

HUMBOLDT COMMUNITY SERVICES DISTRICT



WATER AND SEWER DESIGN AND CONSTRUCTION STANDARDS

Second Revision

Approved by the
HCSD Board of Directors
at its Regular Meeting of
September 13, 2016

Set No. _____

HUMBOLDT COMMUNITY SERVICES DISTRICT
DESIGN AND CONSTRUCTION STANDARDS

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SECTION I

GENERAL DESIGN AND APPROVAL STANDARDS

HUMBOLDT COMMUNITY SERVICES DISTRICT
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I. GENERAL DESIGN AND APPROVAL STANDARDS

1. General Requirements

- A. All improvements hereinafter mentioned shall conform to these Standard Improvement Specifications, Appendices as prepared by the District and the conditions for main extension as approved by the Board of Directors. Design shall also be in conformance with the Uniform Plumbing Code (UPC) and the State Department of Health Services (DOHS) California Waterworks Standards (Title 22).
- B. Improvement work shall not be commenced until the District has been notified in advance and if work has been discontinued for any reason, it shall not be continued again until the District has been again notified.
- C. All required improvements shall be constructed in accordance with the District Standard Specifications and approved by District. The District may require tests to be performed on any materials or specific item of improvement work and such tests shall be conducted at the sole expense of the Applicant.
- D. It shall be the responsibility of the Applicant that all sanitary sewers and water mains installed in streets, service roads, alleys or highways shall be constructed prior to the surfacing of such streets, service roads, alleys, or highways. Service connections for all sanitary sewers and water mains shall be placed at sufficient length to obviate the necessity for disturbing the street or alley improvements when service connections thereto are made.
- E. The Applicant will secure all necessary permits from all agencies with jurisdiction in the work.
- F. The Applicant shall install improvements in accordance with the general requirements set forth in this Section provided that the District may require changes in details if unusual conditions arise during construction which warrant such change in the interests of the District.
- G. Sanitary Sewers. Sanitary sewer lines and appurtenances, including manholes, cleanouts, pump stations, and off-site lines, shall be provided within all subdivisions and shall connect with existing sewer lines and appurtenances. Where a sewer line is constructed or laid within a street, the sub-divider shall install a lateral connection extending past the right-of-way line to serve each lot within the subdivision as shown on the Standard Detail Drawings. Sanitary sewer lines, appurtenances, and service connections shall be constructed or laid to grades approved by the District. Where further

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development appears probable beyond the proposed subdivision, the Applicant may be required to install manholes instead of cleanouts at the end of a line.

- H. Water. Adequate water supply and distribution systems, water mains and fire hydrants connected to the water system serving the District shall be installed by the Applicant, subject to the approval of the District. Where further development appears probable beyond the proposed subdivision, the Applicant may be required to install larger water mains to handle such additional development. Applicant may also be required to extend water lines within the subdivision to provide ties to existing or proposed lines to provide maximum flexibility for water system operation. Where additional storage facilities, pumps or private building water service pipe diameter over-sizing are required to serve the development, the Applicant may be required to have such facilities designed and constructed at his sole expense.
- I. Main Line Markers. All sewer and water mains which are located on private property other than roadways, shall be marked with a reflective utility line marker each 300' at each deflection point, valve locations and at all other utility crossings (such as storm drains).
- J. Quantity of water delivered to the distribution system from the District water source must be sufficient to supply adequately, dependably and safely the total requirements of all the customers, including fire hydrants, under maximum consumption. The distribution system must be capable of adequately delivering this water supply to all customers.
- K. The distribution facilities, wherever possible, shall be in grid form so that pressures throughout the system tend to become equalized under varying rates and location of drafts. The basic design criteria for pipeline sizing shall be that which provides full fire requirements of the American Insurance Association combined with peak summer flows of the domestic requirements.
- L. The distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in shutting down a transmission main, or necessitate the removal from service of a length of pipe greater than five hundred (500') feet in length and in no case should more than two fire hydrants be removed from service at any one time.
- M. Service lines from the water main shall be installed at the time the main is constructed to avoid frequent cutting of the street.

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- N. In locations where high groundwater can be expected or along trench slopes greater than 15%; permanent design solutions may be required by the District to control drainage. Drainage control solutions may include impervious water stops with trench relief drains to daylight or other techniques to control trench water depending on site conditions.
- O. REVIEW THESE STANDARD IMPROVEMENT SPECIFICATIONS CAREFULLY. They are enforced by State Code and Humboldt Community Services District ordinance. Failure of your project to meet these specifications upon District inspection may result in delay of acceptance and approval of the project and the provision of water and sewer service, until any non-conformance is corrected.

2. Improvement Plan Drawings

- A. In general, improvement plan drawings shall contain all applicable information as indicated on the District improvement plan checklist.
- B. In general, improvements shown shall be based on an indicated centerline or pipeline stationing and all facility improvements shall be referenced from this line with a station and offset distance (i.e.: 12" FH, STA 14+15, 25' RT), to allow the improvement to be staked and checked during construction.
- C. At a minimum, the following information shall be shown on all improvement plans:
- District signature block
 - County signature block
 - Fire Dept. signature block
 - Applicable standard District notes
 - Engineer's name and seal
 - North arrow and barscale
 - TBM and basis of bearings
 - Legend
 - Water main size and length (12" W-278')
 - Sewer main size, length and slope (8"SS-250', S=0.005)
 - Complete sewer manhole information
SSMH 301, 105+00, 5' RT
RIM 100.00, IFL 92.1, OFL 92.0

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- Complete cleanout information
CO 306, 110+50, 5' FT
RIM 101.0, INV 93.5
- Complete sewer lateral information
107+50, 25' RT
INV 102.75

3. Record Drawings

Record drawings of the construction shall be filed with the District upon completion of said improvements. Upon receipt and acceptance of said record drawings, the District will issue a letter of completion. The letter of completion must be completed and on file in the District office before water or sewer service may be commenced.

4. Plan Check and Administration Fee.

A non-refundable fee in the amount of 3% of the estimated cost of the construction shall be paid to the District at the time of plan approval. The estimated cost of construction shall be determined by one of the following:

- A. Applicant's engineer's opinion of estimated probable cost of water and sewer facility construction, based on the submitted improvement plans based on current prices, which is Acceptable to District.
- B. A signed written quotation from a licensed contractor with the correct license type for the work involved, indicating the unit price, material and quantity breakdown together with total price extensions, which is acceptable to District.

The opinion of probable estimated cost, which is acceptable to District, shall be the Applicant's opinion of cost and shall not be a warranty by District of the actual cost of the construction.

The "3%" fee shall include the cost charged for the initial "first" plan check submittal together with the incorporated comments of the "second" plan check resulting in a final product that may be signed by both the Applicant's engineer and the District.

Additional plan checking by the District after the "second" plan check shall be considered an additional charge to the Applicant at the District charge out rate as set by District's Fee Schedule, and shall be due prior to District plan approval and signature. "Second" plan check submittals that substantially

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differ from the "first" plan check submittal in the opinion of the District, shall be considered new projects and subject to the "3%" fee.

5. Inspection Fee

- A. An inspection fee shall be paid to District by Applicant and shall be determined by District based on the amount of time and effort necessary to observe and test the construction. Applicant shall deposit with District 50% of the estimated total cost of the inspection prior to first call for inspection. Final inspection cost payment shall be paid to District by Applicant prior to final acceptance of improvements by District. The District's opinion of inspection cost shall be provided to establish the 50% inspection deposit amount and may not represent the full amount of the true inspection costs involved. Actual inspection costs shall be based on the actual inspection hours required at an hourly District charge out rate *as set by District's Fee Schedule*. Inspection costs shall also include the costs of physical testing of the construction such as compaction testing. The Applicant shall reimburse the District the actual costs of compaction and other testing.
- B. The District reserves the right to make any and all inspections necessary to observe conformance with the design intent expressed in the approved drawings and District standards. Construction observation shall not relieve the Applicant or Applicant's contractor from the obligations to perform the work in accordance with commonly accepted construction industry standards and all other applicable code and policy requirements including full compliance with the California Occupational Safety and Health Act and all similar legislature.
- C. The Applicant's construction contractor shall be required to assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety to all persons and property. This requirement shall be made to apply continually and not be limited to normal working hours.

SECTION II

**WATER SYSTEM
STANDARDS**

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II. WATER SYSTEM DESIGN STANDARDS

PURPOSE:

To provide guidelines for the design of water utility projects and thereby reduce the time required for processing the plans. These guidelines do not include but may reference, additional conditions, which may be promulgated by all other pertinent ordinances, codes, and official policy set forth by the Humboldt Community Services District. These guidelines are intended to impose minimum acceptable design criteria. More stringent requirements may be imposed at the discretion of the General Manager based on specific project conditions.

It is the responsibility of the design engineer to initiate written requests for approval of any design concepts contrary to these criteria, to verify additional requirements imposed, perform any necessary calculations or studies, and resolve specific design problems with the appropriate agency and/or District.

WATER SYSTEM:

1. Materials

- A. Service lateral tubing 2" and smaller shall be polyethylene, PE 3408, 200 psi minimum.
- B. 2" service lateral polyvinyl pipe shall be minimum Schedule 40.
- C. 4" through 12" water mains shall be Polyvinyl Chloride (PVC) AWWA C900, Class 150, minimum, or Ductile Iron pipe, AWWA C151, Class 50, minimum.
- D. 14", 16" or 18" diameter water mains shall be Ductile Iron pipe or PVC AWWA C905 (DR 21), or as shown on the plans and specifications.
- E. Asbestos cement pipe shall not be allowed under any circumstances.
- F. Ductile Iron pipe must be polyethylene encased and have approved cathodic protection.
- G. Where the normal mainline static pressure exceeds 150 psi, Ductile Iron pipe 200 PVC must be used.

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2. Alignment

- A. Typical alignment shall be in accordance with the Standard Drawings.
- B. Public water mains outside the public street are not allowed without special permission from the General Manager.
- C. Minimum allowable radius for 8" diameter water mains is 250 feet and for 12" diameter water mains is 350 feet.
- D. New mains must match the grade and centerline offset of existing water mains where possible.
- E. Maintain a constant distance from centerline wherever possible.
- F. Conform to the State of California Department of Health Services "Criteria for the Separation of Water Main and Sanitary Sewer".
- G. Install felt expansion material between pipes with 1" or less vertical clearance.
- H. Minimum clear horizontal separation from existing gas, electrical, and telephone lines shall be 5 feet between pipes.
- I. Minimum clear horizontal separation from a metallic pipeline with an induced current shall be 5 feet.
- J. Minimum clear horizontal separation from a storm drain shall be 5 feet.

3. Size

- A. All new water mains shall be designed to comply with recommended California Fire Code and AWWA standards.
- B. Recommended California Fire Code requires that minimum fire flow at all fire hydrants be:
 - 1. Residential 1,000 GPM, and commercial 1,500 GPM, with a 20 psi residual pressure.
 - 2. Industrial areas - 2,500 gallons per minute with a 20 psi residual pressure;
 - 3. Or as required by Appendix B of the California Fire Code, whichever is greater.

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- C. For residential/commercial installations, public and private mains shall be 8-inch diameter minimum.

A six-inch diameter main may be used where all of the following conditions exist:

- Fire district has furnished District written confirmation that no fire hydrants are or will be required.
- The dead end cul-de-sac street length is less than 500 feet.
- The looped street length is less than 1,000 feet.

A four-inch diameter main may be used when all of the following conditions exist:

- All of the three conditions above exist and the main can only serve six residential parcels or less at current zoning build-out.
- Individual water service laterals (not mains) may be used when all of the following conditions exist:
 - All of the above conditions exist and the requested water service can serve three residential parcels or less.

and,

- No current or future main extensions to serve additional parcels are possible beyond the parcels or frontage of the requesting parcel.

- D. For industrial installations, looped system shall be eight-inch diameter minimum and dead end system shall be 12-inch diameter minimum.
- E. The General Manager may require increased pipe size (oversizing) for overall system benefit.
- F. Where oversizing is required by the District, the Applicant shall enter into an agreement with the District to provide such installation. The District may pay Applicant the difference in cost to install the larger pipe system or, at District option, supply Applicant the cost difference in length(s) of larger diameter pipe. The difference in cost shall be determined by District and based on current prevailing costs to construct such facilities.

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4. Cover

- A. Definition: cover is the distance from the top of the pipe to finished grade.
- B. Standard installation shall be in accordance with General Construction Note No. 9.
- C. Where cover is less than the standard cover, Class 50 Ductile Iron pipe is required.
- D. The minimum cover for all water main construction, under any circumstances, is 36".
- E. Where cover exceeds 8', special permission from the General Manager is required.
- F. Service laterals must have 24" minimum cover in accordance with the Standard Drawings.

5. Connection to an Existing Main

- A. In most major streets, or in new streets, the new water main may be bored and jacked into place. Conditions should be verified with the County Encroachment Officer.
- B. All hot taps shall be by District personnel unless specifically authorized by General Manager.
- C. Cut-in tee must be used if additional valves are required on the existing main. If the new lateral is larger than existing main, the tee shall be the size of the new lateral and reduced to the size of the existing main.
- D. Size-on-size taps are allowed up to 8" in accordance with the approved standards (except on wrapped steel mains).
- E. 12" size-on-size taps are allowed only under emergency situations and with the specific approval of the General Manager.
- F. All flushing, testing, and disinfection of water main shall be completed prior to final connection to the existing water system. Temporary connection shall be made per the Standard Drawings.

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6. Valving

- A. Valving at intersections shall be in accordance with the Standard Drawings.
- B. Main line valves within 250' of an intersection may be considered as part of the intersection.
- C. All hydrants must be on separately valved sections of the public main.
- D. Valves shall be "resilient seat gate" type unless otherwise approved by the District.

7. Service Lines and Water Meters

- A. Size of water meter shall be determined by the District using the current AWWA guidelines.
- B. Water meter services shall be installed in what would be considered the sidewalk area, fronting the parcel it is to serve, and outside of the driveway area.
- C. Maintain a 12" minimum horizontal and vertical sewer lateral separation per UPC.
- D. Residential (single unit):
 - 1. One meter cannot serve more than one parcel.
 - 2. Individual 1" services, for 1" meter shall be installed for all new parcels within a subdivision.
 - 3. Where residential fire sprinklers are required, install minimum individual 1" service for 1" meter. Backflow devices may be required to separate the systems on the site.
 - 4. Upon connection to water service, customer shall install a privately owned and maintained water shutoff valve on his side of service as close to the meter as practicable.

E. Apartments:

Each building/complex will be master metered or individually metered at the option of Applicant and at District's approval.

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F. Condominiums:

1. Each unit shall be individually metered.
2. Individual meters shall be clustered.
3. Separate irrigation meters for common areas are required.

G. Mobile Home Parks:

1. In parks where spaces are individually owned, separate metered services are required for each mobile home.
2. In parks where spaces are rented or leased master meters shall be required.
3. Separate irrigation meters for common areas are required.

H. Commercial:

1. Size of the meter and service are based on calculations provided by the applicant and approved by the District in accordance with AWWA standards.
2. A minimum 2" service line is required for a shell building or light industrial.
3. A minimum 8" Fire Protection service line is required for industrial lots and shopping centers as approved by the General Manager.
4. Commercial installations will require backflow prevention.
5. See General Construction Note No. 25 regarding provisions for Industrial Waste Monitoring.

I. Irrigation:

1. All irrigation services must include backflow prevention devices.
2. Irrigation meter size shall be determined by the maximum flow required at any one control valve.

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3. Sizing of irrigation meters shall be provided by applicant and approved by District.
 4. Backflow devices specified on the irrigation plan must conform to Humboldt Community Services District Standard Drawings and must be on the current Dept. of Health Services Approved List of Devices.
- J. Private Fire Systems:
1. Before combustible materials may be stored or constructed on site, the Fire Department must approve fire flow and access. Before a fire hydrant may be placed in service, a high velocity flush of the fire hydrant shall be witnessed and approved by Humboldt Community Services District personnel.
 2. Service line size must be the same or larger than the size required for the sprinkler system or the private hydrant system.
 3. All private fire systems require detector check assemblies in accordance with DOHS standards.
 4. On residential systems, water backflow prevention assemblies may be required where fire system connects to the domestic water system.
 - a. A "stand-alone" residential fire sprinkler system (not connected to any domestic plumbing facilities) will require a California State approved water backflow prevention device.
 - b. A "looped" residential fire sprinkler system (connected to a kitchen sink or two toilets) will not require a water backflow prevention device.
 5. Fire Department connection location and configuration must be approved by the Fire Dept.

8. Fire Hydrants

- A. Before combustible materials may be stored or constructed on site, the Fire Department just approve fire flow and access. Before a fire hydrant may be placed in service, a high velocity flush of the fire hydrant shall be witnessed and approved by the District.
- B. Location of fire hydrants must be approved by the Fire Department.

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- C. Fire hydrants that serve one parcel and are located onsite shall be considered a private fire hydrant.
- D. Each hydrant must be on a separate valved main line section.
- E. Whenever possible, locate hydrants at street intersections.
- F. If it's not possible to locate at an intersection, locate the hydrant near a property line or where it will minimize interference with property use.
- G. Locate hydrants a minimum of 10' from drop curb of driveways.
- H. Residential areas:
 - 1. Space fire hydrants every 500', or as approved by the Fire Dept.
 - 2. Evenly distribute hydrants throughout the project.
 - 3. No property may be more than 250' from the nearest hydrant or as approved by the Fire Dept.
 - 4. Approximately one fire hydrant is needed for every two acres in a residential development.
- I. Commercial and Industrial Areas:
 - 1. General hydrant spacing shall be every 300' or as approved by the Fire Dept.
 - 2. Evenly distribute hydrants throughout the project.
 - 3. No property may be more than 150' from the nearest hydrant.
- J. Recommended fire flow required at all fire hydrants:
 - 1. Residential - 1,000 gallons per minute with a 20 psi residual.
 - 2. Commercial areas - 1,500 gallons per minute with a 20 psi residual.
 - 3. Industrial areas - 2,500 gallons per minute with a 20-psi residual.
 - 4. Or as required by Appendix B of the California Fire Code, whichever is greater.

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9. Backflow Devices

- A. Backflow devices are required to be installed per State of California Administrative Code, Title 17 and current District Cross-Connection Control Policy.
- B. All backflow devices that are installed must be on the approved Dept. of Health Services list.
- C. Backflow assemblies must be installed above ground and as near as possible to the water meter as shown on the Standard Drawings.
- D. Where residential fire sprinklers are installed, double check valve backflow preventers may be required where the fire service connects to the domestic service. The backflow preventer must be accessible for testing and maintenance.
 - 1. A "stand-alone" residential fire sprinkler system (not connected to any domestic plumbing facilities) will require a California State approved water backflow prevention device.
 - 2. A "looped" residential fire sprinkler system (connected to a kitchen sink or two toilets) will not require a water backflow prevention device.
- E. All irrigation services require backflow prevention devices.
- F. Parcels with a private water source shall have double check valves installed on each service.

10. Pressure

- A. Maximum allowable main line pressure is 120 psi measured at a fire hydrant.
- B. Maximum allowable service pressure measured at the meter is 95 psi.
- C. Minimum service pressure measured at meter is 20 psi, unless otherwise approved by the General Manager.
- D. If the service pressure exceeds the maximum of 95 psi, an individual pressure regulator will be required on the service line.
- E. Fire flows must be calculated in areas of low pressure.

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- F. For calculating pressures in high level zones, calculate the maximum pressure using the elevation of the reservoir at overflow elevation.

11. Specialty Items

- A. Air vacuum relief valves:
 - 1. Combination air vacuum relief valves are required at locations in the system that is one pipe diameter or more higher than the remainder of the system, such as over a hilltop as determined by the District.
 - 2. Air vacuum relief valves are not required in residential areas if services are installed at or near the crown within one pipe diameter vertically of the high point.
- B. Pressure reducing valves are installed to maintain overall system balance.
- C. Surge or pressure relief valves may be installed where pressure could potentially reach above the maximum allowable including providing additional protection on the low-pressure side of pressure reducing stations.
- D. Manual blow-offs are required at the end of every main.

12. Special Conditions

- A. The need for cathodic protection will be determined by the General Manager for each project. This may require soils reports or other additional information.
- B. Delineated fault zones and Special Structure Crossings:
 - 1. Ductile Iron pipe must be installed in delineated fault zones and extend to 100' outside each side of the delineated fault boundaries as determined by the District.
 - 2. Pumper connections or fire hydrants shall be installed approximately 50' outside each side of the delineated fault zone.
 - 3. Flextend assembly, as manufactured by EBAA Iron, Inc. of Eastland, Texas, or approved alternative, with valve must be installed adjacent to and on the fault side of the pumper connection or fire hydrant.
 - 4. A valve must be located between the Flextend assembly and the fire hydrant or pumper connection.

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5. Special structure crossings serving storage tanks, pumping facilities or greater than 50 services may require the above design considerations as determined by the General Manager.

C. Abandoned water mains and services:

1. For lines 1" or smaller, expose service line at the main, close the corporation stop, disconnect the service line and plug or cap the corporation stop.
2. For lines 1-1/2" or larger, close and cap the valve and plug the abandoned line.
3. Valve boxes and risers for abandoned valves and services must be removed.
4. All steel (or pipes subject to corrosion) water mains 12" and larger, within the public right of way, must be broken every 50' or as directed by the District and filled with slurry cement backfill.

D. Private water mains vs. Public water mains

1. Public water mains may not be constructed outside the street right-of-way without specific approval of the General Manager.
2. Fire hydrants that serve one parcel and are located onsite shall be considered a private fire hydrant.
3. Normally where the water mains are publicly maintained, the sewer mains should also be publicly maintained.

- E. Water mains installed outside of the paved roadway or street right of way shall be ductile iron pipe and shall have suitable access unless specially authorized by the General Manager.

13. Access and Easements (Applies to Water and Sewer)

- A. All public mains outside the public right of way require a dedicated 20-foot minimum access and utility easement.
- B. All non-paved pipeline locations where access is required, require a 6-inch minimum thick, 12 foot wide all weather shale access road with 20 foot x 20-foot turnaround per District standards. Maximum slope 15%. Access road slope greater than 15% requires 3-inch AC over 12-inch aggregate base.

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- C. Non pipeline facilities shall be reviewed for access and utility requirements on a case by case basis.

14. Main Extensions

Where, in the opinion of the District, an Applicant's request for sewer or water service can serve additional parcels; the District may require the Applicant to enter into an agreement for pipeline extension, to extend the sewer or water main across the frontage of the requesting parcel to the property line. Where parcels of land adjacent to the pipeline request service from and can benefit from this improvement, then the District shall charge and collect from these adjacent real property owners a pro-rated share of this improvement cost and reimburse main extension Applicant upon receipt of payment for each connection. The potential reimbursement period shall be five (5) years from the date of District accepted improvement or until Applicant receives the full costs incurred by the construction of said pipeline extension, whichever first occurs.

SECTION III

WATER MAIN CONSTRUCTION

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III. WATER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

WATER MAIN CONSTRUCTION

1. Description

- A. All water mains and related appurtenances shall be constructed in accordance with the Humboldt Community Services District Water System Design Standards.
- B. In order to maintain compatibility with existing District materials and operations, certain valves, meters, gauges and water service appurtenances will not have an "approved equal" and shall be of the type herein required.

2. Pipe

The pipe, except where otherwise specified on the plans, can either be Ductile Iron Pipe (DIP) or Polyvinyl Chloride (PVC), all in accordance with the following:

- A. Each and every length of pipe and coupling shall be marked with the manufacturer's name, lot number and the date the pipe was tested.
- B. The pipe shall be tested in accordance with the most recent American Water Works Standard Specifications and amendments thereto for the pipe furnished. The testing shall be performed in a State licensed materials testing laboratory where the testing standards meet or exceed State of California testing standards.
- C. Accompanying or preceding each load of pipe delivered, if requested, a certificate shall be furnished to the District certifying that the pipe which is (to be) delivered has been tested and meets the requirements of the American Water Works Association Standard Specifications. The certificate shall identify the pipe by manufacturer's name, lot number and date tested by a State certified materials test laboratory.

3. Ductile Iron Pipe

- A. Ductile iron pipe shall be manufactured in accordance with AWWA Standard C151 of the California Waterworks Standard, and as amended in these Specifications and shall be coated with bitumastic when installed above ground.

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- B. Joints shall be U.S. Pipe Tyton Push-On Joint, or approved equal, for underground, and U.S. Pipe TR Flex, or approved equal, for above ground, unless otherwise shown on the plans. Class 50 may be assumed unless otherwise called for. Pipe buried less than 1½ feet shall be Class 52.
- C. All ductile iron pipe and fittings shall be Bituminous coated outside and cement-lined inside with Type V cement mortar lining, per AWWA C104. All ductile iron pipe, fittings, valves and appurtenances shall be encased in an 8-mil polyethylene tube in accordance with ANSI/AWWA C105/A21.5. Installation of polyethylene tube shall be by Method A: One length of polyethylene tube for each length of pipe, overlapped at joint.
- D. Flanged joints shall conform to ANSI/AWWA/C110/A21.10-12. All flanged pipes shall be shop fabricated to the exact lengths required so that no field cutting or threading is required. All flanges shall be firmly attached in the shop.
- E. Gasket material for flanged joints shall be 1/8 inch thick, cloth-inserted rubber, one piece, full-faced with holes to pass bolts. Gasket material shall be free from corrosive alkali or acid ingredients and suitable for use in potable water lines.
- F. Ductile iron pipe used in conjunction with grooved coupling fittings shall have a wall thickness sufficient to permit cutting a groove of the depth required to accommodate the coupling and to maintain the required pressure rating of the pipe.
- G. Bolts and nuts for ductile iron couplings shall be low alloy steel (ASTM A-193). The alloy composition shall be such that the bolts are cathodic to the coupling.
- H. When bolting steel flanges to ductile iron flanges, bolting shall not be stronger than carbon steel per ASTM A307, Grade B.
- I. All bolts installed in corrosive soil as determined by the District shall be stainless steel.
- J. All underground ductile iron pipe shall have loose polyethylene encasement.

4. Polyvinyl Chloride

- A. Polyvinyl chloride (PVC) Pipe 4" through 12" shall be minimum class 150, or as shown on the plans and conforming to the requirements of AWWA C900 "Standard for Polyvinyl Chloride Pressure Pipe, 4" through 12" for Water" and shall be furnished with either bell ends or couplings designed to effect an

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elastomeric pressure seal. PVC pipe greater than 12" shall be Class 12454 (DR18) unplasticized polyvinyl conforming to AWWA C905 and ASTM D2241.

- B. Number 12 insulated coated copper wire shall be attached on top of and along the exterior length of all non-metallic mains and non-perpendicular service laterals for a continuous circuit and shall be extended to the surface at all valve locations blow-offs and meter boxes sufficiently for locator equipment to be attached.
- C. All rubber gaskets shall be solid cross section conforming to ASTM D-1869 and F-477.
- D. PVC service line less than 4" shall be minimum schedule 40.

5. Polyethylene

All water service tubing 2" and smaller shall be polyethylene PE 3408, IDR 7 conforming to AWWA C901-88 and ASTM D-3550 with a water pressure rating of 200 psi. Polybutylene (PB) service tubing shall not be allowed.

6. Fittings

- A. All fittings shall be new gray iron or ductile iron fittings conforming to ANSI/AWWA C110/C153 or latest revision and shall have the proper type of ends to match the type of pipe used. Gray iron fittings shall be coated inside and outside with a petroleum asphaltic coating conforming to AWWA C110 and shall meet or exceed the pressure rating of the pipe to be installed.
- B. Ductile iron fittings shall be cement mortar lined in accordance with AWWA C104 or latest revision and shall have a petroleum asphaltic coating conforming to AWWA C110. Ductile iron fittings shall have a minimum pressure rating of 250 psi and shall otherwise meet or exceed the pressure rating of the pipe to be installed and shall have a minimum Class 53 thickness rating.

7. Gate Valves

- A. Gate Valves Greater Than Three Inches:

Valves 3 inches in diameter and larger shall conform to AWWA C-509 resilient-seated gate valves with iron body, epoxy coated, bronze mounted, non-rising stem valves with O-ring seals. Hand wheels shall be furnished for all installations where valve is exposed, otherwise they shall be furnished with 2-

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inch square operating nut. Valve ends shall be as shown or required for the connection. Valves shall be rated for 200 psi working pressure and shall open counter-clockwise. Valves shall be Waterous, Clow, or AVK. Each valve shall have the manufacturer's name, pressure rating and year in which manufactured, cast into the body.

B. Gate Valves Smaller Than Three Inches:

Valves smaller than three inches shall be epoxy-coated resilient seated gate valves with non-rising stems and be capable of handling a cold water working pressure of 200 pounds. Inlet and outlet are to be threaded. Blow-off valves shall be Clow or Waterous Series 500 with 2-inch square operating nut.

C. Ball Valves Smaller Than Three Inches:

Valves shall be 150 psi, brass body ball valves, with a lever handle as manufactured by Apollo.

8. Butterfly Valves

Butterfly valves shall conform to AWWA Standard C504 or latest revision and shall be of the rubber seat type. Valve discs shall rotate 90 degrees for the full open position to the tight shut position. The valve seat shall provide a tight shutoff at a pressure differential of 150 psi upstream and 0 psi down-stream in either direction. The valve operator shall be the traveling nut type. Valve shall open with a counter-clockwise rotation of the operating nut. Valves shall be as manufactured by Waterous, Clow, or AVK.

9. Valve Boxes

Each valve shall be covered by a pre-cast 8-inch valve box set flush with the street surface with cast iron ring and cover marked "WATER". The valve boxes shall be Christy G5 or approved equal.

10. Fire Hydrant and Lateral Assembly

- A. At the location(s) shown on the plans, the Contractor shall provide and install a fire hydrant and lateral assembly. Fire hydrants shall be "dry barrel" Clow.
- B. No bends will be allowed in fire hydrant laterals without approval of the General Manager.

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- C. All fire hydrants shall have two 2½-inch outlets and one 4-inch outlet. All threads shall be NST.
- D. All public hydrants shall be painted with one coat of reflecting yellow paint. Private hydrants shall be painted red.
- E. All hydrants shall be installed plumb, three inches minimum and six inches maximum above finished grade.
- F. Before a fire hydrant may be placed in service, a high velocity flushing of the hydrant lateral shall be witnessed and approved by District personnel.

11. Asbestos Cement Pipe

- A. The installation of asbestos cement pipe is prohibited.
- B. All cutting, handling and disposal of existing asbestos cement pipe shall be done in compliance with the Contractor's State Licensing Law and all applicable laws and regulations.

12. Air/Vacuum Release Valves and Covers

The valves shall be equipped with an inlet ball valve. The valves shall be as manufactured by APCO, Crispin or approved equal. Size shall be determined by operating conditions.

13. Main Line Pressure Reducing Valves and Vaults

Main line pressure reducing valve assemblies shall be as manufactured by Cla-Val Co. Valves shall be flanged 125 class adjustable from 30 to 125 psi. The pressure reducing station vault shall be as shown on the drawings and shall have a recessed, non-exposed and flush, locking mechanism. Size shall be determined by operating conditions.

14. Pressure Gauges and Appurtenances

Ashcroft, or equal, range [0 to 100] psig, or as shown on the Plans, [3½ inch dial], ¼ inch bottom male connection, stainless steel or brass case, phosphor bronze bourdon tube, glycerin filled, accuracy 1% of full-scale range. All pressure gauges shall have an Apollo ball valve between feed line and gauge.

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15. Gauge Piping

Piping for pressure gauges shall be copper or brass except as noted. A nylon bushing or dielectric union shall be used at connections between iron or steel pipes and the brass or copper pipes.

16. Service Saddles

Service saddles shall be installed as shown on the Plans. Service saddles shall be Ductile Iron saddle casting, stainless steel nylon coated with stainless steel double strap. Service saddles shall be Romac 202N. Saddle shall be stamped for use with C-900 pipe.

17. Corporation Stops

Corporation stops for polyethylene water service shall be manufactured of bronze conforming to ASTM B-62, male iron pipe threaded inlet by joint outlet (IPS) for PE pipe. Corporation stops shall be AY MacDonald.

18. Service Tubing Couplings

Service tubing couplings for iron pipe size polyethylene tubing shall be manufactured of bronze conforming to ASTM B-62 and be of a compression type with a stainless steel insert stiffener. Couplings shall be male iron pipe by compression or female iron pipe by compression. Female iron pipe types shall be AY MacDonald.

19. Angle Meter Stops

Angle meter stops shall be manufactured of bronze conforming to ASTM B-62. A PE pack joint inlet and a meter nut union outlet with a lockwing provided on the top of the fitting to operate the shutoff mechanism. Angle meter stops shall be AY MacDonald.

20. Service Tubing

Service tubing shall be of the diameter shown on the drawings polyethylene plastic tubing of high molecular density specification 3408. The polyethylene shall be Schedule 200 (IPS), as manufactured by Westflex Gold Label. All pipe shall be factory marked with the size and standard indicated.

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21. Water Meter Boxes

- A. Water meter boxes shall be Christy B9X for typical 5/8-inch residential service. Water meter box sizes for services greater than 5/8-inch shall be determined by District on a size by size basis.
- B. Water meters shall be enclosed in a separate individual box. Appurtenant facilities such as backflow devices, etc., shall be contained in their own box.

22. Extension Stems

Extension stems shall be Mueller Figure 1 or Figure 2 as indicated, Kennedy, or equal. Stem diameters shall be 1¼ inches unless otherwise shown. Stem guides shall be Mueller, Kennedy, or equal. Guides shall be spaced such that the slenderness ratio of the stem body does not exceed 200.

23. Tapping Sleeves

Hot tap sleeves shall be Romac Brand "SST" stainless steel tapping sleeves of the size required.

24. Restraint Systems

- A. Mechanical restraint may be used in lieu of thrust block, rods or clamps. Mechanical restraint shall be designed to fully restrain the piping system and pressure with a minimum safety factor of 2:1.
- B. Mechanical restraint devices shall be manufactured of ductile iron pipe conforming to ASTM A536. Dimensions of the device shall be such that it can be used with standardized pipe sizes. Gaskets shall be factory provided for the mechanical restraint device used.
- C. Mechanical restraint devices shall be as manufactured by Romac Industries (grip ring), EBBA Iron (Megalug) or approved equal.

25. Bolts, Gaskets, Glands, Nuts

- A. Bolts, gaskets, glands, nuts, and miscellaneous accessories required to install all valves are to be furnished. Bolts for flanged connections shall be American Standard regular unfinished hex heads. Nuts shall be American Standard regular hexagonal dimensions. Gaskets for flanged connections shall be suitable for the pressure, temperature, and chemical characteristics of the fluid

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handled. The gasket materials shall also be suitable for the pipe system physical characteristics and materials. Gasket material for flanged joints shall be 1/8 inch thick, cloth-inserted rubber, one piece, full faced with holes to pass bolts. Gasket material shall be free from corrosive alkali or acid ingredients and suitable for use in potable water lines. Jointing materials for mechanical joints shall conform to ANSI A21.11.

- B. Specific ground applications may require stainless steel bolts and nuts as determined by the District.

26. Excavation and Backfill

- A. Excavation and backfill of the pipeline shall be as shown on the "Standard Trench Detail" of the Humboldt Community Services District Standard Drawings.
- B. Excess Material from excavation shall become the property of the Contractor and shall be disposed of properly in accordance with all applicable rules and regulations.

27. Laying and Handling Pipe Materials

- A. Proper implements, tools and facilities satisfactory to General Manager shall be provided and used by the contractor for safe, convenient and workmanlike prosecution of the work. All pipe fittings and valves shall be carefully lowered into the trench in such a manner as to prevent damage to pipe coatings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. Before lowering and while suspended, the pipe shall be inspected for defects and the cast iron pipe rung with a light hammer to detect cracks. Any defective, damaged or unsound pipe shall be rejected and sound material furnished. Cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner without damage to pipe.
- B. Whenever it is necessary, either in the vertical or horizontal plane, to avoid obstructions, or when long radius curves are permitted, the amount of deflection shall not exceed the maximum recommended by the pipe manufacturer or that required for satisfactory jointing.
- C. Each length of pipe shall be free of any visible evidence of contamination, dirt and foreign material before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying. At times when pipe laying is not in progress, the open ends of any pipe which have been laid

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shall be closed by approved means to prevent the entrance of small animals or foreign materials. Trench water shall not be permitted to enter the pipe.

28. Laying PVC Pipe

- A. Individual pieces of pipe, valves and fittings shall be joined by placing the rubber rings on the machined ends of the pipe and pulling the couplings, valves or fittings in accordance with the manufacturer's recommendations. The rings shall be checked to be sure they are in the proper position after the coupling is in place. Care shall be taken to insure proper seating of the rings, and adapters shall be utilized for connections as required by the manufacturer.
- B. Fittings for PVC pipe shall be either the mechanical joint type or the push-on type.
- C. PVC pipe shall be as specified in and installed per AWWA C900 or latest revision and in accordance with the manufacturer's recommendations.

29. Laying of Ductile Iron Pipe (DIP)

- A. The flame cutting of pipe by means of oxyacetylene torch shall not be allowed.
- B. Ductile iron pipe shall be as specified in and installed per AWWA C600 or latest revision and in accordance with the manufacturer's recommendations.

30. Thrust Blocking

All tees, bends and plugs shall be provided with thrust blocking and/or gripping as shown on the plans or in accordance with Standard Drawings.

31. Hydrostatic Test

- A. A hydrostatic and leakage test shall be performed after the line has been laid and all backfill placed and compacted as specified elsewhere in these specifications. The Contractor, at his option, may test the line at any time during construction. However, the final test for acceptance shall be made only after all backfill is in place, and compaction tests completed. Each valved section of pipe, or combined sections, as approved by the General Manager, shall be subjected to a hydrostatic pressure of 2 times working pressure but not less than 150 psi for 60 minutes. Valves on existing mains in services required to be operated in connection with this section of pipe shall be slowly filled with

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water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. The pump, pipe connection, all necessary apparatus, gauges and measuring devices shall be furnished by the Contractor. The Contractor shall make the taps into the pipe and shall furnish all necessary assistance for conducting the tests. Before applying the test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary, at the points of the highest elevation, and afterward tightly plugged.

- B. Suitable means shall be provided by the Contractor so that District can determine the quantity of water leakage under the test pressure. Leakage shall not exceed the rate of 24 gallons per inch diameter, per 24 hours, per mile of pipe. All visible leaks shall be repaired regardless of meeting above test. The Contractor shall, at his own expense, locate the cause and repair the leakage.

32. Chlorination of Pipeline

- A. Chlorine may be applied by any of the standard methods indicated in AWWA C651, subject to the approval of the District. The point of application of the chlorination agent shall be at the beginning of the pipe extension, or any valved section of it, and through a corporation stop inserted in the newly laid pipe or at an end line blowoff.
- B. Water from the existing distribution system shall be controlled to flow very slowly in the newly laid pipe during the application of chlorine. Valves on existing mains in service shall be operated only by personnel of the District. The rate of chlorine feed shall be in such proportion to the rate of water entering the pipe that the chlorine dose applied to the water entering the newly laid pipe shall be at least 100 ppm. Precautions shall be taken to prevent back pressure causing a reversal of flow into pipe treated.
- C. Treated water shall be retained in the pipe for a period of twenty-four hours. After the chlorine treated water has been retained for the required time, the free chlorine residual at the pipe extremities and at representative points shall be at least ten (10) parts per million. In the process of chlorinating, all valves and other appurtenances on the newly laid main shall be operated.
- D. Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipeline. The water throughout its length shall, upon test, both chemically and bacteriologically be proved equal to the water quality serviced the public from the existing water supply system. Should the initial treatment,

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in the opinion of the District prove ineffective, the analysis shall be made by a State certified analytical laboratory.

- E. Care shall be taken, and if necessary provisions shall be made by the Contractor to insure no highly chlorinated water from treated pipelines enters any natural surface waters either directly or by way of any storm drainage systems. Contractor shall be responsible for the proper flushing of treated water in conformance with state and federal regulations.
- F. Chlorination procedure shall be repeated until confirmed tests show that the water sampled from the newly laid pipe conforms to the above requirements.
- G. There shall be a 24-hour waiting period after blowing off the main prior to taking bacteria samples. Bacteria tests are valid for only 30 days. If there is more than a 30-day lapse between a passing bacteria test and the applicable tie in, the bacteria test must be repeated prior to water main tie-in. Sampling and testing shall be done by District personnel at the expense of the contractor.

33. Water Main Tie Ins

- A. The Contractor shall notify the District 72 hours prior to individual mainline shutdowns required to facilitate his tie-in operations. The contractor shall schedule tie-in work with the District at (707) 443-4558. Tie-ins will not be scheduled until a passing bacteria test has been received by the District from a certified laboratory. All shutdowns, valve turning operations, and existing main hot-taps shall be performed **by District personnel only**. A District inspector must be present during all tie-in operations. No tie-ins shall be performed without prior authorization of the District.
- B. Contractors or parties who fail to keep field appointments may be billed for scheduled District personnel waiting or standby time which was used and the contractor shall bear the costs incurred by the District for renotification of its customers.
- C. Interruption of service to commercial customers shall, as much as practical, be coordinated with the customer's needs. The Contractor will contact the customer, consider the customer's interests and inform the District accordingly.
- D. After hours work or weekend work is to be avoided whenever possible and any overtime costs of the District shall be at the expense of the contractor requesting such after hours work. Normal field inspection hours are: 8:30 a.m. to 4:30 p.m. Monday through Friday.

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- E. Contractors or parties requiring work of any kind by the District shall request such services a minimum of 7 days in advance of the time such services are desired. Work requests, which will involve District personnel for more than 8 hours and/or extensive number of District supplied parts, shall be requested a minimum of 14 calendar days in advance.
- F. If it is necessary to terminate service to any customer, the contractor shall make the request for such work an additional 72 hours (three additional working days for a total of five working days in advance notice) in advance of the time such services are desired, to allow the customers affected to have a minimum of 72 hours notice.
- G. During the work, the Contractor shall exercise all necessary precautions to prevent the entrance of trench water or any other foreign material into the water main and shall conduct all operations in accordance with the most stringent sanitary practices. The interior of all appurtenances being installed shall be thoroughly swabbed with a 1% hypochlorite disinfecting solution prior to installation per AWWA requirements.

34. Water System Component Reporting

The Contractor shall submit the material type, manufacturer and model number of all water system components to the District prior to final testing.

35. Construction Water

- A. All water furnished by District shall be considered temporary construction water until such time that the water system improvement passes all tests and is accepted into the District and the applicant signs up for permanent service and pays all fees.
- B. Construction water shall be obtained from the District only at the point(s) designated by the District and a refundable deposit for each meter will be required.
- C. Contractors are prohibited from operating main line gate valves or fire hydrants on the District system.
- D. Acquisition of water through appropriation at unmetered fire hydrants or other facilities is a violation of District Ordinance. Use of construction water from sources other than the District Water System must be approved by the District.

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- E. Where curb and gutter improvements are required, no individual water services to be used for temporary construction water shall be set until curb and gutter construction is completed. All meter sets shall be set into Contractor provided meter boxes per District standards.

SECTION IV

SEWER SYSTEM DESIGN STANDARDS

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IV. SEWER SYSTEM DESIGN STANDARDS

PURPOSE

To provide guidelines for design of projects for the sewer utility projects and thereby reduce the time required for plan processing. These guidelines do not include but may reference those additional conditions which may be promulgated by all other pertinent ordinances, codes and official policies set forth by the Humboldt Community Services District, or other government agencies. These guidelines are intended to impose minimum acceptable design criteria. More stringent requirements may be imposed by the General Manager based on specific project conditions.

It is the responsibility of the design engineer to initiate written requests for approval of any design concepts that differ with these criteria, to verify additional requirements imposed, to perform any necessary calculations or studies and to resolve specific problems with the appropriate agency and/or District.

1. Connection to an Existing Public Sewer

- A. Unaccepted connections of new mains to existing mains should be isolated from the collection system by a positive sealing plug. This plug is to be installed in the outlet of the closest manhole on the new main to the existing main. All labor and expense for this shall be borne by the contractor. Failure to comply can result in civil penalties.
- B. A proposed sewer design must show a point of connection to an existing public sewer main. It is common for a project on one property to require the construction of sewer on an adjacent property before it can connect to the public sewer. Sewer system designs shall incorporate the design of any off-site sewer that is required for the connection to the public main. Appropriate portions of District approved plans shall be referenced in the plans unless the mains have been accepted.

2. Materials

- A. Gravity sewer mains shall be Polyvinyl Chloride (PVC); Vitrified Clay Pipe (VCP); or Ductile Iron Pipe (DIP).
- B. Proposed materials for construction of 18" and larger diameter gravity mains require District Review and General Manager's approval.
- C. All ductile iron pipe shall be polyethylene encased.

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- D. Use of asbestos cement pipe is **NOT** allowed under any circumstances.
- E. Sewer force mains shall conform to the materials requirements for water mains. Non-metallic pipes require tracer wire.

3. Alignment

- A. Follow the State of California, Department of Health Services, "Criteria for the Separation of Water and Sanitary Sewer Main."
- B. Public sewer mains outside the public street shall be kept to a minimum.
- C. Horizontal separation from storm drains shall be minimum five feet clear.
- D. Horizontal separation from other utilities, such as gas, underground electric, underground television cable, etc., shall be a minimum of five feet clearance between the pipes.
- E. In general, public sewer mains run parallel to street centerlines.
- F. Horizontal and vertical curves will be allowed only where specifically authorized by the General Manager and with agreement to have the finished line televised at the developers expense. Curved sewers will not be approved if there is a feasible alternate design.
- G. Minimum radius for authorized vertical or horizontal curves is 400'.
- H. Change in horizontal or vertical alignment requires the installation of a manhole.

4. Manholes and Cleanouts

- A. A manhole is required at every horizontal or vertical change in alignment on sewer mains.
- B. Maximum distance between manholes is 300 feet.
- C. A manhole is required at the end of every main, except as otherwise specified in "D" below.
- D. Cleanouts may be installed in lieu of manholes at the end of a sewer main where the distance is less than 300 feet to the nearest manhole and the main size is 8" or less.

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- E. 60" diameter manholes are required for mains larger than 8" in diameter, deeper than 8', or at drop manholes.
- F. Private sewer mains must connect to the public main at a manhole.
- G. Provide sufficient drop through the manhole to compensate for energy loss caused by change of alignment. A minimum drop of 0.10 foot is required.
- H. When pipe size increases, set inlet crown at least as high as the outlet crown.
- I. Manhole channels shall be large enough to accommodate the District sewer camera.

5. Drop Manholes

- A. Minimize the number of drop manholes.
- B. Standard outside drop manhole installations are required when the drop in the manhole is greater than 2 feet.
- C. A 60-inch diameter manhole is required at all drop structures.

6. Accessibility

- A. Manholes should be located in paved roadways wherever feasible.
- B. All-weather vehicle access is required to every other manhole.
- C. Sewer easements are to be a minimum of 20' in width.
- D. All access roads must be a minimum 12' in width.
- E. Possible types of access roads are:
 - 1. 6" of shale for slopes up to 10% compacted to 95% RC. Stabilization sub-base material may be required depending on soil conditions.
 - 2. 2" of AC on 6" of aggregate base for slopes between 10% and 15%.
 - 3. Access road slopes greater than 15% shall not be allowed.
 - 4. Specific access road structural section and surfacing material shall be dependent upon the existing soil and topographic conditions and shall be as

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specified by District. This may include a geo-textile subgrade stabilization fabric.

- F. All access roads longer than 100' shall have an approved turn-a-round.
- G. All sewer lateral locations off of the public main which are inaccessible by District equipment shall be deemed "private" to be owned and maintained by the individual property owner from building to public sewer main.

7. Size

- A. Mains shall be sized to provide adequate capacity for the full build-out of the upstream drainage area at current zoning and a minimum 2 feet per second velocity.
- B. The minimum public gravity main is 6" in diameter.
- C. The minimum private gravity main is 6" in diameter.
- D. The minimum public pressure main is 3" in diameter.

8. Cover

- A. Minimum cover for all gravity sewer mains shall be 42" unless otherwise approved by the General Manager.
- B. Where cover is less than 30" ductile iron pipe must be used.
- C. Definition of cover: distance from the top of the pipe to finished grade.

9. Slope

Design all gravity sewers to achieve a minimum velocity of 2 feet per second when flowing full. Use $n = 0.011$ for new pipe, $n = 0.015$ for the existing system or manufacturer's recommendation whichever is higher.

10. Gravity Sewer Laterals

- A. Each lot shall be served by one lateral.
- B. All gravity sewer laterals connecting to new gravity mains shall connect with a wye connection.

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- C. Minimum slope of sewer laterals is 2% or 1/4" per foot, unless otherwise approved by the General Manager.
- D. Sewer laterals serving building fixtures which have flood level rims located below the elevation of the next upstream manhole cover of the public sewer serving such sewer lateral piping shall be protecting from backflow of sewage by installation of an approved type backwater valve.
- E. A gravity sewer lateral clean-out is required to be placed in what would be considered the sidewalk area, outside of a driveway area, and fronting the parcel it is to serve.

11. Public Pressure Sewer Mains

- A. The minimum public pressure sewer main is 3" in diameter.
- B. The design engineer shall verify the pressure sewer main size required to serve the full build-out of the area at current zoning. One method of doing this is by calculating the worst case operating conditions that the public pressure main may serve. Generally this would be an iterative calculation involving sizing the individual private sewage lift station pump for the parcel to be served with the worst operating condition combination of static head and length (TDH) at District required operating conditions (Section 12) and by assuming that 25% of individual private sewage lift pumps discharge at the same time.
- C. Pressure sewer pipe shall be specified based on design pressure operating conditions and may be PVC Schedule 40, 80, SDR 17 (250 PSI), SDR 21 (200 PSI), or Ductile Iron pipe. Pressure sewer pipe may be C900, Class 150 water pipe and wrapped with green sewer tape marked "sewer".

PVC pipe 3" in diameter and smaller shall be jointed by means of socket fittings and solvent welded unless otherwise specified, PVC pipe 4 inches in diameter and greater shall be jointed by means of gasketed push-on joints and Ductile Iron push-on or mechanical joint fittings.
- D. The velocity shall be 2 FPS minimum and 10 FPS maximum.
- E. Minimum cover shall be 36" to top of pipe from finish grade.
- F. Where an Applicant requests to construct a private pressure sewer lateral that can serve more than the one parcel requesting service, the District may require the Applicant to construct a public pressure sewer main at the sole discretion of the General Manager.

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12. Private Sewage Lift Stations and Pressure Sewer Laterals

- A. Private sewage lift stations and pressure sewer laterals shall be owned and maintained by the individual lot owners from the private sewage lift station to the public gravity or public pressure sewer main.
- B. Private pressure sewer lateral velocity shall be 2 FPS minimum and 10 FPS maximum.
- C. Private sewage lift stations shall be sized to operate between 20 GPM and 90 GPM at TDH.
- D. The design engineer shall submit private lift station pump selection design data for review by District.
- E. Private sewage lift stations and pressure sewer laterals shall be tested by contractor in the presence of the District.
- F. Private sewage lift stations shall not be constructed under any residential structure or within a pond or waterway.

SECTION V

SEWER SYSTEM

CONSTRUCTION

STANDARDS

HUMBOLDT COMMUNITY SERVICES DISTRICT
SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

V. SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

SEWERS

1. Materials

Sewer pipe shall be Ductile Iron Pipe (DIP) or Polyvinyl Chloride Pipe (PVC).

2. Polyvinyl Chloride Pipe (PVC)

- A. PVC solid wall sewer pipe and fittings for gravity sewer shall be made for all new, rigid, unplasticized polyvinyl chloride in accordance with ASTM Standard Specifications D3034 and F679 and shall have a wall thickness of at least SDR35. Joints shall consist of an integral thickened bell-and-rubber ring and shall provide for expansion and contraction at each joint. The rubber ring shall meet the pipe manufacturers recommended lubricant.
- B. All pipe shall have a home mark to indicate full penetration of the spigot when the joint is made.
- C. All PVC pipe entering or leaving a concrete structure shall have a standard manhole gasket, as supplied by the pipe manufacturer, firmly clamped around the pipe exterior and cast into the structure base or near the structure wall center as a water stop.
- D. After pipe installation and placement and compaction of backfill, but prior to placement of pavement, all pipe shall be cleaned and then mandrelled to measure for obstructions. Obstructions shall include, but not be limited to deflections, joint offsets and lateral pipe intrusions. A rigid mandrel, with an effective circular cross section having a diameter of at least 95% of the specified base inside diameter shall be pulled through the pipe by hand. The minimum length of the circular portion of the mandrel shall be equal to the nominal diameter of the pipe. All obstructions encountered by the mandrel shall be corrected by the Contractor. Obstructions due to deflection shall be corrected by replacement of the over-deflected pipe, not by re-rounding in place.
- E. If a section of pipe fails to meet the mandrel test and is reinstalled and fails the second time, said section(s) of pipe shall be replaced with an approved rigid pipe material.

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SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

3. Ductile Iron Pipe (DIP)

- A. Ductile iron pipe shall be cement lined, new pipe conforming to ANSI/AWWA C151/A21.51-02 or most recent issue, if any, as sponsored by the American Water Works Association for thickness Class 50 ductile iron pipe. The pipe shall be furnished with either bell and spigot ends, "Tyton Joints", or mechanical joints except where specifically specified on the plans.
- B. All ductile iron pipe buried underground shall be encased in polyethylene film in the tube form. Polyethylene material and installation procedure for the encasement shall conform to ANSI/AWWA C105/A21.5-05 or most recent issue, if any. Installation Method "A" as described in aforementioned specification shall apply.
- C. Fittings for ductile iron pipe shall conform to ANSI/AWWA C110/A 21.10-12 or most recent edition, if any, and may be either Class 150 gray iron or ductile iron. Fittings shall be bituminous coated outside and cement mortar lined inside. Flanges shall be Class 150 with proper type of ends to match pipe used. Cutting DIP by means of a flame torch will not be allowed.
- D. Couplings for connection to the sewer main shall be of a type approved by the District.
- E. Bolts, gaskets, glands, nuts, and miscellaneous accessories required to install all valves are to be furnished. Bolts for flanged connections shall be American Standard regular unfinished hex heads. Nuts shall be American Standard regular hexagonal dimensions. Gaskets for flanged connections shall be suitable for the pressure, temperature, and chemical characteristics of the fluid handled. The gasket materials shall also be suitable for the pipe system physical characteristics and materials. Gasket material for flanged joints shall be 1/8 inch thick, cloth-inserted rubber, one piece, full faced with holes to pass bolts. Gasket material shall be free from corrosive alkali or acid ingredients and suitable for use in potable water lines. Jointing materials for mechanical joints shall conform to ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A2.11.

4. Sewage Valves

In sanitary sewage applications, valves shall be resilient seat gate valves for pressure applications and plug type for gravity applications. All valves shall have stainless steel stems and shall be manufactured by "AVK".

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SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

5. Corrosive Environments

In general, where steel materials are to be used in sewage applications and environments, they shall be stainless steel. Examples include, but are not limited to; bolts, washers, inserts, grates, valve stems, cable, chain, base plates, etc. Where steel products are not applicable, non-corrosive materials shall be used to the extent possible; including plastic, polyethylene, fiberglass, etc. Where cast or ductile iron is applicable, it shall be factory applied cement coated inside and Bituminous coated outside.

6. Excavation and Backfill

- A. Excavation and backfill shall be as shown on "Standard Trench Detail" of the Humboldt Community Service District Standard Drawings.
- B. All stumps and large roots encountered during trenching operations shall be removed to the satisfaction of the District. The trench shall be opened sufficiently ahead of the pipe laying operations to reveal obstructions. Trench crossings shall be provided as necessary to accommodate public travel and to provide convenient access to adjacent properties. Flow shall be maintained in any sanitary sewers, storm drains, water lines, or water courses encountered in trenching.
- C. All cutting, handling and disposal of asbestos cement pipe shall be done in accordance with the Contractor's State Licensing Law and all applicable laws and regulations.

7. Existing Manholes

- A. Existing manholes and cleanouts located within the street right of way shall be adjusted to conform to finished pavement grades in accordance with the details shown on the plans.
- B. Prior to the removal of an existing manhole frame, a platform shall be constructed in the manhole above the top of the sewer to prevent any dirt or debris from falling into the sewer. The platform shall remain in place until all work on the manhole has been completed and the asphalt concrete has been placed around the manhole. Prior to the removal of the platform from the manhole, all dirt and debris shall be removed.
- C. Lowering of the manhole ring and cover shall be accomplished by the removal of existing concrete grade rings below the manhole ring or by removing the

HUMBOLDT COMMUNITY SERVICES DISTRICT
SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

upper section of manhole barrel and therefore substituting a shorter section of barrel.

- D. In the event that the portion of barrel section to remain is cracked or damaged or otherwise made unsuitable for use by such trimming, the entire section shall be removed and replaced with a new section of barrel at Contractor expense. Trimming of taper sections will not be permitted.
- E. All sections of the manhole shall be set in cement mortar or in approved gasket material. Trim excess inside joint gasket or cement mortar material. Manhole sections shall be smoothly plastered inside after all joint settlement has occurred.
- F. After placing the surface course of asphalt concrete, all manholes and cleanouts shall be located and marked with white paint "dimple" the asphalt before the close of that work day.
- G. Within five working days of paving, all manholes and cleanouts shall be adjusted to grade and inspected.

8. Pipe Laying

- A. Where ground water occurs, pumping shall continue until backfilling has progressed to a sufficient height to prevent flotation of the pipe. Water shall be disposed of in such a manner as to cause no property damage or not be a hazard to public health or the environment and shall not be discharged into the sewer system.
- B. Where projects consist of construction of new mains or extensions of existing mains, contractors must make provisions to keep flow from entering the sewer collection system. This shall include the installation of a positive sealing plug on the outlet of the new mains closest manhole to the existing main. Additionally, if any new laterals enter the new main between the existing main and closest manhole on the new main, each lateral shall be individually plugged with a positive sealing plug. The Contractor shall be held responsible to periodically check that all plugs are holding tight. The Contractor shall ensure that the water contained in the new main is not contaminated with human or hazardous waste, prior to removal of any plugs. The Contractor shall make provisions to de-water the trench without disposal into the sewer collection system and without cause of property damage or hazard to the public health or environment. Failure to comply may result in penalties.

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SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

- C. Where construction consists of constructing a new main or extension of an existing main, the downstream end of the new main shall be securely closed with a tight fitting plug until the construction is accepted by the District.
- D. If the new sewer main is connecting to an existing main at a location other than an existing manhole, the Contractor shall pothole the existing sewer main to verify invert grades and locations.
- E. Sewer pipe shall be installed on the alignment and grade shown on the plans and in accordance with the Standard Specifications, or as directed by the District. Existing sewer laterals shall be removed and replaced at the locations shown on the plans, or as directed by the District at Contractor expense.
- F. Sewer pipe shall be laid in straight lines and on uniform rates of grade between points where changes in alignment or grade are shown on the plans. The interior of the pipe shall be free of foreign matter before lowering into the trench.
- G. The pipe manufacturer's written instructions covering the installation of his pipe shall be closely followed unless otherwise directed by the District or these Special Provisions. The trench shall not be backfilled until authorized by the District. Pipe laying shall proceed upgrade with the spigots pointing in direction of flow. Installation of sewer pipe proceeding from the upgrade to downgrade direction shall not be allowed. The invert of the pipe shall be set at required line and grade.
- H. Electro-optical grade setting devices shall be used to set grade and shall be operated by a person proficient in its operation. Batter boards shall not be allowed.
- I. Any section of pipe found to be defective or which has had grade or joints disturbed shall be re-laid by the Contractor at his expense.
- J. Proper implements, tools and facilities satisfactory to the District shall be provided and used by the contractor for the safe and efficient execution of the work. All pipe fittings and accessories shall be carefully lowered into the trench by means of derrick, ropes, or other suitable equipment in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. The pipe and accessories shall be inspected for visible defects prior to lowering into trench. Any visibly defective or unsound pipe shall be replaced.

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- K. The line and grade of existing utilities shall not be altered. Any leakage caused in existing utilities by reason of the Contractor's operations shall be immediately repaired at the Contractor's expense.
- L. Existing storm drains shall be supported or removed and replaced at the Contractor's option. In any case, the Contractor shall be responsible for maintaining the existing line and grade of the storm drains.
- M. Existing water lines shall be supported in place with service maintained during construction. The Contractor shall be responsible for any damage resulting from improper backfilling.
- N. Sewer lateral inverts shall be set above the mid point of the sewer main.

9. Sewer Structures

- A. Manholes shall be standard pre-cast concrete manholes as detailed on the District standard details. Mains larger than 8" in diameter or deeper than eight feet require 60" diameter manholes. Pre-cast concrete manhole bases must be approved by the District.
- B. Manhole bases may be "poured in place" concrete on undisturbed earth. The bases shall be poured full thickness against the side of the manhole excavation or to dimensions shown on the plans. The channel size and length shall be constructed as to allow for and accommodate a sewer camera. The manhole excavation site shall be dampened before pouring.
- C. Pre-cast manhole bases, conforming to District Standard Drawings in dimensions and the requirements outlined below for materials may be used. Such pre-cast bases shall be placed on a minimum 12-inch thick cushion of drain rock, as shown in the Standard Drawings. The drain rock shall extend a minimum of 6 inches beyond the outside edges of the base.
- D. Concrete for manhole bases shall be $\frac{3}{4}$ " max. aggregate with 3,000 psi 28 day compressive strength Portland cement concrete conforming to the applicable requirements. The Portland cement shall be Type V conforming to ASTM Designation: C-150 or low alkali Type II cement meeting the requirements for Type V cement.
- E. Where steel reinforcement is required in manhole base construction, such reinforcement shall be furnished and placed as shown on the Standard Drawings and in accordance with the applicable provisions.

HUMBOLDT COMMUNITY SERVICES DISTRICT
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- F. Where a manhole barrel impression ring is not used the base slab and initial riser section shall be connected with integrally poured concrete to create a watertight joint. Flow channels shall be constructed as shown on the plans. Changes in size or grade shall be made gradually and changes in direction by smooth curves. All finished surfaces shall be smoothly troweled with a steel trowel. All manhole barrels and taper section shall be pre-cast concrete sections using Type V Portland cement complying with ASTM Designation: C-150 or low alkali Type II cement meeting the requirements for Type V cement.
- G. The 48 inch and 60 inch diameter barrels and taper section shall be constructed in accordance with the applicable provisions of ASTM Designation: C-478 and shall be inspected by the District to determine that the interior surfaces are smooth and free of pockets or depressions.
- H. Manhole frames and covers shall be in accordance with District standard details.
- I. At locations where sewer is to be installed into or out of existing manholes, the manhole wall shall be core drilled and base shall be chipped to accept the new size of pipe and to form a flow channel in the manhole base. The Contractor shall dry pack around the pipe between the pipe and the manhole wall opening. The Contractor shall also backfill the area around the pipe with concrete to insure a watertight connection.
- J. Mainline cleanouts shall be installed per District standard details at the locations shown on the plans.
- K. All joints in manholes shall be double sealed by means of a preformed, self-bonding, self-sealing plastic gasket, such as "Ram-Nek" or "Kent-Seal", or approved equal. Joint seals shall be installed in full compliance with the manufacturer's current recommendations. All joints shall be grouted on the inside of manhole.
- L. After placing the surface course of asphalt concrete, all manholes and cleanouts shall be located and marked with white paint or "dimple" the asphalt before the close of that work day.
- M. Within five working days of paving, all manholes and cleanouts shall be adjusted to grade and inspected.
- N. All manholes shall include polyethylene plastic steps.
- O. After testing and acceptance the complete interior of the manhole (wetwell) shall be coated with "Thoro-Seal", "Xpex", or approved waterproofing sealant.

HUMBOLDT COMMUNITY SERVICES DISTRICT
SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

10. Testing of Sewers

- A. Testing of all portions of the sewer including manholes will be required prior to placing permanent paving.
- B. For either exfiltration or infiltration test, the maximum leakage for trunk sewer, sewer mains and appurtenant sewer laterals shall not exceed 100 gallons per inch of pipe diameter per mile per 24 hours as measured over a period of 30 minutes minimum. Should the leakage exceed the maximum allowable rate, the Contractor shall repair, overhaul, or rebuild the defective portion of the sewer line to the satisfaction of the District at no additional cost to the District. After repairs have been completed by the Contractor, the line shall be retested as specified above, all at no cost to the District.
- C. Manholes, pump stations, wet wells and other structures shall be filled to the top with water and shall show no leakage over a thirty (30) minute period.
- D. The test shall be performed after the line has been laid and all backfill placed and compacted as specified elsewhere in these specifications. The Contractor, at his option, may test the line at any time during construction. However, the final test for acceptance shall be made only after all backfill is in place and compaction testing completed and accepted.
- E. In the event that the exfiltration test prescribed above is impractical due to wet trench conditions, these portions of the sewer line where such conditions are encountered will be tested for infiltration. The District shall determine whether the exfiltration or infiltration test will be used.
- F. Even though the test for leakage is within the prescribed limits, the Contractor shall repair any obvious leaks.
- G. Low pressure air testing may be used in lieu of water testing at the option of the Contractor. Water testing may be required by the District. The following procedure shall be used for air testing.
 - 1. Clean pipe to be tested by propelling a snug fitting inflated rubber ball through the pipe with water. Remove any debris.
 - 2. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
 - 3. If the pipe to be tested is submerged in ground water, Inspector may require that gauge pressures be increased to compensate for groundwater hydrostatic pressure.

HUMBOLDT COMMUNITY SERVICES DISTRICT
SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

4. Add air slowly to the portion of the pipe installation under test until the internal pressure is raised to 4.0 psig.
 5. Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any leakage is observed, bleed off air and make necessary repairs.
 6. After an internal pressure of 4.0 psig is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
 7. After the two-minute period, air pressure shall not drop greater than 0.5 PSIG for a period of at least 15 minutes without the introduction of additional air.
- H. The District will perform a closed-circuit television inspection of the newly constructed sewer system at Contractor's expense. A DVD of the television inspection shall be produced and delivered to the Contractor in color, together with a typed log of the inspection.
- I. The following conditions shall exist prior to the television inspection:
1. All sewer lines shall be installed, backfilled and compacted;
 2. All structures shall be in place, all channeling complete and all pipelines accessible from structures;
 3. All other underground facilities, utility piping and conduit within two feet of the sewer main, shall be installed;
 4. All compaction required shall be completed;
 5. Pipelines to be inspected shall be balled, flushed and mandrel tested;
 6. The final air or water test shall have been completed.
 7. Immediately before the television inspection, run fresh water into the sewer until it passes through the downstream manhole.
- J. When the above work has been completed, the Contractor shall provide the District with two weeks advance notice of the date requested for the television inspection.

HUMBOLDT COMMUNITY SERVICES DISTRICT
SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

- K. The following closed-circuit television inspection observations shall be considered defects in the construction of the sewer pipelines and will require corrections prior to acceptance:
1. Off grade - 0.06 foot, or over, deviation from grade;
 2. Joint separations - over over 1/2" or that may cause material to hang up;
 3. Offset joints;
 4. Chips in pipe ends - none more than 1/4" deep;
 5. Cracked or damaged pipe or evidence of the presence of an external object bearing upon the pipe (rocks, root, etc.);
 6. Infiltration;
 7. Debris or other foreign objects;
 8. Other obvious deficiencies when compared to Approved Plans and Specifications, these Standards and Standard Drawings.
- L. The Contractor shall be notified in writing of any deficiencies revealed by the television inspection that will require repair, following which the Contractor shall excavate and make the necessary repairs and request a television re-inspection. Television re-inspection shall be at the Contractor's expense.
- M. Sewer Pipe Deflection Testing

Where PVC pipe is used, a deflection test shall be made of the piping after the pipe has been cleaned by balling and flushing and after all underground construction in the area by other agencies is complete. Deflection tests shall be performed after the pipe has been in place for 30 days. Deflection tests may be performed in less than 30 days as approved by the District if the sewer needs to be activated. The test shall be performed by contractor with a mandrel at contractor's expense.

To be acceptable, the mandrel shall be drawn through the pipe using only the force that can be exerted by one man on the end of a rope, using no mechanical advantage.

HUMBOLDT COMMUNITY SERVICES DISTRICT
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Pipe that has deflected more than the allowance shall be uncovered and either relayed or replaced. The deflection test shall be repeated as indicated above after another 30-day period. The additional work and testing shall be performed by and at the expense of the Contractor. Re-rounding or other attempts to reduce over deflection without uncovering shall not be acceptable. Re-rounded pipe shall be removed, replaced and retested at the Contractor's expense.

11. Trench Resurfacing

Trench resurfacing shall be as shown on the standard details. In general, the typical structural section shall equal the existing section or as required by the encroachment permit issued by Humboldt County.

SECTION VI

GENERAL

CONSTRUCTION

NOTES

HUMBOLDT COMMUNITY SERVICES DISTRICT
GENERAL CONSTRUCTION NOTES

VI. GENERAL CONSTRUCTION NOTES

1. All material, workmanship and construction details shall conform to the District Water and Sewer Design and Construction Standards including all addenda, standard plan revisions and special provisions.
2. The construction contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety of all persons and property. This requirement shall be made to apply continuously and not be limited to normal working hours; and construction Contractor shall agree to defend, indemnify and hold District and District Engineer harmless from any and all liability, excepting liability arising from the sole negligence of the design professional or District.
3. The Contractor is responsible for contacting Underground Service Alert (811), in advance, of all applicable excavations in accordance with the law.
4. The contractor shall secure a trench permit from the California Division of Industrial Safety prior to excavating any trench over 5 feet in depth.
5. The contractor shall provide all the necessary equipment, labor and material required for sheeting, shoring and bracing for the protection of life and limb which shall conform to the industrial safety order. Nothing in these specifications shall be constituted to impose tort liability on the District.
6. The contractor shall coordinate all water and sewer main connection work with the District, (707) 443-4558, and shall give proper notice.
7. **Only Humboldt Community Services District Personnel shall operate valves on existing water mains or water services.**
8. All trenching, backfill and resurfacing required for installation of water system and sewer system facilities shall be per District standard details and County encroachment permit requirements.
9. Minimum depth of cover from finished grade for water mains shall be 36".
10. 4" and 10" diameter main must be specifically approved by the General Manager.
11. 11.2" through 16" main line valves shall be resilient seat wedge gate. 18" or larger mainline valves shall be butterfly valves.

HUMBOLDT COMMUNITY SERVICES DISTRICT
GENERAL CONSTRUCTION NOTES

12. Blow off valves shall be a 2" gate valve with square operating nut.
13. No. 12 coated copper wire shall be laid on top of and along entire length of all non-metallic mains and shall be extended to the surface at all valve locations, blow-offs, meter boxes, manholes, and cleanouts sufficiently for locator equipment to be attached. Tracer wire shall be installed on all services not perpendicular to the main. Fasten the wire to the top of the pipe so as not to be displaced by backfilling procedure (one method of accomplishing this is to affix the wire to the top of the pipe with duct tape at approximately 10 feet intervals).
14. Water mains to be constructed within 10' of sewer pipe require special installation and design must be specifically approved by the General Manager.
15. Private water and sewer service laterals beyond the public right of way shall conform to Section 1108 of the Uniform Plumbing Code including; (a) the bottom of the water pipe, at all points, shall be at least 12 inches above the top of the sewer lateral; and (b) the water pipe shall be placed on a solid shelf excavated to one side of the common trench with a minimum clear horizontal distance of at least 12 inches from the sewer lateral.
16. There shall be no un-metered connections to the District system, including connection-bypassing meter for testing on-site plumbing or for obtaining construction water. Pressure testing against valves shall not be allowed. When a subdivision water main has been accepted and tied-in the individual curb stops will be locked off with cable ties. Cutting of or tampering with the cable ties will constitute a straight tie-in connection. Such connections will be severed by the District and could result in substantial penalties.
17. Start excavation by exposing end of existing water main to determine its line and grade. Start new main 8-10 feet from and on same line and grade as existing main. Pipe laying shall then be adjusted so depth of new main conforms to existing main.
18. Unless otherwise shown on the plans, 1" water meter services shall be installed in residential developments.
19. All polyethylene water service tubing shall be SDR-9, 200 PSI conforming to ASTM D-2737.
20. For services larger than 1", if either the water service lateral or the on-site building line is already existing within the tolerances specified on the Standard Details, the last one installed shall be on the same line and grade as the existing one.

HUMBOLDT COMMUNITY SERVICES DISTRICT
GENERAL CONSTRUCTION NOTES

21. All meter boxes, vaults and pits shall be bedded on a 3" minimum thick, 3/4" drain rock, CL 2 aggregate base, or other clean material with typical sand equivalent of 20 minimum, uncontaminated by native soil, against compacted or undisturbed base. The gravel bed shall extend to a 4" minimum beyond all sides of the meter box. Box shall be set flush with top of curb, sidewalk or ground, whichever is applicable. In new subdivisions lot numbers must be noted on inside of meter box lid with a permanent marking pen.
22. Meter boxes shall be located out of traffic loading areas and driveways.
23. Upon application, District will allow the installation of a temporary check valve and water meter on the end of the existing main for construction water.
24. When a connection is required to an existing water main, the contractor shall provide all excavation, shoring, backfill and trench resurfacing. Where the connection is to be a "hot tap", the District shall make the tap, at Developer expense. No hot tap shall be made within 12 inches of the nominal diameter of a pipe joint (i.e.: beyond the pipe bell joint taper). If necessary the joint shall be removed, and the proposed hot tap shall be replaced with a "cut-in" tee. When a "cut-in" tee and valve(s) assembly is required on the plans, the contractor shall provide and install the entire assembly (including valves), and any other hardware necessary under District inspection, and shall provide all other work and materials necessary to complete the installation to District standards.
25. Upon completion of construction, final connection will be made by the contractor at the developer's expense under inspection by the District's inspector, unless otherwise specified on the plans.
26. After a street has been overlaid, all utility structures will be marked in white paint or "dimple" asphalt before the close of that workday.
27. Within 5 days of paving, all utility structures and boxes will be brought to grade and inspected.
28. In multi-unit commercial complexes where there is a potential in one or more individual units for a District Industrial Wastewater Discharge permit; provisions for separate metering for water and/or sewer may be required.

SECTION VII

STANDARD DRAWINGS

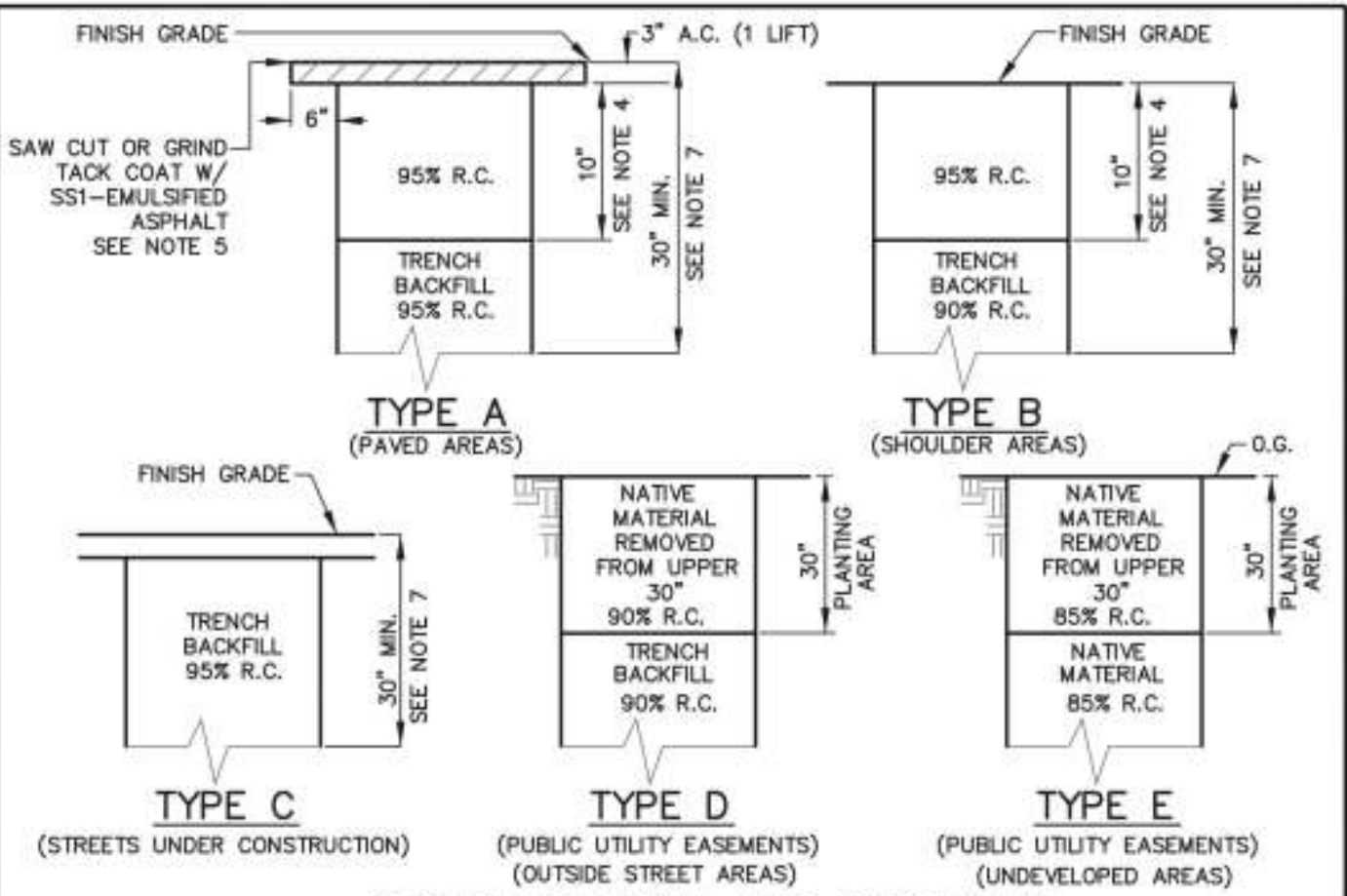
HUMBOLDT COMMUNITY SERVICES DISTRICT
STANDARD DRAWINGS

VII. CONSTRUCTION STANDARD DRAWINGS

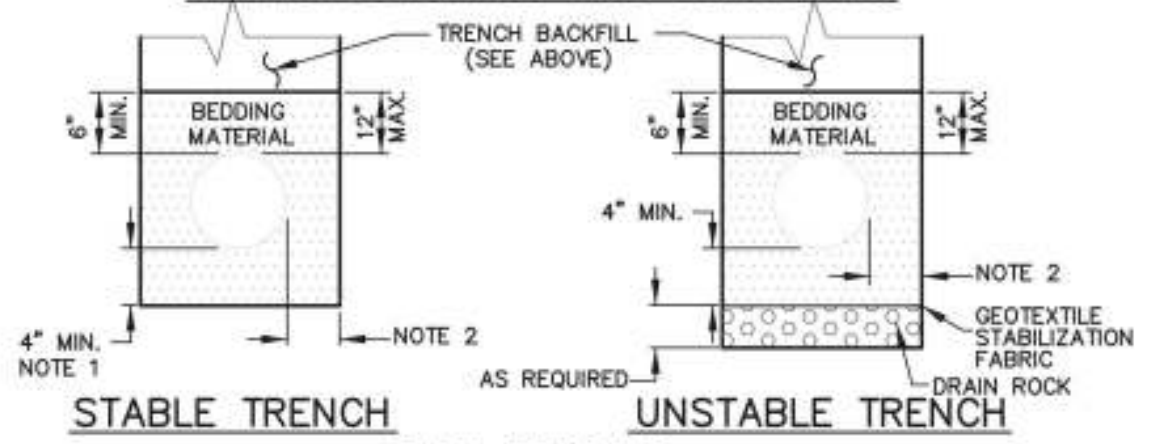
<u>WATER STANDARDS</u>		
<i>Standard Drawing No.</i>	<i>Description</i>	<i>Date</i>
WS-100A	Standard Trench Details - Water and Sewer	SEP 16
WS-100B	Standard Trench Detail Notes	SEP 16
WS-101	Concrete Thrust Block	SEP 16
WS-102	Concrete Anchor Blocks for Vertical Bends	SEP 16
WS-103	Typical Valve and Water Main Locations	SEP 16
WS-104	5/8" x 3/4" and 1" Domestic Water Service	SEP 16
WS-105	1-1/2" Domestic Water Service	SEP 16
WS-106	2" and Larger Water Service Installation	SEP 16
WS-107	Typical Multi-Meter Manifold	SEP 16
WS-108	3/4" Double Check Valve Type Backflow Preventer	SEP 16
WS-109	Reduced-Pressure Backflow Preventor	SEP 16
WS-110	Detector Check Valve, Single Service	SEP 16
WS-111	Detector Check Valve, Double Service	SEP 16
WS-112	Typical Gate Valve and Valve Box with Riser	SEP 16
WS-113	Fire Hydrant	SEP 16
WS-114	Air-Vacuum Release Valve	SEP 16
WS-115	Endline Blow-Off	SEP 16
WS-116	Temporary Blow-Off w/Main Line Valve	SEP 16
WS-117	Temp. Blow-Off and/or Metered Connection Mains Under Connections	SEP 16

HUMBOLDT COMMUNITY SERVICES DISTRICT
STANDARD DRAWINGS

<u>WATER STANDARDS</u>		
<i>Standard Drawing No.</i>	<i>Description</i>	<i>Date</i>
WS-118A	Pressure Reducing Station	SEP 16
WS-118B	PressureReducing Station Notes	SEP 16
WS-119	Typical Installation of Surge or PRV Valve	SEP 16
WS-120	Pipe-Pipe Crossing Detail	SEP 16
WS-121	Pipe-Structure Crossing Detail	SEP 16
WS-122	Typical Water Main Lowering Detail	SEP 16
WS-123	Typical Water Main Installation Over Structure	SEP 16
WS-124	Abandoned Pipe Plug Detail	SEP 16
WS-125	Typical Dirt Stop and Water Main Encasement	SEP 16



TRENCH BACKFILL AND SURFACING



PIPE BEDDING

NOTES:

1. 1/4 PIPE O.D. OR 4" MIN. WHEN EXCAVATION IS IN ROCKY GROUND.
2. PIPE DIAMETER 18" OR LESS: 6" MIN., 9" MAX./PIPE DIA. GREATER THAN 18": 9" MIN., 12" MAX.
3. RELATIVE COMPACTION DESIGNATED R.C.
4. THE MINIMUM STREET STRUCTURAL SECTION SHALL BE 3" A.C. ON 10" A.B. OR MATCH EXISTING PAVEMENT, WHICHEVER IS THICKER, SPECIFIED ON PLANS, OR REQUIRED BY ENCROACHMENT PERMIT.
5. SAW CUT OR GRIND PAVEMENT SIX INCHES FROM EDGE OF TRENCH AFTER TRENCH IS BACKFILLED.
6. MINIMUM PIPE COVER SHALL BE 36" WATER, 42" SEWER FROM TOP OF PIPE.
7. NEW STREETS AND SHOULDER AREAS UNDER CONSTRUCTION SHALL BE COMPACTED TO 95% RELATIVE COMPACTION FOR A MINIMUM DEPTH OF 30" PER CALTRANS SECTION 19-5.03.
8. INSTALL #12 COPPER COATED TRACER WIRE ON/OVER ALL NON-METALLIC MAINS.

HUMBOLDT COMMUNITY SERVICES DISTRICT	WATER AND SEWER STANDARD TRENCH DETAILS	APPROVED DATE: 9/2016 STD. DWG. WS-100A
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I. MATERIAL SPECIFICATIONS:

1. BEDDING MATERIAL:
 - A.) PEA GRAVEL— CONFORMING TO CALTRANS SECTION 68-2.02F, PERMEABLE MATERIAL, CLASS 1, TYPE B.
 - B.) CL 2 AB. — CONFORMING TO CALTRANS SECTION 26-1.02, CLASS 2 AGGREGATE BASE, 3/4" MAXIMUM.
 - C.) PERMEABLE — CONFORMING TO CALTRANS SECTION 68-2.02F, CLASS 2 PERMEABLE MATERIAL.
2. AGGREGATE BASE:
 - A.) CL 2 AB. — CONFORMING TO CALTRANS SECTION 26-1.02, CLASS 2 AGGREGATE BASE, 3/4" MAXIMUM.
3. DRAIN ROCK:
 - A.) NO. 3 ROCK— SHALL BE A WASHED ROCK OF THE NOMINAL SIZE DESIGNATED AS 1" TO 2".
4. GABION ROCK:
 - A.) GABION ROCK— SHALL BE A WASHED OR NON-WASHED ROCK OF THE NOMINAL SIZE DESIGNATED AS 4" TO 12".
5. NATIVE MATERIAL:
 - A.) NATIVE MATERIAL— NATIVE MATERIAL USED AS BACKFILL SHALL BE FREE OF ORGANIC MATTER, REFUSE OR OTHER UNSATISFACTORY MATERIALS, STONES, OR LUMPS GREATER THAN OR EXCEEDING 3" IN GREATEST DIMENSION.
6. SHALE MATERIAL:
 - A.) SHALE MATERIAL— SHALE MATERIAL SHALL MEET THE QUALITY REQUIREMENTS FOR CL 2 AB AND CONTAIN ENOUGH FINE MATERIALS TO BE ABLE TO BE COMPACTED TO 95% RC IN A TIGHT SUSTAINABLE MATRIX.

II. COMPACTION REQUIREMENTS:

1. BEDDING MATERIAL:
 - A.) PEA GRAVEL SHALL EITHER BE HAND TAMPED UNDER AND AT THE SIDES OF THE PIPES IN LIFTS NOT GREATER THAN 6" OR SHAPED AND COMPACTED PRIOR TO PIPE INSTALLATION.
 - B.) CL 2 AB SHALL MEET THE ABOVE REQUIREMENTS AND SHALL ADDITIONALLY BE COMPACTED UNDER THE PIPE TO 90% RC AND UP TO THE SPRING LINE OF THE PIPE TO 90% RC IN TWO SEPERATE LIFTS RESULTING IN A FIRM UNYIELDING BEDDED TRENCH. JETTING SHALL NOT BE ALLOWED.
2. AGGREGATE BASE:
 - A.) AGGREGATE BASE SHALL BE COMPACTED WITH MECHANICAL HAND OPERATED, OR EQUIPMENT MOUNTED OR TOWED METHODS TO ACHIEVE THE REQUIRED COMPACTION. IN ANY EVENT, COMPACTION METHODS SHALL NOT DAMAGE THE PIPE, EXCEED THE LOADING CAPACITY OF THE PIPE, OR RESULT IN A CHANGE TO THE DESIGN PIPE SLOPE REQUIRED OR DEFLECTION UNITS. JETTING SHALL NOT BE ALLOWED.
3. DRAIN ROCK:
 - A.) DRAIN ROCK SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR.
4. SHALE MATERIAL:
 - A.) SHALE SHALL MEET THE COMPACTION REQUIREMENTS FOR CL 2 AB.
5. NATIVE MATERIAL:
 - A.) NATIVE MATERIAL COMPACTED TO 90% RC SHALL MEET THE COMPACTION REQUIREMENTS OF CL 2 AB. NATIVE MATERIAL COMPACTED TO LESS THAN 90% RC MAY BE COMPACTED BY WHEEL ROLLING.

**HUMBOLDT COMMUNITY
SERVICES DISTRICT**

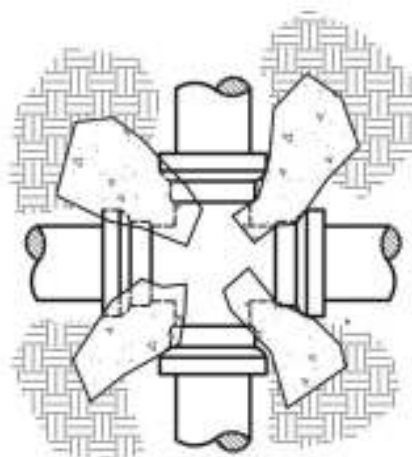
**WATER AND SEWER STANDARD
TRENCH DETAIL NOTES**

APPROVED DATE: 9/2016
STD. DWG.
WS-100B

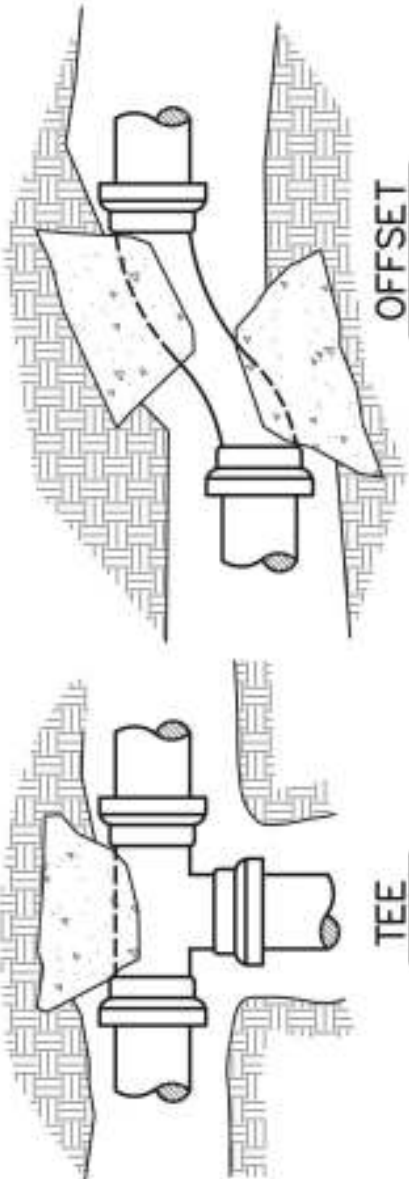


BEND

TYPICAL CONC. BLOCKING SHOWN IN PERSPECTIVE



CROSS



TEE

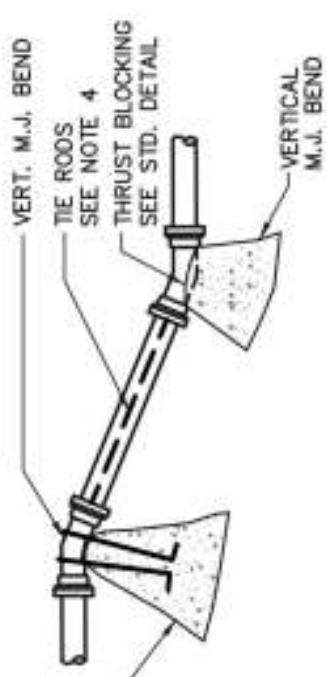
OFFSET

NOTES:

1. SAFE BEARING LOAD OF SOIL FOR HORIZONTAL THRUST SHALL NOT BE EXCEEDED.
2. CONCRETE BLOCKING, CAST-IN-PLACE, TO EXTEND FROM BELLS OF FITTINGS TO UNDISTURBED SOIL AND ENTIRE BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
3. IN USING THE THRUST BLOCKING TABLE BELOW, ASSUME 2000 P.S.F. BEARING CAPACITY UNLESS OTHERWISE SHOWN ON THE PLANS. THE DESIGN ENGINEER SHALL SPECIFY THRUST BLOCKING REQUIREMENTS FOR ALL OTHER SOIL BEARING CONDITIONS.
4. FOR PLUGGED LEG(S) OF TEE OR CROSS, USE HARNESS TYPE BLOCKING AS SHOWN ON THE STD DETAILS AND CONCRETE BLOCKING INDICATED IN THE TABLE BELOW.

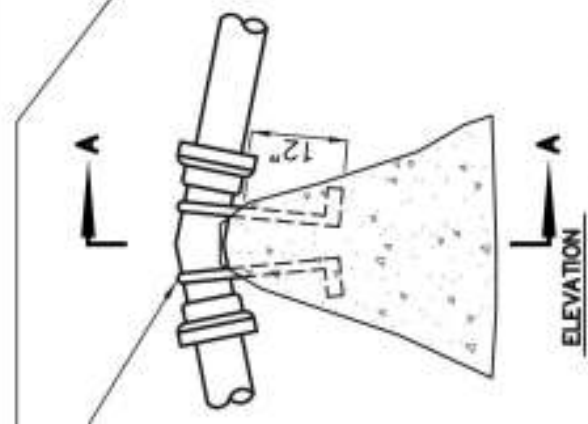
MIN REQ'D BEARING AREA IN SF PER 100 P.S.I. TEST PRESSURE *						
	SOIL BRG CAPACITY	HARNESS BLOCKS	TEES & DEAD ENDS	90° BENDS	45° BENDS	22-1/2° BENDS
4"	1000	2	2	3	2	1
	2000	1	1	1.5	1	0.5
6"	1000	4	4	6	3	2
	2000	2	2	3	2	1
8"	1000	7	7	10	5	3
	2000	4	4	5	3	2
10"	1000	12	12	17	10	5
	2000	6	6	8.5	5	2.5
12"	1000	16	16	22	12	6
	2000	8	8	11	6	3

* MULTIPLY NO. IN TABLE BY TEST PRESSURE & DIVIDE BY 100



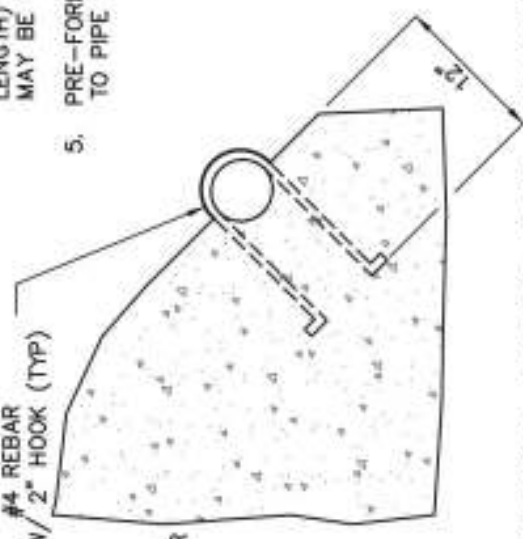
NOTES:

1. ALL EXPOSED REBAR SHALL BE PAINTED WITH BITUMASTIC OR APPROVED EQUAL
2. CONCRETE ANCHOR BLOCKS SHALL BE INSTALLED BY THE CONTRACTOR TO WITHSTAND A THRUST PRODUCED BY THE TEST PRESSURE PLUS 50 P.S.I. MINIMUM LOADING FOR THE REBAR ANCHOR.
3. USE MJ RETAINER GLANDS AT ALL FITTINGS.
4. FOR PVC PIPE, TIE RODS (THREADED FULL LENGTH) BETWEEN FITTINGS (MIN 2 REQ'D) MAY BE USED IN LIEU OF RETAINING GLANDS.
5. PRE-FORMED #4 REBAR SHALL CONFORM TO PIPE DIAMETER.

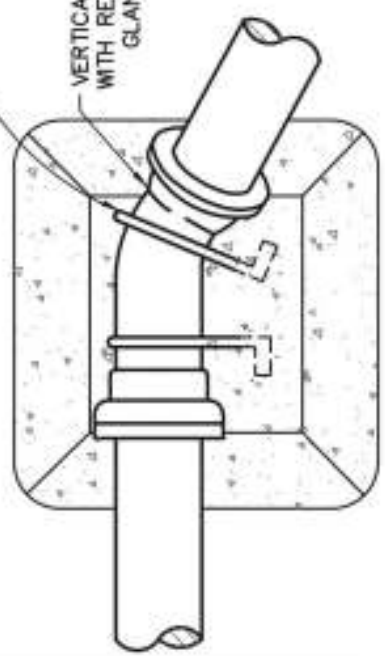


ELEVATION

TYPICAL CONCRETE ANCHOR BLOCK FOR VERTICAL BEND



VERTICAL M.J. WITH RETAINER GLANDS

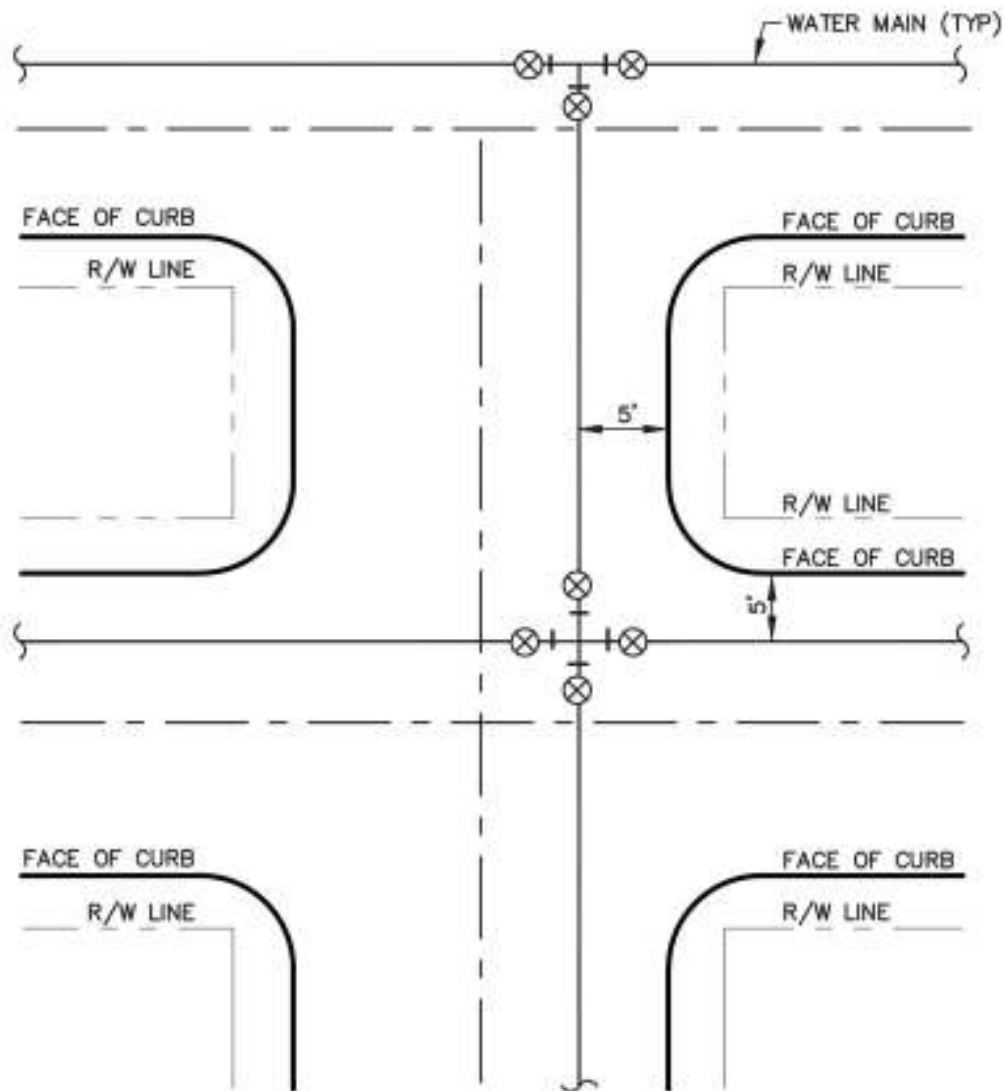


TYPICAL CONCRETE ANCHOR BLOCK FOR COMBINATION HORIZONTAL - VERTICAL BEND

HUMBOLDT COMMUNITY SERVICES DISTRICT

CONCRETE ANCHOR BLOCKS FOR VERTICAL BENDS

APPROVED DATE: 9/2016
STD. DWG.
WS-102



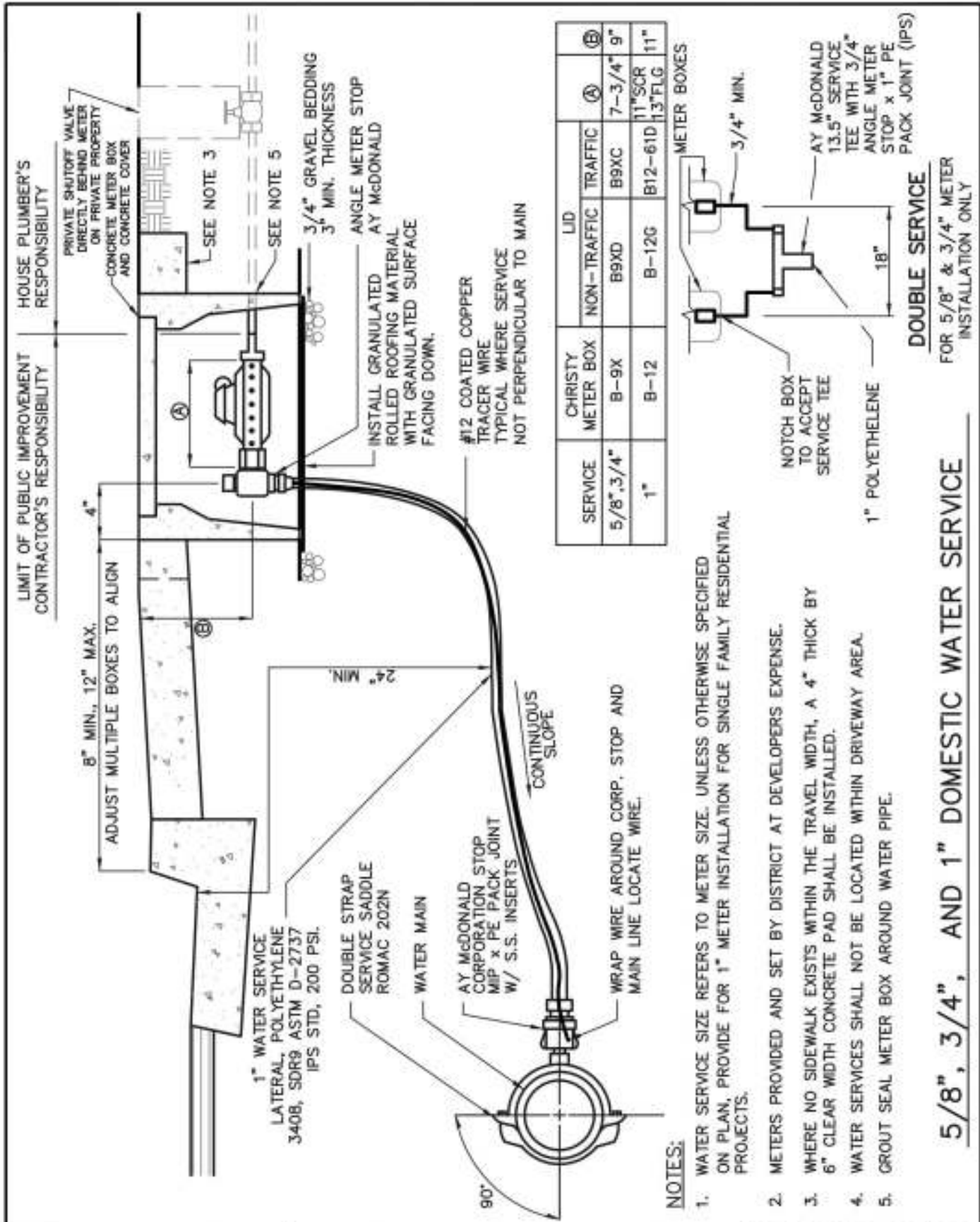
NOTES:

1. WATER MAIN SHALL BE LOCATED PARALLEL TO STREET CENTERLINES AT THE OFFSET SHOWN ABOVE UNLESS CONFLICTS WITH OTHER UNDERGROUND FACILITIES CANNOT BE AVOIDED. NON-STANDARD ALIGNMENTS SHALL BE APPROVED BY THE DISTRICT PRIOR TO INSTALLATION.
2. MAINLINE VALVES, EXCEPT HYDRANT VALVES AND TAPPING VALVES, SHALL BE CLUSTERS WHERE FEASIBLE.
3. A MINIMUM OF THREE (3) MAINLINE VALVES ARE REQUIRED FOR "T" INTERSECTIONS AND FOUR (4) VALVES ARE REQUIRED FOR CROSS INTERSECTIONS, UNLESS OTHERWISE APPROVED BY THE DISTRICT.
4. MAINLINE VALVES SHALL BE REQUIRED TO ISOLATE FIRE HYDRANTS, BOTH PUBLIC AND PRIVATE, INTO SEPERATELY VALVED MAINLINE SECTIONS, AND SHALL HAVE A MAX. SPACING OF 500'.
5. VALVES WITHIN 250' OF AN INTERSECTION MAY BE CONSIDERED MAINLINE VALVES.

HUMBOLDT COMMUNITY SERVICES DISTRICT

TYPICAL VALVE AND WATER MAIN LOCATIONS

APPROVED DATE: 9/2016
 STD. DWG.
WS-103



NOTES:

1. WATER SERVICE SIZE REFERS TO METER SIZE. UNLESS OTHERWISE SPECIFIED ON PLAN, PROVIDE FOR 1" METER INSTALLATION FOR SINGLE FAMILY RESIDENTIAL PROJECTS.
2. METERS PROVIDED AND SET BY DISTRICT AT DEVELOPERS EXPENSE.
3. WHERE NO SIDEWALK EXISTS WITHIN THE TRAVEL WIDTH, A 4" THICK BY 6" CLEAR WIDTH CONCRETE PAD SHALL BE INSTALLED.
4. WATER SERVICES SHALL NOT BE LOCATED WITHIN DRIVEWAY AREA.
5. GROUT SEAL METER BOX AROUND WATER PIPE.

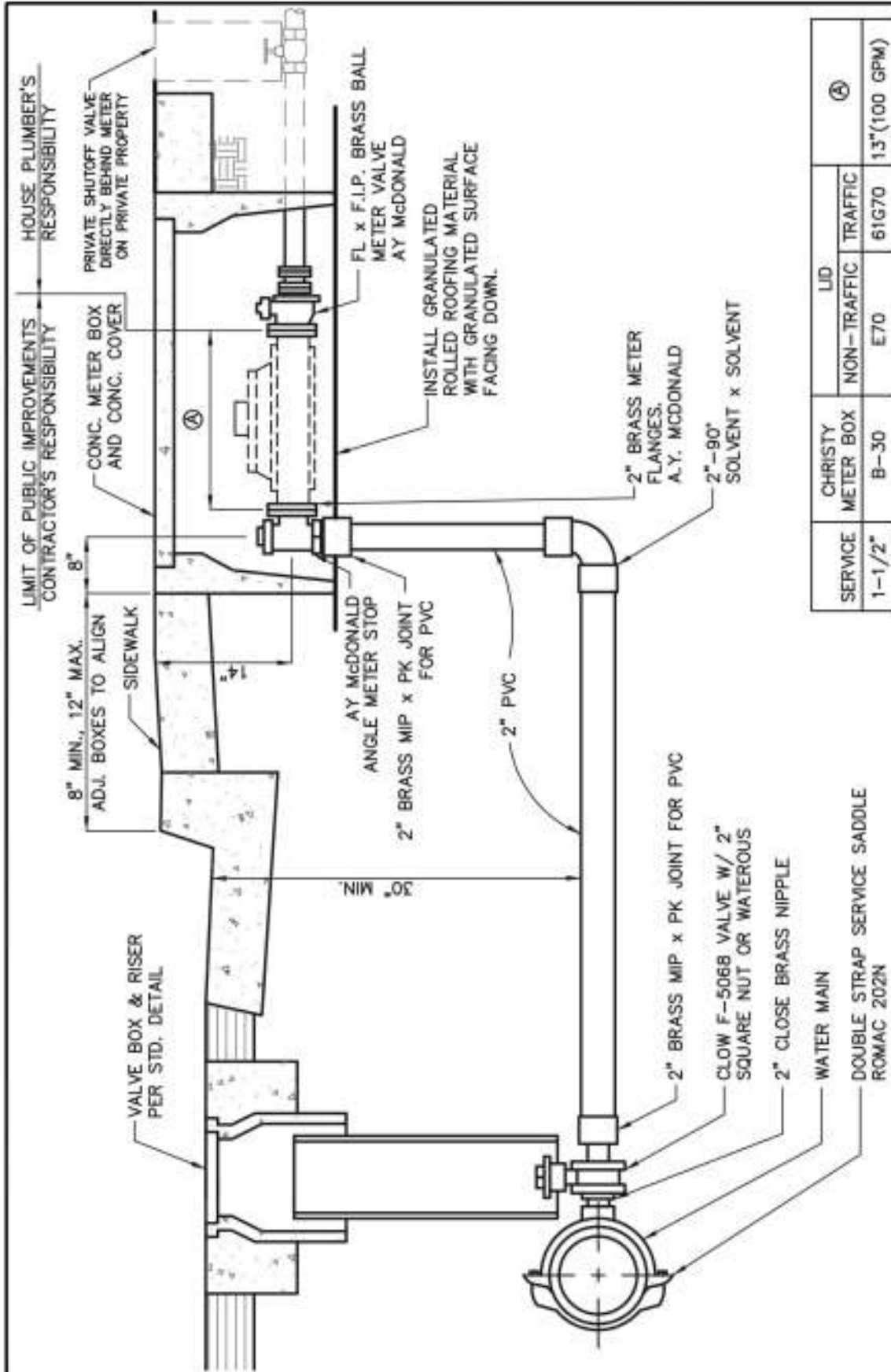
DOUBLE SERVICE
FOR 5/8" & 3/4" METER
INSTALLATION ONLY

5/8", 3/4", AND 1" DOMESTIC WATER SERVICE

HUMBOLDT COMMUNITY SERVICES DISTRICT

5/8", 3/4", AND 1" DOMESTIC WATER SERVICE

APPROVED DATE: 9/2016
STD. DWG.
WS-104



SERVICE	CHRISTY METER BOX	LID	
		NON-TRAFFIC	TRAFFIC
1-1/2"	B-30	E70	61G70
			13"(100 GPM)

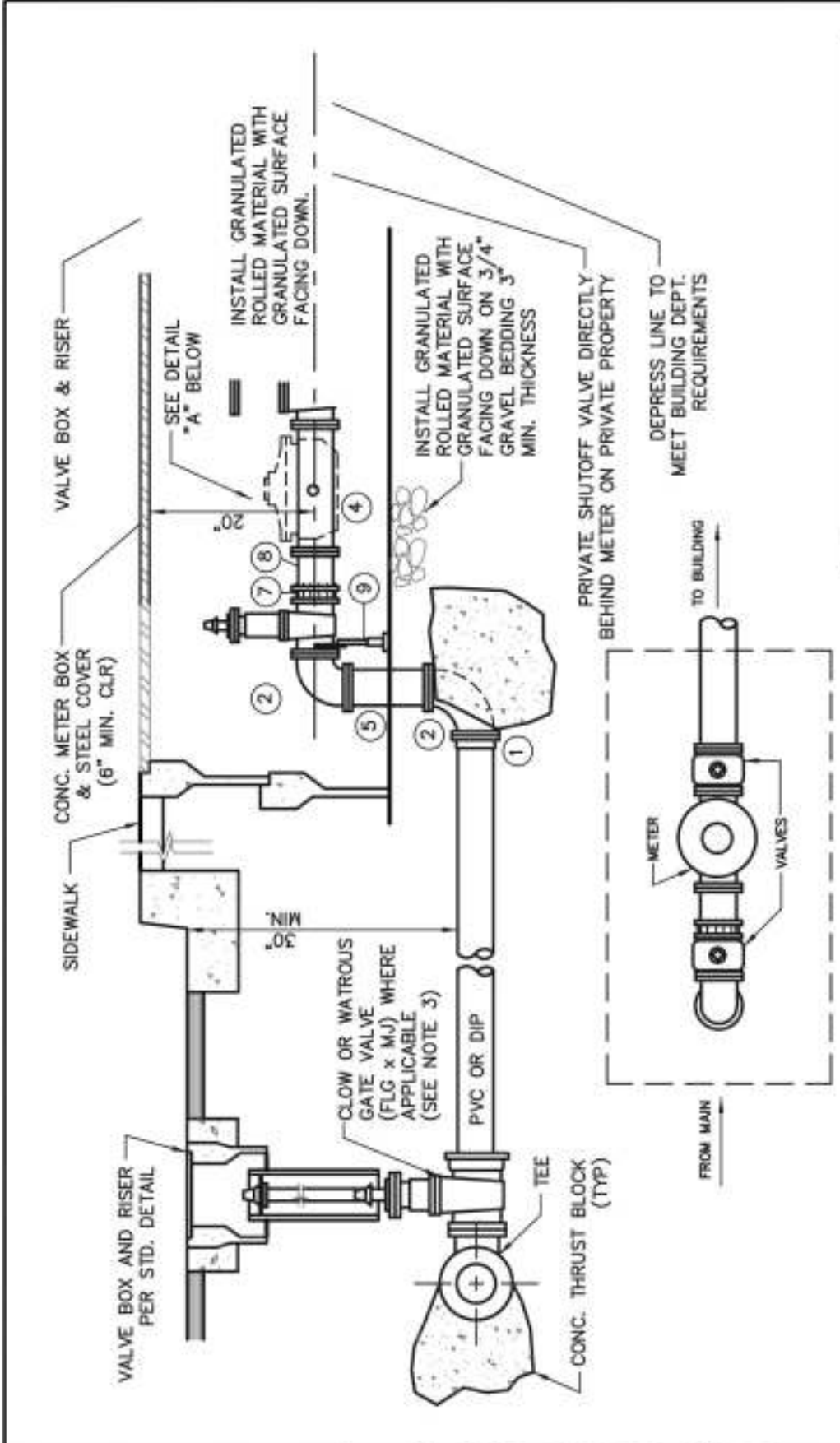
NOTES:
 1. METERS PROVIDED AND SET BY DISTRICT AT DEVELOPER'S EXPENSE.

HUMBOLDT COMMUNITY SERVICES DISTRICT

1-1/2" DOMESTIC WATER SERVICE

APPROVED DATE: 9/2016
 STD. DWG.
WS-105

1-1/2" DOMESTIC WATER SERVICE



NO.	ITEM
1	FLANGE ADAPTER
2	90° ELL. (D.I.P.)
3	PVC PIECE—LENGTH AS REQUIRED.
4	METER BY DISTRICT FORCES
5	SPOOL—LENGTH AS REQUIRED (D.I.P.)
6	UNI—FLANGE OR FLG. COUPLING ADAPTER
7	2" FLANGE COUPLING ADAPTER
8	SPOOL — LENGTH PER METER MANUF.
9	PIPE SUPPORT STAND

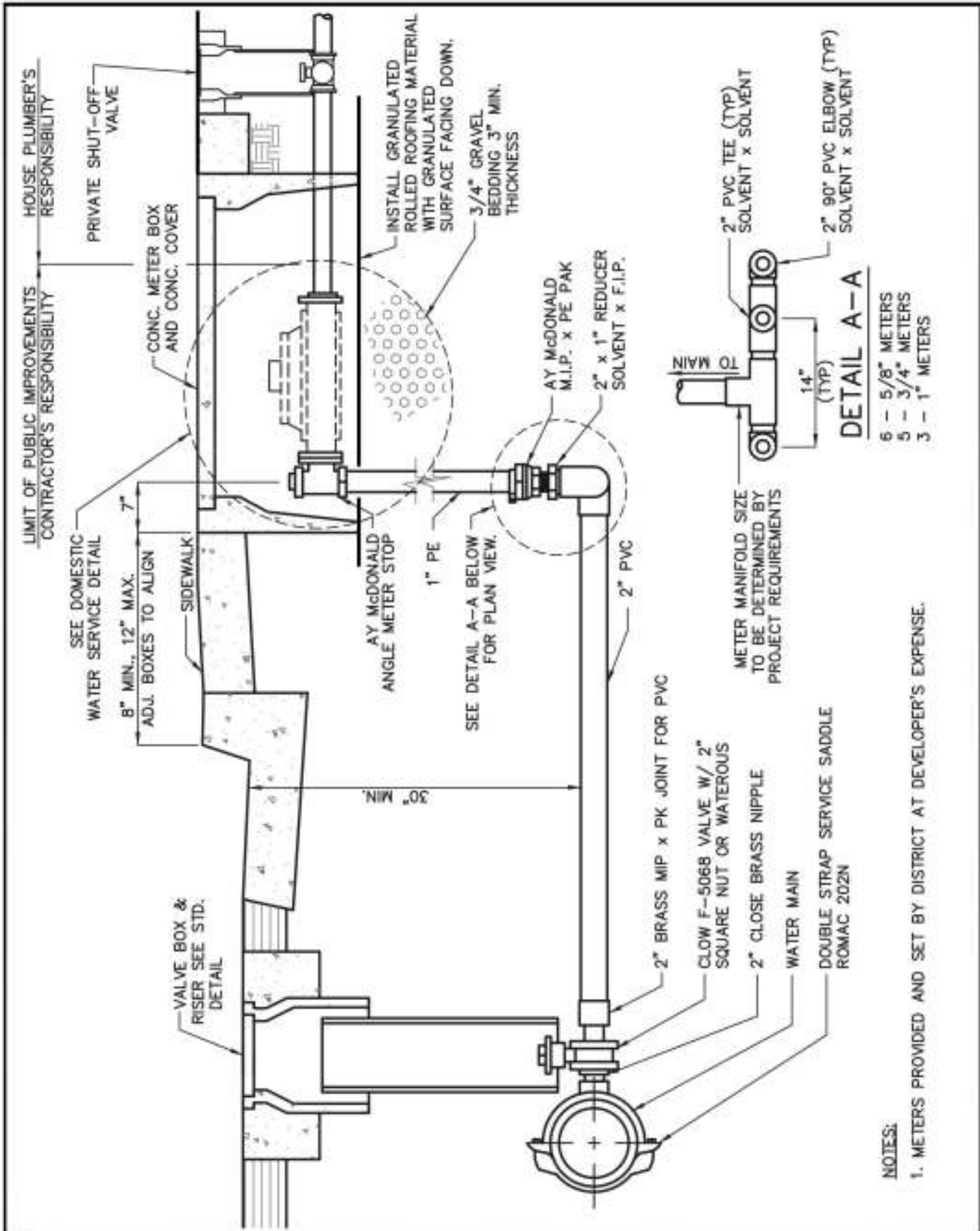
DETAIL "A"

- NOTES:**
- 2" SHOWN, AND MAY BE SOLVENT WELD, LARGER SIZES SHALL BE FLANGED.
 - METER BOX MUST BE SET SO THE STEEL COVER IS FLUSH WITH FINISHED SURFACE.
 - SEE WATER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS.
 - GATE VALVES TO BE RESILIENT SEAT TYPE PER AWWA SPECIFICATION C509
 - SEE ENGINEERS APPROVED LIST FOR TAPPING SLEEVES, METER BOXES AND COVERS.
 - METERS PROVIDED BY DISTRICT AT DEVELOPERS EXPENSE.

HUMBOLDT COMMUNITY SERVICES DISTRICT

2" AND LARGER WATER SERVICE INSTALLATION

APPROVED DATE: 9/2016
 STD. DWG.
WS-106



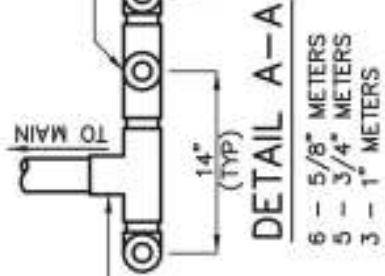
HUMBOLDT COMMUNITY SERVICES DISTRICT

TYPICAL MULTI-METER MANIFOLD

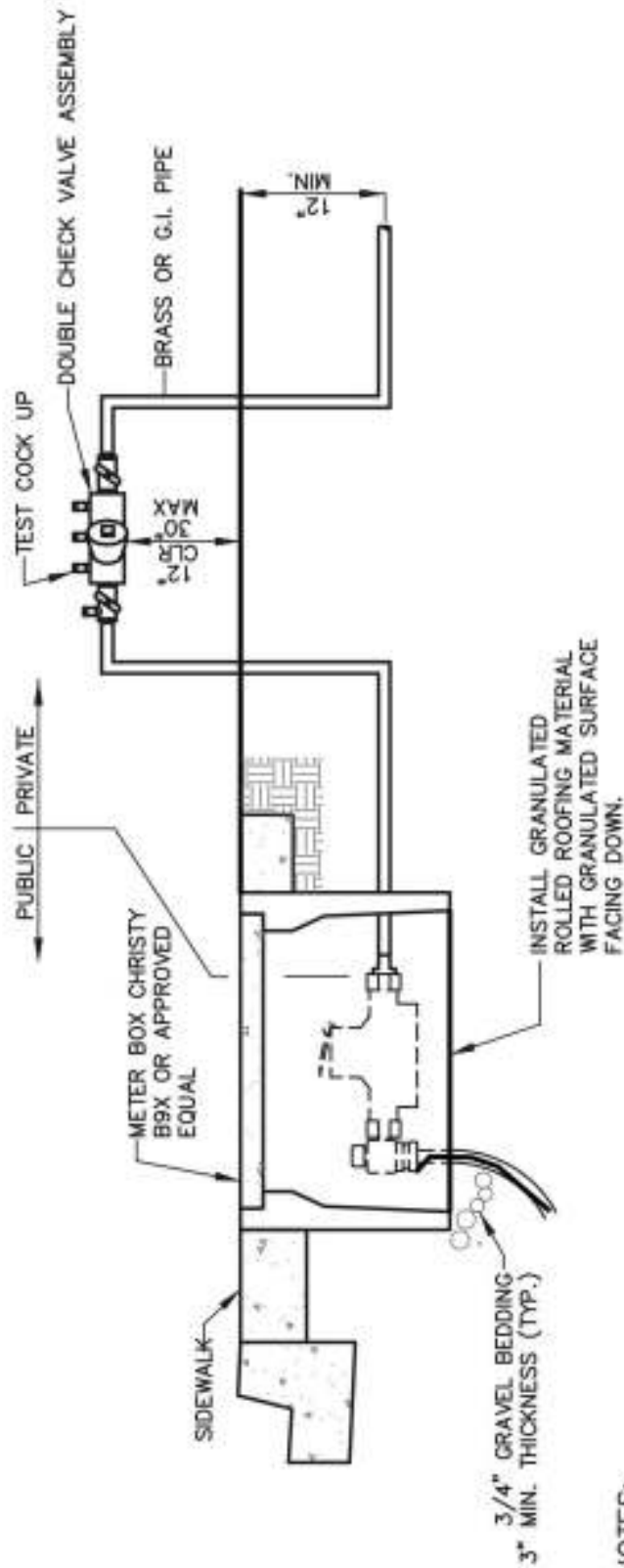
APPROVED DATE: 9/2016
 STD. DWG.
WS-107

NOTES:

1. METERS PROVIDED AND SET BY DISTRICT AT DEVELOPER'S EXPENSE.



6 - 5/8" METERS
 5 - 3/4" METERS
 3 - 1" METERS



NOTES:

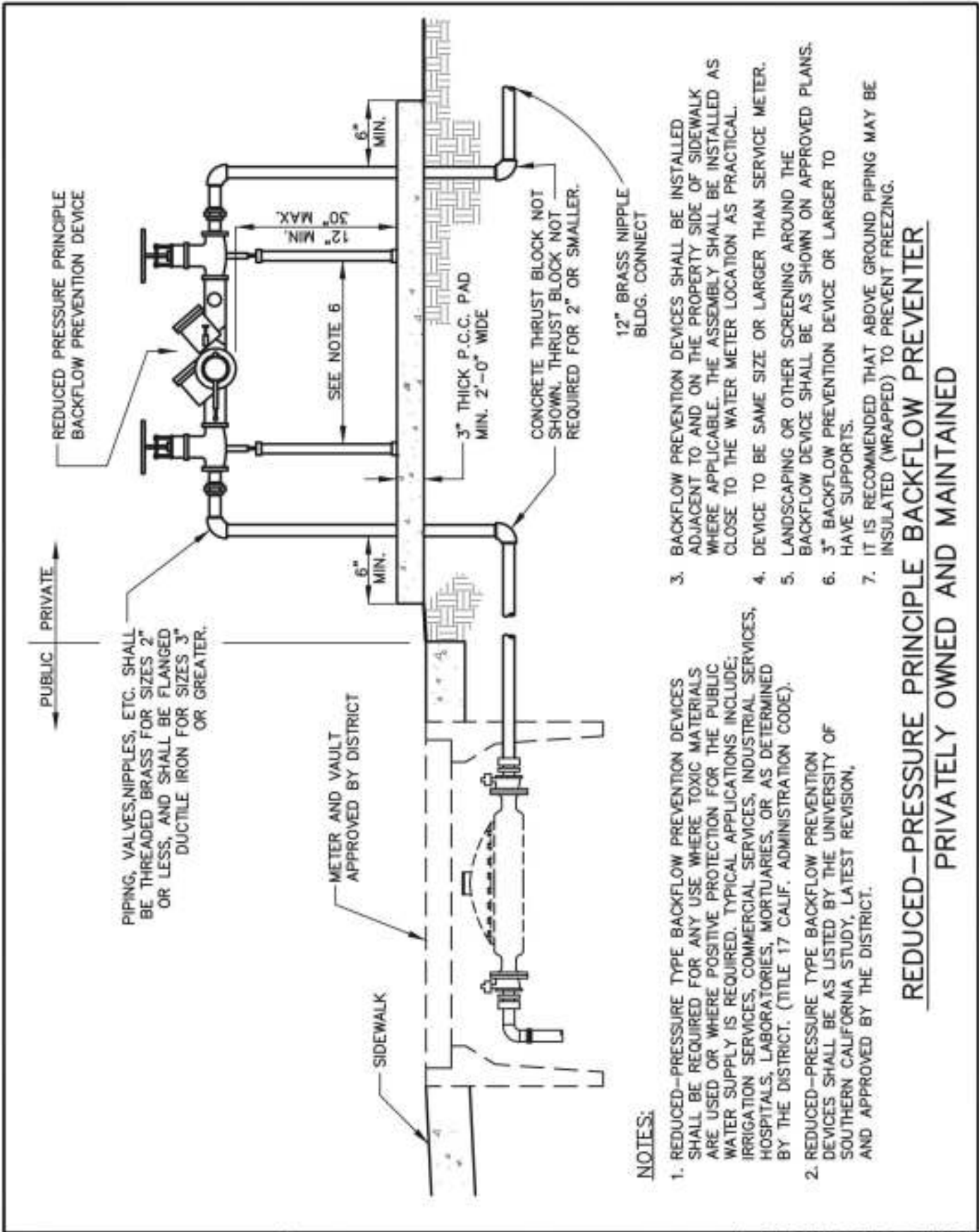
1. DOUBLE CHECK VALVE ASSEMBLIES ARE USED FOR DOMESTIC SERVICES TO PARCELS WITH A SECOND WATER SOURCE, WATER BOOSTER PUMP, OR WATER STORAGE TANK.
2. ALL DOUBLE-CHECK VALVE ASSEMBLIES SHALL BE PROVIDED WITH A MINIMUM OF FOUR (4) TEST COCKS W/ QUICK COUPLINGS.
3. ABOVE GROUND INSTALLATION REQUIRES G.I. PIPE.
4. BACKFLOW PREVENTION DEVICES SHALL BE INSTALLED ADJACENT TO AND ON THE PROPERTY SIDE OF THE SIDEWALK WHERE APPLICABLE. THE ASSEMBLY SHALL BE INSTALLED AS CLOSE TO THE WATER METER LOCATION AS PRACTICAL.
5. DOUBLE CHECK VALVE TYPE BACKFLOW PREVENTION DEVICES SHALL BE AS LISTED BY THE UNIVERSITY OF SOUTHERN CALIFORNIA STUDY, LATEST REVISION, AND APPROVED BY THE DISTRICT.
6. DEVICE TO BE SAME SIZE OR LARGER THAN SERVICE METER.
7. IT IS RECOMMENDED THAT ABOVE GROUND PIPING MAY BE INSULATED (WRAPPED) TO PREVENT FREEZING.
8. DEVICE IS PRIVATELY OWNED AND MAINTAINED BY PROPERTY OWNER.

**DOUBLE CHECK VALVE
TYPE BACKFLOW PREVENTER**

HUMBOLDT COMMUNITY SERVICES DISTRICT

**DOUBLE CHECK VALVE
TYPE BACKFLOW PREVENTER**

APPROVED DATE: 9/2016
STD. DWG.
WS-108



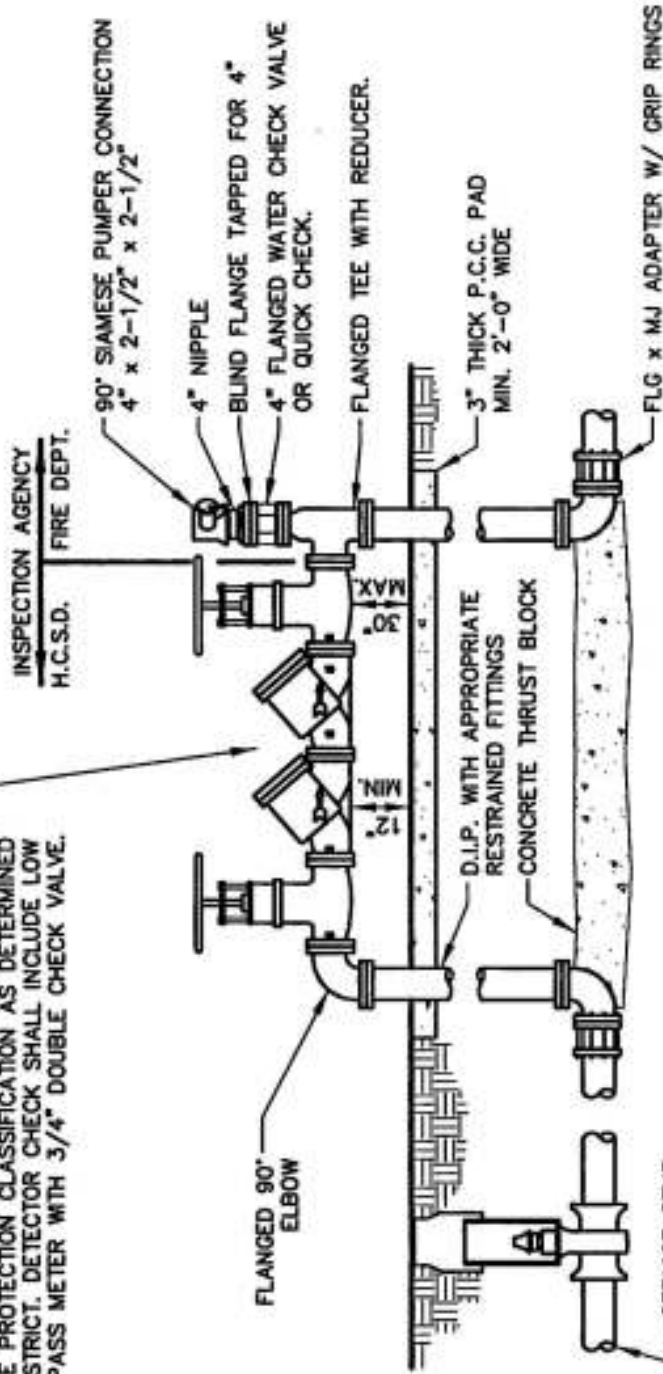
NOTES:

1. REDUCED-PRESSURE TYPE BACKFLOW PREVENTION DEVICES SHALL BE REQUIRED FOR ANY USE WHERE TOXIC MATERIALS ARE USED OR WHERE POSITIVE PROTECTION FOR THE PUBLIC WATER SUPPLY IS REQUIRED. TYPICAL APPLICATIONS INCLUDE: IRRIGATION SERVICES, COMMERCIAL SERVICES, INDUSTRIAL SERVICES, HOSPITALS, LABORATORIES, MORTUARIES, OR AS DETERMINED BY THE DISTRICT. (TITLE 17 CALIF. ADMINISTRATION CODE).
2. REDUCED-PRESSURE TYPE BACKFLOW PREVENTION DEVICES SHALL BE AS LISTED BY THE UNIVERSITY OF SOUTHERN CALIFORNIA STUDY, LATEST REVISION, AND APPROVED BY THE DISTRICT.
3. BACKFLOW PREVENTION DEVICES SHALL BE INSTALLED ADJACENT TO AND ON THE PROPERTY SIDE OF SIDEWALK WHERE APPLICABLE. THE ASSEMBLY SHALL BE INSTALLED AS CLOSE TO THE WATER METER LOCATION AS PRACTICAL.
4. DEVICE TO BE SAME SIZE OR LARGER THAN SERVICE METER.
5. LANDSCAPING OR OTHER SCREENING AROUND THE BACKFLOW DEVICE SHALL BE AS SHOWN ON APPROVED PLANS.
6. 3" BACKFLOW PREVENTION DEVICE OR LARGER TO HAVE SUPPORTS.
7. IT IS RECOMMENDED THAT ABOVE GROUND PIPING MAY BE INSULATED (WRAPPED) TO PREVENT FREEZING.

REDUCED-PRESSURE PRINCIPLE BACKFLOW PREVENTER
PRIVATELY OWNED AND MAINTAINED

HUMBOLDT COMMUNITY SERVICES DISTRICT	REDUCED-PRESSURE BACKFLOW PREVENTER	APPROVED DATE: 9/2016 STD. DWG. WS-109
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DOUBLE DETECTOR CHECK VALVE DEVICE DEPENDENT ON FIRE PROTECTION CLASSIFICATION AS DETERMINED BY DISTRICT. DETECTOR CHECK SHALL INCLUDE LOW FLOW BYPASS METER WITH 3/4" DOUBLE CHECK VALVE.



NOTES:

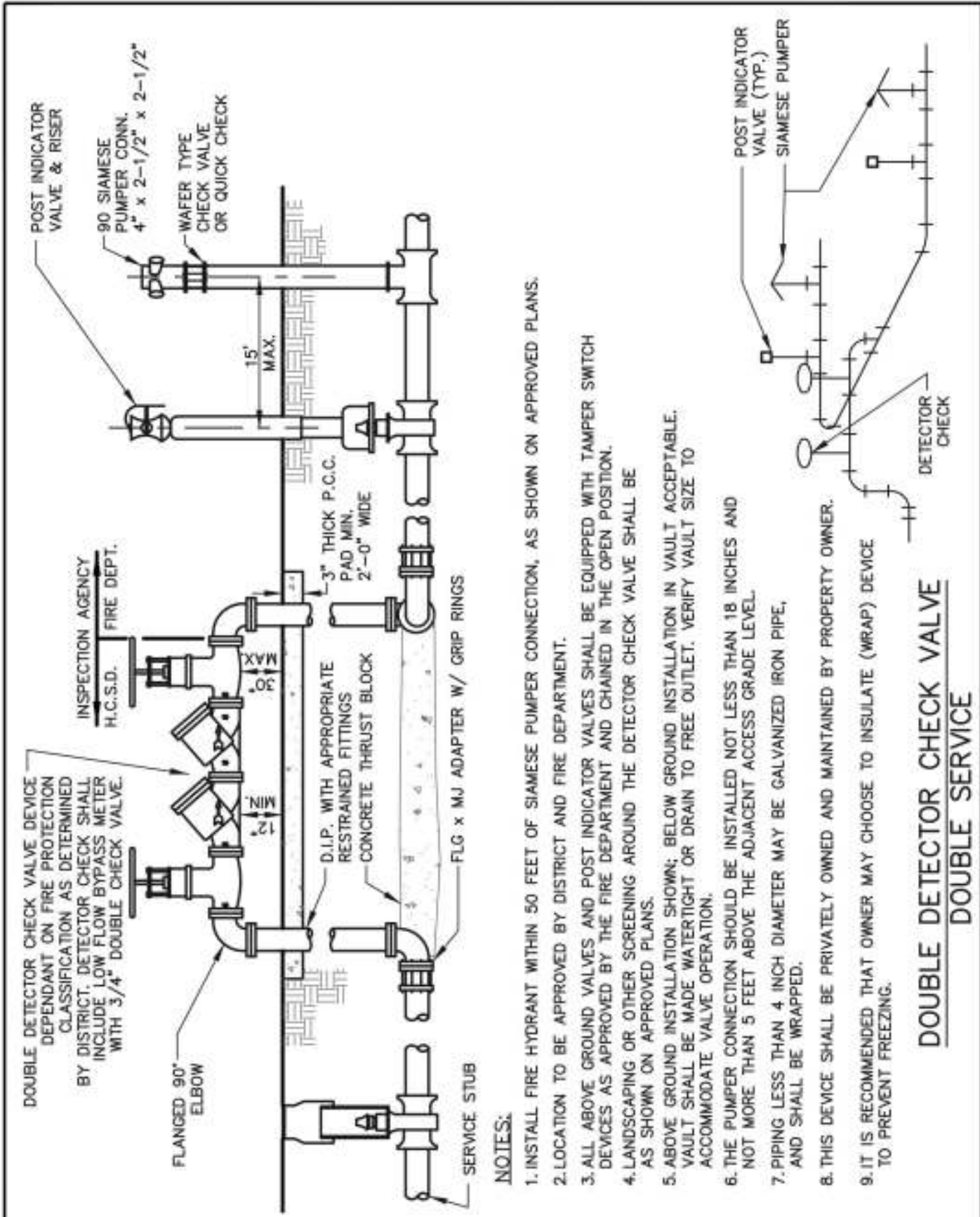
1. INSTALL FIRE HYDRANT WITHIN 50 FEET OF SIAMESE PUMPER CONNECTION, AS SHOWN ON APPROVED PLANS.
2. LOCATION TO BE APPROVED BY DISTRICT AND FIRE DEPARTMENT.
3. ALL ABOVE GROUND VALVES AND POST INDICATOR VALVES SHALL BE EQUIPPED WITH TAMPER SWITCH DEVICES AS APPROVED BY THE FIRE DEPARTMENT AND CHAINED IN THE OPEN POSITION.
4. LANDSCAPING OR OTHER SCREENING AROUND THE DETECTOR CHECK VALVE SHALL BE AS SHOWN ON APPROVED PLANS.
5. ABOVE GROUND INSTALLATION SHOWN; BELOW GROUND INSTALLATION IN VAULT ACCEPTABLE. VAULT SHALL BE MADE WATERTIGHT OR DRAIN TO FREE OUTLET. VERIFY VAULT SIZE TO ACCOMMODATE VALVE OPERATION.
6. THE PUMPER CONNECTION SHOULD BE INSTALLED NOT LESS THAN 18 INCHES AND NOT MORE THAN 5 FEET ABOVE THE ADJACENT ACCESS GRADE LEVEL.
7. PIPING LESS THAN 4 INCH DIAMETER MAY BE GALVANIZED IRON PIPE, AND SHALL BE WRAPPED.
8. THIS DEVICE SHALL BE PRIVATELY OWNED AND MAINTAINED BY PROPERTY OWNER.
9. IT IS RECOMMENDED THAT OWNER MAY CHOOSE TO INSULATE (WRAP) DEVICE TO PREVENT FREEZING.

**DOUBLE DETECTOR CHECK VALVE
SINGLE SERVICE**

HUMBOLDT COMMUNITY SERVICES DISTRICT

DOUBLE DETECTOR CHECK VALVE SINGLE SERVICE

APPROVED DATE: 9/2016
STD. DWG.
WS-110



DOUBLE DETECTOR CHECK VALVE DEVICE
DEPENDANT ON FIRE PROTECTION
CLASSIFICATION AS DETERMINED
BY DISTRICT. DETECTOR CHECK SHALL
INCLUDE LOW FLOW BYPASS METER
WITH 3/4" DOUBLE CHECK VALVE.

INSPECTION AGENCY
H.C.S.D. FIRE DEPT.

FLANGED 90°
ELBOW

MAX
3.0

MAX
1.2

D.I.P. WITH APPROPRIATE
RESTRAINED FITTINGS
CONCRETE THRUST BLOCK

SERVICE STUB

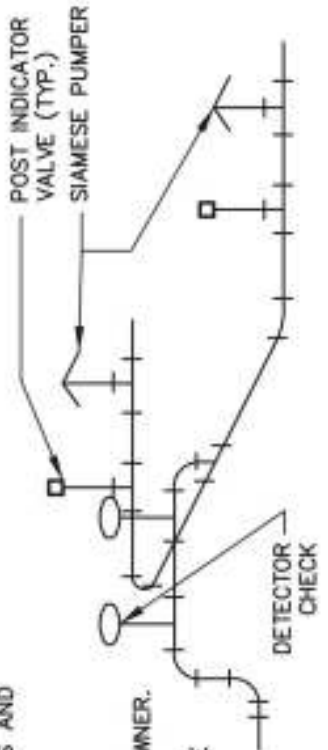
3" THICK P.C.C.
PAD MIN.
2'-0" WIDE

15' MAX.

FLG x MJ ADAPTER W/ GRIP RINGS

NOTES:

1. INSTALL FIRE HYDRANT WITHIN 50 FEET OF SIAMESE PUMPER CONNECTION, AS SHOWN ON APPROVED PLANS.
2. LOCATION TO BE APPROVED BY DISTRICT AND FIRE DEPARTMENT.
3. ALL ABOVE GROUND VALVES AND POST INDICATOR VALVES SHALL BE EQUIPPED WITH TAMPER SWITCH DEVICES AS APPROVED BY THE FIRE DEPARTMENT AND CHAINED IN THE OPEN POSITION.
4. LANDSCAPING OR OTHER SCREENING AROUND THE DETECTOR CHECK VALVE SHALL BE AS SHOWN ON APPROVED PLANS.
5. ABOVE GROUND INSTALLATION SHOWN; BELOW GROUND INSTALLATION IN VAULT ACCEPTABLE. VAULT SHALL BE MADE WATERTIGHT OR DRAIN TO FREE OUTLET. VERIFY VAULT SIZE TO ACCOMMODATE VALVE OPERATION.
6. THE PUMPER CONNECTION SHOULD BE INSTALLED NOT LESS THAN 18 INCHES AND NOT MORE THAN 5 FEET ABOVE THE ADJACENT ACCESS GRADE LEVEL.
7. PIPING LESS THAN 4 INCH DIAMETER MAY BE GALVANIZED IRON PIPE, AND SHALL BE WRAPPED.
8. THIS DEVICE SHALL BE PRIVATELY OWNED AND MAINTAINED BY PROPERTY OWNER.
9. IT IS RECOMMENDED THAT OWNER MAY CHOOSE TO INSULATE (WRAP) DEVICE TO PREVENT FREEZING.



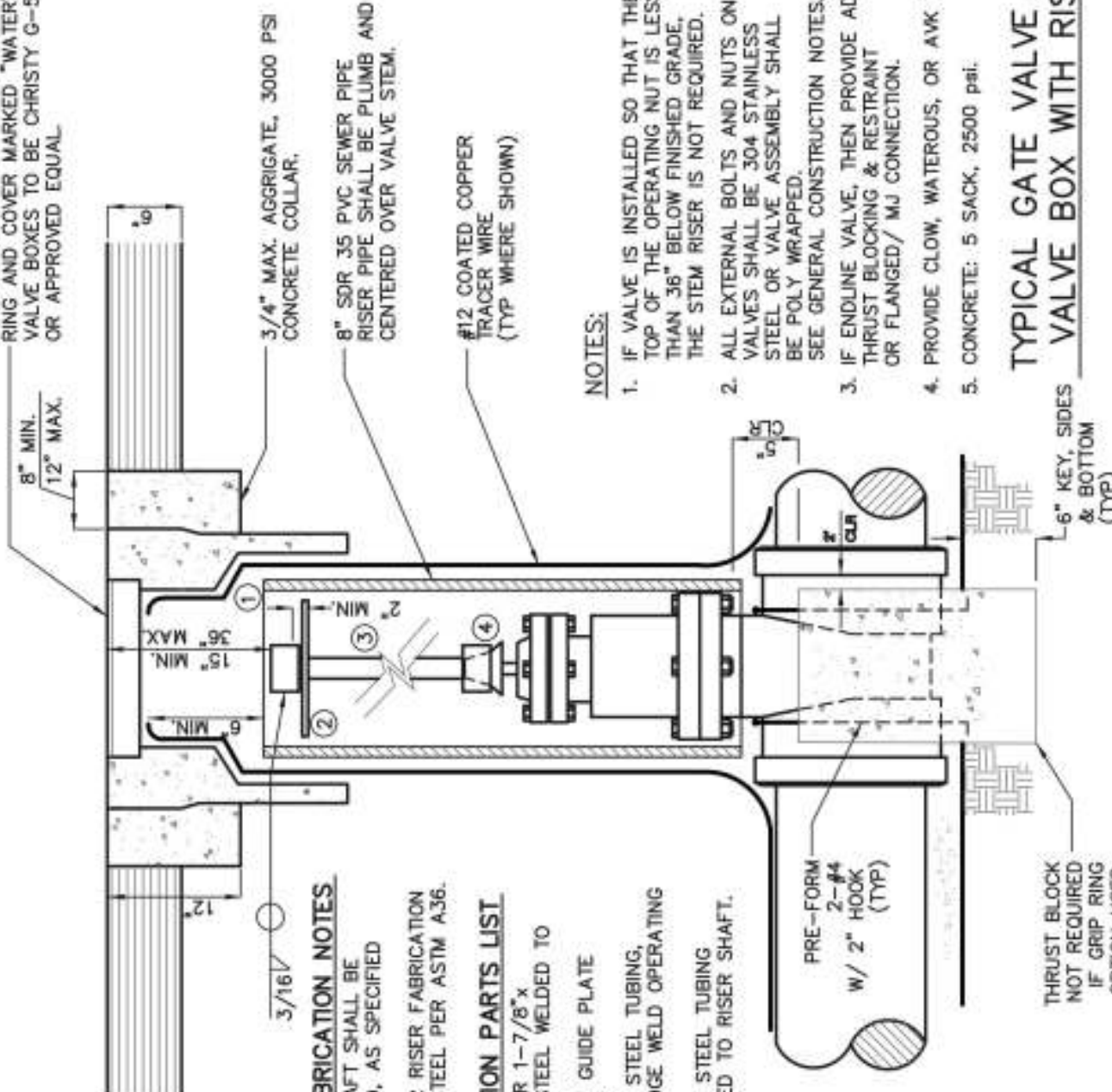
**DOUBLE DETECTOR CHECK VALVE
DOUBLE SERVICE**

**HUMBOLDT COMMUNITY
SERVICES DISTRICT**

**DOUBLE DETECTOR CHECK
VALVE DOUBLE SERVICE**

APPROVED DATE: 9/2016
STD. DWG.
WS-111

PRECAST VALVE BOX SET FLUSH WITH STREET SURFACE WITH CAST IRON RING AND COVER MARKED "WATER". VALVE BOXES TO BE CHRISTY G-5 OR APPROVED EQUAL.



STEM EXTENSION FABRICATION NOTES

1. ALL WELDS TO RISER SHAFT SHALL BE FILLET WELD ALL AROUND, AS SPECIFIED BELOW.
2. ALL STEEL REQUIRED FOR RISER FABRICATION SHALL BE STRUCTURAL STEEL PER ASTM A36.

VALVE STEM EXTENSION PARTS LIST

- ① VALVE OPERATING NUT OR 1-7/8" x 1-7/8" x 2" HIGH, SOLID STEEL WELDED TO RISER SHAFT.
- ② 1/8" THK. x 7-1/2" DIA. GUIDE PLATE WELDED TO RISER SHAFT.
- ③ 1-1/2" x 3/16" SQUARE STEEL TUBING, LENGTH AS REQUIRED. EDGE WELD OPERATING NUT AT BOTH ENDS.
- ④ 2-1/2" x 3/16" SQUARE STEEL TUBING 2-1/2" IN LENGTH WELDED TO RISER SHAFT.

NOTES:

1. IF VALVE IS INSTALLED SO THAT THE TOP OF THE OPERATING NUT IS LESS THAN 36" BELOW FINISHED GRADE, THE STEM RISER IS NOT REQUIRED.
2. ALL EXTERNAL BOLTS AND NUTS ON VALVES SHALL BE 304 STAINLESS STEEL OR VALVE ASSEMBLY SHALL BE POLY WRAPPED. SEE GENERAL CONSTRUCTION NOTES.
3. IF ENDLINE VALVE, THEN PROVIDE ADEQUET THRUST BLOCKING & RESTRAINT OR FLANGED/ MJ CONNECTION.
4. PROVIDE CLOW, WATEROUS, OR AWK VALVE.
5. CONCRETE: 5 SACK, 2500 psi.

TYPICAL GATE VALVE AND VALVE BOX WITH RISER

6" KEY, SIDES & BOTTOM (TYP)

THRUST BLOCK NOT REQUIRED IF GRIP RING OPTION USED.

PRE-FORM 2-#4 W/ 2" HOOK (TYP)

HUMBOLDT COMMUNITY SERVICES DISTRICT

TYPICAL GATE VALVE AND VALVE BOX WITH RISER

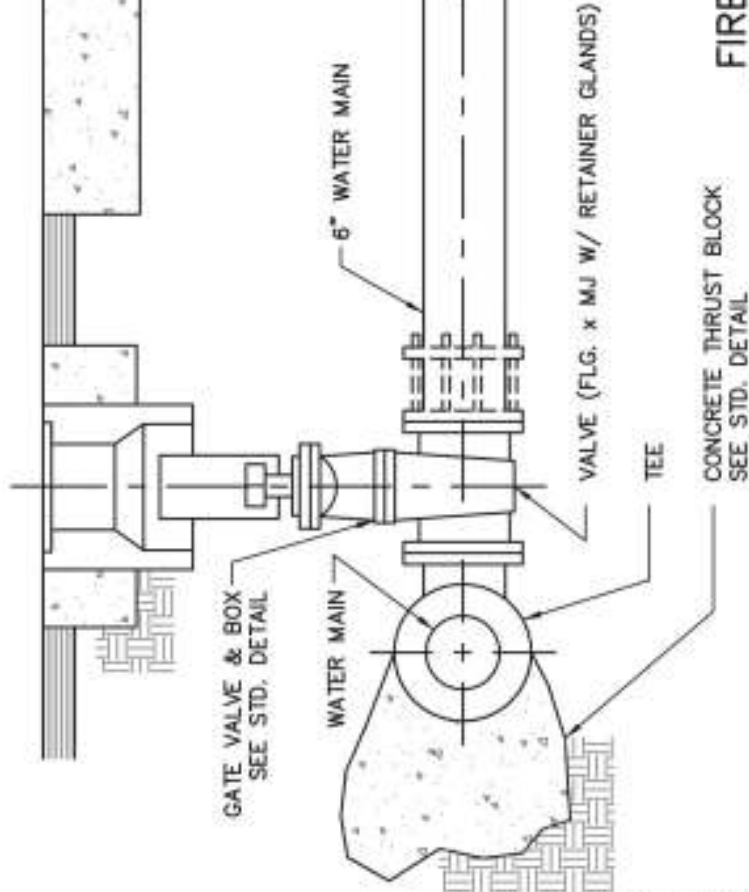
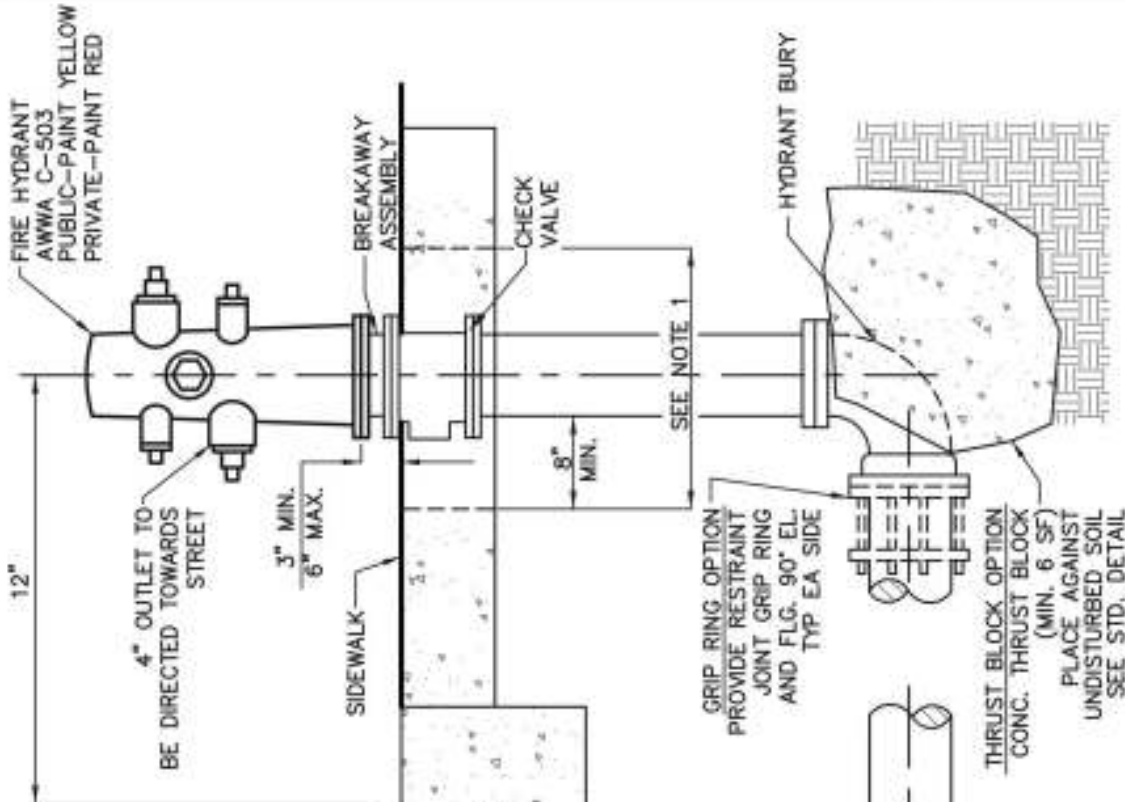
APPROVED DATE: 9/2016
STD. DWG.
WS-112

HYDRANT SCHEDULE (WET BARREL)

CLOW MODEL 76 (W/ 5-1/4" MAIN VALVES)
 PUMP THREADS TO MATCH FIRE DEPARTMENT
 PROVIDE 1-4" AND 2-2 1/2" OUTLETS
 W/ CLOW CHECK VALVE MODEL LBIW 400A

NOTES:

1. WHERE NO SIDEWALK EXISTS OR WHERE F.H. IS INSTALLED IN PLANTER STRIP, A 6" THK. x 2' SQ. CONCRETE PAD SHALL BE INSTALLED.
2. VERIFY FIRE PROTECTION REQUIREMENTS WITH FIRE DEPARTMENT.
3. INSTALL 10' MIN. FROM DRIVEWAY.
4. PROVIDE GRIP RINGS OR THRUST BLOCKING AT CONTRACTOR'S OPTION.



FIRE HYDRANT

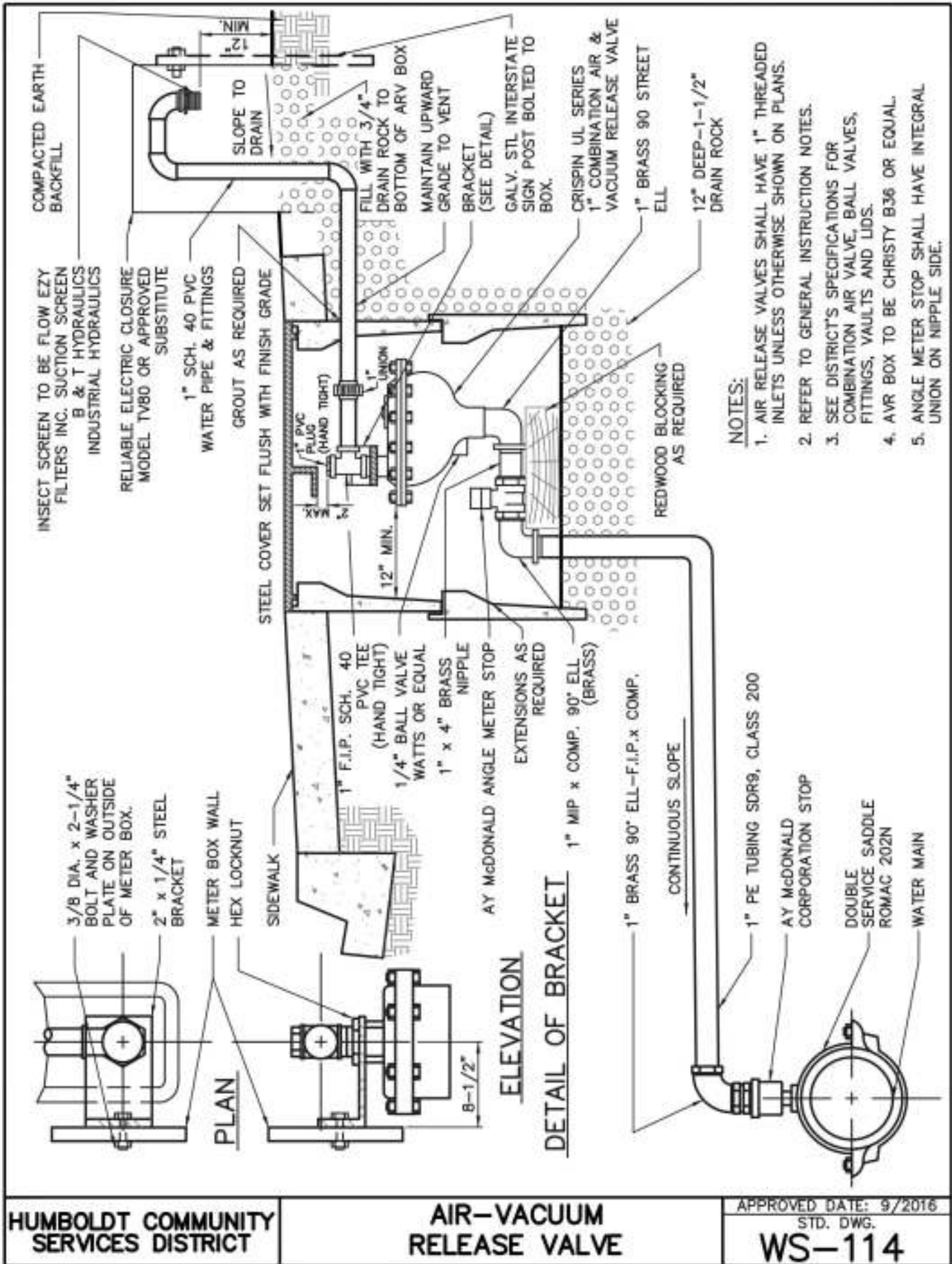
HUMBOLDT COMMUNITY SERVICES DISTRICT

FIRE HYDRANT

APPROVED DATE: 9/2016

STD. DWG.

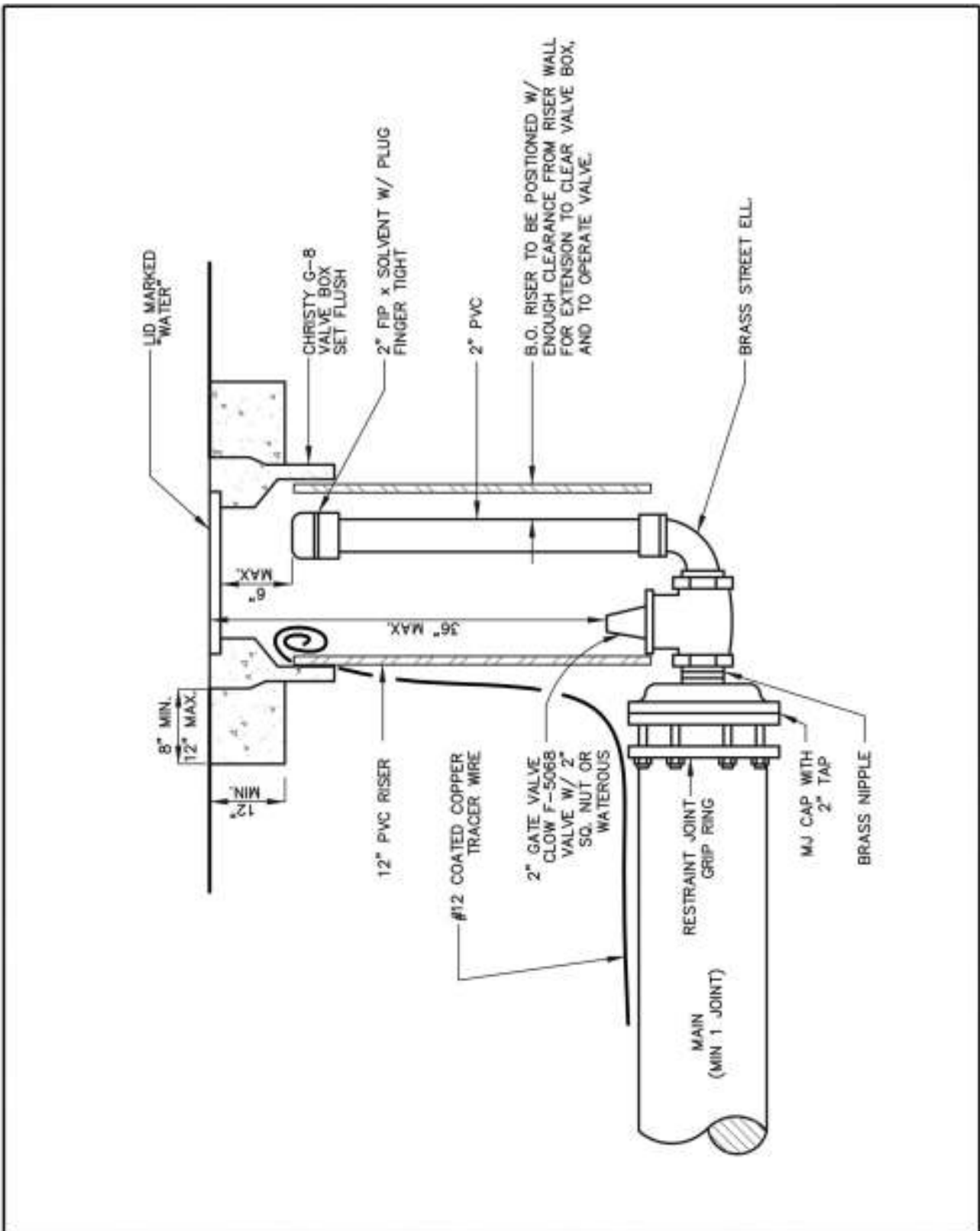
WS-113



HUMBOLDT COMMUNITY SERVICES DISTRICT

AIR-VACUUM RELEASE VALVE

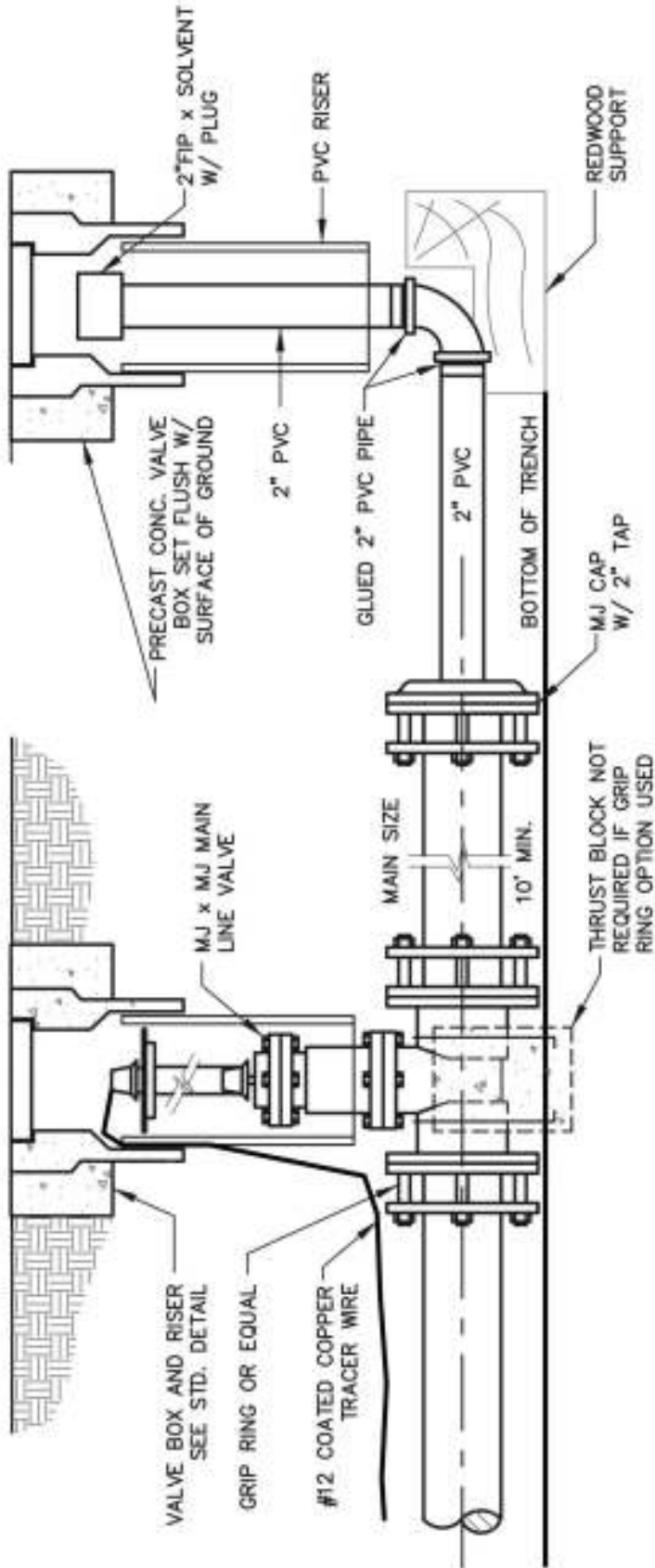
APPROVED DATE: 9/2016
 STD. DWG.
WS-114



HUMBOLDT COMMUNITY SERVICES DISTRICT

ENDLINE BLOW-OFF

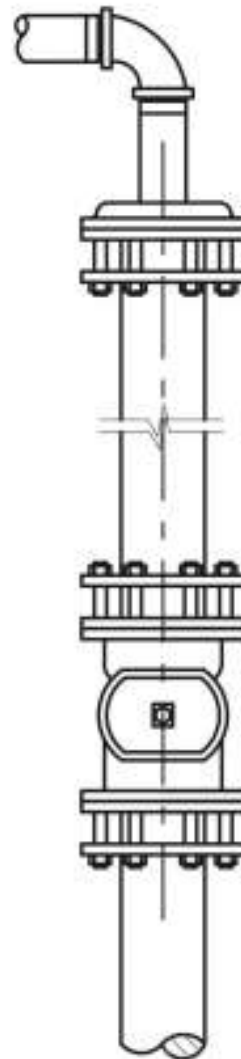
APPROVED DATE: 9/2016
 STD. DWG.
WS-115



ELEVATION

NOTES:

1. TO BE INSTALLED IN CASES WHERE MAIN MAY BE EXTENDED IN FUTURE.
2. ALL BOLTS AND NUTS SHALL BE STAINLESS STEEL.



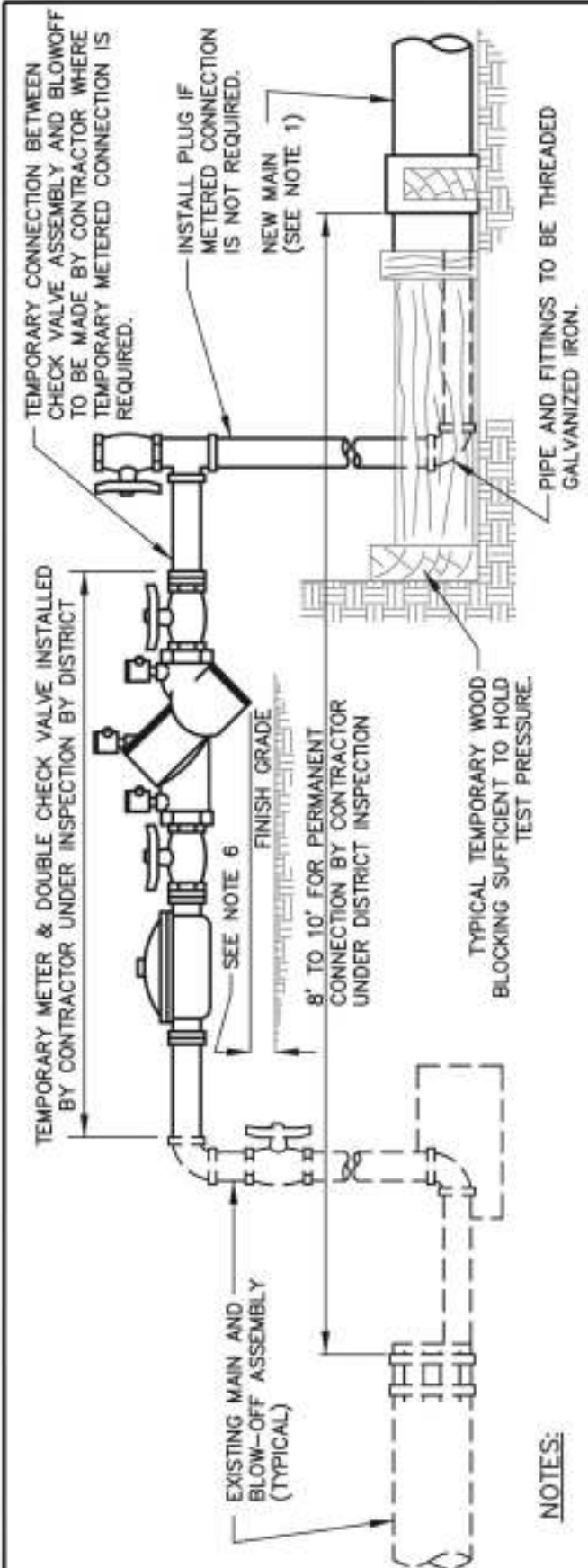
PLAN

BLOW-OFF WITH MAIN LINE VALVE

HUMBOLDT COMMUNITY SERVICES DISTRICT

TEMPORARY BLOW-OFF WITH MAIN LINE VALVE

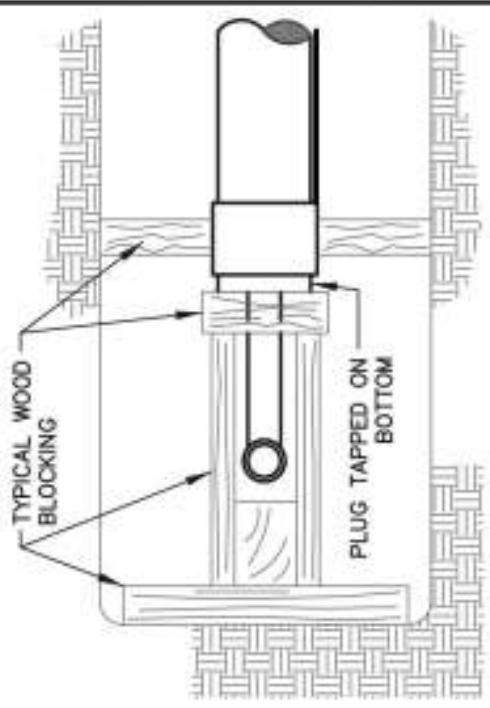
APPROVED DATE: 9/2016
 STD. DWG.
WS-116



ELEVATION

NOTES:

1. END OF NEW MAIN TO BE ON SAME LINE AND GRADE AS EXISTING WHERE FEASIBLE.
2. WOOD BLOCKING TO BE FOR THRUST PRODUCED BY TEST PRESSURE PLUS 50 P.S.I.
3. SAFE BEARING LOAD OF SOIL FOR HORIZONTAL THRUST SHALL NOT BE EXCEEDED.
4. THE CONTRACTOR SHALL MAKE FINAL TIE-INS AT THE DEVELOPERS EXPENSE UNDER THE INSPECTION OF A DISTRICT REPRESENTATIVE.
5. SHOULD THE BLOWOFF ON THE EXISTING MAIN BE LOCATED OUT OF THE TRAVELED WAY. THE TEMPORARY BLOWOFF PIPING SHALL BE EXTENDED OUT OF THE TRAVELED WAY AND THE RISERS, METER, AND CHECK VALVE WILL BE INSTALLED OUT OF TRAVELED WAY.
6. CLEARANCE TO BE 6" ABOVE INUNDATION LEVEL OR 12" MIN. ABOVE FIN. GRADE.
7. TWO INCH TEMPORARY CONSTRUCTION METER ACCEPTABLE UNTIL COMBUSTABLE MATERIAL STORED ON SITE OR CONSTRUCTION ABOVE GRADE BEGINS.



PLAN

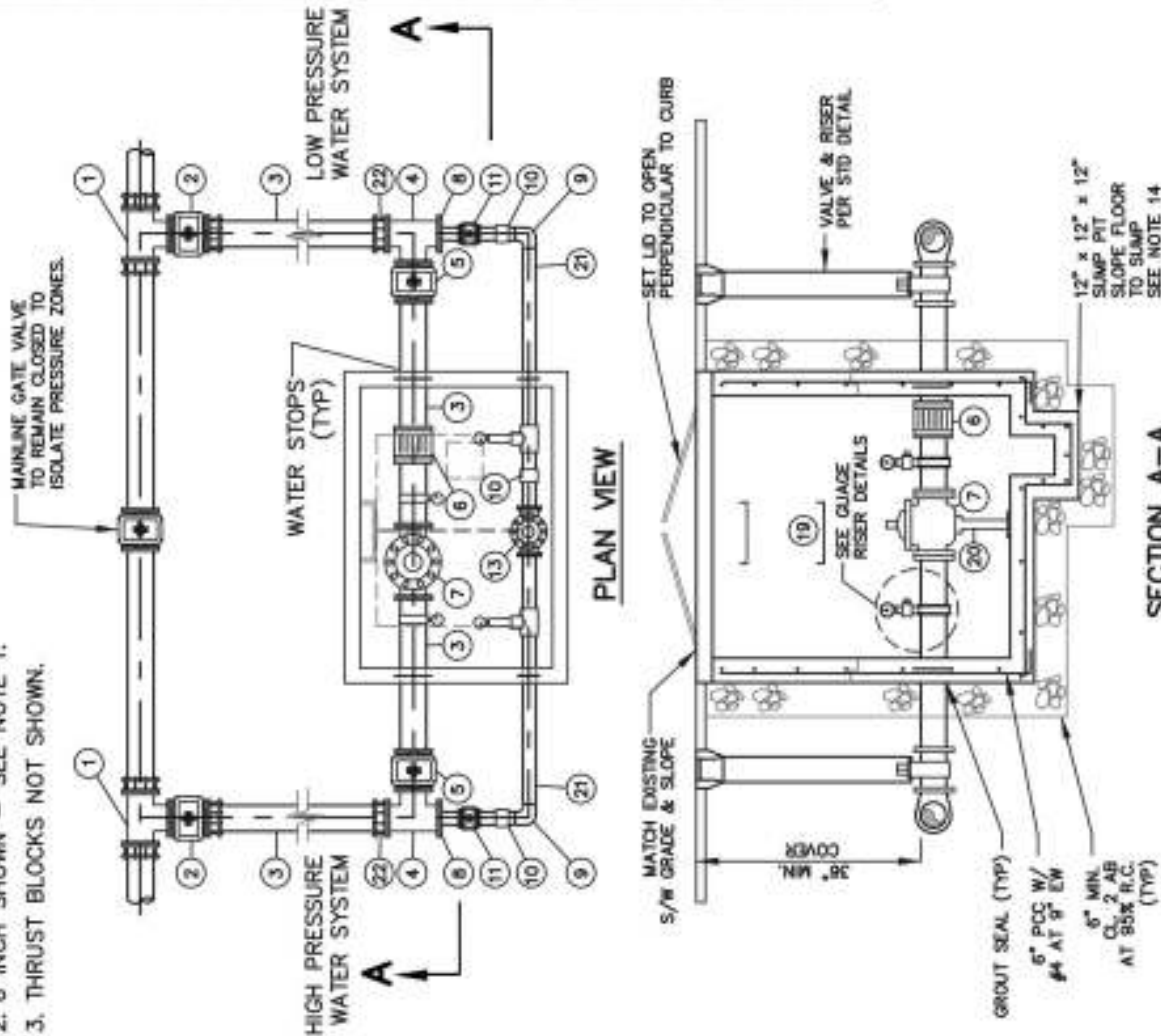
HUMBOLDT COMMUNITY SERVICES DISTRICT

TEMP. BLOW-OFF AND/OR METERED CONNECTION MAINS UNDER CONNECTIONS

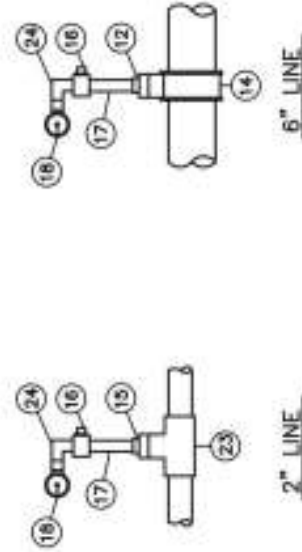
APPROVED DATE: 9/2016
STD. DWG.
WS-117

NOTES:

1. SEE WS-118B FOR P.R.V. NOTES.
2. 6 INCH SHOWN - SEE NOTE 1.
3. THRUST BLOCKS NOT SHOWN.



NO	ITEM
1	8" x 6" TEE (MJ x FLG)
2	6" GATE VALVE (FLG x MJ) (CLOW)
3	6" WATER MAIN (DIP IN VAULT)
4	6" TEE (FLG)
5	6" GATE VALVE (FLG) (CLOW)
6	6" TRANSITION COUPLING (ROMAC 501)
7	6" FLG PRV - HIGH FLOW (WILKINS)
8	6" BLIND FLG. W/ 2" TAP
9	2" IPS G.I.P. ELL.
10	2" UNION
11	2" GATE VALVE (CLOW)
12	3/4" x 1/4" BRASS BUSHING
13	2" PRV - LOW FLOW (WILKINS)
14	6" x 3/4" DOUBLE STRAP SADDLE ROMAC 202NS
15	1" x 1/4" PVC REDUCER
16	1/4" BALL VALVE (BRASS)
17	1/4" x 6" BRASS NIPPLE
18	PRESSURE GAUGE (GLYCERIN FILLED, TOTAL 4)
19	POLYETHYLENE ACCESS STEPS 12" O.C.
20	ADJUSTABLE PIPE SUPPORTS EA. PRV
21	2" G.I.P. W/ 3M TAPE WRAP (TYP)
22	6" FLG x MJ ADAPTER W/ GRIP RINGS
23	2" x 2" x 1" TEE
24	1/4" STREET ELBOW



GAUGE RISER DETAIL

HUMBOLDT COMMUNITY SERVICES DISTRICT

PRESSURE REDUCING STATION

APPROVED DATE: 9/2016
 STD. DWG.
WS-118A

P.R.V. NOTES:

1. PRV PIPE SIZES SHALL BE SIZED FOR THE DESIGN FLOW REQUIRED.
2. THE TYPICAL PRV VAULT SHALL BE A MINIMUM I.D. 5' X 5' X 5' DEEP, 6" THICK REINFORCED CONCRETE (3250 PSI) W/ #4 AT 9", LAP SPLICED PER ACI CODE. THE LID SHALL BE A 5' X 5' SPRING ASSISTED DOUBLE LEAF ALUMINUM LID WITH FLUSH LOCKING MECHANISM. THE LID SHALL BE A BILCO, HALLIDAY, OR APPROVED EQUAL FOR TRAFFIC LOADING CONDITIONS. THE FINAL VAULT PRODUCT SHALL BE WATERTIGHT. THE VAULT SHALL BE A MINIMUM OF 2 SECTIONAL UNITS FOR EASE OF INSTALLATION WITH TONGUE & GROOVE MATCH JOINTS DOUBLE SEALED WITH KENT SEAL. THE LID MAY BE INTERGRALLY POURED WITH THE TOP SECTION IF FINISHED GRADE IS FLAT, OR SHALL BE A SEPERATELY CAST TOP SLAB THAT CAN BE ADJUSTED AND GROUTED TO MATCH SLOPE CONDITIONS. THE DESIGN ENGINEER MAY BE REQUIRED TO PROVIDE VAULT AND LID FABRICATION DETAIL DRAWINGS AS DETERMINED BY THE DISTRICT.
3. ADJUSTABLE PIPE SUPPORTS TO BE PLACED UNDER P.R.V'S.
4. ALL EXPOSED PIPING SHALL BE COATED WITH BITUMASTIC OR APPROVED EQUAL AFTER NUTS ARE TIGHTENED.
5. ALL PRESSURE REDUCING VALVES SHALL BE EPOXY FUSED INSIDE AND OUTSIDE.
6. PIPING SHALL BE CENTERED HORIZONTALLY IN THE VAULT AND PROVIDE 12" MIN. CLEARANCE FROM WALLS, LIDS, FLOORS, AND PIPES.
7. THE VAULT FLOOR SHALL BE ROUGH BROOM FINISH AND 0.5% MIN. SLOPE TO SUMP.
8. CAST VAULT LID TO ALLOW EASY ACCESS TO STEPS AND UNRESTRICTED REMOVAL OF 6" P.R.V.
9. P.R.V. VALVES TO BE DOUBLE GASKETED.
10. FIELD VERIFY VAULT DEPTH KNOCKOUT LOCATIONS.
11. ALL BOLTS SHALL BE STAINLESS STEEL.
12. PROVIDE (4) PRESSURE GUAGES, GLYCERIN FILLED.
13. CONTRACTOR SHALL FURNISH & PROVIDE ALL SPECIALS & ADAPTERS REQUIRED FOR A COMPLETE FUNCTIONING PRV STATION. DIS-SIMILAR METAL CONTACT SHOULD BE AVOIDED.
14. SUMP PIT SHALL ONLY BE USED WHERE 4" GRAVITY STORM DRAIN OUTLET WILL NOT WORK.
15. PRV SENSING LINE SHALL BE HIGH PRESSURE HYDRAULIC HOSE (NOT COPPER).

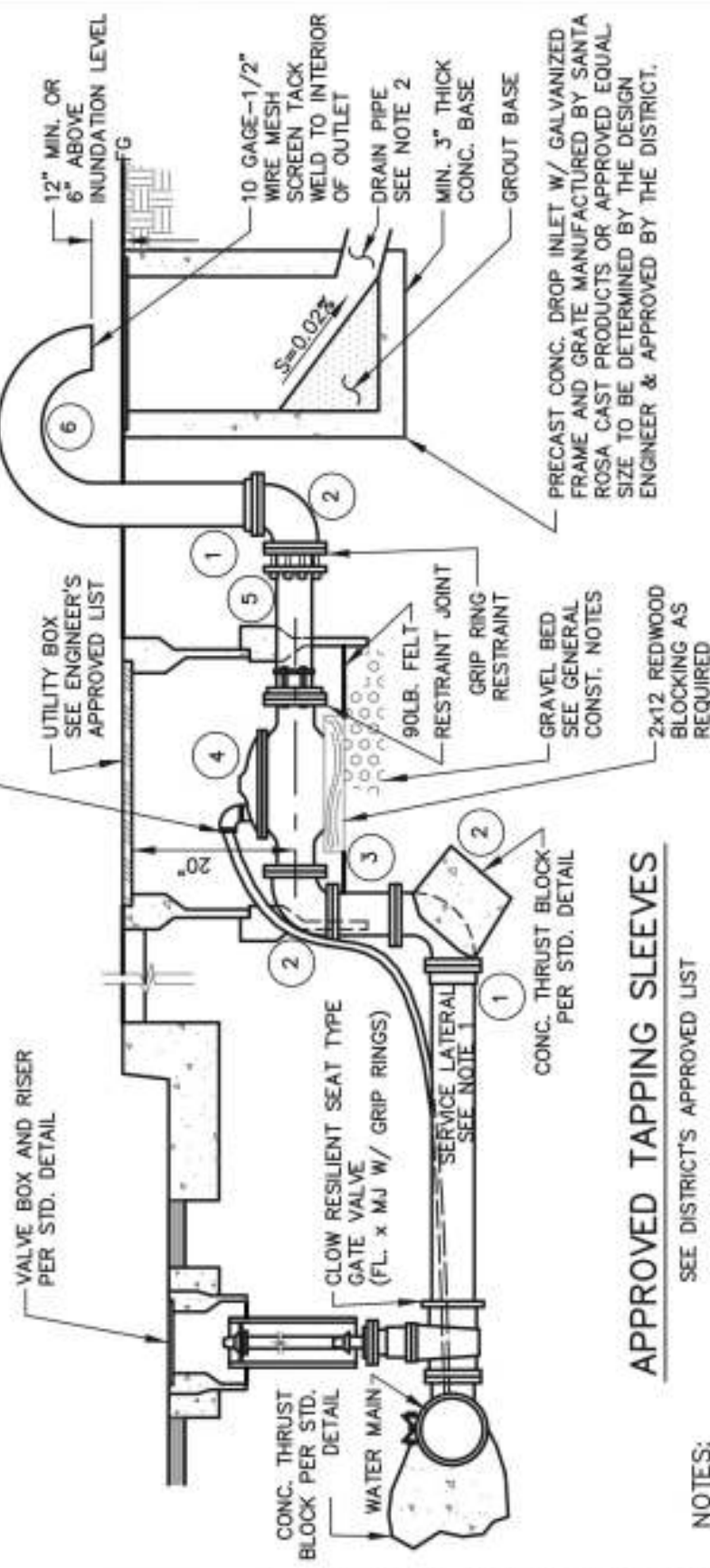
**HUMBOLDT COMMUNITY
SERVICES DISTRICT**

**PRESSURE REDUCING
STATION NOTES**

APPROVED DATE: 9/2018
STD. DWG.

WS-118B

1" PE SDR 9 SENSING LINE--ATTACH TO SURGE ANTICIPATOR. MAKE 1" HORIZONTAL TAP CONNECTION TO WATER MAIN. APPROVED TAPPING SADDLES & VALVES PER STD. DETAIL.



APPROVED TAPPING SLEEVES

NOTES:
SEE DISTRICT'S APPROVED LIST

1. SERVICE LATERAL PIPE SHALL BE EITHER 4" DIA. OR EQUAL IN SIZE TO THE SURGE ANTICIPATOR VALVE, WHICHEVER IS GREATER. THE PIPE MATERIAL SHALL BE CL. 150 DUCTILE IRON, UNLESS OTHERWISE SHOWN ON THE PLANS. SHOULD THE SURGE ANTICIPATOR VALVE BE SMALLER THAN 4", INSTALL A FLANGED REDUCER AS REQUIRED ON THE INLET SIDE OF THE VALVE.
2. DISCHARGE WATER SHALL DRAIN EITHER TO AN EXISTING DRAINAGE SYSTEM OR TO DAYLIGHT. THE PROJECT ENGINEER SHALL SUBMIT HIS/HER DESIGN TO THE APPROPRIATE AGENCIES FOR APPROVAL.
3. ALL PIPING AND FITTINGS ON THE DISCHARGE SIDE OF THE SURGE ANTICIPATOR VALVE SHALL BE EQUIVALENT IN SIZE TO THE VALVE.
4. DISCHARGE RISER SHALL BE FABRICATED FROM STANDARD WELDED STEEL PIPE. WELDING SHALL CONFORM TO AWWA STANDARD C206. THE RISER ASSEMBLY SHALL BE TAPE COATED PER AWWA STANDARD C209.
5. CONTACT THE DISTRICT FOR SPECIFIC TELEMETRY REQUIREMENTS WHICH MUST BE MET.
6. SEE GENERAL CONSTRUCTION NOTES.
7. SURGE ANTICIPATOR VALVE INSTALLATION IS SHOWN. PRESSURE RELIEF VALVE INSTALLATION IS SIMILAR EXCEPT NO SENSING LINE IS REQUIRED.

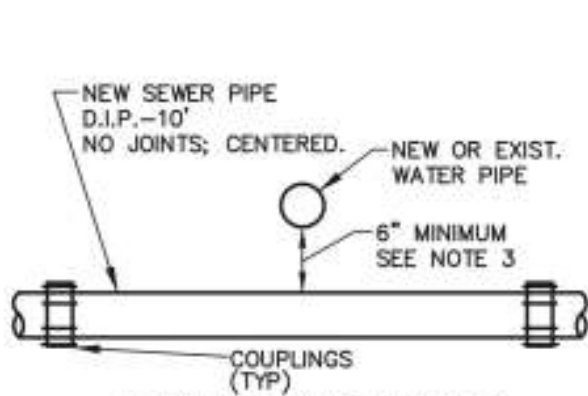
PARTS LIST

NO.	ITEM DESCRIPTION
1	FLG x MJ ADAPTER W/ GRIP RINGS
2	C.I.P. FLG. 90" ELL-SIZE AS REQUIRED
3	D.I.P. FLG. SPOOL-LENGTH AS REQUIRED
4	SURGE ANTICIPATOR CLA-VALVE MODEL 52-03
5	PRESSURE RELIEF CLA-VALVE MODEL 50G-01
6	FLG. DIP-LENGTH AS REQUIRED FABRICATED WELDED STEEL DISCHARGE PIPE SEE NOTE 4

HUMBOLDT COMMUNITY SERVICES DISTRICT

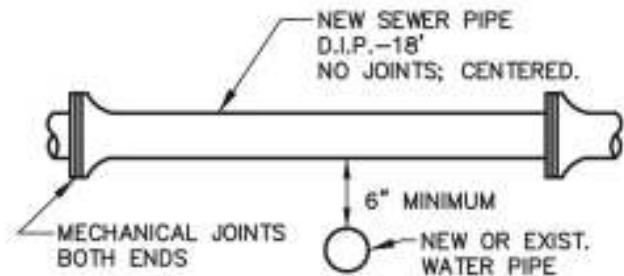
TYPICAL INSTALLATION OF SURGE OR PRV VALVE

APPROVED DATE: 9/2016
STD. DWG.
WS-119



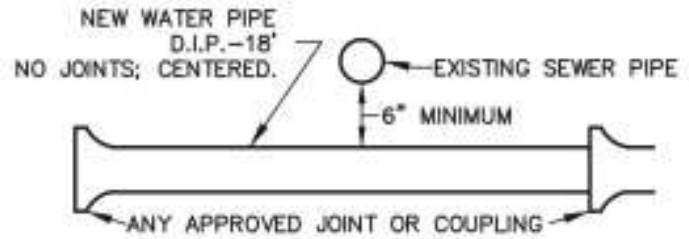
**NEW SEWER UNDER
NEW OR EXISTING WATER**

CASE 1



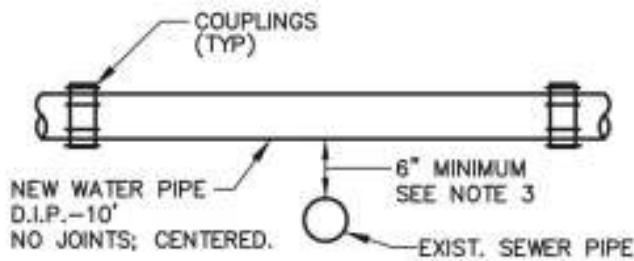
**NEW SEWER OVER
NEW OR EXISTING WATER**

CASE 2



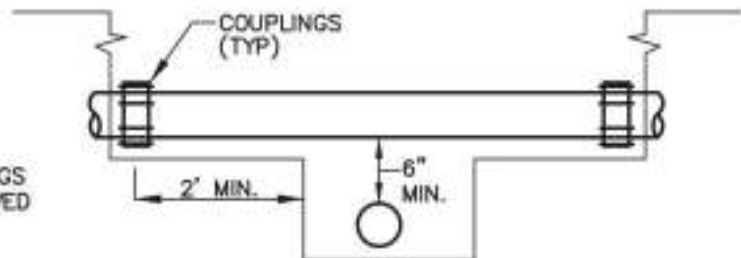
**NEW WATER UNDER
EXISTING SEWER**

CASE 3



**NEW WATER OVER
EXISTING SEWER**

CASE 4



NEW PIPE UNDER EXISTING

CASE 5 - SEE NOTE 4

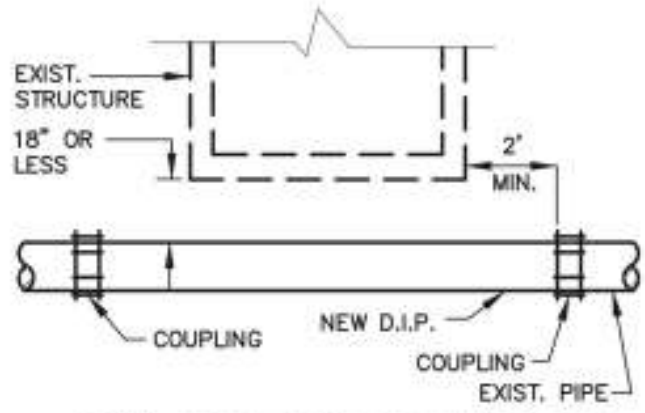
NOTES

1. THIS STANDARD APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS OF LARGER DIAMETER SHALL BE AS APPROVED BY THE DISTRICT.
2. ALL NEW DUCTILE IRON SHALL BE WRAPPED IN POLYETHYLENE FILM IN TUBE FORM PER DISTRICT CONSTRUCTION SPECIFICATIONS.
3. WHERE SEWER CROSSES BELOW A WATER MAIN, WITH 1' OR MORE OF VERTICAL CLEARANCE, NO SPECIAL INSTALLATION IS REQUIRED.
4. NEW PIPE UNDER EXISTING-CASE 5 SHALL BE USED WHEN THE EXISTING PIPE HAS A JOINT OVER OR WITHIN 2' OF THE NEW TRENCH.
5. ANY PIPE-PIPE CROSSING WITH LESS THAN 6" VERTICAL CLEARANCE SHALL NOT BE INSTALLED WITHOUT APPROVAL OF THE DISTRICT.
6. WATER MAIN LOWERING PER STD. DETAIL.
7. SEE ENGINEER'S APPROVED LIST FOR APPROVED COUPLINGS.

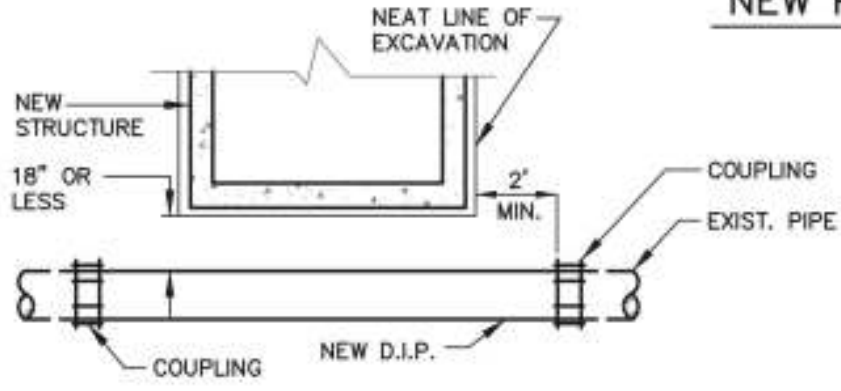
**HUMBOLDT COMMUNITY
SERVICES DISTRICT**

**PIPE - PIPE
CROSSING DETAIL**

APPROVED DATE: 9/2016
STD. DWG.
WS-120



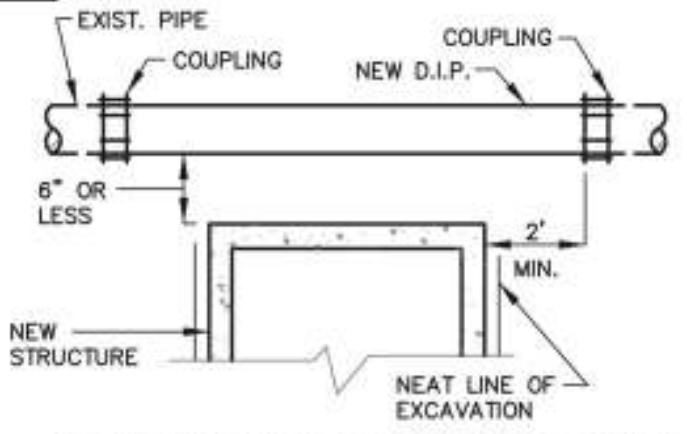
**NEW PIPE UNDER EXISTING
TYPE A**



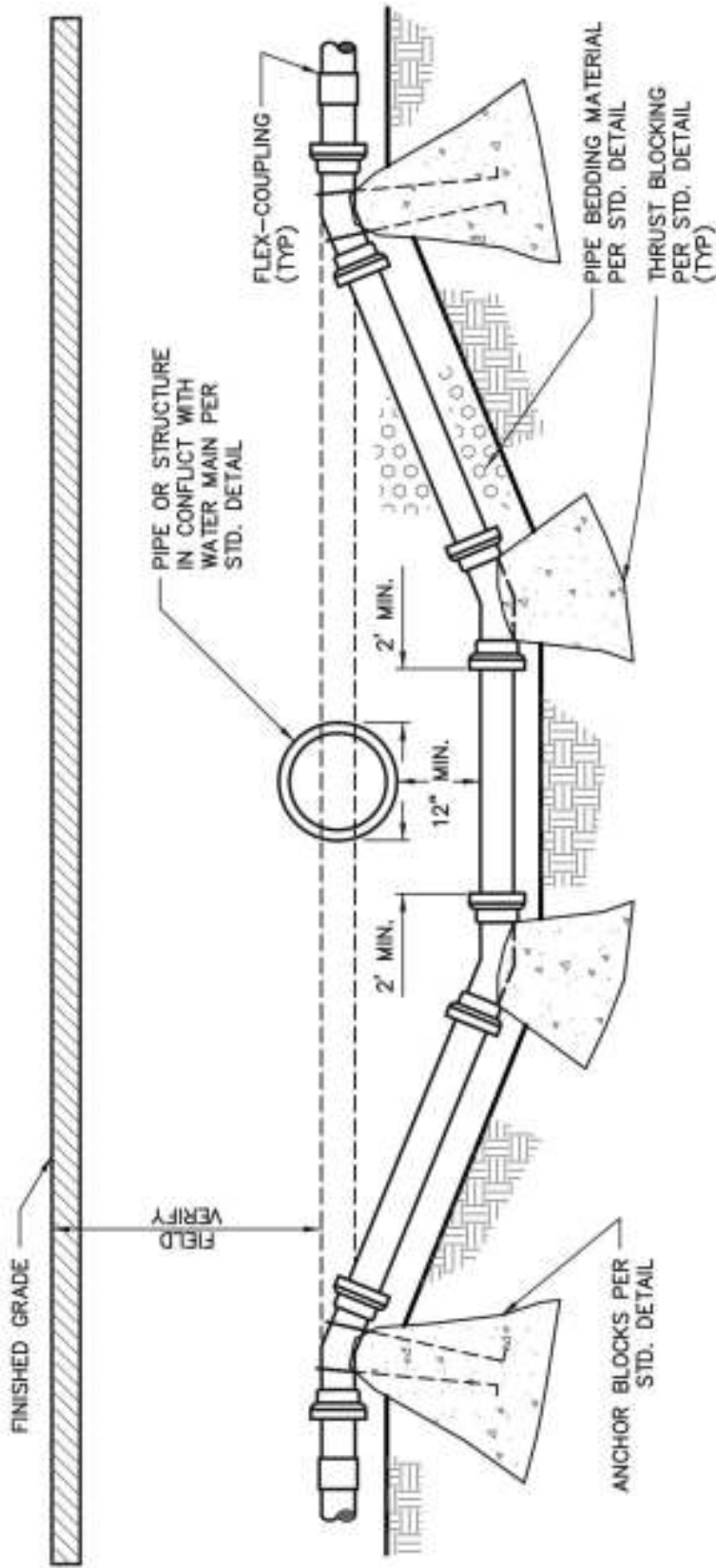
**NEW STRUCTURE OVER EXISTING
TYPE B**

NOTES:

1. THIS STD. APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS INVOLVING PIPES OF LARGER DIAMETER SHALL BE AS APPROVED BY THE DISTRICT.
2. WHEN PIPES CROSS WITHIN THE DIMENSIONS SHOWN, A NEW DUCTILE IRON PIPE SECTION SHALL BE INSTALLED AS DETAILED.
3. ALL DUCTILE IRON PIPE SHALL BE ENCASED IN POLYETHYLENE FILM IN TUBE FORM.
4. ANY TYPE "A" INSTALLATION REQUIRING MORE THAN ONE LENGTH OF PIPE SHALL BE ENCASED PER STD. DETAIL
5. SEE ENGINEER'S APPROVED LIST FOR APPROVED COUPLINGS.



**NEW STRUCTURE UNDER EXIST.
TYPE C**



NOTES:

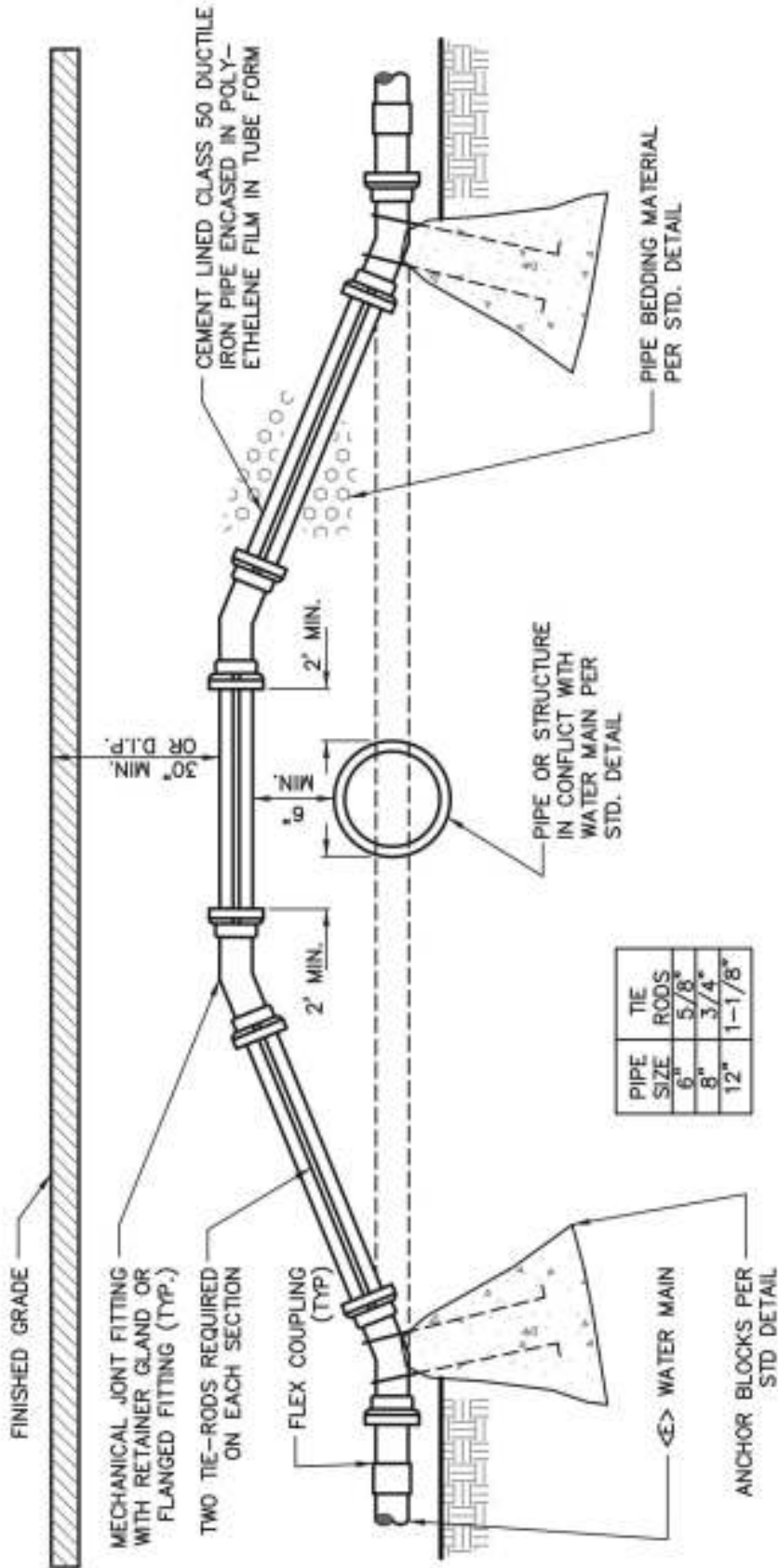
1. ALL PIPE & FITTINGS SHALL BE MJ DIP W/ RETAINER GLANDS OR PVC WITH GRIP RING OPTION.
2. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS.
3. ALTERNATE DESIGN SHALL BE REVIEWED AND APPROVED BY DISTRICT.

TYPICAL WATER MAIN LOWERING DETAIL

HUMBOLDT COMMUNITY SERVICES DISTRICT

TYPICAL WATER MAIN LOWERING DETAIL

APPROVED DATE: 9/2016
 STD. DWG.
WS-122



PIPE SIZE	TIE RODS
6"	5/8"
8"	3/4"
12"	1-1/8"

NOTES:

1. ALL PIPE & FITTINGS SHALL BE MJ DIP W/ RETAINER GLANDS OR PVC IF GRIP RING OPTION USED.
2. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS.
3. TO BE USED ONLY WITH THE APPROVAL OF THE DISTRICT.
4. CL. 52 DUCTILE IRON REQUIRED WHERE COVER IS LESS THAN THAT REQUIRED BY THE GENERAL CONSTRUCTION NOTES.
5. ALTERNATE DESIGN TO BE REVIEWED AND APPROVED BY THE DISTRICT.

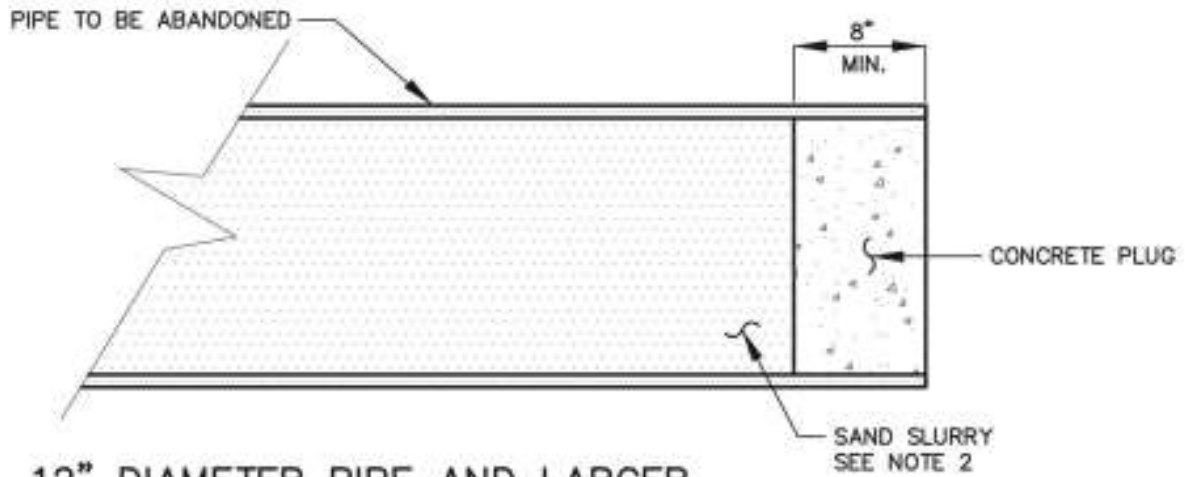
TYPICAL WATER MAIN INSTALLATION OVER STRUCTURE

HUMBOLDT COMMUNITY SERVICES DISTRICT

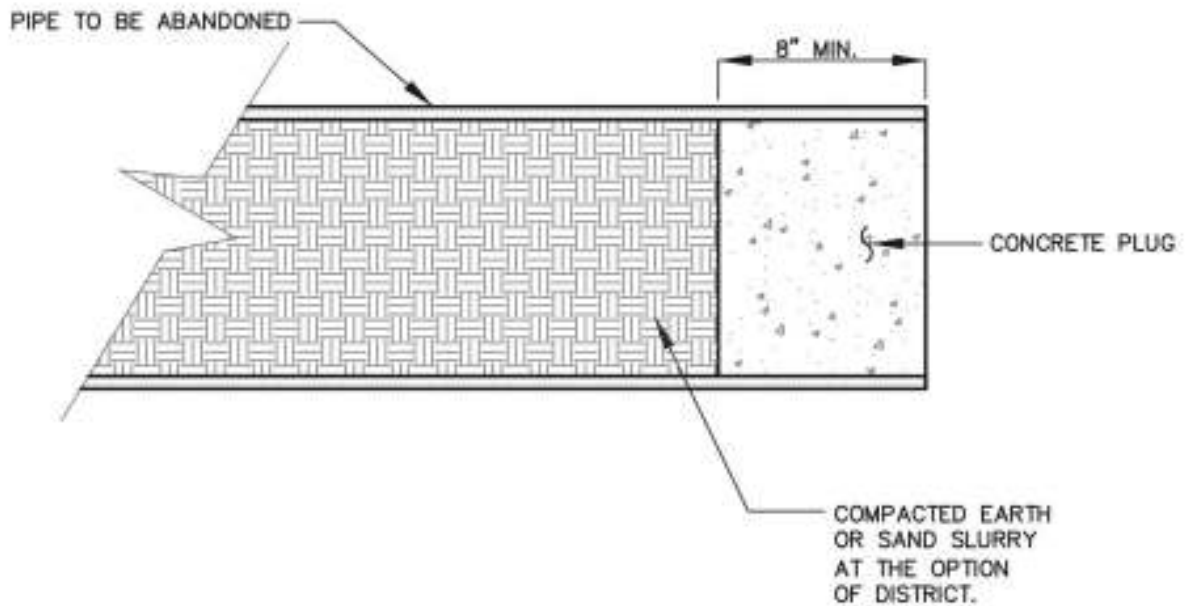
TYPICAL WATER MAIN INSTALLATION OVER STRUCTURE

APPROVED DATE: 9/2016
STD. DWG.

WS-123



12" DIAMETER PIPE AND LARGER



10" DIAMETER PIPE AND SMALLER

NOTES:

1. PIPE PLUGS SHALL BE INSTALLED TO THE SATISFACTION OF THE DISTRICT.
2. ABANDONED PIPES, 12" AND LARGER, SHALL BE BROKEN INTO EVERY 50' AND SHALL BE FILLED COMPLETELY WITH SAND SLURRY.

HUMBOLDT COMMUNITY SERVICES DISTRICT

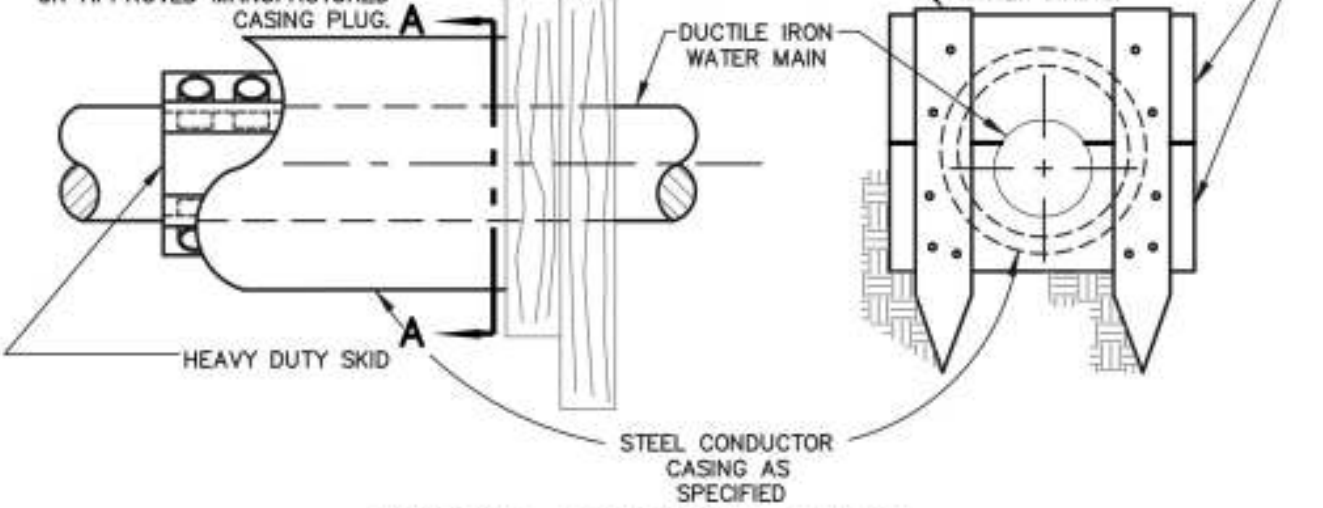
ABANDONED PIPE PLUG DETAIL

APPROVED DATE: 9/2016
STD. DWG.
WS-124

MIN. 2" THICK ROUGH CUT TREATED REDWOOD PLANKS WITH OPENING CUT TO FIT WATER MAIN OR APPROVED MANUFACTURED CASING PLUG.

REDWOOD 2x4 STAKES

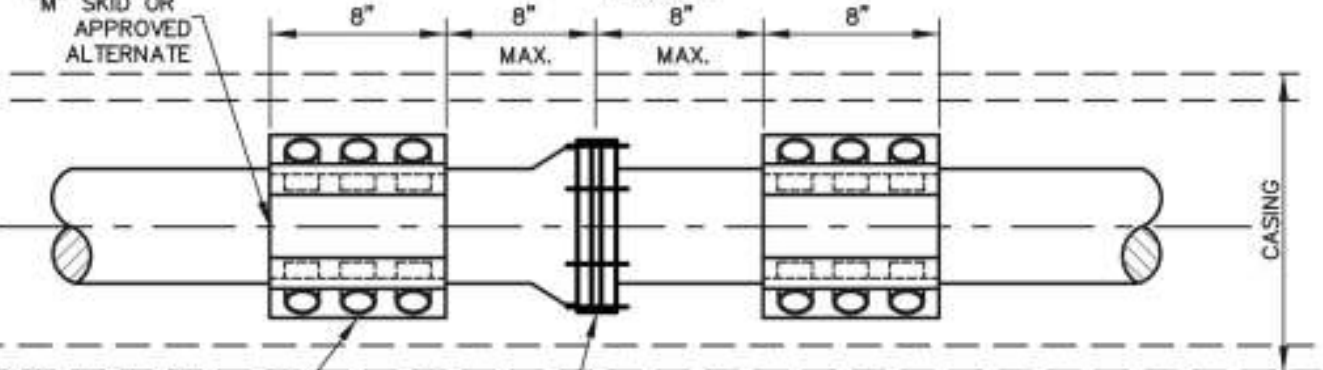
MIN. 2" THICK ROUGH CUT TREATED REDWOOD PLANKS WITH OPENING CUT TO FIT WATER MAINS.



TYPICAL DIRT STOP DETAIL

CALPICO MODEL "M" SKID OR APPROVED ALTERNATE

NO SCALE



TYPICAL PIPE JOINT & INSULATOR

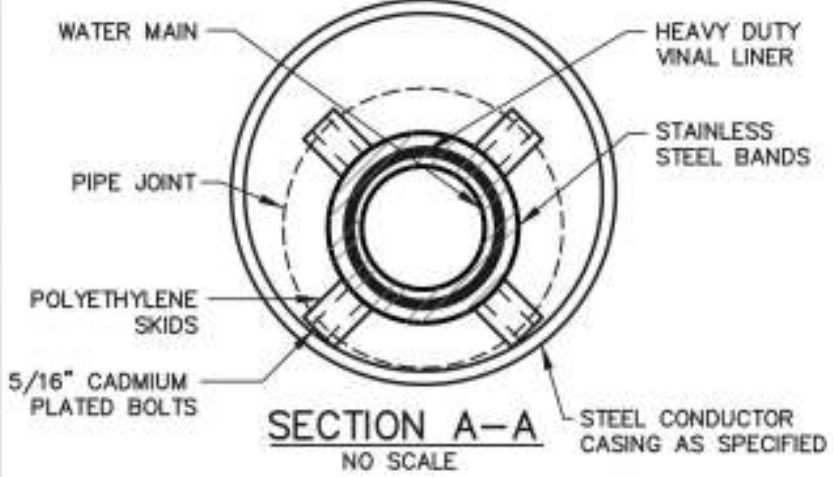
NO SCALE

SKID HEIGHT TO BE SUCH THAT PIPE JOINT DOES NOT REST ON CASING.

MECHANICAL JOINT, DUCTILE IRON PIPE W/ RETAINER GLANDS OR TR FLEX RESTRAINED JOINT PIPE.

NOTES:

1. INSTALL PER MANUFACTURERS SPECIFICATIONS
2. SEE GENERAL CONST. NOTES.
3. WHERE CONDUCTOR CASING IS EXISTING R.C.P., REDWOOD SKIDS MAY BE INSTALLED IN LIEU OF POLYETHYLENE SKIDS WITH DISTRICT APPROVAL.
4. CASING MAY REQUIRE SAND FILL AT THE OPTION OF DISTRICT.



SECTION A-A

STEEL CONDUCTOR CASING AS SPECIFIED

MINIMUM SIZE CASING REQUIRED

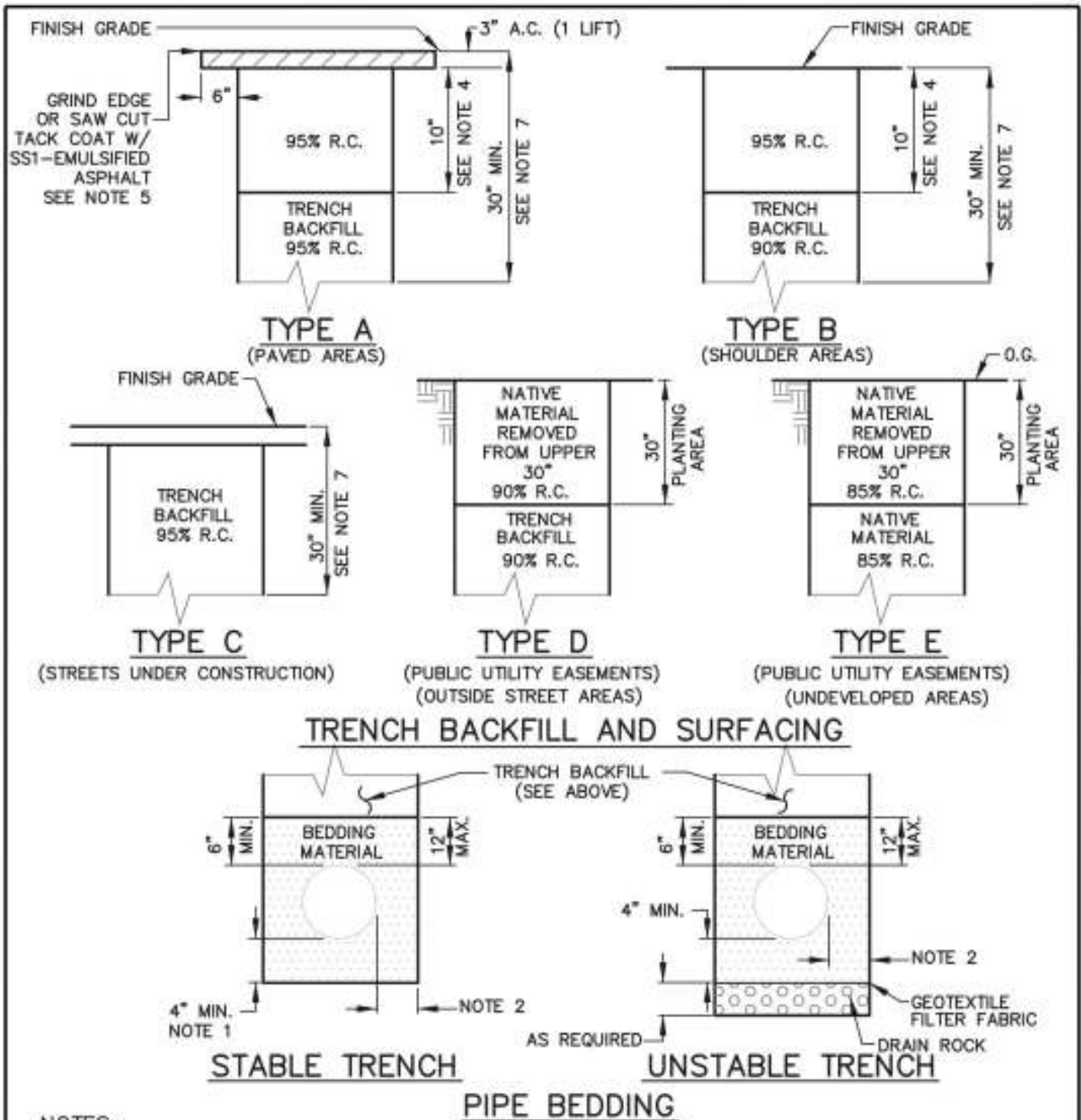
PIPE SIZE	6"	8"	12"	14"	16"
CASING SIZE (INSIDE DIA.)	16"	16"	20"	24"	30"
CASING WALL THICKNESS	.250	.250	.250	.250	.375

HUMBOLDT COMMUNITY SERVICES DISTRICT

TYP. DIRT STOP AND WATER MAIN ENCASEMENT

APPROVED DATE: 9/2016
STD. DWG.
WS-125

<u>SEWER STANDARDS</u>		
<i>Standard Drawing No.</i>	<i>Description</i>	<i>Date</i>
SS-200A	Standard Trench Details - Water and Sewer	SEP 16
SS-200B	Standard Trench Detail Notes	SEP 16
SS-201	Standard 48" Diameter Precast Concrete Manhole	SEP 16
SS-202	Standard 60" Diameter Precast Concrete Manhole	SEP 16
SS-203	Outside Drop-In Sanitary Sewer Manhole	SEP 16
SS-204	Inside Drop-In Sanitary Sewer Manhole	SEP 16
SS-205	Standard Manhole Frame and Cover	SEP 16
SS-206	Standard Manhole Channel Details	SEP 16
SS-207	Abandoned Manhole Detail	SEP 16
SS-208	Sewer Service Lateral	SEP 16
SS-209	Sewer Service Lateral Cleanout	SEP 16
SS-210	Mainline Cleanout	SEP 16
SS-211	Pressure Main Connection to Endline Main Cleanout	SEP 16
SS-212	Pressure Sewer Lateral Service Connection	SEP 16
SS-213	Turnaround	SEP 16
SS-214	Grease, Sand, and Oil Interceptor (GOI)	SEP 16
SS-214A	Grease, Sand, and Oil Interceptor (GOI)	SEP 16
SS-215	Sampling Box	SEP 16
SS-216	Pressure Sewer Main Valve Riser	SEP 16



NOTES:

1. 1/4 PIPE O.D. OR 4" MIN. WHEN EXCAVATION IS IN ROCKY GROUND.
2. PIPE DIAMETER 18" OR LESS: 6" MIN., 9" MAX./PIPE DIA. GREATER THAN 18": 9" MIN., 12" MAX.
3. RELATIVE COMPACTION DESIGNATED R.C.
4. THE MINIMUM STREET STRUCTURAL SECTION SHALL BE 3" A.C. ON 10" A.B. OR MATCH EXISTING PAVEMENT, WHICHEVER IS THICKER, SPECIFIED ON PLANS, OR REQUIRED BY ENCROACHMENT PERMIT.
5. SAW CUT PAVEMENT SIX INCHES FROM EDGE OF TRENCH AFTER TRENCH IS BACKFILLED.
6. MINIMUM PIPE COVER SHALL BE 36" (WATER MAIN), OR 42" (SEWER MAIN) FROM TOP OF PIPE.
7. NEW STREETS AND SHOULDER AREAS UNDER CONSTRUCTION SHALL BE COMPACTED TO 95% RELATIVE COMPACTION FOR A MINIMUM DEPTH OF 30" PER CALTRANS SECTION 19-5.03.
8. INSTALL #12 COPPER COATED TRACER WIRE ON/OVER ALL NON-METALLIC MAINS.

HUMBOLDT COMMUNITY SERVICES DISTRICT

WATER AND SEWER STANDARD TRENCH DETAILS

APPROVED DATE: 9/2016
 STD. DWG.
SS-200A

I. MATERIAL SPECIFICATIONS:

- 1. BEDDING MATERIAL:
 - A.) PEA GRAVEL- CONFORMING TO CALTRANS SECTION 68-2.02F, PERMEABLE MATERIAL, CLASS 1, TYPE B.
 - B.) CL 2 AB. - CONFORMING TO CALTRANS SECTION 26-1.02, CLASS 2 AGGRIGATE BASE, 3/4" MAXIMUM.
- 2. AGGREGATE BASE:
 - A.) CL 2 AB. - CONFORMING TO CALTRANS SECTION 26-1.02, CLASS 2 AGGRIGATE BASE, 3/4" MAXIMUM.
- 3. DRAIN ROCK:
 - A.) NO. 3 ROCK- SHALL BE A WASHED ROCK OF THE NOMINAL SIZE DESIGNATED AS 1" TO 2".
- 4. GABION ROCK:
 - A.) GABION ROCK- SHALL BE A WASHED OR NON-WASHED ROCK OF THE NOMINAL SIZE DESIGNATED AS 4" TO 12".
- 5. NATIVE MATERIAL:
 - A.) NATIVE MATERIAL- NATIVE MATERIAL USED AS BACKFILL SHALL BE FREE OF ORGANIC MATTER, REFUSE OR OTHER UNSATISFACTORY MATERIALS, STONES, OR LUMPS GREATER THAN OR EXCEEDING 3" IN GREATEST DIMENSION.
- 6. SHALE MATERIAL:
 - A.) SHALE MATERIAL- SHALE MATERIAL SHALL MEET THE QUALITY REQUIREMENTS FOR CL 2 AB AND CONTAIN ENOUGH FINE MATERIALS TO BE ABLE TO BE COMPACTED TO 95% RC IN A TIGHT SUSTAINABLE MATRIX.

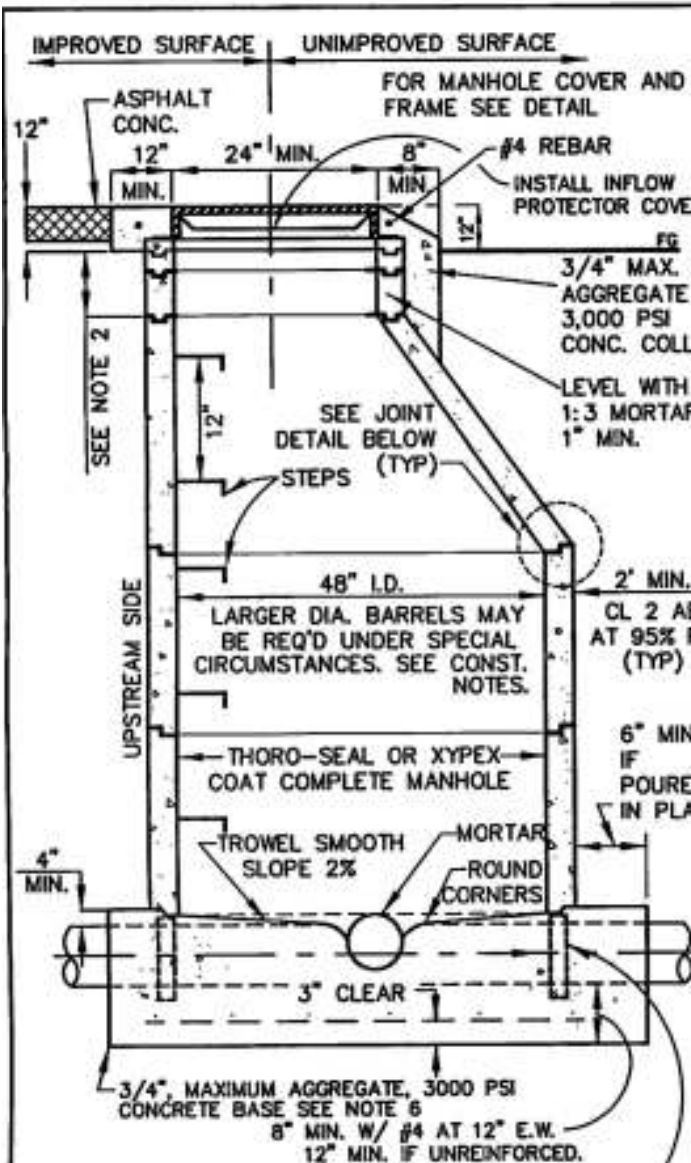
II. COMPACTION REQUIREMENTS:

- 1. BEDDING MATERIAL:
 - A.) PEA GRAVEL SHALL EITHER BE HAND TAMPED UNDER AND AT THE SIDES OF THE PIPES IN LIFTS NOT GREATER THAN 6" OR SHAPED AND COMPACTED PRIOR TO PIPE INSTALLATION.
 - B.) CL 2 AB SHALL MEET THE ABOVE REQUIREMENTS AND SHALL ADDITIONALLY BE COMPACTED UNDER THE PIPE TO 90% RC AND UP TO THE SPRING LINE OF THE PIPE TO 90% RC IN TWO SEPERATE LIFTS RESULTING IN A FIRM UNYIELDING BEDDED TRENCH. JETTING SHALL NOT BE ALLOWED.
- 2. AGGREGATE BASE:
 - A.) AGGREGATE BASE SHALL BE COMPACTED WITH MECHANICAL HAND OPERATED, OR EQUIPMENT MOUNTED OR TOWED METHODS TO ACHIEVE THE REQUIRED COMPACTION. IN ANY EVENT, COMPACTION METHODS SHALL NOT DAMAGE THE PIPE, EXCEED THE LOADING CAPACITY OF THE PIPE, OR RESULT IN A CHANGE TO THE DESIGN PIPE SLOPE REQUIRED OR DEFLECTION UNITS. JETTING SHALL NOT BE ALLOWED.
- 3. DRAIN ROCK:
 - A.) DRAIN ROCK SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR.
- 4. SHALE MATERIAL:
 - A.) SHALE SHALL MEET THE COMPACTION REQUIREMENTS FOR CL 2 AB.
- 5. NATIVE MATERIAL:
 - A.) NATIVE MATERIAL COMPACTED TO 90% RC SHALL MEET THE COMPACTION REQUIREMENTS OF CL 2 AB. NATIVE MATERIAL COMPACTED TO LESS THAN 90% RC MAY BE COMPACTED BY WHEEL ROLLING.

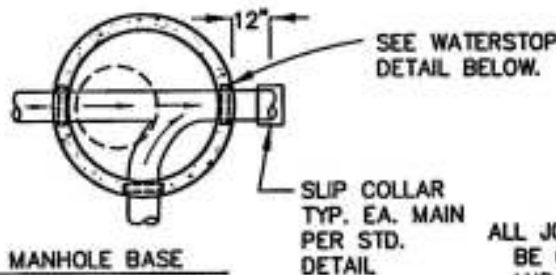
HUMBOLDT COMMUNITY SERVICES DISTRICT

WATER AND SEWER STANDARD TRENCH DETAIL NOTES

APPROVED DATE: 9/2016
STD. DWG.
SS-200B

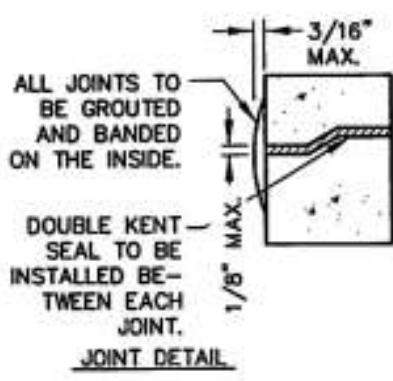


- NOTES:**
1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MIN. OF 1 FOOT ABOVE ADJACENT FINISHED GRADE.
 2. MIN. OF ONE 3" GRADE ADJUSTMENT RING. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS = 12". ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
 3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP. JOINT 1-1/2"(3/4X2-1/2") DOUBLE KENT SEAL.
 4. CONE SECTION (TAPER) MUST BE ECCENTRIC FOR 48" MANHOLE UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE DISTRICT.
 5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER MANHOLE IS SET, CUT OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT SHELF AND U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
 6. POURED-IN-PLACE BASE SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED. PRECAST BASE TO BE FROM A DISTRICT APPROVED LIST AND PLACED ON 12" THICK 3/4" DRAIN ROCK SUBBASE INSTALLED AGAINST UNDISTURBED EARTH (NOT SHOWN).
 7. JOINT BETWEEN BASE AND BARREL TO BE SEALED W/2-1/2"(3/4"X2-1/2") DOUBLE KENT SEAL, OR PLASTER 6" FILLET, 1:3 MORTAR.
 8. 3/4" MAXIMUM AGGREGATE 3000 PSI CONCRETE COLLAR W/#4 REBAR, SHALL BE BROUGHT UP TO FINISHED GRADE.
 9. STANDARD MANHOLE BARREL SECTION PER ASTM C478. BACKFILL WITH CL 2 AB AT 95% RC.
 10. BARREL AND TAPER SECTIONS MAY BE CAST IN PLACE AS APPROVED BY THE DISTRICT.
 11. STEPS SHALL BE FIBERGLASS ENCAPSULATED POLYETHYLENE.

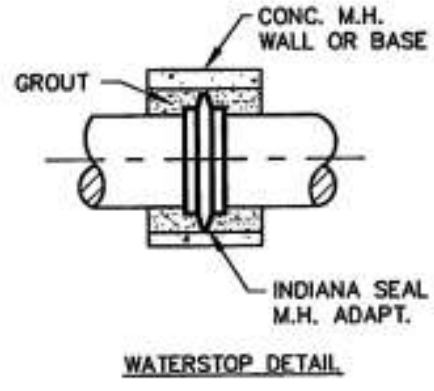


MANHOLE BASE CHANNELIZATION PLAN CHANNEL SIZE AND LENGTH TO ACCOMODATE SEWER CAMERA

A SLIP COLLAR SHALL BE INSTALLED IN THE SEWER MAIN WITHIN 12" OF THE BASE OF THE MANHOLE (TYP-NOT SHOWN) NOT REQUIRED WHEN PRECAST BASES ARE MANUF. W/ FLEX CPLGS. ALREADY INSTALLED.



ALL JOINTS TO BE GROUTED AND BANDED ON THE INSIDE.
DOUBLE KENT SEAL TO BE INSTALLED BETWEEN EACH JOINT.

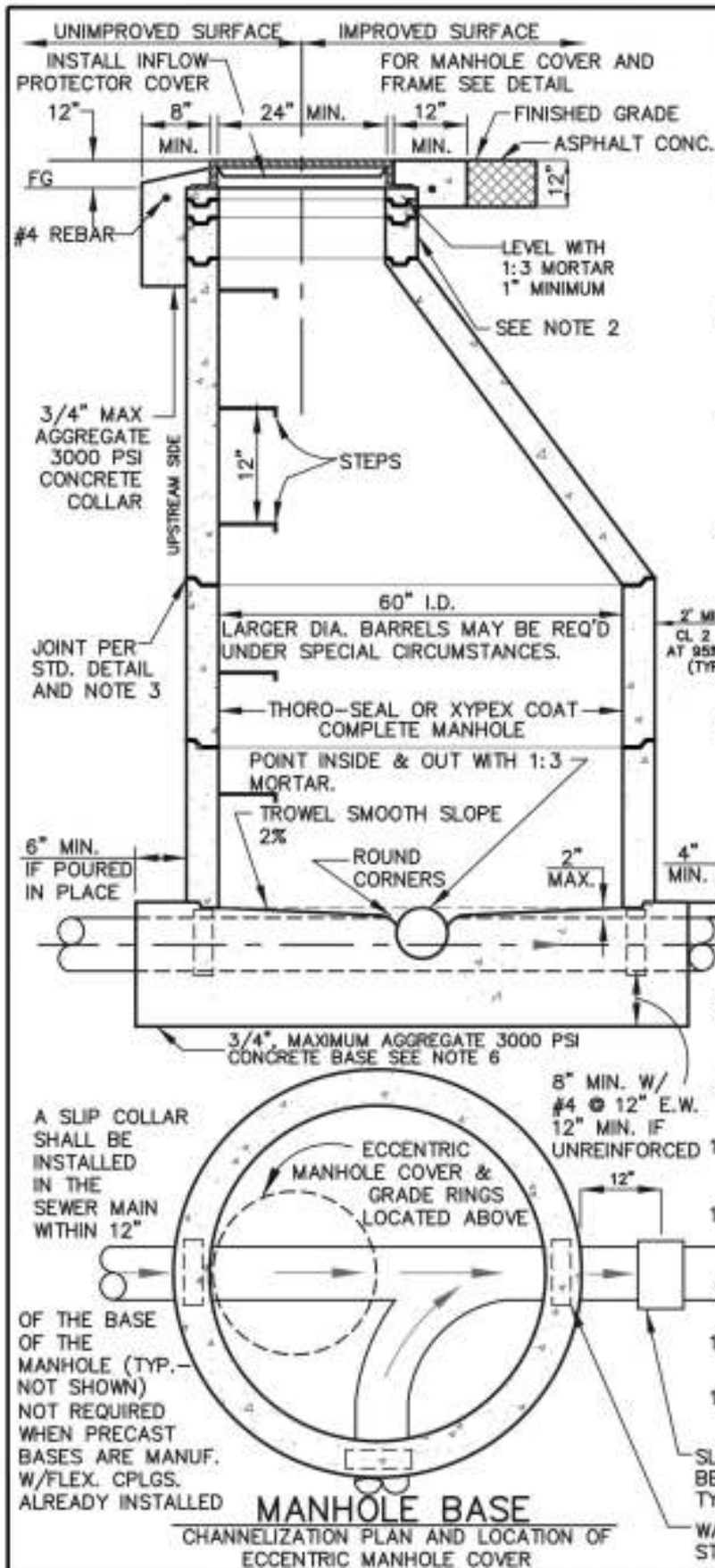


WATERSTOP DETAIL

HUMBOLDT COMMUNITY SERVICES DISTRICT

STANDARD 48" DIA. PRECAST CONCRETE MANHOLE

APPROVED DATE: 9/2016
STD. DWG.
SS-201



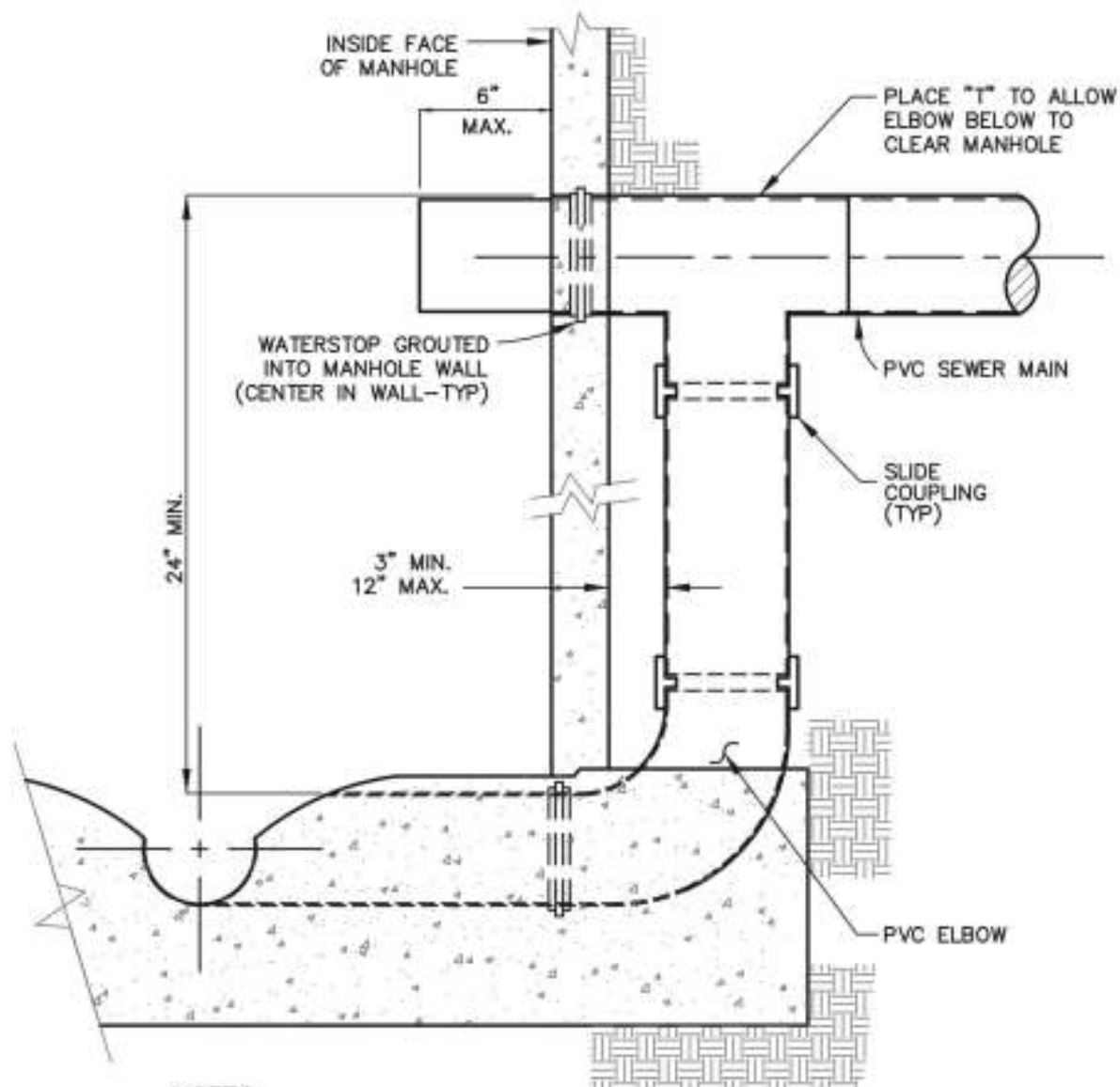
NOTES

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MIN. OF 1 FOOT ABOVE ADJACENT GRADE.
 2. MIN. OF ONE 3" GRADE ADJUSTMENT RING. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS = 12". ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
 3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP. JOINT 1-1/2" (3/4" X 2-1/2") DOUBLE KENT SEAL.
 4. CONE SECTION (TAPER) MUST BE ECCENTRIC FOR 60" MANHOLE UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE GENERAL MANAGER.
 5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER MANHOLE IS SET, CUT OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT SHELF AND U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
 6. POURED-IN-PLACE BASE SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED. PRECAST BASE TO BE FROM DISTRICT APPROVED LIST AND PLACED ON 12" THICK 3/4" DRAIN SUB-BASE INSTALLED AGAINST UNDISTURBED EARTH (NOT SHOWN).
 7. JOINT BETWEEN BASE AND BARREL SHALL BE SEALED W/ 2-1/2" (3/4" X 2-1/2") DOUBLE KENT SEAL, OR PLASTER 6" FILLET, 1:3 MORTAR.
 8. 3/4" MAXIMUM AGGREGATE 3000 PSI CONCRETE COLLAR W/ #4 REBAR, SHALL BE BROUGHT UP TO FINISH GRADE.
 9. STANDARD MANHOLE BARREL SECTION PER ASTM C478.
 10. BARREL AND TAPER SECTIONS MAY BE CAST IN PLACE AS APPROVED BY THE DISTRICT.
 11. 60" I.D. MANHOLE TO BE USED FOR ALL TRUNK AND COLLECTOR SEWERS 8" TO 30" OR WHERE DIMENSION FROM FINISHED GRADE TO THE SEWER FLOW LINE IS GREATER THAN 8'-0", AS INDICATED ON THE DESIGN PLANS.
 12. STEPS SHALL BE FIBERGLASS ENCAPSULATED POLYETHYLENE.
 13. CHANNEL SIZE & LENGTH TO ACCOMMODATE SEWER CAMERA.
- SLIP COLLAR (BELL END NOT ALLOWED)
BELL ENDS SHALL BE LAID FACING UPSTREAM.
TYPICAL EACH SEWER MAIN.
- WATERSTOP PER STD. DETAIL

HUMBOLDT COMMUNITY SERVICES DISTRICT

STANDARD 60" DIA. PRECAST CONCRETE MANHOLE

APPROVED DATE: 9/2016
STD. DWG.
SS-202



NOTES:

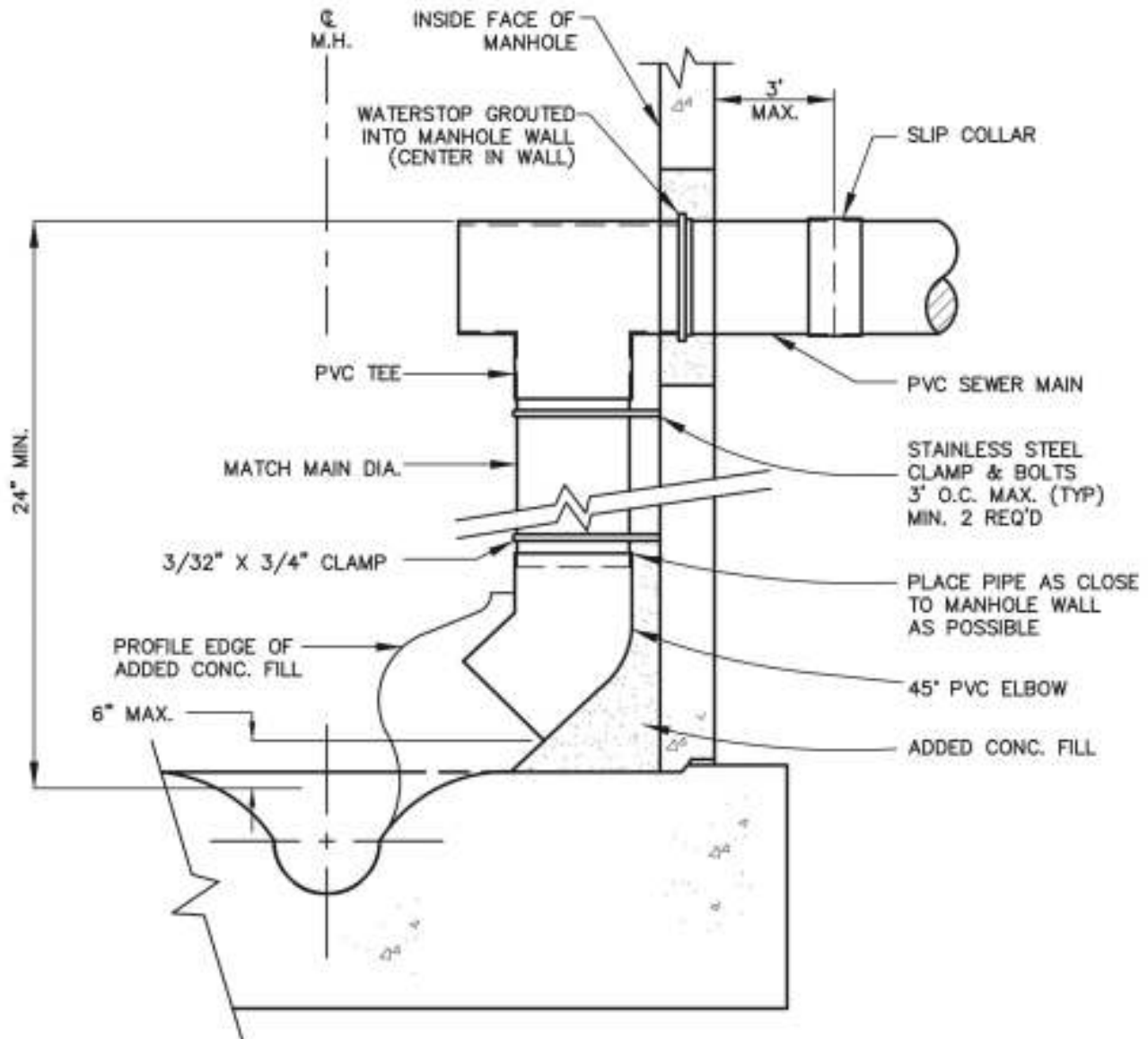
1. INSTALL WATERSTOP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS SHOWN.
2. NEW MANHOLES CONSTRUCTED USING THIS STANDARD SHALL BE 60 INCHES IN DIAMETER, & INSTALLED PER STD DETAIL.
3. ENCLOSE ELBOWS IN CONCRETE. FORM SMOOTH CHANNEL TO MANHOLE FLOWLINE.
4. PVC PIPE AND FITTINGS TO BE SDR-35.
5. VERTICAL COUPLING TO BE PVC SLIDE COLLAR, DO NOT USE CAULDER COUPLING.
6. DROP MANHOLES SHALL NOT BE USED FOR PIPE DIAMETERS GREATER THAN 8 INCH.

HUMBOLDT COMMUNITY SERVICES DISTRICT

OUTSIDE DROP IN SANITARY SEWER MANHOLE

APPROVED DATE: 9/2016
STD. DWG.

SS-203



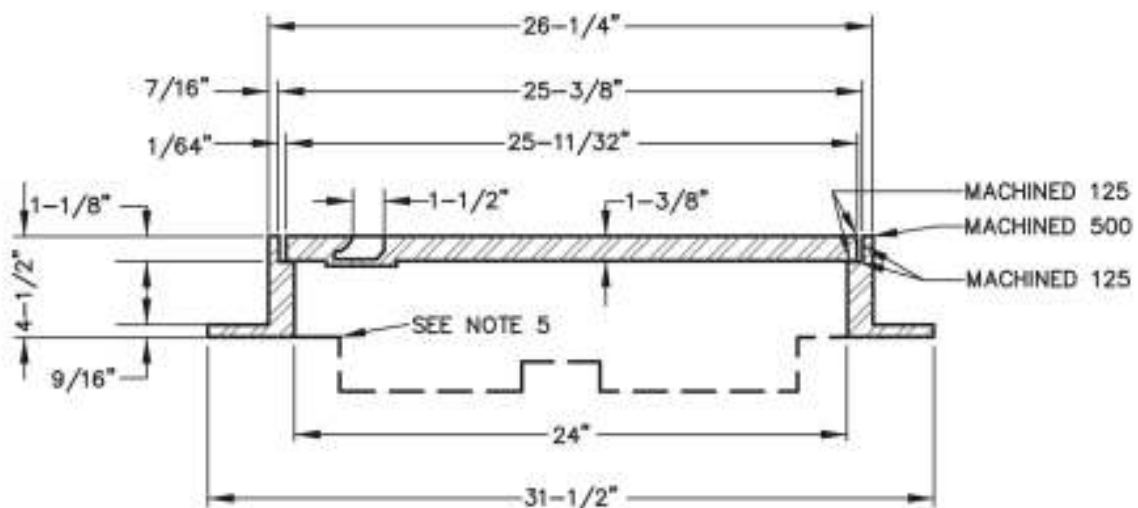
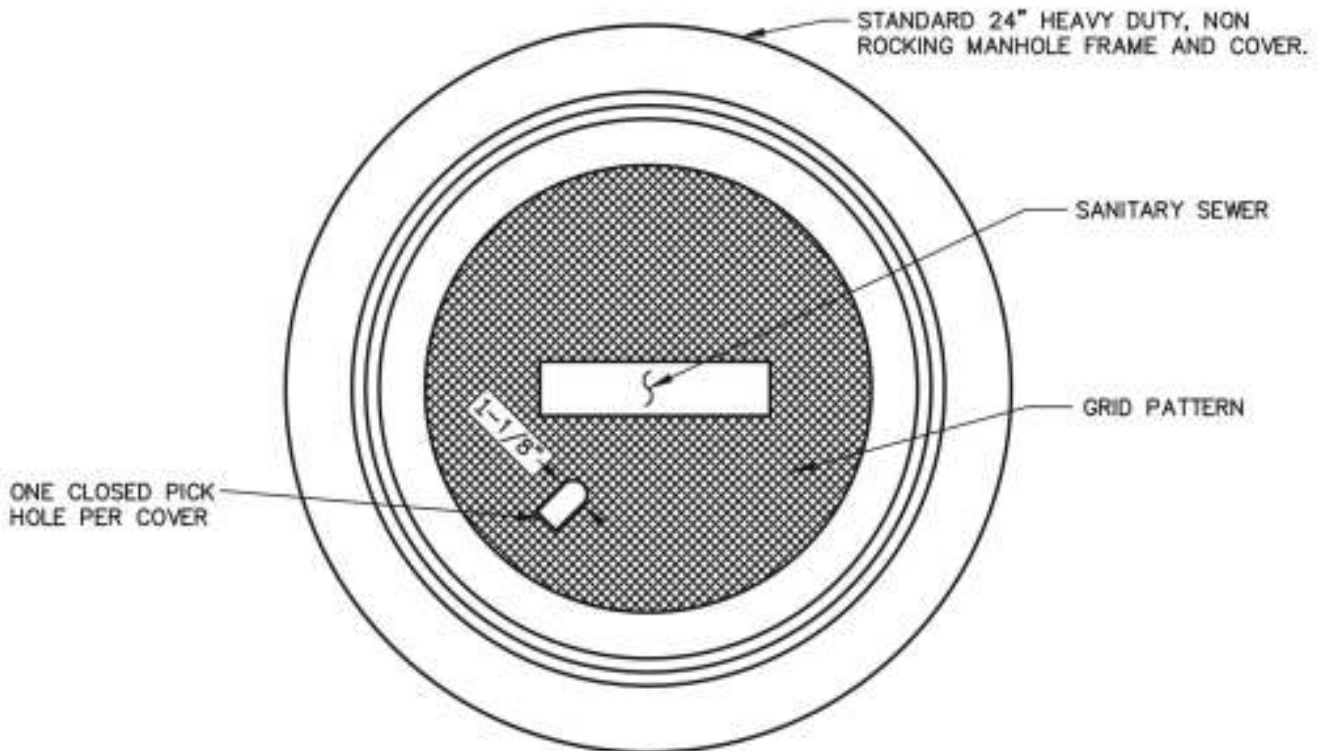
NOTES:

1. TO BE USED ONLY WITH PRIOR APPROVAL OF DISTRICT. DISTRICT STANDARD IS OUTSIDE DROP MANHOLE AS PER STD. DETAIL.
2. INSTALL WATERSTOP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS SHOWN.
3. NEW MANHOLES CONSTRUCTED USING THIS STANDARD SHALL BE 60 INCHES IN DIAMETER, & INSTALLED PER STD. DETAIL.
4. ENCLOSE ELBOWS IN CONCRETE. FORM SMOOTH CHANNEL TO MANHOLE FLOWLINE.
5. PVC PIPE AND FITTINGS TO BE SDR-35.
6. DROP MANHOLES SHALL NOT BE USED FOR PIPE DIAMETERS GREATER THAN 8 INCH.

HUMBOLDT COMMUNITY SERVICES DISTRICT

INSIDE DROP IN SANITARY SEWER MANHOLE

APPROVED DATE: 9/2016
 STD. DWG.
SS-204



NOTES:

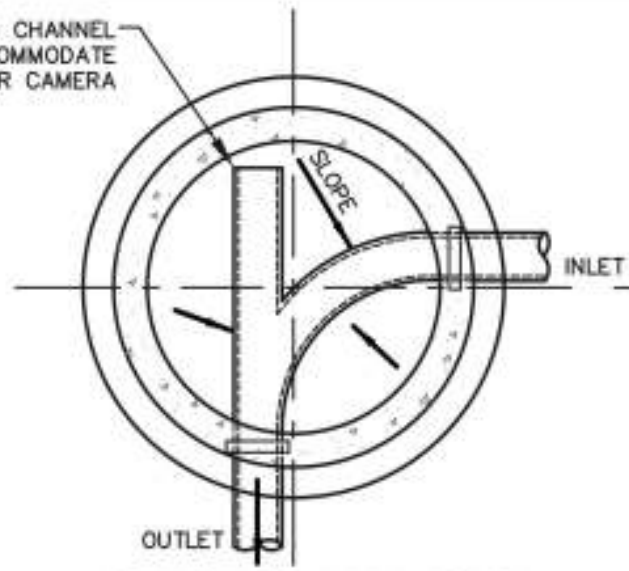
1. SPECIFY SANITARY SEWER WHEN ORDERING.
ALL CASTING SHALL BE DIPPED IN APPROVED ASPHALT PAINT.
2. ALL MATERIAL USED IN MANUFACTURING SHALL CONFORM TO A.S.T.M. DESIGNATION A-159-G3000, OR OF UNITED STATES GOVERNMENT SPECIFICATIONS QQI-652B.
3. MINIMUM WEIGHT COMPONENTS: COVER - 130 POUNDS
FRAME - 135 POUNDS
4. PROVIDE D & L SUPPLY A-1024 MANHOLE FRAME & COVER OR APPROVED EQUAL.
5. MANHOLES SHALL HAVE INFLOW PROTECTOR COVERS.

HUMBOLDT COMMUNITY SERVICES DISTRICT

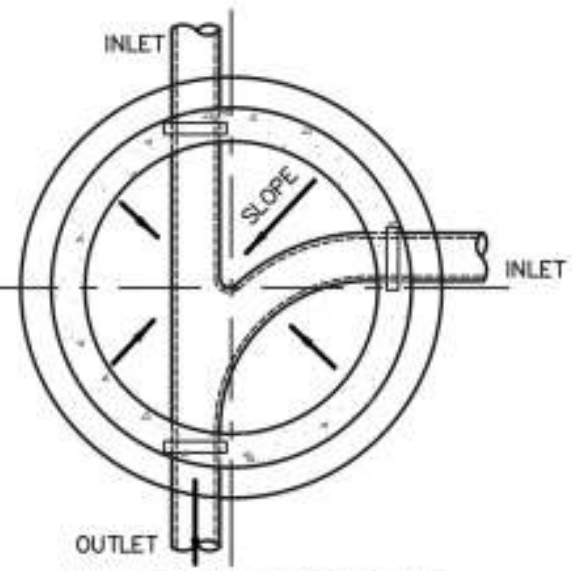
STANDARD MANHOLE FRAME AND COVER

APPROVED DATE: 9/2016
STD. DWG.
SS-205

EXTEND CHANNEL TO ACCOMMODATE SEWER CAMERA

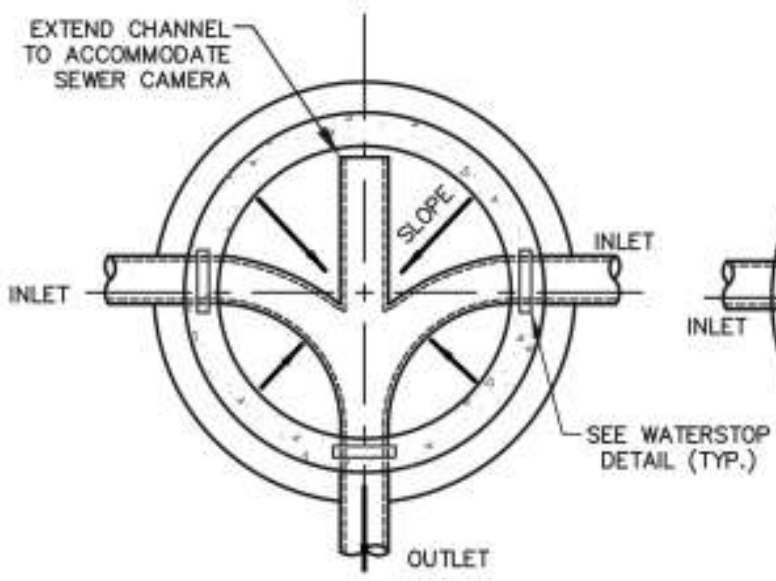


STANDARD MANHOLE

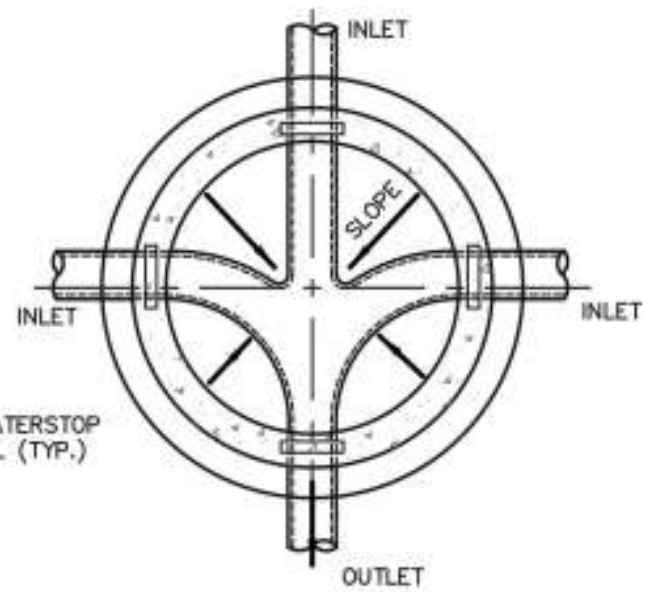


JUNCTION MANHOLE

EXTEND CHANNEL TO ACCOMMODATE SEWER CAMERA



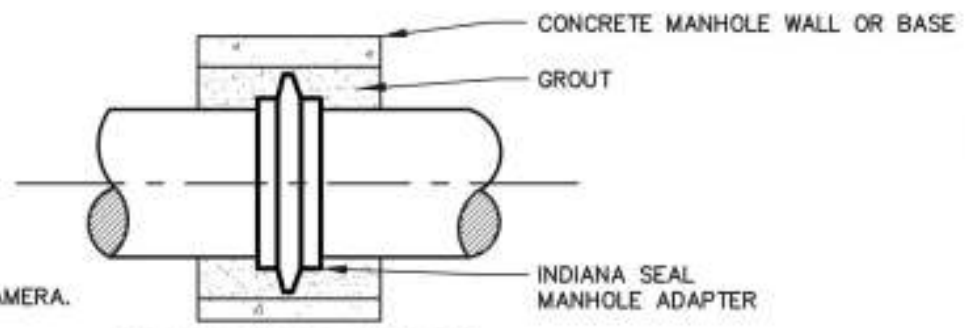
JUNCTION MANHOLE



JUNCTION MANHOLE

NOTES:

1. THERE SHALL BE A .10' DROP ACROSS BASE OF MANHOLE FROM INLET TO OUTLET.
2. CHANNEL SIZE AND LENGTH TO ACCOMMODATE SEWER CAMERA.

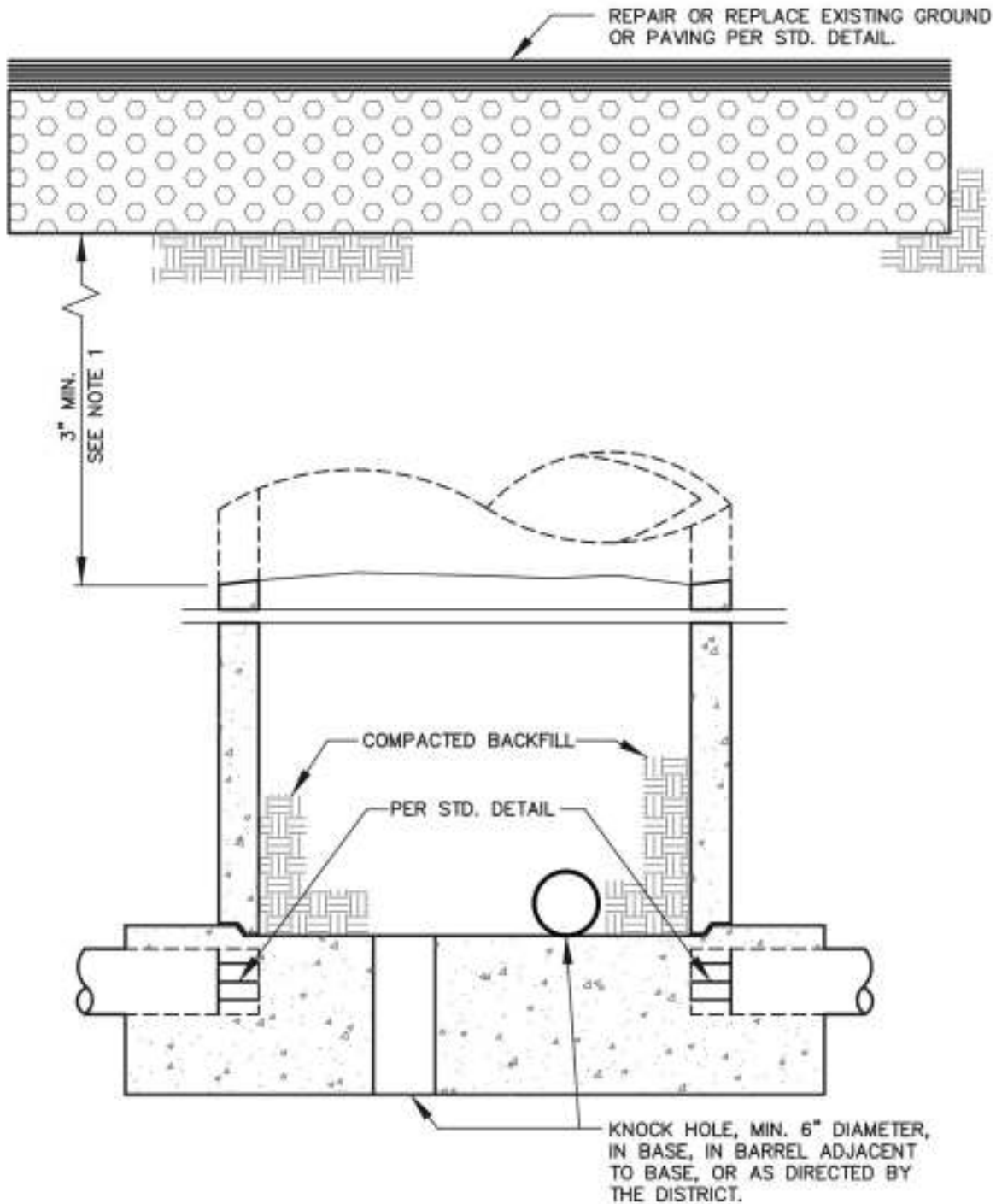


WATERSTOP DETAIL

HUMBOLDT COMMUNITY SERVICES DISTRICT

STANDARD MANHOLE CHANNEL DETAILS

APPROVED DATE: 9/2016
STD. DWG.
SS-206



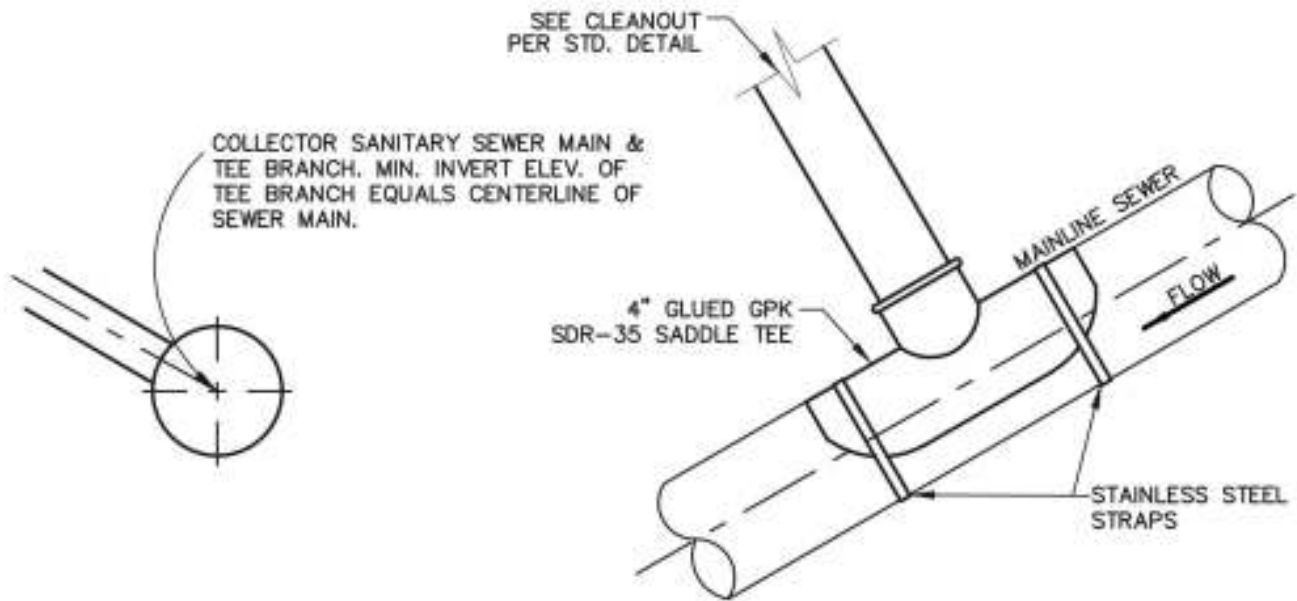
NOTES:

1. REMOVE FRAME, COVER, TAPER AND BARREL SECTIONS.
2. AFTER PLUGGING ALL PIPES IN MANHOLE, THE REMAINING PORTION OF THE BARREL SECTION AND VOIDS CREATED BY THE REMOVAL OF THE UPPER PORTIONS OF THE MANHOLE, SHALL BE BACKFILLED AND COMPACTED TO 90% RELATIVE COMPACTION WITH RIVER RUN OR CL 2 AGGREGATE BASE.

HUMBOLDT COMMUNITY SERVICES DISTRICT

ABANDONED MANHOLE DETAIL

APPROVED DATE: 9/2016
 STD. DWG.
SS-207



NEW SEWER LATERAL CONNECTIONS TO NEW MAINS

1. DUCTILE IRON PIPE
2. POLYVINYL CHLORIDE (PVC) PIPE, SDR-35 WHEN USED WITH A MANUFACTURED "Y" SPECIFICALLY DESIGNED FOR PVC LATERALS. THE "Y" SHALL BE OF THE SAME MATERIAL AS THE SEWER MAIN.

LATERAL CONNECTIONS TO EXISTING MAINS

1. PVC. (SDR-35)
 - 4" TAP WITH GPK:102-0064, 6x4 SADDLE TEE SOLVENT SKIRT W/ S.S. STRAPS, OR 102-0084, 8x4 SADDLE TEE SOLVENT SKIRT W/ S.S. STRAPS.
 - A) CUT 4-1/2" HOLE TO ACCOMMODATE GPK TEE.
 - B) USE PRIMER & SOLVENT PER MANUFACTURER'S RECOMMENDATION.
2. LATERALS GREATER THAN 4" DIA. REQUIRE MANHOLE CONNECTION TO MAIN.

NOTES

1. THE SEWER SERVICE LATERAL SHALL BE OF SUFFICIENT DEPTH TO ADEQUATELY SERVE THE BUILDING SITE, AND IN NO CASE SHALL BE LESS THAN 3 FT. DEEP AT THE BACK OF THE P.U.E. UNLESS OTHERWISE AUTHORIZED BY THE DISTRICT.
2. WHERE PROBLEMS ARE ANTICIPATED IN PROVIDING SEWER SERVICE TO A GIVEN BUILDING SITE, THE LATERAL INVERT AT THE BACK OF THE P.U.E. SHALL BE STAKED BY THE OWNER'S ENGINEER.
3. SERVICE LATERAL SHALL NOT BE LOCATED WITHIN DRIVEWAY AREA.
4. MINIMUM 2% SLOPE EXCEPT WHERE A VARIATION IS SPECIFICALLY APPROVED BY THE DISTRICT.

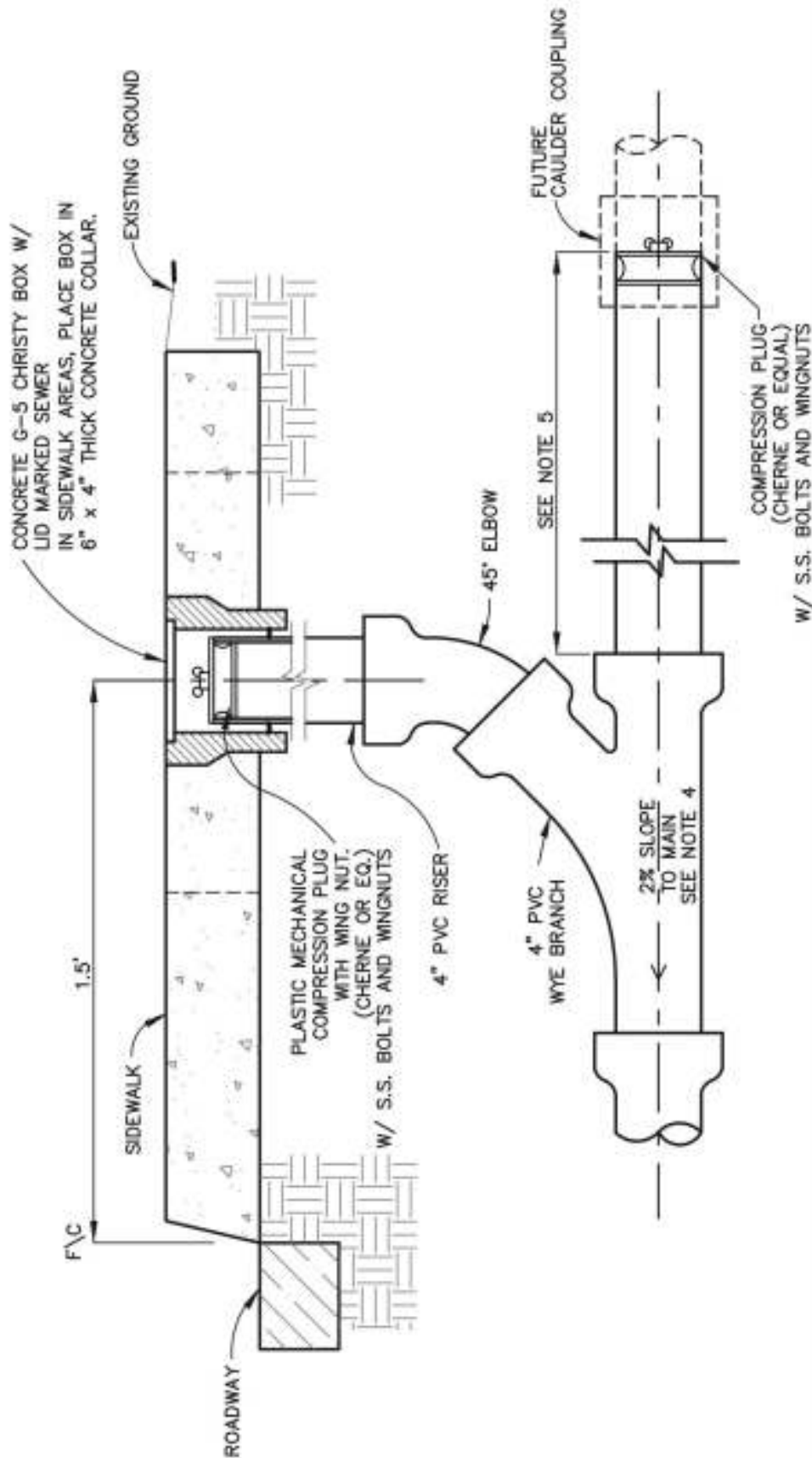
**HUMBOLDT COMMUNITY
SERVICES DISTRICT**

**SEWER SERVICE
LATERAL**

APPROVED DATE: 9/2018
STD. DWG.
SS-208

NOTES:

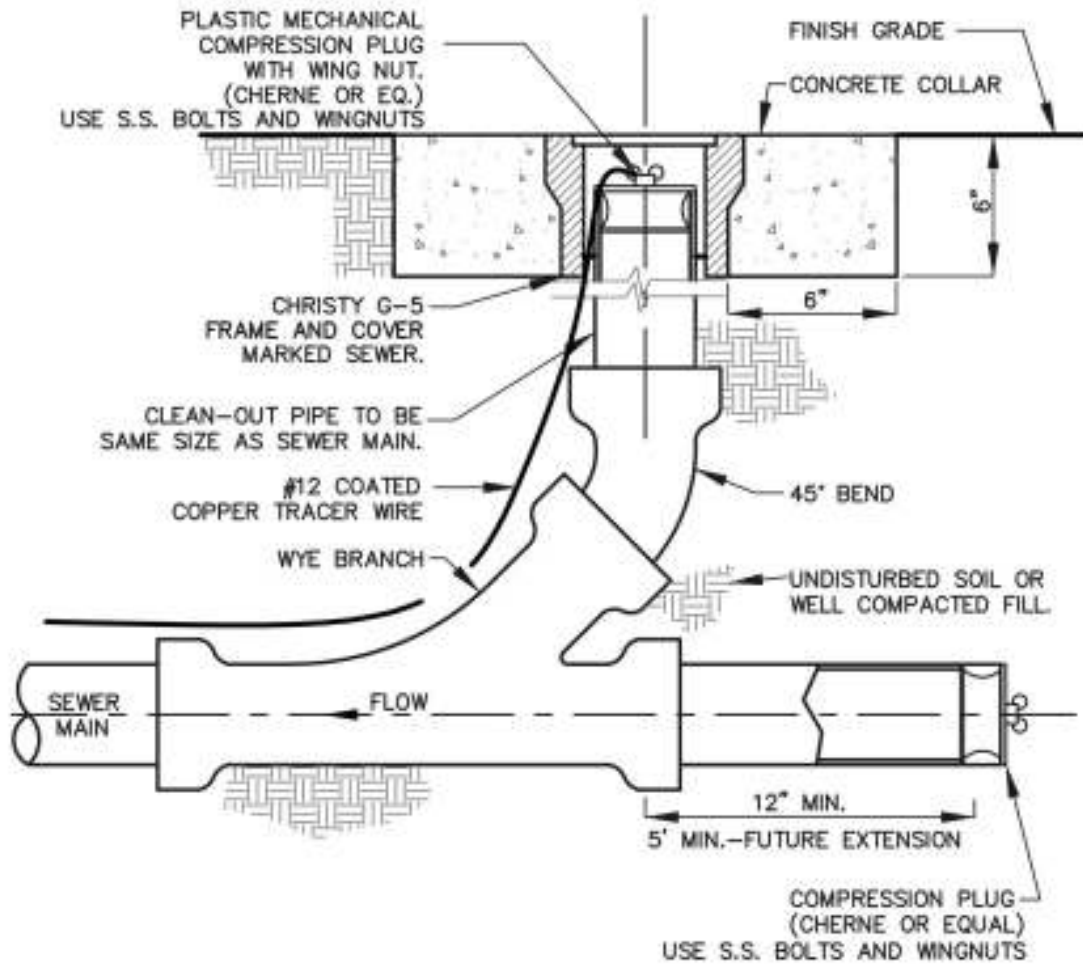
1. THE SEWER SERVICE LATERAL SHALL BE OF SUFFICIENT DEPTH TO ADEQUATELY SERVE THE BUILDING SITE, AND IN NO CASE SHALL BE LESS THAN 3 FT. IN DEPTH AT THE BACK OF THE P.U.E. UNLESS OTHERWISE AUTHORIZED BY THE DISTRICT.
2. WHERE PROBLEMS ARE ANTICIPATED IN PROVIDING SEWER SERVICE TO A GIVEN BUILDING SITE, THE LATERAL INVERT AT THE BACK OF THE P.U.E. SHALL BE STAKED BY THE OWNER'S ENGINEER.
3. SERVICE LATERAL SHALL NOT BE LOCATED WITHIN A DRIVEWAY AREA.
4. MINIMUM 2% SLOPE EXCEPT WHERE A VARIATION IS SPECIFICALLY APPROVED BY THE DISTRICT.
5. EXTEND TO 1' BEHIND P.U.E. OR 10' BACK OF SIDEWALK.



HUMBOLDT COMMUNITY SERVICES DISTRICT

SEWER SERVICE LATERAL CLEANOUT

APPROVED DATE: 9/2016
 STD. DWG.
SS-209



MAINLINE CLEAN-OUT

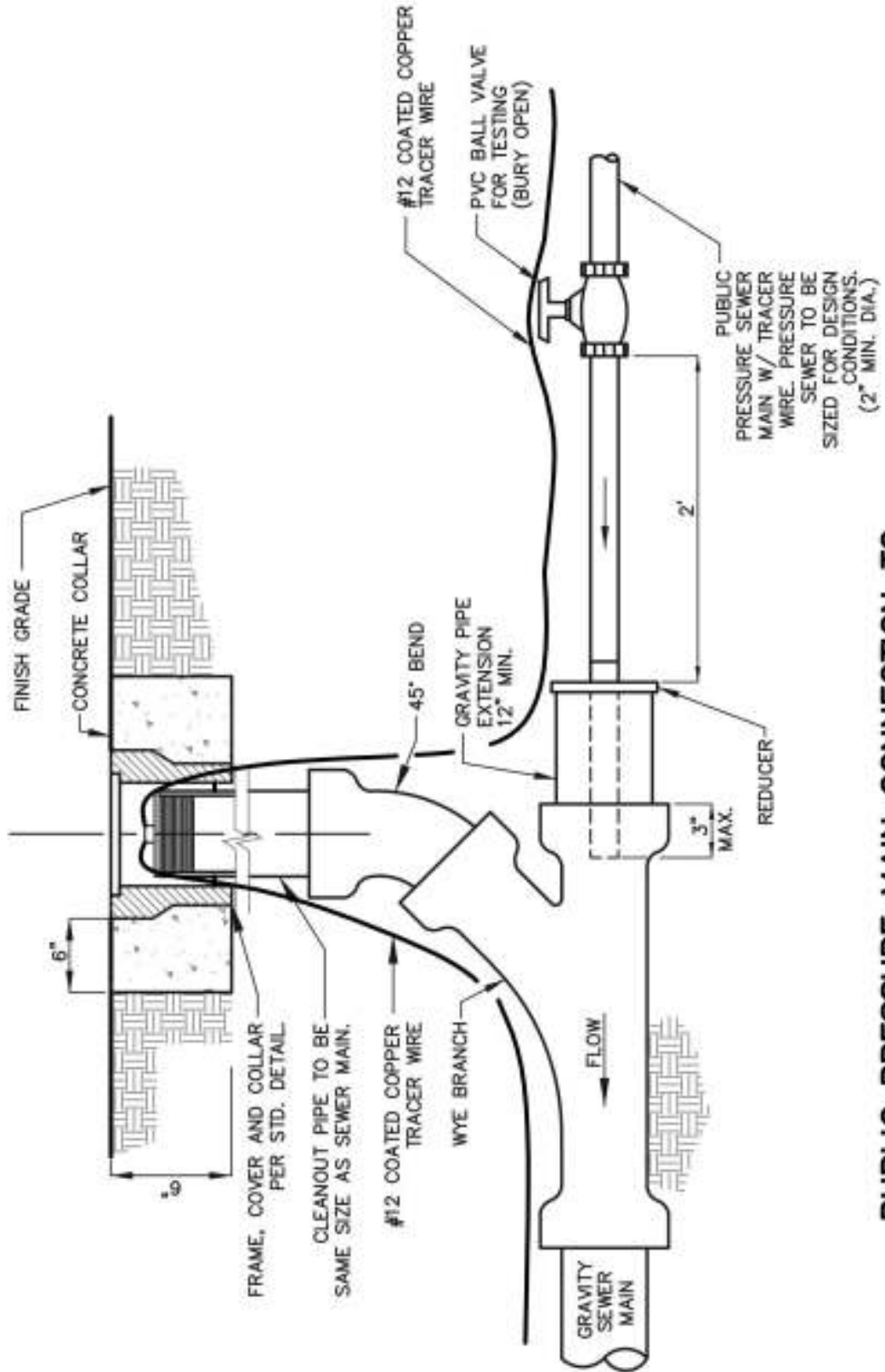
HUMBOLDT COMMUNITY SERVICES DISTRICT

MAINLINE CLEANOUT

APPROVED DATE: 9/2018

STD. DWG.

SS-210



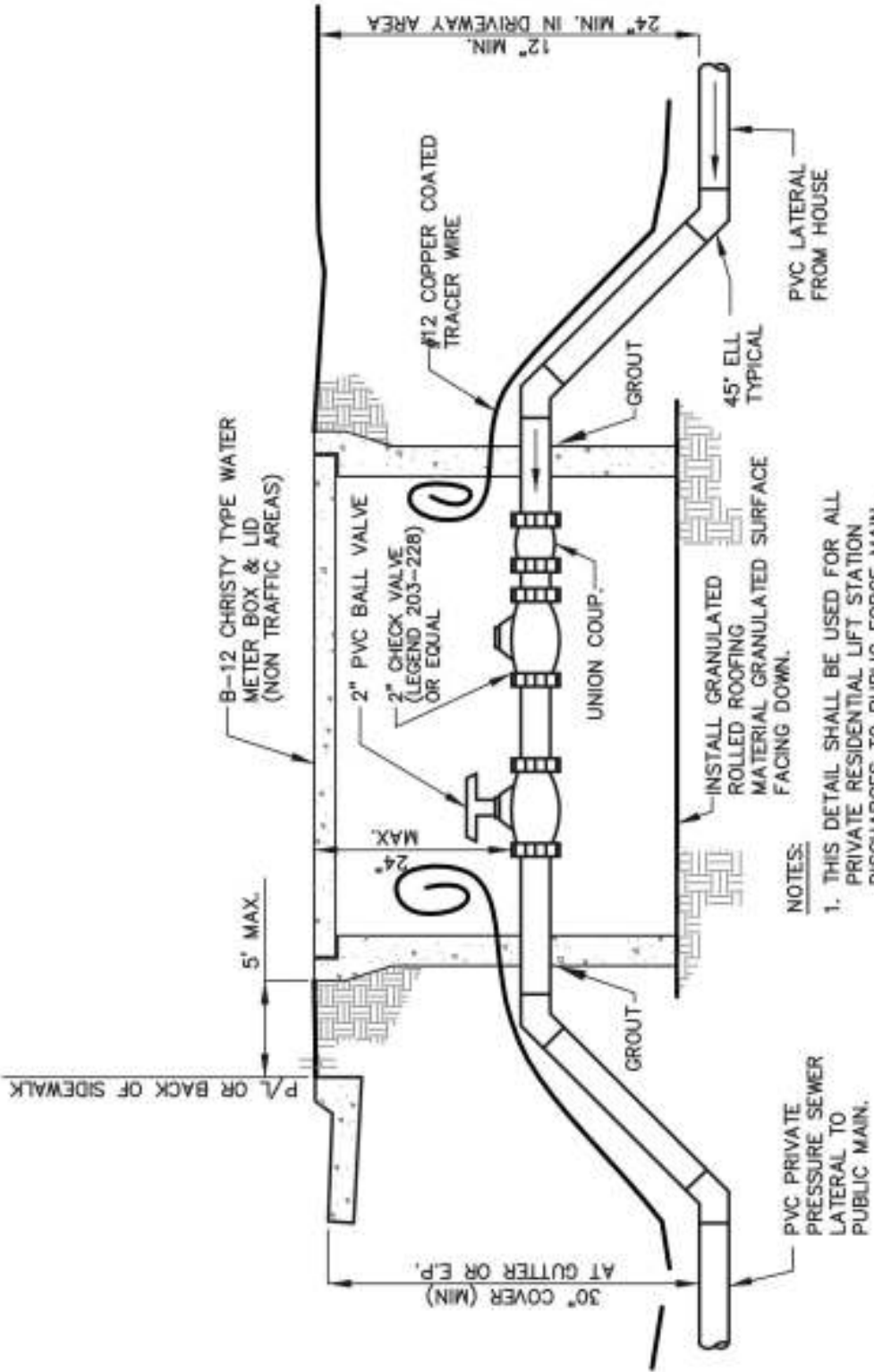
**PUBLIC PRESSURE MAIN CONNECTION TO
ENDLINE GRAVITY MAIN CLEANOUT**

NTS

HUMBOLDT COMMUNITY SERVICES DISTRICT

PRESSURE MAIN CONNECTION TO ENDLINE MAIN CLEANOUT

APPROVED DATE: 9/2016
STD. DWG.
SS-211



NOTES:

1. THIS DETAIL SHALL BE USED FOR ALL PRIVATE RESIDENTIAL LIFT STATION DISCHARGES TO PUBLIC FORCE MAIN.
2. INDIVIDUAL PRESSURE SEWER LATERALS ARE CONSIDERED PRIVATELY OWNED & MAINTAINED FROM PUBLIC MAIN TO HOUSE.
3. BOXES SHALL NOT BE LOCATED IN SIDEWALK AREAS.
4. PRESSURE SEWERS SHALL BE SIZED FOR DESIGN CONDITIONS (1.5" MIN. DIA.)

TYPICAL PRIVATE PRESSURE SEWER LATERAL SERVICE CONNECTION TO PUBLIC MAIN

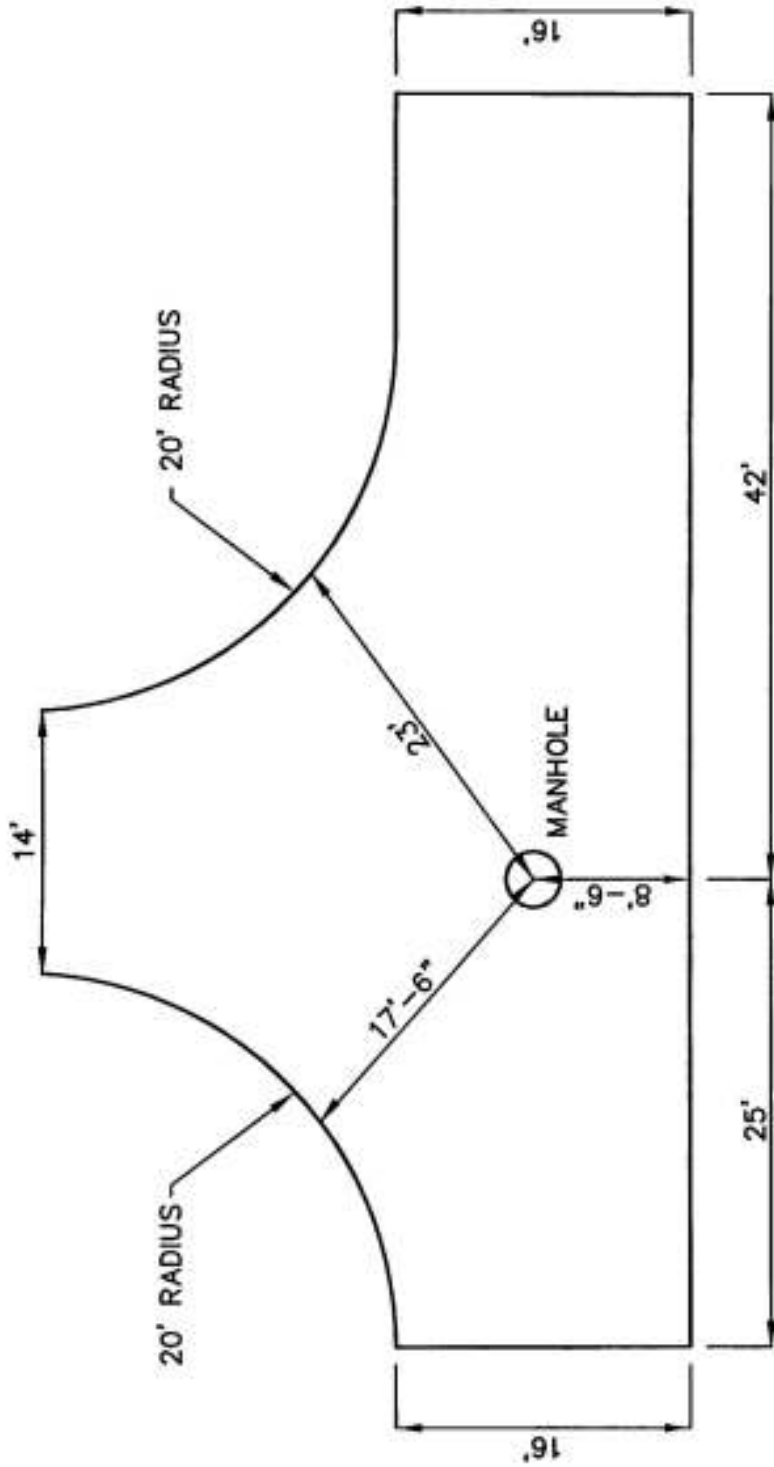
NTS

HUMBOLDT COMMUNITY SERVICES DISTRICT

PRESSURE SEWER LATERAL SERVICE CONNECTION

APPROVED DATE: 9/2016
STD. DWG.

SS-212



NOTES:

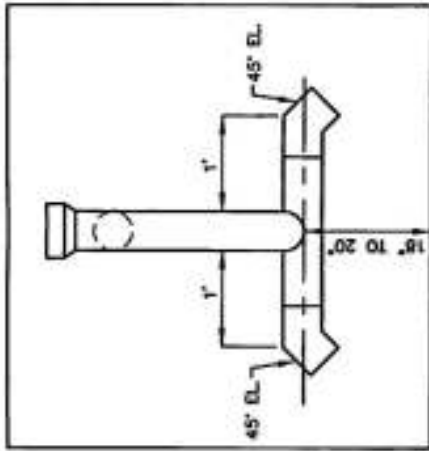
1. MINIMUM TURNAROUND FOR SEWER ACCESS ROAD.
2. DIFFERENT DIMENSIONS AND CONFIGURATION MAY BE USED WITH SPECIAL PERMISSION.

TURNAROUND
1" = 10'

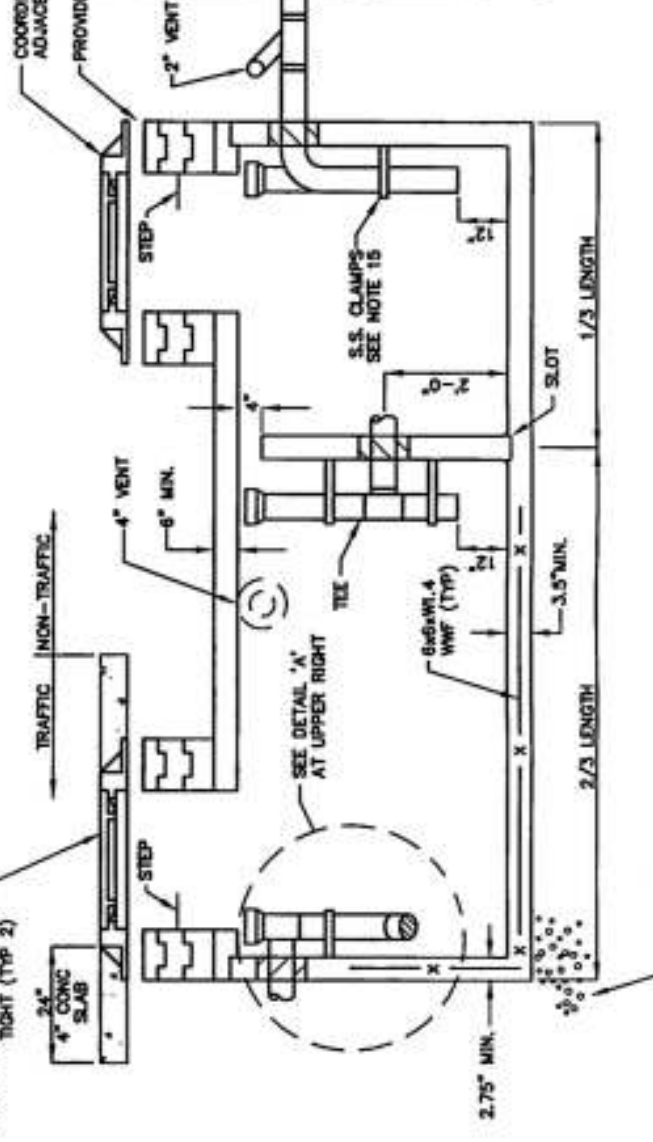
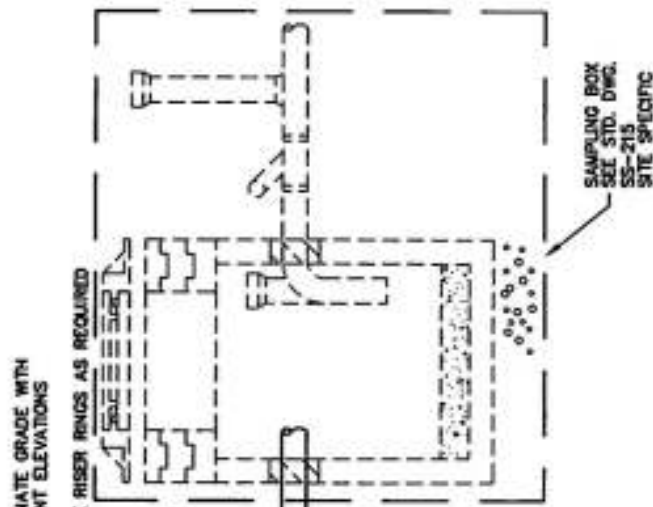
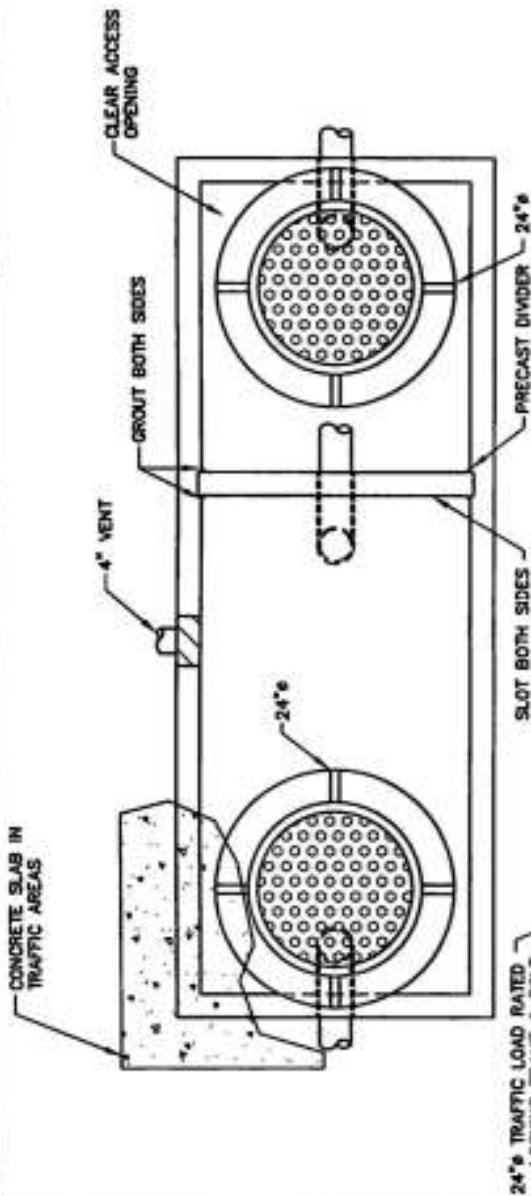
HUMBOLDT COMMUNITY SERVICES DISTRICT

TURNAROUND

APPROVED DATE: 9/2016
STD. DWG.
SS-213



DETAIL A
NTS



GREASE INTERCEPTOR
NTS

INSTALL INTERCEPTOR
ON COMPACTED
3/4" MINUS CRUSHED ROCK,
6" DEEP.

HUMBOLDT COMMUNITY
SERVICES DISTRICT

**GREASE, SAND AND OIL
INTERCEPTOR**

APPROVED DATE: 9/2016
STD. DWG.
SS-214

CONSTRUCTION NOTES:

1. CONTRACTOR TO VERIFY DIMENSIONS FOR INVERTS FROM GRADE TO CENTERLINE. COORDINATE INVERT ELEVATIONS WITH DESIGNER.
2. CONTRACTOR SHALL PROVIDE & INSTALL ALL INTERIOR PIPING IN GREASE INTERCEPTOR.
3. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL TO HCSD PRIOR TO PURCHASE AND INSTALLATION.
4. CONTRACTOR SHALL FILL INTERCEPTOR WITH CLEAN WATER. ALL PIPING CONNECTIONS AND GRADE RISERS SHALL BE GAS & AIRTIGHT.
5. GREASE INTERCEPTOR IS A PRIVATE FACILITY, TO BE OWNED AND MAINTAINED BY OWNER. INTERCEPTOR SHALL BE LOCATED OUTSIDE THE PUBLIC RIGHT OF WAY ON PRIVATE PROPERTY.
6. GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE OF BUILDINGS IN A LOCATION ACCESSABLE TO WASTE HAUL PUMPER.
7. IN TRAFFIC AREAS, A 4" CONCRETE SLAB SHALL EXTEND 24" MIN. BEYOND ALL SIDES OF TANK.
8. TANK CAPACITY TO BE DETERMINED BY DESIGNER CALCULATIONS TO BE SUBMITTED TO HCSD FOR REVIEW.
9. PIPING SHALL BE CENTERED IN INTERCEPTOR.
10. PROVIDE FIBERGLASS ENCAPSULATED POLYETHYLENE STEPS AT 12" O.C.
11. PIPING SHALL BE SDR-35 PVC, OR ABS. (GLUED FITTINGS)
12. CONTRACTOR SHALL THORO-SEAL OR XYPEX COAT COMPLETELY INSIDE INTERCEPTOR VAULT, AND SAMPLING BOX.
13. MINIMUM 4"Ø VENT HOLE BETWEEN CHAMBERS.
14. PIPING SHALL BE SECURED WITH STAINLESS STEEL CLAMPS AND BOLTS 3'-0"O.C. (TYP), MINIMUM (2) REQUIRED.
15. DOUBLE KENT SEAL SHALL BE INSTALLED BETWEEN FRAME, GRADE RINGS, AND TOP OF INTERCEPTOR BOX, FOR A WATER AND AIR TIGHT SEAL.

STRUCTURAL NOTES:

1. CONCRETE: 28 DAY STRENGTH F'C = 4500 PSI
2. REBAR: ASTM A-615 GRADE 60
3. WIRE: ASTM A1064/A1064M
4. DESIGN: ACI-318-14 BUILDING CODE
ASTM C-857 MIN. STRUCTURAL DESIGN
LOADING FOR UNDERGROUND PRECAST
CONCRETE UTILITY STRUCTURES
5. LOADS: H-20 TRUCK WHEEL W/ 30% IMPACT

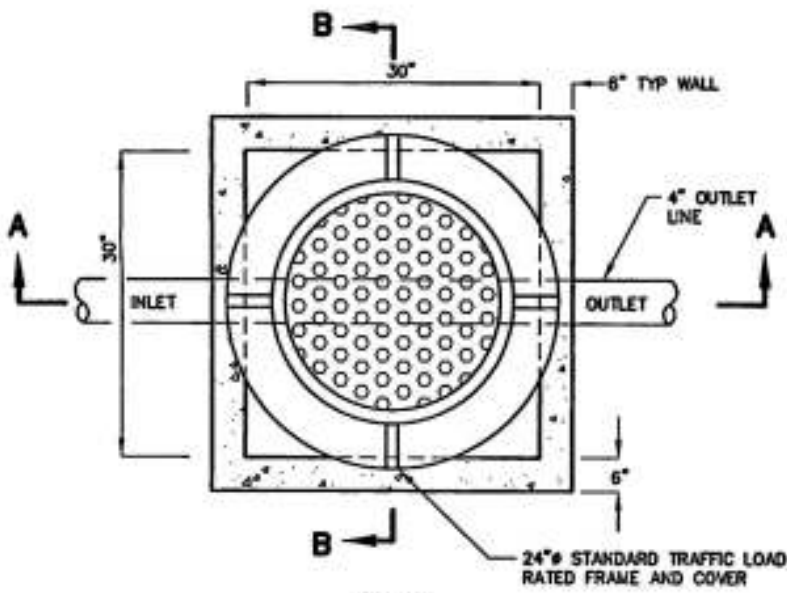
**HUMBOLDT COMMUNITY
SERVICES DISTRICT**

**GREASE, SAND AND OIL
INTERCEPTOR**

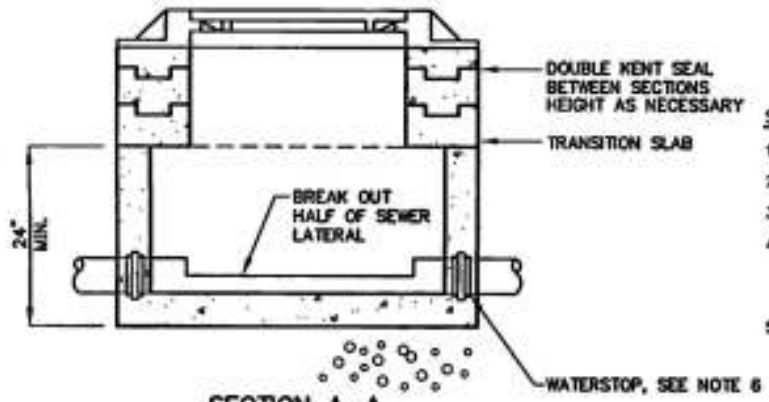
APPROVED DATE: 9/2016

STD. DWG.

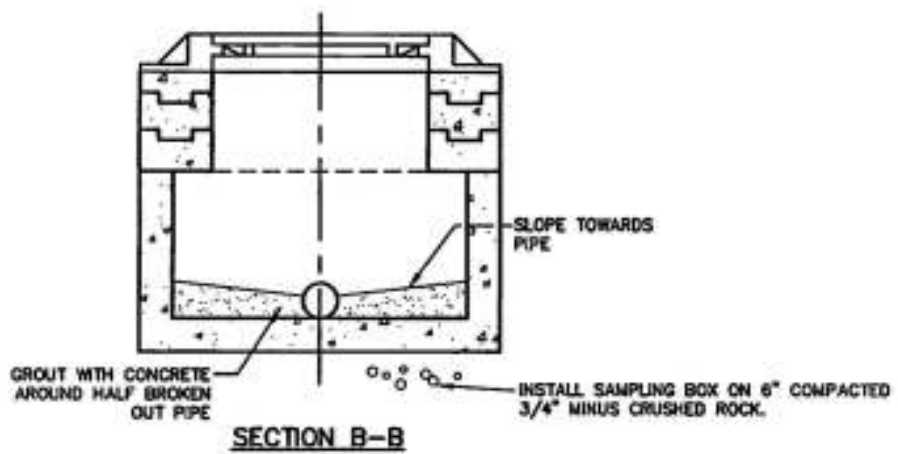
SS-214A



PLAN



SECTION A-A



SECTION B-B

CONSTRUCTION NOTES:

1. SAMPLING MANHOLE TO BE LOCATED OUTSIDE OF PUBLIC RIGHT OF WAY, EXCEPT WITH WRITTEN APPROVAL OF HCSD.
2. AN ALTERNATIVE DESIGN BY A REGISTERED ENGINEER MAY BE SUBMITTED FOR REVIEW BY HCSD.
3. LOCATION SUBJECT TO THE APPROVAL OF HCSD.
4. MANHOLE SHALL BE 30" x 30" MIN. INSIDE DIMENSION PRECAST BOX WITH 24" Ø STANDARD TRAFFIC LOAD RATED FRAME AND COVER.
5. ALL SURFACE WATER MUST DRAIN AWAY FROM SAMPLING MANHOLE.
6. INDIANA SEAL MANHOLE ADAPTER GASKET TO BE GROUTED INTO THE BOX WALL NEAR THE CENTER OF THE WALL.
7. CONTRACTOR TO VERIFY DIMENSIONS FOR INVERTS FROM GRADE TO CENTERLINE. COORDINATE INVERT ELEVATIONS WITH DESIGNER.
8. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL TO HCSD PRIOR TO PURCHASE AND INSTALLATION.
9. PIPING SHALL BE SDR-35 PVC.
10. CONTRACTOR SHALL THORO-SEAL OR XYPEX COAT COMPLETELY INSIDE SAMPLING BOX.
11. DOUBLE KENT SEAL SHALL BE INSTALLED BETWEEN FRAME, GRADE RINGS, AND TOP OF SAMPLING BOX, FOR A WATER AND AIR-TIGHT SEAL.

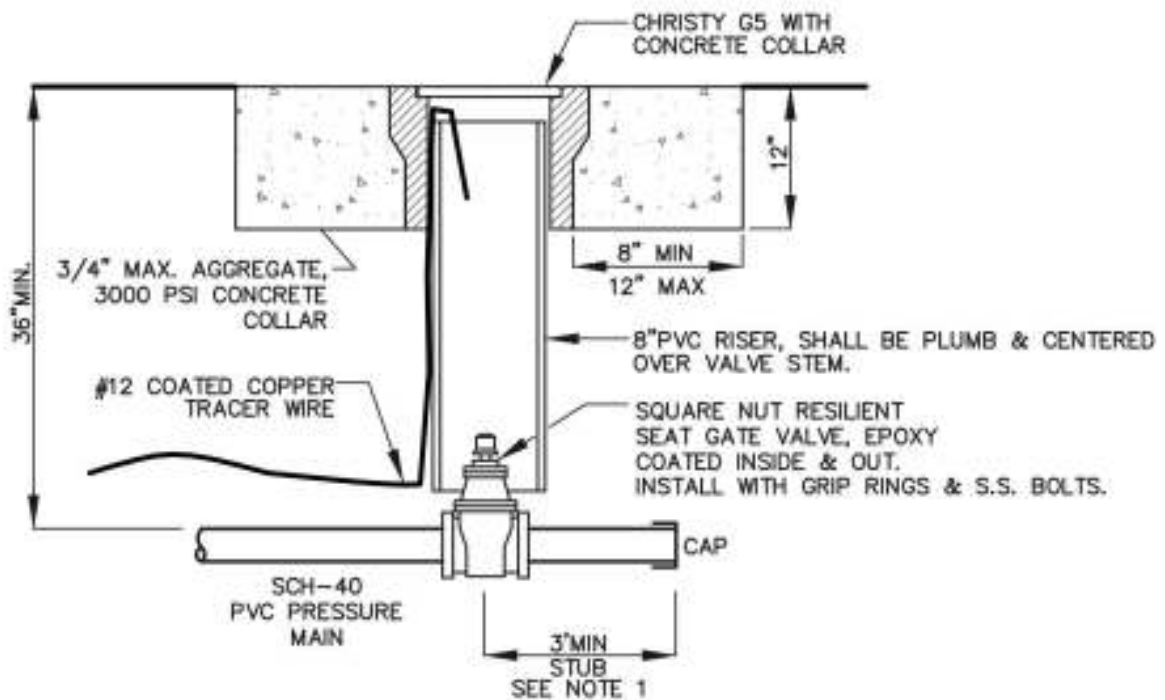
STRUCTURAL NOTES:

1. CONCRETE: 28 DAY STRENGTH $f'c = 4500$ PSI
2. REBAR: ASTM A-615 GRADE 60
3. MESH: ASTM A-185 GRADE 65
4. DESIGN: ACI-318-83 BUILDING CODE
ASTM C-857 MIN. STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES.
5. LOADS: H-20 TRUCK WHEEL W/ 30K IMPACT

HUMBOLDT COMMUNITY SERVICES DISTRICT

SAMPLING BOX

APPROVED DATE: 9/2016
STD. DWG.
SS-215



NOTES:

1. FOR ENDLINE PRESSURE SEWER MAIN

**PRESSURE SEWER MAIN
VALVE RISER DETAIL**

NTS

HUMBOLDT COMMUNITY
SERVICES DISTRICT

PRESSURE SEWER MAIN
VALVE RISER DETAIL

APPROVED DATE: 9/2016
STD. DWG.

SS-216