

B-5 MECHANICAL JOINTED VALVES

Valves with mechanical joint ends shall conform to the requirements of AWWA C111. Gaskets shall conform to AWWA C111 with duck tips and backs.

B-6 PLASTIC FILM WRAP

All buried valves and fittings shall be completely encapsulated with a 10-mil wrap of polyethylene film as set forth in the Technical Specifications for Plastic Film Wrap of Valves, Flanges and Other Fittings.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
PLASTIC FILM WRAP OF VALVES, FLANGES
AND OTHER FITTINGS**

A GENERAL

This specification designates the requirements for the manufacture and installation of polyethylene plastic wrap around all valves, flanges, and other fittings when buried underground.

B MATERIALS

The polyethylene film shall be of virgin polyethylene and shall meet the requirements of ASTM D 1248 for Type I, Class A, Grade E-1 and shall have a flow rate not exceeding 0.4 grams/minute per ASTM D 1238.

The polyethylene film shall be 10 mils in thickness. The length shall be sufficient to firmly attach the film to the pipe on either side of the valve, flange or fitting. The following minimum flat sheet widths shall be used for the specified valve sizes:

| Nominal Valve or Flange Size (Inches) | Minimum Flat Sheet Width (Inches) |
|--|--|
| 6 | 24 |
| 8 | 24 |
| 10 | 30 |
| 12 | 36 |
| 16 and Larger | 48 |

Tape for securing the polyethylene wrap shall be 2-inch-wide adhesive tape, such as Polyken 900 (polyethylene), Scotchwrap 5 (polyvinyl), or approved equal. The tape shall be such that the adhesive will bond securely to both metal surfaces and polyethylene film.

C INSTALLATION

The valves shall be wrapped by passing the flat sheet of film under the valve bottom and bringing the ends up around the body to the stem and securing it in place with 2-inch strips of the plastic adhesive tape. The polyethylene shall be secured around the valve stem in such a manner as to leave the stem free to operate. The film shall be brought completely around the flanges and secured to the pipe with plastic adhesive tape on either side of the valve, flange or fitting.

--END OF SECTION --

**TECHNICAL SPECIFICATIONS
FOR
WATER SERVICES**

A WATER SERVICES

Water services shall be installed at the location shown on the Plans using the type of materials, valves, and appurtenances as shown on the Standard Details included with these Specifications. The water services shall be terminated at an angle meter stop at the locations shown on the Standard Details.

B WATER METERS

Water meters shall be installed by the District (refer to Standard Detail W-3).

C METER BOXES

Concrete meter boxes shall be purchased and installed by the Owner for each meter connection as shown in Standard Detail W-3.

D MATERIALS

Schedule 80 PVC or copper tubing shall be used for all services.

Angle meter stop, corporation stop, and customer valve shall be ball type. Angle meter stops and customer valves shall be lockable. Water service materials are listed below, and are also indicated on the appropriate standard detail. Alternate equivalent materials may only be used with written approval from the District.

D-1 SERVICE SADDLES

For AC/DI PIPE

1" – 2" FIP TAP W/BRZ BODY AND BRZ STRAPS

JAMES JONES PART # J979

FORD PART # 202B

For PVC C900 PIPE

1" – 2" FIP TAP W/BRZ BODY AND SS STRAPS

JAMES JONES PART # J969

FORD PART # 202BS

D-2 CORP STOPS - BALL TYPE

1"- 2" MIP X CTS COMPRESSION BALL CORP

JAMES JONES PART # J1535

FORD PART #FB1100

1" - 2" MIP X PVC COMPRESSION BALL CORP
JAMES JONES PART #J1977
FORD PART # FB1102

D-3 ANGLE METER STOP - BALL TYPE

1" CTS X MCN COMPRESSION ANGLE BALL VALVE
JAMES JONES PART# J1963W
FORD PART # BA43-W

1-1/2" - 2" CTS COMPRESSION X METER FLG BALL VALVE
JAMES JONES PART # J1975W
FORD PART # BFA43-W

1" PVC COMPRESSION X MCN ANGLE BALL VALVE
JAMES JONES PART #J4211W
FORD PART # NOT AVAILABLE

1-1/2" - 2" PVC COMPRESSION X METER FLANGE
JAMES JONES PART # J1979W
FORD PART # NOT AVAILABLE

D-4 CUSTOMER BALL VALVE

1" FIP X MCN BALL VALVE W/LEVER HANDLE
JAMES JONE PART # J1908W
FORD PART # B13-W

1-1/2" - 2" FIP X METER FLANGE BALL VALVE W/LEVER HANDLE
JAMES JONES PART # J1913W
FORD PART # BF13-W

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
CONNECTIONS TO DOMESTIC WATER SYSTEM**

A WATER MAINS

Whenever the location of existing mains makes it necessary to use a gradual transition on the alignment of the proposed mains, the transition shall be made in the shortest practical distance with the maximum deflection per joint for curves not to exceed 5 degrees if DIP is used. If PVC pipe is used, ductile iron fittings will be required to make the transition. All tie-ins, taps, saddles and connections to existing District mains shall be made in the presence of an authorized District representative.

B VALVES AND HYDRANTS

Installation of valves and hydrants to existing mains shall be made by use of tapping sleeves and valves or by cutting in fittings as determined by the District. Tapping sleeves and valves shall be subject to approval by the District. Tapping valves shall be a resilient seat gate valve as specified in the Technical Specifications for Resilient Seat Gate Valves.

C CROSS-CONNECTION CONTROL REQUIREMENTS

Cross-connections of any type that permit a backflow condition from any source or system other than that of the District's potable water mains are prohibited. A connection constituting a potential or actual backflow hazard is not permissible unless a backflow device or air gap, which is approved by the California State Department of Health Services and complies with Title 17 of the California State Administrative Code, is installed. Such an installation shall at all times be subject to inspection and regulation by the District and San Luis Obispo County Public Health Department for the purpose of avoiding possibility of backflow.

The District will not provide any water service to any premises or continue to serve water unless the public water supply is protected as required by State and County regulations.

Backflow preventive devices shall be approved by the County and shall be installed by and maintained at the expense of the water user.

The County will test such devices. The owner of the property shall overhaul or replace backflow preventers if they are found defective.

Service of water to any premises may be discontinued by the District if a backflow prevention device required by the County is not installed; if any defect is found in an installed backflow preventative device has been removed or bypassed; or if unprotected cross-connections exist on the premises; and service will not be restored until such conditions or defect are corrected.

Regulations Relating to Cross-Connections, California Administrative Code – Title 17 – Public Health

Manual of Cross-Connection Control Procedures and Practices, State of California, Department of Health Services.

Water users which have multiple water systems shall abide by the requirements specified in Title 17 for marking safe and unsafe water lines, and have a designated water supervisor, if required by the District.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
TESTING AND DISINFECTION OF WATER PIPE**

A HYDROSTATIC TESTING

After completion of the pipeline installation, the line shall be tested under a hydrostatic pressure test of at least 150 psi, as measured at the low point of the pipeline, for a period of not less than 4 hours for each section of pipe tested. The pressure shall be maintained by restoring the test pressure whenever it falls 5 psi. At the conclusion of the 4 hours, the test pressure shall be restored and all water used during the tests shall be accurately measured to determine the actual leakage.

The Owner shall provide suitable calibrated tanks for measurement of leakage and shall furnish the necessary bulkheads, piping, calibrated gauges, pumps, power, labor and other means, and shall do everything necessary for filling the pipeline and for obtaining and maintaining the required water pressure.

The Owner, at his own expense, shall do all excavating necessary to locate and repair leaks or other defects which may develop under test, including removal of backfill already placed. The Owner shall make all repairs necessary to secure the required water tightness and shall replace excavated material, following which the test shall be repeated until the pipe is found satisfactory.

The maximum allowable leakage volume for rubber-gasketed pipe is defined by the formula.

$$L = [HND(P)^{1/2}] / C$$

Where:

- L = allowable leakage (gallons)
- H = specified test period (hours)
- N = number of rubber-gasketed joints in the pipe tested
- D = diameter of the pipe (inches)
- P = Specified test pressure (psig)
- C = 7,400

| Allowable Leakage per 50 Joints for 4 Hour Test Duration | | | | | |
|--|----------------------------|------|------|------|------|
| Test Pressure | Nominal Pipe Diameter, in. | | | | |
| | 4 | 6 | 8 | 10 | 12 |
| 200 | 1.53 | 2.29 | 3.06 | 3.82 | 4.59 |
| 175 | 1.43 | 2.15 | 2.86 | 3.58 | 4.29 |
| 150 | 1.32 | 1.99 | 2.65 | 3.31 | 3.97 |

Regardless of the rate of leakage, all detectable leaks shall be repaired.

B DISINFECTION OF WATER LINES

After pressure testing and prior to acceptance of the work, the entire pipeline, including all valves, fittings, hydrants and other accessories shall be disinfected in accordance with AWWA C651 – Continuous-Feed Method and as follows (Tablet Method will not be allowed):

Chlorine residual shall be determined in accordance with the method specified in the Appendix to AWWA C651 with amounts of sufficient chlorine to produce a dosage of 40-50 ppm and a residual of not less than 5 ppm after 24 hours. The Contractor shall provide and keep chlorine residual testing and indicating apparatus available on the site during the disinfection period.

During the chlorination process, all valves and accessories shall be operated. After chlorination, the water shall be flushed from the line at its extremities until the replacement water tests are equal, chemically and bacteriologically, to those of the permanent supply.

Following the flushing of the line, the Owner shall retain a qualified laboratory to perform a bacteriological test. Such a test shall meet the California Department of Health Services requirements for domestic water purposes prior to acceptance by the District for integration and use in the system. The cost of the test(s) shall be born by the Owner.

The new water main shall be kept physically disconnected from the active distribution system until satisfactory completion of the bacteriological test. See AWWA C651 Section 4.8.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
POLYVINYL CHLORIDE SEWER PIPE AND FITTINGS**

A GENERAL

Polyvinyl chloride PVC pipe may be used on residential tract sewers and residential house laterals only to sizes not exceeding 12 inches in diameter. Coordinate with District for larger pipe requirements.

B MATERIALS

PVC pipe, fittings, couplings, and joints shall conform to the requirements of ASTM D-3034, SDR 35, and shall have gasketed joints.

B-1 IDENTIFICATION MARKS

All pipe, fittings, and couplings shall be clearly marked at an interval not to exceed 5 feet as follows:

- (1) Nominal pipe diameter.
- (2) PVC cell classification.
- (3) Company, plant, shift, ASTM, SDR, and date designation.
- (4) Service designation or legend.

For fittings and couplings, the SDR designation is not required.

B-2 CELL CLASSIFICATION

Pipe shall be made of PVC plastic having a cell classification of 12454-B, 12454-C, or 13364-B as defined in ASTM D 1784. The fittings shall be made of PVC plastic having a cell classification of 12454-B, 12454-C, or 13343-C per ASTM D-1784.

B-3 TEST REQUIREMENTS

Pipe, fittings, and couplings shall meet the requirements of the section titled "Requirements" of ASTM D-3034. During production of the pipe, the manufacturer shall perform the specified tests for each pipe marking. A certification by the manufacturer indicating compliance with specification requirements shall be delivered with the pipe. The certification shall include the test result data.

B-4 GASKETS

Gaskets shall conform to ASTM F-477 and ASTM D-3212. A single rubber gasket shall be installed in each bell end of a joint of pipe or fitting.

C FITTINGS

PVC fittings shall include branches of every type and stoppers. Fittings shall be furnished and installed in conformance with these specifications.

C-1 BRANCHES

Branches shall be securely and completely fastened to the barrel of the fitting in the process of manufacture. Wye branches shall have their axes 45 degrees to the longitudinal axis of the pipe measured from the socket end. All branches shall terminate in sockets, and the barrel for the branch shall be of sufficient length to permit making a proper joint when the lateral pipe is inserted in the branch socket.

The material and quality of PVC fittings and the joints for fittings shall conform to the applicable provisions of these specifications.

Installation of Branches: PVC wyes, tees and other types of branches shall be furnished and installed along with PVC sewer. Wyes shall be installed for all sewer house connections including foreseeable future sewer house connections. The longitudinal barrel of branch fittings to be placed in line and grade with the sewer mains shall be of the same diameter, quality and type as said sewer. Installation, earthwork and bedding for branches shall conform to the applicable provisions set forth for mainline sewer pipe and the Technical Specifications for Sewer Laterals. The branch of wye fittings shall be inclined upward at an angle of 45 degrees from a horizontal line. No wye or tee for sewer laterals shall be placed closer than 5 feet in the downstream side to the centerline of any structure.

Where sewer laterals are not constructed, the wye or tee branch socket shall be plugged.

All joints for stoppers shall be adequate to withstand the internal pressure of the leakage and/or infiltration test; however, joints shall be made in such a manner that they may be removed without injury to the socket.

D INSTALLATION

The bedding and pipe zone material for PVC sewer pipe shall be placed from 12-inches below the bottom to 12-inches over the top of the pipe and shall be pipe bedding aggregate conforming to the requirements of the Technical Specifications for Earthwork and the Standard Details.

All installation of PVC pipe shall be in conformance with ASTM D-2321 (latest edition). During the months of April thru October, PVC pipe exposed to the sun prior to laying shall be shaded from direct sun for at least thirty (30) minutes before connection is made to manholes. Allowance shall also be made for the movement of pipe at house branch locations.

Any pipe which does not comply with the Specifications, is out of round, and has been rejected by the District, shall be removed from the jobsite and disposed of by the Owner.

D-1 LAYING PVC PLASTIC PIPE

Trenches shall be kept free of water during the laying operation. All pipe shall be laid without break, upgrade from structure to structure, with the bell ends of the pipe upgrade. Pipe shall be laid to the line and grade given so as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the flow line. The interior of the sewer pipe shall be cleaned of all dirt and superfluous materials of all description as the work progresses.

D-2 JOINING SYSTEMS

All pipes shall have a home mark on the spigot end to indicate proper penetration when the joint is made. The socket and spigot configurations for the fittings and couplings shall be compatible to those used for the pipe. Pipe shall be joined with elastomeric gasketed joints manufactured with a socket configuration which will preclude improper installation of the gasket and will ensure the gasket remains in place during the joining operation.

Joining of pipe shall be in accordance with the manufacturer's printed instructions, which shall be furnished to the District. The spigot end shall be inserted to the proper depth of the socket as indicated by the home mark.

D-3 SHORT JOINTS AT MANHOLES AND STRUCTURES

A 2-foot joint of PVC shall be placed at inlets and outlets to each manhole or structure to be constructed.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
CONNECTIONS TO EXISTING SEWER PIPE**

A TEMPORARY HANDLING OF SEWAGE

Certain work in connection with tying into existing sewers and manholes may require the temporary handling of sewage either by temporary bypass lines, pumping, bulkheading at low flows, or other means to be approved by the District. Sewage so diverted shall be handled in a manner so as not to create a public nuisance or health hazard. The Owner shall be responsible for any costs related to making these connections.

B REMODELING EXISTING MANHOLES

Where an existing manhole base has to be reworked, provisions shall be made to keep pieces of concrete and debris out of the sewer. Where new flow-through channels have to be cut, they shall be cut so that the resulting section is smooth and conforms to the intended shape. Deviation from form and grade shall not be greater than 1/4-inch. Where holes are required in existing manhole walls for new or revamped connections, the Owner will be required to use coring-type equipment if, in the opinion of the District, the Contractor's method of making holes will result in excessive damage to existing manholes. The size of the hole shall have a maximum dimension of 4-inches larger than the outside diameter of the pipe. The annular space shall be filled with dry-pack mortar.

C DATUM VERIFICATION

The Owner shall be responsible for verifying all existing elevations when making tie-ins regardless of data provided by the District.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
SEWER LATERALS**

A GENERAL

These specifications designate the requirements for furnishing and installation of sewer laterals.

Sewer laterals shall be constructed of the type and size and at the locations required and as approved by the District and in conformance with these specifications. The term "sewer lateral" is used in these specifications and on the plans to designate a branch sewer laid from a sanitary sewer main to a point on a street or public right-of-way or easement boundary from which sewer service to an individual building unit can be obtained through proper sewer extension by the property owner and shall be constructed according to the form, dimensions and details shown on the Standard Details.

B MATERIALS AND WORKMANSHIP

B-1 MATERIALS

Sewer laterals shall be of the same material as the main sewer line.

B-2 SIZE OF PIPE

Sewer laterals shall be not less than 4 inches internal diameter. Actual size of building sewers larger than 4 inches shall be determined by fixture unit requirements as per the current edition of the Uniform Plumbing Code.

B-3 DEPTH OF PIPE

Sewer laterals shall be placed at such depth to give a minimum of 48-inches of cover to the top of the bell at the property line or to edge of the easement. The minimum distance between the gutter flowline and the top of the sewer lateral shall be 3 feet.

C INSTALLATION - SEWER LATERALS

Sewer laterals and sanitary "wye" or "tee" branch fittings shall be of the diameter and of the form required and as approved by the District.

Each branch fitting shall have its barrel diameter equal to the diameter of the sanitary sewer main and the spur (or branch) diameter as necessary for connection to the sewer lateral. The spur pipe of branch fittings shall be inclined at an angle of 45 degrees from a horizontal line and shall be supported with compacted clean sand, crushed rock or other material approved by the District in accordance with the Standard Details. All branch fittings that are to be left unconnected shall be plugged with a stopper equal in diameter to the outside of the pipe barrel and affixed securely in place. The stopper shall be of the same material used for the laterals.

Sewer laterals shall join to branch fittings at the sanitary sewer main as set forth above by eighth bends. All sewer laterals shall be plugged with a stopper in the socket at the last joint of said sewer laterals which shall be securely jointed and shall lie approximately at the public right-of-way boundary and/or property line.

Insulated tracer wire shall be placed above all sewer laterals, tracer wire shall be 12-gauge minimum. Bring tracer wire up in valve boxes, meter boxes, etc. Coil wire in box with sufficient length to extend two feet above finish grade.

C-1 LOCATION OF SEWER LATERALS

The location of each sewer lateral shall be marked at its upper end by chiseling a letter "S" 1-1/2-inches high on the top of the curb. If the terminal point of the sewer lateral is more than 8 feet beyond the curb line or curb improvements do not exist, the Contractor or Owner shall furnish and install a wood stake at the end of the sewer lateral in conformance with the Standard Details.

C-2 FITTING AT END OF SEWER LATERALS

Branch fittings shall be installed at the end of sewer laterals and unconnected ends shall be plugged with stoppers as provided herein.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
CHEMICAL-RESISTANT COATINGS FOR MANHOLES**

A GENERAL

This section includes materials and installation of a chemical-resistant coating for new concrete manholes.

B MATERIALS

All manholes, wet wells, and/or other concrete appurtenance subject to corrosion from gas, vapors, or chemicals associated with raw sewage, shall be coated with one of the systems listed below.

B-1 TYPE "B" COATING: POLYURETHANE

Coating system shall be a two-component, minimum 100% solids, polyurethane, with primer. Characteristics shall be as follows:

Tensile Strength on Concrete: 2,500 psi (minimum) per ASTM D 412.

Flexibility: No effect bending 0.50 mm plate with 30-mil coating over 1/8-inch mandrel per ASTM D 1737 or no effect bending 180° over 1-inch mandrel with 15-mil coating per ASTM D 522.

Elongation: 50% (minimum) recoverable, per ASTM D 412.

Surface Hardness: 60 minimum, Shore "D" per ASTM D 2240.

Abrasion Resistance: Weight loss of 80 mg (maximum) on Taber abraser, CS-17 wheel, 1,000 grams, 1,000 cycles per ASTM D 4060.

B-1A PRODUCT

Product shall be Zebron as manufactured by Zebron Corp.; Sancon 100 as manufactured by Sancon Engineering Inc.; Polibrid 670-S primer with 705 topcoat as manufactured by Polibrid Coatings, Inc. (Carboline); or equivalent.

B-1B THICKNESS

Apply prime coat and finish coats to give a total dry coating thickness of at least 125 mils.

B-2 EPOXY COATING

Coating system shall be a two part high build epoxy system composed of 100% solids epoxy resin, formulated for spray application. Product shall be installed according to manufacturer recommendations by experienced, trained technicians. Characteristics shall be as follows:

Tensile Strength: 6,000-psi per ASTM D 638

Flexural Strength: 10,000-psi per ASTM D 790

Compressive Strength: 10,000-psi per ASTM D 695

Tensile Elongation @ Break: 4.5%

Hardness: 80 minimum, Shore "D" pr ASTM D 2240

B-2A PRODUCT

Product shall be S-301 Epoxy Spray System as manufactured by Warren Environmental; Enviroline 222 as manufactured by Enviroline Group; or equivalent.

B-2B THICKNESS

Apply coating(s) to give a total dry coating thickness of at least 80 mils.

B-3 PVC SHEET LINER

The materials used in the liner, welding strips and other accessory items, shall be a combination of polyvinyl chloride resin, pigments and plasticizers, specially compounded to remain flexible. Polyvinyl chloride resin shall constitute not less than 99 percent, by weight, of the resin used in the formulation. Copolymer resins will not be permitted. Material shall be free of cracks, cleavages or other defects affecting the protective characteristics of the liner.

All plastic liner plate sheets, welding strips, and other accessory items shall have the following physical properties when tested at 77 degrees Fahrenheit.

Tensile Strength: 2,200 psi (minimum) per ASTM D 412.

Elongation at Break: 200% (minimum) per ASTM D 412.

Surface Hardness: 50 minimum, Shore "D" per ASTM D 2240.

Abrasion Resistance: Weight loss of 40 mg (maximum) on CS-17 Calibrase Wheel, 1,000 grams, 1,000 cycles per ASTM D 1004.

Pull Out Resistance: Liner plate locking extensions embedded in cured concrete shall withstand a test pull of 100 pounds per linear inch for one minute.

C SURFACE PREPARATION AND APPLICATION

The coating shall not be applied to the frame and cover, but shall extend up the grade rings (as required) and terminate at the junction with the frame and manhole concrete.

Surface preparation and application shall be per manufacturer's recommendations.

D TESTING

The Contractor, in the presence of the District, shall inspect each coat of primer and finish coating in accordance with ASTM D 4787 to determine integrity. Each coating application will be checked and deficiencies marked. After observing specified recoat time, apply additional coating materials over areas having any holidays or pinholes. After correction of deficiencies, the Contractor shall reinspect those areas to determine the acceptability

of the additional coating. Each coating application must be to the satisfaction of the District prior to succeeding coating applications.

E WARRANTY

In accordance with Section 6-3 of the General Conditions, the Owner shall warranty the work for a period of one (1) year from the date the work was accepted by the District. The District will inspect the condition of the coating(s) prior to the end of the warranty period with an emphasis on the condition of the coating(s) at the crown of the pipe and the top of the manhole. Evidence of corrosion or abrasion of the coating, or other evidence of wear will result in the Owner repairing the work at no cost to the District.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
TESTING OF PVC SEWER PIPE**

A TEST FOR DAMAGED OR DEFECTIVE PLASTIC SEWER PIPE IN PLACE

Following the permanent and densification of backfill and prior to the placing of permanent pavement, all main line pipe shall be cleaned to the District's satisfaction and then mandrelled to measure for obstructions (deflections, joint offsets, and lateral pipe intrusions). A rigid mandrel shall be pulled through the pipe by hand. The mandrel shall have a cross section equivalent to a circle having a diameter of at least 95% of the average inside diameter for PVC pipe. The minimum length of the circular portion of the mandrel shall be equal to the nominal diameter of the pipe.

Obstructions encountered by the mandrel shall be corrected by the Owner.

All material, equipment, and labor to perform the test shall be provided by the Owner and/or Contractor.

B TEST FOR LEAKAGE AND INFILTRATION

It is the intent of these specifications that the completed sewer pipes of all types, along with manholes and other appurtenances, shall be watertight.

Each section of sewer between two successive manholes shall be tested for leakage and/or, at the option of the District, for infiltration. Where groundwater is encountered, the infiltration test shall be made.

Even though a section may have previously passed the leakage or infiltration test, each section of sewer shall be tested subsequent to the last backfill compacting operation in connection therewith, wherein, in the opinion of the District or Owner's Engineer, heavy compaction equipment used in any of the operations may have damaged or affected the required watertight integrity of the pipe, structure and appurtenances. The Owner or his Contractor shall furnish all material required for the tests and bear all costs in connection therewith. Tests shall be made in the presence of the Owner's Engineer.

If the leakage and/or infiltration rate, as shown by the tests specified herein, is greater than the amount specified, the pipe joints shall be repaired or, if necessary, the pipe shall be removed and relaid at the Owner's expense. The sewer will not be considered acceptable until the leakage and/or infiltration rate, as determined by test, is less than the allowable.

Prior to testing, all service laterals shall be installed and shall be tested simultaneously.

B-1 LEAKAGE TEST

The Owner may, at his option, air test or water test for leakage, except where the difference in elevation between the invert of the upper structure and the invert of the lower structure is more than 12 feet. In this instance, the air test shall be made.

Water Test Procedure: Each section of sanitary sewer between two successive structures shall be tested by closing the lower end of the sewer to be tested and the inlet sewer of the upper structure with plugs or stoppers and filling the pipe and structure with water to a point 5 feet above the invert of the open sewer in the upper structure or to a height of 12 feet above the invert of the sewer in the lower structure, whichever gives the least hydrostatic pressure on the lower structure.

The total leakage shall be the decrease in volume of water in the upper structure. The leakage shall not exceed 1.6 gallons per 100 feet per 4 hour test per inch diameter of sewer pipe being tested. The length of house connections shall not be used in computing the length of sewer main being tested.

If the leakage, as shown by the test, is greater than allowed, the pipe shall be overhauled and, if necessary, replaced and relaid until the joints and pipe shall hold satisfactory under this test. All tests must be completed before the street or trench is resurfaced, unless otherwise determined by the District. The Owner or his Contractor shall furnish all labor and materials for making the tests required at his own expense.

Air Test Procedure: Each section of sewer between two successive manholes shall be tested by plugging all pipe outlets with suitable test plugs. Air shall be slowly added until the internal pressure is raised to 4.0 pounds per square inch gage (psig). The compressor used to add air to the pipe shall have a blowoff valve set at 5 psig to ensure that at no time the internal pressure in the pipe exceeds 5 psig. The internal pressure of 4 psig shall be maintained for at least two minutes to allow the air temperature to stabilize, after which the air supply shall be disconnected and the pressure allowed to decrease to 3.5 psig. The time required for the internal air pressure to drop from 3.5 psig to 3.0 psig shall be measured and the results compared with the values calculated using the following formula:

$T = KL$, Where T = time in seconds,
L = distance between successive manholes in feet, and
K = appropriate value from the following table (see table on next page).

| Pipe Diameter (inches) | Minimum Time (min:sec) | Length for Minimum Time | K Value |
|---------------------------|---------------------------|----------------------------|---------|
| 8 | 3:47 | 298 | 0.760 |
| 10 | 4:43 | 239 | 1.19 |
| 12 | 5:40 | 199 | 1.71 |
| 14 | 6:27 | 180 | 2.15 |
| 16 | 7:29 | 160 | 2.81 |
| 18 | 8:30 | 133 | 3.85 |
| 20 | 9:59 | 100 | 5.99 |
| 24 | 10:34 | 100 | 6.34 |

If the pressure drop from 3.5 psig to 3.0 psig occurs in less time than the calculated values, the pipe shall be overhauled and, if necessary, replaced and relaid until the joints and pipe shall hold satisfactorily under this test.

B-2 TEST FOR INFILTRATION

If, in the construction of a section of the sewer between structures, groundwater is encountered, the end of the sewer at the upper structure shall be closed sufficiently to prevent the entrance of water and pumping of groundwater shall be discontinued for at least three days after which the section shall be tested for infiltration. The infiltration shall not exceed 1.6 gallons per 100 feet per 4 hour test per inch diameter of main line sewer being tested and does not include the length of house laterals entering that section. Where any infiltration in excess of this amount is discovered before completion and acceptance of the sewer, the sewer shall be immediately uncovered and the amount of infiltration reduced to a quantity within the specified amount of infiltration, before the sewer is accepted, at the expense of the Owner. Should, however, the infiltration be less than the specified amount, the Owner shall stop any individual leaks that may be observed when ordered to do so by the District. (or Project Engineer?) The Owner shall furnish all labor and materials for making the tests required at his own expense. All tests must be completed before street or trench is resurfaced, unless otherwise determined by the District.

C TESTS FOR ALIGNMENT AND GRADE, AND DAMAGED OR DEFECTIVE PIPE IN PLACE

After the pipe has been installed, backfilled to existing grade, tested for leakage and/or infiltration, manholes raised to grade and resurfaced, the pipe shall be "balled" from manhole to manhole with a sewer scrubbing ball of type and size to be approved by District.

After balling the pipe, perform the following:

1. "Mirror" straight sewers and inlet/outlet ends of curvilinear sewers. Perform balling and mirroring in the presence of the Owners Engineer and in conformance with General Condition 3-9 and 3-10 to test for alignment,

grade, damaged or defective pipe in place, or any other type of faulty installation. Should balling and mirroring indicate any faulty installation of the pipe, repairs or replacements shall be made at the Owner's expense.

2. Closed circuited television (CCTV) inspection shall be performed to determine if the sanitary sewer was installed in accordance with District requirements. The television inspection system shall include a color television camera with pivoted head, a television monitor, cables, power sources, and other equipment. The inspection video shall be in color and have a continuous graphic display of date, time, and footage in .1 foot increments. The system to be utilized on the project shall be approved by the District. The Contractor shall televise the pipeline during optimum low-flow level conditions as pre-approved by the District.

All video inspection equipment utilized shall produce MPEG 1 or MPEG 2 formatted files playable on a computer with Microsoft Windows[®] Media Player. Contractor has the option to use either new, blank, high quality CD or DVD disks. Contractor shall record an individual digital video file for each sewer segment in the MPEG-1 or MPEG-2 format. Each file shall be identified by its own unique video file name. Each video disk may contain as many video files as the disk permits. In addition, the disk shall contain the individual written inspection report for each line on the disk in digital "PDF" format. Post-construction video inspection disks following completion of work shall be submitted to the District and shall become the District's property. Each video disk submitted shall be accompanied with written inspection reports. The written reports shall include, but are not necessary limited to:

- Video File Name;
- Time and date of the inspection;
- Upstream manhole number;
- Downstream manhole number;
- Sewer size;
- Footage;
- Direction of televised inspection;
- Location of service connections (laterals) by feet from beginning manhole;
- Location of significant features such as grade breaks, pipe breaks, offset joints, cracking, change in pipe material, standing water, etc.;
- Include footage and description of beginning/ending of inspection.

If deficiencies are observed, the Owner will make the required corrections and re-video the pipeline prior to acceptance of the system.

3. Video inspection shall be performed after all installation, backfilling, compacting, testing, balling, mandreling and flushing has been completed.

--End of Section--

**TECHNICAL SPECIFICATIONS
FOR
TRAFFIC REGULATION**

A GENERAL

This section describes procedures for traffic regulation and temporary steel plate bridging during construction in public streets and highways.

A-1 STANDARD SPECIFICATIONS

Wherever reference is made to the State Specifications and Plans, such reference shall mean the latest edition of the State of California, Business and Transportation Agency, Department of Transportation Standard Specifications and Plans, latest edition.

B VEHICULAR TRAFFIC

The Contractor shall provide safe and continuous passage for pedestrian and vehicular traffic at all times.

B-1 TRAFFIC CONTROL PLAN

The Contractor shall submit, not less than 14 working days prior to start of construction operations, a traffic control plan to San Luis Obispo County or California Department of Transportation for approval. Preparation of any additional traffic control plans or detail that may be required during the course of the work shall be the Owner's or Contractor's responsibility. No work shall begin involving or requiring alternate traffic control until a traffic control plan is approved by the appropriate authority.

B-2 TRAFFIC CONTROL DEVICES AND SIGNS

Furnish, construct, maintain, and remove detours, road closures, traffic signal equipment, lights, signs, barricades, fences, K-rail, flares, solar-powered flashing arrow signs, miscellaneous traffic devices, flagmen, drainage facilities, paving, and such other items and services as are necessary to adequately safeguard the public from hazard and inconvenience. All such work shall comply with the ordinances, directives, and regulations of authorities with jurisdiction over the public roads in which the construction takes place and over which detoured traffic is routed by the Contractor. After devices have been installed, the Contractor shall, at his own expense, maintain and keep them in good repair and working order until no longer required. The Contractor shall also pay the cost of replacing such devices that are lost or damaged, to such an extent as to require replacement, regardless of the cause of such loss or damage.

B-3 PLACEMENT OF TRAFFIC CONTROL DEVICES AND SIGNS

The placement of construction signing, striping, barricades, and other traffic control devices used for handling traffic and public convenience shall conform to the latest edition of the State of California, Department of Transportation, "Manual of Traffic Controls for Construction and Maintenance Work Zones".

C TEMPORARY STEEL PLATE BRIDGING, WITH A NONSKID SURFACE

When backfilling operations of an excavation in the traveled way, whether transverse or longitudinal, cannot be properly completed within a workday, provide steel plate bridging with a nonskid surface and shoring to preserve unobstructed traffic flow.

C-1 PLATE DESIGN

Design steel plate bridging for HS20-44 truck loading per Caltrans Bridge Design Specifications Manual. The Contractor may use standard steel plate with known coefficient of friction equal or exceeding 0.35.

D VEHICULAR TRAFFIC CONTROL

Accomplish construction in phases by detouring traffic from its normal patterns along the route in approximately 1/2-mile intervals between major cross streets to form the construction zone. Restore traffic to normal patterns in each phase before proceeding to the next phase.

E PEDESTRIAN TRAFFIC CONTROL

Maintain and delineate a minimum of one 4-foot-wide pedestrian walkway along each public street at all times during construction. Maintain existing pedestrian accesses at intersections at all times. When existing crosswalks are blocked by construction activity, install signs directing pedestrian traffic to the nearest alternative crosswalk.

F ACCESS TO ADJACENT PROPERTIES

Maintain reasonable access from public streets to adjacent properties at all times during construction. Prior to restricting normal access from public streets to adjacent properties, notify each property owner or responsible person, informing him of the nature of the access restriction, the approximate duration of the restriction, and the best alternate access route for that particular property.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
CONCRETE CONSTRUCTION**

A GENERAL

These specifications designate the requirements for furnishing and installation of concrete.

B CONCRETE

B-1 CLASS A

Class A concrete shall contain not less than six sacks of Portland cement per cubic yard and have a minimum compressive strength of 3,000 psi in 28 days.

B-2 CLASS B

Class B concrete shall contain not less than five sacks of Portland cement per cubic yard and have a minimum compressive strength of 2,500 psi in 28 days.

B-3 CLASS C

Class C concrete shall contain not less than five sacks of Portland cement per cubic yard and have a minimum compressive strength of 2,000 psi in 28 days.

C REINFORCING

Where reinforced concrete is required, reinforcing steel conforming to the applicable provisions of the State Specifications shall be furnished and installed.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
REMOVAL AND RESURFACING OF
STREET PAVEMENT AND SURFACES**

A GENERAL

Street pavement and surfaces shall be removed and replaced in all areas of construction in conformance with details shown on the Plans and as specified herein. Resurfacing of existing pavement and surfaces damaged or removed in connection with the construction of improvements shall conform to the provisions of permits issued by the state, county, or other agency for the work within the rights-of-way of the respective agency.

B EARTHWORK

All earthwork shall conform to the provisions of the Technical Specifications for Earthwork of these Specifications.

C PAVEMENT REMOVAL

C-1 GENERAL

Street pavement or existing road surfacing shall be removed within the limits of all construction excavations prior to proceeding with excavation operations of any nature. Surplus material shall be removed as provided in the Technical Specifications for Earthwork. Prior to removal of existing surfacing, pavement cuts shall be made as shown on the Plans and/or specified herein. All pavement cuts shall be neat and straight along both sides of the trench and parallel to the alignment of the pipe to provide an unfractured and level pavement joint for bonding existing surfacing with pavement replacement. Where large irregular surfaces are removed, such trimming or cutting as hereinafter provided shall be parallel with roadway centerline or at right angles to the same. All cut edges shall provide clean, solid, vertical faces free from all loose material.

C-2 PORTLAND CEMENT CONCRETE SURFACES

Concrete pavement, including cross-gutters, curbs and gutters, sidewalks, driveways and concrete surfaces of whatever nature, shall be saw cut to minimum depth of 1-1/2 inches prior to removal in accordance with details shown on the Plans or as specified herein. Said saw cut shall be made at a point approximately 1 foot beyond the edge of the trench and/or excavation. The saw cut shall be made after backfilling, and the additional concrete pavement shall be removed and disposed of by the Contractor prior to resurfacing.

C-3 ASPHALT CONCRETE PAVEMENT

Streets and alleys surfaced with asphalt concrete pavement shall be initially cut by means of pneumatic pavement cutters or other approved equipment at the limits of the trench and/or excavation prior to removal of surfacing. After backfilling the excavation, asphalt concrete pavement shall be saw cut to a minimum depth of 4 inches at a point not less than 9 inches outside the limits of excavation or the previous pavement cut (made by pneumatic tools),

which ever limits are the greater. The additional surfacing so cut shall be removed and disposed of by the Contractor prior to resurfacing.

C-4 ROAD MIXED SURFACING

Streets and alleys surfaced with road mixed surfacing shall be cut at the limits of the trench and/or excavation prior to removal of existing surfacing. Cuts may be made with pneumatic tools or other approved equipment. The extra trimming width made by saw cuts prior to resurfacing asphalt concrete pavement will not be required.

D RESURFACING

In all streets or alleys in which the surface is removed, broken or damaged by equipment or in which the ground has caved in or settled due to the installation of the improvements, the surface shall be restored to the original grade and crown section. Where the street has been improved with roadway surface, base course, curb, sidewalk or gutter, trenches or damaged sections shall be restored with the type of improvement conforming to that which existed prior to the work. Prior to resurfacing, the existing surfacing shall be removed as provided above. All broken and jagged edges of the trench shall be straight. If during the initial removal of the existing pavement a method of removal was used which disturbed the adjoining pavement or if during general construction the adjacent pavement was disturbed, then this adjoining pavement must also be removed and replaced. Disturbed or undermined cement treated base shall be removed and replaced with its equivalent aggregate base, and asphalt concrete paving above the cement treated base shall be sawed in a straight line and replaced in kind.

All work shall match the appearance of the existing improvements and finished pavement shall not deviate from existing grade by more than 1/8 inch in 10 feet and shall be free from ruts, depressions, and irregularities. Asphaltic paint binder shall be applied to the vertical faces of all asphaltic concrete pavement against which the pavement replacement materials are to be placed. The completed surface, when ready for acceptance, shall be thoroughly compacted, true to grade and cross section and shall be free from ruts, depressions, and irregularities. Where the trench line is approximately parallel with the traveled way, the pavement shall be brought to the final grade with a Barber-Green paving machine or approved equivalent. The resulting edge of contact between the new and existing pavement on each side shall parallel the existing trench and be a straight and neat join line. New pavement shall not lap over existing pavement.

In the event that it is necessary to construct a temporary patch, the materials used shall be approved by the agency having jurisdiction. A permanent patch shall be constructed as soon as practical.

E TEMPORARY RESURFACING

In the event that it is necessary to construct a temporary patch, the materials used shall be approved by the agency having jurisdiction. A permanent patch shall be constructed as soon as practical.

--End of Section--

**TECHNICAL SPECIFICATIONS
FOR
USE OF COMPLETED FACILITIES**

The District shall have the right upon ten (10) days written notice to the Owner and his Surety to take possession of and use any completed or partially completed portion of the work notwithstanding that the time for completing the entire work may not have expired, but such taking possession and use and assumption of maintenance of any portion of the work shall not be deemed an acceptance of any work. It is the intent of this section to provide for the District placing into operation portions of the facilities as the work progresses.

When any section of the improvements has been completed in all respects, except for trench resurfacing, the District may so notify the Owner and his Surety in writing as provided herein. After such notice has been given, the District shall have the right to place such section of the facility into service and to operate same. The Owner will be relieved of the duty of maintaining and protecting said portion of the work except for any resurfacing, if required. When resurfacing is not required, the Owner shall be relieved of the responsibility and duty of maintaining and protecting portions of the roadway only after receiving written notice from the District.

However, nothing in this section shall be construed as relieving the Owner of the full responsibility for making good defective work or materials as specified in the General Conditions.

--END OF SECTION--

**TECHNICAL SPECIFICATIONS
FOR
CLEAN-UP**

During the progress of the work, the work area shall be kept free of any accumulation of rubbish and debris. Upon completion of the work and before Acceptance of the completed facility by the District, all unused materials, rubbish, concrete forms, surplus excavated material and other materials or equipment shall be removed from the work area.

If during the progress of the work any improvements, such as, fences, lawns, shrubs or other vegetation, whether on private or public property are damaged, they shall be restored to a condition equivalent to that which existed before work started before acceptance of the completed facilities by the District.

A SEWER MAIN CLEANING

Prior to the acceptance of any sewer line by the District, the contractor shall clean all lines with a Wayne-type sewer cleaning ball. Any stoppage, dirt or foreign matter shall be removed from the lines. All cleaning and testing of sewer lines shall take place after all construction work is completed, up to but not including, the paving. The system will be inspected after paving is completed and any damage to the system during paving and cleanup will be corrected before approval.

B WATER MAIN CLEANING

Prior to the acceptance of any water line by the District, the contractor shall flush, disinfect, and test the water line. Flushing, disinfecting, and testing of water lines shall take place after all construction work is completed, up to but not including, the paving. The system will be inspected after final paving is completed and any damage to the system during final paving and cleanup will be corrected before approval.

--END OF SECTION--

Standard Drawings

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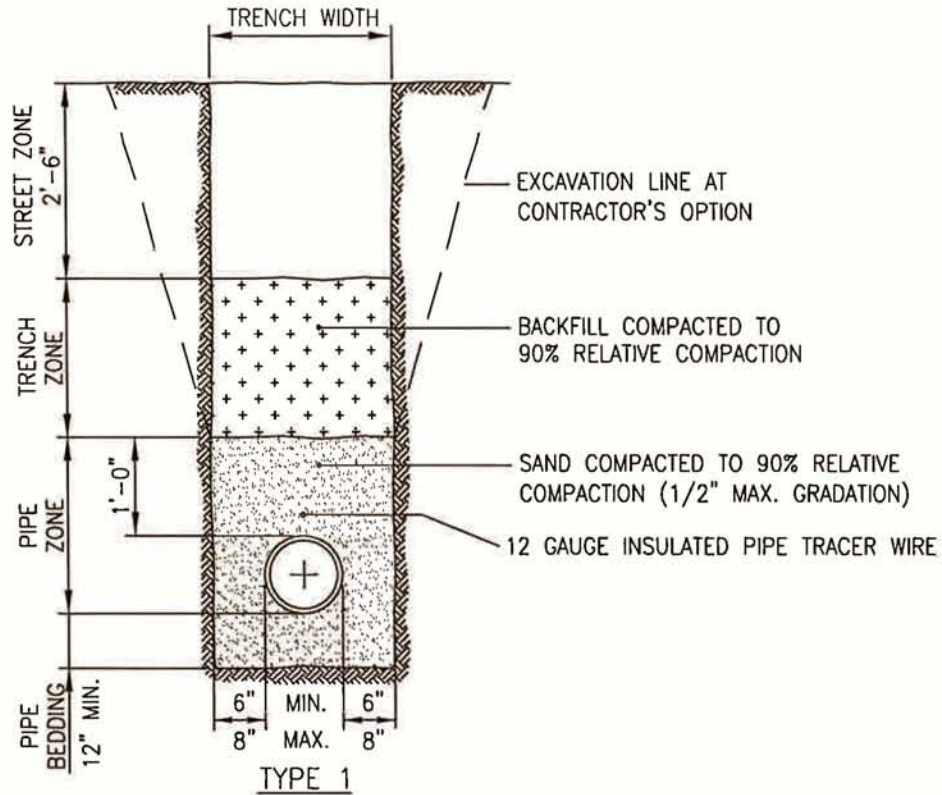
WATER NOTES

1. THE WATER FACILITIES TO BE DEDICATED TO THE NCSD (DISTRICT) SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE NCSD STANDARD SPECIFICATIONS.
2. THE DISTRICT SHALL BE NOTIFIED AT LEAST SEVEN (7) WORKING DAYS PRIOR TO START OF CONSTRUCTION. TELEPHONE (805) 939-1133. CONSTRUCTION WILL NOT TAKE PLACE ON WEEKENDS UNLESS SPECIFICALLY APPROVED BY DISTRICT. A PRECONSTRUCTION MEETING IS REQUIRED IN ACCORDANCE WITH DISTRICT STANDARDS SECTION GC 3.6.
3. THE CONSTRUCTION PLANS MUST BE APPROVED BY THE DISTRICT PRIOR TO THE START OF ANY WATER FACILITIES CONSTRUCTION. TWO (2) SETS OF APPROVED PLANS SHALL BE FURNISHED TO THE DISTRICT AND ONE (1) SET TO THE DISTRICT'S ENGINEER. PRIOR TO DISTRICT APPROVAL, THE PLANS MUST BE SIGNED BY A CALIFORNIA REGISTERED CIVIL ENGINEER. ALL UTILITIES SHALL APPROVE PLANS PRIOR TO NCSD.
4. ALL PIPE, FITTINGS, MATERIALS, AND INSTALLATION SHALL CONFORM TO THE LATEST EDITIONS OF THE AWWA SPECIFICATIONS.
5. PRIOR TO ACCEPTANCE OF THE WATER FACILITIES, ALL NECESSARY EASEMENT DOCUMENTS SHALL BE PROPERLY EXECUTED AND RECORDED. THREE (3) COPIES EACH OF THE RECORDED DOCUMENTS SHALL BE FURNISHED TO THE DISTRICT.
6. WATER MAINS SHALL BE INSTALLED 5-FEET FROM THE FACE OF CURB UNLESS OTHERWISE INDICATED ON THE PLANS.
7. ALL WATER SERVICES SHALL BE METERED, DISTRICT EMPLOYEES TO DROP-IN METERS.
8. CONTRACTORS WILL COORDINATE ALL TIE-INS OF NEW WATER MAINS TO EXISTING WATER MAINS WITH THE DISTRICT TO MINIMIZE SERVICE INTERRUPTIONS. PROVIDE AT LEAST 2 WORKING DAYS NOTICE PRIOR TO CONSTRUCTION.
9. THE WATER SYSTEM, INCLUDING LATERALS, SHALL BE HYDROSTATICALLY TESTED PRIOR TO PLACING STREET PAVEMENT.
10. VALVES SHALL BE FLANGE CONNECTED TO FITTINGS WHEN LOCATED ADJACENT TO FITTINGS.
11. WATER LINES SHALL HAVE A MINIMUM COVER OF 36 INCHES.
12. FITTINGS SHALL BE FLANGED OR MECHANICAL JOINTS.
13. CONTRACTOR SHALL ADJUST VALVE BOXES, FIRE HYDRANT BREAK-OFF FLANGES, METER BOXES, ETC. TO SUBDIVISION FINISH GRADES AFTER CURBS AND GUTTERS, SIDEWALKS, AND STREETS HAVE BEEN CONSTRUCTED AT NO COST TO DISTRICT.
14. WHERE FIRE HYDRANTS ARE INSTALLED OR UP GRADED, THE CONTRACTOR SHALL INSTALL REFLECTORIZED, RAISED PAVEMENT MARKERS (STIMSONITE HYDRANT MARKERS), ALSO COMMONLY CALLED "BLUE DOTS". A TWO PART EPOXY ADHESIVE SHALL BE USED TO INSTALL THE MARKERS. ONE MARKER SHALL BE INSTALLED PERPENDICULARLY OPPOSITE EACH FIRE HYDRANT, APPROXIMATELY 6-INCHES OFFSET FROM THE CENTERLINE OF THE STREET ON THE HYDRANT SIDE OF THE STREET.
15. SERVICES THAT DO NOT COME STRAIGHT OFF THE MAIN ARE TO HAVE TAPE MARKED "CAUTION WATER LINE BELOW". TAPE TO BE INSTALLED 15-INCHES ABOVE THE SERVICE.
16. FIRE HYDRANTS, METER BOXES AND BLOWOFFS SHALL BE LOCATED NO CLOSER THAN 5-FEET FROM BEGINNING OF CURB RETURN, DRIVEWAY OR ANY OTHER UTILITY.
17. DURING CONSTRUCTION OF THE IMPROVEMENTS, THE OWNER SHALL NOTE DEVIATIONS FROM THE PLANS ON A SET OF PLANS SPECIFICALLY SET ASIDE FOR THIS PURPOSE. ANY CHANGES SHALL BE MADE ON THE ORIGINALS OF THE PLANS WITH A SUITABLE NOTE ON EACH SHEET STATING THAT THE ORIGINALS ARE THE "RECORD DRAWINGS".
18. UPON COMPLETION OF CONSTRUCTION, ONE COMPLETE SET OF RECORD DRAWINGS, ORIGINAL PLOTS ON MYLAR, ALONG WITH ELECTRONIC (AUTOCAD DWG.) FILES SHALL BE FURNISHED TO THE DISTRICT.
19. WORK SHALL BE DONE IN ACCORDANCE WITH THE APPROPRIATE ENCROACHMENT PERMITS.
20. DISINFECT PIPELINES PER DISTRICT STANDARDS - DO NOT USE TABLETS.

**NIPOMO
COMMUNITY SERVICES DISTRICT**

STANDARD WATER NOTES

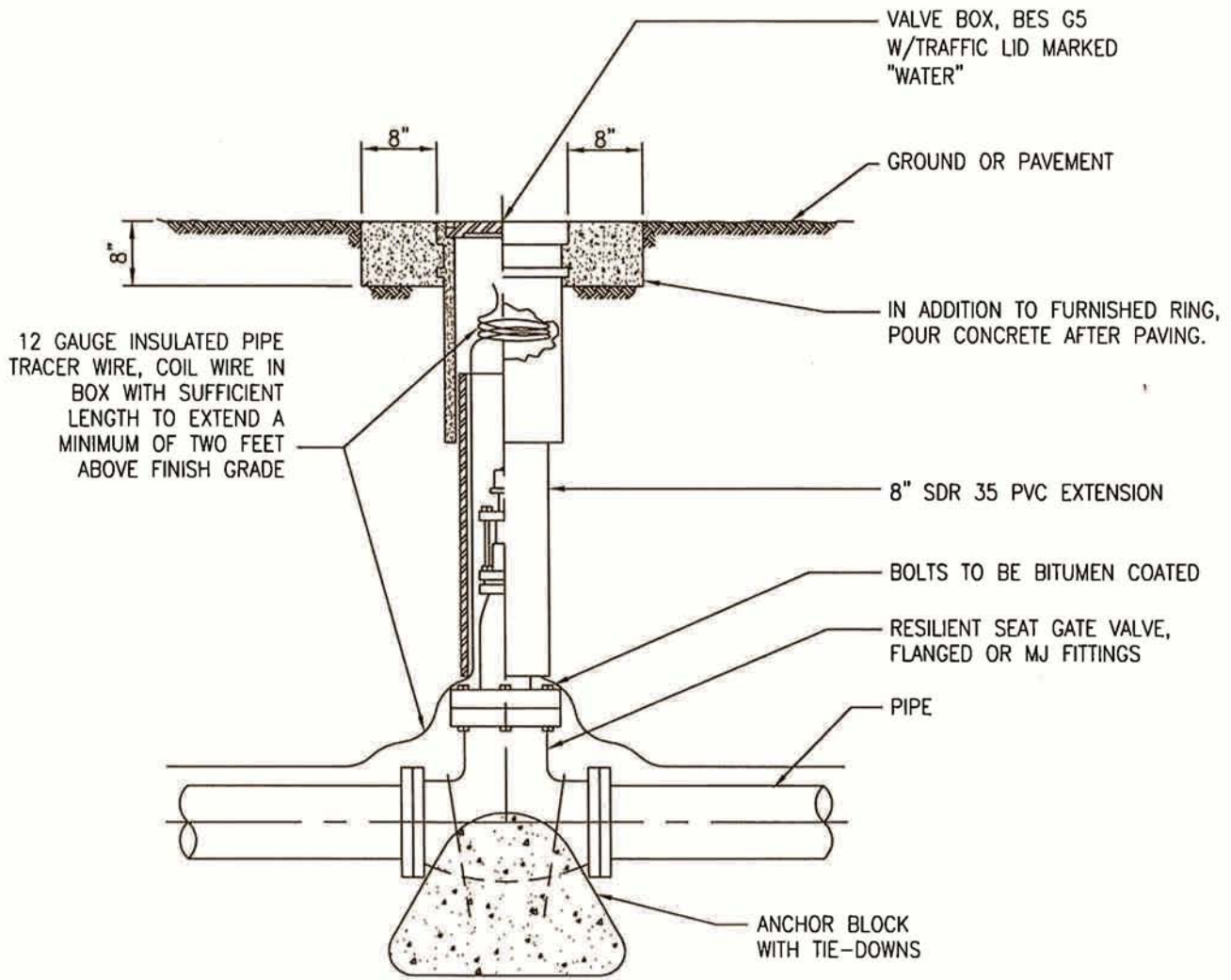
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NOTES:

1. SAND SHALL BE PER STANDARD SPECIFICATIONS FOR EARTHWORK.
2. SEE STANDARD SPECIFICATIONS FOR EARTHWORK IF TRENCH WIDTH EXCEEDS THE MAXIMUM SHOWN ON THIS DRAWING.
3. STREET ZONE TO BE COMPACTED TO 95% RELATIVE COMPACTION IF UNDER ROAD BED OR TO 90% RELATIVE COMPACTION IF OUTSIDE OF PAVEMENT PER (ASTM D-1557, 5 LAYER). SEE TECHNICAL SPECIFICATIONS FOR EARTHWORK.
4. SEE STREET IMPROVEMENT PLANS (IF APPLICABLE) FOR PAVING REQUIREMENTS.
5. MINIMUM COVER OVER ALL DISTRIBUTION MAINS TO BE 3'-0" AS MEASURED FROM THE BOTTOM OF PAVEMENT.

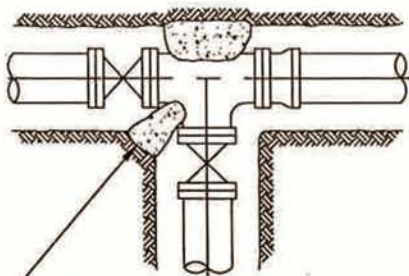
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| | | NIPOMO COMMUNITY SERVICES DISTRICT | |
| | | WATER PIPE BEDDING AND BACKFILL DETAILS | |
| DATE | REVISION | DATE DRAWN FEB 2008 | SHEET NO. W-2 |



SECTION - ELEVATION

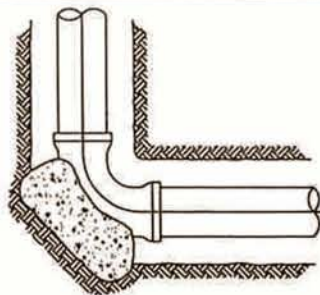
NOTE:
 WHEN VALVE BOX IS USED FOR SEWER APPURTENANCE, THE LID SHALL BE MARKED "SEWER".

| | | | |
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| | | NIPOMO COMMUNITY SERVICES DISTRICT | |
| | | VALVE BOX ASSEMBLY | |
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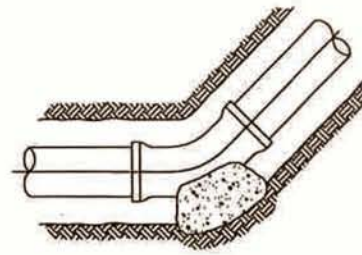


INSTALL THRUST BLOCK IF IN LINE VALVE IS USED. (CONDITION 6)

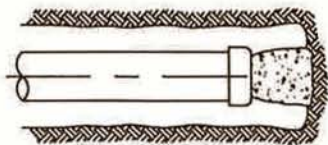
CONDITION 1
(OUTLET OR FIRE HYDRANT)



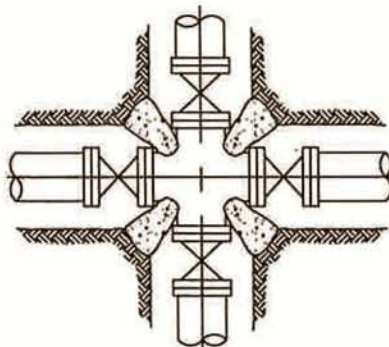
CONDITION 2
(ANGLE = 90°)



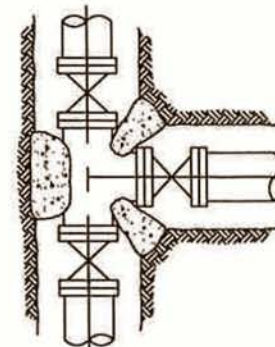
CONDITION 3
(ANGLE = 45°)



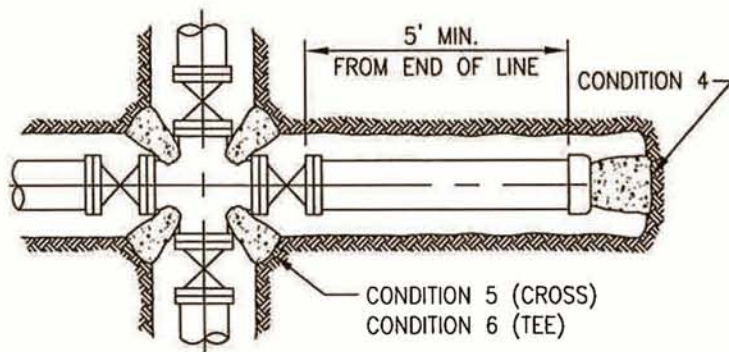
CONDITION 4
(END CAP)



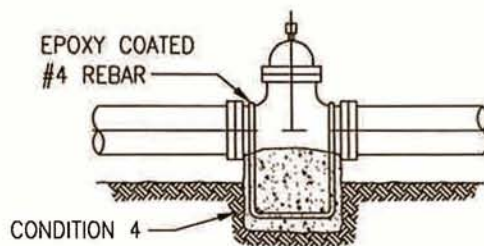
CONDITION 5
(MAINLINE CROSS)



CONDITION 6
(MAINLINE TEE)



CROSS OR TEE AT END OF LINE



EPOXY COATED #4 REBAR

CONDITION 4

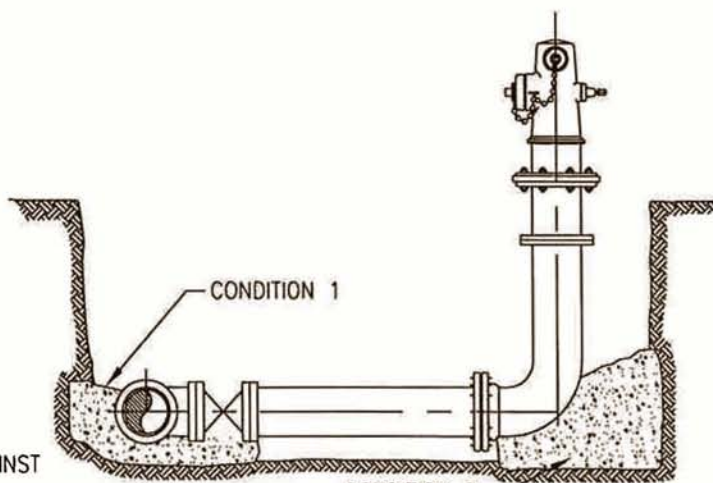
ANCHOR FOR IN LINE VALVES

| THRUST BLOCK BEARING AREA IN SQ. FT. | | | | | | |
|--------------------------------------|-----------|------|------|------|-----------|-----------|
| PIPE SIZE | CONDITION | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 6" | 5.0 | 7.0 | 4.0 | 5.0 | 3.5 EACH | 3.5 EACH |
| 8" | 8.5 | 12.0 | 6.5 | 8.5 | 6.0 EACH | 6.0 EACH |
| 10" | 13.0 | 18.5 | 10.0 | 13.0 | 9.0 EACH | 9.0 EACH |
| 12" | 18.5 | 26.0 | 14.0 | 18.5 | 13.0 EACH | 13.0 EACH |

BASED ON 1500 P.S.F., 200 P.S.I. TEST PROCEDURE

NOTES:

1. SIZE THRUST BLOCK ACCORDING TO THE LARGEST OUTLET DIAMETER ON TEE OR CROSS.
2. ALL THRUST BLOCK BEARING FACES SHALL BE POURED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED MATERIAL.
3. SEE SPECIFICATIONS FOR CONCRETE REQUIREMENTS.



FIRE HYDRANT

NIPOMO
COMMUNITY SERVICES DISTRICT

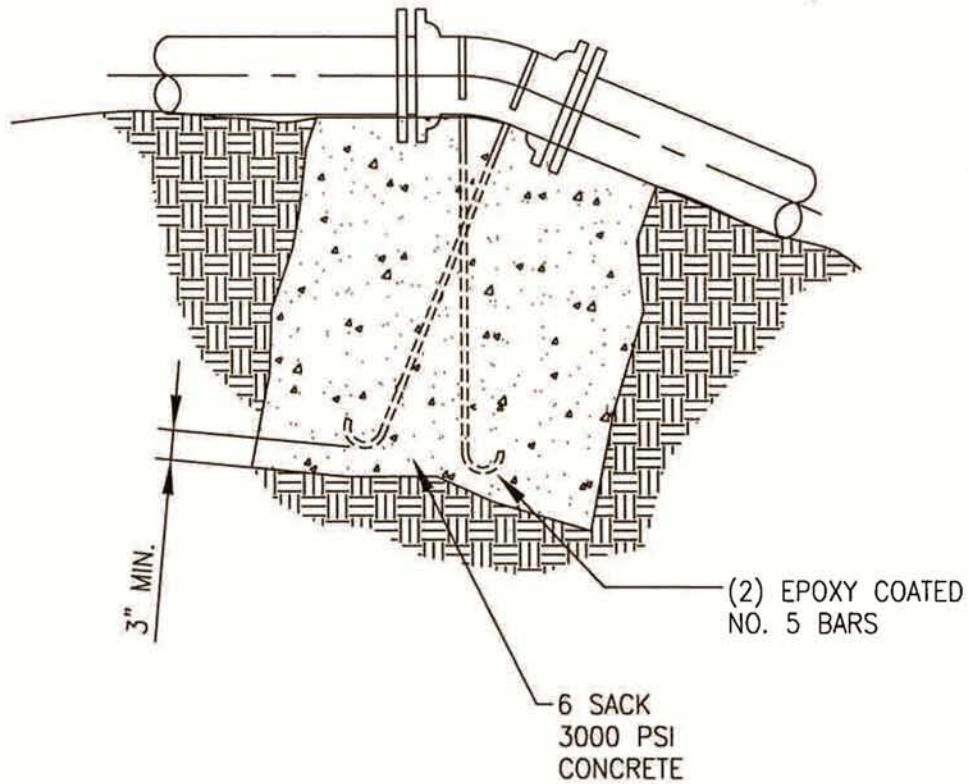
TYPICAL THRUST BLOCK DETAILS

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DATE DRAWN
FEB 2008

SHEET NO.
W-4

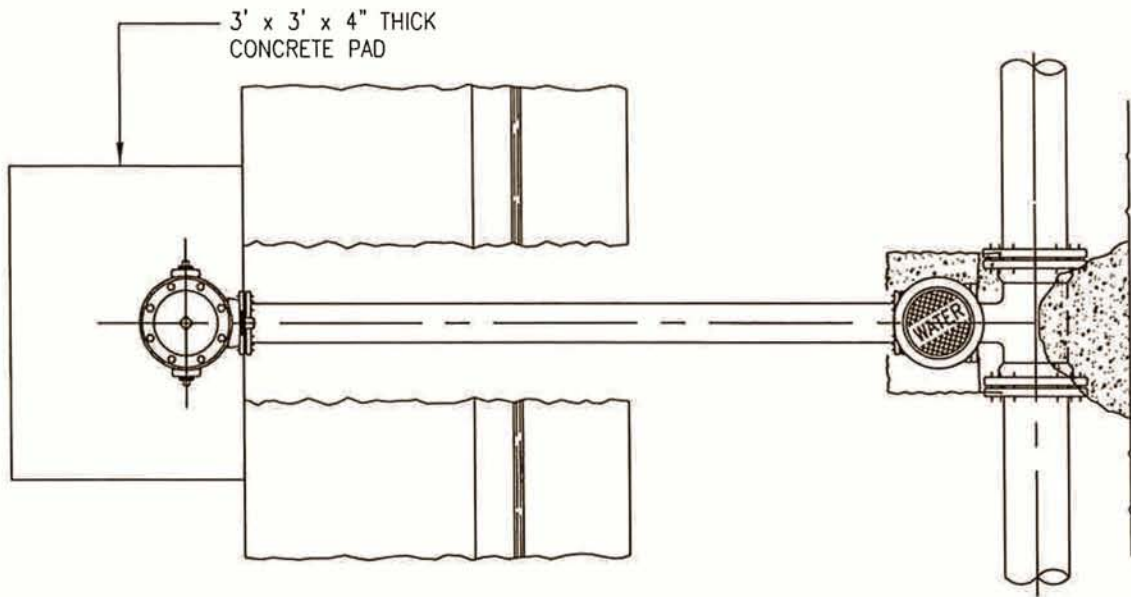


GENERAL NOTES:

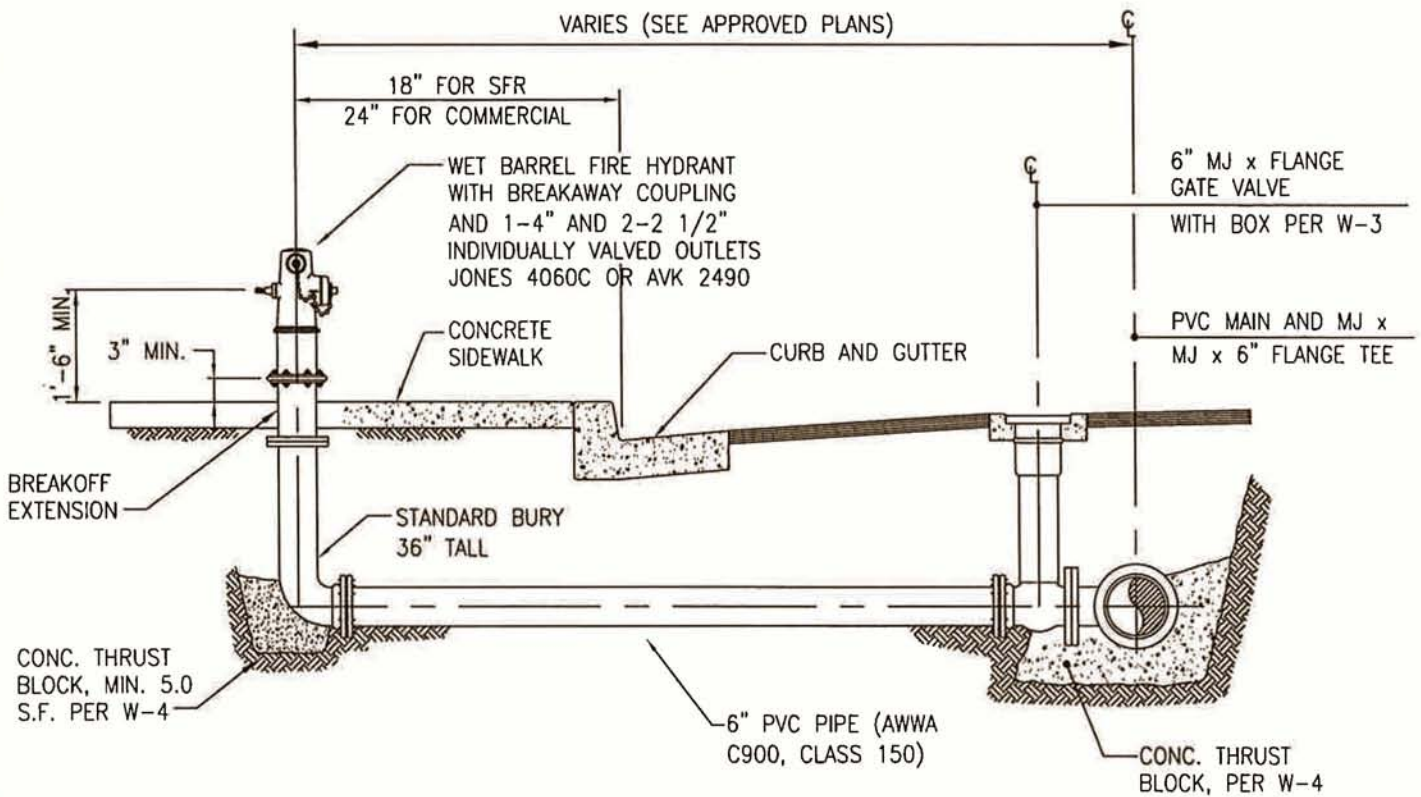
1. CONCRETE BLOCK SHOULD BE APPROXIMATELY EQUAL IN ALL DIMENSIONS.
2. ALL BOLTED FLANGED ITEMS SHALL HAVE 30 MIL PLASTIC WRAP AND TAPED COVERING BOLTS AND FITTINGS.

| CONCRETE VOLUME | | | |
|-----------------|--------------|--------------|----------|
| SIZE | 11-1\4' BEND | 22-1\2' BEND | 45' BEND |
| 12" | 1 YD | 3 YDS | 6 YDS |
| 10" | 1 YD | 2 YDS | 4 YDS |
| 8" | 0.5 YD | 1 YD | 2 YDS |

| | | | |
|------|----------|---------------------------------------|------------------|
| | | NIPOMO COMMUNITY SERVICES DISTRICT | |
| | | STANDARD ANCHOR BLOCK DETAIL | |
| DATE | REVISION | DATE DRAWN FEB 2008 | SHEET NO. W-5 |



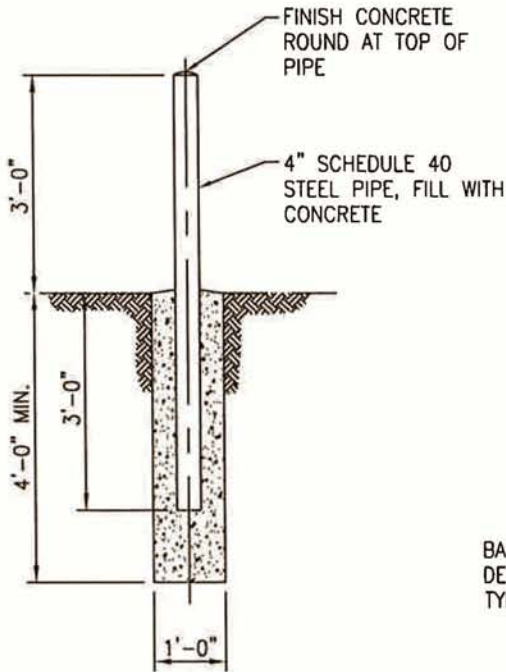
PLAN



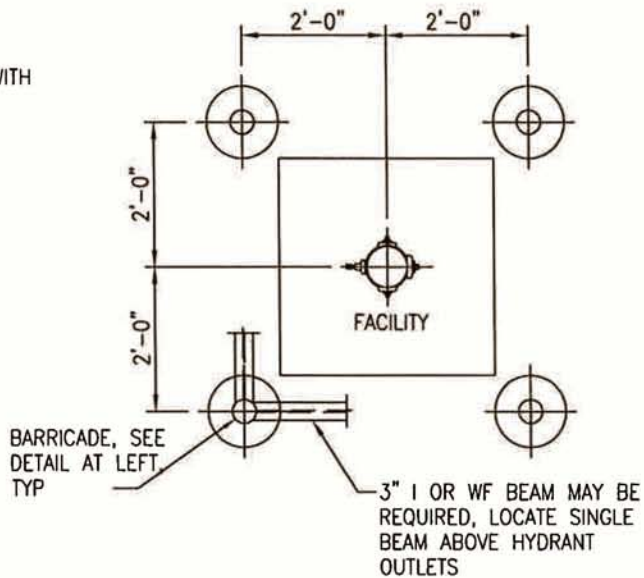
ELEVATION

| | | | |
|------|----------|---------------------------------------|------------------|
| | | NIPOMO COMMUNITY SERVICES DISTRICT | |
| | | FIRE HYDRANT ASSEMBLY | |
| DATE | REVISION | DATE DRAWN FEB 2008 | SHEET NO. W-6 |

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BOLLARD/BARRICADE
DETAIL



BOLLARD/BARRICADE
PLAN

NOTES:

1. EXACT LOCATION OF BARRICADES MAY BE CHANGED BY THE DISTRICT IN THE FIELD.
2. SEE APPROVED PLANS FOR NUMBER OF BARRICADES TO BE USED AND FOR BRACES, IF REQUIRED.
3. THE EXTERIOR OF THE ABOVE GROUND PORTION OF THE BARRICADE SHALL BE PAINTED WITH TWO COATS OF DEVOE BAR-RUST 233H EPOXY COATING AND TWO COATS OF DEVOE NO. 379 DEVTHANE (MEDIUM YELLOW).
4. FOR SAFETY, BARRICADES SHALL NOT BE INSTALLED INSIDE THE CLEAR ZONE OF A ROADWAY AS DEFINED BY CALTRANS.

NIPOMO
COMMUNITY SERVICES DISTRICT

BOLLARD/BARRICADES

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| DATE | REVISION | DATE DRAWN FEB 2008 | SHEET NO. W-7 |
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