

Appendix N

DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS
Section 5: Water Distribution

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**DESIGN AND CONSTRUCTION STANDARDS
AND SPECIFICATIONS**

SECTION 5

WATER DISTRIBUTION

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DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS

SECTION 5

WATER DISTRIBUTION

5-1 GENERAL

All construction of water mains and related appurtenances shall conform to these Standards, the Gold Bar Municipal Code, applicable American Water Works Association (AWWA) Specifications and Section 7-11 of the WSDOT/APWA Standard Specifications. The general requirements of AWWA and the WSDOT/APWA Standard Specifications shall apply unless they are inconsistent with any of the provisions of this particular section. Should inconsistencies occur, these Standards shall have precedence.

Relocation, alteration and/or improvements to the water system that are necessitated due to construction of improvements by private developers, shall comply with all adopted standards, and be paid for by the local improvement district, utility, individual, firm or corporation initializing the improvements or alteration.

Any public water system, or any plumbing in a residential or nonresidential facility providing water for human consumption, which is connected to a public water system shall be lead free. With respect to solders and flux lead free shall mean no more than 0.2% lead, and with respect to pipes and pipe fittings no more than 8% lead.

Water main extensions will be required when the property does not front on a water main or when the existing water main is not adequate for the increased use proposed. At the time of connection, the property owner will be required to extend the main for the full public or private road frontage of the lot on which the structure to be connected is located. If the lot does not front on a public or private road for its full width, the main shall be extended to the boundary line of the nearest adjoining lot, which may be anticipated to require future connection to the main. The standard size shall be 8 inches in diameter with a minimum diameter of 6 inches if approved by the Gold Bar Public Works Department.

Water main extensions and/or new fire hydrant installations may also be required per the requirements of the Uniform Fire Code.

For single family homes and duplexes, a fire hydrant is required within 350 feet of any structure.

For all other buildings from triplexes to commercial uses, a fire hydrant is required within 200 feet, but not closer than 50 feet to any structure (measured distance to be along route to be traveled by fire equipment).

Unless finish grade information is provided to the water service construction crew prior to the installation, the property owner/applicant will be responsible for and may be charged for any necessary adjustments.

After the installation of any water service by the City of Gold Bar Public Works Department, the property owner/developer shall be held responsible for, and may be charged for, any and all damages to the service line, meter setter, meter and meter boxes/vault or any other appurtenances until completion of construction and/or the structure is approved for occupancy.

All water mains on private property that are looped back to the public right-of-way or are open to the general public system shall be installed in easements, granted to the city, and shall be maintained by the city.

The minimum water main easement width shall be 10 feet in width and shall be exclusive for the water main and appurtenances.

Due to the complexities of many water mains and their interface with other underground structures, all water main construction shall be staked to insure placement within designated easements. Any deviation from this requirement must be approved by the Public Works Director

WATER DISTRIBUTION

Upon completion of the installation of the water system, the original signed mylar of the water plan must be as-built by the developer/contractor, certified as such by the developer/contractor and turned in to the city. It is recommended that an as-built print be submitted for checking by the Public Works Department prior to submitting the originals. The water as-built is to be submitted and approved prior to city acceptance of the new installation.

The installation of all water mains and appurtenances shall be in accordance with the construction plans as approved by the Public Works Department for the project. Any deviation or changes are to be approved by utilities before the changes are incorporated into the work.

All materials shall be new and undamaged. Unless otherwise approved by the Public Works Department, the same manufacturer of each item shall be used throughout the work. Contractors shall furnish a water tight plug of the appropriate size which shall be installed in the end of the water main anytime work is delayed or stopped.

5-2 CONSTRUCTION PLANS

- A. The design and construction of water and sewer mains, which are to be connected to the city water system, shall be designed by a registered, professional engineer of the State of Washington, at the applicants expense.
- B. All plans must include the information listed within 1-10.1 thru 1-10.4 of these standards.
- C. Water plans to be separate from others but should have water mains highlighted and indicate locations of other utilities.
- D. Plans must show easements where mains are on private property and all hydrants, meters, and other appurtenances must be within the easements which must be a minimum of 10 feet wide with no other utilities within 3 feet of the water main.
- E. Easements must be executed at completion of construction and mains must be in the middle of easement as much as possible. Access to easements for maintenance must remain open. Structures, fences, and shrubs are not to be planted on easements.
- F. Show elevations of sewer mains, water mains and storm drains where they cross each other.
- G. A minimum of 10 feet horizontal clearance shall be maintained between a water main, sewer main and storm drains whenever possible.
- H. All hydrants when installed must be covered by a burlap bag or other suitable covering until accepted by the city and placed in service.
- I. An AWWA or D.O.H. approved backflow prevention assembly may be required for irrigation systems, commercial applications and/or residences which maintain an approved home occupation. Determination shall be made at the time of application by the Public Works Director and shall be based upon existing D.O.H. standards and/or those activities which may pose a potential cross connection risk to the public water system.

5-2.1 REQUIRED NOTES ON PLANS

- A. No connection to the existing mains will be allowed except by means of an approved backflow prevention device prior to satisfactory flushing, testing, disinfection, and receipt of satisfactory bacteriological test results. The city Public Works Department shall conduct the bacteriological testing.

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- B. All connections to existing water mains shall be made by the contractor/developer with prior approval of plans by the Public Works Director
- C. All work and materials must conform to City of Gold Bar Standards.
- D. The City of Gold Bar Public Works Department must be notified at least 24 hours prior to commencing construction.
- E. The owner or the owner's authorized agent shall notify The Public Works Department of a person who can be contacted regarding problems during construction on a 24 hour basis.

5-2 BACKFLOW PREVENTION

All backflow prevention devices connected to the city owned system shall be tested and shown to be in satisfactory working condition prior to being installed into the system. Documentation of annual testing indicating satisfactory results must be provided prior to the installation of that device.

To prevent contaminated water from the new main from entering the existing distribution system, two check valves or a double check valve assembly shall be used on the line supplying the water. Two check valves or a double check valve assembly is sufficient backflow protection only for filling and flushing of the new main. During the hydrostatic pressure test, the temporary connection between the new main and the existing distribution system shall be removed.

An AWWA or D.O.H. approved backflow prevention assembly shall be required for irrigation systems, commercial applications and/or residences which maintain an approved home occupation. Determination shall be made at the time of application by the Public Works Director and shall be based upon existing D.O.H. standards and/or those activities which may pose a potential cross connection risk to the public water system.

Cost, installation and maintenance of required backflow prevention assemblies are the sole responsibility of the applicant/owner. Services with backflow prevention shall be required to participate in an annual cross connection control inspection/maintenance program conducted by the City of Gold Bar at applicant/owners expense.

For fire and irrigation, the minimum level of backflow prevention required is a double check valve assembly. Air gaps and reduced pressure backflow assemblies are required wherever a potential health hazard exists. Minimum requirements are based on a risk assessment according to D.O.H standards. The risk assessment shall be conducted by the city or the city engineering consultants.

The City of Gold Bars backflow prevention program is based on WAC 248-54-285 and Gold Bar Municipal Code 13.04.

Plan approval does not constitute approval of a backflow prevention system. A separate backflow prevention or assembly must be obtained and installed prior to initiation of water service.

5-4 EXISTING UTILITIES

When utility services occupy the same space as the new water main, the contractor shall do all necessary excavation to fully expose such services. The contractor shall protect said services and work around them during excavating and pipe laying operations. The contractor shall be responsible for all damages to the services due to his operation and shall immediately notify the engineer and arrange for replacement of all damaged services.

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In the event of conflict, the contractor shall remove and restore existing catch basin connections, inlet connections, drains, side sewers, inlets, and other sewerage and drainage facilities. All restoration shall be constructed to city standards. Water main pipe shall be installed to clear mainline sewers and storm drains.

It is anticipated that the contractor will encounter private water service utilities (water service lines running between the City Water service meter and private residences) during work operations. Records of these utilities are not maintained by the city and will not be field located by the Public Works Department. It shall be the contractor's responsibility to ascertain the location of and protect these private utilities from damage. Damage to these services shall be repaired by the contractor performing the work. Repairs shall meet all requirements of these standards.

Ends of abandoned water main shall be plugged by filling with Class 3000 or Commercial Concrete for a minimum longitudinal length of twelve (12) inches.

5-5 FIRE FLOW

Fire Flow requirements shall be based upon adopted levels within the City of Gold Bar's most current approved and adopted Water System Plan, the City Comprehensive Plan and the Uniform Fire Code.

5-6 PIPE AND FITTINGS FOR WATER MAINS

5-6.1 DESCRIPTION

The work included in the following sections shall apply to the construction of water distribution and transmission mains and appurtenances for both temporary and permanent installation.

5-6.2 MATERIALS

All water main distribution piping shall be ductile iron pipe, cement lined, standard thickness Class 52, unless otherwise specified and shall conform to the standards of USA Standard A-21.51 (AWWA C-151), and be installed in accordance with the manufacturer's recommendations. Any deviation from this policy must be approved by the Public Works Director on the plans for the project.

Polyethylene tubing shall conform to the requirements of AWWA C901. The pipe shall bear the seal of the National Sanitation Foundation for potable water pipe. Pipe joints shall be made in accordance with the manufacturer's recommendations. Solvent welded pipe joints will not be permitted. Minimum working pressure shall be 200 psi.

Cement lining thickness shall be in accordance with USA Standard A21.4 (AWWA) C-104).

5-6.3 JOINTS AND FITTINGS

Rubber gasket pipe joints shall be push-on-joint (Tyton) or mechanical joint (M.J.) in accordance with USA Standard A21.11 (AWWA C-111), unless otherwise specified. Flanged joints shall conform to USA Standard B16.1.

Bolts on mechanical joints and fittings shall be tightened uniformly with a torque wrench which measures the torque applied. The torque for mechanical joints shall be as follows:

Bolt size - inches

Range of Torque - ft/lbs

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5/8	40-60
3/4	60-90
1	70-100
1-1/4	90-120

Nuts spaced 180° apart shall be tightened alternately in order to produce equal pressure on all parts of the gland.

Set screws on retained glands shall be torqued to manufacturer's specifications.

Bolts for fittings and joints shall be cast or ductile iron, zinc or chromium plated or stainless steel.

Cast or ductile iron fittings shall be short body for pressure rating of 200 psi, unless otherwise noted. Metal thickness and manufacturing process shall conform to applicable portions USA Standards A21.20, A21.11, B16.2 and B16.4. All fittings shall be cement lined per USA Standard A21.4 (AWWA C-104).

5-7 TRENCH EXCAVATION, BEDDING AND BACKFILL FOR WATER MAINS

5-7.1 DESCRIPTION

This work shall consist of excavating, bedding, and backfilling for water mains and appurtenances, for both temporary and permanent installation under ordinary conditions.

5-7.2 GENERAL

Material excavated from trenches and piled adjacent to the trench, or in a roadway or public thoroughfare, shall be piled and maintained so that the toe of the slope of the material is at least 2 feet from the edge of the trench. It shall be piled in such a manner as will cause a minimum of inconvenience to public travel, and provisions shall be made for merging traffic where such is necessary. Restricting of driveway access shall be kept to a minimum. Free access shall be provided to fire hydrants, water valves, and meters, and clearance shall be left to enable free flow of storm water in gutters, other conduits, and natural watercourses.

Trenches that are left open overnight must be steel plated and clearly marked to offer protection to pedestrians and vehicular traffic. Steel plates shall be meet traffic barring rating approval and approved by the City Public Works Department.

Free access shall be maintained to all other utility control valves, meters and vaults.

5-7.3 GRADE AND ALIGNMENT

Prior to any pavement cutting or removal, or excavation for pipe laying, the contractor shall verify, in the presence of a Public Works Inspector, the locations and establish the depth of the existing water mains at the points where connections are to be made. The contractor shall verify the dimensions, type, and condition of the existing water main. The profile shall be adjusted so neither a high spot nor a low spot is created adjacent to the connection to the existing water mains.

The minimum cover for water mains 12 inches in diameter or smaller shall be 36 inches to the top of pipe. The minimum cover for water mains over 12 inches in diameter shall be 48 inches to the top of pipe. The maximum depth shall not be greater than 60 inches to the top of pipe.

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All depths both minimum and maximum shall be from finish grades and shall be adhered to unless approved by the Public Works Department in writing. The water line and hydrants shall be installed by line and grade information as supplied by a survey.

5-7.4 TRENCH EXCAVATION

5-7.4(1) GENERAL

The contractor shall perform all excavation of every description and of whatever materials encountered. All excavations shall be made by open cut unless otherwise provided for. The bottom of trenches shall be accurately graded to provide uniform bearing and support for each length of pipe on undisturbed or compacted soil at every point along its entire length, except at the joints.

Bell holes shall be excavated to the extent necessary to permit accurate work in making and inspecting the joints. The banks of the trenches shall be kept as nearly vertical as soil conditions will permit. Where determined necessary by the engineer to control trench width, to protect adjacent structures, or to provide safe working conditions, the trench shall be properly sheeted and braced.

See Section 3-9 of these Specifications for additional information on trench excavation.

5-7.4(2) TRENCH WIDTHS

The minimum and maximum trench widths for water main installation shall be as follows:

TRENCH WIDTHS (In Inches)

<u>Nominal Pipe Diameter</u>	<u>Minimum Earth</u>	<u>Minimum Rock</u>	<u>Maximum</u>
2	18	24	36
3	18	24	36
4	18	24	36
6	24	24	36
8	24	24	36
12	28	28	40
16	30	30	42
18	31	31	43
20	33	33	45
24	36	36	48
30	40	40	52
36	47	47	59
42	54	54	66
48	61	61	73
54	68	68	80
60	75	75	87

5-7.4(3) CRIBBING AND SHEETING-SHORING

The contractor shall adequately shore trenches to protect the work, existing property, utilities, pavement, etc., and to provide safe working conditions in the trench. The method of shoring shall be according to the

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contractor's design. The contractor may elect to use a combination of shoring and overbreak, tunneling, boring, sliding trench shields or other methods of accomplishing the work, provided the method meets all applicable local, state and federal safety codes. Damages resulting from improper cribbing or from failure to crib shall be the sole responsibility of the contractor.

See Section 3-9 Underground Utilities for additional requirements on shoring requirements.

5-7.4(4) UNSUITABLE MATERIAL

Whenever in excavating the trench for water mains and the bottom of the trench exposes peat, soft clay, quicksand, or other unsuitable material, such material shall be removed from the trench and replaced by Foundation Material Class A as specified in Section 3-20.6 of these Specifications. All unsuitable material shall be loaded directly into trucks and hauled to a waste site obtained by the contractor. Stockpiling of unsuitable material on the project site will not be allowed.

5-7.4(5) BEDDING THE PIPE

Bedding material, when specified or required by the Public Works Department shall be washed course sand No.2 as specified in Section 3-20.3 or 5/8" Crushed Surfacing as specified in Section 3-20.5 of these Specifications. Bedding is defined as 6 inches below the pipe, around the pipe, and 6 inches above the pipe. Native material may be used for bedding of ductile iron pipe unless judged unsuitable by the Public Works Department.

5-7.4(6) BACKFILLING TRENCHES

The contractor shall use suitable native excavated material for trench backfill unless notified by the Public Works that the native material is unsuitable. The inspector will examine excavated native material at the time of excavation to determine its suitability for use as backfill. Unsuitable backfill material shall be removed from the site, disposed of, and replaced by Washed Course Sand No. 2 as specified in Section 3-20.3 or 5/8" Crushed Surfacing as specified in Section 3-20.5 of these Specifications and as directed by the Public Works Director.

All water service lines and meter boxes shall be backfilled using Washed Course Sand or equivalent to within 6 inches of final grade.

In backfilling the trench, the contractor shall take all necessary precautions to protect the pipe from any damage or shifting. The contractor shall backfill from the side of the trench to a maximum uniform depth of 1 foot above the crown of the ductile iron pipe before starting mechanical compaction.

During all phases of the backfilling operations and testing as outlined herein, the contractor shall protect the pipe installation, provide for the maintenance of traffic as may be necessary, and provide for the safety of property and persons.

See Section 3-9 for additional requirements on backfilling.

5-7.4(7) COMPACTION OF BACKFILL

Trench backfill shall be spread in layers and be compacted by mechanical tampers of the impact type approved by Public Works. Water settling will not be permitted. After the initial backfill is placed the remaining backfill material shall be placed in successive layers not exceeding 1 foot in loose thickness, and each layer shall be compacted to the density specified below:

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- a) Improved areas such as street and sidewalk areas shall be compacted to 95% of maximum dry density.
- b) Unimproved areas or landscape areas shall be compacted to 90% of maximum dry density.

See Section 3-9 for additional requirements on compaction.

5-8 CONSTRUCTION REQUIREMENTS

5-8.1 DEWATERING OF TRENCH

Where water is encountered in the trench, it shall be removed during pipe-laying operations and the trench so maintained until the ends of the pipe are sealed and provisions are made to prevent floating of the pipe. Trench water or other deleterious materials shall not be allowed to enter the pipe at any time. Silty or dirty trench water shall be filtered prior to leaving the construction site or entering any water course.

5-8.2 HANDLING OF PIPE

All types of pipe shall be handled in a manner that will prevent damage to the pipe, pipe lining or coating. Pipe and fittings shall be loaded and unloaded using hoists and slings in a manner to avoid shock or damage, and under no circumstances shall they be dropped, skidded, or rolled against other pipe. Damaged pipe will be rejected, and the contractor shall immediately place all damaged pipe apart from the undamaged and shall remove the damaged pipe from the site within 24 hours.

Methods of pipe handling shall be corrected by the contractor if the inspector determines that these methods are damaging to the pipe.

Dirt or other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations, and any pipe or fitting that has been installed with dirt or foreign material in it shall be removed, cleaned, and relaid. A clean whisk broom shall be used for this purpose and for brushing to remove foreign matter prior to joining of pipe ends. At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a watertight plug or by other means approved by Public Works to ensure cleanliness inside the pipe.

Pipe shall be stacked in such a manner as to prevent damage to the pipe, to prevent dirt and debris from entering the pipe, and to prevent any movement of the pipe. The bottom tiers of the stack shall be kept off the ground on timbers, rails or other similar supports. Pipe on succeeding tiers shall be alternated by bell and plain end. Timbers 4 inches by 4 inches in size shall be placed between tiers and chocks shall be placed at each end to prevent movement. For safety each size of pipe shall be stacked separately and clearly marked to protect pedestrians and vehicular traffic. If pipe is to be stored for a prolonged period of time, pipe ends shall be covered to protect the pipe against contamination.

PVC pipe shall not be stored in the sunlight for a time period not to exceed the manufactures recommendation.

5-8.3 CUTTING PIPE

Whenever it becomes necessary to cut a length of pipe, the cut shall be made by abrasive saw or by a special pipe cutter. All pipe ends shall be square with the longitudinal axis of the pipe and the outside shall be

WATER DISTRIBUTION

beveled and otherwise smoothed so that good connections can be made without damage to the gasket. Threads shall be cleanly cut. Oxyacetylene torch cutting of ductile iron pipe will not be allowed.

5-8.4 LAYING PIPE ON CURVES

Long radius curves, either horizontal or vertical, may be laid with standard pipe by deflecting the joints. If the pipe is shown curved in the drawings and no special fittings are shown, the contractor can assume that the curves can be made by deflecting the joints with standard lengths of pipe. If shorter lengths are required, the drawings will indicate maximum lengths that can be used. The amount of deflection at each pipe joint when pipe is laid on a horizontal or vertical curve shall not exceed the manufacturer's printed recommended deflections.

Where field conditions require deflection or curves not anticipated in the drawings, the inspector will determine the methods to be used.

When rubber gasketed pipe is laid on a curve, the pipe shall be jointed in a straight alignment and then deflected to the curved alignment. Trenches shall be made wider on curves for this purpose.

Maximum deflections at pipe joints and laying radius for various pipe lengths are specified in the following table, or if not, shall conform to the manufacturer's and AWWA for the given type of pipe:

Maximum Permissible Deflection in Laying Mechanical-Joint Pipe

Size of Pipe Inches	Max. Permissible Deflections Per Length - In Inches				Approx. Radius of Curve Produced by Succession of Deflections			
	12-ft Length	16-ft Length	18-ft Length	20-ft Length	12-ft Length	16-ft Length	18-ft Length	20-ft Length
3	16	23	25	27	105	130	155	180
4	16	23	25	27	105	130	155	180
6	14	19	22	24	120	160	175	200
8	11	14	16	18	160	220	240	265
10	11	14	16	18	160	220	240	265
12	11	14	16	18	160	220	240	265
14	7	10	11	12	250	310	350	400
16	7	10	11	12	250	310	350	400
18	6	8	9	10	290	380	430	480
20	6	8	9	10	290	380	430	480
24	5	7	7	8	350	440	555	600
30	5	7	7	8	350	440	555	600
36	4	6	6	7	430	510	650	690

Maximum Permissible Deflection in Laying Push-In Joint Pipe

Size of Pipe	Max. Permissible Deflections Per Length - In Inches				Approx. Radius of Curve Produced by Succession of Deflections			
	12-ft	16-ft	18-ft	20-ft	12-ft	16-ft	18-ft	20-ft

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Inches	Length	Length	Length	Length	Length	Length	Length	Length
3	10	14	15	17	175	220	260	280
4	10	14	15	17	175	220	260	280
6	10	14	15	17	175	220	260	280
8	10	14	15	17	175	220	260	280
10	10	14	15	17	175	220	260	280
12	10	14	15	17	175	220	260	280
14	6	8	9	10	290	380	430	480
16	6	8	9	10	290	380	430	480
18	6	8	9	10	290	380	430	480
20	6	8	9	10	290	380	430	480
24	6	8	9	10	290	380	430	480
30	4	5	6	7	430	615	650	690
36	4	5	6	7	430	615	650	690

5-8.5 CONNECTIONS TO EXISTING MAINS

New taps and connections to the existing water system, over 1" in diameter, shall be installed by the developer, including the meter box, provided that it complies with all specifications of the city and state. In new subdivisions the developer shall install all water service connections. Installation of service connections shall coincide with the installation of the water main.

No water system valves on existing mains shall be operated by the contractor. City staff will operate all valves to accomplish shutdowns and subsequent reactivations. Draining of existing water mains will be conducted in the presence of city staff.

The owner/contractor will connect a double check valve assembly to the end of the water line at the designated point as shown on the approved plans. The approved double check valve assembly will be required during pressure, flushing and purity tests.

After receiving satisfactory purity tests, the owner/contractor will notify the public works inspector to schedule the removal of the double check assembly and to the final connection of the water main.

Water used for flushing and testing shall not be discharged into any waterways until the chlorine content is reduced to or falls below a reading of 1.2 parts per million.

Any party installing, repairing, extending or modifying water lines in the public right of way/ easement, which lines are connected to the city's water system will be required to provide insurance bonding and indemnification as per Gold Bar Municipal Code 13.04.240.

5-8.6 LOOPED MAINS

Unless otherwise approved by the city, dead ending of water main will not be permitted. All dead ends must be looped to existing water mains. In the event it is necessary for the developer to obtain an easement for the city through private property to accomplish looping of the dead end, the easement shall be a minimum of 10 feet wide. In those situations where the city has granted approval for a dead end main, a hydrant shall be required at the end of the main unless the city approves a blowoff assembly..

5-9 SERVICE LINES

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5-9.1 GENERAL

Service lines from the water main to the meter for all services 2 inches and smaller shall be polyethylene tubing. A number 10 copper trace wire is required for polyethylene pipe. All service lines 4 inches and larger shall be cement lined ductile iron pipe from the main to the meter.

Each single-family and duplex unit (side) shall be metered from their own individual connection. Commercial and/or multi-family applications may be served from a central master meter location as determined by the public works department.

Service lines from the water main to the meter for all services 2 inches and smaller shall be no shorter than 5 feet nor longer than 50 feet unless otherwise approved, in writing, from the city.

All service connection piping within the public right-of-way shall be a minimum of 30 inches below the finish grade surface. For further details on services and hook-ups, see Standard Nos. 502A and 502B.

On services installed in conjunction with new water mains, it is required that the services be installed from the main to the permanent curb stop and be subjected to purity and hydrostatic testing with the new water main as detailed in Sections 5-14 and 5-15.

5-9.2 MATERIALS

Polyethylene tubing shall conform to the requirements of AWWA C901. The pipe shall bear the seal of the National Sanitation Foundation for potable water pipe. Pipe joints shall be made in accordance with the manufacturer's recommendations. Solvent welded pipe joints will not be permitted. Minimum working pressure shall be 200 psi.

Ductile iron pipe shall conform to the requirements shown in Section 5-6.2 of these Standards.

5-9.3 CONNECTIONS

Service connections on all water mains or for any service 1 inch or larger shall be installed with Mueller, Rockwell, Romac or approved equal pipe saddles. The minimum acceptable tap size shall be 1 inch.

No service connections may be installed on fire service mains or on fire hydrant laterals between the hydrant valve and the fire hydrant.

5-10 VALVES FOR WATER MAINS

5-10.1 GENERAL

All valves shall be inspected upon delivery in the field to ensure proper working order before installation and shall be free of all rust and dirt. Valves shall be disinfected prior to being placed in any active system. They shall be set and jointed to the pipe in the manner as set forth in the AWWA Standards for the type of connecting ends furnished. The valves shall also be carefully inspected for injury to the outer protective coatings.

An Operating Nut Extension shall be installed when the ground surface is more than 24 inches above the valve operating nut. The Operating Nut Extension shall extend into the top section of the Standard Valve

WATER DISTRIBUTION

Box and shall clear the bottom of the lid by a minimum of 10 inches. When required, it shall be furnished and installed by the contractor.

At a minimum, valving shall be installed at all intersections, on each end of easements, and in line at maximum spacing of 600 feet, such that no more than 75 people would be out of service in any given shutdown. Additional valving may be required in high density areas.

5-10.2 AIR AND VACUUM RELEASE VALVES

If requested by the city, air and vacuum release valves shall be incorporated into the design of all new water system extensions or replacements. Air and vacuum release valves shall be installed per the manufactures requirements.

5-10.3 BUTTERFLY VALVES

Butterfly valves shall conform to AWWA C504, Class 150, with cast iron short body and "O" ring stem seal. Butterfly valves shall be used for all lines over 8 inches in diameter, except as noted in Section 5-10.5.

Butterfly valves in chambers shall have a mutual crank operation.

Buried butterfly valves will require valve operator extensions per Section 5-10.1 and as shown on Standard No. 504.

5-10.4 CHECK VALVES

Check valves for permanent installations other than cross connection control shall be rated the source pressure, unless otherwise specified, and shall have adjustable tension lever and spring to provide non-slamming action under all conditions unless otherwise specified. For backflow prevention see Section 5-3.

5-10.5 GATE VALVES

Buried gate valves shall be iron body, bronze mounted, resilient seal, nonrising stem suitable for installation with the type and class of pipe being installed. Ends to be equipped with standard 2 inch operation nut, and "O" ring stem seals. Valves must be of the type to have two "O" ring stem seals in the stuffing box of the valve to facilitate seal replacement without valve dismantling.

Gate valves shall only be used for lines 8 inches and smaller, all lines 12 inches or larger shall utilize butterfly valves, except as approved by Public Works. This is also a requirement for 12 inch tapping valves.

Valves not buried shall be specified on the plans.

Two inch gate valves shall be super heavy duty with resilient seat. Valves shall be Waterous Series 500, M&H 4067, or approved equal.

5-10.6 VALVE BOXES

Valve boxes in all areas shall be cast iron, two piece units designed with tabs (lugs) on cover, equal to a "Rich No. 940" as manufactured by Rich or Sather. Tabs on lid must be aligned to correspond with the direction of travel of the main. Fogtite or equal. See Standard Plan No. 504.

WATER DISTRIBUTION

The valve and valve box shall be set plumb with the valve box centered on the operator nut. Valve boxes shall be set flush in pavement and gravel roads. Asphalt or concrete is required in gravel roads 2 feet around the valve box. When the top of the valve operation nut is more than 3 feet below finished grade, a valve operator extension shall be installed per Standard No. 504. The minimum extension length shall be 12 inches.

5-10.7 VALVE MARKER POSTS

Marker posts per Standard No. 510 shall be installed for all valves located in unimproved or unpaved areas. Valve marker posts shall be set as directed by the public works inspector in a safe and reasonable conspicuous location. The distance to the valve is to be neatly stenciled on the post with 2 inch numerals. Valve markers shall be painted with traffic safety yellow paint and be installed in a minimum of 24" of compacted soil or crushed rock. Valve marker posts are not required for auxiliary hydrant valves.

5-11 HYDRANTS

5-11.1 GENERAL

Fire hydrants shall be installed in accordance with Standard Plan No. 507, at locations as shown on the approved plans. They shall be painted with 2 coats of high gloss Traffic Safety Yellow "Rust-Oleum" type paint.

Hydrants shall be the "Traffic Model" type with approved breakaway features. All hydrants shall be brass to brass subseat, minimum valve opening of 5-1/4 inches "O" ring stem seal, 6 inch mechanical or flange shoe connection, 1-1/4 inch pentagonal operating nut. Approved models are listed on Standard Drawing No. 507.

All hydrants shall have a minimum of (2) 2-1/2 inch National Standard Thread connection and (1) 4 1/2" National Standard Thread pumper connection (steamer port).

5-11.2 CAP REQUIREMENTS

- A. One seal to be nitrile/vinyl rubber, suction style for zero leakage, color to be gray.
- B. One-eighth inch vinyl covered aircraft cable, 18 inches minimum length to be attached to cap and adapter.
- C. Force to connect or disconnect to be a minimum of 18 ft/lbs, maximum of 30 ft/lbs.
- D. Outside diameter (not to exceed) 7-3/4 inches, overall length (not to exceed) 2 inches.

All hook-ups to fire hydrants for temporary water for whatever purpose shall be approved by the public works department and will require a hydrant use permit.

5-11.2 HYDRANT GUARD POSTS

Hydrant guard posts shall be required anywhere hydrants are exposed to any traffic or pedestrian hazards and have no other means of protection, as deemed necessary by the City Public Works Department.

WATER DISTRIBUTION

Hydrant guard posts, when required shall be either reinforced concrete posts 8" x 8" x 6' long, or 6" diameter x 6' long Schedule 40 steel pipe, concrete filled. All guard posts shall be painted with traffic safety yellow paint and be installed in a minimum of 42" of compacted soil or crushed rock. See Standard No. 510

5-12 PRESSURE REDUCING STATIONS

When pressure reducing stations are required or needed, all pipe, fittings, and equipment shall be supported and blocked against static and dynamic loading in accordance with the equipment manufacturers' recommendations and as approved by Utilities. Drain lines from pumps or other equipment shall be piped to a below grade drainage system connected to the station sump or drain. All drains shall utilize either an air gap or approved backflow prevention assembly to eliminate potential contamination.

5-13 CONCRETE THRUST BLOCKING

Concrete thrust blocking, as indicated on the Drawings and Standard Plans Nos. 505 and 506, shall be placed at bends, tees, dead ends, crosses and as designated by the engineer. Blocking shall be Class 3000 concrete mix poured in place.

Concrete thrust blocks shall be cast in place and have a minimum of 1/4 square feet of bearing against the fitting and 2 square feet of bearing against undisturbed soil and shall be clear of joints so as to permit taking up or dismantling the joint. All poured in place blocking shall have a minimum measurement of 12 inches between the pipe and the undisturbed bank. All blocking configurations and sizes shall be per Standard Nos. 505 and 506. All blocking as shown on the Standards are considered as minimums, and consideration should be given to unusual circumstances and topography.

Although, Standard Plan Nos. 505 and 506 will work quite adequately in many situations, they should not be used to substitute for professional engineering design, particularly in situations involving large diameter pipe lines (greater than 12 inches), high velocity situations (greater than 10 ft/sec), or soils where soil type or stability may be questionable. One of the more common cases of thrust block failure is the installation of thrust blocks in unstable soil, or in locations too close to trenches for other pipe lines.

5-14 HYDROSTATIC PRESSURE TEST

All water mains and appurtenances shall be hydrostatically tested as specified in Section 7-11.3(11) of the WSDOT/APWA Standard Specifications. A copy of this test procedure is included in the back of this Section.

The contractor shall provide all necessary equipment and shall perform all work connected with the tests. The contractor shall perform the test to assure that the equipment to be used for the test is adequate and in good operating condition and all air has been released prior to requesting the city inspector to witness the test.

5-15 DISINFECTION OF WATER MAINS

Before being placed in service, all newly installed pipe shall be flushed, chlorinated and a satisfactory bacteriological report obtained.

Disinfection by the Dry Calcium Hypochlorite Method shall not be allowed unless written approval has been obtained from the public works director.

WATER DISTRIBUTION

Disinfection of water mains shall be performed in accordance with AWWA Standard C651-86 and Section 7-11.3(12) of the Standard Specifications. A copy of this procedure is included in the back of this Section.

Flushing water must be disposed of in accordance with City of Gold Bar Water Management and Washington State Department of Ecology Standards. Flushing water may require dechlorination, site removal and/or disposal. Method of disposal shall be approved by the engineer.

5-15.1 CHLORINE DOSAGE

References in Section 7-11.3(12) of the WSDOT/APWA Standard Specifications to an initial chlorine content of the water of not less than 50mg/l is hereby changed to 25mg/l.

The amounts of chlorine (Cl₂) required to give 25mg/l for 100-foot lengths of various diameter of pipe are:

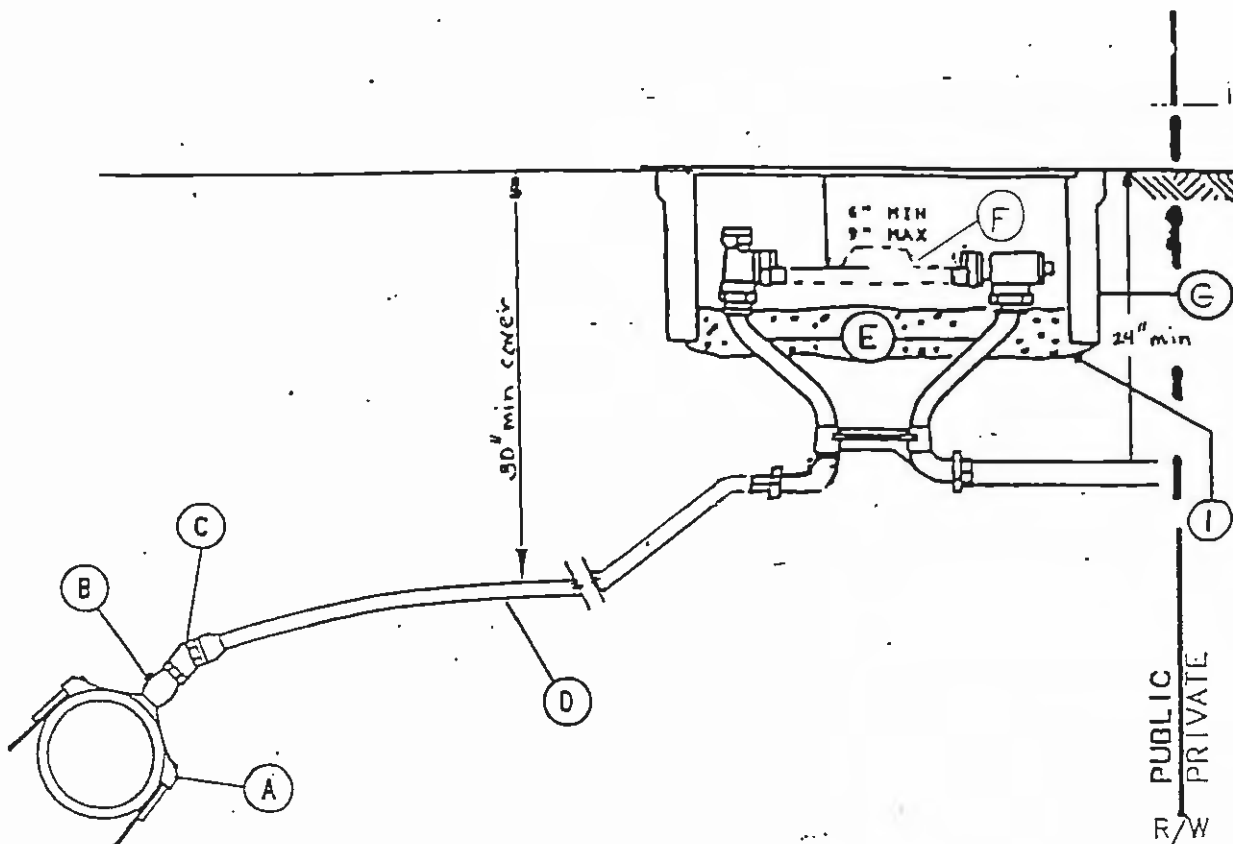
AMOUNTS OF CHLORINE REQUIRED FOR 25 MG/L DOSAGE

Pipe Size (inches)	Volume of Water Per 100 ft length (gallons)	Household Bleach 5-1/4% (gallons)	Commercial Bleach 12-1/2% (gallons)
4	65.3	.03	.13
6	146.5	.07	.03
8	261.0	.13	.053
10	408.0	.2	.08
12	588.7	.3	.12
14	799.6	.4	.16
16	1044.4	.5	.21
20	1631.9	.8	.33
24	2349.9	1.1	.47
30	3671.7	1.8	.75
36	5287.3	2.5	1.1
42	7196.6	3.5	1.44
48	9399.6	4.6	1.6

5-16 UNDERGROUND UTILITIES

Activities such a trench excavation, tunneling or boring, pipe embedment, backfilling, compaction, safety and pavement patching, whether for public or private utilities, shall conform to the requirements set forth in this Section and other Sections of these standards.

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NOTE:

- (A) RCMAC, ROCKWELL, AND MUELLER SERVICE CLAMPS WITH C.C. THREAD OR I.P. THREAD TO BE USED ON ALL MAINS 3" DIA AND LARGER.
- (B) CORPORATION STOPS:
1" - MUELLER H1500 & H1500S, FORD F400, 500 WITH LAO 4-44 OR LO 4-44, F1000, F1100.
- (C) PACK JOINT AND APPROPRIATE STAINLESS STEEL STIFFENER OR COMPRESSION FITTING WITH 1/8" OR 1/4" BEND.
- (D) 1" POLYETHYLENE WITH #10 COPPER TRACER WIRE.
- (E) METER SETTER, (FORD SERIES 70), WITH INLET ANGLE METER STOP, LOCKWINGS, HORIZONTAL INLET AND OUTLET, CHECK VALVE OUTLET; METER SETTER SHALL BE CAPABLE OF ACCEPTING 5/8" & 3/4" PRECISION METER.
- (F) METERS SHALL BE INSTALLED BY THE CITY WATER DIVISION AT OWNERS EXPENSE.
- (G) METER BOX SHALL BE: BROCKS STANDARD SERIES 1419, CARSON SERIES 1419 (PLASTIC) OR FOGTITE #10 (CONCRETE).
- (H) 1" service taps to existing main shall be done by city staff. All others shall be done by the contractor/developer with city approval.
- (I) BACKFILL WITH SAND TO BONNET.

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STDS

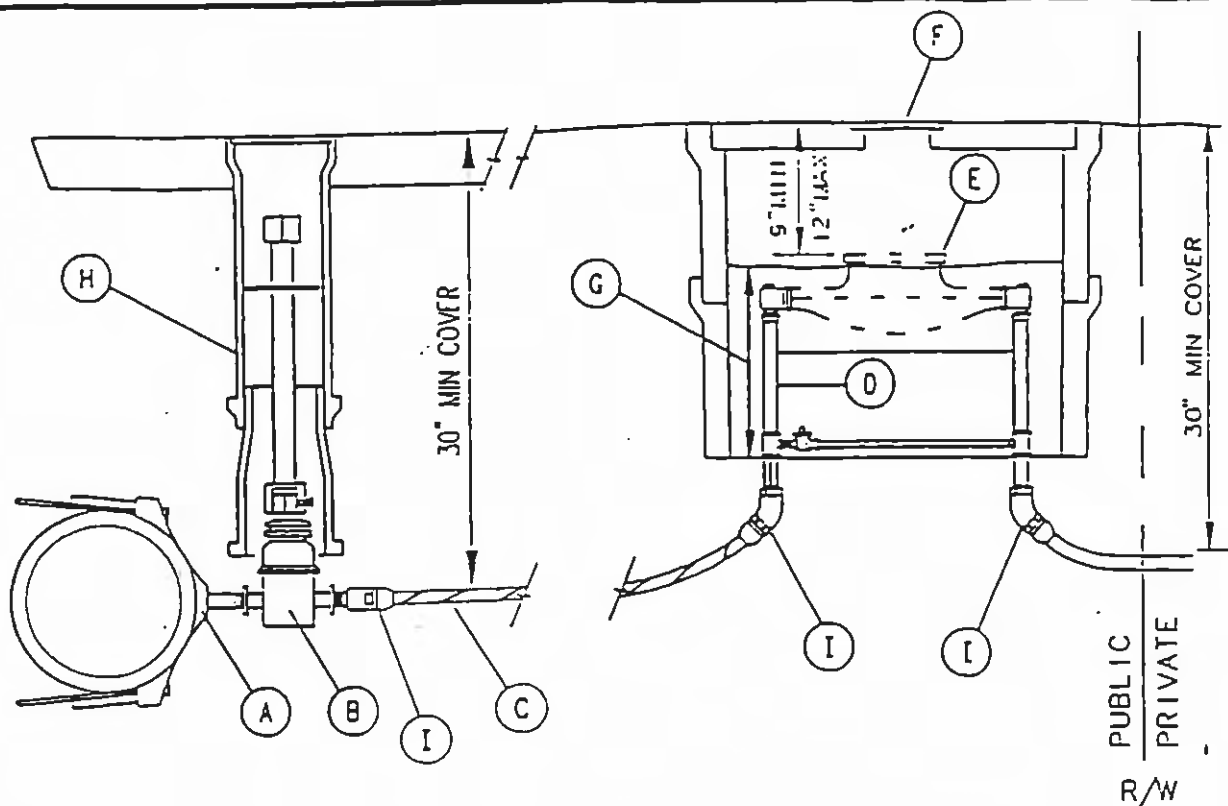


3/4" - 1" METERED WATER SERVICE

10/23/98
date revised

502A
number

CITY OF COLD SPRING HARBOR PUBLIC WORKS DEPARTMENT



NOTES:

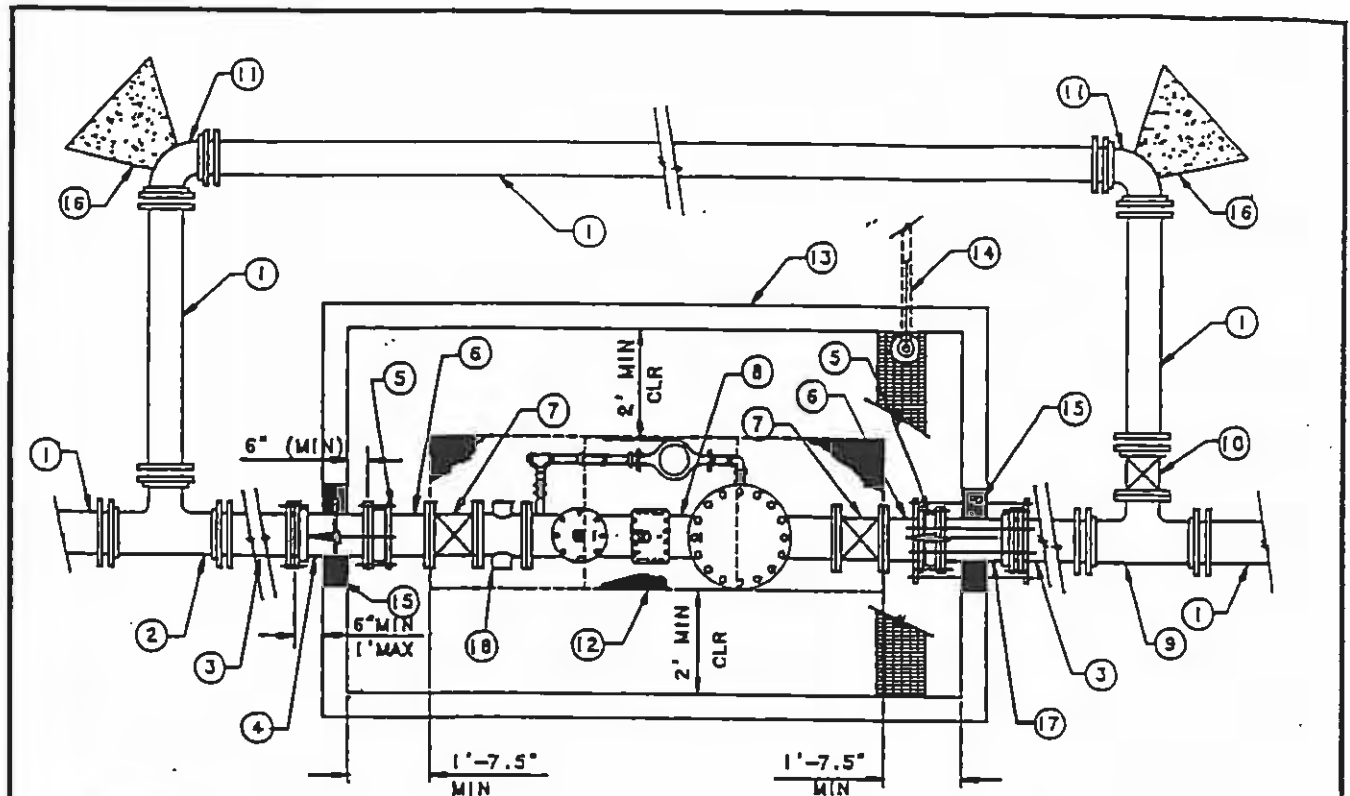
- (A) RCMAC, ROCKWELL, AND MUELLER DOUBLE STRAP SERVICE CLAMPS WITH C.C. THREAD OR I.F. THREAD TO BE USED ON ALL MAINS 3" DIA AND LARGER AND ON ALL A.C. MAINS. ALL NEW HORIZONTAL TAPS ON EXISTING WATER MAINS SHALL BE DONE BY THE CITY OF EVERETT WATER DIVISION AT THE DEVELOPERS OR CONTRACTORS EXPENSE.
- (B) SUPER HEAVY DUTY 2" GATE VALVE WITH RESILIENT SEAT. GATE VALVES SHALL BE: WATEROUS SERIES 500, M & H 4067, OR APPROVED EQUAL.
- (C) 2" POLYETHYLENE, W/ A #10 COPPER TRACE WIRE.
- (D) METER SETTERS SHALL BE FORD 90 SERIES COPPERSETTER. V88-87-1261177 WITH VERTICAL INLET AND OUTLET.
- (E) METERS SHALL BE INSTALLED BY THE CITY WATER-DEPT. AT OWNERS EXPENSE.
- (F) METER BOXES SHALL BE: CARSON SERIES 1730 (PLASTIC), BROOKS SERIES 65T (CONCRETE) OR FOGTITE #2 (CONCRETE).
- (G) BACKFILL WITH SAND TO BONNET.
- (H) ADJUSTABLE VALVE BOX AND EXTENSION SEE STD 504.
- (I) PACK JOINT AND INSTALL APPROPRIATE STAINLESS STEEL STIFFENER OR COMPRESSION FITTING (TYPICAL).



2" METERED WATER SERVICE

10/23/98
date revised

502B
number



PARTS LIST

- | | |
|---|---|
| <ul style="list-style-type: none"> ① DUCTILE IRON PIPE ② TEE (ALL MJ W/MEGA LUGS) ③ SPOOL (PExPE) ④ WALL SLEEVE (FLxMJ) TO BE USED WITH CAST IN-PLACE VAULTS. ⑤ FLANGE COUPLING ADAPTOR (FLxMJ) ⑥ SPOOL (PExFL) IF NEEDED ⑦ GATE VALVE CL 125 (FLxFL). ⑧ METER ASSEMBLY SEE NOTE 4. ⑨ TEE (MJ W/MEGA LUGS x FL) ⑩ GV (FLxMJ W/MEGA LUG) | <ul style="list-style-type: none"> ⑪ 90° ELL (ALL MJ W/MEGA LUGS) ⑫ UTILITY VAULT CO LID WITH TRAFFIC LOADED LOCKING STEEL COVERS OR EQUAL. ⑬ UTILITY VAULT CO PRECAST VAULT OR EQUAL. ⑭ 2" GRAVITY SUMP DRAIN EXTEND TO DAYLIGHT OR STORM DRAINAGE SYSTEM. ⑮ NON-SHRINK GROUT ⑯ CONC THRUST BLOCK SEE STD DETAIL NO 505 ⑰ SPOOL (FLxPE) WITH SHACKLE BOLTS TO BE USED ON PRECAST VAULTS. ⑱ FLANGE x FLANGE SPOOL WITH TWO 2" TEST OUTLETS & BRASS PLUGS. LENGTH OF SPOOL TO BE 3 TIMES THE DIAMETER OF THE PIPE TO THE TEST PLUGS. |
|---|---|

NOTES

- | | |
|--|--|
| <ul style="list-style-type: none"> 1. MINIMUM VAULT INSIDE HEIGHT SHALL BE 78". 2. NEPTUNE PROTECTUS METERS SHALL HAVE A 6" MINIMUM CLEARANCE BETWEEN FLOOR AND LOWEST PART OF METER. ALL OTHERS SHALL HAVE 12" MINIMUM CLEARANCE. 3. MINIMUM CLEARANCE BETWEEN METER AND TOP OF VAULT SHALL BE 36". 4. BRAND AND STYLE OF METER AND ACCESSORIES TO BE DETERMINED BY city public works dept. | <ul style="list-style-type: none"> 5. PIPING AND VALVES SHALL BE SUPPORTED BY POURED-IN-PLACE CONCRETE OR STEEL STANDS. THE NUMBER OF AND PLACEMENT OF SUPPORT STANDS TO BE DETERMINED BY CITY ENGINEER ACCORDING TO SIZE OF PIPE AND METER. 6. OS&Y VALVES SHALL HAVE A MINIMUM CLEARANCE OF 3" BETWEEN STEM AND TOP OF VAULT WHEN VALVE IS FULLY OPEN. |
|--|--|

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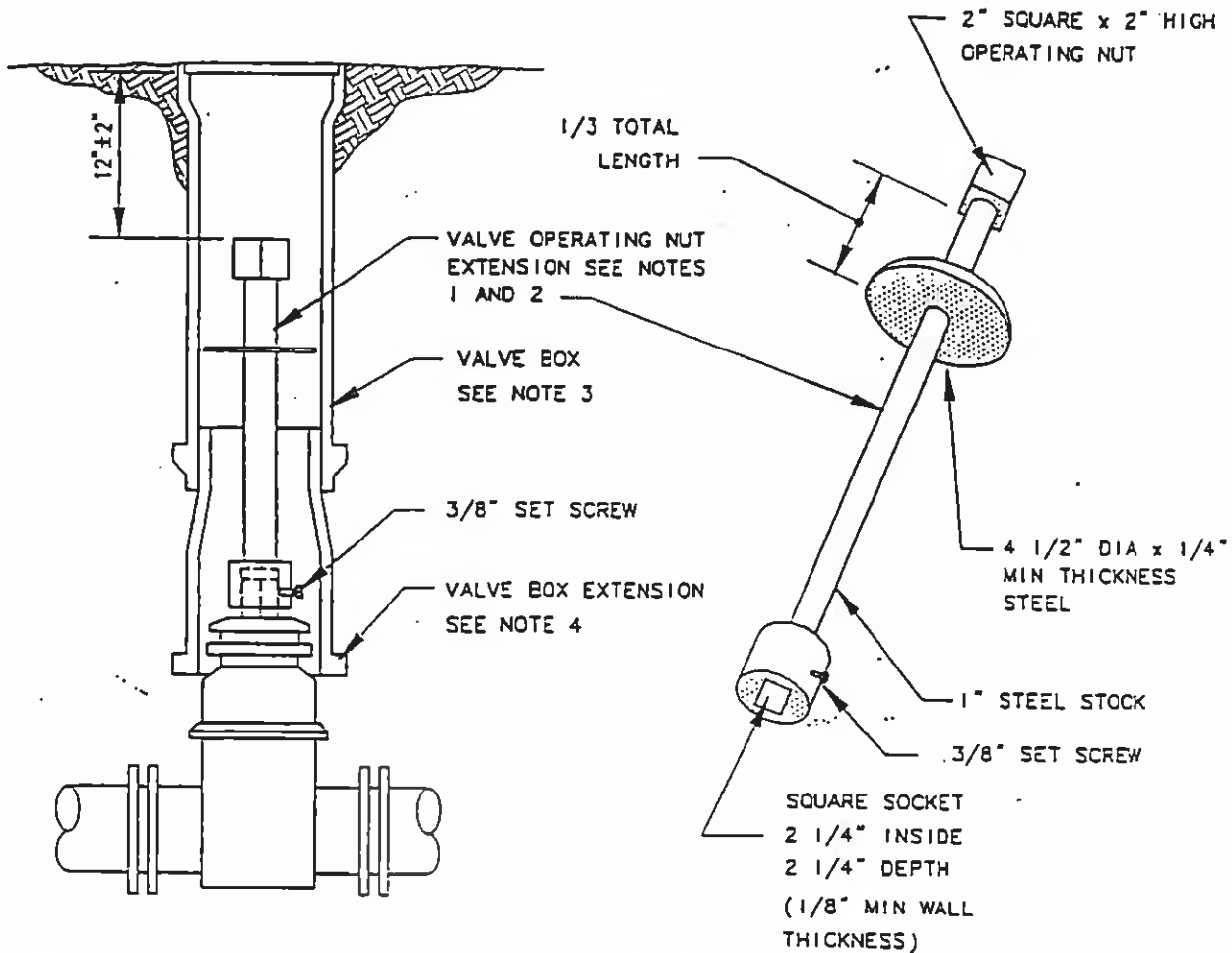


METER VAULT FOR 3' AND LARGER

10/23/98
date

503
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



VALVE BOX AND EXTENSION

VALVE OPERATING NUT EXTENSION

NOTES:

- 1 VALVE OPERATING NUT EXTENSIONS ARE REQUIRED WHEN THE VALVE NUT IS MORE THAN TWO (2) FEET BELOW FINISHED GRADE. EXTENSIONS ARE TO BE A MINIMUM OF ONE (1) FOOT LONG. ONLY ONE EXTENSION WILL BE ALLOWED PER VALVE.
- 2 ALL VALVE OPERATING NUT EXTENSIONS ARE TO BE MADE OF STEEL, SIZED AS NOTED, AND PAINTED WITH TWO (2) COATS OF METAL PAINT.
- 3 VALVE BOXES IN ALL AREAS SHALL BE CAST IRON, TWO PIECE UNITS, DESIGNED WITH (LUGS) ON COVER, EQUAL TO "RICH NO. 940" AS-MANUFACTURED BY RICH OR SATHER.



WATER BOX AND EXTENSION

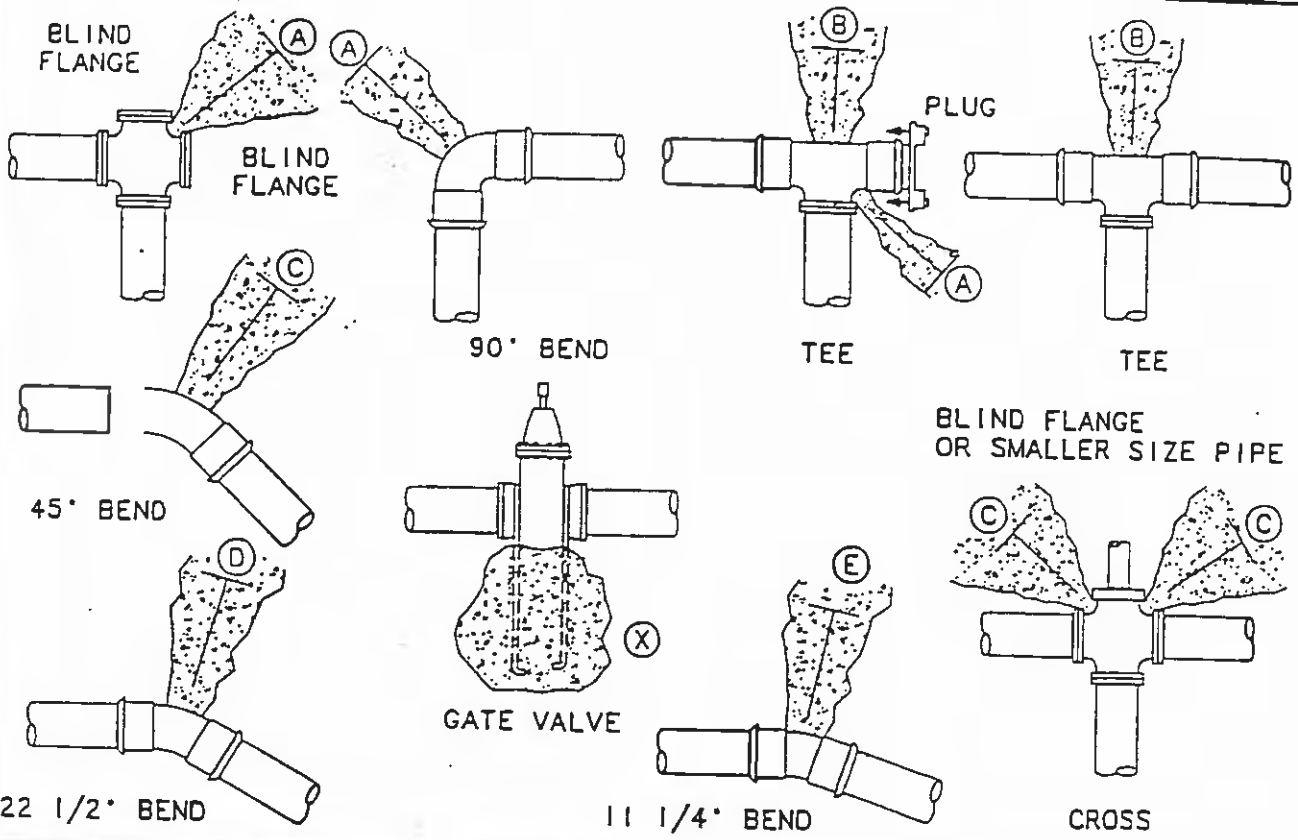
10/23/98
date

504
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT

U.S. 12/10/98

12/10/98



THRUST BLOCK - TABLE

MIN. BEARING AREA AGAINST UNDISTURBED SOIL
SQUARE FEET

PIPE SIZE	(A) FT ²	(B) FT ²	(C) FT ²	(D) FT ²	(E) FT ²	(X) FT ²
4"	3	1	1	1	1	NONE
6"	4	4	2	1	1	NONE
8"	7	6	4	2	1	4
10"	11	10	6	3	2	6
12"	16	14	9	5	3	9
14"	22	19	12	6	3	12
16"	29	25	16	8	4	16
18"	36	31	20	10	5	20
20"	45	39	24	13	6	24
22"	54	47	29	15	8	29
24"	64	56	35	18	9	35
28"	87	76	48	24	12	48
30"	101	87	55	28	14	55
36"	175	125	78	40	20	78
42"	197	171	107	55	27	107
48"	257	223	140	71	36	140

NOTES:

1. BEARING AREA OF CONCRETE THRUST-BLOCK BASED ON 200 PSI PRESSURE AND SAFE SOIL-BEARING LOAD OF 2,000 POUNDS PER SQUARE FOOT.
2. AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES, AND SOIL CONDITIONS.
3. CONCRETE BLOCKING (CLASS 3000) SHALL BE CAST IN PLACE AND HAVE A MINIMUM OF 1/4 SQUARE FOOT BEARING AGAINST THE FITTING.
4. BLOCK SHALL BEAR AGAINST FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP OR DISMANTLING OF JOINT.
5. CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE UNDER ALL CONDITIONS OF SERVICE.
6. MINIMUM ROD DIAMETER SHALL BE 3/4" ASTM A-307 WITH 36KSI YIELD STRENGTH.

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HORIZONTAL THRUST BLOCKS

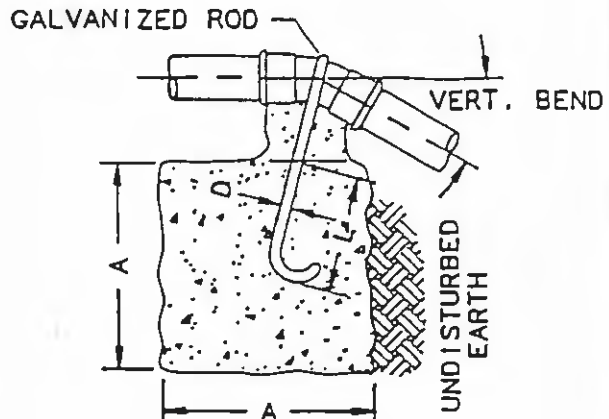
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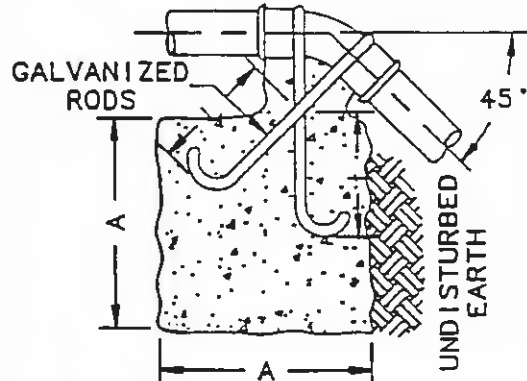
CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT

VERTICAL BLOCKING

PIPE SIZE	VB	CU. FT.	A	D	L
4"	11 1/4'	8	2.0'	3/4"	1.5'
	22 1/2'	11	2.2'		2.0'
	30'	17	2.6'		
6"	11 1/4'	11	2.2'	3/4"	2.0'
	22 1/2'	25	2.9'		
	30'	41	3.5'		
8"	11 1/4'	16	2.5'	3/4"	2.0'
	22 1/2'	47	3.6'		
	30'	70	4.1'	3/4"	2.5'
12"	11 1/4'	32	3.2'	3/4"	2.0'
	22 1/2'	88	4.5'	7/8"	3.0'
	30'	132	5.1'		
16"	11 1/4'	70	4.1'	7/8"	3.0'
	22 1/2'	184	5.7'	1 1/8"	4.0'
	30'	275	6.5'	1 1/4"	
20"	11 1/4'	91	4.5'	7/8"	3.0'
	22 1/2'	225	6.1'	1 1/4"	4.0'
	30'	330	6.9'	1 3/8"	4.5'
24"	11 1/4'	128	5.0'	1"	3.5'
	22 1/2'	320	6.8'	1 3/8"	4.5'
	30'	480	7.9'	1 5/8"	5.5'
VERTICAL BLOCKING FOR 45° BENDS					
4"	45°	30	3.1'	3/4"	2.0'
6"		68	4.1'		
8"		123	5.0'		
12"		232	6.1'	3/4"	2.5'
16"		478	7.8'	1 1/8"	4.0'
20"		560	8.2'	1 1/4"	
24"		820	9.4'	1 3/8"	4.5'



VERTICAL BLOCKING
FOR 11 1/4°, 22 1/2°, & 30° BENDS



VERTICAL BLOCKING
FOR 45° BENDS

NOTE:

CONCRETE BLOCKING BASED
ON 200 P.S.I. PRESSURE
& CLASS 3000 CONCRETE

DEAD WEIGHT BLOCKING

PIPE SIZE IN.	PIPE AREA IN ²	TYPE OF FITTING			
		22 1/2°	45°	60°	90°
4	12.5	0.3	0.6	0.7	1.1
6	28.3	0.5	1.1	1.4	2.1
8	50.3	0.9	1.9	2.5	3.8
12	113	2.1	4.2	5.6	8.4
16	201	3.7	7.5	9.9	15
18	254	4.9	10	13	20
20	314	6.0	12	16	24
24	432	7.9	16	21	32

TYPE OF FITTING

SIZE OF DEAD WEIGHT BLOCK, C.Y. CONCRETE

506.DWG

1 STD.

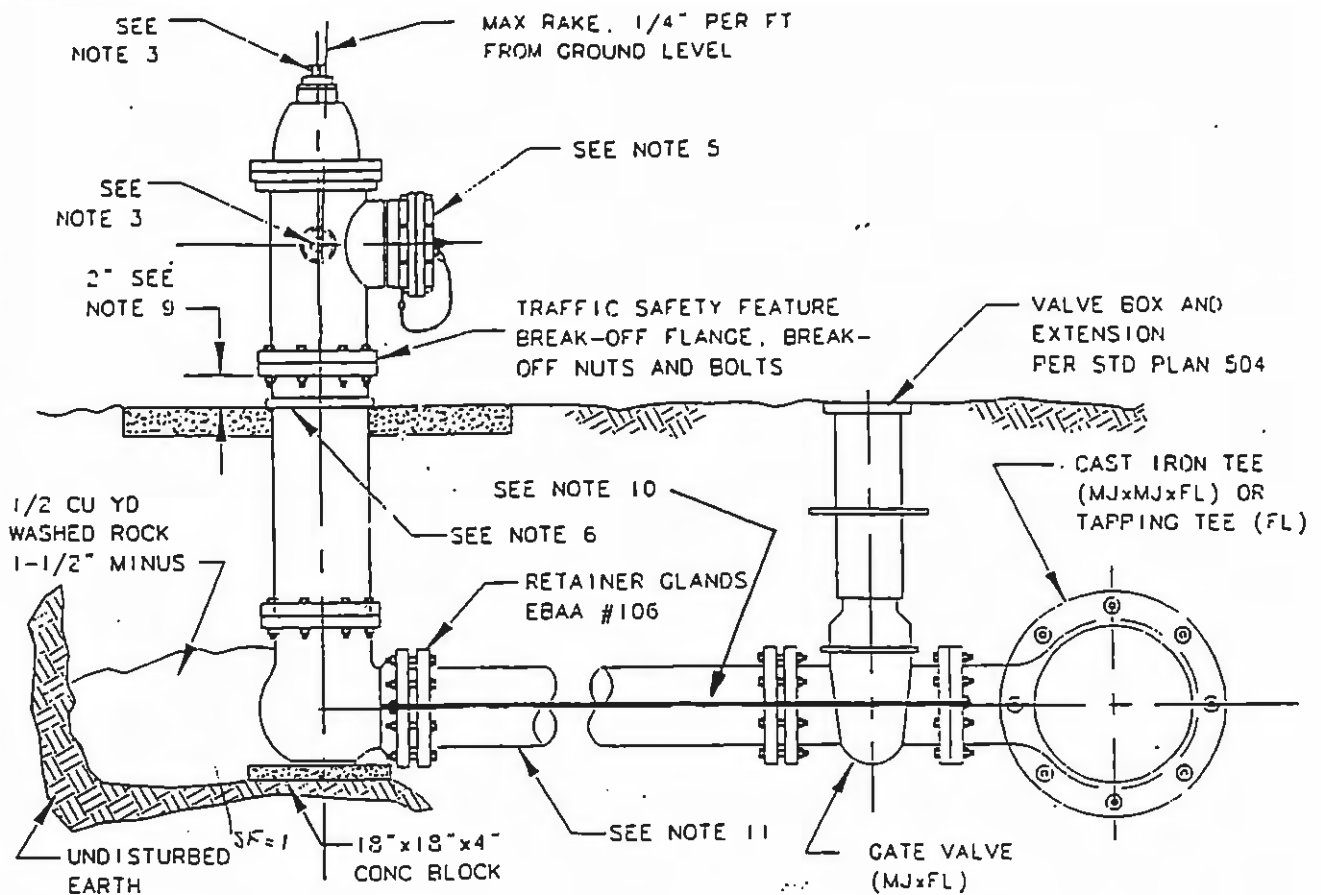


VERTICAL AND DEAD WEIGHT CONCRETE BLOCKING

10/23/98
date

506
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



NOTES:

1. HYDRANTS AND ALL MATERIALS TO BE APWA OR AWWA APPROVED (MUELLER, A-423; CLOW, MEDALLION) OR APPROVED EQUAL.
2. 5-1/4" VALVE MINIMUM.
3. 1-1/4" OPERATING NUT AND CAP NUT FOR 2-1/2" PORTS
4. (2) 2 1/2" National Standard Thread connections
5. (1) 4 1/2" National Standard Thread pumper connection
6. IF HYDRANT RISES THROUGH CONCRETE, USE EXPANSION STRIP AROUND HYDRANT BARREL, PER STD PLAN 509. IN ADDITION, INSTALLATION OF THE HYDRANT ON PRIVATE PROPERTY SHALL EQUAL OR EXCEED THE STANDARDS FOR INSTALLATION OF PUBLIC FIRE HYDRANTS IN THE CITY OF GOLD BAR
7. PROVIDE FOR VEHICULAR TRAFFIC PROTECTION WHEN NECESSARY PER STD. PLAN 510.
8. STEAMER PORT TO BE FACING STREET OR ROADWAY FOR FIRE ENGINE ACCESS.
9. BREAK-OFF FLANGE TO BE 2" ABOVE GROUND LEVEL.
10. Install shackle rod, or Megalugs & thrustblock on Hydrant Tee & shoe.
11. HYDRANT CONNECTION PIPE TO BE DUCTILE IRON CLASS 52. ANY INTERMEDIATE JOINTS TO BE MJ WITH RETAINER GLANDS
12. FIRE HYDRANTS SHALL BE PAINTED WITH TWO COATS OF HIGH GLOSS traffic safety yellow "RUST-OLEUM" paint.

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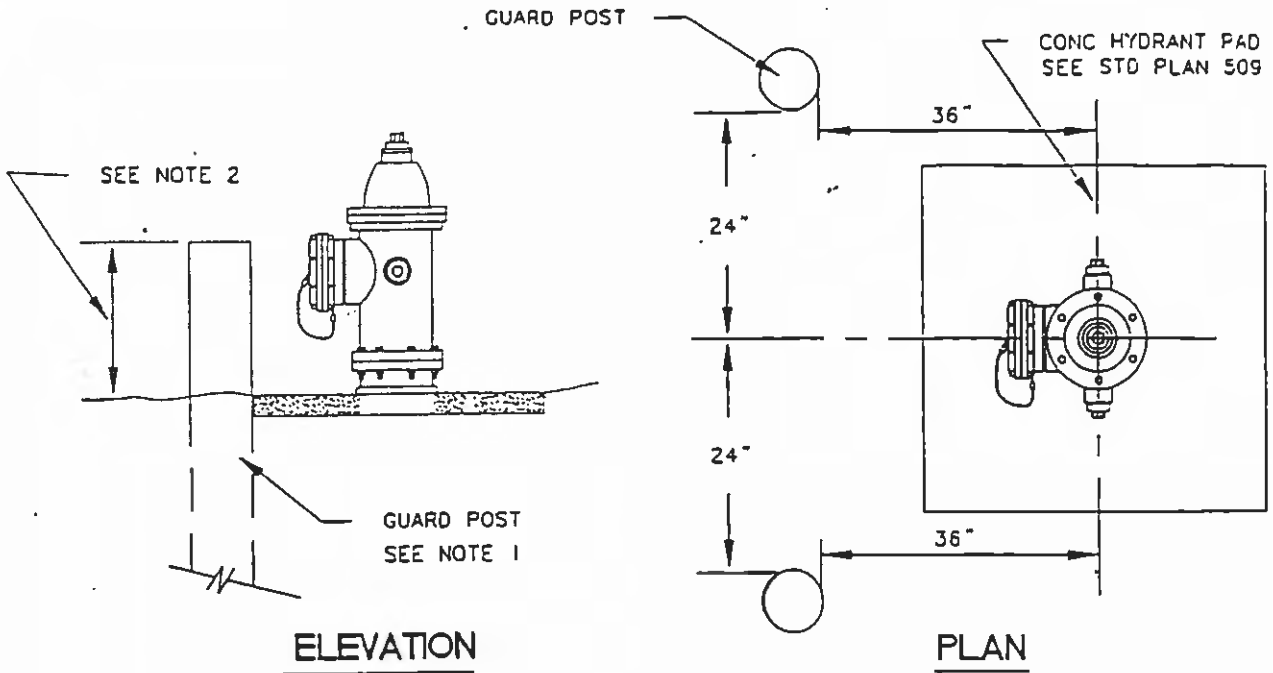


FIRE HYDRANT ASSEMBLY

10/23/98
date revised

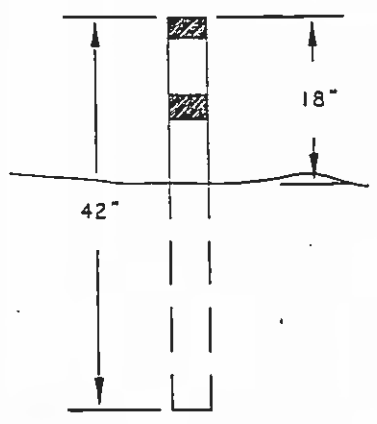
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CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



FIRE HYDRANT GUARD POST

(SEE NOTES 1 AND 2)



VALVE MARKER POST

(SEE NOTES 3, 4 AND 5)

NOTES:

- 1 GUARD POSTS SHALL BE 6' LONG, 9" IN DIAMETER PRECAST CONCRETE OR 6' LONG, 6" DIAM SCH 40, CONCRETE FILLED CLASS 52 STEEL PIPE. PAINTED WITH TWO COATS OF "RUST-O-LEUM" NO. 2766, HI GLOSS YELLOW PAINT.
- 2 TOP OF GUARD POST SHALL BE LEVEL WITH TOP OF PUMPER PORT.
- 3 VALVE MARKER POST SHALL BE 42" PORTABLE TRAFFIC DELINEATOR POST W/TWO REFLECTOR STRIPS. THEY SHALL BE FURNISHED NEW AND UNUSED AND BURIED 24" DEEP, TO LEAVE 18" EXPOSED AS A MARKER POST THE LETTER "V" AND THE DISTANCE TO THE VALVE SHALL BE STENCILED ON THE POST WITH 2" HIGH NUMERALS, WITH BLACK ENAMEL PAINT.
- 4 VALVE MARKER POSTS SHALL BE INSTALLED FOR ALL VALVES LOCATED IN UNIMPROVED OR UNPAVED AREAS. VALVE MARKER POSTS SHALL BE SET AS DIRECTED BY THE PUBLIC WORKS INSPECTOR IN A SAFE AND REASONABLY CONSPICUOUS LOCATION.
- 5 VALVE MARKER POSTS ARE NOT REQUIRED FOR AUXILIARY HYDRANT VALVES.

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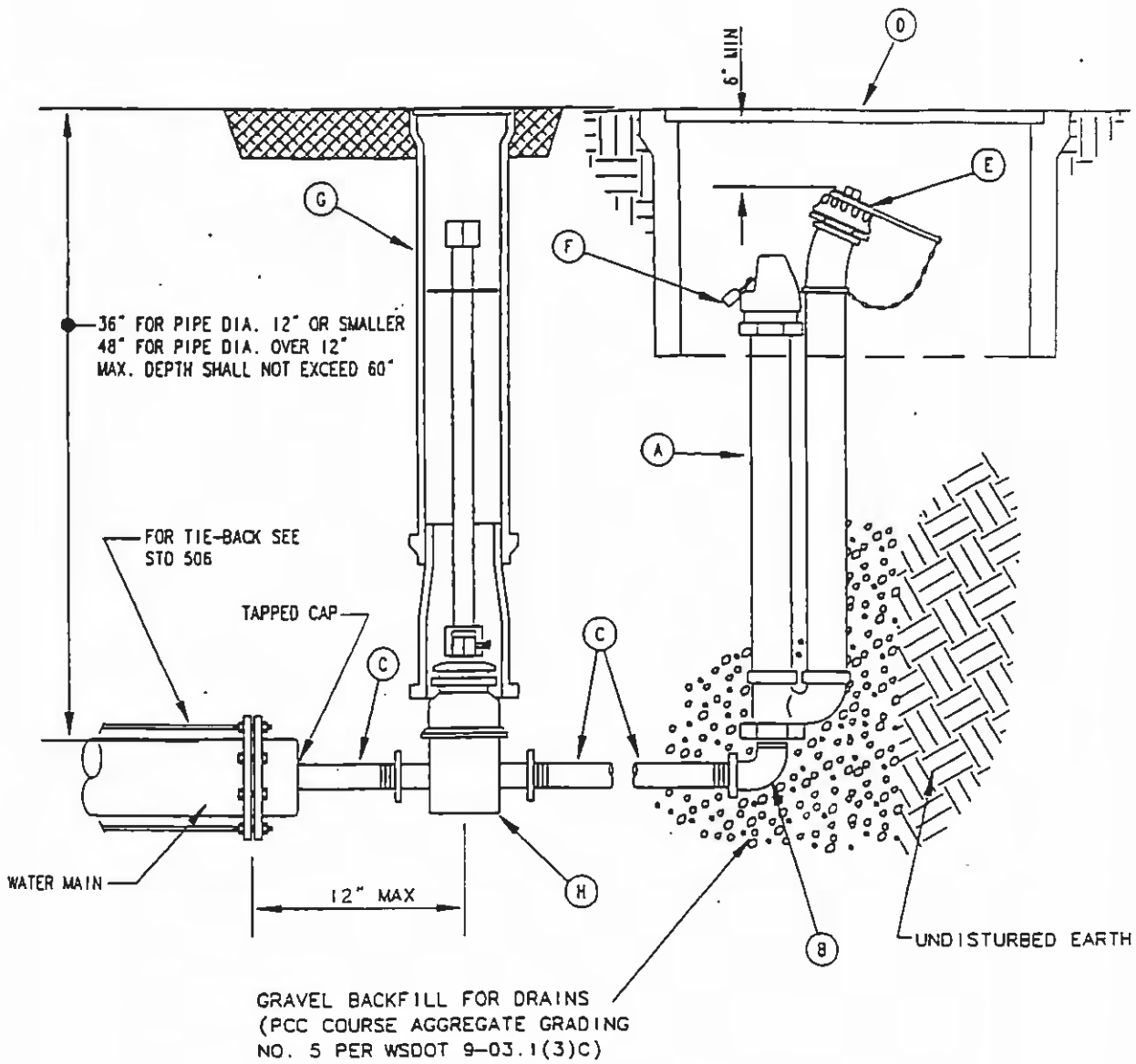


**FIRE HYDRANT GUARD POST
AND VALVE MARKER POST**

10/23/98
date

510
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



LEGEND:

- | | |
|---|---|
| (A) MAINGUARD 2" BLOW-OFF HYDRANT | (E) 2" CAP NATIONAL STANDARD THREAD. |
| (B) 2" BRASS STREET "L" | (F) LOCK TO BE SUPPLIED BY CITY OF Gold Bar |
| (C) 2" BRASS NIPPLE | (G) VALVE BOX AND EXTENSION PER STD DWG 504 |
| (D) CONCRETE METER BOX, FOGTITE OR EQUAL.
FOGTITE NO. 2 IN NON TRAVELED AREAS
FOGTITE NO. 2T IN VEHICULAR TRAFFIC
& SIDEWALK AREAS (DIAMOND PLATE FRAME) | (H) 2" SUPER HEAVY DUTY GATE VALVE WITH RESILIENT SEAT
(WATEROUS SERIES 500 OR M&H 3067 OR APPROVED EQUAL) |

STO 10511 DWG

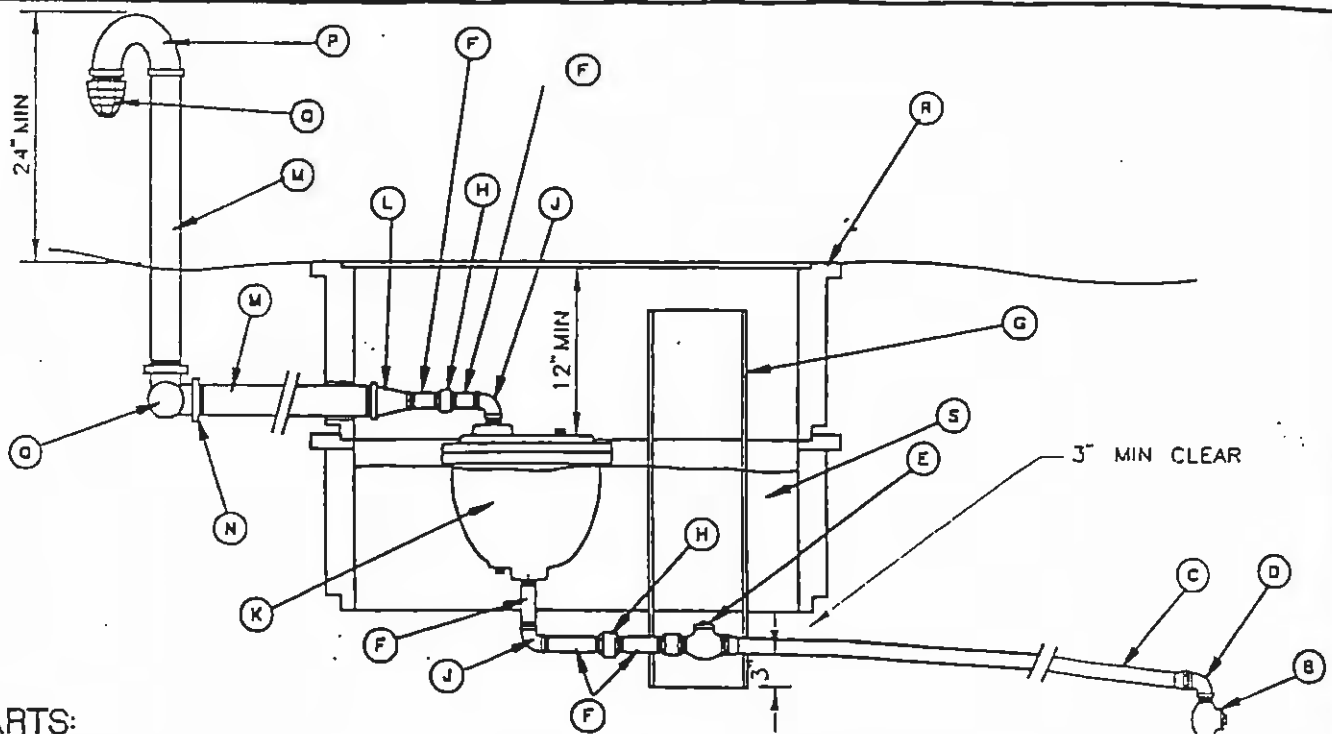


BLOW-OFF ASSEMBLY

10/23/98
date

511
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



PARTS:

- | | |
|---|--|
| (A) CL 52 DUCTILE IRON PIPE | (L) 2"x1" GALV REDUCER |
| (B) 1" FORD 600 SERIES CORP | (M) 2" GALV PIPE |
| (C) 1" TYPE "K" COPPER TUBING | (N) 2" STREET ELL (HORIZ) |
| (D) 1" FORD 602-44 ANGLE COUPLING | (O) 2" GALV 90° ELL (VERT) |
| (E) 1" FORD B21-444 CURB STOP | (P) 2" GALV RETURN BEND |
| (F) 1" BRASS NIPPLE | (Q) GALV BEEHIVE STRAINER GREENBURG P-24-08, FOR 2" PIPE |
| (G) 6" PVC PIPE | (R) UTILITY BOX CARSON 1730 SERIES, BROOKS SERIES 65T OR FOGTITE NO 2. |
| (H) 1" BRASS UNION | (S) BACKFILL WITH SAWDUST TO BONNET. |
| (J) 1" BRASS 90° ELL | |
| (K) 1" COMBINATION AIR AND VACUUM RELIEF VALVE APCO 143-C, VALMATIC 201C OR EQUAL | |

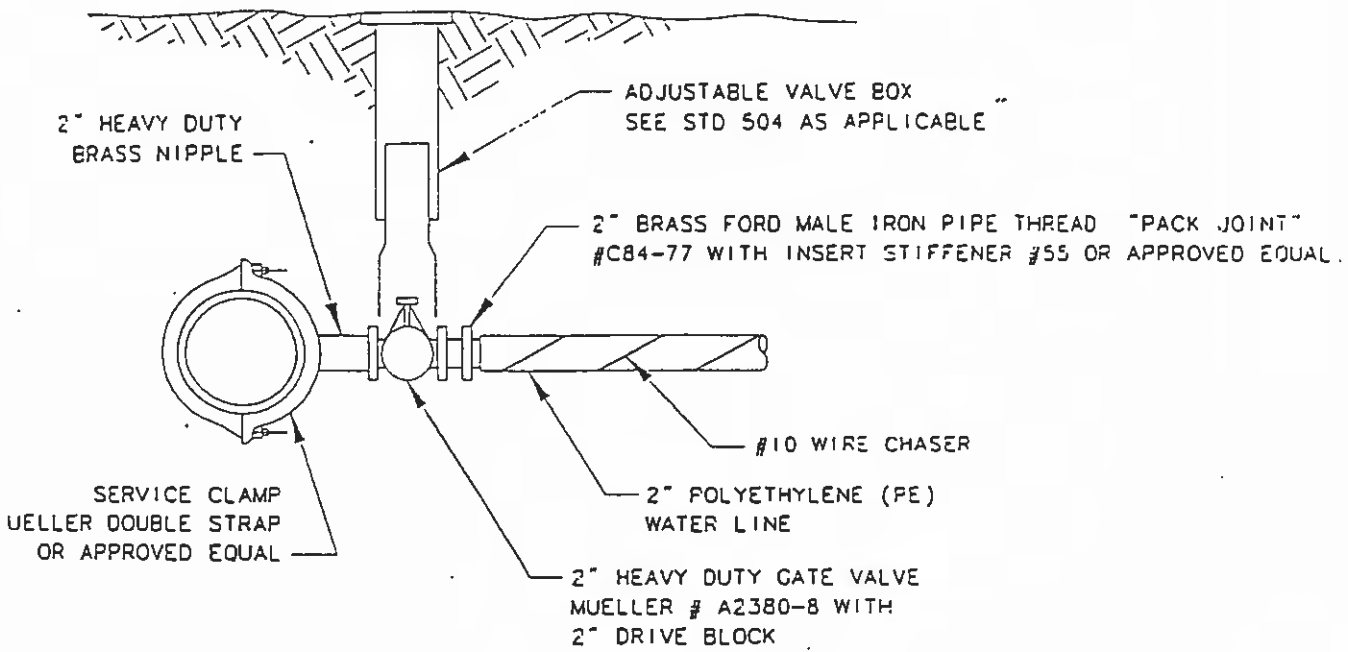
NOTES

1. AIR-VAC UNIT AND BOX TO BE INSTALLED IN NON-TRAFFIC AREA.
2. USE MUELLER DOUBLE STRAP SERVICE CLAMP OR APPROVED EQUAL ON ALL MAINS LESS THAN 6" IN DIAMETER.
3. ALL PIPE FITTINGS BETWEEN MAIN AND UNION, AFTER AIR/VACUUM RELIEF VALVE, SHALL BE BRASS.
4. INSTALLATIONS FOR OTHER SIZE AIR/VACUUM RELIEF VALVES SHALL BE INDIVIDUALLY DESIGNED AND WILL REQUIRE APPROVAL BY THE UTILITIES DIVISION.
5. PAINT METER BOX LID AND RISER ASSEMBLY (2) COATS SAFETY YELLOW, OIL BASE ENAMEL- HAND BRUSH APPLIED. STENCIL RISER ASSEMBLY WITH "AV" AND SIZE OF AIR/VAC ASSEMBLY ON SIDE FACING ROADWAY IN 2" BLACK LETTERS.
6. AIR/VAC RELEASE VALVE ASSEMBLY SHALL BE INSTALLED AT HIGH POINT ON LINE. IF HIGH POINT FALLS IN LOCATION WHERE ASSEMBLY CANNOT BE INSTALLED, PROVIDE ADDITIONAL DEPTH TO CREATE NEW HIGH POINT.
7. CONCRETE VAULT PENETRATIONS SHALL BE CORE DRILLED AND GROUTED.

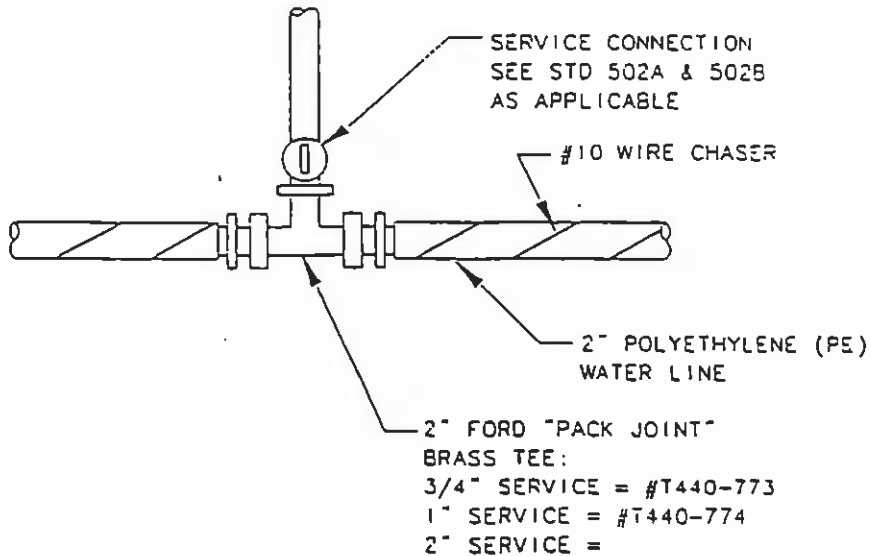
12.DWG
A STDS



1" AIR-VACUUM VALVE ASSEMBLY	10/23/98 date revised	512 number
CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT		



CONNECTION TO MAIN



SERVICE CONNECTION PLAN

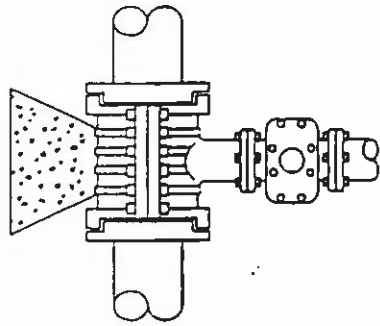


2" PLASTIC WATER MAIN

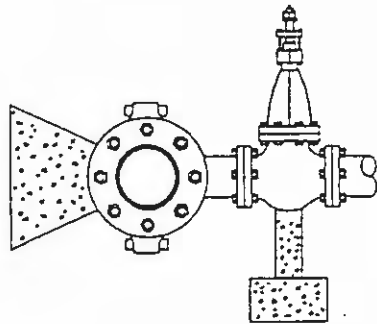
10/23/98
date

513
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



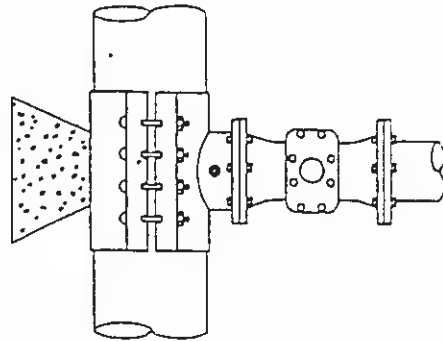
PLAN



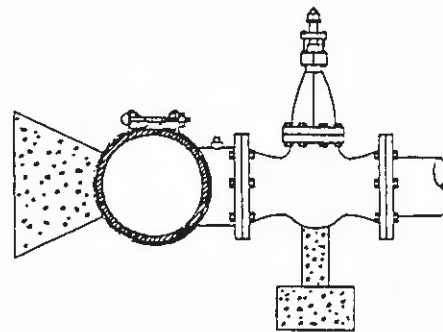
ELEVATION

INSTALLED ON ASBESTOS CEMENT PIPE,
CAST IRON PIPE AND DUCTILE IRON
PIPE.

CAST IRON TAPPING TEE
MECHANICAL JOINT SLEEVE



PLAN



ELEVATION

STAINLESS STEEL TAPING TEE

INSTALLED ON ASBESTOS CEMENT PIPE,
CAST IRON PIPE AND DUCTILE IRON
PIPE.

STEEL TAPPING TEE

INSTALLED ON DUCTILE IRON PIPE
ONLY.

STAINLESS STEEL OR STEEL
TAPPING TEE

NOTES:

1. STAINLESS STEEL TAPPING TEES SHALL HAVE FULL CIRCLE SEAL.
2. STEEL TAPPING TEES SHALL BE EPOXY COATED.
3. ALL TEES AND VALVES TO BE WATER TESTED BEFORE TAP.
4. NO SIZE ON SIZE TAPS. TAP SHALL BE AT LEAST 2" SMALLER THAN THE EXISTING MAIN.

STD51STD514.DWG

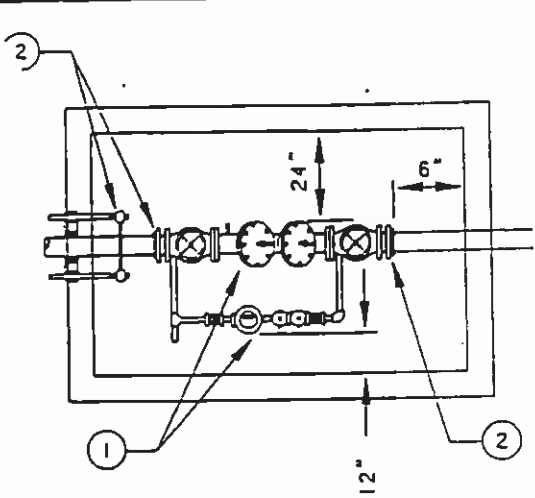


TAPPING TEES

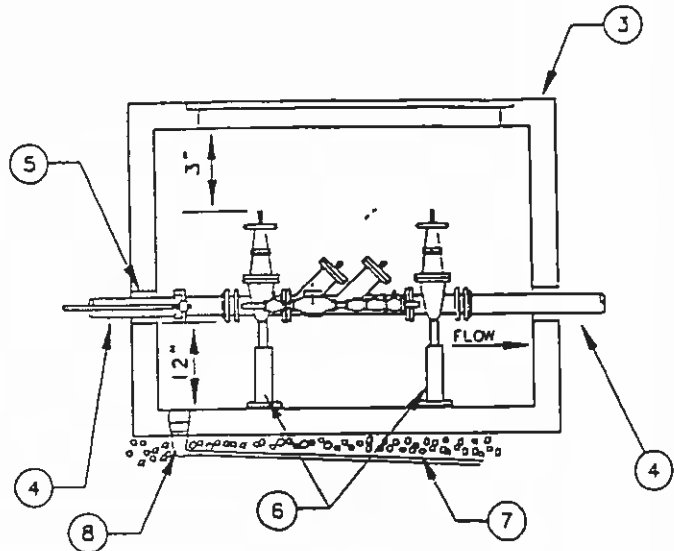
10/23/98
date

514
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



PLAN



ELEVATION

LEGEND

- ① UL-FM LISTED SOFTSEATED STATE APPROVED DOUBLE CHECK DETECTOR VALVE ASSEMBLY INCLUDING: 2-O.S.& Y RESILIENT SEATED GATE VALVES, TEST COCKS, 3/4" BRASS OR COPPER BYPASS WITH INLINE VALVES, 5/8" METER (METER TO READ IN CUBIC FEET), AND A 3/4" DOUBLE CHECK-VALVE ASSEMBLY. backflow assemblies may be approved for interior installations.
- ② UNI-FLANGE WITH SET SCREWS OR MJ x FL ADAPTOR WITH MEGALUG OR GALVANIZED SHACKLE TO MAIN WITH 2-3/4" RODS, OR MJ RETAINER GLANDS.
- ③ PRECAST CONCRETE VAULT WITH STEEL ACCESS HATCH (AS MANUFACTURED BY UTILITY VAULT CO OR AN APPROVED EQUAL). PROVIDE OSHA APPROVED HOT DIPPED GALVANIZED STEEL LADDER INSTALL IN SUCH A WAY THAT VAULT ACCESS DOES NOT INTERFERE WITH INSTALLED EQUIPMENT MAINTENANCE.
- ④ DUCTILE IRON PIPE (SIZED AS REQUIRED) CLASS 52.
- ⑤ WATER TIGHT GROUT SHALL BE USED IN ALL VAULT PENETRATIONS.
- ⑥ 2 - brass * ADJUSTABLE PIPE SUPPORTS FOR 2 1/2" DIAM AND LARGER PIPE.
* galvanized may be substituted with city approval
- ⑦ GRAVEL FOUNDATION AS REQUIRED.
- ⑧ DRAIN, SLOPE TO DAYLIGHT WHEN POSSIBLE.

NOTES

- 1. TEE AND GATE VALVE REQUIRED ON MAIN.
- 2. SINGLE DETECTOR CHECKS ARE NOT APPROVED BACKFLOW PREVENTION DEVICES.
- 3. ASSEMBLY REQUIRES CERTIFICATION UPON INSTALLATION AND RECERTIFICATION ANNUALLY.
- 4. TEST COCKS ARE REQUIRED TO BE PLUGGED IF ASSEMBLY IS INSTALLED UNDERGROUND.
- 5. MAXIMUM HEIGHT OF ASSEMBLY IS FIVE FEET UNLESS AN OSHA APPROVED PLATFORM IS PROVIDED.
- 6. MINIMUM INSIDE VAULT HEIGHT IS 78" FOR 3" SERVICE AND LARGER.
- 7. METER SHALL BE INSTALLED SUCH THAT IT CAN BE READ WITHOUT ENTERING VAULT WITH ACCESS HATCH OPEN.
- 8. ALL DIMENSIONS ARE MINIMUM CLEARANCE REQUIREMENTS.

15.DWG

ASTD

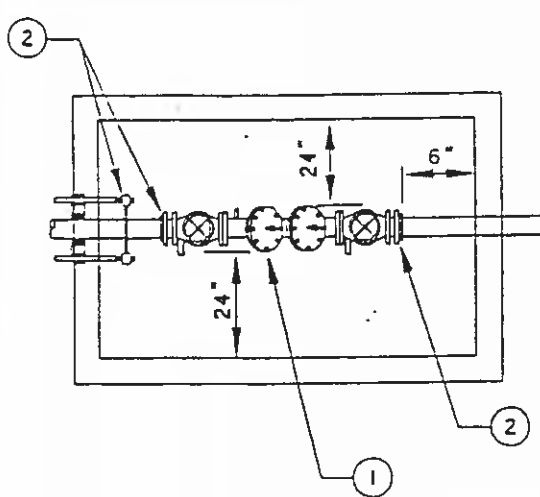


**DOUBLE CHECK DETECTOR VALVE ASSEMBLY
(DCDA) 3" AND LARGER SERVICES**

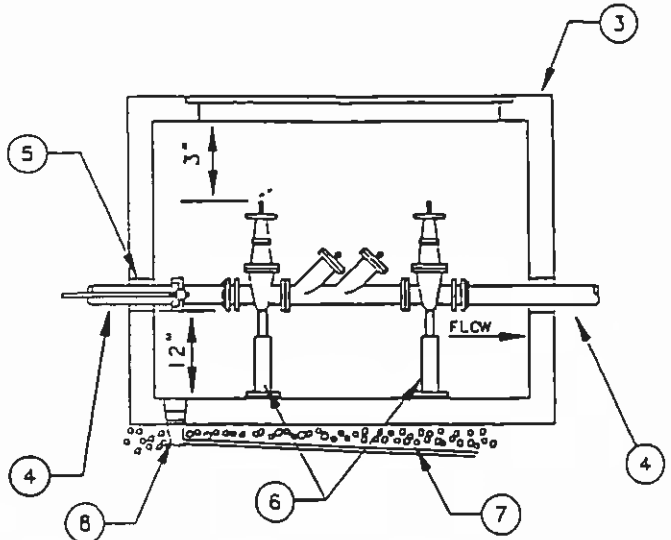
10/23/98
date

515
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



PLAN



ELEVATION

LEGEND

- ① UL-FM LISTED SOFTSEATED STATE APPROVED DOUBLE CHECK VALVE ASSEMBLY INCLUDING: 2-O.S. & Y RESILIENT SEATED GATE VALVES, AND TEST COCKS.
- ② UNI-FLANGE WITH SET SCREWS OR MJ x FL ADAPTOR WITH MEGALUG OR GALVANIZED SHACKLE TO MAIN WITH 2-3/4" RODS, OR MJ RETAINER GLANDS.
- ③ PRECAST CONCRETE VAULT WITH STEEL ACCESS HATCH (AS MANUFACTURED BY UTILITY VAULT CO OR AN APPROVED EQUAL). PROVIDE OSHA APPROVED HOT DIPPED GALVANIZED STEEL LADDER. INSTALL LADDER IN SUCH A WAY AS TO PROVIDE VAULT ACCESS THAT DOES NOT INTERFERE WITH INSTALLED EQUIPMENT OR MAINTENANCE THEREOF.
- ④ DUCTILE IRON PIPE (SIZED AS REQUIRED) CLASS 52.
- ⑤ WATER TIGHT GROUT SHALL BE USED IN ALL VAULT PENETRATIONS.
- ⑥ 2 - brass* ADJUSTABLE PIPE SUPPORTS FOR 2 1/2" DIM AND LARGER PIPE
* galvanized may be substituted with city approval
- ⑦ GRAVEL FOUNDATION AS REQUIRED.
- ⑧ DRAIN, SLOPE TO DAYLIGHT WHEN POSSIBLE.

NOTES

- 1. TEE AND GATE VALVE REQUIRED ON MAIN.
- 2. SINGLE DETECTOR CHECKS ARE NOT APPROVED BACKFLOW PREVENTION DEVICES.
- 3. ASSEMBLY REQUIRES CERTIFICATION UPON INSTALLATION AND RECERTIFICATION ANNUALLY
- 4. TEST COCKS ARE REQUIRED TO BE PLUGGED IF ASSEMBLY IS INSTALLED UNDERGROUND.
- 5. MAXIMUM HEIGHT OF ASSEMBLY IS FIVE FEET UNLESS AN OSHA APPROVED PLATFORM IS PROVIDED.
- 6. MINIMUM INSIDE VAULT HEIGHT IS 78" FOR 3" SERVICE AND LARGER.
- 7. METER SHALL BE INSTALLED SUCH THAT IT CAN BE READ WITHOUT ENTERING VAULT WITH ACCESS HATCH OPEN.
- 8. ALL DIMENSIONS ARE MIN CLEARANCE REQUIREMENTS

STD516.DWG

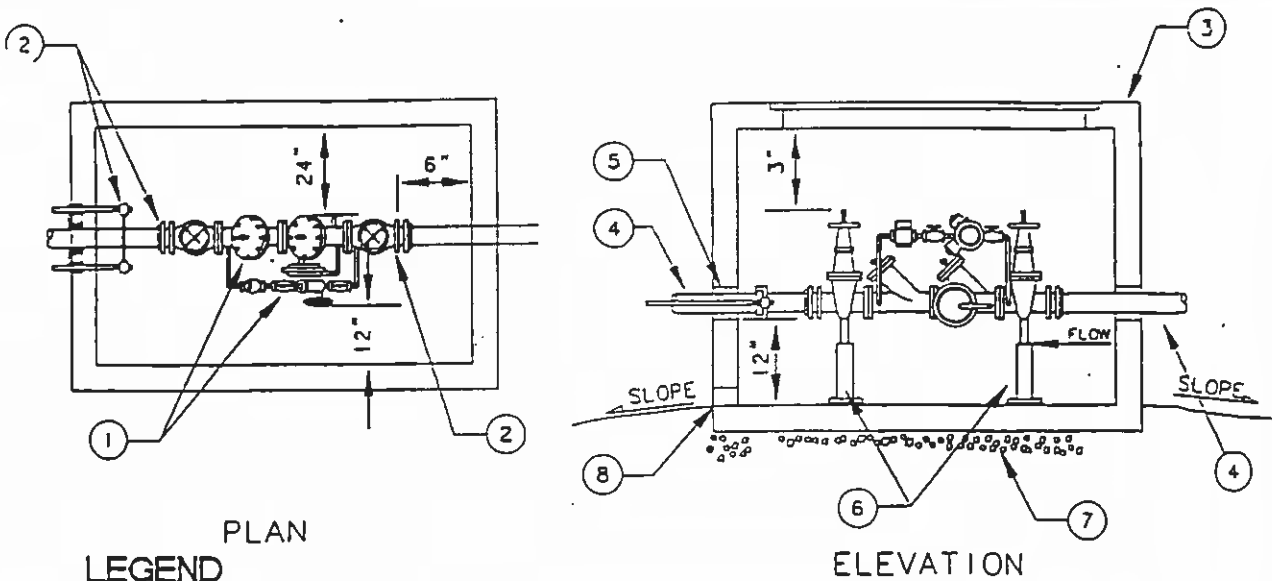


**DOUBLE CHECK VALVE ASSEMBLY
(DCVA) 3" AND LARGER SERVICES**

10/23/98
date

516
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



- LEGEND**
- ① UL-FM LISTED SOFTSEATED STATE APPROVED REDUCED PRESSURE DETECTOR ASSEMBLY INCLUDING: 2-0.S.& Y RESILIENT SEATED GATE VALVES, TEST COCKS, 3/4" BRASS OR COPPER BYPASS WITH IN LINE VALVES, 5/8" METER (METER TO READ IN CUBIC FEET), AND A 3/4" REDUCED PRESSURE BACKFLOW ASSEMBLY.
 - ② UNI-FLANGE WITH SET SCREWS OR MJ x FL ADAPTOR WITH MEGALUG OR GALVANIZED SHACKLE TO MAIN WITH 2-3/4" RODS, OR MJ RETAINER GLANDS.
 - ③ PRECAST CONCRETE VAULT WITH STEEL ACCESS HATCH (AS MANUFACTURED BY UTILITY VAULT CO OR AN APPROVED EQUAL).
 ABOVE GROUND INSTALLATIONS WILL: BE PROVIDED WITH 6'-6"x36" STEEL DOOR FOR ACCESS, THE EXTERIOR WILL BE PAINTED WITH AN APPROVED PAINT, PROVIDED WITH SUFFICIENT INSULATION TO PREVENT FREEZING AND SITE WILL BE PROVIDED WITH A 6' HIGH SECURITY FENCE WITH PEDESTRIAN AND VEHICLE GATES.
 BELOW GROUND INSTALLATIONS WILL: BE PROVIDED WITH OSHA APPROVED LADDER, INSTALLED IN SUCH A WAY AS TO NOT INTERFERE WITH INSTALLED EQUIPMENT MAINTENANCE.
 - ④ DUCTILE IRON PIPE (SIZED AS REQUIRED) CLASS 52.
 - ⑤ WATER TIGHT GROUT SHALL BE USED IN ALL VAULT PENETRATIONS.
 - ⑥ 2 - brass* ADJUSTABLE PIPE SUPPORTS FOR 2 1/2" DIAM AND LARGER PIPE.
 *galvanized may be substituted with city approval.
 - ⑦ GRAVEL FOUNDATION AS REQUIRED.
 - ⑧ DRAIN SHALL BE INSTALLED WITH APPROVED AIR GAP (SEE STD 519), BE ABLE TO BE BORE SIGHTED TO DAYLIGHT WHICH MUST BE ABOVE 100 YEAR FLOOD LEVEL. DRAIN WILL BE SIZED SO AS TO PROVIDE FREE GRAVITY DRAINAGE OF MAX DISCHARGE OF RELIEF VALVE PORT.

NOTES

- 1. TEE AND GATE VALVE REQUIRED ON MAIN.
- 2. TEST COCKS ARE REQUIRED TO BE PLUGGED IF ASSEMBLY IS INSTALLED UNDERGROUND.
- 3. MAXIMUM HEIGHT OF ASSEMBLY IS FIVE FEET UNLESS AN OSHA APPROVED PLATFORM IS PROVIDED.
- 4. MINIMUM INSIDE VAULT HEIGHT IS 78" FOR 3" SERVICE AND LARGER.
- 5. METER SHALL BE INSTALLED SUCH THAT IT CAN BE READ WITHOUT ENTERING VAULT WITH ACCESS HATCH OPEN.
- 6. ALL DIMENSIONS ARE MINIMUM CLEARANCE REQUIREMENTS.
- 7. ASSEMBLY REQUIRES CERTIFICATION UPON INSTALLATION AND RECERTIFICATION ANNUALLY.

10/23/98 DWG

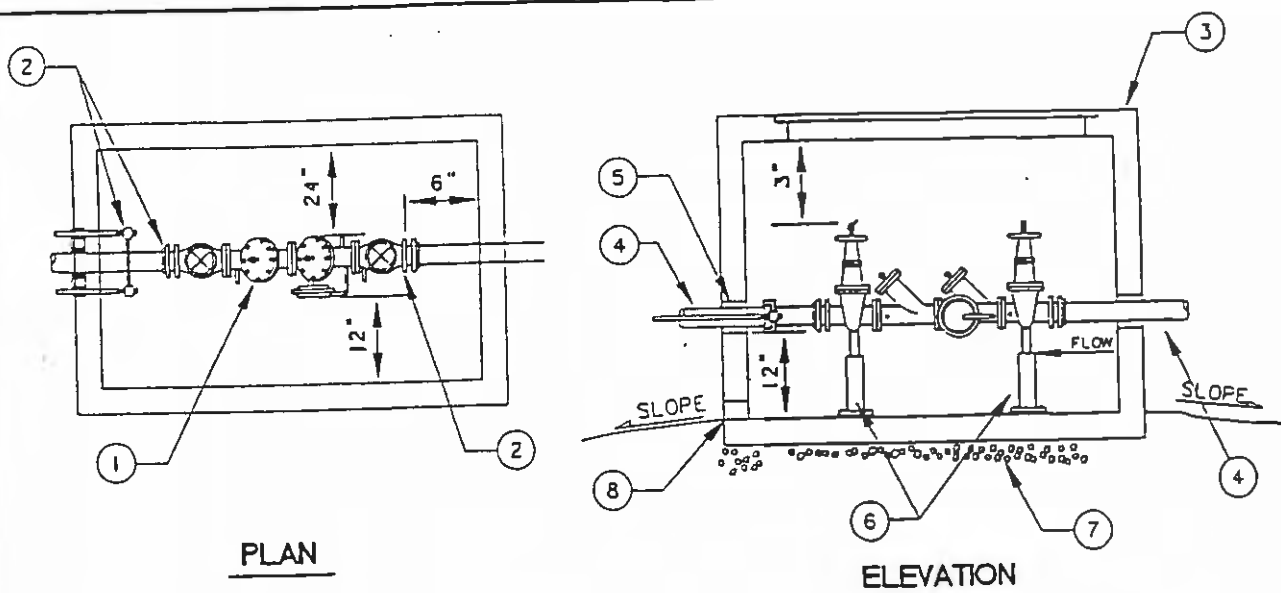


**REDUCED PRESSURE DETECTOR ASSEMBLY
(RPDA) ALL SIZES**

10/23/98
date

517
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



LEGEND

- ① UL-FM LISTED SOFTSEATED STATE APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY INCLUDING: 2-O.S.& Y RESILIENT SEATED GATE VALVES, AND TEST COCKS.
- ② UNI-FLANGE WITH SET SCREWS OR MJ x FL ADAPTOR WITH MEGALUG OR GALVANIZED SHACKLE TO MAIN WITH 2-3/4" RODS, OR MJ RETAINER GLANDS.
- ③ PRECAST CONCRETE VAULT WITH STEEL ACCESS HATCH (AS MANUFACTURED BY UTILITY VAULT CO OR AN APPROVED EQUAL).
ABOVE GROUND INSTALLATIONS WILL: BE PROVIDED WITH 6'-6"x36" STEEL DOOR FOR ACCESS. THE EXTERIOR WILL BE PAINTED WITH AN APPROVED PAINT, PROVIDED WITH SUFFICIENT INSULATION TO PREVENT FREEZING AND SITE WILL BE PROVIDED WITH A 6' HIGH SECURITY FENCE WITH PEDESTRIAN AND VEHICLE GATES.
BELOW GROUND INSTALLATIONS WILL: BE PROVIDED WITH OSHA APPROVED LADDER. INSTALLED IN SUCH A WAY AS TO NOT INTERFERE WITH INSTALLED EQUIPMENT MAINTENANCE.
- ④ DUCTILE IRON PIPE (SIZED AS REQUIRED) CLASS 52.
- ⑤ WATER TIGHT GROUT SHALL BE USED IN ALL VAULT PENETRATIONS.
- ⑥ 2 - brass* ADJUSTABLE PIPE SUPPORTS FOR 2 1/2" DIAM AND LARGER PIPE.
*galvanized may be substituted with city approval.
- ⑦ GRAVEL FOUNDATION AS REQUIRED.
- ⑧ DRAIN SHALL BE INSTALLED WITH APPROVED AIR GAP (SEE STD 519), BE ABLE TO BE BORE SIGHTED TO DAYLIGHT WHICH MUST BE ABOVE 100 YEAR FLOOD LEVEL. DRAIN WILL BE SIZED SO AS TO PROVIDE FREE GRAVITY DRAINAGE OF MAX DISCHARGE OF RELIEF VALVE PORT.

NOTES

1. TEE AND GATE VALVE REQUIRED ON MAIN.
2. TEST COCKS ARE REQUIRED TO BE PLUGGED IF ASSEMBLY IS INSTALLED UNDERGROUND.
3. MAXIMUM HEIGHT OF ASSEMBLY IS FIVE FEET UNLESS AN OSHA APPROVED PLATFORM IS PROVIDED.
4. MINIMUM INSIDE VAULT HEIGHT IS 78" FOR 3" SERVICE AND LARGER.
5. METER SHALL BE INSTALLED SUCH THAT IT CAN BE READ WITHOUT ENTERING VAULT WITH ACCESS HATCH OPEN.
6. ALL DIMENSIONS ARE MINIMUM CLEARANCE REQUIREMENTS.
7. ASSEMBLY REQUIRES CERTIFICATION UPON INSTALLATION AND RECERTIFICATION ANNUALLY.

STD518.DWG



**REDUCED PRESSURE BACKFLOW ASSEMBLY
(RPBA) ALL SIZES**

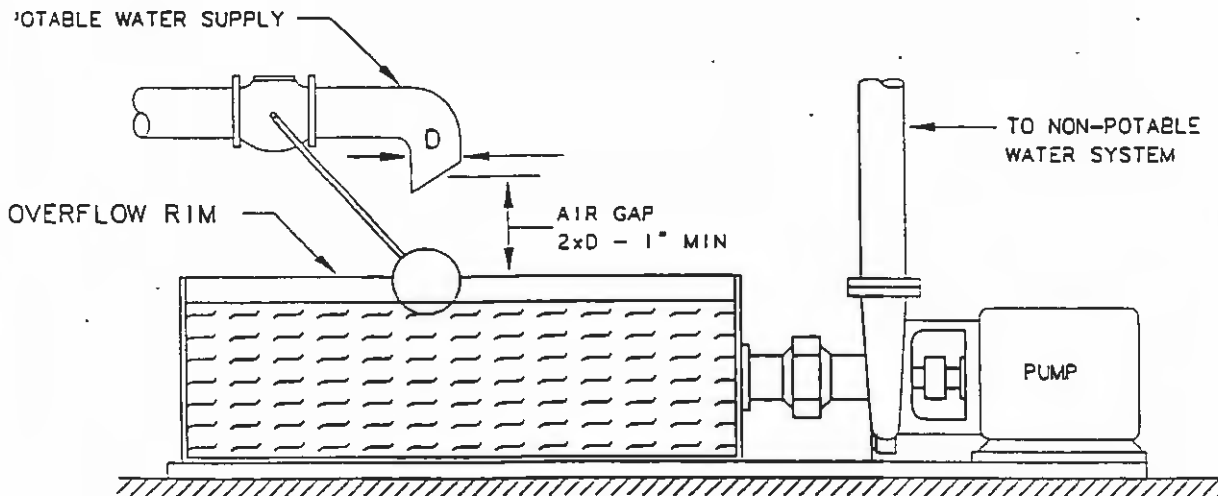
10/23/98
date

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number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT

APPROVED AIR GAP SEPARATION

AN APPROVED AIR GAP IS A PHYSICAL SEPARATION BETWEEN THE FREE FLOWING DISCHARGE END OF A POTABLE WATER SUPPLY PIPELINE AND THE OVERFLOW RIM OF AN OPEN OR NON-PRESSURE RECEIVING VESSEL. THESE VERTICAL, PHYSICAL SEPARATIONS MUST BE AT LEAST TWICE THE DIAMETER OF THE INLET PIPE BUT NEVER LESS THAN ONE INCH. IF SPLASHING IS A PROBLEM, TUBULAR SCREENS MAY BE ATTACHED OR THE SUPPLY LINE OUTLET MAY BE CUT AT A 45 DEGREE ANGLE. IF SUPPLY LINE IS CUT AT A 45 DEGREE ANGLE THE AIR GAP DISTANCE IS MEASURED FROM THE CENTER OF THE ANGLE. HOSES ARE NOT ALLOWED. BYPASSES ARE NOT ALLOWED. THE INSPECTION OF AIR GAPS SHALL BE INCLUDED IN THE YEARLY TESTING PROGRAM FOR BACKFLOW DEVICES.

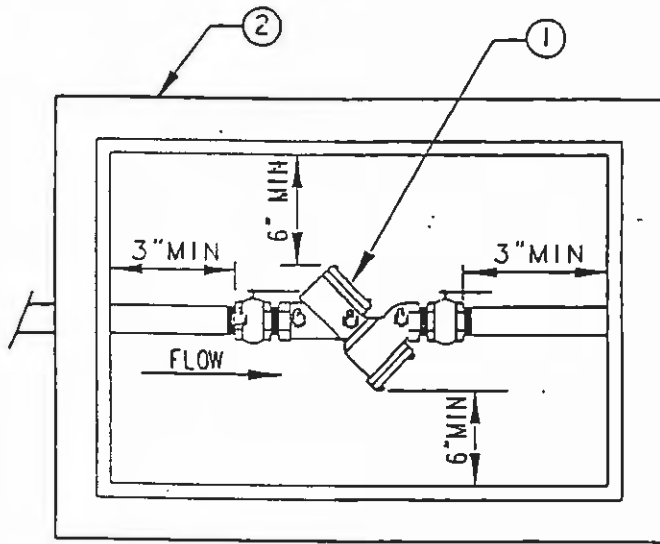


AIR GAP FOR MAKEUP TANK

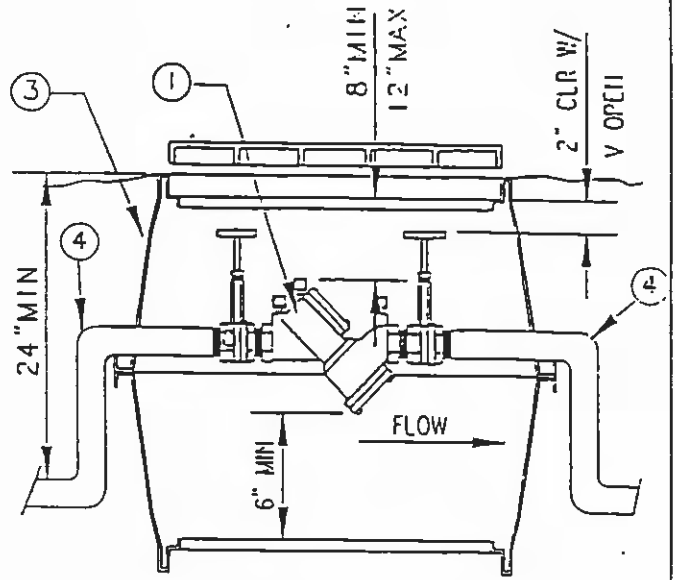
10/23/98
date

519
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



PLAN



ELEVATION

LEGEND

- ① STATE APPROVED DOUBLE CHECK VALVE ASSEMBLY
- ② IN TRAFFIC AREAS USE:
 PRECAST CONCRETE VAULT (UTILITY VAULT CO 233-LA, OR APPROVED EQUAL)
 OR PLASTIC VALVE BOX (UTILITY VAULT CO 1324-12L OR APPROVED EQUAL)
 IN TRAFFIC AREAS :
 A TRAFFIC LOADED BOX MUST BE USED AND LOCATION APPROVED BY THE
 THE CITY OF *GOLD BAR* PRIOR TO INSTALLATION.
- ③ IF A DAYLIGHT DRAIN CANNOT BE PROVIDED THERE MUST BE A 4" MIN
 LAYER OF FREE DRAINING GRAVEL AT THE BOTTOM OF BOX.
- ④ ANGLES MAY BE IN OR OUT OF BOX SO LONG AS SUFFICIENT ROOM IS ALLOWED
 AT EACH END FOR VALVE OPERATOR AND DCVA REPAIR OR MAINTENANCE.
- ⑤ PROVIDE FREE DRAINING SOIL.

NOTES

- 1. ALL TEST COCKS MUST HAVE BRASS PLUGS.
- 2. TEST COCKS MUST FACE UP OR SIDWAYS WHICH EVER IS MORE ACCESSIBLE

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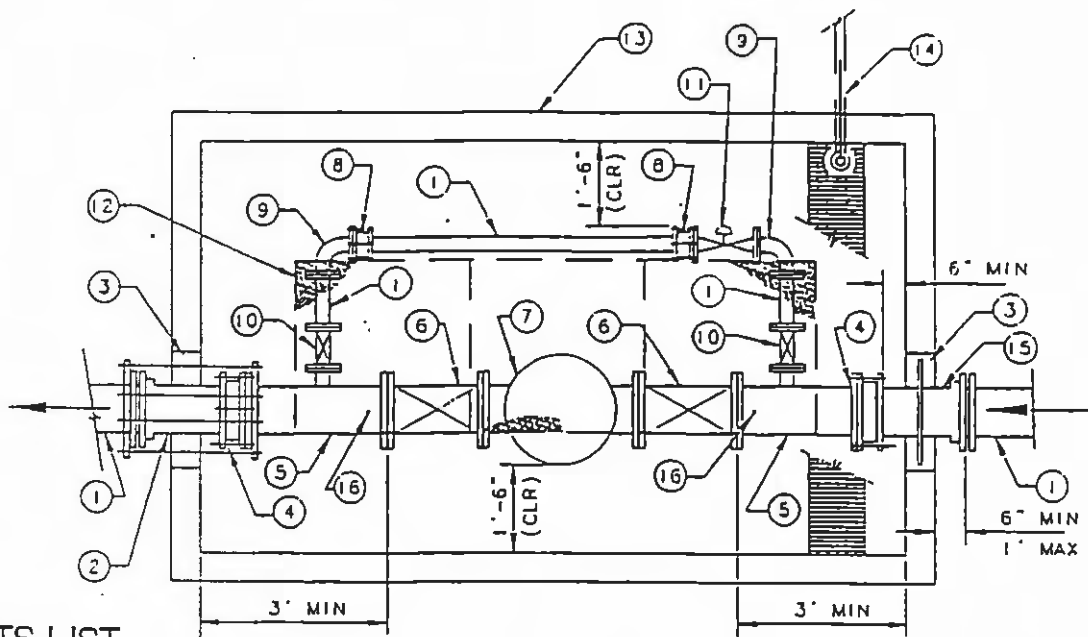


DOUBLE CHECK VALVE ASSEMBLY (DCVA)
 FOR 2 1/2" AND SMALLER SERVICE

10/23/98
 date revised

520
 number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



PARTS LIST

- | | |
|---|---|
| ① DUCTILE IRON PIPE | ⑩ GV (FL×FL) |
| ② SPOOL (MJ×PE) WITH SHACKLE BOLTS TO BE USED IN PRECAST VAULTS | ⑪ PRV (FL×FL) |
| ③ NON-SHRINK GROUT | ⑫ UTILITY VAULT CO LID WITH TRAFFIC LOADED LOCKING STEEL COVERS OR EQUAL. |
| ④ FLANGE COUPLING ADAPTOR (FL×MJ) | ⑬ UTILITY VAULT CO PRECAST VAULT |
| ⑤ TEE (ALL FL) | ⑭ 2" GRAVITY SUMP DRAIN EXTEND TO DAY-LIGHT OR TO STORM DRAINAGE SYSTEM. |
| ⑥ GV CL 200 (FL×FL) | ⑮ WALL SLEEVE (FL×PE) TO BE USED WITH CAST IN PLACE VAULTS. |
| ⑦ PRV (FL×FL) | ⑯ 1/4" GAUGE TAPS WITH 1/4" BALL VALVES FOR ISOLATION. |
| ⑧ FLANGE COUPLING ADAPTOR | |
| ⑨ 90 ELL (ALL MJ W/MEGA LUGS) | |

NOTES

1. MINIMUM VAULT INSIDE HEIGHT SHALL BE 78".
2. MINIMUM CLEARANCE BETWEEN PRV VALVES AND FLOOR SHALL BE 12".
3. MINIMUM CLEARANCE BETWEEN HIGHEST PART OF ASSEMBLY AND TOP OF VAULT SHALL BE 24".
4. PROVIDE LIQUID FILLED 2 1/2" GAUGES AMETEK SERIES 550L OR EQUAL.
5. ALL EQUIPMENT MUST BE RATED FOR SOURCE PRESSURE.
6. PIPING AND VALVES SHALL BE SUPPORTED BY POURED-IN-PLACE CONCRETE OR STEEL STANDS. NUMBER OF AND PLACEMENT OF STANDS TO BE DETERMINED BY CITY ENGINEER ACCORDING TO VALVE SIZE.
7. BRAND AND TYPE OF PRV AND ACCESSORIES TO BE DETERMINED BY City of Gold Bar : public works dept.

TYPICAL PRV INSTALLATION

10/23/98
date revised

521
number

CITY OF GOLD BAR - PUBLIC WORKS DEPARTMENT



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