

Westborough Water District
Water System Requirements

PART 1 – GENERAL

1.01 DESCRIPTION

This document describes the requirements for all water system facilities that upon project completion will be conveyed to the Westborough Water District (WWD).

1.02 REGULATORY AGENCIES

- A. Water System: All water system work shall be in conformance with the rules and regulations of the Westborough Water District, State Department of Health Services, and County of San Mateo.
- B. Backfill and Repaving: All trench backfill and repaving work within public right-of ways shall be performed in conformance with the requirements of the agency having jurisdiction over the right-of-way:
 - 1. Within City limits, this agency is the City of South San Francisco.
 - 2. Within State highway right-of-way, this agency is CALTRANS.
- C. Safety: All work shall be in conformance with the requirements of OSHA and the State Division of Industrial Safety. For work within public right-of-way areas, the safety regulations of the agency having jurisdiction over the right-of-way shall be observed.
- D. Pollution Abatement: All work shall be performed in conformance with NPDES (National Pollutant Discharge Elimination System) regulations as well as with all other applicable pollution abatement rules and regulations.

1.03 INSURANCE

Prior to beginning the work, the Contractor shall provide in an insurance company or companies acceptable to the WWD and in form and coverage subject to the approval of the WWD, insurance certificates in conformance with current WWD requirements.

For projects located within public right-of-way areas, additional insurance may be required by the agency having jurisdiction over the right-of-way area. All insurance shall be at the cost of the Contractor.

1.04 BONDS

Prior to beginning the work, the Contractor shall provide in form satisfactory to the WWD all bonds required by the WWD. All bonds shall be provided at the expense of the Contractor.

1.05 PERMITS

Prior to beginning the work, the Contractor shall, at this expense, obtain all permits required for the work.

1.06 INSPECTION

- A. Agency: Inspection of water system facilities including backfill around piping will be performed by the WWD District Manager and his authorized representatives. In public right-of-way areas, trench backfill and repaving will be inspected by the agency having jurisdiction over the right-of-way area. In non-public right-of-way areas, the Owner shall retain a competent soils engineer who shall perform field tests and certify in writing prior to project acceptance that the backfill is in conformance with project requirements. All inspection fees shall be paid by the Contractor.
- B. Notification: The WWD General Manager shall be notified by the Contractor 10 days prior to the proposed start of construction. If construction is not continuous, the General Manager shall be notified at least 48 hours in advance of the resumption of construction. Any work performed without proper notification may be rejected by the WWD on that basis alone.
- C. Observation: The WWD General Manager and his authorized representatives shall at all times have access to the work, and the Contractor shall furnish every reasonable facility for ascertaining that the materials and workmanship are in conformance with WWD requirements. All work done and all materials furnished shall be subject to the WWD's on-site and off-site observation. The WWD General Manager will observe and inspect facilities solely to protect the interests of the WWD, and to determine whether the completed work is acceptable and can be incorporated into the WWD system. The WWD does not assume thereby any responsibility for the safety practices of the Contractor. The Contractor is responsible for the correct location of all facilities which are installed.

All work shall be inspected by the WWD prior to backfill; work which has been covered prior to the inspection by the WWD shall be uncovered at the Contractor's expense for observation.

1.07 CHANGES AND "AS-BUILT" DRAWINGS

All work shall be performed in conformance with the contract documents approved by the WWD. Changes shall not be made without the written approval of the WWD General Manager. The "As-Built" drawings provided to the WWD following project completion shall indicate all changes. Prior to project acceptance the Contractor shall submit to the WWD "As-Built" drawings consisting on one set of mylar copies and 3 sets of blue line copies.

1.08 REPAIR OF DAMAGES

The Contractor shall repair at his expense (or at the option of the WWD, shall reimburse the District for the cost of repairs effected by it) any damage to WWD or other property caused by his work.

1.09 SITE CONDITIONS

The WWD has performed no investigation of subsurface conditions in the work area. The Contractor shall visit the site prior to submitting his bid and shall be responsible for making his own evaluations, inspections, and determinations of all site conditions, including subsurface conditions.

1.10 LINES AND GRADES

The Contractor shall be solely responsible for all lines and grades. At no cost to the Contractor, the WWD at its convenience will assist the Contractor by marking the location of existing WWD facilities based on best available information. However, this locating assistance is guaranteed neither accurate nor complete. The Contractor shall uncover all existing facilities by hand excavation ahead of his trenching operation.

1.11 SALVAGEABLE MATERIALS

Existing WWD materials removed during the normal prosecution of work deemed salvageable by the District, except as noted on the Contract Documents to be reused, shall remain under District ownership and shall be delivered to the WWD Skyline water storage tank site by the Contractor.

1.12 PERSONAL LIABILITY

Neither the WWD, its General Manager, nor any of its officers or employees, shall be personally responsible for any liability arising under or by virtue of the Contractor's work.

1.13 QUALITY ASSURANCE

- A. Experience Clause: Manufacturer's furnishing pipe, valves, or appurtenances shall have had similar products in successful operation under similar operating (installation) conditions for a period of at least 5 years, and shall if requested submit a list of representative installations.
- B. Leakage Test: All piping systems shall be tested for leakage in accordance with the requirements specified for each typed of pipe. The Contractor shall provide all material and labor required for the leakage test including pumps, gauges, corporation stops, and temporary plugs and thrust blocks; and shall dispose of the water following completion of the test. Gauges shall be laboratory-calibrated test gauges, and shall be recalibrated by a certified laboratory at the Contractor's expense prior to the leakage testing if requested by the WWD. It shall be the Contractor's responsibility to block off during the testing all valves and accessories which might be damaged by the test pressure, and to provide suitable thrust restraints. Leakage testing shall be witnessed by the WWD. Should the test of any section of pipe result in leakage greater than the specified limit, the Contractor shall repair the defective work until this section is retested at a leakage within the specified allowance. Water for testing will be furnished by the WWD at no cost to the Contractor. The Contractor shall incorporate into the work at his expense all appurtenances required for the disinfection work such as corporation stops, blowoffs, etc.
- C. DISINFECTION AND BACTERIOLOGICAL TESTS.
 - 1. General. All piping systems conveying potable water shall be disinfected. Disinfection shall be in accordance with AWWA C651, except as otherwise required by this document. The Contractor shall provide all materials and labor required for the disinfection process and shall dispose of the disinfection solution following final approval of the disinfection bacteriological testing. Water will be furnished by the WWD from sources available at the site. Cost of water shall be paid by the Contractor.

2. PROCEDURE:

- a. Preliminary Preparation. The system shall be flushed with water to remove all dirt introduced into the piping during the construction operations. All service outlets and fire hydrants shall be opened and the flushing operations continued until clear water flows from each (Note: flushing shall be deferred until after completion of the disinfection process if tablets have been placed in the pipeline during construction for disinfection). The Contractor shall dispose of the water from the flushing operations in a manner conforming with NPDES regulations.
- b. Introduction of Disinfection Agent. The disinfection agent may be any chlorine compound approved by AWWA C651. The disinfection agent shall be injected slowly and continuously into the system until tests indicate a chlorine residual concentration of at least 25 mg/L at each pipeline outlet. All outlets shall then be closed and this condition maintained for 24 hours.
- c. Preliminary Tests. After 24 hours, tests shall be made for residual chlorine at each pipeline outlet. The minimum acceptable concentration shall be 10 mg/L. If the concentration is less than 10 mg/L, the disinfection procedure shall be repeated. If the concentration at each outlet is over 10 mg/L, the system shall be flushed out until a test at each outlet indicates a chlorine residual of less than 0.5 mg/L.
- d. Bacteriological Analyses. The WWD will obtain samples of water from the system and have bacteriological analyses performed by a State certified laboratory. The number of samples taken shall conform to AWWA C651 and State Department of Health Services requirements. Cost of bacteriological analyses shall be paid by the Contractor.
- e. Final Approval. The requirement for final approval is that each water sample analyzed shall be in conformance with State disinfection requirements. If all bacteriological analyses are not in accordance with these requirements, the disinfection procedure shall be repeated.

- f. Disposal of Disinfection Water. The Contractor shall dispose of the disinfection water in a manner conforming with NPDES requirements.
- g. Disinfection of Piping Used for Final Connection to Existing Pipelines. New pipe, fittings and other piping accessories required for connections shall be spray or swab disinfected with a minimum 1 percent solution of chlorine just prior to being installed.

PART 2 – MATERIALS

2.01 SHOP DRAWING REQUIREMENTS

- A. WWD-Approved Materials: Where specific materials are listed below by manufacturer's name and model number, no shop drawing submittals are required.
- B. Approved-Equal Materials: Where the term "approved equal" is used below, the Contractor may propose the use of alternative materials to those named by submitting shop drawings for the proposed alternative materials. Five copies of each shop drawing shall be submitted to the WWD for review. No alternative materials shall be incorporated into the work until they have been received the WWD's favorable review. Where the term "or approved equal" is not utilized below, no alternatives will be considered by the WWD.
- C. Contractor Verification: Where model, style or types of manufacturer's products are listed below, they are intended to indicate a standard of quality. The Contractor shall verify that the referenced model, style, or type is correct for the actual project application prior to ordering the materials.

2.02 POLYVINYL CHLORIDE (PVC) PIPE

- A. QUALITY ASSURANCE
 - 1. Shop Drawings: None required.
 - 2. Leakage Test: All PVC piping shall be tested for leakage in accordance with the requirements contained in Part 1 – General for 4 consecutive hours at a test pressure of 150 psi. Allowable leakage shall not exceed the following:

MAXIMUM ALLOWABLE LEAKAGE

<u>Pipe Diameter</u>	<u>Allowable Leakage per 1000 Lineal Feet of Pipe During Test Period</u>
4"	0.33 gallons
6	0.50
8	0.66
10	0.83

3. Disinfection: Piping shall be disinfected in accordance with the requirements contained in Part 1 – General.

B. MATERIAL

1. Pipe: PVC Pipe shall conform to AWWA Standard C900, pressure class 200 (dimension ratio 14), with outside diameters conforming to ductile iron pipe diameters. Pipe joints shall be gasket bell and spigot (push-on) type.
2. Fittings: Fittings shall conform to AWWA Standard C110 with end connections of the type shown on the Contract Documents. Where flanged fittings are shown on the Contract Documents, the Contractor shall furnish and install a flanged by push-on adapter. Flanges shall be screw-on type. Bolts and nuts for buried flanged joints shall be stainless steel; for above grade locations, black steel. Fittings shall be furnished with a 1 mil thick exterior bituminous coating, and a cement lining conforming to AWWA Standard C104. District-approved fitting manufacturers are Tyler, Trinity Valley and V.S. Pipe and Foundry Co.

2.03 COPPER TUBING

- A. Tubing. Copper tubing for buried service shall conform to the requirements of ASTM Designation B-88, Type K, soft.
- B. Fittings: Fittings shall be copper or bronze.
- C. Joints: Joints for pipe and fittings shall be of the angle grip seal compression type not requiring flaring or soldering (See specific requirements for service fittings below).
- D. Leakage Test: Copper tubing shall be tested in conjunction with the PVC pipe. All observed leakage shall be corrected.

2.04 GATE VALVES

- A. Gate Valves 4 inch Size and Larger: These valves shall be resilient seat type gate valves which have a fully unobstructed flow way free of cavities or projections and no pockets in which sediment or debris can be deposited. The sealing mechanism shall be a replaceable, internally-reinforced, specially-contoured, molded, rubber disc. seat ring attached to the face of the disc with self-locking stainless steel screws. The stem nut shall be bronze, and shall be integrally cast in the cast iron disc. An anti-friction washer shall be provided above the thrust collar. The stuffing box shall be of the "O" ring seal type with stainless steel bolts and nuts, and the valve shall be of the type which can be repacked in the fully open position, under pressure, with no leakage. The bonnet bolts and nuts shall also be stainless steel. The valve disc. and entire inside of the valve body shall be coated with an epoxy coating that is non-toxic, imparts no taste to water, and is approved by the Federal Food and Drug Administration for use with potable water. The valves shall meet the pressure test requirement of AWWA Standard C500. The resilient seat type Mueller valve is in conformance with this performance specification when provided with stainless steel bolts and nuts for the stuffing box and bonnet.

Gate valves shall have push-on end connections unless flange or mechanical joint end connections are shown on the Drawings. Operating nuts for buried valves shall be 2-inch square type; extension stems shall be provided where required so that the top of the operating nut is located not more than 42 inches below finished grade.

- B. Gate Valves Smaller than 4-inch Size: These valves shall be brass body gate valves with flanged or screwed end connections and non-rising stem, wrought iron handwheel operator. The valves shall conform to Federal Specification WN-V-54D, except for the wrought iron handwheel operators which exceed this Federal Specification.
- C. Tapping Valves and Sleeves: Tapping sleeves shall be Mueller Type H-615 with stainless steel bolts and nuts. Tapping valves shall be Mueller H-667, furnished with stainless steel bolts and nuts for both the stuffing box and bonnet.

2.05 FIRE HYDRANTS

Fire hydrants shall be Clow Model 960 with a steamer and two 2 ½" outlets. Each hydrant shall be furnished with a ductile iron fire hydrant bury with a push-on end connection suitable for PVC pipe. Where required, a break-off riser shall be furnished for compatibility with project final grade. All buried bolts and nuts shall be stainless steel.

The fire hydrant shall be bolted to the bury (or riser) with break-off type stainless steel bolts and nuts. Following installation, each hydrant shall be given a coat of paint by the Contractor, using the WWD's standard paint used for fire hydrants.

2.06 SERVICE FITTINGS

Service fittings shall be brass, with compression type end connections not requiring flaring or soldering. The following Mueller catalog numbers are listed as a standard of quality; similar and equal projects of Ford will be acceptable as will approved equal models of other manufacturers:

A. 3/4 Inch and 1 Inch Size Service Connections:

Corporation Stops	H-15008
Meter Stops	H-14265
Unions	H-15403
U-Branch Connection	H-15363
Angle Meter Check Valve	H-14244

B. 1-1/2 Inch and 2 Inch Size Service Connections:

Corporation Stops	H-15013
Meter Stops	H-14277
Unions	H-15403

2.07 SERVICE SADDLES

Service saddles shall be used for all connections to PVC pipe. Service saddles shall have bronze bodies, neoprene gaskets, and stainless steel bolts, nuts, and straps. Service saddles shall be double strap type, and shall have AWWA (CC) threads.

2.08 VALVE BOX

Valve boxes shall be adjustable, slip-type, minimum 8-inch diameter, with cast iron or ductile iron traffic covers with the word "water" cast into the cover. Riser pipe between the valve bonnet and the valve box shall be 8 inch diameter PVC sewer pipe.

2.09 METER BOXES

Meter boxes shall be concrete with concrete lids, except in traffic areas where metal traffic-type lids shall be provided. The following products of Christy Concrete Products, Inc. are WWD-approved; similar and equal products of other manufacturers will be given consideration:

CHRISTY PRODUCTS CATALOG NUMBERS

<u>Meter Size</u>	<u>Meter Box</u>	<u>Meter Box Lid</u>	
		<u>Non-Traffic Area</u>	<u>Traffic Area</u>
5/8"x3/4" Single	B9	B9D	B9-61G
5/8"x3/4" Double	B24	B24E	B24-61G
1"	B30	B30E	B30-61G
1-1/2"	B36	B36E	B31-61G
2"	B36	B36E	B36-61G

2.10 WATER METERS

Water meters will be furnished by the WWD at no cost to the Contractor.

2.10 AIR RELEASE VALVES

Air release valves shall be iron body type, 1 inch minimum size. Products of APCO and Val Matic are WWD-approved; similar and equal products of other manufacturers will be given consideration.

2.11 FLEXIBLE COUPLINGS

Flexible couplings shall have cast iron bodies, neoprene gaskets, and stainless steel bolts and nuts:

- A. Straight Couplings: Straight flexible couplings shall be Smith-Blair Type 441, Superior Style 41 or 42, or approved equal. Bolts and nuts shall be stainless steel.
- B. Flanged Coupling Adapters: Flanged coupling adapters shall be Smith-Blair Type 912 or approved equal.

2.12 DETECTOR CHECK VALVES

Detector check valves shall be of a type approved by the Fire Department of the City of South San Francisco and Underwriters Laboratories.

2.12 BACKFLOW PREVENTERS

Backflow preventers shall be reduced pressure type. Products shall be of a type approved by the County of San Mateo Health Department.

2.13 CONCRETE

Concrete for thrust blocks shall conform to the requirements of the current State Standard Specifications (CALTRANS). Concrete shall be Type A containing a minimum of 564 pounds of Portland cement per cubic yard. Minimum compressive strength after 28 days shall be 3,500 psi.

2.14 TRENCH BEDDING AND BACKFILL MATERIAL

Trench bedding and backfill material for the PVC pipe shall be sand to a minimum depth of 12 inches over the top of the pipe (See detailed pipe installation and trench backfill requirements). Trench backfill from 12 inches above the pipe to finished grade shall conform to the project requirements.

2.15 COPPER LOCATOR WIRE

Copper wire for installation as locator wire for nonmetallic piping materials shall be No. 8 size, bare copper wire.

PART 3 – EXECUTION

3.01 TRENCHING

- A. Width: Trenching for pipe unless otherwise specified shall be in open cut to the lines and grades shown. Unsheathed trenches shall not exceed a total width of 8 inches wider on each side of the pipe than the exterior diameter of the pipe barrel. Where sheathing is required, the width of trench shall be increased only sufficiently to accommodate the sheathing and timbers.
- B. Excavation: The trench shall be excavated a minimum of 4 inches deeper than the bottom of the pipe location, and a minimum of 4 inches of sand placed in the trench for bedding of the pipe.
- C. Sheathing: The sides of excavated trenches shall be supported where required by and in a manner set forth by the rules, orders, and regulations prescribed by the Division of Industrial Safety of the State of California. Sheet piling and other timbering shall be withdrawn in such a manner as to prevent caving of the walls of excavations or damage to piping or other structures. No sheathing or timbering shall be left in the trench.
- D. Dewatering: The Contractor shall remove all water which may accumulate in the excavation during the progress of the work so that all work can be done in the dry. Trenches shall be kept free from water while pipe or other appurtenances are being installed, while concrete is setting, and until backfill has progressed to a sufficient height to anchor the work against possible flotation of leakage.

The Contractor shall at all times have on site sufficient pumping equipment for immediate use. Water shall be disposed of in such a manner as to cause no injury to property, be a menace to public health, or violate pollution regulations.

- E. Open Trench Limitation: Trenching work each day shall be limited to the work area in which pipe laying and backfilling can be completed during that work day.

3.03 INSTALLATION OF PIPING AND APPURTENANCES

A. PVC Piping and Appurtenances

1. Location: Piping shall be installed true to line and grade as shown on the Contract Drawings. Buried pipelines shall be installed at a continuously sloping grade between points of given elevation without low or high points. Locations of the pipeline may be modified to clear obstructions, as approved by the WWD, but it shall be the responsibility of the Contractor to furnish and install at no cost to the WWD all pipe, fittings, and other materials required to modify the pipeline location. Buried pipe shall be installed with a minimum 36 inches of cover to finish grade unless otherwise noted on the Drawings.
2. Handling: Pipe shall be handled carefully in accordance with the manufacturer's recommendations during unloading and installation. Pipe shall be kept clean during installation, and shall be plugged at the end of each day's work or when pipe is not being laid to prevent the entry of water or foreign material into the pipe.
3. Trench Conditions: A minimum depth of 4 inches of sand shall be placed in the bottom of the trench as bedding material for the pipe. Each pipe length shall have a full, even bearing for its entire length on the sand bedding material. All pipe shall be laid in the dry; the Contractor shall dewater the trench as required.
4. Jointing: Jointing shall be in accordance with the manufacturer's installation instructions. Special care shall be taken to excess the manufacturer's recommendations for joint deflection. Curvature of pipeline installation shall be accomplished by uniformly bending the pipe through its entire length. Maximum allowable offset per 20 foot length of pipe shall be in accordance with the following:

MAXIMUM ALLOWABLE OFFSET PER 20 FOOT LENGTH

<u>Pipe Diameter</u>	<u>Offset</u>
4"	23"
6	16
8	12
10	9
12	8

For bends exceeding the allowable deflection, the Contractor shall furnish and install, at no cost to the WWD, fittings as required. Only known location of fittings are shown on the Contract Drawings; the Contractor shall furnish and install additional fittings as required.

Flanged joints shall be bolted up evenly and tightly. Mechanical joint glands shall be pushed evenly into place and the bolts tightened with a torque wrench to the amount recommended by the pipe manufacturer.

4. Pipe Taps: Pipe taps shall be made using a shelltype cutter which retains the coupon and chips. The coupon from each tap shall be retained by the Contractor and presented to the WWD. Service saddles shall be utilized for all taps in conformance with the pipe manufacture's recommendations. Installation of tapping sleeves and tapping valves ("hot taps") shall be performed only by contractors approved by the WWD.
5. Pipe Support and Thrust Restraints: All piping, valves and appurtenances shall be adequately supported and braced against thrust to the satisfaction of the WWD.
6. Piping Appurtenances. Piping appurtenances shall be installed in conformance with the recommendations of the manufacturers and details included with the Contract Documents. If differences occur between these documents, the decision of the WWD will be final.
7. Gate Valves. Gate valves shall be installed with a 2 foot long spool between the valve and the tee (or cross). A valve box shall be installed above the operating nut of each buried valve, and the valve box adjusted to final grade prior to project completion.
8. Locator Wire. Locator wire shall be taped to the top of the pipe, or as otherwise directed by the WWD. It shall be installed continuously without splices between pipeline valves.

At each valve, including fire hydrant valves, the locator wire shall be bent up inside the valve box and terminated 4 inches below the bottom of the valve box.

3.04 TRENCH BACKFILL

- A. Initial Backfill: Backfill material around the pipe and to a minimum depth of 12 inches over the top of the pipe shall be sand. This sand shall be placed along each side of the pipe in 6 inch layers until backfilling to the 12 inch depth above the pipe is complete.
- B. Upper Backfill: The upper portion of the trench above the point one foot over the pipe shall be backfilled in conformance with the project earthwork specifications.
- C. Compaction Density: Compaction density of the trench backfill shall be in conformance with the project earthwork specifications.

3.05 REPAVING

Repaving shall be performed in conformance with the requirements of the agency having jurisdiction over the right-of-way in which the work is being performed. If required by the agency or the WWD, the Contractor shall install temporary paving prior to the final repaving at no cost to the WWD. In non-public right-of-way areas, the Contractor shall repave all areas to restore them to an equal condition as existed prior to construction.

3.06 ADJUSTMENT OF VALVE AND METER BOXES TO GRADE

Prior to project final acceptance, all valve boxes and meter boxes shall be adjusted in elevation to final grade in conformance with the direction of the WWD.

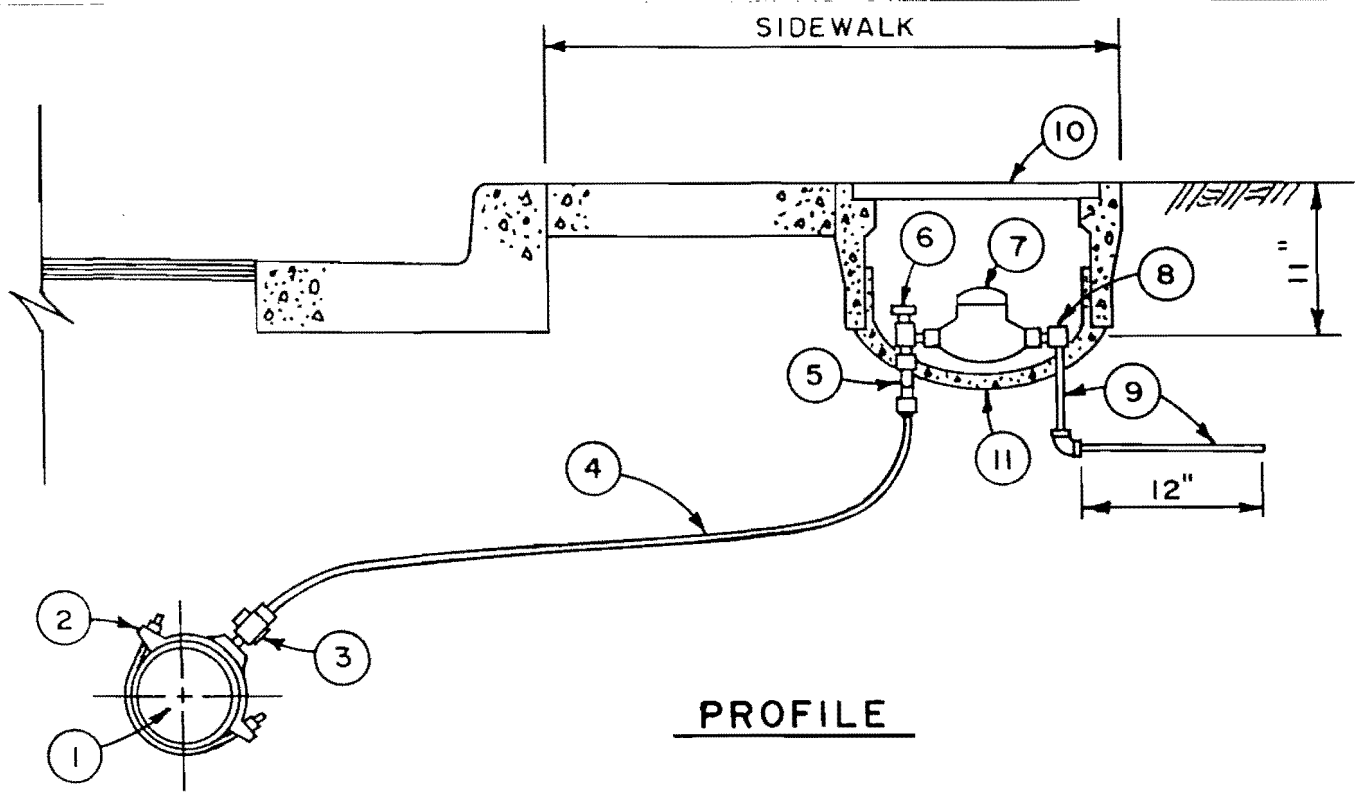
3.07 ADDITIONAL PIPING FITTINGS AND APPURTENANCES REQUIRED TO SUIT SITE CONDITIONS

In addition to those piping fittings and appurtenances shown on the Drawings, additional fittings and appurtenances may be required to suit site conditions such as changes in vertical or horizontal alignment caused by interferences, or the necessity to complete a change in alignment that exceeds the maximum pipe joint allowable deflection. Air release valves shall be provided at all high points and blow off valves at all low points of the pipeline installation as directed by the WWD. All pipe, fittings, and appurtenances required in addition to those shown on the Drawings shall be provided at no cost to the WWD.

3.08 MODIFICATION AND CONNECTIONS TO EXISTING SYSTEM

Modification of existing WWD pipelines shall be performed only by WWD-approved contractors. The Contractor shall schedule his construction operations at a time acceptable to the WWD. The Contractor shall have all material at the site for inspection by the WWD a minimum of 48 hours prior to the scheduled start of work. It shall be the responsibility of the Contractor to verify, by field measurement, all existing site conditions including pipe materials and appurtenances prior to ordering piping materials.

END OF SECTION



LEGEND

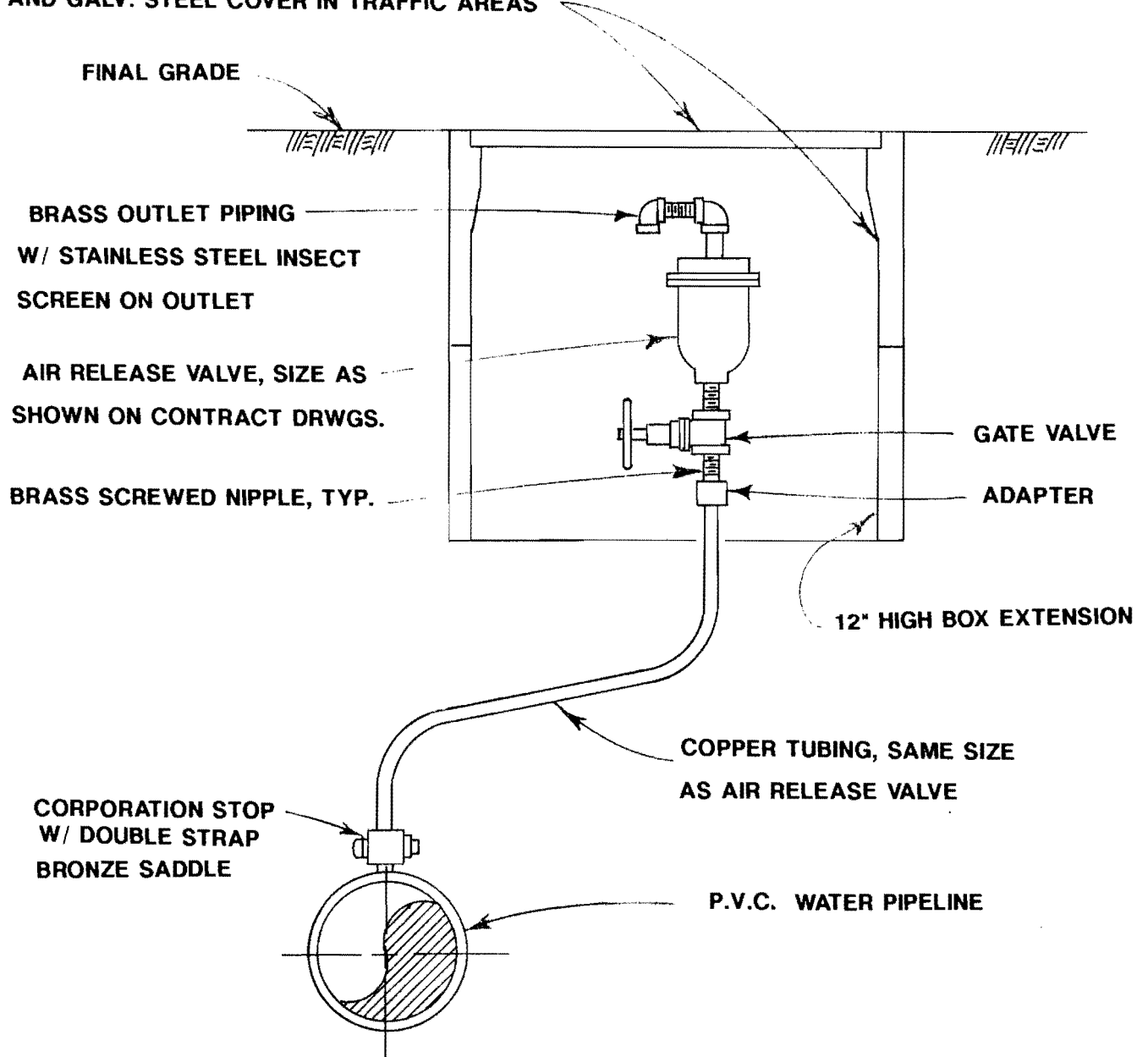
- ① WATER PIPELINE.
- ② DOUBLE STRAP BRONZE SADDLE (C.C. THREAD).
- ③ 1" CORPORATION STOP (COMPRESSION OUTLET).
- ④ 1" COPPER TUBING. SLOPE CONTINUOUSLY UPWARD TO METER.
- ⑤ U-BRANCH CONNECTION, DOUBLE 3/4" SERVICE ONLY.
- ⑥ LOCK WING ANGLE METER STOP (I. P. THREAD INLET).
- ⑦ WATER METER, FURNISHED BY DISTRICT. INSTALL WITH REGISTER DIRECTLY UNDER READING LID.
- ⑧ ANGLE METER CHECK VALVE (I. P. THREAD OUTLET).
- ⑨ BRASS PIPE NIPPLE (I. P. THREAD).
- ⑩ METER BOX AND LID. WHERE NO SIDEWALK EXISTS, INSTALL AT LOCATION DETERMINED BY DISTRICT WITH TOP OF LID 1/2" ABOVE FINAL GRADE.
- ⑪ CONCRETE, MIN. 1 1/2" THICK, INSTALLED FOLLOWING SATISFACTORY COMPLETION OF LEAKAGE TEST.

NOTE: MATERIALS AND INSTALLATION SHALL BE IN CONFORMANCE WITH DISTRICT REQUIREMENTS.

STANDARD INSTALLATION DETAIL
 3/4" AND 1"
 SERVICE CONNECTION

WESTBOROUGH COUNTY
 WATER DISTRICT
 SOUTH SAN FRANCISCO, CA.

PRECAST CONCRETE METER BOX (INTERIOR 12" X 20" MIN.),
 WITH REINFORCED CONCRETE COVER IN NON-TRAFFIC AREAS
 AND GALV. STEEL COVER IN TRAFFIC AREAS



PROFILE OF AIR RELEASE VALVE INSTALLATION

NO SCALE

NOTES:

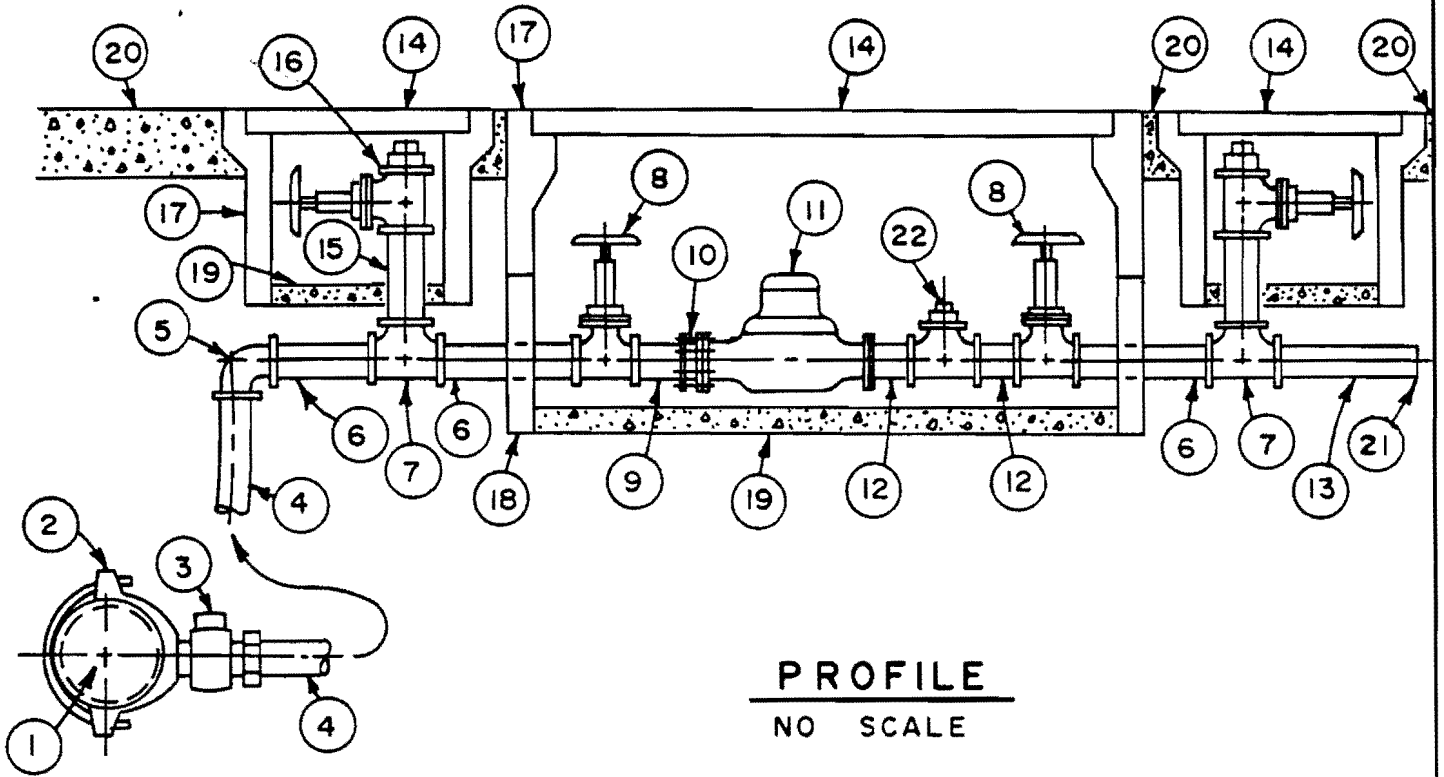
1. MATERIALS SHALL CONFORM TO DISTRICT REQUIREMENTS.
2. LOCATION OF METER BOX SHALL BE DETERMINED IN FIELD BY DISTRICT PERSONNEL.

STANDARD INSTALLATION DETAIL

AIR RELEASE VALVE

SAN MATEO COUNTY, CA.

**WESTBOROUGH
 WATER DISTRICT**



PROFILE
NO SCALE

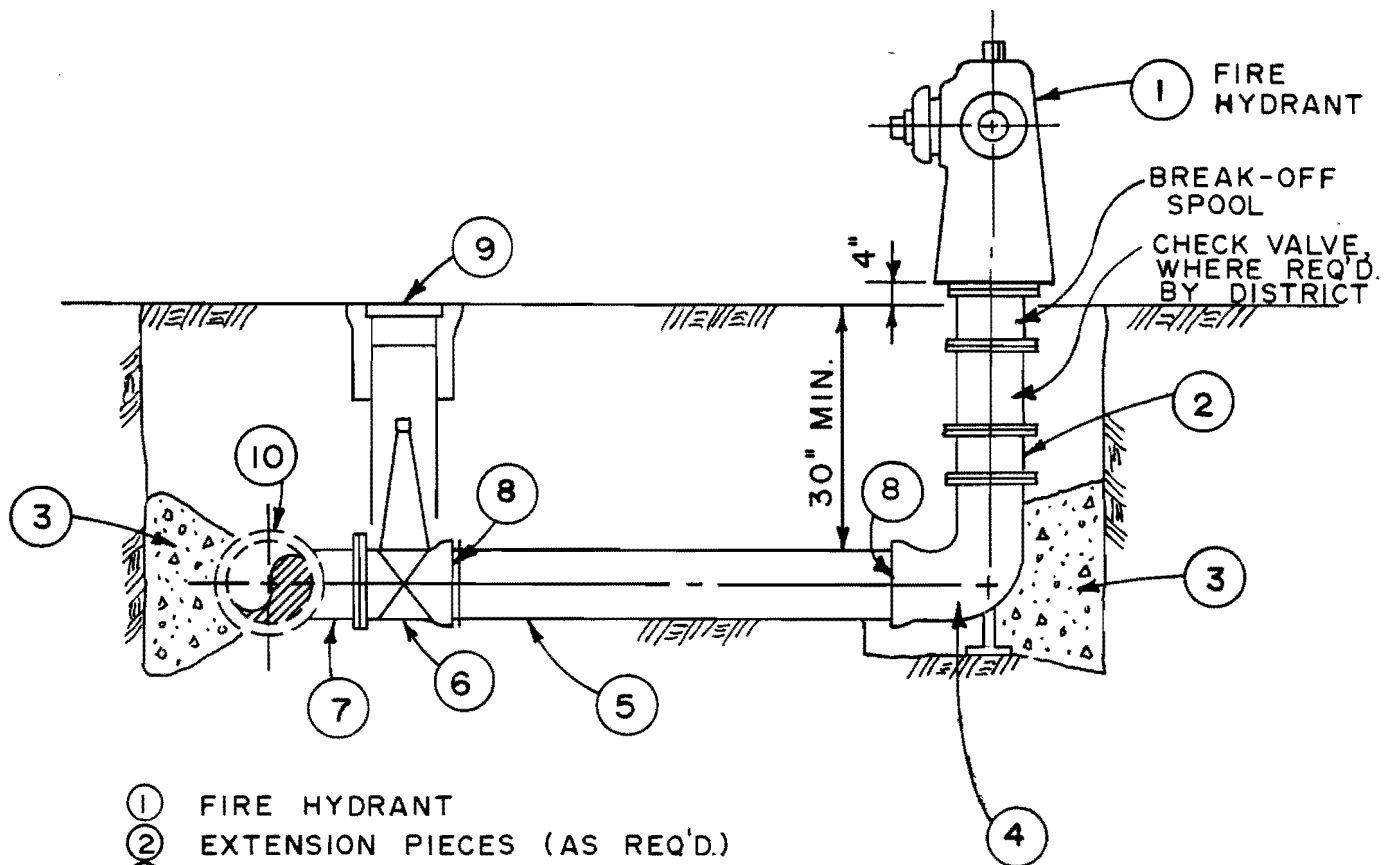
LEGEND

- ① EXISTING PIPELINE (CONSULT DISTRICT FOR DIAMETER, MATERIAL, AND SADDLE REQUIREMENTS).
- ② DOUBLE STRAP BRONZE SADDLE (WHERE REQUIRED) WITH STAINLESS STEEL NUTS & BOLTS.
- ③ CORPORATION STOP WITH A.W.W.A. (CC) INLET THREAD & COMPRESSION TYPE OUTLET CONNECTION.
- ④ TYPE K COPPER TUBING WITH COMPRESSION TYPE FITTINGS; OR BRASS PIPE WITH SCREWED FITTINGS (NOTE: DIAMETER EQUAL TO SERVICE CONNECTION SIZE).
- ⑤ 90° ELL WITH COMPRESSION TYPE INLET CONNECTION FOR COPPER TUBING AND I.P. TYPE OUTLET CONNECTION FOR BRASS PIPE.
- ⑥ BRASS NIPPLE, LENGTH AS REQUIRED (NOTE: DIAMETER EQUAL TO SERVICE CONNECTION SIZE).
- ⑦ BRASS TEE.
- ⑧ GATE VALVE.

CONTINUED ON REVERSE SIDE

STANDARD INSTALLATION DETAIL
1-1/2 & 2"
SERVICE CONNECTION

SAN MATEO COUNTY, CALIFORNIA
WESTBOROUGH
WATER DISTRICT



- ① FIRE HYDRANT
- ② EXTENSION PIECES (AS REQ'D.)
- ③ CONC. THRUST BLOCK
- ④ HYDRANT BURY
- ⑤ 6" PIPELINE
- ⑥ TAPPING VALVE (FLANGE BY MECH. JT.)
- ⑦ TAPPING SLEEVE
- ⑧ FIELD LOK GASKET SYSTEM (WHERE REQ'D. BY DISTRICT)
- ⑨ VALVE BOX (SEE "GATE VALVE" STD. DETAIL)
- ⑩ EXISTING PIPELINE (CONSULT DISTRICT FOR SIZE & TYPE)

NOTES

1. MATERIALS AND INSTALLATION SHALL BE IN CONFORMANCE WITH DISTRICT STANDARD SPECIFICATIONS.
2. HYDRANT SHALL TYPICALLY BE LOCATED 2 FEET BEHIND CURB. IN OTHER AREAS, LOCATION SHALL BE DETERMINED IN FIELD BY DISTRICT. ORIENT NOZZLES TO SUIT LOCATION.
3. USE HORIZONTAL BENDS IN 6" PIPELINE AS REQUIRED, BUT NO VERTICAL BENDS.
4. ALL BOLTS AND NUTS FOR FLANGED JOINTS SHALL BE STAINLESS STL.
5. GUARD POSTS SHALL BE INSTALLED IN CONFORMANCE WITH DISTRICT REQUIREMENTS.

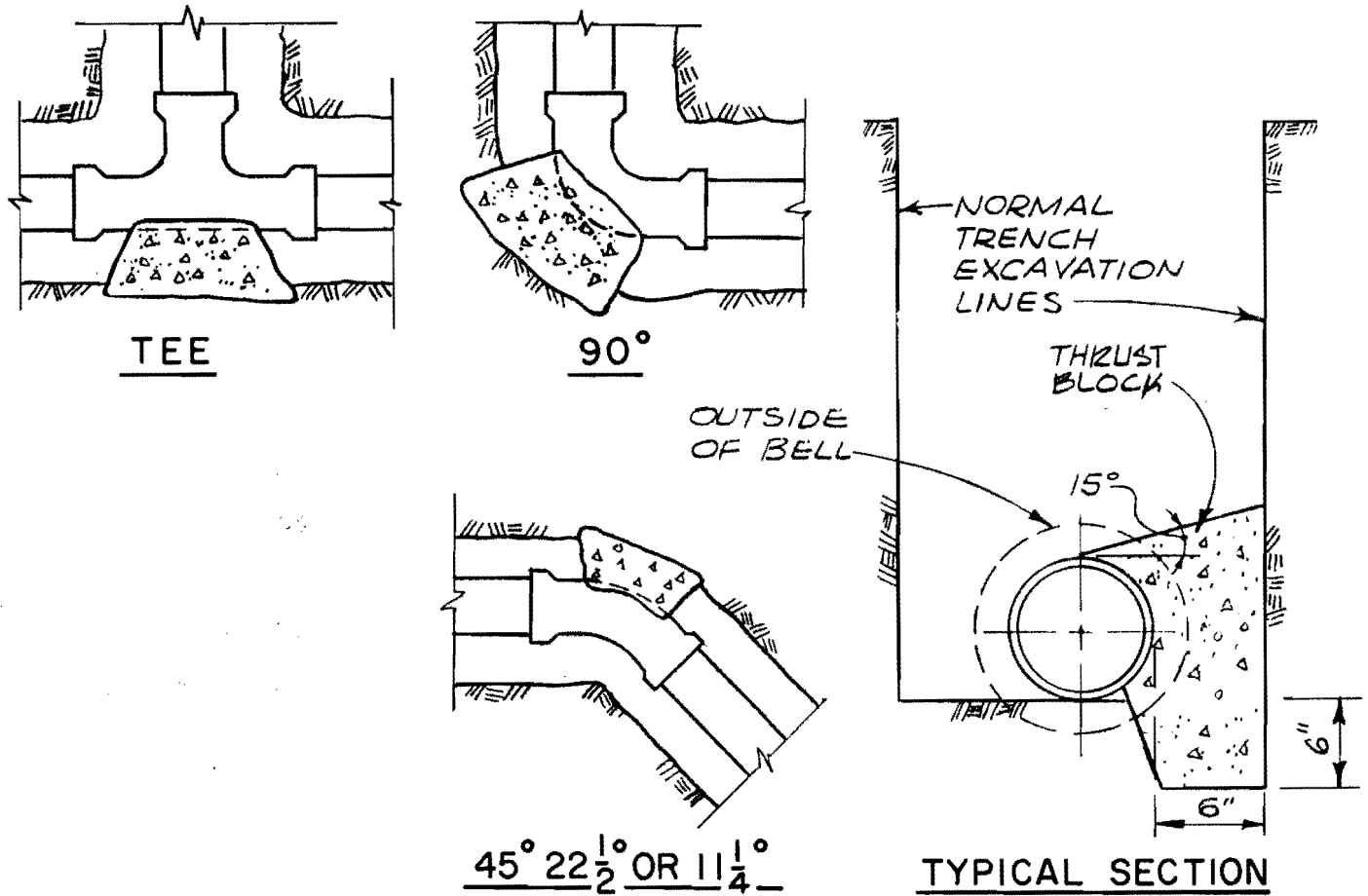
STANDARD INSTALLATION DETAIL

FIRE HYDRANT
CONNECTION TO EXISTING PIPELINE

SAN MATEO COUNTY, CALIFORNIA

WESTBOROUGH
WATER DISTRICT

ADOPTED: SEPT. 1982



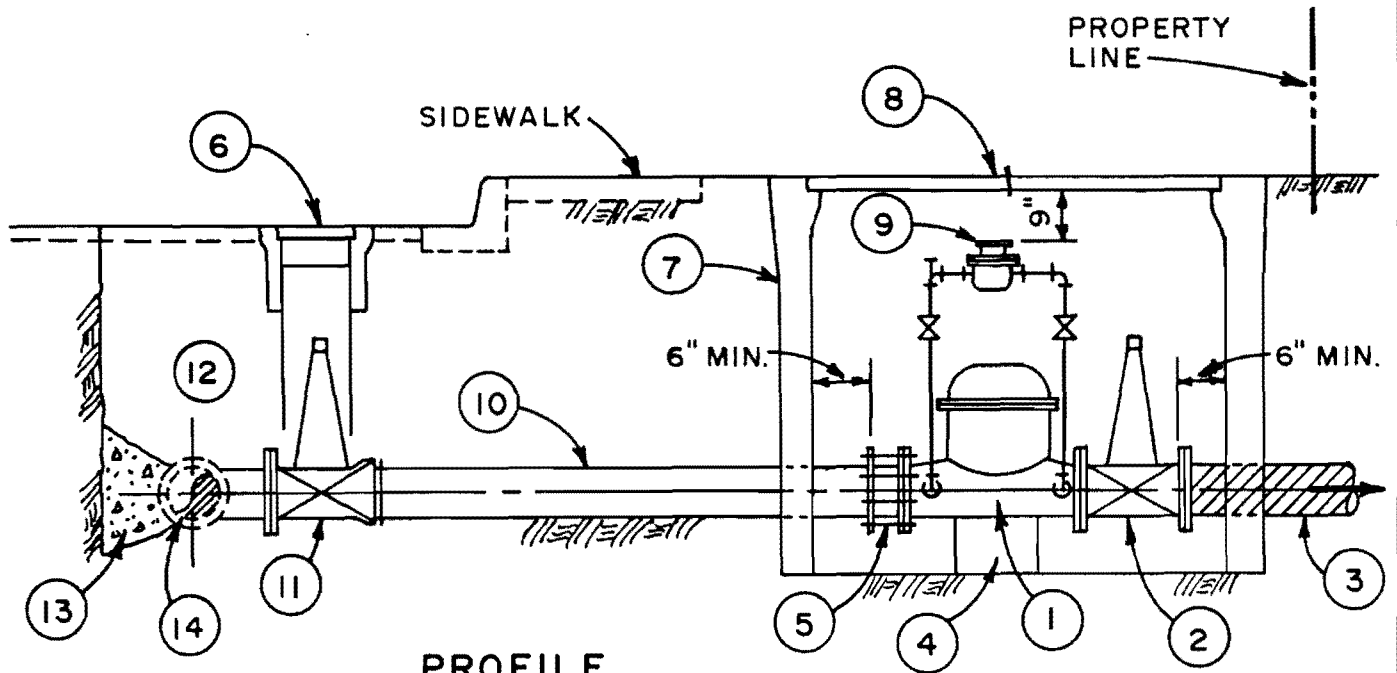
MINIMUM REQUIRED BEARING AREA AGAINST UNDISTURBED EARTH WALL

PIPE SIZE	AREA IN SQUARE FEET AT FITTINGS				
	TEE & CROSS	90°	45°	22 1/2°	11 1/4°
6	3	5	3	2	2
8	6	8	4	2	2
10	8	11	6	3	2
12	11	15	8	4	2
16	18	25	14	7	4

NOTES:

1. THRUST BLOCKS SHALL BE PLAIN CONCRETE POURED AGAINST UNDISTURBED EARTH.
2. CAPS AND PLUGS SHALL HAVE THRUST BLOCKS WITH AREAS AS SPECIFIED FOR TEES. CAPS, PLUGS, FLANGES, AND MECHANICAL JOINTS SHALL BE COVERED WITH 8 MILS OF POLY-ETHYLENE BEFORE THRUST BLOCKS ARE POURED.
3. AREA IS IN A PLANE AT RIGHT ANGLES TO THE LINE OF RESULTANT THRUST.
4. THRUST BLOCKS ARE DESIGNED FOR AN ALLOWABLE SOIL BEARING VALUE OF 3000 LB/S.F. AND 200 P.S.I.G. TEST PRESSURE. AREAS SHALL BE INCREASED FOR SOILS WITH LOWER BEARING VALUES OR FOR HIGHER TEST PRESSURE.

HORIZONTAL THRUST BLOCKS	DATE SEPT. 69	DISTRICT STANDARDS WESTBOROUGH WATER DISTRICT SAN MATEO COUNTY, CALIFORNIA
	REV. APR. 72	



PROFILE

NO SCALE

- ① DETECTOR CHECK (SIZE AS REQ'D. FOR FIRE SERVICE)
- ② GATE VALVE (FLANGE BY FLANGE)
- ③ APPLICANT-OWNED PIPELINE (FIRE SERVICE ONLY)
- ④ PIPE SUPPORT
- ⑤ FLANGED COUPLING ADAPTER (WITH 2 ANCHOR STUDS)
- ⑥ VALVE BOX (SEE GATE VALVE STD. DETAIL)
- ⑦ METER BOX & EXTENSION PIECES (SIZE AS REQ'D.)
- ⑧ TRAFFIC COVER WITH READING LID
- ⑨ BYPASS WATER METER
- ⑩ **CLASS 52 DUCTILE IRON PIPE, POLYETHYLENE ENCASED OR TAPE WRAPPED.**
- ⑪ TAPPING VALVE (FLANGE BY MECH. JT. WITH RETAINER GLAND)
- ⑫ TAPPING SLEEVE
- ⑬ CONC. THRUST BLOCK
- ⑭ EXISTING PIPELINE (CONSULT DISTRICT FOR SIZE & TYPE)

NOTES

- 1. MATERIALS AND INSTALLATION SHALL BE IN CONFORMANCE WITH DISTRICT STANDARD SPECIFICATIONS.
- 2. DETECTOR CHECK ASSEMBLY SHALL TYPICALLY BE LOCATED ADJACENT TO PROPERTY LINE.
- 3. ALL NUTS AND BOLTS SHALL BE STAINLESS STEEL.
- 4. PIPING FOR THE BYPASS METER SHALL BE BRASS.

STANDARD INSTALLATION DETAIL

DETECTOR CHECK

CONNECTION TO EXISTING PIPELINE

SAN MATEO COUNTY, CALIFORNIA

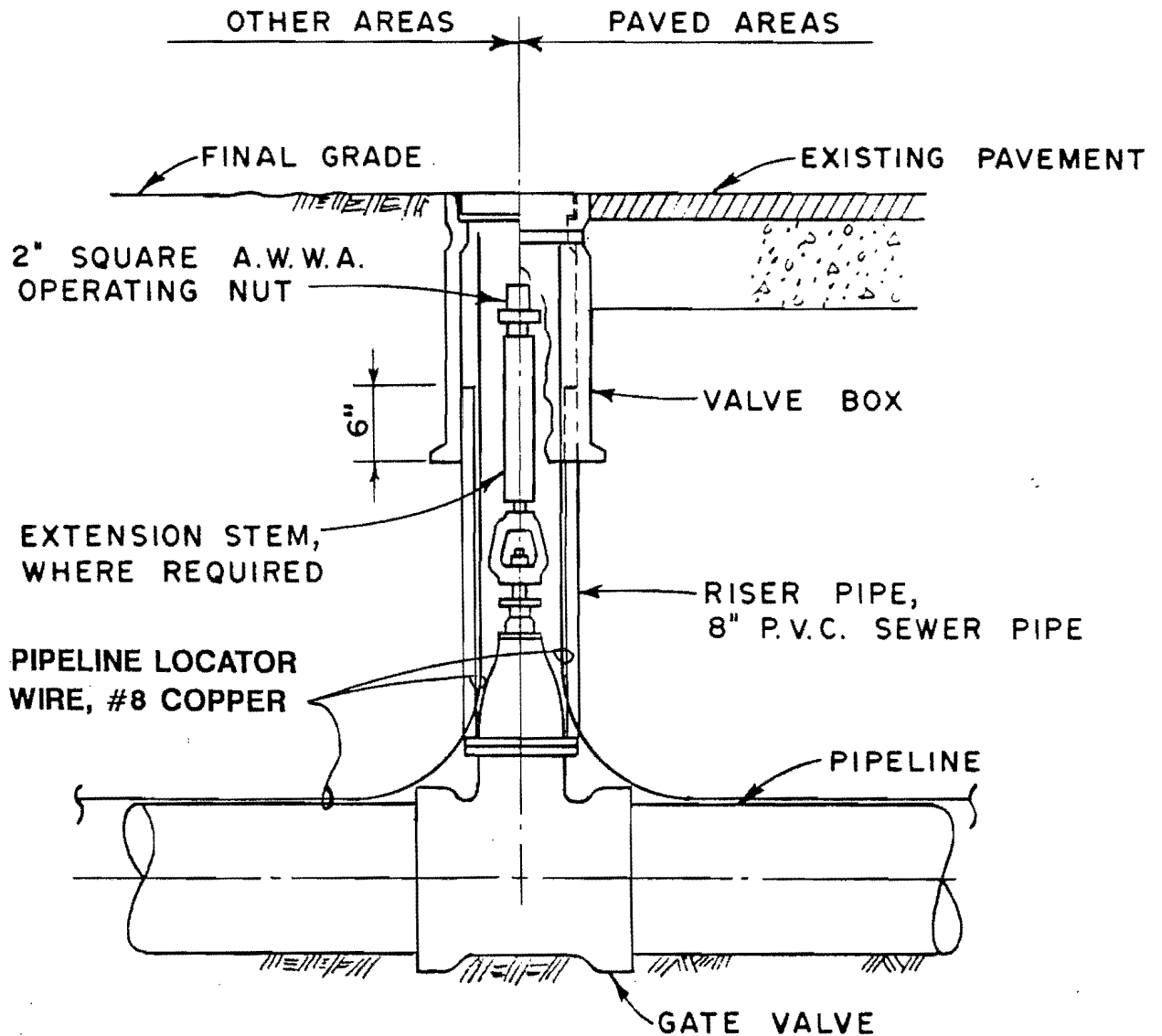
**WESTBOROUGH
WATER DISTRICT**

LEGEND (CONTINUED)

- ⑨ BRASS NIPPLE, 4" LONG.
- ⑩ FLEXIBLE METER CONNECTION.
- ⑪ WATER METER. LOCATE DIRECTLY BENEATH READING LID.
- ⑫ BRASS NIPPLE, CLOSE.
- ⑬ BRASS NIPPLE, EXTEND 6" BEYOND METER BOX.
- ⑭ METER BOX COVER. SEE NOTE BELOW.
- ⑮ 2" DIAMETER BRASS NIPPLE, LENGTH AS REQUIRED.
- ⑯ 2" GATE VALVE WITH PLUG.
- ⑰ METER BOX, SIZE AS REQUIRED.
- ⑱ METER BOX EXTENSION.
- ⑲ CONCRETE, MINIMUM 1½" THICK, PLACED AFTER SATISFACTORY COMPLETION OF LEAKAGE TESTING AND INSPECTION BY DISTRICT OF SERVICE CONNECTION INSTALLATION.
- ⑳ SIDEWALK. SEE NOTE BELOW.
- ㉑ CUSTOMER POINT OF CONNECTION.
- ㉒ BRASS PLUG.

NOTES

1. MATERIALS AND INSTALLATION SHALL BE IN CONFORMANCE WITH DISTRICT STANDARD SPECIFICATIONS.
2. UNLESS OTHERWISE DIRECTED BY THE DISTRICT, THE 3 METER BOXES SHALL BE LOCATED WITHIN, AND AT THE BACK EDGE OF, THE SIDEWALK. THIS WILL NORMALLY REQUIRE THAT THE BOXES BE INSTALLED PARALLEL TO THE SIDEWALK.
3. METER BOX COVER REQUIREMENTS WILL BE DETERMINED BY THE DISTRICT. IN POTENTIAL TRAFFIC LOCATIONS, STEEL CHECKERED PLATE COVERS WILL BE REQUIRED; IN NON-TRAFFIC LOCATIONS, REINFORCED CONCRETE COVERS WILL BE REQUIRED. THE COVER OVER THE WATER METER SHALL BE A READING-LID TYPE.



NOTES:

1. SEE SPECIFICATIONS FOR MATERIAL AND ADDITIONAL INSTALLATION REQUIREMENTS.

GATE VALVE
 (ALL VALVES 10" AND SMALLER)

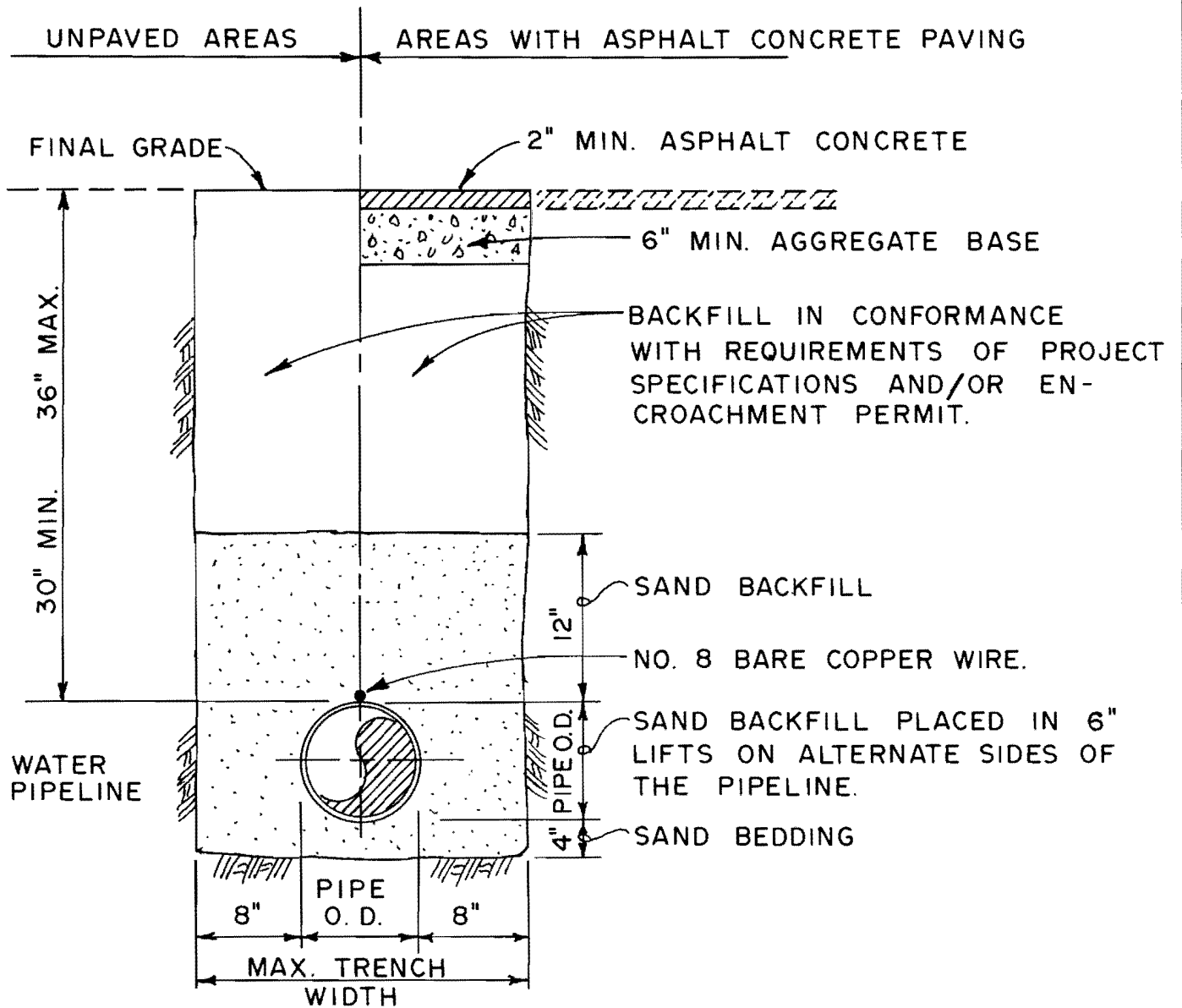
DATE SEPT. 69

REV.

JULY 1974

NOV. 1981

DISTRICT STANDARDS
WESTBOROUGH
 WATER DISTRICT
 SAN MATEO COUNTY, CALIFORNIA



NOTES:

1. MATERIALS AND INSTALLATION SHALL BE IN CONFORMANCE WITH DISTRICT REQUIREMENTS.
2. ATTACH COPPER WIRE TO PIPE WITH ELECTRICAL TAPE WRAPPED AROUND PIPE AT 4' SPACING. BEND WIRE UP INSIDE EACH VALVE BOX (INCLUDING FIRE HYDRANT VALVES), AND TERMINATE 4" BELOW FINAL GRADE.

STANDARD INSTALLATION DETAIL
TYPICAL TRENCH SECTION

**WESTBOROUGH COUNTY
 WATER DISTRICT**
 SOUTH SAN FRANCISCO, CA.