

REGULATIONS, SPECIFICATIONS

AND

STANDARD DETAILS  
(INCLUDING 1996 REVISIONS)



OCTOBER, 1999  
(Revised July, 2000)





**SAN BENITO COUNTY WATER DISTRICT  
REGULATIONS AND SPECIFICATIONS**

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THE UNIVERSITY OF CHICAGO  
DEPARTMENT OF CHEMISTRY  
5301 SOUTH CAMPUS DRIVE  
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TO: [Name]

FROM: [Name]

SUBJECT: [Subject]

[Main body of the letter containing the primary message]

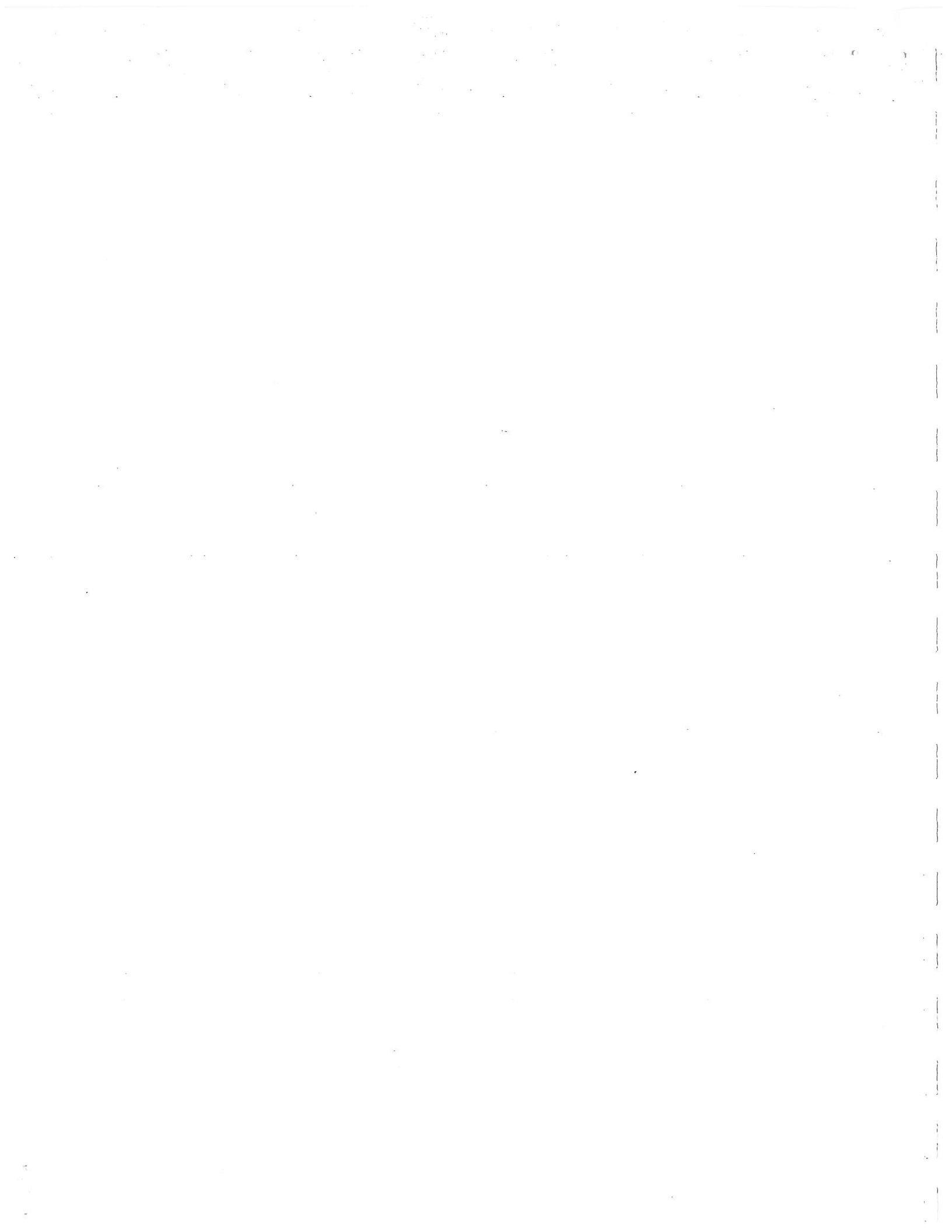
Very truly yours,  
[Signature]

[Name]

[Address]

[City, State, Zip]

**POLICIES and PROCEDURES**



## POLICIES AND PROCEDURES

### 1. PURPOSE

The purpose of these Regulations and Specifications is to provide a policy to be used by the San Benito County Water District in connection with any and all applicants who are required or may desire to construct pipelines and appurtenances to connect to the existing and/or proposed distribution system of the District, whether immediately or in the future.

### 2. WHO IS COVERED

These Regulations and Specifications shall apply to any and all individuals, builders or subdividers who may construct pipelines and appurtenances to be connected to District facilities.

### 3. RESOLUTION ADOPTING POLICY REGARDING SUBDIVISION OF LAND

A "Resolution Adopting District Policy Regarding the Subdivision of Land Within the San Felipe Project's Direct Distribution System in Zone 6" is hereby incorporated in and made a part of these Regulations and Specifications. (See page PP-3.)

### 4. RESOLUTION ESTABLISHING INSPECTION FEES

A "Resolution of the San Benito County Water Conservation and Flood Control District Establishing Inspection Fees Per Ordinance No. 11" is hereby incorporated in and made a part of these Regulations and Specifications. (See page PP-4.)

### 5. ORDINANCE NO. 11

"An Ordinance Establishing the District's Fees for Inspection of Water Lines Within the District's Distribution System and Providing for Modification Thereof by Resolution" is hereby incorporated in and made a part of these Regulations and Specifications. (See page PP-5.)

### 6. ORDINANCE NO. 12

"An Ordinance of the San Benito County Water District Establishing a Backflow Prevention System and Regulations Relating Thereto" is hereby incorporated in and made a part of these Regulations and Specifications. (See page PP-6.)

7. AGREEMENT

Before issuing final approval to an individual, builder or subdivider to construct and/or connect to the District's distribution system, an Agreement will be required binding the individual, builder or subdivider to certain terms and/or conditions relative to the proposed project. The District shall determine the terms and conditions of such an Agreement.

8. APPLICATION FOR FIRE PROTECTION

Any and all individuals, builders or subdividers intending to use District facilities for the purpose of Fire Protection shall provide the District with plans for such facilities. An Application for Fire Protection must be completed, approved by the District, and recorded in the San Benito County Courthouse by the applicant. The Application for Fire Protection is hereby incorporated in and made a part of these Regulations and Specifications. (See page PP-16.) This application will be in addition to any other agreements or permits required by the District.

Maintenance of all fire protection appurtenances is the responsibility of the applicant. Approval of the Fire Protection Application by the District does not relieve the applicant of these responsibilities.

9. PERMITS

Any connection to or work around U. S. Bureau of Reclamation Facilities shall require a Bureau permit. This specifically includes work within right-of-ways and easements of the U.S. Bureau of Reclamation. The individual, builder or subdivider shall be responsible for acquiring and following the requirements of said Bureau permit.

A copy of the Bureau "Outline of Process for Permits and Consents" is hereby incorporated in and made a part of these Regulations and Specifications. (See page PP-17.) Permits will be submitted to the District for forwarding to the U.S. Bureau of Reclamation.

10. SUPPLEMENTAL WATER SYSTEM

Any and all individuals, builders or subdividers intending to use San Felipe Project water for supplemental water purposes shall be required to enter into a Contract with the District. Said Contract shall include, but not be limited to, the following conditions:

- (a) The individual, builder or subdivider shall acknowledge that the water supply by the District shall be a supplemental source only.
- (b) The individual, builder or subdivider shall be responsible for the quality of the water in terms of potability.
- (c) The individual, builder or subdivider shall be responsible for adequate storage of the water.
- (d) The individual, builder or subdivider shall hold the District, its employees and agents, harmless from any claim of liability with regard to the supplemental water delivery.



# RESCINDED

By Res. No. 98-14

RESOLUTION NO. 88-04

## RESOLUTION ADOPTING DISTRICT POLICY REGARDING THE SUBDIVISION OF LAND WITHIN THE SAN FELIPE PROJECT'S DIRECT DISTRIBUTION SYSTEM IN ZONE 6

WHEREAS, each subdivider shall construct at his sole expense, a pipeline from the District's subsystem onto all parcels of 5 (five) acres or more intended to be, or currently served by the District's direct distribution system; and

WHEREAS, each 5 (five) acre or larger parcel shall be provided with a tee at the main line, a below ground valve and a blind flange of a size to be determined by the District. At the option of the subdivider, an above ground riser may be installed on each parcel. The construction of the riser shall be in strict accordance with all District Regulations and Specifications; and

WHEREAS, when the subdivider installs above ground risers, he shall provide a meter specified by the District and manufactured by the Sparling Instruments Company, Inc. The subdivider shall also provide the District with the new Assessor's Parcel Number, the name and address of the parcel owner, and the serial number and size of the meter being installed on each particular parcel; and

WHEREAS, all subdividers shall, prior to construction, provide the District with two sets of plans which shall include existing District facilities and all pipelines and appurtenances proposed to be built. At the option of the District, said plans may be submitted to the District's Engineer for his review and approval. The costs of this review shall be borne by the subdivider; and

WHEREAS, the subdivider shall, prior to construction, submit a list of all materials (pipeline, valves, etc.) proposed for the project. All materials shall meet the District's requirements as found in the Regulations and Specifications; and

WHEREAS, all construction shall be inspected by an inspector designated by the District. If full time inspection is required, the costs and expenses of said inspection shall be borne by the subdivider; and

WHEREAS, all pipeline testing shall be in accordance with the District's Regulations and Specifications and shall be witnessed by the District's inspector; and

WHEREAS, when the construction and testing have been completed and accepted by the District, the subdivider shall deed the lines and appurtenances, free of all encumbrances, to the District. The deed dedicating the system to the District shall be accompanied by "as-built" drawings consisting of one set of reproducible mylar prints and three sets of black and white prints; and

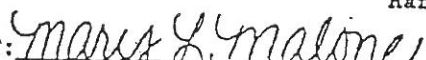
WHEREAS, a 20' permanent easement over the pipeline shall be dedicated to the District for the purpose of maintenance and repair of the system. A metes and bounds description shall be provided to the District and also recorded in the San Benito County Recorder's office.

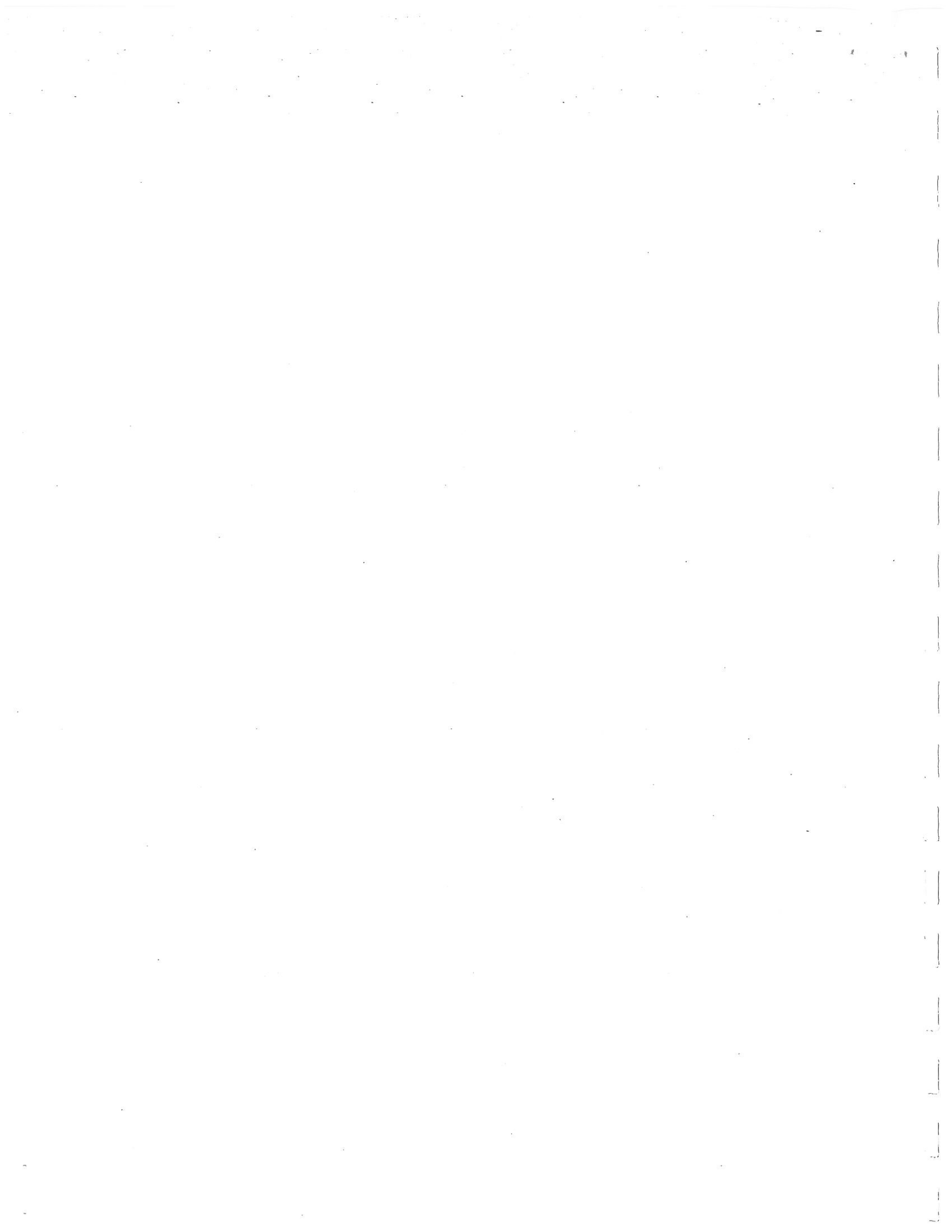
NOW, THEREFORE, BE IT RESOLVED and ORDERED by the Board of Directors of San Benito County Water Conservation and Flood Control District that this Resolution be incorporated as District policy regarding the subdivision of land within the San Felipe Project's direct distribution system in Zone 6.

PASSED AND ADOPTED by the Board of Directors of the San Benito County Water Conservation and Flood Control District this 27th day of April, 1988, by the following vote:

AYES: DIRECTORS: Cullum, Gabriel, Overfelt and Porteur.  
NOES: DIRECTORS: None.  
ABSENT: DIRECTORS: Swanson.

  
Harry J. Cullum, President.

ATTEST:   
Mary L. Malone, District Secretary.



RESOLUTION NO. 88-16

RESOLUTION OF THE SAN BENITO COUNTY WATER CONSERVATION AND  
FLOOD CONTROL DISTRICT ESTABLISHING INSPECTION FEES PER  
ORDINANCE NO. 11

WHEREAS, Ordinance No. 11 provides that the San Benito County Water Conservation and Flood Control District shall initially establish inspection fees and at least annually thereafter, review the fee structure and

WHEREAS, the Board of Directors has reviewed a proposed fee structure and is prepared to establish initial inspection fees,

NOW, THEREFORE, the Board of Directors of the San Benito County Water Conservation and Flood Control District resolve as follows:

1. Inspection fee schedule: The following fees shall be charged for District inspection of water facilities, which fees are based upon the estimated cost of construction of the water lines and appurtenances:

<u>Estimated cost of construction</u>	<u>Inspection fee</u>
First \$50,000	3%
Next \$150,000	2%
Amount exceeding \$200,000	1 1/2%


2. Review of fee schedule: The fee schedule established herein shall be reviewed at least annually. Unless earlier reviewed, this schedule shall be placed on the Board's December agenda for each year to determine if the established fee structure adequately meets the needs of the District.

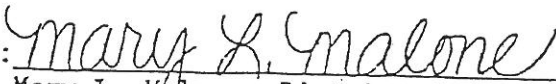
AYES: DIRECTORS: Cullum, Gabriel, Overfelt and Porteur.

NOES: DIRECTORS: None.

ABSENT: DIRECTORS: Swanson.

SAN BENITO COUNTY WATER CONSERVATION  
AND FLOOD CONTROL DISTRICT

  
Harry J. Cullum, President

ATTEST:   
Mary L. Malone, District Secretary



**RESOLUTION NO. 98-14**

**A RESOLUTION OF THE SAN BENITO COUNTY WATER DISTRICT  
BOARD OF DIRECTORS  
RESCINDING RESOLUTION 88-04 AND  
ESTABLISHING POLICY REGARDING DISTRIBUTION EXTENSION  
AND/OR MODIFICATION  
FOR PARCELS IMPACTED BY THE SUBDIVISION OF LAND  
WITHIN THE SAN FELIPE PROJECT  
DISTRIBUTION SYSTEM SERVICE AREA IN ZONE 6**

**WHEREAS**, Resolution 88-04 resolution adopting District policy regarding the subdivision of land within the San Felipe Project direct distribution system in Zone 6 provides for the expansion or extension of the San Felipe Project's direct distribution system to parcels of five (5) acres or more intended to be or currently served by the District's direct distribution system; and

**WHEREAS**, experience has shown that certain modifications to that policy are necessary; and

**WHEREAS**, experience has shown that subdivision regularly reduces parcel sizes to the extent that the current delivery meters are larger than necessary and inappropriate for accurate metering and operation of the District system.

**NOW, THEREFORE BE IT RESOLVED** by the Board of Directors of the San Benito County Water District that:

1. Resolution No. 88-04 is rescinded.
2. The landowner shall be responsible for the extension and/or modification of the District's distribution system to provide service to all parcels of five (5) acres or more resulting from the subdivision of the lands currently served or intended to be served by the District's San Felipe Distribution System.
3. The landowners shall fulfill their responsibility to extend and/or modify the District's distribution system at the time of the subdivision of the land and prior to recordation of the Final Map.
4. The extension and/or modification of the District's distribution system shall be coordinated with San Benito County to the maximum extent practical.
5. The location, design and specifications of all extensions, additions and modifications to the District's San Felipe Distribution System shall be

determined solely and conclusively by the District except as expressly provided herein;

6. The design and construction shall be in strict accordance with District regulations and specifications then in effect and shall be reviewed and approved by the District Engineer. The cost of design review including, but not limited to facilities, land rights, document preparation and administration shall be borne by the landowner. The charge will be in accordance with District Rules and Regulations from time to time in effect.
7. The landowner design submittal shall include a list of all materials (pipe fittings, valves, etc), proposed for the project.
8. All materials shall meet the District's regulations and specifications then in effect and be approved by the District Engineer.
9. All extensions, additions and modifications shall be installed by the District at the landowners expense unless the landowner elects to undertake the installation.
10. The landowner, at the landowners expense, ~~may~~ shall have the facilities installed by a competent and experienced contractor who is licensed for the construction of water facilities by the State of California and approved by the District Engineer and shall indemnify and hold the District harmless from any personal injury, death or property damage resulting therefrom. *(As amended by Resolution No. 2000-15 on 07-17-00)*
11. The District reserves the right to construct, with its own personnel or by contract, taps on existing pipelines and extensions involving complicated connections to or interference with the District's facilities; such construction shall be at the landowners expense.
12. All facilities constructed in accordance with these regulations shall, upon acceptance by the District, become the property of the District and shall thereafter be operated and maintained by the District as a part of the San Felipe Distribution System.
13. New facilities shall be located only on land owned by the District in fee, in a public street or highway right-of-way or an easement granted to the District within an area satisfactory to the District.
14. The landowner will cause to be conveyed or granted to the District without cost to the District such land and/or easements as the District determines to be necessary for the extension, addition or modification of the San Felipe Distribution System.
15. All materials and construction undertaken by the landowner shall be inspected by an inspector designated by the District Engineer. Costs and expenses of said inspection shall be in accordance with District rules and regulations and shall be borne by the landowner.
16. Designs, drawings, material lists and land and easement descriptions may be included in the subdivision map and improvement drawings required for the subdivision by San Benito County. This landowner cost reduction measure shall be subject to the prior approval of the District Manager.

17. Where the modification of the distributions system require the replacement of existing valves and meters the landowner shall be credited the salvage value of the valves, fittings and/or meters as determined solely and conclusively by the District.

**NOW THEREFORE BE IT RESOLVED** by the Board of Directors of the San Benito County Water held on Wednesday, July 29, 1998 by the following vote.

AYES: DIRECTOR Rupert, Gonzales, Perry, Buzzetta, Swanson  
NOES: DIRECTOR None  
ABSENT: DIRECTOR None

/s/ Robert M. Swanson  
Robert Swanson, President

ATTEST: /s/ Janet L. Torres  
Janet L. Torres, Administrative Services Officer





ORDINANCE NO. 11

AN ORDINANCE ESTABLISHING THE DISTRICT'S FEES  
FOR INSPECTION OF WATER LINES WITHIN THE DISTRICT'S  
DISTRIBUTION SYSTEM AND PROVIDING FOR MODIFICATION  
THEREOF BY RESOLUTION

BE IT ORDAINED by the Board of Directors of the San Benito County Water Conservation and Flood Control District as follows:

Section 1. Intent of Ordinance: The District personnel presently inspects water lines for new construction or developments located within the District's distribution system for the purpose of insuring compliance with the District's construction standards. It is the intention of this ordinance to establish inspection fees so that the District may recover its costs for such inspection.

Section 2. Inspection Fees: Inspection fees charged for District inspection of water facilities shall be based upon the estimated cost of the construction of the water lines and appurtenances and shall be established at least annually by resolution of the Board of Directors.

Section 3. Payment of Fees: The fees established pursuant to the authority granted in this ordinance shall be paid in advance of the District's inspection. In the event fees are not so paid in advance, the District shall have no obligation to perform any such inspection until such fees are paid.

Section 4. The fee schedule established pursuant to the authority granted in this ordinance shall be reviewed at least annually. Any modification of the fee schedule shall be accomplished by resolution of the District Board of Directors.

Section 5. Constitutionality: If any section or phrase of this ordinance is for any reason held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this ordinance.

Section 6. This ordinance shall be in full force and effect at 12:01 a.m. on the 30th day after its passage and shall be published once in the Evening Free Lance, a newspaper of general circulation published and printed in the County of San Benito, State of California, together with the names of the members of the Board of Directors voting for and against same prior to 15 days from passage hereof.

Passed and adopted this 28th day of December, 1988, by the following vote:

AYES: DIRECTORS: Cullum, Gabriel, Overfelt and Porteur.

NOES: DIRECTORS: None.

ABSENT: DIRECTORS: Swanson.

SAN BENITO COUNTY WATER CONSERVATION AND  
FLOOD CONTROL DISTRICT BOARD OF DIRECTORS

By Harry J. Cullum  
Harry J. Cullum, President

ATTEST:

Mary L. Malone  
Mary L. Malone, District Secretary



ORDINANCE NO. 12  
AN ORDINANCE OF THE SAN BENITO COUNTY WATER DISTRICT  
ESTABLISHING A BACKFLOW PREVENTION SYSTEM AND REGULATIONS  
RELATING THERETO

The Board of Directors of the San Benito County Water District does ordain as follows:

I. PURPOSE

The purpose of this Ordinance is to establish reasonable precautions for the protection of San Benito County Water District's agricultural and nonagricultural water users from a potential hazard of receiving or consuming water that may contain chemicals, while continuing to allow (1) chemigation practices (the injection of necessary plant nutrients and agricultural chemicals into the farmer's on-farm irrigation facilities), (2) tailwater reuse, and drainage recycling, (3) delivery of water to commercial facilities (such as manufacturers, food and fiber processing facilities, and other businesses), (4) agricultural chemical tank filling operations, and (5) commingling well water with District water.

Water pressure in the District's system is greater than the pressure in a water user's system when water is being delivered under normal operating conditions. However, water pressure in the District's pipeline may suddenly drop below the pressure in a water user's system in the event of a break in the District's pipeline or a power failure causing a shutdown of the District's pumps. This drop in pressure may reverse the pressure gradient, thereby making it possible for the water in the water user's system to be drawn or flow back into the District's pipeline.

If a water user is injecting chemicals into an on-farm pipeline system or mixing chemicals with water from the District's system or recycling tailwater or drainwater or operating a well connected to the same system when the pressure in the District's system drops below the pressure in his on-farm system, the diluted chemical and/or well water may be drawn into the District's pipeline. The same problem may occur in connection with certain deliveries of nonagricultural (M&I) water.

## II. PERMITS

- A. Chemigation. All agricultural water users either (1) conducting chemigation practices (the injection of necessary plant nutrients, agricultural chemicals, or any other materials into the farmer's on-farm irrigation facilities), or (2) reusing tailwater or drainage recycling or (3) commingling well water through facilities or equipment interconnected with the District's water distribution system shall be required to install a District approved backflow prevention device and obtain a Chemigation Permit from the District. A separate backflow prevention device shall be required at each location where any of the above practices are taking place. Moving of the device from one location to another shall not be permitted. Permit applications shall be made on forms to be provided by the District, which forms shall include the Delivery Meter No., Assessor's Parcel No., Well No., the type of activity (chemigation, tailwater reuse, or commingling of well water) to be conducted at the site, and such other terms and conditions as the District deems advisable and in the best interest of the District. Installation, operation, and maintenance of any equipment required by this Ordinance shall comply with the permit. Such permit shall have a term of five years unless (1) delivery of water to the site by the District is discontinued, or (2) the nature of the service category is changed, or (3) specified otherwise therein, or (4) it is revoked in accordance with this Ordinance.
- B. Chemical Tank Filling. 1/  
All agricultural water users and commercial agricultural chemical applicators conducting agricultural chemical tank filling or mixing with water supplied from the District's distribution system shall obtain a permit from the District for each site to be used for such activities. Permit applications shall be made on forms to be provided by the District, which forms shall include the Delivery Meter No., Assessor's Parcel No., Well No., and such other terms and conditions as the District deems advisable and in the best interest of the District. Installation, operation, and maintenance of any equipment required by this Ordinance shall comply with the permit. Such permit shall have a term of five

years unless (1) delivery of water to the site by the District is discontinued, or (2) the nature of the service category is changed, or (3) specified otherwise therein, or (4) it is revoked in accordance with this Ordinance.

C. Nonagricultural (M&I). All nonagricultural (M&I) water users within categories 3 through 11 of Section III.B shall obtain a permit from the District for each M&I delivery location. Permit applications shall be made on forms to be provided by the District, which forms shall include the Delivery Meter No., Assessor's Parcel No., Well No., the type of activity to be conducted at the site, and such other terms and conditions as the District deems advisable and in the best interest of the District. Installation, operation, and maintenance of any equipment required by this Ordinance shall comply with the permit. Such permit shall have a term of five years unless (1) delivery of water to the site by the District is discontinued, or (2) the nature of the service category is changed, or (3) unless specified otherwise therein, or (4) it is revoked in accordance with this Ordinance.

1/ All agricultural water users and commercial agricultural chemical applicators conducting agricultural chemical tank filling or mixing with water supplied from the District's distribution system are also required to do so only in compliance with Section 6610 of Title 3 of the California Administrative Code, as the same may now or hereafter be amended, regarding backflow prevention. Commercial (for hire) applicators are also required to comply with Section 6630, Title 3 of that code, as the same may now or hereafter be amended, regarding conspicuous and legible marking of spray and mixing equipment.

As of the effective date of this Ordinance, Sections 6610 and 6630 provide as follows:

Section 6610. "Each service rig and piece of application equipment that handles pesticides and draws water from an outside source shall be equipped with an air gap separation, reduced pressure principle backflow prevention device, or double check valve assembly. Backflow protection must be acceptable to both the water purveyor and the local health department."

Section 6630. "Each person engaged for hire in the business of pest control shall keep each ground rig, service rig, and similar equipment used for mixing or applying pesticides conspicuously and legibly marked with either the business' name, or with "licensed Pest Control Operator," "Fumigation Division," Licensed Funigator" or substantially similar wording, and the pest control operator license number of the person or firm. The markings shall be large enough to be readable at a distance of 25 feet."

### III. EQUIPMENT REQUIREMENTS

A. General. Except as otherwise provided in Paragraph B of this Section III; the following table specifies the type of backflow prevention device or equipment required to be installed by the permittee in the specified conditions. All equipment installed pursuant to permits issued under this Ordinance shall be (1) as specified and approved by the District, (2) installed within 25 feet upstream of any other piped connections or injection point(s) whichever is closer to the District's delivery for which the permit is granted, (3) a permanent fixture at the location for which the permit is issued for a period of not less than one (1) year, and (4) be installed by the water user.

#### 1. Distance from District Delivery

Upon special application by the water user and a written finding by the District Manager that the circumstances warrant a variance from the standard distance requirement (25 feet) set forth herein, the District Manager may issue permits allowing a device to be installed at a distance greater than 25 feet providing; (a) that such distance shall at no time exceed 75 feet from the District's delivery, (b) that both the water user and landowner(s) certify and attest that there are no piped connections of any size or type upstream of the proposed installation point, and (c) that the device is visible and readily accessible.

III. B. SPECIFIED EQUIPMENT

Water or Service Category  
and Protection Device Required

WATER SERVICE CATEGORY

PROTECTION DEVICE REQUIRED 2/  
TO BE INSTALLED BY THE WATER  
USER

- |   |   |
|---|---|
| 1. Agricultural deliveries discharging into on-farm pipelines injecting agricultural chemicals, reusing tailwater, recycling drainage water, or commingling well water.                   | A. Air Gap Separation, or<br>B. Double Chemigation Valve Assembly. <u>3/</u>            |
| 2. User owned piped facilities capable of being used for tank filling for the Purpose of mixing or applying chemicals.  | A. Air Gap Separation, or<br>B. Double Chemigation Valve Assembly. <u>4/</u>            |
| 3. Motels, restaurants, apartments, public and private meeting places, schools, hospitals, medical buildings, nursing and convalescent homes, clinics and offices.                        | A. Air Gap Separation, or<br>B. Approved Double Check Valve Assembly.                   |
| 4. Public or private parks, playgrounds, cemeteries, golf courses.  | A. Air Gap Separation, or<br>B. Approved Double Check Valve Assembly.                   |
| 5. Canneries, packing houses, gins, reduction plants, food processors, cold storage facilities, vehicle washing facilities, feed lots, feed processors and animal containment facilities. | A. Approved Air Gap Separation, or<br>B. Reduced Pressure Principle Backflow Preventer. |
| 6. Chemical plants - supplying, manufacturing, processing, compounding or treating.   | A. Air Gap Separation.  |
| 7. Metal manufacturing, cleaning, processing, or fabrication plants or shops.   | A. Air Gap Separation, or<br>B. Approved Reduced Pressure Principle Backflow Preventer. |
| 8. Oil or gas production, storage or transmission properties or facilities.   | A. Air Gap Separation, or<br>B. Approved Reduced Pressure Principle Backflow            |
| 9. Sewage treatment and storm drain facilities.   | A. Air Gap Separation, or<br>B. Reduced Pressure Principle Backflow Preventer.          |



10. Vehicle maintenance or repair facilities.
- A. Air Gap Separation, or  
B. Reduced Pressure Principle Backflow Preventer.
11. Any facility, structure or operation not covered above or a private water system, upon a finding by the District Manager that a protection device of the type he specifies is necessary to provide the protection required by these Regulations.
- A. Air Gap Separation, or  
B. Reduced Pressure Principle Backflow Preventer, or Approved Double Check Value Assembly.

2/ If a single delivery provides more than one category of service from a single outlet, the protection device required shall be that as required for the high hazard use. Required backflow prevention devices for service categories 3-11 were obtained from the State of California, Health and Welfare Agency, Department of Health Services' Manual of Cross Connection Control Procedures and Practices. An "approved" device for these categories shall be one which has been tested, approved and listed by the University of Southern California, Foundation for Cross-Connection Control and Hydraulic Research Requirements for all service categories are subject to review and revision.

3/ The term "chemigation valve" shall mean a specially equipped flanged check valve that permits no leakage in a direction reverse to the normal flow. The closure element (e.g. clapper, disc, poppet, or other design) shall be internally weighted or loaded to promote rapid and positive closure. The valve shall be additionally equipped with: (1) A nominal 2" diameter combination air vent/vacuum relief and minimum 4" diameter inspection port located on the top of the valve upstream of the closure element, (2) a minimum 3/4" orifice size automatic low pressure drain located on the bottom of the valve upstream of the closure element, and (3) 1 nominal 3/4" diameter female thread test port located on the side of the valve downstream of the closure element. The approval of the chemigation valve by the District will be based on a favorable laboratory evaluation report by an approved independent testing laboratory. A double chemigation valve assembly means two chemigation valves in series, the second (downstream) valve need not be equipped with the 2" vacuum relief valve.

4/ Chemical tank tilling at delivery sites identified as low pressure deliveries pursuant to Appendix A. shall be done only through the use of an Air Gap Separation--direct hose connections are not allowed.



#### IV. IMPLEMENTATION AND INSTALLATION SCHEDULE

- A. Effective immediately, any water user or his designee who desires to conduct chemigation practices (the injection of necessary plant nutrients and agricultural chemicals into the farmer's on-farm irrigation facilities), or reuse tailwater or recycle drainwater, or commingle well water or fill his chemical tank or conduct any of the M&I water service activities listed in Section III. B shall obtain a permit and install the equipment required by this Ordinance prior to any such activity.
- B. All backflow prevention devices shall be installed no later than July 1, 1990.
- C. Applications for the permits required by this Ordinance shall be filed with the District office at 30 Mansfield Road, Hollister, California (P. O. Box 899, Hollister, CA 95024) at least 60 days prior to (1) the scheduled installation date or (2) the chemigation or reuse of tailwater or commingling of well water, whichever comes first, so that the permit can be issued by the District and the equipment can be timely acquired and installed by the water user.

#### V. DEVICES PROVIDED BY DISTRICT

Chemigation valves, approved double check valves and reduced pressure principal backflow preventers required by this Ordinance shall be made available by the District at the District's cost which cost shall be billed to the installing water user. Title to such devices shall remain in the District.

#### VI. INSTALLATION, MAINTENANCE, AND REPAIR

- A. The purchase and installation of the devices on facilities required under this Ordinance shall be at the sole expense of the permittee (water users).

- B. Normal maintenance and repair of the devices or facilities required under this Ordinance will be performed by the District provided however, that damage inflicted by abuse shall be billed to the water user.

#### VII. INSPECTIONS AND TESTING

- A. The District will inspect all new equipment installations for compliance with this Ordinance.
- B. All equipment installed pursuant to this Ordinance shall be inspected and tested at least annually pursuant to a schedule established by the District.
- C. All permittees shall assist and cooperate with District testing and inspection personnel to the extent reasonably necessary.

#### VIII. ENFORCEMENT

- A. Lack of Equipment or Permit
  - 1. Water deliveries to sites and for activities subject to requirements established by this Ordinance, including installation deadlines, and specified equipment as listed in Section III. B above, but for which there is no permit on file and no equipment installed pursuant to this Ordinance, shall be terminated upon 15 days written notice, except that the termination for (1) prohibited tank filling activities or (2) a water user's second failure to obtain a required permit and install the required equipment shall be effective immediately. When the user obtains the required permit, water service will be restored, but the activities covered by this Ordinance shall continue to be prohibited until installation of the equipment required under this Ordinance.
  - 2. Water deliveries to sites and for activities covered by this Ordinance and for which the required equipment has been installed without the required permit shall be terminated upon 30 days written notice.

3. In addition to the termination of water service as provided in paragraphs 1 and 2 above, chemical tank filling which does not comply with this Ordinance shall be reported to the appropriate regulatory agency.
- B. Improper Equipment. Upon a finding by the District that improper equipment has been installed or the equipment has been deficiently installed, the water user shall be given 30 days written notice to install the proper equipment or otherwise correct the deficiency. If the water user fails to correct the deficiency within the 30 day period, water service to the delivery site shall be terminated.
  - C. Equipment Test Failure
    1. Upon a finding by the District that equipment required by this Ordinance has been bypassed, altered, or otherwise made nonfunctional, the provision of Section VIII. A.1 (Lack of Equipment) shall be applicable and water service shall be terminated upon five days written notice (immediately in the case of chemical tank filling) until proper functioning is restored and the equipment is retested and recertified.
    2. Where equipment is found to be operational but otherwise fails its periodic test by the District, the water user shall cease regulated activities until repairs have been made and the device has been retested and recertified..

#### IX. MISCELLANEOUS

- A. The District Manager is hereby authorized and directed to do any and all things necessary to implement and effectuate this Ordinance.
- B. All District rules and Regulations pertaining to the delivery of, use of, and payment for water shall remain in full force and effect, except as otherwise provided herein.

- C. An appeal from any decision or determination made pursuant to this Ordinance may be made to the Board of Directors. Any such appeal shall be in writing and shall be filed with the Secretary of the District within 15 days after the decision or determination of the District Manager. In the absence of such an appeal, the decision or determination shall be final. In the event of an appeal, the decision of the Board shall be final.
- D. The District Manager shall provide a general summary of the provisions of this Ordinance to all landowners and water users within the District.

X. INVALIDITY

Should any provision of this ordinance be found by a court of law to be unconstitutional, unlawful, or invalid, such court decision shall not affect the validity of the remaining provisions of this ordinance.

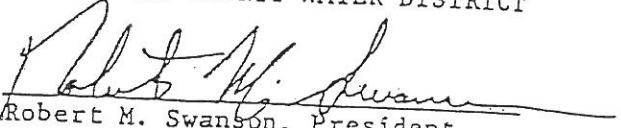
XI. EFFECTIVE DATE

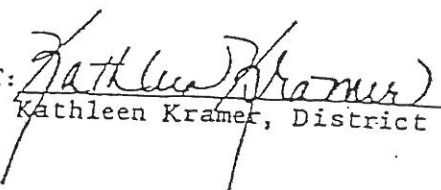
This ordinance shall be in full force and effect at 12:01 a.m. on the 30th day after its passage and shall be published once in the Pinnacle, a newspaper of general circulation published and printed in the County of San Benito, State of California, together with the names of the members of the Board of Directors voting for and against same prior to 15 days from passage hereof.

Passed and adopted this 9th day of APRIL, 1990, by the following vote.

- AYES: DIRECTORS: Swanson, Porteur, Gabriel and Cullum
- NOES: DIRECTORS: None
- ABSENT: DIRECTORS: Overfelt

SAN BENITO COUNTY WATER DISTRICT

  
Robert M. Swanson, President

ATTEST:   
Kathleen Kramer, District Secretary

Recording requested by and  
after recording, return to:

SAN BENITO COUNTY WATER DISTRICT  
P. O. Box 899  
Hollister, CA 95024-0899

APPLICATION FOR SUPPLEMENTAL FIRE PROTECTION

The undersigned \_\_\_\_\_ whose property is located  
at \_\_\_\_\_, APN \_\_\_\_\_  
does hereby request the use of the San Benito County Water District facilities for the pur-  
pose of supplemental FIRE PROTECTION.

The applicant understands that all necessary appurtenances for the connection to District  
facilities shall be the responsibility of the landowner or his lessee. Plans for all such appur-  
tenances shall be submitted to the District's Chief of Operations at the District Office, 30  
Mansfield Road, Hollister, California 95023, (408) 637-8218 and the California Department  
of Forestry, (408) 637-4475 for their approval, prior to installation.

It is further understood that the undersigned shall be responsible for the cost, installation  
and maintenance of said appurtenances.

THE UNDERSIGNED UNDERSTANDS AND AGREES THAT ALTHOUGH WATER FROM  
THE DISTRICT'S DISTRIBUTION SYSTEM MAY BE USED FOR THE PURPOSE OF  
FIRE PROTECTION, THE DISTRICT CANNOT GUARANTEE THE AVAILABILITY OF  
WATER FOR SUCH PURPOSES. THE UNDERSIGNED, AND HIS AGENTS, SUCCE-  
SORS, AND ASSIGNS, AGREE TO HOLD THE DISTRICT AND ITS AGENTS AND  
EMPLOYEES FREE AND HARMLESS FROM ANY LOSS OR DAMAGE INCURRED AS A  
RESULT OF INADEQUATE WATER OR PRESSURE IN THE DISTRIBUTION SYSTEM  
FOR FIRE FIGHTING PURPOSES.

The undersigned set their hand and seal this \_\_\_\_\_ day of \_\_\_\_\_,  
19\_\_\_\_.

Applicant

District

**ALL-PURPOSE ACKNOWLEDGMENT**

State of \_\_\_\_\_ }  
County of \_\_\_\_\_ }

On \_\_\_\_\_ before me, \_\_\_\_\_  
DATE NAME TITLE OF OFFICER - E.G. "JANE DOE, NOTARY PUBLIC"

personally appeared \_\_\_\_\_  
NAME(S) OF SIGNER(S)

personally known to me - OR -  proved to me on the basis of satisfactory evidence  
to be the person(s) whose name(s) is/are  
subscribed to the within instrument and ac-  
knowledged to me that he/she/they executed  
the same in his/her/their authorized  
capacity(ies), and that by his/her/their  
signature(s) on the instrument the person(s),  
or the entity upon behalf of which the person(s)  
acted, executed the instrument.

Witness my hand and official seal.

SIGNATURE OF NOTARY

**CAPACITY CLAIMED BY SIGNER**

- INDIVIDUAL(S)
- CORPORATE OFFICER(S) \_\_\_\_\_  
TITLE(S)
- PARTNER(S)
- ATTORNEY-IN-FACT
- TRUSTEE(S)
- SUBSCRIBING WITNESS
- GUARDIAN/CONSERVATOR
- OTHER: \_\_\_\_\_

SIGNER IS REPRESENTING:  
NAME OF PERSON(S) OR ENTITY(IES)

ATTENTION NOTARY: Although the information requested below is OPTIONAL, it could prevent fraudulent attachment of this certificate to unauthorized documents.

THIS CERTIFICATE  
MUST BE ATTACHED  
TO THE DOCUMENT  
DESCRIBED AT RIGHT:

Title or Type of Document \_\_\_\_\_  
Number of Pages \_\_\_\_\_ Date of Document \_\_\_\_\_  
Signer(s) Other Than Named Above \_\_\_\_\_



United States Department of the Interior  
Bureau of Reclamation

Outline of Process for Permits and Consents

The following is to be used as a guide to insure that all necessary information is submitted:

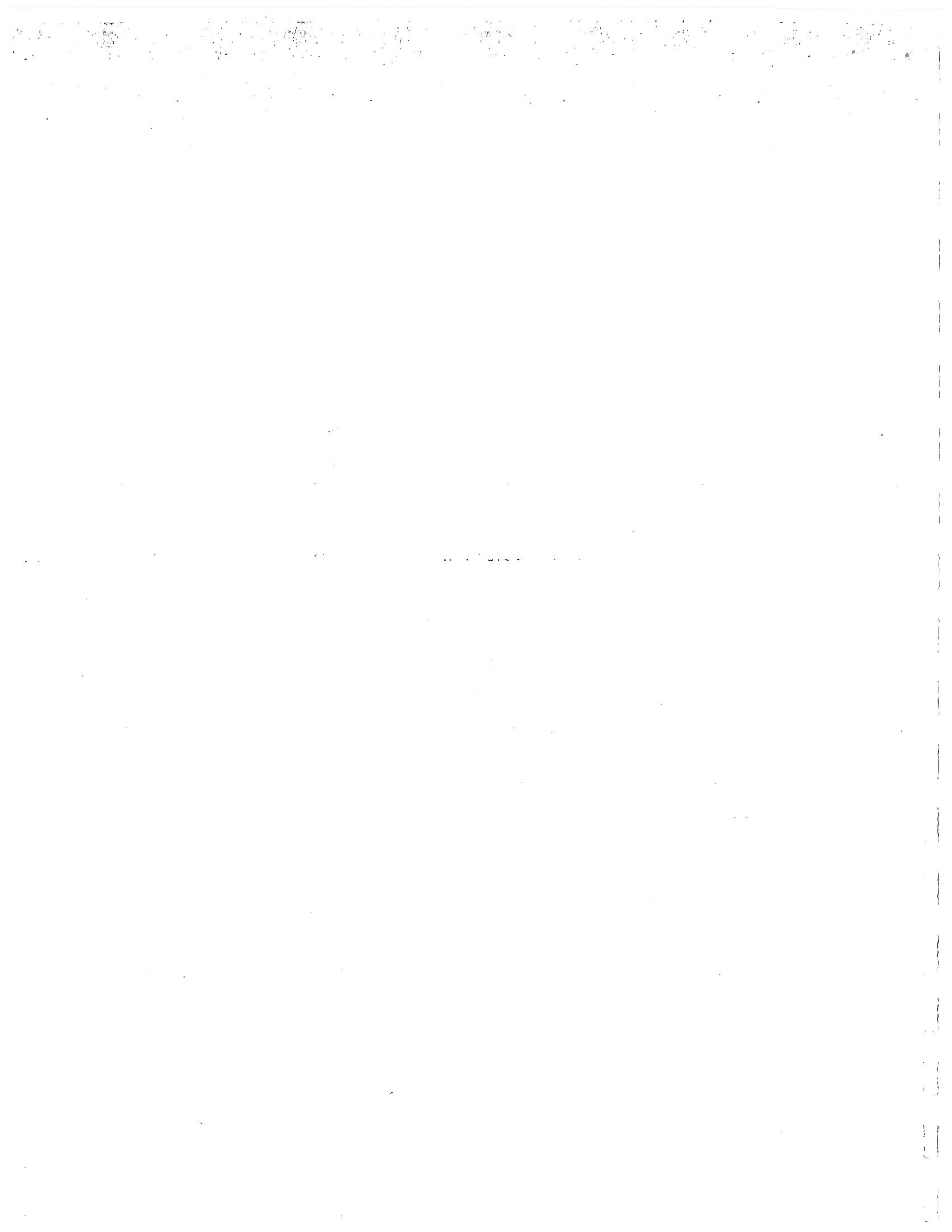
1. Copies of all correspondence received from applicant.
2. An initial deposit fee of \$200.00 from the applicant.
3. Letter from applicant agreeing to pay all administrative fees.
4. Six (6) legible copies of all pertinent maps, and drawings including plan and profile.
5. District comments, suggestions, land use stipulations, and recommendations.
6. Description of environmental impact or any available environmental statement or report with respect to the application.
7. Name and mailing address of individual, partnership or corporation to whom the document is to be issued. If partnership, names of partners composing partnership. If a corporation, state in which the corporation was organized.
8. Any other supporting information.

All of the above information should be delivered to the Water District for mailing to the Tracy Office.

When package is received by Tracy Office:

1. Sent to Engineering for review
2. Prepare CEC and draft of document
3. Letter to Regional Office with package ATTN: MP 401
4. Document received by Tracy Office from MP 401
5. Document sent to Water District for processing
6. Document received from Water District
7. Document to MP 401 for execution
8. Document received from MP 401
9. Document sent to Water District

To insure the continuity of the process all additional information should be processed by the Water District first.





**DESIGN CRITERIA**



## DESIGN CRITERIA

### 1. PIPELINE CRITERIA

(a) Underground Pipe - All pipelines shall have a minimum 36" cover to finish grade, and shall be laid at uniform grades so as to limit high points in the pipeline.

All high points shall have air valves as shown on the standard details. All pipelines shall be designed on plan and profile sheets. All tapping valves and sleeves are subject to District approval and shall be Mueller cast-iron type or equal for sizes 12" and under. Sizes over 12" shall be Romac "SST" tapping sleeves. A tapping sleeve cannot be used on the existing RPM pipe (all pipe 27" and larger in Subsystem 9 and 10).

(b) Pipeline Size Requirements - The minimum size pipeline shall be 8" diameter and the maximum size pipeline shall be 12" inside diameter unless otherwise approved by the District. All pipelines larger than 12" inside diameter shall be designed and constructed by the District at the expense of the Contractor.

The pipeline diameter shall equal or exceed the nominal diameter for any delivery served from the pipeline.

All pipelines shall be looped when practical and appropriate in the opinion of the District.

Pipelines shall be sized along the following criteria:

<u>Size</u>	<u>Cumulative Service Area</u>
8"	35 acres or less
10"	70 acres
12"	125 acres or more

or lesser size (8" minimum) used when a hydraulic analysis is performed.

The size of delivery pipe shall be no greater in diameter than the line pipe to which it is teed or tapped.

### 2. METER CRITERIA

All deliveries shall be sized from the table below according to the number of acres it serves.

<u>Max. Acres Served</u>	<u>Min. Nominal Delivery Meter Size</u>
5	2"
25	4"
60	6"
80	8"
Over 80 acres	Consult District

Piping valves, vertical flow meters, and fittings shall match the nominal delivery meter size, excepting Type C, E, and F deliveries (as shown in the standard details) where the piping size between the delivery meters and the buried butterfly valve shall be approved by the District.

Piping valves, appurtenances, and vertical flow meters are specified in Division 5, "Mechanical" and pipe and fittings are specified in Division 3, "Pipeline" of these standard specifications.

### 3. PUMPING STATION/TREATMENT FACILITY

Should the proposed project contain either a private pumping station or private treatment facility, the District shall review the proposed plans and specifications with regard to location, size, capacity, type, and method of operation. This review is in addition to any required local, State, or Federal reviews.

No pump station will be allowed or constructed that will, in the opinion of the District Engineer, have a negative impact on either the flow or pressure in any District facilities.

### 4. ENCROACHING FACILITIES

Encroachments within SBCWD pipeline corridor rights-of-way shall be held to the practicable minimum. Underground encroachments in areas where SBCWD facilities such as pipeline, thrust blocks and appurtenances are located shall also be held to the practicable minimum.

Transverse pipeline or conduit crossings of the type described in the specifications generally will be allowed if they comply with the criteria presented herein and in the Standard Details, and if no other practicable alternative exists.

Longitudinal pipeline or conduit encroachments of SBCWD pipeline rights-of-way generally will not be allowed. However, in special cases where no other feasible alternative exists, short longitudinal encroachments complying with the guidelines presented herein may be allowed. In no case will natural gas, petroleum-product, or other pipelines with cathodic protection be allowed in a longitudinal encroachment, nor will longitudinal encroachments be permitted in the area of a planned SBCWD pipeline.

Generally, individual lots in a subdivision will not be allowed to encroach on SBCWD pipeline rights-of-way. In some instances, however, individual lots may be allowed if no other feasible alternative exists. In that event, the purchaser of the lot must sign an easement agreement and comply with all the encroachment requirements.

Structures that may not be constructed in, on, or along SBCWD pipeline rights-of-way include buildings, garages, carports, trailers, longitudinal curbs, gutters, sidewalks, longitudinal concrete or gunite lined drainage channels, street light standards, supports for large signs, longitudinal fences, power or telephone poles and similar surface structures.

No trees, vines, or deep-rooted plants will be allowed within the SBCWD pipeline rights-of-way.

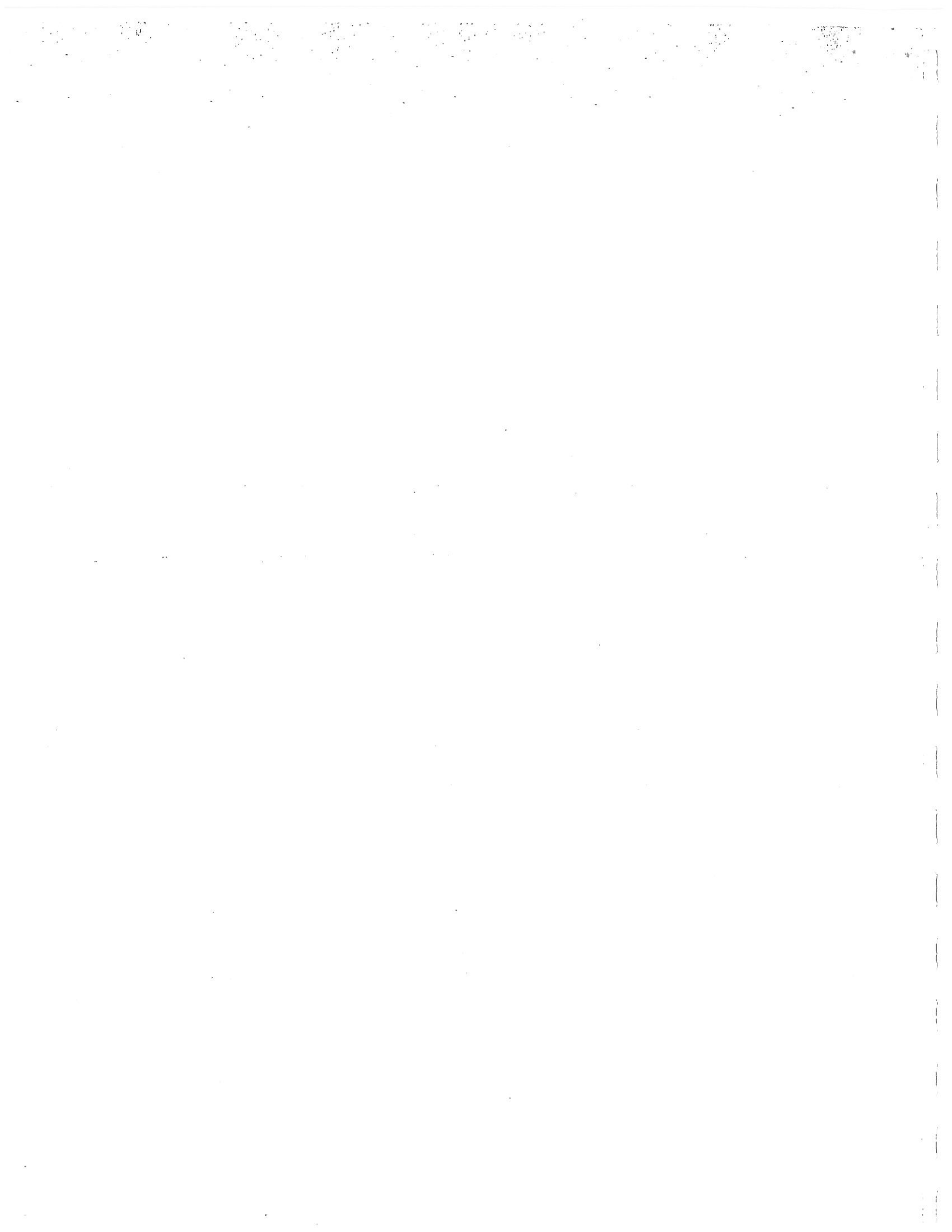
High voltage direct current power lines shall not be permitted to encroach on the SBCWD pipeline rights-of-way, except in unusual circumstances. Individual power services crossing the SBCWD pipeline will be allowed where no alternative exists. Generally, power crossings will be limited to distribution lines and a very limited number of street lights and traffic signals where no other alternative exists.

All temporary or permanent changes in ground surfaces within SBCWD pipeline rights-of-way are to be considered to be encroaching structures and must be handled as such. Earthfills and cuts on adjacent property shall not encroach onto SBCWD pipeline rights-of-way without prior approval by SBCWD.

The ground surfaces within SBCWD pipeline rights-of-way must be restored to a condition equal to that which existed before the encroachment work began or as shown on the approved plans.

Existing gravity drainage of the SBCWD pipeline rights-of-way must be maintained. Any new drainage facilities or modifications to existing facilities must be approved by the District.

If unusual conditions are proposed for the encroaching structure or unusual field conditions within SBCWD pipeline rights-of-way are encountered, the SBCWD reserves the right to impose more stringent criteria than those prescribed herein.



**GENERAL PROVISIONS**





## GENERAL PROVISIONS

### 1. INTRODUCTION

The GENERAL PROVISIONS contained herein are a portion of the Regulations and Specifications for the construction of pipelines and appurtenances to connect to the existing and/or proposed distribution system of the San Benito County Water District, whether immediately or in the future.

References in these Specifications to the Contractor shall, for the purpose of this document, refer to the individual, builder or subdivider constructing the facilities.

References in these Specifications to pay quantities and to payment shall not be applicable.

All questions regarding the applicability of any section of these Specifications shall be directed to the District in writing. Unless exemption of any provision, section, sentence, clause or part of these Specifications is given in writing, by the District, it shall be deemed applicable.

### 2. DEFINITIONS

The following terms, as used in any of the Regulations and Standard Specifications, are respectively defined as follows:

- (a) "Contract Documents" - Shall mean these Regulations and Specifications including but not limited to: the Standard Details, the Payment Bond, the Performance Bond, the General Provisions, the Specifications, the Specification Drawings, the referenced Schedule of Prevailing Rates of Wages and all addenda setting forth any modifications or interpretations of any of said documents.
- (b) "Contract" - Shall mean any and all work being performed by an individual, builder or subdivider which will connect to the existing and/or proposed distribution system of the District, whether immediately or in the future.
- (c) "District" - The San Benito County Water District with principal office in Hollister, California.
- (d) "Board of Directors" or "Board" - The Board of Directors of the District.
- (e) "Engineer" - Unless otherwise stated, District Engineer, acting either directly or through properly authorized agents or employees, such employees or agents acting within the scope of the particular duties entrusted to them.
- (f) "Contractor" - Shall mean the individual, builder or subdivider proposing construction and connection to the District's system.

(g) "Subcontractor" - The term Subcontractor, as employed herein, includes only those parties having a direct contract with the Contractor and it includes one who furnishes material worked to a special design according to the plans or specifications of this work but does not include one who merely furnishes material not so worked.

(h) "County" - County of San Benito, California

(i) "Pipe Invert" - The bottom of the inside of the pipe.

### 3. MATERIALS AND CONSTRUCTION UTILITIES

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation and other facilities necessary for the execution and completion of the work. Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of a good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials. Certificates of compliance for manufacturing and testing will be required and shall be submitted to the District prior to the installation of any materials or equipment.

### 4. PERMITS AND REGULATIONS

Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor. As previously stated, any work performed on the facilities in the rights-of-way or easements of the U.S. Bureau of Reclamation require a permit from the U.S. Bureau of Reclamation. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the District, he shall bear all costs arising therefrom.

### 5. BONDS AND INSURANCE

(a) Performance and maintenance payment bonds: The Contractor shall furnish to the District bonds as follows:

(1) Performance bond.-Performance bond with a surety or sureties approved by the District and with a penal amount equal to 100 percent of the contract price at the time of award.

(2) Payment bond.-Payment bond with a surety or sureties approved by the District for the protection of all persons supplying labor and material in the prosecution of the work provided for in the contract, for the use of each such person. The payment bond shall be in the sum of 50 percent of the contract price at the time of award.

(3) Maintenance Bond.-Corporate Surety Maintenance Bond for faulty workmanship and materials in the amount of ten percent (10%) of the total contract

cost. Said bond is to be for the term of one year after completion and acceptance of the work and shall be delivered to the District before acceptance of the contract.

(4) Costs.-All costs of furnishing performance and payment bonds shall be the responsibility of the Contractor.

(b) Requirements for execution of surety bonds: Each surety company bond (bid, performance, payment) which purports to have been executed by an agent or attorney-in-fact for the corporate surety is required to have submitted with it a power of attorney to the signatory agent or attorney-in-fact and executed by the corporate surety upon a date reasonably proximate to the date of the bond, or the power of attorney shall be accompanied by a certification of the surety to the effect that the power of attorney was in full force and effect upon a date reasonably proximate to the date of the bond.

(c) Bonding of Subcontractors: For the purposes of this paragraph, the term "subcontractor" shall mean every party to whom a part of the contract may be sublet to perform construction, alteration, or repair work on the jobsite regardless of the tier in the chain of subcontractual relationships. The term "subcontractor" does not include suppliers or others not actually performing work at the jobsite.

Except for subcontracts of \$25,000 or less, the prime contractor shall require every subcontractor of whatever tier, as evidence of his reliability and financial responsibility, to furnish a payment bond in form and with a reasonable surety thereon acceptable to the prime contractor in a penal sum of not less than 50 percent of the subcontract price to assure payment to all persons supplying labor, materials, or rental equipment to such subcontractor for either incorporation or consumption in the work covered by this contract or in its performance, provided that the maximum penal sum required will be \$250,000. The prime contractor shall furnish a copy of each subcontractor payment bond received to the District, which copy shall be accompanied by a properly dated power of attorney as provided in the paragraph above.

The obligee under the payment bond shall be the party who has let the subcontract. The bond shall give a right of action to those persons supplying such labor, materials, or rental equipment due to loss caused by the non-payment of any and all moneys owing on account thereof, provided, however, that written notice of such indebtedness is furnished to the prime contractor, the principal, and the sureties within 90 days, and suit therefor is initiated within one year, both periods to commence on the day on which the last of the labor, materials, or rental equipment were performed or furnished.

(d) Certificate of Insurance: Attention is directed to Section 7-1.12 of the California Department of Transportation Standard Specifications.

Contractor shall provide, at the time of execution of the agreement or contract for work, at his own expense, a certificate of insurance for general liability of \$1,000,000 for each occurrence or aggregate and workers' compensation.

All insurance shall be primary and the District shall be named as an additional insured under the policy.

Prior to commencement of work, the Contractor shall provide Builder's Risk "All Risk" completed value insurance coverage (including flood but unless otherwise specified in the bid documents excluding earthquake and tidal wave) upon the entire project and including completed work and work in progress. The District shall be named as an additional insured. The policy shall be endorsed to provide that it will not be cancelled without giving thirty (30) days prior written notice to the District by mail.

(e) Workers' Compensation: Pursuant to the requirements of Section 1860 of the Labor Code, the Contractor will be required to secure the payment of workers' compensation to his employees in accordance with the provisions of Section 3700 of the Labor Code.

Prior to the commencement of work, the Contractor shall sign and file with the District a certification in the following form:

"I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provision and furnish proof of said insurance before commencing the performance of the work of this contract."

(f) Nothing contained in this paragraph shall create any contractual relationship between any subcontractor and the District.

#### 6. PRECONSTRUCTION MEETING AND CONSTRUCTION SCHEDULE

After approval of the project by the District and 14 days prior to the start of construction, a preconstruction meeting shall be held. At the preconstruction meeting, the Contractor shall submit a construction schedule showing the order in which the Contractor proposes to carry on the work with estimated dates on which the Contractor will start and complete each part of the work. The construction schedule as submitted shall be used as a basis to determine inspection requirements. If the Contractor proposes to change the order of work or scheduled dates, he shall submit a revised construction schedule to the District.

#### 7. INSPECTION AND ACCEPTANCE

(a) All work (which term includes, but is not restricted to materials, workmanship, and manufacture and fabrication of components) shall be subject to inspection and test by the District at all reasonable times and at all places prior to acceptance. Any such inspection and test is for the sole benefit of the District and shall not relieve the Contractor of the responsibility of providing quality control measures to assure that the work strictly complies with the contract requirements. No inspection or test by the District shall be construed as constituting or implying acceptance. Inspection or test shall not relieve the Contractor of responsibility for damage to or loss of the material prior to acceptance, nor in any way affect the continuing rights of the District after the acceptance of the completed work under the terms of paragraph (f) of this clause, except as hereinabove provided.

(b) As stated under "Policies and Procedures", the requirements of Ordinance No. 11 and subsequent resolutions shall govern concerning the inspection fees and payment of fees.

(c) The Contractor shall, without charge, replace any material or correct any workmanship found by the District not to conform to the District's construction standards unless in the public interest the District consents to accept such material or workmanship. The Contractor shall promptly segregate and remove rejected material from the premises.

(d) If the Contractor does not promptly replace rejected material or correct rejected workmanship, the District (1) may, by contract or otherwise, replace such material or correct such workmanship and charge the cost thereof to the Contractor, or (2) may terminate the Contractor's right to proceed in accordance with the clauses of this contract.

(e) The Contractor shall furnish promptly, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspection and test as may be required by the District. All inspection and test by the District shall be performed in such manner as not to unnecessarily delay the work. Special, full-size, and performance tests shall be performed as described in the specifications. The District reserves the right to charge to the Contractor any additional cost of inspection or test when material or workmanship is not ready at the time specified by the Contractor for inspection or test or when reinspection or retest is necessitated by prior rejection.

(f) Unless otherwise provided, acceptance by the District shall be made as promptly as practicable after completion and inspection of all work required, or that portion of the work that the District determines can be accepted separately. Acceptance shall be final and conclusive except as regards latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards to District's rights under any warranty or guarantee.

#### 8. INSPECTION WORKING HOURS

Inspections shall be provided by the District between the hours of 8 A.M. and 4 P.M. on non-holiday weekdays and paid as specified under "Policies and Procedures".

The Contractor shall pay overtime for all inspections required to be performed by District employees due to the scheduling of work by the Contractor between 4 P.M. and 8 A.M. on weekdays, and anytime on Saturdays, Sundays and District Holidays, and shall include travel time of the inspector. District holidays are as follows:

New Year's Day	January 1
Lincoln's Birthday	February 12
President's Day	Third Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Veteran's Day	November 11
Thanksgiving Day	Fourth Thursday in November
Day after Thanksgiving	Fourth Friday in November
Christmas Day	December 25

Should a holiday fall on a Saturday, Friday is the day off. If the holiday falls on Sunday, Monday is the day off.



9. TIME LIMITATIONS

All shutdowns must be performed after the hour of 9 A.M. and be completed by 2 P.M. The maximum allowable shut-down on any one service is 5 hours unless otherwise approved by the District. The Contractor shall give 7 days written notice to the District of any tie-in so proper inspection may be provided.

10. STANDARD DETAILS AND INSTRUCTIONS BY DISTRICT

Where details shown on the standard details differ from the requirements of these specifications, the requirements of these specifications shall govern. In the event there are minor differences as determined by the District between details and dimensions shown on the standard details and those of existing features at the site, the details and dimensions of existing features at the site shall govern.

The District will furnish additional instructions by means of drawings or memorandum when necessary for the proper execution of the work.

11. DRAWINGS AND SPECIFICATIONS ON THE WORK

The Contractor shall keep one copy of all drawings and specifications on the work in good order, available to the District and his representatives. Such drawings and specifications shall include any changes or modifications to the work that have been included in the work completed.

12. RECORD DRAWINGS

Upon completion of construction and acceptance by the District, the Contractor shall provide the District with "as-built" drawings consisting of one (1) set of reproducible mylar prints and three (3) sets of prints as stated in Resolution No. 88-04 included under "Policies and Procedures" of these Regulations and Specifications.

13. LANDS FOR WORK

The District shall provide access to District property as necessary to construct connections to District-owned facilities. The Contractor shall confine his operations to the immediate area of the centerline location and shall conduct his operations in such a manner as to avoid injury or damage to adjoining property or improvements.

Should the Contractor find it necessary to use additional land for his purposes during construction of the work, he shall provide for the use of such lands at his own expense, together with right of access to same.

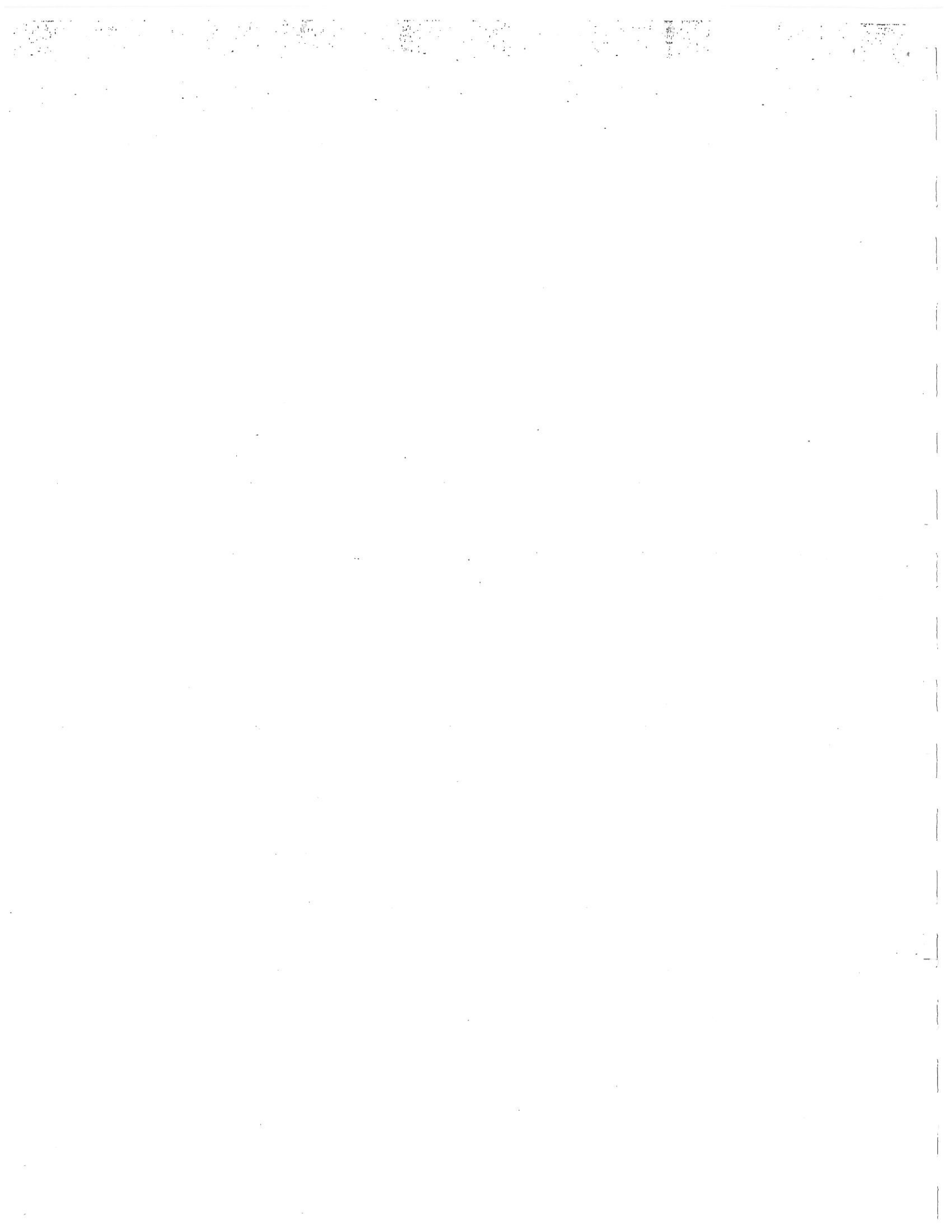
As stated in Resolution No. 88-04 included under "Policies and Procedures", the District will require a 20-foot permanent easement for the purpose of maintenance and repair of the system.

14. SUBSTITUTION OF BRANDS

Where materials and equipment are specified on the standard details or in the specifications as similar and equal to a certain brand, the Contractor may submit a request to the District for approval of another brand of equal quality. No substitution may be made without such prior approval and the District shall be the final judge of equality.

15. OWNERSHIP OF REMOVED MATERIALS

Unless otherwise specifically stated in the specifications, any existing equipment or materials removed by the Contractor during the course of the work shall remain the property of the District. Equipment shall be removed with care to prevent unnecessary damage and shall be neatly stored at a location adjacent to the site of the work or at the District Maintenance Yard at 30 Mansfield Road as directed by the District. All removed meter tubes and meters shall remain the property of the District and shall be returned to the District Maintenance Yard as directed by the District.





## SPECIFICATIONS

- DIVISION 1. GENERAL REQUIREMENTS
- DIVISION 2. EARTHWORK
- DIVISION 3. PIPELINE
- DIVISION 4. CONCRETE
- DIVISION 5. MECHANICAL
- DIVISION 6. SPECIAL CONSTRUCTION



## DIVISION 1 - GENERAL REQUIREMENTS

### SECTION 1.1 - SPECIAL CONDITIONS

#### 1.1.1 REVIEW SCHEDULE

The District will require 14 calendar days for review of drawings or data submitted by the Contractor for review, and this review time will apply to each separate submittal or resubmittal independent of the review status of the drawings or data.

#### 1.1.2 SUBMISSION OF PLAN AND PROFILE DRAWINGS

Unless otherwise specifically stated in the Special Provisions, the Contractor shall submit to the District prior to initiation of construction, five sets of plan and profile drawings showing the proposed pipeline, appurtenances and all adjacent utilities and structures for the District's review. Said plan and profile shall also indicate existing District facilities and the proposed method of connecting to said facilities.

#### 1.1.3 PERFORMANCE AND SUPERVISION OF WORK BY CONTRACTOR

a. Performance of work: The Contractor shall perform on the site and with his own organization and forces on his payroll work equivalent to at least 30 percent of the total amount of construction work at the site. The cost of contractor furnished material and equipment incorporated in the work shall not be included in computing the total amount of construction work at the site.

b. Supervision of work: If the Contractor does not give personal superintendence to the work at all times during its performance and until the work is completed and accepted, he shall provide a competent superintendent fully authorized to act in his behalf. The superintendent shall be an employee of the Contractor and on the Contractor's payroll.

#### 1.1.4 SHOP DRAWINGS, PRODUCT DATA AND STANDARDS

a. General: All drawings submitted by the Contractor shall have the Contractor's or supplier's title and drawing number on each drawing. Drawings and data shall show the District specifications number. All dimensions shall be in feet and inches and all wording, signs, symbols, etc. shall be in English.

b. Review drawings and data: As soon as practicable before proceeding with fabrication or procurement of material, the Contractor shall submit to the District for review five copies of the drawings and data listed below under the heading "Submittal of the following is required." Any fabrication or procurement performed or shipment made prior to review of the drawings and data shall be at the Contractor's risk. The District shall have the right to require the Contractor to make any changes in the equipment design which the District determines necessary to make the equipment conform to the requirements of these

specifications without additional cost to the District. Review by the District of the Contractor's drawings or data shall not be held to relieve the Contractor of any part of the Contractor's responsibility to meet all of the requirements of these specifications or of the responsibility for the correctness of the Contractor's drawings.

The drawings shall show any necessary details in fabrication or erection, which are not shown on the plans furnished to the District, and shall verify details and dimensions which are shown. Where dimensions of structures are dependent on dimensions of equipment, the Contractor shall verify these dimensions before starting any work dependent on or affected by them.

Where submittal data are required for commercial products or equipment, the Contractor shall submit complete identifying data giving the name of the Project, Contractor, equipment to which the drawing applies, manufacturer's name, type, model, size and characteristics of the equipment. When a catalog sheet is submitted, the particular item proposed shall be underlined or marked. The data shall be comprehensive and shall fully demonstrate that all equipment specified and required will be provided. Each shipment of drawings shall be accompanied by a letter of transmittal giving a list of the drawing numbers and the names mentioned above. If the equipment is accepted, two approved prints will be returned to the Contractor. If the Contractor wishes extra copies be returned, he shall submit additional copies.

Submittal of the following is required:

- (1) PVC pipe: Commercial Products Data.
- (2) All fittings: Commercial products data and/or shop drawings..
- (3) Steel casing pipe: Checked detail shop drawings of field joints showing manufacturing dimensions and tolerances and material data.
- (4) All valves: Commercial products data.
- (5) Any underground appurtenances: Commercial products data and/or shop drawings.
- (6) Any private pump stations: Certified shop and erection drawings, and data regarding pump and motor characteristics and performance. The data shall include guaranteed performance curves based on shop tests of the pumping unit which show that the unit meets the specified requirements for head, capacity, efficiency and horsepower for the capacity step specified. Certified tests of mechanically duplicate units will be acceptable.

c. Mailing address: All drawings, data, test reports, and curves shall be forwarded to: San Benito County Water District, 30 Mansfield Road, Hollister, CA 95024.

## SECTION 1.2 - MATERIALS

### 1.2.1 MATERIALS TO BE FURNISHED BY THE CONTRACTOR

- a. General: The Contractor shall furnish all materials required for completion of the work.

The words "material" or "materials" as used in these specifications to denote items furnished by the Contractor shall be construed to mean equipment, machinery, product, component, or any other item required to be incorporated in the work.

Materials furnished by the Contractor shall be of the type and quality described in these specifications or shown on the standard details. The Contractor shall make diligent effort to procure the specified materials from any and all sources, but where, because of U.S. Government priorities or other causes materials required by the specifications become unavailable, substitute materials may be used, provided that no substitute materials shall be used without prior written approval of the Engineer. The Engineer's determination as to whether substitution shall be permitted and as to what substitute materials may be used shall be final and conclusive.

- b. Inspection of Materials: Materials furnished by the Contractor which will become a part of the completed construction work shall be subject to inspection in accordance with Clause No. 3 and 7 of the General Provisions at any one or more of the following locations, as determined by the Engineer: at the place of production or manufacture, at the shipping point, or at the site of the work. To allow sufficient time to provide for inspection, the Contractor shall submit to the Engineer, at time of issuance, copies in triplicate of purchase orders, including drawings and other pertinent information covering materials on which inspection will be made as advised by the Engineer, or shall submit other evidence in the event such purchase orders are issued verbally or by letter.

The inspection of materials at any of the locations specified above or the waiving of the inspection thereof shall not be construed as being conclusive as to whether the materials and equipment conform to the requirements under Clause No. 7(a) of the General Provisions, nor shall the Contractor be relieved thereby of the responsibility for furnishing materials meeting the requirements of these specifications. Acceptance of all materials will be made only at the site of the work.

## 1.2.2 REFERENCE SPECIFICATIONS AND STANDARDS

- a. General: The materials to be furnished by the Contractor which are specified by reference to Federal Specifications, Federal Standards, or other standard specifications or codes shall be in compliance with the latest editions or revisions thereof in effect on the date drawings are received, including any amendments or supplements. In the event of conflicting requirements between a referenced specification, standard, or code, and these specifications, these specifications shall govern.

Unless otherwise specified, all materials that will become a part of the completed work shall be new and shall conform to the Federal or other specifications and standards referred to herein. Where reference specifications numbers are designated throughout these specifications, they refer to Federal Specifications unless otherwise noted. In the event that the materials are not covered by Federal or other specifications, the materials furnished shall be of standard commercial quality. Where types, grades, or other options offered in

the reference specifications are not specified in these specifications, the material furnished will be acceptable if it is in accordance with any one of the types, grades, or options offered.

The references to materials, wherein manufacturer's products or brands are specified, are made as standards of comparison only as to type, design, character, or quality of the article required, and do not restrict bidders to the manufacturer's products or to the specific brands named. It shall be the responsibility of the Contractor to prove equality of materials and products to those referenced and to provide all descriptive information, test results, and other evidence as may be necessary to prove the equality of materials or products which he offers as being equal to those referenced.

Single copies of Federal Specification may be obtained at Business Service Centers of Regional Offices of the General Services Administration. Specifications, standards, and codes published by associations or other standardizing agencies should be obtained by the Contractor, at his expense, directly from those agencies.

b. Address for obtaining reference specifications and standards: Addresses for obtaining some of the referenced specifications, standards, and codes are listed below. Information on other specifications, standards, and codes referred to in these specifications may be obtained from the Bureau of Reclamation, Attention D-1330, P.O. Box 25007, Denver, CO 80225.

Federal Specifications and Standards - Specification Sales (3 FR SBS), Building 197, Washington Navy Yard, General Services Administration, Washington, D.C. 20407.

Military Specifications and Standards - Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

AISC - American Institute of Steel Construction, Inc., 1221 Avenue of the Americas, New York, NY 10020.

AISI - American Iron and Steel Institute, 1000 16th Street NW, Washington, D.C. 20036.

ANSI - American National Standards Institute, 1430 Broadway, New York, NY 10018.

ASME - American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.

ASTM - American Society of Mechanical Engineers, 1916 Race Street, Philadelphia, PA 19103.

AWS - American Welding Society, Inc., 2501 NW Seventh Street, Miami, FL 33125.

AWWA - American Water Works Association, Inc., 6666 W. Quincy Avenue, Denver, CO 80235.

IEEE - Institute of Electrical and Electronic Engineers, 345 East 47th Street, New York, NY 10017.

IPCEA - Insulated Power Cable Engineers Association, 192 Washington Street, Belmont, MA 02178.

JIC - Joint Industrial Council, 7901 Westpark Drive, McLean, VA 22101.

NEC - National Electrical Code, National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

NEMA - National Electrical Manufacturers Association, 155 East 44th Street, New York, NY 10017.

SAE - Society of Automotive Engineers, 400 Commonwealth Drive, Pittsburgh, PA 15096.

UL - Underwriters' Laboratories, 207 East Ohio Street, Chicago, IL 60611.

### 1.2.3 MATERIALS AND WORKMANSHIP

As stated in clause No. 3 of the General Provisions, materials used in the manufacture of equipment to be furnished by the Contractor shall be of the most suitable grade for the purpose intended. The Contractor shall be responsible for the accurate manufacture and fabrication of the equipment in accordance with the best modern practice and the requirements of these specifications notwithstanding minor errors or omissions therefrom.

Liberal factors of safety and adequate shock-absorbing features shall be used throughout the designs and especially in the design of all parts subject to stresses or shock, including alternating- and vibrating-type stresses and shock. Shock-absorbing features shall include provisions which prevent components from loosening.

Unless otherwise specified, materials used in the manufacture of the equipment shall conform to applicable Federal Specifications or Federal Standards, and if there are no applicable Federal Specifications or Federal Standards, shall conform to the applicable specifications of the American Society for Testing and Materials, the Society of Automotive Engineers, or the American National Standards Institute. If the Contractor for justifiable cause proposes to deviate from or to use materials not covered by the Federal Specifications or Federal Standards, he shall state the reasons for and exact nature of the deviation and shall submit for the approval of the Engineer complete specifications for the materials that he proposes to use.

Parts shall be made accurately to standard gage where possible so as to facilitate replacement and repair. Bolts, nuts, screws, taps, pipes, and pipe fittings shall be unified screw threads conforming to ANSI B1.1 and B2.1. For internal connections of individual items of equipment only, the Contractor will be permitted to deviate from ANSI, provided that he furnishes a complete set of all such necessary taps and dies which might be required by the District to facilitate repair or replacement.

### 1.2.4 RIGHT TO OPERATE AND USE UNSATISFACTORY MATERIALS OR EQUIPMENT

If, after installation, the operation or use of the materials or equipment furnished by the Contractor proves to be unsatisfactory to the Engineer, the District shall have the right to operate or use such



materials or equipment until correction of defects, errors, or omissions, by repair or by partial or complete replacement, can be made without interfering with District operations. Unless otherwise agreed upon in advance, the period of such operation or use, pending correction of defects, will not exceed one year.

## SECTION 13 - LOCAL CONDITIONS

### 1.3.1 ELECTRICAL SUPPLY AND COMMUNICATION LINES

The Contractor shall make all necessary or required provisions and shall perform all work required by his operations under the contract and incident to any interference with electrical supply and communication lines, whether overhead or underground, existing on the date drawing approval is received with their operation or with the maintenance of service thereon, all in a manner satisfactory to the owners or operators thereof and to the Engineer.

The District will not be responsible for any errors or omissions. It shall be the responsibility of the Contractor to discover the true nature and location of utilities prior to beginning work.

The cost of providing and maintaining all necessary or required temporary structures; of making any necessary repairs, replacements, or similar operations; or furnishing indemnity or other bonds, if required; and all or any other costs required by this paragraph shall be paid by the Contractor.

### 1.3.2 INTERFERENCE WITH EXISTING IMPROVEMENTS

The pipeline and structures to be constructed under these specifications will be adjacent to, cross, or extend along existing improved property of others, including roadways, driveways, pipelines, orchards, and cultivated lands. The Contractor shall conduct his operations in such sequence and such manner as to minimize disturbance to or destruction of improvements and to interfere as little as possible with the operations of property owners. Permits shall be obtained by the Contractor, at his expense, for operations on rights-of-way of roadways and streets.

If, in the opinion of the Engineer, there is sufficient operating space to perform the work in a reasonable manner without removing or destroying existing improvements, the Contractor shall perform the work without removing or destroying such improvements and in no event shall the Contractor remove any trees, shrubs, or vines on the right-of-way or construction easements without the prior approval of the Engineer. Where the Contractor is prohibited by the Engineer from removing existing improvements, he will be permitted to remove obstructions such as overhanging branches and to perform such pruning as is necessary for the prosecution of the work. The pruning and removal of branches shall be done in such a manner as to cause the minimum amount of damage to the existing improvements.

The Contractor shall confine all of his operations within such space as is available within the right-of-way limits. If the Contractor's operations are such as to require additional space, the Contractor shall arrange and secure, at his own expense, any additional temporary space required for his operations.

The excavation, disposal of the excavated material, and backfill operations shall be performed in such a manner that lands and improvements can be restored as nearly as practicable to their



original conditions, as determined by the Engineer. Any stones, trees, brush, or other deleterious material left by construction operations shall be disposed of by means acceptable to the Engineer.

Pipe trenches shall not remain open more than 15 calendar days unless otherwise authorized in writing by the Engineer. In case pipe trenches are left open longer than 15 calendar days, the Engineer shall have the right to order the Contractor to backfill the pipe trenches and reexcavate when the pipe-laying operations are ready to proceed, and such refilling and reexcavation shall be at the Contractor's expense.

At all times the Contractor shall provide means of ingress and egress over construction activities so as to permit the removal of crops and access to residences, garages, and usual farm activities. The Contractor shall not store pipe or imported backfill materials on the right-of-way for more than 45 calendar days unless otherwise directed.

Where the pipelines cross or extend along a public street or roadway, not more than one lane of traffic shall be blocked at any time.

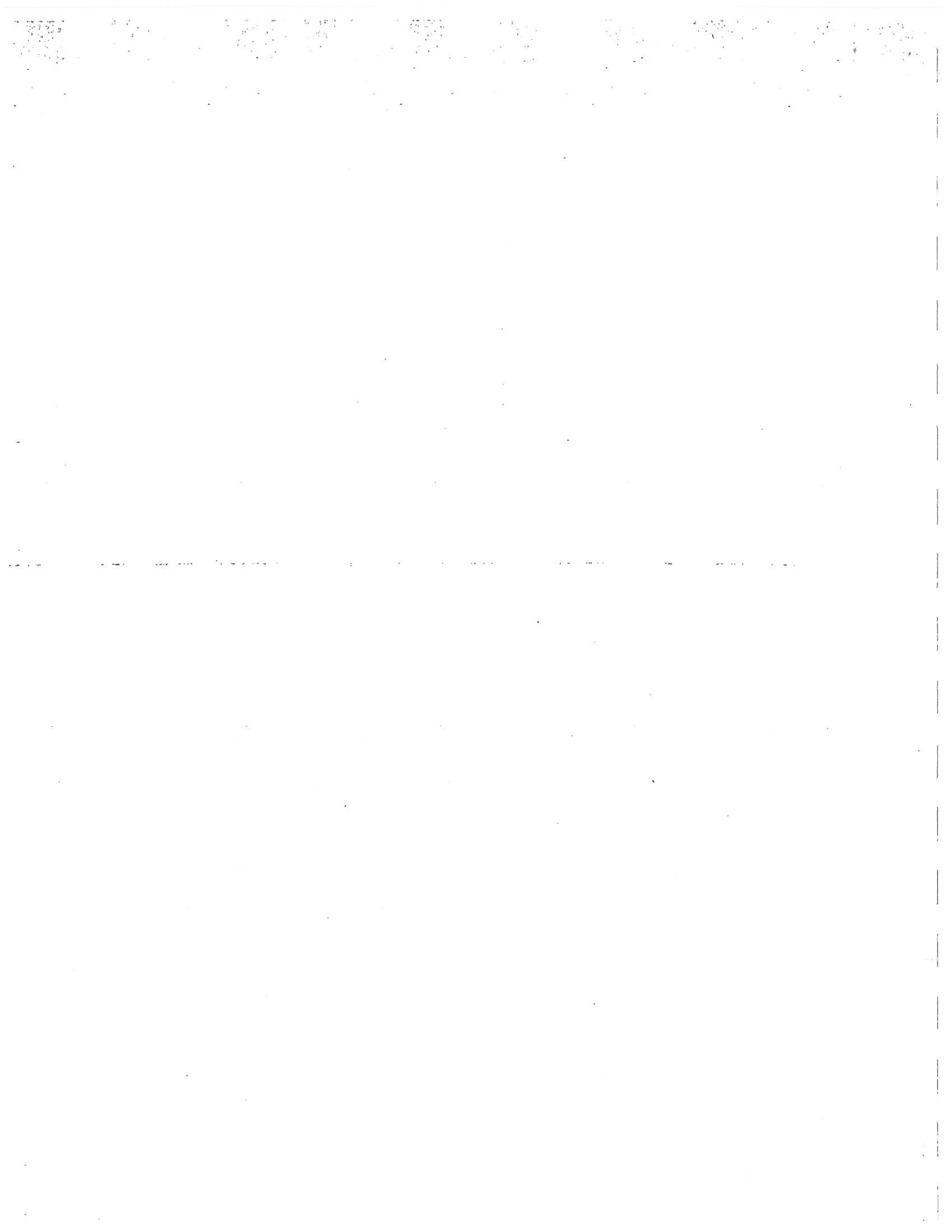
Where the pipelines cross utility lines, the owners of such utility lines shall be notified 72 hours prior to the construction at such utility line crossing. Temporary service shall be provided by the Contractor during any period when utility lines are disturbed, unless the Contractor makes other arrangements with the owners.

Domestic waterlines and sewerlines shall not be interfered with for a period of more than 2 hours unless otherwise approved by the District.

Where the pipelines are constructed across agricultural land, the Contractor shall provide the property owners with an access route across the zone of construction at all times.

The Contractor shall adequately protect all adjoining property from damage and shall be fully responsible for any damage to adjoining property that may result from his operations under the contract. Such protection shall include erection and maintenance of barricades, flasher lights, danger signals, signs, and other precautionary measures for the protection of public and private property.

The Contractor will be held strictly responsible for all damages to persons or property that occur as a result of his fault or negligence. The Contractor shall promptly notify the property owners of any damage which is his responsibility. The Contractor, within 30 days after his knowledge of or notice from a landowner of damages off the right-of-way caused by his operations under this contract, shall notify the District in writing as to his disposition of each such claim or assumption of responsibility for damage caused by any such unauthorized use. In order to adequately protect the District against claims, demands, or liabilities arising out of the Contractor's construction operations, the District shall notify the Contractor to settle the matter. If no action is taken by the Contractor within 7 days, the District will, at the Contractor's expense, settle the matter.



## DIVISION 2 - EARTHWORK

### SECTION 2.1 - EXCAVATION

#### 2.1.1 EXCAVATION FOR PIPE TRENCHES

a. General: Excavation for pipe trenches includes excavation for lateral pipelines, delivery installations, and pipeline accessories that are outside the lines for excavation for structures. It also includes other additional excavation that is outside the lines shown on the standard detail titled "Typical Trenches" that is required for certain pipeline accessories and structures. Pipeline accessories are defined as connecting, controlling, or measuring devices along the pipelines, including pipe bends, anchors, collars and air valves.

Excavation for pipe trenches for lateral pipelines, delivery installations, and pipeline accessories shall be to the lines, grades, and dimensions shown on the standard detail, as provided in this paragraph or as directed.

The bottom of the trench shall be finished accurately to the lines and grades shown on the standard detail or established by the Engineer.

The minimum widths of excavation at bottom of trench permitted are shown on the standard detail.

Trenches shall be excavated 4-inches below the bottom of the pipe and refilled with sand to the bottom of the pipe as shown on the standard detail.

b. Safety: All excavation shall conform to "Title 8 of the California Administrative Code," Article 6 of the Construction Safety Orders.

c. Foundation for pipe: Where the foundation material below the layer of sand is unsuitable as determined by the Engineer, the Contractor shall overexcavate the bottom of the trench as shown on the standard detail or as directed and replace the overexcavation with compacted sand. The backfill below the pipe shall be placed and compacted as specified in paragraph 2.2.2. If at any point in trench excavation the natural foundation material is disturbed or loosened during the excavation process or otherwise, it shall be compacted in place, or, where directed, it shall be removed and replaced with suitable material and compacted in accordance with paragraph 2.2.2. Any and all excess excavation or overexcavation performed by the Contractor for any purpose or reason except for additional excavation as may be prescribed by the Engineer, and whether or not due to the fault of the Contractor, shall be at the expense of the Contractor. Fill and compacting of fill for such excess excavation or overexcavation shall be at the expense of the Contractor.

#### 2.1.2 DISPOSAL OF EXCAVATED MATERIALS

All material from required excavations which is determined to be suitable by the Engineer may be

used for backfill about structures or other required earthwork. Excess materials and all unsuitable material shall be removed to a site obtained by the Contractor at the Contractor's expense. Any permits required for disposal of excess material shall be obtained by the Contractor.

It shall be the responsibility of the Contractor to make all arrangements and to dispose of the material removed in excavation and not suitable or required for backfill or other required earthwork.

Unless otherwise directed, no material shall be wasted in drainage channels. Waste banks shall be left with reasonably even and regular surfaces.

## SECTION 2.2 - BACKFILL

### 2.2.1 BACKFILL IN PIPE TRENCHES

Backfill in pipe trenches includes placing all backfill required about lateral pipelines, delivery installations, and pipeline accessories excavated in accordance with paragraph 2.1.1.

Backfill in pipe trenches shall be sand as specified under paragraph 4.1.1, shall be washed and shall be placed to the lines shown on the standard detail, as specified in this paragraph, or as directed. Backfill shall be placed and compacted as specified in paragraph 2.2.2. The amount of sand used for backfill, and the manner of depositing the sand shall be subject to the approval of the Engineer.

The Contractor shall furnish and place gravel in the air valve pipe wells as shown on the standard detail. The gravel shall conform to paragraph 2.2.5.

The 4-inch layer of sand below the bottom of the pipe shall be placed before the pipe is laid in the trench. The 4-inch layer of sand below the bottom of the pipe shall be compacted and struck off parallel to the centerline grade of the pipe.

Backfill shall not be dropped directly on the pipe. All backfill shall be carefully placed and spread in uniform layers. Backfill shall be placed to about the same elevation on both sides of the pipe to prevent unequal loading and displacement of pipe. The difference in elevation of the backfill on both sides of pipe shall not exceed 6-inches at any time. Backfill above compacted backfill about the pipe may be placed as soon as compacting of backfill about the pipe is completed, provided that the placing of this backfill shall be delayed at locations designated by the Engineer for the procurement of samples of compacted backfill about the pipe for testing, and further provided that if the tests indicate insufficient density of the compacted backfill about the pipe, the Contractor may be required to remove the backfill above the compacted backfill about the pipe, continue compacting the backfill until the proper density is obtained, and replace the backfill above the compacted backfill above the pipe, all at the Contractor's expense. Compacted backfill shall be placed to a minimum depth of 2 feet above the top of the pipe before construction equipment is used over the pipe. Once the above earth covers are in place, the maximum equipment loading allowed over the pipe shall be HS-20 loading in accordance with the "Standard Specifications for Highway Bridges," AASHTO latest edition. Construction equipment that exerts a larger load on the top of the pipe shall not be allowed to travel over the pipe at any time, until a method for protecting the pipe from a larger load is approved by the Engineer.

All lands along the laterals shall be restored to their original condition within 30 calendar days after the pipe is laid in the pipe trenches, provided that arrangements may be made to dispose of excess material thereon as provided in paragraph 2.1.2.

## 2.2.2 COMPACTING BACKFILL IN PIPE TRENCHES

- a. General: Backfill in pipe trenches shall be compacted as shown on the standard details, as specified in this paragraph, or as directed.
- b. Location of compacted backfill:
  - (1) Sand backfill, backfill for bedding, and backfill on outside of horizontal curves shall be compacted as shown on the standard detail.
  - (2) Backfill placed under or within 4 feet of the edge of pavement shall be compacted to the surface to County of San Benito requirements, and to dimensions and slopes as directed.
  - (3) Backfill placed where other pipelines cross lateral pipelines shall be compacted to the horizontal centerline of the pipeline crossing the lateral pipeline and to dimensions and slopes as directed.
  - (4) Backfill placed at tees with horizontal outlets, pipe bends, encasements, and collars including collar-type blocking shall be compacted as shown on the standard details.
  - (5) Where additional excavation for pipe trenches is shown on the standard details, or directed, to remove low density of other unsuitable material, the backfill required for this additional excavation shall be compacted.
  - (6) Backfill placed around valve boxes, deliveries, and pipe erected vertically for air valves shall be compacted as shown on the standard details.
- c. Compacting backfill: Backfill in pipe trenches shall be compacted in layers having about the same top elevation on both sides of the pipe to prevent unequal loading and displacement of the pipe. All compacted backfill in pipe trenches shall be free from voids or loose material. Backfill shall be compacted as specified in Sections 6 and 19 of the State of California Department of Transportation Standard Specifications.

Sand shall be deposited in horizontal layers and compacted to the relative density specified below. The excavating and placing operations shall be such that the materials, when compacted, will be blended sufficiently to secure the highest practicable unit weight and best stability. Water shall be added to the materials as may be required to obtain the specified density by method of compaction being used.

The thickness of the horizontal layers after compaction shall not be more than 6-inches if

compaction is performed by tampers or rollers; not more than 12-inches if compaction is performed by treads of crawler-type tractors, surface vibrators, or similar equipment; and not more than the penetrating depth of the vibrator if compaction is performed by internal vibrators.

The relative density tests will be made by the District at the Contractor's expense. The relative density of the compacted material shall be not less than 90 percent around the pipes and 12-inches above the top of the pipe and not less than 90 or 95 percent for the remainder of the trench as shown in the standard details. The relative density will be determined by the California Test No. 216 or 231. At the District's option the relative density may be determined by the Standard Bureau of Reclamation's relative density tests for cohesionless free draining soils. For this test, the compacted material shall not be less than 70 percent around the pipes and the remainder of the trench.

Relative density (%) =

$$\frac{\text{Max. Den. X (in-place den.-min.den.)}}{\text{In-place den. x (max. den.-min.den.)}} \times 100\%$$

### 2.2.3 STRUCTURE BACKFILL

All structural backfill shall be spread in lifts not exceeding 8 inches in uncompacted thickness; each layer shall be brought to the proper moisture content and compacted to not less than 90% of optimum density as measured by ASTM Test Designation D1557.

Do not backfill retaining walls or tank walls until the concrete wall and supporting slab have reached the specified 28-day strength with a minimum elapsed time of 10 days.

Structural backfill shall have a sand equivalent of not less than 20 and shall conform to the following grading as specified in Section 19-3.06 of the State of California Department of Transportation Standard Specifications:

<u>Sieve Sizes</u>	<u>Percentage Passing</u>
3"	100
No. 4	35-100
No. 30	20-100

### 2.2.4 TEST PITS

The Contractor shall excavate, at his expense, test pits along the lateral pipelines of 12-inch-diameter pipe at locations and at times as determined by the Engineer.

The test pits shall be excavated after the backfill has been placed and compacted to a height of outside diameter plus 12-inches above the bottom of the pipe as shown on the standard detail.

The test pits shall be excavated to a depth and area sufficient in size to allow a District inspector to visually inspect the haunch area of the pipe for voids or loose material next to the pipe and, if required, to take a field density test. Test pits shall meet all safety requirements.



After the haunch area of the pipe has been inspected and, if required, the field density test has been taken, the Contractor shall backfill and compact the test pit area in accordance with the applicable paragraphs of these specifications. If the inspection of the haunch areas of the pipe and/or the results from the field density tests show that the backfill has not been placed and compacted as required by these specifications, the Contractor will be required to excavate additional test pits along the pipeline to determine the extent of the area over which the backfill has not been placed and compacted as required. The Contractor will be required to replace and recompact the backfill in the pipe trench to meet the specifications requirements throughout the entire area of unsuitable backfill as determined from the additional test pits. The work required to excavate additional test pits and to replace and recompact the backfill shall be performed at no cost to the District.

#### 2.2.5 GRAVEL

The Contractor shall furnish all materials and perform all work for placing gravel fill in valve boxes and valve pipe wells.

The gravel shall be placed in the locations and to the lines and thicknesses shown on the standard details or as directed.

The materials used for gravel shall be as specified in Section 90-3.02 of the State of California Department of Transportation Standard Specifications and shall also be subject to approval of the Engineer. The gravel shall consist of sand and gravel, shall be reasonably well graded, and shall contain the minimum practicable amount of fine material. The gravel shall not contain stones having a dimension of more than one inch.





## DIVISION 3 - PIPELINE

### SECTION 3.1 - PIPELINE, GENERAL

#### 3.1.1 PIPE, GENERAL

The Contractor shall furnish and lay pipe as shown on the Standard Details and as specified in these specifications. Where a delivery connection or line pipe crosses an existing conduit, a minimum clear distance between pipeline and conduit of 1-foot outside to outside shall be provided. Where two pipelines furnished under these specifications are installed parallel to each other, a minimum clearance of 18 inches shall be maintained between them. Pipe installed parallel to an existing conduit shall have a minimum clearance as shown on the Standard Details, and these specifications, or shall conform to the requirements of the conduit owner, whichever is greater. The types of pipe permitted under these specifications are specified in the following paragraphs.

During manufacturing, transporting, storing, and laying pipe and pipe fittings, the pipe and pipe fittings shall not be dropped or subjected to any unnecessary jar, impact, or other treatment that could crack the shell or otherwise damage the pipe. Pipe shall not be loaded and hauled to the worksite until after the specified curing period. The Contractor shall not lay any pipe by using a method of stabbing or swinging one joint into the collar or bell of another joint.

The Contractor shall not reuse rubber gaskets when pipe joints are pulled and refitted.

The Contractor shall submit for District review those materials listed in Section 1.1.4 "Shop Drawings, Product Data and Standards" of these Standard Specifications.

#### 3.1.2 LINE PIPE

The Contractor shall be required to install PVC pressure pipe for line and delivery pipe. No other pipeline material will be permitted in distribution system construction. PVC shall be SDR 26 for Class 160 or SDR 21 for Class 200 pipe as specified under Section 3.2 "PVC Pressure Pipe".

#### 3.1.3 CASING PIPE

The casing pipe shall be steel pipe as specified by AWWA C 200. Single weld butt joints will be acceptable and field welding shall conform with AWWA C 206. The pipe shall have a minimum wall thickness of ½" and the inside diameter shall be at least 2" greater than the largest outside diameter of the carrier pipe. The casing shall be so installed as to prevent formation of waterway under the roadway. It shall have been bearing throughout its length and slope to one end. The ends of the casing shall be sealed to protect against the entrance of foreign material which might prevent ready removal of the carrier pipe.

The casing pipe shall be lined and coated with a coal-tar protective coating as specified by AWWA C 203.

Casing to be installed in open trench shall have a Bell and Spigot type ring joint similar to those specified by AWWA C 203.

### 3.1.4 FILLING AND HYDROSTATIC TESTING OF THE PIPELINE SYSTEM

The Contractor shall fill and test the pipeline as specified in this paragraph. Before filling the pipeline, the Contractor shall remove all debris. The pipeline shall be filled at a slow rate to prevent air entrapment. After the pipeline has been completely filled, it shall be maintained at a full condition for a minimum period of 24 hours before testing.

The Contractor shall furnish suitable testing plugs or caps, all necessary pressure pumps, pipe connections, gages, other equipment, and all labor required. The Contractor shall perform a combined pressure and leakage test.

The Contractor's proposed rate, time, and procedure for filling the pipeline shall be approved by the Engineer before any water is placed in the pipeline. The Contractor shall notify the Engineer at least 24 hours of the testing procedures to be used by the Contractor and before pressure is to be applied to the pipeline. Pipelines shall be tested to a minimum pressure of 200 psi. If the total length of pipeline is less than 100 feet, the pressure test may be waived by the Engineer. Upon completion of testing, the pipeline shall remain full of water. The Engineer will notify the Contractor as to when the Engineer needs to be present to observe the test results and shall be notified by the Contractor as testing proceeds.

The duration of each test shall be 2 hours. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe to maintain pressure within 5 psi of the 200 psi test pressure after the pipe has been filled with water and the air in the pipeline has been expelled. No installation shall be accepted if the leakage is greater than  $L = N \times D \times 0.0019$  where  $L$  = allowable leakage in gallons per hour,  $N$  = number of joints in the tested line, and  $D$  = minimal diameter of the pipe in inches at 200 psi test pressure.

For example, if 300 feet of 20 foot lengths of eight-inch line is being tested,

$$L = (14 \text{ joints})(8 \text{ inches})(.0019)$$

$$L = 0.21 \text{ gallons/hr. allowable leakage.}$$

If the section fails to pass the pressure or leakage test, faulty joints shall be repaired at the Contractor's expense, even to the extent of disassembling and remaking the joint, and all defective pipe and fittings shall be removed and replaced in a manner satisfactory to the Engineer. Additional tests and repairs shall be made at the Contractor's expense until the section passes the specified test.

If, in the judgment of the Engineer, it is impracticable to follow the foregoing procedure exactly for any reason, modifications in the procedure shall be made as required and approved, but in any event the Contractor shall be responsible for the ultimate tightness of the line within the above soundness and tightness requirements.

Pumps shall always be monitored while in operation to avoid accidental over pressuring of the

pipeline. Pumps shall run continuously and shall have pressure relief valves and a bypass line in the system. Two gages are required to provide a means of ensuring a correct pressure reading. Valves shall be located at the air-bleed outlet and between the pump and the bulkhead.

### 3.1.5 DELIVERY INSTALLATIONS

The Contractor shall furnish and install the delivery installations as shown on the Standard Details unless directed otherwise by the Engineer. The delivery type and location shall be shown on the Drawings.

### 3.1.6 TELEMETRY CABLE

Telemetry cable, where specified or shown on the drawings, shall be buried with all line pipe to the burial dimensions shown on the drawings. Where two line pipes are parallel, a cable shall be provided for each line pipe. At each lateral tee, a concrete electrical pull box and cover shall be provided. The pull box shall have inside dimensions of  $10\frac{1}{2}$  x  $17\frac{1}{4}$  x 12 inches deep, and shall be CALTRANS Number 3 $\frac{1}{2}$  or approved equal. The pull box shall be installed per CALTRANS Standard Specifications. Three feet of slack cable from each line pipe branch shall be placed in the box unless directed otherwise. Cable shall be provided and located to provide for future telemetry connection from devices to be located at the centerline of each delivery concrete foundation four feet above grade.

For each delivery concrete foundation, slack cable shall be coiled 24 inches below grade, adjacent to the concrete foundation and over the delivery pipe. The position of all buried slack cable shall be indicated by plastic marking tape designed for that purpose.

Cable shall be filled, rodent-resistant, double-jacketed type and shall conform to the following minimum specifications:

REA Designation BJFY

REA Specification - manufactured in accordance with PE-39

Shield - 0.010 inch copper corrugated tape.

Jacket - Double insulated (inner and outer sheath); outer jacket to be high molecular weight polyethylene.

Pair Color Coding - in accordance with PE-39.

Gauge - 19 AWG.

Number of Pairs - 12

Cable shall be continuous, with no cut ends, except at lateral ends and lateral tees. Cut ends shall be sealed with heat shrinkable sleeves. Electrical continuity shall be demonstrated to the Engineer prior to sealing and backfilling cut ends. Bends shall observe the minimum radius recommended by the cable manufacturer.

### 3.1.7 LOCATOR WIRE SYSTEM

The Contractor shall furnish and install a locator wire system on all line pipe. Locator wire shall be buried with all line pipe to the burial dimensions shown on the drawings. Locator wire shall be No. 12 AWG wire with THWN insulation and shall be taped on the top of the pipeline. The wire shall be carried into the valve box for every buried valve. Six feet of slack shall be left in each valve box with the wire entering and leaving without being broken. Splices shall be made only in the valve boxes. The wire shall be installed so as to make it easily accessible as shown on the Standard Detail.

### 3.1.8 CONSTRUCTING NON-TRENCHED ROAD CROSSINGS

- a. General: The Contractor shall furnish all materials for and construct the road crossings by jacking or slurry boring where the drawings prohibit trenching as shown on the standard detail. No excavation for the purposes of this paragraph shall be within 4-feet of edge of pavement.
- b. Jacking: The method of jacking under the highways and railroads shall be approved by the Engineer. The material required to be excavated during jacking operations shall be removed carefully so as to prevent caving and flow of the material into the pipe. The excavated hole shall be of a diameter no greater than 0.2 foot larger than the outside diameter of the pipe. Areas resulting from caving or excavation outside the specified limits shall be backfilled with sand or grout by a method that will fill the voids. The end of the pipe shall be kept within 6 inches of the face of the excavation at all times. The pipe-jacking operations shall be continuous from the time they are started until all the pipe is jacked in place. Excavated material shall be disposed of as directed.
- c. Carrier Pipe Installation: The carrier pipe shall be installed using steel casing insulators. The method of threading the carrier pipe shall be approved by the Engineer. There shall be a minimum of 2-inches of sand bedding between the outside of the carrier pipe (including couplings, etc.) and the inside of the casing. This bedding shall fill the entire annular space, with a maximum vertical unfilled void at the top of 2-inches. Precautions, approved by the Engineer, shall be taken to avoid sandblast damage to the carrier pipe during sand insertion.
- d. Materials:
  - (1) Carrier pipe shall conform to the applicable paragraphs of these specifications. Flexible couplings shall be provided on the carrier pipe at the ends of the casing pipe as shown on the standard detail.
  - (2) Casing pipe shall be smooth steel pipe conforming to the paragraphs of these specifications.
  - (3) Sand shall conform to paragraph 4.1.1.c.

(4) Mortar and grout shall be as specified in this paragraph. Mortar for pipe joints shall be mixed not richer than one part, by weight, of cement to one part, by weight, of clean well-graded sand, and not leaner than one part, by weight, of cement to two parts, by weight, of clean well-graded sand, and with just sufficient water to obtain the proper consistency. To improve the workability of the mortar, the Contractor may replace not more than 7 percent, by weight, of cement with hydrated lime, or may replace not more than 30 percent, by weight, of cement with an approved pozzolan, or may add an air-entraining agent in the mortar, or use any approved combination of these. Cement and sand and admixture or pozzolan, if used, for mortar in joints shall conform to the requirements for these materials as used in the pipe. Hydrated lime shall be a standard commercial product as approved. Any mortar which has become so stiff that proper placement cannot be assured without retempering shall be wasted, and mortar shall be prepared in small batches so as to prevent stiffening before it is used. Mortar for filling grooves shall be of such consistency that it will adhere to the ends of the pipe.

Grout used for filling joints by pouring shall be mixed in the proportion of one part of cement, by weight, to not more than one part, by weight, of sand passing No. 16-mesh screen, and thoroughly mixed to a consistency of thick cream.

### 3.1.9 PIPE IN PAVED ROAD AND DRIVEWAY CROSSINGS

Except as otherwise shown on the drawings, pipe in paved road and driveway crossings, including fittings, shall be furnished in pipe classes of not less than the pipe class of the adjacent line pipe, provided that pipe shall not be less than class 160 pipe. In all cases where Class 160 pipe is used, compaction shall be to the original ground surface unless directed otherwise by the Engineer.

### 3.1.10 PIPE CROSSINGS

Any contractor or individual duly authorized to perform construction or improvements within the SBCWD pipeline rights-of-way must notify the water district at least 48 hours prior to commencement of work and at least 24 hours prior to recommencement of work after a period of interrupted construction activity.

Any contractor or individual constructing improvements in, on, or along SBCWD pipeline rights-of-way must limit his construction to the encroaching structure previously approved by the SBCWD and construct the improvements strictly in accordance with plans approved by the SBCWD. Inspection of the construction will be made by the water district personnel. SBCWD retains the right to suspend or terminate the contractors activities within SBCWD pipeline rights-of-way if he deviates from approved plans.

Prior to construction of any structure that encroaches within SBCWD pipeline right-of-way, an excavation must be made to determine the location of existing SBCWD facilities. The excavation must be made by or in the presence of water district personnel.

Special efforts must be taken to field locate and protect SBCWD buried electrical and telemetering cables.



Any non-metallic encroaching structure below ground level shall be accompanied with a metallic strip within the SBCWD pipeline rights-of-way.

For pressure pipelines or force mains within SBCWD rights-of-way, joints must be watertight and field tested for leakage at 120% of design pressure before placing encasement or backfilling over joints. No leakage will be allowed.

The owner of newly constructed facilities that encroach on SBCWD pipeline rights-of-way shall notify the water district of the completion of construction and shall provide the water district with three copies of as-built drawings showing actual improvements constructed in, on, or along the rights-of-way.

Except in case of ordinary maintenance and emergency repairs, an owner of encroaching facilities shall give the water district at least 10 days notice in writing before entering upon SBCWD pipeline rights-of-way for the purposes of constructing, reconstructing, repairing, or removing the encroaching structure or performing any work on or in connection with the operation of the encroaching structure.

## SECTION 3.2 - PVC PRESSURE PIPE

### 3.2.1 GENERAL

Polyvinylchloride (PVC) pressure pipe, sizes 8 through 12 inches in diameter, shall be furnished, installed, and tested as herein specified.

PVC pressure pipe shall conform to ASTM D 2241 for standard dimension ratio SDR 26 for 160 psi pipe or SDR 21 for 200 psi pipe.

PVC pressure pipe shall be tested to levels as shown in ASTM D 2241.

Joints in line pipe shall be rubber gasketed.

Fittings for PVC pressure pipe shall be as specified under Section 3.3, "Fittings for PVC Pressure Pipe."

### 3.2.2 MATERIALS

a. Pipe: PVC pressure pipe shall be made from Class 12454-A or 12454-B virgin PVC resin compounds in accordance with ASTM D 1784. Physical and chemical properties shall be in accordance with ASTM D 1784.

b. Rework Materials: Clean rework materials generated from the manufacturer's own pipe production may be used by the same manufacturer for like purpose provided that the rework material meets the requirements of paragraph 3.2.2a above and the finished product incorporating the rework material is equal in quality to the product made from virgin compounds.

### 3.2.3 LAYING PVC PRESSURE PIPE

PVC piping shall be installed in a neat, workmanlike manner. Piping shall be installed to accurate lines and grades, and as specified.

Where temporary supports are used, they shall be sufficiently rigid to prevent shifting or distortion of the pipe. Provision shall be made for expansion where necessary.

Before assembly, all dirt and chips shall be removed from inside the pipe and fittings and from the threads.

After being cut to final lengths, the ends of PVC piping shall be reamed to remove burrs.

A sufficient number of unions shall be used to allow for the dismantling of all pipes, valves, and equipment. Unions shall be 250 WSP and shall be made of PVC for joining PVC pipe and malleable iron or steel with brass or bronze seats for joining ferrous pipe.

At all times when pipe installation is not actually in progress, the open ends of pipe shall be closed by temporary plugs, caps, or other approved means. For exterior buried piping, watertight plugs shall be used and if water or debris is in the trench when work is resumed, the plug shall not be removed until adequate provision has been made to prevent any water or debris entering the pipe even though this may necessitate dewatering the trench.

Testing of PVC pressure pipe shall be as specified under Section 3.14, "Filling and Hydrostatic Testing of the Pipeline System."

## SECTION 3.3 - FITTINGS FOR PVC PRESSURE PIPE

### 3.3.1 GENERAL

Tees, crosses, tapers, adapters, couplings, and bends shall be fabricated of steel or cast iron, and shall conform to the provisions of this section. All joints between steel tapers, adapters, couplings, and bends and PVC pressure pipe shall be rubber gasket joints. Shop drawings of the design of fabricated steel fittings and fittings to connect PVC pressure pipe to other types of pipe or to concrete structures or encasements shall be submitted to the District for review as specified under Section 1.1.4, "Shop Drawings, Product Data and Standards" of these Standard Specifications.

Tapers and adapters shall have ends which will fit the type of joint in the adjacent pipeline.

### 3.3.2 MATERIALS

- a. Steel Fittings: Steel pipe for use in fittings, including riser pipe on delivery meters and fire flow nozzle, shall be as specified by AWWA C 200. Single weld butt joints will be acceptable and field welding shall conform with AWWA C 206. Steel fittings shall be fabricated in accordance with AWWA C 208. Steel flanges shall be Class D or E conforming with AWWA C 207.

b. Cast Iron Fittings: Cast iron fittings shall conform to AWWA C 110 for fittings modified as necessary to accept PVC pressure pipe spigots. The overall length of fittings except tapers may vary from the AWWA standard subject to the approval of the Engineer.

Cast iron fittings shall be suitable for the class of pipe adjacent to the fittings. Flange-to-hub adapters shall be manufactured with seats perpendicular to the centerline of the pipe, capable of accepting end thrust. Cast iron fittings shall be cement mortar lined in accordance with AWWA C 104.

Where required, cast iron tapers and adapters shall be provided with cast-on rings or lugs of sufficient size to transmit the thrust from the taper or adapter to the concrete collars.

c. Tapping Valve and Sleeve: Tapped connections in pipe and fittings shall be made in such manner as to provide a watertight joint and adequate strength against pullout. The maximum size of taps in pipe or fittings without bosses shall not exceed that listed in the appropriate table of the Appendix to ANSI A21.51 based on 3 full threads for cast iron and 2 full threads for ductile iron. Tapping valve and tapping sleeves shall be Mueller type or equal cast iron flange type. Gate valve for use with tapping sleeve shall be as specified in Section 5.2.2, Materials, and shall be compatible with the tapping sleeve and tapping machine.

Where the size of the connection exceeds that given above for the pipe in question, a boss shall be provided on the pipe barrel, the tap shall be made on the flat part of the intersection of the run and branch of a tee or cross, or the connection shall be made by means of a tapped tee, branch fitting and tapped plug or reducing flange, or tapping tee and tapping valve, all as indicated or approved.

All drilling and tapping of pipe shall be done normal to the longitudinal axis of the pipe; fittings shall be drilled and tapped similarly, as appropriate. Drilling and tapping shall be done only by skilled mechanics. Tools shall be adapted to the work and in good condition so as to produce good, clean-cut threads of the correct size, pitch and taper.

### 3.3.3 LININGS AND COATINGS

a. Interior:

(1.) The interior of all steel fittings shall be fusion-bonded epoxy coated in accordance with AWWA C 213. Fusion-bonded epoxy shall be Scotchkote 134 and liquid-applied repair coating Scotchkote 314, as manufactured by 3M Company, Electrical Specialties Division, 3M Austin Center, P.O. Box 2963, Austin, Texas, 78769-2963 (1-800-722-6721); or equal. Coating thickness shall be 12-15 mils.

(2.) Cast iron fittings shall be cement-mortar lined in accordance with AWWA C 104.

b. Exterior:

(1.) Above-grade: The above-grade exterior of steel or cast-iron fittings shall be coated as follows:



Surfaces shall be pickled or sandblasted in accordance with SSPC Designation SP-8 or SP-6, respectively. One prime coat shall be applied to a minimum dry film thickness of 2.0 mils within 4 hours of blasting or while the pickled metal is still warm. Primer shall be Carboline Rustcon 230, Engard 123, Koppers Pug Primer, or an approved equal product.

Topcoat shall consist of two (2) coats of alkyd enamel in the color "Warning Blue", number 963 as used by Triangle Paint Corporation, Inc., of Berkeley, California.

Above-grade PVC fittings shall also be painted as specified herein.

(2.) Below-grade: Steel fittings installed below grade shall be fusion-bonded epoxy coated as specified above.

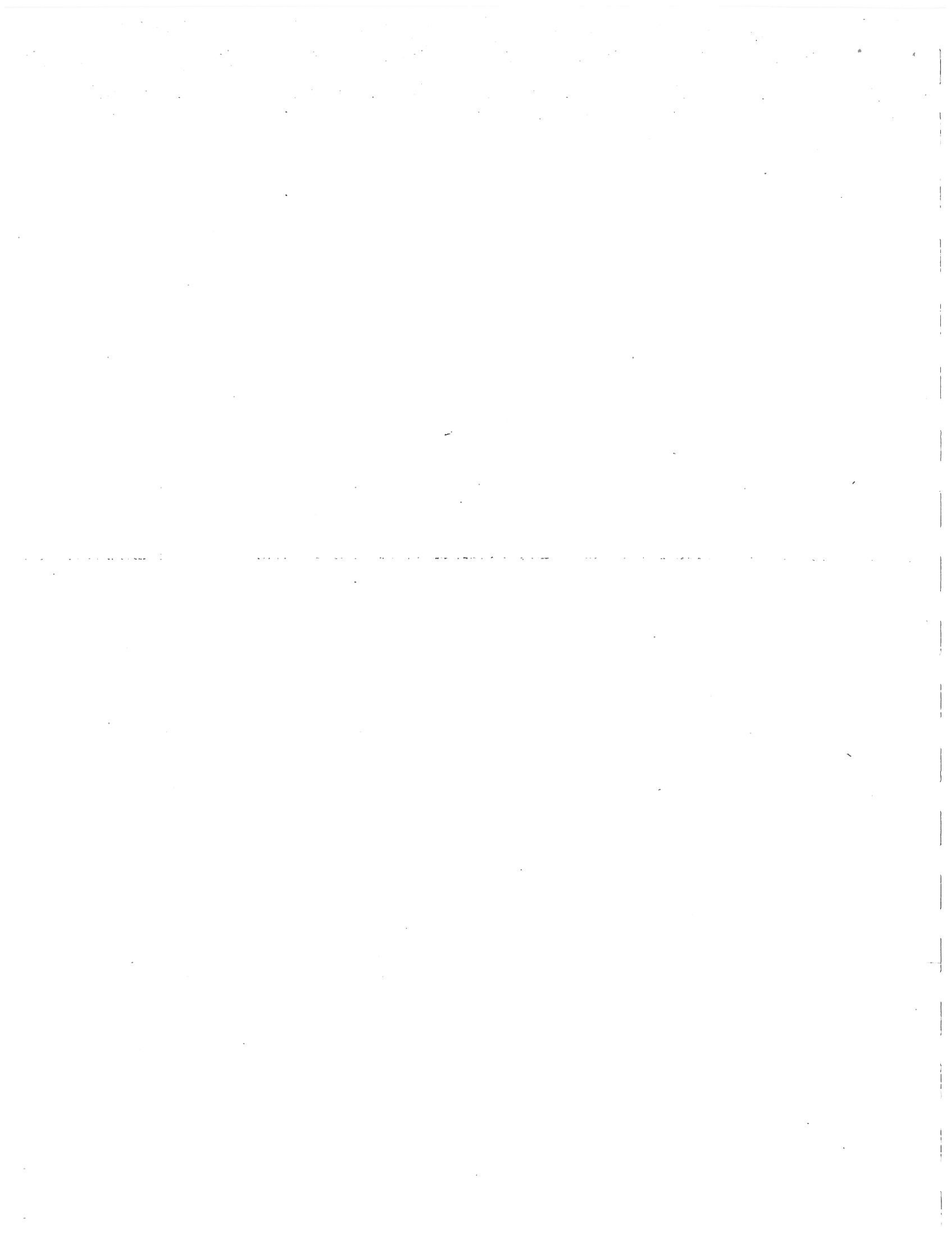
Cast-iron fittings installed below grade shall be encased with polyethylene wrap to produce a minimum thickness of 8 mils over all surfaces in accordance with AWWA C 105.

3.3.4

#### INSTALLATION

The Contractor shall furnish and install such temporary supports and bracing as may be required to hold the fittings in place and prevent distortion during backfilling and placing of concrete; however, the embedment of timber supports will not be permitted.

Fittings shall be cleared of all debris, dirt, etc., before being installed.



## DIVISION 4 - CONCRETE

### SECTION 4.1 - CONCRETE, NEW CONSTRUCTION

#### 4.1.1 MATERIALS

The Contractor shall furnish all materials for use in concrete, including cement, water, sand, coarse aggregate, and specified admixtures; and shall furnish all reinforcing bars and fabric and materials for curing concrete. Prior to placement of concrete, the Contractor shall submit to the District the brand name and manufacturer for each admixture and for curing compound. The District reserves the right to require submission of manufacturer's test data and certification of compliance, and to require submission of samples for testing of admixtures and/or curing compound prior to or during use in concrete.

a. Cement: Cement shall be Portland cement and shall conform to ASTM C 150 for Type II cement. Contractor shall use a single, approved standard brand throughout the work.

b. Water: Water shall be clean and free from deleterious amounts of acid, alkalis, silt, or organic materials.

c. Sand and coarse aggregate: Sand and coarse aggregate shall meet all requirements of ANSI/ASTM C 33. Coarse aggregate shall conform to size No. 57 (1 to 3/16-inches).

The District reserves the right to test the sand and coarse aggregate at the Contractor's expense and if required, the Contractor shall submit, for preliminary tests and approval, representative samples of the sand and coarse aggregate proposed for use in the work.

d. Air-entraining admixture: The air-entraining admixture shall conform to ASTM C 260.

e. Chemical admixture: The Contractor may use chemical admixtures which conform to ASTM C 494, type A or D when approved by the Engineer.

f. Reinforcing bars and fabric: Reinforcing bars shall conform to ANSI/ASTM A 615, grade 60, including supplementary requirements. Fabric shall be electrically welded-wire fabric conforming to ANSI/ASTM A 185 or A 497. Wire for tying reinforcement in place shall be No. 18 AWG black annealed or heavier.

g. Formwork: Formwork shall be 5/8 B-B Plyform, Class I or better. Each sheet shall be grade stamped with an APA grade mark.

#### 4.1.2 COMPOSITION

The maximum water-cement ratio of the concrete shall be 5.5 gallons per sack. The slump of the concrete when placed shall not exceed 3-inches. The compressive strength of the concrete shall be sufficient to insure that each concrete mix meets the following requirements:

- a. Eighty percent of test cylinders shall have a compressive strength at 28 days in excess of 3,000 psi.
- b. The average compressive strength at 28 days of any six consecutive test cylinders shall exceed 3,000 psi.

The compressive strength of the concrete will be in accordance with Section 90-9 of the latest edition of the State of California Department of Transportation Standard Specifications.

Unless otherwise directed, the Contractor shall design the concrete mix in accordance with these specifications.

<u>Class of Concrete</u>	<u>Maximum Size Aggregate in Concrete (inch)</u>	<u>Maximum Slump (inch)</u>	<u>Total Air Content (%)</u>
A	1 inch	3	5.5 ± 0.5

Each mix design shall be submitted to the Engineer for review prior to use of the concrete mix.

The District will test the concrete for compliance with the specifications and reserves the right to design and adjust mix proportions.

Air-entraining admixture shall be used in such amount as will effect the entrainment of from 4 to 6 percent of air, by volume, of the concrete as discharged from the mixer.

#### 4.1.3 EXECUTION

a. Batching, Mixing, and Transportation: All concrete shall be mixed and delivered in accordance with the "Specification for Ready-Mixed Concrete" (ASTM C 94).

b. Forms: The forms shall be smooth, mortar-tight, true to the required lines and grade, and of sufficient strength to resist springing out of shape during the placing and vibrating of concrete. All dirt, chips, sawdust and other foreign matter shall be completely removed before concrete is placed. Forms previously used shall be thoroughly cleaned of all dirt, mortar and foreign matter before being used. Before concrete is placed in forms, all inside surfaces of the form shall be thoroughly coated with an approved form sealer. The form sealer shall be of high penetrating quality leaving no film on the surface of the forms that can be absorbed by the concrete or be incompatible with concrete paint.

All exposed edges shall be chamfered with triangular fillets not less than 3/4 inch by 3/4 inch. These fillets and chamfer strips shall be milled from clear straight grain lumber and shall be surface on all sides.

Joints in formwork for exposed building foundation walls and curbs shall be taped.

c. Stripping: Forms shall be removed in such manner as to insure the complete safety of the structure.

Formwork for walls and other parts not supporting the weight of the concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations (minimum elapsed time 24 hours) particularly when form ties will be bent by the removal operations.

Formwork for beam soffits and slabs and other parts that support the weight of concrete, shall remain in place until the concrete has reached its specified 28-day strength, with a minimum of 14 days elapsed before form removal.

When shores and other vertical supports are so arranged that the form facing material may be removed without loosening or disturbing the shores and supports, the facing material may be removed at an earlier age as specified or permitted. The shores and supports shall remain in place until the concrete has reached its specified 28-day strength, with a minimum of 14 days elapsed before form removal.

Retaining walls, building walls or tank wall shall not be backfilled until the concrete wall and supporting slab or slabs have reached the specified 28-day strength, with a minimum of 10 days elapsed time before backfilling.

Whenever the formwork is removed during the curing period, the exposed concrete shall be cured by one of the methods specified herein.

d. Reinforcing: Steel reinforcement shall be accurately placed and shall be supported and secured against displacement by the use of adequate and proper supporting and spacing devices, tie wires, etc., so that it will remain in its correct location in the finished work. No supporting devices shall be used that will impede the flow of concrete.

Unless otherwise directed, the minimum concrete coverage for steel reinforcement shall be as follows:

Where concrete is deposited against ground:	3"
Concrete in forms exposed to earth:	2"

The clear spacing between parallel bars shall not be less than 1-1/2 times the nominal diameter of the maximum size aggregate, and in no case less than 1-1/2 inches, except at splices which may be wired together.

Reinforcement will be inspected for compliance with requirements as to size, shape, length, splicing, position, and amount after it has been placed.

e. Placing concrete: All concrete shall be placed, finished and cured, and all other pertinent construction practices shall be in accordance with the Specifications for Structural Concrete for Buildings (ACI 301), hereby made a part of these specifications.

In addition to the requirements of ACI 301, concrete shall be placed so that:

- (1) A uniform appearance of surfaces will be obtained.
- (2) The concrete will be free of all rock pockets, honeycombs and voids.

- (3) Deposit as nearly as practical in its final position.
- (4) Deposit in walls in approximately 18 inch layers, preceding at a uniform rate.
- (5) Do not deposit or place concrete until all forms, reinforcing steel, and construction joints have been inspected by the Engineer and accepted in advance within the entire extent of the pour.

(6) The subgrade must be moist when the concrete is placed for floor slabs to prevent excessive loss of water from the concrete mix.

f. Vibrators and vibrating: Employ as many vibrators and tampers as necessary to secure the desired results. Minimum: one per each 20 cubic yards of concrete placed per hour.

Eliminate the following practices:

- (1) Pushing of concrete with vibrator.
- (2) External vibration of forms.
- (3) Allowing vibrator to vibrate against reinforcing steel where steel projects into green concrete.
- (4) Allowing vibrator to vibrate contact faces of forms.

Vibrators shall function a minimum frequency of 3600 cycles per minute when submerged in concrete.

Supplement vibration by forking and spading along the surfaces of the forms and between reinforcing whenever flow is restricted.

g. Curing:

(1) General: Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures and shall be maintained with minimal moisture loss at a relatively constant temperature for the period of time necessary for the hydration of the cement and proper hardening of the concrete.

(2) Initial Curing: Initial curing shall immediately follow the finishing operation. Concrete shall be kept continuously moist at least overnight. One of the following materials or methods shall be used.

- o Ponding or continuous sprinkling.
- o Absorptive mat or fabric kept continuously wet.
- o Waterproof paper conforming to ASTM C 171.

- o Curing compounds conforming to "Specifications for Liquid Membrane-Forming Compounds for Curing Concrete" (ASTM C 309). Such compounds shall be applied in accordance with the recommendations of the manufacturer and shall not be used on any surfaces against which additional concrete or other cementitious finishing materials are to be bonded, nor on surfaces on which such curing is prohibited by the project specifications.

(3) Final curing: Immediately following the initial curing and before the concrete has dried, additional curing shall be accomplished by one of the following materials or methods:

- o Continuing the method used in initial curing.
- o Waterproof paper conforming to "Specifications for Waterproof Paper for Curing Concrete" (ASTM C 171).
- o Other moisture-retaining coverings as approved.

(4) Duration of curing: The final curing shall continue until the cumulative number of days or fractions thereof, not necessarily consecutive, during which temperature of the air in contact with the concrete is above 50°F has totaled 7 days. If high-early-strength concrete has been used, the final curing shall continue for a total of 3 days. Rapid drying at the end of the curing period shall be prevented.

(5) Formed surfaces: Steel forms heated by the sun and all wood forms in contact with the concrete during the final curing period shall be kept wet. If forms are to be removed during the curing period, one of the above curing materials or methods shall be employed immediately. Such curing shall be continued for the remainder of the curing period.

h. Construction joints: Joints not shown on the drawing shall be so made and located as to least impair the strength of the structural element and shall be approved by the Engineer.

The surfaces of all concrete at all joints shall be thoroughly cleaned and all laitance removed by sandblasting. In preparation for the next pour, the joints shall be dampened, then thoroughly covered with a coat of neat cement mortar of similar proportions to the mortar in the concrete. The mortar shall be as thick as possible on vertical surfaces at least 1/2" thick on horizontal surfaces. The fresh concrete shall be placed before the mortar has obtained its initial set.

i. Embedded items: All sleeves, inserts, anchors, and embedded items required for adjoining work or for its support shall be placed prior to concreting. Embedded items shall be positioned accurately and supported against displacement. Voids in sleeves, inserts and anchor bolt slots shall be filled temporarily with a readily removable material to prevent entry of concrete into the voids.

j. Cold weather concreting: When the mean daily temperature falls below 40°F, concreting shall be in accordance with the "Recommended Practice for Cold Weather



Concrete - ACI 306". A written statement of the precautions proposed to be taken for depositing concrete below 40°F. temperature shall be submitted to the Engineer for acceptance.

k. Concrete finishes:

(1) Rough or board form finish: Rough or board form finish surfaces shall be true to line and plane with no specific requirements for selected facing materials. Tie holes and defects shall be patched and fins shall be rubbed down with wooden blocks. Otherwise, surfaces shall be left with the texture imparted by the forms.

(2) Grout cleaned finish: After the concrete, still freshly hardened, has been predampened, a slurry consisting of 1 part cement (including an appropriate quantity of white cement) and 1-1/2 parts sand passing the No. 16 sieve, by damp loose volume, shall be spread over the surface with clean burlap pads or sponge rubber floats. Any surplus shall be removed by scraping and then rubbing with clean burlap. The finish shall be cured in an approved manner. Sample to be approved by Engineer.

(3) Broom or belt finish: Slabs shall be given a coarse traverse scored texture by drawing a broom or burlap belt across the surface. This operation shall follow immediately after floating. Slab finishing tolerance shall be 1/8" in 10'.

## SECTION 4.2 - REPAIR OF CONCRETE

All concrete that is damaged or defective from any cause; concrete that is honeycombed, fractured, or otherwise defective; and concrete which, because of excessive surface depressions, must be excavated and built up to bring the surfaces to the prescribed lines shall be removed and replaced and imperfections and irregularities on concrete surfaces shall be corrected to the satisfaction of the Engineer. The proposed method of repair shall be submitted for approval prior to any repairs.



## DIVISION 5 - MECHANICAL

### SECTION 5.1 - MECHANICAL, GENERAL

The Contractor shall submit for District review those materials listed in Section 1.1.4 of these Standard Specifications.

This section covers valves and appurtenances and flow meters. Fittings and pipe are specified in Division 3, "Pipeline" of these Standard Specifications.

### SECTION 5.2 - VALVES AND APPURTENANCES

#### 5.2.1 GENERAL

The Contractor shall furnish and install the various types and sizes of valves and appurtenances and flow meters. The valves and appurtenances and flow meters shall be in accordance with the requirements of these specifications and as shown on the standard details.

In-line valves shall be of a diameter equal to the downstream pipe, unless shown otherwise.

#### 5.2.2 MATERIALS

- a. Sleeve-type couplings: Style 38, without pipe stops, as manufactured by Dresser Manufacturing Division, 41 Fisher Avenue, Bradford, PA 16701; or equal.
- b. Valve boxes:
  - (1) Valve boxes for field installation shall be concrete valve boxes equal to Series No. 9 or valve extension No. 1-R by Brooks Products, Inc., 10141 Olney Street, El Monte, CA 91734.
  - (2) Valve boxes and valve box extensions for roadway installation shall be equal to No. 3-RT by Brooks Products, Inc., 10141 Olney Street, El Monte, CA 91734.
- c. Gravel for valve boxes: Gravel for valve boxes shall conform to paragraph 2.2.5.
- d. Bronze Gate valves: Bronze gate valves, Federal Specification WW-V-54D, type I, II, or III, class B, Screwed. Valves shall open when turning the operator in a counter-clockwise direction.

Bronze gate valves shall be used only in air valve installations.

- e. Tapping Sleeves and Gate Valves: AWWA Standard C 509, resilient-seated with stainless steel bolts, "O" ring seals, non-rising stem, open left, two-inch (2") square wrench nut with 304 stainless steel retainer nut inside. Gate valves shall be as manufactured by Mueller or approved equal.

Gate valve used for tapping sleeves shall be flanged on both sides. Mueller tapping sleeve or equal shall be used for installations of 12" or smaller.

Gate valves 10" or larger shall be approved by the District. Bypass valves may be required.

f. Butterfly valves: AWWA standard C 504, class 150B, with the axis of the leaf horizontal with the valve in the installed position. Butterfly valves shall be Groundhog as manufactured by Henry Pratt Company, 401 S. Highland Avenue, Aurora, IL 60507; or approved equal.

Buried butterfly valves, except bypass valves, shall be flanged type, suitable for buried service, and equipped with manual operators with 2 inch square operating nut. Valves shall open when turning the operator in a counter-clockwise direction. The valves shall be furnished with the valve boxes and extension stems, and a total of four tee-handled wrenches.

Buried butterfly valves for bypasses shall be flanged type, suitable for buried service, equipped with manual operators with 2 inch square operating nut. Valves shall open when turning the operator in a counter-clockwise direction. The valves shall be furnished with the valve boxes and extension stems.

The 2" operator nuts for all buried butterfly valves shall be 4 feet or less from the original ground surface. All extensions shall be approved by the Engineer.

The butterfly valves at the deliveries shall be flanges and equipped with manual operators, handwheels, and position indicators. Valves shall open when turning the operator in a counter-clockwise direction.

g. Air valves: Air release valves shall be APCO Model 145C Combination Air Release Valves or approved equal. The valve shall have a 2" minimum large orifice and 5/64" minimum small orifice. The valve shall be of the lever frame type. The valve shall have 1" NPT threaded inlet and outlet. The valve shall permit large volumes of air to pass while the line is filling or draining and continuous venting of the air pockets while the line is in service. The valve will include both of these functions in a single valve body.

h. Corporation stops: Catalog No. H-9996 as manufactured by Mueller Co., Decatur, Illinois; or equal.

i. Vertical flow meter: The vertical flow meter shall consist of a meter tube, flow straightening vanes and vertical propeller meter as shown on the standard details.

(1) Meter tube: The meter tube shall be of fabricated steel construction as specified for steel fittings in Section 3.3, "Fittings for PVC Pressure Pipe" of these Standard Specifications with wall thickness of not less than 3/16" thick, and shall have a flanged side outlet of the same size as the inlet. The flanged inlet and outlet shall conform to AWWA standard C 207, Class D, flanges with bolt holes straddling the centerline. A flanged mounting shall be provided at the top of the meter tube, which is suitable for attaching the meter assembly.

A 1½" and 3/4" coupling shall be provided and located on the meter tube and shall include appropriate plugs, as shown in the standard details.

(2) Flow straightening vanes: Provide flow straightening vanes immediately upstream of the inlet flange on all flow meters 6" and larger. Such vanes shall conform to the meter manufacturer's recommended design for welded vanes.

(3) Vertical propeller meter: Sparling Meter Manufacturing Series 100, Model FM132 Verti-flow meter.

j. The Contractor shall install, on any pipeline that terminates by any means other than an above ground delivery, a "blow-off valve" (2 inch discharge minimum) as shown on the standard detail. Said valve shall be capable of expelling air and/or water from the pipeline.

### 5.2.3 LININGS AND COATINGS

Lining of valves and appurtenances shall be as per the manufacturer's recommendations. The steel meter tube interior shall be fusion-bonded epoxy coated in accordance with AWWA C 213. Fusion-bonded epoxy shall be Scotchkote 134 and liquid-applied repair coating Scotchkote 314, as manufactured by 3M Company, Electrical Specialties Division, 3M Austin Center, P.O. Box 2963, Austin, Texas, 78769-2963 (1-800-722-6721); or equal. Coating thickness shall be 12-15 mils.

Before exposure to the weather and after thorough cleaning to remove all rust, dirt, grease and other foreign matter, the equipment and appurtenances specified herein shall be coated as specified hereinafter.

a. Above grade: Ferrous parts, not customarily finished at the shop, shall be pickled or sandblasted in accordance with SSPC Designation SP-8 or SP-6, respectively. One prime coat shall be applied to a minimum dry film thickness of 2.0 mills within 4 hours of blasting or while the pickled metal is still warm. Primer shall be Carboline Rustcon 230, Engard 123, Koppers Pug Primer, or an approved equal product.

Topcoat shall consist of two (2) coats of alkyd enamel in the color "Warning Blue, number 963 as used by Triangle Paint Company, Inc., of Berkeley, California.

b. Below grade: Buried valves and appurtenances shall be encased with polyethylene wrap to produce a minimum thickness of 8 mils over all surfaces in accordance with AWWA C 105.

### 5.2.4 INSTALLATION

Valves shall be installed as nearly as possible in the positions indicated on the drawings consistent with the conveniences of operating the hand wheel. All valves shall be carefully erected and supported in their respective positions free from all distortion and strain or appurtenances during handling and installation. All material shall be carefully inspected for defects in workmanship and material, all debris and foreign material cleaned out of valve openings and seats, all operating mechanisms operated to check their proper functioning, and all nuts and bolts checked for tightness.

Valves and other equipment which do not operate easily or are otherwise defective shall be repaired or replaced at the Contractor's expense.

Valves shall not be installed with stems below the horizontal. Valves shall be set plumb and supported adequately in conformity with instructions of the manufacturer.

A permanent type gasket of uniform thickness shall be provided between flanges of valves.

## DIVISION 6 - SPECIAL CONSTRUCTION

### SECTION 6.1 - SPECIAL STRUCTURE REQUIREMENTS

#### 6.1.1 AIR VALVE WELLS

a. General: The Contractor shall furnish and erect pipe vertically for the air valves as shown on the standard details. The pipe lengths and diameters shall be as shown on the standard details or as directed. Where wells require pipe of sufficient length, the pipe may be furnished in manufactured lengths. Otherwise, the pipe shall be cut to lengths shown on the standard details or as directed.

b. Materials: Pipe erected vertically for the air valve wells may be concrete culvert pipe conforming to ANSI/ASTM C 76, Class II or III. Cement used in concrete culvert pipe shall meet the requirements of Federal Specification SS-C-1960 3A for Type II portland cement and shall meet the low-alkali requirements and false-set limitations specified therein.

Pipe erected vertically shall have bell-and-spigot ends, tongue-and-groove ends, or square-cut ends. Pipe joints for the air-valve wells shall be banded, collared, or bell-and-spigot joints without rubber gaskets.

The Contractor shall furnish and install covers for the air-valve wells in accordance with the standard details. Covers for the air-valve wells shall conform to paragraph 6.12.

c. Erection: Backfill or concrete placed about the pipe erected vertically shall be placed carefully so that the pipe will not be moved after erection.

#### 6.1.2 COVERS FOR AIR-VALVE WELLS

a. General: The Contractor shall furnish and install covers for the air-valve wells as shown on the standard details and in accordance with this paragraph. The metal covers and related support brackets and hardware shall be galvanized zinc-coated (hot dip) after fabrication. Painting is not required.

b. Materials:

(1) Structural steel.-Structural shapes, plates and bars shall conform to Federal Specification QQ-S-741D.

(2) Expansion anchors.-Expansion anchors shall conform to Federal Specification FF-S-325, group 1, type 1, class 2, or group II, type 4, class 1. Proof load test will not be required.

(3) Bolts and nuts.-Bolts and nuts shall conform to Federal Specifications FF-N-836C and FF-B-575C.

c. Welding: Welding shall conform to the requirements of AWS D1.1.

d. Galvanizing zinc coating (hot dip): Galvanizing zinc coating (hot dip) shall conform to ASTM Designations A 123 and A 153. Galvanizing zinc coating (hot dip) on assembled metal work shall conform to ASTM Designations A 384, A 385 and A 386.

### 6.13

#### INDICATOR POSTS

a. General: The Contractor shall furnish and erect indicator posts at each valve site indicated by the Engineer. The indicator posts shall be erected as shown on the drawings.

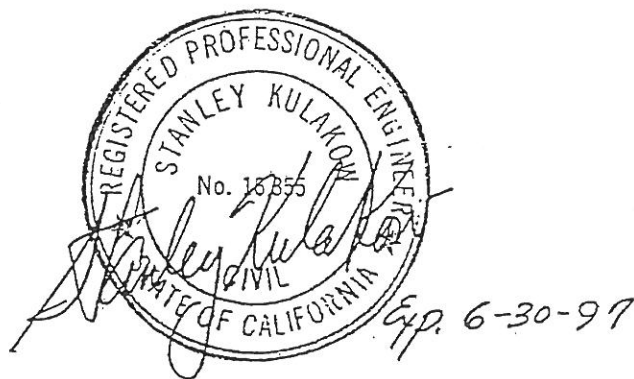
b. Materials: The indicator posts shall be flexible fiberglass delineators with concave design. Delineators shall be white, 62-inches long, and furnished with yellow, 3"x12", engineering grade reflective tape. Engineering grade reflective tape shall be installed 2 inches from the top of the delineator post. The delineators shall be Flextron No. FT-62-MCD as manufactured by Carson Manufacturing Co. or approved equal.

c. Erection: The Contractor shall perform all work, including earthwork required for complete erection of the indicator posts. The indicator posts shall be installed as per manufacturer's recommendations.

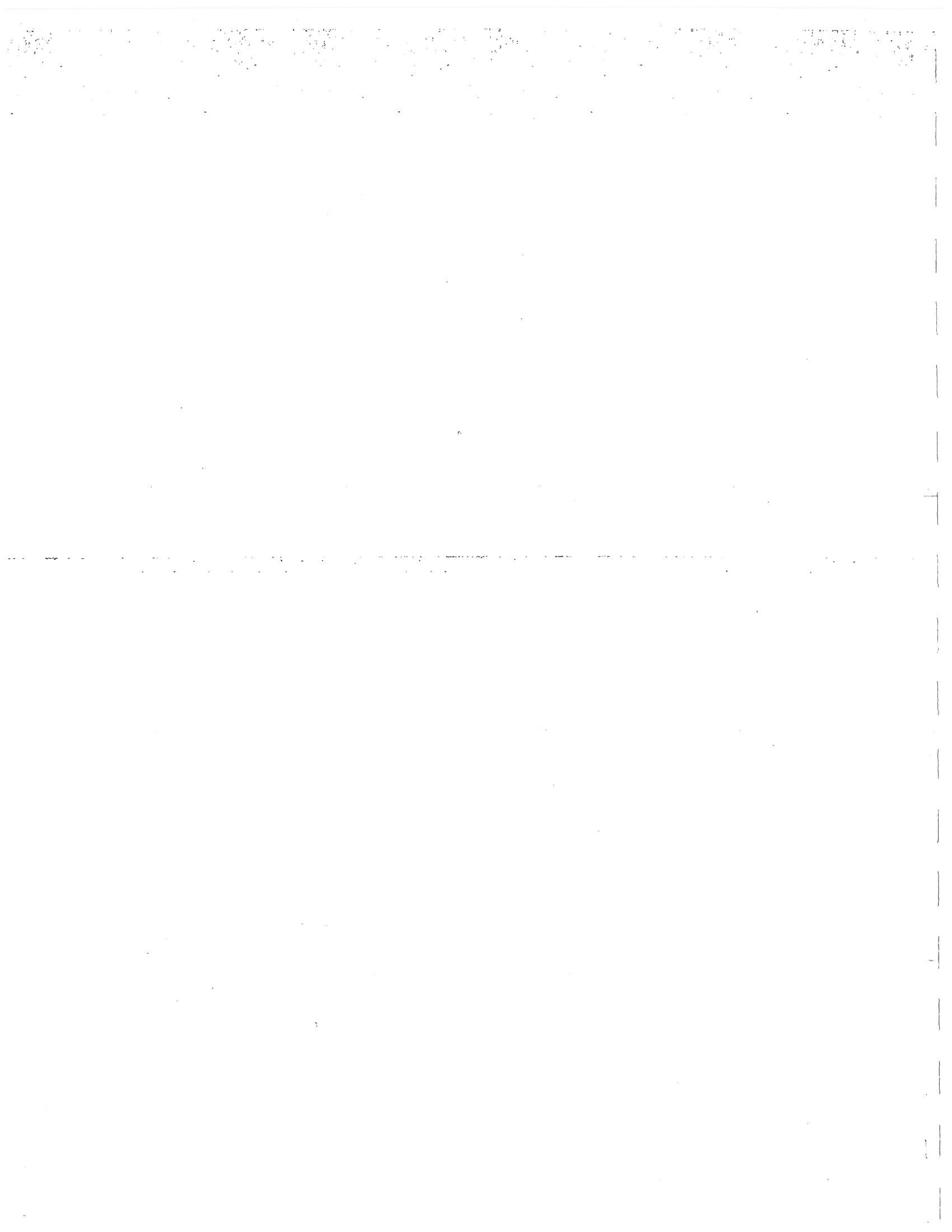
SAN BENITO COUNTY WATER DISTRICT

STANDARD DETAILS

AUGUST, 1993



DISTRICT ENGINEER





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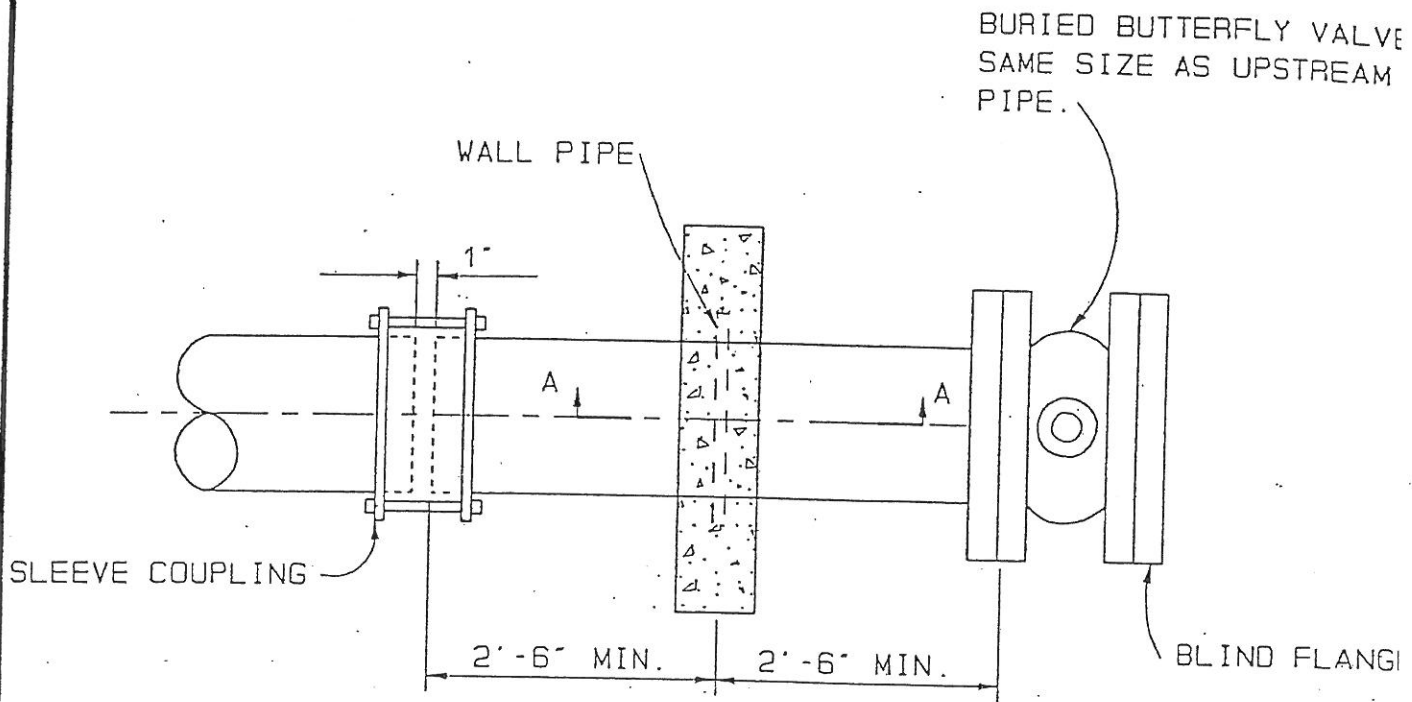
6. Chain Link Fence

Standard Plan - A85

SECTION 1

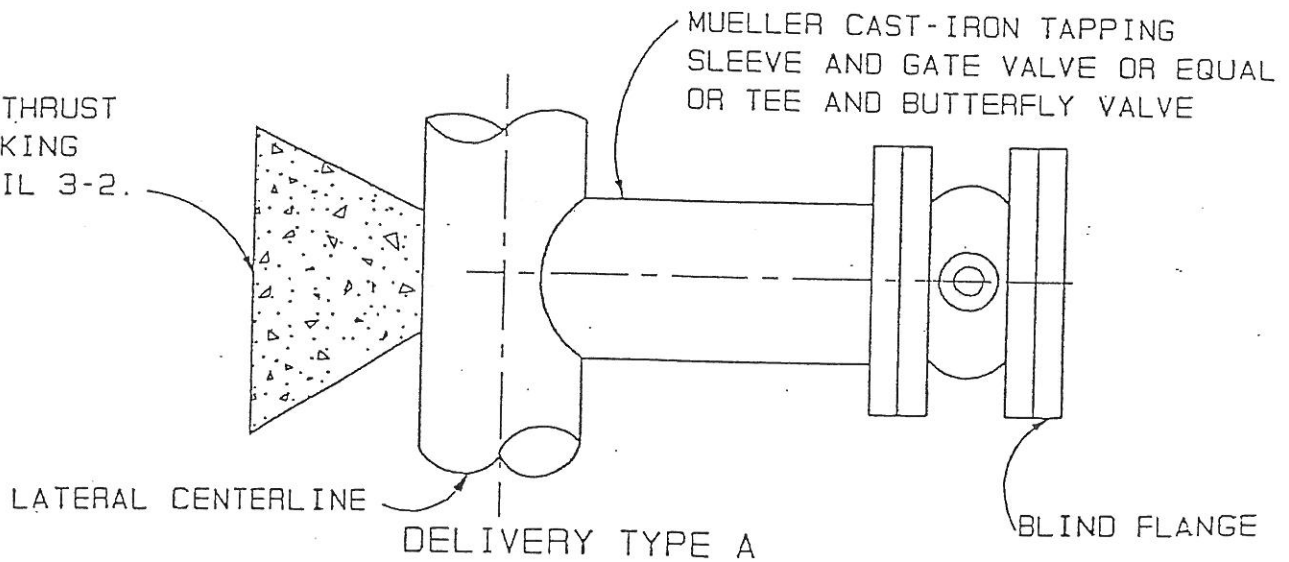
DELIVERY DETAILS





DELIVERY TYPE D

SEE THRUST  
BLOCKING  
DETAIL 3-2.

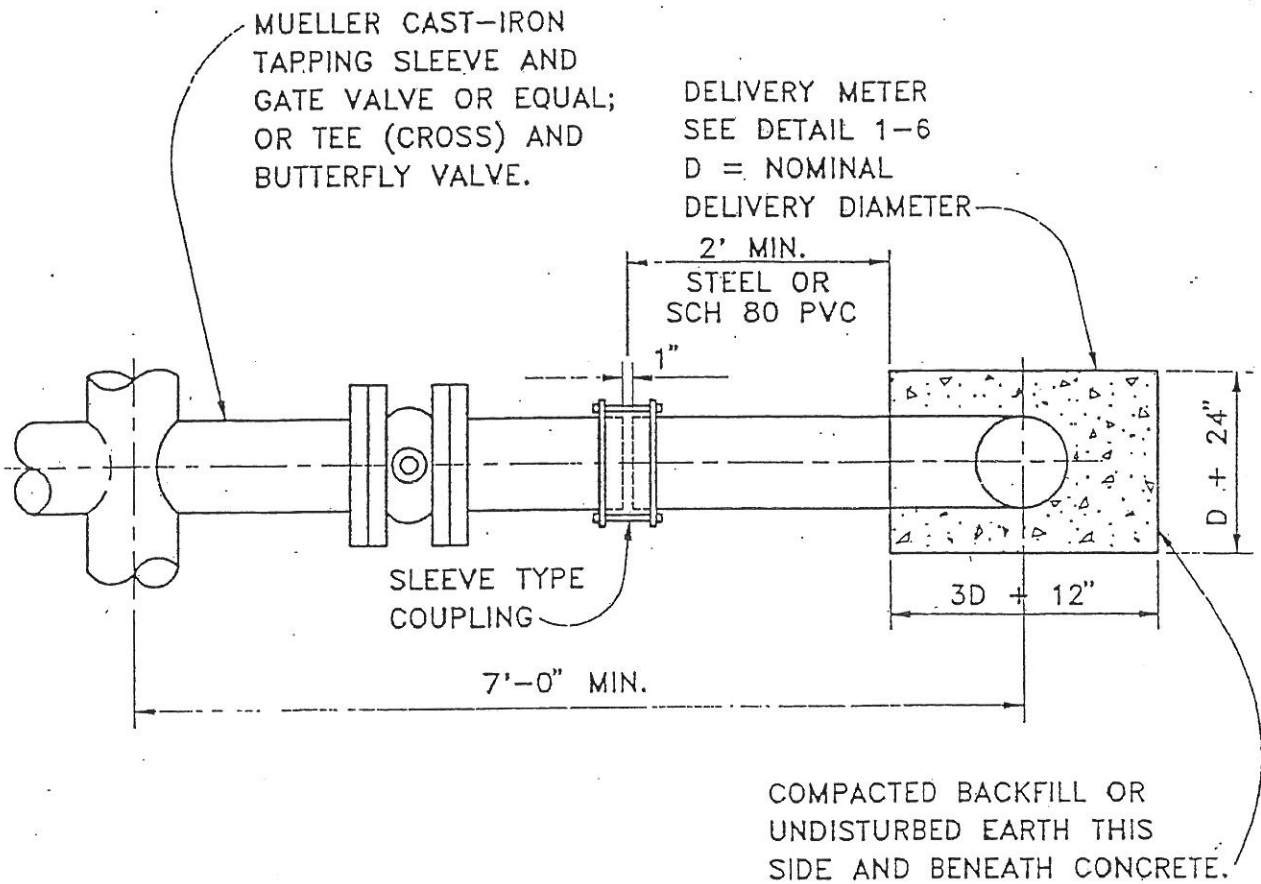


DELIVERY TYPE A

NOTES:

- 1) SEE IN-LINE THRUST BLOCK DETAIL 3-7 FOR SECTION A-A.
- 2) FOR 12" AND UNDER USE MUELLER CAST-IRON TAPPING SLEEVE. FOR OVER 12" USE ROMAC "SST" TAPPING SLEEVE.

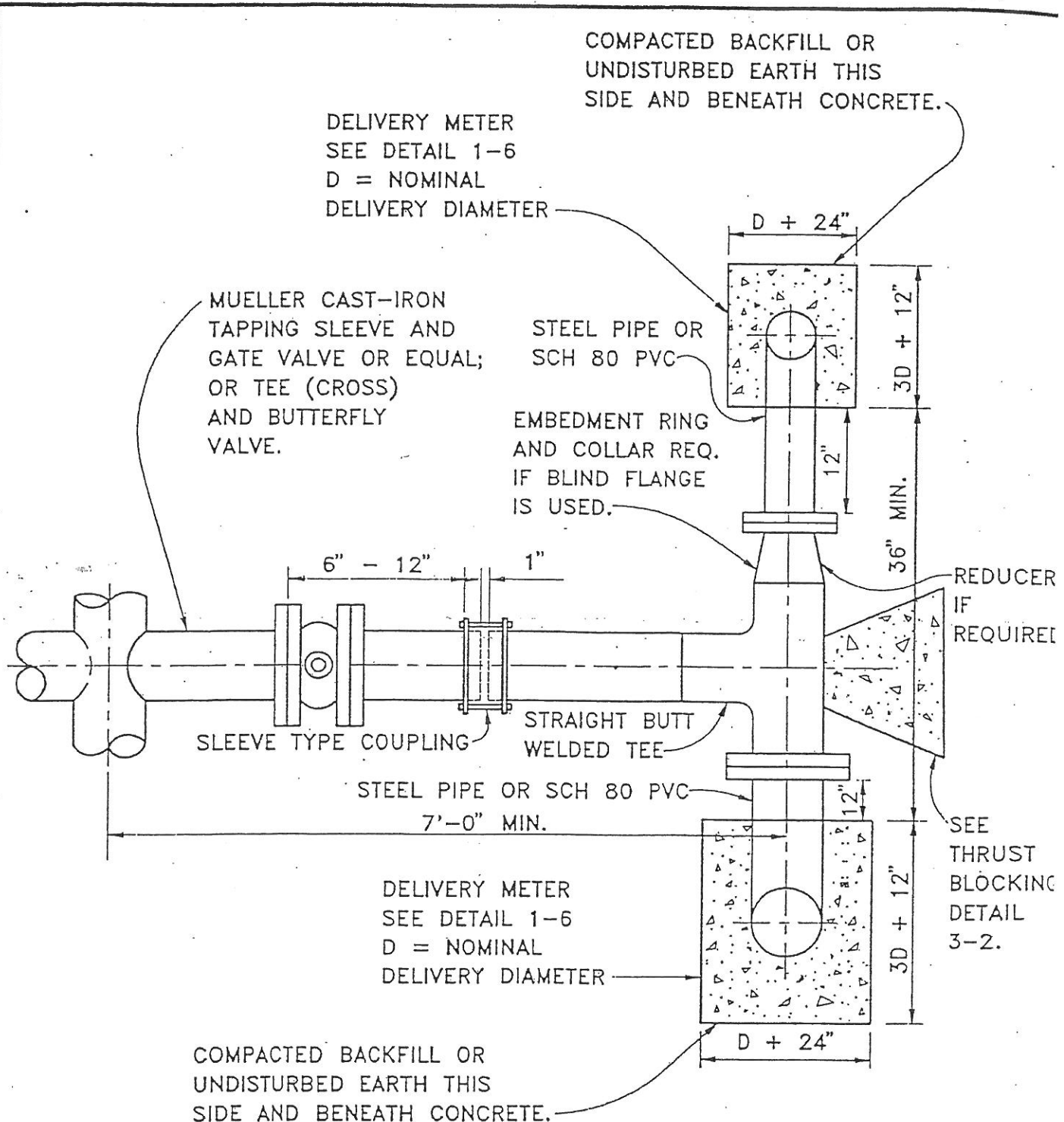
SAN BENITO COUNTY WATER DISTRICT		DESIGNED BY:	SCALE:
		C+D	NO SCALE
DELIVERY TYPE A AND D		DRAWN BY:	DATE:
		C+D	MAR 1993
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.



NOTES:

- 1) SEE DELIVERY TYPE E DETAIL 1-4 IF DELIVERY IS AT END OF LATERAL.
- 2) FOR 12" AND UNDER USE MUELLER CAST-IRON TAPPING SLEEVE. FOR OVER 12" USE ROMAC "SST" TAPPING SLEEVE.

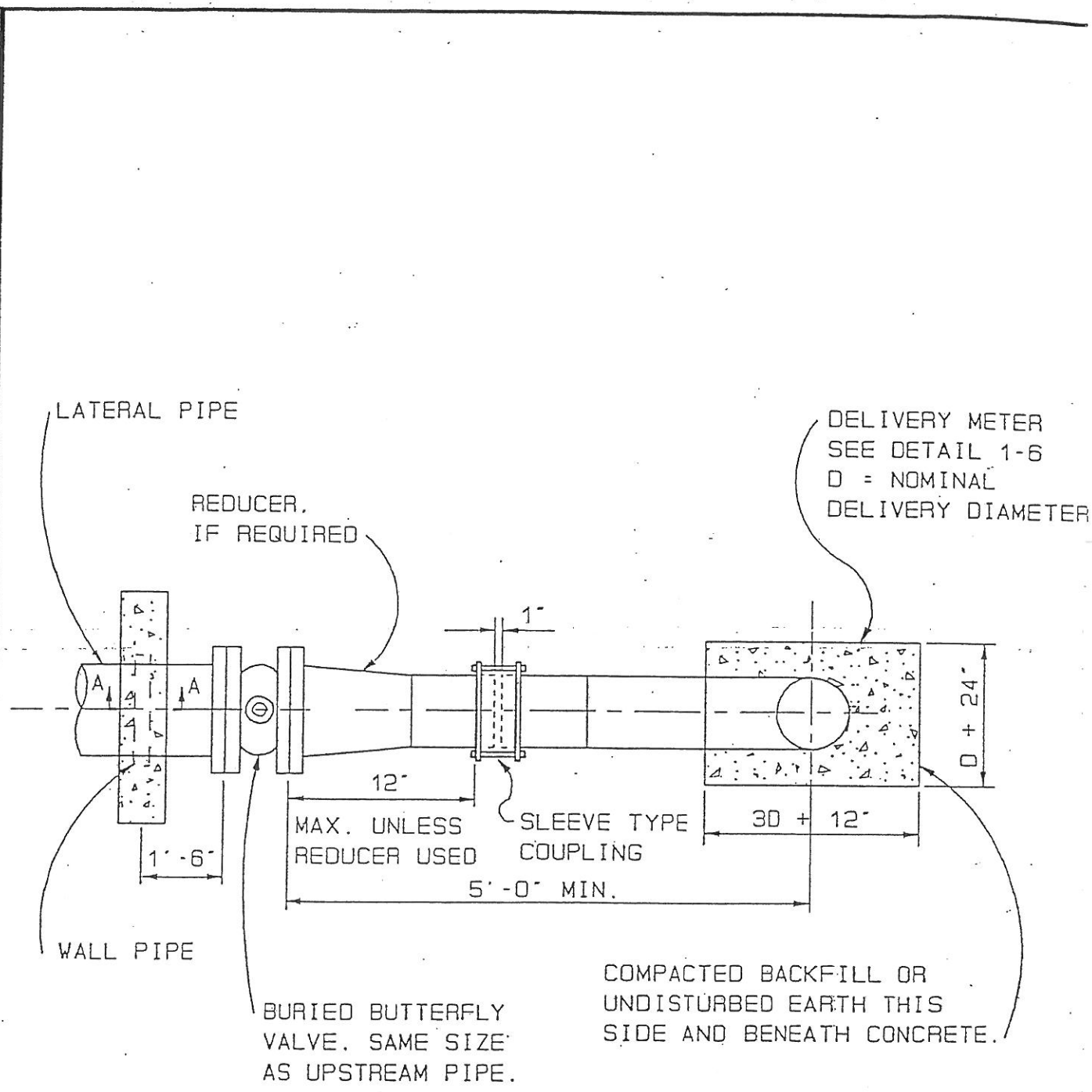
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		DRAWN BY:	DATE:
		C+D	FEB 1996
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
		C+D	1-2



NOTES:

- 1) SEE DELIVERY TYPE F DETAIL 1-5 IF DELIVERY IS AT END OF LATERAL.
- 2) FOR 12" AND UNDER USE MUELLER CAST-IRON TAPPING SLEEVE. FOR OVER 12" USE ROMAC "SST" TAPPING SLEEVE.

<p>SAN BENITO COUNTY WATER DISTRICT</p> <p>DELIVERY TYPE C</p>		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	FEB 1996
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
_____ DISTRICT MANAGER	_____ DISTRICT ENGINEER	C+D	1-3

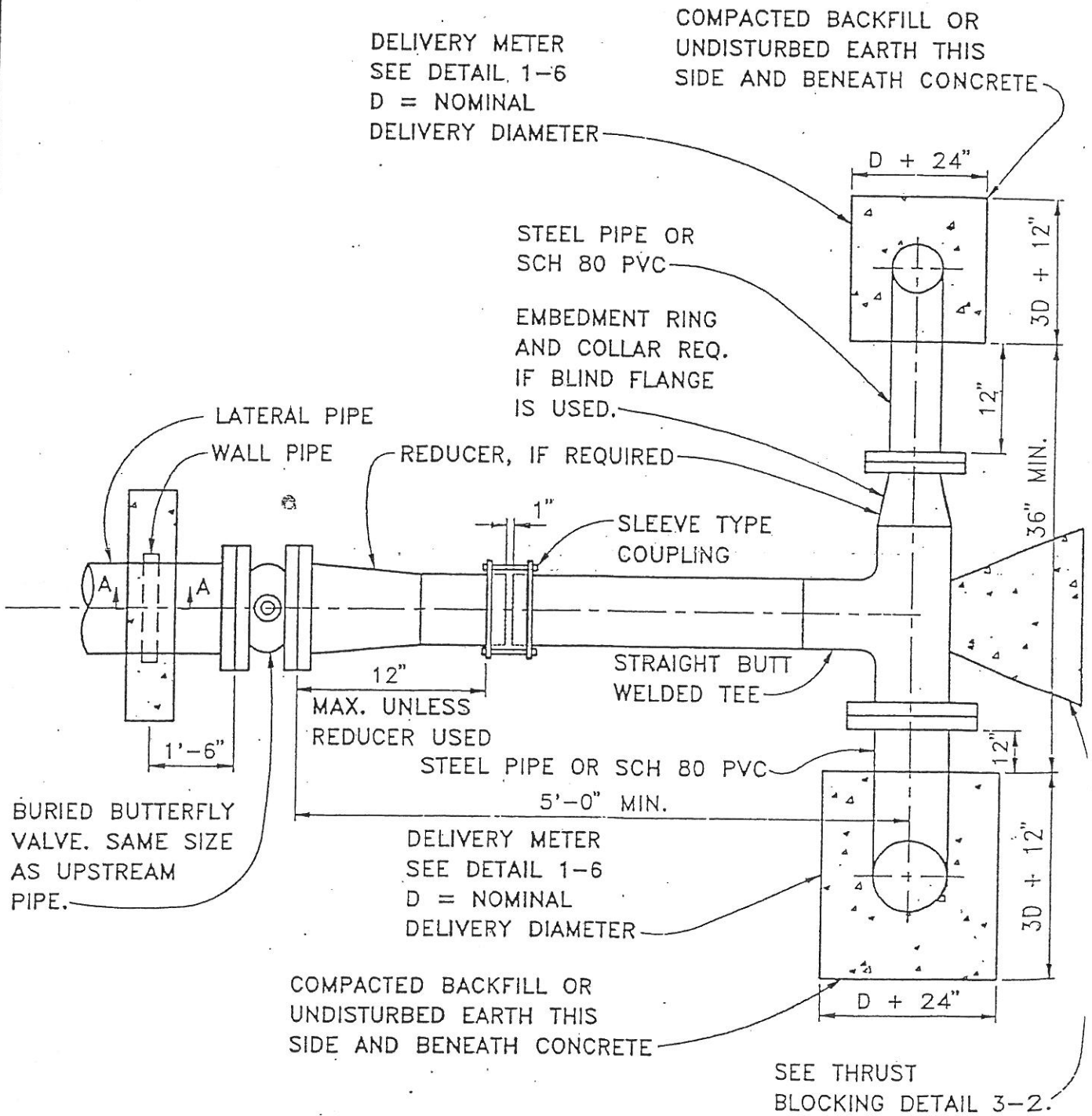


NOTES:

1) SEE IN-LINE THRUST BLOCK DETAIL 3-7 FOR SECTION A-A.

SAN BENITO COUNTY WATER DISTRICT		DESIGNED BY:	SCALE:
		C+D	NO SCALE
DELIVERY TYPE E		DRAWN BY:	DATE:
		C+D	NOV 1992
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.

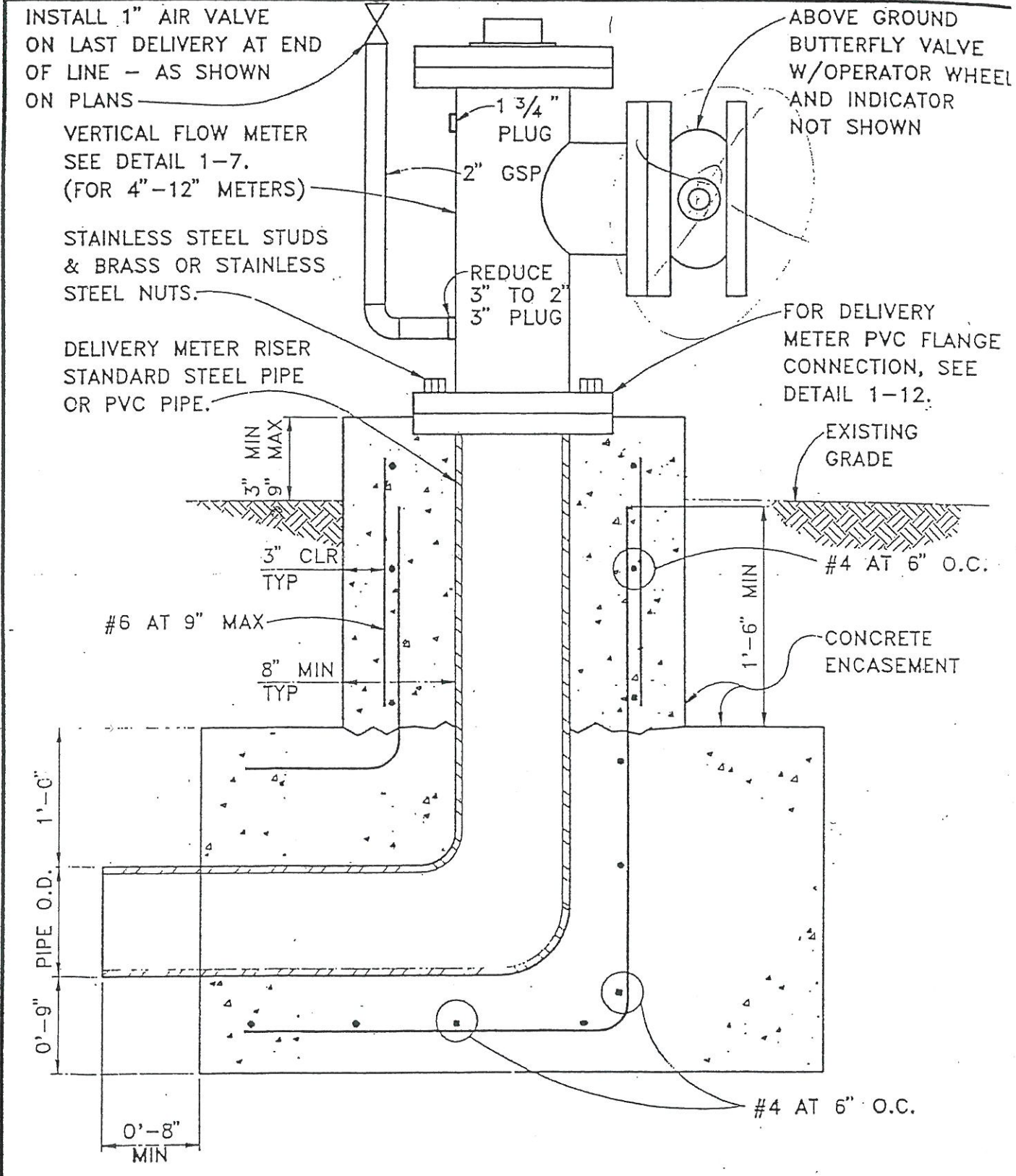




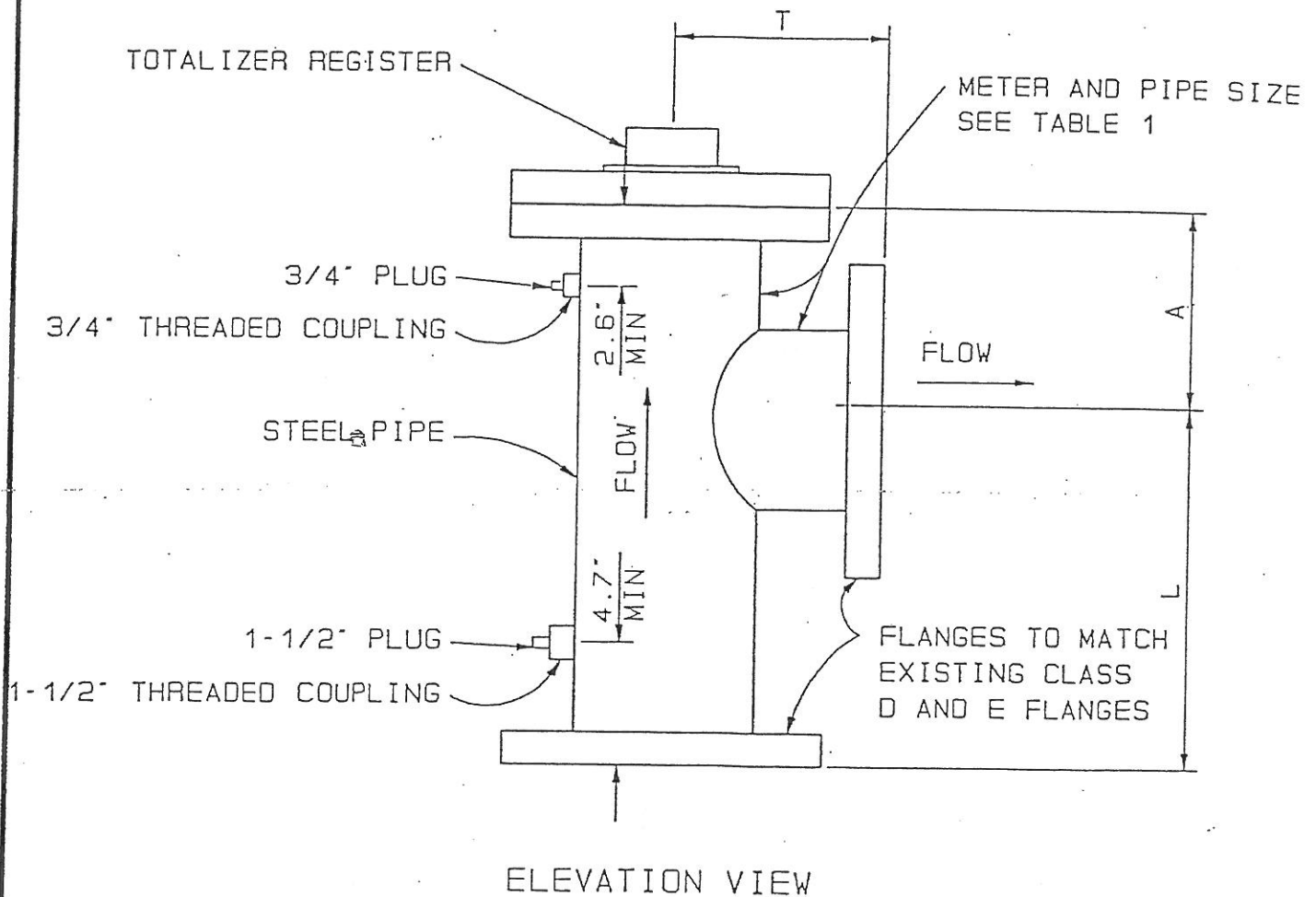
NOTES;

1) SEE IN-LINE THRUST BLOCK DETAIL 3-7 FOR SECTION A-A.

SAN BENITO COUNTY WATER DISTRICT DELIVERY TYPE F		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	FEB 1996
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
		C+D	1-5



SAN BENITO COUNTY WATER DISTRICT DELIVERY METER DETAIL (4" -12" METERS)		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	FEB 1996
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
		C+D	1-6



PIPE AND METER SIZE	L	A	T
4"	15.90"	4.10"	8"
6"	17.25"	5.15"	8"
8"	24.50"	6.50"	8"
10"	24.75"	7.55"	9"
12"	25.25"	8.45"	10"

SAN BENITO COUNTY WATER DISTRICT

VERTICAL FLOW METER

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

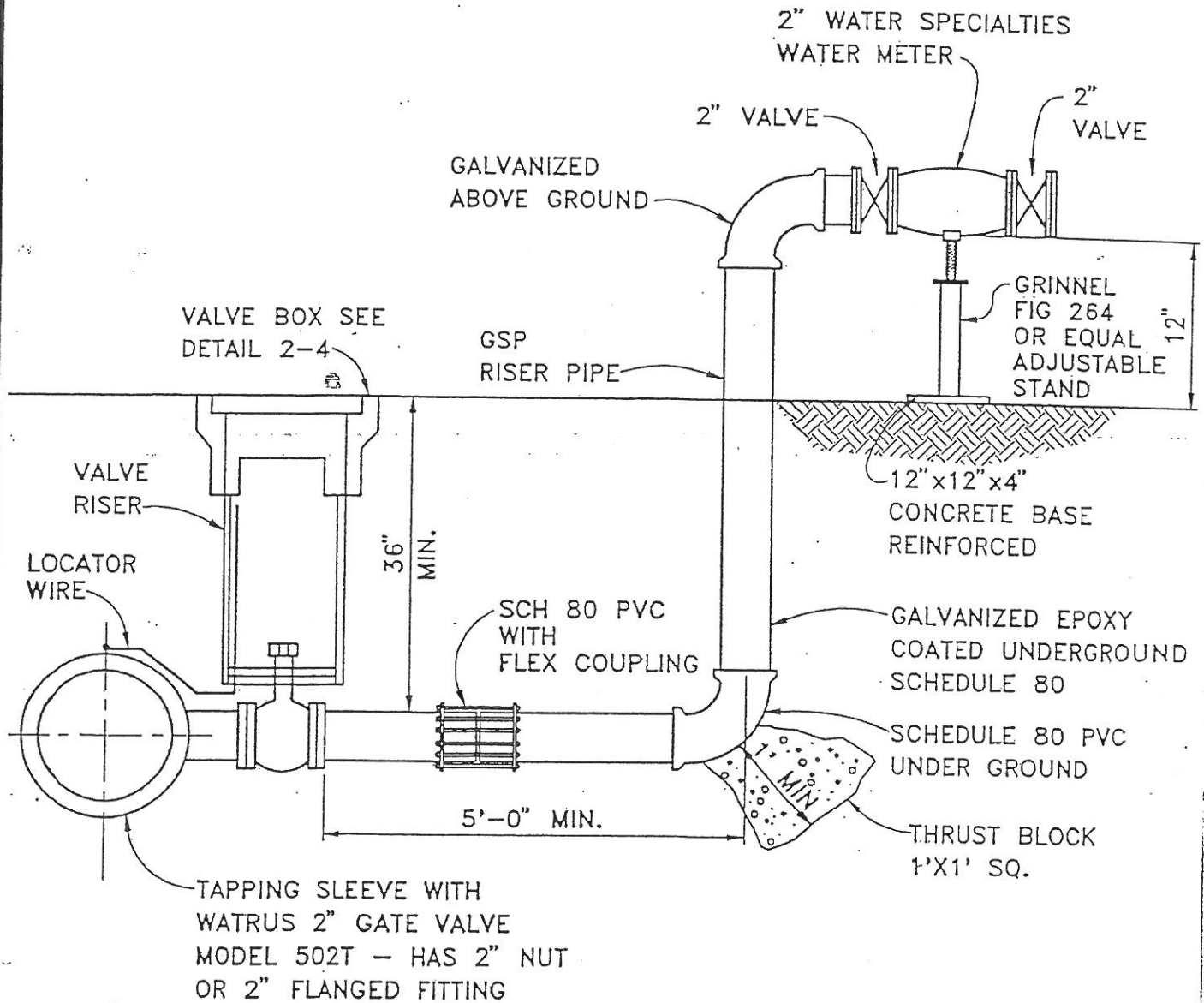
APPROVED BY:

APPROVED BY:

CHECKED BY:

DRAWING NO.

SEE SPECIFICATIONS FOR PAINTING REQUIREMENTS



NOTE: IF DISTANCE FROM MAIN LINE TO RISER PIPE IS 20 FT. OR MORE  
 USE 4" TAPPING SLEEVE AND GATE VALVE WITH VALVE BOX. INSTALL  
 4" TO 2" REDUCER BEFORE GATE VALVE NEAR THE RISER.

SAN BENITO COUNTY WATER DISTRICT

2" RISERS FOR  
 5 ACRE PARCELS

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

FEB 1996

APPROVED BY:

APPROVED BY:

CHECKED BY:

DRAWING NO.

INSTALL SPOOL WITH 2-1/2" GALV. NPT NIPPLE WELDED AT CENTER.

INSTALL 2-1/2" X 2-1/2" ANGLE FIRE PLUG VALVE (WHARF HYDRANT) WITH PENTAGON OPERATOR, NUT, CAP AND CHAIN. (DISCHARGE THREADS TO BE MALE. NATIONAL HOSE THREADS SUITABLE FOR CA DEPT. OF FORESTRY.) PAINT VALVE AND CAP SAFETY YELLOW.

DELIVERY METER SEE DETAIL 1-6

RELOCATE BUTTERFLY VALVE FROM DISCHARGE OF VERTICAL FLOW METER TO END OF TEE (OPERATOR NOT SHOWN).

EXPANSION JOINT

INSTALL ADJUSTABLE PIPE SADDLE SUPPORT GRINNELL FIG. 264 OR EQUAL

4" GRAVEL

INSTALL 6" THICK CONCRETE SLAB WITH 6" X 6" - 10" X 10" WELDED WIRE MESH. WIDTH OF SLAB TO MATCH CONCRETE METER BASE DIAMETER.

NOTES:

- 1) A REFLECTORIZED BLUE BOTT'S DOT SHALL BE INSTALLED IN THE CENTER OF THE ROAD PAVEMENT OPPOSITE THE FIRE NOZZLE.
- 2) ALL CONSTRUCTION SHALL MEET S.B.C.W.D. AND THE CA DEPT. OF FORESTRY AND FIRE PROTECTION STANDARDS.
- 3) A LIMITED NUMBER OF MANUFACTURED STEEL SPOOLS (WITHOUT THE 2-1/2" NPT NIPPLE) ARE AVAILABLE AT THE S.B.C.W.D. OFFICE AT \$50 PER 4" SPOOL, \$75 PER 6" SPOOL, \$100 PER 8" OR LARGER SPOOL.

SAN BENITO COUNTY WATER DISTRICT

FIRE FLOW NOZZLE

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

APPROVED BY:

APPROVED BY:

CHECKED BY:

DRAWING NO.

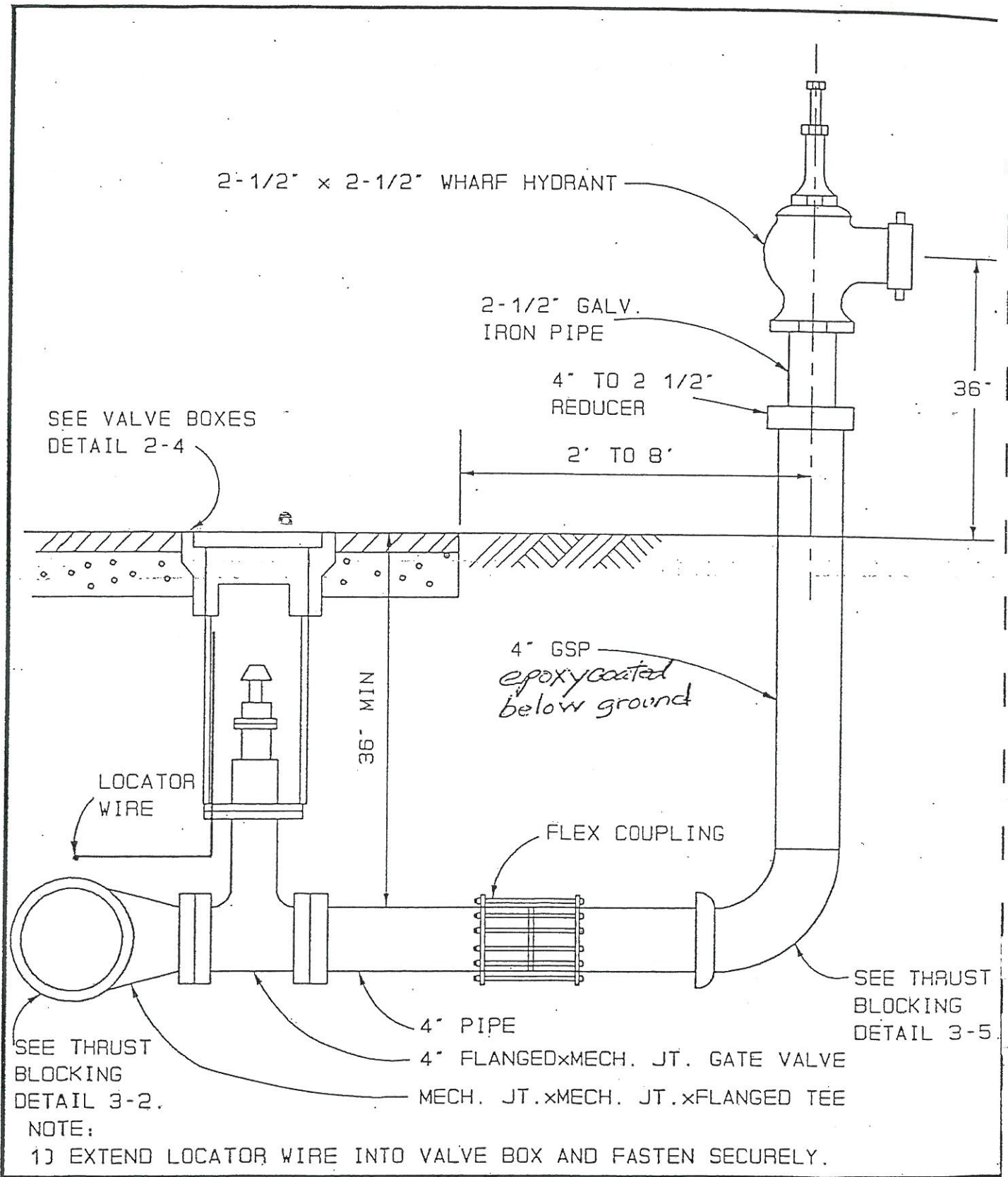
DISTRICT MANAGER

DISTRICT SUPERVISOR

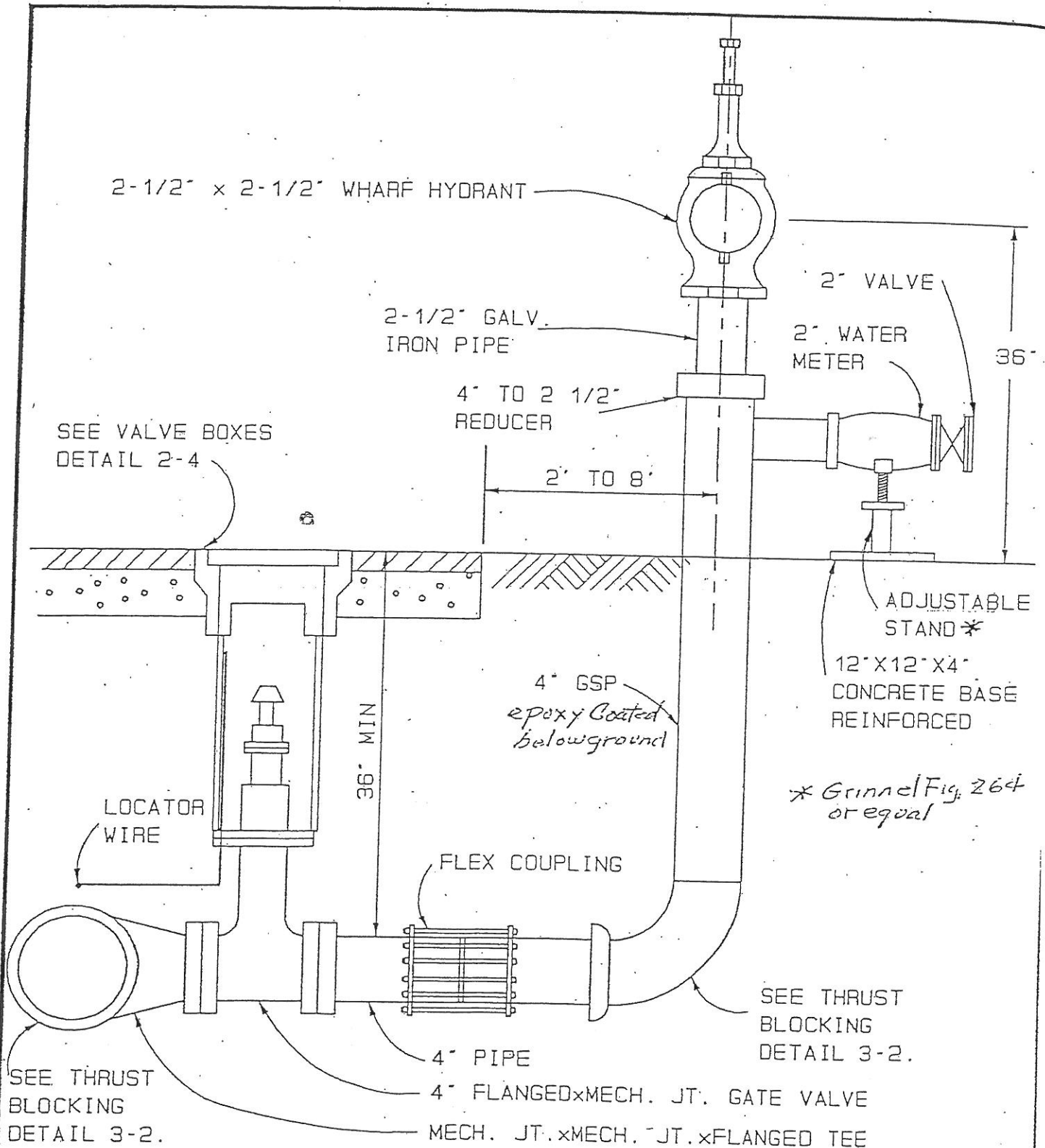
C+D

1-0





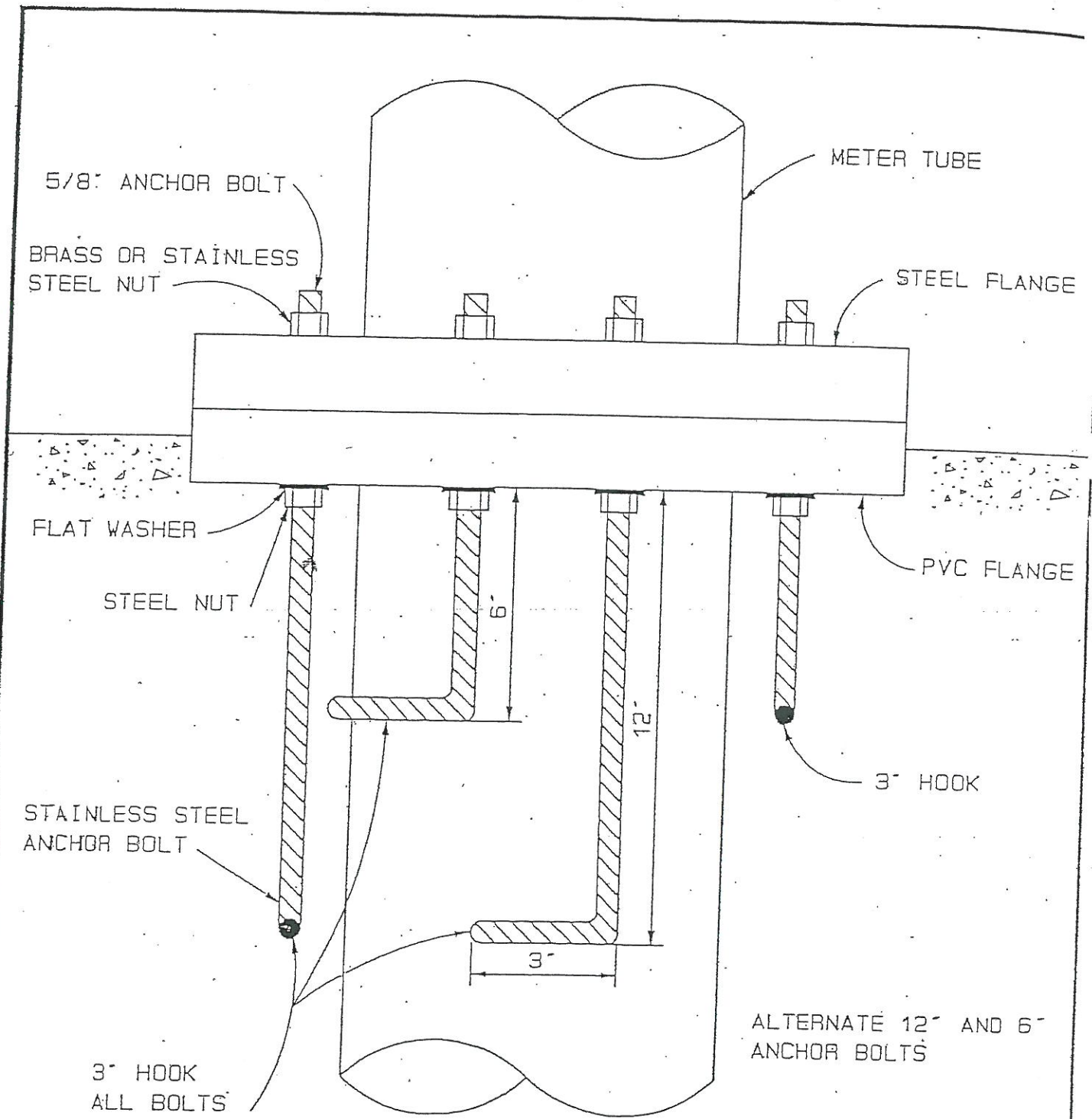
SAN BENITO COUNTY WATER DISTRICT		DESIGNED BY:	SCALE:
		C+D	NO SCALE
2-1/2" WHARF HYDRANT		DRAWN BY:	DATE:
		C+D	NOV 1992
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
		C+D	1 12



\* Grinnel Fig. 264 or equal

NOTE:  
 1) EXTEND LOCATOR WIRE INTO VALVE BOX AND FASTEN SECURELY.

SAN BENITO COUNTY WATER DISTRICT 2-1/2" WHARF HYDRANT AND 2" DELEVERY METER		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	MAR 1993
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
DISTRICT MANAGER	DISTRICT ENGINEER	C+D	1-11



NOTES:

- 1) 5/8" THREADED STAINLESS STEEL BAR WITH 3" BEND ON ONE END CAN BE USED 18" IN LENGTH AND 12" IN LENGTH

SAN BENITO COUNTY WATER DISTRICT  
 DELIVERY METER  
 PVC FLANGE CONNECTION

DESIGNED BY:

C+D

DRAWN BY:

C+D

SCALE:

NO SCALE

DATE:

MAR 1993

APPROVED BY:

APPROVED BY:

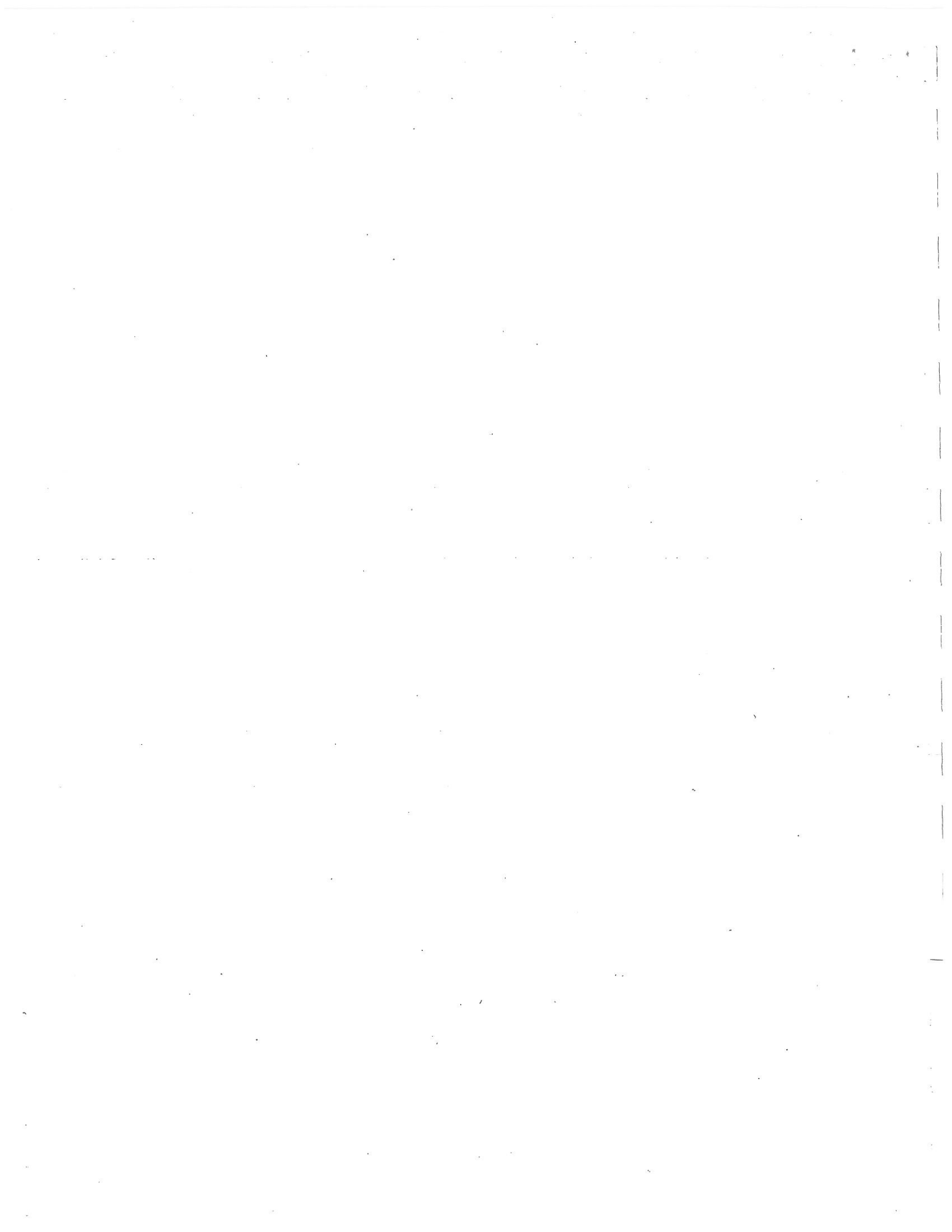
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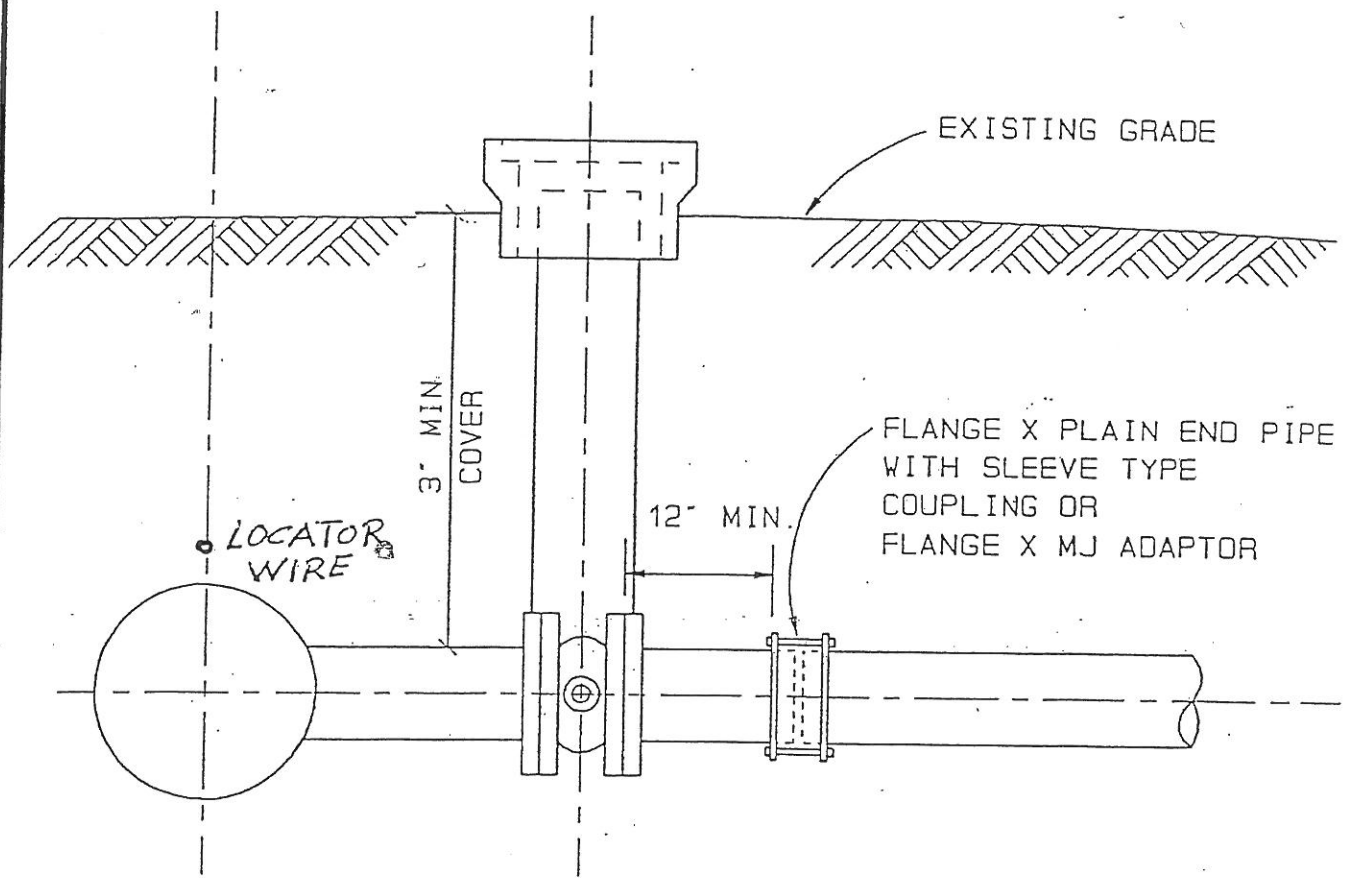
DRAWING NO.



SECTION 2

PIPELINE DETAILS





SAN BENITO COUNTY WATER DISTRICT  
 LATERAL VALVE INSTALLATION

DESIGNED BY:	SCALE:
C+D	NO SCALE
DRAWN BY:	DATE:
C+D	NOV 1992
CHECKED BY:	DRAWING NO.
C+D	2-1

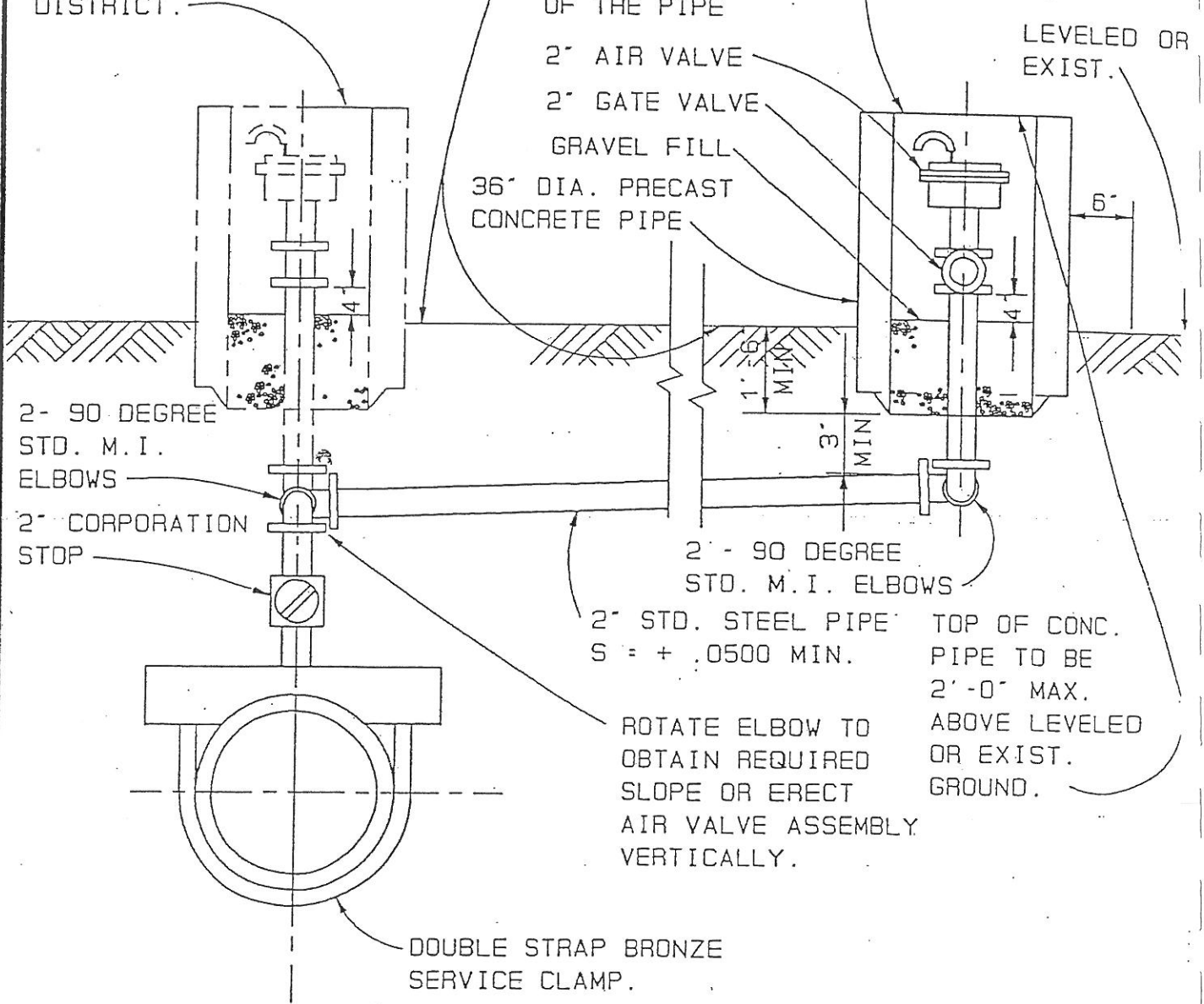
APPROVED BY:  
 \_\_\_\_\_  
 DISTRICT MANAGER

APPROVED BY:  
 \_\_\_\_\_  
 DISTRICT ENGINEER

THE AIR VALVE ASSEMBLY TO BE ERECTED VERTICALLY ABOVE OUTLET NOZZLE UNLESS DIRECTED OTHERWISE BY DISTRICT.

COMPACT BACKFILL BENEATH CONC. PIPE TO WITHIN 1' FROM THE BOTTOM OF THE PIPE

COVER NOT SHOWN FOR PIPE WELL. SEE AIR VALVE COVER DETAIL 2-3



NOTES:

- 1) 36" DIAMETER PRECAST CONCRETE PIPE SHALL CONFORM TO ASTM C 76 CLASS II OR III

SAN BENITO COUNTY WATER DISTRICT

AIR VALVE INSTALLATION

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

APPROVED BY:

DISTRICT MANAGER

APPROVED BY:

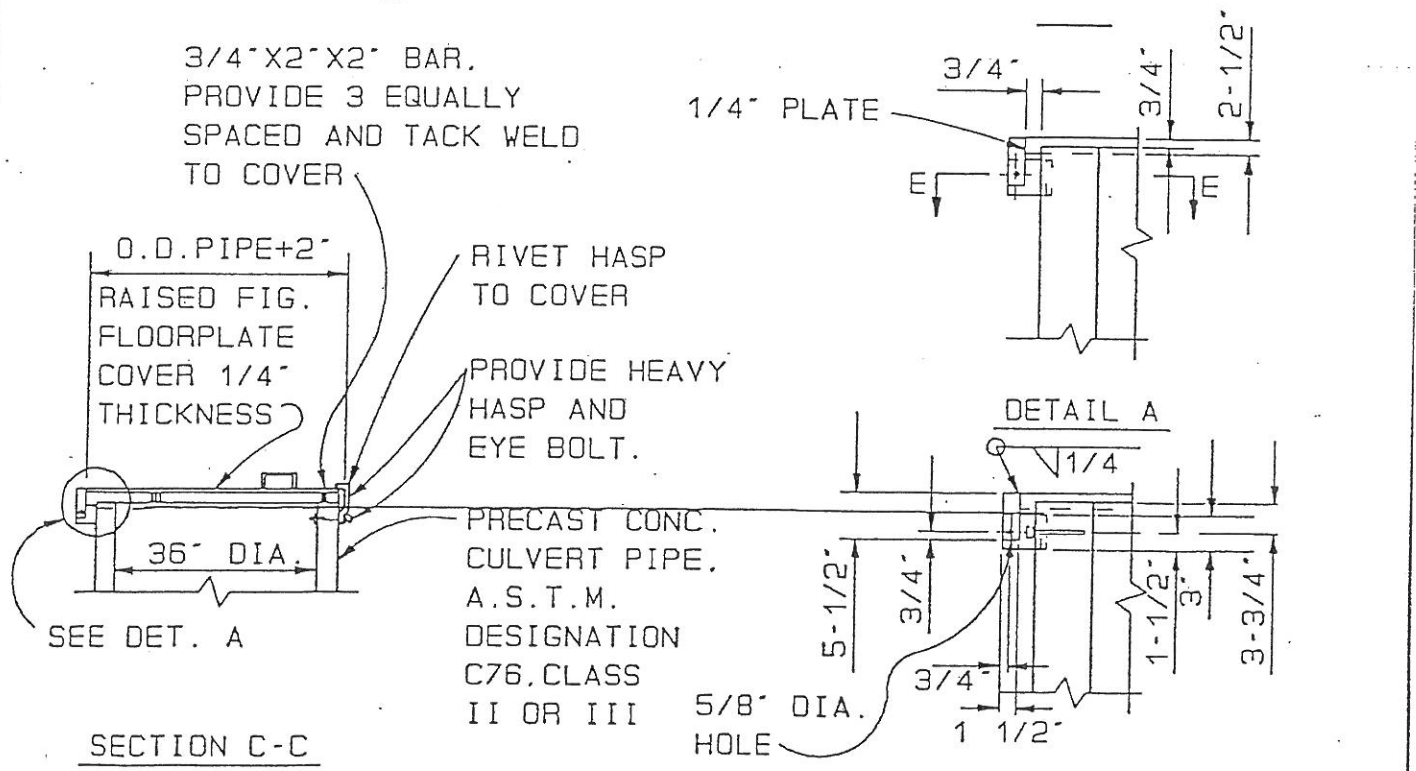
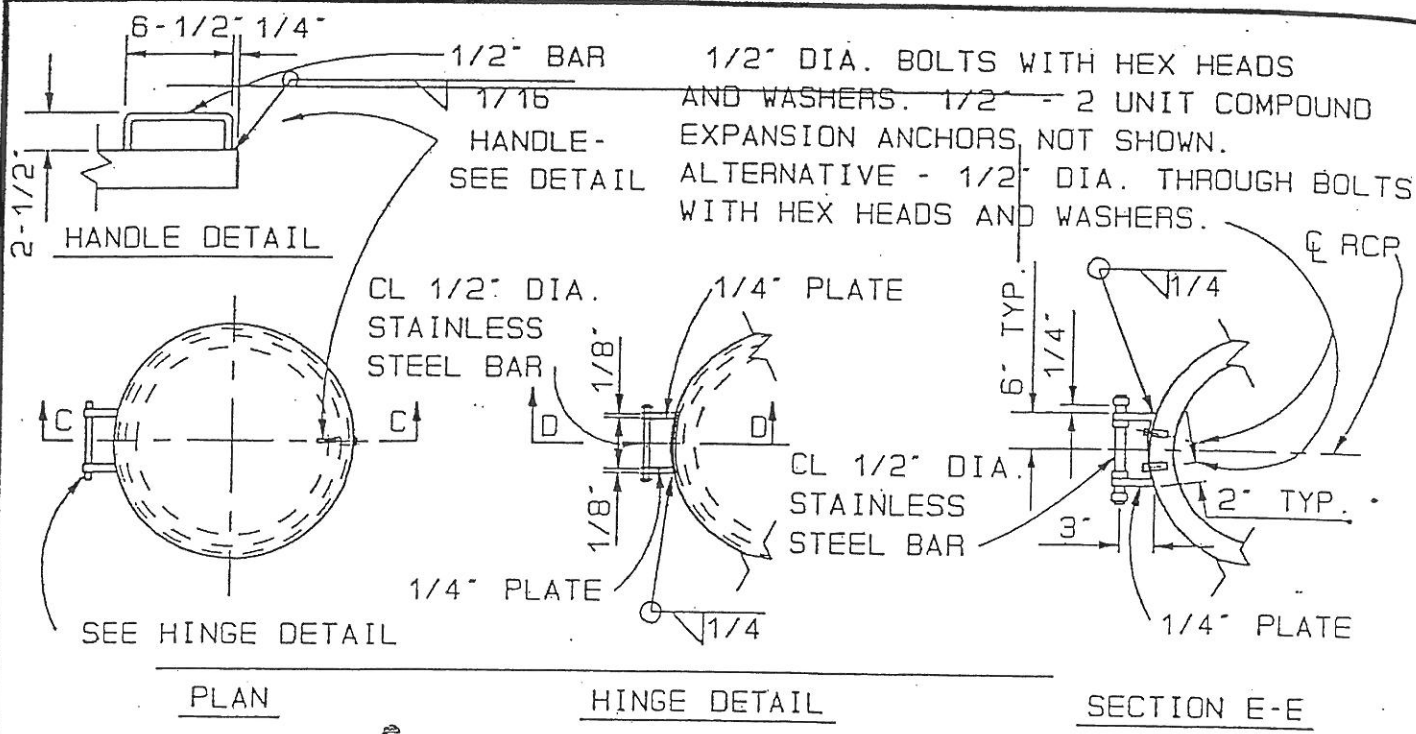
DISTRICT ENGINEER

CHECKED BY:

C+D

DRAWING NO.

2-2



NOTES:  
 1) GALVANIZE AFTER FABRICATION.

SAN BENITO COUNTY WATER DISTRICT  
 AIR VALVE COVER

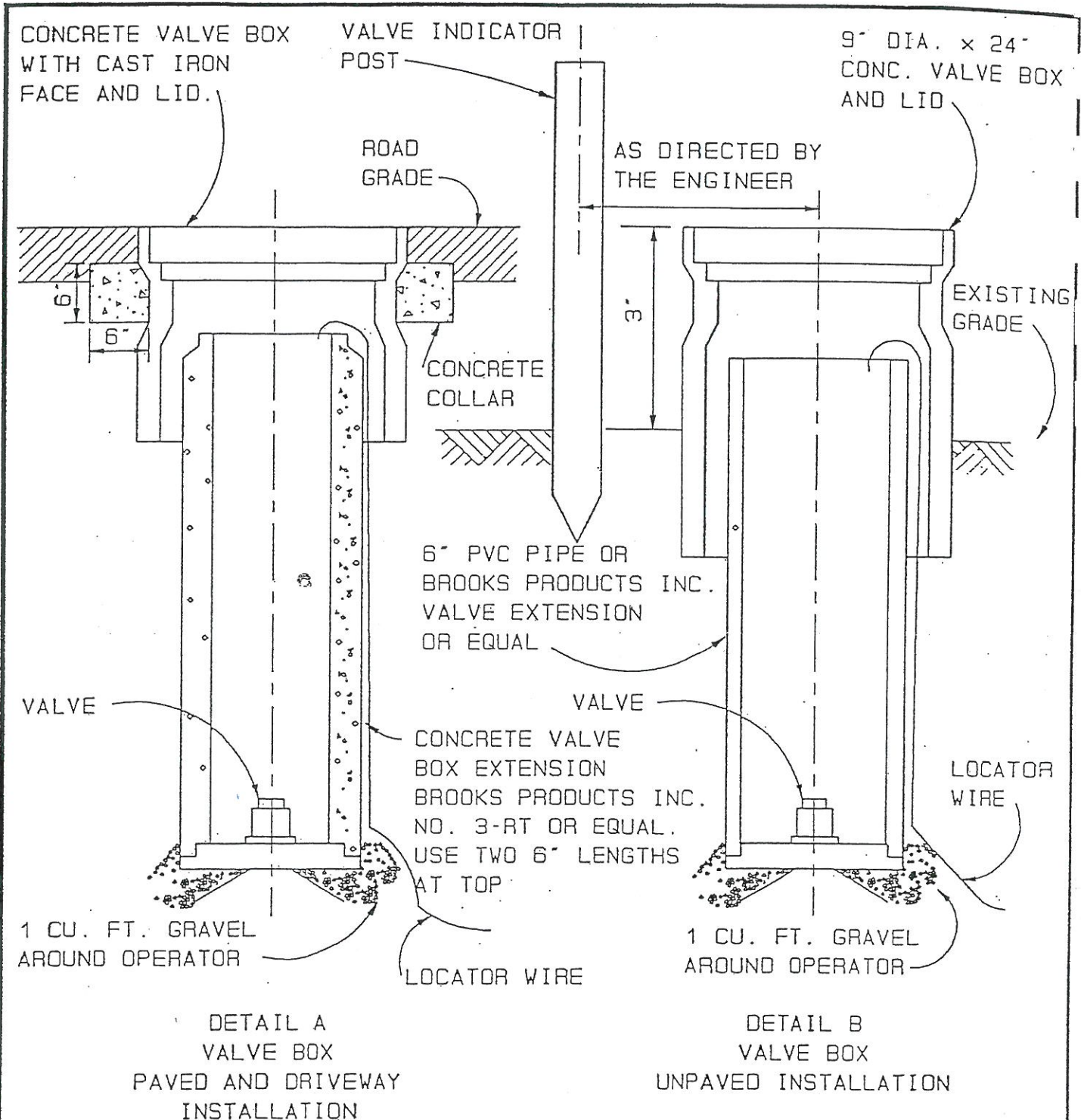
DESIGNED BY: C+D  
 SCALE: NO SCALE

DRAWN BY: C+D  
 DATE: NOV 1992

CHECKED BY: C+D  
 DRAWING NO.: 2-3

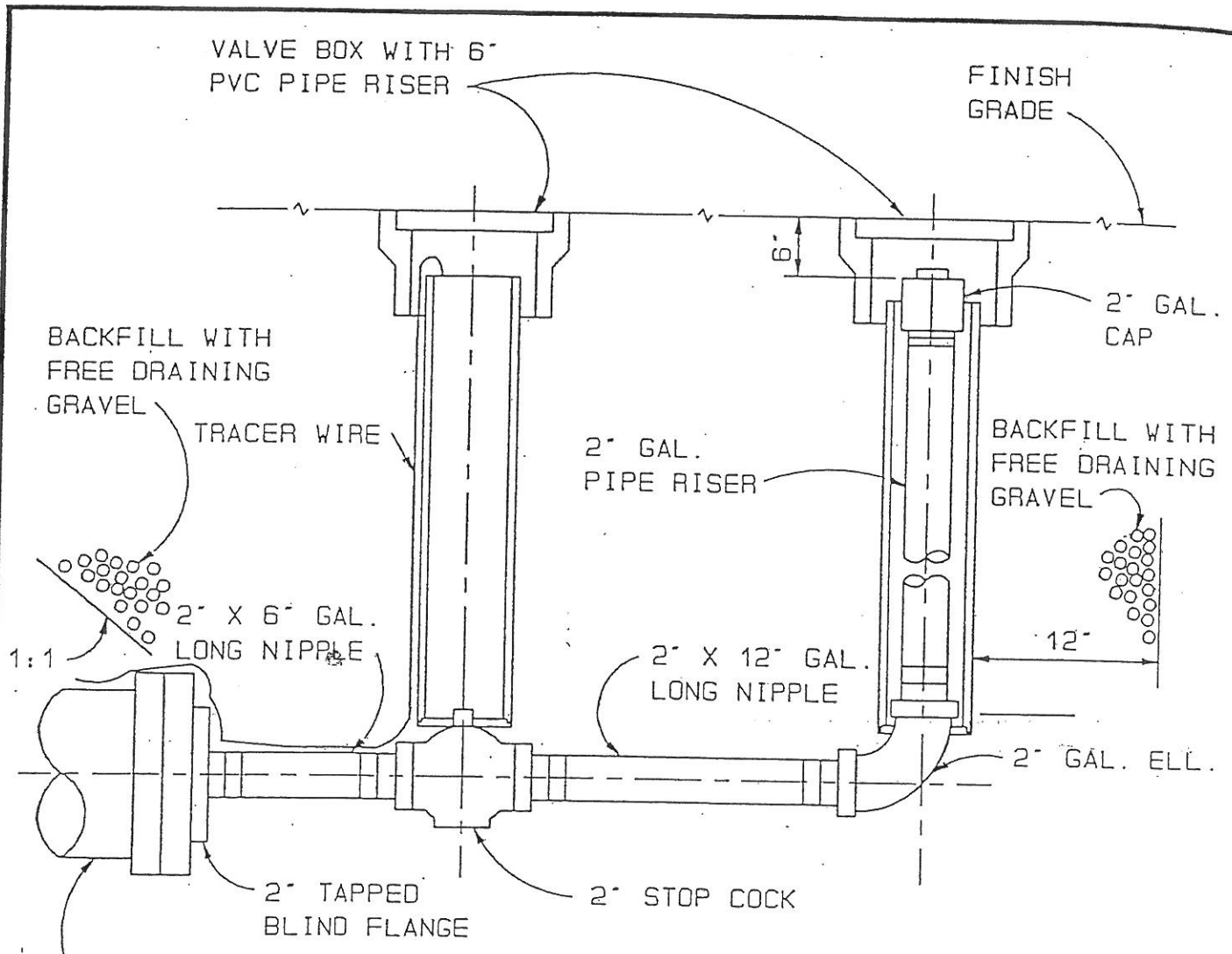
APPROVED BY: \_\_\_\_\_  
 DISTRICT MANAGER

APPROVED BY: \_\_\_\_\_  
 DISTRICT ENGINEER



NOTES:  
 1) LOCATOR WIRE FROM THE TOP OF PIPE SHALL BE BROUGHT UP TO THE TOP OF THE VALVE BOX AS SHOWN.

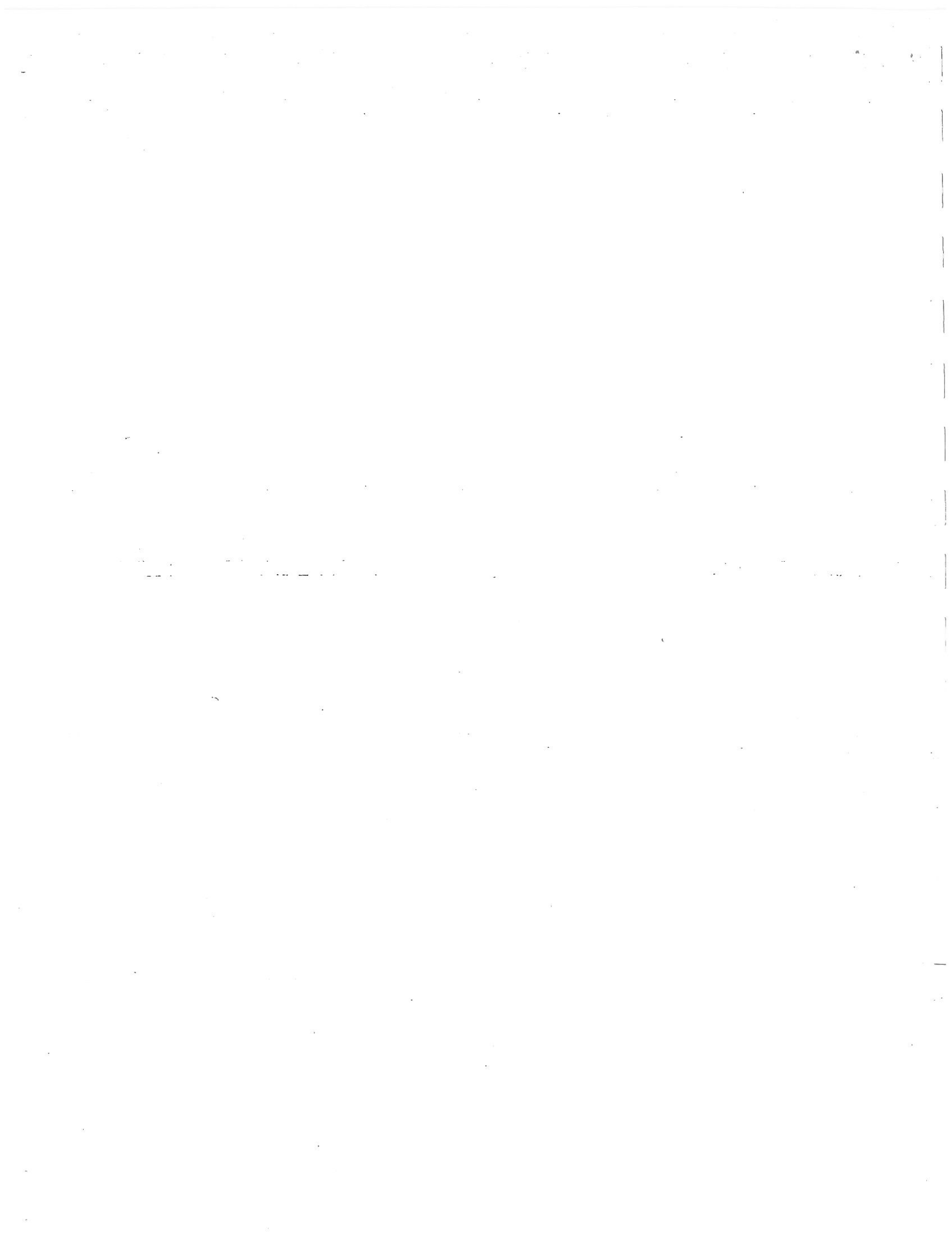
SAN BENITO COUNTY WATER DISTRICT  VALVE BOXES		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	NOV 1992
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
DISTRICT MANAGER	DISTRICT ENGINEER	C+D	2-4



SIMILAR TO TYPE A OR D DELIVERY - SEE DELIVERY DETAILS FOR REQUIRED THRUST BLOCKING.

NOTES:  
 1) ALL PIPE SHALL BE SCHEDULE 80, GALVANIZED AND THREADED. ALL FITTINGS SHALL BE 300 LB (EXTRA HEAVY) MALLEABLE IRON GALVANIZED FITTINGS.

SAN BENITO COUNTY WATER DISTRICT  BLOWOFF ASSEMBLY		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	NOV 1992
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
DISTRICT MANAGER	DISTRICT ENGINEER	C+D	2-5





SECTION 3

CONSTRUCTION DETAILS



WHEN TRENCHING IN PAVED AREAS. MIN. SURFACE RECONSTRUCTION:

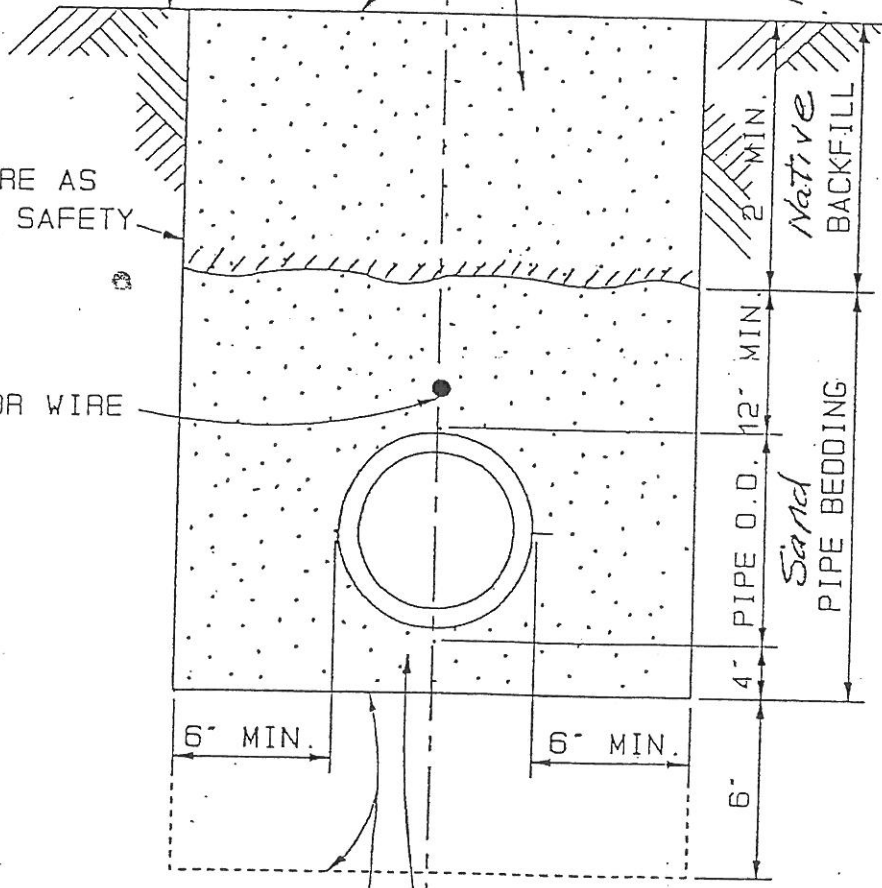
- 1) ALL BACKFILL TO BE CLEAN SAND - 95% COMPACTION
- 2) PROVIDE 3" A.C OVER 9" C II AGG. BASE SUBJECT TO COUNTY, CITY OR OTHER APPROVAL. A.C., AGG. BAS PER CALTRANS SPECS.

MOUND OR SPREAD AS DIRECTED

EXISTING GROUND

SLOPE OR SHORE AS REQUIRED FOR SAFETY

LOCATOR WIRE



90% COMPACTION EXCEPT IN PAVED AREAS.

OVEREXCAVATE IN LOW DENSITY OR OTHER UNSUITABLE MATERIAL AS DIRECTED AND REPLACE WITH SAND COMPACTED TO 90% MIN.

PIPE BEDDING TO BE CLEAN SAND WITH 12" MIN. COVER, 6" MIN. SIDE CLEARANCE, AND 4" MIN. BEDDING COMPACTED TO 90% MIN.

SAN BENITO COUNTY WATER DISTRICT

TYPICAL TRENCHES

DESIGNED BY: C+D	SCALE: NO SCALE
DRAWN BY: C+D	DATE: NOV 1992
CHECKED BY: C+D	DRAWING NO. 3-1

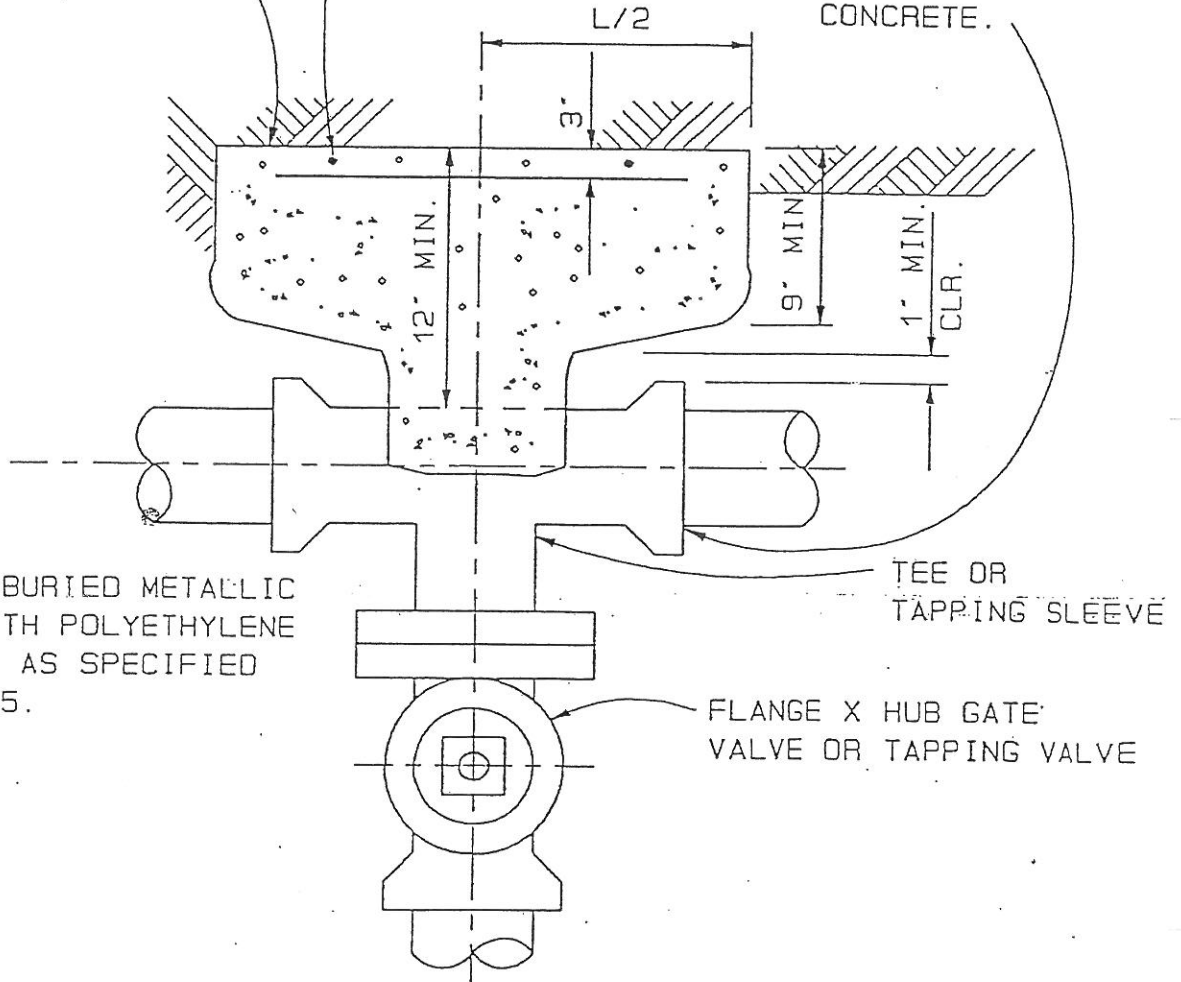
APPROVED BY:  
\_\_\_\_\_  
DISTRICT MANAGER

APPROVED BY:  
\_\_\_\_\_  
DISTRICT ENGINEER

UNDISTURBED EARTH

NO. 4 REBARS -  
12" CENTERS BOTH WAYS

FLANGES, BOLTS, &  
NUTS SHALL BE  
KEPT CLEAR OF  
CONCRETE.



NOTE:  
ENCASE ALL BURIED METALLIC  
SURFACES WITH POLYETHYLENE  
WRAP (8MIL) AS SPECIFIED  
IN AWWA C105.

TEE OR  
TAPPING SLEEVE

FLANGE X HUB GATE  
VALVE OR TAPPING VALVE

BRANCH PIPE SIZE	BEARING AREA (S.F.)	L X H
3" OR 4"	2	1'5" X 1'5"
6"	3	1'9" X 1'9"
8"	5	2'3" X 2'3"
10"	9	3'0" X 3'0"
12"	15	3'10" X 3'10"

SAN BENITO COUNTY WATER DISTRICT

THRUST BLOCKING - TEES

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

APPROVED BY:

APPROVED BY:

CHECKED BY:

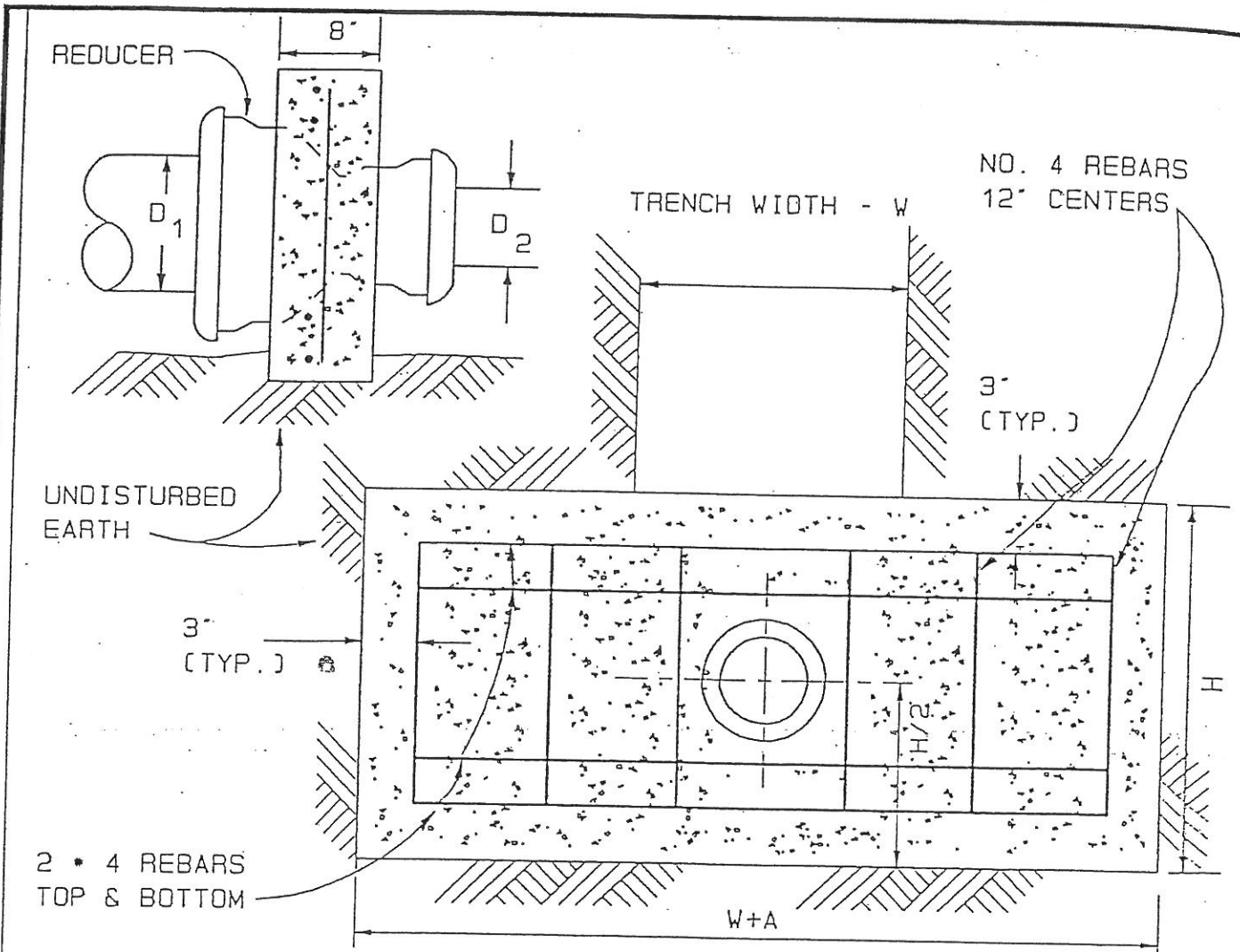
DRAWING NO.

DISTRICT MANAGER

DISTRICT ENGINEER

C+D

3-2



2 # 4 REBARS  
TOP & BOTTOM

NO. 4 REBARS  
12" CENTERS

TRENCH WIDTH - W

3" (TYP.)

UNDISTURBED  
EARTH

3" (TYP.)

W+A

H

ANCHORS FOR REDUCERS		
$D_1 \times D_2$	H	A
12" x 10"	1'-4"	2'-0"
12" x 8"	2'-0"	2'-6"
12" x 6"	2'-0"	3'-2"
8" x 6"	1'-0"	2'-0"
8" x 4"	1'-0"	2'-10"
6" x 4"	1'-0"	1'-4"

NOTES:

- 1) ENCASE ALL BURIED METALLIC SURFACES WITH POLYETHYLENE WRAP AS SPECIFIED IN AWWA C105.
- 2) REDUCER ANCHOR IS REQUIRED ONLY WHEN LARGER CONNECTING JOINT IS OTHER THAN FLANGED.

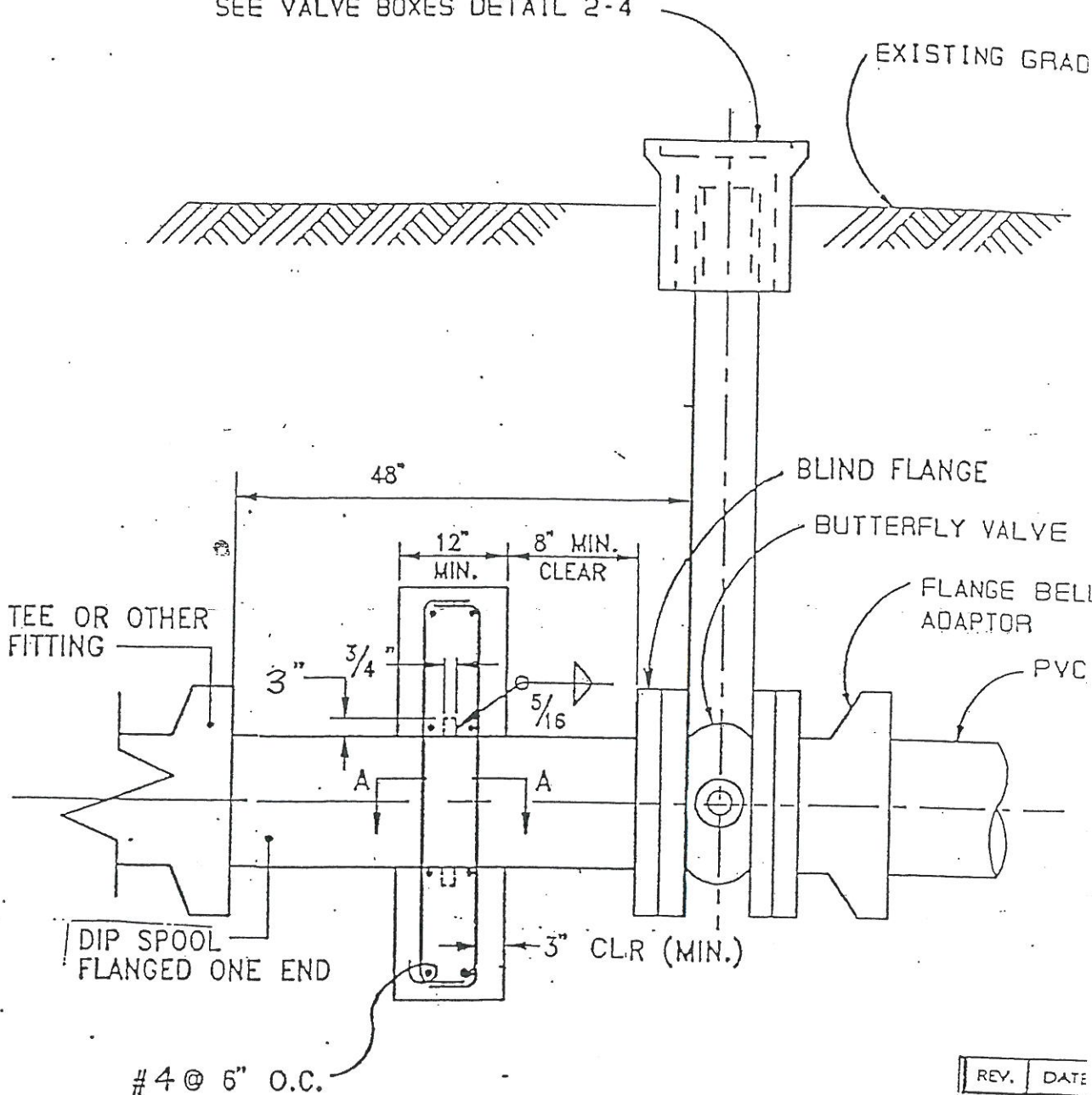
SAN BENITO COUNTY WATER DISTRICT  
THRUST BLOCKING - REDUCERS

DESIGNED BY: C+D	SCALE: NO SCALE
DRAWN BY: C+D	DATE: NOV 1992
CHECKED BY: C+D	DRAWING NO. 3-2

APPROVED BY:  
\_\_\_\_\_  
DISTRICT MANAGER

APPROVED BY:  
\_\_\_\_\_  
DISTRICT ENGINEER

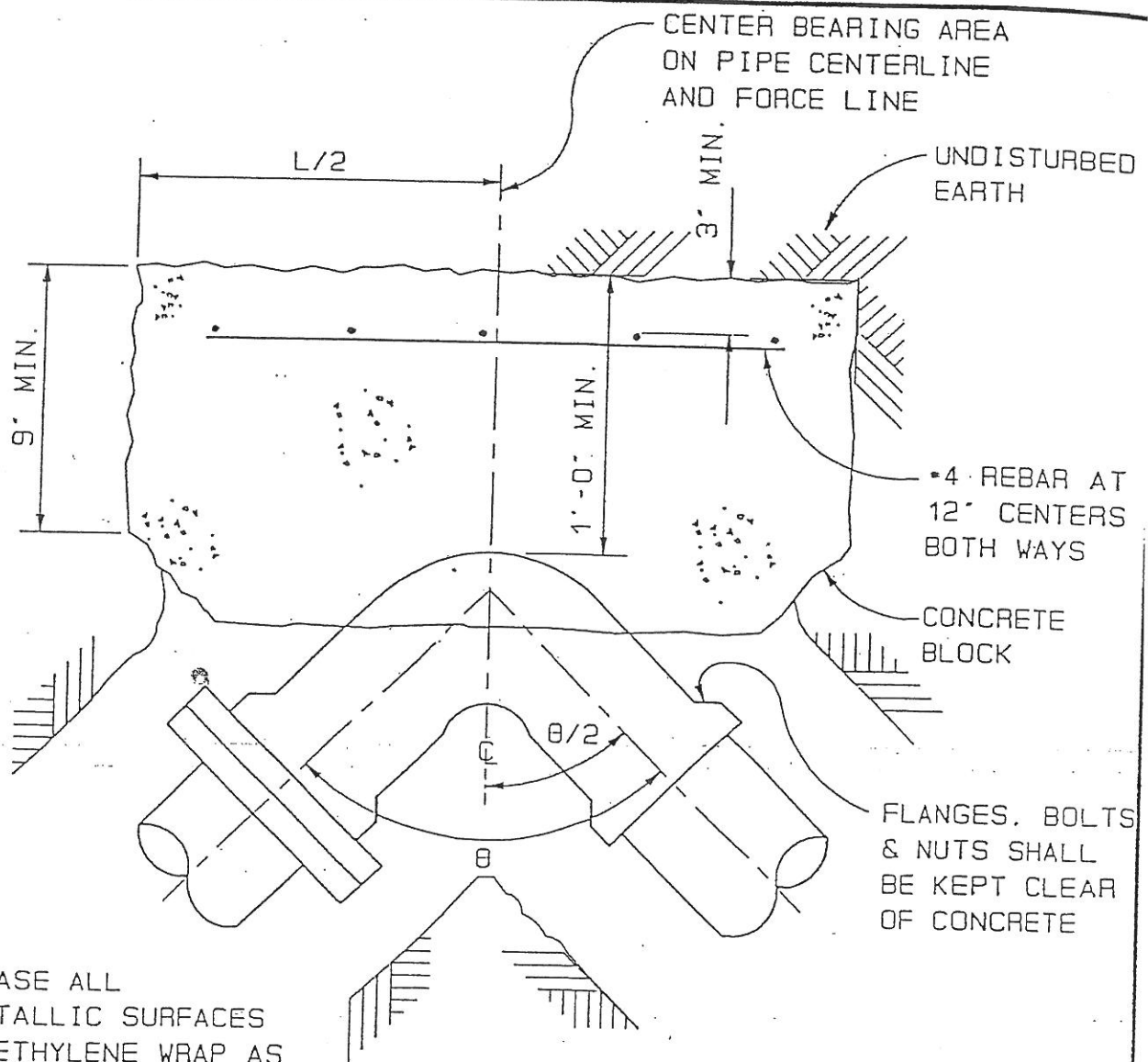
VALVE BOX, UNPAVED  
 INSTALLATION SHOWN  
 SEE VALVE BOXES DETAIL 2-4



REV.	DATE
1	4-15-
2	5-17-

{ NOTE: SEE IN-LINE THRUST BLOCK DETAIL 3-7 FOR SECTION A-A. }  
 { REQUIRED BEARING SHALL BE AGAINST UNDISTURBED SOIL. }

SAN BENITO COUNTY WATER DISTRICT	DESIGNED BY:	SCALE:
	C+D	NO SCALE
THRUST BLOCKING - VALVES	DRAWN BY:	DATE:
	C+D	NOV 1992
APPROVED BY:	CHECKED BY:	DRAWING NO.
DISTRICT MANAGER	DISTRICT ENGINEER	C+D
		3-4



NOTE: ENCASE ALL BURIED METALLIC SURFACES WITH POLYETHYLENE WRAP AS SPECIFIED IN AWWA C105.

Pipe Size	REQUIRED BEARING AREA (SQ. FT.)					BEARING AREA DIMENSIONS (L x H)				
	5.625°	11.25°	22.25°	45°	90°	5.625°	11.25°	22.25°	45°	90°
6"	1	1	2	3	5	1'0" x 1'0"	1'0" x 1'0"	1'5" x 1'5"	1'9" x 1'9"	2'3" x 2'3"
8"	1	1	2	4	8	1'0" x 1'0"	1'0" x 1'0"	1'5" x 1'5"	2'0" x 2'0"	2'10" x 2'10"
10"	1	2	4	7	12	1'0" x 1'0"	1'5" x 1'5"	2'0" x 2'0"	2'8" x 2'8"	3'5" x 3'5"
12"	1	3	5	9	17	1'0" x 1'0"	1'9" x 1'9"	2'3" x 2'3"	3'0" x 3'0"	4'2" x 4'2"

SAN BENITO COUNTY WATER DISTRICT  
THRUST BLOCKING - ELBOWS

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

APPROVED BY:

DISTRICT MANAGER

APPROVED BY:

DISTRICT ENGINEER

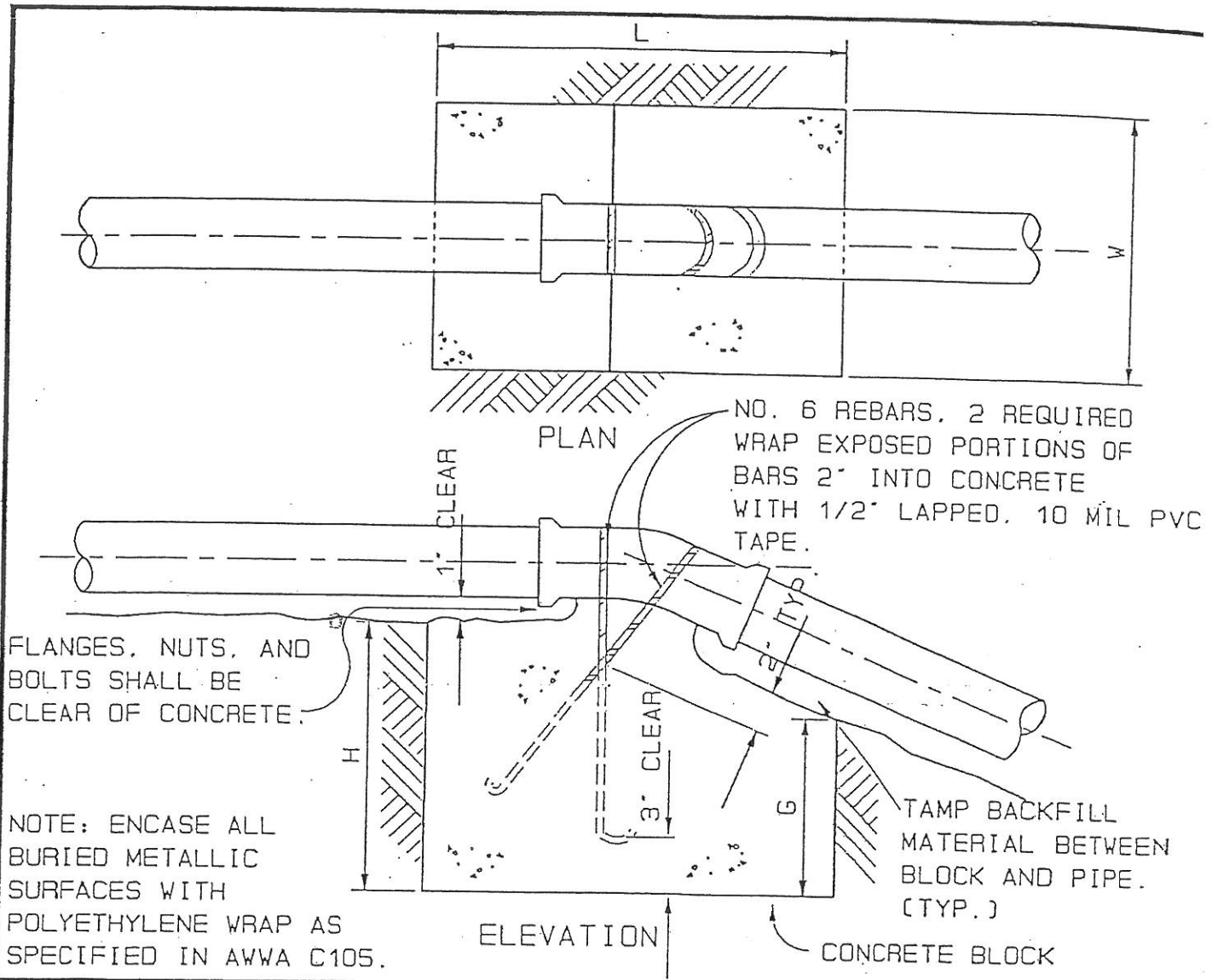
CHECKED BY:

C+D

DRAWING NO.

3-5





THRUST BLOCK DIMENSIONS- UPWARD THRUST

Pipe Size	11.25° BEND				22.25° BEND				45° BEND			
	L	W	H	G	L	W	H	G	L	W	H	G
6"	2'0"	2'0"	1'0"	9"	2'0"	2'0"	2'0"	1'0"	3'0"	2'0"	2'0"	6"
8"	2'0"	2'0"	1'0"	9"	3'0"	2'0"	2'0"	1'0"	4'6"	2'0"	3'0"	6"
10"	3'0"	2'0"	2'0"	1'8"	4'0"	2'0"	2'0"	1'0"	6'0"	2'0"	3'8"	8"
12"	3'0"	2'0"	2'0"	1'8"	6'0"	2'0"	2'0"	1'0"	7'0"	2'6"	4'0"	8"

SAN BENITO COUNTY WATER DISTRICT  
ELBOWS UPWARD THRUST BLOCKING

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

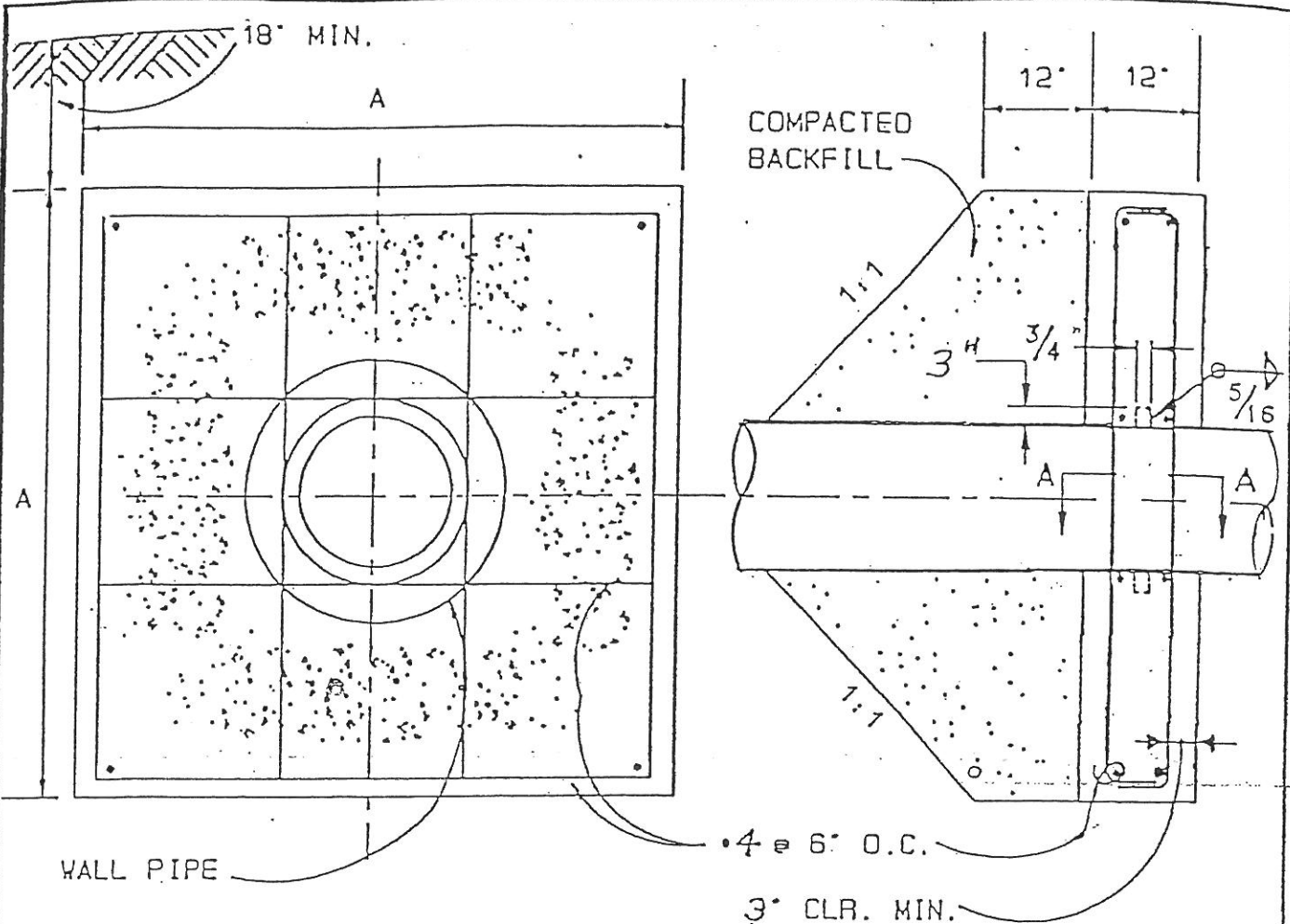
APPROVED BY:

APPROVED BY:

CHECKED BY:

DRAWING NO.





WALL PIPE

• 4 @ 6" O.C.

3" CLR. MIN.

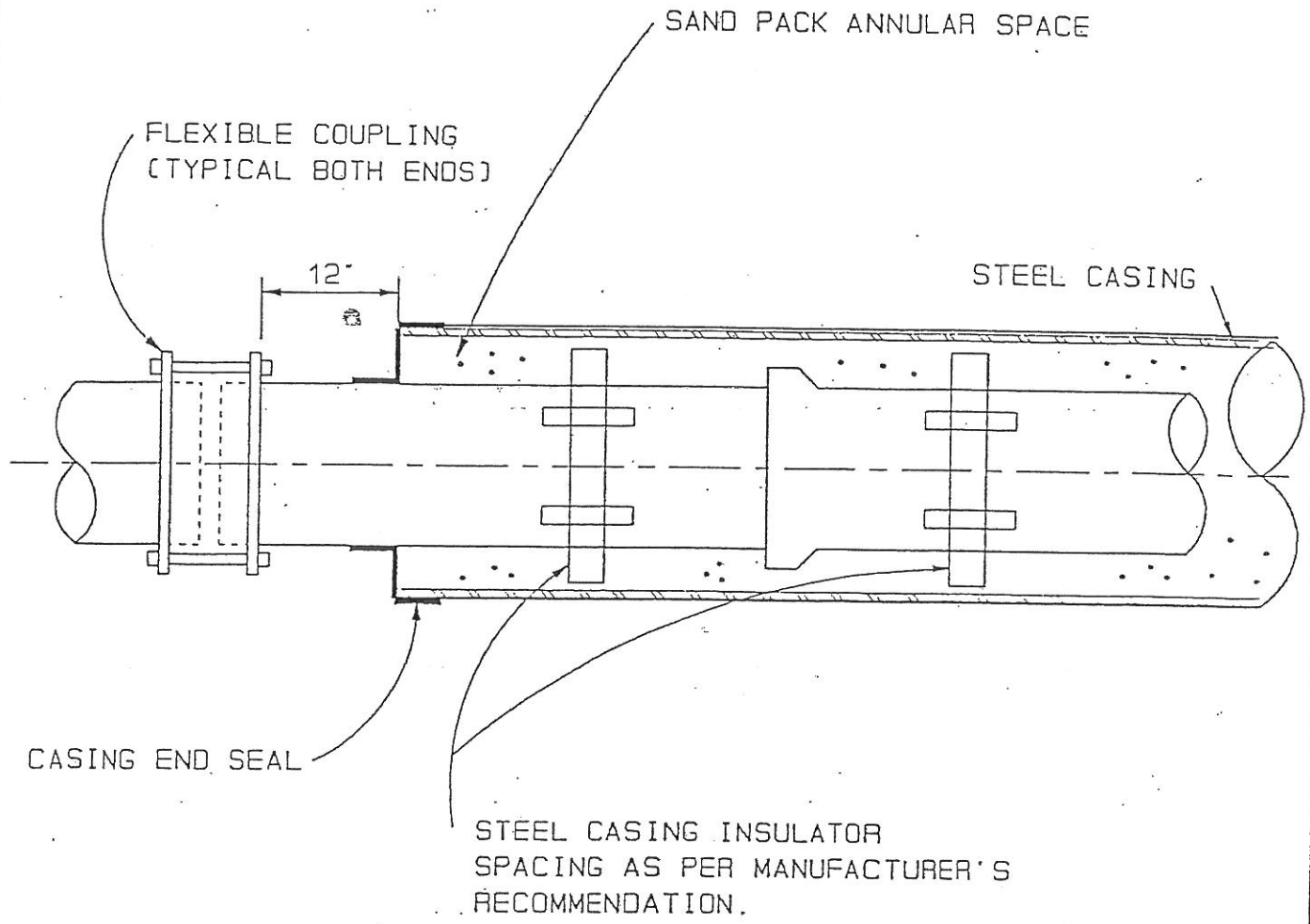
SUB 9 LOW

PIPE SIZE	BEARING AREA	A	A
4"	2 SQ FT	1'-4"	1'-6"
6"	4 SQ FT	2'-0"	2'-3"
8"	7 SQ FT	2'-7"	3'-0"
10"	11 SQ FT	3'-3"	3'-9"
12"	15 SQ FT	3'-11"	4'-6"

REV.	DATE
1	4-15-96
2	5-17-96

NOTES: 1) SEE IN-LINE THRUST BLOCK DETAIL 3-7 FOR SECTION A-A.  
 2) THE VALUE OF 1500 PSF TO BE USED IN DESIGNING.  
 ACTUAL SOIL CONDITIONS REVEALED BY OPEN TRENCH MAY REQUIRE ADJUSTMENT IN THRUST BLOCK AREA.

<p>SAN BENITO COUNTY WATER DISTRICT</p> <p>IN-LINE THRUST BLOCK</p>		DESIGNED BY:	SCALE:
		C+D	NO SCALE
<p>APPROVED BY:</p> <p>DISTRICT MANAGER</p>		DRAWN BY:	DATE:
		C+D	NOV 1992
<p>APPROVED BY:</p> <p>DISTRICT ENGINEER</p>		CHECKED BY:	DRAWING NO
		C+D	3-7

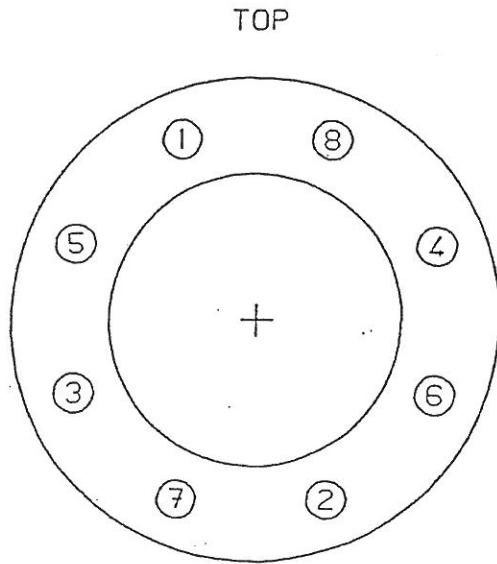


SAN BENITO COUNTY WATER DISTRICT  
 BORING AND JACKING DETAILS

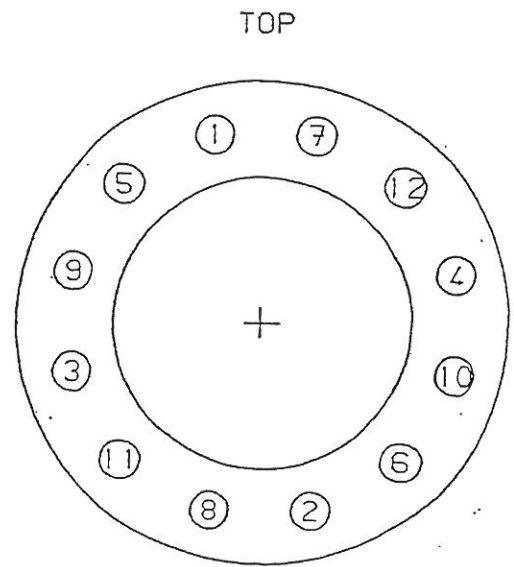
DESIGNED BY:	SCALE:
C+D	NO SCALE
DRAWN BY:	DATE:
C+D	NOV 1992
CHECKED BY:	DRAWING NO.
C+D	2-0

APPROVED BY: \_\_\_\_\_  
 DISTRICT MANAGER

APPROVED BY: \_\_\_\_\_  
 DISTRICT ENGINEER



8 BOLT  
TIGHTENING SEQUENCE



12 BOLT  
TIGHTENING SEQUENCE

TIGHTEN BOLTS ACCORDING TO SEQUENCE SHOWN ABOVE. TIGHTENING SHOULD BE ACCOMPLISHED IN A MINIMUM OF THREE STAGES WITH FINAL TORQUE VALUES ACCORDING TO THE TABLE BELOW. UNIFORM TIGHTENING WILL ELIMINATE LEAKING GASKETS. TORQUE VALUES SHOULD BE CHECKED UPON COMPLETION OF TIGHTENING SEQUENCE. A 1/8" THICK NEOPRENE OR RUBBER GASKET SHALL BE USED. RING TYPE GASKETS ARE RECOMMENDED.

VALVE SIZE	BOLT QUANTITY-SIZE	REQUIRED TORQUE
4"	8 - 5/8"	80 Ft. Lbs.
6"	8 - 5/8"	80 Ft. Lbs.
8"	8 - 3/4"	140 Ft. Lbs.
10"	12 - 7/8"	145 Ft. Lbs.
12"	12 - 1"	145 Ft. Lbs.

SAN BENITO COUNTY WATER DISTRICT  
FLANGE BOLT TIGHTENING

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

APPROVED BY:

APPROVED BY:

CHECKED BY:

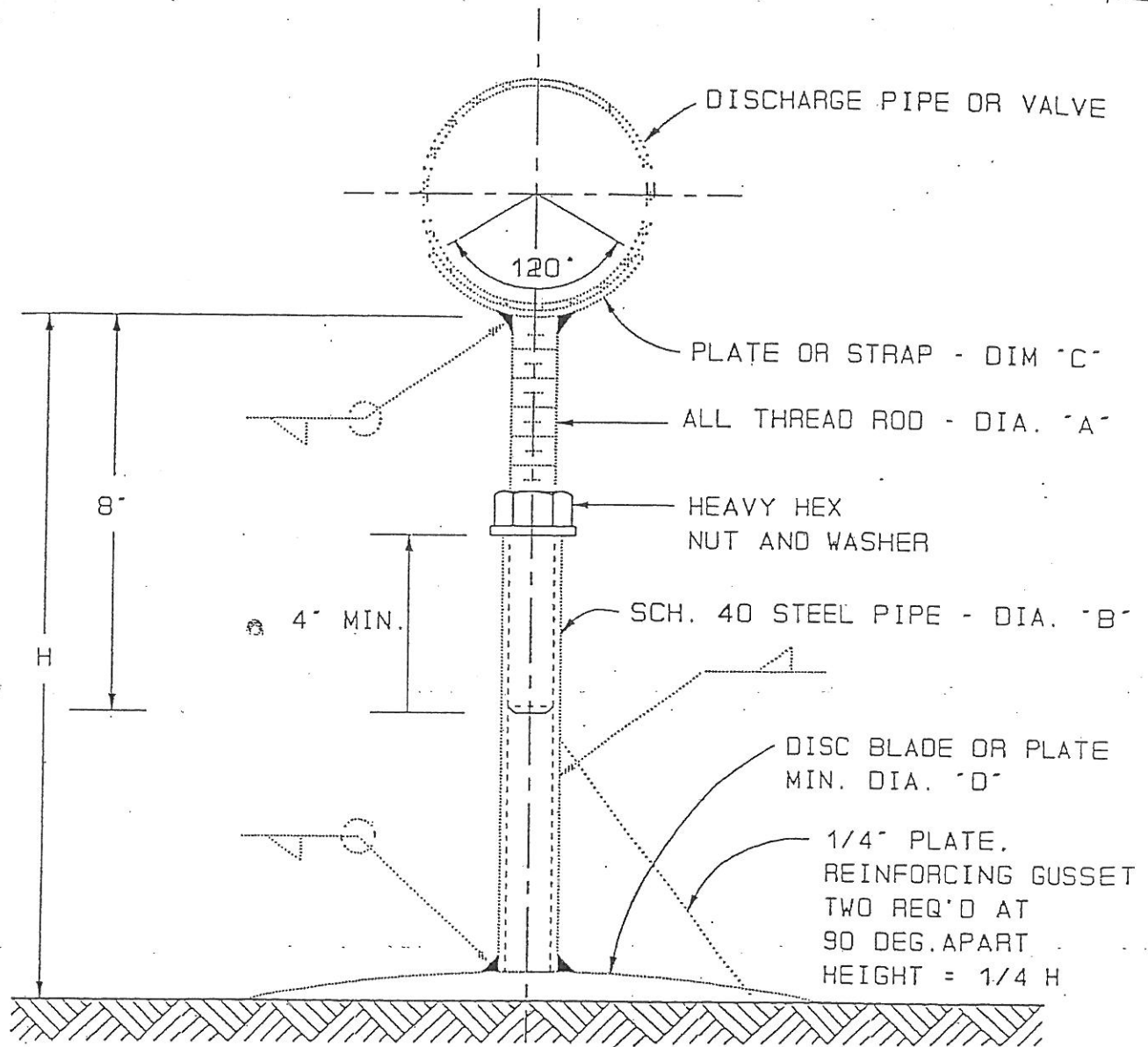
DRAWING NO.

DISTRICT MANAGER

DISTRICT ENGINEER

C+D

2-9



DIMENSIONS AND DIAMETERS

PIPE DIA.	A	B	C
4"	7/8"	1"	1/4" X 1-1/4"
6"	1"	1-1/4"	3/8" X 1-1/2"
8"	1"	1-1/4"	3/8" X 1-1/2"
10"	1-1/4"	1-1/2"	1/2" X 2"
12"	1-1/4"	1-1/2"	1/2" X 2"

H - MAX	D	GUSSET
2'	12"	NOT REQ'D
4'	24"	REQ'D
6'	30"	REQ'D

SAN BENITO COUNTY WATER DISTRICT

PIPE SUPPORT

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

APPROVED BY:

DISTRICT MANAGER

APPROVED BY:

DISTRICT ENGINEER

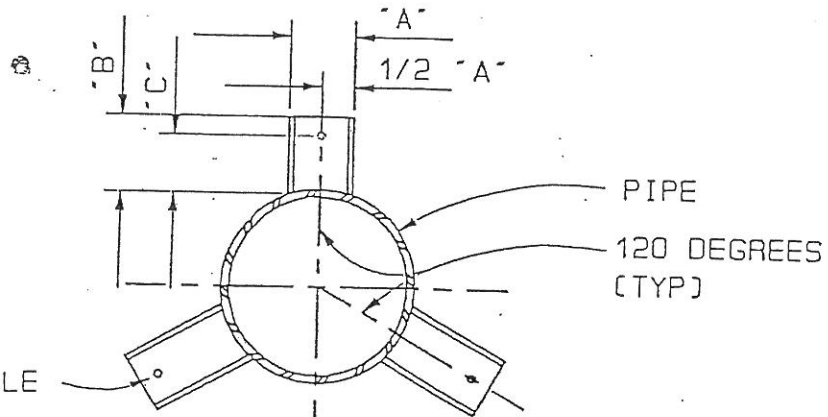
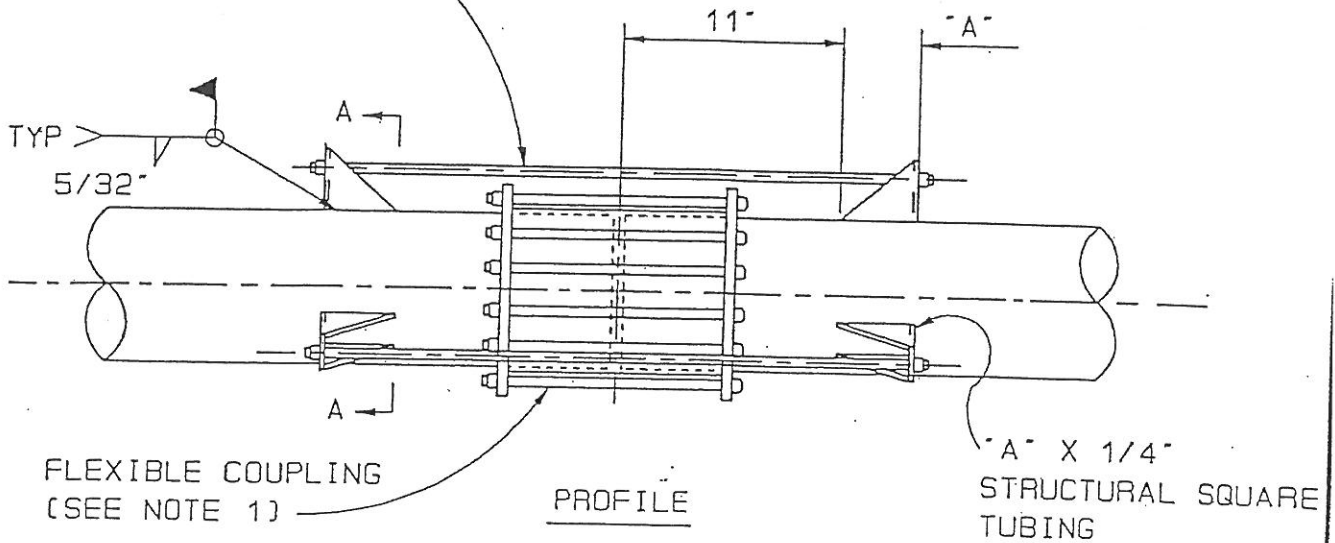
CHECKED BY:

C+D

DRAWING NO.

3-10

"D" DIA. ALL-THREAD (2A + 25" LONG)  
WITH WASHERS AND NUTS



"D" + 1/8" DIA. HOLE

SECTION A-A

NOTES:

- 1) FLEXIBLE COUPLING SHALL HAVE A MIDDLE RING LENGTH OF 7 INCHES.
- 2) THIS RESTRAINT IS USED WITH 4" TO 12" NORMAL PIPE ONLY.
- 3) BOLTING PATTERN OF FLEXIBLE COUPLING SHALL BE OFFSET WITH RESTRAINT LAYOUT.
- 4) GAP BETWEEN PIPES SHALL BE 3/4" +/- 1/4".

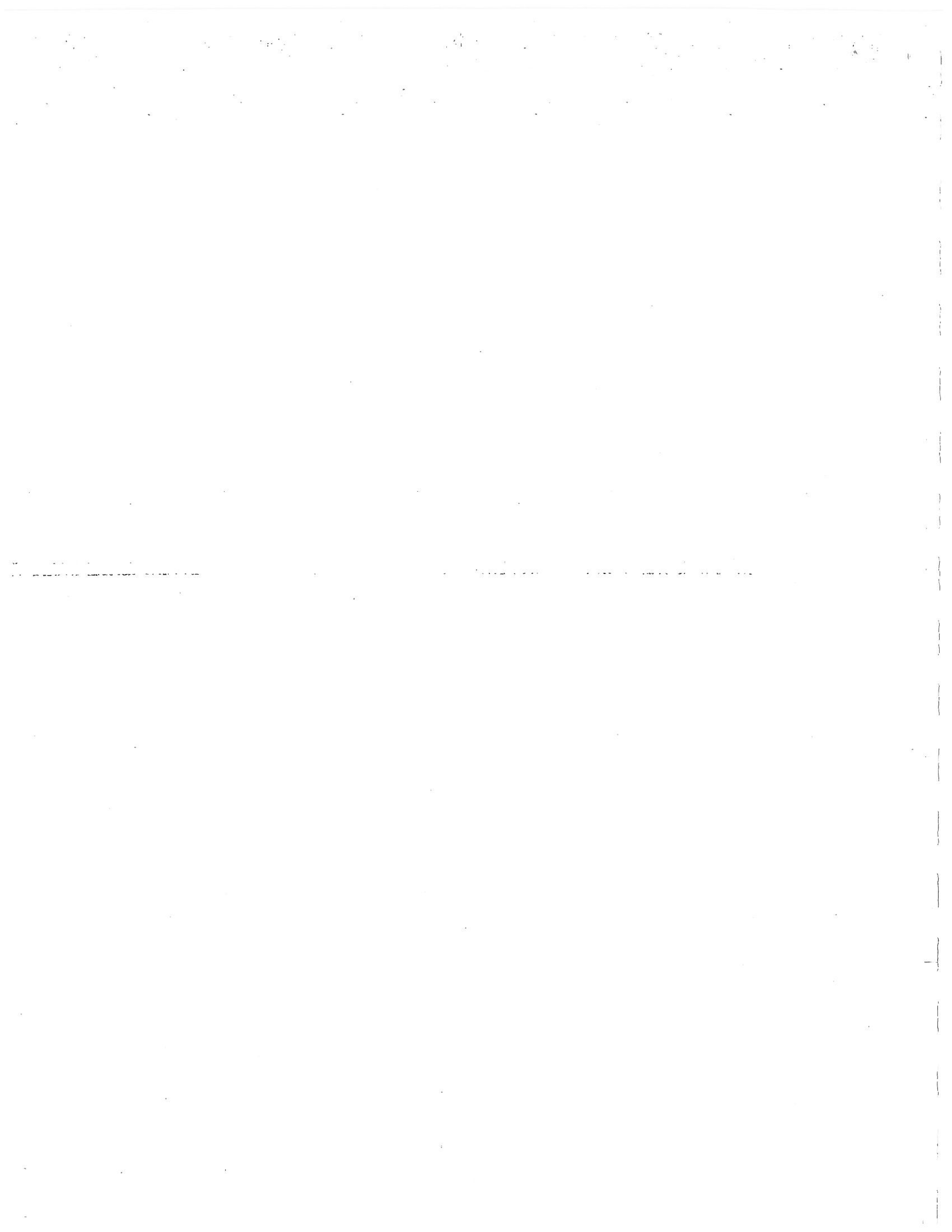
PIPE DIAMETER	"A"	"B"	"C"	"D" - DIA.
4"	2.5"	4.0"	3.0"	0.5"
6"	2.5"	4.0"	3.0"	0.5"
8"	2.5"	4.0"	3.0"	0.5"
10"	3.5"	4.5"	3.25"	0.75"
12"	3.5"	4.5"	3.25"	0.75"

SAN BENITO COUNTY WATER DISTRICT  
FLEXIBLE COUPLING RESTRAINT

DESIGNED BY: C+D	SCALE: NO SCALE
DRAWN BY: C+D	DATE: NOV 1992
CHECKED BY: C+D	DRAWING NO. 3-11

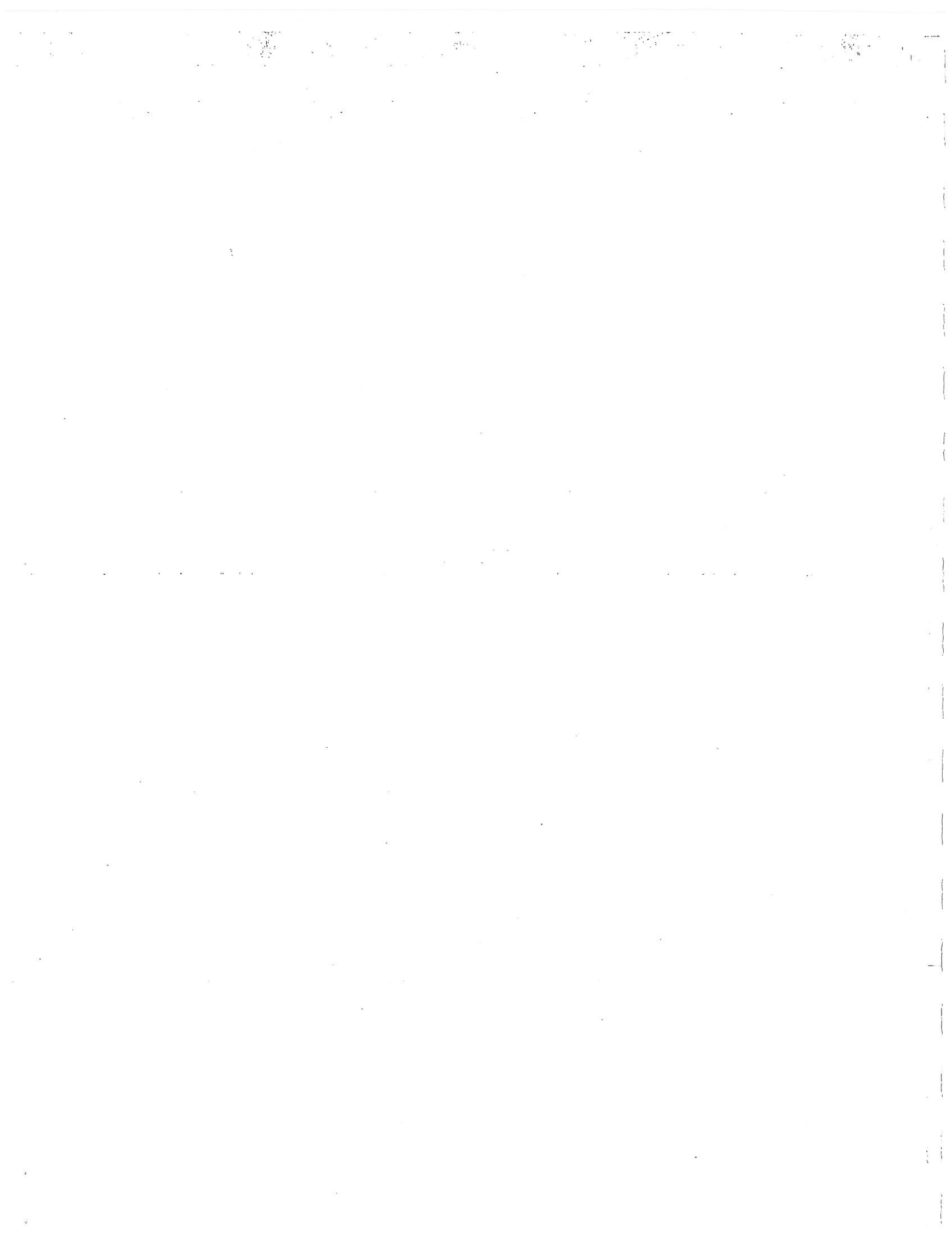
APPROVED BY:  
\_\_\_\_\_  
DISTRICT MANAGER

APPROVED BY:  
\_\_\_\_\_  
DISTRICT ENGINEER

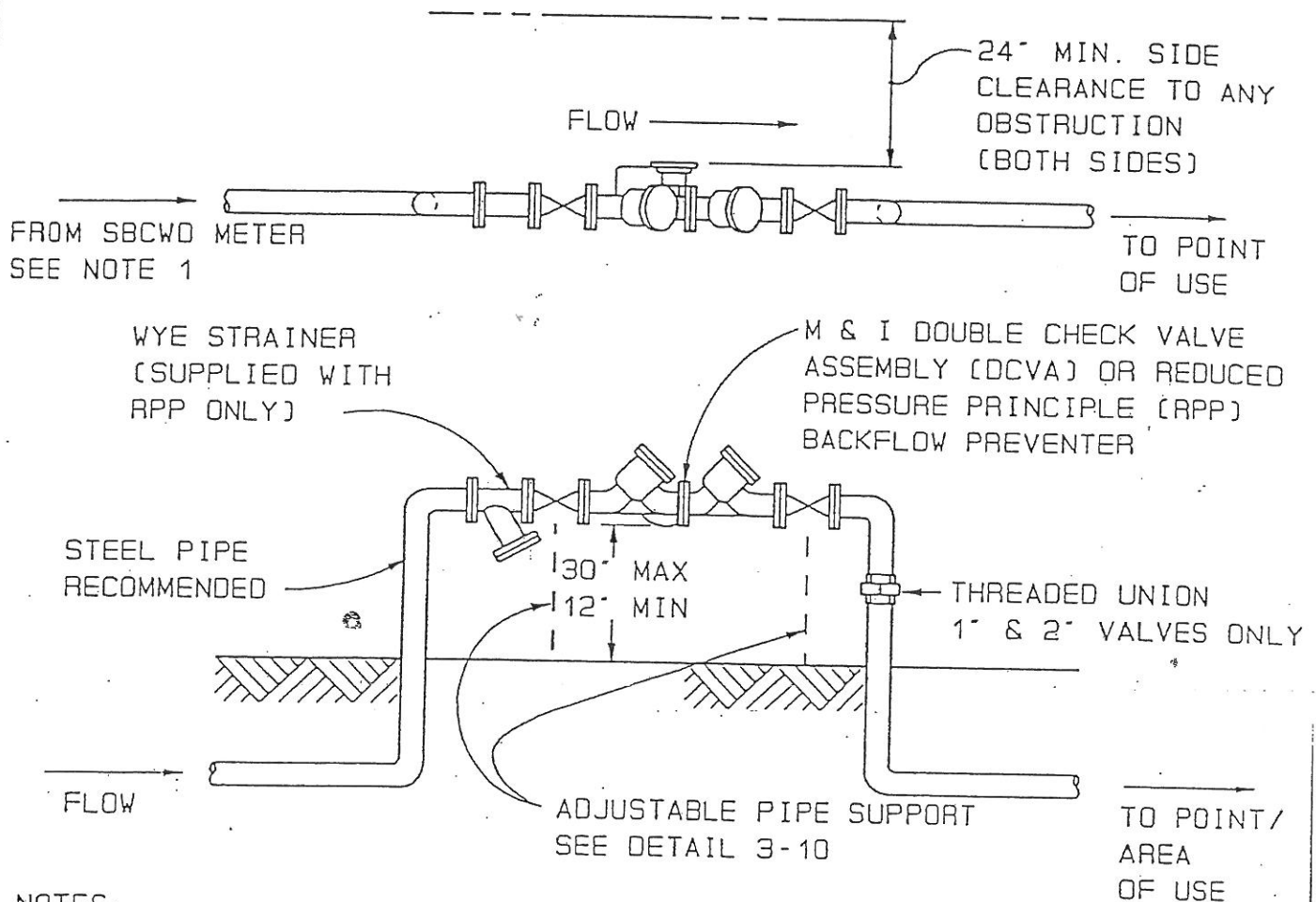


SECTION 4

BACKFLOW PREVENTION  
DETAILS







NOTES:

- 1) VALVE MUST BE INSTALLED WITHIN 25' OF THE DISTRICT'S METER EXCEPT UPON APPROVAL FROM THE DISTRICT.
- 2) THIS DRAWING APPLIES TO BOTH M & I DOUBLE CHECK VALVE ASSEMBLIES (DCVA) AND REDUCED PRESSURE PRINCIPLE (RPP) BACKFLOW PREVENTERS.
- 3) ALL VALVES SHALL BE AWWA/USC APPROVED AND WILL BE SUPPLIED BY THE DISTRICT AT THE WATER USER'S EXPENSE.
- 4) DIFFERENT MANUFACTURER'S VALVES AND VALVES OF DIFFERENT SIZES MAY VARY IN APPEARANCE.
- 5) WATER USERS ARE CAUTIONED THAT THESE DEVICES HAVE PRESSURE LOSSES OF 8 - 14 PSI UNDER NORMAL OPERATING CONDITIONS.
- 6) IF A BOOSTER PUMP IS REQUIRED, IT SHOULD BE INSTALLED UPSTREAM OF THE VALVE -SEE DETAILS 4-9 AND 4-10.
- 7) TWO ADJUSTABLE PIPE SUPPORTS ARE RECOMMENDED FOR VALVE INSTALLATIONS 3" OR LARGER.

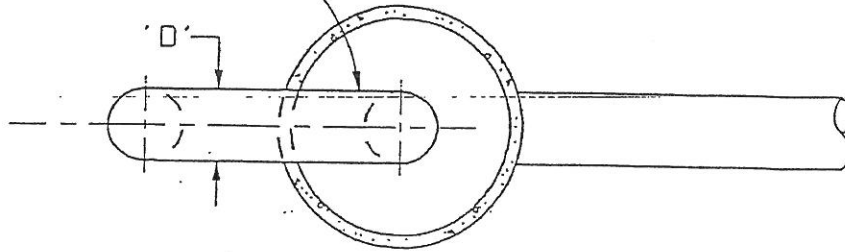
SAN BENITO COUNTY WATER DISTRICT  
 MUNICIPAL AND INDUSTRIAL  
 BACKFLOW VALVE INSTALLATION

DESIGNED BY: C+D	SCALE: NO SCALE
DRAWN BY: C+D	DATE: NOV 1992
CHECKED BY:	DRAWING NO.

APPROVED BY:

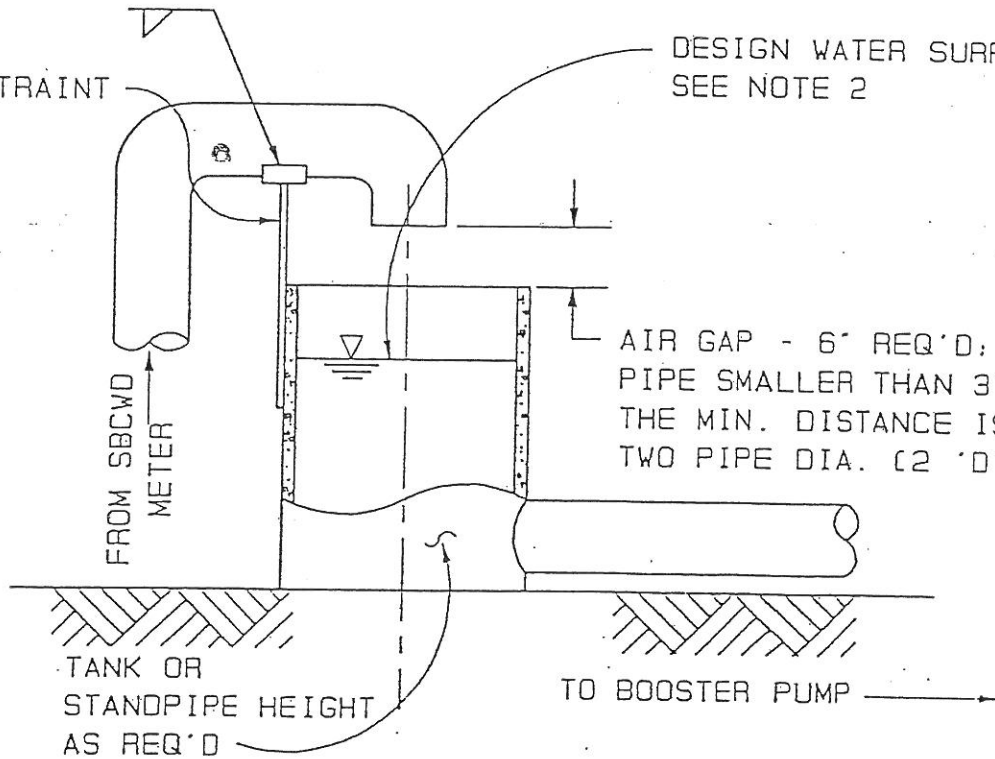
APPROVED BY:

DISCHARGE PIPE



PIPE RESTRAINT

DESIGN WATER SURFACE  
SEE NOTE 2



AIR GAP - 6" REQ'D; EXCEPT  
PIPE SMALLER THAN 3";  
THE MIN. DISTANCE IS  
TWO PIPE DIA. (2 'D')

TANK OR  
STANDPIPE HEIGHT  
AS REQ'D

TO BOOSTER PUMP

NOTES:

- 1) AUTOMATIC REMOTE OPERATED WATER LEVEL CONTROL VALVES MAY BE USED.
- 2) STANDPIPE MAY BE CONSTRUCTED TO ANY HEIGHT, ALTHOUGH WATER USERS SHOULD VERIFY THAT THE MINIMUM DELIVERY HEAD IS GREATER THAN THE HEIGHT OF THE DISCHARGE PIPE.

SAN BENITO COUNTY WATER DISTRICT  
MUNICIPAL AND INDUSTRIAL  
AIR GAP INSTALLATION

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

APPROVED BY:

APPROVED BY:

CHECKED BY:

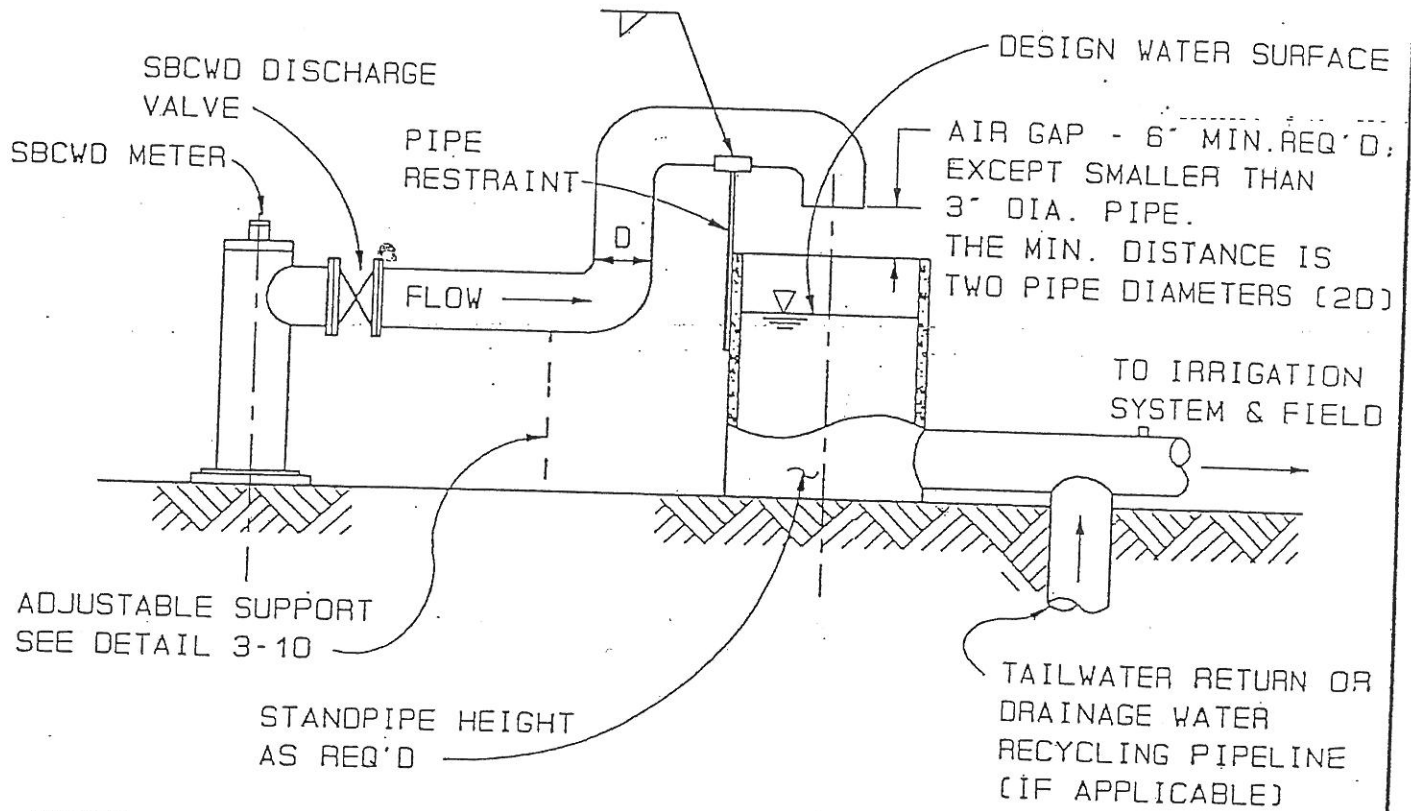
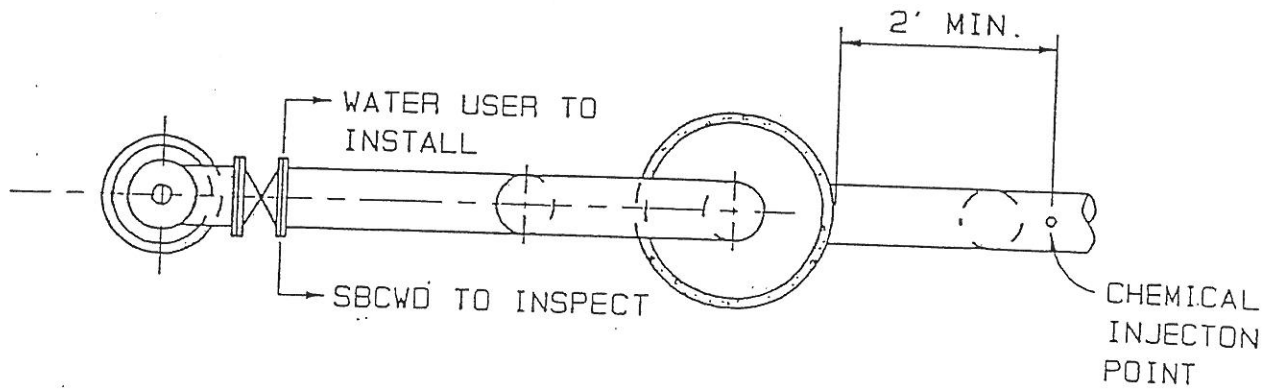
DRAWING NO.

DISTRICT MANAGER

DISTRICT ENGINEER

C+D

4-2



NOTES:

- 1) AUTOMATIC REMOTE OPERATED LEVEL CONTROL VALVES MAY BE USED.
- 2) STANDPIPE MAY BE CONSTRUCTED TO ANY HEIGHT, ALTHOUGH WATER USERS SHOULD VERIFY THAT THE MINIMUM DELIVERY HEAD IS GREATER THAN THE HEIGHT OF THE DISCHARGE PIPE.
- 3) STANDPIPE MUST BE WITHIN 25' OF THE DISTRICT DELIVERY AND THERE SHALL BE NO PIPE CONNECTIONS OR INJECTION POINTS UPSTREAM OF THE STANDPIPE.

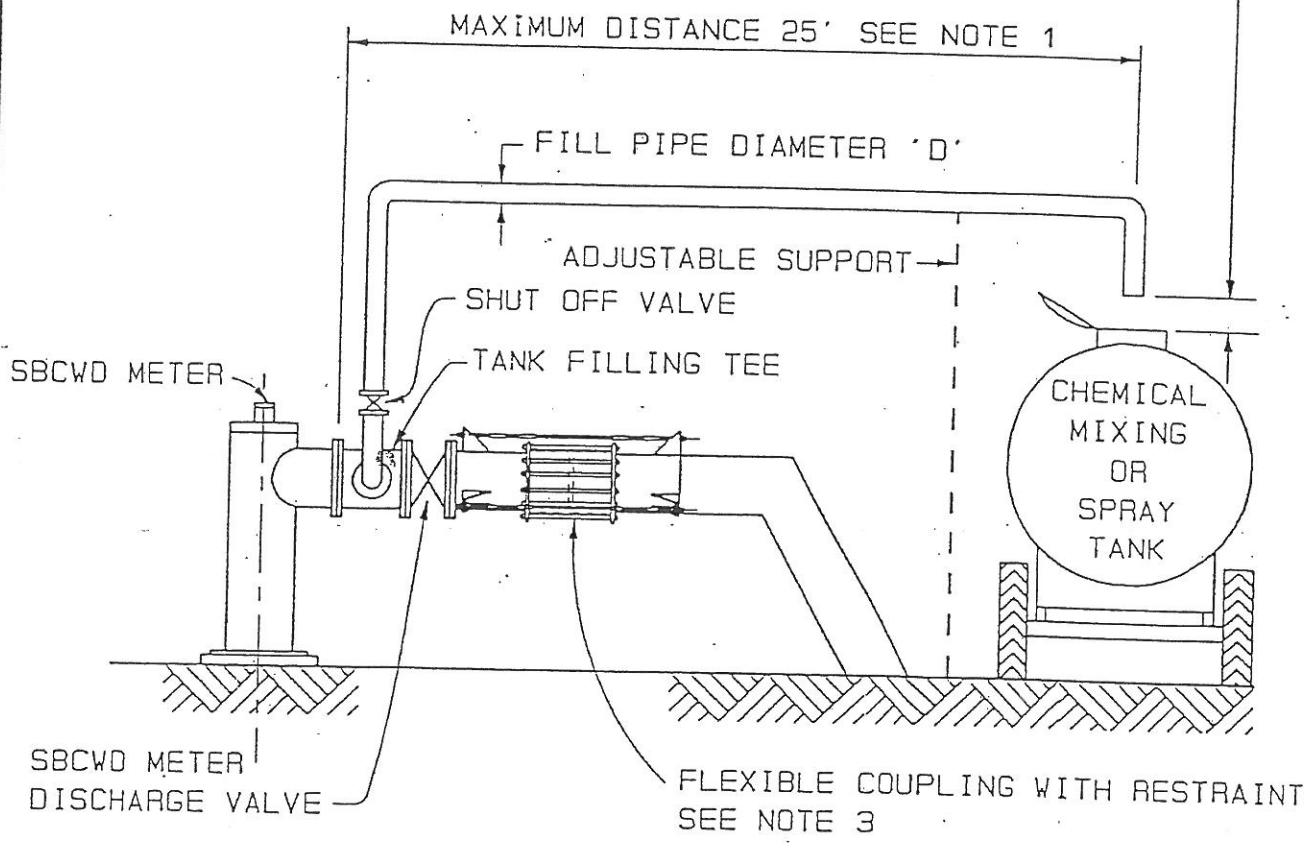
SAN BENITO COUNTY WATER DISTRICT  
STANDPIPE WITH AIR GAP

DESIGNED BY: C+D	SCALE: NO SCALE
DRAWN BY: C+D	DATE: NOV 1992
CHECKED BY:	DRAWING NO.:

APPROVED BY:  
DISTRICT MANAGER

APPROVED BY:  
DISTRICT ENGINEER

AIR GAP - 6" MINIMUM REQ'D;  
 EXCEPT SMALLER THAN 3" DIA. PIPE  
 THE MINIMUM DISTANCE REQ'D  
 IS TWO PIPE DIAMETERS (2D)



NOTES:

- 1) THE DISCHARGE OF THE FILL PIPE SHALL BE WITHIN 25' OF THE DELIVERY METER. EXCEPTION; MAY BE EXTENDED TO 75' IF DISCHARGE FILL PIPE IS UNDERGROUND OR UPON SPECIAL APPROVAL.
- 2) CHEMICAL TANK FILLING AT DELIVERY SITES IDENTIFIED AS LOW PRESSURE DELIVERIES BY THE DISTRICT SHALL BE DONE ONLY THROUGH THE USE OF AIR GAP SEPARATION.
- 3) FLEXIBLE COUPLING RESTRAINT SEE DETAIL 3-11.

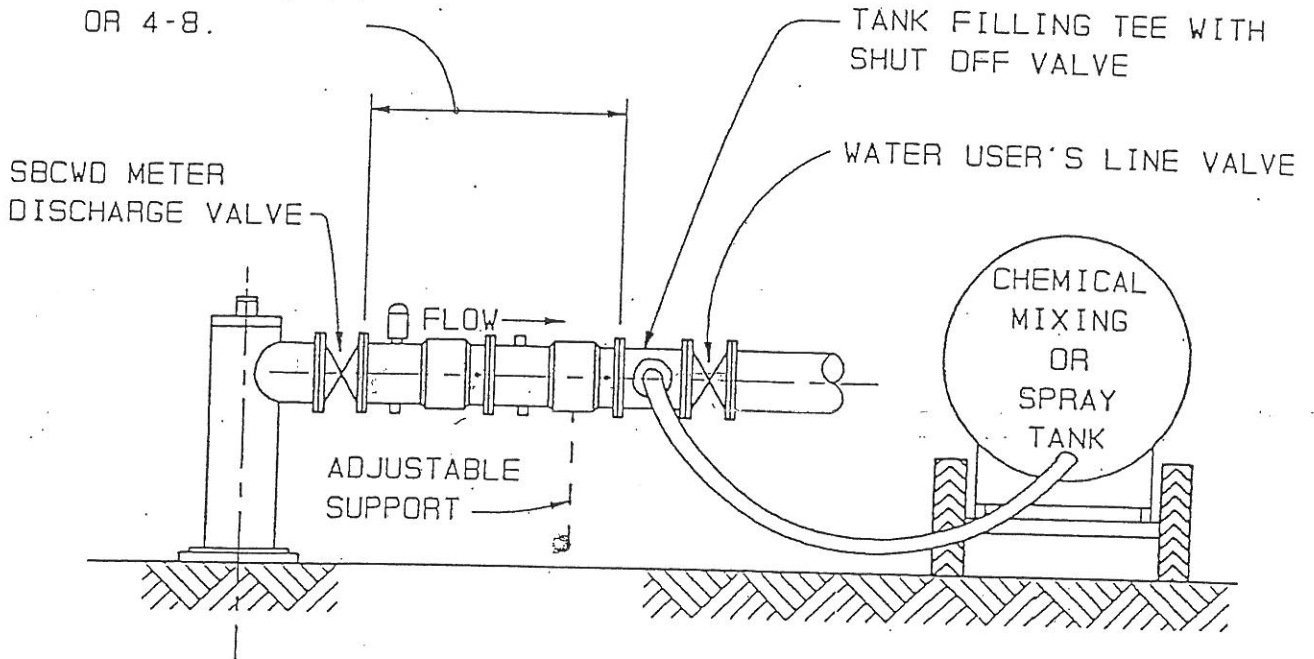
SAN BENITO COUNTY WATER DISTRICT  
 CHEMICAL TANK FILLING  
 WITH AIR GAP

DESIGNED BY: C+D	SCALE: NO SCALE
DRAWN BY: C+D	DATE: NOV 1992
CHECKED BY: C+D	DRAWING NO.: 4-4

APPROVED BY:  
 \_\_\_\_\_  
 DISTRICT MANAGER

APPROVED BY:  
 \_\_\_\_\_  
 DISTRICT ENGINEER

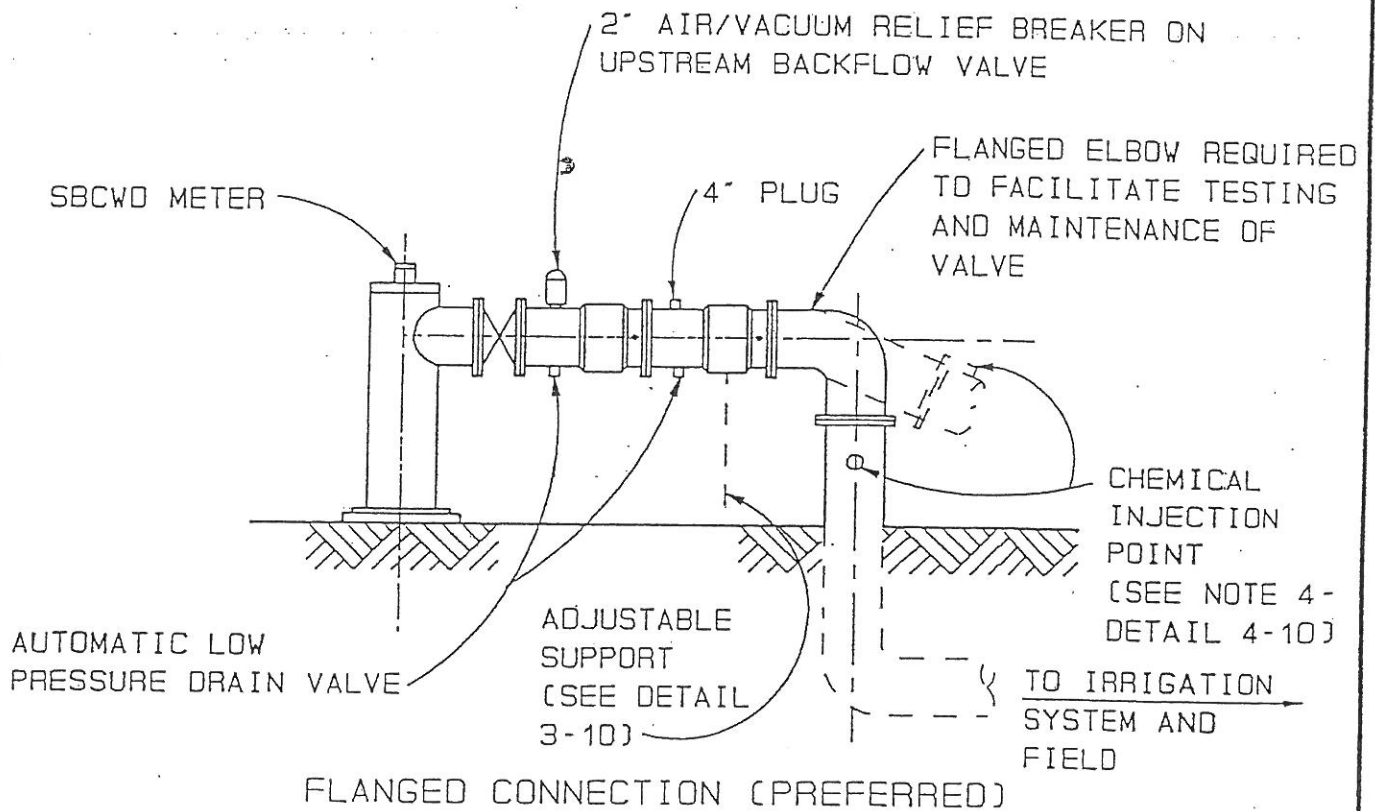
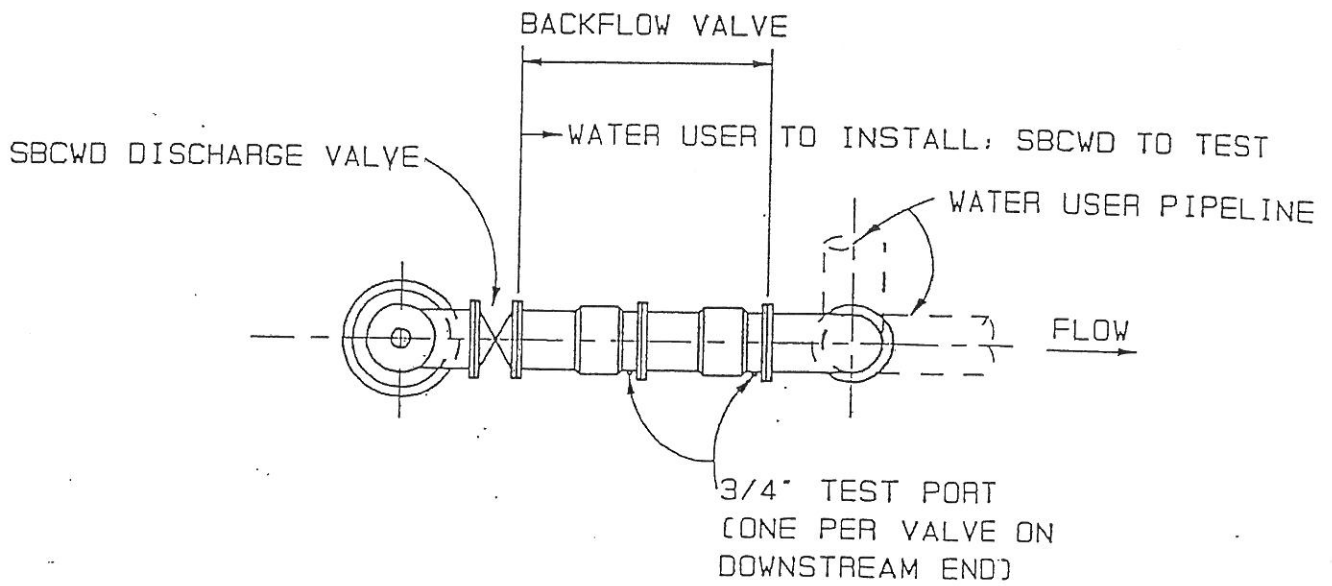
BACKFLOW VALVE  
 INSTALLED PER  
 DETAIL 4-6, 4-7  
 OR 4-8.



NOTES:

- 1) THE CONNECTION OF THE FILL HOSE TO THE METER DISCHARGE PIPE SHALL BE DOWNSTREAM FROM THE DOUBLE BACKFLOW VALVE.
- 2) HOSE FILL CONNECTIONS ARE NOT ALLOWED WITH A SINGLE BACKFLOW VALVE.

SAN BENITO COUNTY WATER DISTRICT CHEMICAL TANK FILLING WITH BACKFLOW VALVES		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	NOV 1992
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
DISTRICT MANAGER	DISTRICT ENGINEER	C+D	1-5



SAN BENITO COUNTY WATER DISTRICT  
4" & 6" BACKFLOW PREVENTION  
FLANGED INSTALLATION

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

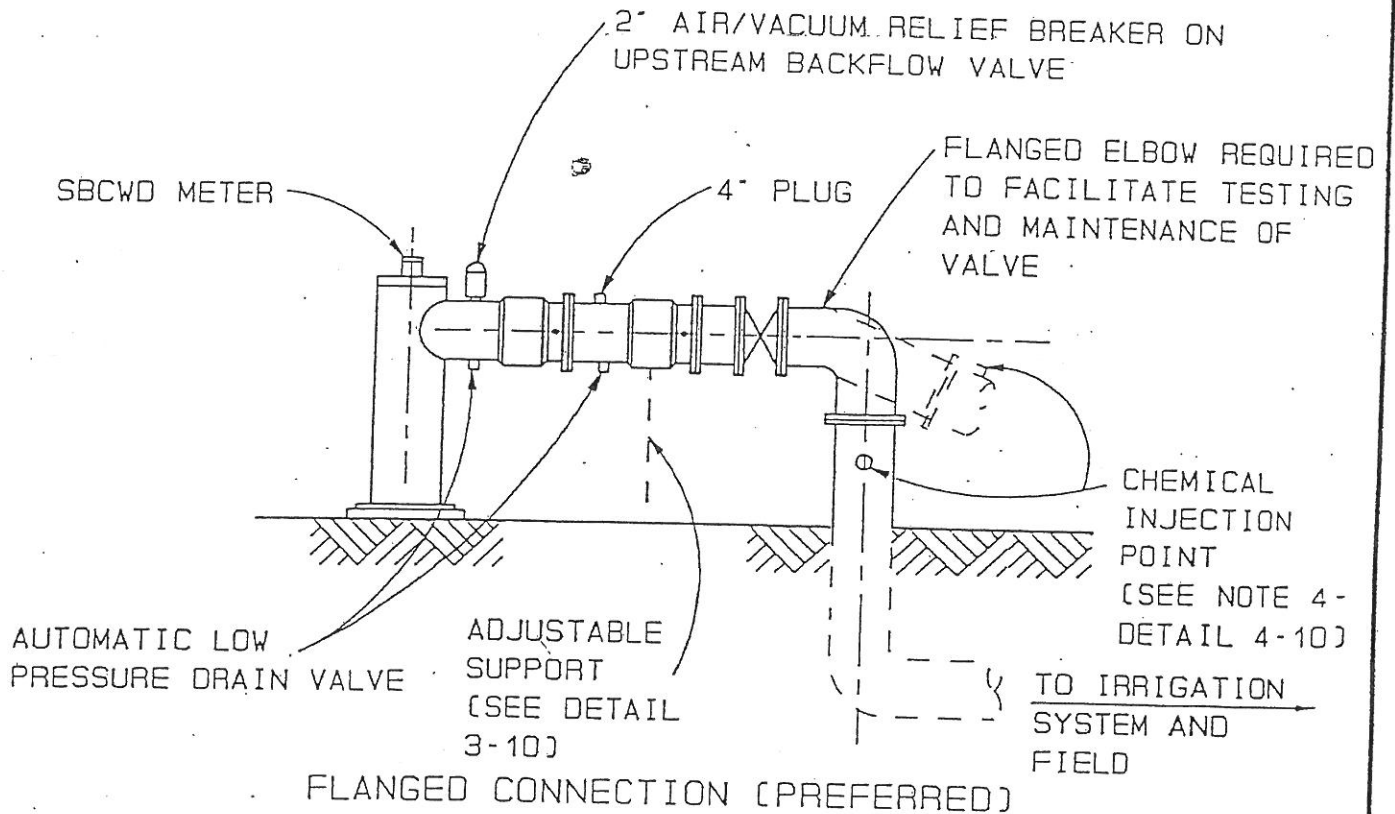
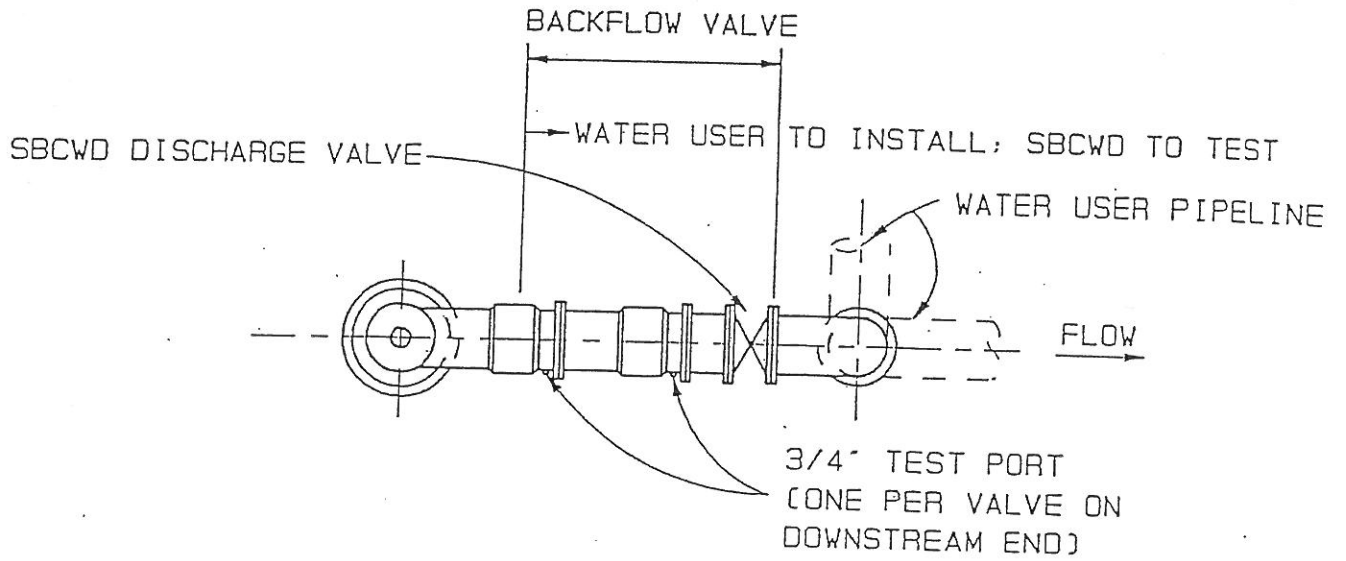
NOV 1992

APPROVED BY:

APPROVED BY:

CHECKED BY:

DRAWING NO.



SAN BENITO COUNTY WATER DISTRICT  
8", 10", 12" BACKFLOW PREVENTION  
FLANGED INSTALLATION

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

CHECKED BY:

C+D

DRAWING NO.:

17

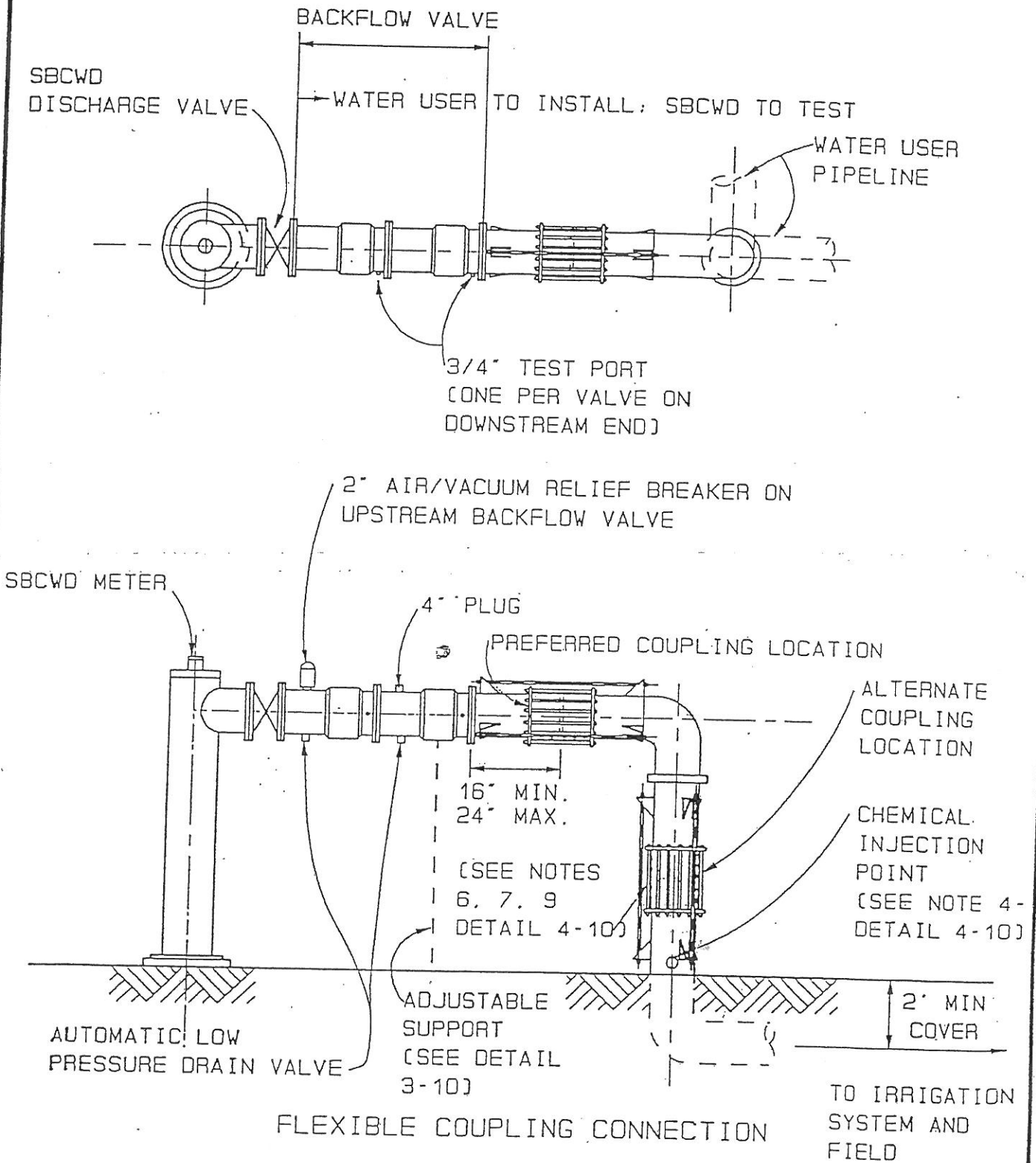
APPROVED BY:

DISTRICT MANAGER

APPROVED BY:

DISTRICT ENGINEER





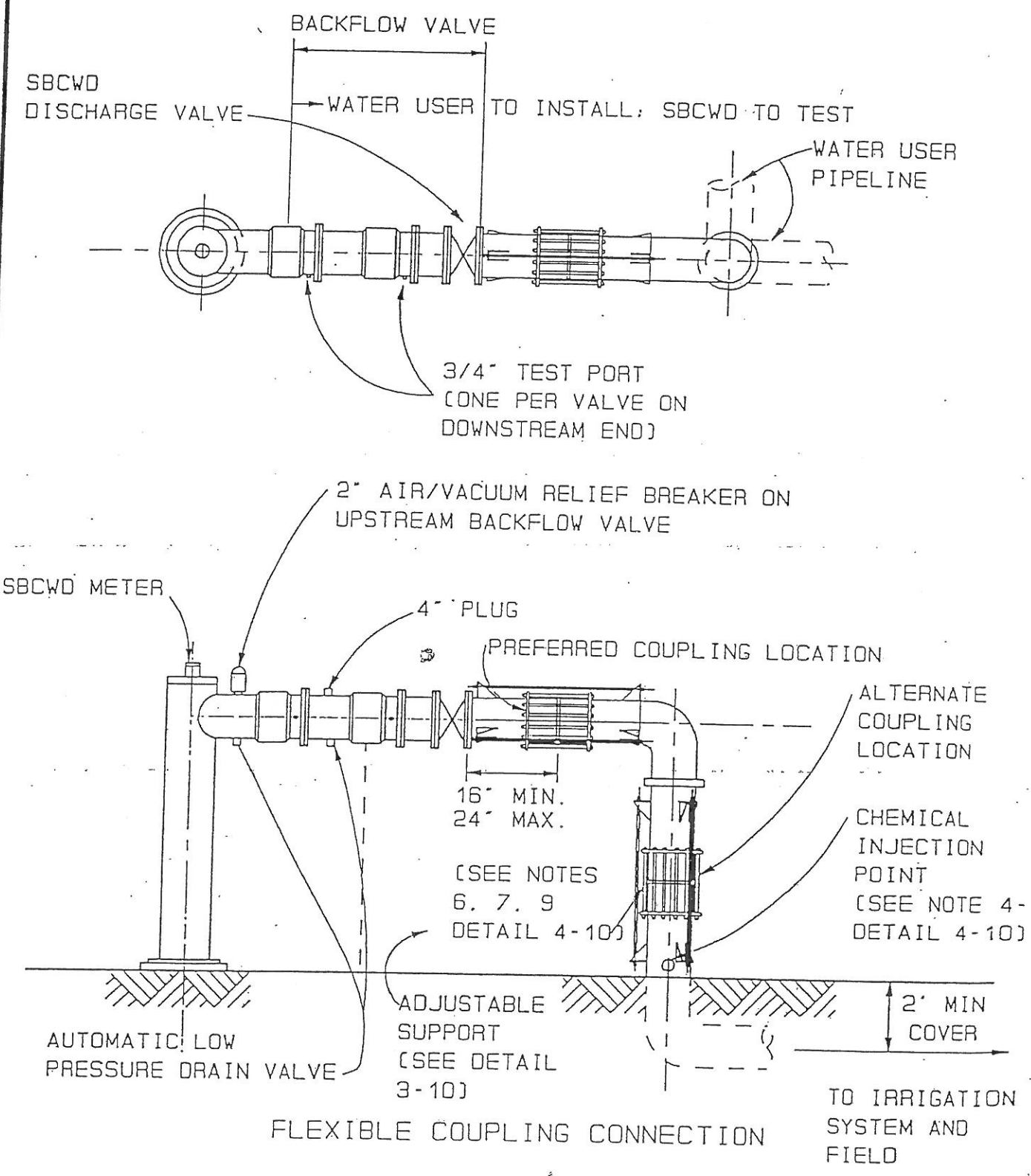
SAN BENITO COUNTY WATER DISTRICT  
4" - 6" BACKFLOW PREVENTION  
FLEXIBLE COUPLING INSTALLATION

DESIGNED BY: C+D	SCALE: NO SCALE
DRAWN BY: C+D	DATE: NOV 1992
CHECKED BY:	DRAWING NO.

APPROVED BY:

APPROVED BY:





SAN BENITO COUNTY WATER DISTRICT  
8", 10", 12" BACKFLOW PREVENTION  
FLEXIBLE COUPLING INSTALLATION

DESIGNED BY:	SCALE:
C+D	NO SCALE
DRAWN BY:	DATE:
C+D	NOV 1992
CHECKED BY:	DRAWING NO.

APPROVED BY:

APPROVED BY:

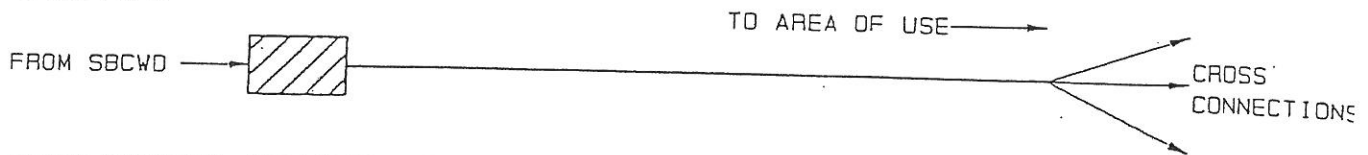
NOTES FOR FLANGED INSTALLATION AND  
FLEXIBLE COUPLING INSTALLATION;  
DETAILS 4-6, 4-7, 4-8 AND 4-9

1. ALL PIPE JOINTS AND CONNECTIONS SHALL BE WATERTIGHT.
2. AN ADJUSTABLE PIPE SUPPORT MUST BE INSTALLED AND MAINTAINED TO FACILITATE TESTING.
3. TAILWATER RETURN OR DRAINAGE WATER RECYCLING PIPELINE MUST BE A MINIMUM OF 4' BEYOND THE DOWNSTREAM FLANGE OF THE BACKFLOW VALVE.
4. THE CHEMICAL INJECTION POINT MUST BE A MINIMUM OF 2' BEYOND THE DOWNSTREAM FLANGE OF THE BACKFLOW VALVE.
5. BACKFLOW VALVES MAY BE INSTALLED ANYWHERE WITHIN 25' OF THE DISTRICT'S DELIVERY PROVIDING THERE ARE NO PIPE CONNECTIONS OR INJECTION POINTS OF ANY TYPE UPSTREAM OF THE VALVE.
6. RESTRAINTS ARE NECESSARY TO PREVENT ADDED LOAD AND STRESS ON THE DISTRICT'S EQUIPMENT AND TO PREVENT SEPARATION OF THE FLEXIBLE COUPLING. THE AMOUNT AND DIRECTION OF THRUST WILL VARY DEPENDING UPON THE CONFIGURATION OF THE WATER DISCHARGE PIPING.
7. IT IS THE WATER USER'S RESPONSIBILITY TO ASSURE THAT PROPER THRUST RESTRAINT IS PROVIDED TO PREVENT DAMAGE TO THE DISTRICT'S FACILITIES. THE WATER USER SHALL NOT INSTALL ANY FLEXIBLE COUPLING OTHER THAN THE CONFIGURATION SHOWN FOR THRUST, SHEAR AND TORSION.
8. BACKFLOW VALVES SHALL BE ABOVE THE HIGHEST DOWNSTREAM OUTLET, AND SHALL HAVE A MINIMUM OF 12" OF GROUND CLEARANCE.
9. ONE FLEXIBLE COUPLING WITH A MINIMUM 7" MIDDLE RING LENGTH AND RESTRAINTS ARE REQUIRED TO FACILITATE TESTING AND MAINTENANCE OF VALVE. SEE DETAIL 3-11 FOR RESTRAINT.

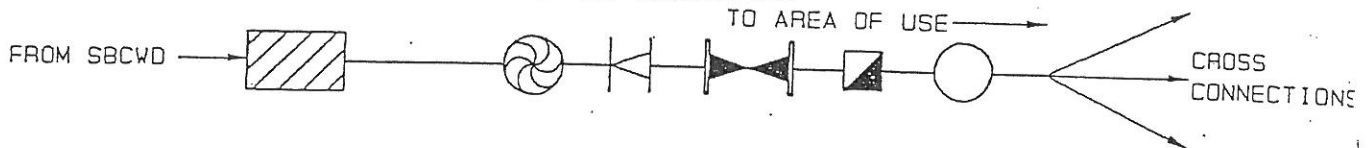
SAN BENITO COUNTY WATER DISTRICT PRIMARY DELIVERY INSTALLATION NOTES		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	NOV 1992
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.

SITUATION \*1 - WITH TREATMENT, NO PUMP

EXISTING

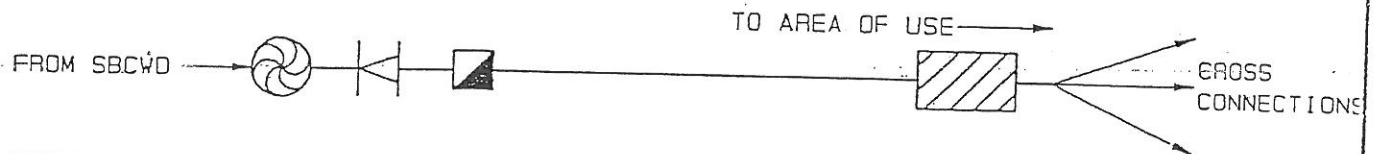


RECOMMENDED SOLUTION IF PUMP IS REQUIRED

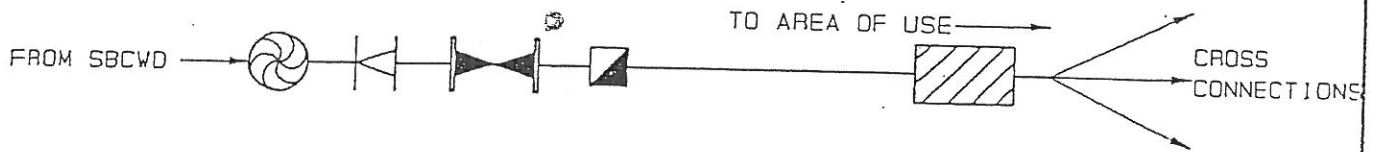


SITUATION \*2 - WITH TREATMENT, EXISTING PUMP UPSTREAM

EXISTING

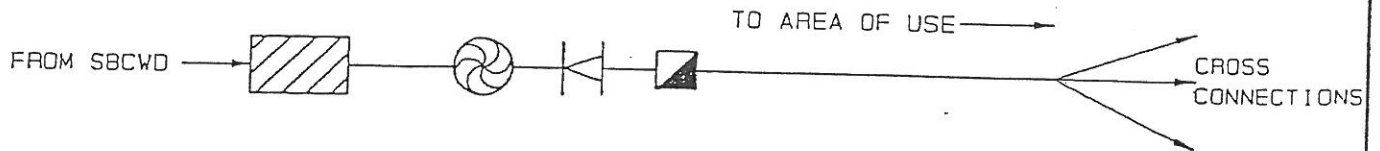


RECOMMENDED SOLUTION

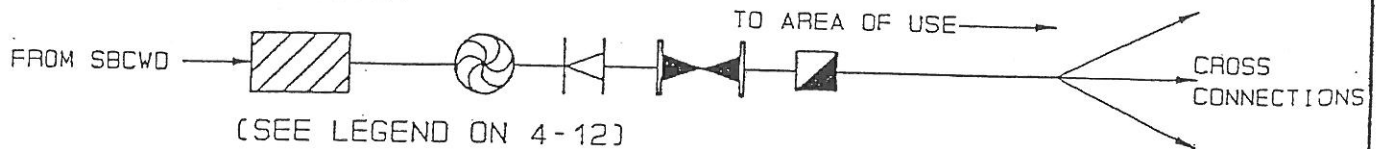


SITUATION \*3 - WITH TREATMENT, EXISTING PUMP DOWNSTREAM

EXISTING



RECOMMENDED SOLUTION



(SEE LEGEND ON 4-12)

SAN BENITO COUNTY WATER DISTRICT  
MUNICIPAL AND INDUSTRIAL  
REMOTE BACKFLOW VALVES  
SITUATIONS AND SOLUTIONS - A

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1992

APPROVED BY:

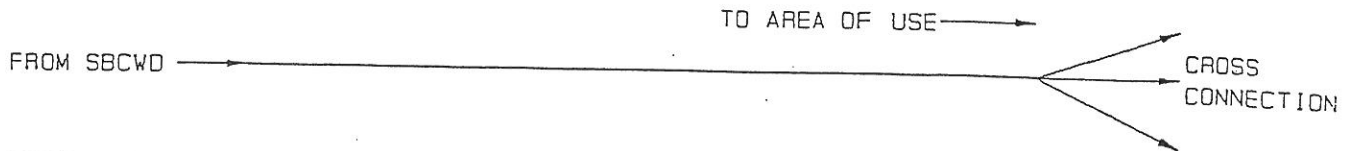
APPROVED BY:

CHECKED BY:

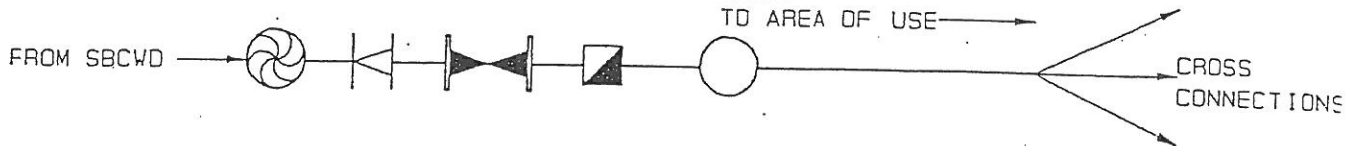
DRAWING NO.

SITUATION \*4 - NO TREATMENT. NO PUMP

EXISTING

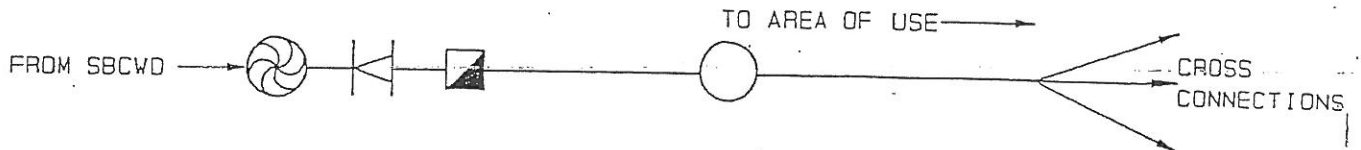


RECOMMENDED SOLUTION IF PUMP IS REQUIRED

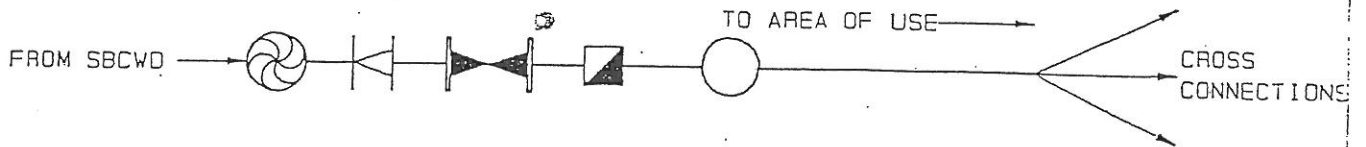


SITUATION \*5 - NO TREATMENT. WITH EXISTING PUMP

EXISTING









RECOMMENDED SOLUTION



LEGEND

NOTES

-  BOOSTER PUMP
-  BOOSTER PUMP CHECK VALVE
-  BACKFLOW PREVENTION DEVICE
-  BOOSTER PUMP ON/OFF PRESSURE SWITCH
-  HYDROPNEUMATIC OR WATER TANK
-  POTABLE WATER TREATMENT PLANT

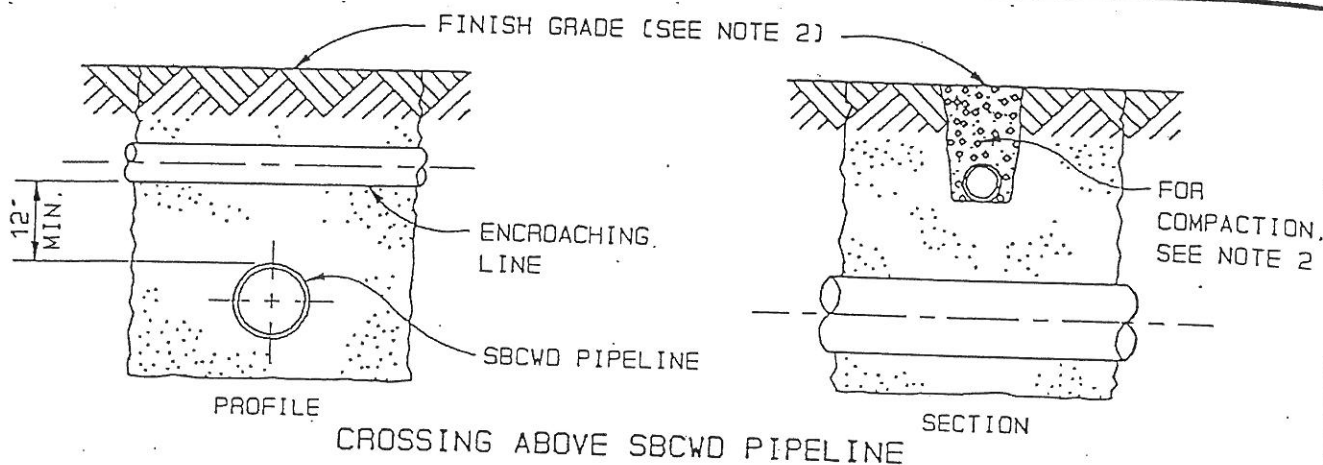
1. THESE DIAGRAMS REPRESENT GENERAL CONFIGURATIONS ONLY. INDIVIDUAL SITES WILL VARY.
2. THERE SHALL BE NO CROSS CONNECTIONS TO ANY POINT OF USE UPSTREAM OF THE BACKFLOW PREVENTION DEVICE.
3. INSTALLATION OF M & I DELIVERY BACKFLOW PREVENTION DEVICES AT DISTANCES GREATER THAN 25' FROM THE DISTRICT'S DELIVERY SHALL BE ALLOWED ONLY UPON SUBMITTAL, REVIEW AND APPROVAL OF SBCWD.
4. WATER USERS SHOULD CONSULT WITH THEIR WATER TREATMENT PLANT AND/OR PUMP INSTALLER BEFORE ATTEMPTING TO MAKE ANY SYSTEM MODIFICATION.

SAN BENITO COUNTY WATER DISTRICT MUNICIPAL AND INDUSTRIAL REMOTE BACKFLOW VALVES SITUATIONS AND SOLUTIONS - B	DESIGNED BY:	SCALE:
	C+D	NO SCALE
	DRAWN BY:	DATE:
	C+D	NOV 1992
APPROVED BY:	APPROVED BY:	DRAWING NO.

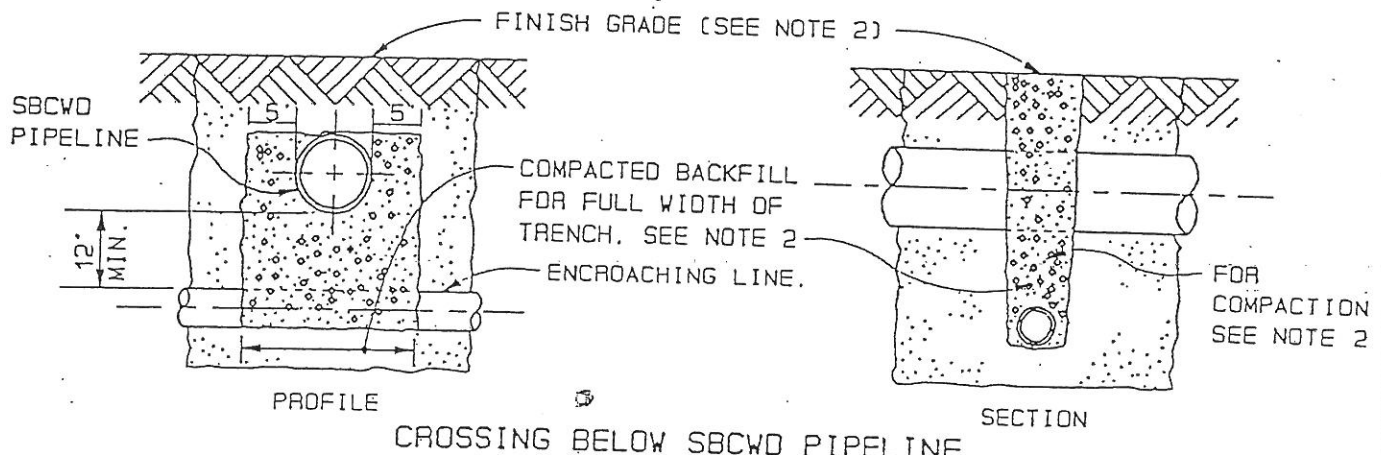
SECTION 5

PIPE CROSSING DETAILS

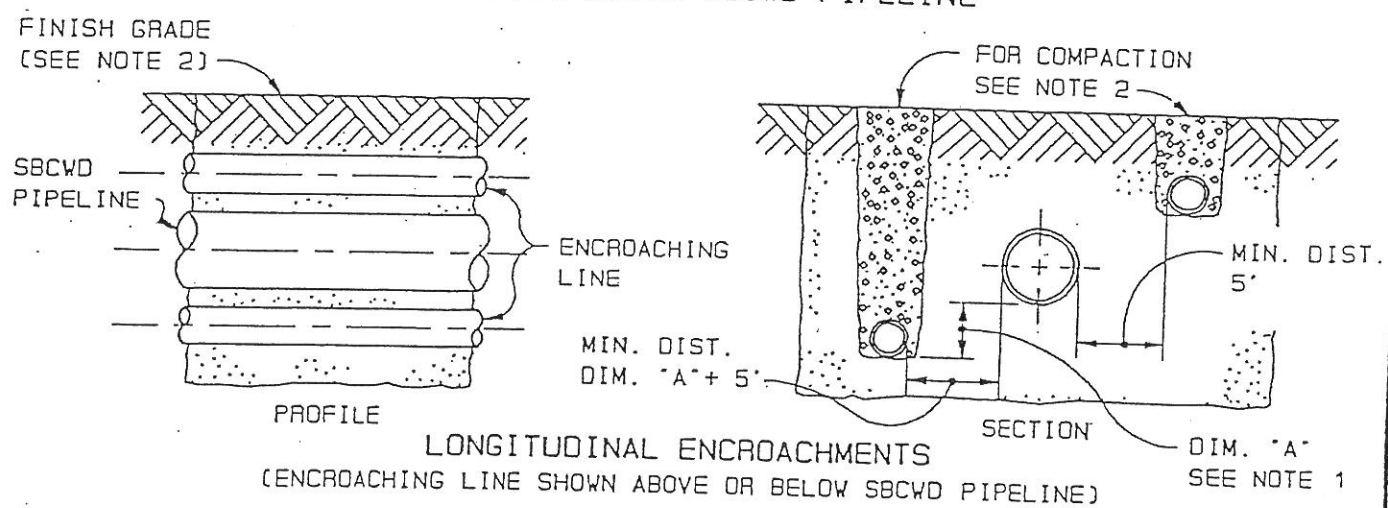




CROSSING ABOVE SBCWD PIPELINE



CROSSING BELOW SBCWD PIPELINE



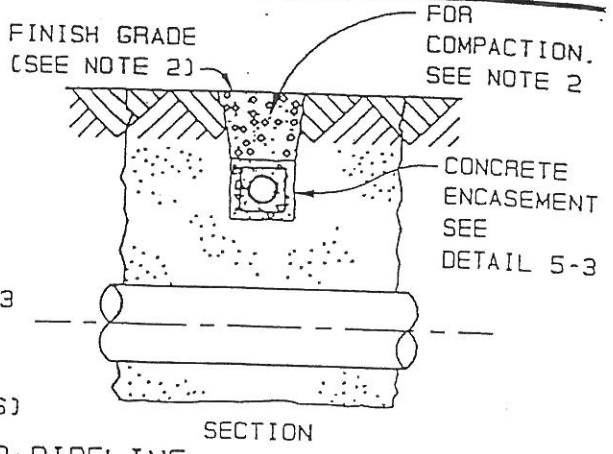
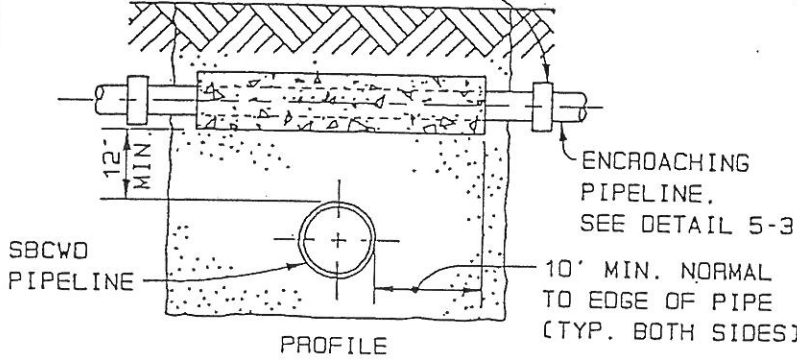
LONGITUDINAL ENCROACHMENTS  
(ENCROACHING LINE SHOWN ABOVE OR BELOW SBCWD PIPELINE)

- NOTES:
- 1) VERTICAL DISTANCE BETWEEN BOTTOM OF SBCWD PIPELINE AND BOTTOM OF ENCROACHING LINE AS DETERMINED BY DESIGN OF ENCROACHING LINE.
  - 2) SEE SPECIFICATIONS SECTION 2.2 BACKFILL AND DESIGN CRITERIA SECTION 4.

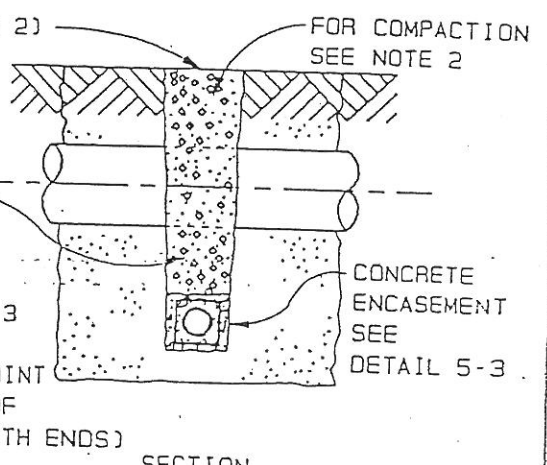
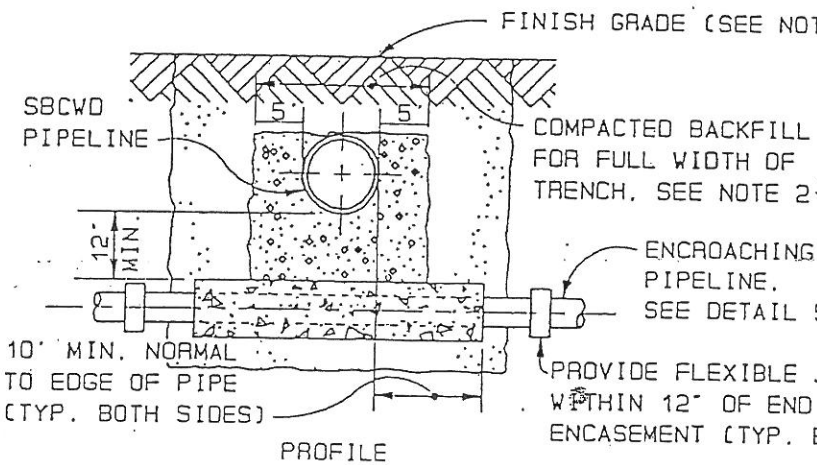
SAN BENITO COUNTY WATER DISTRICT PIPE CROSSING POTABLE WATER LINE AND OTHER UTILITY LINES		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	MAR 1993
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.



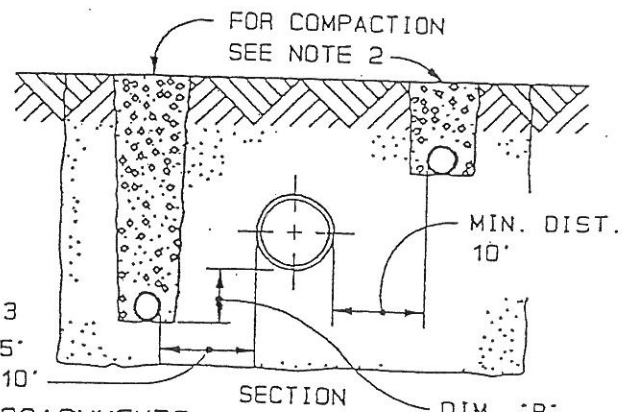
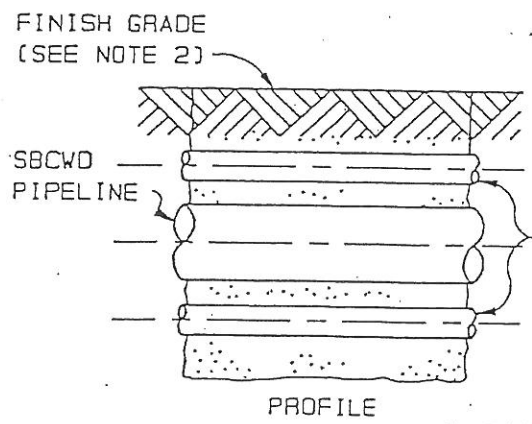
PROVIDE FLEXIBLE JOINT  
WITHIN 12" OF END OF  
ENCASEMENT (TYP. BOTH ENDS)



CROSSING ABOVE SBCWD PIPELINE



CROSSING BELOW SBCWD PIPELINE



LONGITUDINAL ENCROACHMENTS

(ENCROACHING PIPELINE SHOWN ABOVE OR BELOW SBCWD PIPELINE)

NOTES:

- 1) VERTICAL DISTANCE BETWEEN BOTTOM OF SBCWD PIPELINE AND BOTTOM OF ENCROACHING PIPELINE AS DETERMINED BY DESIGN OF ENCROACHING PIPELINE.
- 2) SEE SPECIFICATIONS SECTION 2.2 BACKFILL AND DESIGN CRITERIA SECTION 4.

SAN BENITO COUNTY WATER DISTRICT  
PIPE CROSSING  
SEWER LINE AND  
NON-POTABLE WATER LINE

DESIGNED BY: C+D	SCALE: NO SCALE
DRAWN BY: C+D	DATE: MAR 1993
CHECKED BY:	DRAWING NO.:

APPROVED BY:

APPROVED BY:



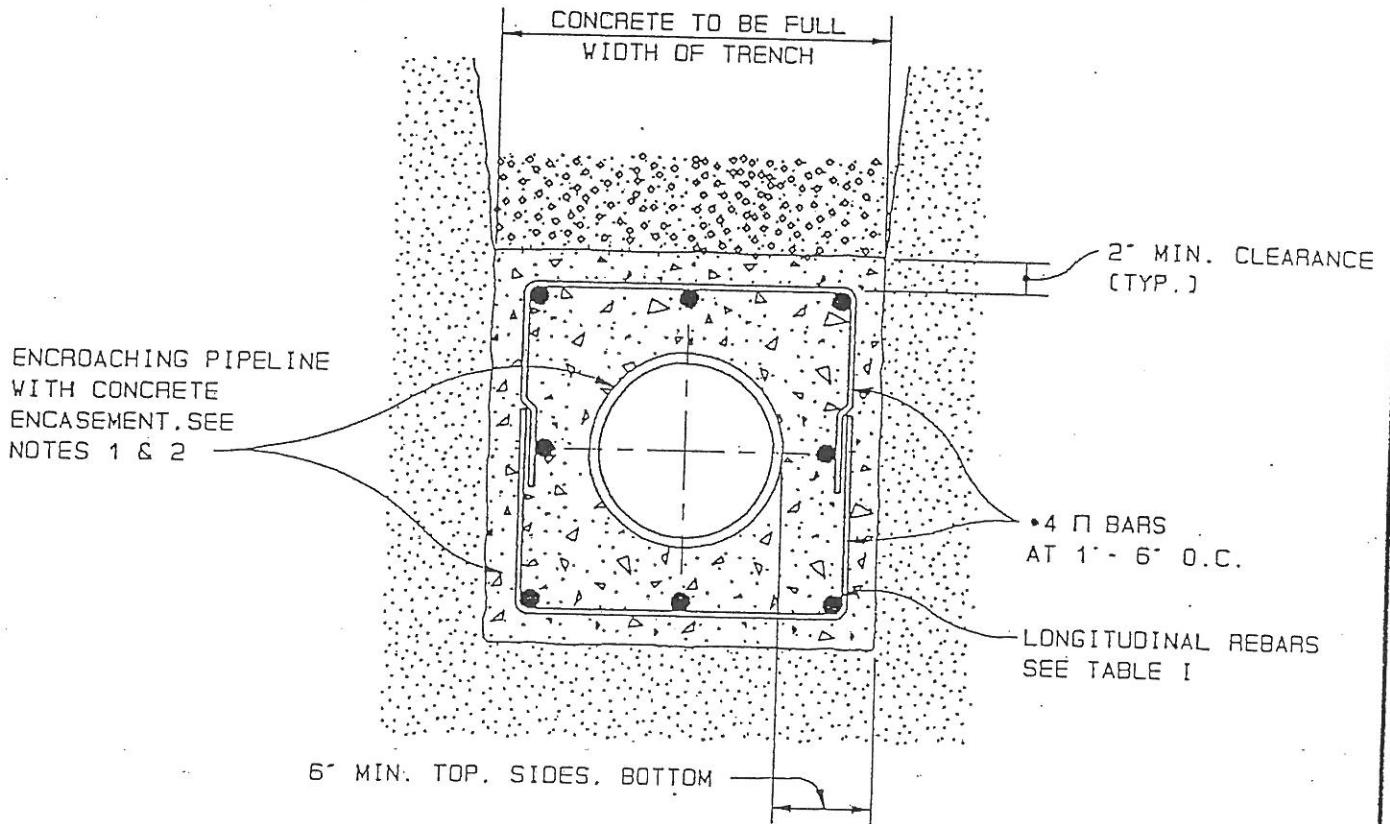


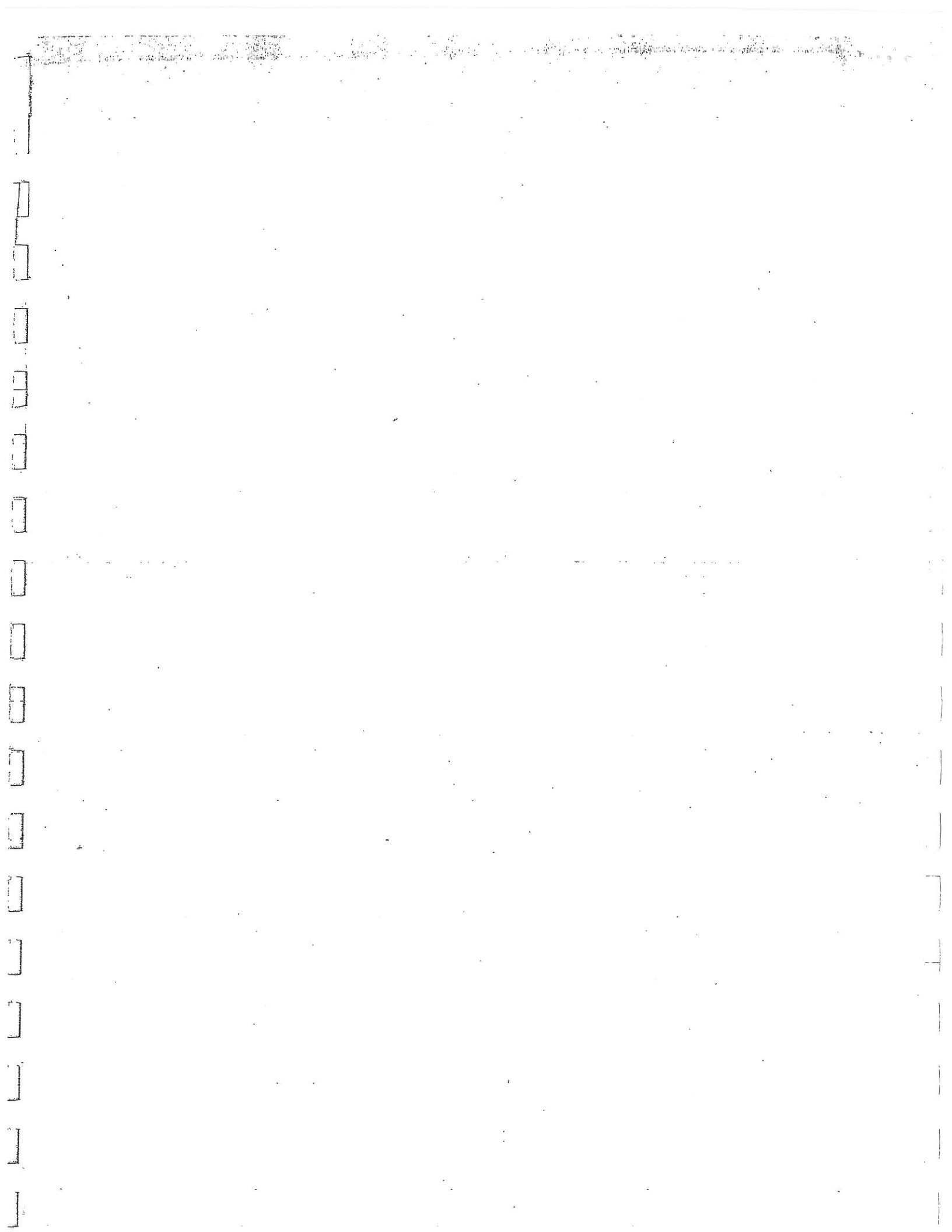
TABLE I

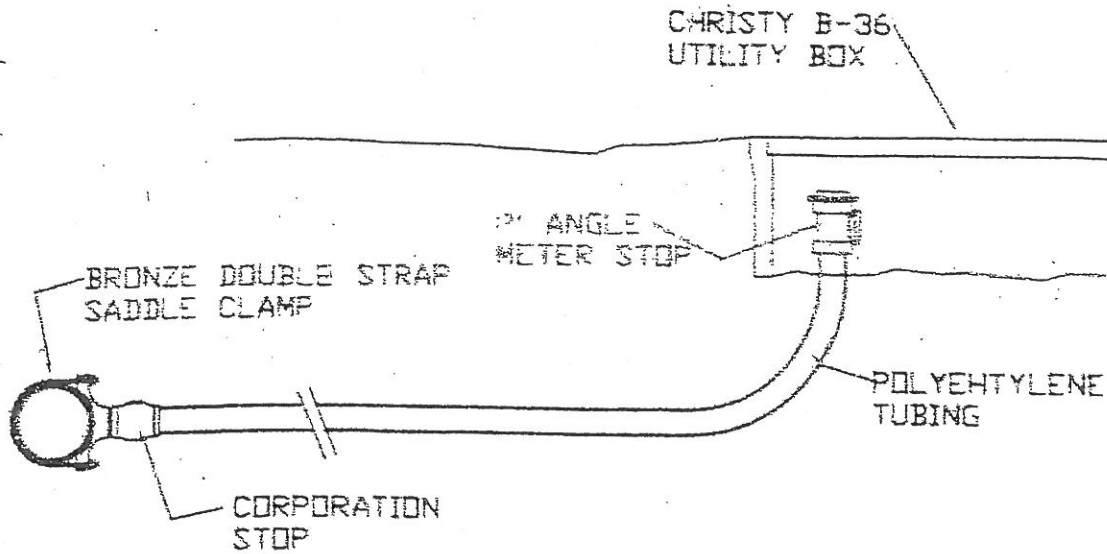
SIZE OF ENCROACHING MAIN	LONGITUDINAL REINFORCEMENT
12" AND SMALLER	•4 AT 1' - 0"
14" TO 24"	•5 AT 1' - 0"
26" TO 48"	•6 AT 1' - 0"
LARGER THAN 48"	SPECIAL DESIGN

NOTES:

- 1) FOR PRESSURE PIPELINES OR FORCE MAINS WITHIN SBCWD R.O.W., JOINTS MUST BE WATERTIGHT AND FIELD TESTED FOR LEAKAGE AT 120% OF DESIGN PRESSURE BEFORE PLACING ENCASEMENT OR BACKFILLING OVER JOINTS. NO LEAKAGE WILL BE ALLOWED.
- 2) CONCRETE ENCASEMENT MUST BE PLACED AGAINST UNDISTURBED OR COMPACTED SOIL.

SAN BENITO COUNTY WATER DISTRICT PIPE CROSSING CONCRETE ENCASEMENT		DESIGNED BY:	SCALE:
		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	MAR 1993
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
_____	_____	C+D	5-3
DISTRICT MANAGER	DISTRICT ENGINEER		





NOTES:

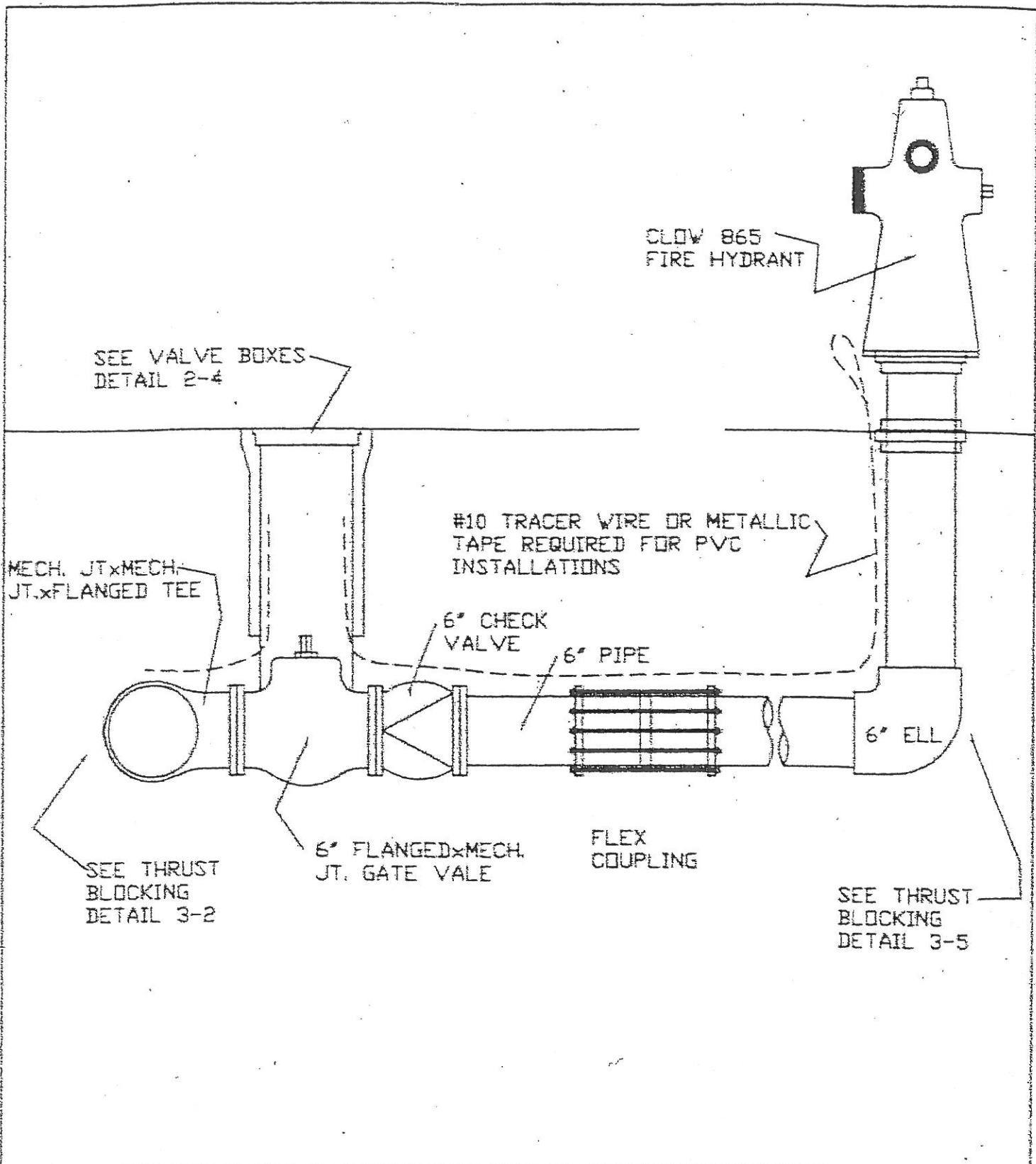
1. ALL WATER SERVICE INSTALLATIONS INCLUDE METER BOX.
2. 2"Ø WATER SERVICE WITH 2" ANGLE METER STOP (FORD, MUELLER OR JONES)
3. ALL WATER SERVICES SHALL HAVE A HAND TAMPED SAND BEDDING 9" BENEATH THE TUBING AND SHALL HAVE 6" MINIMUM CLEARANCE ON EACH SIDE.
4. ALL WATER SERVICES SHALL BE POLYETHYLENE CTS SDR 9 (ASTM D2737) TUBING.
5. CORPORATION STOP SHALL BE FORD, MUELLER OR JONES.
6. WATER METER BOX SHALL BE CHRISTY B-36 WITH B36D LID OR APPROVED EQUAL.
7. A MINIMUM CLEARANCE OF 12" BETWEEN WATER SERVICES REQUIRED IN COMMON TRENCH.
8. ALL TUBING CONNECTIONS SHALL BE THE COMPRESSION TYPE: FORD "PACK JOINT", MUELLER "INSTA-TITE" OR EQUAL.

SAN BENITO COUNTY WATER DISTRICT  
 TYPICAL 2"Ø UNDERGROUND DELIVERY

DESIGNED BY:	SCALE: NO SCALE
DRAWN BY:	DATE: DEC. 2004
CHECKED BY:	DRAWING NO: 1-13

APPROVED BY:  
 \_\_\_\_\_  
 DISTRICT MANAGER

APPROVED BY:  
 \_\_\_\_\_  
 DISTRICT ENGINEER



SAN BENITO COUNTY WATER DISTRICT  
FIRE HYDRANT ASSEMBLY

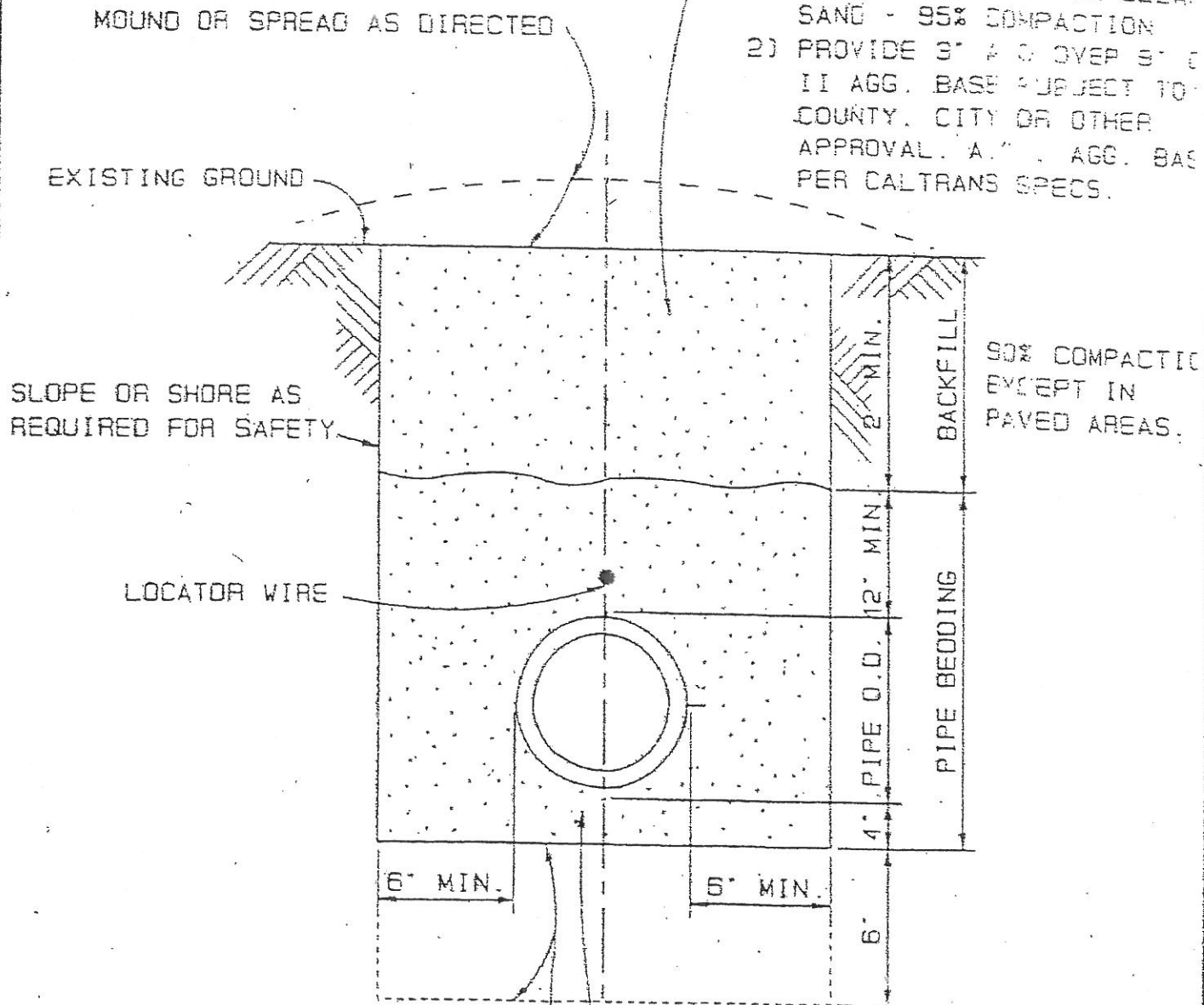
DESIGNED BY:	SCALE: NO SCALE
DRAWN BY:	DATE: DEC. 2004
CHECKED BY:	DRAWING NO: 1-14

APPROVED BY:  
DISTRICT MANAGER

APPROVED BY:  
DISTRICT ENGINEER

WHEN TRENCHING IN PAVED AREAS, MIN. SURFACE RECONSTRUCTION:

- 1) ALL BACKFILL TO BE CLEAN SAND - 95% COMPACTION
- 2) PROVIDE 3" & 3" OVER 3" & II AGG. BASE SUBJECT TO COUNTY, CITY OR OTHER APPROVAL. A. " AGG. BASE PER CALTRANS SPECS.



OVEREXCAVATE IN LOW DENSITY OR OTHER UNSUITABLE MATERIAL AS DIRECTED AND REPLACE WITH SAND COMPACTED TO 90% MIN.

PIPE BEDDING TO BE CLEAN SAND WITH 12" MIN. COVER 6" MIN. SIDE CLEARANCE AND 4" MIN. BEDDING COMPACTED TO 90% MIN.

SAN BENITO COUNTY WATER DISTRICT

TYPICAL TRENCHES

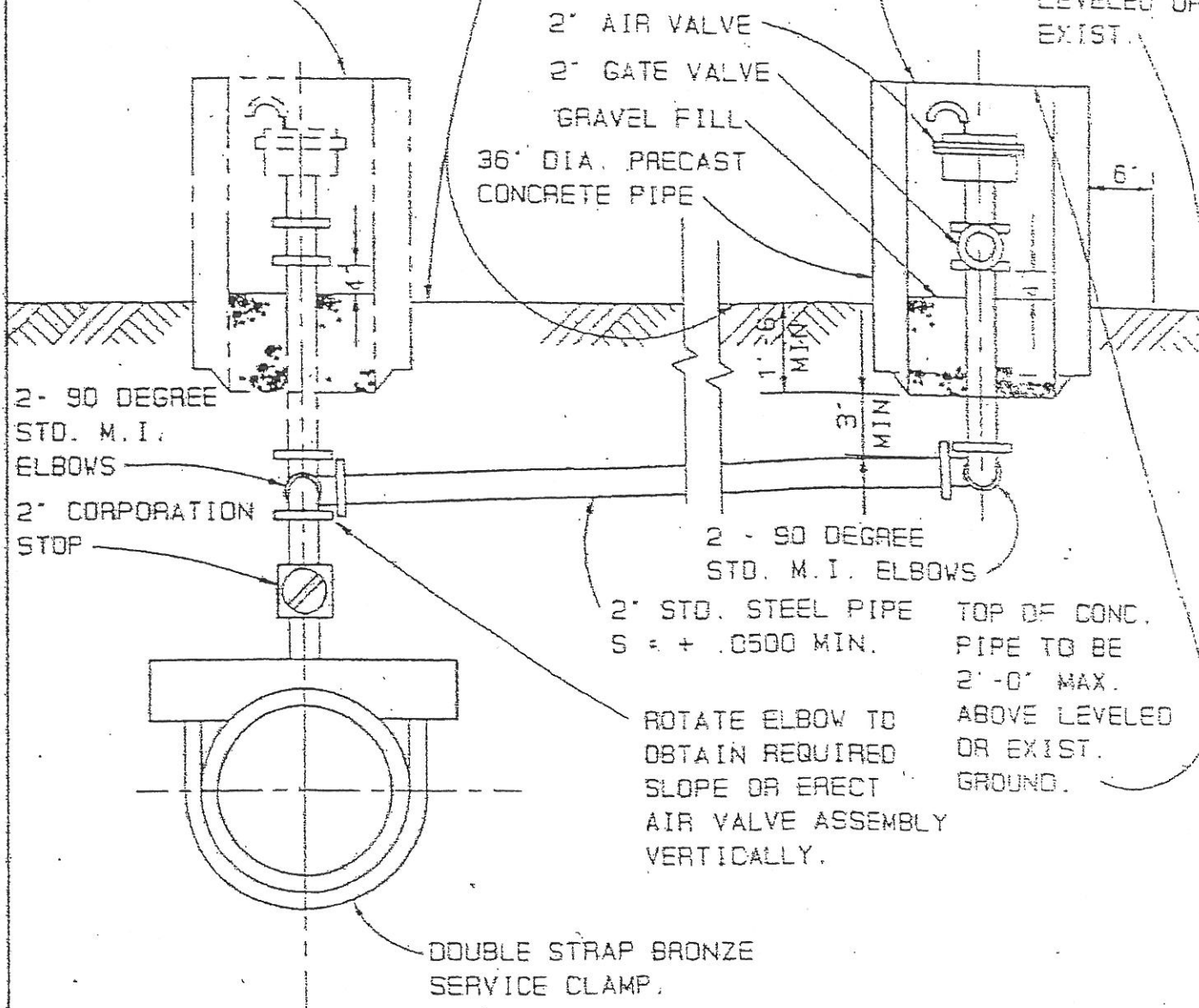
DESIGNED BY:	SCALE:
C+D	NO SCALE
DRAWN BY:	DATE:
C+D	NOV 1952

THE AIR VALVE ASSEMBLY TO BE ERECTED VERTICALLY ABOVE OUTLET NOZZLE UNLESS DIRECTED OTHERWISE BY DISTRICT.

COMPACT BACKFILL BENEATH CONC. PIPE TO WITHIN 1' FROM THE BOTTOM OF THE PIPE

COVER NOT SHOWN FOR PIPE WELL. SEE AIR VALVE COVER DETAIL 2-3

LEVELED OF EXIST.



NOTES:

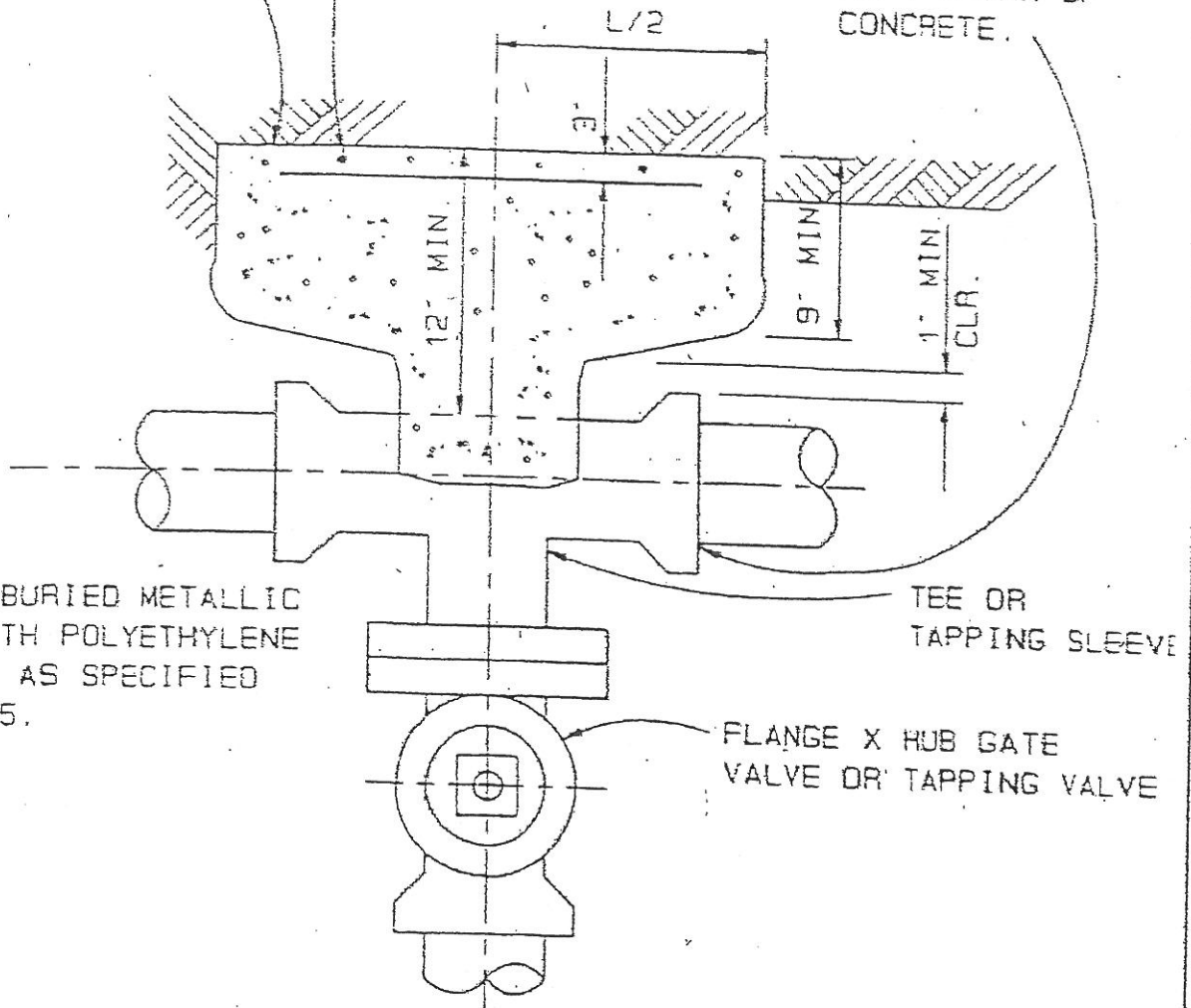
- 1) 36" DIAMETER PRECAST CONCRETE PIPE SHALL CONFORM TO ASTM C 76 CLASS II OR III

SAN BENITO COUNTY WATER DISTRICT		DESIGNED BY:	SCALE:
AIR VALVE INSTALLATION		C+D	NO SCALE
		DRAWN BY:	DATE:
		C+D	NOV 1992
APPROVED BY:	APPROVED BY:	CHECKED BY:	DRAWING NO.
		C+D	0.0

UNDISTURBED EARTH

NO. 4 REBARS -  
12" CENTERS BOTH WAYS

FLANGES, BOLTS, &  
NUTS SHALL BE  
KEPT CLEAR OF  
CONCRETE.



NOTE:  
ENCASE ALL BURIED METALLIC  
SURFACES WITH POLYETHYLENE  
WRAP (8MIL) AS SPECIFIED  
IN AWWA C105.

TEE OR  
TAPPING SLEEVE

FLANGE X HUB GATE  
VALVE OR TAPPING VALVE

BRANCH PIPE SIZE	BEARING AREA (S.F.)	L X H
3" OR 4"	2	1'5" X 1'5"
6"	3	1'9" X 1'9"
8"	5	2'3" X 2'3"
10"	9	3'0" X 3'0"
12"	15	3'10" X 3'10"

SAN BENITO COUNTY WATER DISTRICT  
THRUST BLOCKING - TEES

DESIGNED BY:

C+D

SCALE:

NO SCALE

DRAWN BY:

C+D

DATE:

NOV 1953

APPROVED BY:

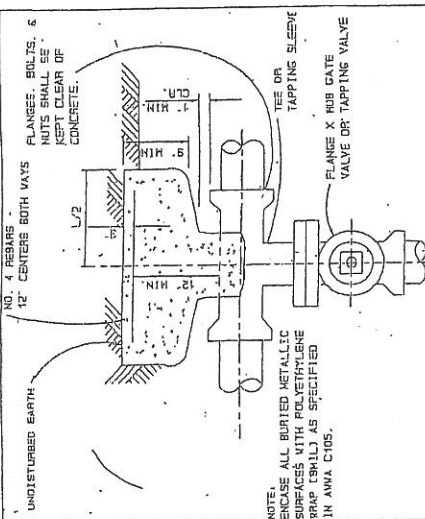
APPROVED BY:

CHECKED BY:

DRAWING NO.



REFER TO SPECIFIC REGULATIONS, SPECIFICATIONS AND STANDARD DETAILS FOR A COMPLETE SET OF REQUIREMENTS



BRANCH PIPE SIZE	BEARING AREA (S.F.)	L X H
3" OR 4"	2	1'5" X 1'5"
6"	3	1'5" X 1'5"
8"	5	2'3" X 2'3"
10"	8	3'0" X 3'0"
12"	15	3'10" X 3'10"

**SAN BENITO COUNTY WATER DISTRICT**

**THRUST BLOCKING - TEES**

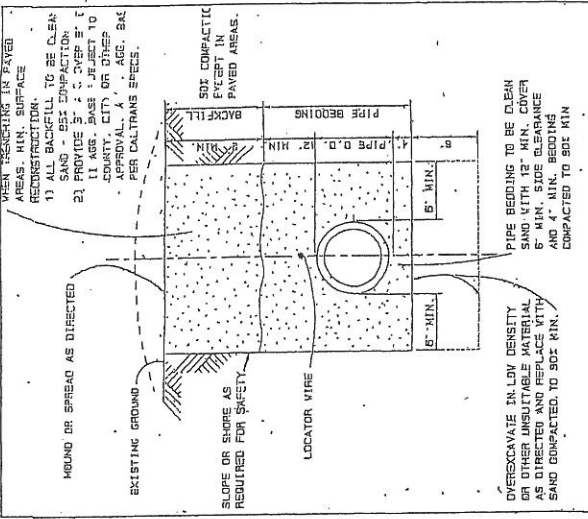
SCALE: NO SCALE

DATE: NOV 1952

DRAWN BY: C-HO

CHECKED BY: C-HO

DESIGNED BY: C-HO



**SAN BENITO COUNTY WATER DISTRICT**

**TYPICAL TRENCHES**

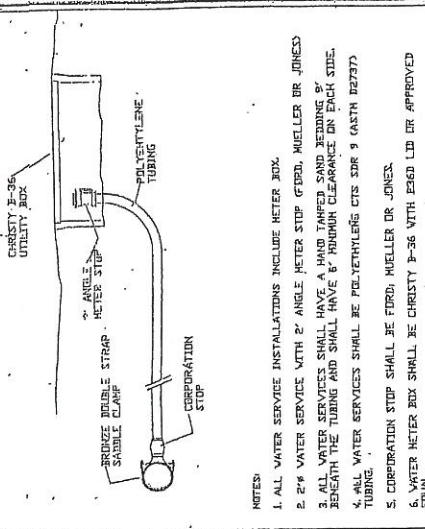
SCALE: NO SCALE

DATE: NOV 1952

DRAWN BY: C-HO

CHECKED BY: C-HO

DESIGNED BY: C-HO



- NOTES:**
1. ALL WATER SERVICE INSTALLATIONS INCLUDE METER BOX.
  2. 2" WATER SERVICE WITH 2" ANGLE METER STOP (FORD, MUELLER OR JONES).
  3. ALL WATER SERVICES SHALL HAVE A HAND TAMPED SAND BEDDING 6" BENEATH THE TUBING AND SHALL HAVE 6" MINIMUM CLEARANCE ON EACH SIDE.
  4. ALL WATER SERVICES SHALL BE POLYETHYLENE CTS SDR 9 (ASTM D2737).
  5. CORPORATION STOP SHALL BE FORD, MUELLER OR JONES.
  6. WATER METER BOX SHALL BE CHRISTY P-36 WITH 2560 LID OR APPROVED EQUAL.
  7. A MINIMUM CLEARANCE OF 18" BETWEEN WATER SERVICES REQUIRED IN COMMON TRENCH.
  8. ALL TUBING CONNECTIONS SHALL BE THE COMPRESSION TYPE: FORD "PACK JOINT", MUELLER "INSTA-TITE" OR SUDAL.

**SAN BENITO COUNTY WATER DISTRICT**

**TYPICAL 2" UNDERGROUND DELIVERY**

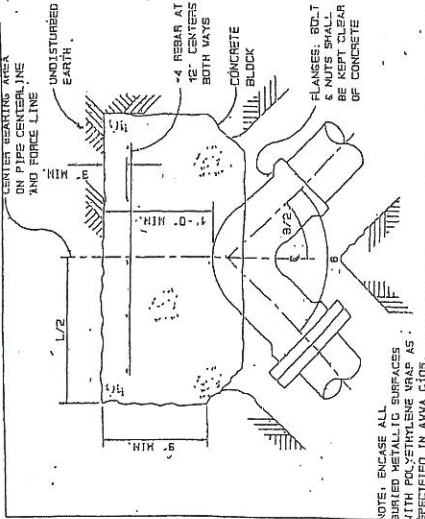
SCALE: NO SCALE

DATE: NOV 1952

DRAWN BY: C-HO

CHECKED BY: C-HO

DESIGNED BY: C-HO



**SAN BENITO COUNTY WATER DISTRICT**

**THRUST BLOCKING - ELBOWS**

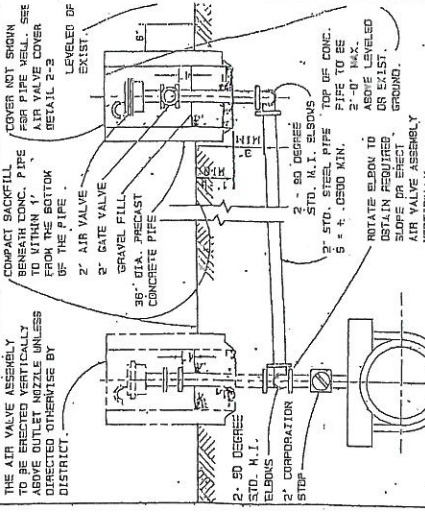
SCALE: NO SCALE

DATE: NOV 1952

DRAWN BY: C-HO

CHECKED BY: C-HO

DESIGNED BY: C-HO



**SAN BENITO COUNTY WATER DISTRICT**

**AIR VALVE INSTALLATION**

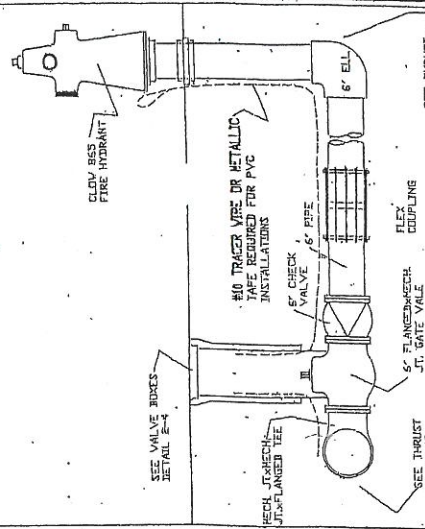
SCALE: NO SCALE

DATE: NOV 1952

DRAWN BY: C-HO

CHECKED BY: C-HO

DESIGNED BY: C-HO



**SAN BENITO COUNTY WATER DISTRICT**

**FIRE HYDRANT ASSEMBLY**

SCALE: NO SCALE

DATE: NOV 1952

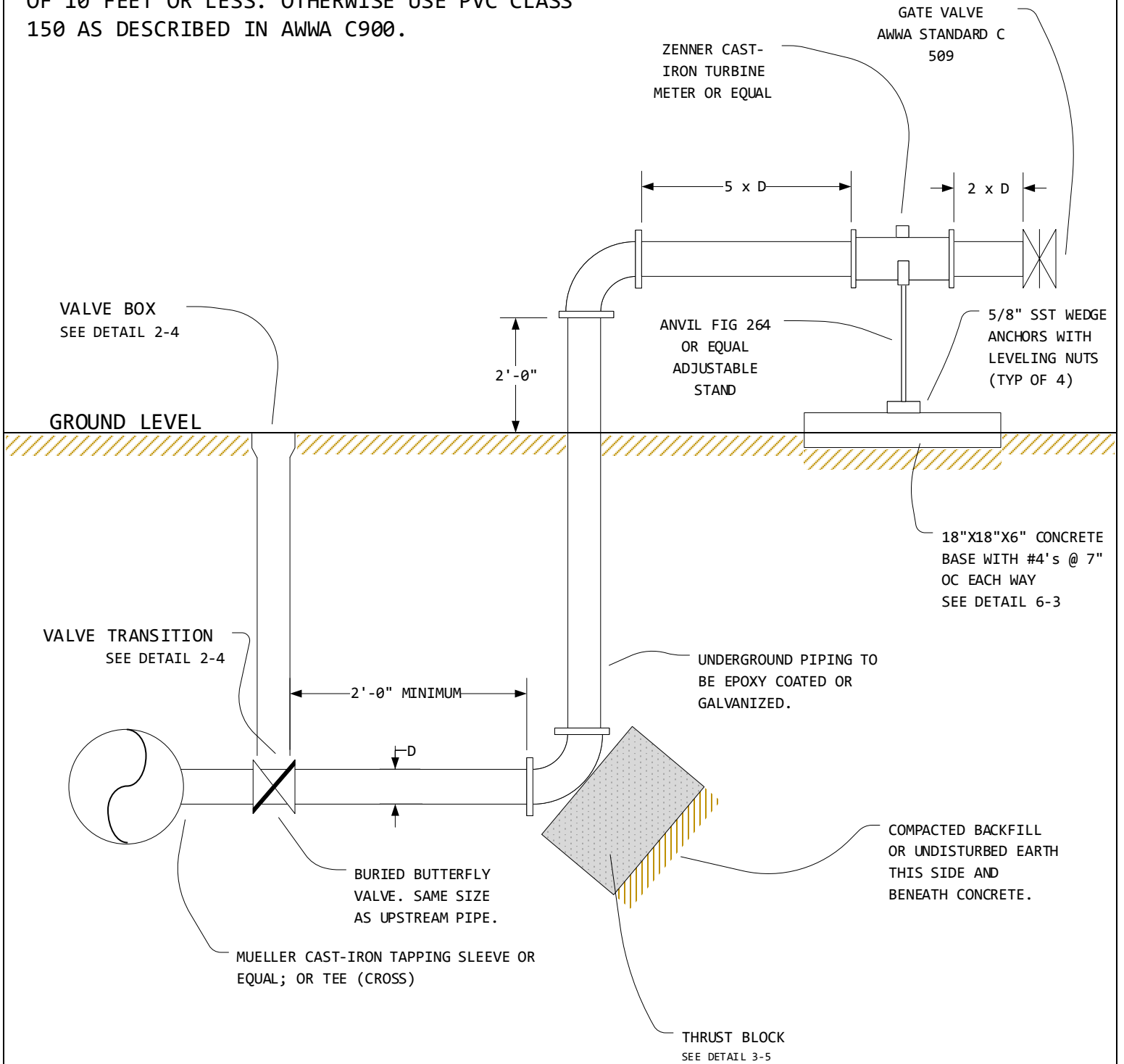
DRAWN BY: C-HO

CHECKED BY: C-HO

DESIGNED BY: C-HO



**NOTE:**  
 DUCTILE IRON SPOOLS TO BE USED ON SHORT RUNS  
 OF 10 FEET OR LESS. OTHERWISE USE PVC CLASS  
 150 AS DESCRIBED IN AWWA C900.



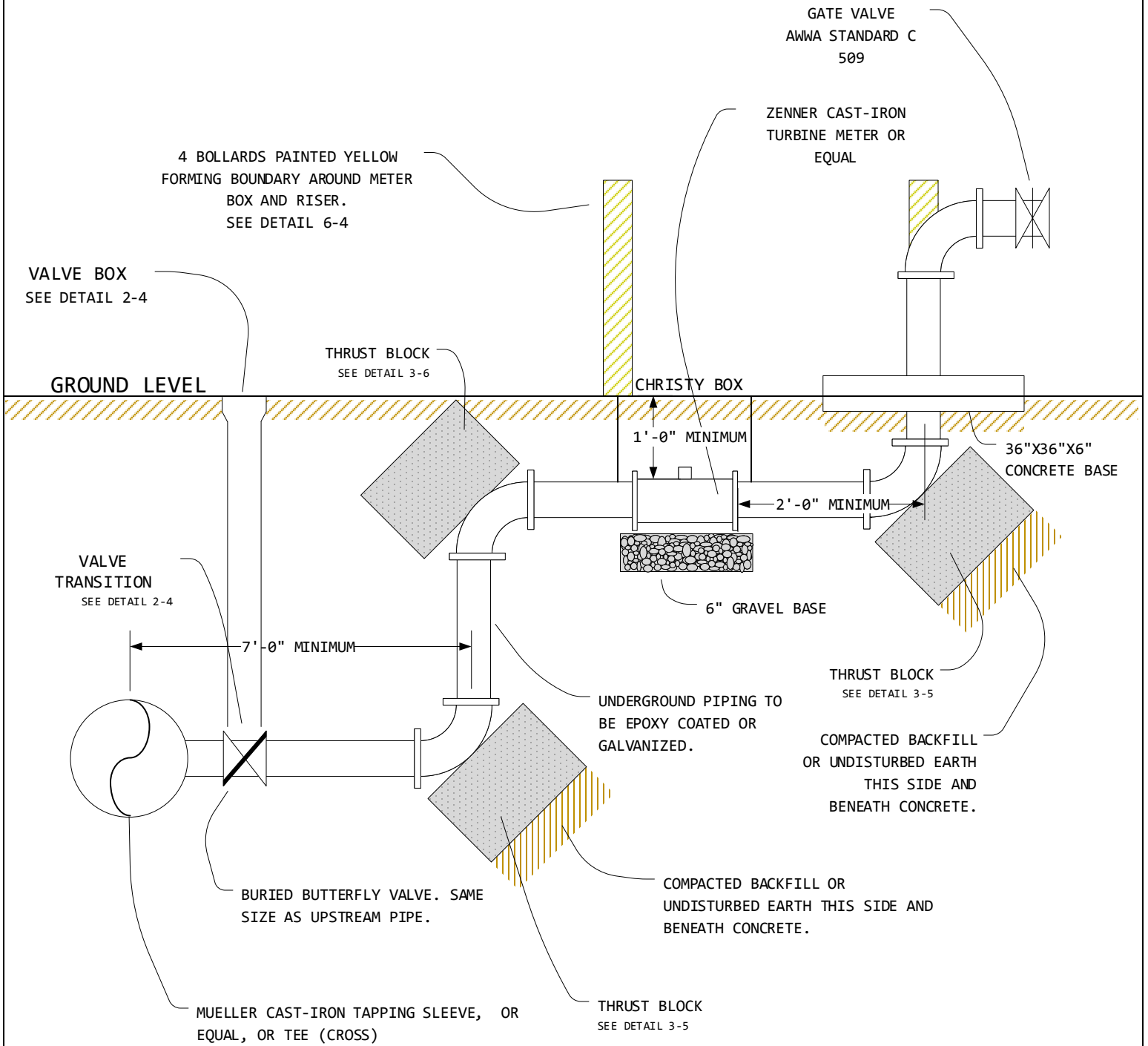
# Delivery and Turbine Meter Detail

Regulations, Specifications, and  
 Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: MAY 2016
CHECKED BY: GH	DRAWING NO. <b>6-1</b>

**NOTE:**

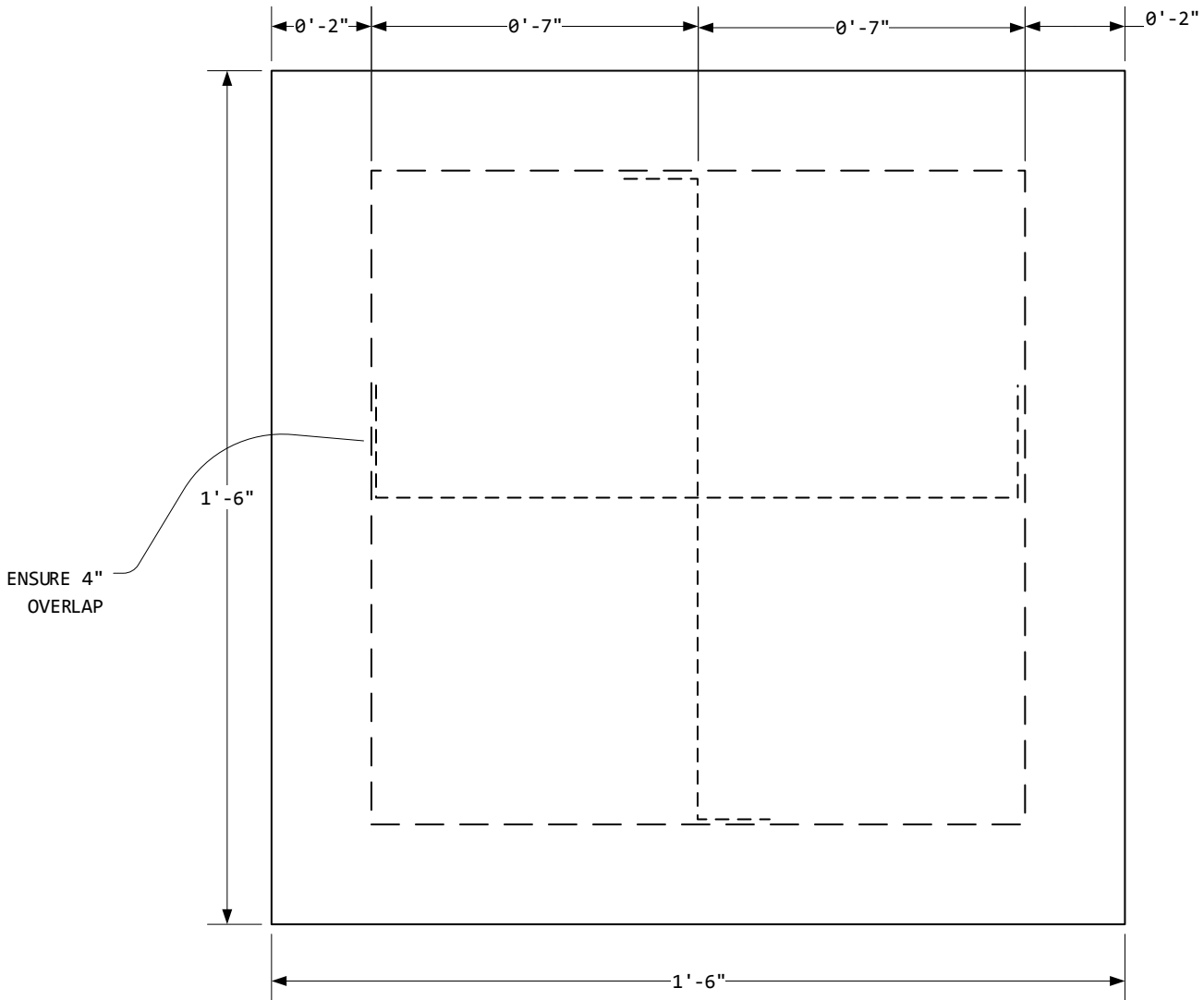
ALL LIDS, PIPES, METERS, BACKFLOW DEVICES, AND VALVES TO BE PAINTED PURPLE. ALL LIDS MARKED "RECYCLED WATER".



# RECYCLED WATER DELIVERY AND TURBINE METER DETAIL

Regulations, Specifications, and  
Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: MAY 2016
CHECKED BY: GH	DRAWING NO. 6-2



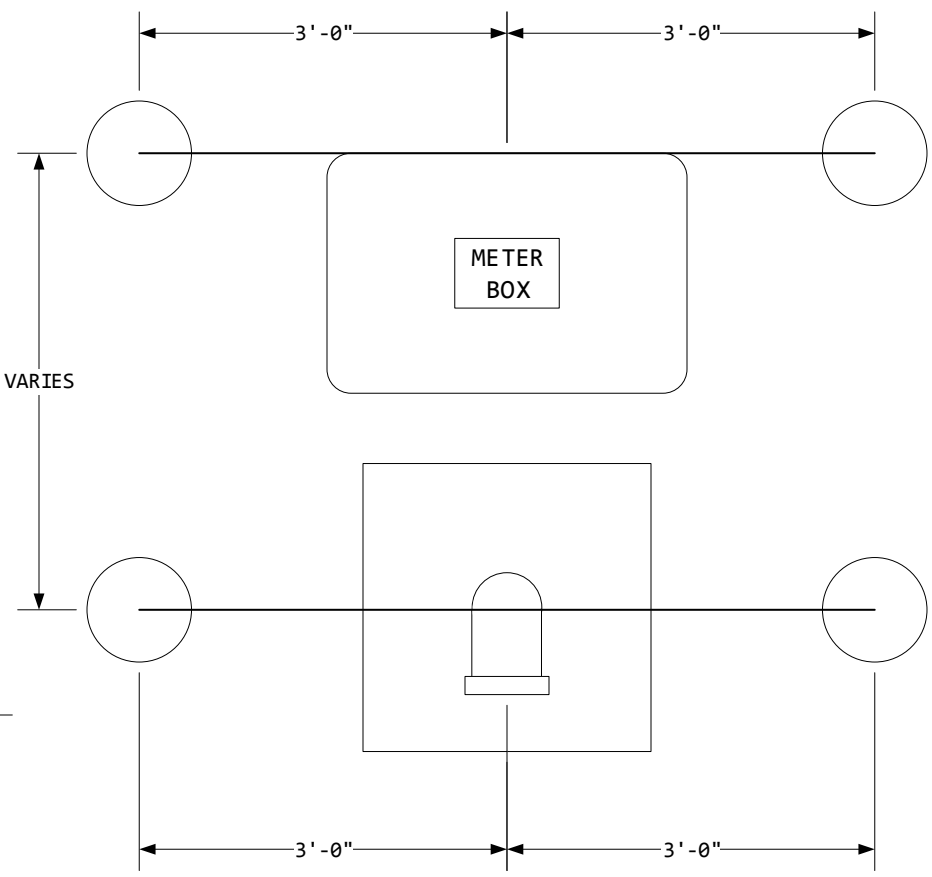
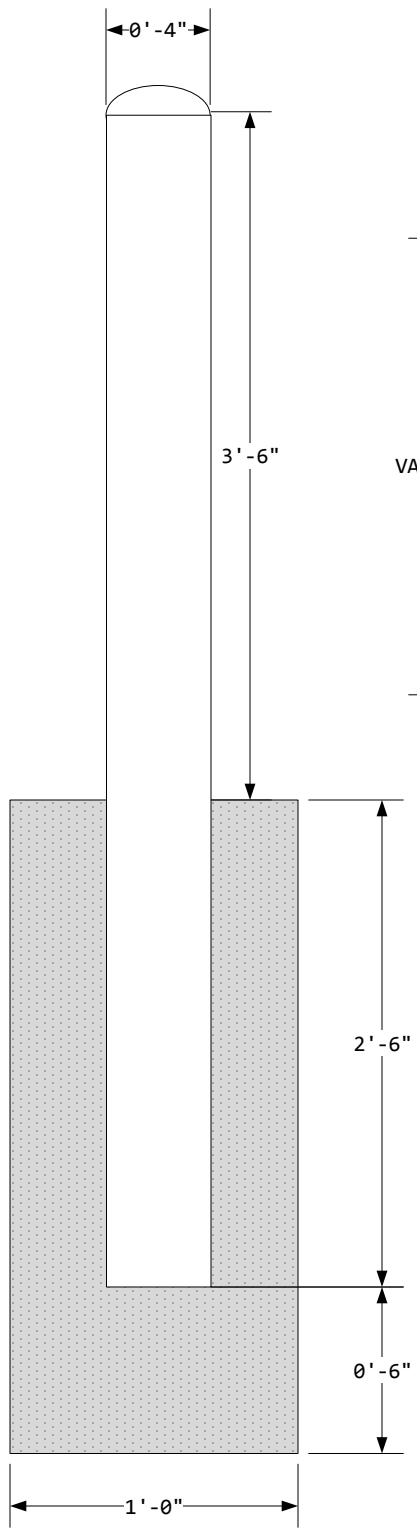
18"X18"X6" CONCRETE BASE WITH #4s @ 7" OC EACH WAY



# ADJUSTABLE STAND FOOTING

Regulations, Specifications, and  
Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: MAY 2016
CHECKED BY: GH	DRAWING NO. 6-3



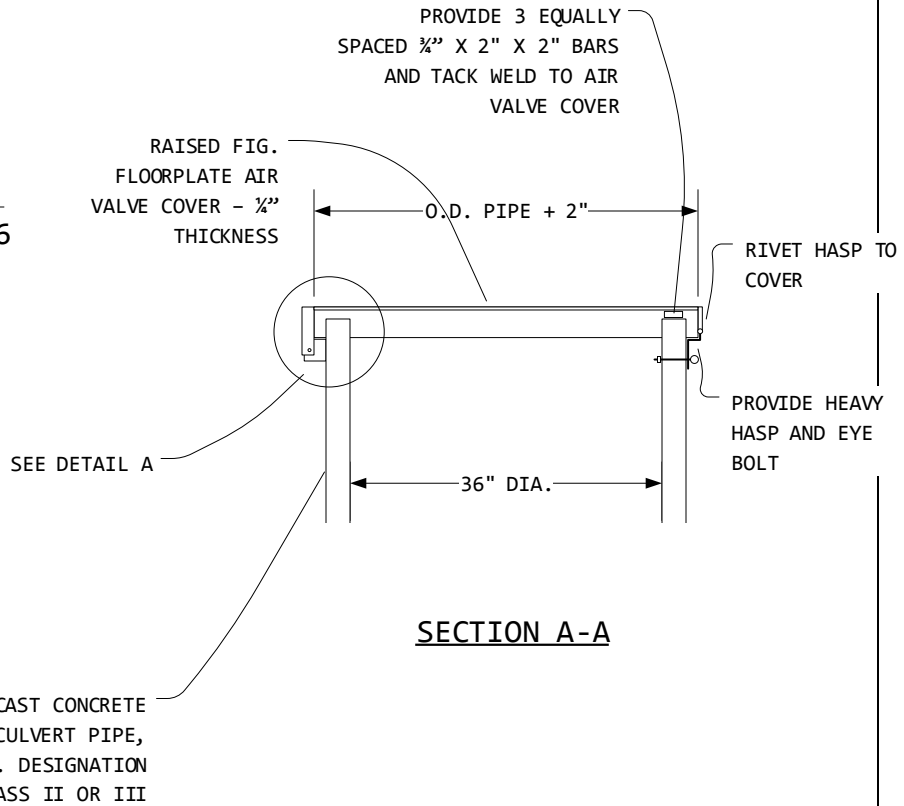
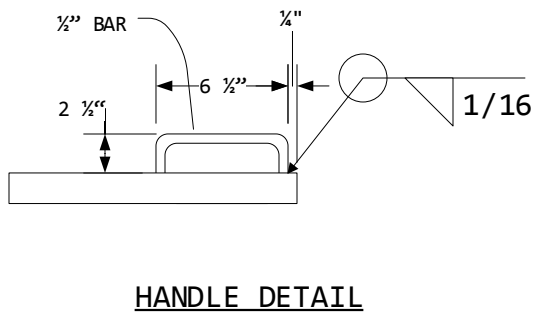
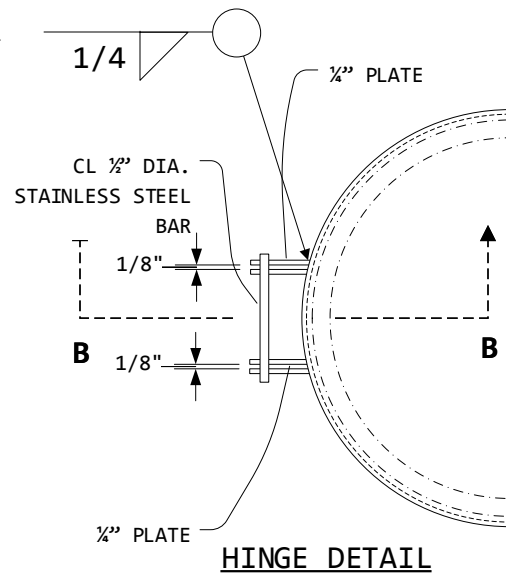
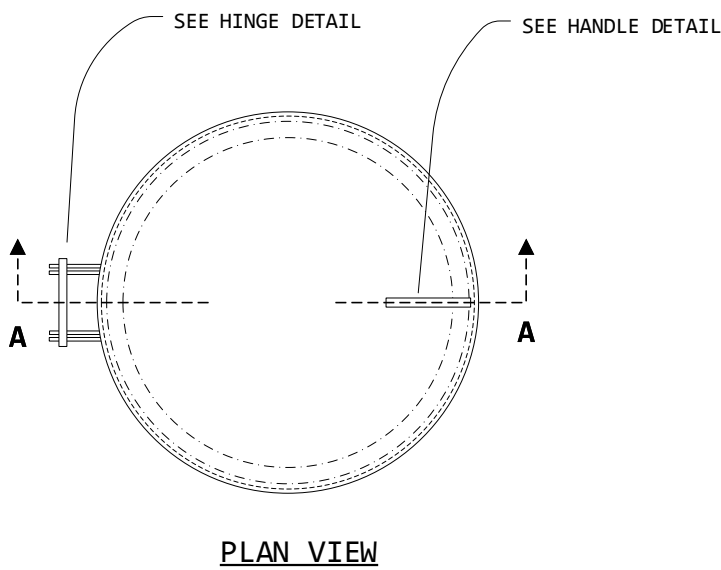
**NOTE:**  
 BOLLARDS ARE TO BE PAINTED YELLOW AND FILLED WITH CONCRETE.  
 BOLLARDS ARE TO BE PLACED INLINE WITH THE RISER AND THE EDGE OF METER BOX AS SHOWN ABOVE.



# RECYCLED WATER STEEL BOLLARD DETAIL

Regulations, Specifications, and  
 Standard Details

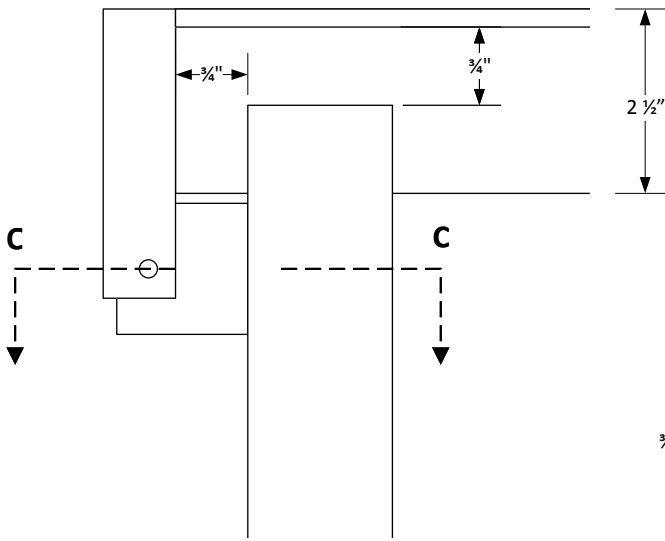
DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: MAY 2016
CHECKED BY: GH	DRAWING NO. <b>6-4</b>



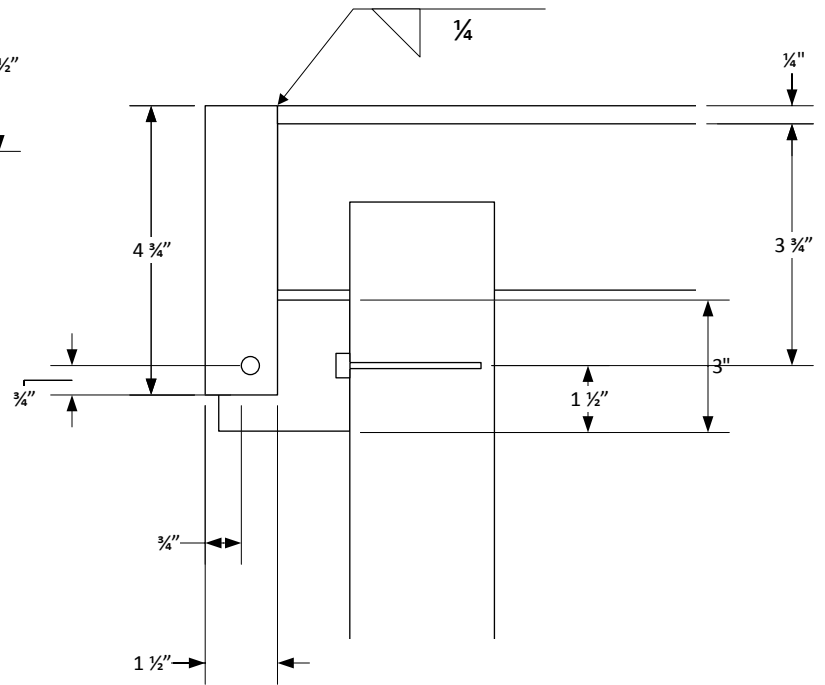
# AIR VALVE COVER

## Regulations, Specifications, and Standard Details

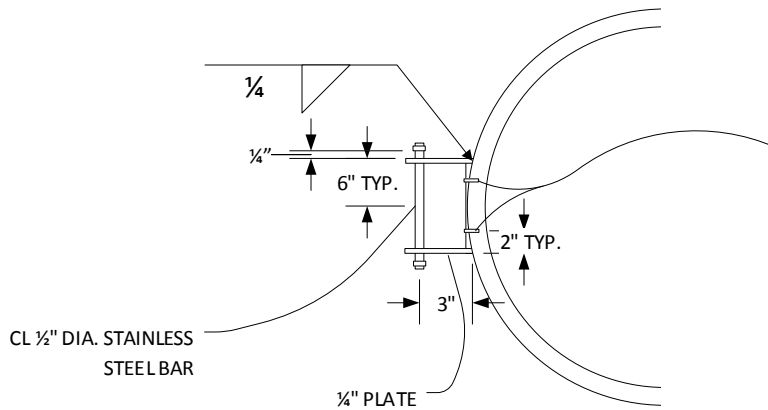
DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: JUNE 2016
CHECKED BY: GH	DRAWING NO. 6-5 1/2



**DETAIL A**



**SECTION B-B**



**SECTION C-C**

1/2" DIA. BOLTS WITH HEX HEADS AND WASHERS. 1/2" - 2 UNIT COMPOUND EXPANSION ANCHORS NOT SHOWN. ALTERNATIVE - 1/2" DIA. THROUGH BOLTS WITH HEX HEADS AND WASHERS.



# AIR VALVE COVER

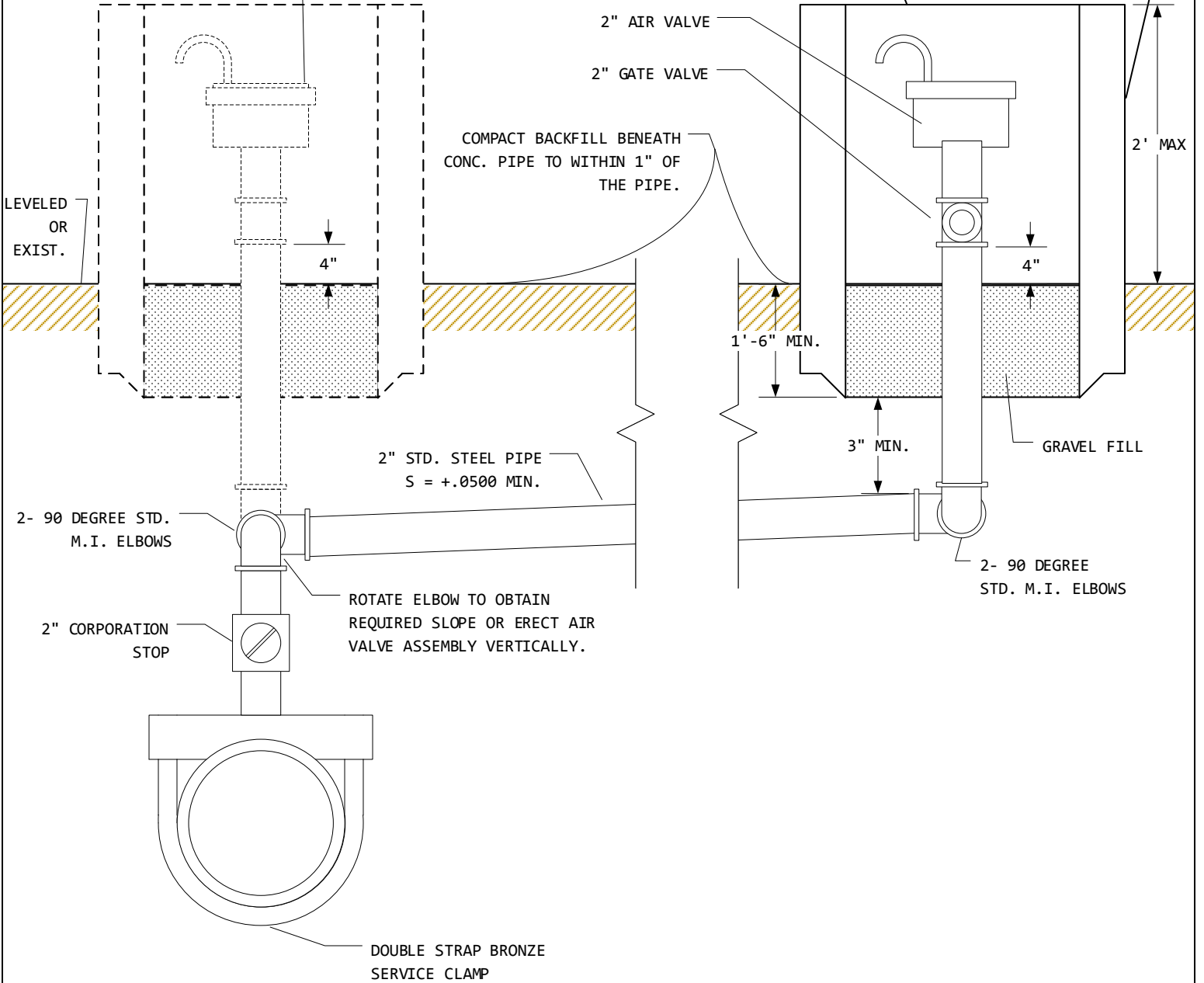
Regulations, Specifications, and Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: JUNE 2016
CHECKED BY: GH	DRAWING NO. 6-5 2/2

THE AIR VALVE ASSEMBLY TO BE ERECTED VERTICALLY ABOVE OUTLET NOZZLE UNLESS DIRECTED OTHERWISE BY DISTRICT.

COVER NOT SHOWN FOR PIPE WELL. SEE AIR VALVE COVER DETAIL 6-5 1/2 & 6-5 2/2

36" DIA. PRECAST CONCRETE PIPE

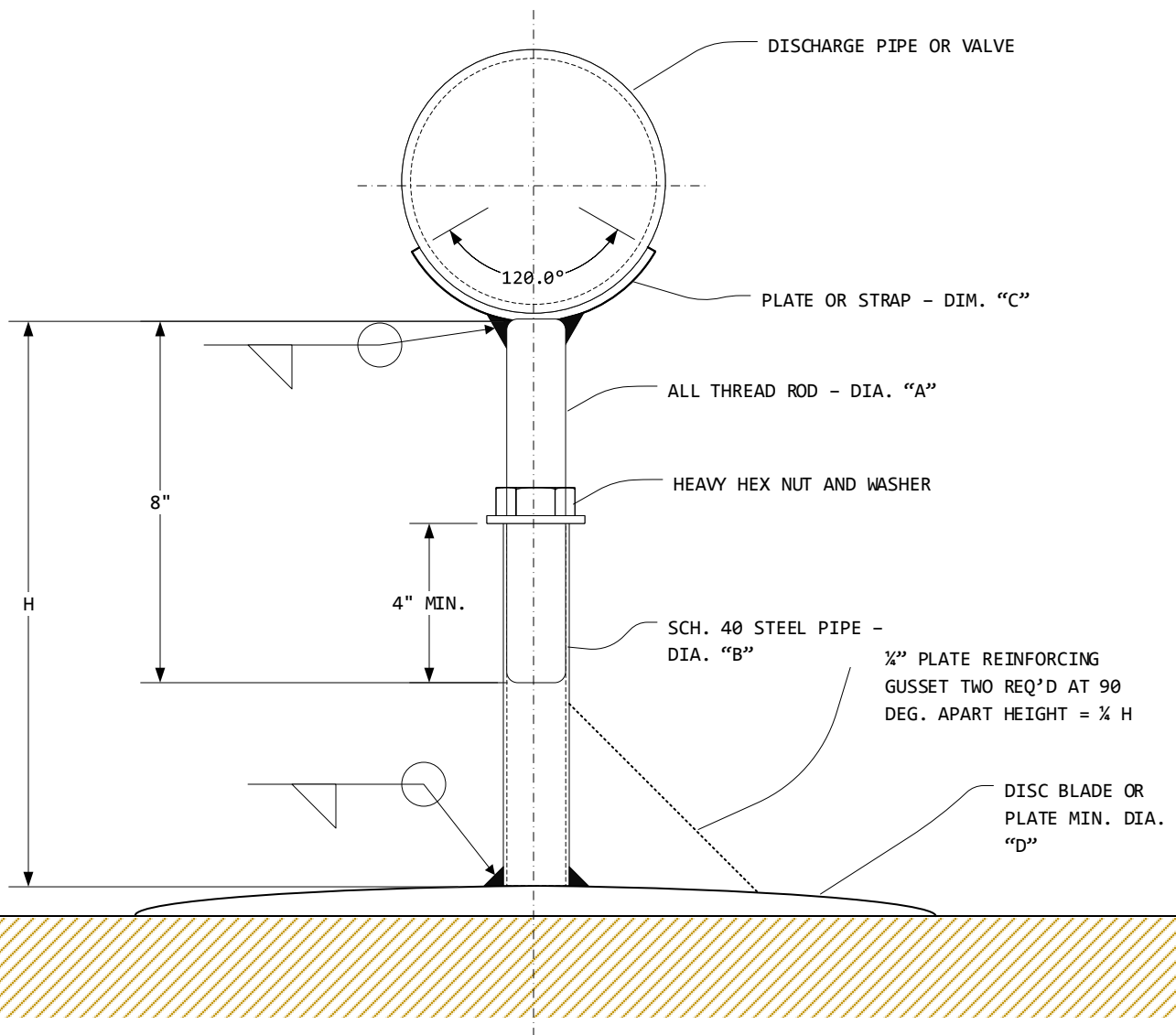


# AIR VALVE INSTALLATION

Regulations, Specifications, and Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: JUNE 2016
CHECKED BY: GH	DRAWING NO. 6-6





## DIMENSIONS AND DIAMETERS

PIPE DIA.	A	B	C
4"	1"	1"	1/4" X 1 - 1/4"
6"	1 - 1/4"	1 - 1/4"	3/8" X 1 - 1/2"
8"	1 - 1/4"	1 - 1/4"	3/8" X 1 - 1/2"
10"	1 - 1/2"	1 - 1/2"	1/2" X 2"
12"	1 - 1/2"	1 - 1/2"	1/2" X 2"

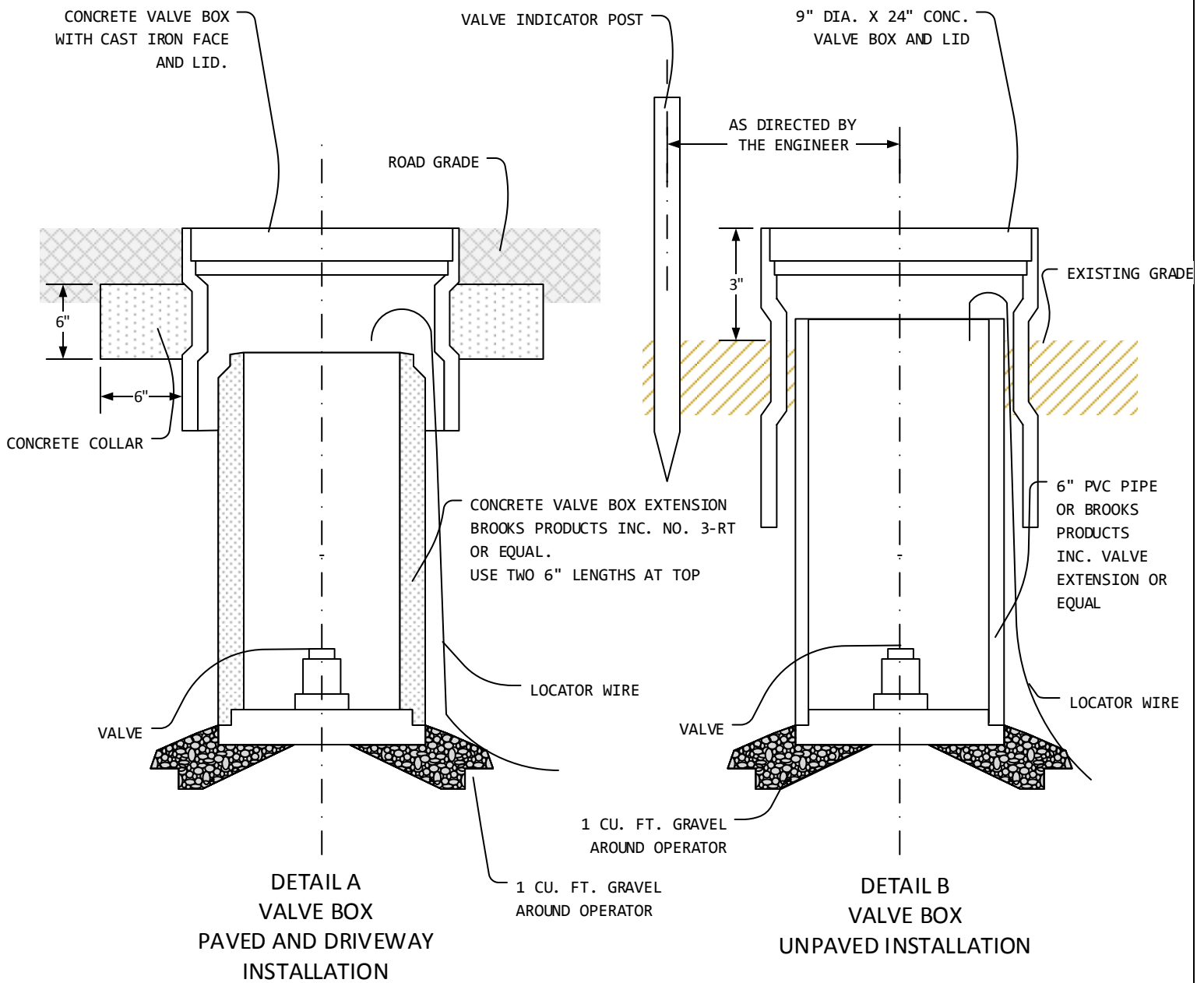
H - MAX	D	GUSSET
2"	12"	NOT REQ'D
4"	24"	REQ'D
6"	30"	REQ'D



## ADJUSTABLE STAND

Regulations, Specifications, and  
Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: JULY 2016
CHECKED BY: GH	DRAWING NO. 6-7



**NOTES:**

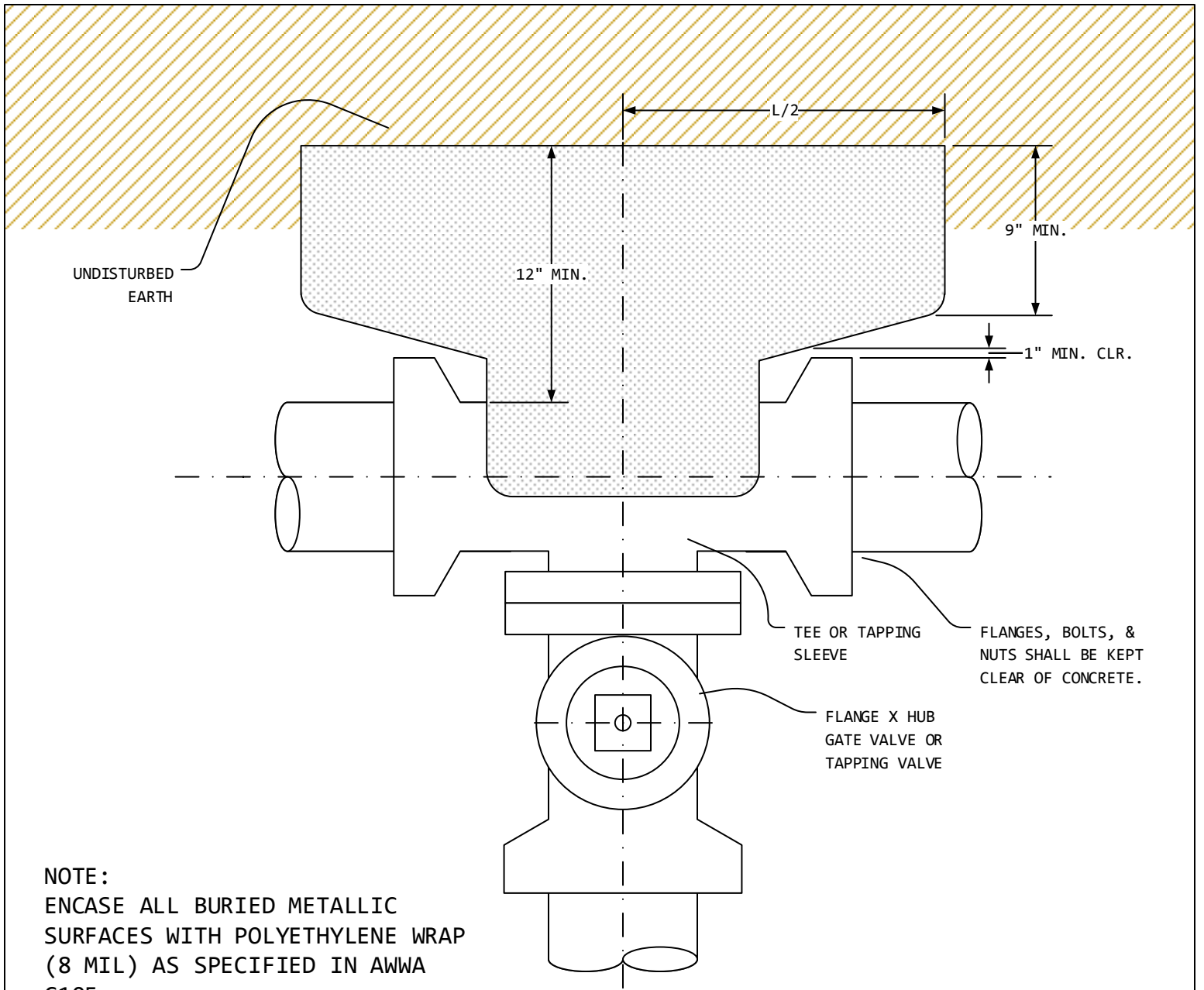
1) LOCATOR WIRE FROM THE TOP OF PIPE SHALL BE BROUGHT UP TO THE TOP OF THE VALVE BOX AS SHOWN.



# Valve Boxes

Regulations, Specifications, and  
Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: JULY 2016
CHECKED BY: GH	DRAWING NO. 6-8



NOTE:  
 ENCASE ALL BURIED METALLIC SURFACES WITH POLYETHYLENE WRAP (8 MIL) AS SPECIFIED IN AWWA C105.

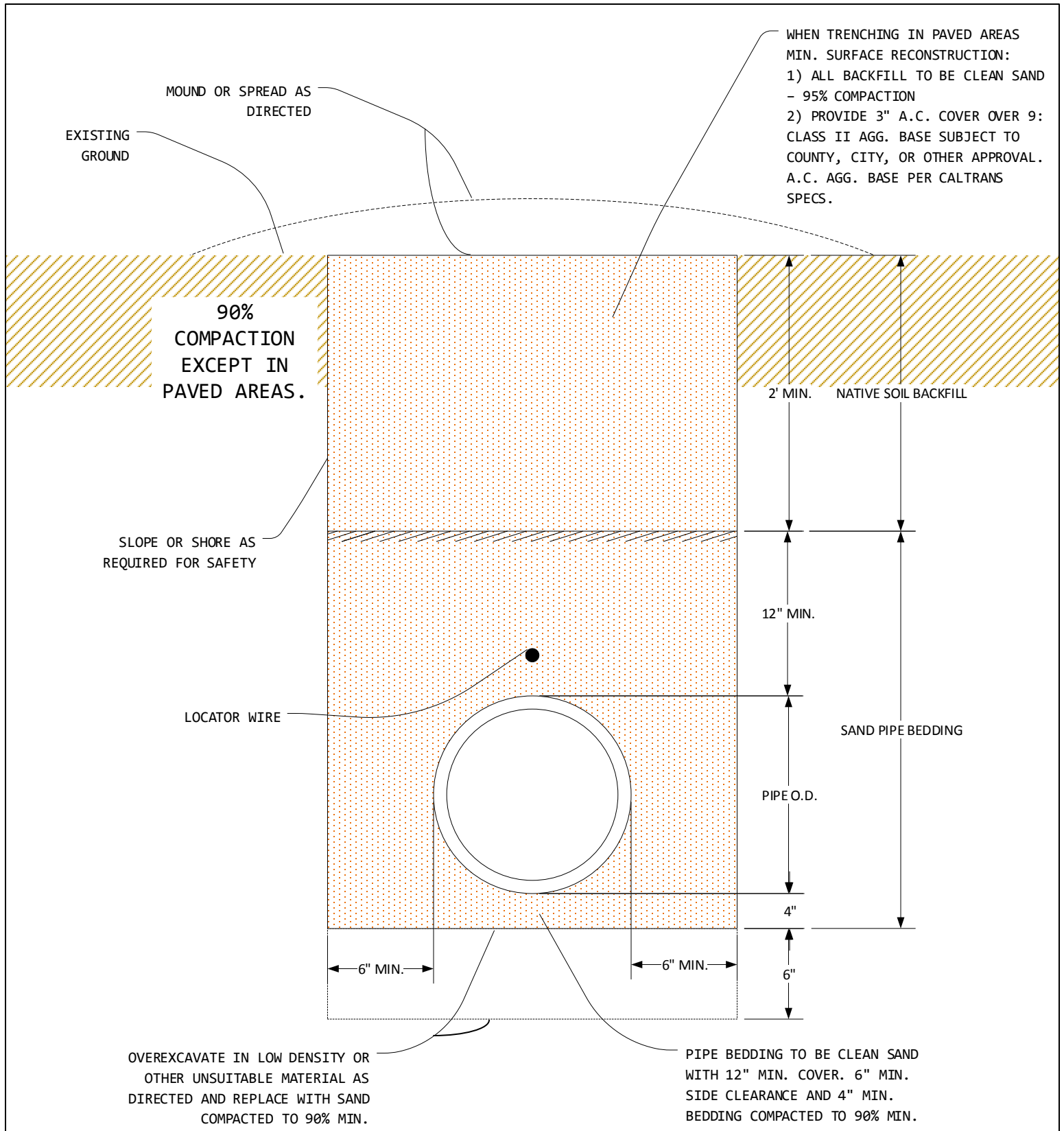
BRANCH PIPE SIZE	BEARING AREA (S.F.)	L X H
3" OR 4"	2	1'5" X 1'5"
6"	3	1'9"X1'9"
8"	5	2'3"X2'3"
10"	9	3'0"X3'0"
12"	15	3'10"X3'10"



# THRUST BLOCKING - TEES

Regulations, Specifications, and Standard Details

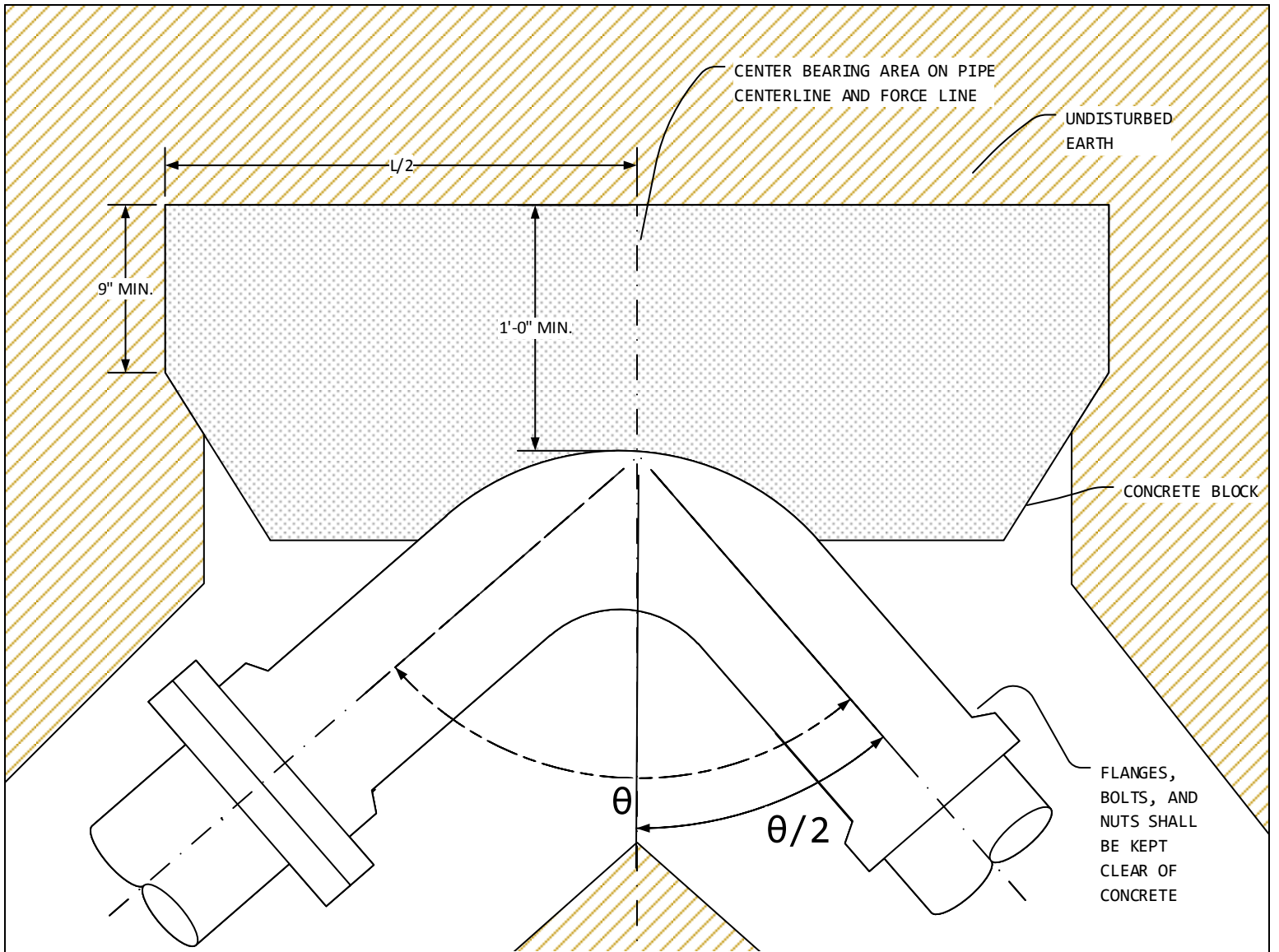
DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: JULY 2016
CHECKED BY: GH	DRAWING NO. 6-9



# TYPICAL TRENCHES

## Regulations, Specifications, and Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: JULY 2016
CHECKED BY: GH	DRAWING NO. <b>6-10</b>



NOTE: ENCASE ALL BURIED METALLIC SURFACES WITH POLYETHYLENE WRAP AS SPECIFIED IN AWWA C105

PIPE SIZE	REQUIRED BEARING AREA (SQ. FT.)					BEARING AREA DIMENSIONS (L X H)				
	5.625°	11.25°	22.25°	45°	90°	5.625°	11.25°	22.25°	45°	90°
6"	1	1	2	3	5	1'0" X 1'0"	1'0" X 1'0"	1'5" X 1'5"	1'9" X 1'9"	2'3" X 2'3"
8"	1	1	2	4	8	1'0" X 1'0"	1'0" X 1'0"	1'5" X 1'5"	2'0" X 2'0"	2'10" X 2'10"
10"	1	2	4	7	12	1'0" X 1'0"	1'5" X 1'5"	2'0" X 2'0"	2'8" X 2'8"	3'5" X 3'5"
12"	1	3	5	9	17	1'0" X 1'0"	1'9" X 1'9"	2'3" X 2'3"	3'0" X 3'0"	4'2" X 4'2"



# THRUST BLOCKING - ELBOWS

Regulations, Specifications, and  
Standard Details

DESIGNED BY:  
DSM & GH

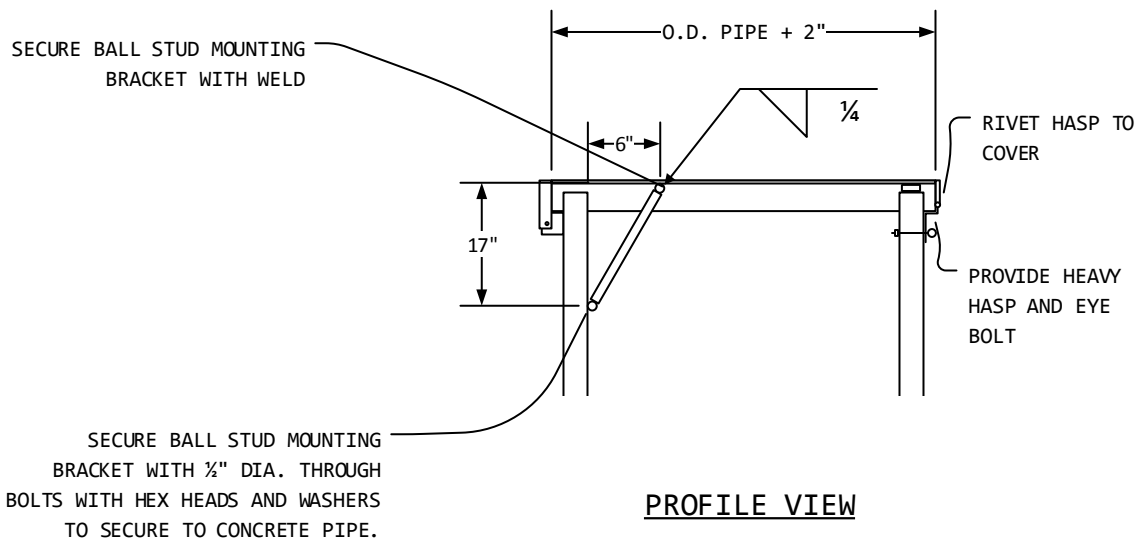
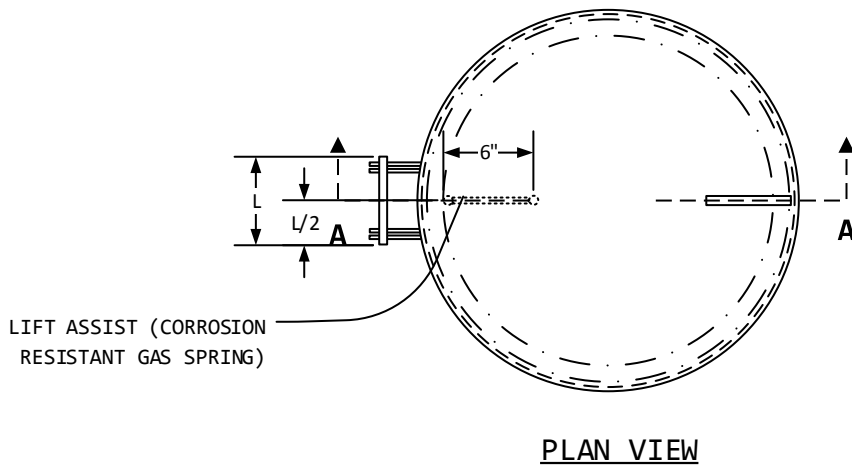
SCALE:  
NO SCALE

DRAWN BY:  
DSM

DATE:  
JULY 2016

CHECKED BY:  
GH

DRAWING NO.  
**6-11**



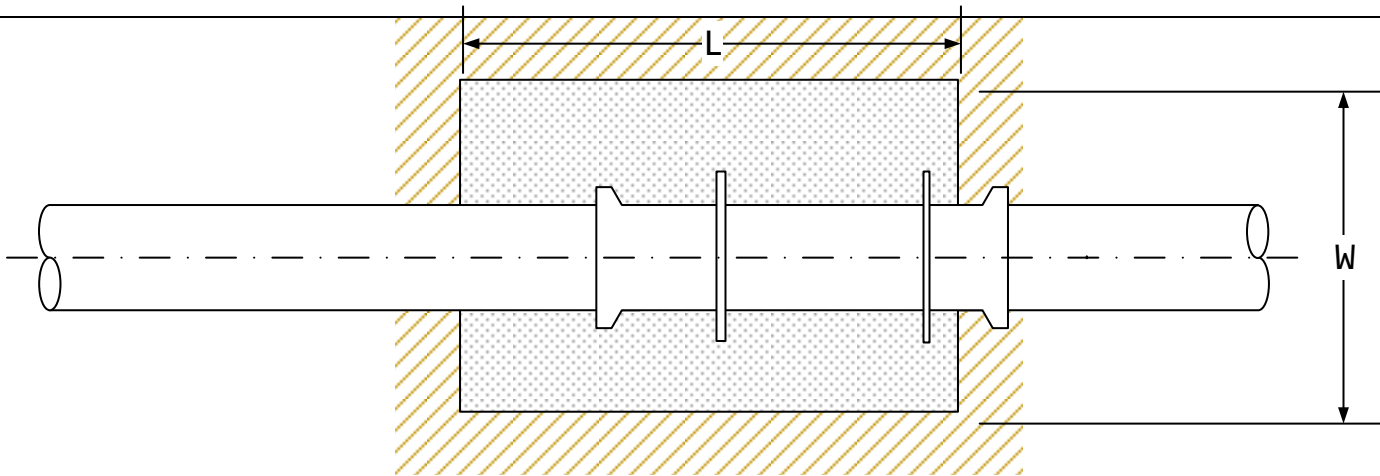
NOTE: INSTALL CORROSION RESISTANT GAS SPRING (PRODUCT #9517T5 @ MCMMASTER-CARR.COM) RATED FOR 135 LB EXTENSION FORCE USING BALL STUD MOUNTING BRACKETS (PRODUCT #5992K31).



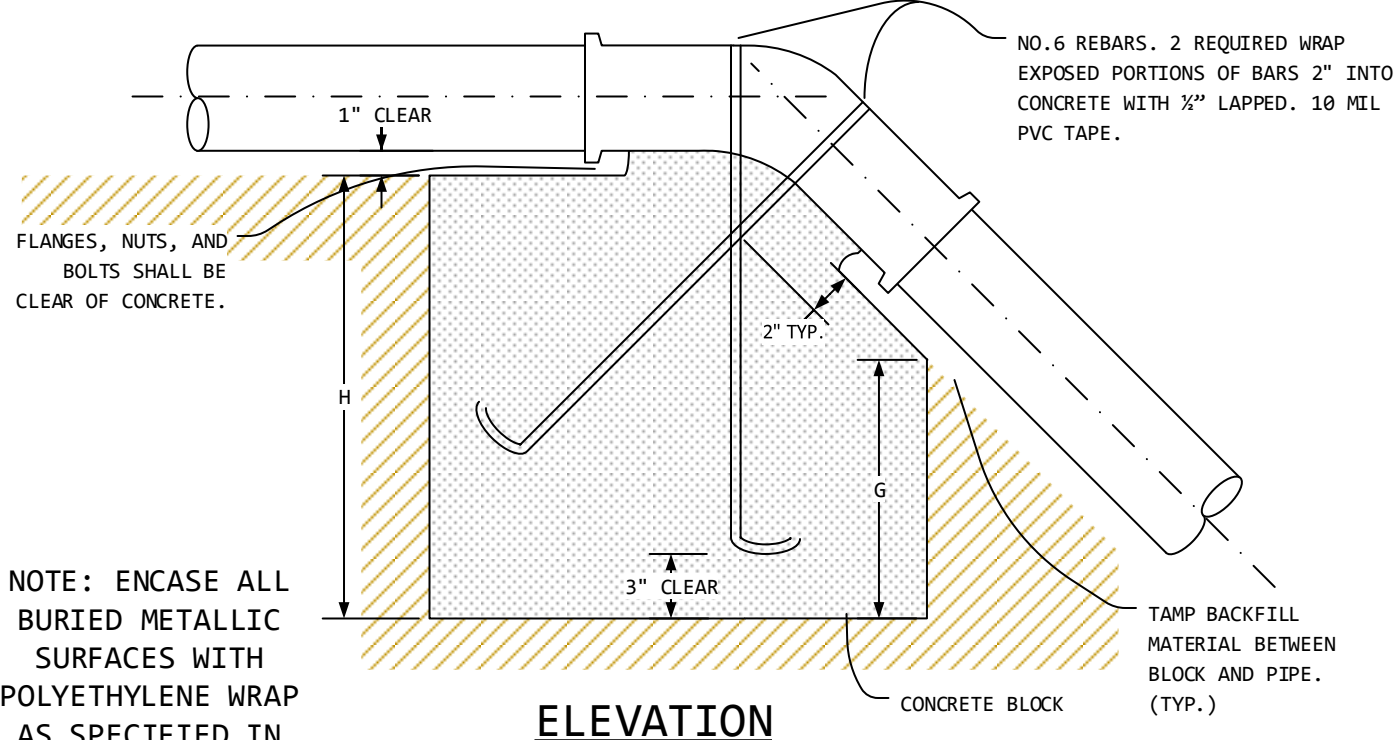
# LIFT ASSIST FOR VAULT COVERS

Regulations, Specifications, and Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: JULY 2016
CHECKED BY: GH	DRAWING NO. <b>6-11</b>



**PLAN**



**ELEVATION**

**THRUST BLOCK DIMENSIONS – UPWARD THRUST**

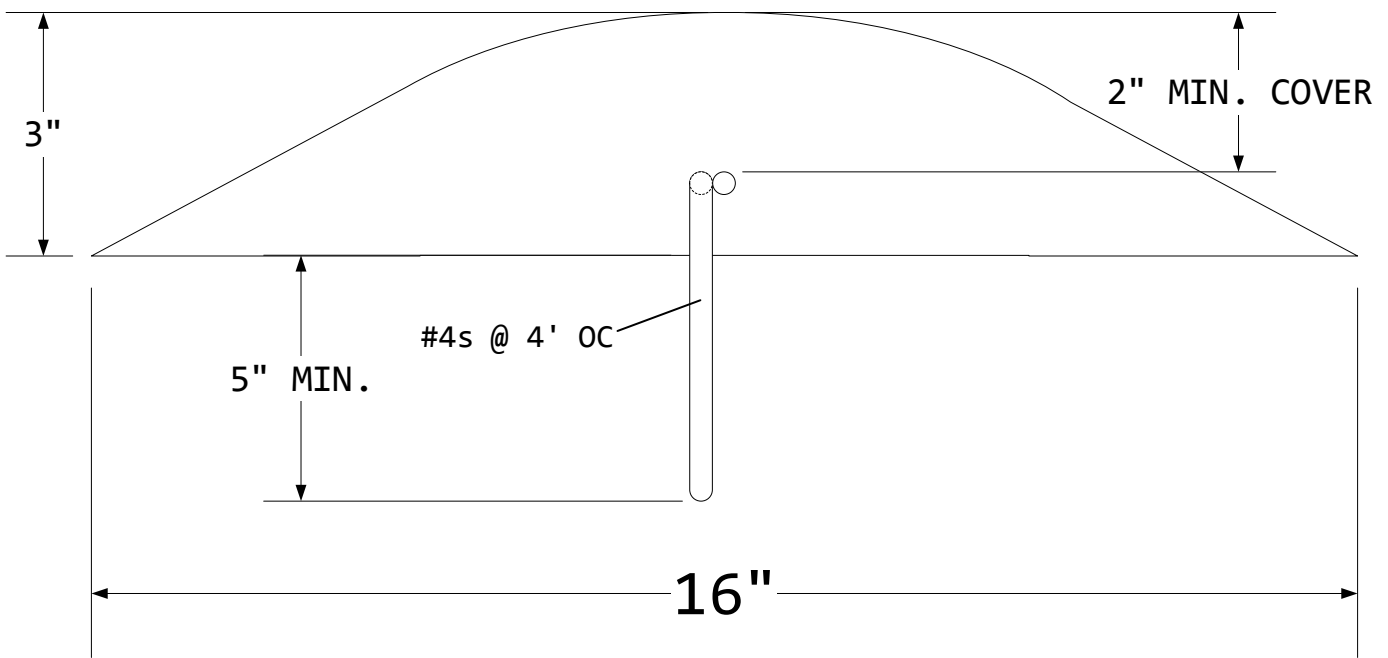
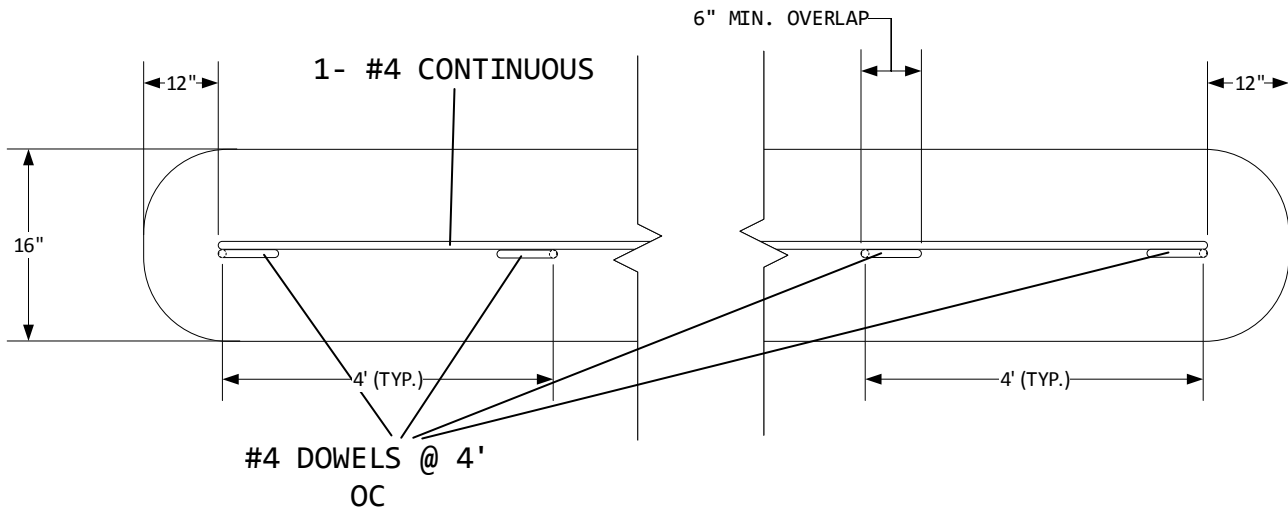
PIPE SIZE	11.25° BEND				22.25° BEND				45° BEND			
	L	W	H	G	L	W	H	G	L	W	H	G
6"	2' - 0"	2' - 0"	1' - 0"	9"	2' - 0"	2' - 0"	2' - 0"	1' - 0"	3' - 0"	2' - 0"	2' - 0"	6"
8"	2' - 0"	2' - 0"	1' - 0"	9"	3' - 0"	2' - 0"	2' - 0"	1' - 0"	4' - 6"	2' - 0"	3' - 0"	6"
10"	3' - 0"	2' - 0"	2' - 0"	1' - 8"	4' - 0"	2' - 0"	2' - 0"	1' - 0"	6' - 0"	2' - 0"	3' - 8"	8"
12"	3' - 0"	2' - 0"	2' - 0"	1' - 8"	6' - 0"	2' - 0"	2' - 0"	1' - 0"	7' - 0"	2' - 6"	4' - 0"	8"



**THRUST BLOCKING –  
ELBOWS**

Regulations, Specifications, and  
Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: JULY 2016
CHECKED BY: GH	DRAWING NO. <b>6-13</b>



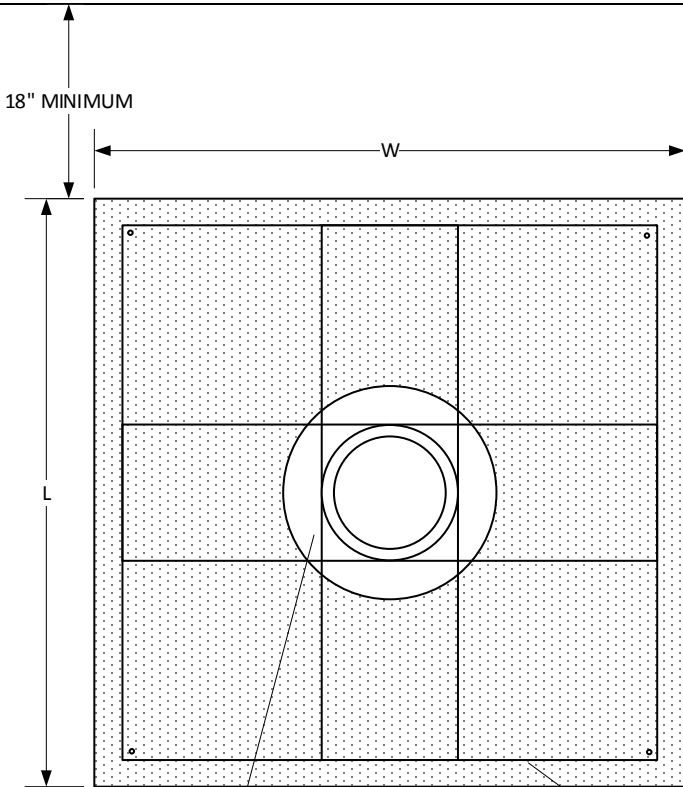
# SPEED BUMP

Regulations, Specifications, and Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: DECEMBER 2016
CHECKED BY: GH	DRAWING NO. <b>6-14</b>



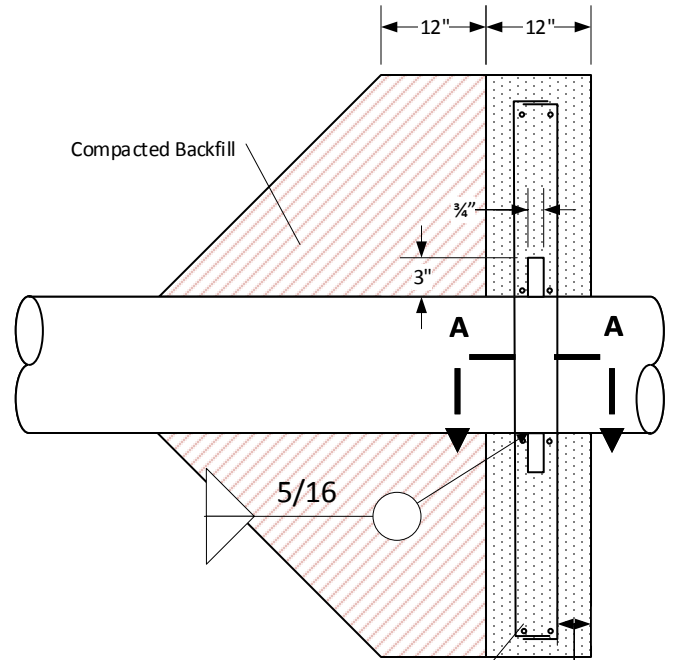
SURFACE GRADE



WALL PIPE

**Section A-A**

#4 @ 6" O.C.



Compacted Backfill

5/16

#4 @ 6" O.C.

3" Clearance Min.

**NOTE :**

1. SEE IN-LINE THRUST BLOCK DETAIL 3-7 FOR SECTION A-A.
2. THE VALUE OF 1500 PSF TO BE USED IN DESIGNING. ACTUAL SOIL CONDITIONS REVEALED BY OPEN TRENCH MAY REQUIRE ADJUSTMENT IN THRUST BLOCK AREA.

PIPE SIZE	BEARING AREA (S.F.)	L	W
4"	2	1' -4"	1' -6"
6"	3	2' -0"	2' -3"
8"	5	2' -7"	3' -0"
10"	9	2' -3"	3' -9"
12"	15	3' -11"	4' -6"
18"	15	3' -11"	4' -6"



# IN-LINE THRUST BLOCK

Regulations, Specifications, and Standard Details

DESIGNED BY:  
DSM & GH

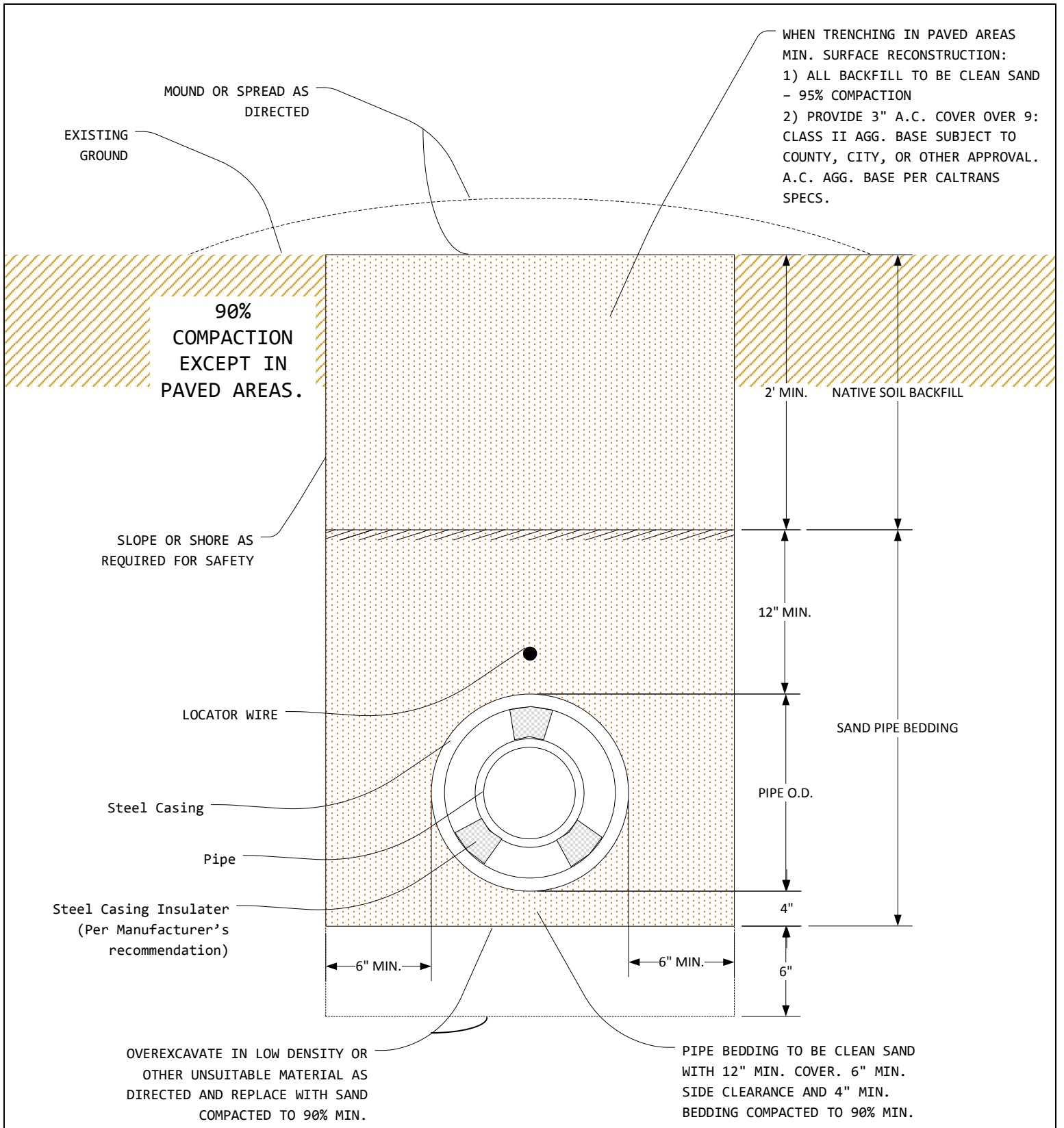
SCALE:  
NO SCALE

DRAWN BY:  
DSM

DATE:  
May 2019

CHECKED BY:  
GH

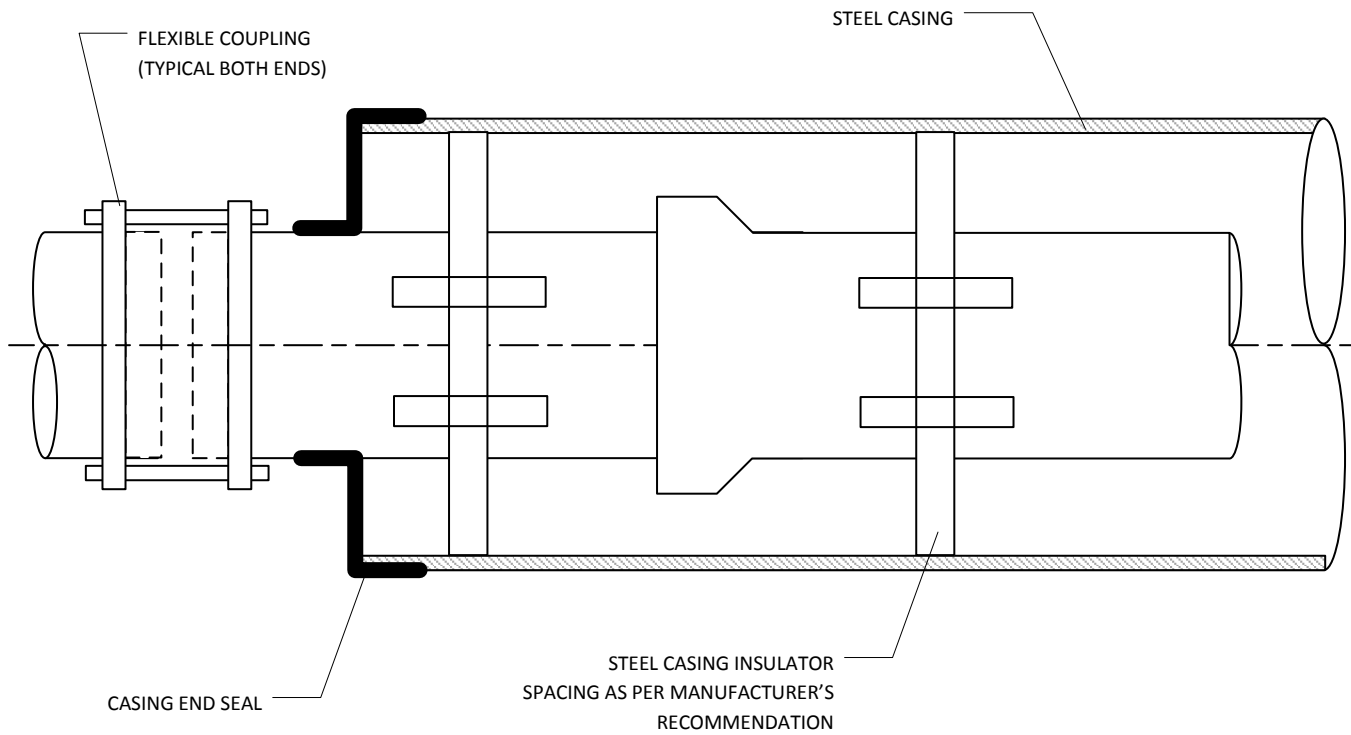
DRAWING NO.  
**6-15**



# Typical Piping Trench for Encased Pipe

## Regulations, Specifications, and Standard Details

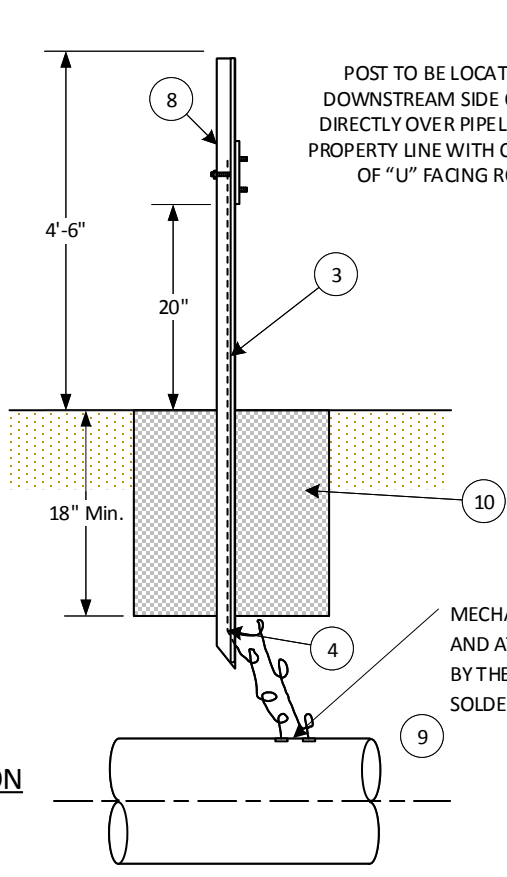
DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: October 2020
CHECKED BY: GH	DRAWING NO. 6-16



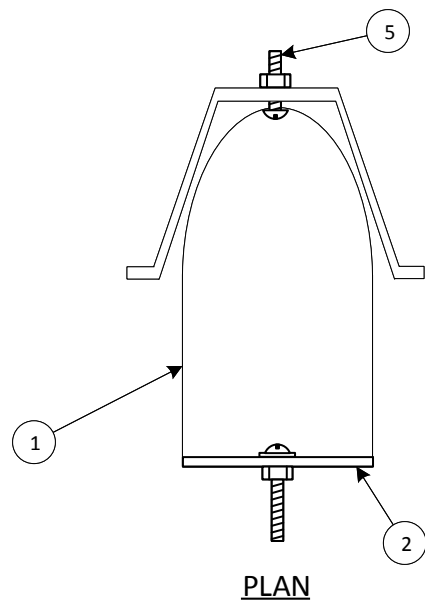
# Encased Pipe Details

Regulations, Specifications, and Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: October 2020
CHECKED BY: GH	DRAWING NO. 6-17



**ELEVATION**



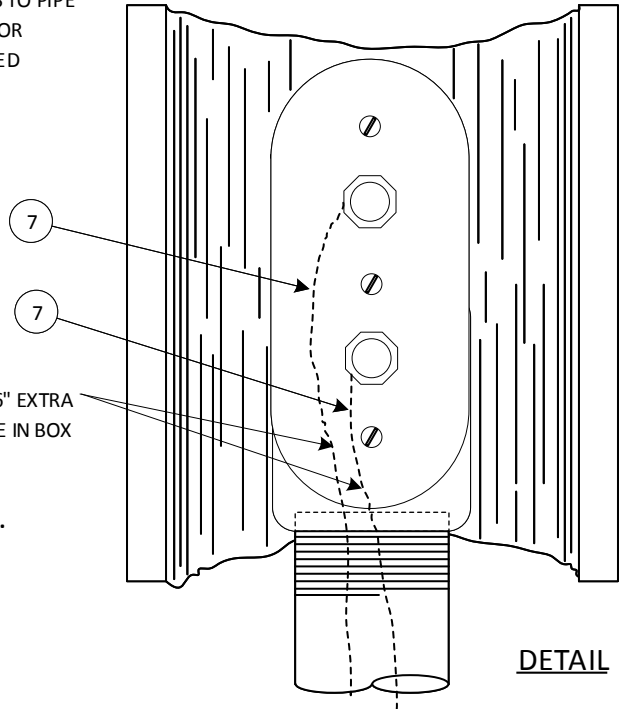
**PLAN**

**DETAIL DRAWINGS OF TYPICAL CATHODIC PROTECTION TEST STATION ASSEMBLY**

- NOTES:**  
 1. CONTRACTOR TO FURNISH AND INSTALL ALL MATERIAL.

MECHANICALLY SECURE AND ATTACH LEADS TO PIPE BY THERMIT WELD OR SOLDER AS REQUIRED

LEAVE MIN. OF 6" EXTRA TEST WIRE IN BOX



**DETAIL**

**MATERIALS LIST**

ITEM	REQ'D	SIZE	DESCRIPTION	UNIT
1	1	3/4"	CONDULET HEAD WITH 1/2" HOLE DRILLED IN CENTER OF BACK (FABRICATED AS PER PORTER CO., ACE, OR EQUAL)	340-
2	1	3/4"	BLANK CONDULET INSULATED COVER, WITH TWO 3/4" DRILLED HOLES	340-
3	1	3/4" X 2'-6"	RIGID GALV. CONDUIT, REAMED AND THREADED BOTH ENDS	340-
4	1	3/4"	INSULATED BUSHING, THREADED	340-
5	1	3/16" X 2"	MACHINE SCREW, CADMIUM PLATED STEEL, W/ 2 NUTS AND FLAT WASHERS	340-
6	1	#10 X 3/4"	BRASS SCREW, 32NF, W/ BRASS NUT AND TWO BRASS FLAT WASHERS	340-
7	1	AS REQ'D	WIRE, NO 10 OR 12 AWG, COPPER, 600V, THW INSULATION	340-
8	1	6'-0"	POST "U" TYPE STEEL POST (YELLOW)	340-
9	2	-	NO. 15 CHARGE, W/SLEEVE OR EUTEC ROD 157-1/8" AND EUTECTOR FLUX 157 OR EQUIVALENT	340-
10	1	40 LB BAG	TYPE I PORTLAND CEMENT	340-



**Cathodic Protection Test Station (Above Ground)**  
 Regulations, Specifications, and Standard Details

DESIGNED BY: DSM & GH	SCALE: NO SCALE
DRAWN BY: DSM	DATE: December 2021
CHECKED BY: GH	DRAWING NO. 6-18