

The District will not furnish flagmen or any devices for the control of traffic. All flagmen employed by the Developer shall be state certified.

If at any time the Developer's activities result in closure, substandard condition, or restrictions to traffic use of all or portions of the roadway which are specified to remain open to traffic, the Developer shall immediately, at his own expense, furnish all material, labor, equipment, necessary to restore the streets to the satisfaction of the District and the County. Work necessary to restore the streets to traffic shall continue on a round-the-clock basis until they are reopened to traffic in conformance with the specifications. Upon failure of the Developer to immediately provide the necessary material, labor, equipment, to restore the streets to traffic when ordered to do so by the District, the District shall be at liberty without further notice to the Developer or his Surety, to provide the necessary material, labor, equipment to restore the streets to traffic and all costs thereof shall be at the Developer's own expense.

32. SANITATION

Necessary sanitation convenience properly secluded from public observation shall be provided and maintained during the Work as required by appropriate agency.

33. SAFETY

The Developer and Developer's Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during the performance of the Work, and for compliance with all federal, state and local safety laws and regulations. This requirement will apply continuously and will not be limited to normal working hours.

The right of the District or the District Engineer to conduct construction review of the Contractor's performance or inspection of the Work or the site is not intended to include review of the adequacy of the Contractor's safety measure in, on or near the construction site.

34. CONFINEMENT OF CONTRACTOR'S OPERATIONS

The Developer shall ensure that the Contractor confines construction activities within the property of the Developer and the limits of easements and construction permits outside of the Developer's property. Damage to property or persons from any encroachment beyond these limits shall be the responsibility of the Developer.

35. ALIGNMENT

The Developer shall furnish sufficient horizontal control, including lot stakes, for locating and staking the lines and appurtenances. Accuracy of such horizontal control is the sole responsibility of the Developer and any modification of horizontal location of any facility shall be at the Developer's expense.

The water main shall be installed on the ground or roadway rough grade with forty-two (42) inches minimum cover for 12" and larger mains and thirty-six (36) inches minimum cover for 10" and smaller mains. A maximum depth of 60" cover shall be maintained for all pipe diameters, unless specified otherwise by the District. The notice by the Developer to the District that the ground or roadway is ready for water main installation shall be considered a representation that the Developer has brought the ground or roadway to grade or subgrade, and that he intends no further grading work. Any modification of the main or appurtenances required to adjust the grade changes shall be at the Developer's expense. If the Developer contemplates off-roadway grading after installation of the water main that will affect the setting of fire hydrants or other appurtenances, he shall so state in writing prior to the installation of the main. Any adjustments required by such grading shall be at the Developer's expense.

The District will authorize the Developer to proceed with installation of the water main only after all necessary grading and fills are completed, and other utilities or pipes which, in the opinion of the District, should be installed prior to the water main have been completed. The District reserves the right to stop installation of portions of the water

system which, in the opinion of the District, will be damaged or jeopardized by other utility or pipe installation until such other installations are complete.

36. TAPS, CUT-INS AND LARGE METER TESTS

All taps and cut-ins to the existing water mains, excluding manholes, shall be made by a contractor approved by the District. If extensions require meters three inches or larger, then meter installation, including valves, piping, vaults, drain lines and meters shall be performed by the Developer's Contractor according to District standards. The Developer shall pay the meter test fee established by the District and shall sign a District meter application form and pay all fees and charges due at that time.

37. RECORDING

The District will not approve the Plat for recording until all of the underground portion of the extension(s) have been installed and tested. A copy of the proposed final plat must be delivered to the District before recording for review of adequacy of easements.

A copy of the final recorded plat and all necessary recorded easements shall be delivered to the District before service connections will be allowed to the extension.

38. COST OF WATER

The District will furnish a reasonable amount of water without cost for the initial testing, flushing and purifying of the system. Developer shall pay the cost of all other water furnished by the District for testing, flushing or purifying the system based upon the District's estimates of the quantity of water used, estimates shall be conclusive.

Construction water shall be furnished at District's regular rates through a temporary meter and double check assembly rented to Developer at rates established by District resolution. Return of the meters is a condition of acceptance. There will be a deposit required.

39. DEFECTIVE MATERIALS & WORKMANSHIP

Materials, work or workmanship which, in the opinion of the District Engineer, do not conform to these Specifications and Plans or fail to meet the tests herein described or are not equal to the sample submitted to and approved by the District Engineer, or are in any way unsatisfactory or unsuited to the purpose for which they are intended will be rejected. The Developer shall remove from the work and its vicinity, without delay, all rejected materials.

Unsatisfactory materials and workmanship may be rejected at any time, notwithstanding any previous testing, inspection or acceptance of such materials, equipment or workmanship.

40. DELAY IN COMPLETION

The Developer is expected to carry on the work and to complete it without unnecessary delay once the work has begun. If the work is not completed within a reasonable time from the date the work is begun, the District may revoke its acceptance of the Developer's Agreement, or it may impose reasonable conditions as a prerequisite to continuation of the work, including a charge paid by the Developer for such cost or damage as the District has suffered because of the delay. In the event the District finds it necessary to complete the work to be performed by the Developer, or is otherwise damaged by the Developer's failure to complete the work, the Developer shall be liable to the District for its costs, expenses, and damages arising out of his failure to complete the work.

Should the Developer abandon the work, fail or refuse to complete the work embraced in the contract or fail to pay just claims for labor and materials, the District reserves the right to charge against the Developer all extra legal, engineering or other costs caused by such abandonment, failure or refusal. The legal costs will also include all attorney's fees and other costs to the District in defending or prosecuting any suits in connection with such abandonment, failure or refusal and non-payment of claims, wherein the District is made a co-defender, and the Developer agrees to pay all such costs.

If the Developer abandons the work for any cause or refuses to comply with the provisions of the Plans and Specifications, the District has the right to notify the Developer's surety and require said surety to complete the work in accordance with the Plans and Specifications.

41. BILL OF SALE

Upon completion of the work and approval of the District, the Developer shall, as a condition of acceptance by the District, convey the work lien-free to the District by bill of sale, in accordance with the form attached as an appendix to these regulations.

42. INDEMNITY

The Developer shall indemnify, defend and hold the District and all of its representative harmless from and against all losses and claims, demands, payments, suits, actions, recoveries and judgments of every nature and description brought or recovered against the District by reason of the act or omission of the Developer, its agents or employees, in the performance of the Work, and for any cost or expense incurred by the District in connection therewith, including overhead expenses, legal expense, reasonable attorney's fees and cost attributable thereto; and if suit in respect to the foregoing is filed, then developer shall appear and defend the same at its own cost and expense, and if judgment is rendered or settlement made requiring payment of damages by the District, then the Developer shall pay the same.

Developer shall indemnify, defend and hold District harmless from any liability or expense including reasonable attorney's fees incurred by District by reason of Developer's (or Developer's employees or contractors) breach of any covenant contained in any franchise or permit granted by state, city, or public or private utility to District for the purpose of enabling Developer to undertake construction within any rights-of-way.

Developer further agrees that if any official complains to the District that Developer is violating such franchise or permit in any respect, or if Developer damages any District's facilities, then the Developer upon reasonable notice shall comply with such franchise or permit or to make repairs or restoration. If the District deems it necessary to make any repairs or restoration (emergency or otherwise), then the Developer shall reimburse the District for the cost thereof.

In any claim against the District, its agents or employees by any employees of the Developer, its contractor, or any subcontractor, or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation contained herein shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Developer, Contractor, or any subcontractor under Workmen's compensation Acts, Disability Benefit Acts, or other employee benefit acts. THIS WAIVER HAS BEEN MUTUALLY NEGOTIATED BY THE PARTIES.

43. DEVELOPER'S PUBLIC LIABILITY & PROPERTY DAMAGE INSURANCE

The Developer shall not commence work until he has furnished evidence (in duplicate copy) of insurance required hereunder, and such insurance has been approved by the District Attorney; nor shall the Developer allow any contractor or subcontractor to commence work on his contract or subcontract until the same insurance requirements have been complied with by such contractor or subcontractor.

The Developer shall purchase from insurance companies which have an A. M. Best rating of "A VII" or better commercial general liability and automobile liability insurance against liability to the Developer, the District, the District's Engineer and the District employees for negligent injury to person or property resulting from performance, supervision, or inspection of the work. The District and District's Engineer shall be named as an additional insured under such policy. Proof of the existence of such insurance shall be provided to the District in a form acceptable to the District. The minimum limits of coverage shall be as follows:

General Aggregate	$ 2,000,000.00
Products-Comp/OPS Aggregate	1,000,000.00
Personal Injury	1,000,000.00
Each Occurrence	1,000,000.00
Automobile Liability	1,000,000.00

Policies shall be kept in force until the project is accepted by the District. The District shall be given at least 45 days written notice by "certified mail" of cancellation, non-renewal, material reduction or modification of coverage.

The coverage provided by the Developer's insurance policies are to be primary to any insurance maintained by the District, except with respect to losses attributable to the sole negligence of the District. Any insurance that might cover this Agreement which is maintained by the District shall be in excess of the Developer's insurance and shall not contribute with it.

The Developer's insurance policy shall protect each insured in the same manner as though a separate policy had been issued to each. The inclusion of more than one insured shall not affect the rights of any insured with respect to any claim, suit or judgment made or brought by or for any other insured or by or for any employee of any other insured.

The general aggregate provisions of the Developer's insurance policy shall be amended to show that the general aggregate limit of the policies apply separately to this project.

The Developer's insurance policy shall not contain a deductible or self-insured retention in excess of $10,000 unless approved by the District."

Providing coverage in the stated amounts shall not be construed to relieve the Developer from liability in excess of such limits.

44. COMPENSATION & EMPLOYER'S LIABILITY INSURANCE

The Developer shall maintain Workmen's Compensation Insurance or Maritime workmen's Insurance, as required by state or federal statue for all of his employees to be engaged in work on the Project and, in case any such work is sublet, the Developer shall require the contractor or subcontractor similarly to provide Workmen's Compensation Insurance or Maritime workmen's Insurance for all of the latter's employees to be engaged in such work. The Developer's Labor & Industries account number shall be noted in the Proposal in the space provided.

In the event any class of employees engaged in work at the site of the Project is not covered under the Workmen's Compensation Insurance or Maritime workmen's Insurance, as required by state and federal statute, the Developer shall maintain and shall cause each contractor or subcontractor to maintain Employer's Liability Insurance with a private insurance company for limits of at least One Hundred Thousand Dollars ($100,000.00), each person and One Million Dollars ($1,000,000.00), each accident and furnish satisfactory evidence of same.

45. COSTS OF LITIGATION

If either the District or the Developer commences any legal action relating to the provisions of this agreement, then the prevailing party shall be entitled, to recover all costs of litigation including but not limited to costs, witness, expert and reasonable attorney's fees, including all such costs and fees incurred on appeal.

In any litigation arising out of this Agreement or related to this Project to which the District is not a party the Developer will reimburse the District for all of its costs and expenses, including attorney's or engineer's fees, incurred as a result of such litigation.

46. STIPULATION OF VENUE

It is agreed by the Developer that venue for any lawsuit arising out of this contract shall be the county wherein the primary construction site for the Project is located. Developers shall include a stipulation of venue in said county clause in all subcontracts hereunder.

47. PERFORMANCE & MAINTENANCE BOND

The Developer shall, prior to the commencement of the work, furnish a surety bond by a licensed insurance company in the amount of not less than 100% of the cost of any work in the Rights-of-Way or offsite easements as estimated and/or approved by the District's Engineer, insuring the District that the work will be performed in accordance with the District approved plans, and that any defective work or material discovered by the District within one year after the Work has been formally accepted by the District will be corrected or replaced by the Developer in accordance with the provisions of these regulations.

The Developer shall, prior to acceptance of the Work by the District, furnish a Maintenance Bond, or "Assignment of funds" in an amount equal to $2,000.00 or in the amount of not less than 10% of the amount of the cost of the work, whichever is greater, insuring the District that any defective work or material discovered by the District within two years after the Work has been accepted by the District will be corrected or replaced by the Developer in accordance with the provisions of these regulations. The Surety Bond shall assure correction of any defect covered by the Developer's warranty within thirty days.

48. DUST AND/OR MUD CONTROL: (EROSION CONTROL)

The Developer shall furnish all labor, equipment and means required and shall carry out protective measures, wherever and so often as necessary to prevent his operations from producing dust and/or mud in amounts damaging to property or causing nuisance. The Developer shall be responsible for any damage resulting from dust and/or mud originating from his operations. The dust and/or mud abatement measures shall be continued until all required resurfacing is complete, or until the Developer has complete arrangements with the District, whereby he is relieved of further responsibility. All erosion control measures shall be in accordance with the standards and requirements of the local AHJ.

49. DAMAGE TO EXISTING IMPROVEMENTS

All damage done to existing improvements during the progress of the work on the structures covered by these Specifications shall be repaired or restored by the Developer to the satisfaction of the District, using for such repair materials and methods conforming to the requirements of the "Conditions and Standards" of the District Plans and Specifications, any additional instruction issued therefore by the Engineer, with the intent that such damaged improvements be restored to equal or superior condition existing prior to damage. If the Developer fails to furnish the necessary labor and materials for such repairs, when ordered, the District may cause said labor and materials for such repairs to be furnished by other parties, and the cost thereof shall be paid by the Developer.

50. EASEMENTS

a. General: The Developer shall deliver to the District recorded utility easements and rights of access for all properties over which his extension to the water system has been constructed and such other easements as the Commissioners may require. Title reports for all easement encumbered properties shall proceed by the Developer and submitted to the District. The Developer shall hold the District harmless from all expenses of removing any encumbrances or restrictions on the District's right to use and have rights-of-way to the property through which the water main and appurtenances are constructed.

Unless otherwise approved by the District, all easements shall be a minimum of fifteen (15) feet wide and shall grant the District the right of access over the Grantor's property to repair and maintain the water mains. All easements shall prohibit the construction of any structures, or other substantial objects over the easement. No fences shall be constructed over easements without the express written permission of the District. Any fences permitted for construction over easements shall require the installation of an approved gate which will provide access at all times for maintenance by District vehicles. The Developer shall be responsible for applying for and securing any and all permits required to install such gates. The easements shall be exclusive in nature to the extent that other utilities may be permitted to cross them but not run parallel to the water lines within the easement, without the express written permission of the District.

Easements may be submitted on forms provided by the District. However, no easement will be accepted by the District until the Developer has first submitted a fully executed copy of the proposed easement to the District attorney for his review and approval.

b. Plats: In the case of extensions which are part of a development done concurrently with the platting of the property involved, the easement granted the District shall

be boldly shown on the face of the plat. The plat shall contain the following restriction and grant of rights-of-way, boldly displayed:

BUILDING RESTRICTIONS AND RIGHTS-OF-WAY

No permanent structure shall be erected, and no large trees or large shrubs, or ornamental landscaping items shall be installed in the area of ground for which easements in favor of District or its successors have been designated in this plat. Fences and gates shall not be installed without the express written permission of the District. District and its successors shall have the right to enter upon property within this plat to install, lay, construct, renew, operate, and maintain water and utility lines and mains.

c. Survey: After construction of the extension, the Developer shall provide the District with a survey map showing the legal description of the property involved, the location of easements granted by the Developer to the District and the location of all water mains and appurtenance thereto which are part of the extension. The survey map shall be prepared and signed by a surveyor or civil engineer registered in the State of Washington.

d. Procedure: Before final approval of any application of extension of the District's system is effective, and before any service is given, the District's regulations with respect to easements must be fulfilled. One should begin as soon as possible to comply with these regulations by taking the following steps:

(1) Complete and execute the easement document, including a legal description, and submit it to the District. Approved forms are available through the District offices at the address listed below, and as contained in the attached appendix. All legal property owners must sign the easement and have their signatures notarized. If the easement is signed by a single person, this needs to be stated on the form.

(2) Direct the Developer's surveyor to prepare a survey map showing the easements and the location of the water main, and to send copies of the map to the District.

51. DESIGN STANDARDS

a. General Requirements

(1) Water mains shall be laid only in dedicated streets or in easements which have been granted to the District. A street is normally not considered dedicated until the plat which created it has been filed with the County Auditor. Water mains shall be extended to the far end of the property being developed.

(2) All water mains 10" or less shall have a minimum 36" cover from finished grade. Water mains 12" or larger shall have a minimum cover of 42" cover from finished grade. The maximum shall be 60" cover unless approved by the District.

(3) Whenever possible, loop water mains to minimize occurrence of dead end lines. Provide fire hydrant or Blowoff assembly at dead end mains for flushing purposes.

(4) Mains shall generally be located parallel to and ten feet northerly or easterly of street centerline.

(5) Valves shall be installed at intervals not to exceed 1,000 feet. Valves shall be installed at each end of easements. Valves shall be installed on the water main at each end of mains located in easements.

(6) Fire hydrants shall not exceed every 600 feet in residential areas. Fire hydrants are required every 300 feet in commercial areas. This is the minimum requirement. The Fire District providing protection may require closer spacing.

(7) Fire hydrants on dead end streets and roads shall be located within approximately 300 feet from the frontage center of the farthest lot. Distances required herein shall be measured linearly along street or road.

(8) Pipes connecting hydrants to mains shall be at least 6 inches in diameter and not longer than 50 feet.

(9) Dead end lines are not permitted except where the Developer can demonstrate to the District's satisfaction that it would be improbable to extend the line at a future date. Water mains on platted cul-de-sacs shall extend to the plat line beyond the cul-de-sac to neighboring property for a convenient future connection, and a two (2) inch blow off assembly shall be provided.

(10) All materials shall be new and undamaged.

(11) Water main shall be ductile iron, pipe class 52.

(12) All pipe and fittings shall be cement-lined ductile iron.

(13) Provide bends in field to suit construction and in accordance with pipe manufacturer's recommendation so as not to exceed allowable deflection at pipe joints.

(14) Provide thrust blocking or restrained joints at all fittings and bends in accordance with the District Standards.

(15) Provide anchor blocking at all up-thrust vertical bends in accordance with District Standards.

(16) All valve markers shall be installed and marked with the distance to valve being referenced.

(17) Water services shall be high molecular (200 psi, SR 7) "poly" pipe (no joints beneath pavement areas).

(18) All residential lots to be served with a single, 5/8x 3/4 inch (minimum) meter unless otherwise specified. All service lines shall be the minimum size otherwise specified by the County Plumbing Code in accordance with fixture units, unless otherwise specified. Provide restrained joint pipe and fittings when installed in site sensitive areas identified by the District.

(19) Meter services and meter boxes shall be set to final grade and all adjustments shall be made prior to final acceptance. Services shall be stubbed up and capped prior to final pressure testing of the system, and meters should be centered in the meter box.

(20) All water services shall end within road rights-of-way or easements.

(21) All services, meter setters, and meter boxes shall be installed by the Developer. The District will install the meters.

(22) Contractor shall install water sample stations to District Standards at all locations required by the District.

(23) All new buildings and residences shall include in their water service a suitable pressure reducing valve to protect the plumbing from excessive pressures, if system pressure will exceed 80 PSI.

(24) All new construction shall comply with the "Accepted Procedure and Practice in Cross Connection Control Manual as published by the Pacific Northwest Section of the American Water works Committee", latest edition, and current amendments thereto. A copy of such is available for review at the District office.

(25) Cut in connections shall <u>not</u> be made on Fridays, holidays or weekends.

(26) All tapping sleeves and tapping valves shall be pressure tested prior to making connection to existing mains.

(27) Contractor shall notify the District and obtain approval prior to any water shut-off or turn-on, affecting the water system, a minimum of two business days in advance.

(28) Road restoration shall be per local AHJ design and construction standards. Developer and contractor shall become familiar with all local AHJ conditions of required permits, and shall adhere to all conditions and requirements.

b. System Demand

(1) Minimum Fire Flow Requirements shall be per local fire AHJ.

(2) Minimum system pressures to be 30 psi under maximum hour demands conditions and 20 psi under maximum hour demands, plus fire flow demands.

(3) Maximum design velocities in mainline to be eight (8') feet/second under maximum hour demand, plus fire flow demand.

(4) Where maximum system pressure exceeds 80 psi, the Developer shall install individual pressure reducing valves, or a "regional" PRV station. The District will have sole and exclusive discretion in the determination of need for said PRV station(s).

(5) Where maximum system pressure exceeds 100 psi, the Developer shall install a "regional" PRV station. The District will have sole and exclusive discretion in the determination of need for said PRV station(s).

SECTION 3

ENGINEERING SPECIFICATIONS, MATERIALS OF CONSTRUCTION, AND METHODS OF CONSTRUCTION

SECTION THREE:

ENGINEERING SPECIFICATIONS, MATERIALS OF CONSTRUCTION AND METHODS OF CONSTRUCTION

ENGINEERING SPECIFICATIONS

1. GENERAL

All work shall be constructed in conformance with the most current Standard Specifications for Road, Bridge & Municipal Construction and current amendments thereto, State of Washington revised as to form by the APWA Supplement to make reference to Local Governments, herein referenced to as "Standard Specifications" and the Conditions and Standards as adopted by the District, shall be included as a part of the Specifications. Where the Standard Specifications and Conditions and Standards conflict with one another, the Conditions and Standards shall take precedence.

MATERIALS OF CONSTRUCTION

1. GENERAL

The type and class of materials to be used shall be as shown on the project plans reviewed and approved by the District. Where no specific reference is shown, the following specifications shall govern the materials used. All materials shall be new and undamaged, of a known brand, with replacement parts readily available from the general Seattle/Tacoma area.

Prior to the installation of any facilities required for the project, all materials shall be approved by the District.

All reference specifications herein shall be of the latest revision.

2. DUCTILE IRON PIPE

The ductile iron pipe shall conform to ANSI specification A21.51 or AWWA Specification C151, and current amendments thereto. Grade of iron shall be a minimum of 60-42.10. The pipe shall be cement-lined in accordance with ANSI/AWWA C104/A21.4 and the exterior shall be coated with an asphaltic coating. Each length shall be plainly marked with the manufacturer's identification, year cast, thickness, class of pipe and weight. Bolts furnished for mechanical joint pipe shall be high strength cast iron, with a minimum tensile strength of 50,000 psi. The class of ductile iron pipe shall be Class 53 for 4-inch pipe, and Class 52 for 6-inch and larger diameter pipe.

The pipe shall have a nominal inside diameter of the size indicated on the District approved Plans or as otherwise stated herein. All pipe shall be of one manufacturer and be carefully installed in complete compliance with the manufacturer's recommendations and these Specifications. Pipe shall be U.S Pipe, Tyler, Pacific States or approved equal. Pipe shall be manufactured in the United States.

All ductile iron pipe shall be push-on or mechanical joint. All joints shall conform to ANSI Standard A21.11 (AWWA C-111).

Flanged joints shall conform to ANSI/AWWA C110/A21.10.

All push on joints must use field lock gaskets.

3. SERVICE LINE MATERIALS

a. Ductile Iron Service Pipe

Service connections above 4" shall be ductile iron pipe Class 53 or as may otherwise be approved by the District (no service lines will be allowed between 2-inch and 4-inch unless approved otherwise by the District).

b. HDPE "Poly" Pipe

All service connections from the water main to the customer's service shall be made with new high molecular "poly" pipe (size as noted in details) I.P.S. SDR7 (200 psi) and blue in color. Any two-inch diameter services shall be supplied and installed with a new two-inch diameter threaded gate valve, with valve box at the main. 2" inch PVC "sleeves" are required to be installed beneath roadway sections for new service lines. Pipe to be Driscopipe or equal.

4. FITTINGS

a. Ductile Iron Fittings

Fittings for ductile iron pipe shall be ductile iron AWWA C110 and C111, and shall be cement-mortar lined conforming to AWWA C104 (ANSI Standard A21.4). Compact fittings shall conform to AWWA C153 (ANSI Standard A21.53). Fittings shall be U.S. Pipe, Tyler, or approved equal. Fittings shall be manufactured in the United States, unless approved otherwise by the District.

Rubber gaskets for push-on (tyton) or mechanical joint (M.J.) in accordance with ANSI Standard A21.11 (AWWA C-111).

b. Transition, Reducing and Flexible Couplings

Solid sleeves or Romac Alpha Couplings required. Romac 501 couplings shall not be used, unless approved otherwise by the District.

5. TAPPING TEE AND TAPPING VALVE

The tapping tee shall be ductile iron or Stainless Steel as approved by the District. The tapping valve shall meet the specifications of the gate valves.

6. CASING (MAIN LINE)

Welded steel pipe casing shall meet or exceed ASTM Designation A53. Minimum wall thickness shall be determined by the District depending on local conditions and applications. Casing spacers shall be per District approval and shall be installed per the manufacturer's recommendations. After installation, the casing shall be backfilled with sand or grout at the ends sealed with Advanced Product Systems End Seal, or similar product per District approval.

Pipe inside casing shall be restrained with "Field Lok 350" gaskets, or approved equal.

7. FIRE HYDRANTS

Fire hydrants shall be a breakaway type and conform to AWWA Standard C502-73 and be one of the following types: M&H (129), Clow, or Mueller (Centurion).

They shall be non-rising stem compression-type which open counter-clockwise, and close with pressure. The main valve opening diameter shall be 5-1/4 inches and the hydrant barrel shall have a diameter of 7 inches unless otherwise specified. The hydrant seat and hydrant seat retaining ring shall be bronze. All external bolts, nuts and studs shall be cadmium plated in accordance with ASTM A165 Type HS or rust proofed by some other process approved by the District. Gaskets shall be of rubber composition.

Fire hydrants shall be equipped with one 4-1/2" NST pumper port with Stortz adaptor and cap, and two 2-1/2" NST hose ports, unless located in City of Puyallup. The pumper port size for fire hydrants located in the City of Puyallup shall be 4" (#8 Tacoma Steamer Port Thread). Ports shall be fitted with renewable bronze nipples locked in place.

Furnish and install one blue line marker at a location as determined in the field.

The fire hydrants shall be painted with two (2) coats of Rustoleum Brand paint, color as specified by the District. See Standard Detail Fire Hydrant Assembly for additional specifications.

8. GATE AND BALL VALVES

Valves 2-inch through 12-inch shall be gate valves and conform with the requirements of AWWA Standard Specifications for gate valves for ordinary water works service number C-500 and C-509, except where superseded by the following: They shall be ductile iron body with epoxy coating inside and out with fusion welded resilient rubber wedge seat. The valves shall be non-rising stem, open to the left, and shall be equipped with standard 2" square operating nuts. Valves shall be equipped with "O-ring" packing. Valves shall be Mueller 2360 Series RW GV, Clow C509, Kennedy C509, or M&H C509.

1-1/2" and smaller diameter valves shall be ball valves approved by the District. Said ball valves shall be equipped with a slotted operator, and with an adapting 2" square operating nut (Ford Cat. No. QT-67, or equal) secured with a stainless steel cotter pin.

9. BUTTERFLY VALVES

All valves larger than 12 inches shall be butterfly valves. Butterfly valves shall be Class 150 or better, either M & H 450 or 4500 or Pratt equivalent, and shall meet the requirements of AWWA C-504-70.

Valve shafts shall meet or exceed the strength requirements of AWWA C-504-70 and be one-piece. Packing shall be "O-ring", or other design approved by the District.

Butterfly valves to be installed underground shall have sealed mechanical operators, open to the left and have 2" standard square operating nuts.

Complete manufacturer's specifications for the valves proposed for use shall be submitted to the District for approval. No valves shall be used which have not been approved by the District.

10. BLOW-OFF ASSEMBLY

Per District Standard Plan Section 4, Water Main Standard Details for 2" Blow-Off Assembly.

11. AIR AND VACUUM RELEASE ASSEMBLY

Per District Standard Plan Section 4, Water Main Standard Details for Air & Vacuum Release Assembly.

12. VALVE BOXES

Valve boxes shall be style No. 940 or District approved equal and be cast iron with adjustable sections; 5" inside diameter, 18" top section and regular 24" base section as

required. A valve cover marked "WATER" shall be provided. Valve box "ears" shall be installed in the direction of flow.

13. VALVE STEM EXTENSIONS

The materials for the valve stem extension shall be as shown on the standard detail.

14. CONCRETE MARKER POSTS

A concrete valve marker post shall be four inch minimum square section and a minimum of 42" in length, with beveled edges and containing at least one (1) 3/8" x 37" bar of reinforcing steel. Paint shall be "Rust-oleum #7792 Gloss White."

15. FIRE HYDRANT GUARD POSTS

The guard posts shall be Precast reinforced concrete, eight inches in diameter, six feet long. Paint shall be "Rust-oleum #7792 Gloss White.

16. LOCATING WIRE

Locating wire shall be 14 gauge solid copper, with blue neoprene coating. All connections or splicing shall be made with "3M Brand" direct bury splice kit, Catalog No. 1 IS, or equal.

17. METER BOXES

Fog-Tite, Olympic, Sigma-Raven, or owner approved equal.

18. SERVICE SADDLES

All service connections shall be epoxy-coated and installed with stainless steel double strap service saddles which shall be manufactured by Romac, Smith-Blair, Ford, Mueller, or owner-approved equivalent, and as further specified in the Standard Details (Section 4 of this document).

19. METERS

See Standard Details (Section 4 of this document) herein.

20. FOUNDATION GRAVEL

Foundation gravel shall consist of standard 1-1/2-inch <u>washed</u> aggregate which is normally used as the coarse aggregate in concrete. This material shall not have a wear percentage exceeding fifteen percent (15%) in the abrasion test, ASTM Designation D-2 or D-289.

21. GRAVEL BASE

This material shall conform to and be placed in accordance with Section 4-02 of the Standard Specifications for Road, Bridge 7 Municipal Construction, of the State of Washington, for gravel base formerly designated as Class "B". The material may also be used for select backfill of trenches, if and only if specifically approved by the District based on the approved location/installation of the pipeline.

METHODS OF CONSTRUCTION

1. GENERAL

A pre-construction conference will be held at the District office (or other approved location) prior to the start of construction.

The developer shall notify the District five (5) business days in advance of proposed construction to allow for checking of materials, as may be applicable and warranted, to be used on the job.

Except as otherwise noted herein, all work shall be accomplished with adopted standards of the District, as recommended in applicable American Waterworks Association (AWWA) specifications, and according to the recommendations of the manufacturer of the material or equipment used. The contractor performing actual construction shall have a copy of the plans and specifications on the job site at all times.

2. ALIGNMENT

All new water mains shall be placed ten (10) feet north or east of the centerline of the street rights-of-way in all new Plats and/or undeveloped rights-of-way. New water mains in and along existing roadways will be installed at a location approved by AHJ Utilities. Unless otherwise specified, the location of the water mains, hydrants, valves, and principal fittings will be in accordance with the approved plans. The Developer shall provide sufficient horizontal control, in the form of centerline stakes, property corners, or other markers, as required for proper pipe location.

3. CLEARING AND GRUBBING

Clearing and grubbing shall consist of the removal of all trees, stumps, brush, and debris and shall be confined within the limits of the easements obtained for the construction of this project and/or existing public rights-of-way.

Construction work in forested and native unimproved areas shall be conducted with extra precaution. Construction activity, stored materials and piles of earth shall not extend beyond the designated work limits. Trees and foliage which are not to be removed in construction shall be protected. Finish grades after completion shall match original grades,

sloped to prevent ponding. Remove any surplus dirt or over burden piled around trees to prevent future damage; remove such material by hand if necessary. Clear and fell trees with sufficient care to prevent damage.

All trees which are removed by the Developer shall become the property of the Developer and shall become his responsibility to remove from the site, unless otherwise noted in the easement stipulations or elsewhere in these specifications. Removal of clearing and grubbing debris shall be subject to the approval of the District and shall, in no way, constitute a hazard to the continuous operation of any existing utilities. Any damage to the existing utilities shall be repaired by the respective utility company, at the expense of the Developer. Any private improvements in the rights-of-way and easement areas shall not be removed until permission has been given by the District.

All fences adjoining any excavation or embankment that may be damaged or buried shall be carefully removed and temporarily erected on the adjoining property or stored for reinstallation.

No debris of any kind shall be deposited in any stream or body of water, or in any street or alley. All waste material shall be hauled to a waste site arranged for by the Developer. Any permits required for disposal shall be secured and paid for by the Developer.

The Developer shall be responsible for all damage to existing improvements resulting from his operations.

4. EXCAVATION AND BACKFILL

a. Traffic to be Maintained

The Developer shall make safe provision for necessary traffic around, over, or across the work in progress and shall schedule pavement patching to follow after backfill is completed.

b. Excavating in Paved Areas

Prior to excavating in paved areas, the existing road surface shall be cut one (1) foot (minimum) back from the outer edge of the excavation with a cutter and removed. The cuts shall be made in clean, straight lines to insure a minimum of damage to existing pavements. All cuts in existing asphalt or concrete pavement shall be made with an approved concrete saw, except that where the concrete has been overlaid with asphalt, the pavement shall be cut with a cutter 1 foot (minimum) from the outer edge of the excavation on each side of the trench section. If the Developer fails to protect the trench edges during trenching and backfilling, it shall be required, at his own expense, to recut the edges prior to repairing the pavement.

c. Trench Excavation

Trench excavation shall be unclassified. The terms earthwork or excavation include all materials excavated or removed regardless of material characteristics. The Developer shall make his own estimate of the kind and extent of materials which will be encountered in the excavation.

Trenches shall be excavated to the line and depth so that all 12" and larger pipelines constructed shall have not less than 42 inches and all 10" and smaller pipelines constructed shall have not less than 36 inches, nor more than 60" of cover, measured from the top of the pipe to the approved finished grade, unless otherwise approved by the District.

If a grade revision is made, the cover over the water main must remain within these limits. Otherwise, the water main shall be reconstructed. All added costs of inspecting such water main reconstruction shall be charged to the Developer.

The excavation shall be made in a straight grade through localized breaks in grade. The excavation shall be deepened gradually at changes in the street grades so that there are no abrupt changes in pipeline grade.

Where it is necessary to cross sanitary sewer or storm sewer trenches, all trench backfill shall be removed and replaced with mechanically compacted granular material to provide a uniform support for the full length of the pipe.

The root systems of all trees not to be removed which are located on or near easements and rights-of-way shall not be cut or disturbed, but shall be tunneled or otherwise protected by the Developer to ensure that no damage is done.

During trenching, installing of pipelines and appurtenances, and the placing of backfill, trenches shall be kept free of water. The Developer shall furnish all equipment necessary to dewater the trench and shall dispose of the water in such a manner as not to cause a nuisance or menace to the public. At no time will ground or stormwater, mud, miscellaneous debris, etc., be allowed to enter the pipeline being constructed.

When deemed necessary by the District, the trench shall be extended below the pipeline grades to permit the placing of foundation materials.

Foundation material (gravel, spalls, etc.) required in the bottom of the trench to provide proper pipe support shall be furnished by the Developer. The Developer shall perform all excavation of every description and of whatever substance encountered. Boulders, rocks, roots, and other obstructions shall be completely removed or cut out to the new width of the trench and to a depth 6 inches below the water main grade. Where material is removed from below water main grade, the

trench shall be backfilled to grade with material satisfactory to the District and thoroughly compacted.

The maximum length of open trench permissible on any line, in advance of pipe laying, will be 100 feet, unless otherwise specifically approved by the District Operations Manager.

Upon completion of work each day, all open trenches shall be completely backfilled, leveled, and temporarily graveled or patched, unless otherwise approved by the District.

d. Trench Backfill

No timber bracing, lagging, sheathing, lumber or other trench shoring materials shall be left in any excavation.

At all roadway and driveway crossings, as well as below existing or future pavement sections, the trench shall be immediately backfilled and compacted with 100% crushed rock after the pipe is installed and inspected, and shall be immediately provided with a temporarily graveled surface, and continually maintained on a daily basis until replaced with permanent repair as required.

All paved crossings shall have a temporary asphalt (cold mix) paved surface installed, which surface shall be a minimum of 4 inches in compacted thickness, and fully maintained level with existing undisturbed pavement until replaced with permanent repair. Sufficient cold mix to make immediate repairs and to maintain repairs until permanent repair is made, shall be on the job site.

The Developer shall be responsible for restoring to a condition equal to their original or superior condition, any and all existing culverts, ditches, drains, landscaping, or other facilities which are damaged as a result of the Developer's operations.

e. Timbering and Sheeting

The Developer shall provide and install timbering and sheeting as necessary to protect workmen, the work, and existing utilities and other properties. All work involving timbering and sheeting shall be done in accordance with all applicable local, State and Federal safety regulations. All timbering and sheeting above the pipe shall be removed prior to backfilling. Sheeting below the top of the pipe may be cut off and left in place. Removal of timbering shall be accomplished in such a manner that there will be no damage to the work or to other properties. The design of all timbering and sheeting shall be the Developer's responsibility.

5. DEWATERING AND CONTROL OF WATER

The Developer shall dewater and dispose of the water so as not to cause injury to public or private property, or cause a nuisance or menace to the public. Dewatering systems shall be designed and operated so as to prevent the removal of natural soils.

During excavating, installing of water mains, placing of trench backfill, and the placing and setting of concrete, excavations shall be kept free of water. The static water level shall be drawn down below the bottom of the excavation so as to maintain the undisturbed state of the natural soils, and allow the placement of backfill to the required density. The dewatering system shall be installed and operated so that the groundwater level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property. The control, routing, storage, release, etc., of storm, ground, and/or surface water shall be the contractor's (Developer's) responsibility and be in strict conformance with all applicable regulatory agencies, applicable permits, and permit requirements. The Developer or his Contractor shall be responsible for obtaining and adhering to all relevant permits in this regard.

The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill, and prevent flotation or movement of structures, and water mains.

In carrying out the work within the limits of streams, or an area that will drain to a stream during a rain, the Developer is required to comply with the regulations of the appropriate local, State, and federal agencies. Any isolated potholes remaining from the Developer's operations shall be provided with open water channels in such a manner that there will be a direct drainage outlet at the lowest elevation of the pothole.

Dust control water shall be applied as designated by the District, and for such period of time as the District deems necessary.

The Developer shall contact the applicable agencies and secure such permits as may be necessary to cover his proposed method of operation within the areas described above. If no permit is necessary, and if deemed necessary by the District, he shall obtain a letter from the appropriate agency.

6. COMPACTION OF TRENCH BACKFILL

Unless otherwise approved in writing by the District Operations Manager, compaction of trench material is required. The density of compacted backfill material shall meet requirements outlined in the Standard Specifications, or as otherwise approved in writing by the District. The contractor shall provide, procure and employ a District approved soils laboratory to perform density tests of areas specified by the District. Any area which demonstrates non-compliance shall be excavated and re-compacted to the satisfaction of the District.

7. TRENCH SAFETY SYSTEMS

All trenches which exceed a depth of four feet shall be provided with safety systems that meet the requirements of the Washington Industrial Safety & Health Act, Chapter 49.17 RCW.

8. FOUNDATION, BEDDING AND BACKFILL GRAVEL

a. Bedding Material

Bedding material shall be carefully placed and firmly compacted to provide a firm, uniform cradle for the pipe. The minimum thickness of the required bedding material layer shall be six inches for pipelines greater than 18 inches, four inches under the bell for all pipe sizes of 18 inches and smaller, and six inches under the bell for all pipe diameter where rock is excavated. To provide this firm, continuous support for the pipe, it shall be necessary to hand tamp or "slice" bedding material solidly under the pipe. The District reserves the sole right to require the installation of pipe bedding based on actual field conditions. Failure of the Contractor to install the material when deemed necessary by the District shall be cause for rejection of the installation by the District.

After the pipe laying operation, additional bedding material shall be placed and compacted for the full width of the trench up to the crown of the pipe.

b. Trench Backfill Gravel Base

The District may evaluate and approve, on a case-by-case basis, the utilization of suitable excavated material or import gravel base material for trench backfill. When so approved (in writing) suitable excavated material and/or gravel base, as specified in Section 4-02 of the Standard Specifications; or granular material commonly known as pit run gravel, may be utilized in those areas specifically approved by the District Operations Manager.

Trench backfill shall be free from wood, roots, bark, or other extraneous material. It shall have such characteristics of particle size and shape that it will compact readily to a firm, stable base. The maximum size of stone in the backfill shall not exceed that which will pass a 4-inch square sieve opening. Unless otherwise approved, gradation shall be per WSDOT Section 9-03.19, "Bank Run Gravel for Trench Backfill."

9. WATER PIPE INSTALLATION

All pipe shall be installed in accordance with these specifications and the instruction of the manufacturer, subject to the approval of the District. All pipe ends shall be square with the

longitudinal axis of the pipe, and any damage to the ends shall be cut off prior to installation, if approved by the District. When it is necessary to cut the pipe the pipe shall be cut with approved cutting tools.

The pipe shall be laid in a straight grade through localized breaks in grade. The excavation shall be deepened gradually at changes in street grades so that there are no abrupt changes in pipeline grade. To maintain the required alignment, use short lengths and deflect the joints or use necessary bends.

Each pipe section shall be carefully lowered into place onto bedding material that is placed to a minimum depth of four inches in the trench after inspecting it for defects and removing any gravel or dirt, etc., from the interior of the pipe.

All pipe and fittings shall be fully restrained unless approved otherwise by the District.

When necessary, water mains to be constructed under other utilities shall meet the minimum cover requirements. Where it is necessary to cross sanitary sewer or storm drain trenches, all trench backfill shall be removed and replaced with mechanically compacted granular material to provide a uniform support for the full length of the pipe.

The Washington State Department of Health (DOH) requires a 10-foot horizontal separation and 18-inch vertical separation between all sanitary sewer lines and water mains. A 1-foot horizontal and vertical separation is required between all water facilities and underground power, telephone, and other facilities unless otherwise approved. These dimensional separations shall be adhered to unless otherwise approved by the District.

10. ROAD AND STREAM CROSSINGS

The Developer may use any method which produces satisfactory results, and is acceptable to the District and the regulatory agencies having jurisdiction of the road or stream, provided that the Developer restores the road or stream to its original or superior condition. Normally, highway and stream crossings require the placing of a steel pipe casing by jacking or tunneling and laying the water main inside the casing.

Steel casing shall be of sufficient diameter, size, and strength to enclose the water main and to withstand maximum highway loading. Sizing and wall thickness of the casing shall be subject to approval by the District and/or Pierce County. Sand backfill between the casing and the water main, or other District-approved means of pipe support, will be required. The ends of the casing are to be sealed with "Advanced Product Systems End Seal" or approved equal after installation, backfill, and testing of the pipe are completed.

11. EROSION CONTROL

All erosion control shall be in accordance with local AHJ standards and regulations.

12. CONCRETE BLOCKING

Concrete blocking mix shall be Cement concrete Class 3000, it shall be cast in place and have a minimum of ¼ square foot bearing against the fittings and a minimum of two square feet bearing against undisturbed soil. Blocking shall bear against fittings only and shall be clear of joints so as to permit taking up or dismantling the joint. All bends and tees shall be adequately blocked. Minimum sized blocks are shown in the Standard Blocking Details. The Developer shall install blocking which is adequate to withstand full test pressure as well as to continuously withstand operating pressure under all conditions of service. For concrete blocking based on 200 psi test pressure, with safe soil load bearing of 1,000 pounds per square foot, see Standard Details (Section 4) for minimum dimensional requirements. The Developer shall be responsible for determining the actual size of blocking based on local conditions. Calculations for same shall be provided to the District for verification of same and stamped by a Washington State licensed engineer employed by the Developer. Pea gravel or other smooth surfaced rock are not acceptable as concrete mix aggregate.

13. FIRE HYDRANT INSTALLATION

Fire hydrants shall be set as shown in the Standard Detail (Section 4 of this document). Mega-lugs shall be used. The hydrant and gate valve must have lugs. Fire hydrant ports are to be oriented as determined by the applicable local fire AHJ.

In some instances, it may be necessary to provide hydrants in or near cuts and fill. Where this occurs, the area for at least a five (5) foot radius around the hydrant shall be graded and leveled, and the cut or fill slopes shall be neatly graded by hand, unless otherwise approved by the applicable local fire AHJ.

No tool other than an approved hydrant operating wrench shall be used when opening or closing hydrants. Existing hydrants shall not be operated by the Contractor except as allowed by the District.

Existing fire hydrants shall be relocated, as shown on the Standard Details (Section 4), by installing new fittings, new ductile iron pipe and Mega-lugs between the gate valve and the fire hydrant. New gaskets shall be installed at each connection.

14. WATER SHUTOFF

Where it is necessary to shut off the existing mains to make a connection, the Developer shall notify the District Operations Manager 2 business days in advance of such shut off and the District will shut off the mains. Once the water has been shut off, the Developer shall diligently pursue the connection to completion so that the time required for the shut off may be held to a minimum.

All connections to existing mains shall be completed the same day as they are started. The Developer shall time his operations so that the water will not be shut off overnight or over weekends or during holidays. On shutdowns effecting commercial or emergency service, connections during non-peak periods may be required (at the discretion of the District), for example weekends or midnight hours.

15. SERVICE CONNECTIONS

Prior to construction of the new water mains, and if so directed by the District, the Developer shall remove, tag and deliver existing meters to the District and provide an approved and temporary jumper for existing meter location in order to maintain service. The District staff will then inspect and overhaul the meters, and deliver them to the construction site when the Developer is ready to reinstall the meters.

Any relocated meters shall be installed at the property line. A new meter box, per District Standards, shall be furnished by the Developer for each service. Any meters damaged or clogged during construction will be replaced by the District and back charged to the Developer.

Service lines shall be installed up to the meter prior to conducting pressure testing and disinfection of water mains, the services shall then be connected to meters.

16. GATE VALVE INSTALLATION

Gate valves shall be set in the ground vertically and shall be opened and shut under pressure to check operation and, at the same time, show no leakage.

Valves 6 inches and larger that are not flanged to other fitting shall be blocked in accordance with the Standard Details (Section 4). Concrete collars shall be placed around the valve boxes as also shown and referenced in the Standard Details.

17. BUTTERFLY VALVE INSTALLATION

Butterfly valves shall be installed and tested in the same manner as gate valves. The Contractor is cautioned to test Butterfly Valves in strict compliance with manufacturer's recommendations. Test pressures may need to be adjusted accordingly.

18. VALVE BOX INSTALLATION

Valve boxes shall be set flush in pavement. In gravel shoulder and in unimproved roadway areas, install a protective concrete pad as shown in the Standard Details. In paved areas install a protective concrete collar and an asphalt patch per the Standard Details. Valve boxes shall be installed such that the slots in the valve box lid shall be oriented in the direction of the pipe.

19. INSTALLATION OF VALVE MARKER POSTS

Valve markers shall be installed for all valves except fire hydrant valves and District designated valves located in paved areas. The markers shall be set to leave 18 inches exposed above ground. The exposed portion of the markers shall be painted white. The valve size and the distance to the valve, rounded off to the nearest foot, shall be stenciled on the marker in two-inch-high numbers using black paint. A single valve marker can be utilized to identify valve clusters.

20. INSTALLATION OF FIRE HYDRANT GUARD POSTS

Guard posts shall be installed per the Standard Details only in low speed traffic areas i.e. parking lots or trafficked road side pull outs. The exposed portion of the posts shall be painted white.

21. BLOW-OFF ASSEMBLY INSTALLATION

Per District standard plans for water system construction.

22. AIR AND VACUUM RELEASE VALVE INSTALLATION

Air and vacuum release valve assemblies shall be sized and approved by the District and installed as shown in the Standard Details (Section 4). Location of air and vacuum release valves shall be at localized high points of the system. Air and vacuum release assemblies shall be installed in a location as "approved" by the District Operations Manager. Where required by the District Operations manager, the new main shall be constructed with additional depths of cover to alleviate the need for these types of valve assemblies at localized system high points.

23. LOCATING WIRE

All PVC and DI water mains (service laterals) and services shall have 14 gauge solid copper wire with blue neoprene coating placed in the trench over the water line and the ends brought up into the valve or meter boxes.

24. CONNECTIONS TO EXISTING UTILITIES

Unless otherwise specified by the District, where it is necessary to connect to existing facilities, the operation of the existing facility shall be maintained, if possible, while making the connection. Wet tap connections shall be installed as shown on the approved Plans and further detailed in the Standard Details (Section 4). The tapping valve shall remain closed and operated only as directed by the District. Cut-in tees and crosses shall be installed as shown on the District approved Plans and the valves on the branches of the tee or cross shall remain closed unless otherwise directed by the District. The District will determine and approve of the initial "tie in" prior to constructing same. There are to be no

connections to the existing system until the new system has passed pressure and purity tests.

At connections of new piping to existing piping all of the new piping, appurtenances and blocking shall have been installed, disinfected and tested up to the point of cutting into the existing line before the connection is made.

Provide the District operation Manager 2 business days' notice prior to making connections to the existing system and proceed only after receiving permission. Assemble all necessary material and equipment 48 hours before starting work to allow the District inspector to examine the material for acceptability. District will notify all affected customers. Generally, no cut-in connections or connections of new piping to existing piping will be scheduled on, days immediately before a weekend or holiday, District recognized holidays, or non-work hours unless otherwise approved (in writing) or required by the District.

Bolts, flanges, gaskets, couplings and all accessories shall be checked and assembled where possible by the Developer and verified by the District prior to shut down of the water system. Before connection or cut-in, the fittings, pipes, valves, and couplings shall be cleaned and sterilized with chlorine solution in the same manner as provided for the pipeline. The cleaning and sterilizing shall be done immediately prior to installation and in the presence of the District. Once the water has been shut off, the Developer shall proceed rapidly and without interruption to complete the connection.

After connection to the existing system, the opening of the valves shall be done with the authorization of, and in the presence of, the District's authorized representative.

The Developer shall not operate any valves or make any connections to the existing water main without prior approval of the District. The Developer shall make the necessary arrangements with the District for the connection to the existing water main.

25. TESTING & DISINFECTION

The water main pipes shall be substantially disinfected, purged and tested before being placed in service. All water for testing and disinfecting must be obtained by the Developer by arrangement with the District. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the Developer. When testing, "feed" for the pump shall be from a sanitary barrel or other suitable container, wherein the actual amount of "makeup" water can be measured periodically during the test period.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All concrete blocking shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Developer shall furnish and install temporary blocking.

<u>Note:</u> Due to the recent Endangered Species Act, the sequence in which the various steps of Waterworks Testing are to occur has been revised. In particular, the pressure testing is to occur after the pipe has been flushed of all chlorinated water to ensure that, in the event of a pressure failure, no chlorinated water will be released from the system into the environment.

Upon completion of pipe installation and prior to placing into service, all new mains and repaired portions of, or extensions to existing mains shall be disinfected by chlorination. Dosage shall not be less than 50 ppm of available chlorine. A chlorine residual of not less than 10 ppm free chlorine shall remain in the water after standing 24 hours in the pipe. The chlorine shall be applied by placement of dry crystals directly in the pipe or the following method:

a. A solution containing approximately 5 percent available chlorine by weight shall be prepared by first making a paste of a chlorine-bearing compound and water and then thinning to the proper proportions with water to insure that all active ingredients are dissolved.

b. If HTH or Perchloren is used at 70 percent available chlorine, the proportions shall be six (6) pounds of compound per ten (10) gallons of water.

   If Clor is used at 15 percent available chlorine, the proportions shall be one (1) part Clor per two (2) parts water.

c. The solution shall be applied through a corporation cock inserted in the horizontal axis of the pipe located at the beginning of the Extension or any valved section thereof. Injection of the solution shall be by means of a hypochlorinator, hand operated pump or motor operated pump approved by the District/Engineer.

d. Water from the existing distribution system, or other source of supply approved by the District/Engineer, shall be controlled to flow very slowly into the newly laid pipe line during application of the chlorine. A color comparator set will be used to determine the chlorine residual of the entering water.

e. No connections shall be made between the existing distribution system and the pipelines not pressure tested and approved for purity constructed under this Contract without a Washington State Department of Health approved backflow prevention device installed in the connecting line. Any connection must be witnessed by the District/Engineer.

f. In the process of chlorinating newly laid pipe, all valves or other appurtenances shall be operated while the pipe line is filled with chlorinating agent and under normal operating pressure.

g. After the twenty-four hour detention period, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its length shows, upon test, the absence of chlorine in excess of that carried in source of supply for flushing. All flushing methods shall conform to District standard as described below.

After disinfection of all new mains and repaired portions of, or extension to existing mains, all pipes shall be thoroughly flushed through all hydrants, blow-offs or other approved means to assure that all solids and contaminated materials have been removed. Water required for the initial flushing will be paid for by the District.

When flushing after disinfection, the Contractor shall be responsible for the disposal of treated water flushed from the mains, and shall completely neutralize the wastewater for protection of aquatic life in the receiving water before disposal into any natural drainage channel. The Contractor shall be responsible for disposing of disinfecting solution to the satisfaction of state and local authorities. Should the Contractor choose to flush to the sewage collection system, these activities must be coordinated through the appropriate agency.

Clear, clean, uncontaminated water used in flushing shall be directed to approved storm water runoff conveyance systems. Contractor shall use care to minimize erosion caused by flushing procedures.

Flushing shall be accomplished as follows:

a. The Contractor shall schedule and organize his work so as to use flushing water during off-peak hours only.

b. The District and the Engineer shall be notified a minimum of 2 business days prior to the time of water main flushing.

c. Flushing shall be done only in the presence of a representative of the District.

d. Flushing shall be done through hydrant ports. Where hydrant ports are not available (dead ends) then a tap shall be provided large enough to develop a velocity of at least 2.5 fps in the main.

e. Each section of newly laid pipes between valves or dead ends shall be flushed independently.

f. Fire hydrants and other dead end appurtenances shall be flushed simultaneously with the main line.

After the water mains have been disinfected and flushed, they shall be hydrostatically tested in sections of convenient length as approved by the Inspector.

The mains shall be pressure tested prior to achieving purity after completion of flushing of highly chlorinated water as approved by the Inspector. The system to be tested must be physically separated from the District's Water System during such tests.

Hydrostatic pressure test equipment shall be cleaned, disinfected and flushed prior to connection to pipe system to be tested. Test equipment shall be kept clean of dirt and foreign matter at all times. The test equipment shall be rinsed or swabbed as necessary using a water solution containing a minimum of 50 ppm chlorine. Following disinfection, the pressure test equipment shall be flushed with potable water prior to connection to system to be tested. A potable water source shall be used to pump system to test pressure. Potable water shall also be used throughout the hydrostatic test procedure and to serve as a source of make-up water between hydrostatic pressure tests.

The pumps, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished by the Contractor. The District will provide the gauge for the witnessed pressure test. Water meters used to measure water used to re-pressurize the line shall be positive displacement with a sweep unit hand registering 1 gallon per revolution as approved by the Inspector. Also water used to re-pressurize shall be pumped from a container sized and graduated appropriately to measure the amount of water used.

Where the District has water available for testing, it will be furnished without charge. Where water is not available from the District, the Contractor shall provide water for testing from a source approved by the Inspector.

a. <u>Preparation</u>

1) Tests shall be made after corporation stops and service lines are installed.

2) At points where pressure reaction and movement may occur, the pipe shall be properly blocked or braced. Where permanent blocking is not required, the Contractor shall furnish and install temporary blocking and remove it after testing.

3) Prior to calling out the Inspector to witness the pressure test, the Contractor shall have all equipment set up completely ready for operation and shall have successfully performed the test to assure himself that the pipe is in a satisfactory condition.

b. Test

1) The mains shall be filled with water and all air removed prior to starting the test.

2) The main shall then be pumped up to a hydrostatic pressure equal to 250 psi at all elevations tested. In no case shall the test pressure exceed 200 percent of the safe working pressure of the class of pipe tested.

3) The pump shall then be stopped for a period of 15 minutes.

4) The main shall then be pumped up again to the test pressure.

5) The quantity of water required to restore the pressure shall then be recorded.

Acceptability of the test will be determined by two factors:

a. The quantity of water lost from the main during the 15 minute test period shall not exceed the quantities shown in the following table:

Pipe Diameter (inches)	6	8	10	12	14	16
Water Loss (GPH/1000 L.F. Pipe)	0.71	0.95	1.19	1.42	1.66	1.90
Water Loss/1000 L.F. Pipe (15 minute test)	0.18	0.24	0.30	0.36	0.42	0.48

These figures are established by the Ductile Iron Pipe Research Association.

b. There shall not be an appreciable or abrupt loss in pressure during the fifteen (15) minute test period.

After acceptance of pressure testing, the Inspector will arrange for taking samples for bacterial tests.

The Inspector shall arrange the laboratory testing for purity, which normally takes 2 to 5 working days.

Should the initial treatment result in an unsatisfactory bacterial test, the original chlorination and flushing procedure shall be repeated by the Contractor until satisfactory results are obtained. Failure to get a satisfactory result on the bacterial test shall be considered as a failure of the Contractor to keep the pipe clean during

construction, or to properly chlorinate the main, and Contractor shall be required to clean, repair or replace the newly constructed main until a satisfactory test is achieved. Water required for retesting and flushing shall be paid for by the developer.

The water system will not be acceptable to the District until receipt of a satisfactory report from the laboratory used by the District on water samples submitted to that office for bacteriological analysis, or other certified laboratory(ies).

The hypo-chlorinated water shall be discharged in strict compliance with regulatory guidelines and requirements. The Contractor shall be responsible for procuring all permits, making adequate provisions, and incurring all costs in this regard to include, but not be limited to, District approval of point and method(s) of discharge, hoses, trenching, hauling, etc.

26. ADJUSTMENT OF NEW AND EXISTING UTILITY STRUCTURES TO GRADE

This work consists of constructing and/or adjusting all new and existing utility structures encountered on the project to finished grade.

a. General

On asphalt concrete paving projects, the valve boxes shall not be adjusted until the pavement is completed, at which time the center of each valve box lid shall be relocated from references previously established by the Developer. The pavement shall be cut as further described, and base material removed to permit removal of the lid.

The asphalt concrete pavement shall be cut and removed to a neat circle, as further noted herein, and shown in the Standard Detail. The valve box and lid shall be brought up to desired grade, which shall conform to the surrounding road surface. A concrete collar shall be placed per the Standard Detail. Care shall be exercised to insure the valve box "ears" point in the direction of the new water main on which it is installed.

Asphalt concrete patching shall not be carried out during wet ground conditions or when air temperature is below 50 degrees F. Asphalt concrete mix must be at the required temperature when placed. Before making the asphalt concrete repair, the edges of the existing asphalt concrete pavement and the outer edge of the casting shall be tack coated with hot asphalt cement. The remaining 2" shall then be filled with Class B asphalt concrete and compacted with hand tampers and a patching roller.

The completed patch shall match the existing paved surface for texture, density, and uniformity of grade. The joint between the existing pavement and the patch

shall then be carefully painted with hot asphalt cement or asphalt emulsion, and shall be immediately covered with dry paving sand before the asphalt cement solidifies. All debris, such as asphalt pavement, cement bags, etc., shall be removed and disposed of by the Developer. Before acceptance of the job, valve and meter boxes shall be cleaned of all debris and foreign material. Any damage occurring to the existing facilities due to the Developer's operations shall be repaired at his own expense.

b. Adjustment of Monuments and Cast Iron Frames and Covers

Monuments and monument castings shall be adjusted to grade in the same manner as for valve boxes.

27. FINISHING AND CLEANUP

Before acceptance of water main construction, all pipes, catch basins, and other surrounding facilities shall be cleaned of all debris and foreign material. After all other work on the project is completed, and before final acceptance, the entire roadway, including the roadbed, planting and sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades, and cross-sections shown on the plans and as hereinafter specified.

On water main construction where all or portions of the construction is in undeveloped areas, the entire area which has been disturbed by the construction shall be so shaped that upon completion, the area will present a uniform appearance, blending into the contours of adjacent properties. All other requirements outlined previously shall be met. Slopes, sidewalk areas, planting areas, and roadway shall be smoothed and finished to the required cross-section and grade by means of a grading machine insofar as it is possible to do so without damaging existing improvements, trees and shrubs. Machine dressing shall be supplemented by hand work to meet the requirements herein, to the satisfaction of the District.

Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. All graded areas shall be true to line and grade as shown on the typical sections and as required by the District or Pierce County. When the existing planting is below sidewalk and curb, the area shall be filled and dressed out to the walk regardless of the limits shown on the plans. Wherever fill material is required in the planting area, is shall be left enough higher to allow for final settlement, but nevertheless, the raised surface shall present a uniform appearance.

All rocks in excess of six (6) inches in diameter unless used as ornamental or landscaping rock shall be removed from the entire construction area and shall be disposed of in the same manner as required for other waste material. In no instance shall the rock be thrown

onto private property. Overhang on slopes shall be removed and slopes shall be dressed neatly so as to present a uniform, well sloped surface.

All excavation material at the outer lateral limits of the project shall be removed entirely. Trash of all kinds resulting from the clearing and grubbing or grading operations shall be removed, and disposed of at Contractor's prearranged location. Where machine operations have broken down brush and trees beyond the lateral limits of the project, the Developer shall remove, dispose of and replace the same as applicable at this own expense.

Drainage facilities, such as catch basins, inlets, culverts, and open ditches, shall be cleaned of all debris which is the result of the Developer's operations.

All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements, such as Portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities which have been sprayed by the asphalt cement shall be cleaned to the satisfaction of the District.

Castings for manholes, monuments, water valves lamp poles, vaults, and other similar installations which have been covered with the asphalt material shall be cleaned to the satisfaction of the District.

28. FINAL INSPECTION

The Developer shall bear all costs incurred in correcting any deficiencies found during inspection, including the cost of any additional inspection that may be required by the District to verify the correction of said deficiency.

29. GENERAL GUARANTEE AND WARRANTY

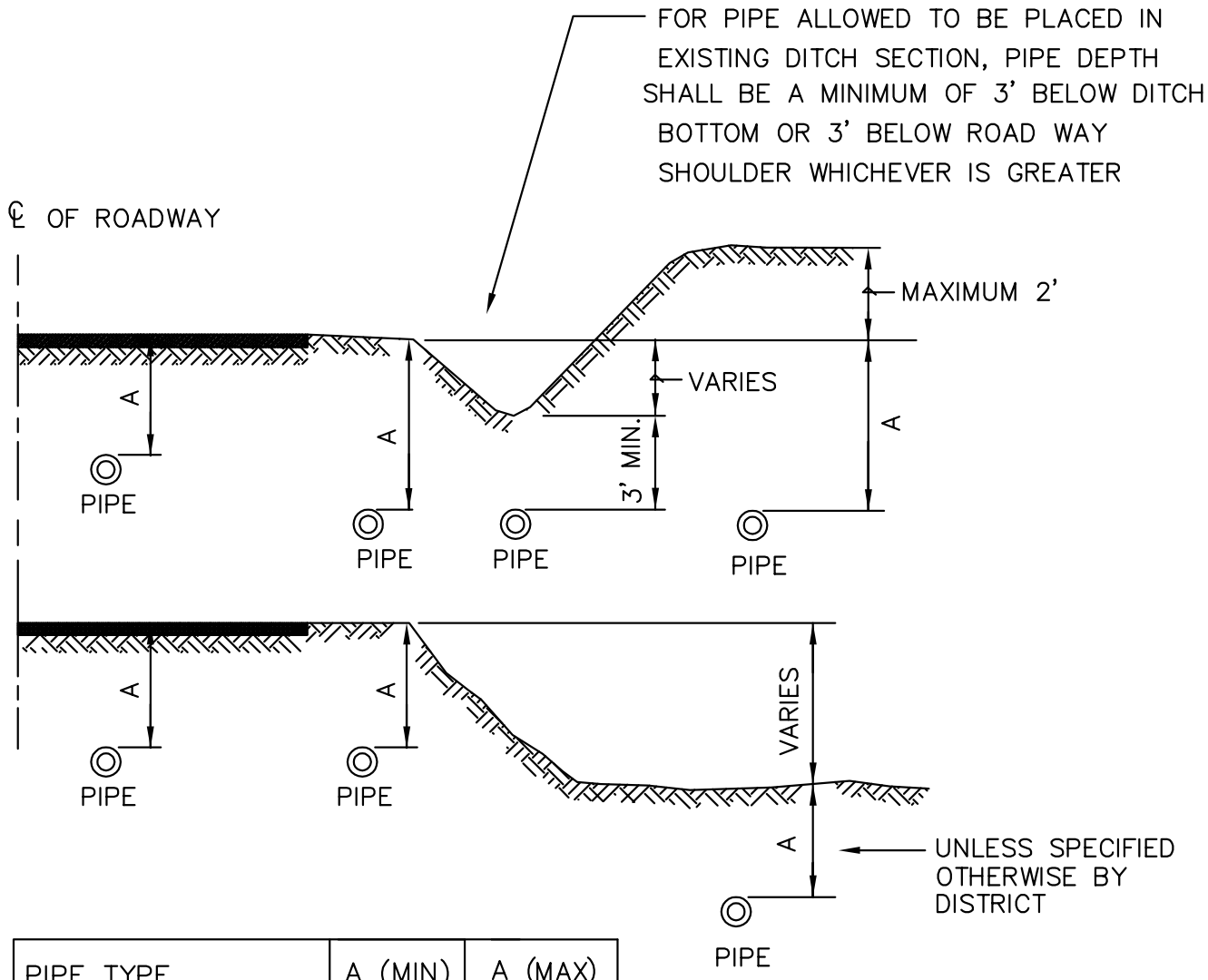
The Developer shall be required, upon completion of the work, and acceptance by the District, to furnish to the District a written guarantee covering the material and workmanship for a period of two years after the date of final acceptance, and he shall make all necessary repairs during that period at his own expense, if such repairs are necessitated as a result of furnishing, under this agreement, poor materials and/or workmanship. The Developer shall obtain warranties from the contractor, subcontractors, and suppliers of material or equipment where such warranties are specifically required herein, and shall deliver copies of same to the District upon completion of the work.

SECTION 4

WATER MAIN STANDARD DETAILS

SECTION FOUR – WATER MAIN STANDARD DETAILS

1. Water Main Depth Requirements
2. Water Main Trench Section
3. Typical Utility Crossing (03A & 03B)
4. Typical Water Casing
5. Concrete Thrust Block
6. Vertical Anchor Block
7. Valve Box Adjustment
8. Water Valve Stem Extension
9. Valve Marker Post Detail
10. Tracer Wire and Splice
11. Wet Tap Connection
12. Cut In Connection
13. Fire Hydrant Installation (13A & 13B)
14. Fire Hydrant Relocation
15. Fire Hydrant Location in Cut or Fill
16. 1" & Smaller Water Service (16A & 16B)
17. 1-1/2" & 2" Water Service
18. Double Residential Service
19. Meter & Meter Vault Assembly 3" through 10"
20. 2" Blow-Off Assembly
21. Air & Vacuum Release Assembly
22. Water Sampling Station
23. Fire Line Appurtenances
24. Double Check Detector Assembly (DCDA) in Vault (24A & 24B)
25. Double Check Detector Assembly (DCDA) in Mechanical Room
26. Pressure Reducing Valve (PRV) Station
27. Reduced Pressure Backflow Assembly (RPBA)
28. 2" & Smaller Double Check Valve Assembly (DCVA)
29. Atmospheric Vacuum Breaker for In-line Faucets and Hose Bibbs



PIPE TYPE	A (MIN)	A (MAX)
12" OR LARGER	42"	60"
10" OR SMALLER	36"	60"

NOTE:

ALL PIPES SHALL BE RESTRAINED JOINT WITH FIELD - LOK, MEGALUG, OR APPROVED EQUAL.

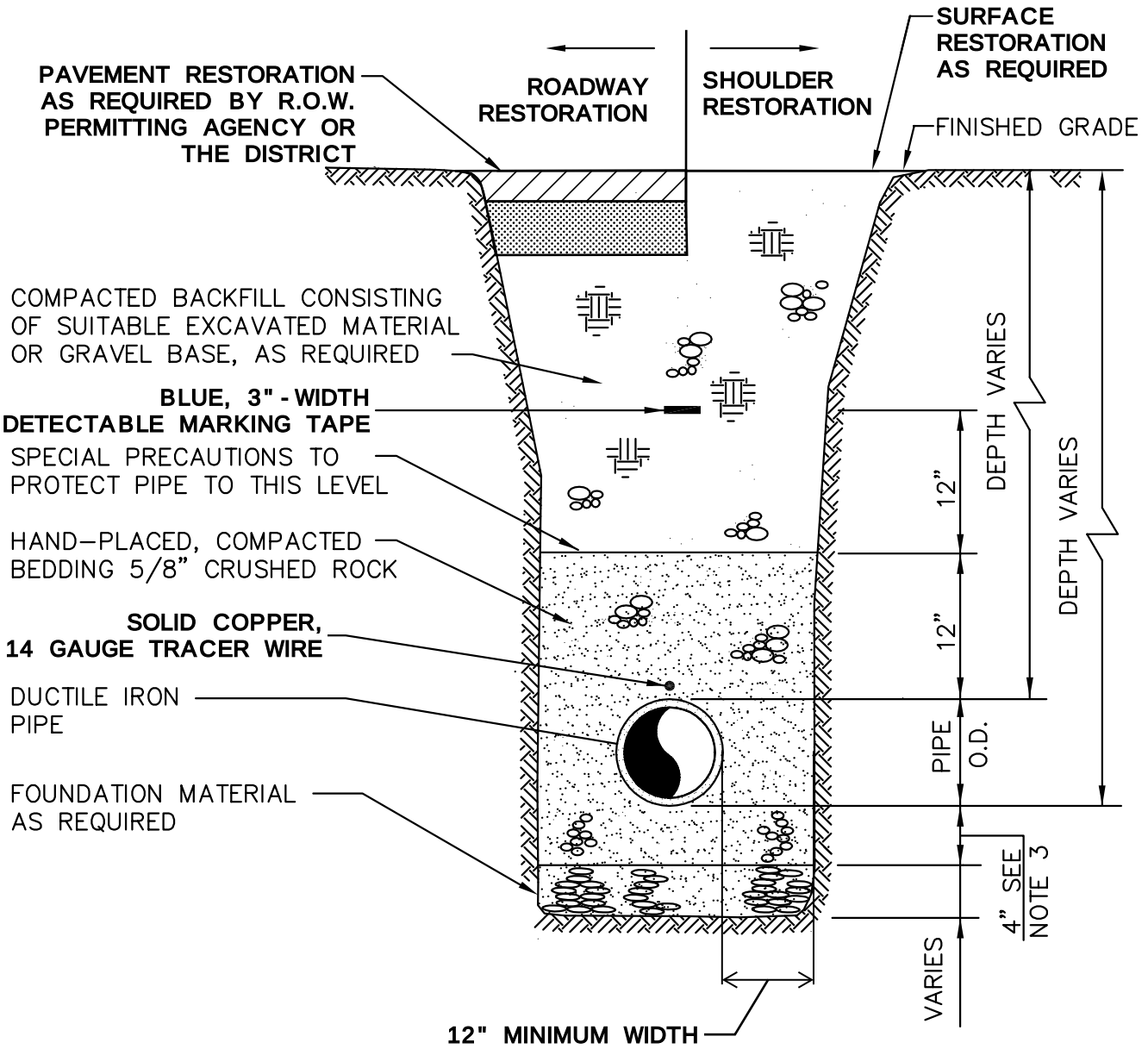
VALLEY WATER DISTRICT

WATER MAIN DEPTH REQUIREMENTS

APRIL 2023

STANDARD DETAIL NO.

01



NOTES:

1. **BACKFILL MATERIAL AND COMPACTION SHALL BE IN CONFORMANCE WITH DISTRICT STANDARDS AND/OR THE PERMITTING AGENCY REQUIREMENTS, AS MAY BE APPLICABLE.**
2. **BEDDING MATERIAL SHALL BE 5/8" CRUSHED ROCK. NATIVE MATERIAL SHALL NOT BE USED IN BEDDING ZONE.**
3. **PLACE MINIMUM 6" BEDDING MATERIAL UNDER BELL OF PIPE FOR ALL PIPE GREATER THAN 18" DIAMETER OR WHERE ROCK IS EXCAVATED; OTHERWISE 4" BEDDING MATERIAL REQUIRED.**
4. **BRING TRACER WIRE UP INTO EACH VALVE BOX, PER STANDARD DETAIL 07.**
5. **ALL JOINTS SHALL BE RESTRAINED.**
6. **ALL PIPE SPOOLS WITH BELL END SHALL BE MINIMUM 5' IN LENGTH.**

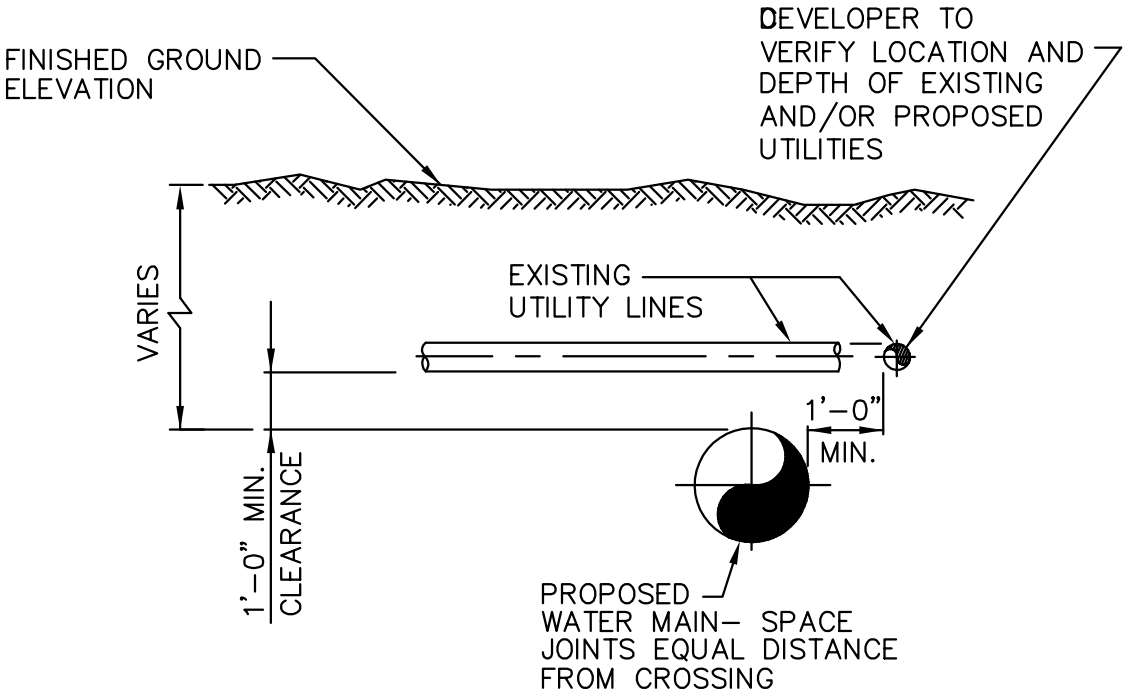
VALLEY WATER DISTRICT

WATER MAIN TRENCH SECTION

APRIL 2023

STANDARD DETAIL NO.

02



NOTE: CONCRETE ENCASEMENT (BEDDING) SHALL BE UTILIZED, IF APPROVED BY THE DISTRICT, AT LOCALIZED UTILITY CROSSING IF MINIMUM PIPE SEPARATION (ELEVATION) CANNOT BE MAINTAINED / ACHIEVED.

POWER / COMMUNICATION / GAS / STORM UTILITIES ADJACENT TO WATER MAIN

VALLEY WATER DISTRICT

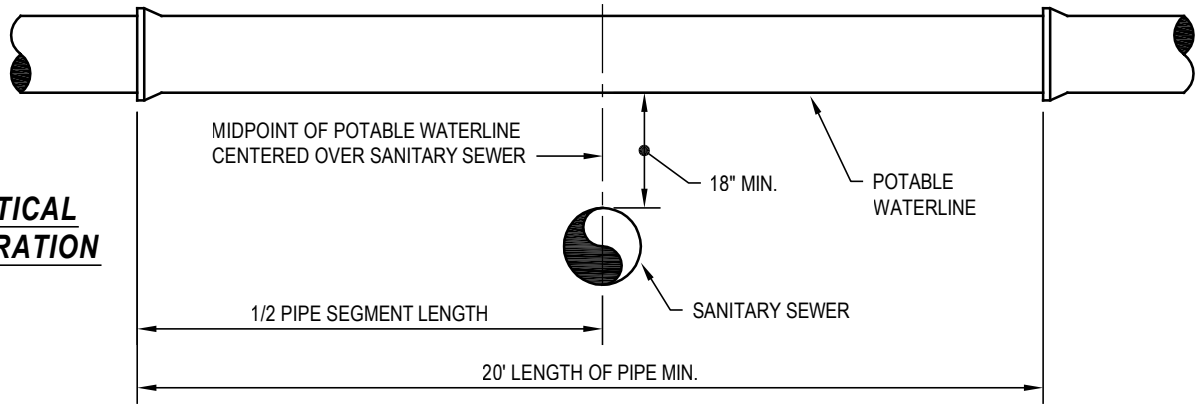
TYPICAL UTILITY CROSSING

APRIL 2023

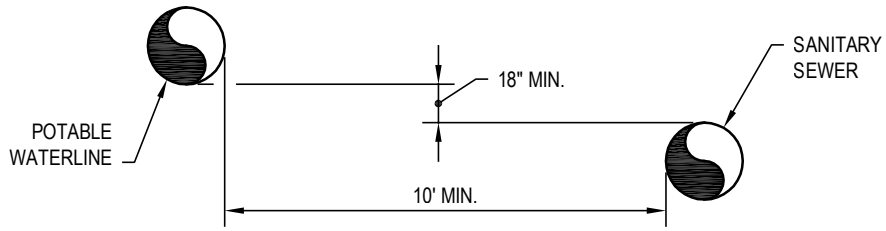
STANDARD DETAIL NO.

03A

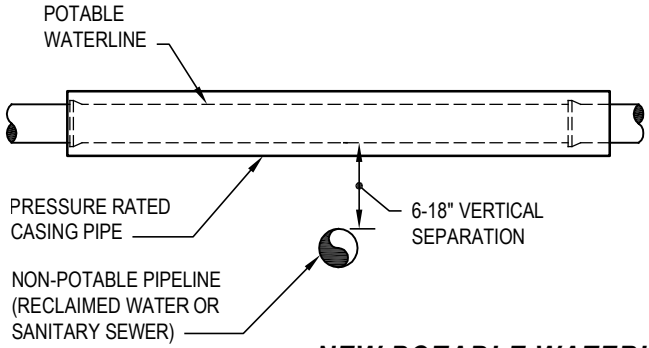
VERTICAL SEPARATION

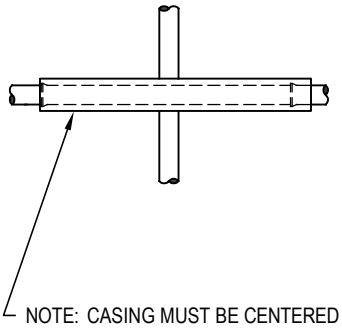


HORIZONTAL SEPARATION

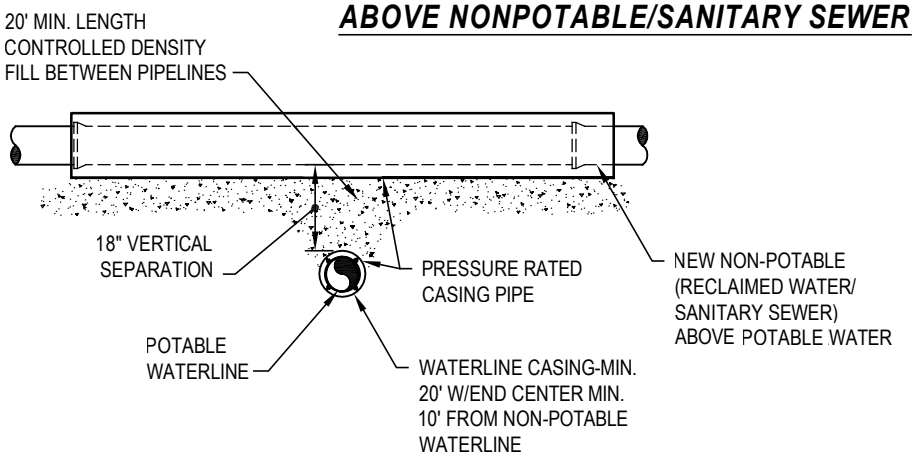


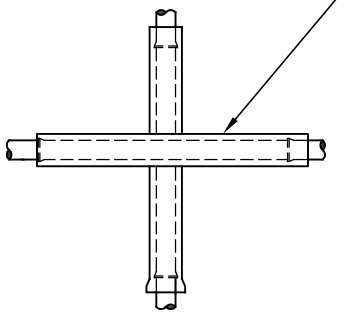
NEW POTABLE WATERLINE CONSTRUCTED ABOVE NONPOTABLE/SANITARY SEWER





NONPOTABLE PIPELINE CONSTRUCTED ABOVE POTABLE WATERLINE





PLAN VIEW

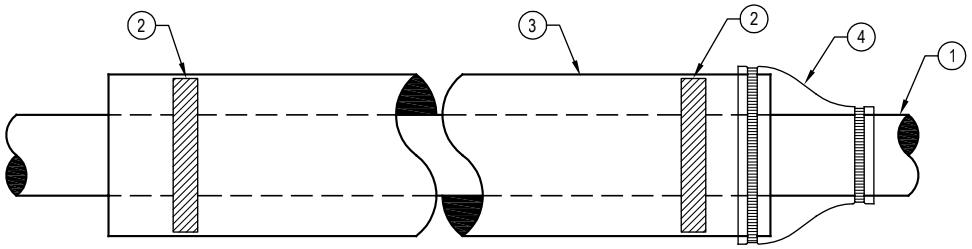
VALLEY WATER DISTRICT

TYPICAL UTILITY CROSSING

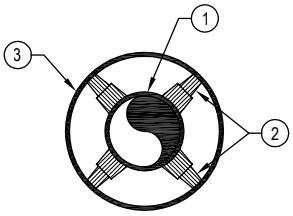
APRIL 2023

STANDARD DETAIL NO.

03B



TOP VIEW



SECTION VIEW

KEY NOTES

1. WATER MAINLINE.
2. CASING SPACER, PER DISTRICT APPROVAL.
3. STEEL CASING, OR OTHER PRESSURE-RATED CASING PER DISTRICT APPROVAL.
4. ADVANCED PRODUCT SYSTEMS END SEAL, OR PER DISTRICT APPROVAL.

PIPE SIZES	CASING SIZES	CASING WALL THICKNESS
6"	12"	1/4"
8"	16"	1/4"
10"	20"	1/4"
12"	24"	1/4"
14"	28"	1/4"
16"	32"	1/4"

GENERAL NOTES:

1. **CONCRETE ENCASEMENT (BEDDING) SHALL BE UTILIZED, IF APPROVED BY THE DISTRICT, AT LOCALIZED UTILITY CROSSING IF MINIMUM PIPE SEPERATION (ELEVATION) CANNOT BE MAINTAINED / ACHIEVED.**
2. **DEVELOPER / CONTRACTOR TO VERIFY LOCATION AND DEPTH OF EXISTING AND / OR PROPOSED UTILITIES.**
3. **CASING SPACERS SHALL BE CENTER RESTRAINED POSITION TYPE.**
4. **MINIMUM OF 3 CASING SPACERS PER SECTION OF PIPE.**
5. **CASING TO BE EXTENDED 5' BEYOND ANY CURBS, WALLS, STRUCURES, OR FOOTINGS.**
6. **ENCASEMENT OF WATER MAIN REQUIRED WHEN 18" VERTICAL SEPERATION CANNOT BE ACHIEVED.**

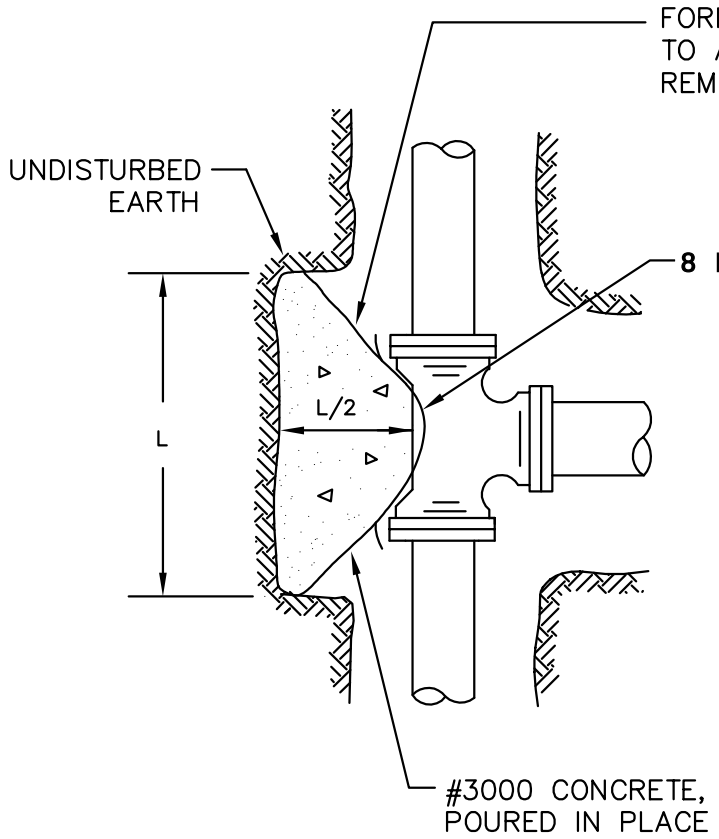
VALLEY WATER DISTRICT

TYPICAL WATER CASING

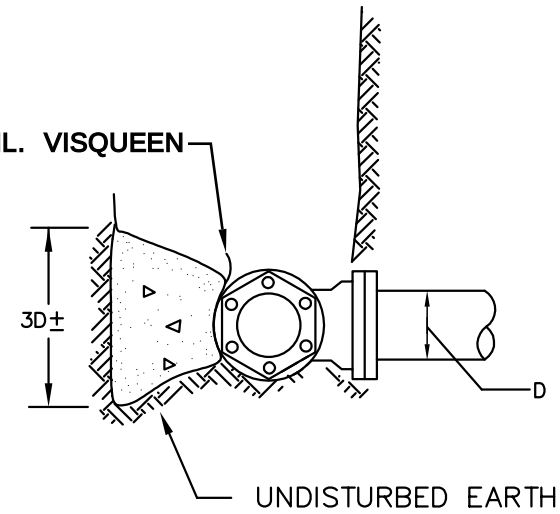
APRIL 2023

STANDARD DETAIL NO.

04



PLAN



ELEVATION

NOTE: ECOLOGY BLOCKS MAY ONLY BE USED FOR TEMPORARY PURPOSES, AND MUST BE APPROVED BY DISTRICT PRIOR TO INSTALLATION.

TABLE 1: THRUST BLOCK SIZE

FITTING SIZE (INCHES)	BEARING AREA OF BLOCK IN SQUARE FEET				
	TEES & PIPE ENDS	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
	1000 PSF SOIL BEARING STRENGTH				
3	1.6	2.3	1.3	1.0	1.0
4	2.8	4.0	2.2	1.1	1.0
6	6.4	9.0	4.9	2.5	1.2
8	11.3	16.0	8.7	4.5	2.3
10	17.7	25.0	13.6	6.9	3.5
12	25.4*	36.0*	19.5	10.0	5.0
14	34.6*	49.0*	26.5*	13.6	7.0
16	45.2*	64.0*	34.6*	17.7	8.9

TABLE 2: BEARING VALUE OF SOIL

SOIL TYPE	SAFE BEARING LOAD LBS/SF
MUCK, PEAT, ETC.	0
SOFT CLAY/ALLUVIAL SOIL	1,000
SAND	2,000
SAND AND GRAVEL	3,000
SAND AND GRAVEL CEMENTED WITH CLAY	4,000
HARD SHALE	10,000

NOTE:
***MAXIMUM BEARING AREA ALLOWED IS 25 SQ FT; BEARING AREA MAY BE REDUCED BY CONDUCTING SOILS TEST TO CONFIRM HIGHER SOIL BEARING.**

THIS TABLE REPRESENTS THE "MINIMUM" CONSTRUCTION STANDARDS. THE DEVELOPER'S / CONTRACTOR'S ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING THE APPROPRIATE SIZE OF ALL THRUST BLOCKS BASED ON EXISTING AND LOCAL CONDITIONS.

VALLEY WATER DISTRICT

CONCRETE THRUST BLOCK

APRIL 2023

STANDARD DETAIL NO.

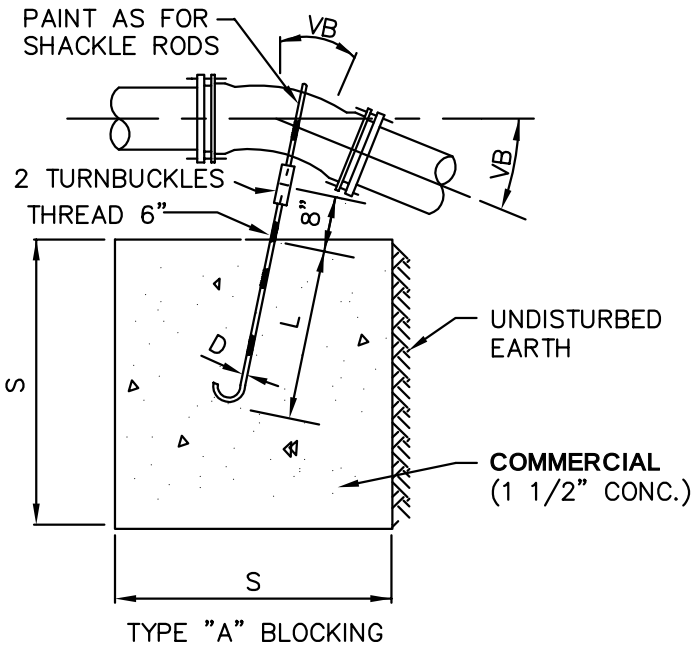
05

TYPE "A" BLOCKING
FOR 11 1/4°–22 1/2°–30° VERTICAL BENDS

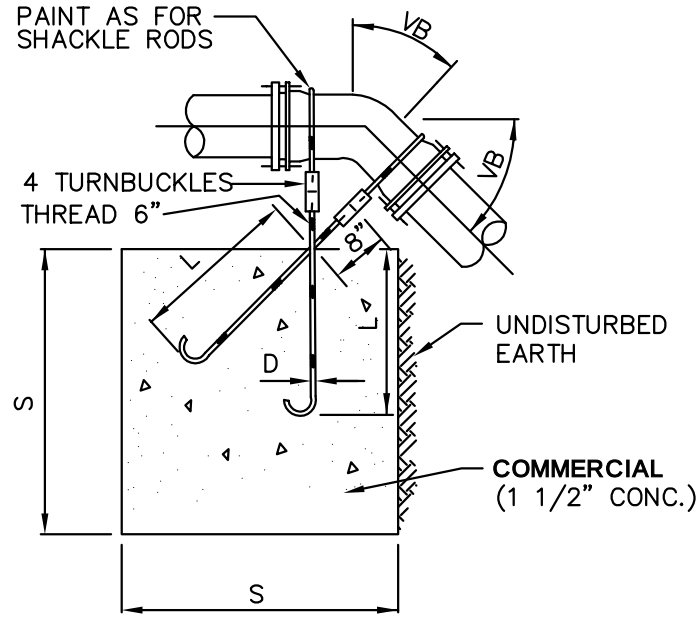
PIPE SIZE NOMINAL DIAMETER– INCHES	TEST PRESSURE PSI	VB VERTICAL BEND DEGREES	No. OF CU. FT. OF CONC. BLOCKING	S SIDE OF CUBE LIN. FT.	D DIAM. OF SHACKLE RODS (2) INCHES	L DEPTH OF RODS IN CONCRETE LIN. FT.
4"	300	11 1/4	8	2	5/8"	1.5
		22 1/2	11	2.2		2.0
		30	17	2.6		
6"	300	11 1/4	11	2.2	5/8"	2.0
		22 1/2	25	2.9		
		30	41	3.5		
8"	300	11 1/4	16	2.5	5/8"	2.0
		22 1/2	47	3.6		
		30	70	4.1	3/4"	2.5
12"	250	11 1/4	32	3.2	5/8"	2.0
		22 1/2	88	4.5	7/8"	3.0
		30	132	5.1		
16"	225	11 1/4	70	4.1	7/8"	3.0
		22 1/2	184	5.7	1 1/8"	4.0
		30	275	6.5	1 1/4"	
20"	200	11 1/4	91	4.5	7/8"	3.0
		22 1/2	225	6.1	1 1/4"	4.0
		30	330	6.9	1 3/8"	4.5
24"	200	11 1/4	128	5.0	1"	3.5
		22 1/2	320	6.8	1 3/8"	4.5
		30	480	7.9	1 7/8"	5.5

TYPE "B" BLOCKING
FOR – 45° VERTICAL BENDS

		VB		S	D	L
4"	300	45	30	3.1	5/8"	2.0
6"			68	4.1		
8"			123	5.0		
12"	250		232	6.1	3/4"	2.5
16"	225		478	7.8	1 1/8"	4.0
20"	200		560	8.2	1 1/4"	
24"			820	9.4	1 3/8"	4.5



TYPE "A" BLOCKING



TYPE "B" BLOCKING

THIS TABLE REPRESENTS THE "MINIMUM" CONSTRUCTION STANDARD. THE DEVELOPER'S / CONTRACTOR'S ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING THE APPROPRIATE SIZE OF ALL ANCHOR BLOCKS BASED ON EXISTING AND LOCAL CONDITIONS.

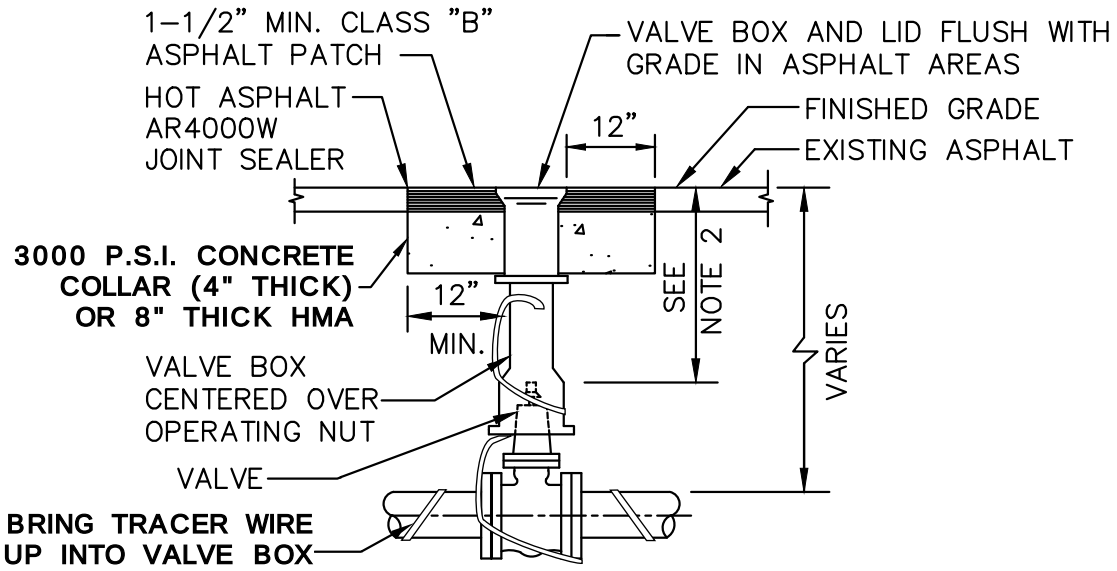
VALLEY WATER DISTRICT

VERTICAL ANCHOR BLOCK

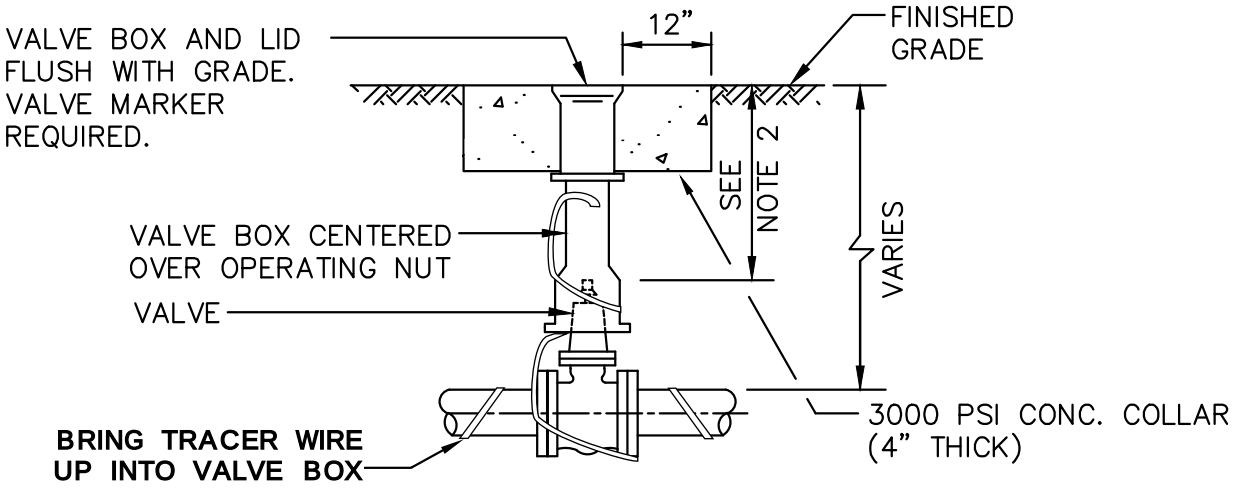
APRIL 2023

STANDARD DETAIL NO.

06



VALVE BOX IN ASPHALT AREA

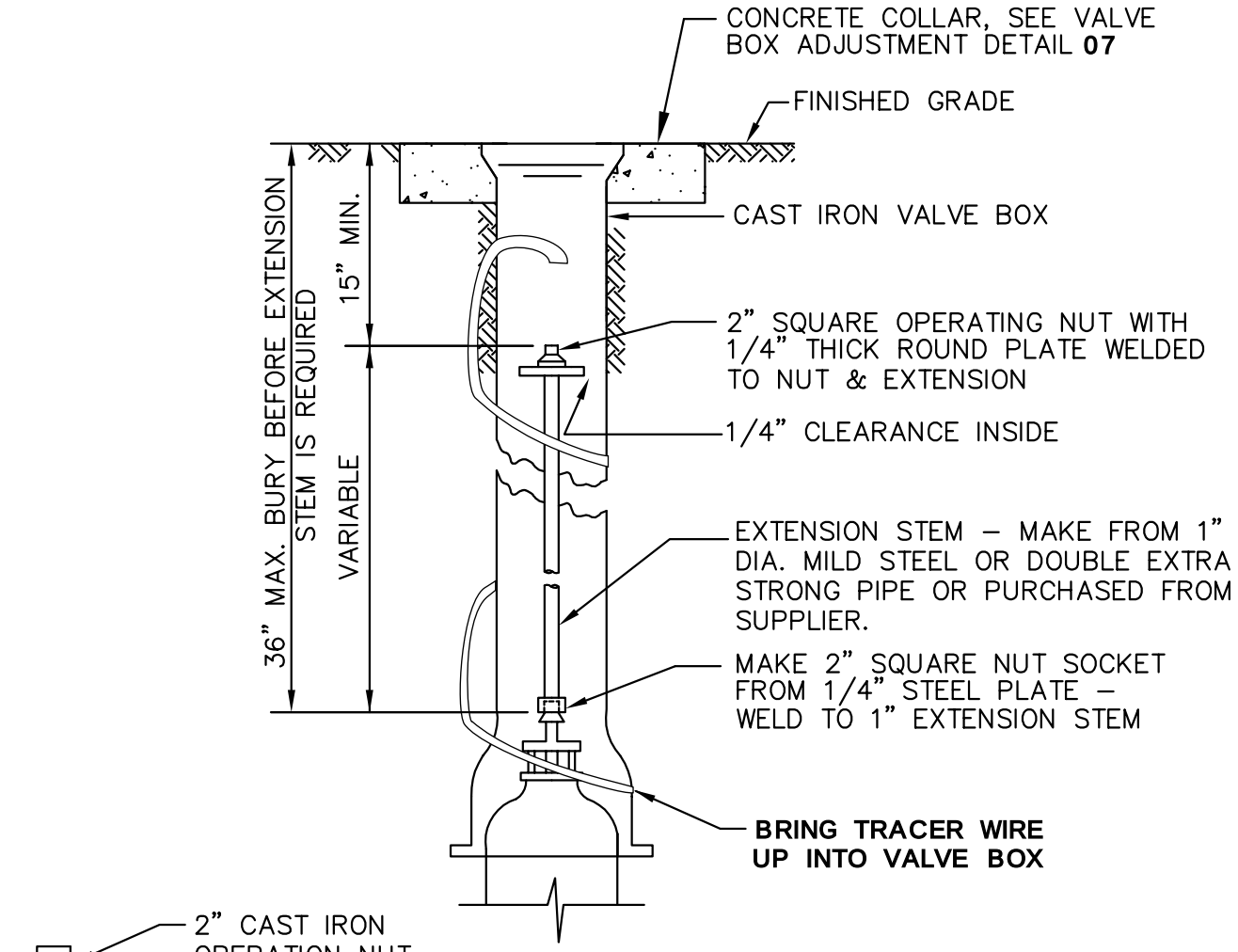


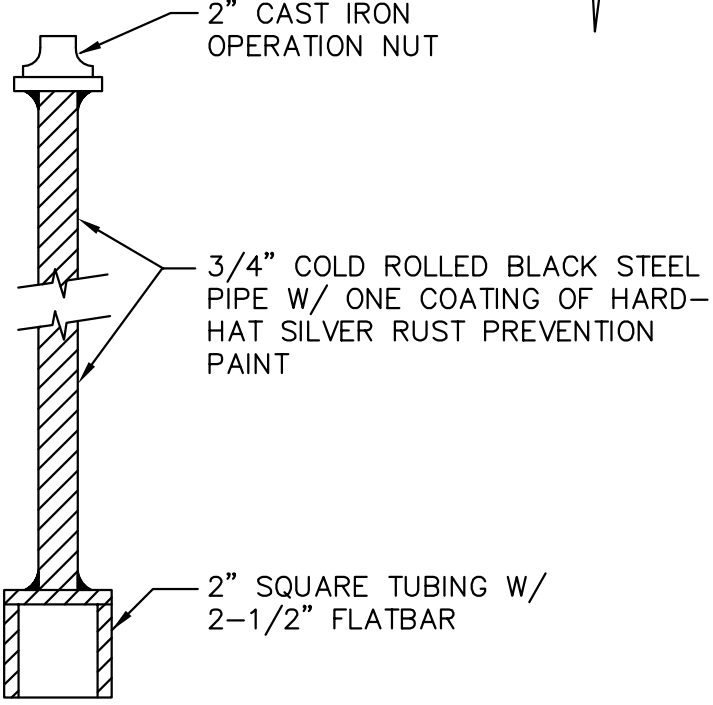
VALVE BOX IN UNIMPROVED AREA

NOTES:

1. **WRAP TRACER WIRE AROUND OUTSIDE OF VALVE BOX AND INSERT NEAR THE TOP. BURN OR DRILL A HOLE FOR THE TRACER WIRE.**
2. **EACH VALVE SHALL BE PROVIDED WITH AN ADJUSTABLE CAST IRON VALVE BOX OF 5" INSIDE DIAMETER. VALVE BOXES SHALL HAVE A TOP SECTION WITH AN 18" MIN. LENGTH, AND 24" BASE. THE VALVE BOX SHALL BE STYLE NO. 940 OR APPROVED EQUAL. VALVE BOX EARS SHALL BE PLACED IN LINE WITH PIPE IT SERVES.**
3. **15" MINIMUM, 36" MAXIMUM FOR OPERATOR NUT. EXTENSION MAY BE REQUIRED.**
4. **SEE DETAIL 23 FOR FIRE LINE VALVES AND APPURTENANCES.**

VALLEY WATER DISTRICT	**VALVE BOX ADJUSTMENT** APRIL 2023	STANDARD DETAIL NO. **07**





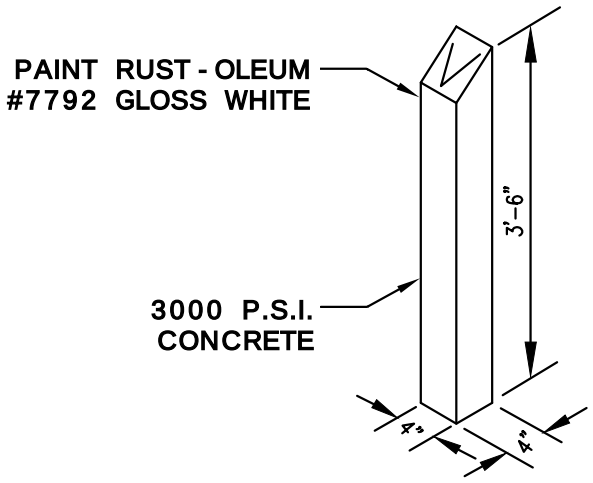
VALLEY WATER DISTRICT

WATER VALVE STEM EXTENSION

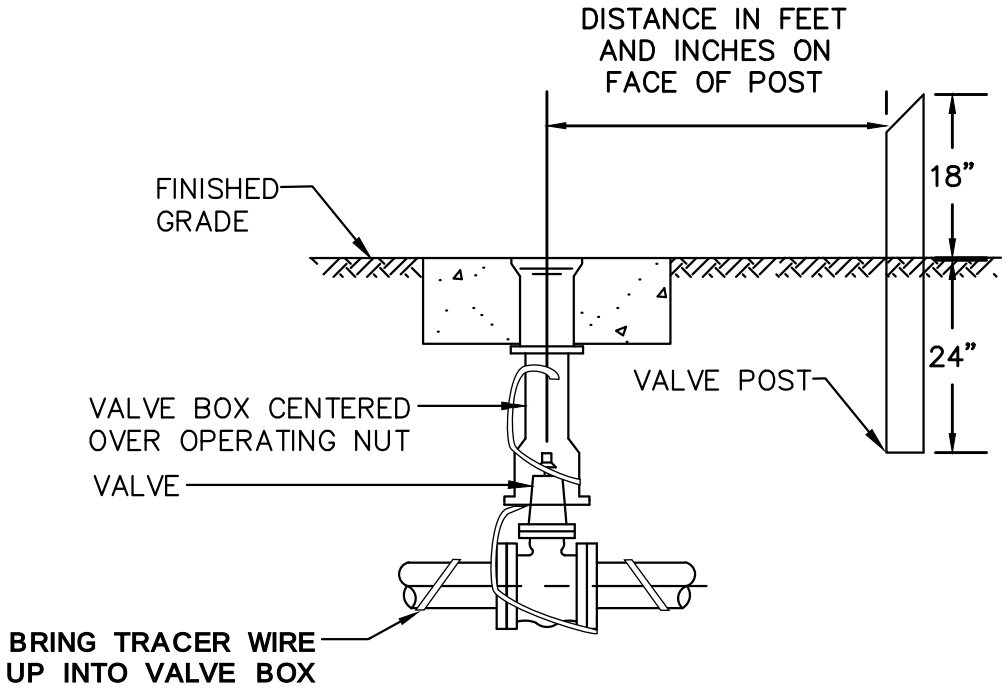
APRIL 2023

STANDARD DETAIL NO.

08



VALVE MARKER POST DIMENSIONS



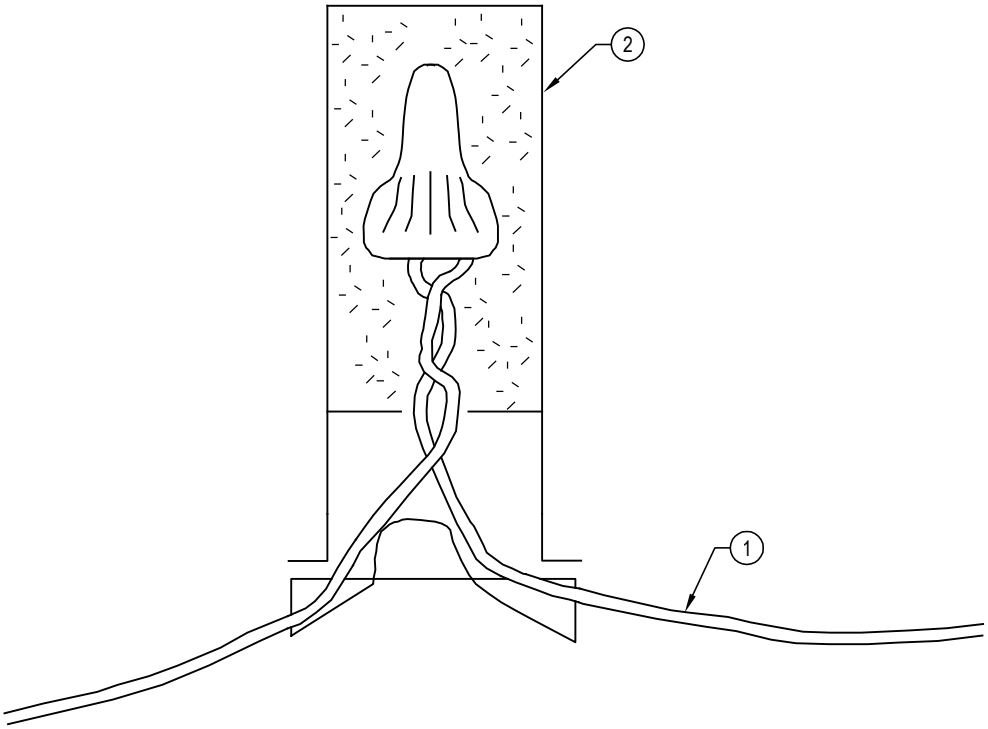
VALLEY WATER DISTRICT

VALVE MARKER POST DETAIL

APRIL 2023

STANDARD DETAIL NO.

09



KEY NOTES

(1) 14 GAUGE SOLID COPPER WIRE.

(2) 3M BRAND DIRECT BURY SPLICE KIT, OR EQUAL.

GENERAL NOTES

1. TRACER WIRE SHALL BE INSTALLED WITH ALL MAIN LINE, BLOW-OFF, AND SERVICE PIPING.
2. TRACER WIRE SHALL BE INSTALLED IN ALL VALVE BOXES; SEE VALVE BOX ADJUSTMENT DETAIL 07.
3. TIE KNOTS IN LOCATE WIRE AT ALL SPLICES TO PREVENT SEPARATION DURING BACKFILL.
4. TAPE TRACER WIRE TO TOP OF MAINLINES AT REGULAR INTERVALS.
5. DO NOT SPLICE SERVICE LINE TRACER WIRE INTO MAIN LINE TRACER WIRE.
6. TIE SERVICE TRACER WIRE AROUND MAIN LINE TRACER WIRE.

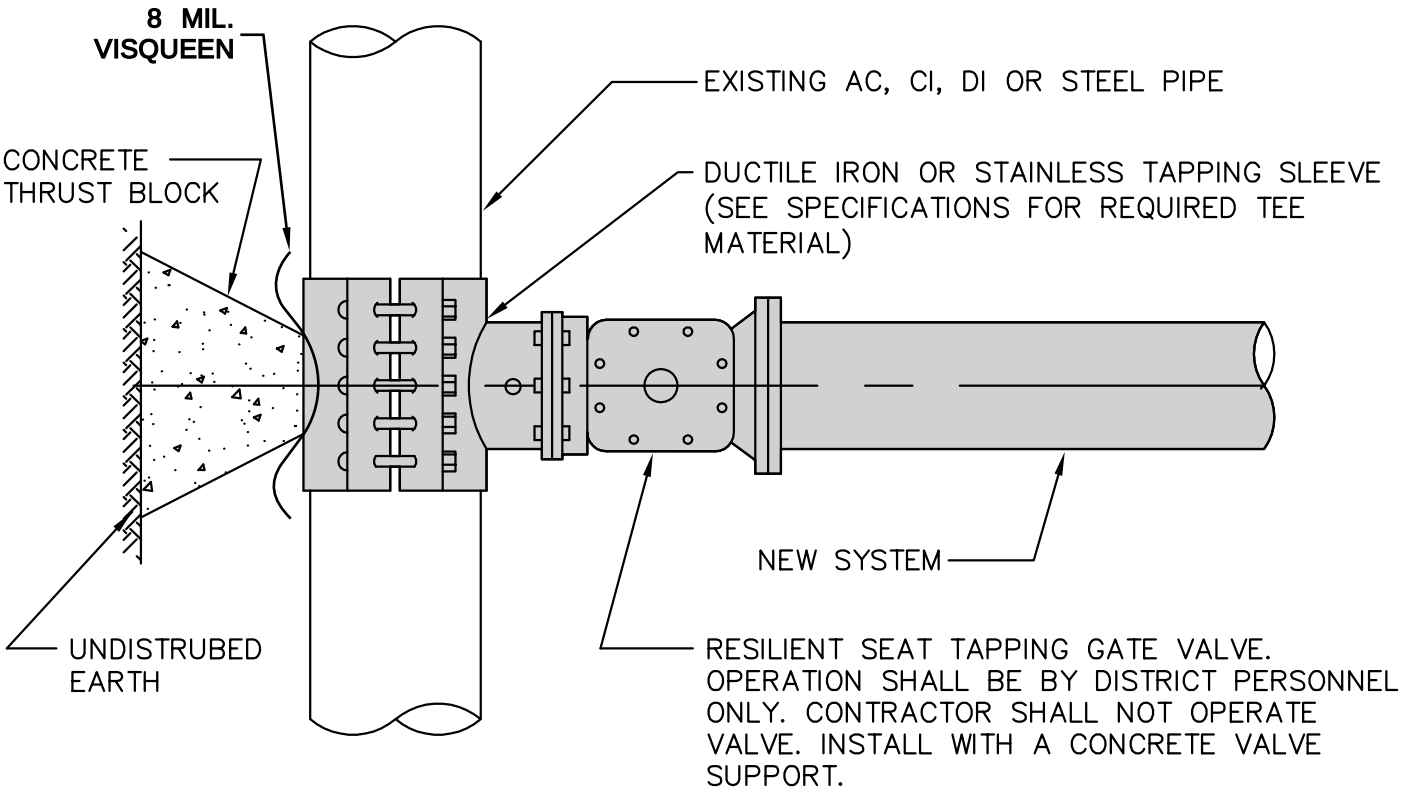
VALLEY WATER DISTRICT

TRACER WIRE AND SPLICE

APRIL 2023

STANDARD DETAIL NO.

10

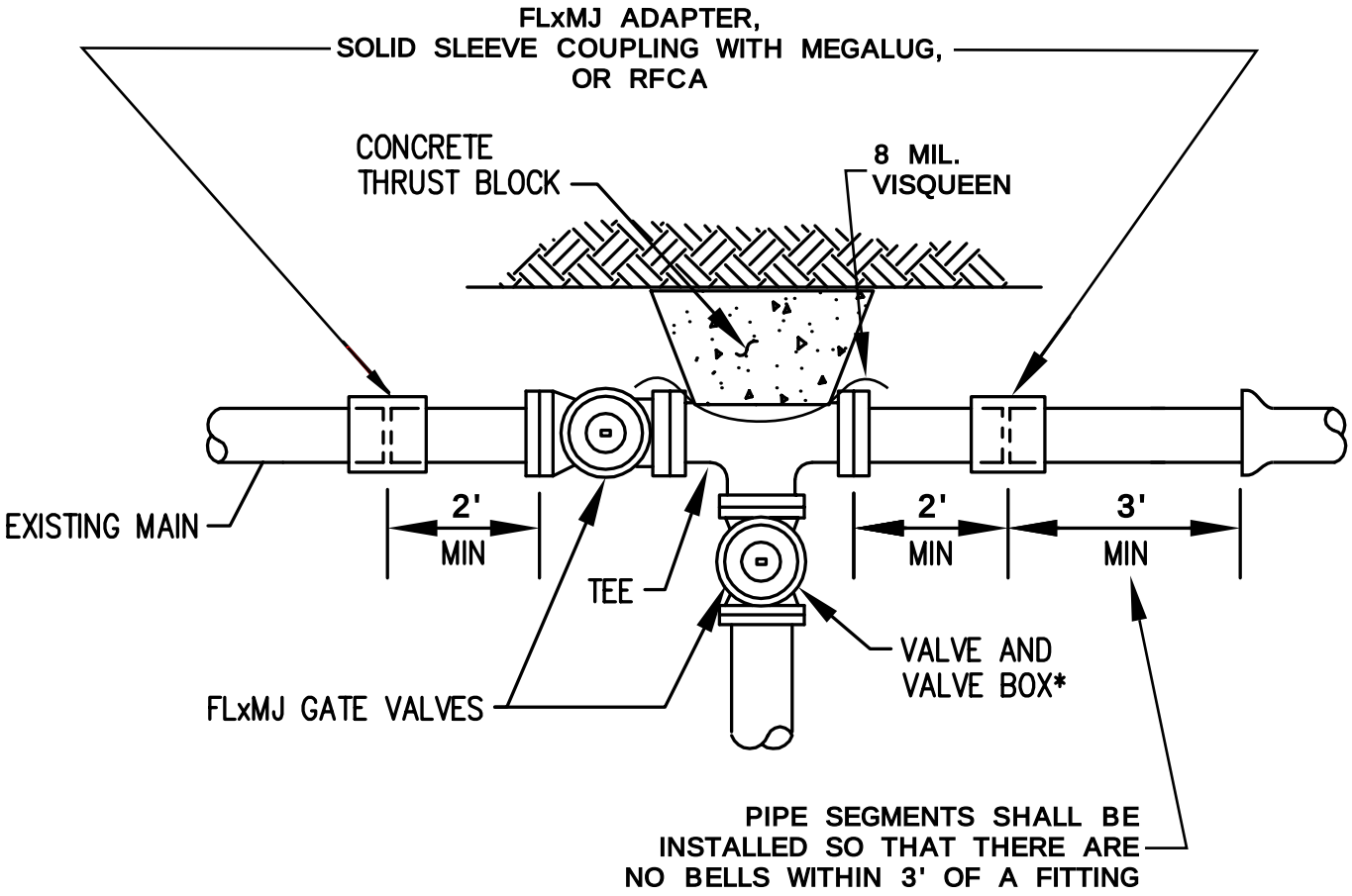


NOTE:

1. O.D. STEEL PIPE SHALL USE S.S. SLEEVE (FUSION COATED)

2. STAINLESS STEEL SLEEVE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY

VALLEY WATER DISTRICT	**WET TAP CONNECTION** APRIL 2023	STANDARD DETAIL NO. **11**



*NOTE:

1. SPLIT MJ CAST IRON SLEEVE FOR A.C. PIPE.
2. DUCTILE IRON SLEEVE FOR DUCTILE IRON AND PLASTIC PIPE.
3. VALVES TO BE CONFIGURED AS SHOWN ON APPROVED PLANS.

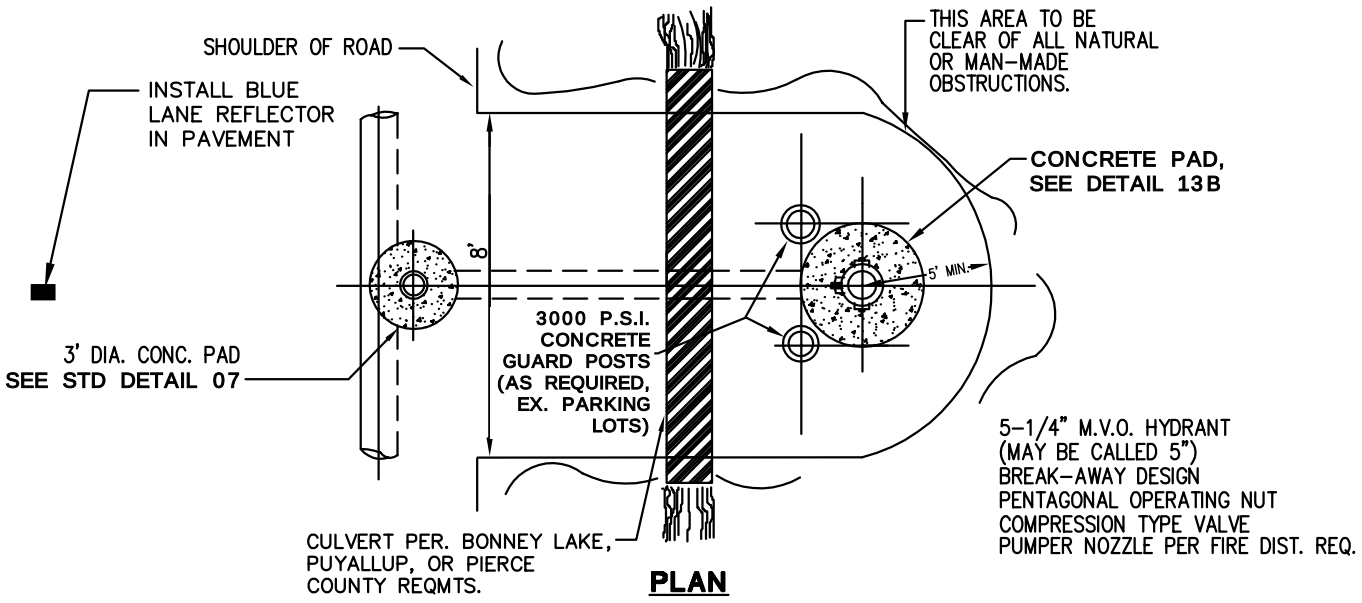
VALLEY WATER DISTRICT

CUT IN CONNECTION

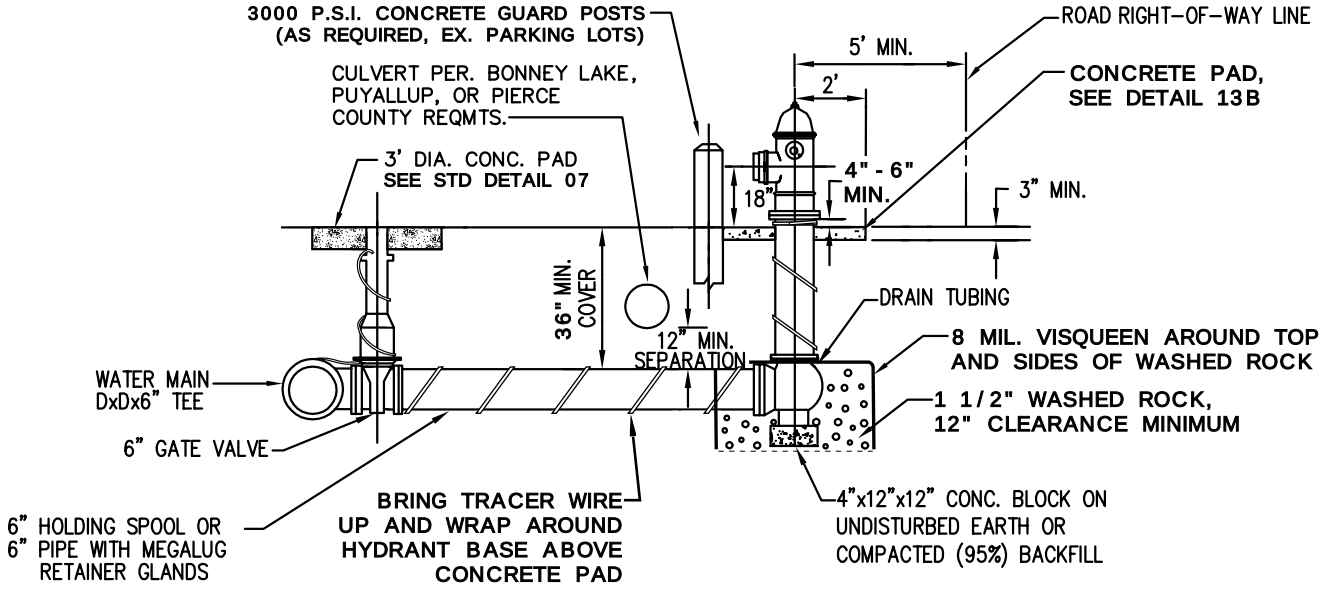
APRIL 2023

STANDARD DETAIL NO.

12



PLAN



ELEVATION

NOTES:

1. USE RESTRAINED JOINTS (MEGALUG RETAINER GLANDS, OR "FIELD LOK" GASKETS) AT ALL JOINTS WITHIN HYDRANT LATERAL.
2. AN OPERATING NUT EXTENSION SHALL BE INSTALLED WHEN THE GROUND SURFACE IS MORE THAN 36" ABOVE THE VALVE OPERATING NUT.
3. HYDRANT SHALL BE PRIME-COATED WITH A RUST-INHIBITIVE PRIMER, AS APPROVED BY THE DISTRICT. TOP COATS SHALL BE ACID AND OIL RESISTANT ENAMEL, AS APPROVED BY THE DISTRICT, **SEE HYDRANT COLOR TABLE, DETAIL 13B.**
4. STENCIL ON FACE OF HYDRANT BARREL WITH 2" CONTRASTING LETTERS, THE DISTANCE FROM THE HYDRANT TO THE GATE VALVE IN FEET, ROUNDED TO THE NEAREST FOOT.
5. FINISH ALL EXPOSED METAL PER SPECIFICATIONS.
6. GUARD POSTS TO BE USED ONLY **IN LOW SPEED ZONES OR WHERE REQUIRED BY THE DISTRICT.**
7. HYDRANT BURY DEPTHS ARE TO CORRESPOND WITH WATERMAIN DEPTH AT ALL HYDRANT INSTALLATION LOCATIONS. DUE TO THE VARYING DEPTH OF WATERMAIN, HYDRANT BURY DEPTHS MAY NEED TO BE ADJUSTED (THERE IS NO STANDARD BURY FOR FIRE HYDRANTS). SUCH HYDRANT BURY ADJUSTMENTS SHALL BE INCIDENTAL TO THE UNIT PRICE BID(S), AND NO REQUESTS FOR ADDITIONAL COMPENSATION WILL BE CONSIDERED.
8. **REPAINT FIRE HYDRANT COLOR AS SPECIFIED PER THE COLOR TABLE, DETAIL 13B.**

VALLEY WATER DISTRICT

FIRE HYDRANT INSTALLATION

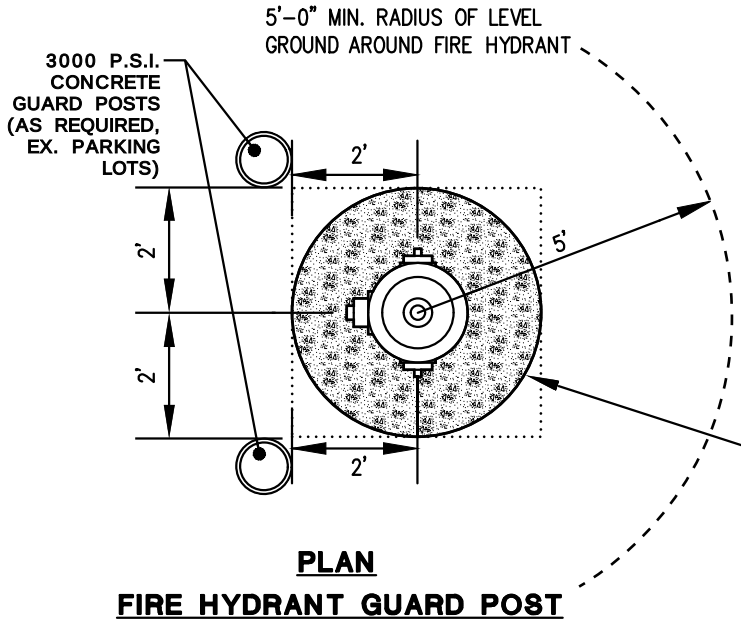
APRIL 2023

STANDARD DETAIL NO.

13A

AHJ = AUTHORITY HAVING JURISDICTION

HYDRANT PORT SIZE TABLE	
AHJ	SIZE
OTHER	5" PUMPER PORT
CITY OF PUYALLUP	4" PUMPER PORT (#8 TACOMA STEAMER PORT THREAD)



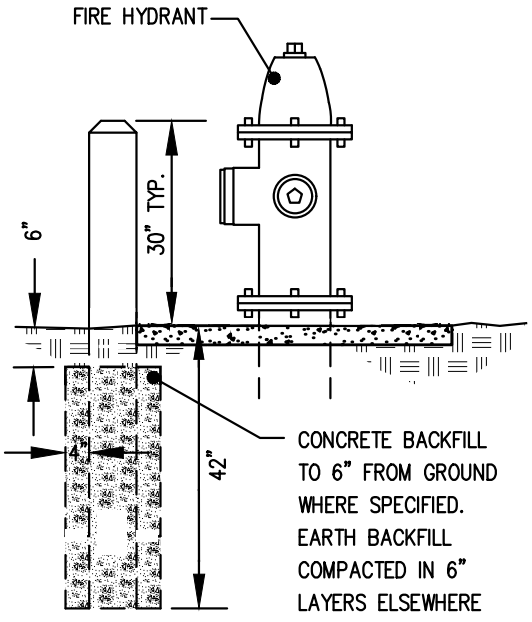
PLAN

FIRE HYDRANT GUARD POST

GUARD POST WILL NOT BE ALLOWED IN THE STREET CLEAR ZONE **UNLESS OTHERWISE APPROVED.**

HYDRANT COLOR TABLE		
ITEMS	AHJ	COLOR
FIRE HYDRANT	CITY OF PUYALLUP	#7543 SAFETY YELLOW
	CITY OF ORTING	#7564 SAFETY RED
	PIERCE COUNTY	#7715 ALUMINUM
	CITY OF BONNEY LAKE	#7792 GLOSS WHITE
HYDRANT LETTERS	ALL	BLACK

NOTE: ALL PAINT SHALL BE RUST-OLEUM PROFESSIONAL OIL-BASED, UNLESS NOTED ABOVE.



ELEVATION

NOTES:

1. GUARD POST SHALL BE 8" DIAMETER X 6' LONG PRECAST CONCRETE POSTS AS PER TECHNICAL SPECIFICATIONS. PAINT WITH 1 COAT PRIMER, AS APPROVED BY THE DISTRICT, AND TWO (2) COATS OF ACID AND OIL RESISTANT ENAMEL, COLOR **RUST-OLEUM #7792 GLOSS WHITE.**
2. PAINT AS SPECIFIED FOR HYDRANT GUARD POST. STENCIL ON FACE OF HYDRANT BARREL WITH 2" CONTRASTING LETTERS, THE DISTANCE FROM THE HYDRANT TO THE GATE VALVE IN FEET (ROUNDED TO THE NEAREST FOOT).

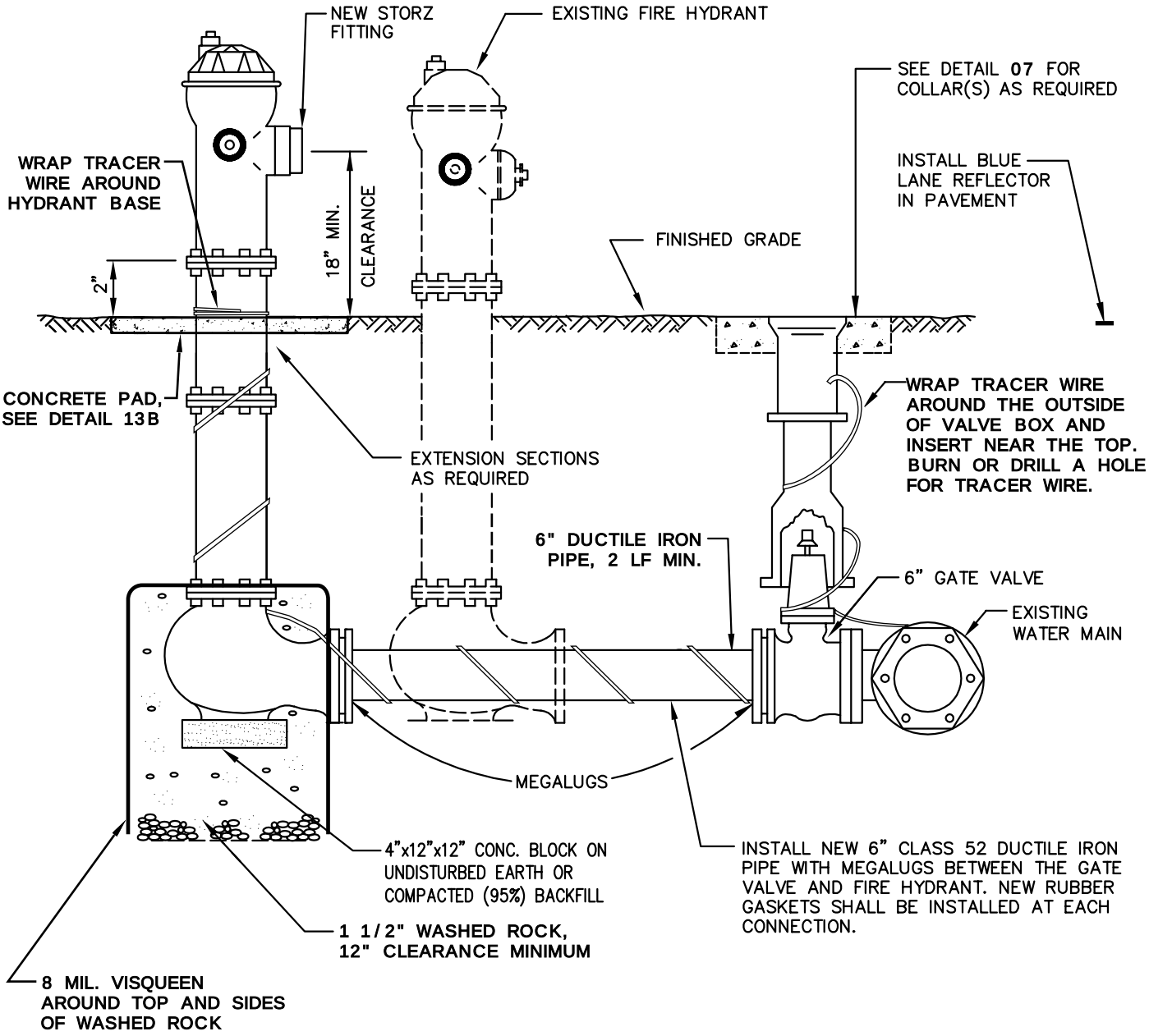
VALLEY WATER DISTRICT

FIRE HYDRANT INSTALLATION

APRIL 2023

STANDARD DETAIL NO.

13B



NOTES:

1. **ALL FIRE HYDRANTS SHALL HAVE PUMPER PORTS WITH STORZ ADAPTORS (PROVIDED BY DEVELOPER/CONTRACTOR). SEE THE HYDRANT PORT SIZE TABLE ON DETAIL 13B.**
2. PROVIDE 15' OF 12" (MIN.) STORM PIPE IN ANY ADJACENT DITCH SECTION. RIP–RAP ENDS AND FILL ABANDONED DITCH SECTION
3. PROVIDE MIN. 5' – 0" CLEARANCE AND LEVEL AREA AROUND RELOCATED HYDRANT
4. **REPAINT FIRE HYDRANT COLOR AS SPECIFIED PER THE COLOR TABLE ON DETAIL 13B.**

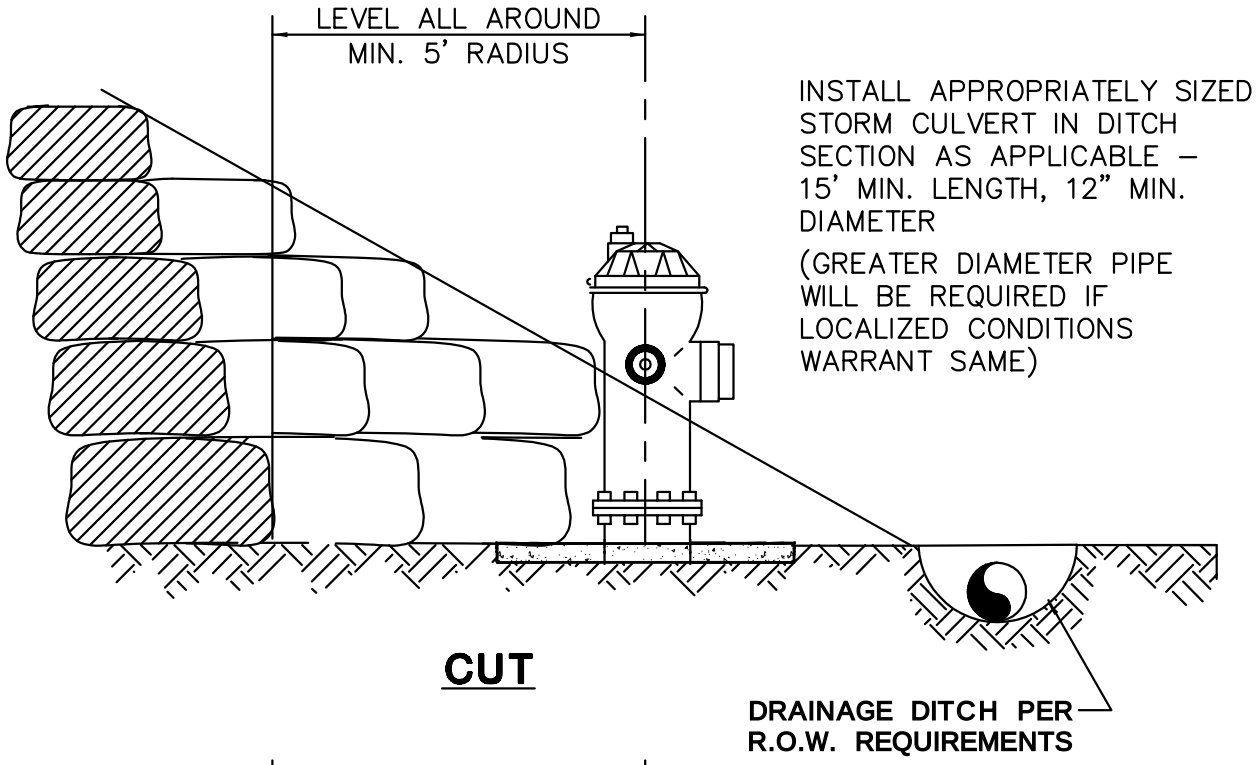
VALLEY WATER DISTRICT

FIRE HYDRANT RELOCATION

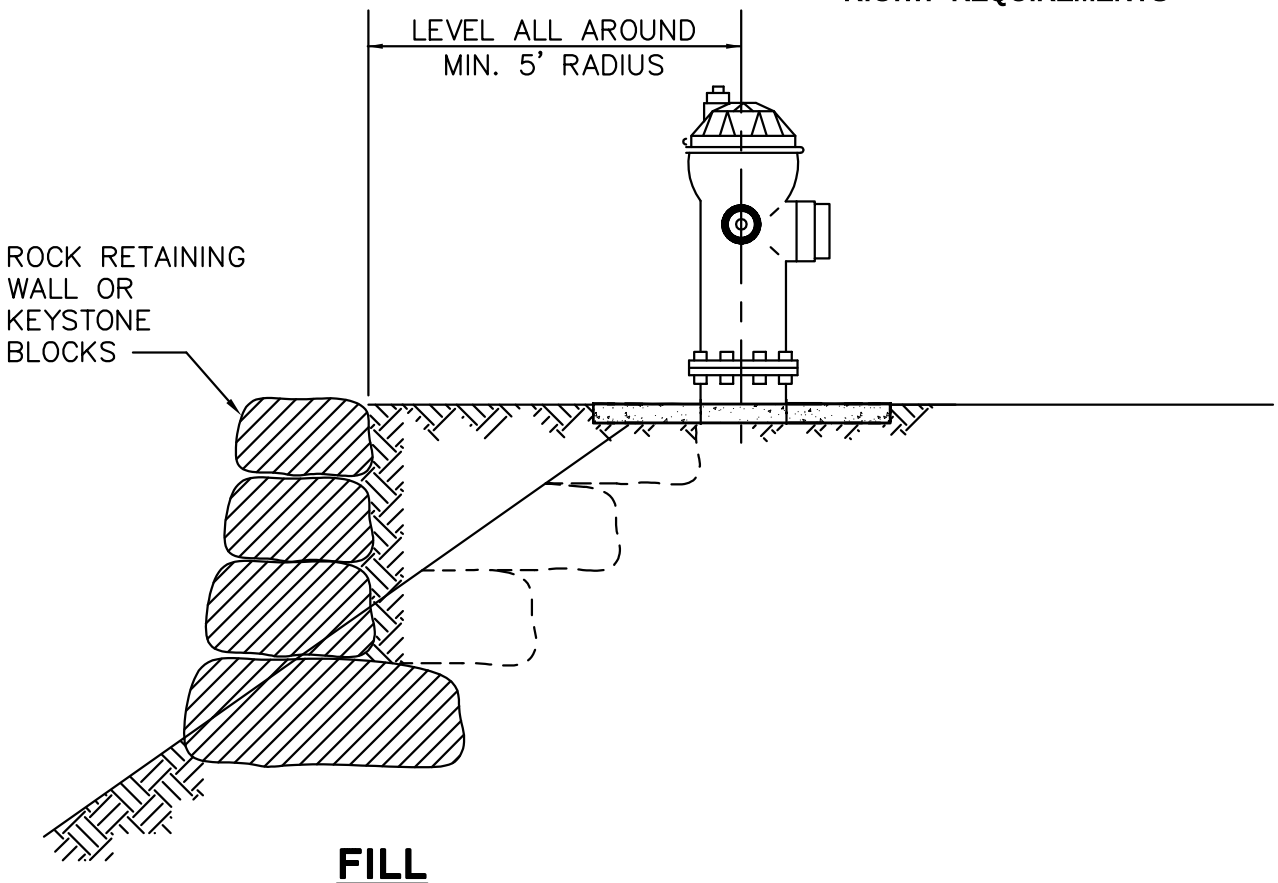
APRIL 2023

STANDARD DETAIL NO.

14

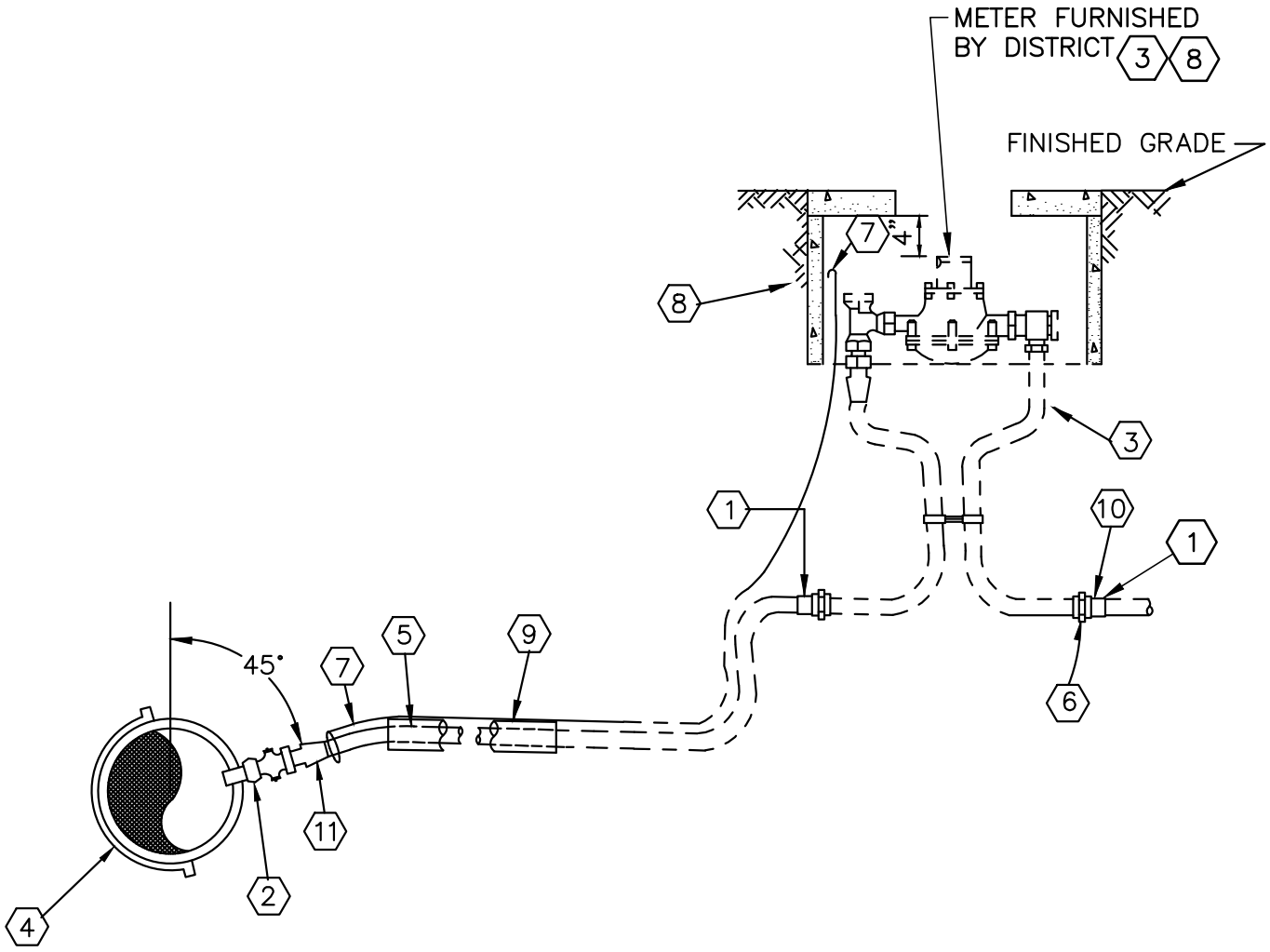


CUT



FILL

VALLEY WATER DISTRICT	**FIRE HYDRANT LOCATION IN CUT OR FILL** APRIL 2023	STANDARD DETAIL NO. **15**



NOTES:

1. **SET BOTTOM OF METER BOX AT TOP OF INLET AND OUTLET OF METER.**
2. **DCVA SHALL BE INSTALLED DOWNSTREAM OF METER IF SERVICE SUPPORTS A DEDICATED FIRE SPRINKLER SYSTEM.**

VALLEY WATER DISTRICT

1" & SMALLER WATER SERVICE

APRIL 2023

STANDARD DETAIL NO.

16A

LEGEND

(1) FOR 5/8"x3/4" METER:
FORD C86–34–G–NL (3/4" MIP X 1" PJ OR 1" GRIP FOR POLY)

FOR 1" METER:
FORD C86–44–G–NL (1" MIP X 1" PJ OR 1" GRIP FOR POLY)

(2) 1" MIP X MIP JOINT CORP STOP EQUAL TO FORD FB500–4–NL

(3) FOR 5/8"x3/4" METER:
FORD COPPER SETTER **VBH72 - 12W - 11 - 33 - NL (W/ GASKETS), OR APPROVED EQUAL**

FOR 1" METER:
FORD COPPER SETTER **VBH74 - 12W - 11 - 44 - NL (W/ GASKETS), OR APPROVED EQUAL**

(4) ROMAC DOUBLE STRAP SADDLE, **202S OR APPROVED EQUAL**

(5) 1" HIGH MOLECULAR (200 PSI, SDR 7) "POLY" PIPE (LENGTH AS REQUIRED)

(6) FOR 5/8"x3/4" METER:
3/4" FIP BRASS UNION (PART OF SETTER) **UNION - 3 - NL**

FOR 1" METER:
1" FIP BRASS UNION (PART OF SETTER) **UNION - 4 - NL**

(7) 14 GUAGE WIRE FROM MAINLINE TAP TO METER BOX AND EXPOSE 6" MINIMUM IN BOX (RUN INSIDE 2" PVC GUARD CONDUIT WHERE APPLICABLE)
TRACER WIRE SHALL BE SOLID COPPER.

(8)* **SIGMA - RAVEN: RMB - 13 - 24 - 12 METER BOX AND**
SIGMA - RAVEN: RML - DI - 13"x24"(DUCTILE IRON) READER LID WITHOUT AMR RECESS
MARKED "WATER METER".

(9) INSTALL SERVICE LINE IN 2" PVC GUARD PIPE (SCH–**40**) WHEN CROSSING ROADWAY (3' MINIMUM BEYOND AND BENEATH PAVEMENT SECTION)

(10) PROVIDE APPROVED WATERTIGHT PLUG UNTIL CONNECTION TO PRIVATE SYSTEM IS MADE.

(11) FIPxPEP FITTING

*** USE OLYMPIC FOUNDRY SM29 (DUCTILE IRON) FOR HIGH - TRAFFIC / PAVED AREAS**

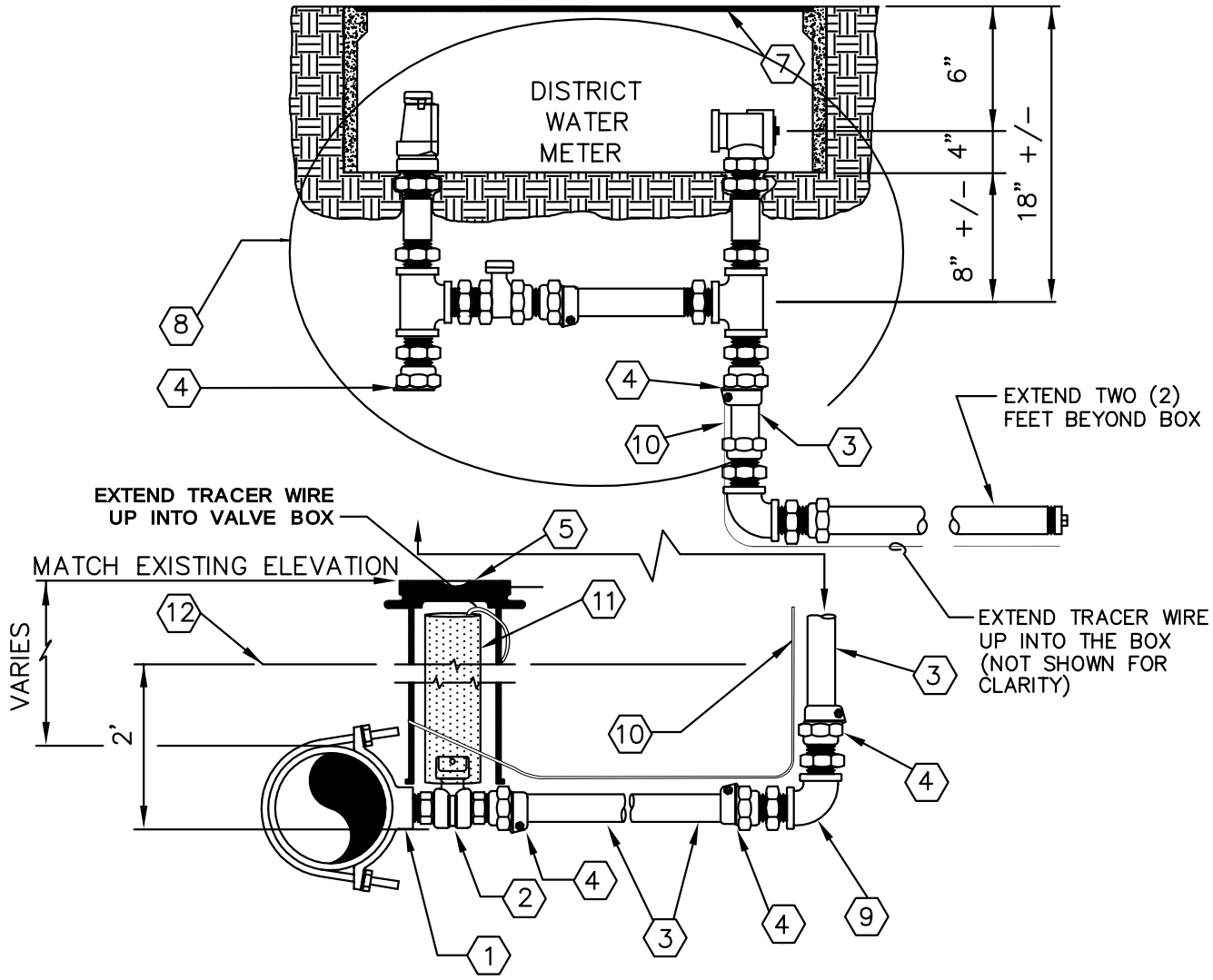
VALLEY WATER DISTRICT

1" & SMALLER WATER SERVICE

APRIL 2023

STANDARD DETAIL NO.

16B



DESCRIPTION	MAKER OR RATING	1–1/2"	2"
1. DOUBLE STRAP SADDLE	ROMAC, FORD OR MUELLER	202 IPT	202 IPT
2. GATE OR BALL VALVE W/ 2" OPERATING NUT	FORD OR MUELLER	BALL VALVE B11–666 W/QT67	RESILIENT SEAT GATE
3. PIPE – HIGH MOLECULAR POLYETHYLENE PIPE (I.P.S.)	SDR7(200PSI)		
4. COUPLING MALE	FORD OR MUELLER	C84–66	C84–77
5. VALVE BOX	**STYLE NO. 940**		
6. NIPPLE BRASS		1–1/2" X 6"	2" X 6"
7. METER BOX	**FOG - TITE / OLYMPIC**	**NO. 2 / SM30**	**NO. 2 / SM30**
8. METER SETTER	FORD OR MUELLER	VBH 86–12 B 11–66	VBH 87–12 B 11–77
9. BRASS 90° ELBOW		1–1/2"	2"
10. TRACER WIRE	14 GAUGE COPPER WIRE	SOLID	SOLID
11. PVC SLEEVE BENEATH PAVEMENT	PVC–SCH.80	4" DIA.	4" DIA.
12. DETECTABLE MARKER TAPE	PE, BLUE	3" MIN. WIDTH	3" MIN. WIDTH

NOTE: **CONTACT VWD FOR SPECIFIC METER DIMENSIONS PRIOR TO ADJUSTING SETTERS.**

VALLEY WATER DISTRICT

1-1/2" & 2" WATER SERVICE

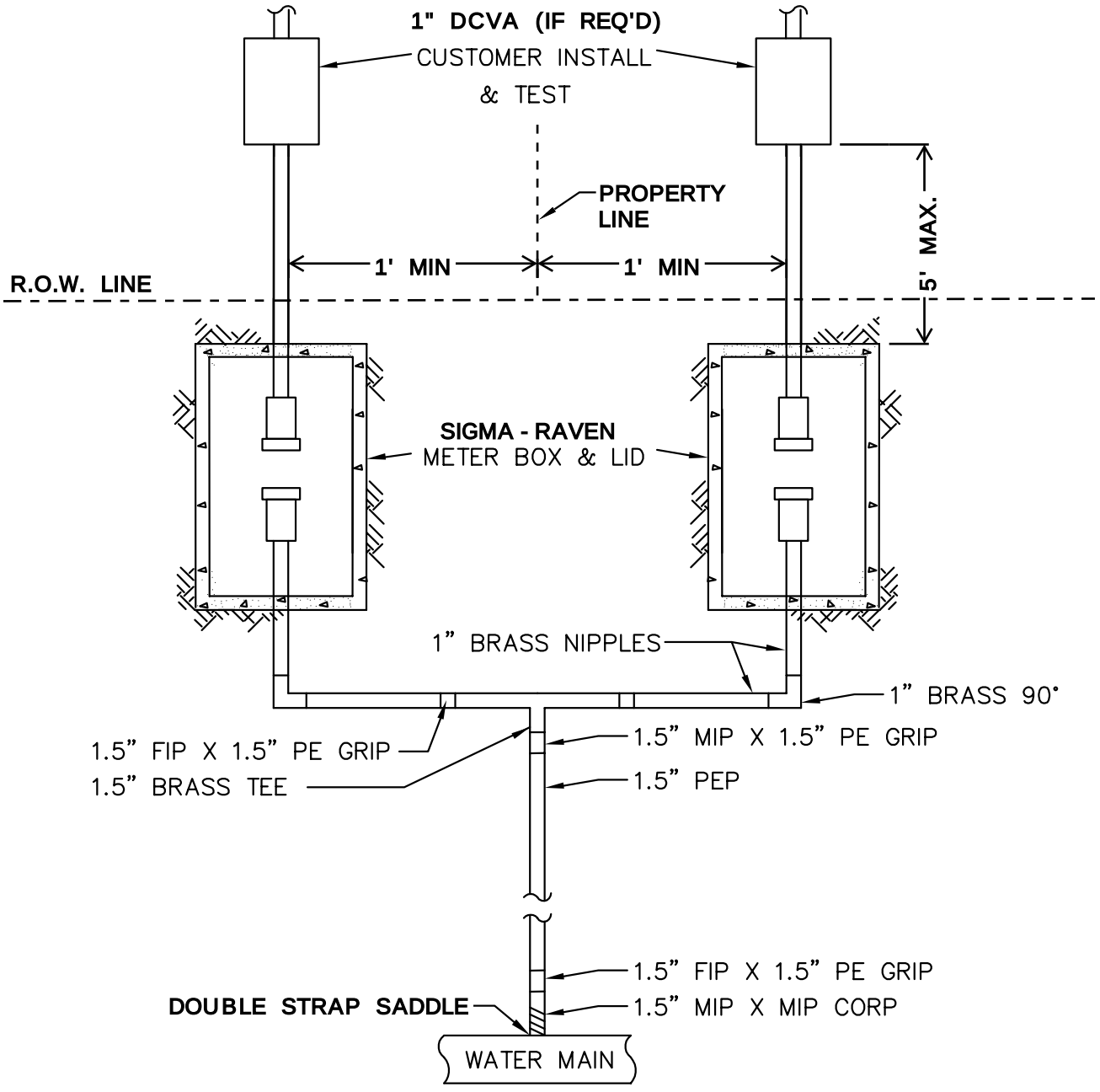
APRIL 2023

STANDARD DETAIL NO.

17

NOTES:

1. **DOUBLE RESIDENTIAL SERVICE ONLY TO BE USED WHEN APPROVED BY THE DISTRICT.**
2. **TRACER WIRE IS REQUIRED, BUT NOT SHOWN BELOW FOR CLARITY.**



PLAN VIEW

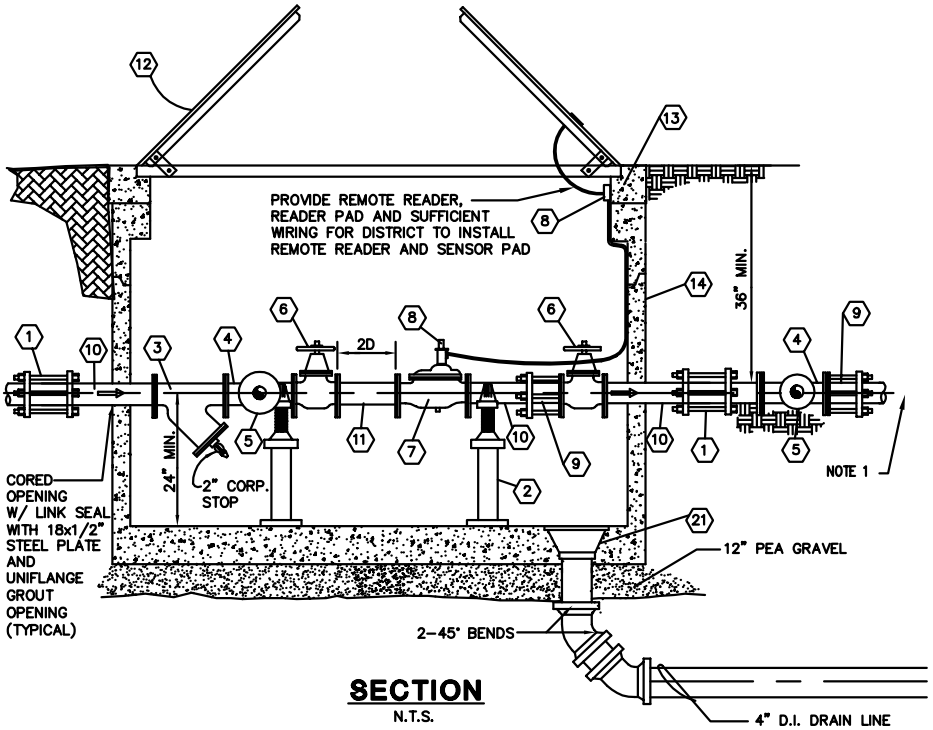
VALLEY WATER DISTRICT

DOUBLE RESIDENTIAL SERVICE

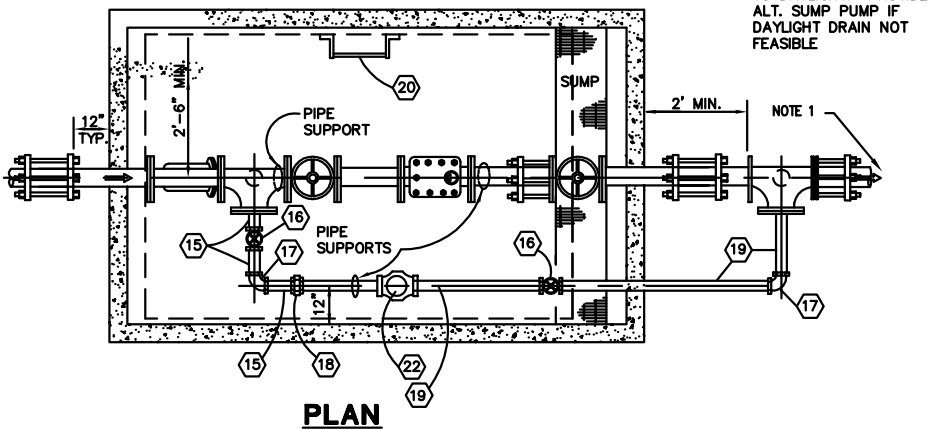
APRIL 2023

STANDARD DETAIL NO.

18



SECTION
N.T.S.



PLAN
N.T.S.

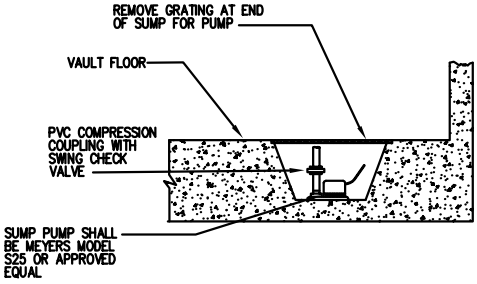
MATERIAL LIST FOR 3" AND LARGER ASSEMBLIES	
ITEM	DESCRIPTION
1	DI SLEEVE OR APPROVED EQUAL
2	ADJUSTABLE PIPE SUPPORTS, STANDON S92 IN 304 S.S.
3	STRAINER, ZURN FSC D.I. "Y" OR CLA-VAL X43H
4	TEE, FLANGE BY FLANGE
5	BLIND FLANGE, TAPPED FOR BY-PASS LINE
6	R.S. GATE VALVE, FLANGE BY FLANGE W/HANDWHEEL
7	WATER METER, SENSUS OR APPROVED EQUAL
8	SELF GENERATING REMOTE READOUT, SENSUS OR APPROVED EQUAL
9	COUPLING ADAPTER, FLxMJ
10	DUCTILE IRON PIPE, PLAIN END BY FLANGE
11	DUCTILE IRON PIPE, FLANGE BY FLANGE
12	48"x72" ALUMINUM HATCH, LW PRODUCTS COMPANY, RATED FOR H-20 LOADING
13	6" EXTENSION RING
14	PRECAST VAULT, UTILITY VAULT CO. (SEE BELOW FOR CALL OUTS)
15	2" BRASS NIPPLE, THREADED, LENGTH AS REQUIRED
16	2" CI RS GATE VALVE, SCREWED END W/ HANDWHEEL
17	2" BRASS 90° ELBOW
18	BRASS UNION
19	2" BRASS PIPE, LENGTH AS REQUIRED
20	FREE STANDING ALUMINUM LADDER WITH LADDER UP ACCESSORY ATTACHED TO SIDE OF HATCH AND FLOOR
21	4" FLOOR DRAIN, ZURN NO. 551 W/GRATING ON INLET
22	2" BYPASS METER

NOTES:

1. FOR PREMISE ISOLATION, INSTALL AN APPROVED BACKFLOW PREVENTION DEVICE IN ACCORDANCE WITH DEPT. OF HEALTH REGULATIONS.
2. ALL PIPE AND FITTINGS TO BE DUCTILE OR CAST IRON.
3. ALL TEST COCKS SHALL BE PLUGGED.
4. ALL VAULT PENETRATIONS SHALL BE CORED, WITH LINK-SEAL OR APPROVED EQUAL INSTALLED AROUND PIPE.
5. EXTERIOR VAULT TO BE COATED WITH 2 COATS OF BLACK BITUMASTIC SOLUTION. VAULT TO BE DRY PRIOR TO APPLICATION.
6. VAULTS TO BE SOLID WALL WITH NO KNOCKOUTS
7. IF SUMP PUMP IS REQUIRED, DEVELOPER SHALL SUPPLY POWER TO THE VAULT IN CONFORMANCE WITH ALL LOCAL AND STATE CODES.
8. ALL CONSTRUCTION SHALL CONFORM TO THE VALLEY WATER DISTRICT STANDARD SPECIFICATIONS.
9. METER AND METER PERMIT SHALL BE PURCHASED AND OBTAINED FROM VALLEY WATER DISTRICT.
10. LID DRAINS SHALL BE INCORPORATED INTO THE HATCH FRAME.

	METER VAULT REQUIREMENTS			
METER SIZE	MAINLINE	BY-PASS	METER VAULT (UTILITY VAULT)	METER TYPE
3"	3" D.I.	2"	687-LA	TURBINE W/GEN. REMOTE
4"	4" D.I.	2"	5106-LA	TURBINE W/GEN. REMOTE
6"	6" D.I.	3"	612-LA	DISTRICT DISCRETION

NOTE: ALL VAULTS SHALL BE SOLID WALL (NO KNOCKOUTS)



SUMP AND SUMP PUMP NOTES:

1. SUMP PUMP MAY BE SUBSTITUTED FOR FLOOR DRAIN IF DRAIN LINE CANNOT BE DAYLIGHTED. DETERMINATION TO BE MADE BY DISTRICT.
2. PROVIDE RECESSED DOOR HANDLE BOX IN ACCESS HATCH FOR PADLOCK W/BOLT-DOWN COVER OVER LOCK, BOX LARGE ENOUGH FOR "MASTER LOCK".

SUMP PUMP DETAIL
NO SCALE

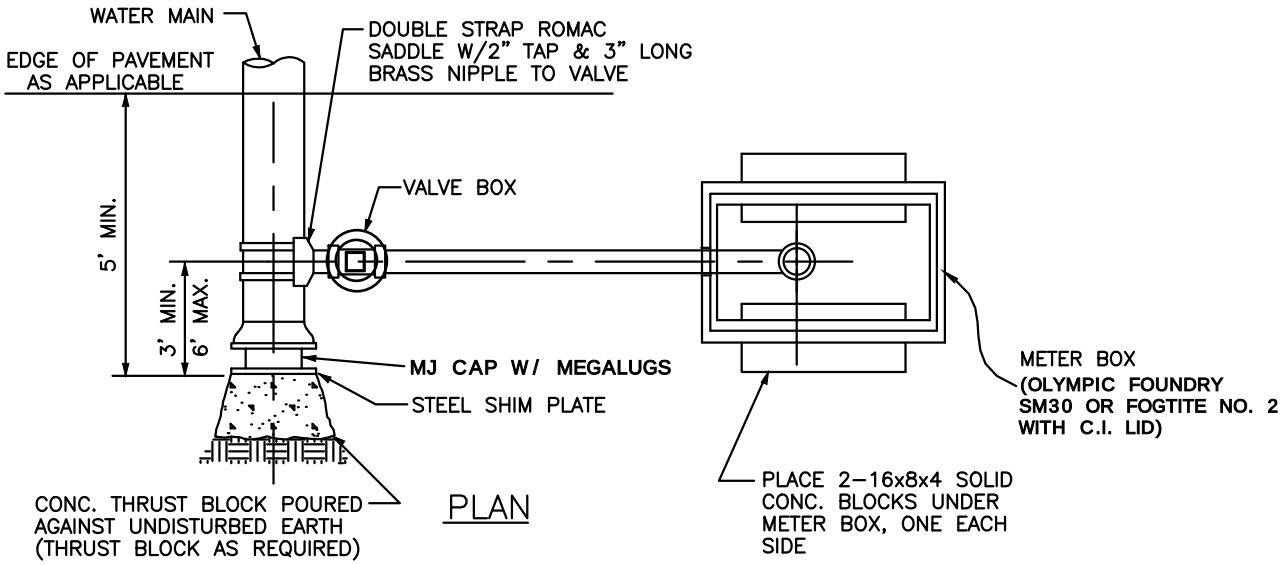
VALLEY WATER DISTRICT

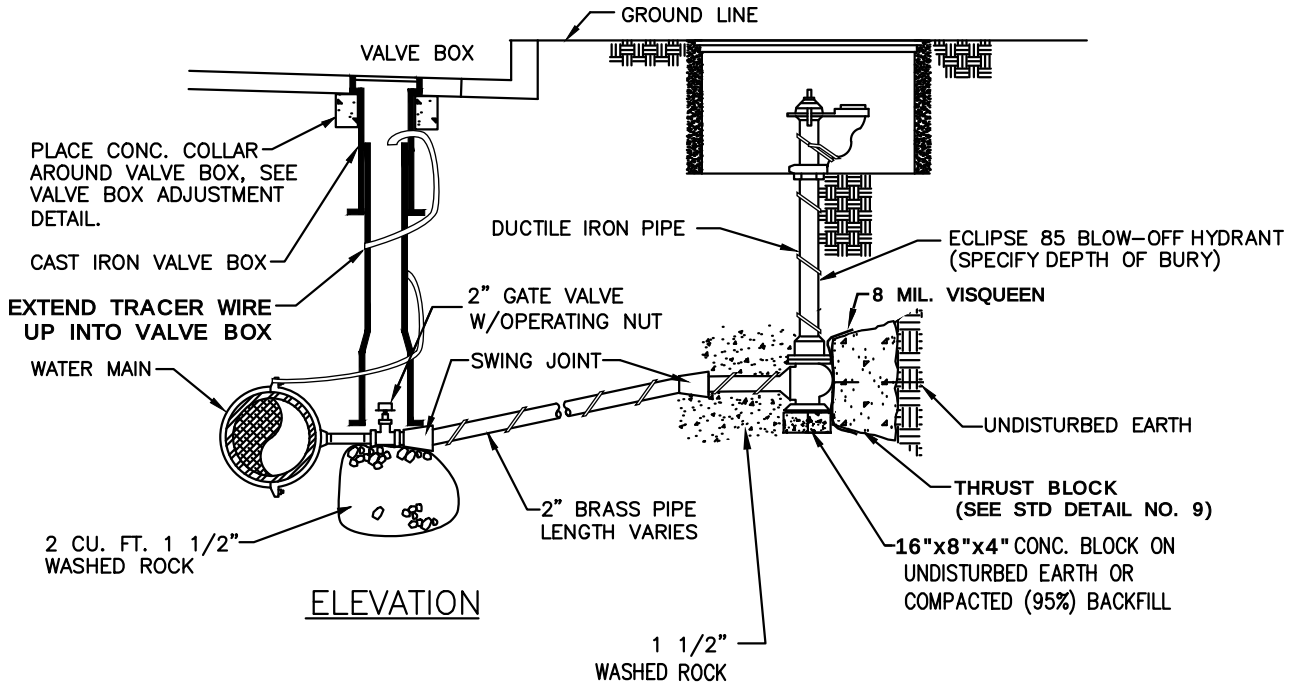
METER & METER VAULT ASSEMBLY 3" THROUGH 10"

APRIL 2023

STANDARD DETAIL NO.

19





NOTES:

1. BLOW-OFF HYDRANTS SHALL BE NON-FREEZING, SELF-DRAINING TYPE.
2. SET UNDERGROUND IN DISTRICT APPROVED METER BOX, THESE HYDRANTS SHALL BE FURNISHED WITH A 2" FIP INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN TO THE DESIGN, AND BE SERVICEABLE FROM ABOVE GRADE WITH NO DIGGING.
3. THE OUTLET SHALL BE BRONZE AND BE 2-1/2" NST.
4. THESE HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE.

   (SPECIFY OVERALL LENGTH 6" SHORTER THAN NORMAL DEPTH OF BURY. MINIMUM OPENING IN METER BOX SHALL BE 10".)
5. **INSTALL VALVE MARKER POST FOR 2" GATE VALVES WITHIN UNIMPROVED AREAS.**

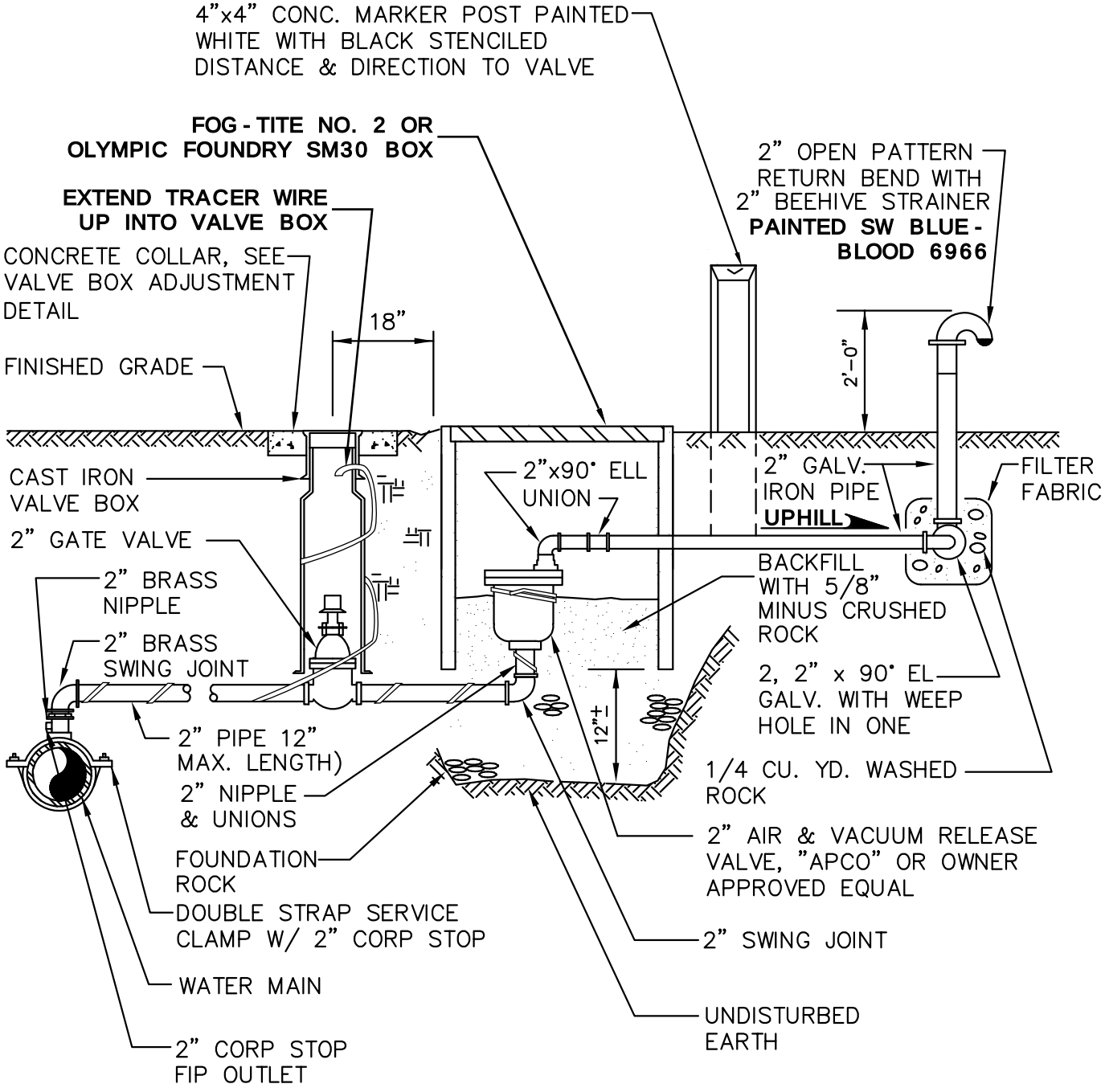
VALLEY WATER DISTRICT

2" BLOW-OFF ASSEMBLY

APRIL 2023

STANDARD DETAIL NO.

20



NOTES:

1. **GATE VALVE: AWWA RESILIENT SEAL, THRDxTHRD WITH OPERATING NUT.**
2. **ALL PIPING BETWEEN DOUBLE STRAP SADDLE AND INLET SIDE OF COMBINATION AIR & VACUUM RELEASE ASSEMBLY SHALL BE BRASS.**
3. **TAP MAIN AT SYSTEM HIGH POINT. LOCATION TO BE APPROVED BY THE DISTRICT.**

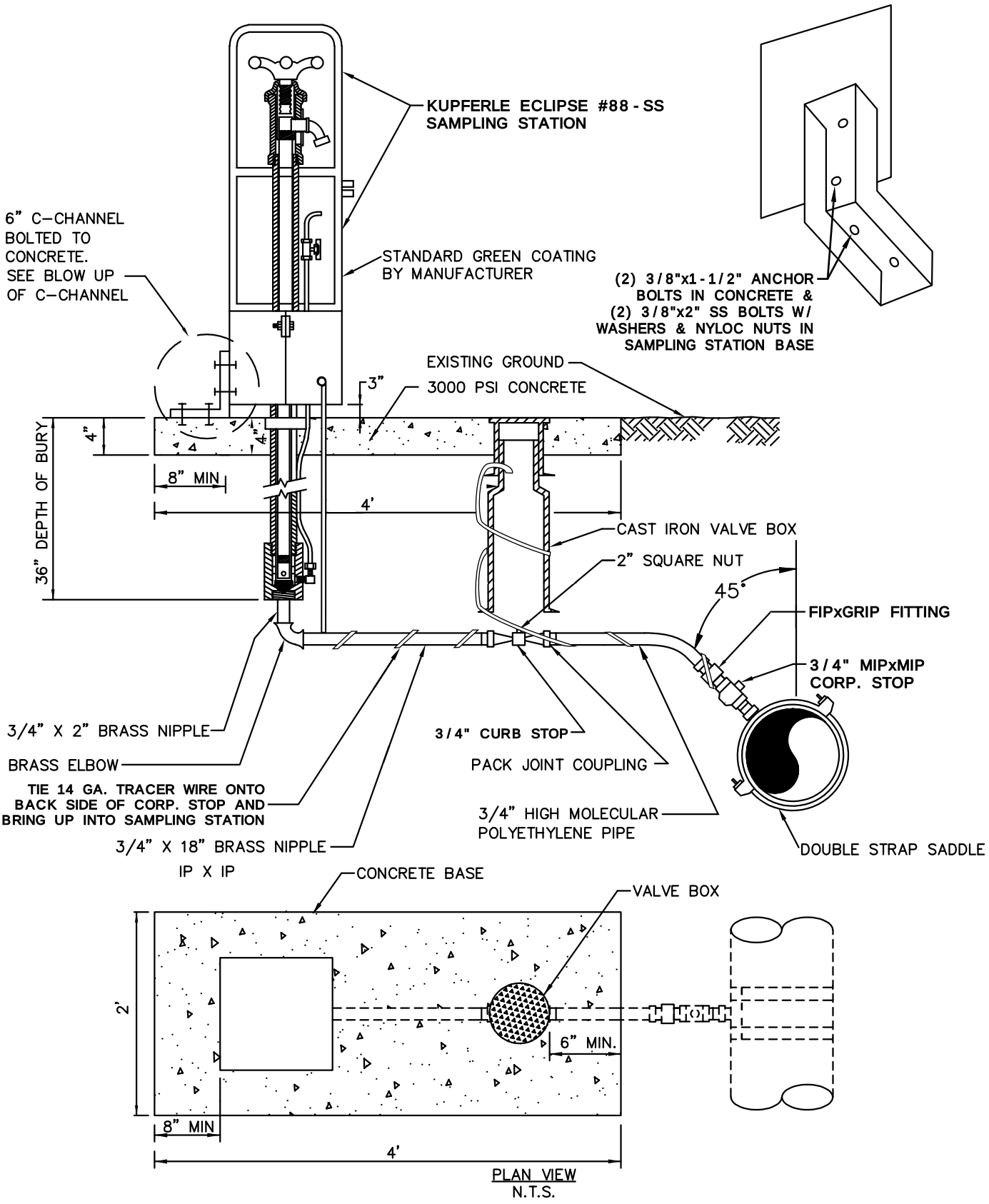
VALLEY WATER DISTRICT

AIR & VACUUM RELEASE ASSEMBLY

APRIL 2023

STANDARD DETAIL NO.

21



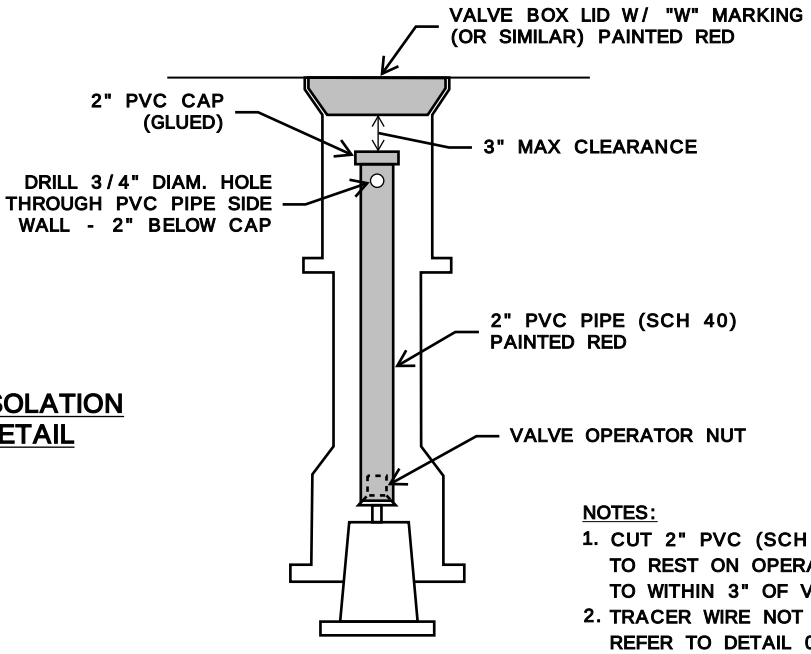
VALLEY WATER DISTRICT

WATER SAMPLING STATION

APRIL 2023

STANDARD DETAIL NO.

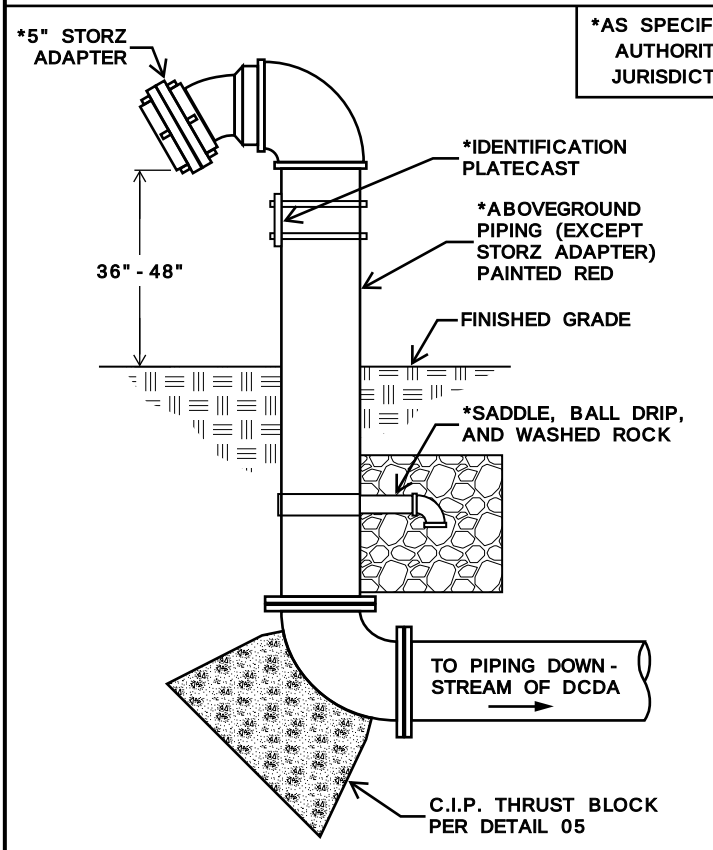
22



FIRE LINE ISOLATION VALVE DETAIL

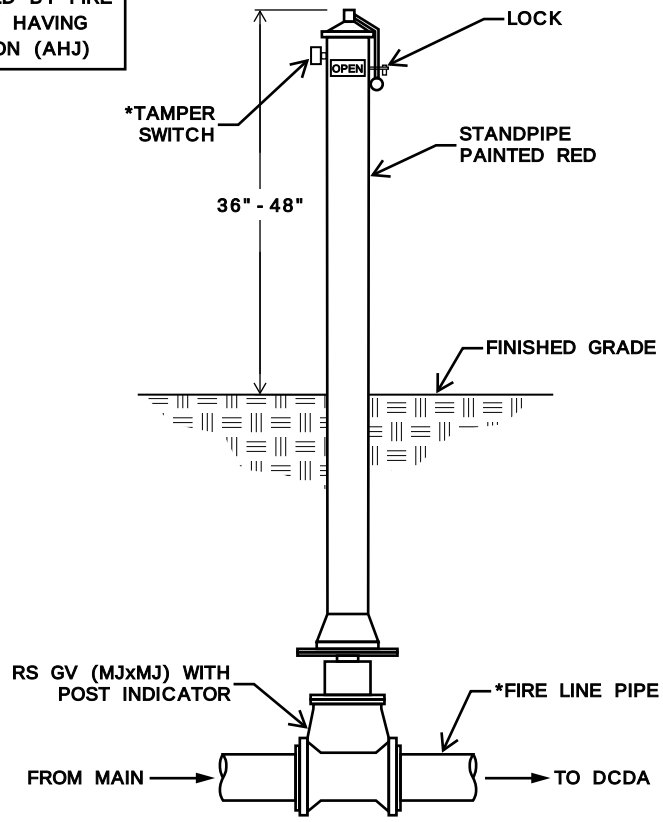
NOTES:
1. CUT 2" PVC (SCH 40) PIPE TO LENGTH TO REST ON OPERATOR NUT AND EXTEND TO WITHIN 3" OF VALVE BOX LID.
2. TRACER WIRE NOT SHOWN FOR CLARITY. REFER TO DETAIL 07.

*AS SPECIFIED BY FIRE AUTHORITY HAVING JURISDICTION (AHJ)



NOTES:
1. FIRE DEPARTMENT CONNECTION (FDC) PIPE SIZE & MATERIAL TO BE DETERMINED BY DEVELOPER'S/CONTRACTOR'S LEVEL III CERTIFIED DESIGNER OR PROFESSIONAL ENGINEER.
2. MIN./MAX. DISTANCE TO BUILDING IT SERVES AND NEAREAST HYDRANT SHALL BE AS SPECIFIED BY AHJ.

FDC DETAIL



NOTES:
1. POST INDICATOR VALVE (PIV) REQUIREMENTS TO BE DETERMINED BY DEVELOPER'S/CONTRACTOR'S LEVEL III CERTIFIED DESIGNER OR PROFESSIONAL ENGINEER.
2. MIN./MAX. DISTANCE TO BUILDING IT SERVES SHALL BE AS SPECIFIED BY AHJ.

PIV DETAIL

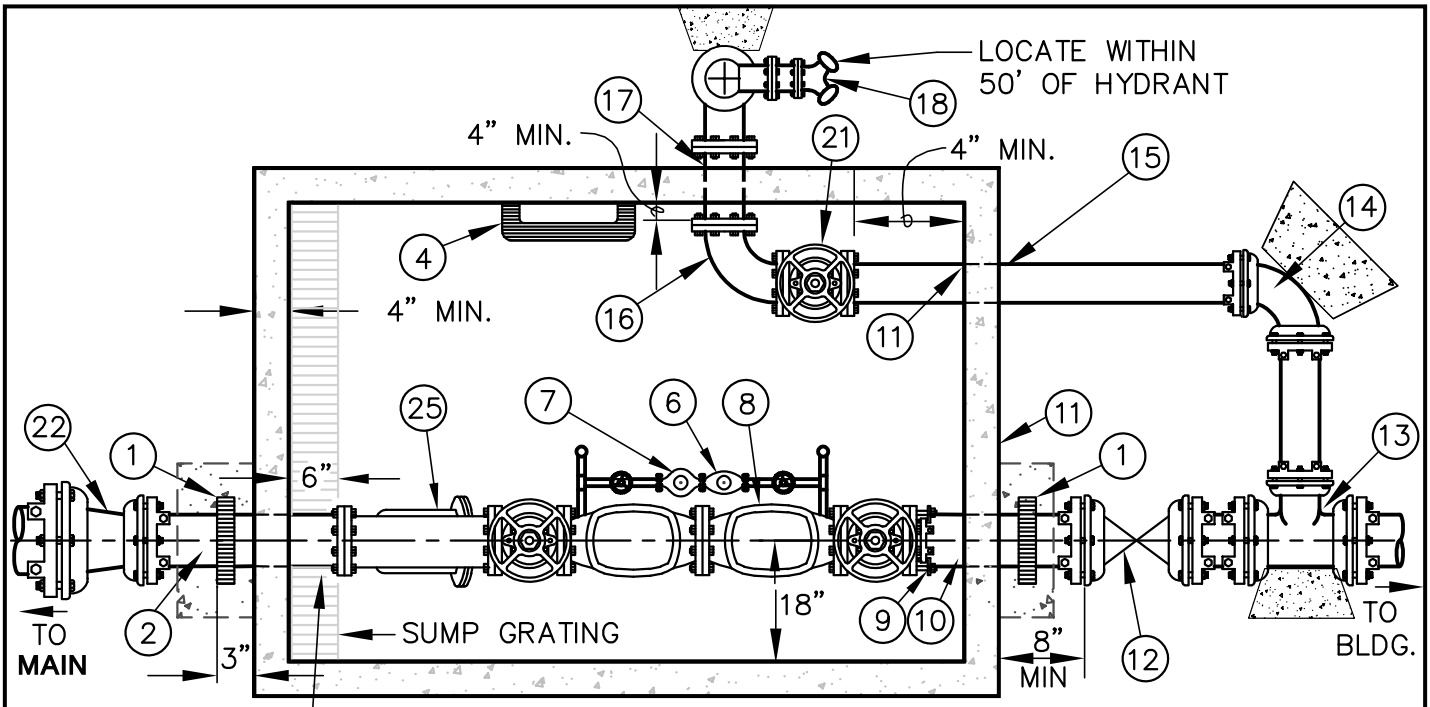
VALLEY WATER DISTRICT

FIRE LINE APPURTENANCES

APRIL 2023

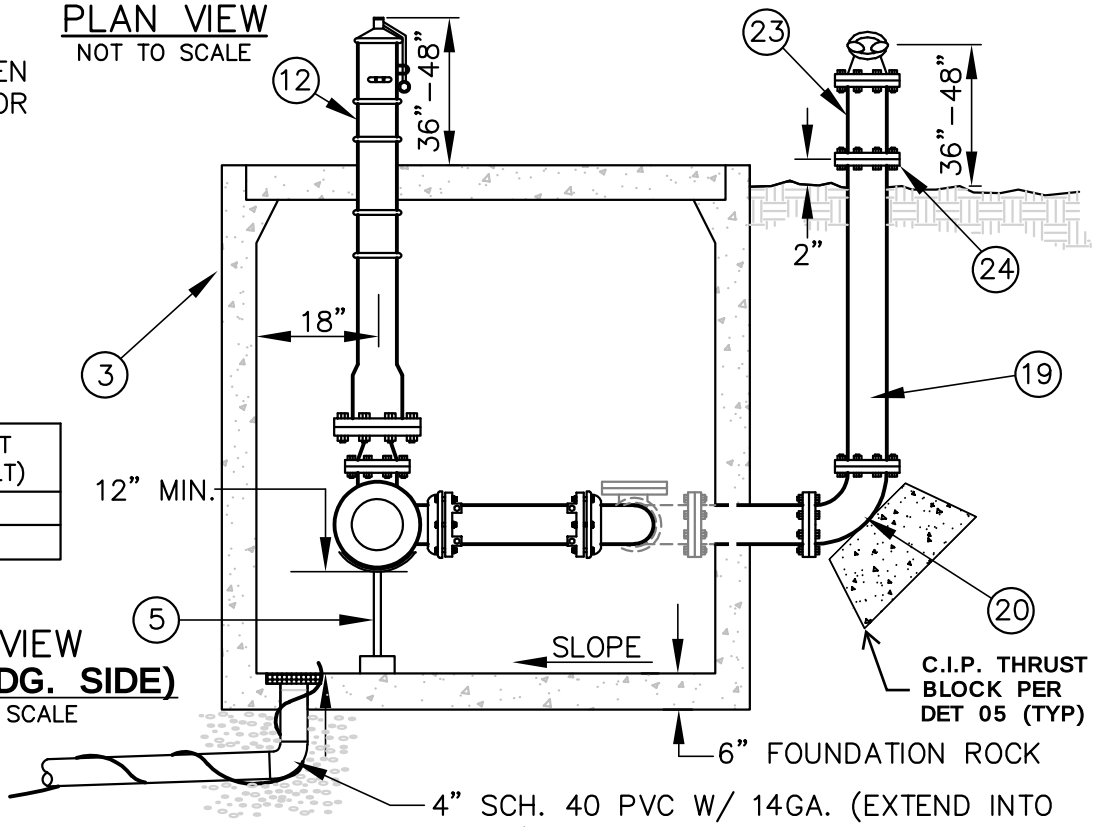
STANDARD DETAIL NO.

23



PLAN VIEW
NOT TO SCALE

MAINTAIN 6" MIN. SEPARATION BETWEEN VAULT WALL INTERIOR AND BOLTS ON FITTINGS



DCDA SIZE	METER VAULT (UTILITY VAULT)
4"	5106–LA
6"–10"	612–LA

END VIEW
(FROM BLDG. SIDE)
NOT TO SCALE

NOTES:

1. DESIGN FOR 4" THRU 10" DOUBLE CHECK DETECTOR **ASSEMBLY.**
2. SEE ATTACHED NOTES FOR MATERIAL LISTING.
3. ANY FIRE VAULT DCDA MUST HAVE A SENSUS COMPATIBLE METER INSTALLED AND A A SENSUS 520M MXU (RADIO) MUST BE INSTALLED THROUGH THE VAULT LID.

VALLEY WATER DISTRICT

DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) IN VAULT

APRIL 2023

STANDARD DETAIL NO.

24A

MATERIAL LISTING

1. 2' X 2' X 8" THICK FORMED CONCRETE BLOCKING WITH LOCKING FOLLOWER RING.
2. CL 53 SPOOL, PE X FL
3. PRECAST CONCRETE VAULT WITH DOUBLE HINGED STEEL PLATE DOORS, DIMENSION TO VARY WITH SIZE OF ASSEMBLY. SEE TABLE, STANDARD DETAIL **24A.**
4. O.S.H.A. APPROVED LADDER USE STAINLESS STEEL FASTENERS AT 3' MAX. SPACING.
5. PIPE SUPPORT STANDS UNDER DCDA. (MIN 3 REQ'D)
6. COPPER OR BRASS BYPASS WITH AN APPROVED DCDA. PLUMB TO INSIDE OF VAULT.
7. 3/4" METER SUPPLIED W/ DCDA UNIT.
8. WASHINGTON STATE DEPARTMENT OF HEALTH DCDA IN MAIN LINE WITH TWO O.S. & Y. RESILIENT SEATED SHUTOFF VALVES AND TEST COCKS. SEE SPECIFICATIONS FOR APPROVED GATE VALVES.
9. EBAA IRON SERIES 2100 MEG-A-FLANGE.
10. CLASS 52 PIPE LENGTH TO FIT.
11. GROUT INTERIOR AND EXTERIOR ALL AROUND PIPE AND ALL WALL PENETRATIONS USING NON-SHRINK GROUT. ALL WALL PENETRATIONS SHALL ALSO HAVE LINK SEAL.
12. GATE VALVE MJ X MJ WITH POST INDICATOR VALVE (PIV).
13. MJ TEE ASSEMBLY SIZED ACCORDINGLY.
14. 90° BEND, (MJ).
15. CL 53 SPOOL, PE X FL.
16. 90° BEND, FL.
17. CL 53 SPOOL, FL X FL.
18. UL LISTED F.D. CONNECTION AND UL LISTED BREAKAWAY CAPS.
19. D.I. CL 53 SPOOL, LENGTH AS REQUIRED FL X FL.
20. 90° BEND FL.
21. SWING TYPE GRAVITY OPERATED CHECK VALVE WITH BALL DRIP VALVE TO BE INSTALLED HORIZONTALLY.
22. REDUCER (IF REQUIRED) OUTSIDE OF VAULT.
23. GALV. OR STAINLESS STEEL PIPE. SIZE PER FIRE JURISDICTION.
24. DUCTILE IRON FLANGE (ADAPT. TO GALV. OR S.S. PIPE).
25. ZURN-WILKINS MODEL FSC DUCTILE IRON "Y" STRAINER OR CLA-VAL X43H WITH BLOWDOWN

DOUBLE CHECK DETECTOR AND VAULT ASSEMBLY NOTES:

1) PROPERTY OWNER SHALL FURNISH AND INSTALL THE DCDA AND ALL PIPING AND APPURTENANCES SHOWN ON THIS PLAN.
2) BACK FLOW PREVENTORS SHALL BE FEBCO OR STATE APPROVED EQUAL. (SUBMITTAL REQUIRED)
3) PROPERTY OWNER SHALL PROVIDE INSPECTION & INITIAL TEST OF THE DCDA PRIOR TO ESTABLISHMENT OF WATER SERVICE. SUBSEQUENT ANNUAL TESTING OF DCDA REQUIRED BY OWNER.
4) ITS SHALL BE THE OWNERS RESPONSIBILITY TO SIZE THE FIRE SPRINKLER SERVICE LINE.
5) ALL PIPING, VALVES & FITTINGS DOWNSTREAM OF THE VAULT ARE SHOWN & CALLED OUT GENERICALLY. A SEPARATE DETAIL PLAN FOR VAULT INSTALLATION AND SPRINKLER LINE MUST BE SUBMITTED AND APPROVED BY THE FIRE MARSHALL PRIOR TO INSTALLATION.
6) LADDERS SHALL BE INSTALLED IN COMPLIANCE TO O.S.H.A. REQUIREMENTS.
7) NO CHEMICALS ARE ALLOWED IN THE FIRE SPRINKLER PIPING SYSTEM.
8) LOCATE VAULT IN PLANTING AREA AND NOT IN PAVING AREA, UNLESS APPROVED BY THE DISTRICT.
9) PIPE SHALL BE CL. 52 AND CEMENT LINED. (EXCEPT AS SHOWN)
10) A SUMP PUMP SHALL BE INSTALLED W/ POWER CONDUIT AT THE OWNERS EXPENSE IF GRAVITY DRAIN IS NOT FEASIBLE.
11) TEMPORARY SUPPORT SHALL BE PROVIDED UNDER VALVES AT THE TIME OF INSTALLATION. AFTER COMPLETE INSTALLATION, INSTALL PERMANENT PIPE SUPPORT STAND.
12) SIZE VAULT BASED ON SIZE OF APPARATUS AND MEETING MINIMUM CLEARANCES. (VAULT SUBMITTAL REQUIRED)
13) MINIMUM APPARATUS SIZE SHALL BE 4".
14) VAULT SHALL BE SEALED TO PREVENT WATER LEAKAGE.
15) ALL MJ JOINTS TO BE RESTRAINED W/ MEG-A-LUG OR EQUAL.
16) PAINT ALL PIPING **SW BLUEBLOOD 6966.**
17) IF A FIRE DCDA IS TO BE LOCATED INSIDE A BUILDING THEN THERE MUST BE A SENSUS COMPATIBLE DETECTOR METER INSTALLED AND A SENSUS 510M MXU RADIO MUST BE INSTALLED ON THE OUTSIDE OF THE BUILDING. THE DETECTOR METER MUST BE WIRED TO THE 510 MXU THROUGH THE WALL OR DOOR OF BUILDING.
18) THE DISTRICT DOES NOT ACCEPT OWNERSHIP OR RESPONSIBILITY OF THE FIRE LINE AFTER THE ISOLATION VALVE AT THE WATER MAIN IF THE DCDA IS INSTALLED INSIDE THE BUILDING. THE PIPING FROM THE VALVE TO EITHER THE FIRE VAULT OR TO BUILDING ARE OWNED BY THE DEVELOPER/OWNER.
19) ALL FIRE LINES INSIDE A VAULT OR BUILDING MUST BE EQUIPPED WITH A FIRE LINE STRAINER UPSTREAM TO PREVENT DAMAGE TO FIRE SPRINKLER SYSTEM.

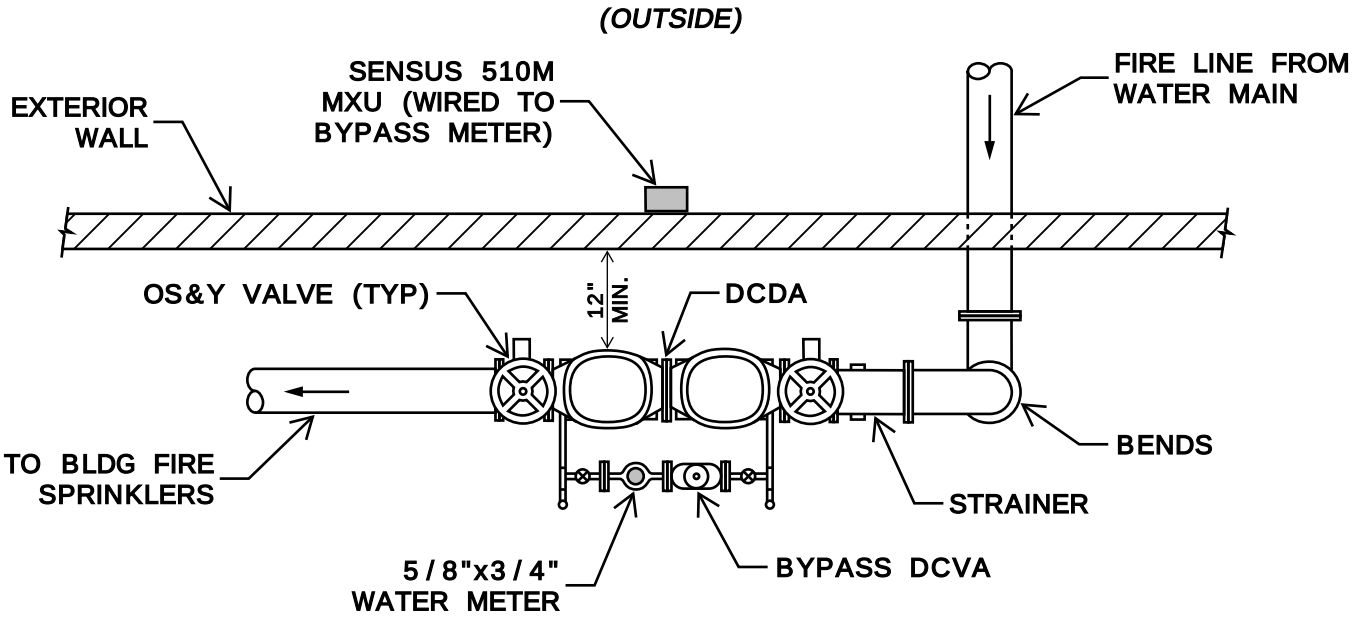
VALLEY WATER DISTRICT

DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) IN VAULT

APRIL 2023

STANDARD DETAIL NO.

24B



NOTES:

1. BYPASS LINE SHALL BE COPPER OR BRASS WITH AN APPROVED DCVA.
2. FIRE LINE PIPING SHALL BE RESTRAINED JOINT, CEMENT-LINED D.I. WITH CONCRETE THRUST BLOCKS.
3. DCDA AND DCVA MODELS SHALL BE ON MOST RECENT EDITION OF WASHINGTON STATE DEPARTMENT OF HEALTH'S LIST OF APPROVED ASSEMBLIES.
4. A STRAINER SHALL BE PROVIDED UPSTREAM OF THE DCDA TO PREVENT DAMAGE TO THE FIRE SPRINKLER SYSTEM. STRAINER SHALL BE ZURN FSC D.I. "Y" STYLE OR CLA-VAL X43H "H" STYLE.
5. DCDA IN MECHANICAL ROOM SHALL INCLUDE A SENSUS COMPATIBLE DETECTOR METER AND INSTALLATION OF A SENSUS 510M MXU (RADIO) ON THE OUTSIDE OF THE BUILDING'S EXTERIOR WALL, COMPLETE WITH WIRING TO THE METER THROUGH THE BUILDING ENVELOPE.
6. PROPERTY OWNER SHALL BE RESPONSIBLE FOR DESIGN AND SIZING OF THE FIRE LINE, DCDA, DCVA, AND ASSOCIATED SPRINKLER EQUIPMENT, AS WELL AS FLOOR DRAINAGE. MINIMUM APPARATUS SIZE SHALL BE 4".
7. ASSEMBLY'S VERTICAL CLEARANCE ABOVE FLOOR ELEVATION SHALL BE PER CURRENT UNIFORM PLUMBING CODE AND SHALL PROVIDE ADEQUATE SPACE FOR MAINTENANCE AND TESTING.
8. FOR DCDA UNITS INSIDE THE BUILDING, THE DISTRICT'S OWNERSHIP AND MAINTENANCE RESPONSIBILITIES TERMINATE AT THE ISOLATION VALVE LOCATED AT THE WATER MAIN. PROPERTY OWNER SHALL BE RESPONSIBLE FOR ALL PIPING, VALVES, AND APPURTENANCES DOWNSTREAM OF THE ISOLATION VALVE.
9. TESTING OF BOTH DCDA AND DCVA SHALL BE PERFORMED BY A WASHINGTON STATE DEPARTMENT OF HEALTH CERTIFIED BACKFLOW ASSEMBLY TESTER UPON INSTALLATION AND ANNUALLY THEREAFTER. PROPERTY OWNER SHALL BE RESPONSIBLE FOR OBTAINING TESTS AND PROVIDING RESULTS TO DISTRICT. PASSING INITIAL TEST RESULTS ARE REQUIRED BEFORE WATER SERVICE WILL BE ACTIVATED.
10. DCDA ASSEMBLY SHALL BE MAINTAINED BY PROPERTY OWNER. ACCESS TO MECHANICAL ROOM SHALL BE PROVIDED TO DISTRICT AS NEEDED FOR INSPECTION AND MAINTENANCE OF METERING EQUIPMENT.
11. DIMENSIONS AND REQUIREMENTS SHOWN HEREIN ARE MINIMUM STANDARDS REQUIRED FOR CONNECTION TO DISTRICT WATER MAINS. ADDITIONAL MEASURES MAY BE REQUIRED BY LOCAL FIRE MARSHALL.

VALLEY WATER DISTRICT

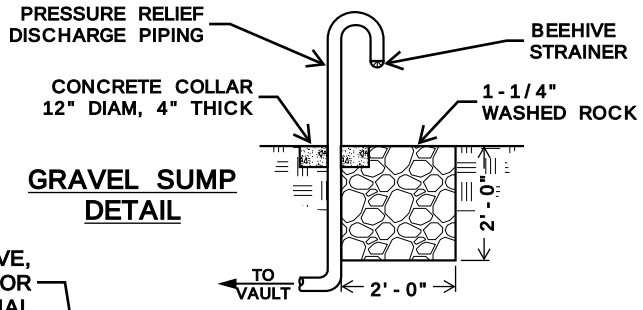
DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) IN MECHANICAL ROOM

APRIL 2023

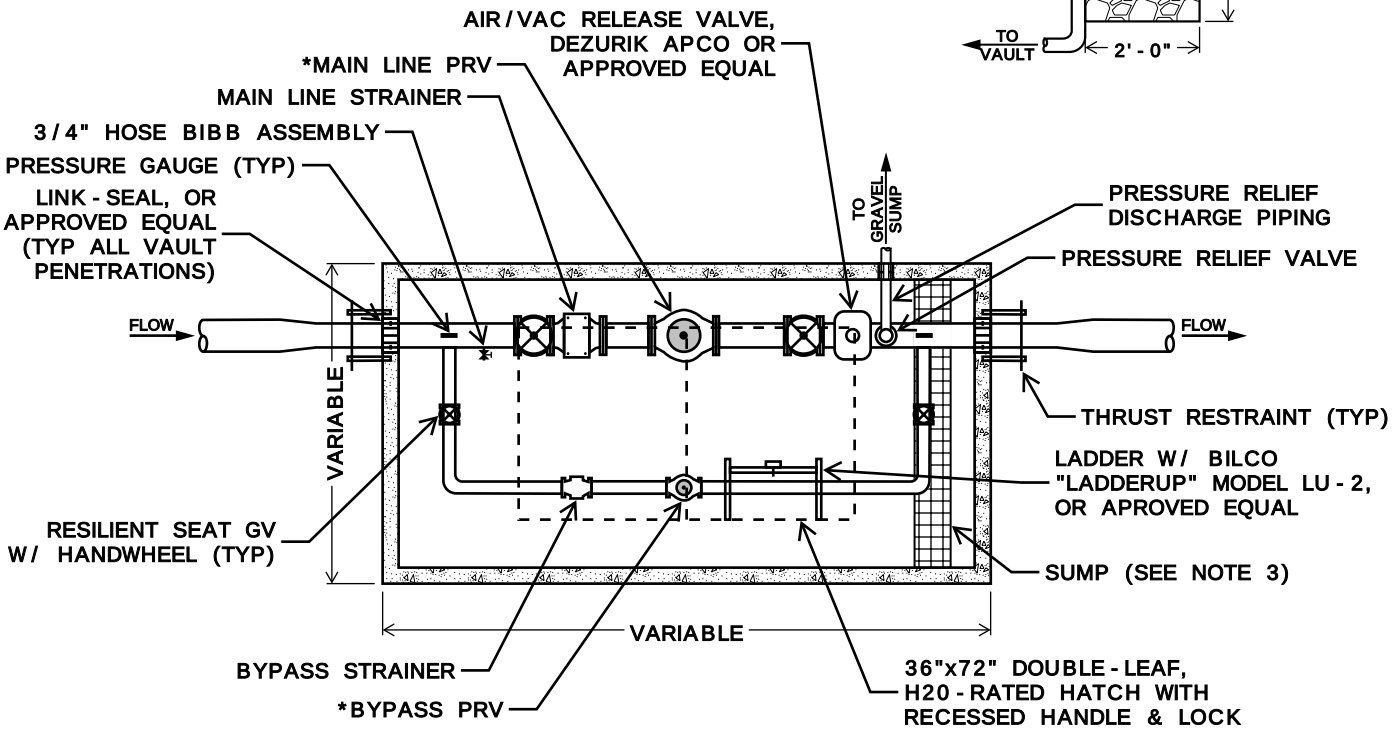
STANDARD DETAIL NO.

25

* BOTH PRVs SHALL HAVE THE FOLLOWING:
  - EPOXY - COATED BODY
  - STAINLESS STEEL TRIM
  - VALVE POSITION INDICATOR



GRAVEL SUMP DETAIL



PLAN VIEW

NOTES:

1. PRESSURE REDUCING STATION (COMPLETE PRV & VAULT ASSEMBLY) SHALL BE A PACKAGED SYSTEM WITH DESIGN, FURNISH, AND START-UP BY CIMCO-GC SYSTEMS. DESIGN SHALL BE APPROVED BY DISTRICT.
2. VAULT SHALL INCLUDE THE ITEMS SHOWN ABOVE, PLUS ADDITIONAL REQUIRED FEATURES AS DESIGNED BY CIMCO-GC SYSTEMS. PILOT CONTROLS SHALL BE INSTALLED FACING VAULT INTERIOR FOR ACCESSIBILITY.
3. VAULT SHALL INCLUDE A SUMP WITH AT LEAST ONE OF THE FOLLOWING ITEMS:
   - DRAIN TO DAYLIGHT (IF POSSIBLE)
   - IF POWER AVAILABLE, THEN ELECTRIC FLOAT SUMP PUMP
   - IF NO POWER AVAILABLE, THEN SUMP DRAIN EJECTOR ASSEMBLY MODEL #996633-51-2.
4. ALL TRANSITION COUPLINGS SHALL BE RFCA OR LONG SLEEVE COUPLING WITH MECHANICAL WEDGE RESTRAINT (EBAA IRON MEGALUG, ROMAC, OR APPROVED EQUAL).
5. BYPASS PIPING, UNIONS, AND FITTINGS SHALL BE THREADED BRASS, UNLESS APPROVED OTHERWISE.
6. PIPE SUPPORTS SHALL BE STANDON MODEL S92 IN 304 S.S., OR APPROVED EQUAL.
7. VAULT PIPING SHALL BE PAINTED WITH PRIMER AND TWO COATS OF BLUE ENAMEL BY CIMCO-GC SYSTEMS.
8. VAULT INTERIOR SHALL BE PAINTED GLOSS WHITE, EXTERIOR SHALL BE COATED WITH BITUMASTIC SOLUTION.
9. ABOVE-GROUND PRESSURE RELIEF DISCHARGE PIPING SHALL BE PAINTED, COLOR SW BLUEBLOOD 6966.
10. GRAVEL SUMP SHALL BE LOCATED SUCH THAT DISCHARGED WATER DOES NOT POOL AROUND VAULT (I.E. LOCATED DOWNHILL FROM VAULT OR SUFFICIENT DISTANCE AWAY TO PROMOTE SOIL INFILTRATION).

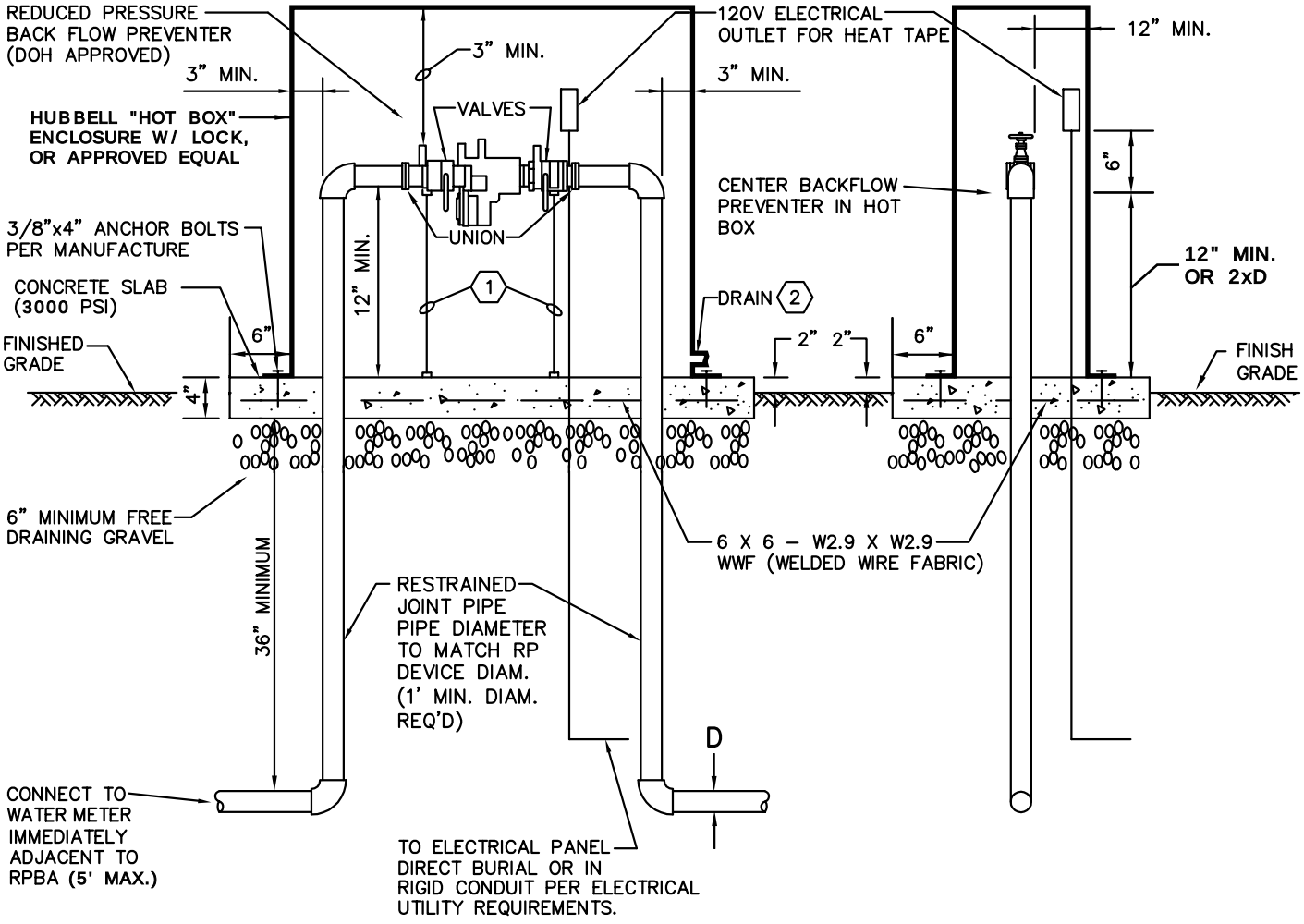
VALLEY WATER DISTRICT

PRESSURE REDUCING VALVE (PRV) STATION

APRIL 2023

STANDARD DETAIL NO.

26



(SIDE AND END VIEWS)

NOT TO SCALE

NOTES:

1. PROVIDE DISTRICT APPROVED SUPPORT FOR 2 - 1/2" AND LARGER DEVICES.
2. DRAIN SHALL BE SIZED IN ACCORDANCE WITH AWWA CROSS CONNECTION CONTROL MANUAL **REQUIREMENTS.**

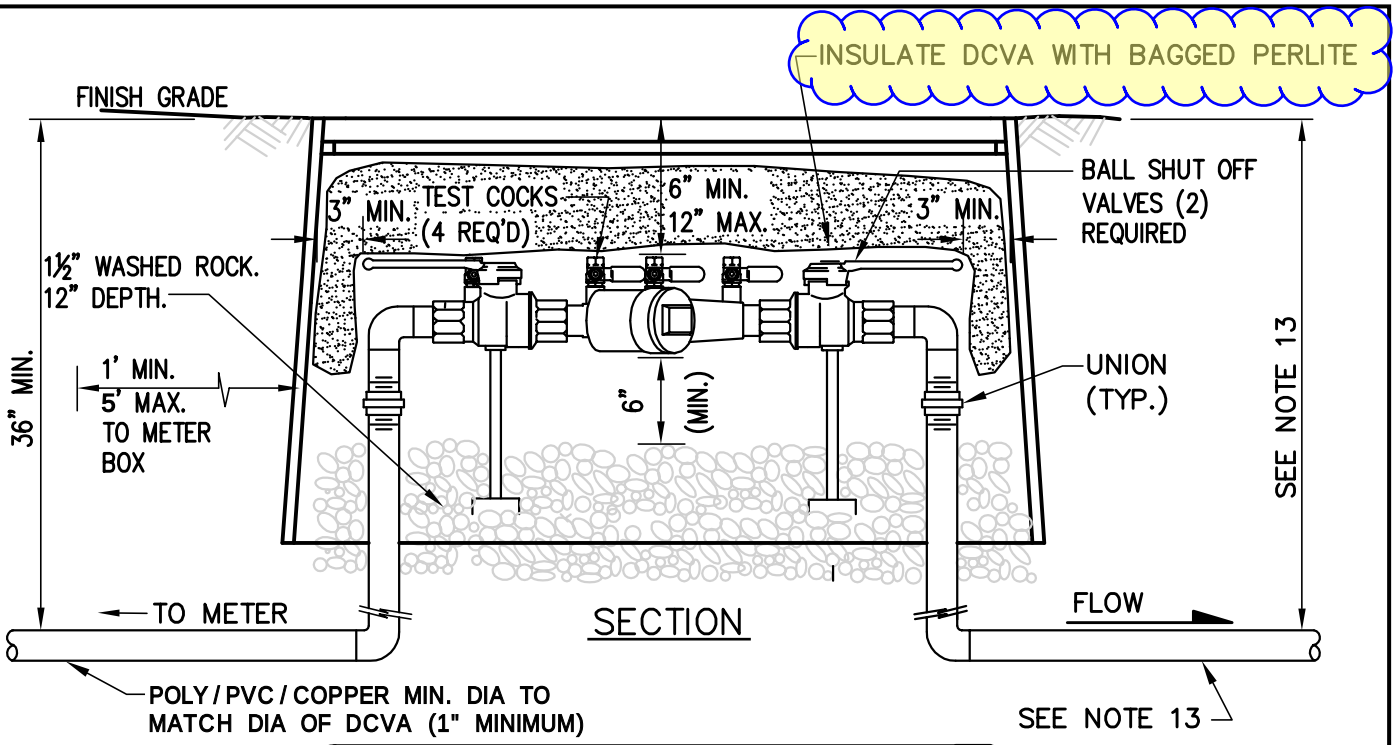
VALLEY WATER DISTRICT

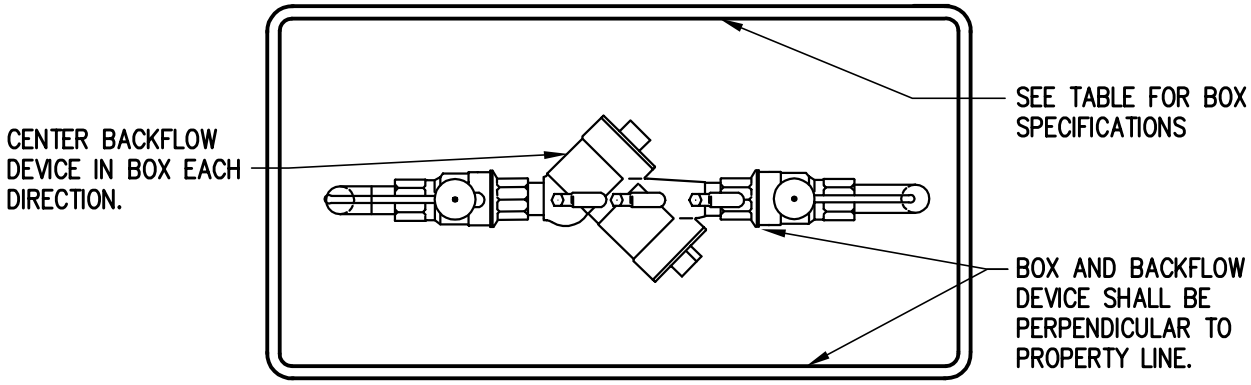
REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA)

APRIL 2023

STANDARD DETAIL NO.

27





PLAN

NOTES:

1. APPROVED DCVA TO BE INSTALLED HORIZONTAL WITH GROUND.
2. DESIGNED FOR BACK SIPHONAGE, BACK PRESSURE AND LOW HEALTH HAZARDS.
3. TEST COCKS TO EITHER FACE OUTWARDS OR UPWARDS FROM ASSEMBLY.
4. THE DCVA MAY INSTALLED BELOW GROUND PROVIDED ALL ALL OF THE CLEARANCES ARE MET.
5. DO NOT INSTALL IN AN AREA SUBJECT TO FLOODING.
6. DCVA MUST BE ACCESSIBLE.
7. DCVA MUST BE PROTECTED FROM FREEZING CONDITIONS.
8. THE BACKFLOW ASSEMBLY MUST BE A WASH. STATE APPROVED MODEL.
9. DCVA MUST BE TESTED AFTER INSTALLATION AND YEARLY THEREAFTER BY A WASHINGTON STATE CERTIFIED BACKFLOW ASSEMBLY TESTER.
10. TEST RESULTS SHALL BE SENT TO VALLEY WATER DISTRICT.
11. FLUSH LINES PRIOR TO INSTALLATION OF BACKFLOW PREVENTER.
12. SUPPORTS REQUIRED ON 2" AND LARGER DCVA ASSEMBLIES.
13. COVER & TYPE OF PIPE FOR FIRELINES SHALL BE AS REQUIRED BY THE JURISDICTIONAL FIRE DISTRICT.

WATER BOX REQUIREMENTS	
SIZE	CARSON INDUSTRIES MODEL NO.
1" & 1½"	1324–3B
2"	1730–3B

NOTES

1. CLEARANCES SHOWN ABOVE MUST BE MET OR BOX WILL NEED TO BE UP–SIZED
2. BOXES & LIDS SHALL BE EQUIPPED WITH THE BOLT DOWN FEATURE. DO NOT INSTALL READER FLAP

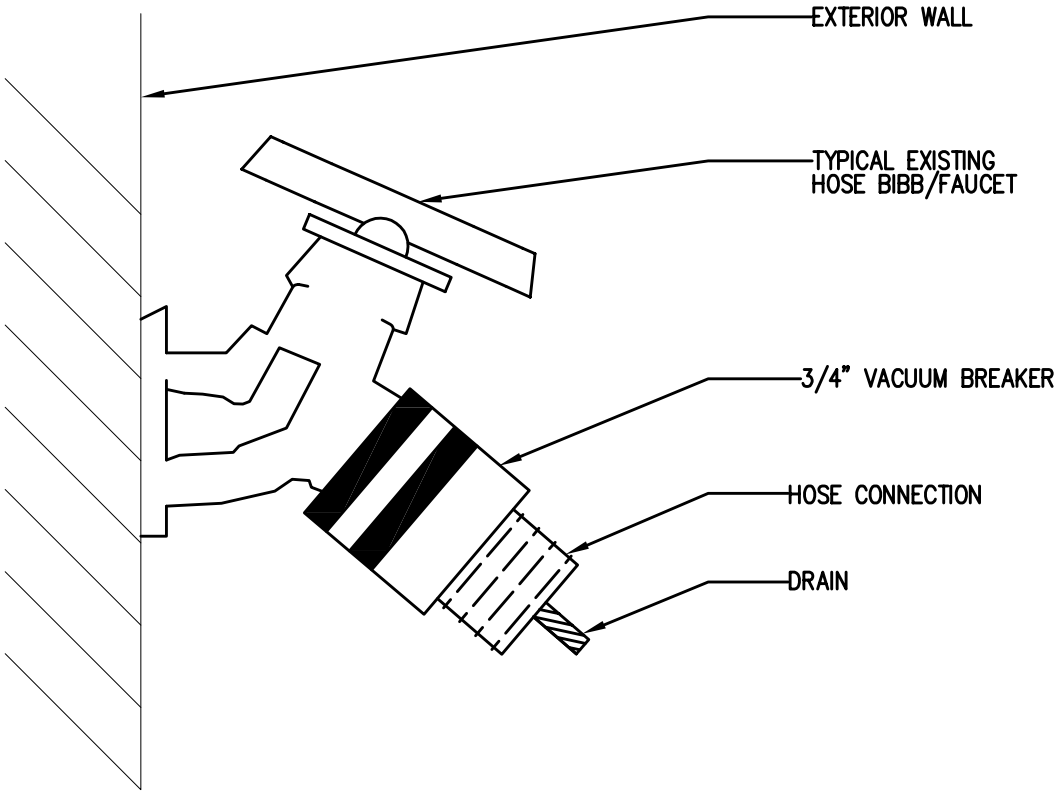
VALLEY WATER DISTRICT

2" & SMALLER DOUBLE CHECK VALVE ASSEMBLY (DCVA)

APRIL 2023

STANDARD DETAIL NO.

28



NOTES:

1. HOSE BIBB ATMOSPHERIC VACUUM BREAKER (AVB) SHALL BE SCREW-ON TYPE WITH SET SCREW.
2. INSTALL ATMOSPHERIC VACUUM BREAKER ON FAUCETS WHEN USING GARDEN HOSE TO FILL POOLS, HOT TUBS, AND OTHER WATER STORAGE TANKS.
3. NEVER LEAVE GARDEN HOSE SUBMERGED IN YOUR POOL OR HOT TUB.

VALLEY WATER DISTRICT

ATMOSPHERIC VACUUM BREAKER FOR IN-LINE FAUCETS & HOSE BIBBS

APRIL 2023

STANDARD DETAIL NO.

29

SECTION 5

STANDARDS FOR "AS-BUILT" DRAWINGS

SECTION FIVE:

STANDARDS FOR "AS-BUILT" DRAWINGS

The following are requirements for all "As-Built" drawings submitted for approval and/or acceptance to the District.

1. Every sheet shall have a statement signed by a Registered Professional Engineer licensed by the State of Washington attesting to the completeness and accuracy of the "As-Built" drawings. Easements for water facilities not located in the public rights-of-way shall be recorded and the recording number shall be shown on the "As-Built" drawings.

2. The water system drawings shall show all valves, tees, fittings and hydrants. All dimensions shall be listed on the drawings.

3. Where services are tapped off of new or existing water mains, location of taps shall be shown on a separate table on the "As-Built" drawings. Location of the meter box and setter, depth of service line, size of service line and address or addresses served shall also be shown on this table.

4. All "As-Built" drawings shall be on 24" x 36" reproducible fixed lined Mylar (no adhesive backed additions will be allowed).

5. All meters shall clearly show that they are in the public rights-of-way or easements and the recording number shown on the "As-Built" drawing.

6. District auto-CADD file, latest revision, shall be furnished and supplied to the District if requested.

SECTION 6

APPENDICES
AND
MISCELLANEOUS DISTRICT DOCUMENTS

SECTION SIX:

APPENDICES AND MISCELLANEOUS DISTRICT DOCUMENTS

1. Developer Extension Process

2. Application for Developer Extension Agreement

3. Developer Extension Checklist

4. Plan Checklist

5. Developer Extension Agreement

6. Performance Bond for Developer Water Extensions

7. Easement for Water Facilities

8. Assignment of Funds for Construction of Improvements

9. Maintenance Bond

10. Bill of Sale

11. Insurance Coverage Questionnaire