LAKEWOOD WATER DISTRICT

DESIGN/CONSTRUCTION SPECIFICATIONS & STANDARDS

2024

Board of Commissioners

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LAKEWOOD WATER DISTRICT

Design/Construction Specifications & Standards

2024

Adopted by the Board of Commissioners on the 28th day of March 2024

Marshall Meyer, General Manager

LAKEWOOD WATER DISTRICT

GENERAL PROVISIONS AND DESIGN STANDARDS FOR DEVELOPER AND DISTRICT CONTRACTS 2024

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GENERAL PROVISIONS AND DESIGN STANDARDS FOR THE WATER DISTRIBUTION SYSTEM

The Lakewood Water District General Manager has the right to require, add, modify, or delete any requirement(s) he deems necessary.

1. GENERAL

These provisions cover the construction of water distribution mains of 24-inch and smaller diameter for privately financed projects in which the developer shall make all necessary arrangements to pay the construction costs directly to the Contractor. The developer must complete Lakewood Water District's "Developer Extension Agreement" if applicable, and have it approved by the Operations Manager before any work is started. However, if these provisions are part of a "Public Works Contract", they must be approved by the District's Board of Commissioners. The "notice of award" signed by the District General Manager followed by a "notice to proceed" must be completed before any work can commence.

Please note that if not specifically covered in this DEA, then the current edition of the *WSDOT/APWA Standard Specifications for Roads, Bridges, and Municipal Construction (M 41-10)* shall govern; Provided that the General Manager has the right to modify if they deem necessary.

All pipe, fittings, valves, hydrants, and other materials installed under these specifications are intended to form a durable section of the distribution system of ample strength capacity and provide the highest quality potable water. All materials must meet the Districts standards as described within this document.

Payment for Services—the Lakewood Water District's policy applies to all owners, contractors and developers that are petitioning the District to install water service connections, main extensions, and setting of meters, shall pay all costs prior to installation or scheduling of work activities. Applicants will then be placed in a rotation on a first paid, first serve basis as work allows. The Lakewood Water District usually schedules the work activity within two weeks, however, circumstances out of the District's control may prevent it from meeting this goal, and it may result in a longer period of time for commencement of work activities. The District will make every effort to schedule the work as soon as possible on behalf of the owner, contractor, or developer's schedule.

It is the District's Policy to eliminate dead end water mains wherever possible. All water mains must be looped or tied together from at least two directions to provide equal flow of water. This will increase the gallons per minute available for fire flow and help eliminate chlorine residual problems along with improving water quality.

There shall be no unauthorized use of District fire hydrants during construction.

2. WORK QUALITY

All the work shall be performed in a responsible, serious, and skillful manner. First class work according to the true intent of the Drawings and Specifications as interpreted by the Water District Inspector is required. The Inspector's decision as to the true intent of the Drawings and Specifications shall be final.

3. SUPERVISION OF CONTRACTOR'S EMPLOYEES

The Contractor shall keep a competent person at his/her work site, as required under WAC 296-155-650, to inspect the work and to supervise the conformance of the Contractor's operations within the regulations of the WAC.

4. CHARACTER OF CONTRACTOR'S EMPLOYEES

The Contractor shall employ only competent and skillful persons to do the work and whenever the Inspector administering the contract shall notify the Contractor in writing that any person on the work is, in his/her opinion incompetent, disrespectful to other workers District staff or the public in general, or otherwise unsatisfactory, the Contractor shall forthwith discharge such persons from the work and shall not again employ them on this contract.

5. QUALITY AND CARE OF MATERIAL

Any and all material necessary for the construction of any part of the improvements specified herein shall be of domestic manufacture and comply with the "The Buy American Act" and shall be new and of high quality and acceptable to the Water District Inspector. The Contractor shall take care of, and be responsible for, any loss or damage from any cause to any materials delivered at or in the vicinity of the work to be used by him/her thereon in connection with this contract prior to its completion.

6. INSPECTION

A) THE WORK

All materials furnished and work done shall be subject to inspection.

The Inspector monitoring the contract shall at all times have access to the work wherever it is in progress or being performed, and the Contractor shall provide proper facilities for such access and inspection. Such inspection shall not relieve the Contractor of the responsibility of performing the work correctly, utilizing the best labor and materials in strict accordance with the Specifications of this Contract. All material or work approved and later found to be defective shall be replaced without cost to the Lakewood Water District.

B) INSPECTOR'S AUTHORITY

The District Inspector shall have power to reject materials or workmanship, which does not fulfill the requirements of these Provisions or Specifications, but in case of dispute, the

Contractor may appeal to the Operations Manager or Engineering Manager of the Water District monitoring the contract, whose decision shall be final.

Nothing herein contained, however, shall be taken to relieve the Contractor of their obligations or responsibilities under this Contract.

7. ASBESTOS CEMENT PIPE

When the contract drawings specify or it is otherwise necessary for the contractor to come into contact with or work on asbestos cement pipe, they shall comply with the procedures as required by WAC 296-62 and WAC 296-65. For information and notifications forms on the proper removal and packaging of asbestos materials contact the Puget Sound Air Pollution Control Authority in Seattle at 206-344-7330 or 1-800-552-3565. For information on how to transport and dispose of the asbestos materials, contact the Pierce County Environmental Health Department in Tacoma, Washington at 253-798-6528.

Should you have any questions concerning this matter or require information in regard to the requirements of WAC, please call our Safety Officer/Inspector at 253-588-4423.

8. SAFETY AND HEALTH PROVISIONS

The Contractor shall at all times have sole responsibility for the safety and health standards at the work site and the District assumes no responsibility. The Contractor shall exercise adequate precautions for the safety and health of all persons, including employees, and Subcontractor's employees, in the performance of this contract and shall comply with all applicable provisions of federal, state, county, and municipal safety and health laws and regulations. It is the Contractor's responsibility to furnish safety equipment or to contractually require Subcontractors to furnish adequate safety equipment to properly perform their work responsibilities.

If the Water District's Inspector witnesses a safety violation, they will advise the contractor first. It is the Contractor's responsibility to make any necessary corrections. Failure to correct safety violations shall be grounds for the District to notify the appropriate State or other authority to stop work on the project.

Any of the above actions by employees of the Lakewood Water District shall in no way relieve the Contractor of their responsibility to provide for the safety and health of all persons, including its employees and the employees of the Subcontractor.

9. INDEMNIFICATION

The Contractor acknowledges that pursuant to the terms of this agreement, the Contractor is totally responsible for the safety of persons and property in the performance of this Contract. To the greatest extent allowed by law, the Contractor assumes the risk of all damages, loss, cost, penalties and expense and agrees to indemnify, defend and hold harmless the Lakewood Water District, from and against any and all liability which may accrue to or be sustained by the Lakewood Water District on account of any claim, suit or legal action made or brought against the Lakewood Water District for the death of or injury to persons (including Contractor's or

subcontractor's employees) or damage to property involving contractor, or subcontractor(s) and their employees or agents, arising out of and in connection with or incident to the performance of the Contract except for injuries or damages caused by the sole negligence of the District. In this regard, Contractor recognizes that Contractor is waiving immunity under Industrial Insurance Law, title 51 RCW. This indemnification extends to the officials, officers and employees of the District and also includes attorney's fees and the cost of establishing the right to indemnification there under in favor of the Lakewood Water District. Provided, however, this provision is intended to be applicable to the parties to this agreement and it shall be interpreted to allow a Contractor's employee to have a claim or cause of action against Contractor except insofar as may be necessary to effectuate the indemnification herein given.

10. PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE

The Contractor shall procure and maintain, during the life of this contract, a policy of public liability insurance and property damage insurance with an insurance carrier satisfactory to the District in such form as is satisfactory to the District to protect the District from loss from liability imposed by law for damages (1) on account of bodily injury including death resulting therefrom accidentally suffered or alleged to be suffered by any person or persons whatsoever that may be caused directly or indirectly by the performance of the contract and (2) on account of injury to or destruction of any property whatsoever including the resultant loss of use that may be caused directly or indirectly by the performance of the contract or resulting from any act of commission or omission by the Contractor or by any subcontractor or by anyone employed directly or indirectly by either of them.

The Lakewood Water District shall be designated in said policy of insurance, as additional insured and said policy shall be primary over any other insurance policy the District may have. The insurance policy, together with all endorsement thereon, shall be deposited with such officer of the Lakewood Water District as the District may designate. Said public liability insurance shall be in amounts of not less than $1,000,000.00 for one person injured in one accident or not less than $1,000,000.00 for more than one person injured in one accident and said property damage insurance shall be in an amount of not less than $1,000,000.00 for any one accident.

A certificate outlining the above insurance requirements and stating the policy premium has been paid shall be submitted to the District for review and approval by the Lakewood Water District General Manager, Operations Manager, or Engineering Manager and filing thereafter.

11. OBSTRUCTION OF PUBLIC THOROUGHFARES

Whenever, during the course of construction, it becomes necessary because of the nature of the work, for the Contractor to barricade any street, or any part thereof, or to place any obstruction which will impede the flow of traffic in any public thoroughfare, then the Contractor shall be required to give notice of the intended interruption at least (3) working days prior to such barricading or obstruction of any thoroughfare.

Such notice shall be given to, but not limited to, the following departments of governing authority (City of Lakewood, Pierce County):

- Department of Transportation and/or Traffic Division
- Fire, Police and/or Sheriff
- Lakewood Water District

Where such obstruction or interruption to traffic interferes with normal usage of thoroughfares along scheduled routes of local transit companies, then such notice shall also be given to the companies, citing the thoroughfares to be affected, the nature of the obstruction and the period of time involved. The Contractor shall maintain during all phases of construction the access for local traffic and emergency vehicles.

The posting of flaggers, advance warning signs, barricades, traffic cones, flashers, etc., shall be the responsibility of the Contractor and shall be in accordance with the current "Manual on Uniform Traffic Control Devices for Streets and Highways" as accepted by the Washington State Department of Transportation.

The Contractor shall be responsible for all necessary detour signs and cones and shall provide and place flashers and barricades within the project area and shall coordinate with the District Inspector all matters pertaining to the movement of vehicular and pedestrian traffic past the project area. In addition, the District Inspector shall be notified a minimum of three (3) working days in advance of the date and time that implementation is to be made for all detours, closures, and other activities involving the disruption of travel of pedestrian or vehicular traffic.

There shall be safe walkways provided and maintained at all times for pedestrians, subject to the approval of the Inspector.

Whenever, in the opinion of the Inspector, traffic conditions dictate, a uniformed officer shall be employed to control traffic until the Inspector determines that there no longer exists any traffic problem.

12. WORKING DAYS AND NON-WORKING DAYS

The working day shall be Monday through Thursday, 7:30 AM TO 5:00 PM. Friday 7:30 AM to 4:00 PM. Inspection rates for working days during working hours will be $120.00 Per Hour. Any changes to this must have prior approval from the Operations Manager or Engineering Manager. A non-working day is Saturday, Sunday, or legal District holidays.

13. WORK ON NON-WORKING DAYS

Work on a non-working day will require that the District have three (3) full working days' notice.

All work on a non-working day will require Water District Inspector and other District personnel, depending on the nature of the work, at their overtime rates of pay the overtime rates of pay are $145.00 per hour.

The District will give the final approval for work on a non-working day based on the availability of personnel.

14. CLAIMS AND PROTESTS

If the Contractor considers any work required of him/her to be outside the requirements of the contract or considers any record or ruling of the Inspectors of the District as unfair, he/she shall ask for written instructions or decision immediately, and then file a written protest with the District against the same within five (5) days thereafter. Otherwise, the Contractor will be considered as having accepted the required work record or ruling.

15. EXTRA WORK

No charge to the Water District for extra work or any other charge in the contract will be allowed unless the extra work or change has been authorized in writing by the Water District Operations Manager or Engineering Manager and unless the compensation or method of determining the compensation is stated in such written authority and agreed upon by all parties prior to completion of the extra work.

The District reserves the right to furnish any necessary materials which were not included in the Drawings or Specifications as it deems advisable. The contractor shall have no claims for costs and profit on materials furnished by the District.

The Contractor's cost records pertaining to work paid for by the District shall be open to inspection or audit by representatives of the Lakewood Water District during the life of the contract and for a period of not less than three (3) years after the date of acceptance thereof. The Contractor is required to retain such records for that period. Where payment for materials or labor is based on the cost thereof to forces other than the Contractor, the Contractor expressly guarantees that the cost records of such other forces shall be open to inspection and audit by representatives of the Lakewood Water District on the same terms and conditions as the cost records of the contractor.

If an audit is to be commenced more than sixty (60) days after the acceptance of the contract, the Contractor will be given a reasonable notice of time when such audit is to begin.

16. PLANNING THE WORK

The Contractor shall have a plan and schedule of his/her work. This plan and schedule must be approved by the Water District Inspector. A minimum of three (3) working days' notice shall be

given by the Contractor to the Water District Operations Manager, or Engineering Manager prior to commencing work.

Such a plan shall cover but not be limited to the following points:

A) Contractor shall provide a detailed schedule for all phases of work to be completed including delivery of materials, and District inspection of materials prior to installation. The schedule must show all phasing plans that might alter the installation of the mains, hydrants and services. The schedule must also include dates of procurement and execution of all applicable District, City, County, and State permits.

B) The work shall be divided into sections in such a manner as to permit each section to be completed and cleaned up in the shortest time possible. The water main construction once started shall continue until completed in its entirety without delay.

C) The plan shall provide for the least interference with normal street traffic and access to abutting property.

D) A study shall be made of the points at which heavy flushing flows may be disposed of. Such flows in the new mains shall be in the amounts 100 GPM in four-inch mains, 220 GPM in six-inch mains, 400 GPM in eight-inch mains and 900 GPM in twelve-inch mains. For mains larger than 12 inches, the Contractor shall coordinate with the District for flushing requirements. The Contractor shall provide tees and temporary blow-off valves and piping or temporary hydrants if necessary to discharge such flows at suitable points at no charge to the District.

E) Where a new main is replacing an existing main, all existing hydrants and customer services must be kept in use until the new main has passed the sanitary tests. The services can then be transferred to the new main and the new hydrants placed in service and the existing line abandoned.

F) The Contractor shall verify the location and elevation of all other utilities, including the existing water main to be connected to, sufficiently in advance of approaching them with the water main construction so that corrections in vertical and/or horizontal alignment may be accomplished if necessary.

G) Access must be maintained to the District's valves and apparatuses. The main line and hydrant valves may be adjusted down to support grading operations, but these valves will need to be raised to grade at each of the following phases as soon as possible, and in no case can they be buried for more than 14 calendar days of being lowered for Subbase, Base Rock, ATB, any individual lift of HMA, chip seal, fog seal, or any other reason. While the valves are buried Swing Ties and clear instruction to their location must be in place and always maintained, until such time as they are visible.

If extreme weather conditions or other unforeseen circumstances are deemed by the Inspector to be unsuitable for proper installation of water mains in accordance with these provisions, the work shall not start or shall be interrupted until conditions have improved sufficiently as to allow the work to progress without delay until completed.

Contractor delays resulting from work required to be completed by District personnel, such as shutdown or tapping of existing mains, or installation of water services before street repairs, shall be considered by the Contractor in their schedule.

17. WORK DONE BY THE LAKEWOOD WATER DISTRICT

Lakewood Water District shall perform or contract all work within the public rights-of-way of the City of Lakewood and/or Pierce County. The District will provide the Points of Connection for the Developer's Contractor to match depth and grade. The connection shall not be made by the Contractor until all District provisions have been satisfied.

The Contractor will furnish all material and labor necessary to provide the required taps for testing and sterilizing. Water for testing and sterilizing will be furnished without charge to the Contractor.

Purity samples shall be collected and submitted to the testing lab by the District at the developer/contractor's cost.

18. COORDINATION

The Contractor shall diligently comply with the following requirements:

A) Cooperate in planning and layout of the work well in advance of operations.
B) Inform other Contractors of job requirements at proper time to prevent delay or revisions.
C) Be informed of the requirements of other Contractors and the District and check his/her own work for conflicts with the work of other Contractors and that of Lakewood Water District crews.
D) Ensure delivery of materials and performance of work on coordinated schedule with other Contractors.

19. INSTRUCTIONS TO CONTRACTOR

All instructions will be given by the Lakewood Water District Operations Manager or Engineering Manager, or Inspectors). No other instructions shall be recognized.

20. EXAMINATION OF DOCUMENTS AND SITE

The Contractor shall exhibit that they have carefully examined all contract documents and site conditions, and understands the character, quality and quantity of work called for and all

conditions of the contract. The Contractor shall carefully compare and check all documents for omissions and discrepancies. This coordination shall proceed each phase of the work and omissions and discrepancies shall be reported promptly to the Water District Operations Manager or Inspector.

21. DRAWINGS

The Contractor understands and agrees that the work herein described and shown on the Drawings shall be complete in every detail, even though the specifics of each required procedure or item are not explicitly mentioned. The Contractor will be liable to provide all labor and materials necessary for the completion of the work intended to be included and described in this contract. The Contractor shall not avail themselves of any unintentional errors or omissions that may exist herein or on the Drawings and shall notify the District of any perceived errors or omissions.

Anything mentioned in the Specifications and not shown on the Drawings and anything on the Drawings and not mentioned in the Specifications shall be of like effect and shall be understood to be shown and/or mentioned in both. In case of differences between Drawings and Specifications, the Specifications shall govern. In addition, in the event of any conflict between the Special Provisions and the Technical Provisions, the Special Provisions shall control. In case of discrepancy of figures between Drawings, Specifications or both, the matter shall immediately be submitted to the Lakewood Water District Operations Manager for their decision.

Discrepancies shall not be adjusted by the Contractor, save only at their own risk and expense. The Water District General Manager shall furnish from time to time such detailed drawings and other information, as they may consider necessary.

22. EXISTING UTILITIES AND FACILITIES

All design drawings for new facilities, and the requirements for notification, locating/marking, protection and repairing of existing utilities and facilities shall be in accordance with RCW 19.122. As provided in the law, the contractor is responsible for maintaining all utility locate marks for 45 days before placing a call for renewed locate marks.

The developer/engineer shall contact all private and public utilities and show on the Drawings only those utilities within the project limits indicated as existing by the various utilities. When other utilities are replacing their existing utilities, Lakewood Water District requires clearance from its utilities, as detailed in the current edition of the District's Design and Construction Standards.
It shall be the Contractor's responsibility to locate or have located in the field all existing underground utilities. Dial Before you dig "811."

Existing utilities shown in the Drawings are not necessarily all utilities in the area and are only a guide. Exact locations must be determined in the field by the Contractor.

Once the utilities have been located, it shall be the Contractor's responsibility to maintain locations throughout the duration of the contract.

If the Contractor damages a utility, which has been properly located, the Contractor shall be responsible for all costs associated with the repair. Should the Contractor accidentally damage an underground facility, which is incorrectly located (as defined by Chapter 19.122 RCW) by the Lakewood Water District, then the damage will be repaired at no cost to the Contractor. If requested, the contractor shall be required to dig up and expose utility. The Contractor shall have no claim for additional compensation or time against this contract due to improper location of utilities.

The Contractor shall not install any water facilities closer than the clearances listed in the current edition of the District's Design and Construction Standards. All utility crossings shall have one (1) foot vertical clearance, with the exception of sanitary sewers, which shall only be crossed over by water mains with a minimum vertical clearance of 18 inches. Any variance of the above will require prior approval of the Water District Operations Manager or their representative and be in accordance with the State's *Pipeline Separation Design and Installation Reference Guide*.

The Contractor shall assume all responsibility and expense for damage to existing improvements on or adjacent to the work site caused by their operation. The Contractor shall provide for the protection of poles, overhead and underground lines, concrete curbs, and existing structures at its own expense and shall be responsible for the expense of all necessary repairs.

The risk of loss resulting from changed or differing site conditions as defined in Revised Code of Washington Section 19.122.040 is the responsibility of the Contractor or its successors in interest.

When boring under an existing asbestos cement (AC) water main the following requirements will apply: 1) a section of the AC main will be replaced with either ductile iron or C900 PVC main of the same size if the vertical clearance from the top of the bore hole to the AC pipe is less than two (2) feet for Class A soil, less than three (3) feet for Class B soil or less than four (4) feet for Class C soil, 2) the length of the replacement pipe shall be at least 12" each side of the crossing bore hole, 3) a minimum length of four (4) feet of replacement pipe.

23. CLEARING AND GRUBBING

This item shall consist of clearing and grubbing, ahead of trench excavation, all areas with trees, stumps, brush, roots, vegetation, rubbish, and other objectionable material.

The limits of clearing as well as grubbing operations, are dependent to a considerable degree upon the Contractor's operations and it shall be his/her responsibility to determine these limits providing he/she does not go beyond right-of-way or easement lines. The clearing and grubbing shall be at least the width of the trench plus that needed for placement of material excavated from the trench.

Trees, shrubbery, and flower beds designated by the Inspector shall be left in place and care shall be taken by the Contractor not to damage or injure such trees, shrubbery or flower beds by any of its operations. If the Contractor damages or destroys said items which they have been directed to preserve, they shall replace it in kind acceptable to the Inspector and guarantee the item to live for a period of one (1) year.

The refuse resulting from the clearing and grubbing operation shall be hauled to a waste site secured by the Contractor and shall be disposed of in a legal manner as to meet all requirements of state, county and municipal regulations regarding health, safety, and public welfare.

24. ALIGNMENT AND GRADE

The proposed pipe alignment and grade shall be detailed on the accompanying contract Drawings.

Alignment and grade shall be taken from survey stakes provided by the developer's engineer and placed at a maximum of 50 feet apart by a licensed professional surveyor or at their direction. Stakes shall be offset and shall have a lath guard stake showing the cut or fill to flowline of the pipe and finished grade. The Water District Inspector will check the staking prior to construction.

A cut sheet shall be provided showing cuts to flow-line grade, finished grade and all other applicable information.

Each installed pipe shall be checked for line and grade before proceeding with the next pipe.
Line and grade may be taken from curb or pavement when such structures parallel the work and shall conform to elevations and distances shown on the Drawings.

Revision of pipe alignment and/or grade may be required by the Inspector in the field should obstructions or unsuitable conditions be encountered, or an obviously more suitable location is evident.

25. INTERFERENCE

The Contractor shall inform the railroads of any possible interference to ensure that their facilities are properly protected during the water main construction.

All shrubbery, trees, and private improvements adjacent to the work shall be carefully protected from damage.

Where the pipe is to be laid in a non-surfaced area, shrubbery and private improvements shall be removed, properly cared for, and replaced upon completion of the work.

Where lawns are destroyed, four inches of topsoil shall be placed, rolled, and sod laid, all in accordance with the Inspector's approval. Arrangements shall be made by the Contractor with

the Inspector to ensure the success of the lawn. In lieu of the above, allowances can be made for grass seeding or hydro-seeding with prior approval of the Water District Operations Manager.

26. TRENCH EXCAVATION

All trenches shall be sufficiently true to line and grade to permit accurate alignment of pipe and shall clear the side of the pipe to permit proper tamping of the pipe bedding.

The minimum trench width shall be the nominal pipe diameter plus 16 inches. The maximum trench width shall be as required in Section 7.09 of the most recent WSDOT/APWA Standard Specifications.

The Contractor shall provide sloping-benching or shielding for trench protection in accordance with WAC 296-155. This includes excavations that require entry by District crews to perform construction-related work. See Section 8, Safety and Health, of these general provisions.

Pavement cuts shall be held to the minimum width required by the work and shall present uniform lines. T-cut needed before permanent paving per City of Lakewood's, WSDOT's or Pierce County's specification requirements, whichever jurisdiction is applicable.

If the Water District Inspector deems the trench bottom to be unsuitable for supporting the pipe, the unsuitable material shall be removed and disposed of and bank run sand and gravel or crushed rock placed for pipe bedding as directed by the Inspector.

Excavation at pipe joints shall be of ample size to permit inspection of all joints.

Pipe laying operations in certain areas may necessitate temporary removal of mailboxes, private driveways, drains, service lines, conduits, etc., to facilitate construction. In the event that the Contractor finds it necessary to remove the above-mentioned items, it is to be particularly understood that it will be his/her responsibility to restore these items in a manner equal to their original condition and satisfactory to the Inspector. The Contractor shall maintain adequate temporary provisions for domestic deliveries, utility service and access to firefighting equipment.

The preceding requirement will be the same for any temporary removal of road culverts, whether under State, County, City, or private jurisdiction.

The Contractor shall always keep the dust from its operations under control to prevent a nuisance.

All stumps within four feet of the pipe shall be entirely removed.

Boulders and rocks shall be entirely removed or cut to full trench width and 12 inches below grade.

Where pipe is to be laid on fill, all topsoil and debris shall be removed from the existing ground and the fill made of suitable material thoroughly compacted to pipe grade by methods approved by the Inspector.

The Contractor shall provide all necessary bridges for the proper handling of traffic over the trench and shall provide access to private property where required.

The Contractor shall provide adequate cross drainage and prevent flooding of the trench.

27. MATERIALS

All materials shall be new, free from defects, of current approved manufacture, and of the quality specified or shown below.

DISTRICT FURNISHED MATERIALS (if applicable)

Materials supplied by the District, if applicable, will be furnished to the Contractor and will be picked up by the Contractor at the District office or, if approved by the Water District Operations Manager, the District shall make arrangements to have materials delivered. The Contractor will be required to sign a receipt for all materials supplied to them by the Lakewood Water District.

Once the Contractor has received the materials, they will be fully responsible for control and security of the materials until formal final acceptance of the contract.

A) PIPE

All ductile iron pipe shall conform to the latest revision of the ANSI/AWWA C151 and ANSI/AWWA C104 Specifications, Class 50 (CL52 for fire hydrant and fire line), except as these Specifications may be modified in the Special Provisions.

Only ductile iron pipe manufactured by U.S. Pipe and Foundry Company, Pacific States Cast Iron Pipe Company, Griffin Pipe Company, or American Pipe Company are acceptable.

SPECIAL NOTE: All gaskets furnished with pipe shall be styrene butadiene rubbers (SBR), unless specified otherwise by the Water District Operations Manager. When deemed necessary, "Nitrile" (NBR) gaskets will be required. When NBR gaskets are required, they must be color-coded and/or marked in color so as to be easily identifiable as nitrile. All gaskets must conform to ANSI/AWWA C111-72 or the latest revision thereof. The gasket requirements for the specific project will be indicated on the face of the plan for the project.

B) DOMESTIC AND IMPORTED DUCTILE IRON FITTINGS:

All domestic (USA-made only) and imported (made by other countries) ductile iron fittings shall conform to the latest ANSI/AWWA C110 Specifications or ANSI/AWWA C153 for Mechanical Joint Compact Ductile Iron Class 350 fittings. All fittings shall be epoxy-coated ductile iron or have

cement-mortar lining conforming to ANSI/AWWA C104. Mechanical joint glands supplied with the above domestic "ductile iron" fittings shall be ductile iron in accordance with the above specifications. Domestic fittings shall be in compliance with the Buy American Act.

At the time of this revision, Sigma, Star Pipe Products are the only Import Fittings manufacturers approved by the District. This approval excludes fittings manufactured in China; other countries of origin are allowed. Consideration of other manufactures can only be made prior to the annual revision of the Specifications. Prior to consideration the proposing manufacturer must provide the following information, at a minimum.

- Proof that the products meet all applicable AWWA Standards,
- Reference list of local municipalities using the products,
- White papers and/or supporting technical information proving the products meet or exceed the present requirements, and
- Certification of country of origin. Products cast in China are not allowed even if manufacturer's products cast in other countries are approved.

The above information is the minimum that must be provided, additional information may be requested by the District at its sole discretion to aid in the review and consideration process.

SPECIAL NOTE: See note above under subsection A.

The end flanges of flanged gate valves shall conform in dimensions and drilling to the Standard ANSI B16.1 for cast iron flanges and flanged fittings, Class 125 unless specifically provided otherwise in plans or supplementary specifications. The bolt holes shall straddle the vertical centerline. The use of Foster Adaptors, or Flex Adaptors, as manufactured by Infact Corp, is allowed to make connections between FLG x MJ or MJ x MJ fittings.

Gate boxes, manhole rings, covers, and special castings shall be in accordance with drawings attached or as specified herein.

Fire hydrants and other restrained joints will be restrained by the use of Mega-lugs as manufactured by EBAA Iron, Inc., or approved equal, or where installation calls for FIELD LOK gaskets for 4" to 24"" pipe as approved by District Inspector.

C) GATE VALVES

All gate valves shall conform to the latest revision of ANSI/AWWA Standard C509, or C515, Gate Valves for Ordinary Water Service, as manufactured by Mueller or AVK only with the following modifications:

1) All gate valves shall be Mueller or AVK resilient wedge gate valves.
2) All gate valves shall be non-rising stems, furnished with O-Ring stem seals. Number, size and design shall conform to Section 3.12 of the AWWA Standards for gate valves.

3) All gate valves shall have a square operating nut which operates left (counterclockwise) to open.
4) All gate valves, 20-inch or larger, shall be horizontal stem, equipped with machine cut cast steel gears, extended type grease case, position indicators and bypass, all in accordance with the AWWA Specifications.

D) BUTTERFLY VALVES

All butterfly valves shall conform to AWWA C504 for Rubber Seated Butterfly Valves, Class 150B. The butterfly valves shall be Mueller or AVK "Lineseal III". Butterfly valve installation shall only be used where approved by Lakewood Water District.

E) VALVE BOXES AND COVERS

Cast iron valve boxes and lids shall be as indicated on the Water District standard drawing 5 – Valve Box Installation. All buried valves shall be provided with a valve box and lid with an extension of cast iron soil pipe as necessary. The Contractor shall maintain the location and provide access to all valves within the project. No valve shall remain buried during construction for more than 14 calendar days.

The fire lines require a locking valve box type Tyler 6855.

F) TAPPING SLEEVES

Tapping sleeves shall be mechanical joint type or stainless steel (Romac, Smith Blair or Ford is acceptable), whichever type is specified on the plan.

Cast iron, mechanical joint sleeves shall be Model H-615 or H-619 manufactured by Mueller Company, or approved equal, and only when approved by Lakewood Water District Operations Manager to be used if the above cannot be used.

G) MECHANICAL JOINT RESTRAINT

Mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A536-80. The dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11 and ANSI/AWWA C153/A21.53 of the latest revision. Twist-off nuts, sized same as tee-head bolts, shall be used to ensure proper actuating of restraining devices. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGA-LUG, Romac Flex-Ring, or approved equal.

Restrained joint PVC pipe (Diamond Lok-21, Eagle Loc 900), mechanical joint restraints ("mega-lug" by EBBA Iron or equivalent) and restrained joint ductile iron pipe (US Pipe Field Loc 350 gaskets or equivalent) shall be used in lieu of thrust blocks where feasible.

H) T-HEAD BOLTS

Unless specified otherwise, all T-head bolts and nuts supplied for mechanical joint fittings, valves, sleeves, couplings, hydrants, tapping sleeves, etc., shall be made of high-strength, low alloy steel, conforming to ANSI/AWWA C111 Corrosion-resistant steel ("Cor-Ten"), or ductile iron of ASTM A536 specially alloyed and heat treated conforming to ANSI/AWWA Standard C111/A21.11.

I) TIE RODS

Tie rods and nuts for hydrant laterals, etc., shall be made of high strength, low alloy steel conforming to ANSI/AWWA C111 ("Cor-Ten"), unless specified otherwise in the Drawings or Special Provisions.

J) CONCRETE WORK

All work shall be completely "formed" except where otherwise noted on the Drawings, and all concrete shall have a strength of not less than 1800 PSI at seven days and 3000 PSI in 28 days. No concrete shall contain less than six sacks of cement per cubic yard.

The size of concrete thrust anchors will depend upon existing soil conditions and shall be as determined by the Water District Inspector. Concrete for anchoring up to 8-inch pipe fittings and valves shall be thoroughly mixed in clean containers at the job site or mixed at a batch plant. Concrete for anchoring fittings and valves greater than 8-inch nominal diameter shall be supplied from an acceptable batch plant.

All thrust anchors shall be supported by bearing satisfactory to the Inspector before any concrete is poured.

28. CONNECTIONS

The contractor shall furnish temporary bracing material and incidental material as well as labor for trenching, backfilling and making connections to existing pipelines.

The Contractor shall provide written documentation that 1) flushing has occurred and samples taken are satisfactory, 2) disinfection has been performed and bacteriological samples are negative, 3) a pressure test has been completed and accepted by the Water District inspector, and 4) any other requirement by the Water District Inspector prior to the District allowing the Contractor to make connection to the public water system under the observation of the Water District Inspector.

Where the connection to an existing water main requires interruption of service to the area, the customers affected shall have a minimum of ***48 hours advance notice, no connection shall commence after 12:00 p.m.*** The Contractor and Water District Inspector shall set the connection date. Connections shall not be made on Fridays or the day prior to any District observed holiday without prior written approval from the District. All fittings and materials necessary to complete the connection must be available at the job site for inspection and approval prior to setting the connection date.

The Contractor shall have all material and equipment required on the site of the work and crews organized to carry each connection through as a continuous operation before shutting down any pipe in service.

Should the Contractor cancel or fail to show for a mutually agreed upon scheduled work, they shall pay the District for costs incurred resulting from preparation and response for that work.

In all cases, operations of valves on mains in service and notification of customers will be done by the Water District or as directed by the Water District Inspector.

Where connections are made to existing asbestos cement (transite) mains, sand shall be placed under the AC main before backfilling the trench. The connecting pipe shall be properly supported to prevent settlement.

The Contractor shall notify affected customers of any water shutdowns.

29. INSTALLATION INSTRUCTIONS FOR PUSH-ON JOINT PIPE

Any foreign matter in the gasket seat shall be removed; the gasket shall be wiped clean, flexed and then inserted in the socket in accordance with the manufacturer's recommendations.

As the gasket fits snugly in the gasket seat, it may be necessary to smooth out the entire circumference to remove any bulges, which would interfere with the proper entry of the spigot end. A thin film of lubricant shall be applied to the surface of the gasket after it is in place, and to the spigot end of the pipe to be joined. Excess lubricant shall not be used beyond where the pipe will contact the gasket and only lubricant, as supplied and labeled for potable use by the pipe manufacturer, shall be used. The lubricant shall be stored in a container with a tight-fitting cover and shall be applied to the gasket with a small sponge or brush. The container shall be kept closed and if the lubricant becomes contaminated with foreign material, it shall be discarded.

The spigot end of the pipe shall be clearly marked to indicate the depth of the bell socket and wiped clean, lubed and placed in approximate alignment with the bell of the pipe to which it is joined.

The pipe shall then be inserted into the bell until the spigot end is in contact with the bottom of the bell socket.

Field cut pipe may be used; however, the outside of the cut end should be tapered back about 1/4-inch at an angle of 30 degrees with the center line of the pipe, care being used to remove any sharp edges which might injure or roll the gasket. All pipes must have a minimum of 36" of cover and a maximum of 48" of cover, unless otherwise approved by the District.

Where possible, US Pipe Field Lok 350 Gaskets or approved equal shall be used in accordance with the District's Standard Plans rather than using concrete thrust anchors. Concrete anchors will normally be needed when connecting to the existing Lakewood Water District water system and where the Water District Inspector determines they are necessary. The project plans shall show where concrete anchors are required.

Detectable marking tape shall be installed along the entire length of the water main, buried a maximum of 12 inches below final grade. Tape shall consist of inert polyethylene plastic that is impervious to all known alkalis, acids, chemical reagents, and solvents likely to be encountered in the soil. Tape shall be blue and have a metallic foil core. Tape shall be imprinted continuously over its length with "WATER" and "CAUTION" in permanent black ink, prominently shown. The width of the tape shall be as recommended by the manufacturer based on the depth of installation.

Number 12 locate wire shall be furnished and installed along all pipe, hydrant laterals, blow-offs, service pipe, and all other water appurtenances.

30. LAYING OF PIPE

The Contractor shall provide all tools and equipment required in quantity and capacity sufficient to carry out the work promptly and safely.

The interior of all pipes, fittings, valves, and hydrants shall be cleaned of all foreign matter before they are laid in place and special attention be given to spigot ends and bells to see that no matter that will adversely affect the jointing is present.

The work shall be so arranged that bells are laid in the direction of progress, and on any appreciable slope, bells shall face up grade.

Pipe in and out of fittings shall be at least 10 feet long unless shown otherwise on the drawings or as required by the Inspector.

The interior of the pipe shall be always protected from the entrance of trench water, maintaining pumps at the bell holes, if necessary, until the joints are made up.

At all times when no laying is in progress, or other conditions warrant as determined by the Water District Inspector, open ends of pipe and fittings shall be plugged watertight to prevent the entrance of foreign matter or water into the pipe.
Tracer wire shall be placed along water mains during installation and terminated in valve boxes in areas where underground utilities are congested. Wire shall be furnished by the contractor.

31. TESTING

As each valved section is completed, all points where pressure reaction and movement may occur, shall be properly anchored, braced or shackled prior to pressure testing.

The Contractor shall furnish and assemble all testing equipment including measuring devices and shall furnish all labor required for testing. The District will not furnish test gages.

Upon completion of construction, the water main shall be filled slowly by the Contractor under the direction of the Water District Inspector, allowing an adequate amount of time for the disinfection of the newly constructed main. The pressure test shall be conducted a minimum of 24 hours after the filling of the pipe. The test pressure shall be 100 PSI over static (150 PSI minimum) and shall be for a duration of one hour unless specified otherwise in the Special Provisions. There shall not be an appreciable or abrupt loss in pressure during the test period. The allowable leakage shall be specified in A Guide for the Installation of Ductile Iron Pipe published by the Ductile Iron Pipe Research Association.

While under test pressure, the entire installation shall be carefully examined for defective material and joint leaks.

Prior to the pressure test, the line will be flushed, and purity and chlorine residual tests will be administered. Following the pressure test, another purity test will be administered. Purity samples shall be collected and submitted to the testing lab by the District at the developer/contractor's cost.

Local distribution pressure or test pressure shall not be applied to the newly installed water main unless the Water District Inspector is present.

Defective material furnished by the Contractor or furnished in good condition by the District and damaged after acceptance by the Contractor shall be replaced by the Contractor at their own expense.

Defective material furnished by the District and discovered before final acceptance will be replaced with sound material by the District, but the Contractor shall remove the defective material and install the new material at its own expense.

If it is necessary to replace defective material, the pressure test shall be rerun after such replacement.

After the steps listed above have been completed, the District will schedule a fire flow test at its convenience.

32. DISINFECTION

In laying of distribution pipelines, care shall be taken to ensure that the interior of the pipe is kept free of foreign matter or trench water. As the pipe is laid in the trench, dry calcium

hypochlorite shall be placed in each length of pipe in quantity sufficient to produce a chlorine residual of no less than 10 PPM in the filled line after the required 24-hour retention period.

The Water District Inspector may require the Contractor to swab the inside of each pipe length with a chlorine solution prior to laying the pipe. This requirement will depend on the time of year, usually May through September, or the condition of piping interior.

Upon completion of construction, the line shall be filled slowly under the direction of the Water District Inspector and a pressure test will be conducted. The chlorinated water resulting from the initial filling shall be retained in the line for a period of not less than 24 hours, after which the contractor, under the direction of the Water District Inspector, will remove the chlorinated water, de-chlorinate the water by approved methods, and thoroughly flush the line. The first set of bacterial test samples will be taken 24 hours after the initial flushing. A second set of bacterial test samples may be taken after a minimum of 48-hour retention period of the water remaining in the pipe after the initial flushing.

Should the samples not test free of coliform bacteria, the line shall be disinfected again and re-flushed, at the expense of the Contractor, until two successive satisfactory samples are obtained.

48 hours is the minimum time required by the bacteriological laboratory to process samples.

33. SALVAGED MATERIAL

By the request of the Lakewood Water District, Contractor may be required to deliver to the District yard those materials requested, at no expense to the District.

34. SERVICES AND SAMPLE STATIONS

Corporation stops with brass pipe stubs will be installed by Water District crews at selected points along the mains for use as sample stations, air release, and points to apply test pressure. The sample stations will be removed by Water District crews after bacterial tests and pressure tests are completed unless the stations can be used for new water service laterals.

The water main Contractor shall provide the necessary excavating required for removal of all the corporations and stubs not designated for services.

Where existing services are to be transferred from old to new mains, the work of the Contractor shall be so planned and coordinated with the District's work such that customers will be shut off as briefly as possible. Contractors are also required to notify customers ***48 hours in advance*** of water outage.

Where water service lines are installed by the Contractor, the lines shall include all work from the tap on the water main to and including the connection to existing property side service pipe. If existing property side service exists, the service line shall terminate at the tail of the meter setter. The work includes the service corp, pipe, fittings, meter, meter riser and meter box. If any

adjustments are required to the service installation because of surface grade changes or other conflicts, the work shall be performed by the Contractor at no cost to the District.

35. TRENCH BACKFILL

GENERAL

Prior to backfilling all form lumber and debris shall be removed from the trench.

Backfill shall be selected excavated material free of rocks over six inches, wood, trash, concrete, asphalt or other unsuitable material.

Excavated material, which will not readily compact to form solid, dense backfill, will be rejected by the Water District Inspector.

Surplus suitable material from other parts of the job can be used as backfill when available.

Bank Run Gravel shall be furnished to make up any deficiency in the available excavated material. Bank Run Gravel shall meet requirements of Section 9-03.19 of the WSDOT/APWA Standard Specifications, or as approved by the Water District Inspector.

Backfilling between bell holes or joints may be started as soon as the joints are made up, but all joints shall be left exposed until after the inspection and pressure test or approved by Water District Inspector.

UNDER PRIVATE IMPROVEMENTS

Private driveways, road entrances, etc., shall immediately be backfilled and compacted as required herein to provide access to residents at all times.

Backfill materials to be placed where private roads, shoulders, driveways, parking lots, sidewalks, etc., will be constructed or reconstructed over the trench shall be full depth bank run gravel or crushed rock, as specified by the most recent WSDOT/APWA Standard Specifications, Section 7.09.3.

INSIDE STATE, CITY, OR COUNTY RIGHT-OF-WAY

The Contractor shall familiarize themselves of the requirements of the State, City, or County with respect to backfill material under roadway surfaces, shoulders, etc.

36. COMPACTION OF TRENCH BACKFILL

The Contractor shall compact the backfill by use of approved methods. Water main trenches backfill may be compacted in successive layers of loose materials not more than 24 inches in depth by use of a tractor mounted compactor such as a “Hopak” or the equivalent. When

portable, hand operated air or gasoline driven compactors are used, the backfill shall be placed in successive horizontal layers of loose material not more than 6-inches in depth and regardless of the method used by compacted to at least 95 percent of maximum density. Maximum density shall be determined as specified in Section 2-03.3(14)D of the Standard Specifications or as required by the Inspector.

The Contractor shall provide the District with compaction test results for all trench backfill at points along the construction as designated by the Water District Inspector. The compaction tests shall be performed by the Washington State Certified Testing Laboratory.

The Contractor shall inform themselves of the additional or different methods of compaction inside State, County, or City dedicated rights-of-way.

Hand operated mechanical tampers shall be impact type air or gasoline driven as approved by the Water District Inspector.

The Contractor will be required to adjust gate valve boxes to the finished paving grade upon completion of the paving. These will include existing boxes affected by the water main construction and/or new paving and new boxes installed by the Contractor or the Water District which lie within the water main construction and/or new paving. Where gate valve boxes are located in the unpaved areas of the project, the Contractor will be required to adjust the boxes to the final contour of the ground.

Meters, yokes and boxes shall be adjusted by the District at the expense of the developer or as directed by the Water District Inspector with the District Operations Manager's approval.

Where hydrants do not conform to final paving grades or ground contours in accordance with Water District Drawings, the developer will be required to have his Contractor remove said hydrants and install the proper bury hydrants or extensions, as determined by the Water District Inspector.

37. OFF-SITE CLEAN UP

All loose surface-stones two inches in diameter or larger shall be removed from the top of the trench and roadway after the backfill has been firmly compacted.

Shrubbery, fences, private improvements, lawns and surfaces disturbed shall be restored to a condition equal to or better than its original condition.

Surplus excavation, pipeline material, tools, temporary structures, and rubbish shall be removed and disposed of by the Contractor, and the construction area shall be left clean at the end of each day to the satisfaction of the Water District Inspector.

All the off-site clean up and repair work shall be completed prior to placing the new water mains into service.

38. ROADWAY REPAIR

No pavement shall be cut unless shown on the drawings. A copy of the right-of-way permit from Pierce County, or the City of Lakewood will be available per contractor's request. Any cutting of the pavement will only be permitted when granted permission by the local authority.

After backfilling, a temporary patch of cold mix asphalt shall be placed on road or street crossings and driveways until the permanent paving patch can be placed.

All roadways or traveled surfaces shall be restored to their original condition or better to the extent required by local authority.

The Contractor shall inform themselves of the requirements for street surface repairs in public roadways and shall make all necessary arrangements with the proper authority for such repairs.

All public and private roadways shall be permanently repaired prior to placing the new water mains into service. Pavement restoration will include alligator cracking, etc., not ditch line of new water main only.

The City has a 5-year moratorium of no cuts into new roadway pavement. The Owner/Developer shall be responsible for any penalty cost if it is required by the City for road cuts prior to 5 years.

The City of Lakewood has established a Pavement Degradation Fee for all cuts made into street pavement. The Owner/Developer shall be responsible for paying the District the cost of the fee determined by the City. The District will then pay the fee to the City as required in the right-of-way permit.

39. USE OF PORTION OF IMPROVEMENT

The Lakewood Water District reserves the right to use for service and distribution purposes, any portion of this improvement which has been sufficiently completed. Such use shall not be construed as acceptance of any part of the work or as a waiver of any claim the District may have against the Contractor.

40. GENERAL SERVICE INSTALLATION REQUIREMENT FOR NEW PLATS

No service installations shall be started until the bacteriological samples are approved. The heavily chlorinated water from the new main(s) shall be de-chlorinated by the Developer.

The Developer shall complete grading of the right of ways to within 6 inches of the sub-grade, prior to service installation. All roadways and easements required for access to the service locations shall be maintained to be passable by automobile traffic.

- Disposal of all soils removed from service and meter trenches is the responsibility of the Developer. They are to be left on site, at a location to be coordinated by the Lakewood Water District and the Developer.
- The Developer is responsible for **marking** underground utility lines and conduits on the project. The Developer is responsible for **repairing** any unmarked underground utility structures damaged in the course of installing services or meters.
- When excavating around or exposing any Water District structure in a new plat, the Water District Inspector in charge of the project shall be notified, to ensure that the integrity of the installations are maintained.
- The Developer shall, upon request by the Water District, excavate the sample station locations for removal by Water District personnel.

The Developer shall coordinate with the Lakewood Water District Operations Manager or the Water District Inspector to determine appropriate service stub locations.

41. WATER SERVICE LOCATIONS

Service locations shall be marked with the following staking plan:

A hub and stake at the meter location, marked with the letters W-MTR, the lot number it will serve, and the finished grade. The top of the stake shall be painted blue or marked with a blue ribbon.

A hub and stake, offset no less than 5 feet and no more than 10 feet behind the water meter location, marked with the letters W-MTR, the finished grade at the meter and the lot number it will serve.

Lot lines shall be indicated with a lot corner stake, and a 10-foot offset stake, marked with the lot numbers.

Radius hubs shall be installed for all Cul-de-sacs and left in place until service installations are complete.

42. PLACEMENT OF METERS

Water meters shall be located in the right of way, in front of the lot being served. Meter locations that cannot meet this requirement must be approved by the Water District Operations Manager.

All meters installed on adjacent lots shall be positioned the same distance from the edge of the pavement.

If property corners are used by other utilities, the service may be located in the center of the lot. Meter line-setter service splitters, whenever possible, shall be used at property corners in order to be able to serve two properties. When a fire hydrant is set at a property corner, water service shall have five feet of separation.

Meters shall be laterally offset a minimum of 2 feet from the lot corners and 5 feet from Fire Hydrants.

Where possible, the meter shall be located between the road and the sidewalk. When the sidewalk meets the curb or roadway, meters shall be located behind the sidewalk.

Whenever possible, to reduce the amount of trenching, services shall be installed in common trenches that serve adjacent lots.

Avoid locating meters in proposed driveways, or other paved areas.

Water service pipes shall not be located parallel with and within 10 feet of any existing or proposed sanitary sewer line, manhole, transformer, vault, or utility pedestal. Water service pipes shall not be located parallel with and within 5 feet of any existing or proposed electrical conduits, cables, street lighting poles, gas pipes, or communication cables.

Meter locations shall be placed no closer than 3 feet to any other utility trench running perpendicular to the water service line.

Developers are responsible for mismarked lots, incorrect grades, incorrect meter locations, and **will be charged for** any changes made after installation is complete. Developers are also responsible for changes in grade made by landscaping contractors or any other sub-contractor.

Developers are responsible for damages to District property by Contractor or subcontractors after installation.

43. LANDSCAPING AND CLEARANCE REQUIREMENTS

GENERAL

- No improvements (building, wall, fence, rockery, tree, bush, structure, etc.) will be allowed that block, restrict, or impede access to the water facilities.
- The ground around the water facilities needs to remain at the original grade unless approved by the District.
- No trees can be planted over, or within 5 feet of water mains. Large trees at full growth need to be planted over 8 feet away from water mains.
- Where trees will be large (over 20 feet tall) at full growth and are planted near water facilities as described below, vertical root barriers need to be placed.

WATER METERS

- Meter box is to be placed at the property line.
- Meter box is to be set level at final grade.
- Keep grass, gravel, beauty bark or other landscape materials off of the meter box.
- Low growing shrubs need to be planted and kept trimmed to allow a minimum of 3 feet of clearance from the meter box.

- Larger shrubs and trees need to be planted no closer than 8 feet from the meter box.
- All structures, plants, fences, etc. need to be installed or trimmed to allow a minimum of 6 feet of overhead clearance in a 3-foot radius around the meter box.
- Fences near the meter box may only be adjacent to one side of the box. The remaining 3 sides need to maintain a minimum 3-foot clearance.
- Keep objects such as trash cans, flowerpots, bird baths, etc. off of and away from the meter box.
- Any change to customer grade or landscaping at the meter box may require Lakewood Water District inspection and approval.

FIRE HYDRANTS

- Fire hydrants are to be placed in accordance with the Fire Marshal's requirements.
- Fire hydrants need to be set with the breakaway flange at, or slightly above final grade.
- Landscaping around hydrants must maintain a minimum of 18 inches between the discharge ports and ground level.
- All structures, plants, fences, etc. need to be installed or trimmed to allow a minimum clearance of 3 feet around the hydrant, and larger plants or trees need to be planted at least 8 feet away.
- All structures, plants, fences, etc. need to be installed or trimmed to allow a minimum of 6 feet of overhead clearance in a 3-foot radius around the hydrant.
- No shrubs, trees, fences or obstructions can be on the street side of the hydrant.
- There is to be no parking or obstructions within 10 feet of the hydrant on the street edge.

VALVE BOXES

- Valve box is to be set level at final grade with "ears" facing in the same direction as the water main.
- Keep grass, gravel, beauty bark or other landscape material off of the valve box.
- Low growing shrubs need to be planted and kept trimmed to allow a minimum of 3 feet of clearance from the valve box.
- Larger shrubs and trees need to be planted no closer than 6 to 8 feet from the valve box depending on the anticipated full growth size.
- All structures, plants, fences, etc. need to be installed or trimmed to allow a minimum clearance of 3 feet around the valve box.
- All structures, plants, fences, etc. need to be installed or trimmed to allow a minimum of 6 feet of overhead clearance in a 3-foot radius around the valve box.
- Keep objects such as trash cans, flowerpots, bird baths, etc. off of and away from the valve box.
- Do not landscape in a manner that will block the view of the valve box from the street.

44. GENERAL BUILDING PLUMBING REQUIREMENTS

- Expansion tanks on hot water tanks are currently required in all new home/building construction or home/building remodels. Expansion tanks are necessary because the new requirement for a check valve at the meter could allow pressure to build in the home/building water system causing leaks or other damage. It is highly recommended for older homes that expansion tanks be added if they do not have them.

Typical Hot Water Expansion Tank Installation

LAKEWOOD WATER DISTRICT

DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DEVELOPERS & CONTRACTORS 2024

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LAKEWOOD WATER DISTRICT

DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DEVELOPERS & CONTRACTORS

The Lakewood Water District General Manager has the right to require, add, modify, or delete any requirements he deems necessary.

PLANS MUST BE PRESENTED FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK

1. DEVELOPER PLANS

A) Right-of-way lines and widths for proposed road and side streets.

B) Label all streets, adjoining subdivisions, and easements with dimensions.

C) Water main line locations shall clearly show dimensions from street center lines or from property lines.

D) Show existing and proposed fire hydrants. The Fire Marshall shall designate the location of all new and relocated fire hydrants. Final design drawings shall have the Fire Marshall's signature of approval before construction can start.

E) Include size, type, and pipe classification for each run of pipe.

F) All pertinent fixtures shall be identified with size and type.

G) All blow-offs for sampling will be charged to the Contractor. It will be the Contractor's responsibility to disconnect.

2. INSPECTION & INSPECTORS

A) The cost of all Lakewood Water District Inspectors will be at a rate of $ 120.00 per hour straight time and $145.00 overtime. The Inspector shall be present during all phases of the installation of the water system; any overtime shall be at a two-hour minimum.

B) A Pre-Construction Meeting will be required prior to the commencement of the work. This meeting will include introduction of District project staff including the Water District Inspector, discussion with the project staff, contractor, utility companies and permitting agencies of any concerns, and a general walk through of the proposed job.

C) The Water District Inspector is not a safety inspector, however, if they determine that inspection is needed in any areas, they can make the Contractor meet safety requirements.

D) A 48-hour notice shall be given to the District before a Water District Inspector is needed on-site of the project. If a District Inspector is scheduled to the project site by the

developer or contractor and a last-minute cancellation for his services is made, a $100 charge will be applied to the Developer or Contractor, whichever is appropriate.

E) As-built measurements must be taken daily, and a copy given to the Water District Inspector.

3. SURVEYING

Survey control and field staking shall be established by the Developer/Contractor or the District's Engineer depending on whether the water system work is under a Developer or District contract. Water main alignment offset stakes or marks shall be set at no more than 50-foot intervals. Water main grades may be required to be shown on the offset stakes/marks, and intermediate stakes as needed, for large water main installations or where known utility line conflicts exist.

The Contractor shall provide all other intermediate measurements; horizontal, vertical and construction or control staking as needed for his operation. Finished Grade must be included on the staking.

4. WATER MAIN DESIGN

Capacity: Minimum design capacity for water mains serving single family residential areas shall be 1,000 GPM over and above average maximum demands at the farthest point of the installation.

Policy to eliminate dead end water mains: During new construction main extensions, whenever possible, all water mains must be looped or tied together from at least two directions to provide equal flow of water. This will increase the flow rate for fire flow and help eliminate chlorine residual problems, improving water quality and providing reliability to the water system infrastructure. If a new dead-end main is installed, where a loop is not possible, then an automatic flushing station must be installed at the end of the main with adequate drainage provided. (See Standard Drawings) The flushing system shall include a meter and the water used be paid for by a homeowners association (HOA), The HOA will also be responsible for maintaining the flushing station.

Minimum design capacity for fire flows serving buildings other than single family dwellings shall be determined by the Fire Marshal.

Minimum pipe size is 8-inch. Pipe shall be ductile iron of domestic manufacture, Class 50 pursuant to ANSI A21.50 and AWWA C-150.

Maximum design velocity during fire flows shall not exceed 7.5 feet per second during peak day demand.

Whenever possible, maximum deflection by fitting is 45°. Successive bends shall be separated by straight runs not less than ten (10) diameters in length.

5. CONNECTION TO THE EXISTING WATER SYSTEM & SYSTEM MATERIALS

All connections to the existing water system shall be accomplished by Lakewood Water District unless approved otherwise by the District. Connections to Lakewood Water District mains with new mains must be live tapped, unless otherwise approved by the District.

Water mains shall be constructed and tested in accordance with Section 7-09 of the Standard Specifications. Bacteriological test samples will be taken by the District, but at the Contractor's expense. Purity samples shall be determined as acceptable by the testing lab before connections are made to the existing water system. All of the following will be inspected by Lakewood Water District Inspectors after the successful installations are completed.

A) Pipe for Water Mains: Pipe for water mains 4-inch and larger shall be ductile iron and shall be thickness Class 50 or greater, with Tyton or approval equal joints. Pipe shall be in accordance with ANSI Standard A21.51 (AWWA C-151). Pipe shall be cement lined in accordance with ANSI Standard A 21.4 (AWWA C-104). All fire lines and fire hydrant pipe shall be Class 52.

B) Pipe Fittings for Water Mains: Pipe fittings for water mains shall be short body, ductile iron, for 150 PSI working pressure. They shall be mechanical joint conforming to ANSI Standard A21.10 (AWWA C-110), ANSI Standard A21.11 (AWWA C-111) and ANSI Standard A21.53 (AWWA C–153). All fitting joints shall be restrained joint (See Section 10 – CONCRETE THRUST BLOCKING AND MECHANICAL JOINT RESTRAINTS).

C) In lieu of flanges on ductile iron fittings and valves, Foster Adaptors manufactured by Infact Corporation, or approved equal will be used to allow mechanical restraint.

D) Valves: Gate valves shall be the standard used in this District. A bypass line may be required in certain instances on valves larger than 8-inch.

E) Sufficient valves shall be provided on water mains so that inconvenience and sanitary hazards will be minimized during repairs. Valves should be located at not more than 300-foot intervals in commercial areas and at approximately 600-foot intervals in other areas.

F) Approvals for purity sample tests shall be delivered to the District before any connection to the water system is made.

6. GATE VALVES

Gate valves shall conform to the latest AWWA standards. Rated for cold water, 200 PSI working pressure. They shall be non-rising stem, counter clockwise opening, mechanical joint ends (except 6-inch valves on fire hydrant lines, which shall be mechanical joint by flange) valve stems shall be provided with o-ring seals and shall be as manufactured by the Mueller Company or AVK. All gate valves smaller than 12-inch shall be resilient seat gate valves. 12-inch and larger isolation

valves will be resilient seated gate valves or resilient seated butterfly valves if approved by the District. Approval of materials must be obtained from the District for each job before commencing work.

7. VALVE BOXES

Valve boxes shall be installed over valve operators. Boxes shall be two-piece, adjustable, cast iron (with extension pieces, if necessary) -- APWA 045 top section and lid.

The letters "WW" shall be cast in relief in the top. Valve operating nut deeper than 40 inches must use valve nut extension.

Fire Systems must have locking top and lid (Tyler 6855).

8. VALVE MARKERS

Shall be placed on the pavement curbing where valves are located outside of the surfaced area.

9. WATER SERVICES

Installation shall be the sole responsibility of Lakewood Water District and charged at the current established rates. Exception to this being a certified contractor who must be approved by Lakewood Water District.

All domestic and fire system services three (3) inches in diameter and above will be charged at "time and materials" and include the General Facilities Charge.

Where possible, water services shall not exceed one hundred (100) feet in length between the water main and the structure or appliance receiving water. Water service lengths greater than 100 feet shall require approval of the District's Operations and Maintenance Manager or Engineering Manager. All water services over 150 feet in length shall require a Temporary Service Agreement between the owner and the District prior to installation of the water service. All required private easements shall be the responsibility of the property owner, not the District.

Water services shall be 1-inch IPS, SIDR 7, 200 PSI, ASTM D2239 polyethylene pipe with a meter riser installed per the Lakewood Water District standard single water service detail drawing. 1-1/2 inch and 2-inch water services shall be CTS, SDR9, 200 PSI, ASTM D2737 polyethylene pipe with a meter riser as shown on the District's standard water service detail drawing.

The water service piping shall be one continuous piece, without joints, between corporation stop to meter riser assembly. All connections to plastic tubing type services shall be made by using ¾" and 1" Mueller Instatite fittings, Ford, Tyler or AY McDonald brass fittings. The 1½ inch and 2-inch service connections shall be made with Mueller 110 compression fittings or Ford Brass

fittings or similar AY McDonald Product. All service material shall be Low brass Setters and checks are required to be made by Mueller, Ford, or AY McDonald.

Water services shall be installed a minimum of three (3) feet below finished grade. Service pipe shall be wrapped with 12-gauge copper tracing wire, extending from the main to the meter box. Tracer wire shall be attached to the saddle and extend a minimum of 12 inches into the meter box. Water Services shall extend to the property line and be fitted at that point with a meter setter and vault. Connections to existing water mains shall be wet taps through a tapping saddle and tapping valve and shall be made by the District.

10. CONCRETE THRUST BLOCKING AND MECHANICAL JOINT RESTRAINTS

Mechanical joint restraints ("mega-lugs" by EBBA Iron, grip ring accessory pack by ROMAC, or equivalent) shall be used in lieu of thrust blocks on all mechanical joint fittings (bends, tees, crosses, pipe ends). Depending on the type and size of fitting, additional pipe joint fittings may be required to provide adequate pipe restraint length. However, when connecting to existing water mains, thrust blocks will likely be required because lock joint gaskets may not be installed in the joints of the connected water main. The District's Engineer or Inspector will make the determination if thrust blocks are required and the blocking will normally be shown on the project plans.

Where required, concrete thrust blocking shall be in accordance with the details shown on the Plans. Place 4 mil plastic between concrete blocking and fittings. No concrete is to get on bolt threads. Concrete shall be cured for at least two days prior to any pressure test of the pipe.

For pipe adjoining the mechanically restrained fittings, Field-Lok gaskets shall be installed in pipe joints in accordance with the District's Standard Details 1 through 4.

Full sized concrete ecology blocks are acceptable where temporary thrust blocking is required.

11. FIRE HYDRANTS

General: All hydrant lateral pipe shall be Class 52 or greater ductile iron with mega lugs on the valve follower and hydrant follower. Place one-inch washed rock around hydrant weep hole, then place 6 mil plastic sheeting over the washed rock before placing the backfill around the hydrant. All fire hydrants shall be buried to grade within three (3) inches of the marked bury line on the hydrant.

A) Mueller A423 Super Centurion 250

Fire hydrants shall comply in all respects with latest AWWA (C-502), UL (246), & FM (1510) specification. Hydrants shall be rated for a working pressure of 250 PSI and a hydrostatic test pressure of 500 PSI. Hydrants shall be – 5-1/2 inch main valve opening, have two 2-1/2 inch NST hose Nozzles, one 4-1/2 inch NST Pumper Nozzle, fitted with Storz adapter, 4-foot bury, 6-inch M.J. Bottom Connections or flange connection, 1-1/4 inch operating

nut. Open left, painted X-3472 CASE YELLOW (high grade alkyd-type, high gloss enamel intended for use on primed exterior and interior wood or metal). Repainting of hydrants may be required by the District Inspector.

Fire hydrants shall be of a compression type design with the main valve opening against the pressure and closing with the pressure. Hydrants shall be of dry top design complete with weather seal on one-piece bronze operating nut, self-lubricating sealed oil reservoir to provide positive continuous lubrication. Reservoir to be factory pre-filled with the proper type and amount of oil. All threaded and bearing parts metal to metal, metal to rubber in the bonnet section shall be automatically and fully lubricated each time the hydrant is cycled, full opened to full closed. The bonnet casting of the fire hydrant shall be a one-piece casting forming an integral lubricant reservoir with a minimum of two "O-RING" seals at the base of the bonnet. Lubrication of the hydrant shall be through a filler plug located in the bonnet of the hydrant, through which level of the lubricant can be checked. Lubrication shall not be through a fitting in the Operating Nut. All hydrants shall be of the traffic type and shall be provided with a two-piece breakable Flange and with a Breakable Stem Coupling.

The Breakable Stem Coupling shall be made of stainless steel and shall be of the Torque-Diverting Type. Breakable flanges shall be of the 8-bolt design. Breakable bolts or Breakable Lugs are NOT ACCEPTABLE. Breakable stem couplings made of CAST IRON or of ALUMINUM are NOT ACCEPTABLE. A main valve Travel Stop shall be provided in the Shoe as an integral part of the Shoe. The internal ferrous surfaces of the Shoe shall be epoxy lined with a two-part Thermo setting epoxy. All hydrants shall be furnished with a minimum of two drain valves and the drain valve facings shall made of either rubber or a polyethylene material.

The drain valve facings shall be retained in position by stainless steel screws. The Seat Ring shall thread into a bronze drain ring forming an all-bronze drainway. All pressure seals shall be rubber "O-Rings". The area of the lower stem, which is reduced in a diameter, shall be sealed away from moisture by means of compression of the rubber main valve "O-Rings". All barrel flanges shall be an integrally cast part of the upper and lower barrels with the exception of those breakable flanges which are designed to break on traffic impact. All lower Bury castings shall be one piece up to and including a 6-foot Bury Fire Hydrant. The operating nut, Thrust collar, and Treaded Stem drive shall be one piece bronze. A friction reduction agent shall be located between the Thrust collar and hold down nut in the Bonnet section. All internal bronze parts shall contain less than 16% Zinc. All bolting material below ground shall be of full ¾ inch diameter. If the bolt is less than ¾ it shall be made of Silicon Bronze or 303 Stainless steel. If the lower barrel is made of Ductile Iron, then all below ground connecting parts, including the shoe, shall be of Ductile Iron. A raised bury line shall be integrally cast on the lower barrel to indicate ground line for proper hydrant setting.

There shall be no springs used in the internal construction of the hydrant.

For all Fire Hydrants, the finished landscaping must match the bury line just below the flange as indicated on fire hydrants. All hydrants must be cleaned and painted if necessary.

Lakewood Water District will perform hydrant flow tests unless otherwise agreed to by the District. The District shall designate the hydrant(s) that will be tested.

B) American AVK High Pressure—250 PSI

Fire hydrants shall comply in all respects with latest AWWA (C-502), UL (246), & FM (1510) specification. Hydrants shall be rated for a working pressure of 250 PSI and a hydrostatic test pressure of 500 PSI. Hydrants shall be – 5-1/2 inch main valve opening, have two 2-1/2 inch NST Hose Nozzles, one 4-1/2 inch NST Pumper Nozzle, fitted with Storz adapter, 4-foot bury, 6-inch MJ Bottom Connections or flange connection, 1-1/4 inch operating nut. Open left, painted Sherwin Williams PPG-95-8002. Repainting of hydrants may be required by the District Inspector.

Stainless Steel Stem—The stem is made of stainless steel, having optimum elongation and tensile resistance capabilities.

The stainless-steel stem threads are rolled in a separate cold pressing process in order to maintain the stainless-steel structure and increase its strength. Furthermore, this method ensures smooth thread edges and consequently low operating torques.

The stainless-steel stem is 100% lead free.

Body and Bonnet Assembly—The effective assembly of the valve body and bonnet ensures durable tightness. A round rubber bonnet gasket fits into a recess in the valve bonnet preventing it from being blown out by pressure surges.

Stainless steel (304) bonnet bolts are countersunk into the valve bonnet and body of the valve. Encircled by the bonnet gasket and sealed with hot melt. Thus, there is no risk of corrosion, as the bolts are not exposed to the medium or soil. Furthermore, the bonnet bolts do not require re-torquing to ensure a proper seal of the bonnet and valve assembly.

Warranty – Ten-year warranty that covers both the cost of the defective valve and the reasonable cost to either repair or replace the defective valve.

12. SINGLE FAMILY RESIDENTIAL

All new single family dwellings shall have a public fire hydrant within 350 feet of its normal access from public right-of-way; maximum spacing shall be 600 feet.

13. RESIDENTIAL ESTATES

Residential estate zone, which shall have a public hydrant within 300 feet of its normal access from public right-of-way maximum spacing, shall be 600 feet.

14. BUILDINGS

All new buildings in commercial, industrial and apartment (including duplex) shall have a public hydrant within 200 feet of its normal access from public right-of-way.

15. LATERAL SPACING

Lateral spacing of fire hydrants shall be approved by the Fire Marshal and predicated on hydrants being located at street intersections.

16. SPECIAL REQUIREMENTS

All buildings other than single family dwellings, which are located such that any portion is more than 150 feet in vehicular travel from a street property line, shall provide fire hydrants connected to the water system. The lead from the service main to the hydrant shall be no less than six inches in diameter. Any hydrant that leads over 50 feet in length from water main to hydrant shall be no less than eight inches in diameter. Provisions shall be made wherever appropriate in any project for looping all dead end or temporarily dead-end mains.

17. WATER METERS

All primary meters will be provided by the District as part of the GFC fees and charges. All meter installations larger than 3 inches will require an isolation valve to be installed immediately downstream of the meter and enclosed in the meter enclosure.

18. WATER METER YOKES

Yokes with check valve assembly, for 5/8 x ¾ inch meter shall be the standard. 1-inch meters shall be fitted with angle stops and angle checks. 1-1/2 and 2-inch meters shall be fitted with angle stops and angle checks. Yokes and associated service fittings shall be manufactured by Mueller, Ford, or AY McDonald. The meter box shall be made of concrete or plastic and shall be of sufficient depth to expose the bottom pipe and allow a minimum of 10 inches from the top of the meter to the bottom of the lid.

19. VAULT COVERS

Valve box and vault covers shall be designed to carry the appropriate traffic loadings. When located in the street section, they shall be designed to carry H-20 loading.

20. BLOW-OFF ASSEMBLY

Blow off assembly shall be installed as per the Lakewood Water District standard 2-inch blow off-assembly detail drawing. No assembly shall be installed closer than 18 inches from or further

than three feet from the end of the pipe. Temporary blowoffs shall be installed at the end of new water mains for flushing before connecting to the water system.

21. BEDDING

Bedding material shall be placed a minimum of four inches under, around, and to a level of six inches above the top of the pipe. Existing backfill material may be used for bedding at the sole discretion of the District. Where the excavation is required below the normal grade line because of poor soil conditions, the base shall be coarse sand or crushed rock. Bedding material shall be coarse sand. Compaction of the trench backfill must be by mechanical tamping to a density of 95% as required by the Lakewood Water District. Bedding, backfill and compaction at all road crossings must conform to City of Lakewood, Town of Steilacoom, or Pierce County specifications, depending on the agency with authority over the project.

22. UNDERMINING OF ASBESTOS CEMENT WATER MAIN

Lakewood Water District requires that when an existing asbestos cement (AC) water main is undermined by more than 3 lineal feet, one full stick of AC pipe from joint to joint must be replaced with ductile iron or C900 PVC pipe with Smith Blair or Romac compression couplings. This is, and has been, a requirement by Lakewood Water District since the ULID sewer construction projects in the early 1980s.

A District Inspector shall be on-site when an AC main is exposed and during any AC main replacement. When AC main is undermined and not replaced with ductile iron or PVC pipe, the backfill shall be controlled density fill (CDF); otherwise, sand or crushed rock backfill can be used if approved by the District. All new water mains shall be disinfected before it is placed in service.

When the work is being done by the District, any costs associated with replacing the disturbed AC pipe shall be estimated by the District and collected as a deposit prior to commencement of construction. Any difference between actual costs and the deposit shall be collected or refunded.

When other utilities are replacing their existing utilities, Lakewood Water District requires a minimum of two feet of vertical clearance from its facilities.

23. GENERAL REQUIREMENTS & PROJECT COMPLETION

Finishing and cleanup shall be accomplished without additional compensation. All manholes and catch basins shall be kept clean during the entire period of construction. The contractor shall provide dust control at all times.

Upon completion, the Lakewood Water District will make a final walk through inspection after all the landscaping and paving has been completed. Checks will be made to see that all the valves are open, properly placed to final grade with operating nuts within 40 inches of the surface. (Note on As-built the length of extensions used). Finishing and cleanup shall be accomplished without additional compensation.

All fire hydrants set to bury line grade. All services set to grade, boxes intact and to grade. Pressure test and purity samples have passed, and the hydrant flow test completed. Lakewood Water District will need a total of six copies of the final As-built.

Existing asphalt, concrete pavements, or bituminous surfacing disturbed by the work shall be replaced as per City of Lakewood, Town of Steilacoom, or Pierce County specifications.

The District will not accept new water facilities as having been completed until final inspection and acceptance by the District.

24. MINIMUM UTILITY LINE SEPARATION REQUIREMENTS

Minimum Utility Separation Requirements

	Separation (feet)*							
	Electric U/G	Gas	Water Main	WW Force	WW Gravity	Storm Sewer	Structure	Major Vegetation
District Water Main	5	3	2 to 3	7 to 10	10	4	10	10

* Horizontal distance from District water main for parallel utility lines or objects

WW = waste water

Vertical separation from all utilities shall be not less than 12 inches unless approved by the District.

25. FIRE SYSTEMS

The Lakewood Water District Operations and Maintenance Manager has the right to require, add, modify, or delete any requirements he deems necessary.

The District allows two types of fire protection systems.

- Separate dedicated fire system connected independently to the water system and detached from any other water service.
- Residential fire sprinkler systems

It is not the responsibility of the District to determine the fire system connection and pipe sizes. The fire system sizes must be determined by a fire sprinkler designer or the Fire Marshal's office. All fire systems must be approved by the Fire Marshal's office before installation of the system. Once the fire flow requirements are provided to the District, a meter size and cost will be

determined for the fire service line installation from the water main to and including the meter box.

A) Dedicated Fire Systems

All fire suppression water systems are required to have:

1. A separate connection and service to the distribution system
   a) Each fire suppression system shall be connected to the public water system with service lines the same size as the system feed line.
   b) Fire connections are dedicated to suppressing fire only and no other use is authorized, and violators will be penalized.
   c) Valves shall be provided at the tap onto the supplying water main which shall have a complete valve box providing access to operate the valve with a lockable lid.

2. A backflow assembly commensurate with the degree of hazard
   a) All fire suppression water system connections to the Lakewood Water District mains shall be protected with a backflow assembly. Fire protective systems shall be protected with a Double Check Detector Assemblies (DCDA) or with a Reduced Pressure Detector Assemblies (RPDA) based on the degree of hazard at the discretion of Lakewood Water District, who's decision is final.
   b) Backflow assemblies protecting fire systems shall be installed in a meter box (2" or less in size) or concrete vault (larger than 2") at the property line or easement line.
   c) Fire sprinkler systems shall have a pipe-length distance of one hundred (100) feet or less between the supplying water main and the (Christmas tree) riser distribution point.
   d) Backflow assemblies shall be placed on private property and are owned and maintained by the owner of said property.
   e) It is the responsibility of the property owners to properly maintain the backflow assembly and comply with the State of Washington and Lakewood Water District standards.

3. Protection of the Backflow Assembly
   a) Fire suppression service line meters 2" and smaller shall be in a meter box providing minimum clearances specified herein.
   b) Fire suppression service line meters larger than 2" shall be enclosed in an approved enclosure providing minimum clearances specified herein. Vault installations shall conform to Lakewood Water District standards.
   c) Vented assemblies (RPBA's & SRPVB's) require drains below the assembly piped or mechanical pumped to atmosphere with pipe capable of exceeding 120% of the

maximum flow available through the service line without flooding or affecting the assembly.

d) Backflow assemblies larger than 2” shall be firmly supported from a stable floor.

e) Backflow assemblies located higher than five feet from level ground surface shall have a platform constructed to L&I standards with an applicable building permit for purposes of testing and maintenance of the valve.

f) All enclosures of backflow assemblies shall have access through doors that swing away from the valve and are wider than the assembly is long.

4. Use Meters

a) Fire suppression systems 2” and smaller shall have a meter on the service line before and within 18” of the backflow assembly.

b) The meter shall be located at or as near as possible to the property line or easement line.

c) Meters shall be Sensus© iPERL® meter with Sensus AMI radio that reads in cubic feet.

5. Permits and Inspection during installation

a) A permit to install a fire suppression system and/or a fire suppression system is required by and obtainable from the front counter of the corporate offices of the Lakewood Water District.

b) Lakewood Water District will provide an inspector at the owner’s expense to observe the fire suppression system installation up to and including the Post Indicator Valve (PIV). The PIV is to be located as directed and approved by the Fire Marshal of the appropriate jurisdiction.

6. General requirements

a) Post indicator valve (PIV) shall be at least 20-feet away from a flammable building. Non-flammable building PIV may be installed in wall. Note: Contractor must obtain approval from the Fire Marshal. The installations must have a valve off the water main flanged to the tee; also, all fire systems must use approved backflow protection, commensurate with the degree of the hazard. This should be taken into consideration when designing fire sprinkler systems. All pipes shall be Class 52.

b) Fire line responsibility:

I. All 1”-3” fire lines with Water District meters—maintenance responsibility ends at the meter.

II. All 4”-12” fire line connections maintenance responsibility ends 10’ from main line tee or at right-of-way property line. If PIV is located nearer than 10’ to tee, then maintenance responsibility ends District side of PIV.

III. All gate valves must have a valve box with locking lid (Tyler 6855 spec).

c) Fire systems are to be protected with double check detector assemblies or with reduced pressure detector assemblies, both are required to have a bypass meter -- Sensus iPERL meter with one cubic foot increments and approved radio read. The touch pad is required to be installed in the vault lid. If the system is in a building the pad must be installed in an outside wall no higher than 5’ above ground. The by-pass meter will be provided to the contractor by the District at current cost plus overhead, the District will provide and install the AMI radio and will be expensed back to the customer on a time and materials basis.

B) Residential Fire Sprinkler Systems

1. Single-family homes and duplexes

Voluntary residential (single-family homes and duplexes) fire sprinklers systems were encouraged through House Bill 1295 effective in 2011. The District prefers installation of a multipurpose, flow-through system for residential customers but will consider variations to the concept of a dedicated fire sprinkler system (Refer to *Washington Water Utilities Council, Guide for Water Utility Managers and Governing Bodies on Residential Fire Sprinkler Systems, October 2008*).

The District favors the use of a multipurpose, flow-through system that uses the same water service and household plumbing to supply the fire sprinklers and the various domestic water uses in the home. The District will have final approval of what system and configuration is allowed. Minimum requirements for a flow-through system are:

a) Flow-Through System

I. The standard service will involve a 1-inch service line and a full ¾-inch meter. The service and meter size will be determined by the fire flow demand as provided to the District and other factors such as system pressure, length of the service line, elevation change from water main to the home and available fire meters.

II. All in-home fire sprinkler piping must terminate at a fixture getting regular domestic use to ensure flow through all parts of the in-home system.

III. Backflow prevention will not be required except in special circumstances.

IV. All system components must be UL and NSF approved. The District is currently using an NSF approved Sensus iPERL meter for this application. The applicant must pay the District’s published cost for the required service & meter installation.

V. District staff must have access to the residence to verify that these requirements are met and confirm that all system inspection fees are paid.

2. Multi-family

The provisions stated above for Single-Family, and Duplexes will apply for multi-family flow through fire systems where each living unit is separately metered. Some circumstances, such as multiple story buildings may require backflow prevention devices in the flow through system.

All applicable provisions under Dedicated Fire Systems above, such as meter, meter box and permit requirements, still apply to these flow-through systems.

26. HYDRANT METER REQUIREMENTS

A) Lakewood Water District requires a $200 deposit and a signed hydrant meter permit and regulations form.

B) If a deposit is paid before 12:00 PM the hydrant meter will be delivered the same day. If the deposit is paid after 12:00 PM, the hydrant meter will be delivered no later than the next business day.

C) Lakewood Water District requires a copy of a current backflow assembly test report. The customer will need to provide a copy of the current backflow assembly test report for each assembly when the meter is delivered.

D) Lakewood Water District will hook up the hydrant meter for the customer when it's delivered to make sure the hydrant and meter are in good working condition.

E) The customer will need to provide all necessary fittings, hoses, and supports.

F) General Backflow applications include Approved air gap – pools, hot tubs, or any application where an approved air gap will work to protect the water. Also required on trucks that will be filled with water. Trucks will be visually inspected, and the license numbers recorded. Double check valve assembly – Ditch settling, dust control, filling of new water mains, etc. Also, for filler trucks with no approved air gap that is not being used in a high hazard situation. Reduced pressure backflow assembly – Required for high hazard situations where an approved air gap is not feasible or available. This may include filler trucks using chemicals, pools, sewers, etc. Reduced pressure backflow assembly and approved air gap – Is required on all sewer or sewer related applications.

G) Removal of water will be allowed during the hours of 8:00 a.m. till 5:00 p.m., unless authorization is given by a representative of the Lakewood Water District.

H) Once a hydrant has been designated, you cannot hook up to another hydrant without expressed permission from Lakewood Water District. Failure to comply will result in a $500 fine.

I) The meter permit is good for 6 months. However, the terms may be extended up to one year with prior authorization from the Lakewood Water District; otherwise, the customer

will need to complete a new permit every 6 months. A current copy of a backflow test assembly report will also be required to extend hydrant meter permit terms.

J) The first hydrant meter permit is free of charge; each additional 6 months renewal (or extension) will cost $50 and must be paid before the new permit will be issued or an extension on the initial permit can be extended.

K) The Lakewood Water District will check all hydrant meters and hydrants on an annual basis to be sure that they are in good working condition. The District will also check for a current backflow test assembly report on an annual basis.

L) The hydrant meter permit needs to be always on site during the use of the said hydrant.

M) The permit must be surrendered to an official of the Fire District, the Lakewood Water District, or Law Enforcement if requested.

N) When work is completed, the customer is responsible for calling (253) 588-4423 within 24 hours to schedule a final inspection of the meter and hydrant. District personnel will inspect the meter, hydrant, and take a final read off the meter.

O) The $200 deposit will be applied to the customer's final invoice. If a balance is due after the deposit has been applied, Lakewood Water District will issue an invoice.

P) If the District owes a refund after the deposit is applied, Lakewood Water District will issue the customer a refund check within 30 days after the return of the meter.

Q) Lakewood Water District requires the contractor to provide the exact location and the reads for the hydrant meters at the end of each month, and the customer is billed for the consumption used. There is a minimum rate of $40 plus $5/day rental fee for the meter. If the reads are not provided Lakewood Water District Staff will make attempts to locate and read the meter. The cost of this will be billed on a time and materials basis to the permit holder, along with all usage.

R) Lakewood Water District reserves the right to refuse water from any hydrant if the above regulations are not met to the District's satisfaction.

27. CROSS CONNECTION CONTROL

A) BACKFLOW PREVENTION

1. General

   Backflow Prevention, or Cross Connection Control is for protection of water quality and is regulated by WAC 246-240-290 and administrated and enforced by the Lakewood Water District. The policies, procedures, and criteria for determining appropriate minimum levels or protection shall be in accordance with the Accepted Procedure and Practice in Cross Connection Control Manual – Pacific Northwest Section American Waterworks Association, Seventh Edition, or any superseding edition.

   If water is required for (new or remodel) commercial or residential construction, all temporary services shall be equipped with an approved method of backflow prevention acceptable to Lakewood Water District.

All irrigation systems, new commercial water services, commercial services for building remodels and special residential services must have approved backflow assembly protection, commensurate with the degree of the hazard.
Fire sprinkler systems shall have backflow protection commensurate with the degree of the hazard, but a minimum of a Double Check Detector Check Assembly is required on all new fire systems.

NOTE: All Backflow protection must be checked for flow as needed for sprinkler system designs.

The Lakewood Water District Operations and Maintenance Manager or their designee has the right to require, add, modify, or delete any backflow protection requirements they deem necessary.

Commercial Backflow Checklist

- ❑ Contact District to determine if a plan review is required.
- ❑ If a plan review is required, deliver plans to District and Pay $150 plan review fee. DISTRICT will determine the minimum number of required backflow assemblies.
- ❑ Purchase required backflow assembly permits from District.
- ❑ Install required backflow assemblies.
- ❑ Have installed backflow assemblies tested by certified backflow assembly tester (BAT).
- ❑ Call District for inspection. Do not call until all assemblies are installed and have passed their initial test. Test reports must be available to the District inspector to complete the inspection. If all the required tests have not been completed or the test results are not available, the District inspector will not complete the inspection or sign for occupancy. If another inspection is required additional inspection fees may be assessed.

Residential Backflow Checklist

- ❑ Contact the District to determine what kind of protection is required.
- ❑ Purchase required backflow assembly permits District.
- ❑ Install required backflow assemblies.
- ❑ Have installed backflow assemblies tested by certified backflow assembly tester (BAT).
- ❑ Call District for inspection. Do not call until all assemblies are installed and have passed their initial test. Test reports must be available to the District inspector to complete the inspection. If all the required tests have not been completed or the test results are not available, the District inspector will not complete the inspection. If another inspection is required additional inspection fees may be assessed.

For the list of Backflow testing documents and Backflow Hazzard/Protection Table, please see the District web page [Backflow Testing Documents | Lakewood Water District, Washington]

2. PERMIT INFORMATION
   a) A permit is required for every backflow assembly installation. The District will no longer waive a permit for having an existing assembly which is not up to code. Permits are available in person or can be arranged with a District Backflow Specialist over the phone.
   b) Permits are only available at the front counter of the Lakewood Water District office during regular business hours.
   c) If the District finds a job in progress without a permit, the District will give one working day to obtain the required permit.

3. PERMITS
   a) All new construction, new irrigation system, or any required backflow assembly must have a permit.
   b) All existing buildings or irrigation systems need to have a permit.
   c) Permits for assemblies at the same property are currently $65.00 per backflow assembly for the first two assemblies, and $32.50 for each assembly thereafter.

4. INSPECTIONS
   a) All Backflow Assemblies installed are to be inspected by Lakewood Water District.

5. TESTING
   a) All backflow assembly installations will be the customer's responsibility to have the assembly tested by a Backflow Assembly Tester (BAT) certified in Washington by the state Department of Health.
   b) All backflow assemblies require testing within a twelve-month period conducted by a current and valid Backflow Assembly Tester (BAT) certified in the State of Washington by the Washington State Department of Health using proper equipment calibrated within the last twelve months of test date.

6. REPAIRS
   a) All Backflow assemblies failing a Backflow Assembly Tester's (BAT) exam shall be repaired by a certified plumber with a backflow assembly endorsement by Washington State Labor and Industries.

B) ***BACKFLOW ASSEMBLIES***

A backflow assembly permit must be obtained from Lakewood Water District before any work requiring protection commences. Current prices (subject to change) are: $65.00 for the first assembly and $32.50 for each assembly thereafter per permit on the same property. Permits are obtainable at the front counter of the corporate offices of Lakewood Water District. All backflow prevention assemblies shall be "Lead Free" and be ANSI/NSF 61 certified.

1. Reduced Pressure Backflow Assembly (RPBA) and Reduced Pressure Detector Assembly (RPDA)
   a) Shall be installed in a horizontal configuration, unless approved for alternate configuration by State of Washington Department of Health.
   b) Shall be installed a minimum of twelve (12) inches above atmospherically drainable grade.
   c) An assembly installed more than five (5) feet above floor or ground level must have a permanent platform under it for the tester and/or the maintenance person to stand on. The platform must comply with all applicable safety standards and codes in effect and be covered by a properly executed building permit.
   d) These valves do drip or spit from time to time. Adequate air gapped drain basket shall be installed and properly directed to a daylight drain or pumped drain capable of flows equal to the capacity of the service.
   e) If anchoring to wall is necessary, there must be that at least six (6) inches of clearance between the wall and the assembly unless the testers or maintenance position is designated on that side, when a minimum 36" is required with clear access to and from the designated position.
   f) All backflow assemblies shall be accessible for testing and maintenance.

2. Double Check Valve Assembly (DCVA) and Double Check Detector Assembly (DCDA)
   a) Shall be installed in a horizontal configuration unless approved for alternate configuration by the State of Washington Department of Health and the approval of the Cross Connection Control Department of the Lakewood Water District.
   b) Isolation valves and test cocks shall be accessible for testing and maintenance.
   c) On fire systems double check detector assemblies or reduced pressure detector assemblies are required. Please check with the cross-connection control department before installing.

3. Spill Resistant Pressure Vacuum Breakers (SRPVB)
   a) SPRVB's are not an approved assembly for backflow prevention except in specific applications which must be reviewed and approved by the DISTRICT Cross Connection Control Department prior to installation.

4. Atmospheric Vacuum Breaker (AVB)
   a) AVB's are not an approved assembly for backflow prevention except in specific applications which must be reviewed and approved by the Lakewood Water District Cross Connection Control Department prior to installation.

C) *INSTALLATION REQUIREMENTS FOR BACKFLOW ASSEMBLIES*

1. Landscape Irrigation systems using Double Check Valve Assemblies (DCVA) in-ground for irrigation systems:
   a) Shall be installed in an approved configuration.
   b) Adequate space is required for DCVA's installed in a box below ground. Adequate room for both testing and maintenance shall be provided.
   c) The following are the recommended minimum sizes for a box for below-ground DCVA installation:
      i. ¾" to 1" Assemblies 10"x13"
      ii. 1¼" to 2" Assemblies 14"x20"
   d) The DCVA shall be installed with the test cocks facing up or to the most available side.
   e) DCVA's shall have six (6) inches of clearance below the valve. There shall be adequate drainage material below the valve (drain rock, gravel, pea gravel).
   f) DCVA shall not be more than twelve (12) inches from the top of the box.
   g) Three (3) inches of room shall be provided on the ends of the valve so that shut off ball valve can be accessed.

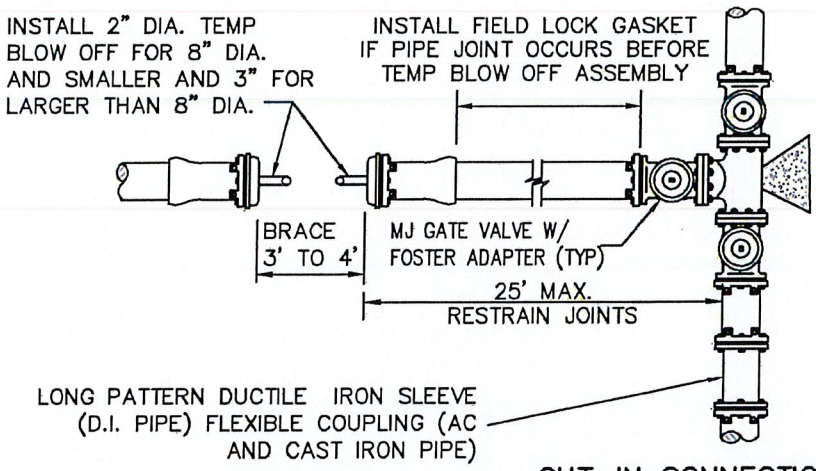
2. Pressure Vacuum Breaker Assemblies (PVBA)
   a) A PVBA shall only be installed in a vertical configuration a minimum of twelve (12) inches above the highest downstream piping.

3. Atmospheric Vacuum Breaker (AVB) – special approval required.
   a) An AVB shall be installed only in a vertical configuration, at least six (6) inches above all downstream piping (highest point of use).
   b) No control valve shall be installed on the downstream side of an AVB. The AVB shall be pressurized for no more than twelve (12) hours in any twenty-four (24) hour period.

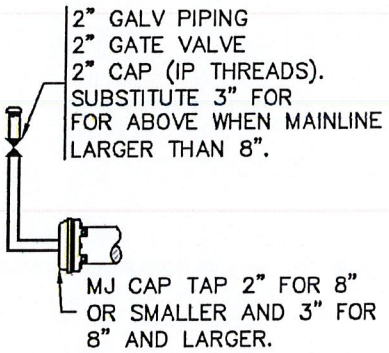
LAKEWOOD WATER DISTRICT

DESIGN / CONSTRUCTION STANDARD DRAWINGS
2024

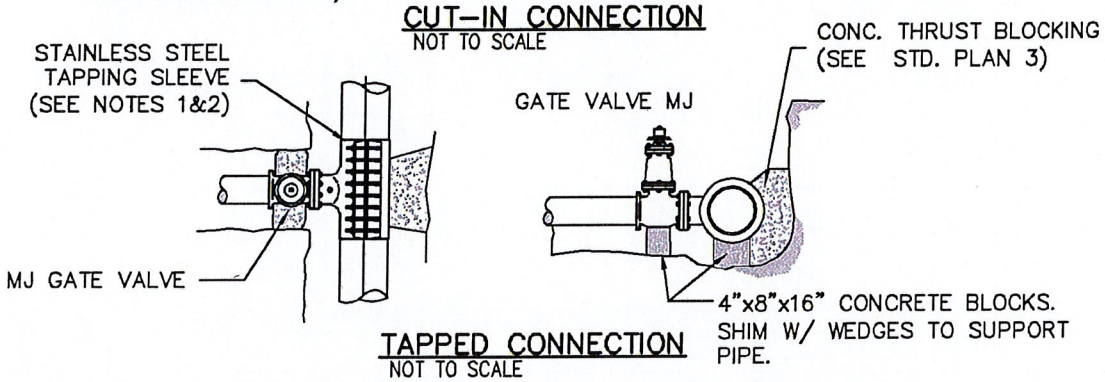
TABLE OF CONTENTS



CUT–IN CONNECTION
NOT TO SCALE



TEMP BLOW–OFF



TAPPED CONNECTION
NOT TO SCALE

NOTES:

TAPPED CONNECTIONS NOT ALLOWED WITHOUT SPECIFIC APPROVAL FROM THE DISTRICT.

NO CONNECTION WILL BE ALLOWED UNTIL ALL PRESSURE TESTING COMPLETED, AND SATISFACTORY BACTERIOLOGICAL TEST RECEIVED. SEE CROSS CONNECTION CONTROL SECTION IN SPECIFICATIONS.

TAPPING SLEEVE TO BE STAINLESS STEEL FOR AC PIPE AND EPOXY COATED STEEL FOR DUCTILE OR CAST IRON PIPE. CLOSEST EDGE OF TAPPING SLEEVE MUST BE 3' (MIN.) FROM COUPLING ON AC PIPE.

SEE DETAILS FOR VALVE BOX, THRUST BLOCKING. PIPE AND FITTING RESTRAINT REQUIREMENTS.

BACKFILL PER JURISDICTIONAL REQUIREMENTS WHEN IN ASPHALT. ALL OTHER AREAS PER THE STANDARD SPECIFICATIONS.

TEMP BLOW OFF'S MUST BE PROTECTED FROM DAMAGE. PLACE IN TRAFFIC BOX IF REQUIRED.

WATER OUTAGE ONLY ALLOWED TUESDAY THROUGH THURSDAY 9:00AM TO 3:00PM. (7) WORKING DAYS NOTICE REQUIRED.

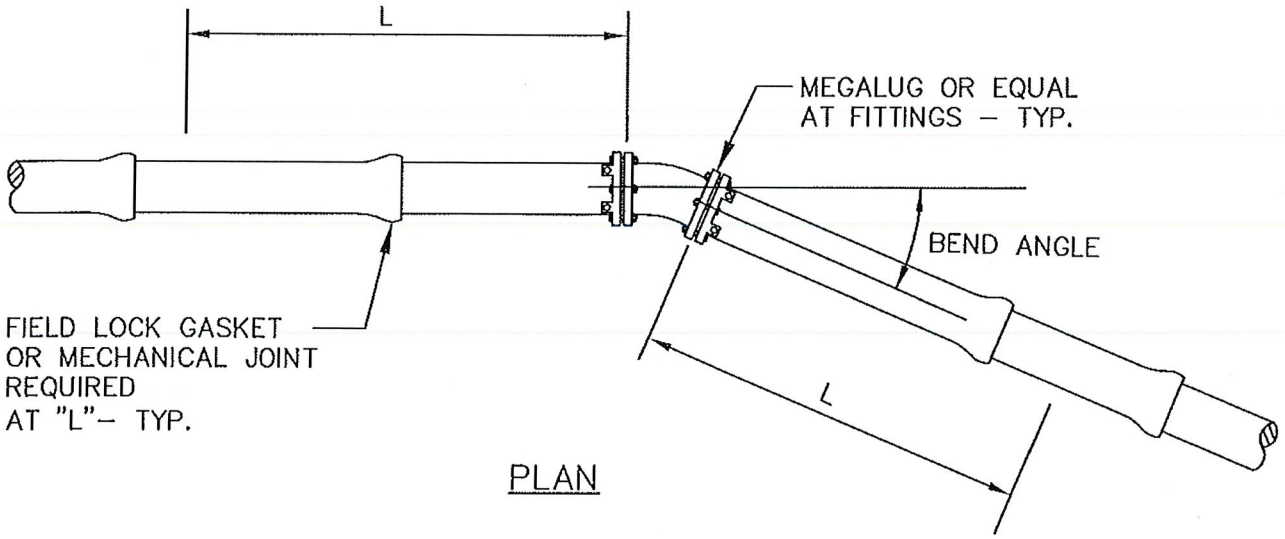
ALL MJ JOINTS TO BE MEGALUG OR EQUAL.

SIMILAR TEMP B.O. REQUIREMENTS FOR TAPPED CONNECTIONS. LOCATE BLOW OFF OUT OF ASPH. WHEN POSSIBLE.

ALL FITTINGS AND PIPE SHALL BE STERILE SWABBED. CONNECTION SHALL BE INSPECTED FOR VISUAL LEAKAGE UNDER FULL LINE PRESSURE PRIOR TO BACKFILL.

1 CONNECTION REQUIREMENTS

LAKEWOOD WATER DISTRICT



PLAN

HORIZONTAL BEND RESTRAINED LENGTH (L) REQUIRED EACH LEG PAST FITTING (FT)					
PIPE SIZE	TEE OR PLUG	90°	45°	22.5°	11.25°
6"	79	38	16	8	4
8"	103	50	21	10	5
10"	124	59	25	12	6
12"	113	54	23	11	6
16"	145	68	29	14	7

NOTES:

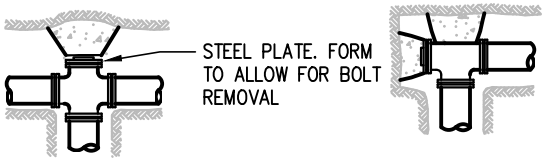
1. RESTRAINED LENGTH SHALL BE ADJUSTED IF CONDITIONS DIFFER FROM ASSUMPTIONS.
2. IF RESTRAINED LENGTH SHOWN IS NOT ACHIEVABLE, THRUST BLOCKS SHALL ALSO BE USED. SEE DETAIL 3.
3. RESTRAINED LENGTHS CAN BE ADJUSTED WITH SITE SPECIFIC SOILS INFORMATION, ENGINEER DESIGN AND DISTRICT APPROVAL.
4. MULTIPLE FITTINGS IN MULTIPLE PLANES SHALL BE DESIGNED AND STAMPED ON AN INDIVIDUAL BASIS BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF WASHINGTON.

ASSUMPTIONS:

1. TEST PRESSURE 200 PSI.
2. LAYING CONDITION 3.
3. SAND–SILT SOIL DESIGNATION.
4. COVER ON 6–10" DIA. AT 3 FEET; COVER ON 12–16" DIA. AT 4 FEET.
5. SAFETY FACTOR 1.5
6. VALUES DEVELOPED WITH DIPRA THRUST RESTRAINT CALCULATOR.

(2) HORIZONTAL BEND RESTRAINT

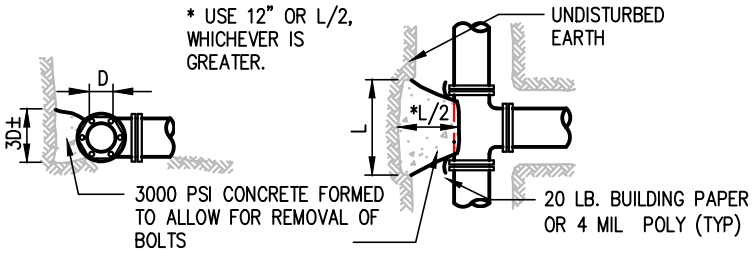
LAKEWOOD WATER DISTRICT



CROSS WITH PLUG

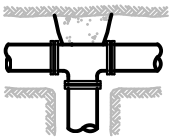
PLUGGED TEE

HORIZONTAL BEND



ELEVATION

PLAN



TEE

THRUST BLOCK TABLE

PIPE SIZE	TEE OR END PLUG	90°	45°	22 ½°	11 ¼°
4" OR 6"	3	4	2	2	2
8"	6	7	4	2	2
12"	12	16	9	5	3
16"	21	29	16	8	4

MINIMUM BEARING AREA AGAINST UNDISTURBED EARTH (SQUARE FEET)

NOTES:

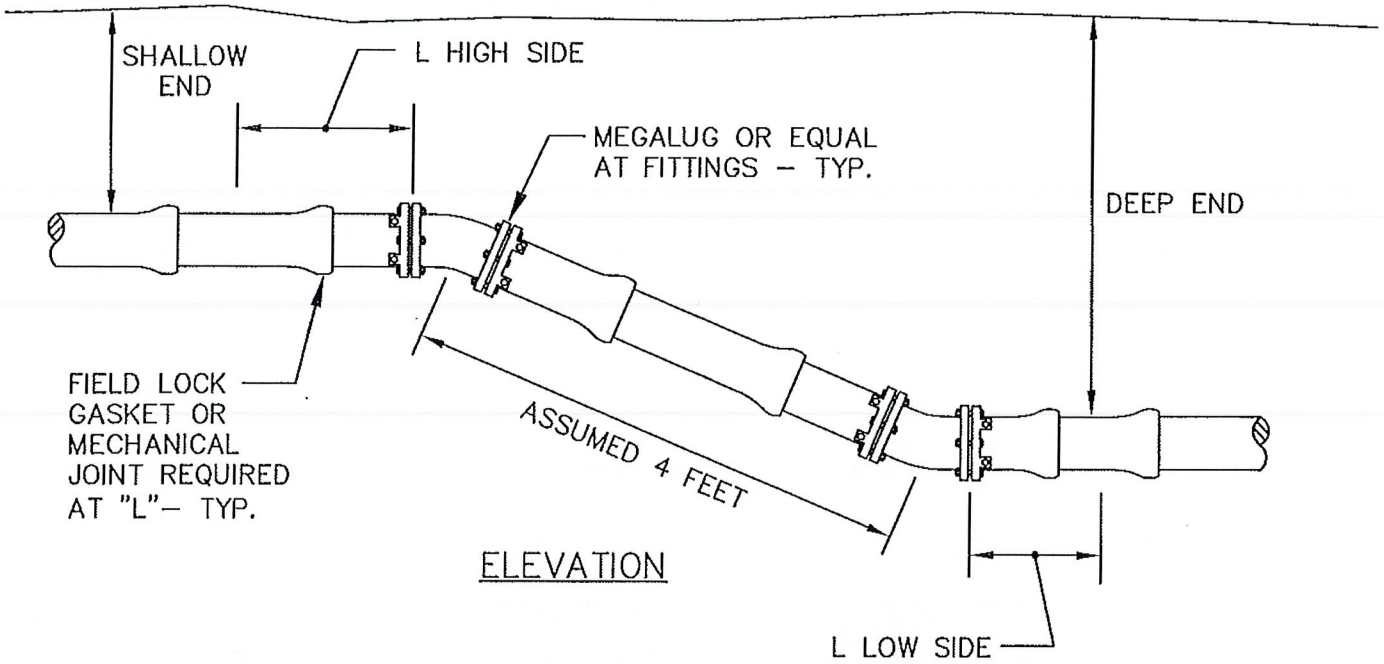
1. BEARING AREA OF CONC. THRUST BLOCK BASED ON 200 PSI PRESSURE AND SOIL BEARING LOAD OF 2000 POUNDS PER SQUARE FOOT.
2. AREAS MUST BE ADJUSTED FOR OTHER SIZE PIPES, PRESSURES AND SOIL CONDITIONS.
3. CONCRETE BLOCKING SHALL BE CAST IN PLACE AND HAVE A MINIMUM OF ½ SQUARE FOOT BEARING AGAINST THE FITTING. SIDES SHALL BE FORMED WITH PLYWOOD OR EQUIVALENT.
4. THRUST BLOCK SHALL BEAR AGAINST FITTING ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT DISMANTLING OF JOINTS.
5. CONCRETE TO BE 3000 PSI MINIMUM. PRE-MIX CONCRETE IS PREFERRED. IF CONCRETE IS HAND MIXED THE PROPORTIONS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. COMPRESSIVE TESTS OF "HAND MIXED" CONCRETE MAY BE REQUIRED. PRE-INSPECTION OF BLOCKING AREA REQUIRED PRIOR TO PLACEMENT OF CONCRETE.
6. CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.
7. THRUST BLOCK USED ONLY WHEN SHOWN ON PLANS OR WHEN CONNECTING TO EXISTING PIPE WHERE EXISTING JOINT RESTRAINT IS UNKNOWN.

DETAIL REVISED:
FEBRUARY 2023

3 THRUST BLOCKING DETAIL

DETAIL FOR CONNECTIONS TO EXISTING MAINS ONLY

LAKEWOOD WATER DISTRICT



ELEVATION

VERTICAL BEND RESTRAINED LENGTH (L) REQUIRED EACH LEG PAST FITTING (FT)						
PIPE SIZE	45°		22.5°		11.25°	
	HIGH SIDE	LOW SIDE	HIGH SIDE	LOW SIDE	HIGH SIDE	LOW SIDE
6"	64	29	30	12	14	5
8"	84	38	39	17	19	7
10"	100	46	47	21	23	9
12"	91	42	43	19	21	8
16"	118	54	56	25	27	11

NOTES:

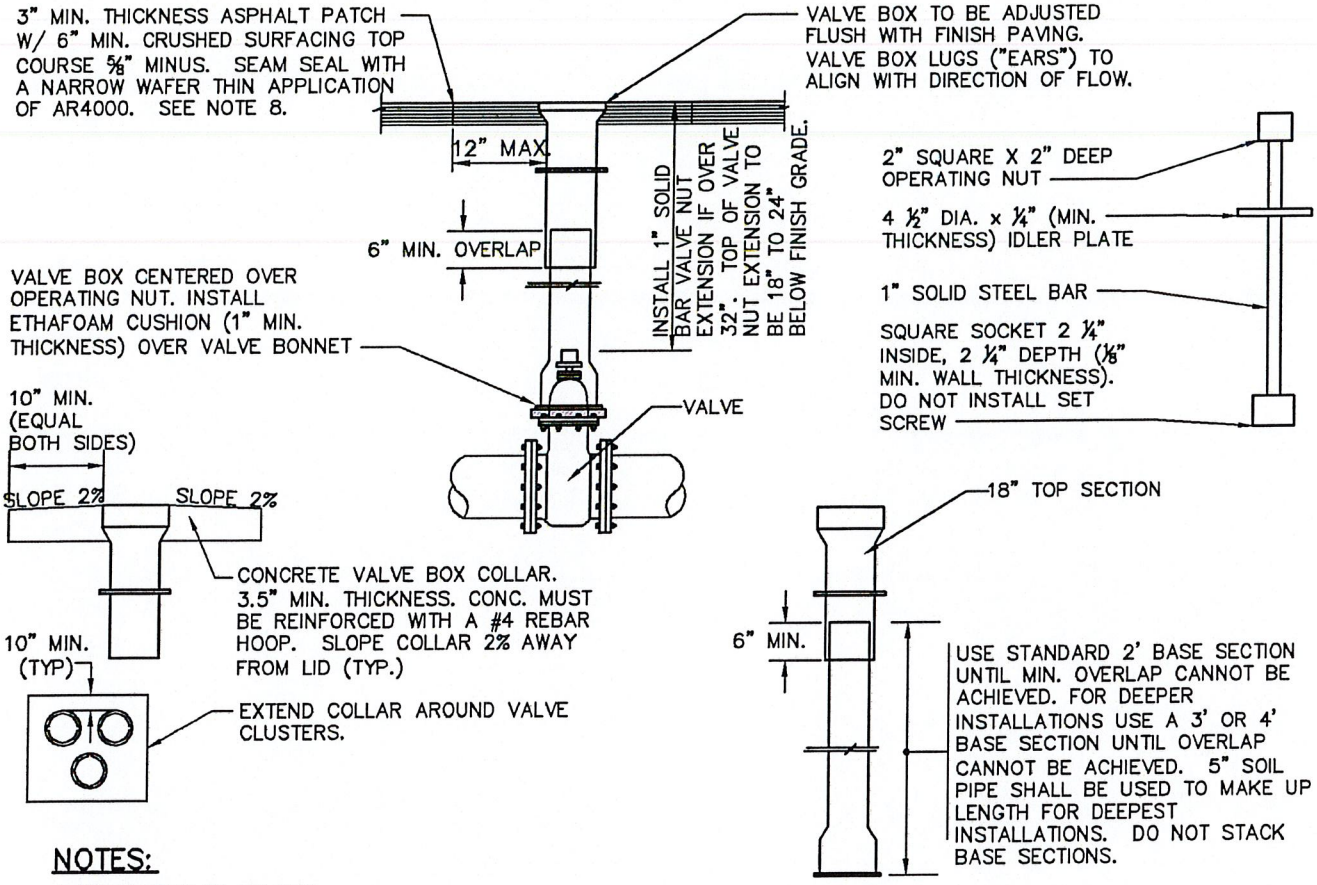
1. RESTRAINED LENGTH SHALL BE ADJUSTED IF CONDITIONS DIFFER FROM ASSUMPTIONS.
2. IF RESTRAINED LENGTH SHOWN IS NOT ACHIEVABLE, THRUST BLOCKS SHALL ALSO BE USED. CONTACT DISTRICT FOR THRUST BLOCKING DETAIL.
3. ALL PIPE BETWEEN VERTICAL BENDS SHALL BE RESTRAINED.
4. RESTRAINED LENGTHS CAN BE ADJUSTED WITH SITE SPECIFIC SOILS INFORMATION, ENGINEER DESIGN AND DISTRICT APPROVAL.
5. 90° VERTICAL BENDS ARE NOT ALLOWED.
6. MULTIPLE FITTINGS IN MULTIPLE PLANES SHALL BE DESIGNED AND STAMPED ON AN INDIVIDUAL BASIS BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF WASHINGTON.

ASSUMPTIONS:

1. TEST PRESSURE 200 PSI.
2. LAYING CONDITION 3.
3. SAND–SILT SOIL DESIGNATION.
4. SHALLOW END COVER ON 6–10" DIA. AT 3 FEET; COVER ON 12–16" DIA. AT 4 FEET.
5. LENGTH BETWEEN FITTINGS ASSUMED TO BE 4 FEET SO KNOWN LENGTH IS 2 FEET.
6. SAFETY FACTOR 1.5
7. VALUES DEVELOPED WITH DIPRA THRUST RESTRAINT CALCULATOR.

4 VERTICAL BEND RESTRAINT

LAKEWOOD WATER DISTRICT



NOTES:

1. VALVE BOX TO BE 045.
2. VALVE BOX LIDS TO BE 4" DEEP IN TRAFFIC AREAS AND A MIN. OF 3" IN OTHER LOCATIONS. LOCKING VALVE BOX LIDS (AMPRO STYLE 940) REQUIRED IF LIDS WILL NOT STAY PUT DUE TO TRAFFIC.
3. SAWCUT VALVE BOX COMPONENTS. BROKEN OR JAGGED VALVE BOX SECTIONS NOT ACCEPTABLE.
4. OVERLAY ADJUSTMENT RINGS NOT ALLOWED, UNLESS APPROVED BY THE DISTRICT.
5. VALVE BOX COLLARS REQUIRED IF VALVE BOX OUT OF PAVING. COLLARS TO BE FLUSH WITH FINISH SURFACE. SLOPE COLLARS AWAY FROM LID @ 2% (TYP.)
6. VALVE BOX LIDS TO BE PAINTED (2) COATS SAFETY YELLOW PAINT.
7. VALVE BOX COLLAR REQUIRED WHEN VALVE BOX OUTSIDE OF PAVING.
8. VALVE BOXES SHALL BE ADJUSTED AFTER PAVING AND PATCHED AS SHOWN ABOVE. VALVES CONNECTED TO THE EXISTING SYSTEM SHALL BE MADE ACCESSIBLE AT ALL TIMES.

5 VALVE BOX INSTALLATION

LAKEWOOD WATER DISTRICT

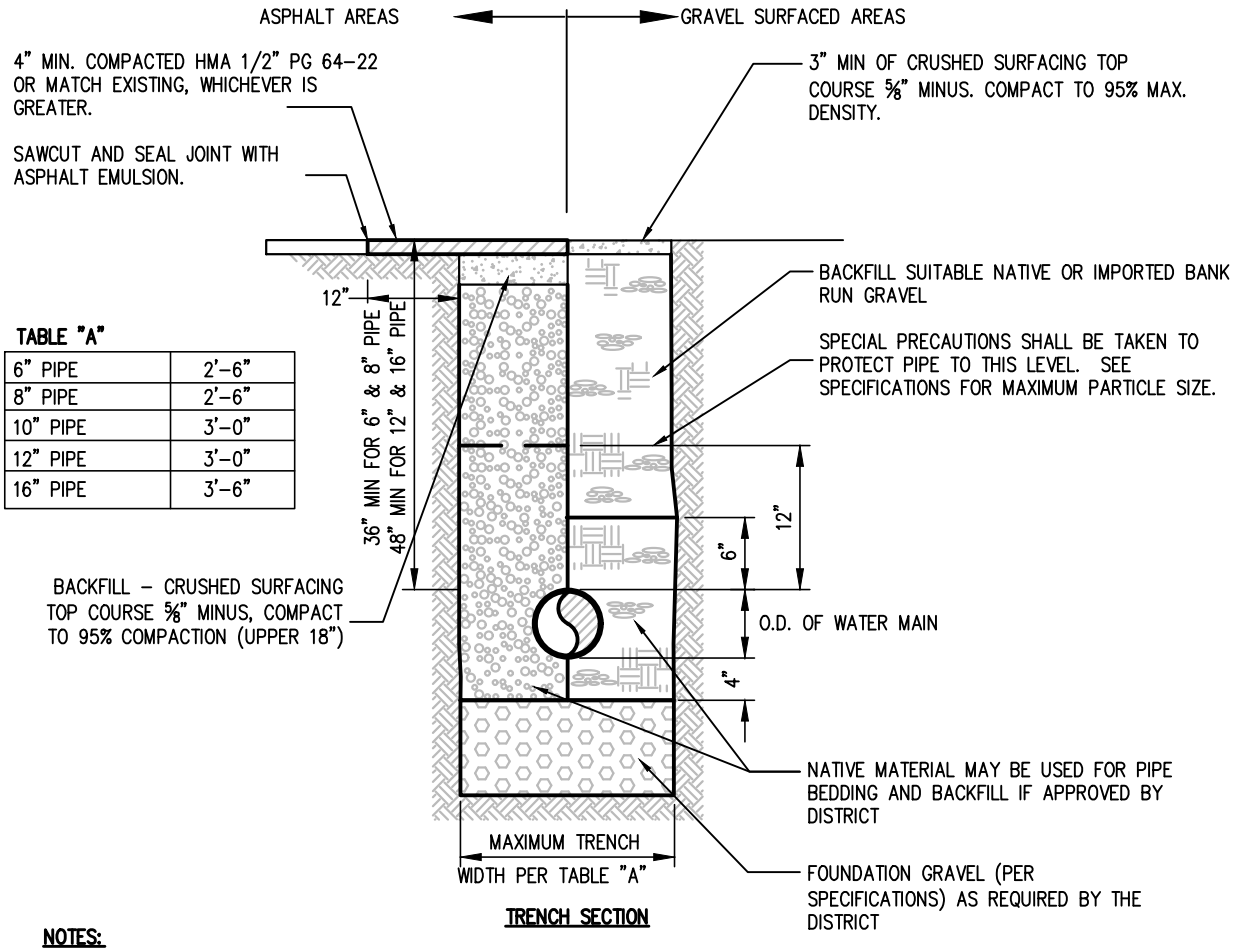


TABLE "A"

6" PIPE	2'-6"
8" PIPE	2'-6"
10" PIPE	3'-0"
12" PIPE	3'-0"
16" PIPE	3'-6"

TRENCH SECTION

NOTES:

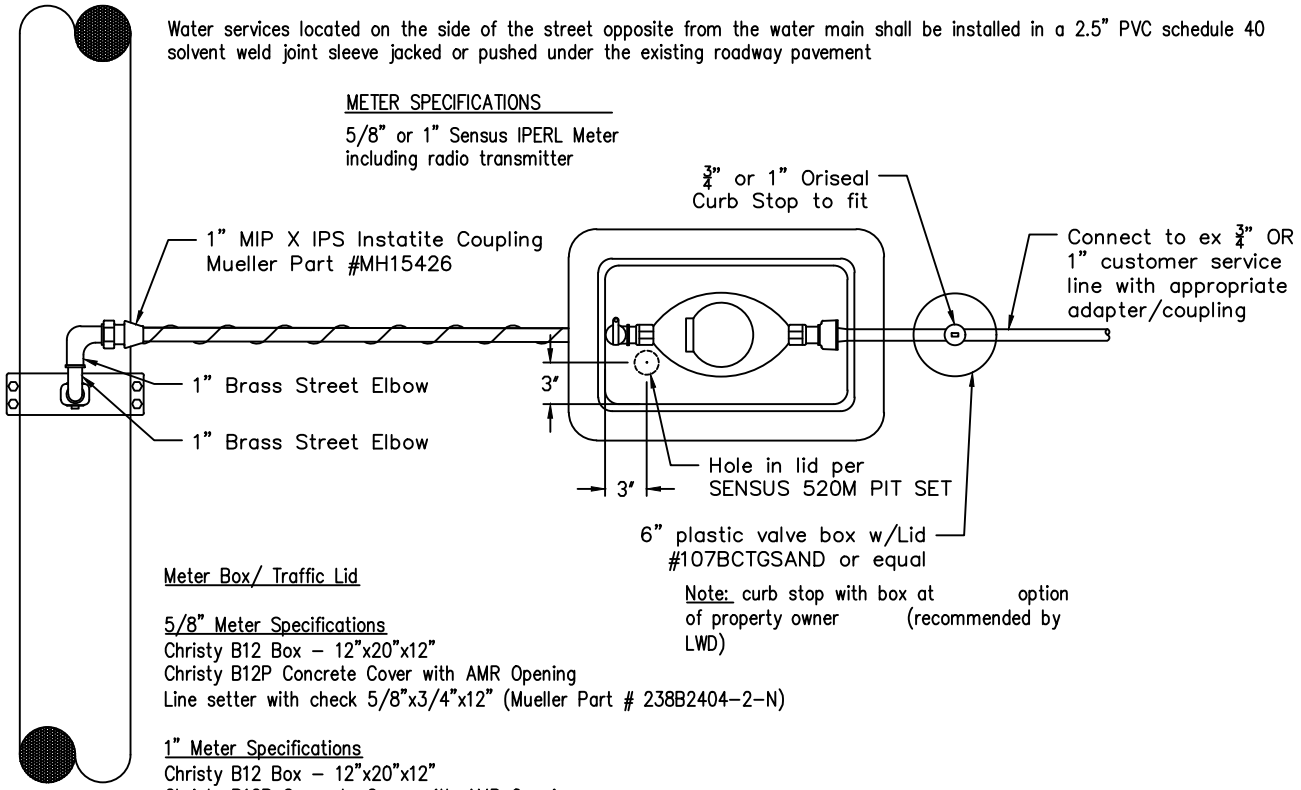
1. BEDDING REQUIRED ONLY IF DIRECTED BY THE DISTRICT DUE TO NATIVE SOIL CONDITIONS. BEDDING SHALL BE 5/8" CRUSHED SURFACING IF NATIVE MATERIAL IS JUDGED UNSUITABLE BY THE DISTRICT. BEDDING UNDER ASPHALT OR CONCRETE PAVEMENT AREAS SHALL BE CRUSHED ROCK 5/8" MINUS.
2. PUMPING SOILS SHALL BE REMOVED FROM THE TRENCH BACKFILL IMMEDIATELY.
3. TEMPORARY PATCH TO BE BACKFILLED AND COMPACTED TO EXISTING GROUND LINE AND PATCHED WITH HMA 1/2" PG 64-22 TEMPORARY PATCH 2" THICK.
4. BACKFILL MATERIAL PLACED IN 6" LIFTS AND COMPACTED TO 95% MAXIMUM DENSITY. BACKFILL SHALL BE CRUSHED ROCK 5/8" MINUS UNDER ASPHALT OR CONCRETE PAVEMENT AND NATIVE MATERIAL IN GRAVEL AREAS IF APPROVED BY THE DISTRICT.

DETAIL REVISED:
FEBRUARY 2023

6 TYPICAL TRENCH SECTION

LAKEWOOD WATER DISTRICT

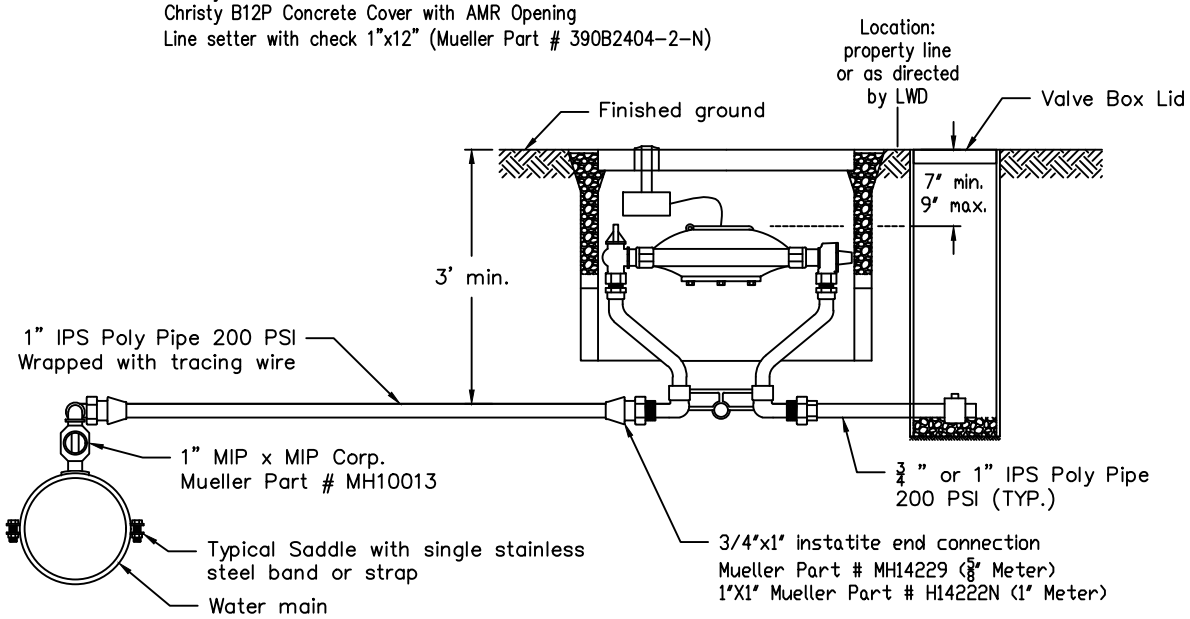
Water services located on the side of the street opposite from the water main shall be installed in a 2.5" PVC schedule 40 solvent weld joint sleeve jacked or pushed under the existing roadway pavement



Meter Box/ Traffic Lid

5/8" Meter Specifications
Christy B12 Box – 12"x20"x12"
Christy B12P Concrete Cover with AMR Opening
Line setter with check 5/8"x3/4"x12" (Mueller Part # 238B2404–2–N)

1" Meter Specifications
Christy B12 Box – 12"x20"x12"
Christy B12P Concrete Cover with AMR Opening
Line setter with check 1"x12" (Mueller Part # 390B2404–2–N)

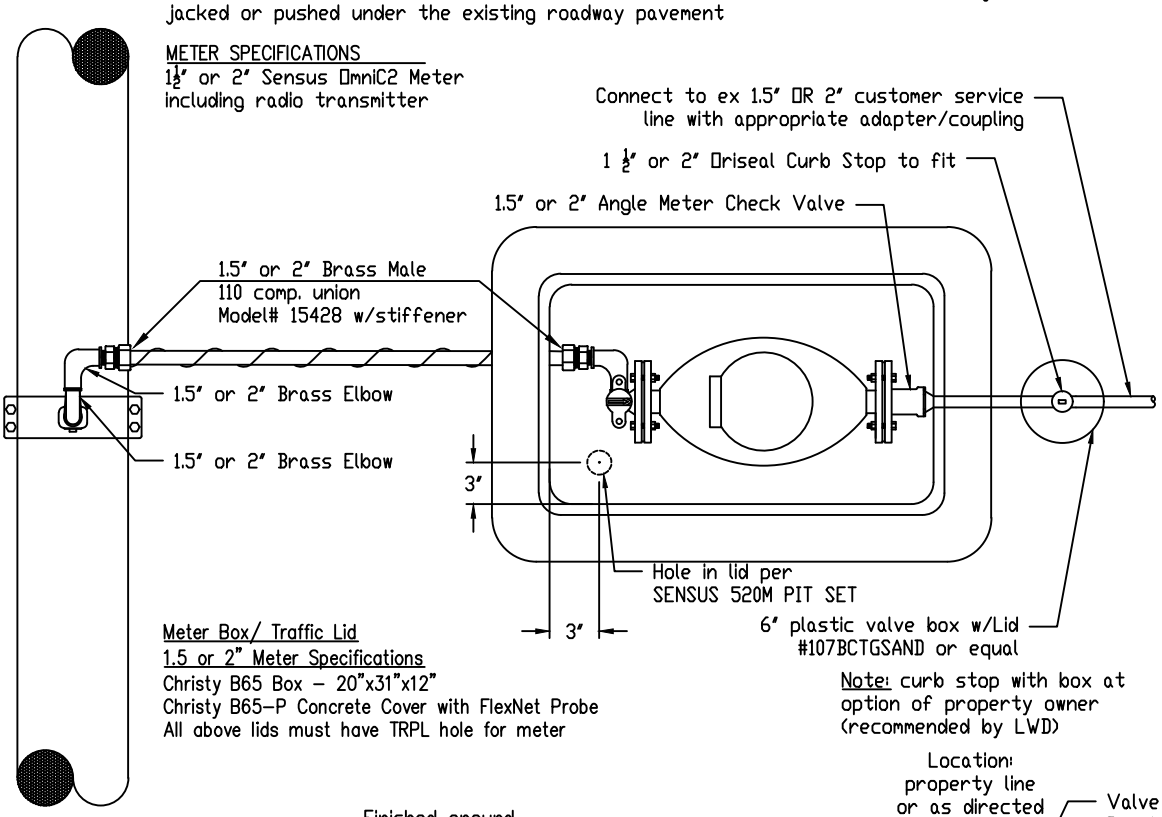


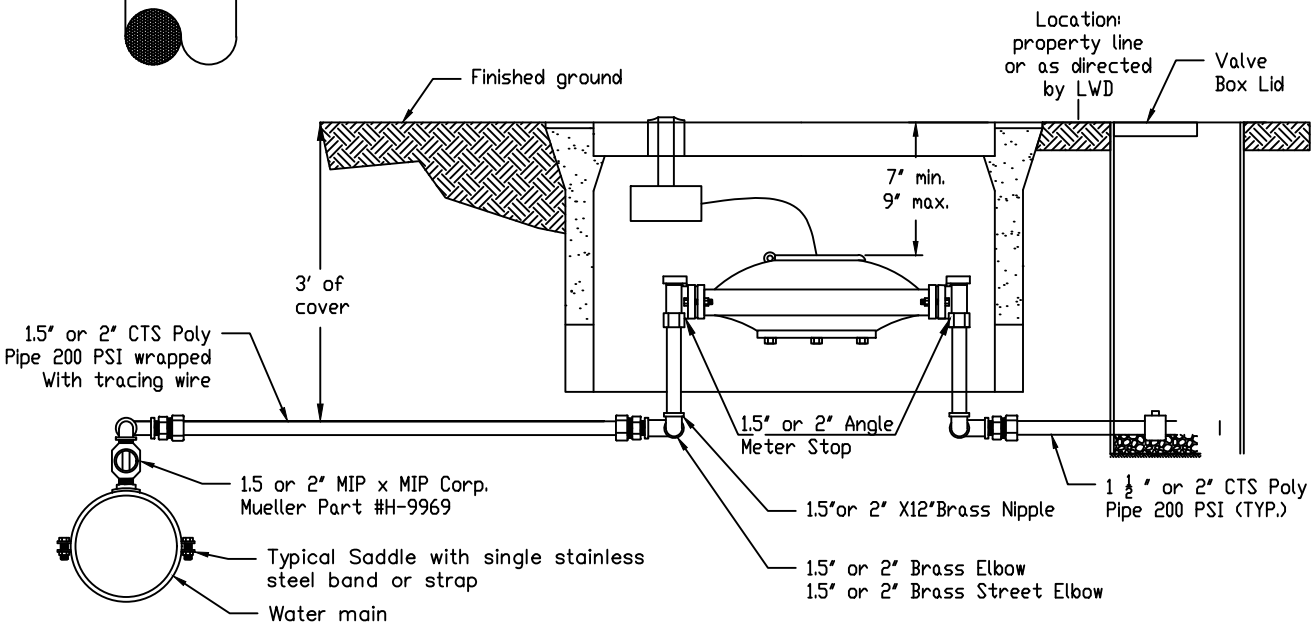
DETAIL REVISED: JANUARY 2023

7A TYPICAL WATER SERVICE FOR A 5/8" AND 1" ASSEMBLY

LAKEWOOD WATER DISTRICT

Water services located on the side of the street opposite from the water main shall be installed in a 2.5" (1.5" Service) or 3" (2" Service) PVC schedule 40 solvent weld joint sleeve jacked or pushed under the existing roadway pavement

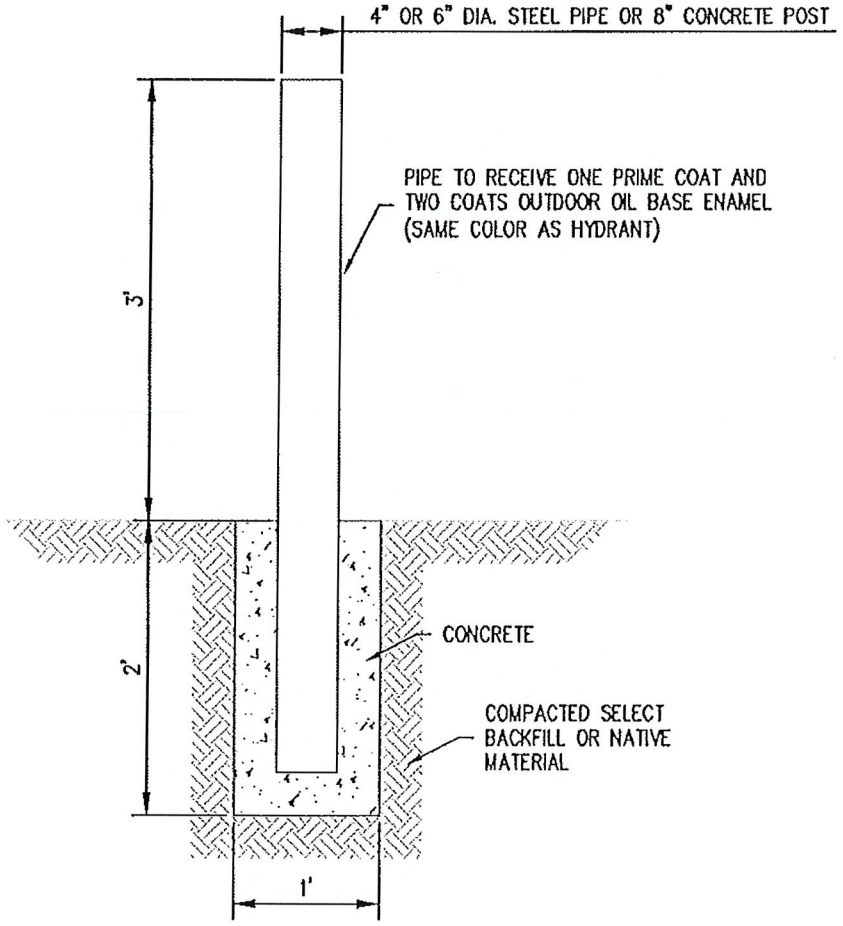




DETAIL REVISED: JANUARY 2023

7B TYPICAL WATER SERVICE FOR 1.5" AND 2" ASSEMBLY

LAKEWOOD WATER DISTRICT

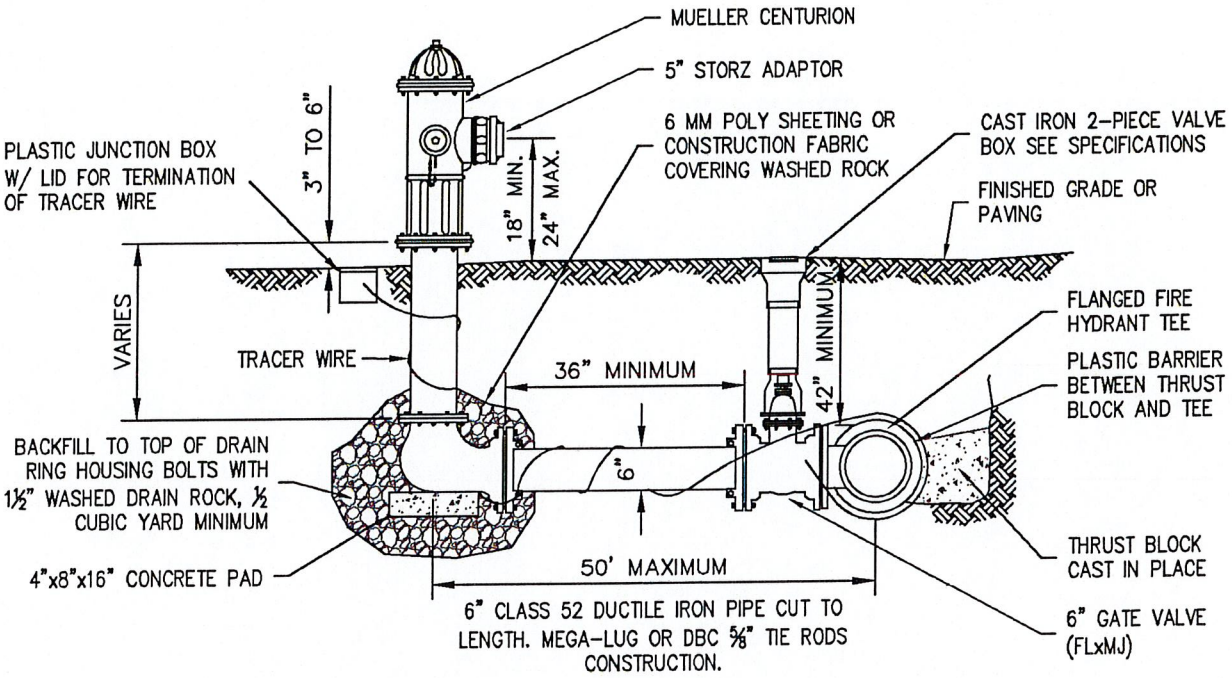


NOTE:

LOCATE BOLLARDS 3' MINIMUM FROM HYDRANT DO NOT BLOCK HYDRANT PORTS.

8 HYDRANT BOLLARD

LAKEWOOD WATER DISTRICT



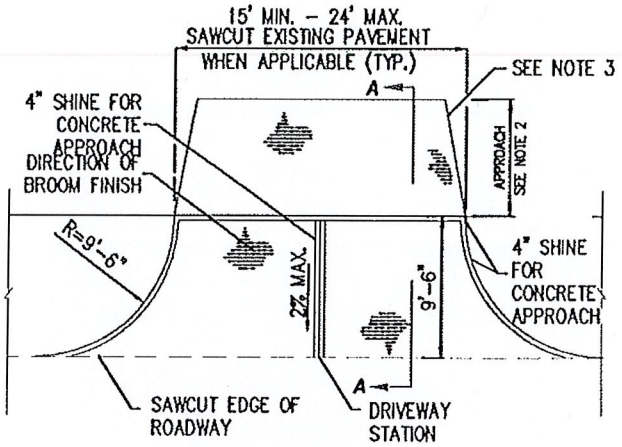
NOTES:

1. ANY HYDRANT SETBACK LONGER THAN ONE FULL LENGTH OF PIPE THAT REQUIRES A BELL AND SPICKET WILL NEED A FIELD LOCK GASKET, AND MAY REQUIRE A THRUST BLOCK AT THE DIRECTION OF THE INSPECTOR.
2. MAINTAIN MINIMUM 3' RADIUS UNOBSTRUCTED WORKING AREA AROUND HYDRANT INCLUDING FUTURE IMPROVEMENTS.
3. 6" GATE VALVE MAY BE MJxMJ IF FOSTER ADAPTER IS USED.

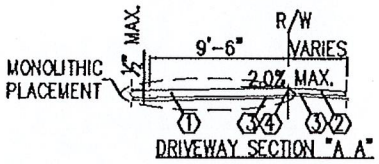
DETAIL REVISED:
JANUARY 2023

9 FIRE HYDRANT

LAKEWOOD WATER DISTRICT



TYPICAL DRIVEWAY PLAN



DRIVEWAY SECTION "A A"

GENERAL NOTES:

1. MATERIALS AND CONSTRUCTION REQUIREMENTS SHALL BE PER LATEST EDITION OF WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION UNLESS OTHERWISE NOTED.
2. PROVIDE MINIMUM OF 10' HMA APRON ON EXISTING GRAVEL APRON DRIVEWAYS. PROVIDE MINIMUM OF 5' CONCRETE APRON ON EXISTING CONCRETE DRIVEWAYS. PROVIDE MINIMUM OF 5' HMA APRON ON EXISTING HMA DRIVEWAYS.
3. PROVIDE TAPER IN DRIVEWAY APRON TO MATCH EXISTING DRIVEWAY WIDTH AS DIRECTED BY CITY ENGINEER WHEN APPLICABLE.
4. DRAINAGE SHALL BE ADDRESSED ON A CASE BY CASE BASIS AS DIRECTED BY THE CITY ENGINEER.

CONSTRUCTION NOTES:

(1) 2" MIN. HMA CL. ½" PG 64-2 COMPACTED OR 6" CEMENT CONCRETE

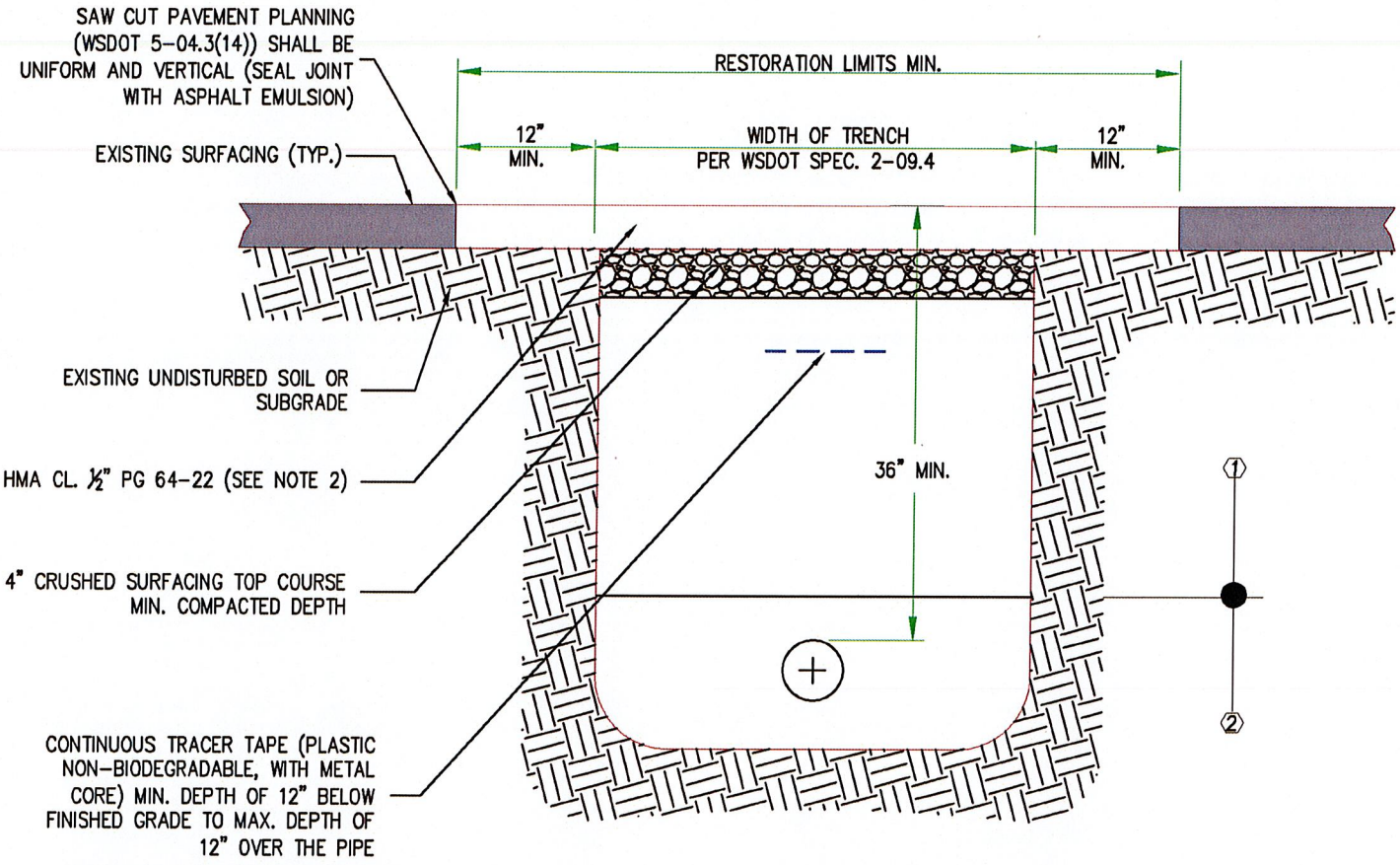
(2) HMA: 2" HMA CL. ½" PG 64-22
CONCRETE: 6" CEMENT CONCRETE

(3) 2" CSTC

(4) THROUGH EXPANSION JOINT/ SCREED POINT FOR CONCRETE APPROACH

10 CITY OF LAKEWOOD DRIVEWAY DETAIL

LAKEWOOD WATER DISTRICT



RESTORATION GENERAL NOTES:

1. MATERIALS AND CONSTRUCTION REQUIREMENTS SHALL BE PER LATEST EDITION OF WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION UNLESS OTHERWISE NOTED.
2. COMPACTED HMA DEPTH SHALL BE 3" MINIMUM OR AS SHOWN IN PLANS OR PERMIT, WHICHEVER IS GREATER, AND SHALL BE COMPACTED TO 92% OF RICE DENSITY.

DETAIL GENERAL NOTES:

1. ALL PATCHES ACROSS CITY STREETS SHALL CONFORM TO THIS DETAIL.

BACKFILL COMPACTION LEGEND

① BACKFILL MATERIAL SHALL BE PLACED IN 6" LIFTS AND COMPACTED TO MINIMUM OF 95% MAXIMUM DENSITY OF THE MODIFIED PROCTOR PER ASTM 1557.

② BEDDING MATERIAL SHALL BE PLACED IN 4" LIFTS AND COMPACTED TO MINIMUM OF 95% MAXIMUM DENSITY OF THE MODIFIED PROCTOR PER ASTM 1557.

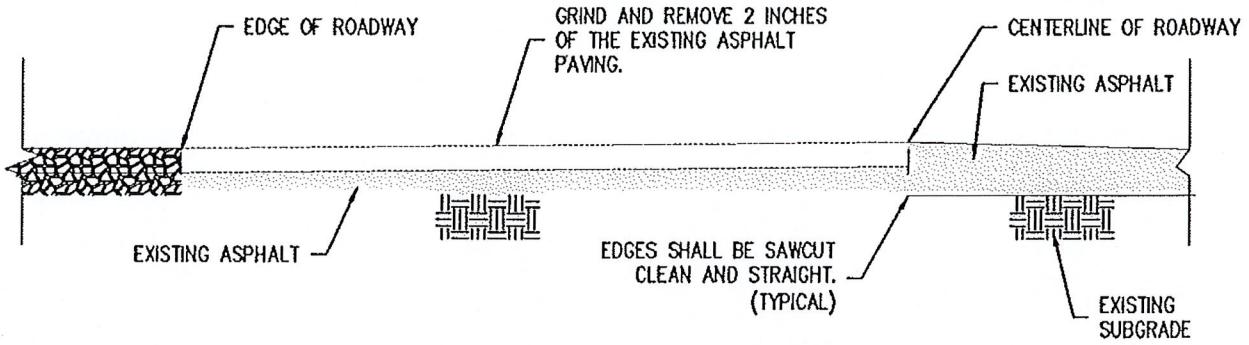
DETAIL REVISED 02/14/2020

11 CITY OF LAKEWOOD TRENCH PATCH DETAIL

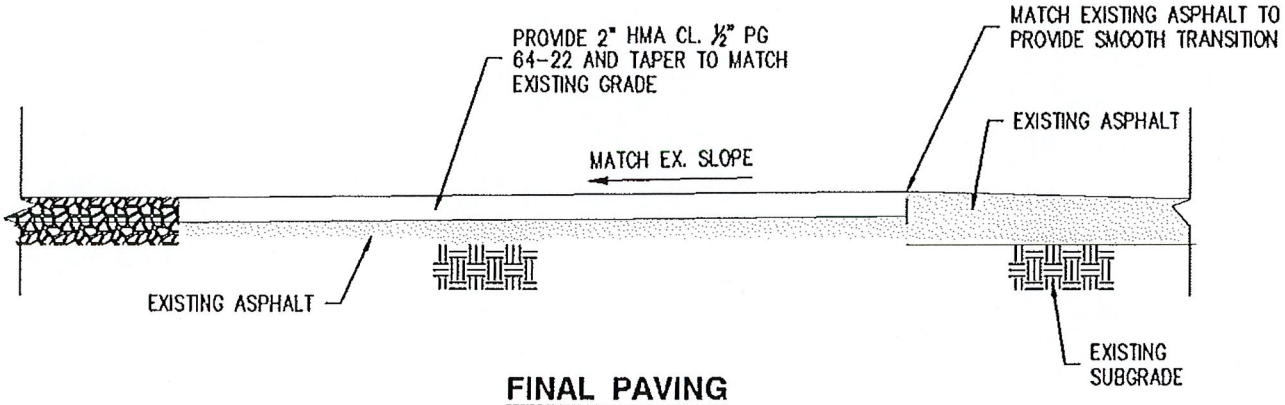
LAKEWOOD WATER DISTRICT

NOTE
EXTENTS OF ONE LANE ROADWAY RESTORATION SHOWN ON PLANS

NOTE: CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS BEYOND THE SCOPE OF THE ROADWAY AND SHOULDER IMPROVEMENTS TO THEIR EXISTING CONDITION OR BETTER. HYDROSEED ALL GRASS AREAS DISTURBED.



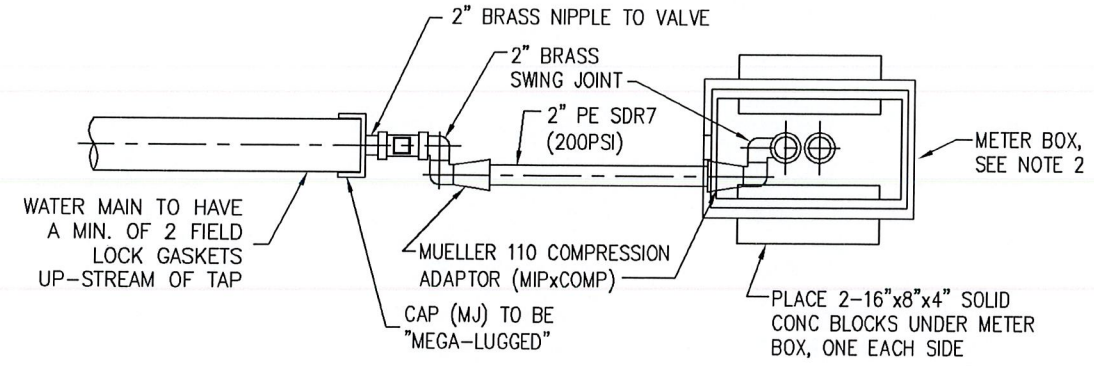
LANE PREPARATION FOR PAVING



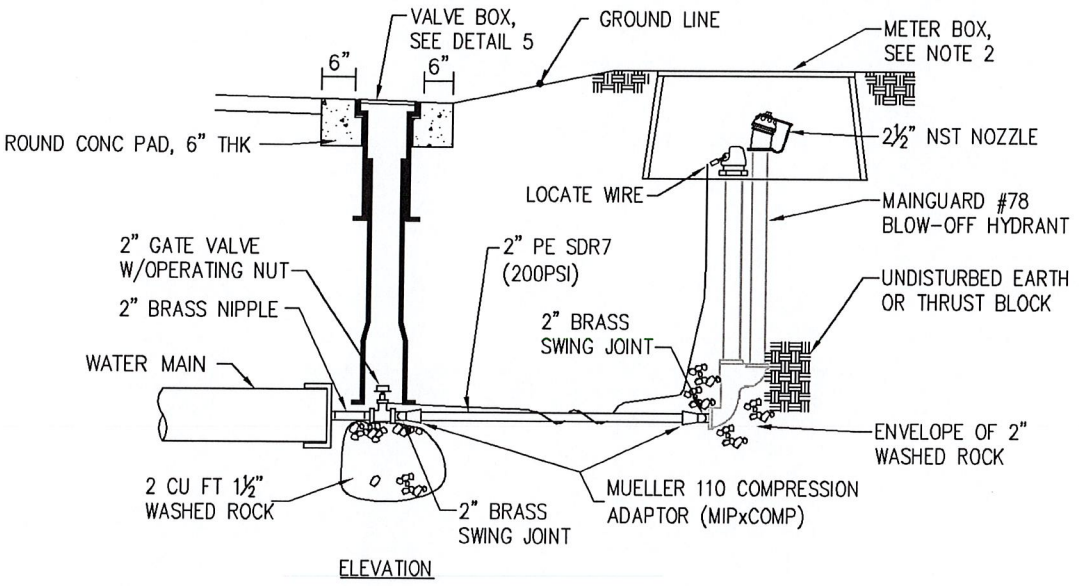
FINAL PAVING

12 ONE LANE ROADWAY RESTORATION

LAKEWOOD WATER DISTRICT



PLAN



ELEVATION

NOTES:

1. BLOW-OFF HYDRANTS SHALL BE #78 MAINGUARD HYDRANT (THE KUPFERLE FOUNDRY CO).
2. SET UNDERGROUND IN ARMORCAST B36 W/ LID OR EQUIVALENT CARSON HD BOX & LID, (30"x17"x12").
3. THE OUTLET SHALL ALSO BE BRONZE AND BE 2-1/2" NST.
4. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE.
5. LOCATE WIRE SHALL BE 12 GAUGE WIRE FROM 2" GV TO METER BOX W/ 6" MIN EXPOSED WITHIN BOX.
6. THRUST BLOCKS TO BE DETERMINED BY LWD INSPECTOR.

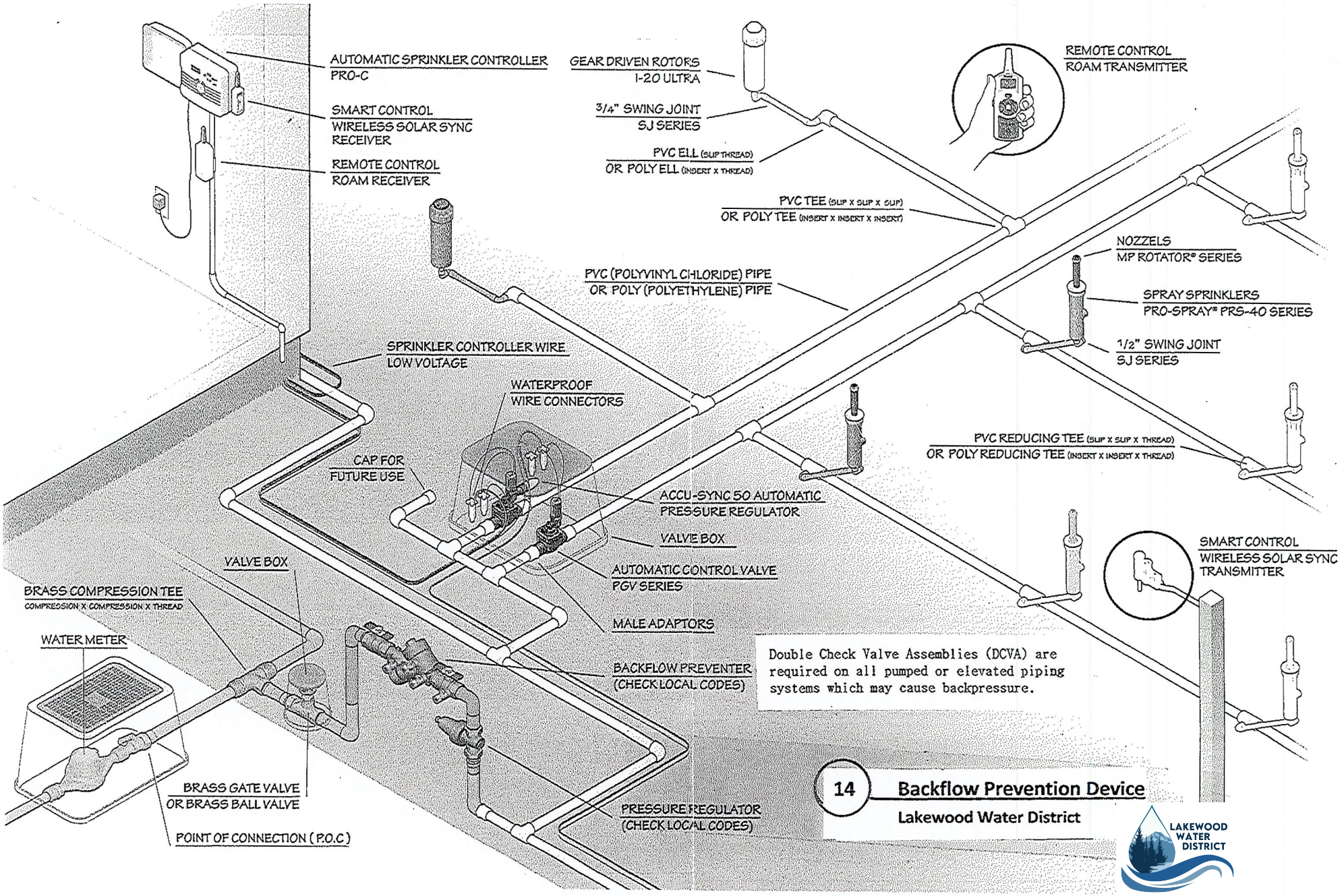
DETAIL REVISED 02/14/2020

13 BLOWOFF ASSEMBLY (2")

LAKEWOOD WATER DISTRICT

Notes: If your System has an: **Atmospheric Vacuum Breaker:** this must be located between 6" and 5' above the highest downstream pipe. And the Shut off Valve must be upstream of vacuum Breaker, no valves allowed downstream of AVB.

Pressure Vacuum Breaker Assembly: this must be located between 12" and 5' above the highest downstream pipe. Control valves are allowed anywhere in the system with a Pressure Vacuum breaker or Double check valve assembly in place.



Double Check Valve Assemblies (DCVA) are required on all pumped or elevated piping systems which may cause backpressure.

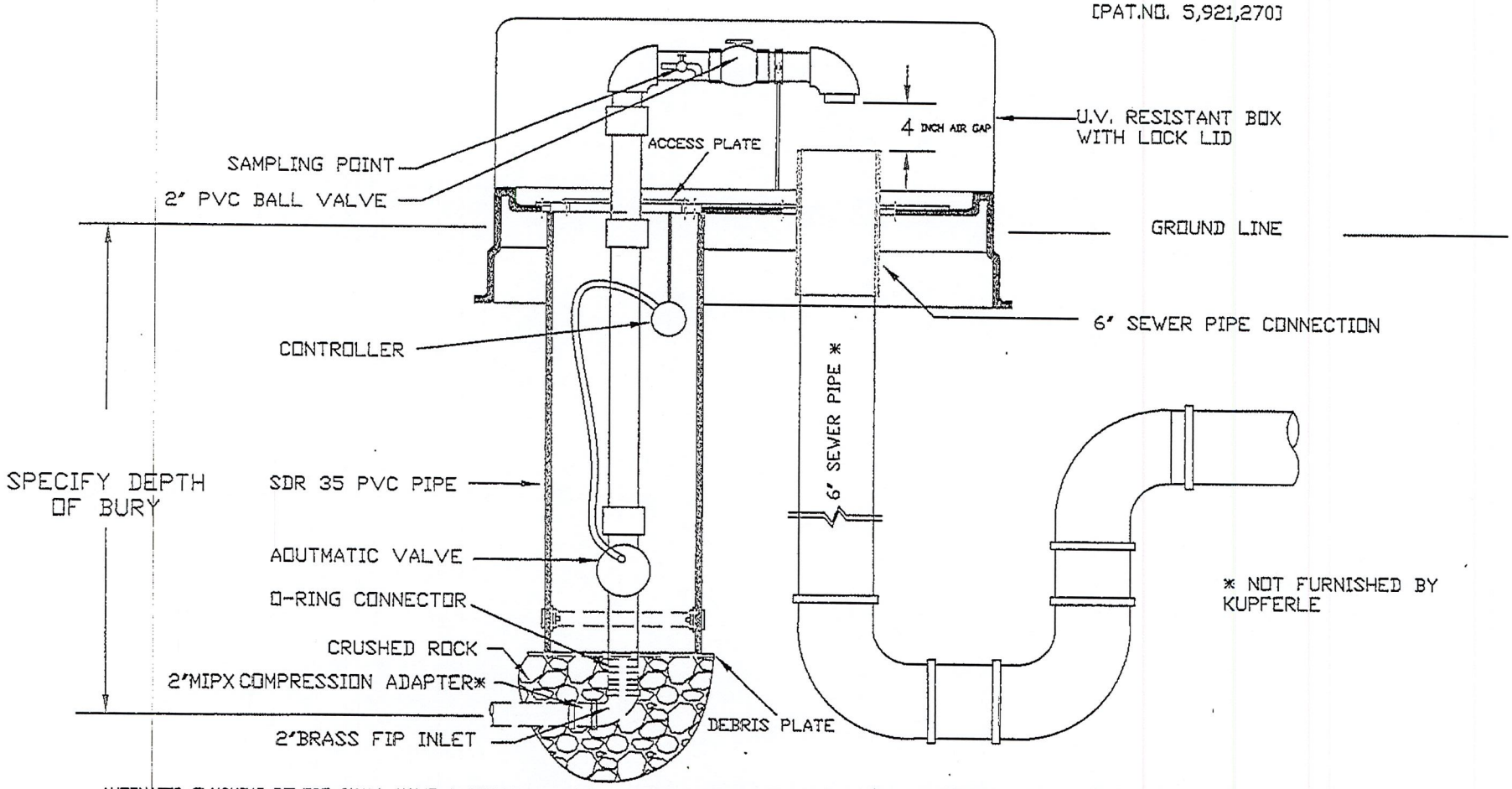
14 **Backflow Prevention Device**

Lakewood Water District

LAKEWOOD WATER DISTRICT

9800 AUTOMATIC FLUSHING DEVICE

[PAT.NO. 5,921,270]

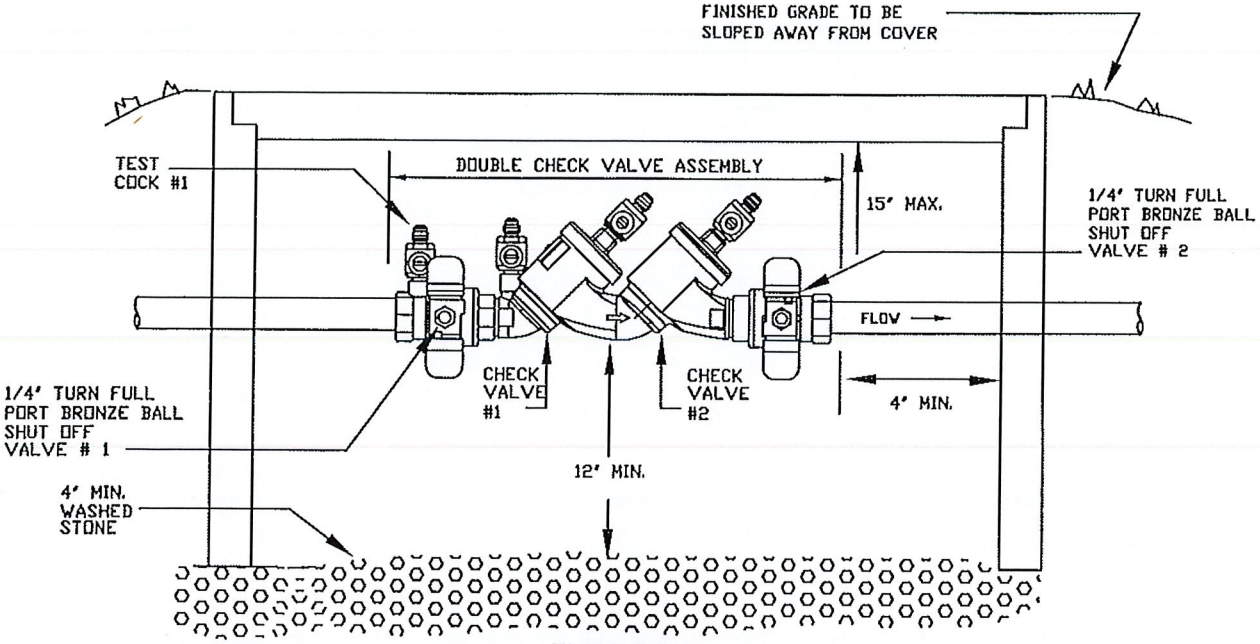


AUTOMATIC FLUSHING DEVICE SHALL HAVE A 2"BRASS FIP INLET, LEADING VERTICALLY INTO A 2"AUTOMATIC SOLENOID VALVE. AUTOMATIC SOLENOID VALVE SHALL HAVE AN INTERNAL, SELF-CLEANING DEBRIS SCREEN, AND HAVE A 220 PSI RATING. EACH UNIT SHALL BE FURNISHED WITH A STAND-ALONE VALVE CONTROLLER. VALVE CONTROLLER WILL NOT REQUIRE A SECOND HAND-HELD DEVICE FOR PROGRAMMING. CONTROLLER MUST HAVE A MINIMUM OF 9 POSSIBLE FLUSHING CYCLES PER DAY, SHALL BE SUBMERSIBLE TO 12 FEET, OPERATE WITH A 9 VOLT BATTERY AND HAVE RESIN-SEALED ELECTRICAL COMPONENTS. SOLENOID SHALL HAVE NO LOOSE PARTS WHEN REMOVED FROM VALVE. EACH UNIT SHALL HAVE A DOUBLE-VALVE, ALL BRASS SAMPLING POINT. REMOVAL OF 2" SOLENOID VALVE SHALL BE POSSIBLE VIA AN O-RING CONNECTOR LOCATED UNDER THE VALVE AFTER REMOVAL OF STAINLESS STEEL ACCESS PLATE. VALVE ASSEMBLY SHALL BE HOUSED IN A PVC ENCLOSURE AND EACH UNIT SHALL BE SELF-DRAINING, NON FREEZING, ALL ABOVE-GROUND COMPONENTS SHALL BE CONTAINED WITHIN A UV-RESISTANT LOCKING COVER, AS MANUFACTURED BY KUPFERLR FOUNDRY COMPANY.
MODEL#9800 ST. LOUIS, MO. 1-800-231-3990, OR APROVED EQUAL.

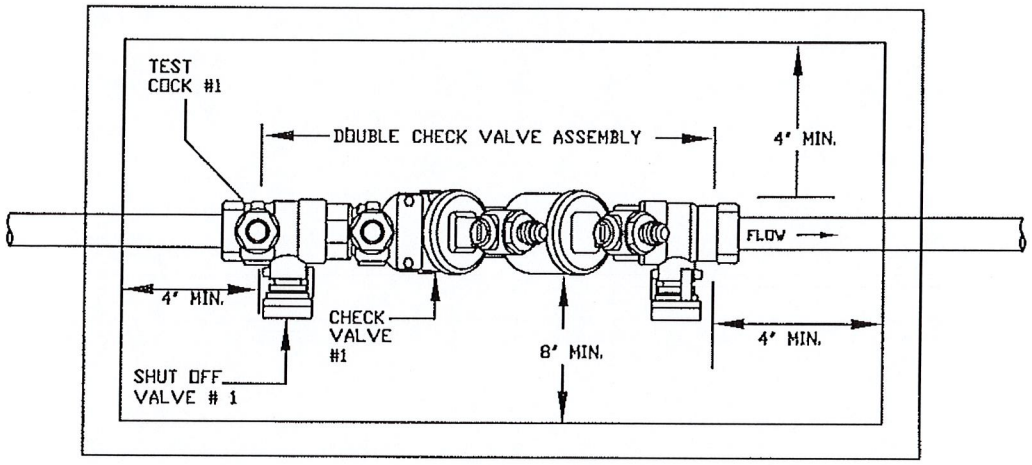
15 **Automatic Flushing Device**

Lakewood Water District

LAKEWOOD WATER DISTRICT

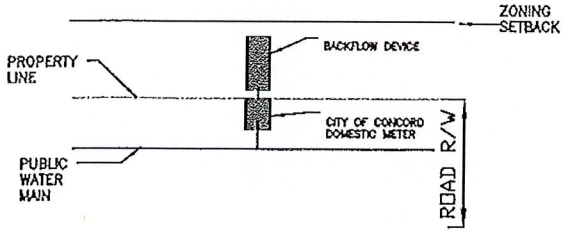


ELEVATION
N.T.S.



PLAN
N.T.S.

NOTES:
1. DOUBLE CHECK VALVE ASSEMBLY MUST CONFORM TO Lakewood Water District SPECIFICATIONS AND BE AN APPROVED MODEL.
2. Lakewood Water District APPROVED DCVA INCLUDES SHUT OFF VALVES #1 AND #2 AS PART OF THE UNIT. NO SUBSTITUTIONS SHALL BE PERMITTED. 4' OF CLEARANCE SHALL BE PROVIDED WITH VALVE OPEN.
3. DCVA SHALL BE SUPPORTED WITH ADEQUATE SUPPORT PEDESTAL(S) AS NEEDED.
4. VAULT, DOORS OR COVERS AND SUPPORT ASSEMBLY SHALL BE DESIGNED BY OWNER AS REQUIRED. VAULT DOORS MUST FLUSH MOUNT AND ACCOMODATE BACKFLOW ASSEMBLY REMOVAL AND VALVE ACCESS.
5. TEST COCK #1 SHALL BE UPSTREAM OF SHUT OFF VALVE #1 AND IS PART OF THE ASSEMBLY. ALL TEST COCKS INSTALLED UPRIGHT AND IN THE HORIZONTAL POSITION



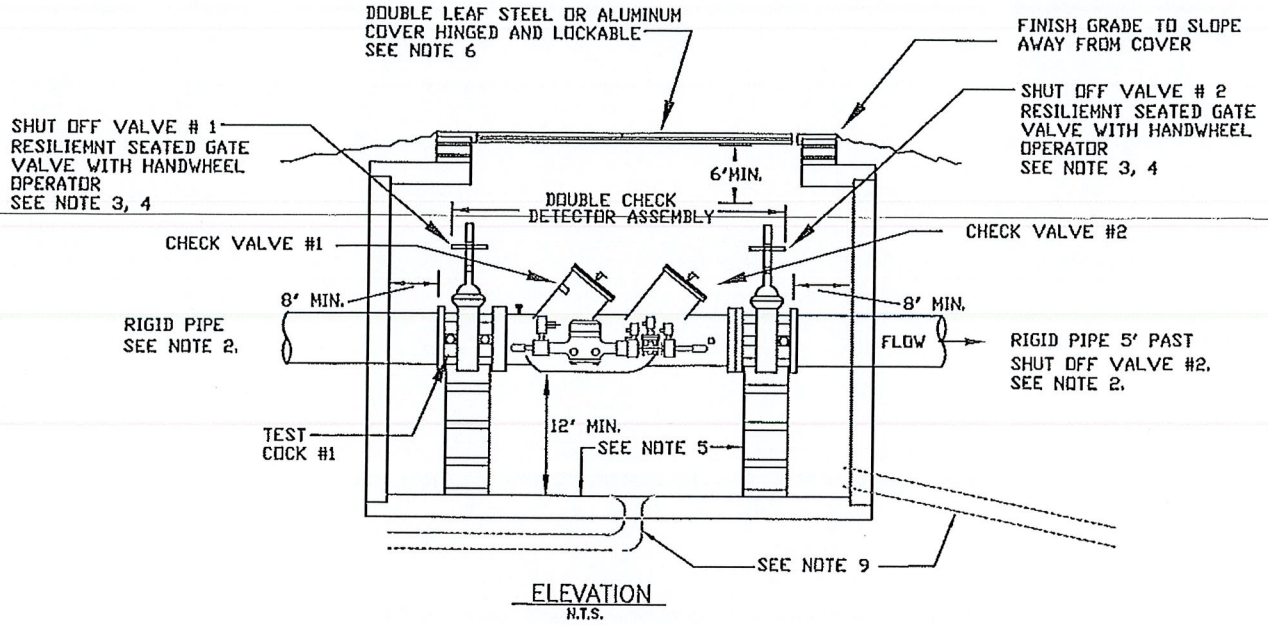
TYPICAL LOCATION REQUIREMENT
N.T.S.

LAKEWOOD WATER DISTRICT

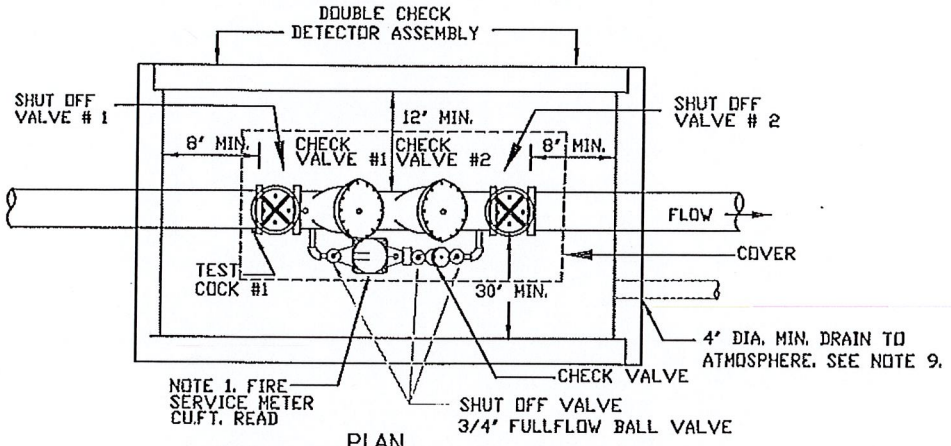
STANDARD DETAIL BACKFLOW PREVENTION

BELOW GROUND ¾ INCH TO 1½ INCH DOUBLE CHECK VALVE ASSEMBLY (DCVA)

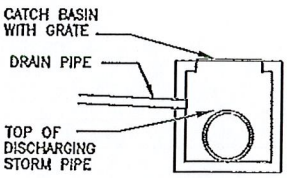
No.	Date	By	REVISION
3	9-13-07	SM	DOMESTIC DETAIL, PIPE EDITS
2	8-30-06	SM	LOCATION DETAIL
1	10-8-96	MP	PAD



ELEVATION
N.T.S.



PLAN
N.T.S.

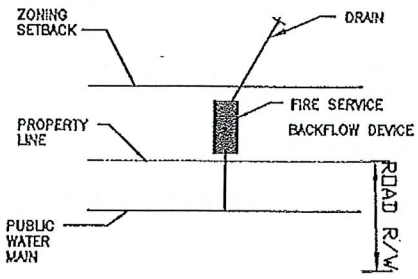


DRAIN ALTERNATIVE:
TIE INTO CATCH BASIN OR STORMWATER MANHOLE PER DETAIL SHOWN ABOVE. NO TIE IN TO STORMWATER PIPE WILL BE ACCEPTED.

N.T.S.

NOTES:

1. The Double Check Detector Assembly (DCDA) For Fire Service(s) Must conform to The Lakewood Water District specifications and be an approved model. Internal Fire System Must Not incorporate a booster pump; otherwise a fire service RPDA must be installed. DCDA backflow must have an approved bypass assembly with a radio meter with reading in CU. FT., Shut-off valves and check valve.
2. Rigid Pipe 5/8" to 3" Brass, K-Copper, or galvanized. 4" – 10" must be DIP.
3. Lakewood Water District approved DCDA includes shut off valves #1 and #2 as part of the unit. No substitutions shall be allowed. 6" of Clearance Shall be provided with the valve open.
4. Fire Line installations shall have outside stem and yoke (os&y) with hand-wheel operators.
5. 4" to 10" DCDA shall be supported with adequate support pedestal(s).
6. Vault, doors or covers and support assemblies shall be designed as required, vault doors must flush mount and accommodate backflow assembly removal and valve access.
7. Test cock #1 shall be upstream of Shut off Valve #1 and is part of the assembly.
8. If drainage cannot be provided to free atmosphere or Storm Drainage, the DCDA shall be installed above ground with the appropriate enclosure incorporated.
9. Drain Port must drain by gravity to atmosphere or connect to storm Drainage. Drainage may be provided as shown or as a floor drain.

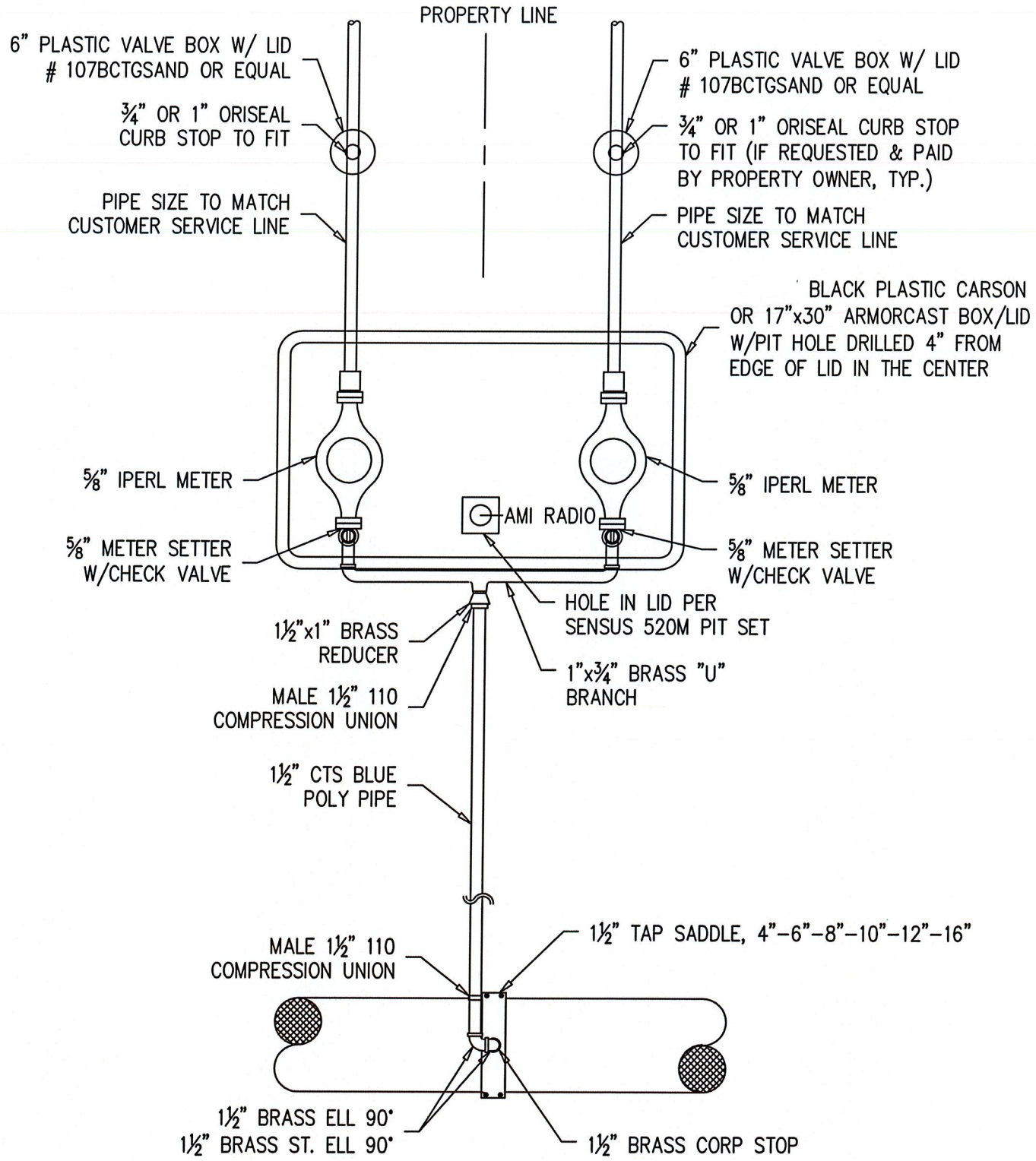


TYPICAL LOCATION REQUIREMENT
N.T.S.

LAKEWOOD WATER DISTRICT

STANDARD DETAIL BACKFLOW PREVENTION

BELOW GROUND 2½ INCH TO 10 INCH DOUBLE CHECK DETECTOR ASSEMBLY (DCDA) FOR FIRE SERVICES



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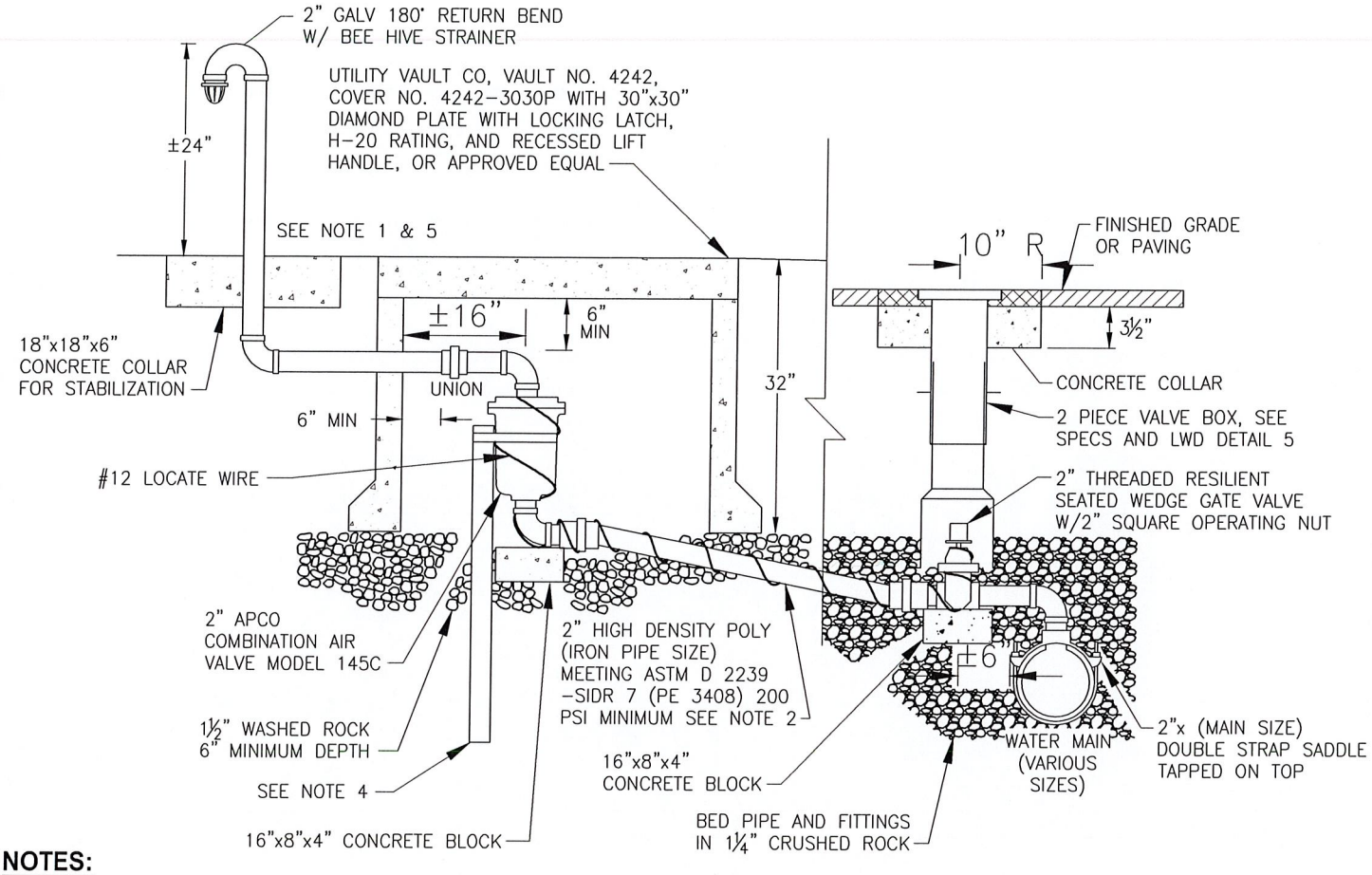
DUAL WATER SERVICE

(NON–TRAFFIC AREAS)

May 12, 2016

LAKEWOOD WATER DISTRICT



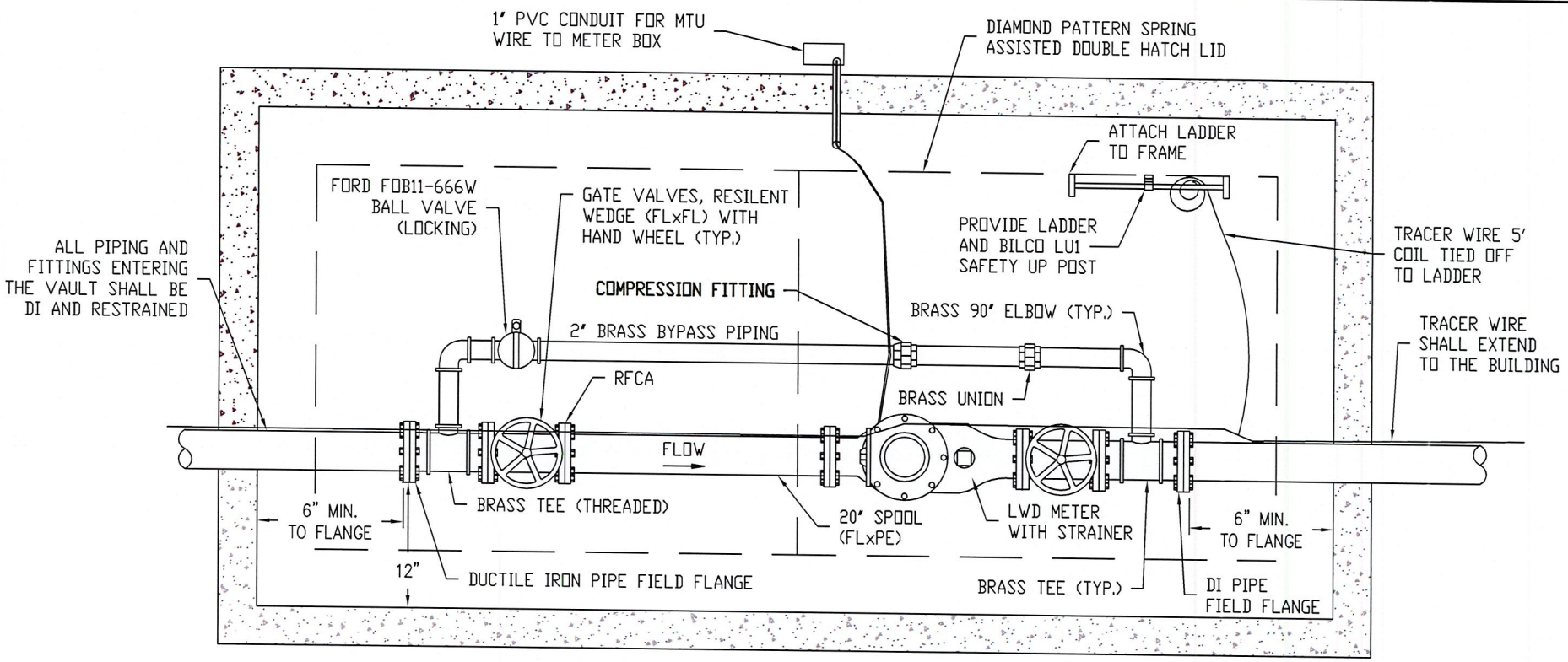
NOTES:

1. ALL FITTINGS FROM THE WATER MAIN TO THE BOTTOM OF THE AIR/VACUUM VALVE SHALL BE BRASS. ALL FITTINGS ABOVE THE AIR/VACUUM VALVE SHALL BE GALVANIZED STEEL. WRAP GALVANIZED PIPE BELOW GROUND WITH 3M TAPE OR EQUAL TO 1" ABOVE GROUND LEVEL.
2. 2" HIGH DENSITY POLY PIPE SHALL MAINTAIN A MINIMUM ONE-DEGREE RISE FROM THE WATER MAIN TO THE AIR/VACUUM VALVE.
3. AIR/VACUUM VALVE VAULT AND VENT RISER TO BE INSTALLED OUT OF THE STREET. EXACT LOCATION TO BE DETERMINED BY LWD.
4. TO STABILIZE AIR/VACUUM VALVE, BURY 2" GALVANIZED PIPE ALONG SIDE VALVE. SECURE WITH STAINLESS STEEL STRAP. SET TOP OF GALVANIZED PIPE 2" BELOW AIR/VACUUM FLANGE.
5. VENT RISER AND RETURN BEND SHALL BE PAINTED, RUST-OLEUM SAFETY YELLOW #7543 OR APPROVED EQUAL.

19 AIR VAC ASSEMBLY (2")

LAKEWOOD WATER DISTRICT

Sept. 1, 2017



1. A MINIMUM OF 10 PIPE DIAMETERS OF STRAIGHT UNOBSTRUCTED PIPE SHALL BE REQUIRED UPSTREAM OF THE METER.
2. THE METER VAULT SHALL BE SIZED PROPERLY TO MEET MINIMUM PIPING CLEARANCE REQUIREMENTS.
3. THE CONCRETE METER VAULT SHALL BE BEDDED WITH 6" OF CRUSHED ROCK. THE INSTALLATION SHALL BE LEVEL AND SET TO MATCH FINAL GRADE.
4. THE CONCRETE METER VAULT AND LID SHALL BE DESIGNED FOR H-20 LOADING. THE HATCHES SHALL BE DIAMOND PLATE ALUMINUM STYLE, L.W. PRODUCTS, BILCO OR A PRE-APPROVED EQUAL AND SHALL HAVE ALL 316 STAINLESS STEEL HARDWARE. THE HATCHES SHALL HAVE A SLAM LOCK HASP AND WEATHER PROTECTED PAD LOCK COVER.
5. THE METER VAULT SHALL BE PROVIDED WITH A DRAIN AND THE FINAL INSTALLATION SHALL DRAIN PROPERLY.
6. THE BYPASS PIPING ARE NOT REQUIRED FOR IRRIGATION ONLY INSTALLATIONS.
7. ALL PIPING SHALL BE A MINIMUM OF 12" ABOVE VAULT FLOOR AND BE SUPPORTED BY ADJUSTABLE JACK STANDS. THE STANDS SHALL BE PLACED IN FOUR LOCATIONS TO PROVIDE FIRM SUPPORT.
8. ALL BYPASS PIPE AND FITTINGS SHALL BE 2" DOMESTIC BRASS MEETING LOW LEAD REQUIREMENTS.
9. THE TOP OF THE METER AND VALVE WHEELS SHALL BE MINIMUM 12" BELOW THE LID.
10. A HOLE SHALL BE DRILLED IN THE VAULT WALL 12" DOWN FROM THE LID FOR A 1" PVC ELECTRICAL CONDUIT TO A REMOTE READER BOX PLACED NO MORE THAN 3' AWAY FROM THE VAULT. THE REMOTE METER BOX SHALL BE A ARMORCAST B-9 WITH AMI COVER. THE CONDUIT PENETRATION SHALL BE GROUTED.
11. THE VAULT SHALL BE INSTALLED IN A PLANTER OR IN A PLANTER ISLAND AND SHALL NOT BE ALLOWED IN ANY DRIVING SURFACE. WHEN PLANS ARE ALTERED A PLANTER ISLAND SHALL BE CREATED TO INSTALL THE VAULT IN.

STANDARD METER LAY LENGTHS	
3" COMPOUND	17"
4" COMPOUND	20"

20

3" & 4" METERS

LAKEWOOD WATER DISTRICT