



STANDARDS MANUAL

For

WATER AND SEWER SYSTEMS

AUGUST, 2020



FOREWORD

To: All Parties involved with Planning, Design, and Construction of Water and Sewer facilities within the service boundaries of Jurupa Community Services District.

From: Chris Berch, General Manager

Subject: Jurupa Community Services District's Water and Sewer Standards Manual

The protection of public health and safety is of utmost importance. The purpose of standard specifications is twofold. The first purpose is to ensure that water and sewer facilities constructed within the Jurupa Community Services District (JCSD, District) are complete, standardized, and in compliance with government codes and water and wastewater industry best practices. The second purpose of the standard specifications is to provide interested parties with the District's procedures, policies, and requirements to aid in the cost-effective planning, design, and construction of water and wastewater facilities within the District.

Adherence to the standards provided in this manual does not waive the requirements of other governing bodies or agencies. Additionally, since these are "standard" procedures and requirements, they cannot apply to all conditions. The District will review all plans and may suggest revision or modification to any details, concepts, or plans submitted.

The design and construction of water and sewer facilities within the District shall adhere to the standards provided in this manual, whether the work is to be constructed by developers or others for the District.

Please call if you have any questions or comments.

JURUPA COMMUNITY SERVICES DISTRICT



Chris Berch, P.E.
General Manager

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JURUPA COMMUNITY SERVICES DISTRICT STANDARDS MANUAL

TABLE OF CONTENTS

SECTION I	:	INTRODUCTION
SECTION II	:	GENERAL REQUIREMENTS
SECTION III	:	WATER SYSTEM DESIGN CRITERIA
SECTION IV	:	SEWER SYSTEM DESIGN CRITERIA
SECTION V	:	BASIC SPECIFICATIONS
SECTION VI	:	STANDARD DRAWINGS
SECTION VII	:	APPENDICES

Each section is separated by dividers with a detailed table of contents under each section. Lettered divider tabs are provided under Sections V, VI & VII for sub-sections as indicated in Table of Contents for each of these sections.

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SECTION I

INTRODUCTION

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TABLE OF CONTENTS

SECTION I - INTRODUCTION

A.	GENERAL	I-1
B.	DEFINITIONS.....	I-2
C.	GENERAL PROCEDURE	I-3
D.	REQUIREMENTS OF OTHER PUBLIC AGENCIES	I-5
E.	REVISING APPROVED WATER AND/OR SEWER IMPROVEMENT PLANS	I-6

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I. INTRODUCTION

A. GENERAL

The Jurupa Community Services District was formed in July, 1956, as a general purpose community services district of the State of California. The boundaries of the District are shown in Appendix A of Section VII.

The District is administered by a five-member Board of Directors and a General Manager.

If water and/or sewer service is desired within the District, service can normally be provided if the following conditions are met:

1. Developer must design (or contract with the District to design), pay for the construction of, have constructed and dedicate to the District the water and/or sewer systems in accordance with the requirements of the Jurupa Community Services District. Water and/or sewer improvements must be provided in: (1) all interior development streets; (2) all streets on the boundary of the development (in order to provide for full frontage improvements); (3) any off-site improvements required to provide water and/or sewer service to the site.
2. Developer must obtain and dedicate water and/or sewer right-of-way to the District. Water and/or sewer systems must be in either dedicated road right-of-way or in specially deeded easements to Jurupa Community Services District having a minimum width of 20-feet for single pipelines and 30-feet for water and sewer pipelines within the same easement. Private roads must meet public street width requirements for easement dedication purposes. No structures, buildings, fences, or other obstructions can be constructed on these easements. The District's standard GRANT OF EASEMENT form shall be used (Appendix B); and shall be formally accepted by District pursuant to the CERTIFICATION OF ACCEPTANCE OF GRANT OF EASEMENT (Appendix C).
3. Water systems will include water pipelines and related fittings and appurtenances, and may also include additional offsite facilities such as pump stations, water storage tanks, pressure regulating stations, and water transmission and distribution mains as are necessary to deliver water to the development and to provide adequate pressure and capacity to such development. Sewer systems will include sewer pipelines, fittings and appurtenances, laterals, manholes and lift stations as are necessary to provide sewer service to the development.
4. The Developer must make the necessary financial arrangements with the District to accomplish the above stated conditions.

B. DEFINITIONS

Wherever words defined herein, or pronouns used in their stead, occur in any of the contract documents, they shall have the meanings here given:

1. "District" - The word "District" shall mean the Jurupa Community Services District, Riverside County, California. The term "Agent", when used with reference to the District, shall include the District's officers, agents, consultants and employees.
2. "General Manager" - The term "General Manager of the Jurupa Community Services District, Riverside County, California" shall mean the person designated by the Board of Directors of the Jurupa Community Services District, Riverside County, California, to have charge, supervision, and administration of the Jurupa Community Services District, Riverside County, California and shall be hereinafter called the "General Manager".

The General Manager may, at their option, designate a person or persons to represent them for inspecting, and reporting on the work as it progresses.

3. "Contractor" - The word "Contractor" shall mean the successful bidder who is entering into this contract with the Jurupa Community Services District, Riverside County, California, or the developer, for the furnishing of the material, equipment, and/or services specified in this contract, and the legal representatives of said party, or the agent appointed for said party in the execution of the contract. Said party is referred to throughout the contract documents as if of the singular number and the masculine gender. The Contractor shall hold a valid Contractor's license in accordance with the provisions of Division 3, Chapter 9 of the Business and Professions Code of the State of California, and all amendments thereto.
4. "Engineer" - "Engineer" shall mean the California Registered Professional Engineer designated by the District to provide general engineering supervision to the various projects, efforts, construction, any work requiring general engineering oversight.
5. "Developer's Engineer" - "Developer's Engineer" shall mean the Registered Professional Engineer designated by Developer to design the proposed water and/or sewer systems in accordance with District rules, regulations and standards.

6. "Owner Property" - "Owner Property" shall mean any work site upon which the Contractor shall be required to perform under the contract including private property, property owned in-fee by the District or upon which it holds an appropriate lease, right of way, license, or encroachment permit.
7. "Developer" - The term "Developer" shall mean the person, persons, or firm having legal authority to enter into agreements with the District as related to work performed within public rights of way and Public Utility Easements and having legal responsibility of the Engineer and Contractor retained or contracted with by Developer to perform the work.
8. "Owner" - The term "Owner" shall mean the administrator of the Contract, which may be the District or Developer of the overlying project or land development.
9. "County" - "County" whenever used shall mean Riverside County, California.
10. "City" – "City" whenever used shall mean city of Jurupa Valley, California or City of Eastvale, California.
11. "Contract" - The term "Contract" shall mean the written agreement covering performance of the work including, but not limited to, the formal Contract, bonds and insurance, notice inviting bids, bidder's plan for construction, statement of experience, financial condition and references, bidding sheet, certified data sheet, special requirements, Standards Manual of Jurupa Community Services District - (Latest Edition) and Drawings.
12. "Work" - The term "work" means that which is proposed to be constructed or done under the Contract or permit, including furnishing of all labor and materials.

C. GENERAL PROCEDURE

Procedures for the development of water and/or sewer systems are shown below. As an option, electronic submittals are acceptable for the entirety of the submittal package. All documents must be clear, legible, properly scaled, and documents not legible will be sent back without review. The following includes the applicable minimum requirements:

1. Developer submits two (2) copies of a project site map showing the boundaries of the area requiring water and/or sewer service and requests water and/or sewer "Availability Letter" from District. The appropriate "Availability Letter" fees shall be paid to the District.
2. Board of Directors' approves or denies said service.

3. District issues water and/or sewer "availability letter(s)"; and District executes County Health Department form "Sanitation 53."
4. Developer has water and/or sewer plans prepared by California licensed civil engineer to District specifications in accordance with applicable provisions specified in the Standards Manual.
5. Developer provides for dedicated right-of-way.
6. Developer's Engineer submits engineered drawings along with plan check fees to District as outlined in Section II of this manual for first (1st) plan check. Drawings must be submitted within two (2) years of the issuance of the "Availability Letter"; otherwise, an updated "Availability Letter" will be required and drawings will not be plan checked until an updated "Availability Letter" is issued.
7. Plan checking process: District reviews and approves plans. The District's approval of the plans prepared by the Developer's Engineer denotes agreement with the Plans as prepared and is not an acceptance of responsibility as to accuracy. The Developer's Engineer shall be responsible for any errors, coordination with other facilities, and interpretation of Plans. The intent is that the completed system shall be in general conformance with the approved Plan and in accordance with the requirements of these Specifications. All revisions and changes in the plans must be approved by the Engineer. Section I.E. provides the procedure that shall be followed for changes on District approved Plans.
8. Developer's Engineer submits original mylars (digital submittal is acceptable) with all approval signatures to District.
9. Drawings approved by the District will be void 24-months from the date of District's signature. Upon such time, drawings must be re-submitted for plan checking (see above no. 6). Also, drawings will need to be re-submitted for first (1st) plan check, for drawings submitted over one (1) year from the previous plan check submittal and anytime if the tract is split into separate tracts (example: -1, -2).
10. Developer posts deposits and necessary fees with District.
11. Developer enters water and/or sewer system construction agreement with District. (Appendix D)
12. Developer contracts with an appropriately licensed Contractor who has a Contractor's Data sheet (Appendix E) on file with the District.

13. Developer/contractor provides insurance certificates to District. (Appendix F)
14. Developer provides "Certification of Streets to Final Grade" to District (Appendix G). These must be submitted prior to scheduling a pre-construction conference.
15. Developer/contractor coordinates pre-construction conference with District. (Appendix H)
16. District issues "Notice to Proceed". (Appendix H)
17. District inspects construction of systems.
18. Developer's Engineer submits complete set of "As-Built" mylar drawings immediately after construction. Additionally, the District shall also be given a submittal of all project map and land base information on a PDF and DWG (or DXF) digital data disk per the requirements provided in Appendix K. Three (3) disks are required to be submitted along with the "as-built" mylar drawings (refer to Appendix N for atlas map updating procedures).
19. Developer provides District with final costs to construct all District systems (for District capitalization purposes).
20. District accepts improvement systems and issues "Notice of Final Acceptance."
21. Developer dedicates systems to District.

In the event that the District makes revisions to any of its rules, regulations or standards as described and set forth herein, all such revisions shall be incorporated and be in effect as if they were in force from the beginning of the procedure and shall therefore be adhered to and/or constructed accordingly, unless otherwise approved by the District.

D. REQUIREMENTS OF OTHER PUBLIC AGENCIES

The requirements for the design of water and/or sewer plans and systems specified herein do not waive, nor are they intended to contradict, any requirements required by any other legal governing public agencies.

Engineers designing said plans and systems for inclusion into the District shall be knowledgeable of and shall comply with the following regulations:

1. The California Waterworks Standards, of the California Administrative Code, Title 22.

2. Riverside County Ordinance No. 460.151, Subdivision Ordinance.
3. Riverside County Ordinance No. 461.10, County Road Improvement Standards and Specifications.
4. Riverside County Ordinance No. 787, Fire Code Standards.
5. Riverside County Ordinance No. 499.12, Encroachments in County Highways.
6. Riverside County Environmental Health Department Requirements.

E. REVISING APPROVED WATER AND/OR SEWER IMPROVEMENT PLANS

If a revision has to be made to an approved mylar which has been signed by the District, the proposed revisions should be made in "red lines" on a blueprint, then it should be brought to the District for review and approval. Once the red line is approved, the Developer's Engineer may check out the original mylar by bringing in their signed reproducible plan or electronic copy (i.e. pdf) of the original mylar prior to release of the original mylar to the Engineer so the District can hold them while the originals are checked out to them to make the revision. Optionally, the District will make another set of reproducibles, at the Developer's Engineers expense, to hold. Once the Developer's Engineer revises the originals per the approved red line plans, they should resubmit both the originals and the red lines to the District for final review and signature. Once the originals are signed for the revision, then the procedure would be the same as any newly signed mylar.

Revisions to signed plans must be made by the Developer's Engineer.

Should revisions be requested by another engineer who is not the original Developer's Engineer, the revising engineer has two options to follow:

1. The revising engineer should contact the original Developer's Engineer and inform them about the proposed revision and get their approval in writing to make the revisions and to check out the originals; then follow the above procedures. The revising engineer is required to have a signature block signed and sealed by them for that particular revision on each revised sheet.
2. The revising engineer may process new plans showing all the existing in dashed lines and label as existing, and showing the revisions in solid lines. The revising engineer must sign and seal these plans and bring them in for District review and signature.

Following the second option does not require the revising engineer to contact and have approval of the Developer's Engineer.

Checking out original plans should be done only by the Developer's Engineer; otherwise, a letter from the Developer's Engineer authorizing changes to the plans is required.

It should be noted that if plan revisions are required prior to or concurrent with the construction of the project and if these changes will require an increase in the bond amount, the revised plans will be held until a new estimate has been prepared and a new bond has been placed with the District.

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SECTION II

GENERAL REQUIREMENTS

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TABLE OF CONTENTS

SECTION II - GENERAL REQUIREMENTS

A.	GENERAL	II-1
B.	PLAN CHECK PROCEDURAL GUIDELINES	II-1
C.	PLAN CERTIFICATIONS.....	II-4
D.	GENERAL NOTES AND REQUIREMENTS (WATER & SEWER).....	II-6
E.	GENERAL NOTES AND REQUIREMENTS (WATER).....	II-8
F.	SPECIAL NOTES (WATER).....	II-10
G.	GENERAL NOTES AND REQUIREMENTS (SEWER)	II-10
H.	IMPROVEMENT PLAN CHECK LIST	II-12
I.	ABBREVIATIONS	II-20
J.	SYMBOLS.....	II-22
K.	GUIDE FOR EASEMENT DRAWINGS	II-22
L.	ESTABLISHMENT OF LINE AND GRADE	II-23
M.	CONTRACTOR'S DATA SHEET	II-24
N.	CONSTRUCTION AGREEMENT	II-24
O.	APPROVED MANUFACTURED MATERIALS	II-24

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II. GENERAL REQUIREMENTS

A. GENERAL

The water and sewer systems shall be designed in accordance with the Jurupa Community Services District's Master Plans, Rules and Regulations, Standards, Specifications, and Standard Drawings, under the direction of a civil engineer licensed in the State of California. All District fees and facilities charges associated with the proposed water and/or sewer system shall be paid for by the Developer.

B. PLAN CHECK PROCEDURAL GUIDELINES

1. Processing Sequence. Refer to "General Procedure" in Section I.
2. Format of Plans. Water and sewer plans shall be formatted as follows (digital submittal of PDF formatted plans will be per District's direction):
 - a. All sheets shall be 24" x 36" (see Appendix I of Section VII for title block format), ink on reproducible mylar plans. Scale shall be 1" = 40' horizontal and 1" = 4' vertical.
 - b. Index sheet shall include an overall layout of the water/sewer system at a scale that clearly delineates the following: streets, lots, valves, fire hydrants, manholes and any existing facilities involved; water and/or sewer certifications, general notes, legend, estimate of quantities and a location map.
 - c. Plan and profile sheets shall include all proposed and existing utility lines, both plan view and elevation; existing ground surface and proposed street grade, existing and proposed water/sewer lines, with the flowline plotted in the profile, and the slope indicated between each vertical point of intersection. Water/Sewer lines and appurtenances shall have stationing with respect to the center line street stationing.
 - d. Self-adhesive or add on labels, certifications, details, etc. are not acceptable on final plans.

3. Requirements for First Plan Check.*

a. RESIDENTIAL DEVELOPMENTS

1. Executed Project Identification Form (see Attachment No. 1, Appendix L) signed and stamped by the Registered Engineer of Record
2. Water and/or Sewer Plans3 copies
(to be approved by District)
3. Record Map.....1 copy
4. Street Plans.....1 copy
5. Storm Drain Plans1 copy
6. Grading Plans.....1 copy
7. Erosion Control Plans1 copy
8. Conditions of Approval of Tentative Map.....1 copy
9. Easement Documents and Plats2 copies
Title Report, Deeds, Etc.....1 copy
Easement Boundary Closure2 copies
(to 3 decimal point (min.))
Coordinate List.....2 copies
Any Appropriate Survey Notes.....1 copy
Any Referenced PM/RS/Etc.1 copy
10. Fees Payable to Jurupa Community Services
District in the Amount Established by the District
11. When a tract is to be phased, submit an overall
conceptual water and sewer layout on the tentative map.
Indicate size and types of mainline pipes to be used.
12. Geotechnical Report1 copy

* Incomplete submittals will not be accepted. If any of the above items are not applicable to the project, please note the reason in the transmittal letter.

b. COMMERCIAL/INDUSTRIAL DEVELOPMENT

1. Items Listed in 3.a. Above
2. Site Plan/Plot Plan2 copies
(with water, sewer, and fire systems shown;
and provide private "on-site" certification)
3. Building Floor Plan/Plumbing Plan1 copy
4. Landscape Irrigation Plan (with backflow1 copy
devices shown at all appropriate locations)
5. Completed District Industrial Waste Form1 copy
6. Submittal of Data Indicating Typical Waste.....1 copy
Discharge Constituents
7. Total Fixture Unit Calculations (water & sewer) ...1 copy
8. Grease Trap/Industrial Waste Clarifier1 copy
Sizing Calculations
9. Fire Protection Plans and Fire Flow Calculations...1 copy
10. Number of Employees1 copy
11. Water Usage of a Similar Type Installation.....1 copy
12. For Restaurants; Number of Seats, Daily1 copy
Meals and/or Peak Hour Meals

4. Subsequent Plan Checks

When the initial check is complete, engineering firms will be notified to pick up "red-lined" prints from the District office at 11201 Harrel Street, Mira Loma, California 91752 or receive "red-lined" files in PDF. Whenever changes other than District corrections are made, these changes shall also be indicated on the check print in order to expedite the processing of the plans. Additionally, Developer shall resubmit all street plan, storm drain plan, etc., wherever revisions to these drawings occur.

5. Plan Approval

Upon approval, the original shall be submitted to the District for the signature of the General Manager or their agents.

- a. When the original has been signed by all agencies involved, send four (4) complete sets of prints along with one mylar reproducible transparency to the District office.

C. PLAN CERTIFICATIONS

The following certifications shall be placed on the first sheet of the plans as appropriate:

1. Water Certification

JURUPA COMMUNITY SERVICES DISTRICT

I certify that the design of the water system in Tract/Plot Plan/Parcel Map No. _____ is in accordance with the water system expansion plans of the Jurupa Community Services District, and that the water service, storage, and distribution system will be adequate to provide water service to such tract/plot plan/parcel map. This certification does not constitute a guarantee that it will supply water to such tract/plot plan/parcel map at any specific quantities, flows, or pressures for fire protection or any other purposes.

General Manager

Date

CERTIFICATION VOID AFTER TWENTY-FOUR (24) MONTHS
FROM ABOVE DATE.

JCSD P.N. _____

2. Sewer Certification

JURUPA COMMUNITY SERVICES DISTRICT

I certify that the design of the sewer system in Tract/Plot Plan/Parcel Map No. _____ is in accordance with the sewer system expansion plans of the Jurupa Community Services District, and that the waste disposal system is adequate at this time to treat the anticipated wastes from the proposed tract/plot plan/parcel map. This certification does not constitute a guarantee the waste disposal system can transport or treat flows that exceed the District estimated flows for the specific type of land use proposed for this development.

General Manager

Date

CERTIFICATION VOID AFTER TWENTY-FOUR (24) MONTHS
FROM ABOVE DATE.

JCSD P.N. _____

3. Jurupa Community Services District Development Engineering

Development Engineer

Date

4. Jurupa Community Services District Engineering Department
Recommended by:

Engineering Manager

Date

5. Riverside County Fire Department
Reviewed by:

Date

6. City of Eastvale/Jurupa Valley (as applicable)
Reviewed by:

City Engineer

Date

7. JCSD Department of Engineering & Operations
Approved by:

Director of Engineering and Operations

Date

The following certification shall be placed on the first sheet of the plans for on-site water and/or sewer plans:

1. Private Certification

The Jurupa Community Services District has reviewed the water and sewer systems within the public right-of-way for this project, said systems are in conformance with District standards and are approved. Said approval does not include any on-site/private systems.

Jurupa Community Services District
General Manager

Date

CERTIFICATION VOID AFTER TWENTY-FOUR (24) MONTHS
FROM ABOVE DATE

JCSD P.N. _____

D. GENERAL NOTES AND REQUIREMENTS (WATER & SEWER)

1. The Contractor shall notify JCSD at least two working days prior to construction.
2. Separation requirements between water and sewer lines shall conform to California State Water Resources Control Board's Division of Drinking Water requirements. The Agency's specifications that are more restrictive shall govern in all cases.
3. All construction and materials shall comply with JCSD standards and specifications. Any construction and/or materials not covered in JCSD standards shall be reviewed and considered for approval by the District prior to construction.
4. Prior to construction of the water and/or sewer lines, the contractor shall expose the existing water and/or sewer lines where connections will occur and verify their elevation and location. Approval of JCSD of a proposed connection to a JCSD facility does not imply approval of the correctness of the elevation and/or location shown on the plans.
5. Contractor shall not backfill trench until the Inspector has obtained as-built stationing on all structures. It shall be the Contractor's responsibility to provide accurate "record drawings" to the District immediately after construction.
6. Approval by JCSD implies no permission other than that within the District's jurisdiction. All permits required by law shall be acquired by the applicant or their contractor. Requirements of JCSD shall take precedence over requirements of other agencies only where JCSD requirements are more stringent.
7. Contractor shall shore all trenches and conduct all construction and operations in accordance with CAL-OSHA requirements and have all encroachment and excavation permits prior to the start of work.
8. Pipe joints shall not be pulled at any angle greater than one-half the maximum angle recommended by the pipe manufacturer.

9. The proposed work shall be subordinated to any operations JCSD may conduct, and shall be coordinated with such operations as directed by JCSD
10. A prejob meeting shall occur prior to construction. Attendees shall include a District inspector, representative from the Operations Department, Tract Superintendent, City of Jurupa Valley / City of Eastvale representative (As Applicable), and the Contractor who will perform the work. "Cut-Sheets" shall be provided to the District prior to this meeting for its review.
11. The Contractor shall notify underground service alert (U.S.A.) and have all underground utilities marked two (2) working days prior to construction, per U.S.A. requirements.
12. Contractor shall furnish and install all systems in accordance with the District's Standard Specifications and Standard Drawings for water and sanitary sewer systems (latest revision). The specifications and Standard Drawings are available from the District. Contractor shall be in possession of District's Specifications and Standard Drawings on the job site at all times.
13. All permits required by law shall be acquired by the applicant or their Contractor. Copies of the excavation and encroachment permits will be given to JCSD prior to the prejob.
14. Contractor shall designate a qualified superintendent with full authority to act on behalf of the Contractor. Said superintendent shall be on the job site at all times during the construction activities and designated construction times.
15. The District's ability to provide water and/or sewer services to this tract may depend on the developers of other tracts completing the construction of systems. The District assumes no responsibility for the construction of the systems, which are to be constructed by such developers.
16. If District systems are located on land which are private (i.e. outside public rights-of-way) legal descriptions and plats (easement documents) shall be prepared in accordance with District standards by the engineer or land surveyor of record. The easement documents shall be reviewed and approved by the District prior to final acceptance of the systems by the District.
17. Immediately upon completion of construction of the water and/or sewer pipelines, the Developer shall hire a District approved video company to video the pipelines in the presence of a District representative in DVD format (video file format to be viewable on a standard DVD

player/computer and/or as approved by the District) or flash drive. District or District representative shall review said video for potential construction defects prior to acceptance of the project. Payment for all such services shall be borne by the Developer. Final video submitted to the District shall be edited, if necessary, to include only accepted reaches of the pipeline.

18. Inscribe an “S” and “W” on the face of the curb to indicate where sewer laterals and water services cross the curbline.
20. Compaction tests for water and sewer systems shall be performed by a geotechnical firm and paid for by the Developer. All compaction tests shall be made in accordance with District specifications. Soils testing results shall be given to the District inspector on a daily basis. At the conclusion of the project, a final compaction report shall be given to the District. The report shall be signed and stamped by a registered geotechnical engineer and shall certify all compaction results met the most stringent Agency’s requirements.

E. GENERAL NOTES AND REQUIREMENTS (WATER)

1. The water line shall be installed by a private contractor in accordance with JCSD Standard Plans and Specifications. The Contractor shall be approved by JCSD
2. Minimum cover over the water main shall be 48-inches, unless otherwise approved in writing by the District.
3. Wherever a water line encounters storm drain pipe or other obstruction, the waterline shall cross with enough vertical clearances to satisfy the State Board’s Division of Drinking Water requirements and Riverside County Environmental Health Department requirements.
4. Meter boxes shall be field located to clear driveways and by a minimum of 2' shall be located to avoid drainage swales. The Contractor shall adjust meter boxes to sidewalk grade when sidewalks are poured.
5. All steel pipe outlets shall be reinforced in accordance with JCSD Standard Drawing No. C-6 and/or D-6.
6. Where simulated weld bells are used for lap-welded fittings, the bell plate thickness shall be 1/4".
7. The Contractor shall install suitable thrust blocks at every vertical and/or horizontal change of direction in accordance with JCSD Standard No. C-1 or C-2, whether or not specifically called for or shown on the Plan. Upon approval by District, Contractor shall utilize fully welded joints (in lieu of

thrust blocks) per JCSD Standard No. C-2A. Thrust restraint for PVC and DIP pipe shall be accomplished with the use of fully restrained joints per Standard No. C-2B, for the entire pipeline, fittings, tees, bend, etc. all joints shall be fully restrained. Suitable thrust blocks in accordance with JCSD Standard No. C-1 and C-2 shall only be used upon prior written approval by the District.

8. All materials, testing and inspection of pipe shall be in conformity with the requirements of Riverside County, and the American Water Works Association (AWWA) Standards.
9. Failure to meet any of the requirements of JCSD, Riverside County, City of Eastvale / Jurupa Valley (As Applicable) and the AWWA Specifications will be cause for rejection.
10. Pipe shall be handled so as to protect pipe joints, lining and coating, and carefully bedded to provide continuous bearing and prevent settlement. Pipe shall be protected against flotation at all times. Open ends shall be sealed at all times when construction is in progress.
11. All welded steel pipe used shall be cement mortar lined and coated, 10 gauge (minimum), unless noted otherwise.
12. All steel bends and fitting shall be cement mortar lined and coated and shall be shop fabricated per AWWA C208-(latest edition) (Modified per District specifications). Contractor shall submit fabrication drawings (from a District approved fabricator) for all AWWA shop fabricated fittings to the District for approval prior to construction. Service connections (2" and smaller) made to existing ACP, DIP, or PVC pipelines shall utilize bronze service saddles with double stainless steel straps.
13. Buildings located on pads with elevations of ____' and below will require pressure regulators per the UPC.
14. For hydrostatic testing purposes, all water pipes shall be considered Pressure Class ____.
15. All appurtenances (i.e. AV, BO, FH, services, etc.) that require relocation shall be reconstructed in accordance with current District standards. Each appurtenance to be relocated shall be evaluated in the field on a case by case basis and reconstructed as directed by the District. However, unless otherwise approved by the District, relocated appurtenances shall be reconstructed from the main to the proposed location.
16. All appurtenances (i.e. AV, BO, FH, services, etc.) That need to be abandoned shall be removed up to and including the valve and valve can at

the mainline connection. The mainline outlet shall be blind flanged upon removal of the valve. In case of services, the corporation stop shall be removed, and the coupling plugged.

17. Locator wire shall be installed over all PVC waterlines, non-ferrous services and pipelines. Locator wire shall be 14-1 solid insulated copper wire (UF), in a continuous strand, placed on top of pipe and secured with tape. Locator wire shall be brought to the surface at all appurtenances (i.e. fire hydrants, water services, air valves, blowoffs, etc.), thus providing continuous “looping” between the appurtenances and the water main. All splices to locator wire shall be made with direct bury connectors.

F. SPECIAL NOTES (WATER)

The following notes are only to be used with commercial and/or industrial developments.

1. The following fire flow test information was obtained.
 - A. A computer hydraulic analysis/field test dated _____ indicated the water system is capable of supplying _____ GPM at _____ PSI residual pressure (*insert location*).
 - B. Minimum required fire flow @ 20 p.s.i. residual = ____ G.P.M. per Riverside County Fire Department.
2. The exact usage of the proposed buildings is not known at this time. Therefore, although not shown on the drawings, backflow devices will be required on all of the buildings on customer side of meter.
3. The blind services for future buildings are shown schematically and may vary during construction. Final location shall be approved by the District prior to construction. All blind services shall be locked off.
4. The water service lateral to each parcel as depicted by these plans may or may not be sufficient to meet fire flow requirements depending upon the type, size, or use of the improvement(s) constructed thereon. An additional or larger water service lateral may have to be installed at the time the actual fire flow requirements of the improvement(s) on a parcel are known.

G. GENERAL NOTES AND REQUIREMENTS (SEWER)

1. The sewer line shall be installed by a private contractor in accordance with JCSD Standards, Plans and Specifications. The contractor shall be approved by JCSD

2. Type of sewer pipe unless otherwise approved, shall be PVC plastic pipe, SDR 35 minimum wall thickness per Section 207-17 of Standard Specifications for Public Works Construction, latest edition.
3. All work and materials shall conform to requirements of the Riverside County Transportation Department Specifications for the Improvements of Subdivision Streets, County Ordinance No. 461, and subsequent amendments.
4. Grading over sewer mains shall be done in such a manner as to prevent the ponding of water.
5. The top of all manholes located in pavement shall be raised to pavement grade (within 5 working days) after streets are paved and/or capped.
6. House connections, wyes, and laterals shall be located in the field at the direction of the subdivider.
7. The minimum class bedding for PVC sewer shall be Class "I" in accordance with JCSD Std. Dwg. No. S-2.
8. Sewer Contractor shall successfully perform two air tests at no additional cost to the District. The first air test shall be completed immediately after installation, backfill and compaction of the sewage system. The second air test shall be conducted after installation of all the other utilities and prior to paving of the streets.
9. Sewer laterals crossing existing curb and gutter shall be backfilled with a 1 sack cement, sand slurry backfill.
10. Connections to existing pipelines shall only be made with District inspector present. Test plugs shall only be removed upon direction of the District or District's representative.
11. Should modification and/or reconstruction (including raising manholes to grade) of an existing manhole be required, prior to the removal of the frame of the sewer manhole, the channel of the manhole shall be completely covered with planking or other suitable material so as to prevent debris from entering the channel. After the manhole reconstruction has been completed, all debris shall be removed from within the manhole and the cover over the channel shall be removed.
12. Depth of grading rings after modification and/or reconstruction (including raising manholes to grade) of an existing manhole shall be per JCSD Std. Dwg. No. S-7.
13. All manholes that are installed or modified shall be vacuum tested per JCSD Std. Dwg. No. S-7.

14. Sewer plug(s) shall be installed prior to commencement of sewer construction and shall be inspected on a weekly basis to ensure that sewer plugs are in place. In addition, the location of the sewer plug(s) shall be identified on the plans.
15. For a residential development, a backwater valve shall be installed in all new sewer laterals. The valve shall be located closer to house, so it can be as shallow as possible for ease of maintenance.

H. IMPROVEMENT PLAN CHECK LIST

The following is a list of District requirements regarding water and sewer improvement plan preparation. The Developer's Engineer should review this list prior to each plan check submittal to ensure conformance with the District's requirements.

The District's review of Plans and Engineering data will cover only general conformity of the design with the Standards and Specifications outlined herein. The District's approval of Plans and Engineering data will not constitute a blanket approval of all dimensions, quantities, physical properties, materials, equipment, devices, or items shown, and does not relieve the Developer's Engineer from any responsibility for errors, deviations, or defects in design therefor.

General

1. Project identification form (Attachment No. 1, Appendix L) must be completed, signed and stamped by the California Registered Engineer of Record for every plan submittal.
2. All sheets must be 24" x 36" and have the District's standard title block. Scale is 1" = 40' horizontal and 1" = 4' vertical.
3. The first sheet of the improvement plan set is an index sheet that includes an overall layout of the water/sewer system at a scale that clearly delineates the following: streets, lots, valves, fire hydrants, manholes and any existing facilities involved. Additionally, the first sheet must include water and/or sewer certifications, general notes, legend, estimate of quantities and a location map.
4. Plan and profile sheets must show all proposed and existing utility lines, both plan view and elevation; existing ground surface (if facilities are to be constructed prior to mass grading) and proposed street grade, existing and proposed water/sewer lines, with the flowline plotted in the profile, and the slope indicated between each vertical point of intersection. Water/Sewer lines and appurtenances shall have stationing with respect to the center line street stationing. Label all pipeline centerlines with bearings and distances.

5. Self-adhesive or add on labels, certifications, details, etc. are not acceptable on final plans (mylars).
6. Construction notes with reference to District standards shall be provided on each individual plan sheet
7. Plans must be in conformance with all District standards and specifications.
8. Proposed improvements must conform to State and County health separation requirements (horizontal and vertical). In case of conflict, the most stringent requirement shall prevail.
9. Show services and laterals to each lot.
10. Check that minimum cover is achieved for all pipelines (plot existing & proposed ground profiles where necessary).
11. Check to make sure quantity estimates are correct.
12. Each construction note should reference a JCSD Standard.
13. Prior to District approval, a California Registered Civil Engineer's signature and stamp is required.
14. Check master plans for proper pipeline sizing
15. Easements need to be shown on the Improvement Plans and on the Final Map. Additionally, submittal of a separate easement document (description and plat) conforming to District format is required.
16. North arrow orientation shall be to the upper half of the plan sheet; and stationing shall increase left to right across the plan street.
17. Topography with contours shall be provided by field survey or aerial photography in areas where pipelines are to be constructed in existing conditions (i.e. no proposed grading).
18. Provide USA notification note on each sheet.
19. Use private on-site certification wording for private water and sewer systems.
20. Plot the locations (horizontal and vertical) of all existing utilities and agency facilities.

21. Check the effects of proposed cuts/fills over existing pipelines. Provide profile over existing pipeline where requested by District.
22. Make sure curve radii are acceptable (allowable joint pulls).
23. Check centerline lengths from record maps.
24. Vertical curves for the pipelines are not allowed.
25. Provide support for existing utilities where waterlines and/or sewerlines cross below.
26. Check grading, street, storm drain, and erosion control plans for possible affects to District facilities.
27. Check environmental clearances.
28. Review soils report.
29. Provide profiles of "stubbed" mainlines.
30. Provide definitive match lines between sheets.
31. Field check site
32. Identify "Master Planned" improvements on plans.
33. Fully-restrain PVC/Steel transition couplings
34. For proposed tract service laterals, show tables below if applicable:

Sewer Lateral Table

Lot/Building	Design Station	As-Built Station	Backwater Device Required?
1		Leave Blank	Yes or No
2			
3			
4			

Water Lateral Table

Lot/Building	Design Station	As-Built Station	Pressure Regulator Required?
1		Leave Blank	Yes or No
2			
3			
4			

Water Plan Review Checklist

1. The pressure class of pipe and appurtenances must be checked based upon the appropriate pressure zone including additional pumping head affects (if applicable).
 - A. Steel Pipe $t = \frac{P(O.D.)}{2 (16,500)}$ (Equation for steel pipe: refer to Section V.B.2 for minimums)
 - B. PVC C909 Pipe

Use CL 235 and CL 305 as required. In the Eastvale area, use CL 305 for all projects south of Cloverdale Road/Limonite Avenue.
2. High points must have air/vacuum release valves and low points must have blowoffs (blowoffs are also required for 8" diameter lines). These appurtenances should be located on branch runs perpendicular to the mainline. These appurtenances should be located on the "short side" of the street and located along lot line projections.
3. Lots should not have less than 50 psi pressure at high water level (HWL). Lots having more than 80 psi require pressure regulators.
4. Maximum fire hydrant spacing is 330'± unless otherwise approved by Fire Department. Fire hydrants should be constructed on the "short side" of street and located along lot line projections. Verify hydrants are located at each intersection and on both sides of the street for those classified as secondary highways or larger. Locate on BCR's, ECR's or lot lines.
5. Valving should be positioned so that when a mainline segment is isolated, no more than 1300'± of line is drained.
6. Make sure there is a way to drain the line once isolated.
7. For pipelines less than or equal to 12" Dia., use resilient seat gate valves.
8. For pipelines greater than 12" Dia., use butterfly valves.

9. Use fully welded steel (CML/CMC Std. Wt.) pipe in easements.
10. In general, waterlines should be located per County of Riverside Standards.
11. Stationing should be provided on all fire hydrants, air valves, and blow offs on both the plan and profile.
12. Provide profiles of pipelines 8" in diameter and larger branch lines where they must cross storm drains or other large facilities.
13. Check street improvement plans and existing water as-builts where existing waterlines occur for relocation and/or abandonment of mainline, FH, AV, BO, etc. and raising and/or lowering of valve cans. Make sure there is a construction note on the water plans to identify this work.
14. Check to make sure system is set-up for future extensions (i.e., proper locations, clear proposed pavement, clear existing utilities, etc.).
15. Check pipe for proper pipe bedding standards.
16. Unless otherwise approved by the District, connections to existing mains shall be accomplished by installations of tees with mainline and side outlet valves.
17. Locate vaults outside public R-O-W in an easement dedicated to the District in areas where conflict may occur with dry utility conduit, other vaults, etc. Further, location shall not occur in pedestrian walkways.
18. For commercial/industrial projects, use two (2) water meters per lot (1-domestic, 1-irrigation).
19. Check sizing of backflow facilities (maximum flow vs meter capacity).
20. Review potential for waterline looping. Large tracts require a minimum of two (2) "supply" pipelines.
21. Provide an air valve and blowoff on each side of mainline valves that are 16" in diameter and larger.
22. On short cul-de-sacs, run pipeline grade down to eliminate need for an air valve.
23. Review soils report to determine if corrosion protection provisions are required.

24. Use fully welded standard weight CML/CMC welded steel pipe for all siphons.
25. Make sure the fire flow requirements have been established, and the water system is capable of providing the required flow.
26. Make sure the water system is set up for future extensions.
27. Review the need for special construction and/or connection details.
28. Make sure no unnecessary siphons are being used.
29. Where siphons are used, the necessary appurtenances (i.e. B.O., A.V.) should be provided.
30. Proper separations must be maintained where service laterals, detector check lines, fire hydrant lines, etc. cross other utilities.
31. Make sure the grade breaks conform with standard fitting and joint pull parameters.
32. Make sure thrust blocks have been properly sized and they do not conflict with adjacent utilities.
33. Show fully-welded CML/CMC steel pipe and fully-restrained joints limits on PVC and ductile iron pipe by dimensions and stations in profile view and appropriate design locations.
34. Make sure pipeline cover meets minimum requirement and is not excessive (plot existing and proposed profiles where necessary).
35. Plot all existing facilities/appurtenances (i.e. valves, FH, BO, AV, serv., sewer laterals, etc.).
36. Verify the location of existing utilities.
37. Meter and service shown in std. dwg. D-1B shall be used for residential developments.
38. Verify Fire Flow Test Information, including static pressure shown on test.

Sewer Checking Criteria

1. Make sure each lot can be served by gravity flow.

2. Check cover (7.0' minimum to top of pipe) unless otherwise approved by the District.
3. In general, sewer lines should be located per County of Riverside Standards.
4. Stationing should be provided on all manholes.
5. Maximum manhole spacing is 350'; unless otherwise approved.
6. Manholes should be located near all BC's, EC's and PCC's. Manholes are mandatory at PRC's.
7. Make sure line is deep enough to serve adjacent properties by gravity flow (3' drop out of building + (length from building to main x 2%) + 1' drop for wye).
8. Verify proper lateral size (4" diameter for single family residential, 6" diameter minimum for all other uses).
9. Manhole Fall: 0.1' on all bends 45° or greater; run "in-line" grades through manholes for grades of at least 2.5% (provide 0.1' fall on grades less than 2.5%).
10. Provide crossing elevations on plans for service laterals where they must cross storm drain facilities.
11. Whenever possible, in commercial and industrial areas, sewer laterals shall connect directly into a manhole.
12. Plot parallel storm drain profiles (dash) and make sure sewer laterals do not conflict.
13. Check street improvement plans where existing sewer lines occur for sewer lateral additions, relocations, manhole adjustments to grade, etc.
14. Check affects of proposed cuts/fills over existing pipelines.
15. Check to make sure sewer system is set-up for future extensions and tributary drainage areas.
16. Check the affects of additional flow on downstream facilities.
17. Check manhole rim elevations from street plans.
18. For commercial and industrial developments, establish a flowline elevation of the lateral at property line.

19. Check for industrial waste provisions (i.e. at a minimum use a building sewer sampler) for all commercial and industrial projects.
20. Use as steep a slope as possible where the number of tributary dwelling units may not achieve 2 fps velocity in the pipe.
21. Check for potential lateral conflicts with other facilities. Plot unusual or critical crossings in profile.
22. Check bedding for sewer pipe depth per district standards. Prepare pipe loading calculations where required.
23. Encase the sewer for load carrying capability when top of sewer is within 3 feet of surface of street. (Ductile iron pipe as alternative).
24. Check pipeline alignment for future extensions, both vertically and horizontally.
25. Where pipe slope is at minimum, conduct a field survey to verify the location and elevation of point of connection.
26. Check the on-site sewer system for the need of any required industrial waste clarifier, grease interceptor, or oil/sand separator.
27. Check to make sure the proposed and/or existing sewer has proper cover.
28. Curved sewers must meet the District's/manufacture's requirements (minimum radius or maximum joint pull).
29. Backwater valves should be provided where required per Section 409 of the Uniform Plumbing Code.
30. Check that the design pipe slope (i.e. along pipe centerline) is based upon actual sewer main length and is greater than minimum.
31. When sewer is located in an easement, the manholes must be readily accessible by maintenance trucks. Bolt-down manhole covers are required when manholes occur on private property.
32. A detail or construction note should be provided for manholes the bottom of which need to be re-contoured for flow when sewer line joins existing manhole.
33. Sewer lines should be stubbed for future extension where required.

34. Manholes must be provided on the mainline where sewer laterals are 8" in diameter and larger.
35. Soffits must be matched where sewer mains of different diameters connect.
36. Rim elevations should be shown to the nearest 0.1' at all structures.
37. Make sure the street profile agrees with street plans and any revisions thereto.
38. Where possible, a minimum slope of 1% should be used on cul-de-sacs.
39. On proposed and existing sewer lines, show arrows delineating sewer flow direction.
40. For deep sewer laterals, JCSD standard drawings S-6A shall be called out on plans.
41. In areas where a proposed sewer will run parallel to a storm drain facility, show table that shows vertical separation between storm drain and sewer laterals.
42. Ensure that proposed monitoring manholes are placed at the R/W line. Monitoring manholes are required if development will be tributary to Inland Empire Brine Line.
43. Sewer laterals shall be proposed using PVC pipe.

I. ABBREVIATIONS

Aband	Abandon
Ah.	Ahead Station
ANSI	American National Standards Institute
ASTM	American Society for Testing Materials
A.V.	Air Valve
AWWA	American Water Works Association
B.C.	Begin Curve
BFV	Butterfly Valve
Bk.	Back Station
Bld Flg	Blind Flange
B.O.	Blow Off
Bot	Bottom

CAL-OSHA	California Occupational Safety and Health Administration
CTS	Cathodic Test Station
C.O.	Clean Out
CML/CMC	Cement Mortar Lined/Cement Mortar Coated
CPLG	Coupling
DIP	Ductile Iron Pipe
DOSH	Division of Occupational Safety and Health
E.C.	End Curve
Elec.	Electrical
Esmt.	Easement
Ex.	Exist
FH	Fire Hydrant
Flg.	Flange or Flanged
FL	Flowline
G	Gas line or service
gpm	Gallons per minute
GV	Gate Valve
HPI	Horizontal Point of Intersection
IPS	Iron Pipe Size
JCSD	Jurupa Community Services District
MH	Manhole
P.C.C.	Point of Compound Curve
P.R.C.	Point of Reverse Curve
P.E.	Polyethylene
PVC	Polyvinyl Chloride
RED	Reducer
RJ	Restrained Joint
S	Sewer main or house lateral
SD	Storm Drain
St. Lt.	Street Light
T	Telephone cable or conduit
U.G.	Underground
VCP	Vitrified Clay Pipe

VPI	Vertical Point of Intersection
W	Water main or service
WSP	Welded Steel Pipe

J. SYMBOLS

Refer to District Standard Drawing No. AA-1.

K. GUIDE FOR EASEMENT DRAWINGS

Maps for easements over private lands should contain sufficient information to reflect every call-out as it is recited in the description.

1. Required Information
 - a. North Arrow (orientation to upper half of plat)
 - b. Scale
 - c. Tract Numbers
 - d. Lot Numbers
 - e. Lot lines
 - f. Ownership Lines
 - g. Section Corner or Rancho Corner Data
 - h. Street R/W and Street Names
 - i. Section, Township & Range and Base & Meridian Data or Rancho Data
 - j. Call out of Easement
 - k. Parcel Numbers
 - l. Dimensions
 - m. Title Block
 - n. Drawing Number
 - o. Signature of General Manager
2. Additional Information When Bearings are Used
 - a. Basis of Bearings
 - b. T.P.O.B. (True Point of Beginning)
 - c. Bearing and Distances

- d. Curve Data
 - e. Designated Point
 - f. Existing Easement Data
3. Right-of-Way Width Requirements for Easements are as follows: The minimum required width for all easements shall be 20 feet. Wherever sewer and water pipelines are to be installed in the same easement, the minimum required width shall be 30 feet. Generally, all pipelines shall be installed at the centerline of the easement. When approved by the District, pipeline may be installed no less than 5 feet from either easement boundary.
4. Tract Maps
- a. Construction prior to Tract Map recordation will require acquisition of rights-of-way description. The description shall be originated by the tract engineer.
 - b. Public Utility easements are not acceptable.
5. Areas Not Included in Tracts

Rights-of-way acquisition shall be completed prior to construction, and prior to Tract recordation where associated with Tract development.

6. Easements Within Subdivisions
- a. Public Streets - no separate easements are required.
 - b. Private Streets or Easements across Private Lands - Easements shall be acquired by separate instrument.
7. District Acceptance of Easements

All easements offered to the District for acceptance shall be formally acknowledged by a "Certificate of Acceptance" as shown in Appendix C.

L. ESTABLISHMENT OF LINE AND GRADE

The line and grade of the improvements shall be per the District approved drawings. Survey control ("staking") shall be necessary for all sewerline improvements and "cut sheets" shall be submitted to the District prior to preconstruction conference.

Survey control ("staking") shall be necessary for all waterline improvements: (1) where curb and gutter does not exist prior to construction of the waterline; (2) where the proposed

waterline does not follow curb grade; (3) where the District requires additional control to occur.

M. CONTRACTOR'S DATA SHEET

Owners, Developers and Developers' Engineers are advised that any contractors who intend to construct facilities for the District submit to the District a Contractor's data sheet before they may engage in construction. The data sheet must be submitted at least 10 working days prior to bidding on a project. A Contractor's data sheet is included for reference in Appendix E of Section VII.

N. CONSTRUCTION AGREEMENT

A Water/Sewer Construction Agreement must also be signed by Developer, Contractor, and District representative prior to the pre-construction meeting. A blank agreement form is included for reference in Appendix D of Section VII.

O. APPROVED MANUFACTURED MATERIALS

A list of District approved manufactured materials is provided in Appendix J of Section VII.

SECTION III

WATER SYSTEM DESIGN CRITERIA

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TABLE OF CONTENTS

SECTION III - WATER SYSTEM DESIGN CRITERIA

A.	GENERAL	III-1
B.	GENERAL LAYOUT	III-1
C.	SYSTEM DEMAND CRITERIA.....	III-1
D.	SYSTEM PRESSURE.....	III-3
E.	PIPE SIZING CRITERIA.....	III-3
F.	PIPELINE MATERIALS	III-4
G.	PIPELINE LOCATION.....	III-4
H.	VALVES.....	III-5
I.	BACKFLOW PREVENTION	III-5
J.	PRESSURE REDUCING STATION	III-6
K.	FIRE SERVICE INSTALLATIONS.....	III-6
L.	CORROSIVE SOIL DESIGN	III-6
M.	WATER SAMPLING STATIONS.....	III-7
N.	SERVICE INSTALLATIONS.....	III-7
O.	FIRE HYDRANTS	III-7
P.	BLOWOFFS	III-7
Q.	COMBINATION AIR/VACUUM RELEASE VALVES	III-8
R.	AVAILABLE FIRE FLOW DETERMINATION.....	III-8

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III. WATER SYSTEM DESIGN CRITERIA

A. GENERAL

Water system improvements proposed for inclusion into the District's service area shall be designed in accordance with the criteria set forth herein, unless otherwise approved in writing by the District.

The design shall take into consideration physical conditions known to exist at the time and place of each installation and the probable operating requirements. Where such conditions render sections of these Specifications inapplicable, alternate methods of design may be submitted to the District, and upon approval thereof, may be incorporated in the plan.

The design shall require at least two different sources of water from two different water pipelines available for each development; thereby providing a "looped system". Two sources from the same water transmission pipeline are acceptable if a source from a different location is unavailable.

B. GENERAL LAYOUT

1. The system shall be designed as a circulating grid with at least three (3) main line valves at each four way intersection.
2. Each line shall be valved so that any segment not exceeding one block (1,300[±] feet) or two fire hydrants of the system may be isolated from service.
3. Dead end mains shall be provided with means of flushing with a fire hydrant.

C. SYSTEM DEMAND CRITERIA

1. The District reserves the right to determine criteria for each water system or sub-system based upon conditions that may exist for that particular location, anticipated level of development, planned use or other criteria. In general, however, water mains, tanks, pump stations and appurtenances shall be sized to handle the highest demand on the system within the sphere of influence.
2. All flows shall be computed on the basis that the area served by the extension or addition is completely improved to limits imposed by its present zoning or the zoning required to allow construction of the proposed development.

The design flow will be the greater flow produced by either:

- (a) Maximum day demand (of the maximum month) plus required fire flow, or:

- (b) Peak hourly demand on days of maximum demand.
3. Residential. Residential peak hour demands for distribution systems serving up to 400 residential units may be calculated from the formula $Q = NCF$, where Q = Peak hourly flow in G.P.M.; N = number of units; $C = 5.0$; F = a diversity factor which may be interpolated from the following table:

<u>N (Number of Units)</u>	<u>F (Diversity Factor)</u>
4	2.0
10	1.8
50	1.0
100	0.7
200	0.5
400	0.4

For distribution systems serving more than 400 units, demand will be determined by the District. The District reserves the right to specify sizing of any pipeline.

Residential maximum day demands can be calculated by dividing the peak hour demand by 1.5.

4. Commercial and Industrial:
- (a) For initial planning, District will use 8100 gpd/gross acre to estimate maximum day demand.
- (b) For final sizing of water systems, demand shall be based on building code requirements. Demand calculations shall be submitted to the District for its review and approval.
5. Agricultural demands will be determined by the District.
6. Fire Flow Demand. The minimum fire flow requirement shall be determined by the fire protection agency serving the area. Unless higher residual pressures are required by the Fire Agency, the computation shall be based upon a minimum of 20 PSI residual operating pressure in the water main from which the fire flow measurement is taken.

D. SYSTEM PRESSURE

1. Internal pipe pressures shall be calculated based upon the maximum hydraulic grade line. Pumping suction and discharge lines shall be investigated as to water hammer under conditions of power failure at full flow. In general, pressures for each zone may be calculated from the following table (NAV88):

Pressure Zone <u>Designation</u>	Elevation of Water Surface (±) <u>(HWL = High Water Level)</u>	Highest Service <u>Elevation</u>	Lowest Service <u>Elevation*</u>
870	887	760	540
900**	N/A	770	550
980	984	860	640
1100	1110	980	760
1110	1120	990	770
1200	1204	1080	860
1350	1354	1230	1010

*Based on Class 150 pipe

**PRV Zone

2. A minimum pressure of 50 psi static based upon the high water level of the reservoir serving the pressure zone shall be provided to each and every customer service. The maximum design pipeline pressure shall be 150 psi unless otherwise approved by the District. The influence of any pumping facilities shall take into account in this analysis (i.e. include pumping head).

E. PIPE SIZING CRITERIA

1. The minimum pipe size shall be 8-inch diameter.
2. Pipeline velocities shall not exceed 5 feet per second during peak hourly domestic flow, or 10 feet per second at maximum day domestic demand plus the required fire flow. Use a "C" value of 120 in the Hazen-Williams formula for flow computations.
3. The District reserves the right to require 12-inch diameter minimum size pipelines in residential areas, with no incremental pipeline diameter upsizing cost to the District, when necessary, as determined by the District.
4. Whenever possible, pipelines shall be looped to provide dual direction supply and system flexibility.
5. In commercial and industrial areas, the standard minimum mainline pipe size shall be 12-inch diameter.

6. The District may require pipe sizing in excess of the minimum size as determined by the design criteria herein when the systems being constructed will serve, or may be extended to serve, additional lands. If oversizing is required by the District, the District's Board of Directors may authorize participation and payment of increased costs of such pipeline in accordance with District criteria.
7. Services and meters shall be sized in accordance with the provisions of Section 1009 of the Uniform Plumbing code, using minimum pressure expected in the system. Minimum service pipe diameter and meter size shall be: 1" line and 3/4" meter.
8. The minimum steel plate thicknesses utilized for water pipeline shall be as shown in Section V, The Water Pipeline Materials Specifications, Section B.2.

F. PIPELINE MATERIALS

1. All District watermains shall be constructed of cement mortar lined and cement mortar coated welded steel pipe (10 gauge minimum plate thickness). As approved in writing by the District, residential developments may be allowed to use 8" and 12" diameter AWWA C909 PVC pipelines.
2. Pipe shall be provided only from District-approved pipe manufacturers. See list in Appendix J of Section VII.

G. PIPELINE LOCATION

1. On south side or west side of the street and out of the main traveled lanes of the road where possible. Locate 7 feet from curb face or berm. Location is not to interfere with other existing utilities.
2. Pipeline is to be installed after roads are constructed to final sub-grade, and developer certifies this in writing on District form.
3. Adjacent to existing or proposed sewer lines, installation shall be in accordance with the State Board's Division of Drinking Water (DDW), or District requirements; whichever is greater. Generally, always cross above sewer lines, preferably with a minimum clearance of 1 foot, and parallel at least 10 feet (O.D. to O.D.) away from sewer lines. Where required by DDW and/or Engineer, water pipe joints shall be fully welded (double pass) and the pipe zone shall be backfilled with a 1 (one) sack cement sand slurry.

4. When minimum cover cannot be provided, concrete encasement or protective slab construction over the pipeline may be substituted. Consult with District staff. Requires special approval.
5. District will require pipeline looping whenever possible. Dead end mains are undesirable.

H. VALVES

1. Location:
 - (a) Large mains (14" and larger): To be determined for each system to meet operational requirements.
 - (b) Small mains (12" and smaller): To provide flexibility of operation, usually located on discharge side of pipe connections; minimum 4 at crosses, 3 at tees and always at beginning of dead end mains. District may require additional valving on critical sections or where proposed valving requires closing more than 3 valves to isolate a section of pipeline.
 - (c) Each main shall be valved so that any segment not exceeding 1,300 feet may be isolated from service.
2. Size & Type:

Full line size gate valves through 12-inch (normal pressure rating 200 psi; specify a gate valve rated to a maximum pressure of 250 psi if required). For 14-inch and larger, use full line size butterfly valves (normal pressure rating 150 psi; specify a butterfly valve rated to a maximum pressure of 250 psi if required).
3. Refer to Standard No. B-1 (Gate Valves) and Standard No. B-3 (Butterfly Valves). Valves shall be provided only from District approved manufacturers. See list in Appendix J of Section VII.

I. BACKFLOW PREVENTION

1. Where domestic service water and/or fire service water may become cross-connected to other water supplies or sources as determined by the District, an approved backflow prevention device is required by Title 17, Drinking Water Supplies, of the California Administrative code, and shall be installed in accordance with District requirements.
2. All materials, installation, and testing shall be in accordance with District backflow prevention Ordinance No. 67.

3. On all commercial and/or irrigation services, the water meter shall not be installed until an approved backflow prevention device is installed “immediately” behind the meter box.

J. PRESSURE REDUCING STATION

1. Where required by the District, pressure reducing station shall be individually designed specifically for each installation, subject to District review and approval of design and materials.

K. FIRE SERVICE INSTALLATIONS

1. Where fire service installations are necessary, the minimum service construction requirement shall be in accordance with Standard No. H-1. If required by the County of Riverside Fire Department or fire flow requirements, two or more fire services shall be installed in accordance with Standard No. H-1.
2. The District shall require that the fire service be constructed in accordance with Standard No. H-4A (metered) if it is subsequently determined solely by the District that unauthorized water use from the fire service is occurring and/or is likely to occur.

L. CORROSIVE SOIL DESIGN

1. Where pipelines are to be constructed in known or likely corrosive soil conditions, cathodic test stations shall be provided in accordance with District requirements and standards at the locations determined by the District.
2. The District, at its option, may also require cathodic test stations for its transmission mains and major pipelines, regardless of existing soil conditions.
3. In order to determine whether or not unfavorable soil conditions exist, the District may request that soil boring samples and laboratory analysis be provided as part of the project. The analysis shall include an evaluation of the following:
 - PH
 - Redox
 - Sulfide
 - Resistivity
 - Sulfate

4. Under certain circumstances, the District may require special pipe installation procedures or types of pipe, including special protective coatings **or** sheathing for pipe and fittings.

M. WATER SAMPLING STATIONS

1. Where water sampling stations are required, as determined by the District, the stations shall be constructed in accordance with Standard No. K-1.

N. SERVICE INSTALLATIONS

1. All services shall be constructed in accordance with the applicable District Standard Drawing.
2. Services shall not be connected to 20-inch or larger mains unless specifically permitted by the District.
3. In addition to a domestic water service meter, all commercial/industrial projects shall be required to provide a separate landscape irrigation meter and service, in conformance with District Standards.

O. FIRE HYDRANTS

1. Fire hydrants shall be designed per requirements of the Fire Protection Agency having jurisdiction. Developer's Engineer must obtain hydrant location approval prior to the District approval of water system improvement plans. Hydrant top and cap painting color shall be per agency having jurisdiction and per District Standard Drawings. Hydrant shall be properly prepped and painted Safety Yellow per Devoe Devthane color.
2. All hydrants shall be constructed per District Standard Drawing No. G-1, G-1A, G-2, and/or G-2A.
3. Fire hydrants shall be provided only from District approved manufacturers (see Section VII, Appendix J).
4. Fire hydrants not in service shall be bagged per District Requirements.

P. BLOWOFFS

Appropriately sized blowoffs shall be located at all low points along the pipeline alignment and at all "dead end" locations. Blow-offs on 8-inch diameter waterlines will also be required unless otherwise directed by the District. Additionally, for all pipelines 14" in diameter and greater, a blowoff shall be located on the upgrade side of all mainline valves. All blowoffs shall be constructed per District Standard Drawing No. F-1, F-1(A), F-2, F-4, and F-4(A).

Q. COMBINATION AIR/VACUUM RELEASE VALVES

Appropriately sized air/vacuum release valves shall be located at all high points along the pipeline alignment and at all "dead ends" that occur at a high point. Additionally, for all pipelines 14" in diameter and greater, an air/vac valve shall be located on the downgrade side of all mainline valves. All air/vac valves shall be constructed per District Standard Drawing No. E-1 and E-2.

R. AVAILABLE FIRE FLOW DETERMINATION

Where required, the District's water system fire flow characteristics will be provided to the Developer's Engineer as shown on Figure III-A. The following should be noted.

1. The Developer's Engineer shall be responsible for all calculations required by the Riverside County Fire Department to verify the required fire flow can be obtained at the project site.
2. The results of computer simulation(s) performed by the District shall be used by the Developer's Engineer as a basis of system flow capabilities.
3. The hydraulic data provided are estimates based on various assumptions that may or may not occur. This information is provided as a convenience and not as a guarantee of flow capabilities at specific pressure by Jurupa Community Services District.

FIGURE III-A
JURUPA COMMUNITY SERVICES DISTRICT
FIRE FLOW REVIEW

Project Identification: _____ W.O. No. _____

Date of Riverside County Fire Department Condition of Approval (attach copy):

Minimum Required Fire Flow: _____ gpm For a _____ hour

Duration at a _____ psi Residual Operating Pressure

COMPUTER SIMULATION RESULTS

System Model Results (if applicable)

Pressure Zone: _____

System Loading of Maximum Day Demand + _____ gpm Fire Flow At Node _____

Resultant Pressure at Node _____ = _____ psi

The minimum required Fire Flow ☐ was ☐ was not obtained

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SECTION IV

SEWER SYSTEM DESIGN CRITERIA

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TABLE OF CONTENTS

SECTION IV - SEWER SYSTEM DESIGN CRITERIA

A.	GENERAL	IV-1
B.	LOCATIONS OF MAINS	IV-1
C.	FLOW RATE COMPUTATIONS	IV-1
D.	PIPE SIZING	IV-2
E.	MANHOLES	IV-3
F.	PIPE VELOCITIES	IV-4
G.	SLOPES	IV-4
H.	BEDDING.....	IV-5
I.	BACKWATER VALVES	IV-6
J.	SEWAGE INJECTORS.....	IV-6
K.	LATERAL CONNECTIONS TO MAIN	IV-6
L.	INDUSTRIAL WASTE PROVISIONS	IV-7

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IV. SEWER SYSTEM DESIGN CRITERIA

A. GENERAL

Sewer system improvements proposed for inclusion into the District's service area shall be designed in accordance with the criteria set forth herein, unless otherwise approved in writing by the District.

The design shall take into consideration physical conditions known to exist at the time and place of each installation and the probable operating requirements. Where such conditions render sections of these Specifications inapplicable, alternate methods of design may be submitted to the District, and upon approval thereof, may be incorporated in the Plan.

B. LOCATIONS OF MAINS

1. Alignment:
 - a. 6' north or east of centerline of street.
 - b. Horizontal curves are allowed on all sizes 8" and larger. All curved sewers shall have a minimum radius of 288', but no less than the radius recommended by the pipe manufacturer. No reverse curves allowed between manholes. Manholes shall be constructed at or near all BC's, EC's, PRC's, and PCC's.
 - c. No vertical curves allowed.
2. Depth: Minimum cover over pipe should be sufficient to service adjacent property by gravity, and cover shall not be less than 7.0' to finish grade of street, unless otherwise approved by District. In addition, sewer mains must be sufficiently deep in subdivisions to allow water lines to be set with 4' min. cover without interference from sewer laterals.

C. FLOW RATE COMPUTATIONS

1. All flows shall be computed on the basis that the area served by the extension or addition is completely improved to limits imposed by its present zoning required to allow construction of the proposed development.

2. Average Daily Rates:

- | a. | Residential Areas: | <u>GPCD</u> | <u>Pop./Unit</u> | <u>GPD/Unit</u> |
|----|--|-------------|------------------|-----------------|
| | Apartments | 90 | 2.0 | 180 |
| | Single Family | | | |
| | Tributary to City
of Riverside Water
Quality Control | | | 252
Plant |
| | Tributary to Western
Riverside County
Regional Wastewater
Authority Plant | | | 220 |
- b. Commercial and Industrial: For initial planning, District will use 2000 gpd/gross acre to estimate average daily flows. For final sizing, investigate each installation

3. Peak Flow Rates:

- a. Residential Areas: $Q_{PEAK} = 2.5Q_{ADF}^{(0.91)}$
Where Q_{PEAK} & Q_{ADF} are in millions of gallons per day (mgd)
- b. Commercial & Industrial: Investigate each installation

D. PIPE SIZING

Pipe sizing for gravity mains shall be determined as shown below:

1. for 8" diameter mains and smaller:
 - a. $n = 0.013$;
 - b. D/d (depth of water to pipeline diameter ratio) ≤ 0.50 (i.e. 50% $\pm$ full)
2. for 10" diameter mains and larger:
 - a. $n = 0.013$
 - b. D/d ratio ≤ 0.75 (i.e. 91% $\pm$ full)
3. House Connection Laterals (at 2% slope, utilizing 45° connection at main)

E. MANHOLES

1. Spacing shall not exceed:
 - a. 350' for all pipes; unless otherwise approved by District.
 - b. Manholes shall be located at or near all BC's, EC's, PRC's and PCC's on curved sewers.
 - c. Distance noted between manholes shall be measured to manhole centerlines.
 - d. Minimum 60" inside diameter manholes shall be required for pipelines deeper than 15' and/or for sewer diameters 15-inch and larger. Minimum 72" inside diameter manholes shall be required for pipelines 30-inch in diameter and larger.
2. Inverts:
 - a. Provide 0.1' fall through manholes for grades less than 2.5%. Show pipe flow line elevations at inlet and outlet of manhole. For grades greater than 2.5%, design grade may be continued through the manhole. Show pipe flow line elev(s). at centerline manhole station.
 - b. Where manhole invert is formed in field, a drop may be required, as follows:
 - 1) 0.1' on all bends 45° or greater
 - c. Unless otherwise approved by the District, junction manholes shall have the crowns (soffits) of the intersecting pipes at the same elevation where their projections intersect the manhole centerline.
 - d. Connections to existing facilities shall be verified in the field during the design stage, or provisions made to verify them prior to construction.
3. Drop manholes may be utilized only upon prior approval by the District. Drops shall not be less than 3 feet. ("Steep" slopes from the first manhole upstream are preferred to drop manholes.)
4. Manholes shall not be buried except where approved by District. Manholes shall be raised above ground level where necessary to maintain them in farmed areas and in waterways.
5. Use of cleanouts on sewer mains is not permitted.

6. A manhole per District Standard Drawing No. S-7 shall be provided at the street right-of-way line for all laterals 6" in diameter and larger unless a wastewater flow monitoring station is provided or unless otherwise approved in writing by the District.

F. PIPE VELOCITIES

1. Minimum
 - a. Sewer Mains: 2 - 2.5 fps
 - b. Force Mains: 2.5 - 3 fps
 - c. Inverted Siphons: 3 fps
2. Maximum
 - a. Sewer Mains: 10 fps
 - b. Force Mains: 5 fps

G. SLOPES

1. House Connection Laterals:

Pipe dia.	4"	6"
Slope	0.020	0.020

(0.010 Extreme Minimum with prior approval only)

2. Sewer Mains:

Pipe Diameter	Minimum Slope
8"	.0040
10"	.0032
12"	.0024
15"	.0016
18"	.0014
21"	.0012
24"	.0010
27"	.0008
30"	.0007

Gradients should be set to 2 figures, evenly divisible by 4, wherever possible.

H. BEDDING

1. PVC (SDR 26 or 35)

The trench width and pipe bedding requirements shall be per JCSD Standard Drawing No. S-2 based on the proposed pipe diameter. Pipe thickness is dependent on depth cover over top of pipe. For pipes installed with less than 14-feet of cover, pipe thickness to be minimum of SDR 35. For pipes installed with greater than 14-feet but less than 25-feet of cover, pipe thickness to be minimum of SDR 26. For other conditions such as deep cover (greater than 25-feet), ground water, additional live loads beyond H20 loading, other trench conditions, wide trench conditions, independent analysis must be conducted. The following assumptions apply:

- a. Minimum Live Load: H20 Traffic Loads;
- b. Unit Weight of Soil: 120 lbs./ft³;
- c. Embedment Stiffness (E'): 1,000 lbs./ft²;
- d. Pipe Bedding: Class I (Full Crushed Rock);
- e. Maximum Diametric Deflection: 7.5%;
- f. Min. Factor of Safety: 2;
- g. Conduct independent analysis for pipes 18-inch dia. and greater;
- h. Refer to AWWA M23 for additional requirements.

2. HDPE (DR 11 minimum)

The trench width and pipe bedding requirements shall be per JCSD Standard Drawing No. S-2A based on the proposed pipe diameter. This pipe material is for installation within sewer easements only and at the District's direction. The minimum pipe thickness is DR 11 with a maximum depth of cover over top of pipe of 25-feet. For other conditions such as deep cover (greater than 25-feet), ground water, additional live loads beyond H20 loading, other trench conditions, wide trench conditions, independent analysis must be conducted. The following assumptions apply:

- a. Minimum Live Load: H20 Traffic Loads;
- b. Unit Weight of Soil: 120 lbs./ft³;
- c. Embedment Stiffness (E'): 1,000 lbs./ft²;

- d. Pipe Bedding: Class I (Full Crushed Rock);
- e. Maximum Diametric Deflection: 7.5%;
- f. Min. Factor of Safety: 2;
- g. Conduct independent analysis for pipes 18-inch dia. and greater;
- h. Refer to AWWA M55 for additional requirements.

I. BACKWATER VALVES

Backwater valves shall be required in accordance with the Uniform Plumbing Code, Latest Edition.

The backwater valves, where required, shall be installed in accordance with the County of Riverside Building and Safety Department's requirements and shall be installed at shallowest location allowing access for future inspection and maintenance. Where backflow valves are required, they shall be installed on private property by the property owner or tract developer and are to be maintained by property owner.

J. SEWAGE INJECTORS

- 1. In some extreme circumstances, the ability to sewer an individual lot by gravity may be uneconomical based on excessive depths of the mainline sewer. The definition of these circumstances shall be determined by the District. Should the District determine these conditions exist for a lot, and upon District approval only, an individual sewage injector may be used.
- 2. The injector shall be constructed to District specifications for installation on private property by the property owner or tract developer. Maintenance of the injector shall be the responsibility of the property owner.

K. LATERAL CONNECTIONS TO MAIN

- 1. Direct connections of 4" and 6" diameter laterals to the mainline shall only be allowed when the sewermain has a diameter less than 15" and the connection is made per Standard Drawing No. S-5, S-6 or S-18. Direct lateral connections to 18" diameter sewer lines and larger shall be allowed at the discretion of the District and only if approved in writing by the District.
- 2. All mainline connections, 8" and larger, shall be made with the installation of a manhole.

L. INDUSTRIAL WASTE PROVISIONS

The developers of all commercial/industrial projects shall provide the District with detailed information concerning the project's expected wastewater quality and quantity. The District will review this information and determine which of the following facilities are required.

1. Building sewer sampler.
2. Wastewater flow monitoring station.
3. Gravity separator.
4. Industrial waste clarifier.
5. Pretreatment facilities.

Additionally, a separate irrigation meter and service shall be required to segregate the water quantity used for irrigational purposes so that equitable sewer user fees can be charged.

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SECTION V

BASIC SPECIFICATIONS

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BASIC SPECIFICATIONS
SECTION A

GENERAL SPECIFICATIONS

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BASIC SPECIFICATIONS
SECTION A
GENERAL SPECIFICATIONS
TABLE OF CONTENTS

	<u>Page</u>
1. Reference Specifications.....	A-1
2. Contractor's Schedule of Work	A-1
3. Inspection.....	A-2
4. Defective Workmanship and Material	A-3
5. Sanitation	A-3
6. First Aid and Protective Facilities.....	A-4
7. Contractor to Provide Facilities for Employees.....	A-4
8. Power	A-4
9. Cleanup	A-4
10. Utilities and Easements.....	A-5
11. Relationship with Other Governmental Agencies	A-5
12. Exposure of Utilities in Advance of Work	A-6
13. Advance Notification of Agencies.....	A-6
14. Crossing, Protection and/or Relocation of Utilities	A-7
A. General.....	A-7
B. Utilities Shown on Plans.....	A-7
C. Special Water/Sewer Crossings	A-8
D. Relocation of Utilities by the Contractor for Their Own Convenience.....	A-8
E. Service Connections.....	A-8
F. Utility Conflicts with Proposed Improvements	A-9
G. Unknown Utilities Disclosed During Contract Work.....	A-9
H. Responsibility of the Contractor	A-11
15. Protection of Facilities Other than Utilities	A-11
16. Ground Water.....	A-11

BASIC SPECIFICATIONS
SECTION A
GENERAL SPECIFICATIONS
TABLE OF CONTENTS
(continued)

	<u>Page</u>
17. Construction Water	A-12
18. Water Supply for Compaction and Dust Control.....	A-12
19. Traffic Control	A-12
20. Access to Adjacent Properties	A-13
21. Construction Staking.....	A-13
22. Protection of Survey Monuments	A-15
23. Record Drawings	A-16
24. Reseeding.....	A-16
25. Erosion Control.....	A-16
A. General.....	A-16
B. Preparation	A-17
C. Material	A-17
D. Protection for Steep Slopes.....	A-17
26. Contractor's Submittals.....	A-18
27. Responsibility for Material Furnished by the District	A-19
28. Errors or Discrepancies Noted by Contractor.....	A-19
29. Handling and Storage of Materials	A-19
30. Geotechnical Services.....	A-19
31. Earthwork.....	A-20
A. General.....	A-20
B. Clearing and Grubbing.....	A-21
C. Grading Along Pipeline	A-22
D. Trench Excavation	A-22
E. Trench and Excavation Shoring.....	A-24
F. Pipe Bedding.....	A-25
G. Crushed Rock Bedding	A-26

BASIC SPECIFICATIONS
SECTION A
GENERAL SPECIFICATIONS
TABLE OF CONTENTS
(continued)

	<u>Page</u>
H. Trench Backfill and Compaction Requirements	A-28
I. Structure Excavation and Backfill	A-32
J. Control of Water	A-33
K. Payment.....	A-33
32. Steel Casing	A-33
33. Jacked Steel Casing.....	A-34
A. Submittal	A-35
B. Potholing of Existing Utilities	A-36
C. Permit Provisions and Requirements	A-36
D. Casing Spacers	A-37
E. Installation of Steel Casing	A-38
F. Installation of Carrier Pipe.....	A-39

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BASIC SPECIFICATIONS

SECTION A

GENERAL SPECIFICATIONS

1. REFERENCE SPECIFICATIONS

The following published reference specification shall hereby become part of these specifications.

- A. State of California, Department of Transportation, "Standard Specifications", (Latest Edition).
- B. "Standard Specifications for Public Works Construction", Latest Edition, published by Building News, Inc., 3055 Overland Avenue, Los Angeles, California 90034. Part I of the "Standard Specifications for Public Works Construction" shall apply to work accomplished under the contract except as herein modified.

2. CONTRACTOR'S SCHEDULE OF WORK

Within seven (7) days from the time the Contract is executed by all parties and at such other times as may be requested by the District, the Contractor shall submit to the District a detailed construction schedule which shall show the order in which the Contractor proposes to carry on the work, the dates at which the Contractor will start the several parts of the work, and the estimated dates of completion of the several parts. The District reserves the right to approve or alter the Schedule proposed by the Contractor, prior to the start of work.

The District may establish priorities for completion of certain parts of the work which may be necessary to provide certain services or which the District may deem advisable in the interest of public safety and convenience.

The construction schedule and supplementary construction schedules submitted shall be consistent in all respects with the time requirements of the contract.

3. INSPECTION

All work and materials furnished under these specifications shall be subject to rigid District inspection and acceptance. Inspection shall mean those services to ensure that the project is constructed in accordance with the plans and specifications including but not limited to District, Agency, or Consultant Inspection Services, Geotechnical and Soils Services, Painting and Coating Inspection Services, Electrical and Structural Inspection Services, etc.

The Contractor shall notify the District at least two working days in advance of any work to be done, in order that inspection, including that of on-site materials, may be provided with a minimum of inconvenience to the District or delay to the Contractor. The Contractor shall perform construction only in the presence of an inspector unless written permission to work during the absence of an inspector has been granted by the District or inspector. Any work done in the absence of an inspector without permission shall be subject to rejection.

The District shall at all times have access to the work during its construction and shall be furnished with every reasonable facility for ascertaining that materials and workmanship are in accordance with the requirements of these Specifications.

When required, the Contractor shall notify the District a sufficient time in advance of manufacture or production of materials to be supplied, in order that the District may arrange for shop or plant inspection and testing. The District shall have access to all parts of the shop or plant where material subject to inspection is being manufactured.

All materials shipped prior to having satisfactorily passed such testing and inspection by the District shall not be used unless approved by the District.

The Contractor shall also furnish the District duplicate, certified copies of all factory and mill test reports when required by the District.

Work or materials failing to conform to these Specifications may be rejected at any time.

The District has made the necessary arrangements for inspection of Contractor's work during the District's field services' regular (i.e. 7:00 a.m. to 3:30 p.m., Monday through Friday) 40 hour work week. If the Contractor works more than an 8 hour day, a

40 hour week, and/or District observed holidays, the financial responsibility for added inspection shall be the responsibility of the Contractor. The prevailing hourly rates for inspection are on file with the District. Such prevailing rates will be applied at 1-1/2 times the regular rates for periods over 8 hours a day and/or 40 hours per week and/or District observed holidays and 2 times the regular rates for periods over 12 hours in one (1) day.

4. DEFECTIVE WORKMANSHIP AND MATERIAL

The Contractor shall promptly remove from the premises all work and materials condemned by the District as failing to conform to the contract, whether incorporated or not, and the Contractor shall promptly replace and re-execute their own work in accordance with the contract and without expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement and pay for reinspection costs.

If the Contractor does not remove such condemned work or materials within a reasonable time after notice, the District may remove them and store the materials at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within 10 days' time after such removal, the District may, upon thirty days' written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof after deducting all the costs and expenses that should have been borne by the Contractor.

5. SANITATION

All parts of the work shall be maintained in a neat, clean, sanitary condition. Fixed and portable toilets, which are made inaccessible to flies, shall be provided wherever needed for use of employees, and their use shall be strictly enforced. All waste and refuse from sanitary facilities provided by the Contractor or from any source related to Contractor's operations shall be taken care of in a sanitary manner, satisfactory to the District, and in accordance with the laws and regulations pertaining thereto. Contractor shall rigorously prohibit and prevent committing of nuisance within the work site area or upon the District's right-of-way or adjacent to private property. Contractor shall furnish all facilities and means for proper sanitation of the work, and shall protect and save harmless the District, its officers and employees from any liability resulting from improper or insufficient sanitation.

6. FIRST AID AND PROTECTIVE FACILITIES

First aid facilities and supplies shall be kept on the jobsite. Instructions in first aid shall be given, and Contractor shall provide emergency first aid treatment and supplies for their employees sufficient to comply with all legal requirements.

7. CONTRACTOR TO PROVIDE FACILITIES FOR EMPLOYEES

Contractor shall, at their own expense, provide all labor, materials, equipment, and facilities which may be required to carry out effectively the provisions of these specifications. Contractor shall receive no additional payment therefore, and all compensation to be received for such work shall be included in the prices bid on the Bidding Sheet.

8. POWER

The Contractor shall provide, at their own expense, all necessary power required for their operations under the contract. The Contractor shall provide and maintain in good order such modern power equipment and installation as shall be adequate, in the opinion of the District, to perform in a safe and satisfactory manner the work required by the Contract.

9. CLEANUP

THROUGHOUT ALL PHASES OF CONSTRUCTION, INCLUDING SUSPENSION OF WORK, AND UNTIL FINAL ACCEPTANCE OF THE PROJECT, the Contractor shall keep the premises occupied by them and the project site in a neat and clean condition, and free from unsightly accumulation of rubbish, excess construction materials, and excess excavated materials. The Contractor shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other cleaning methods.

Materials and equipment shall be removed from the site as soon as they are no longer necessary.

Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

Excess excavated material from the pipe trench shall be removed from the site immediately. Sufficient material may remain for use as backfill. Forms and form lumber shall be removed from the site as soon as practicable after stripping.

FAILURE OF THE CONTRACTOR TO COMPLY WITH THE DISTRICT'S CLEANUP ORDERS MAY RESULT IN AN ORDER TO SUSPEND WORK UNTIL THE CONDITION IS CORRECTED. No additional compensation or extension of time will be allowed as a result of such suspension.

The Contractor shall not discharge smoke, dust, or any other air contaminants into the atmosphere in such quantity as will violate the regulations of any legally constituted authority.

Upon completion of work and before the final estimate is submitted, the Contractor shall, at their own expense and cost, satisfactorily dispose of or remove from the vicinity of the work all plants, buildings, rubbish, unused materials, concrete forms, and other equipment and materials belonging to them or used under their direction during the construction, and in the event of their failure to do so, the same may be removed and disposed of by the District at the Contractor's expense.

10. UTILITIES AND EASEMENTS

The plan portion of each sheet indicates the general location of underground utilities as shown on available records. No attempt has been made to show service connections other than those services improved as part of the contract work. The plans also indicate the location of public right-of-way lines and easements that will be acquired by the District. It shall be the Contractor's responsibility to conduct all their operations within the rights-of-way and easements as shown on these plans.

11. RELATIONSHIP WITH OTHER GOVERNMENTAL AGENCIES

Where the pipeline and structures are constructed within the rights of way under the jurisdiction of other governmental agencies, Contractor shall comply with all requirements of said agencies.

Where the same subject matter is covered by the specifications of two or more agencies, the specifications more restrictive on the Contractor shall govern in all cases.

12. EXPOSURE OF UTILITIES IN ADVANCE OF WORK

It shall be the Contractor's responsibility to determine the exact location and depth of all utilities and service connections. The Contractor shall also determine the type, material, and condition of any utility which may be affected by or affect the work. The Contractor shall have all utility companies field locate all underground lines before start of construction.

In order to provide sufficient lead time to resolve unforeseen conflicts, order materials and take other appropriate measures to ensure that there is no delay in work, the CONTRACTOR SHALL POTHOLE ALL UTILITY MAINS THAT MUST BE CROSSED OR CLOSELY PARALLELED PRIOR TO ANY CONSTRUCTION. CONTRACTOR SHALL THEN IMMEDIATELY PROVIDE THE LOCATION AND DEPTH OF THE "POTHOLED" UTILITIES TO THE ENGINEER. The Contractor shall expose all service connections before excavation in the area. All cost incurred in exposing utilities shall be borne by the Contractor.

THE DISTRICT RESERVES THE RIGHT TO MAKE MINOR ADJUSTMENTS IN PIPELINE ALIGNMENT AND GRADE, ALL AT NO ADDITIONAL COST TO THE DISTRICT.

Failure of the Contractor to comply with these provisions will result in an order to suspend work until these provisions are complied with, and no additional compensation or extension of time will be allowed as a result of such suspension. Payment per bid item or spread.

13. ADVANCE NOTIFICATION OF AGENCIES

It shall be the Contractor's responsibility to determine and notify those agencies requiring advance notification for inspection or other purposes before beginning construction in any area of concern to said Agency. A minimum of two working days advance notice shall be given to the various agencies before beginning construction in the area unless specific advance times and requirements are stated in these detailed specifications or required by the Agency.

14. CROSSING, PROTECTION AND/OR RELOCATION OF UTILITIES

A. General

Utilities for the purpose of these specifications shall be considered as including, but not limited to, and irrespective of ownership; Pipelines (including irrigation mains), conduits, transmission lines, and appurtenances of "Public Utilities" (as defined in the Public Utilities Act of the State of California) and those of private industry, business, or individuals solely for their own use or for use of their tenants; and storm drains, sanitary sewer, street lighting, traffic signal systems, duct banks, telephone cable, transmission cables, and completely buried structures.

The District has made an earnest effort to locate and indicate on the drawings all utilities which exist within the limits of the work. However, the accuracy and completeness of the utilities indicated on the drawings are not guaranteed. If utilities are shown in profile, the depth indicated is based on general practice and is not guaranteed at any specific location. No attempt has been made to show service connections on the plans. It shall be the responsibility of the Contractor to determine the exact location of all utilities and their service connections. The Contractor shall have the utility companies field locate their utilities before excavation. The Contractor shall verify with each utility company the extent to which they will field locate their utilities. Where required, field location by Contractor forces shall be included in the contract price for which such work is appurtenant thereto and no additional allowance will be made therefore. The Contractor shall make their own investigation as to the location and type of existing utilities and associated appurtenances and service connections which may be affected by the contract work, and shall notify the District as to any utility located by the Contractor which has been incorrectly shown or omitted from the drawings.

B. Utilities Shown on Plans

Where utilities cross or parallel the pipeline trench but do not conflict with the permanent work to be constructed, the Contractor shall protect the utility in place unless otherwise indicated on the plans. The Contractor shall notify the utility owner at least two working days in advance of the crossing or parallel construction and will coordinate the construction schedule with the utility service requirements.

Unless otherwise provided in the specifications, full compensation for crossing or paralleling of utilities shown on the plans shall be included in the contract unit price for which such work is appurtenant thereto and no additional allowance will be made therefore. Said various contract prices shall include all labor, materials, tools and equipment necessary or incidental to the work.

C. Special Water/Sewer Crossings

At the locations shown on the plans or if the vertical separation between the outside of the sewer pipe and the outside of existing water pipes at crossings is less than one (1) foot, and when directed by the District, the Contractor shall provide the construction required per the detail shown on the plans and per the California Department of Public Health Water/Sewer Special Construction Requirements. The special construction will be deleted at locations shown if the vertical separation of the waterline above the sewerline is 1 foot or greater.

The District hereby reserves the right to increase or decrease this item from the quantity shown on the Proposal forms without altering the unit price bid per each. Payment will be made in accordance with the unit bid price provided on the Bidding Sheet; in the event no item for said special construction work is designated on the Bidding Sheet, Contractor shall be paid under the "Extra Work" provisions of the Contract Appendix.

D. Relocation of Utilities by the Contractor for Their Own Convenience

The temporary relocation or the alteration of any utility desired by the Contractor solely for their own convenience in the performance of the contract work, to a position or condition other than that provided for in the specifications or shown on the drawings, shall be the Contractor's own responsibility, and they shall make all arrangements with the property owners regarding such work. Any costs of such work for the Contractor's own convenience shall be absorbed in the unit prices or included in the lump sum amounts bid for the various contract items.

E. Service Connections

Compensation for service connection crossings (not shown on the Plans) shall be included in the contract price for which such work is appurtenant thereto and no additional allowance will be made therefore.

F. Utility Conflicts with Proposed Improvements

If a utility, whether shown on the plans or not, should intersect the proposed improvement at grade anywhere along the line of the improvement, the Contractor shall immediately notify the District. The Contractor may be advised to continue with the construction, leaving sufficient "gap" in their construction as determined by the District as may be necessary to accommodate resolution of the conflict, to be completed after the conflict has been resolved. In addition, the Contractor shall notify the District in writing, stating the nature of the conflict, location by schedule, sheet number, name of the street or location of easement and the station at which the conflict occurred. The District shall, within a reasonable time, make the necessary arrangements to resolve the conflict. Completion of the gap after the resolution of conflict shall not be just cause for additional compensation. Such completion of the "gap" shall be started within three working days after the Contractor has been notified of resolution of the conflict and completed in a workmanlike manner within reasonable time thereafter. When directed or approved by the District, changes in line or grade of any structure being built may be made in order to avoid utilities. Any additional costs because of such changes will be paid for as "Extra Work".

When a utility shown on the plans conflicts with the proposed improvements, the District will arrange for the relocation or alteration of said utility or require the Contractor to do same as "Extra Work". Work required in connection with unknown utilities will be performed and paid for as specified in the following paragraphs.

G. Unknown Utilities Disclosed During Contract Work

(Not including service connection)

In the event that a utility is disclosed or installed subsequent to the award of contract, such utility not being indicated on the drawings, the alteration, relocation or proper support and protection shall be done and paid for as follows:

- (1) When said utility is found to occupy the space required to be occupied by a part of the permanent works to be constructed under the Contract, the District will arrange for the relocation or alteration of said utility, or require the Contractor to do same as "Extra Work". *

(2) When the said utility is found to lie parallel to the permanent work and within the trench prism defined by the minimum allowable trench excavation consistent with safety and the rules, orders and regulations of local, State and Federal agencies having jurisdiction; the District will arrange for the relocation, protection or alteration of said utility, or require the Contractor to do same as "Extra Work". *

(3) When said utility is more or less parallel with, and any portion of it does not lie within the trench prism specified hereinabove, the Contractor shall advise the District thereof, and in cooperation with the District of the utility, provide and place the necessary support, if any, for proper protection to ensure continuous and safe operation of the utility. All costs of such work shall be borne by the Contractor.

(4) Utilities found to cross the excavation but not intercepting the permanent works to be constructed, then the Contractor will be required to protect the existing facility in place and construct the proposed facility under the unknown utility.

Compensation for such crossings will be at a unit price per each in accordance with the proposal therefore. The number of such crossings is estimated and the District hereby expressly reserves the right to add to the number shown or decrease from the number shown or to totally delete the item for unknown utility crossings at no change in the unit price per each. The time extension for such crossings shall be determined by the District and shall be added to the total time for completion allowed and for which no liquidated damages will be assessed.

(5) Upon disclosing a utility in the course of excavation that was not indicated on the drawings or marked in the field, the Contractor shall protect it in place. However, the Contractor shall immediately investigate if it is abandoned. The Contractor will be compensated at the bid unit price for unknown utility crossings only for the initial crossing of abandoned lines; and only if the Contractor did protect the abandoned utility in place.

* For District contracted work

H. Responsibility of the Contractor

The Contractor shall be held responsible for all costs for the repair of any and all damage to the contract work or to any utility (whether previously known or disclosed during the work), as may be caused by their operations. Utilities not shown on the drawings to be relocated or altered by others, shall be maintained in place by the Contractor.

At the completion of the contract work, the Contractor will leave all utilities and appurtenances in a condition satisfactory to the utility owners and the District.

15. PROTECTION OF FACILITIES OTHER THAN UTILITIES

It shall be the Contractor's responsibility to protect in place or remove and replace to original condition all existing facilities. The existing natural and man-made features and elevations on the plans are shown by topography. The topography shown is not guaranteed complete. It shall be the Contractor's responsibility to familiarize themselves with the conditions of proposed work and to identify by field investigation those features, whether or not shown on the plans, which require removal and replacement or protection in place. These features include, but are not limited to, fences, cross gutters, roads, sidewalks, driveways, curbs and gutters, power poles, signs, drainage structures, trees, landscaping, etc.

The Contractor shall repair all existing structures which may be damaged as a result of the work under the contract. Reconstruction shall be of the same type and material as the existing facility and shall be of equal quality or better than the original work.

Full compensation for complying with these requirements shall be considered as included in the price bid for the various items of work, and no additional compensation shall be made therefore.

16. GROUND WATER

Contractor shall investigate the possibility of ground water prior to submitting bid and shall assume all cost and liabilities incurred, should a ground water problem arise.

17. CONSTRUCTION WATER

The Contractor shall make all arrangements to furnish all construction water, all at no cost to the District, unless otherwise stated in the Special Requirements herein.

Bidder should contact District prior to submitting bid for further information regarding District's policy on construction water.

The Contractor shall coordinate with the District to obtain and check-out the District's hydrant meter including paying all deposits and fees. Refer to District Standard Drawing No. D-3 for Construction Meter Installation Detail.

18. WATER SUPPLY FOR COMPACTION AND DUST CONTROL

Contractor shall furnish and apply all water necessary for compaction and dust abatement purposes.

He shall apply water to construction areas where dust conditions so warrant, as directed by the District.

The water supply and payment of fees shall be the responsibility of the Contractor, unless otherwise stated in the Special Requirements herein.

Full compensation for complying with these requirements shall be considered as included in the price bid for the various items of work, and no additional compensation shall be made therefore.

19. TRAFFIC CONTROL

It shall be the Contractor's responsibility to maintain traffic warning signs, barricades, flagmen, and other traffic control devices as required to maintain two-way traffic, and as required by agencies having jurisdiction over the roadways in the work area. It shall be the responsibility of the Contractor to investigate with various agencies having jurisdiction over the right-of-way in work area to determine the extent of traffic control that may be required by each agency.

Also, it shall be the Contractor's responsibility to provide all traffic control devices to ensure a safe working environment for any associated project work such as survey, geotechnical and materials testing, etc.... that is required.

Full compensation for compliance with those provisions shall be considered as included in the bid unit price for various items, and no other compensation shall be made therefore.

20. ACCESS TO ADJACENT PROPERTIES

Contractor shall at all times provide access to the properties in the area of work, unless otherwise approved by District. The Contractor shall be responsible for providing 24 hours notice to properties that will not have access. It shall be the responsibility of the Contractor to provide such temporary structures in the area of work to provide reasonable access to the properties. At least one (1) lane on cross streets shall be available at all times for use of vehicles and emergency equipment.

Full compensation for compliance with these provisions shall be considered as included in the bid unit price for various items, and no other compensation shall be made therefore.

21. CONSTRUCTION STAKING

A. Surveying and Staking

The Contractor will provide all construction staking in accordance with Contract Documents. One (1) set of stakes must be provided at 25-foot stations plus all horizontal and vertical angle points and appurtenance outlets for the gravity sewer pipelines. One (1) set of stakes must be provided at 50-foot stations plus all horizontal and vertical angle points and appurtenance outlets for the waterline and sewer force mains. Any costs for re-staking due to stakes lost during construction shall be the responsibility of the Contractor. If the Contractor requires additional staking, the Contractor will be responsible for the additional survey/staking costs. All plans, descriptions and calculations related to surveying including grade sheets, shall be signed and stamped by the Contractor's Land Surveyor, or Professional Engineer authorized by the State of California to practice land surveying.

The Contractor shall provide the District all cut or grade sheets and survey data within no more than two working days after staking and no less than three days prior to construction for any particular phase of the construction work.

B. Lines and Grades

All work under this Contract shall be built in accordance with the lines and grades as shown on the drawings. If changes are required from the original design plans for whatever reason, the Contractor is responsible for revising the staking accordingly. Distance and measurements, except elevations and structural dimensions, are given and made on horizontal planes. For pipeline work, the surveyor will provide offset line and grade stakes at ground level and furnish cut sheets, therefore; the Contractor shall be responsible to transfer of such line and grade into the trench for construction of the work and for accuracy of the transfer cost of transfer shall be included in the unit bid for the work and no extra compensation will be made to the Contractor. The Contractor shall preserve bench marks, survey stakes, and points sets for lines, grades, or measurement of the work in their proper places until authorized by the Project Engineer to remove them. The Contractor shall provide the Engineer with Cut Sheets for approval at minimum of three (3) working days prior to commencing construction. All issues with the staking shall be specifically marked on the cut or grade sheets when these are provided to the District and submitted as an RFI for specific resolution.

C. Potholing

The Contractor shall provide coordinates and elevations, (x, y and z coordinates) of all potholing. The coordinates shall be referenced to the plan provided by the Engineer. Survey of all potholing locations shall be considered part of the construction staking and included in the bid item. No additional compensation will be allowed.

D. Data Provided by the Owner

The Owner or Engineer shall provide the original design data in AutoCAD/Civil 3D format with control data (Northing, Easting) for monumentation shown on recorded maps only. Control data provided by the Owner shall be verified for conformance to the recorded map by the Contractor prior to use for any purpose. The Contractor is responsible for determining if any conflict exists.

The Owner makes no representation as to the compatibility of this Data with your hardware or your software beyond the specified release of referenced specifications.

The Data provided is part of the Owner's proprietary instruments of service and shall not be used by the Contractor or anyone else receiving these datum through or from the Contractor for any purpose other than as a convenience for construction staking services for this project.

To the extent that the Data is electronic files, those files are not the approved construction documents. Further, differences may exist between this Data and corresponding hard-copy, engineering documents or recorded survey documents. In the event that a conflict arises between the signed, recorded or sealed hard-copy survey documents or construction documents ("Hard-Copy Documents") prepared by the Owner and the electronic files, the Hard-Copy Documents shall govern. The Contractor is responsible for determining if any conflict exists. By the use of this Data, the Contractor is not relieved of their duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

To the extent that the Data is intended to be used for staking and/or grading of property, the Contractor should be aware that the Data was prepared anticipating that a duly licensed and qualified Land Surveyor would perform on-site interpretation, verification, cross-checking and field-correction of the Data at the time of actual staking of the property prior to grading.

If changes are required to the original design, the Owner will provide to the Contractor redlined changes on the original plans in PDF format only of the approved changes.

22. PROTECTION OF SURVEY MONUMENTS

It shall be the Contractor's responsibility to protect all of the existing survey monuments. Removal of such monuments or displacement thereof shall require their resetting per the existing type of monument. The cost of resetting such monuments shall be the financial responsibility of the Contractor. Contractor is advised that resetting of monuments must be done by a registered civil engineer or licensed land surveyor. Should the Contractor anticipate removal of any survey monuments, they shall include the cost of resetting of the same in the various items of work.

23. RECORD DRAWINGS

The Contractor SHALL PROVIDE, and keep up-to-date, a complete "as-built" record set of blue-line prints, which shall be corrected daily and show every change from the original Drawings and Specifications and the exact "as-built" locations, measurements, sizes, and kinds of equipment. Prints for this purpose shall be obtained from the Engineer at cost. This set of Drawings shall be kept on the work site and shall be used only as a record set. The Engineer shall require that these drawings be presented monthly for review prior to any progress payment being made. At the completion of construction, the Contractor shall deliver said record set of prints to the District and will be required to certify the accuracy of the Record Drawings.

24. RESEEDING

Where cultivated and maintained ground covers in lawns, parkways or easements have been removed for installation of pipelines, the Contractor shall restore or replace such ground cover in kind by reseeding or resodding, after the backfill in the trench or excavation has been consolidated and the construction area graded and cleared of rocks and other objectionable material as required by these specifications. After reseeding or resodding the areas shall be covered with a suitable mulch.

Where natural vegetation has been removed for installation of pipelines, after the installation, compaction, grading and clearing has been completed, the Contractor shall reseed such areas in accordance with Section 25 - "Erosion Control" of these Basic General Specifications.

All costs to the Contractor for restoration, replacement, reseeding or resodding shall be absorbed in their bid for the applicable unit prices per linear foot of pipe and no other compensation will be made therefore.

25. EROSION CONTROL

A. General

The Contractor shall provide erosion control measures as defined herewith on all areas where the natural vegetation has been disturbed by the construction of the facilities. If a ground cover other than natural vegetation has been disturbed,

this section does not apply and the Contractor shall replace said ground cover in kind.

B. Preparation

After the backfill has been compacted and the pipe line tested, the Contractor shall remove and dispose of rocks and debris from the area to be reseeded. No seeding shall be performed during windy weather or when the ground is too wet or in an untillable condition. The fertilizer and seed shall be spread before the straw cover material is applied. Commercial fertilizer shall not be applied until after the seed has been sown.

C. Material

Materials shall consist of the following: Seed - The seed shall consist of the following mixture: Crested wheatgrass, 47 percent; Intermediate Wheatgrass, 27 percent; Wimmera Ryegrass, 13 percent; Blando Ryegrass, 13 percent. The seed shall be spread at the rate of 100 pounds per acre and shall be applied by the use of a "Cyclone Seed Sower" or equal. Fertilizer - The fertilizer shall be Ammonium Phosphate (16-20-0) spread at the rate of 300 pounds per acre and shall be applied by the use of a "Cyclone Seed Sower" or equal. Mulch - After the application of the seed and fertilizer, new straw (stable bedding straw shall not be used) shall be uniformly spread at the approximate rate of four tons per acre. The straw shall then be "Mulched" into the ground by use of a "wire" roller or other approved equipment.

D. Protection for Steep Slopes

In cases where the grade over the pipe line exceeds 25 percent slope the Contractor shall provide additional erosion control measures to stabilize the backfill material. The Contractor shall submit to the Engineer for his approval, special engineering details of the method to be used.

Full compensation for complying with the requirements of this section shall be included in the unit price per linear foot of pipe installed and no other compensation shall be made therefore. Bidder's attention is specifically called to the fact that the responsibility of determining the amount and the type of erosion protection shall rest with the prospective bidder.

26. CONTRACTOR'S SUBMITTALS

Whenever called for in these Specifications or on the Drawings, or where required by the District, the Contractor shall furnish to the District for review 7 copies of each submittal at no expense to the District. Copies of all shop drawings shall be submitted, accompanied by a letter of transmittal, and shall be addressed to the District.

The letter of transmittal, shall give a list of the numbers of the drawings submitted. All drawings must be marked with the name of the project and the name of the Contractor and be numbered consecutively. All drawings must be complete in every respect.

Revisions indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Drawings and Specifications and shall not be taken as the basis of claims for extra work.

It is considered reasonable that the Contractor shall make a complete and acceptable submittal to the District by the second submission of a submittal item. The District reserves the right to withhold monies due the Contractor to cover additional costs of review beyond the second submission.

Approval of shop drawings will be general and shall not relieve the Contractor from the responsibility for proper fitting and construction of the work, nor from furnishing the material and work required which may not be indicated in the shop drawings when approved; neither does it relieve the Contractor from responsibility for errors in shop drawings.

Example submittals include, but are not limited to the following:

- A. All materials provided by the Contractor
- B. All appurtenances provided by the Contractor
- C. Miscellaneous
 - (1) Pothole information for utilities
 - (2) Copies of permits required to be obtained by the Contractor
 - (3) SWPPP
 - (4) Schedule of construction (with key milestones provided)
 - (5) Waterline filling, disinfection, and flushing procedures
 - (6) Sewer bypass plan

(7) Safety program

27. RESPONSIBILITY FOR MATERIAL FURNISHED BY THE DISTRICT

The Contractor's responsibility for material furnished by the District shall begin upon the Contractor's acceptance at the point of delivery to them. All material shall be examined by the Contractor and District. The Contractor shall immediately (upon delivery) notify the District of any material the Contractor perceives to be defective in manufacture or otherwise damaged. Should the District concur that the material should not be utilized the material will be replaced by the District. Material furnished by the District in good condition and accepted by the Contractor which is later discovered to have been damaged, shall be replaced by the Contractor at their expense. The Contractor shall be responsible for the safe storage of all materials until they have been incorporated in the completed project.

28. ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR

If the Contractor, either before commencing work or in the course of the work, finds any discrepancy between these Specifications and drawings, or between either of them and the physical conditions at the site of the work, or finds any error or omission in any of the drawings or in any survey, they shall promptly notify the Engineer in writing of such discrepancy, error or omission.

29. HANDLING AND STORAGE OF MATERIALS

All materials shall be handled in such a manner as to prevent damage and, in the case of water system work, maintain sanitary conditions. All materials for use in the work shall be stored by the Contractor in such a manner as to prevent damage from exposure to the elements, admixture of foreign materials or from any other cause. The Contractor shall be entirely responsible for damage or loss by weather or other causes as to work under the Contract

30. GEOTECHNICAL SERVICES

All construction operations should be observed by a representative of the geotechnical engineer. The presence of the geotechnical engineer's field representative will be for the purpose of providing observation and field testing, and will not include any supervising or directing of the actual work of the Contractor, their employees, or agents.

Neither the presence of the geotechnical engineer's field representative nor the observations and testing by the geotechnical engineer shall excuse the Contractor in any way for defects discovered in their work. It is understood that the geotechnical engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the Contractor. CONTRACTOR TO PROVIDE SAFE ACCESS FOR GEOTECHNICAL IN CONFORMANCE WITH OSHA STANDARDS AT NO ADDITIONAL COST TO THE DISTRICT.

Dependent upon the circumstances of each particular project, as determined by the District, geotechnical services may include full time monitoring and testing or part time, periodic monitoring and testing.

31. EARTHWORK

A. General

Earthwork shall conform to the requirements of the Agency having jurisdiction, but shall not be less than herein specified. Earthwork shall be performed in accordance with the requirements of Section 19 of the Specifications entitled: "State of California, Department of Transportation, Standard Specifications", Latest Edition, insofar as the same may apply and except as herein modified.

All excavations and embankments required to complete the work as specified herein shall be unclassified and made to the lines and grades shown upon the plans, or as staked in the field. (ALL EXCAVATION SHALL BE UNCLASSIFIED AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY PRIOR TO SUBMITTING THEIR PROPOSAL TO FAMILIARIZE THEMSELF WITH THE CONDITIONS THAT THEY MAY ENCOUNTER DURING CONSTRUCTION.) Excavated materials not required for fill, embankments or backfills shall become the property of the Contractor, and shall be disposed of at their own expense.

All excavations shall be protected and supported as required for safety and in the manner set forth in the rules, orders and regulations prescribed by the Division of Industrial Safety of the State of California.

All trenches and excavations shall be backfilled overnight and on weekends and holidays. Barriers shall be placed at each end of all excavations, and at such places as may be necessary along excavations from sunset each day to sunrise of the next day until such excavation is entirely refilled. (BACKFILL SHALL BE COMPLETE AND STREETS OPEN TO TRAFFIC BY 5:00 P.M. UNLESS OTHERWISE APPROVED BY THE DISTRICT.)

No excavated material shall be deposited on private property unless written permission of the Property Owner thereof is secured by the Contractor, or specifically provided for on these plans and in these specifications. Copies of said written permission, duly signed by the Property Owners of the private property involved, shall be furnished the District by the Contractor before any excavated material is placed outside the limits of the established right-of-way. Free access must be provided to all driveways, watergates, hydrants, etc.

Any water which may be encountered or may accumulate in the excavation shall be pumped out or otherwise removed as necessary to keep the bottom of the excavation free and clear of water during the progress of the work.

B. Clearing and Grubbing

Areas where construction is to be performed shall be cleared of all rubbish and other objectionable material of any kind, which, if left in place, would interfere with the proper performance or completion of the contemplated work, would impair its subsequent use or form obstructions therein. Trees and other landscaping, unless otherwise specifically identified on the plans for removal, shall not be destroyed, and such measures as are necessary shall be taken by the Contractor for the protection thereof. Organic material from clearing and grubbing operations will not be incorporated in excavation backfill.

It shall be the Contractor's responsibility to remove and dispose of all excess material resulting from clearing and grubbing operations at their own expense. The Contractor shall make their own arrangements for disposal sites at their own expense, at which said material may be wasted. Full compensation for clearing and grubbing shall be included in the contract unit price for which such work is appurtenant thereto, and no additional allowance will be made therefore.

C. Grading Along Pipeline

The Contractor shall perform all grading to provide a working pad along the pipeline. The pad grade shall follow the existing ground grade as nearly as possible. If unnecessary excessive overcutting occurs during this operation, the Contractor may be required to replace all such overcut material and recompact to 90%, or to do other remedial work as directed by the District, all at no cost to the District.

D. Trench Excavation

(1) General

Excavation for water/sewer pipe, fittings, and appurtenances shall be in open trench to the depth and in the direction necessary for the proper installation of the same as shown upon the plans or as otherwise directed by the District. Trench banks shall be kept as near vertical as is safe, and where necessary shall be properly braced and sheeted, in accordance with the provisions of the Section herein entitled "Trench and Excavation Shoring". The trench bottom shall be graded to provide a smooth, firm and stable foundation at every point throughout the length of the pipe. For sewer pipe, at each joint the bottom of the trench shall be recessed in such a manner as to relieve the bell or coupling of all load.

Where the excavation has been made deeper than necessary, the Contractor shall furnish crushed rock, sand, or other material approved by the District for bedding to provide uniform support under the lower third of the depth of the pipe barrel. The cost of the material and labor to place and compact to achieve a firm and stable foundation herein specified shall be included in the unit price bid for the size of pipe laid thereon.

(2) Limit of Excavation

Except with specific approval of the Engineer, no more than 500 feet of open trench shall be excavated in advance of laying of pipe.

(3) Tunneling

Tunneling will be permitted only where native earth is of such firmness that it will remain in its original position, without sloughing off,

throughout the work of excavation and backfilling; if sloughing occurs, the roof of the tunnel shall be broken down and the trench excavated as an open trench as herein specified.

(4) Trench Widths

(a) Water

As stated elsewhere in these Specifications, all trenches shall have vertical sides, unless District may designate otherwise. Trench width shall be such that ample working room shall be provided on either side of pipe, provided that width of ditch measured at top of pipe shall not exceed 3 pipe diameters or 3', whichever is greater. In the event of cave-ins of trench sides where aforesaid width is exceeded, District may, at their discretion, require Contractor to use concrete or other means of special backfill for a vertical distance of not less than 1/4 the outer pipe diameter. The cost of the labor and material to provide the concrete cradle, if required, shall be the responsibility of the Contractor, and no additional compensation will be made therefore.

(b) Sewer

The maximum allowable trench width, at the top of the pipe, is the outside diameter of the barrel plus ten (10) inches on either side of the exterior of the pipe barrel. Where the trench width at the top of the pipe is wider than ten (10) inches on either side of the exterior of the pipe barrel, the pipe shall be backfilled from the bottom of the trench to a level one-fourth (1/4) of the diameter above the center of the pipe with 3/4-inch crushed rock or as directed by the District. The cost of the labor and material to provide crushed rock encasement, if required, shall be the responsibility of the Contractor, and no additional compensation will be made therefore.

(5) Blasting

Use of explosives on the work shall be subject to approval of the District. All operations involving handling, storage and use of explosives

shall be conducted with every precaution prescribed by Construction Safety Orders of Division of Industrial Safety, State of California, and by local laws and regulations. Only competent, reliable persons working under experienced supervision shall be permitted to use explosives. Contractor will be held responsible for and shall make good any damage caused by blasting or otherwise resulting from disposition or use of explosives on the work. Contractor shall obtain, at no additional cost to the District, blasting permit(s) that may be required.

(6) Grading for Pipeline Appurtenances

The Contractor shall perform all rough and fine grading to provide a graded area, sloped to drain, extending 3' minimum radially outside the limits of each air valve or blow-off installation as directed by the District in the field to assure accessibility.

The Contractor shall perform all rough and fine grading to provide a graded area, sloped to drain, extending 4' minimum radially outside the limits of each complete fire hydrant installation to assure accessibility. The location and elevation of graded pad for each fire hydrant installation will be directed by the District in the field.

E. Trench and Excavation Shoring

Pursuant to Section 6705 of the Labor Code of the State of California, in advance of any excavation pursuant to this contract, Contractor shall submit to the District for District acceptance a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer. Nothing in this provision shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the "Construction Safety Orders". Reference shall also be made to the rules, orders, and regulations of the Division of Industrial Safety of the State of California, latest edition, and the U.S. Department of Labor, Safety and Health Standards for Construction, latest edition.

FULL COMPENSATION FOR COMPLYING WITH THESE REQUIREMENTS SHALL BE CONSIDERED TO BE INCLUDED WITHIN THE CONTRACT UNIT OR LUMP SUM BID PRICES PAID FOR THE VARIOUS ITEMS ON THE BIDDING SCHEDULE, AND NO ADDITIONAL ALLOWANCE WILL BE MADE THEREFORE.

F. Pipe Bedding

(1) General

(a) Water

Normal bedding without crushed rock or concrete cradle shall be used unless otherwise shown on Drawings or ordered by District. For normal bedding of pipe, bottom of trench shall be excavated uniformly to grade as indicated on the Standard Drawings.

Trench bottom shall be given a final trim such that each pipe section when first laid will be continuously in contact with ground along extreme bottom of pipe. At each joint in the water pipe, the bottom of the trench shall be recessed in such a manner as to relieve the bell of the pipe of all load. Rounding out trench to form a cradle for pipe will not be required.

(b) Sewer

All pipe bedding shall be of the type indicated on the plans and shall be in accordance with the pipe bedding Standard Drawings included in these Specifications.

Bedding shall be sand, gravel or crushed aggregate having a minimum sand equivalent of not less than 30 or having a coefficient of permeability greater than 0.001 centimeters per second. (COMPENSATION FOR BEDDING MATERIAL AS INDICATED ON THE PLANS SHALL BE INCLUDED IN THE CONTRACTOR'S BID FOR THE APPLICABLE UNIT PRICES PER LINEAR FOOT OF PIPE AND NO ADDITIONAL

COMPENSATION WILL BE MADE THEREFORE.) Minimum compaction for all pipe bedding shall be 90% relative compaction.

Where native material is acceptable for bedding as approved by the Engineer (sand equivalent of 30 or greater) the trench bottom shall be graded to provide smooth, firm and stable foundation at every point throughout the length of the pipe. At each joint in the pipe, the bottom of the trench shall be recessed in such a manner so that the load will be carried uniformly throughout the length of pipe, including the bell or collar.

(2) Unstable Material

Where material at the bottom of the trench is found to be unstable, soft, or spongy, such material shall be removed to a depth as determined by the Engineer and replaced with Special Crushed Rock Bedding as specified in Section 1-G herein.

(3) Rock

Where rock is encountered, it shall be removed below grade, and the trench backfilled with suitable material to provide a compacted earth cushion with a thickness under the pipe of not less than 1/2-inch per inch of nominal diameter of the pipe to be installed, with a minimum allowable thickness of 6-inches. Where a special bedding class is indicated on the plans, the depth indicated on the Standard Drawing shall be increased to that stated herein, all at no additional cost to the Owner.

CONTRACTOR SHALL RECEIVE NO ADDITIONAL COMPENSATION FOR ABOVE MENTIONED WORK.

G. Crushed Rock Bedding

As indicated on the plans, or when groundwater is encountered in the excavation, or when soft, spongy and unstable material is encountered in the bottom of the trench, and when approved by the District, the material in the bottom of the trench shall be removed to a depth directed by the District and replaced with well graded 3/4-inch maximum crushed rock bedding as specified below. The crushed

rock bedding shall be installed and compacted as shown on the Standard Drawing attached to these Specifications, or with no standard drawing place crushed rock bedding 8" min. thickness (90% min. compaction) under bottom of pipe. The 3/4-inch maximum crushed rock material shall be approved by the District before use.

Crushed rock shall be the product of crushing rock or gravel. Fifty percent of the particles retained on a 3/8-inch sieve shall have their entire surface area composed of faces resulting from fracture due to mechanical crushing. Not over 5% shall be particles that show no faces resulting from crushing. Less than 10% of the particles that pass the 3/8-inch sieve and are retained on the No. 4 sieve shall be waterworn particles. Gravel shall not be added to crushed rock. Crushed rock shall have the following gradation:

Sieve Sizes	3/4-inch Max Crushed Rock % Passing
1"	100
3/4"	90-100
1/2"	30-60
3/8"	0-20
No. 4	0-5
No. 8	--

Crushed Rock Bedding, where ordered by the District, shall be paid for at the unit price per ton complete in place, if Bidding Sheet so indicates, otherwise total cost of special crushed rock bedding shall be borne by the Contractor.

Payment for trench width for Crushed Rock Bedding shall be limited to a maximum width of three (3) outside pipe diameters or the actual width, whichever is less. Any trench excavation beyond the maximum width limit shall be filled and compacted with crushed rock per the Standard Drawing, and the COST OF THE ADDITIONAL BEDDING SHALL BE BORNE BY THE CONTRACTOR.

THE DISTRICT RESERVES THE RIGHT TO INCREASE OR DECREASE THIS ITEM WITHOUT CHANGE IN UNIT PRICE OF THIS ITEM OR ANY OTHER ITEM.

H. Trench Backfill and Compaction Requirements

(1) General Requirements (Water)

All excavations shall be backfilled with compacted material to level of original ground surface, unless otherwise shown on Drawings or ordered by District. Materials used for backfill shall be imported or selected excavated material and shall be placed as shown on Drawings or as specified in these Specifications or any specifications made a part hereof by reference, or as directed by District. Backfill materials shall not be dropped directly on structures or pipeline, and all materials placed within 6" of pipe or structure shall be free from rocks or boulders larger than 2" maximum dimension and from unbroken masses of earthy materials which might lodge and thereby cause unfilled pockets in excavations.

(2) Backfill Procedure (Water)

Material used in backfilling first layer shall be cohesionless, sandy loam, sandy, or sandy gravel material obtained from required excavation or from approved borrow areas. It shall not contain any rocks or other hard material detrimental to good bedding of pipe or that might be damaging to protective pipe coating. Trench shall be filled to 6" over top of pipe and flooded, jetted, and poled to secure adequate saturation and permitted to stand and settle before placing next layer; balance of trench shall be filled with material from excavation in layers not exceeding 3' in depth. Each layer shall be flooded, poled, and jetted, taking care not to disturb underlying layer, before placing succeeding layer, and Contractor shall at all times protect pipe against flotation.

Contractor shall understand that procedure for backfill outlined hereinabove is general and that conditions may be encountered where, due to a change in type of soil, methods specified hereinabove, particularly flooding, may result in leaving therein areas of dry, uncompacted backfill material adjacent to pipe and that when, in the opinion of District, soil type encountered does not permit adequate backfill compaction by flooding, Contractor will be required to jet all backfill compaction as District may

direct or as specified elsewhere in these Specifications or any specifications made a part hereof by reference.

Along road or street right of way, ENTIRE TRENCH SHALL BE BACKFILLED AS PRESCRIBED BY AGENCY HAVING JURISDICTION. In no event shall backfill material be compacted to a density of less than that of surrounding undisturbed soil. All trench backfill shall be compacted to 90% of maximum density as determined by ASTM D 1557-91, if so required by District and unless greater compaction is prescribed by agency having jurisdiction.

(3) Pipe Protection (Water)

Before backfilling, conductor tubes, if used, shall be strutted sufficiently to prevent distortion while compacting backfill. All struts shall be removed after compacting backfill. After insertion of pipe, conductor tubes shall be grouted with either dry sand or cement grout, at District's option.

Before backfilling, mortar-lined and coated steel pipe, 30" diameter and larger, shall be either filled with water or braced with studs sufficiently to prevent distortion while compacting backfill. All bracing shall be removed after compacting backfill.

(4) Pipe Zone (Sewer)

After the sewer pipe has been laid and inspected as herein specified, the trench shall be backfilled from the level of the bedding shown on the Standard Drawings, to a height of one (1) foot above the top of the pipe with specially selected and carefully compacted material which shall be clean, fine earth or sand, free from large stones or lumps. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe. Minimum compaction for all pipe zone material shall be 90% relative compaction.

(5) Procedure Above Pipe Zone (Sewer)

From the top of the pipe zone backfill to ground surface, the material for backfill may contain stones ranging in size up to 6-inches in diameter, in quantity not exceeding 40 percent of the volume when said coarse materials are well distributed throughout the finer materials so as to eliminate voids and the specified compaction may be attained. Rocks greater than 2-1/2 inches in any dimension will not be permitted in backfill placed within one foot of pavement subgrade.

(6) Compaction Above Pipe Zone (Water & Sewer)

Relative compaction in all streets and easements, public and private, from the pipe zone to the bottom of base material shall be 90% (95% to within 12 inches of the bottom of the base material). The base material shall be the thickness required and compacted to 95% relative compaction.

(7) Compaction Tests

The compaction test, as required by the District, that meets the required compaction, shall be paid for directly to the testing laboratory by the District. The minimum District requirements are as follows: Compaction tests shall be made at intervals not greater than 150' and one (1) test every 1' maximum vertical increment of trench backfill. Additionally at least 50% of all service laterals shall be tested. The tests shall be made in accordance with a combination of the Sand Cone Method (ASTM D1556) and nuclear gauge testing methodology at rates (i.e. 1 sand cone method to "10" nuclear gauge tests) specified by the District and at varying depths.

It should be noted that dependent upon the circumstance of each project (e.g. quantity of earthwork involved), compaction testing could be administered on a full time basis.

It shall be the Contractor's responsibility to pay for all compaction tests that indicate insufficient compaction in the area where the Contractor has previously indicated that compaction was completed.

The Contractor shall provide, at their own expense, all labor and equipment necessary for all compaction test holes. Choice of location of all tests will be made by the District. The aforementioned labor and equipment shall be readily available to perform the necessary work when required. Should the contractor not be ready to perform such work in support conducting the compaction test, and standby charges are incurred by the District for such a delay, the contractor shall be responsible for payment of said standby charges.

It shall be the Contractor's responsibility to advise the District two working days prior to requiring compaction tests.

(8) Compaction Requirements under Agency Permit

Where the permit of a governing agency sets forth requirements for compaction more stringent than those stated herein, the Contractor shall adhere to the Agency requirements.

(9) Excess Excavated Material

The Contractor shall make the necessary arrangements for and shall remove and dispose of all excess or unsuitable material. All costs for the disposal of excess or waste material shall be borne by the Contractor.

It is the intent of these specifications that all surplus material not required for backfill shall be disposed of by the Contractor outside the limits of the public rights-of-way.

Excavated material shall not be deposited on private property unless written permission from the Property Owner thereof is secured by the Contractor. Copies of said written permission, duly signed by the Property Owner of the private property, shall be furnished to the District by the Contractor before such material is placed on private property.

(10) Imported Backfill Material

Whenever the excavated material is, in the opinion of the District, unsuitable for backfill, the Contractor shall arrange and furnish imported

backfill material. Such backfill material shall comply with the requirements of pipe bedding in Section 31.F.(1) herein.

Full compensation for disposing of unsuitable material, as well as for providing suitable material as herein specified, shall be paid for at unit price per ton of such material delivered and placed in accordance with backfill requirements, if Bidding Sheet so indicates, otherwise total cost of Imported Backfill Material shall be borne by the Contractor.

Contractor is hereby notified that the actual quantity of imported backfill material specified herein cannot be determined at this time. The District is anticipating a condition that may not exist; therefore, the quantities are fictitious for the purpose of comparing bids and the District reserves the right to reduce, to totally delete, or increase, the quantity of imported backfill material required without any consideration for adjustment in unit price of this item or any other item if the material is not needed or the final quantities are substantially different from those shown on the bidding schedule.

I. Structure Excavation and Backfill

Structure excavation shall include the removal of all material of whatever nature necessary for the construction of foundations and other structures in accordance with the plans.

In operating compacting equipment near structures, care shall be used to prevent the displacement of, or injury to, the structure. Backfill shall be carried up evenly on all sides in accordance with the soils engineer's recommendations.

No backfilling shall be done until concrete is thoroughly set and is safe to withstand the load.

All excavation shall be unclassified and it shall be the Contractor's responsibility prior to submitting their proposal to familiarize themselves with the conditions that they may encounter during construction.

Full compensation for complying with the above requirements for structure excavation and backfill shall be considered as included in the lump sum bid for a structure, and no other compensation shall be made therefore.

J. Control of Water

The Contractor shall provide and maintain at all times during construction, ample means and devices with which to promptly remove and dispose of all water entering the excavations or other parts of the work. No concrete footings or floors shall be laid in water nor shall water be allowed to rise over them until the concrete or mortar has set at least eight hours. Water shall not be allowed to rise unequally against walls for a period of 28 days. Ground water shall not be allowed to rise around pipe installations until jointing compound in the joints has set.

The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction. Water shall be disposed of in such a manner as not to be a menace to the public health.

Dewatering for structures and pipe lines shall commence when ground water is first encountered, and shall be continuous until such times as water may be allowed to rise in accordance with the provisions of this Section.

K. Payment

Payment for earthwork and for conforming to all of the provisions of these specifications, unless otherwise specified herein and itemized in the bid schedule, shall be considered to be included in the contract unit or lump sum prices paid for the various items of work wherein earthwork is required, and no additional allowance will be made therefore.

32. STEEL CASING

Steel casing shall be butt welded of sheets conforming to ASTM Specification A283/A283M or A53/A53M and shall be constructed at the location shown on the plans or as directed by the District. Construction may be by open trench. If the Contractor elects to install the casing pipe by jacking, the provisions of these specifications for jacked steel casing pipe shall apply. However, payment shall be at the bid unit price for steel casing.

The casing pipe shall have a steel thickness not less than 1/4 inch. It shall be the Contractor's responsibility for selecting a size of casing, at or above the minimum specified, in order that the installation may be done with a sufficient degree of accuracy. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne by the Contractor.

Carrier pipe conforming to these specifications for the designated pipe shall be installed within the casing pipe to the lines and grades shown on the plans. The carrier pipe shall be supported on Advanced Products & Systems Casing Spacers and Insulators, PSI Pipeline Seal and Insulator Inc., Cascade Waterworks Manufacturing Co., or District approved equal. The ends of the steel casing shall be sealed with synthetic rubber end seals with stainless steel band straps with a weep hole installed at lower end for drainage. The annular space between the steel casing and carrier pipe shall be left empty unless grouting is specified by the Engineer or on the plans.

Measurement for payment for casing pipe, excluding carrier pipe within said casing, shall be made along the centerline of the casing pipe between the limits shown on the plans and/or staked in the field.

Payment for steel casing pipe will be at the contract unit price per linear foot for steel casing pipe placed in accordance with these plans and specifications. Payment shall be full compensation for furnishing all labor, excavation, backfill, steel casing pipe, shoring, equipment, services, transportation, sand cement, concrete, all grouting operations described herein, and other appurtenant items of labor and material required to complete the work. The water carrier pipe will be paid for under the bid item for pipe.

33. JACKED STEEL CASING

The Work of this section includes furnishing and installing jacked steel casing under roadways, railroads, storm drain facilities and other major pipelines, facilities or structures; including all labor, excavation, backfill, boring, jacking, steel casing pipe, shoring, equipment, services, transportation, sand cement, concrete, grouting, and other appurtenant items of labor and materials required to complete the work. Jacked steel casings and bore installations shall be installed only by a qualified company regularly engaged in this specialty work.

Jacked steel casing shall be butt welded of sheets conforming to ASTM Specification A283/A283M and shall be constructed in accordance with the provisions of Section 306-2 of the "Standard Specifications for Public Works Construction", Latest Edition, except as herein specified or Northwest Pipe Co. Perma Lok steel casing conforming to ASTM A 36, ASTM A 515, grade 60 or ASTM A 572, grade 42.

The casing pipe shall have a steel thickness not less than 3/8 inch. The casing pipe shall be a minimum of 20 feet in length to a maximum of 40 feet in length. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne solely by the Contractor.

Steel casing pipe of the minimum size and thickness specified shall be installed in place by jacking and boring methods without the use of water or air at the locations shown on the plans, and to grades required to install carrier pipe. If the bore casing is equal to or exceeds 18-inches in diameter and the length of the bore exceeds 80-feet in length, the contractor shall bore using a track machine, unless otherwise directed by the District.

Voids, if developed outside the casing and within limits for boring or jacking, from any cause such as removal of rocks encountered in boring, shall be filled with lean grout forced in under pressure by insertion of a grout pipe outside of the casing. The lean grout shall consist of one part of portland cement to not more than four parts of sand by volume, placed at low pressure. Grout pressure is to be controlled so as to avoid deformation of the casing. Sand for grout to be placed outside the casing shall be of such fineness that 100% will pass a No. 8 sieve and no less than 35% will pass a No. 50 sieve.

If the Contractor is not ready to place the pipe in the casing at the time of completion of boring and jacking operations, the ends shall be bulk headed, and the approach trenches in public streets shall be backfilled, temporary surfacing placed thereon, and the affected portion of the street reopened to traffic. For short (overnight) duration, the trenches may be securely covered with armored plates to allow for uninterrupted traffic.

The contractor shall be responsible for maintaining the specified line and grade, and preventing settlement of overlying structures, or other damage due to the boring and jacking operations. Except as otherwise indicated in this Section of the Specifications, the Contractor shall comply with the applicable provisions of latest adopted edition of the Standard Specifications for Public Works Construction (SSPWC) together with any latest Supplement Amendment. Additionally, jacked steel casing shall be in accordance with applicable ASTM Standards.

A. Submittal

(1) The following shall be submitted:

- (a) Submittals for jacking or boring operation shall be in accordance with SSPWC Section 306-2.1 unless indicated otherwise.

- (b) The contractors attention is directed to the provisions for “Shoring and Bracing Drawings” in Section 6705 of the California Labor Code. If such plan varies from the shoring system standards established in the Construction Safety Orders of the State of California, such alternative systems plans shall be prepared by a civil or structural engineer licensed in the State of California.
- (c) Casing installation schedules which include schedules of excavation, pipeline installation, and backfill operations.
- (d) Material list including diameter, thickness, and class of steel casing.
- (e) Detailed locations and sizes of all boring or jacking and receiving pits.
- (f) Shop drawings of casing insulators (spacers) and end seals including manufactures’ catalog information.
- (g) Permits associated with the boring or jacking operations.
- (h) Pressure concrete mix design and bracing plans to prevent the carrier pipe from shifting or floating in accordance with SSPWC Section 306-2.3.

B. Potholing of Existing Utilities

Contractor shall be required to pothole any existing underground utilities crossing the proposed jacked steel casing installation that may potentially interfere with the installation. Refer to Special Conditions.

C. Permit Provisions and Requirements

- (1) Contractor shall be responsible for obtaining any required permits other than those indicated in the Special Conditions to be obtained by the District. Contractor shall comply and adhere to all permit requirements at no additional cost to the Owner.
- (2) Where Agency permit provisions differ from the specification requirements stated herein, the highest and most stringent standard or requirement shall govern; and Contractor shall construct the

installation to said higher standard at no additional cost to the District.

D. Casing Spacers

Casing isolators/spacers shall have a minimum 14 gauge steel band and where required, 10 gauge risers. The band, risers and connecting studs shall be welded and cleaned at the factory before the application of a fluidized bed fusion bonded PVC coating of between 10-16 mils thickness. The PVC coating shall provide good resistance to acids and alkalies and excellent resistance under ASTM B117 salt spray tests. The isolators/spacers shall have a flexible PVC inner liner of 0.09 inch thickness with a durometer "A" 85-90 hardness and a minimum 58,000 volt dielectric strength. The runners shall be high pressure molded glass reinforced polymer with a minimum compressive strength of 18,000 psi per ASTM D638. The runners shall be 2.0 inch in width and a minimum of 7.0 inches long for C8G-2 models and 11" for C12G-2 models (polyethylene runners are not an acceptable alternative). The runners shall be attached to the band or riser by 3/8" welded steel studs and lock nuts which shall be recessed far below the wearing surface on the runner. The recess shall be filled with a corrosion inhibiting filler. The band section shall be bolted together with cadmium plated studs, nuts and washers. End seals shall be made of synthetic rubber. Banding straps shall be made of stainless steel.

Products of the type indicated shall be made by one of the following:

- (1) Casing Spacers – Pipeline Seal and Insulator Inc. Model C12G-2, Advance Products & Systems Inc. Model S/12, or approved equal.
- (2) End Seals – Pipeline Seal and Insulator Inc. Model S, C or W, Advance Products & Systems Inc. Model AC or AW, or approved equal.

The Contractor shall give the District a minimum of three (3) days advance notice of the start of an excavation or boring operation. All work shall be performed in the presence of the District, unless the District has granted prior approval to perform such work in its absence. All welding procedures used to fabricate steel casings shall be pre-qualified under the provisions of ANSI/AWS D1.1. Welding procedures shall be required for, but not necessarily limited to, longitudinal and girth or special welds for pipe cylinders, casing joint welds, reinforcing plates and grout coupling connections. No exterior or interior joints of the carrier pipe shall have mortar grout applied over a seam until the seam has cooled. Exterior and interior joints of the carrier pipe shall be mortar coated and lined in the field.

E. Installation of Steel Casing

- (1) JACKING HEAD: A steel jacking head shall be fitted to the lead section of the casing in such a manner that it extends around the entire outer surface of the steel casing and projects at least 18 inches beyond the driving end of the casing. The jacking head shall not protrude more than 1/2 –inch outside of the outer casing surface. The head shall be securely anchored to prevent any wobble or alignment variation during the boring or jacking operations. To minimize voids outside the casing, excavation shall be carried out entirely within the jacking head and not in advance of the head. Excavated materials shall be removed from the casing as the boring or jacking operation progresses and no accumulation of excavated materials within the casing shall be permitted.
- (2) JACKING PIT: The excavations for the boring or jacking operations shall be adequately shored to safeguard existing substructures and surface improvements and to ensure against ground movement in the vicinity of the jack supports. Heavy guide timber, structural steel, or concrete cradles of sufficient length shall be provided to assure accurate control of boring or jacking alignment. The Contractor shall provide adequate space within the excavation to permit the insertion of the lengths of casing to be bored or jacked. Timbers and structural steel sections shall be anchored to ensure action of the jacks in line with the axis of the casing. A bearing block, consisting of a timber or structural steel framework, shall be constructed between the jacks and the end of the casing to provide uniform end bearing over the perimeter of the casing and distribute the jacking pressure evenly.
- (3) CONTROL OF ALIGNMENT AND GRADE: The Contractor shall control the application of the jacking pressure and excavation of materials ahead of the casing as it advances to prevent the casing from becoming earthbound or deviating from the required line and grade. The Contractor shall restrict the excavation of the materials to the least clearance necessary to prevent binding in order to avoid loss of ground and consequent settlement or possible damage to overlying structures.
- (4) GROUTING: Not used.

- (5) INSTALLATION: The installation of the casing shall be in accordance with the SSPWC Section 306-2.1 and subject to the approval of the agency having jurisdiction over the area containing the boring or jacking operations.

F. Installation of Carrier Pipe

- (1) JOINTS: All joints of the carrier pipe within the casing shall be in accordance with District Standards.
- (2) INSTALLATION OF PIPE: The end seals shall be pulled on (in case of pull on type of seals) and the casing spacers shall be installed over the carrier pipe at the proper location, in accordance with the casing spacers manufacturer's instructions. Care shall be taken not to damage the carrier pipe coating or the inner coating of casing pipe while installing the carrier pipe. The position of the runners in the carrier pipe and casing shall be as indicated and shall be uniform throughout the casing length. Line and grade of the carrier pipe shall be installed as specified on the plans and deviations shall be permitted. During installation, rifling (rotating) of the carrier within the casing can occur and can be a cause of line and grade discrepancies. Take necessary measures to prevent rifling. Guides may be installed as necessary to prevent rifling (rotating) of the carrier pipe during installation.
- (3) TESTING OF THE CARRIER PIPE: Testing of the carrier pipe shall be completed prior to strapping the end seals.
- (4) END SEALS: After the carrier pipe has been tested, the end seals shall be strapped by stainless steel bands in accordance with the manufacturer's instructions.
- (5) CLOSING OF PITS: After equipment and excavated materials from the boring or jacking operations have been removed from the jacking pit, the Contractor shall prepare the bottom of the jacking pit as a pipe foundation. The Contractor shall remove all loose and disturbed materials below pipe grade to undisturbed earth and re-compact the material.

Measurement for payment for casing pipe excluding carrier pipe within said casing shall be made along the centerline of the casing pipe between the limits shown on the plans and/or staked in the field.

Payment for jacked steel casing pipe will be at the contract unit price per linear foot for jacked steel casing pipe placed in accordance with these plans and specifications. Payment shall be full compensation for furnishing all labor, excavation, backfill, boring, jacking, steel casing pipe, shoring*, equipment, services, transportation, sand cement, concrete, all grouting operations described herein, and other appurtenant items of labor and material required to complete the work. The water carrier pipe will be paid for under the bid item for pipe. The ends of the casing pipe shall be closed using an end seal as manufactured by Advanced Products and Systems, Inc. or District approved equal. Brick and mortar is not acceptable.

* Shoring shall be by steel shield from top of bore pit excavation to bottom, unless otherwise directed by Engineer.

BASIC SPECIFICATIONS
SECTION B

WATER PIPELINE MATERIALS SPECIFICATIONS

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BASIC SPECIFICATIONS
SECTION B
WATER PIPELINE MATERIALS SPECIFICATIONS
TABLE OF CONTENTS

	<u>Page</u>
1. General.....	B-1
A. Alternate Pipeline Materials	B-1
B. Contractor Furnished Materials	B-1
C. Exposed Piping Supports	B-1
D. Piping Sizes.....	B-1
E. Dissimilar Metals	B-2
F. Material Identification	B-2
2. Welded Steel Pipe, CML & CMC	B-2
3. Ductile Iron Water Pipe	B-3
4. Polyvinyl Chloride (PVC) Pipe	B-4
5. Welded Steel Fittings.....	B-9
6. Ductile Iron Fittings.....	B-10
7. AWWA Gate Valves.....	B-10
8. Rubber Seated Butterfly Valves.....	B-10
9. Copper Tubing	B-12
10. Black Steel Pipe	B-12
11. Red Brass Pipe	B-12
12. Stainless Steel Pipe	B-12
13. Insulating Unions	B-12
14. Pressure Gauges	B-13
15. Pressure Regulating Valves	B-13
A. General.....	B-13
B. Pump Control Valves.....	B-13
C. Pressure Relief Valves	B-14

BASIC SPECIFICATION
SECTION B
WATER PIPELINE MATERIALS SPECIFICATIONS
TABLE OF CONTENTS
(continued)

	<u>Page</u>
D. Rate Of Flow Control Valves	B-14
E. Pressure Reducing/Pressure Sustaining Valves	B-14
F. Altitude Valves	B-15
G. Coatings	B-16
H. Options	B-16
16. Flow Meters	B-16
A. Service Flow Meters	B-16
17. NO-OX-ID	B-16
18. Precast Concrete Vaults	B-17
19. Fusion Bonded Epoxy Coating	B-17
20. NSF Compliance	B-18
21. Pipe Supports	B-18

BASIC SPECIFICATIONS

SECTION B

WATER PIPELINE MATERIALS SPECIFICATIONS

1. GENERAL

A. Alternate Pipeline Materials

Where alternate pipeline materials are allowed by the District, the Contractor shall select such materials and construction methods as will result in a satisfactory completed project. All pipe materials shall be new and unused unless otherwise specified. Materials and strength of pipe shall be as shown on the plans or as specified herein.

B. Contractor Furnished Materials

The Contractor shall furnish (excepting materials specifically listed in the Special Requirements to be furnished by the District) and install all pipe, fittings, supports, bolts, nuts, gaskets, jointing materials, appurtenances, auxiliary piping and connections to equipment in accordance with the drawings and specifications, all as required for a complete and workable piping system.

C. Exposed Piping Supports

All exposed piping shall be adequately supported with devices of appropriate design unless otherwise approved by Engineer, the support shall conform to the Standard Drawing A-5 or as shown on the Drawings.

D. Piping Sizes

Pipe sizes are nominal inside diameter unless otherwise noted. All sizes and types of pipe are noted on the Drawings, and specified herein. Where pipe is lined, the nominal diameter shall be the inside diameter of the cement mortar lining, except for wrought iron pipe.

E. Dissimilar Metals

All dissimilar metals shall be insulated from one another with approved insulating flange sets or unions.

F. Material Identification

All pipe and fittings delivered to the job site shall be clearly marked to identify the manufacturer's name, material, class, and thickness. All material shall be new and free of blemishes. Acceptance of pipe and accessories by the District will be based on load bearing tests, and inspection of the complete products as specified hereinafter. Acceptance of installed piping will be based on inspection and leakage tests as specified hereinafter.

2. WELDED STEEL PIPE, CML & CMC

Shop fabricated pipe with machine-applied lining and coating, dye-check shop welding performed after hydrostatic testing of cylinders, pipe per AWWA C200, steel plate per ASTM A1011/A1011M, 10 ga. minimum, minimum yield 36,000 psi, cement mortar coating and lining per AWWA C205. Design stress shall not exceed 18,000 psi. Each pipe section shall be provided, prior to delivery, with temporary plastic end covers, with exposed steel shop coated, 40' maximum joint lengths, lap weld bell x plain end spigot, or as indicated on the Drawings and/or Bidding Sheet, including rubber gaskets and gasket lubricant. Pipe furnished herein shall be from an organization which has had not less than ten (10) years successful experience providing pipelines of the type specified.

The minimum steel plate thicknesses utilized for water pipeline shall be as shown below:

**JURUPA COMMUNITY SERVICES DISTRICT
MINIMUM WATER PIPELINE THICKNESS**

Nominal Pipe Diameter	Minimum Cylinder Diameter	Class 150 Minimum Plate Thickness	Minimum Cement Mortar Lining Thickness	Minimum Cement Mortar Coating Thickness
6"	6-5/8" O.D.	0.1345"	1/4"	3/4"
8"	8-5/8" O.D.	0.1345"	1/4"	3/4"
12"	12-3/4" O.D.	0.1345"	5/16"	3/4"
16"	17-3/8" O.D.	0.188"	5/16"	3/4"
18"	19-3/8" O.D.	0.188"	5/16"	3/4"
20"	21-3/8" O.D.	0.188"	5/16"	3/4"
24"	25-3/8" O.D.	0.188"	3/8"	3/4"
30"	31-3/8" O.D.	0.188"	3/8"	3/4"
36"	37-3/8" O.D.	0.188"	3/8"	3/4"

NOTES

1. *Steel thicknesses indicated hereon are minimum; and design steel thickness shall be determined from the pressure imposed (Class, the design stress of the steel and the O.D. of the cylinder). The minimum acceptable yield strength of the steel shall be 36,000 psi. Design stress shall not exceed 18,000 psi regardless of yield strength of steel.*
2. *All materials shall conform with AWWA Specifications C200 (Steel Pipe CML/CMC, Section C205)*

3. DUCTILE IRON WATER PIPE

Ductile Iron Water Pipe shall be used only where specifically approved by District; and shall comply with ANSI A21.51 rubber gasket push-on type joint bell and spigot, conforming to ANSI A21.11 manufactured in sections of 18 feet or 20 feet. Fittings shall be rubber gasket push-on manufactured in accordance with ANSI A21.10. Where indicated on the Project Drawings, restrained joints shall mean the use of T.R. Flex Pipe as manufactured by U.S. Pipe or approved equal. All ductile iron pipe shall be provided with double polyethylene encasement for the entire length of the pipeline, per AWWA C105.

Unless otherwise specified, the interior of the Ductile Iron Water Pipe and fittings shall be lined with a uniform thickness of cement mortar "double thickness" then sealed with a bituminous coating in accordance with AWWA C104 (latest). The outside surfaces of D.I.P. and fittings shall be coated with a bituminous coating in accordance with ANSI A21.6 or ANSI A21.51.

Standard pressure class for Ductile Iron Water Pipe shall be based on internal pressures and external loadings. Unless otherwise noted, minimum design pressure class shall be 150 psi. Ductile Iron Pipe thickness Class 53 shall be used where flanged or Victaulic-type pipe joints are specified or indicated on the plans.

All service connections made to the Ductile Iron Pipe shall be a brass double service strap type.

4. POLYVINYL CHLORIDE (PVC) PIPE

PVC pipe shall conform to the latest revision of AWWA C909 unless otherwise specified herein.

All rubber rings shall be furnished by the pipe manufacturer. These rubber rings (elastomeric gaskets) shall be manufactured to conform to the requirements of ASTM F477.

This specification includes polyvinyl chloride (PVC) pipe of the following classes/working water pressures:

- For Working Pressures up to 150 psi: Class 235 (DR-18)
- For Working Pressures up to 200 psi: Class 305 (DR-14)

All PVC pipe shall be twenty (20) foot laying lengths and have cast iron outside diameters (C.I.O.D.'s).

AWWA C909 PVC pipe shall be Class 235 minimum (DR-18) or as specified on approved drawings.

PVC pipe shall be installed within one year of its manufactured date. Pipe older than one year shall not be delivered to the construction site.

The District shall require the manufacturer to submit a certificate stating that all pipe has been manufactured and tested in accordance with this specification.

The Contractor shall submit test results showing the physical properties of the materials used in the manufacture of the rubber gaskets, if required by the District. All rubber gaskets furnished under this specification shall be subject to inspection and/or test by the District. Any gasket found to be unsatisfactory by the District shall be immediately replaced by the Contractor, at no expense to the District.

All pipe furnished under these specifications shall be the product of an organization which has had not less than three (3) years of successful experience in the manufacture of pipe of the type specified. The total pipeline shall be the product of one company (or integrated companies) in the business for the design and manufacture of the pipeline materials required herein; unless otherwise approved in writing by the District.

All pipe to be supplied under these specifications must have the following markings on the pipe barrel: Nominal size and O.D. base (for example, 8" C.I.O.D.); dimension ratio number; AWWA pressure class; and manufacturer's name or trademark and production record code.

Joints

Unless otherwise specified or shown, all joints of PVC pipe shall be with elastomeric gasket bell ends. Solvent welded joints will not be allowed. The bell ends shall be an integral thickened bell. The minimum wall thickness of the bell, at any point, between the ring groove and the pipe barrel shall conform to the dimension ratio requirements of AWWA C909.

Pipe Outlets 2 Inches and Smaller

Outlet connections to PVC water mains two (2) inches and smaller shall be bronze service saddles with double bronze straps designed specifically for C.I.O.D. PVC pipe. No single strap saddles or full circle saddles are allowed.

Pipe Outlets Larger Than 2 Inches

Outlets in C909 PVC pipe larger than two (2) inches shall be accomplished through the use of ductile fittings.

For outlets to be installed after initial pipeline construction, a tapping saddle may be used subject to advanced written approval by the District.

Ductile Iron Fittings for PVC

Manufacturers of ductile iron fittings proposed to be furnished under the specification must be approved by the District. Ductile iron fittings shall be American made. Manufacturers of ductile iron fittings, which seek District approval, must conform with District procedures concerning approved manufactured materials.

This specification covers ductile iron fittings for use with AWWA C909 polyvinyl chloride (PVC) pipe including tees, crosses, elbows, reducers, and related special fittings. Cast iron fittings are not permitted.

All fittings for use with PVC C909 pipe shall be cast-iron outside diameter (C.I.O.D.) push-on or mechanical joint fittings with the exception of fittings with valves which shall be push-on or mechanical joint by flange. Ductile iron fittings shall be classified as "compact ductile iron fittings" and shall be produced in strict accordance with ANSI/AWWA A21.53/C153. When flanged fittings are specified or required, the fittings shall be ductile iron conforming to AWWA C110/ANSI A21.10, latest.

Unless otherwise specified, the interior of the ductile iron fitting shall be lined with a uniform thickness of cement mortar "double thickness" then sealed with a bituminous coating in accordance with AWWA C104 (latest). The outside surfaces of the DIP fittings shall be coated with NO-OX-ID special protective metal coating and wax.

All ductile iron fittings shall be double polyethylene encased at the time of installation. Double Polyethylene encasement and installation shall be accordance with AWWA C105.

Restrained System

All PVC pipe shall be fully-restrained, unless otherwise approved by the District. Restrained joints shall be provided by a clamping ring and an additional ring designed to seat on the bell end of the pipe. The rings shall be connected with T-Head bolts or rods. Restraining devices shall provide full (360 degree) support around the circumference of the pipe. No point loading shall be permitted. Restraint of mechanical joint fittings shall be provided by a clamping ring installed on the PVC pipe and connected to the mechanical

joint fitting with T-Head bolts or rods. All restraint devices for PVC pipe shall have a water working pressure rating equivalent to the full rated pressure of the PVC pipe on which they are installed, with a minimum 2:1 safety factor in any nominal pipe size. In addition, restraining devices shall meet or exceed requirements of UNI-Bell B-13 "Recommended Performance Specification for Joint Restraint Devices for Use with PVC Pipe." Restraining devices shall be approved by the District.

All buried steel parts shall be sand blasted in accordance with the coating manufacturer's technical data sheet for "submerged" service and coated with two-coat epoxy. Epoxy shall be Tnemec Series 66 or approved equal. All bolts and connecting hardware shall be of high strength low alloy material in accordance with ANSI/AWWA C111/A21.11. Buried steel parts shall be covered with grease and wrapped with visqueen.

High Deflection Coupling

Pipe joints shall not be pulled at any angle greater than one-half the maximum angle recommended by the pipe manufacturer. If an angle greater than one-half of the maximum angle recommended by the pipe manufacturer is required, install ROMAC Alpha Series Coupling to restrain the joint Minimum Curvature.

Minimum Curvature

Whenever portions of the proposed sewer construction are to be installed on the radius of a curve, the minimum radius and installation of the pipe shall be in accordance with the manufacturer's recommendations.

Locator Wire

Locator wire shall be installed over all non-metallic pipelines, services, and appurtenances for the purpose of providing a continuous signal path for electronic pipe locators used to determine pipe alignment after installation. Locator wire shall be 14-1 solid insulated copper wire (UF), in a continuous strand, placed on top of pipe and secured with tape. The wire shall be tied to the pipe at 10 foot intervals with plastic adhesive tape. Locator wire shall be brought to the surface in concrete valve boxes as approved by the District at 660 feet maximum on centers and at all appurtenances (i.e. fire hydrants, water services, air valves, blowoffs, valve cans, etc.), thus providing continuous "looping" between the appurtenances and the water main. If appurtenant locations exceed the 660 feet maximum spacing the concrete valve box shall be installed at the edge of right-of-way

and the face of curb in front of the box marked with the letters “LW”. If curb does not exist a marker post approved by the District shall be installed within 2 feet of the valve box. Two feet of wire shall be looped within all valve boxes. All splices to locator wire shall be made with direct bury connectors as approved by the District.

After all trench backfill operations are complete, the Contractor shall pay for and conduct the first conductivity test to confirm that the wire is continuous. After the installation of all other underground facilities, the Contractor shall pay for and conduct the second conductivity test to re-confirm that the wire is continuous. The conductivity tests shall only be performed with a District representative present. The Contractor shall be responsible for all costs to confirm, locate, and repair any breaks in the locator wire identified in the conductivity test. In addition, the Contractor shall reimburse the District for all costs to retest repaired sections of the wire. The Contractor is advised to use care in the installation and backfilling operations to prevent damage to the wire.

Splices shall be made at locations approved by the District. The wire connecting device shall be an underground electrical wire connector to splice and effectively moisture-seal the conductors. Wire connectors shall be approved by the District and shall be UL listed and CSA certified for direct burial splices.

Polyethylene Water Service Pipe (PVC Mains Only)

One (1) inch diameter polyethylene water service pipe shall only be allowed to be used under the following conditions: (1) where soil conditions are extremely corrosive to copper water service pipe, and (2) only as authorized in writing by the District.

All polyethylene pipe and tubing furnished under these specifications shall conform to all applicable requirements of the latest revision of AWWA C901. Polyethylene water service pipe shall be iron pipe size and supplied by a District approved manufacturer.

The PE pipe or tubing shall be marked in accordance with ASTM D2239 for IPS pipe sizes. It shall also carry the seal of the National Sanitation Foundation (NSF).

Pressure Rating: The PE pipe and tubing shall be rated for use with water at 73.4°F at a maximum working pressure of 200 psi, based on ASTM D2837.

Dimensions: For iron pipe sizes (IPS), the standard inside dimension ratio (SIDR) shall be SIDR 7 with the average inside diameter, minimum wall thickness and respective

tolerances for any cross section as specified in ASTM D2239.

Minimum Burst Pressure: The minimum burst pressure at 73.4°F determined in accordance with ASTM D1599 latest revision, shall be 630 psi. The time of testing of each specimen shall be between 60 and 70 seconds.

Sustained Pressure: The PE pipe and tubing shall not fail, balloon, burst or weep as defined in ASTM D1598, latest revision, when tested in accordance with Section 7.6 of ASTM D2239.

5. WELDED STEEL FITTINGS

All bends, reducers, increasers, tees, crosses, wyes, and other special fittings, except as specifically noted on the Drawings, shall be constructed of cement mortar lined steel pipe with coating as specified for balance of pipeline, and shall be shop fabricated in accordance with the latest revision of AWWA C208. (as modified below).

ELBOWS

Angle	0-22 1/2°	22 1/2°-45°	45°-67 1/2°	67 1/2°-90°
No. Pieces	2	3	4	5

NOTE: At the break point angles (i.e. 22 1/2°, 45°, and 67 1/2°) the Contractor shall use the elbow with the largest number of pieces.

All fittings shall have a steel cylinder thickness equal to or greater than the specified wall thickness of the pipeline, but not less than 10 gauge. The minimum radius for all bends shall not be less than 2.5 times the nominal diameter of the pipelines. Where simulated weld bells are used for lap-welded fittings, the bell plate thickness shall be 1/4".

Special fittings shall be fabricated from machine cement mortar lined and machine outside coated. The individual parts of the fittings shall be cut from the pipe, welded together, and the coating and lining of shop joints shall be hand applied to provide a finished cement mortar lined and finished outside coated joint comparable to the mechanically applied lining and coating detailed herein.

Specials and fittings fabricated from cylinders that have been hydrostatically tested in accordance with these specifications shall be tested by the dye-check method, or approved equal, prior to the lining and coating of said material. Contractor shall submit

fabrication drawings for all AWWA shop fabricated fittings to the District for approval prior to construction.

Long Radius Steel Elbows

Seamless, forged long radius steel elbows shall be used where specified by the District and shall be shop fabricated in accordance with the latest revision of ASTM A234.

6. DUCTILE IRON FITTINGS

Bends, Tees, Crosses, Reducers, Bushings, Adapters, Caps, and Plugs for Ductile Iron Pipe; ANSI/AWWA C110-(latest), minimum 250 psi rated working pressure, cement mortar lining shall be "double thickness" in accordance with AWWA C104-(latest), flange ends (F) shall conform in dimensions and drilling to ANSI B16.1 for cast-iron flanges and flanged fittings for 125 lb., produced by a "District Approved Manufacturer". Short body pattern is acceptable. Properly fitting rubber gasket joint fittings are also acceptable. Fittings shall be double polyethylene encased per AWWA C105.

7. AWWA GATE VALVES

All resilient seat gate valves shall meet the requirements of AWWA C509-(latest) for rubber seated gate valves and shall be tested bubble-tight. In addition, RS Gate Valves shall be furnished with the following items:

- Valve body and bonnet shall be fusion bonded epoxy coated inside and out (10 mils nominal thickness) and meet all requirements of AWWA C550.
- Low zinc bronze stems.
- All stainless steel body hardware. Resilient seat gate valves shall be produced by a "District Approved Manufacturer".

8. RUBBER SEATED BUTTERFLY VALVES

Butterfly valves shall conform to the latest revision of AWWA C504 and the following:

- Butterfly valves and operators shall be Class 150B, constructed for direct burial and have flanged ends to mate A.S.A. 150 lb. steel flanges.

- Butterfly valves shall be furnished with operators of the traveling nut or worm gear type, self-locking in any position, and sealed, gasketed, and lubricated to withstand a submersion in water to 10 psi. The valve shall open by counter-clockwise rotation of a 2-inch square AWWA operating nut.
- The operator shall be capable of meeting the torque requirements for opening and closing the valve against:
 - 150 psi upstream and 0 psi downstream pressure.
 - Maximum inlet-outlet flow rate of 12 FPS, normal flow rate of 6 FPS, and shall be provided with AWWA stops capable of absorbing up to 300 foot-pounds of input torque without damage to the valve or operator.
- Butterfly valves shall have Buna N seat bonded or mechanically retained, without use of metal retainers or other devices located in the flow stream, to the body and have a disc seating edge of nichrome or stainless steel. All internal mountings or working parts shall be stainless steel.
- Butterfly valves shall have the shaft V-type self-adjusting packing. The shaft shall not be exposed between the valve body and the operator.
- Butterfly valves shall be furnished with records of tests specified in AWWA C504, Section 2.3 and Section 5. All valves shall be furnished with Certified drawings and parts list of the valve and operator. An affidavit of compliance to AWWA C504 shall be furnished for all valves. Five (5) sets of the above information shall be furnished to the District.
- Butterfly valves shall have their internal and external surfaces (except flange faces, stainless steel and rubber surfaces) epoxy coated, to meet all requirements of AWWA C550. All butterfly valves shall be lined (holiday free) with a minimum of 10 mils (2-5 mil coats) of Keysite 750, (white); or DeVoe Bar-Rust No. 235 (white). The epoxy lining shall be applied at the valve manufacturer's plant in accordance with the coating manufacturer's application specifications.

- Approved butterfly valves shall be produced by a "District Approved Manufacturer".

9. COPPER TUBING

Copper tubing shall conform to the requirements of the "Specifications for Seamless Copper Water Tube" (ASTM Designation B88) and shall be Type K. As required by the District, copper tubing shall be installed with a 6 mil (minimum) polyethylene sleeve "Polywrap C" by Northtown Company or District approved equal.

10. BLACK STEEL PIPE

Black steel pipe shall conform to the requirements of the ASTM A53/A53M and shall be "Standard Weight" (Type S) unless otherwise designated. Black steel pipe shall not be cement-mortar lined, for sizes up to 3" diameter but shall have fusion bonded epoxy lining and coating. Pipe/fittings sizes 4" and greater shall be cement mortar lined and outside cement mortar coated; cement mortar lined and outside bare; or bare steel, as designated on the Drawings or Specifications.

Unless otherwise shown, black steel pipe, 3 inches in diameter and smaller, shall be joined with malleable iron screwed fittings. Black pipe 4" and greater shall be joined with standard weight welding fittings produced by a "District Approved Manufacturer".

11. RED BRASS PIPE

Brass pipe and fittings shall conform to the requirements of the "Specifications for Seamless Red Brass Pipe, Standard Sizes" (ASTM Designation B43). As required by the District, brass pipe shall be installed with a 6 mil (minimum) polyethylene sleeve "Polywrap C" by Northtown Company or District approved equal.

12. STAINLESS STEEL PIPE

Stainless steel pipe shall be Type 316 welded, full finished, and shall conform to the "Specification for Seamless and Welded Austenitic Stainless Steel Pipe (ASTM A312/A312M).

13. INSULATING UNIONS

Where dissimilar pipe materials are joined, suitable insulating unions shall be

installed. Insulating unions shall be produced by a "District Approved Manufacturer".

14. PRESSURE GAUGES

Except as otherwise provided in these specifications, pressure gauges shall be 4-inch diameter dials, liquid filled, AISI 316 stainless steel case, have stainless steel elements, and 1/2-inch bottom connection. Accuracy shall be 0.5% of full scale. In all cases the normal operating pressure of the system to which the gauge is attached shall be within the middle 1/3 of the gauge range. Gauges shall read in pounds per square inch for pressure. Gauge shall be produced by a "District Approved Manufacturer."

15. PRESSURE REGULATING VALVES

A. General

Regulating valve shall be a diaphragm actuated, single seated, hydraulically operated globe-type valve. The valve body shall be ductile iron or stainless steel. It shall have two operating chambers sealed from each other by a flexible synthetic rubber fully-supported diaphragm. The valve disc shall be resilient with a rectangular cross section and shall be retained on three sides. Valve bodies and all necessary parts shall be a size and type suitable for use with pressure as specified and include all necessary fittings for correct pilotry and connections. The model numbers shall be as indicated on the Drawings.

Regulating valves shall be subject to hydrostatic test of not less than twice the maximum pressure rating. Pressure rating (Class) shall be as indicated on the Drawings.

B. Pump Control Valves

Control of valve operation shall be by means of an externally mounted, four-way, solenoid pilot valve. Self-cleaning strainers shall be used to protect the control system. Valve shall utilize line pressure for operation. A Limit-switch shall be installed to be adjustable over entire valve travel. Valve shall be equipped with a built-in lift type check feature to prevent reverse flow. It shall operate independently of the solenoid control. Solenoid valve shall operate on 120 VAC.

C. Pressure Relief Valves

The Pressure Relief Valve shall maintain constant upstream pressure by bypassing or relieving excess pressure, and shall maintain close pressure limits without causing surges. The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. There shall be no pistons operating the valve or pilot controls. All necessary repairs shall be possible without removing valve from the line. The pilot control shall be a direct-acting, adjustable, spring-loaded, diaphragm valve, designed to permit flow when controlling pressure exceeds spring setting. The pilot control system shall operate such that as excess line pressure is dissipating the main valve shall gradually close to a positive, drip-tight seating.

D. Rate of Flow Control Valves

The valve shall maintain a constant rate of flow regardless of fluctuations in upstream pressure. The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. There shall be no pistons operating the valve or pilot controls. All necessary repairs shall be possible without removing valve from the line.

The pilot control shall be a direct-acting diaphragm valve designed to close when the actuating differential increases beyond the spring setting. The actuating differential pressure shall be produced by a thin-edge orifice plate installed in an orifice flange located downstream of the valve.

E. Pressure Reducing/Pressure Sustaining Valves

This valve shall maintain a constant downstream pressure regardless of fluctuations in demand. When the upstream pressure becomes equal to the spring

setting of the pressure sustaining control, the valve throttles to maintain a constant inlet pressure. If the downstream pressure is greater than the upstream pressure the valve closes automatically to prevent return flow.

The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. All necessary repairs shall be possible without removing valve from the line.

The pressure reducing pilot control shall be a direct-acting, adjustable, spring-loaded, normally open diaphragm valve, which closes when downstream pressure exceeds the spring setting.

The pressure sustaining pilot control shall be a direct-acting, adjustable, spring-loaded, normally closed diaphragm valve which opens when upstream pressure exceeds the spring setting. The control system shall include a strainer orifice assembly and an adjustable opening speed control.

F. Altitude Valves

The altitude valve shall maintain a constant downstream pressure regardless of fluctuations in demand and shall also close tight when a pressure reversal occurs. It shall be a hydraulically-operated, pilot-controlled, diaphragm type globe or angle valve. The main valve shall have a single removable seat and a resilient disc. The stem shall be guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. No external packing glands are permitted, and there shall be no pistons operating the main valve or any pilot controls.

The pilot control shall be a direct-acting, adjustable, spring-loaded, normally open diaphragm valve, designed to permit flow when controlled pressure is less than the spring setting.

A system of auxiliary check valves shall be used to admit downstream pressure into the main valve cover chamber if pressure reversal occurs. This must result in positive closing of the main valve.

G. Coatings

All regulating valves shall have all wetted ferrous parts epoxy coated. The epoxy shall be thermo-setting, approved for potable water.

All coated surfaces shall be coated with 12 miles of fusion bonded epoxy and be visually and electrically examined for defects. The coating shall be holiday free with a low voltage wet sponge test per AWWA C550.

H. Options

Additional required options to be furnished with the valves shall be indicated on the Drawings utilizing the appropriate model numbers and/or catalog designations.

16. FLOW METERS

A. Service Flow Meters

Service flow meters for 5/8" through 1" diameters shall be displacement type, cold-water meters in accordance with AWWA C700, Latest; produced by a "District Approved Manufacturer". Service flow meters for 1 1/2", 2", and 3" diameters shall be turbine type cold-water meters in accordance with AWWA C701, latest; produced by a "District Approved Manufacturer". Service flow meters 4" diameter and larger shall be produced by a "District Approved Manufacturer" with all bronze turbine by-pass meter. All meters shall be equipped with Radio Reads.

Unless otherwise specified on Drawings and/or on the Bidding Sheet, subsequent to payment of fees and the purchase of the meters through the District, the District will furnish all service meters that are less than or equal to 3" diameter for installation by the Contractor. Meters 4" diameter and larger shall be furnished and installed by the Contractor in accordance with District Standards and Specifications.

17. NO-OX-ID

For specified outside wrapped steel pipelines and/or where specifically directed by the District, outside pipe coating shall be NO-OX-ID special protective metal coating and

wax.

18. PRECAST CONCRETE VAULTS

All precast concrete manhole sections shall be manufactured in a plant especially designed for that purpose. All units will conform to the design shown on the drawings, and all work shall be conducted under strict plant controlled supervision.

Design loads shall consist of dead load, live load, impact, and in addition, loads due to water table, and any other loads which may be imposed upon the structure.

Live loads shall be for H-20 and/or H-20-S16 per AASHTO Standard Specifications for Highway Bridges with revisions. Design wheel load shall be 16 kips. The live load shall be that loading which produces the maximum shears and bending moments in the structure. All reinforcing steel shall be intermediate or hard grade billet steel conforming to ASTM A615/A615M/A706/A706M. Bars other than 1/4" round, or smaller, shall be deformed in accordance with ASTM A615/A615M.

All vaults shall have a 2 piece torsion hinged cover specified for traffic loads where required. The effort necessary to lift the cover shall not exceed OSHA requirements. Cover shall be provided with a 6" x 6" meter reading lid located directly over the meter register. Also, cover shall be provided with a safety chain capable of limiting the travel of the cover. Precast sections shall be joined with a plastic joint sealing compound. The preformed cold-applied ready-to-use plastic joint sealing compound shall be produced by a "District Approved Manufacturer".

Vaults shall be located outside of sidewalk areas. The dimension from the top of the vault to the centerline of the piping within the vault shall not exceed 5'.

19. FUSION BONDED EPOXY COATING

Wherever fusion-bonded epoxy coating is specified on steel piping or equipment for potable water, the coating system shall consist of one coat of Scotchkote 134; Tnemec Series 104 or District approved equal. Minimum dry film thickness shall be 12.0 mils. Surface preparation shall be SSPC-10. Coating shall be in accordance with NSF-61. Method of application shall be electrostatic spray method heat fusion per coating manufacturer's specifications.

Submit manufacturer's data sheets for review and approval, including: method of

application; minimum and maximum DFT; recommended surface preparation; application instructions and curing requirements; etc.

20. NSF COMPLIANCE

All materials in contact with domestic water shall comply with the applicable provisions of California Title 22 Regulations Related to Drinking Water, including NSF 60 and 61 certifications; all at no additional cost to the District. Additionally, Contractor shall provide the District with a written “Affidavit of Compliance” with the California Drinking Water Regulations as part of the submittal approval process. District will provide copies of the Contract Documents and related project information to the California Department of Public Health for their approval.

21. PIPE SUPPORTS

Pipe supports shall be adjustable for pipeline products PSG series pipe supports or District approved equal. Pipe support shall be painted with primer and two (2) coats of paint per District specifications. The pipe and saddle shall be separated by 1/8” thick Neoprene Rubber.

BASIC SPECIFICATIONS
SECTION C

WATER PIPELINE CONSTRUCTION
SPECIFICATIONS

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BASIC SPECIFICATIONS
SECTION C
WATER PIPELINE CONSTRUCTION SPECIFICATIONS
TABLE OF CONTENTS

	<u>Page</u>
1. Water Pipe Installation.....	C-1
A. General.....	C-1
B. Installation.....	C-1
C. Handling.....	C-1
D. Joints (CML/CMC Pipelines)	C-2
E. Curved Alignment.....	C-3
F. Manufacturer Access	C-3
G. Allowable Variations in Pipeline Alignment.....	C-3
H. Pipeline Cover.....	C-4
I. PVC Waterlines	C-4
J. Measurement and Payment.....	C-6
2. Welding Specifications	C-7
A. General.....	C-7
B. Field Welded Pipe Joints	C-10
3. Painting Specifications.....	C-10
4. Concrete Work.....	C-12
A. General.....	C-12
B. Portland Cement Concrete Classification	C-13
5. Pavement Removal and Replacement.....	C-13
A. General.....	C-13
B. Pavement Cutting.....	C-14
C. Permanent Trench Pavement	C-14
D. Asphalt Concrete Cap	C-14
6. Steel Flanges, Bolts, Nuts and Gaskets.....	C-15
7. Elbows, Side Outlets, Tees, Buttstraps, Crosses.....	C-16
8. Tackwelded and Welded Joints - Installation	C-16

BASIC SPECIFICATION
SECTION C
WATER PIPELINE CONSTRUCTION SPECIFICATIONS
TABLE OF CONTENTS
(continued)

	<u>Page</u>
9. Connections to Existing Water System.....	C-17
10. Filling, Testing, and Chlorination.....	C-18
11. Protection of Domestic Water Mains from Contamination	C-18
12. Field Hydrostatic Test and Leakage Test.....	C-18
13. Disinfecting Pipelines	C-20
14. California Regional Water Quality Control Board, Santa Ana Region Permit .	C-22
15. Corrosion Protection	C-22
16. Tapping	C-22
A. Water Mains.....	C-23
B. Water Laterals	C-23
17. Video Inspection (CML/CMC Waterlines)	C-23
Video Inspection Company Requirements	C-25

BASIC SPECIFICATIONS

SECTION C

WATER PIPELINE CONSTRUCTION SPECIFICATIONS

1. WATER PIPE INSTALLATION

A. General

The Contractor shall furnish and install all water pipeline material required for the construction of the water pipeline and appurtenances as herein specified and shown on the Drawings. All pipeline material shall be installed per manufacturer's published recommendations and per the applicable published standards for the particular material being installed unless otherwise modified herein. In case of any conflict, the most stringent and highest requirement shall govern, and the Contractor shall adhere to said requirement, all at no additional cost to the District.

B. Installation

Pipe shall be accurately laid to alignment and grade shown on Drawings or established by District. Each section of pipe shall be lowered into trench in a manner that will prevent injury to pipe, coating, or joints and shall be carefully bedded to provide continuous bearing and prevent uneven settlement. Inside of pipe shall be clean and free from foreign material of any kind before being installed. Contractor will lay pipe units with bell ends in direction of laying, unless otherwise ordered by District or set forth in these Specifications and Drawings.

C. Handling

Contractor may find it necessary to move or haul pipe during progress of the work. Dropping or bumping of pipe will not be permitted, and all damaged pipe will be rejected. Rejected pipe may be repaired if permitted by District, and such repairs shall be subject to approval of District. If pipe is damaged beyond repair through Contractor's hauling or moving program, Contractor shall, at their own expense, replace the pipe. After District and/or material supplier has delivered pipe to Contractor in good order and condition on the job, it shall be Contractor's

responsibility to keep it in good condition, and they shall repair or replace, at their own expense, any pipe damaged from any cause after delivery.

Contractor shall take all necessary precautions to prevent pipe from floating due to water entering trench from any source, shall assume full responsibility for any damage due to this cause, and shall, at their own expense, restore and replace pipe to its specified condition and grade if it is displaced due to floating. Contractor shall maintain inside of pipe free from foreign materials and in a clean, sanitary condition until its acceptance by District.

At all times when work of installing pipe is not in progress, all openings into pipe and ends of pipe in trench shall be tightly closed to prevent entrance of animals and foreign materials.

D. Joints (CML/CMC Pipelines)

(1) Type of Joints and Bonding Requirements

Water pipeline joints shall be constructed in accordance with District Standards. All joints shall be fully welded LAP joints. The minimum number of weld passes shall be per the Welding Specifications Section C.2B contained herein. Where indicated on the Drawing, Contractor shall install insulation flange kits in accordance with District requirements.

(2) Field Joints - Cement Mortar Lining

Mortar shall be Hubs all patch quickset non shrink commercial grout or a District approved equal packaged dry mortar mix consisting of one part cement and three parts sand. Quantity of water shall be sufficient so that when mortar is firmly compressed into a ball shape, it will hold its shape without slump. Mortar shall be mixed separately for each joint to be patched.

Special care should be taken to avoid damage to lining or coating during lowering pipe into trench.

(3) Field Joints - Cement Mortar Coating

Outside field joints are required to be coated with cement-mortar. This shall be accomplished by wrapping a canvas or paper diaper around the joint. The diaper is held on each side by steel strapping. Cement mortar shall be composed of 1 part cement and not more than 3 parts sand and mixed to a consistency of thick cream. The top of the pour must be covered with a protective material, such as cloth or paper.

E. Curved Alignment

Laying pipe on curved alignment with unsymmetrical closure of spigot into bell rings shall be permitted as recommended by pipe manufacturer. For the purpose of reducing angular deflection at pipe joints and for closure sections, Contractor shall be permitted to install pipe sections of less than standard length.

Closing courses and short sections of pipe shall be fabricated and installed by Contractor as found necessary in the field. Where closing pieces are required, Contractor shall make the necessary measurements and shall be responsible for their correctness.

F. Manufacturer Access

Pipe manufacturer shall have free access to the work during laying operations and testing. Any improper act on the part of Contractor which pipe manufacturer may observe shall be reported to District.

G. Allowable Variations in Pipeline Alignment

The pipeline alignment, as shown on the Plans, was determined from record land net data and interference information obtained from contacting the various utilities, along with conducting a field check during design. After the award and prior to the commencement of construction, it will be necessary to review the pipeline alignment shown on the Drawings, just prior to Contractor's trenching for verification of field conditions regarding interference facilities. Contractor and, Engineer and District shall field-review each section of the proposed pipeline to verify the alignment for trenching purposes. The specifications provide that the

District may vary pipe alignment (ALL AT NO ADDITIONAL COST TO THE DISTRICT).

H. Pipeline Cover

Pipeline cover as shown on the attached Standard Drawings and/or the Design Drawings, is hereby defined to be Design Cover over pipeline. Therefore, should field conditions determined at time of construction show that any pipe grade changes are required, District reserves the right to authorize said changes in pipeline grades, and Contractor shall trench and lay pipeline accordingly, ALL AT NO ADDITIONAL COST TO THE DISTRICT.

All pipeline within public roadways shall be installed with no less than 48" of cover below road grade (or projected existing road grade, in case of embankments) unless otherwise shown on the Drawings or approved by the Engineer.

I. PVC Waterlines

(1) Bedding Pipe

Each section of pipe shall be lowered into the trench in a manner that will prevent injury to the pipe, or joints and shall be carefully bedded to provide continuous bearing and prevent uneven settlement. The inside of the pipe shall be clean and free from foreign material of any kind before being installed.

For PVC pipe and ductile iron pipe with mechanical joints, the gasket shall be placed in the groove of the bell. Lubricate the spigot end into the bell and force into position per manufacturer's recommendation.

(2) Laying and Jointing PVC C909

Trenches shall be in a reasonably dry condition when the pipe is laid. Necessary facilities shall be provided for lowering and properly placing the pipe sections in the trench without damage. The pipe shall be laid carefully to the lines and grades given and the sections shall be closely jointed to form a smooth flow line. Where no grades are given, pipe shall be laid in a smooth continuous grade between connections to other mains, blowoffs

and/or air release valves with a minimum cover of 48". Immediately before placing each section of pipe in final position for jointing, the bedding for the pipe shall be checked for firmness and uniformity of surface.

(3) Field Hydrostatic Test (PVC)

For convenience of testing, the pipeline may be divided into sections and each section tested separately. All pipe shall be tested to the pressure rating of the pipe and not less than the pipe's pressure rating:

C909 PVC Class 235 Test Pressure: 235 psi

C909 PVC Class 305 Test Pressure: 305 psi

If any leakage is evidenced in the testing of the pipeline, the various sections of the pipeline shall be isolated for testing between available valves, or between bumpheads located as approved by the District. The maximum allowable leakage for PVC pipe shall be six (6) gallons per day per mile of pipe per inch of pipe inside diameter. If the leakage exceeds this amount, the section being tested will be considered defective. The Contractor shall determine the points of leakage, make the necessary repairs and perform another test. This procedure shall be continued until the leakage in each section falls below the allowable maximum for that section of pipeline.

Leakage shall be determined by metering the water injected into the pipeline while under the required pressure. The Contractor shall submit to District before and after the test the gate and meter used so that these devices may be tested by District.

The Contractor shall provide all calibrated meters for measurement of leakage, all bump heads or skillets, piping, calibrated gages, pumps and other equipment, all water not furnished by District, and all power and labor necessary for the performance of pressure tests satisfactory to the District. The Contractor shall furnish all necessary equipment and labor to fill each section of pipeline tested and for pumping the water from one test section to another as may be necessary for obtaining and maintaining the required

water pressure and for filling the entire pipeline with water after the conclusion of the testing, as hereinafter provided.

The Contractor, at their own expense, shall do any excavation necessary to locate and repair leaks or other defects which may develop under test, including removal of backfill already placed, shall replace such excavated material, and shall make all repairs necessary to meet the required water tightness after which the test shall be repeated until the pipe meets the test requirements. All tests shall be made in the presence of the District. After the pipe has successfully met all test requirements specified herein, the entire pipeline shall be filled with water and so maintained until the completion of the contract unless otherwise ordered by the District.

(4) Thrust Restraint

Thrust restraint shall be accomplished by the use of restrained joints as specified herein. Thrust blocks will not be allowed for PVC pipelines.

J. Measurement and Payment

(1) Pipe

Contractor shall understand that pipeline lengths are approximate and are to be used for establishing unit bid prices and extensions for comparison of bids. UNLESS OTHERWISE STATED IN THE "SPECIAL REQUIREMENTS", all payments shall be based upon said unit bid prices applied to the net centerline pipeline length (station difference - or length shown on drawings) installed by Contractor and shall include all specials, tees, bends, fittings, etc., except when shown otherwise on Bidding Sheet.

The District shall approve pipeline length used for payment purposes. The District reserves the right to increase or decrease the amount of pipeline indicated on Drawings and Bidding Sheet, with no change in Contractor's unit bid price.

Contractor shall include under pipeline unit bid prices, all costs to completely perform all contract work, including but not limited to, the construction of thrust blocks, locator wire along non-metallic pipelines,

shoring methods and materials, and supplying barricades or other safety devices, except costs which are specifically required to be included under separate bid item numbers on Bidding Sheet.

(2) Pipeline Appurtenances

All pipeline appurtenances, including air valve installations, blowoff installations, fire hydrant installations, main line valve installations, side outlet valve installations, blind flange installations, valve marker installations, guard post installations, slope protection cut-off wall installations, slope protection cut-off ditch installations, pedestal mounted terminal housing installations for direct burial cable used and for cathodic protection use, specified connections, specified appurtenances, etc., are shown in detail on Standard Drawings attached in back of these Specifications or are described in the Specifications and/or Drawings. Contractor shall understand and agree that District may elect to eliminate all or a portion of said installations and that they shall receive payment in amount bid therefore, only for those installations they actually constructs.

2. WELDING SPECIFICATIONS

A. General

All welding operators shall be qualified under the Standard Qualification Procedure of the American Welding Society and all applicable provisions of the latest edition of "Structural Welding Code" (ANSI/AWS D1.1) published by the American Welding Society are incorporated into this Specification. Contractor shall adhere to all Cal-OSHA, American Welding Society, American National Standards Institute and local agency safety regulations (including fire) regarding all welding operations.

The District shall have the right at any time to call for and witness making of test specimens by any welder in accordance with these Specifications, and the expense of such tests shall be borne by Contractor.

The provisions of these sections do not apply to the fabrication of pipe or special fittings in conflict with AWWA Standard Specifications for pipe.

All hand welding in both shop or field shall be done by welders certified in accordance with ASA B31.1 latest (AWWA C206-latest).

All welds shall be made by an electric shielded arc method of welding.

Plates shall be held in correct position. Abutting edges shall be properly prepared. Each deposited layer of welded metal shall be thoroughly cleaned before additional metal is applied to its surface. Finished weld bead shall be central to the seam, and the finished joint shall be free from depressions, undercut edges, burrs, irregularities resulting from welding, other than normal bead necessary.

All welds shall be a type that will produce complete fusion with base metal and shall be free from cracks, oxides, and gas pockets within the limits set forth under these Specifications. If the automatic welding machine does not obtain a fusion weld that will penetrate through to the inside of the pipe and protrude beyond the contour of the plate surface, an inside pass shall be made in the root of the groove on the inside of the pipe. Chipping out of the weld in the root of the groove will be required when deemed necessary by the District.

If welding is stopped for any reason, special care shall be taken when welding is resumed to obtain complete penetration between welded metal, plate, and welded metal previously deposited, and if flux is used, it must be redistributed before work is resumed.

The height of the outside weld bead above the contour of the plate surface shall be measured and shall be not less than 1/16-inch. Heights of the outside weld bead above the contour of the plate surface exceeding 1/8-inch shall be removed by grinding or chipping.

Welds found deficient in dimensions but not in quality shall be enlarged by additional welding after thorough cleaning of the surface of previously deposited metal and adjoining plate. However, if work performed since making a deficient weld has rendered the weld inaccessible or has caused new conditions which would make such reinforcement dangerous or ineffective, the original conditions shall be restored by removal of welds, members, or both, before enlarging the deficient weld, or the deficiency shall be compensated by additional work as prescribed by the District.

Welds considered by the District to be deficient in quality or made contrary to any mandatory provision of these Specifications shall be removed by chipping or melting and shall be remade. The weld metal shall be removed throughout its depth to expose clean base metal, but if a strictly local deficiency, the weld need not be removed throughout its entire length, provided that sufficient amount shall be removed to ensure that sound weld metal only remains. A cracked weld shall be removed throughout its length.

When removing part or all of a weld by cutting or chipping, such cutting or chipping shall not extend into the base metal beyond the depth of weld penetration. When removing part or all of a weld by melting, care shall be taken not to burn or otherwise injure the base metal. After the melting operation, burned metal shall be removed to clean, sound metal.

Overheated weld metal and any overheated base metal adjoining same shall be removed and replaced by new weld metal properly applied. However, if the plate is so badly or extensively injured by overheating that it cannot satisfactorily be replaced by weld metal, such additional work as prescribed by the District shall be performed, all at their own expense, with no additional compensation.

All longitudinal, spiral, and girth seams of straight pipe sections, and special sections when practicable, shall be welded with an automatic welding machine. If requested, sample welds shall be submitted to the District for testing in accordance with these Specifications. Approval of such tests shall be required prior to welding of pipe.

Hand welding will be permitted only when it is impracticable to use an automatic welding machine.

Fillet welds shall have full penetration into the corner. Excessive cutting back of the edges of fillet welds is a defect and shall be repaired. Butt welds shall be made by adding weld metal to both sides of the joint, and the underside of the weld in groove shall be chipped out, removing all slag and unsound metal, containing a clean surface for the application of weld metal; in making butt and fillet welds, weld metal shall be deposited in successive layers, so there will be as many passes as there are complete multiples of 1/8-inch in the plate thickness, provided there shall be a minimum of two passes.

B. Field Welded Pipe Joints

Welded field joints in steel pipe shall be lapwelded unless otherwise shown. Welders shall be certified in accordance with the American Standard Code for Pressure Piping (ASA B31.1) or the "Standard for Field Welding of Steel Water Pipe Joints" (AWWA C206). In all hand welding, the metal shall be deposited in successive layers so that there will be at least as many passes or beads in the completed weld as indicated in the following table:

Plate Thickness Inches	Fillet Weld Minimum Number of Passes
3/16	2
1/4	2
5/16	3
3/8	3
13/32	3
7/16	4
15/32	4
1/2	4
More than 1/2	1 for each 1/8 of an inch

Each pass, except the final one shall be thoroughly bobbed or peened to relieve shrinkage stresses and to remove dirt slag, or flux, before the succeeding bead is applied. Each pass shall be thoroughly fused into the plates at each side of the welding groove or fillet, and shall not be permitted to pile up in the center of the weld. Under-cutting along the side will not be permitted.

3. PAINTING SPECIFICATIONS

The Contractor shall provide all labor, material, and equipment necessary for completion of all painting work specified in these Specifications and Drawings.

The Contractor shall deliver all painting materials to the work site in the original containers with seals unbroken and unmutilated and with labels attached. All paints and coatings shall be in compliance with all South Coast Air Quality Management District requirements including volatile organic chemicals (VOC). Containers shall not be opened until after they have been inspected by the District.

Material for prime coat shall be produced by a "District Approved Manufacturer".

Material for finish coat shall be automotive grade synthetic industrial enamel, produced by a "District Approved Manufacturer" unless specifically stated otherwise in these Specifications or Drawings.

The Contractor shall submit a color chart to the District, who will select the finish colors.

All work shall be done by thoroughly qualified painters in a neat, workmanlike manner. All work which shows carelessness or lack of skill in the execution or is defective due to any other cause will be rejected and repainted to the satisfaction of the District, at the expense of the Contractor.

Unless otherwise specified, paint shall be applied by brush or spray.

Paint shall be applied only on thoroughly clean, dry surfaces. Paint shall not be applied in extreme heat, cold, damp, or humid weather or in dust or smoke-laden air.

All exposed iron and steel work, including piping and valves, etc., shall be prime painted at the shop. After installation, said materials shall be cleaned and all welds, tool marks, etc., shall be touched up with primer and given two coats of finish enamel.

Prepared material shall be used without cutting or addition of any material whatsoever, except as directed by the manufacturer and approved by the District. Each coat must be thoroughly dry before application of the next coat.

If brushes are used, they shall have sufficient body and length of bristle to spread the paint in a uniform coat. Paint shall be evenly spread and thoroughly brushed out and with no residual brush marks remaining. On surfaces which are inaccessible for brushing, the paint shall be applied by spray or by sheepskin daubers or other means necessary to obtain a proper thickness of paint as approved by the District.

If a spray method is used, the operator shall be thoroughly qualified in the use of the equipment required. Air compressors employed in spray painting shall be equipped with a suitable trapping device to keep water, oil, and other impurities from entering the air lines. Runs, sags, thin areas, or other imperfections in the paint coat shall be considered as cause for rejection, and the Contractor shall be required to make all necessary corrections to the satisfaction of the District.

Paint materials shall be kept sealed or covered when not in use. Oily rags or waste shall be kept in covered containers and disposed of at frequent intervals.

The Contractor shall be held responsible for protecting freshly painted surfaces from accumulation of dust, dirt, water, or other foreign materials, whatever the cause or source. Any damaged surfaces shall be wiped clean, sanded, or stripped to a clean, dry condition and repainted to the satisfaction of the District.

The Contractor shall protect all parts of the work site against disfigurement by their operations. Tarps and cloths shall be placed where required to protect floors and equipment from spatter and droppings. Electric switch plates, lighting fixtures, hardware, glass, vehicles, etc., shall be removed, covered or otherwise protected from disfigurement by the painting operations. The Contractor shall clean or otherwise restore any spattered surfaces to the satisfaction of the District.

4. CONCRETE WORK

A. General

Concrete shall be composed of portland cement, natural aggregates, and water proportioned to produce required strength and well mixed into required consistency.

Portland cement concrete for thrust blocks, cradles, encasements, and structures shall be composed of portland cement, fine aggregate, coarse aggregate and water proportioned and mixed in accordance with the requirements of Section 90 of the State of California Department of Transportation Standard Specifications, except as may be herein modified.

Concrete for cradles and encasements, and all other concrete structures, shall be constructed to the lines and grades and in accordance with the design shown in the details on the plans.

Prior to placing any concrete, the Contractor shall submit to the District the design mix proposed to be used. Said mix shall set forth the weights of cement, sand, coarse aggregate and the amount of water to be used. (Source of supply shall also be furnished to the District.) The proposed mix shall be approved by the District prior to placing any concrete.

B. Portland Cement Concrete Classification

Concrete Class	Compressive Strength @ 28 days (psi)	Sacks of Cement/CY
"A"	3,500	6
"B"	2,500	5
"C"	2,000	4
"D"	4,000	7

The amount of free water used in concrete shall not exceed 312 pounds per cubic yard, plus 20 pounds for each required 100 pounds of cement in excess of 564 per cubic yard.

5. **PAVEMENT REMOVAL AND REPLACEMENT**

A. General

Pavement removal and replacement for all public roads, including aggregate base and temporary paving where required, shall comply with all the requirements of the agency issuing the Encroachment Permit. In roads established under formation of a special road district, the specifications of the Encroachment Permit shall apply. Any private roads and streets, including driveways, in which the surface is removed or damaged, shall be restored to the original grade and crown by the Contractor. Removed or damaged sections shall be restored with the type of improvements (or better) conforming to that which existed at the time the Contractor entered upon the work.

It shall be the responsibility of the bidder to satisfy themselves as to the existing pavement sections prior to submitting their bid.

Full compensation for temporary and permanent resurfacing, including the replacement of base material as required, shall be included in the unit bid price for pavement removal and replacement per linear foot of mainline trench. Any required pavement removal and replacement for services, fire hydrants, air valves, or other appurtenances shall be considered included in the bid price for the various items, and no additional compensation shall be made therefore.

B. Pavement Cutting

Pavement shall be cut to a straight edge parallel to the pipe alignment prior to excavation. Method of pavement cutting shall be as specified by the Agency having jurisdiction. Under no circumstances shall excavation be started prior to scoring of pavement. If the adjacent pavement is disturbed during the Contractor's operation, the pavement shall be recut on a straight line to remove the damaged pavement before resurfacing. Portland cement concrete pavement and sidewalk shall be saw cut. Pavement cutting shall be considered included in the bid price for pavement removal, disposal, and replacement, and no additional compensation shall be made therefore.

C. Permanent Trench Pavement

The permanent trench pavement shall be in accordance with the Agency having jurisdiction. If not specifically addressed by the road agency's permit, the existing pavement shall be saw cut and the permanent trench base paving shall be constructed to be flush with existing so that the asphalt concrete is smooth, true to grade and cross section thus providing an even driving surface without undulations. The completed base paving surface shall be provided as described herein whether an asphalt concrete cap is specified or not specified. Should an asphalt concrete cap be required, Contractor shall grind down the base paving prior to placement of the A.C. cap.

D. Asphalt Concrete Cap

Where required by the agency issuing the Encroachment Permit or other agency having jurisdiction, an asphalt concrete cap shall be placed along the length of the trench. The installation of the asphalt concrete cap shall be in accordance with the specifications and policies of the agency having jurisdiction. Where the asphalt concrete cap is not specifically stated in the applicable permit or on the drawings, and when directed by the District, the minimum cap shall be a grinded 0.10-foot thick, 12-foot wide section centered over the center of the trench, or the traveled way, and pulled with a "Barber Greene" or equivalent.

Full compensation for placement of asphalt concrete cap, where required, shall be included in the unit bid price per linear foot of mainline trench. Any required asphalt concrete cap for house connection laterals or other appurtenances

shall be considered included in the bid price for the various items, and no additional compensation shall be made therefore.

6. STEEL FLANGES, BOLTS, NUTS AND GASKETS*

Flanges for steel pipe shall conform to requirements for ASA 150-lb. flanges and flanged fittings or ASA 300-lb. flanges and flanged fittings, as noted on Drawings. All flanges shall be forged steel welding-neck or slip-on flanges. Dimensions and drilling of flanges for steel pipe shall conform to ASA 150 or 300, respectively, steel pipe flanges and flanged fittings, and all flanges shall be attached with bolt holes straddling vertical axis of pipe, unless otherwise shown on Drawings. Flanges and their attachment to pipe shall conform to applicable requirements of latest edition of API-ASME Code for Unfired Pressure Vessels. Welding-neck flanges shall be bored to same inside diameter as adjoining pipe.

Bolts shall be heavy hexhead machine per ASTM A307, Grade B. Nuts shall be heavy hex and conform to ASTM A563 (ASME B18.2.2). Washers shall be provided on both nut and bolt sides and shall be of the same material as the nuts. Studs with nuts on both ends shall be furnished wherever close clearances make removal and replacement of fixed head bolts difficult. Bolts and studs shall be of such lengths that not less than two or more than four threads shall project through nut when nut is drawn tight. All bolts, studs, or cap screws used in tapped holes shall be of sufficient length to provide an engagement of length of threaded portion of not less than nominal diameter of bolt for steel nor less than one and one-half times the diameter for cast iron fittings.

Unless stainless steel nuts and bolts are used, each steel/iron type fitting below grade shall be equipped with at least one (1) sacrificial zinc anode cap. Said cap shall be "protecto-cap" or District approved equal.

Slip-on flanges shall be welded along the inner seam surrounding the pipe diameter as well as along the outside pipe and flange interface.

Gaskets for flanged joints shall be 1/16 inch thick compressed non-asbestos sheet, produced by a "District Approved Manufacturer". Flat-faced flanges shall be provided with full face gaskets with bolt holes prepunched. Raised-face flanges shall be provided with ring gaskets.

* Flanges shall be as per Specifications, except that at the option of the Contractor A.S.A. 150-lb. flanges may be changed to Class "E" steel plate flanges per Table 3 of AWWA C207-Latest.

7. ELBOWS, SIDE OUTLETS, TEES, BUTTSTRAPS, CROSSES

For steel pipe, all elbows, side outlets, top outlets, tees, crosses, etc., shall be furnished by the Contractor and shall be shop fabricated in accordance with AWWA C208 (latest); except the minimum radius for all bends shall not be less than 2.5 times the nominal diameter of the pipelines. Whenever the Contractor must perform minor amounts of field fabrication, they will be required to do all fabrication in a manner such that the lining and wrapping/coating may be repaired by hand to a quality equal to the shop applied lining and wrapping/coating. Buttstraps, shearrings, etc. shall be per the applicable Standard Drawings, the Drawings, or applicable AWWA Standards or Manuals.

Service outlets shall be constructed in accordance with the Standard Drawing.

Wherever collar reinforcement is required, both the collar and the plain-end of the flanged x p.e. (plain-end) outlet shall be preshaped to mate with curvature of the main line pipeline, and both the collar and the flanged x p.e. (plain-end) outlet shall be welded into place.

All collar and wrapper reinforcing shall be in accordance with the Standard Drawing and with the following reinforcement guides:

- A. District's Standard for Outlet Reinforcement.
- B. Steel Pipe, Design and Installation, AWWA Manual M-11, latest.
- C. An equal pipeline manufacturer's reinforcing guide, as approved by Engineer.
- D. API-ASME Code for Unfired Pressure Vessels for Petroleum liquids and gases.

If case of conflict, the highest and most stringent standard shall govern.

8. TACKWELDED AND WELDED JOINTS - INSTALLATION

All rubber gasket joints shall be bond welded in accordance with the District standards, unless an alternate method is approved by the District.

The pipe manufacturer shall direct the Contractor on the method of welding the fully welded joints, or the cut-to-fit joints, in order that the joints shall not pull apart or leak when subjected to design pressures stated herein.

9. CONNECTIONS TO EXISTING WATER SYSTEM

Unless otherwise stated in the Special Requirements, Contractor shall furnish and install connections to the existing water systems at locations shown on Drawings. Prior to connecting to the existing water system, the Contractor shall "pothole" the connection location(s) and provide this information along with "Shop Drawings" of the proposed fitting(s) to the District for approval prior to the fabrication of said fitting(s). The Contractor shall perform all work required including any necessary field measurements, cuts-to-fit, temporary connections, and field fabrications to meet existing conditions.

Contractor shall install the proposed pipelines about 3' to 4' short of the connection points to the existing pipelines. Hydro-static/leakage tests SHALL NOT be performed against closed valves that separate the proposed system from the existing system.

Connections SHALL NOT be made between existing District pipelines and proposed pipelines until successful hydrostatic/leakage and disinfection testing of the proposed pipelines has been completed. Upon successful completion of the hydrostatic/leakage and disinfection testing and only upon approval by the District, final connections can be made to the existing pipelines. The pipeline material and appurtenances utilized to make the final connections shall be "swabbed" with a high strength chlorine solution. Minimum dosage in parts per million (ppm) to be determined by District.

The Contractor shall be fully responsible for providing all labor, materials, and equipment to de-water existing pipelines to make the connections or for any other purposes as required. Compensation for such de-watering activities shall be made per the various bid items and no additional compensation shall be made therefore. Contractor shall construct all said connections so that any down-time of existing water systems, due to connection work, shall occur during normal working hours as directed by District.

Contractor shall cooperate with District in scheduling said connections.

District will operate all existing valves necessary for Contractor to accomplish said connection work.

10. FILLING, TESTING, AND CHLORINATION

The Contractor shall fill all contract pipelines (through an approved and certified backflow device furnished by the Contractor) with construction water and may obtain said construction water through hydrants, blow-offs, etc.

The Contractor shall hydrostatically test all contract pipelines, as detailed in the Basic Specifications, to at least 150% of the specified pipe class.

The Contractor shall chlorinate all contract pipelines, as detailed in the Basic Specifications.

Payment by the District to the Contractor for all filling, testing, and chlorination work required under these Specifications SHALL BE INCLUDED IN THE BID PRICES FOR PIPELINE CONSTRUCTION PER THE BIDDING SHEET.

11. PROTECTION OF DOMESTIC WATER MAINS FROM CONTAMINATION

The Contractor shall protect all domestic water mains from contamination by any existing septic tank and/or leach line facilities, etc., which may be adjacent to the jobsite, and payment to the Contractor for any special construction required shall be made per the Extra Work Provisions of the General Conditions herein. Said special construction shall be approved by the District and the State Health Department.

12. FIELD HYDROSTATIC TEST AND LEAKAGE TEST

Upon completion of laying, joining, and backfilling, and after pipe lengths comprising the line ARE NOT LESS THAN 14 DAYS OLD, and prior to resurfacing, pipeline, including all appurtenances (e.g. fire hydrants, services, air valves, etc...) shall be hydrostatically tested per the manufacturer's recommendations. Water required to maintain test pressure shall be measured by meter or other means acceptable to District. Contractor shall provide all necessary thrust restraint required for the hydrostatic testing.

THE MEASURED LEAKAGE SHALL NOT EXCEED 10 GALLONS PER INCH DIAMETER PER MILE PER 24 HOURS. Should leakage exceed this amount, the section being tested will be considered defective and Contractor shall determine points of leakage, make necessary repairs, and conduct a second test. This procedure shall be

continued until leakage equals or is less than the allowable minimum. Note: No leakage is allowed for welded steel pipe with fully welded joints.

Contractor shall provide calibrated meters for measurement of leakage, necessary bulkheads, piping, gauges, pumps, power, and labor, and do and furnish everything necessary for making all tests required, at his own expense, and shall furnish to District copies of all tests performed. The District will provide the pressure gauge to be utilized for pressure testing purposes.

Steel pipe shall be pressure tested to at least 150% of the pipe class rating; i.e. Class 150 = 225 psi test pressure, as measured near the low point of the section of pipe being tested.

PVC C909 pipe shall be tested to the pipe class rating; i.e. Class 235 = 235 psi Class or 305 = 305 psi test pressure, as measured near the low point of the section of pipe being tested.

The hydrostatic test shall be conducted on sections of pipeline as directed by District. CONTRACTOR SHALL RECEIVE NO ADDITIONAL COMPENSATION OTHER THAN THAT STATED IN BIDDING SHEET FOR TESTING LINES. CONTRACTOR SHALL PAY THE DISTRICT FOR INSPECTION TIME FOR ALL RETESTS.

Care shall be taken to see that all air vents are open during filling. After section has been completely filled, it shall be allowed to stand under slight pressure for a sufficient length of time to allow escape of air from any air pockets. During this period all fittings, specials, manholes, and connections shall be examined for leaks. If any are found, they shall be stopped, using a method approved by District. REQUIRED TEST PRESSURE SHALL THEN BE APPLIED AND MAINTAINED FOR THE 4-HOUR PERIOD. Contractor, at their own expense, shall do all excavation necessary to locate and repair leaks or other defects which may develop under test, including removal of backfill already placed and shall replace such excavated material and shall make all repairs necessary to meet the required water tightness, after which test shall be repeated until pipe meets test requirements. ALL TESTS SHALL BE MADE IN THE PRESENCE OF DISTRICT OR DISTRICT'S REPRESENTATIVE. After pipe has successfully met test requirements, as specified, entire pipe shall be filled with water and so maintained until completion of the contract, unless otherwise ordered by District.

Pipe manufacturer and Contractor shall be responsible for any defects in materials and workmanship in manufacture and installation of pipe which may be revealed by such test and shall pay all costs of materials, labor, or other costs incidental to making necessary repairs or replacements resulting from such defects, in accordance with these Specifications.

13. DISINFECTING PIPELINES

Contractor shall furnish all equipment, labor, material, and water for proper disinfection of pipelines. Disinfection shall be accomplished by chlorination after lines have been tested for leakage but before they have been connected to existing system. Prior to chlorination, mains shall be thoroughly flushed out. The new mains shall be cleaned and flushed prior to disinfection. The flushing velocity to be obtained for pipes 12-inches and smaller in diameter shall not be less than 2.5 feet per second. The Contractor shall make the necessary arrangements to attain the minimum velocity. The Contractor shall take due precaution in providing for adequate drainage from the site.

Contractor shall submit filling, disinfection and flushing procedures to District for review. It is the responsibility of the Contractor to dispose of the flushed water from the project area. The Contractor is responsible for any damage as a result of flushing operations. This includes but not limited to: dechlorination of chlorinated water, obtaining written approval from adjacent property owners affected by flushing operations, safety, protection of storm drain inlets, etc. Contractor shall obtain discharge permit for De Minimus water flows from the California Regional Water Quality Control Board as detailed in these specifications.

The flushed water shall have a residual chlorine content not to exceed 0.10 mg/l prior to discharging into the storm drain system. The flushing operation shall be in accordance with the California Regional Water Quality Control Board requirements. Dechlorination prior to flushing is required. The cost of said dechlorination shall be the responsibility of the Contractor.

The Contractor shall provide adequate drainage from the site.

The entire pipeline, including all valves, fittings, hydrants, service laterals, and other accessories, shall be disinfected in accordance with the specifications provided herein.

A chlorine gas-water mixture shall be applied with a solution-feed chlorinating device. Chlorinating agent shall be applied at locations selected by District and as prescribed by them. DOSAGE APPLIED TO WATER WITHIN PIPELINE SHALL BE AT LEAST 50 PPM.

Chlorinated water shall be retained in pipeline long enough to destroy all non-spore-forming bacteria. This period shall be at least 24 hours. After chlorine-treated water has been retained for required time, CHLORINE RESIDUAL AT PIPE EXTREMITIES AND AT OTHER REPRESENTATIVE POINTS SHALL BE AT LEAST 50 PPM. Pump bowl assemblies shall not be exposed to harmful chlorine dosages and/or detention times.

Following chlorination, all disinfection water shall be thoroughly flushed from the pipeline.

Should initial treatment fail to produce satisfactory disinfection of the pipeline as evidenced by the chlorine residual and/or the bacteriological test results, the chlorination procedure shall be repeated until acceptable results are obtained. Contractor shall use caution in discharging any highly chlorinated water, and shall be responsible for obtaining any necessary permission and permits from regulatory agencies. If required, the Contractor shall apply a reducing agent to the solution to neutralize residual chlorine or chloramines remaining in the water at their expense.

Bacteriological tests required by the Health Department shall be taken by the District, and conducted by a laboratory selected by and paid by the District (paid for by the Developer for private projects). All costs for any retesting that may be required shall be paid by the Contractor. All retesting shall conform to District requirements.

Unless otherwise specified herein, minimum requirements for disinfection and bacteriological testing of new pipelines shall be in accordance with ANSI/AWWA C651 except as modified herein; and the location and number of all tests shall be determined by the District, with approval by the State Health Department. A minimum of two (2) consecutive passing bacteria samples (absent for Coliform, absent for e. coli, and HPC $\leq$ 200) are required by the District. The first set of samples shall be taken 24 hours after pipeline is completely flushed and water in said pipeline has been at rest without any water flows. The second set of samples shall be taken 24 hours after first set of samples were taken and water in said pipeline has been at rest without any water flows. No

connections to District's existing water system shall be made until certified test results, in writing for both sets of samples are provided to District for review and approval.

Once District provides approval for connections to District water system, Contractor can make connections. One sample will be taken immediately following completion of connection and energizing of existing line and connection within the vicinity of the connection and second sample taken 24 hours later in same location. This procedure shall be repeated at all proposed connection locations.

14. CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SANTA ANA REGION PERMIT

Contractor shall channel (using sandbags or other means) flushing flow. Contractor shall protect all property from flooding and other damage during flushing operations. Contractor shall post "flooding ahead" signs in streets as required and as directed by the District. Because of demand on existing water system, the District may require Contractor to flush the pipeline over several days, in the evenings, weekends, or holidays.

Contractor shall not allow any discharges from the construction site which may have an adverse effect on receiving waters of the United States.

Discharged water shall meet chlorine residual levels established by the appropriate State Water Quality Control Board. Dechlorination prior to flushing may be required, the cost of which shall be paid by the Contractor.

15. CORROSION PROTECTION

Where indicated on the Drawings, cathodic protection test stations and/or flange insulation kits with test stations shall be constructed in accordance with the applicable District Standards. Payment for installation of cathodic protection test stations and/or flange insulation kits with test station shall be per the unit bid price indicated on the Bidding Sheet for each installation, and no additional compensation shall be made therefore.

16. TAPPING

Connections to existing pipelines shall be made with the installation of tees or wrappers as designated on the plans. The connection sequence shall be as follows: The

existing pipeline shall be drained; the tee or wrapper with valving shall be installed; and District approval of the connection shall occur prior to the re-filling of the existing pipeline.

In certain instances, and only where approved in writing by the District, wet tapping will be allowed as follows:

A. Water Mains

Where connections to existing water mains are made by wet tapping, the Contractor shall perform all required excavation and shall furnish the tapping saddle and gate valve. The District, or a District authorized contractor (Kopel or approved equal), will install the tapping saddle and gate or plug valve and make the wet tap. The Contractor shall pour the thrust block, backfill, complete all compaction of backfill, make closure, set the gate "can" and cover, make all necessary pavement repairs and complete the installation in accordance with the Plans and these Standards.

B. Water Laterals

Where connections to existing water mains are made by wet tapping, the Contractor shall furnish and install all necessary material and perform all required hand and machine excavation, backfill and pavement repair. The District or a District authorized Contractor will perform the actual wet tapping only.

17. VIDEO INSPECTION (CML/CMC WATERLINES)

Upon completion of the installation and backfill of the water pipeline, appurtenances, services, etc. and prior to filling the pipeline with water for the pressure test, the Contractor shall notify the District that the pipeline system is ready for video inspection. Said notification shall be made at least five (5) working days in advance of the actual video inspection date. The video inspection will be made by a video inspection company approved by the District and hired by the Contractor. Video inspection shall be made in the presence of the District or District's representative. Prior to the video inspection, the contractor shall be responsible to provide the following items:

A. Clean water pipelines free of all dirt, rock, debris, etc.

- B. Labor and equipment necessary to excavate the pipeline and provide camera access ports. Access ports shall not exceed 1000 feet in spacing and shall be located at all bends in excess of 22°. Also, labor and equipment necessary to repair the access ports to the satisfaction of the District.
- C. Driveable truck access to each access port within the system to be videoed.
- D. Provide all traffic control methods required.

Should any of the aforementioned items not be in compliance by the time the video inspection is to occur, the Contractor shall be subject to compensating the District for all costs incurred.

Full compensation to the Contractor for complying with the above requirements shall be considered as included in the contract lump sum provided for such work and no additional allowance will be made therefore.

Upon completion of the video for the subject waterlines, the Contractor shall reconnect the piping and backfill all access ports. The video inspection company will provide the District with the DVD (video file format to be viewable on a standard DVD player/computer and/or as approved by the District) and a written report detailing the condition of the interior of the mainline and joints. Subsequent to review of the DVD and report by the District, the District will notify the Contractor that the Contractor may then proceed with the filling, testing, and disinfection of the pipeline; or the District will provide a list of corrective measures that must occur prior to acceptance.

Should remedial activities be necessary, the reconstruction methodology shall be approved by the District prior to commencement of the work. Upon completion of the remedial construction, the Contractor shall once again notify the District that the waterlines are ready for a video inspection. The District reserves the right to re-video any portions of the water system they determine may have been affected by the reconstruction work activities. Further, all related costs including but not limited to reconstruction materials, labor, equipment, video inspection, District and other agency inspection, and administrative costs shall be borne by the contractor.

VIDEO INSPECTION COMPANY REQUIREMENTS

(Closed Circuit Television Inspection - CCTV)

1. Rotating lens camera with articulating head.
2. Scanning capabilities of 360°.
3. Operative in 100% humidity conditions.
4. Lighting for the camera shall minimize reflective glare.
5. Lighting and camera quality shall be suitable to provide clear, in focus picture of the entire periphery of the pipe for all conditions.
6. Camera focal distance shall be adjustable through a range from 6" to infinity.
7. Remote reading distance (footage) counter shall be accurate to one percent (1%) over the length of the particular section being inspected.
8. The camera, television monitor, and other components of the color video system shall be capable of producing a minimum of 350 line resolution.
9. Documentation consisting of a DVD (video file format to be viewable on a standard DVD player/computer and/or as approved by the District) and a written report detailing the condition of the mainline and joints shall be submitted to the District inspector immediately following the video inspection. Each disc shall be labeled with the project or subdivision name, number and pipe run numbers it contains. Each disc shall be delivered in a plastic case. District will also accept the following formats: Thumb Drive and Cloud Service.
10. All video equipment used for domestic water systems shall be certified for domestic waterline inspection only and shall never have been utilized in a non-potable system.

11. The CCTV camera operator shall stop at each defect and pipe joint and televise the entire joint with the pan and tilt feature on the head of the camera, initially, in a complete counterclockwise direction followed by a complete clockwise direction. If a defect is found, the CCTV operator will “home up” the camera prior to defining the defect and determining it’s size and location. The CCTV operator will also stop and record any questionable item such as a stain, crack, paint mark, shadow found or character change in a pipe being inspected. In other words, the CCTV operator must stop, record and note anything questionable no matter how minor. The Engineer, as defined by JCSD Standard Specifications, not the CCTV operator, will decide if a questionable items is a “problem event” when that Engineer reviews the video inspection.

BASIC SPECIFICATIONS
SECTION D

SEWER PIPELINE MATERIALS SPECIFICATIONS

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BASIC SPECIFICATIONS
SECTION D
SEWER PIPELINE MATERIALS SPECIFICATIONS

TABLE OF CONTENTS

	<u>Page</u>
1. General	D-1
2. Gravity Mains	D-1
A. Vitrified Clay Pipe (VCP).....	D-1
B. Polyvinyl Chlorine (PVC) Plastic Pipe (4" to 15" Dia.).....	D-1
C. Acrylonitrile-Butadiene-Styrene (ABS) (4" & 6" Dia.)	D-2
D. High-Density Polyethylene (HDPE).....	D-2
3. Forcemains	D-2
A. Polyvinyl Chloride Plastic Pipe (PVC), (4" to 12" Dia.)	D-2
B. High-Density Polyethylene (HDPE).....	D-2

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BASIC SPECIFICATIONS

SECTION D

SEWER PIPELINE MATERIALS SPECIFICATIONS

1. GENERAL

Where alternate pipeline materials are allowed by the District, the Contractor shall select such materials and construction methods as will result in a satisfactory completed project. All pipe materials shall be new and unused unless otherwise specified. Materials and strength of pipe shall be as shown on the plans or as specified herein.

2. GRAVITY MAINS

A. Vitrified Clay Pipe (VCP)

(1) General

Vitrified clay pipe and fittings shall not be used for proposed pipelines. However, VCP pipe exists the District's sewer system.

(2) Joints

Existing joints in vitrified clay pipe shall be repaired using a factory-made mechanical compression joint, consisting of a plastic material (Polyurethane), or a factory applied rubber coupling, and shall be produced by a District Approved Manufacturer and shall conform with the requirements of Section 208.2.3 Type "G" Joints of the "Standard Specifications for Public Works Construction", Latest Edition. Note the requirements in Section II.G.2.

B. Polyvinyl Chlorine (PVC) Plastic Pipe (4" to 15" Dia.)

PVC solid wall pipe shall meet the requirements of ASTM Designation D-3034, SDR 26 or 35. Whenever portions of the proposed sewer construction are to be installed on the radius of a curve, the minimum radius and installation of the pipe shall be in accordance with the manufacturer's recommendations.

C. Acrylonitrile-Butadiene-Styrene (ABS) (4" & 6" Dia.)

Acrylonitrile-Butadiene-Styrene (ABS) solid wall pipe shall meet the requirements of ASTM designation D-2751, SDR 23.5 or 35.

D. High-Density Polyethylene (HDPE).

HDPE pipe shall meet the minimum requirements of AWWA C906 and have a minimum thickness of DR 11 and shall be color green. Pipe sizing shall be based on outer diameter (O.D.).

3. FORCEMAINS

A. Polyvinyl Chloride Plastic Pipe (PVC), (4" to 12" Dia.)

The pipe to be used shall be rubber gasket joint polyvinyl chloride pressure pipe, Class 235 or 305, conforming to AWWA C909 -(latest), outside dimensions of cast-iron pipe, plain end x gasket bell ends.

Fittings shall be ductile iron ANSI/AWWA C153(latest), 250 psi rated working pressure, interior lining with 3M Scotchkote 134, fusion-bonded epoxy, 2 coats at 8 mils each coat for a total of 16 mils, mechanical joint ends (MT) to fit Class 235 and 305 PVC - C909 pipe.

When flanged fittings are specified or required, the fittings shall be ductile iron conforming to AWWA C110/ANSI A21.10, Latest.

Locator wire shall be installed over all PVC force mains. Locator wire shall be 14-1 solid insulated copper wire (UF), in a continuous strand, placed on top of pipe and secured with tape. Locator wire shall be brought to the surface at all appurtenances (i.e. sewer air valves, sewer cleanouts, etc.), thus providing continuous "looping" between the appurtenances and the water main. All splices to locator wire shall be made with direct bury connectors.

B. High-Density Polyethylene (HDPE)

See previous specification under Gravity Mains.

BASIC SPECIFICATIONS
SECTION E

SEWER PIPELINE CONSTRUCTION
SPECIFICATIONS

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BASIC SPECIFICATIONS
SECTION E
SEWER PIPELINE CONSTRUCTION SPECIFICATIONS
TABLE OF CONTENTS

	<u>Page</u>
1. Sewer Pipe Installation	E-1
A. General	E-1
B. Installation of Pipelines	E-1
C. Sewer Constructed on Radius	E-2
D. Cleaning	E-2
E. Plastic Sewer Systems	E-2
F. Measurement and Payment	E-7
G. Payments to Contractor for Completed Work	E-8
2. Manholes	E-9
A. General	E-9
B. Precast Concrete Sections	E-9
C. Manhole Bases	E-9
D. Manhole Frames and Covers	E-10
E. Standard Manholes	E-11
F. Joint Wrap in Groundwater Conditions	E-11
G. Testing of Manholes	E-11
H. Lining of Manholes	E-12
3. Sewer Laterals	E-12
A. General	E-12
B. Materials	E-13
C. Tees and Wyes	E-13
D. Construction	E-13
E. Payment	E-13
4. Tests For Leakage in Sewer	E-14
A. General	E-14
B. Air Testing (Gravity Sanitary Sewers)	E-15

BASIC SPECIFICATIONS
SECTION E
SEWER PIPELINE CONSTRUCTION SPECIFICATIONS
TABLE OF CONTENTS
(continued)

	<u>Page</u>
C. Water Infiltration Test (Gravity Sanitary Sewers).....	E-15
D. Force Main Pressure Test.....	E-16
5. Concrete Work.....	E-16
A. General.....	E-16
B. Portland Cement Concrete Classification.....	E-17
C. Class "B" Concrete Encasement.....	E-17
D. Reinforced Concrete Encasement.....	E-18
6. Pavement Removal and Replacement.....	E-18
A. General.....	E-18
B. Pavement Cutting.....	E-19
C. Permanent Trench Pavement.....	E-19
D. Asphalt Concrete Cap.....	E-19
7. Connections to Existing Manholes.....	E-20
8. Temporary Handling of Sewage.....	E-20
9. Video Inspection.....	E-20
10. Vacuum Testing of Manholes.....	E-22
A. General.....	E-22
B. Pre versus Post Backfilling Test Criteria.....	E-22
C. Reference Standard.....	E-22
D. Manhole Preparation.....	E-22
E. Basic Field Testing Procedure.....	E-23
F. Minimum Test Times – Standard Manholes.....	E-23
G. Inspection and Re-Testing.....	E-25
H. Approved Vacuum Testing Companies.....	E-25
Video Inspection Company Requirements.....	E-26

BASIC SPECIFICATIONS
SECTION E

SEWER PIPELINE CONSTRUCTION SPECIFICATIONS

1. SEWER PIPE INSTALLATION

A. General

The Contractor shall furnish and install all sewer pipeline material required for the construction of the sewer and appurtenances as herein specified and shown on the Drawings. All pipeline material shall be installed per manufacturer's published recommendations and per the applicable published standards for the particular material being installed unless otherwise modified herein. In case of any conflict, the most stringent and highest requirement shall govern, and the Contractor shall adhere to said requirement, all at no additional cost to the District.

B. Installation of Pipelines

Pipe laying shall proceed up-grade with the spigot ends of bell-and-spigot pipe pointing in the direction of the flow. Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with the adjoining pipe, following manufacturer's instructions for the specific jointing method being used. Any pipe which exceeds 1/2-inch from true alignment, settlement, or joint offset after laying shall be taken up and relayed at the Contractor's expense. The SAG measuring device shall be approved by the District. The SAG measuring device shall have a scale to measure the depth of flow to the invert of the pipe and shall be placed in front of the camera. The Contractor shall clean the pipe by balling.

Notwithstanding prior factory or yard inspection, the District shall have the right to reject any damaged or defective pipe found on the job which in the District's opinion will affect the durability of the installation, and the District may order its removal from the work.

C. Sewer Constructed on Radius

Whenever portions of the proposed sewer construction are to be installed on the radius of a curve, the minimum radius and installation of the pipe shall be in accordance with the manufacturer's recommendations.

D. Cleaning

Before final acceptance of sewer facilities or prior to putting any sewer into service, all sewer facilities shall be visually checked and all foreign objects, materials or obstructions removed from the facilities. The District shall require that the facilities be cleaned by flushing, balling, rodding or other means so that the materials may be removed from the system.

E. Plastic Sewer Systems

(1) General

These provisions establish the requirements for the use of plastic pipe (i.e. PVC, ABS) for house lateral and main line sewer construction. Use is limited to those projects which are approved in writing by the District.

Plastic pipe may only be used where indicated on plans approved by the District. Where plastic pipe is used, one type shall be used between consecutive manholes and shall include the house laterals in that system. When pipe and fittings are fabricated by the same manufacturer, contractor will not be allowed to use fittings from other manufacturers.

Plastic pipe shall not be used for sewers serving industrial areas, or areas that, in the opinion of the District, are likely to be rezoned to industrial zones.

(2) Care & Handling

Pipe shall be stored at the jobsite in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct

sunlight for more than 14 days, pipe must be covered with an opaque material while permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation.

If pipe is strung along trench prior to installation, string only pipe to be used within a 24-hour period; all pipe is to be laid on a flat surface. The interior as well as all sealing surfaces of pipe, fittings, and other accessories shall be kept free from dirt and foreign matter. Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease. Solvent cement when used shall be stored in tightly sealed containers away from excessive heat.

(3) Mandrel Test of ABS & PVC Pipe

Following the placement and densification of backfill and prior to the placing of permanent pavement, all main line pipe shall be cleaned and then mandrelled to measure for obstructions (deflections, joint offsets and lateral pipe intrusions). A rigid mandrel, approved by the Engineer, with a circular cross section having a diameter of at least 95% of the specified average inside diameter, shall be pulled through the pipe by hand.

Ninety-five (95%) of the specified average inside diameter for flexible plastic pipe taken from the appropriate ASTM requirements are as follows:

	ABS Solid Wall (ASTM D-2751) SDR		PVC Solid Wall (ASTM D-3034) SDR	
Pipe Nominal Dia.	23.5"	35"	35"	26"
4"	3.62"	3.69"	3.975"	3.891"
6"	5.33"	5.45"	5.915"	5.793"
8"	N/A	N/A	7.920"	7.754"
10"	N/A	N/A	9.900"	9.692"
12"	N/A	N/A	11.78"	11.538"

(4) High Density Polyethylene (HDPE) Pipe

All laying, slipping, jointing, testing for defects and for leakage shall be performed in the presence of the District's authorized

representative and will be subject to his/her approval before acceptance.

Installation shall conform to the requirements of ASTM D 2321, ASTM D 2774, ASTM F 585, instructions furnished by the pipe manufacturer and supplementary requirements or modifications specified herein. Wherever the requirements of this Section and the aforementioned requirements are in conflict, the more stringent provision shall apply.

HDPE pipe shall be limited for use in easements at the direction of the District. HDPE pipe may be laid with a horizontal curvature, however the curvature radius shall be no greater than 50-percent of the pipe manufacturer's recommendations.

SHIPMENT, STORAGE AND HANDLING

The Manufacturer shall package products for shipment in a manner for safe transport by commercial carrier. The carrier shall use the appropriate methods and intermittent checks to insure the pipe is properly supported, stacked and restrained during transport such that the pipe is not nicked, gouged or physically damaged.

When delivered, a receiving inspection shall be performed and any shipping damage shall be reported to the Manufacturer.

Pipe shall be stored at the job site in unit package provided by the manufacturer. The Contractor shall take every precaution to avoid compression damage or deformation to the pipe and to the ends of the pipe. The pipe shall be stored in such a way as to prevent sagging or bending and shall be protected from exposure to direct sunlight. Gaskets should be stored in a cool, dark place out of the direct rays of the sun, preferably in the original cartons.

The Contractor shall prevent undue scratching or gouging of the pipe in storage and handling of the pipe. Sections of the pipe with cuts or gouges in excess of 10% of the pipe wall thickness shall be

cut out and removed. The undamaged portions of the pipe shall be rejoined using the heat fusion joining method.

When lifting and handling with slings, only wide fabric slings capable of safely carrying the load shall be used to lift, move or lower pipe and fittings. Metal, wire rope or chains shall not be used. Slings shall be of sufficient capacity for the load and shall be inspected before use. Worn or defective equipment shall not be used.

JOINING

HEAT FUSION JOINING: Joints between plain end pipes and fitting shall be made by butt fusion and joints between the main and saddle branch fittings shall be made using saddle fusion using only procedures that are recommended by the pipe and fittings Manufacturer. External beads produced by the heat fusion procedure shall not be removed, but internal beads shall be removed. The Contractor shall ensure that persons making heat fusion joints have received training in the Manufacturer's recommended procedure. The Contractor shall maintain records of trained personnel and shall certify that training was received not more than 12 months before commencing construction. The Contractor shall schedule a time to have the pipe Manufacturer provide training to the Contractor's pipe installer and the District's representative.

MECHANICAL JOINING: Polyethylene pipe and fittings may be joined together or to other materials by means of flanged connections (flange adapters and back-up rings) or mechanical couplings designed for joining HDPE pipe or for joining HDPE pipe to another pipe material such as PVC. Mechanical couplings shall be fully pressure rated and fully thrust restrained such that when installed in accordance with the Manufacturer's recommendations, a longitudinal load applied to the mechanical coupling will cause the pipe to yield before the mechanical coupling disjoins. External joint restraints shall not be used in lieu of fully restrained mechanical couplings. When an outside diameter compression mechanical

coupling is used, a stainless steel stiffener shall be installed in the bore of the HDPE pipe.

MECHANICAL JOINT AND FLANGE INSTALLATION: Mechanical joints and flange connections shall be installed in accordance with the Manufacturer's recommended procedure. Flange faces shall be centered and aligned to each other before assembling and tightening of the bolts. In no case shall the flange bolts be used to draw the flanges into alignment. Bolt threads shall be lubricated and flat washers shall be fitted under the flange nuts. Bolts shall be evenly tightened according to the tightening partner and torque step recommendations of the Pipe Manufacturer. The final tightening torque shall be 100 ft-lbs or less as recommended by the Pipe Manufacturer.

LARGE DIAMETER FITTINGS: Fabricated directional fittings 16 inches IPS and larger shall be butt fused to the end of the pipe. The flange directional outlet connections shall be made up in the trench.

EXCAVATION, BEDDING AND BACKFILL

EXCAVATION: Trench excavations shall conform to the plans and drawings or as otherwise authorized noted. The Contractor shall remove excess groundwater if any encountered. The trench walls shall be shored or reinforced when necessary. The Contractor shall take all the necessary precautions to ensure a safe working environment.

BEDDING: Pipe shall be laid on grade and on stable foundation. Unstable or "mucky" trench bottom soils shall be removed and a 6-inch bedding of compacted material shall be installed to the pipe bottom grade. Excess groundwater shall be removed from the trench before laying the bedding and the pipe. A trench cut in rock or stony soils shall be excavated 6 inches below the pipe bottom grade and brought back to grade with compacted bedding. All ledge rock, boulders and large stones shall be removed.

BACKFILLING: Backfilling shall be performed in accordance with the Manufacturer's recommendations and with the District's Standard Plans. Compacted material shall be at least 90% R.C. in 6-inch lifts.

FINAL BACKFILLING: Final backfill shall be placed and compacted to finish grade in accordance with the Manufacturer's recommendations and with the District's Standard Plans. Native soils without debris, stones, boulders, clumps, clods or the like larger than 8 inches may be used.

FIELD TESTING

BUTT FUSION TESTING: On every day that butt fusions are to be made, the first fusion of the day shall be a trial fusion. The trial fusion shall be allowed to cool completely, then fusion test straps shall be cut out. The test straps shall be 12-inch minimum or 30 times the wall thickness in length with the fusion in the center and 1-inch minimum or 1.5 times the wall thickness in width. Bend the test strap until the ends of the strap touch. If the fusion fails at the joint, a new trial fusion shall be made and the procedure to be repeated. The butt fusion procedure shall not commence until the trial fusion has passed this test.

HYDROSTATIC PRESSURE AND LEAKAGE TESTING: The Contractor shall perform hydrostatic pressure and leakage test in accordance to the District Standards and in strict accordance with the Manufacturer's recommendations. In the event the section of pipe being tested fails, the Contractor shall locate and repair failure at no additional cost to the Contact. Test results shall have the full acceptance of the District prior to passing. No leakage will be allowed for butt fusion joints.

F. Measurement and Payment

Unless specifically otherwise provided for in these Specifications, full compensation for the work required for a complete installation of sewer pipeline

shall be considered included in the bid unit price per linear foot of pipe, and no other compensation shall be made therefore.

Measurement for payment of pipe shall be on the basis of the horizontal linear footage constructed by the Contractor, complete in place. Measurement will exclude the space occupied by structures constructed by the Contractor. Pipe stubs of one pipe length or less installed in manholes shall be included in the price for manholes and will not be included in the measurement for pipe.

Where excavation depth breakdowns are indicated on the Bidding Sheet, the depths (sewer invert to ground surface) shall be determined by the cut sheets prepared by the survey crew.

Where the offset stake elevation varies more than 0.5 feet from the pipe centerline elevation (at the ground surface), the survey crew will take elevation shots to determine the actual cut from ground surface to invert of pipe. Using this procedure, the payment depth will be based upon average depth between 25-foot interval stations.

The District reserves the right to revise pipeline grades, and the Contractor shall trench and lay accordingly. Payment for said grade revisions shall be based upon the unit bid price for the appropriate size and depth category, and no additional compensation shall be made therefore.

G. Payments to Contractor for Completed Work

NO PARTIAL PAYMENT SHALL BE GIVEN TO THE CONTRACTOR FOR CONSTRUCTION OF THE SYSTEM UNTIL THE PORTION OF THE SYSTEM FOR WHICH THE PAYMENT IS TO BE MADE HAS BEEN TESTED AND THE ENGINEER HAS CERTIFIED THAT THE SYSTEM IS SUBSTANTIALLY COMPLETED AND READY FOR USE.

Consideration for partial payment may be given prior to the Contractor completing the permanent pavement (excluding AC Cap), provided the delay of placing the permanent paving was, in the opinion of the Engineer, due to causes beyond the control of the Contractor.

The Engineer may establish priorities for completion of certain parts of the work which may be necessary to provide certain services or which they may deem advisable in the interests of public safety and convenience.

2. MANHOLES

A. General

The manholes shall be constructed in accordance with the Standard Drawing, and at the locations shown on the plans. All concrete used in the manholes shall be Class "A" Concrete, as provided in Section 5 of these Basic Construction Specifications, unless otherwise indicated herein.

B. Precast Concrete Sections

Precast manhole sections shall conform to the size, shape, form and details shown on the Standard Drawing. The precast cylinder units and precast eccentric top sections shall meet the strength requirements for "Precast Reinforced Concrete Manhole Risers and Tops", ASTM C478. The Contractor shall submit shop drawings of the precast manhole Contractor proposes to use. Each manhole section shall be sealed with an approved preformed, permanently flexible gasket to form a watertight joint. Sealed joints shall conform to ASTM C-990; and shall not shrink, harden or oxidize upon aging. Precast concrete grade rings are to be joined and sealed with CS-102B butyl/bitumen blended sealant as manufactured by ConSeal of New Carlisle, Ohio, or District approved equal. Manhole sections shall be set perfectly plumb. Sections of various heights shall be used in order to bring the top of the manhole ring and cover to the elevation shown on the plans.

C. Manhole Bases

Manhole bases shall be constructed of Class "A" concrete poured against native undisturbed material and to the form and dimensions shown on the Standard Drawing. If the Contractor over-excavates beyond the vertical dimensions shown on the Standard Drawing, the depth of concrete below the invert of the pipe shall be increased to greater than the 9" minimum as required to meet undisturbed material; all at no additional cost to the District.

Concrete shall be poured to a level ring-section seating surface, with the base centered over the sewer intersection unless otherwise specified. A metal forming ring shall be used to form a level joint groove in the manhole base. The groove will receive the first precast section to form a watertight joint.

Concrete shall be allowed to reach sufficient compressive strength prior to the installation of the precast manhole sections.

Connections of plastic sewer pipe to a manhole shall be watertight. All PVC or other flexible pipes entering or leaving concrete structures, including manholes, shall have a rubber sealing gasket, as supplied by the pipe manufacturer, firmly seated perpendicular to the pipe axis, around the pipe exterior and cast into the structure as a water stop. Additional requirements may be imposed by the District for manhole connections in projects constructed in areas of high or potentially high groundwater.

Precast manhole bases WILL NOT be allowed.

D. Manhole Frames and Covers

Manhole frames and covers shall be in accordance with the Standard Drawing. All frames and covers shall be traffic strength and shall be monogrammed according to the agency having jurisdiction. All frames and covers shall be composite material, EJ Series per District Standard Drawing No. S-7, Sheet 2 of 2.

The elevations at which manhole frames and covers are to be set shall conform to the requirements set forth on the plans, but in all cases shall be governed by the District in the field. Manholes shall not be constructed to final grade until final paving has been completed. Where the cover is in existing pavement or in the traveled way of the existing road shoulder, it is to be placed flush with the existing surface. Where the cover is in unpaved areas, it shall be set per the Standard Drawing.

Manhole frames shall be set at the required grade and shall be securely attached to the top precast manhole shaft unit with a grout bed and filled as shown on the Standard Drawing. After the frames are securely set in the place provided herein, covers shall be installed and all necessary cleaning and scraping of foreign

materials from the frames and covers shall be accomplished to ensure a fine satisfactory fit. All costs of setting and securing manhole frame and cover sets in place as herein provided, including all necessary concrete work, shall be considered as included in applicable contract unit prices and no additional allowance will be made therefore.

E. Standard Manholes

Standard manholes shall be constructed in accordance with the Standard Drawing and at the locations shown on the plans. Materials and construction of standard manholes shall conform in all respects to the applicable provisions of these specifications.

Standard manholes shall be either four-(4)-foot, five-(5)-foot, or six-(6)-foot diameter as shown on the plans. Full compensation for a complete installation of standard manholes shall be paid for at bid unit price per each and no other compensation will be made therefore.

F. Joint Wrap in Groundwater Conditions

In conditions where groundwater exists (or where the soils report indicates it could potentially exist) external wrap all joints with an approved joint wrap impermeable to the groundwater. Joint wrap shall be a minimum of 65 mils thickness with width at least four (4) inches either side of concrete section joint. Product shall be ConWrap as manufactured by ConSeal of New Carlisle, Ohio, or District approved equal. The external wrap shall be installed in addition to the required joint sealant per Section E.2.B herein.

G. Testing of Manholes

(1) Ground Water Conditions – Infiltration Test

All manholes in areas where ground water exists over the top of the pipe shall be water tested. All pumping of ground water shall be discontinued for at least three (3) days, after which the manhole shall be tested for infiltration. The inlet (s) and outlet of each manhole shall be

plugged. Test for a minimum of thirty (30) minutes. No visible leakage shall be allowed.

(2) Vacuum Testing

All manholes shall be vacuum tested. Refer to Section E.12 herein for specification requirements.

H. Lining of Manholes

Utilithane 1600 Polyurethane Coating, 30SPL, as manufactured by Prime Coatings Inc. is ASTM D16, Type V, elastomeric, high build, corrosion and abrasion resistant, 100-percent pure polyurethane and 100-percent solids (no solvents) containing no volatile organic compounds or fillers.

Hydrogen sulfide resistant and tested by City of Los Angeles per SSPWC Greenbook Section 211-2. The service duty to be for new concrete sanitation wastewater structures, minimum of 150 mils thickness. Adhesion strength to concrete substrate per ASTM D4541 elcometer pull test, with primer, adhesion meets or exceeds 200 psi or the cohesive strength of the concrete substrate. The following are the minimum properties:

- (1) Shore D Hardness ASTM D2240: D66-70
- (2) Tensile Strength ASTM D638 IV: 3,000 psi
- (3) Tear Resistance ASTM D624: 191 psi
- (4) Elongation at Break ASTM D638 IV: 43 to 50%
- (5) Flexibility ASTM D1737: Zero Bend on 1/2" Mandrel at 20 mils
- (6) Dielectric Strength ASTM D149: Greater than 350 volts/mil
- (7) Abrasion Resistance ASTM D4060, CS-17: 378 mg Weight Loss 1,000 gms/cycle
- (8) Impact Resistance ASTM G14: 140 in-lbs

Apply Utilithane LTE 900 Primer for use with concrete substrate. Perform surface preparation per manufacturer's recommendations.

3. SEWER LATERALS

A. General

The sewer laterals shall be constructed as shown on the Standard Drawing. Sewer laterals of the size called for on the plans shall be installed at approximately

the locations shown on the plans. The exact location will be determined in the field by the District or private developer. The Contractor shall field reference each lateral connection with a surface marker. The marker shall be as specified on the Standard Drawing.

B. Materials

All sewer laterals shall be constructed using PVC pipe , and shall meet the requirements of ASTM D-3034.

C. Tees and Wyes

Tees and wyes shall be of the same material as the sewer main and the longitudinal barrel of the tee or wye shall be of the same size as the sewer main. Tees or wyes of the size called for on the plans shall be installed at approximately the locations shown on the plans. The exact location will be determined in the field by the District or private developer. A suitable plug shall be provided and installed prior to backfilling operations to ensure a watertight joint.

D. Construction

All sewer laterals shall be installed per the Standard Drawing. In no case shall any lateral be constructed at less than two percent (2%) slope unless shown on plans. The sewer lateral shall be constructed a minimum distance of five (5) feet horizontally from existing water services.

Unless otherwise approved by the District, any required saddle connections to existing mains shall be made with an approved sewer tapping machine. The Contractor shall submit to the District the Contractor's proposed method for tapping, including manufacturer's tapping equipment descriptions, etc.

E. Payment

Sewer laterals shall be paid for at the unit price per foot bid, measured in a horizontal plane along the centerline of the sewer lateral from the centerline of the main sewer to the property line. Said prices per linear foot shall be considered full compensation for furnishing all pipe and fittings, other materials, equipment and

labor necessary to install the pipe; including clearing and grubbing, pavement removal and replacement, placement of bedding in the locations shown on the plans in accordance with the Standard Drawings and specifications, removal and/or replacement of existing interfering improvements; and all other work pertinent to installing the sewer lateral complete in place and for which no additional compensation shall be made therefore.

In payment for tees and wyes, compensation shall be made for each tee and wye installed at the unit price bid, excepting for tees and wyes installed for cleanouts, compensation for which shall be included in the price per cleanout. The portion of the tee or wye covered by such compensation shall be considered to be the branch portion.

4. TESTS FOR LEAKAGE IN SEWER

A. General

All leakage tests for exfiltration from, and infiltration into the system shall be in accordance with Section 306-1.4 of the "Standard Specifications for Public Works Construction", Latest Edition, except as modified herein. The method of testing and testing equipment shall be approved by the District.

The Contractor shall, at their own expense, furnish all materials for making the tests required under the direction of the District.

If the leakage or infiltration, as shown by the tests, exceeds the standard set forth in said section, Contractor shall, at no additional cost to the District, make the necessary repairs by methods approved by the Engineer to correct the deficiencies. All tests must be completed before the street or trench is resurfaced with permanent pavement replacement, but after complete installation and trench compaction of all facilities within a particular section between manholes.

Full compensation for testing shall be included in the bid price of various items of work, and no other compensation shall be made therefore.

B. Air Testing (Gravity Sanitary Sewers)

The Contractor shall test all sewers by means of the air test specified herein, unless otherwise directed by the District. The air test shall be in accordance with ASTM C828 Standard Test Methods, Latest Edition, for PVC pipeline installations.

Air shall be introduced into the pipeline until 4.0 psi gauge pressure has been reached, at which time the flow of air to the pipe shall be shut off. After the temperature has stabilized the air pressure shall be permitted to drop and, when the internal pressure has reached 3.5 psi gauge, the time lapse required for the air pressure to drop to 2.5 psi gauge shall be measured. The time lapse required for the air pressure to decrease from 3.5 to 2.5 psi (gauge) shall not be less than that calculated based upon equations from ASTM C828. An alternate method of determining the allowable time lapse is to utilize the tables from the National Clay Pipe Institute (NCPI) publication entitled "Low Pressure Air Test for Sanitary Sewers". Tables shall be utilized by taking the next highest main line and lateral lengths in the table which exceeds the actual main line and lateral lengths.

If the time lapse exceeds that calculated or shown in the NCPI tables, the pipe shall be presumed to be within acceptable limits; if the time lapse is less, the Contractor shall make the necessary corrections to reduce the leakage to acceptable limits by repair methods approved by the District.

C. Water Infiltration Test (Gravity Sanitary Sewers)

Where ground water conditions are encountered and the water level prior to any pumping or dewatering operations is above the top of the proposed sewer pipe, then the Water Infiltration Test shall be used in lieu of the air test specified in Section 5-B of these Basic Specifications. The Water Infiltration Test shall be in accordance with Section 306-1.4.3 of the Standard Specifications for Public Works Construction, Latest Edition, except as herein modified.

The infiltration shall not exceed 0.0016 gallons per hour per foot of sewer, per inch of pipe diameter. The test shall be run for a minimum period of two (2) hours. The Contractor shall furnish all labor, materials, equipment required for the infiltration test, at no additional cost to the District.

If ground water conditions are such that the ground water level is between the flow line of the proposed sewer pipe and the top of the pipe, both the air test and the water infiltration test shall be conducted at no additional cost to the District. In such a case, the section of pipe being tested shall be deemed acceptable only if it passes both the air test and the water infiltration test.

D. Force Main Pressure Test

Field hydrostatic test and leakage test shall be performed in accordance with all provisions of Section C12, (Water Pipeline Construction Specifications) with the following modifications.

The test pressure at the location of the testing equipment shall be computed on the basis of the relative elevations of the test gauge and the lowest point in the section being tested, and shall result in a pressure of 150 percent of the design pressure at the lowest point in said section. The test pressure at the highest point in the test section shall be not less than 120 percent of design pressure. The test pump and gauge shall be connected to the force main at a location other than the highest point in the line, to facilitate release of air from the high point.

THE MEASURED LEAKAGE SHALL NOT EXCEED 2 GALLONS PER INCH DIAMETER OF PIPE PER 1000 FEET OF PIPE PER 24 HOURS. Should leakage exceed this amount, the section being tested will be considered defective and Contractor shall determine points of leakage, make necessary repairs, and conduct a second test. This procedure shall be continued until leakage equals or is less than the allowable minimum.

5. CONCRETE WORK

A. General

Concrete shall be composed of portland cement, natural aggregates, and water proportioned to produce required strength and well mixed into required consistency, Type II-V for all concrete in contact with wastewater.

Portland cement concrete for manhole bases, cradles, encasements, thrust blocks and structures shall be composed of portland cement, fine aggregate, coarse aggregate and water proportioned and mixed in accordance with the requirements

of Section 90 of the State of California Department of Transportation Standard Specifications, except as may be herein modified.

Concrete for manhole bases, cradles and encasements, and all other concrete structures, shall be constructed to the lines and grades and in accordance with the design shown in the details on the plans.

Prior to placing any concrete, the Contractor shall submit to the District the design mix proposed to be used. Said mix shall set forth the weights of cement, sand, coarse aggregate and the amount of water to be used. (Source of supply shall also be furnished to the District.) The proposed mix shall be approved by the District prior to placing any concrete.

B. Portland Cement Concrete Classification

Concrete Class	Compressive Strength @ 28 days (psi)	Sacks of Cement/CY
"A"	3,500	6
"B"	2,500	5
"C"	2,000	4
"D"	4,000	7

The amount of free water used in concrete shall not exceed 312 pounds per cubic yard, plus 20 pounds for each required 100 pounds of cement in excess of 564 per cubic yard.

Additional cement and a modified concrete mix, as approved by Engineer, will be required for situations requiring pumping of concrete.

C. Class "B" Concrete Encasement

Class "B" concrete shall be used for unreinforced concrete encasements that may be required by unforeseen field conditions. The quantity shown on the proposal is an estimate. The District hereby reserves the right to reduce this item to a small percentage of that shown on the proposal forms, delete it or increase it, without altering the unit price bid for cubic yard of concrete.

The unit price bid for cubic yard of concrete shall include furnishing all materials and labor and equipment to properly place the concrete as may be required, and no other compensation shall be made therefore.

D. Reinforced Concrete Encasement

At the locations shown on the plans, and in accordance with the detail shown on the plans and/or Standard Drawing, and these Basic Specifications, the Contractor shall construct reinforced concrete encasement around the sewer carrier pipe. Concrete for reinforced concrete encasement shall be Class "A". Reinforcing steel (unless otherwise indicated) shall be No. 4 bar, billet steel having minimum yield point of 60,000 psi, formed and spaced as shown on the plans or the Standard Drawing.

Payment for reinforced concrete encasement shall be at the unit price per cubic yard of concrete for the section as shown on the plans or Standard Drawing, and no other compensation will be made therefore.

6. PAVEMENT REMOVAL AND REPLACEMENT

A. General

Pavement removal and replacement for all public roads, including aggregate base and temporary paving where required, shall comply with all the requirements of the agency issuing the Encroachment Permit. In roads established under formation of a special road district, the specifications of the Encroachment Permit shall apply. Any private roads and streets, including driveways in which the surface is removed or damaged, shall be restored to the original grade and crown by the Contractor. Removed or damaged sections shall be restored with the type of improvements (or better) conforming to that which existed at the time the Contractor entered upon the work.

It shall be the responsibility of the bidder to satisfy themselves as to the existing pavement sections prior to submitting their bid.

Full compensation for temporary and permanent resurfacing, including the replacement of base material as required, shall be included in the unit bid price for pavement removal and replacement per linear foot of mainline trench. Any

required pavement removal and replacement for manholes, house connection laterals, or other appurtenances shall be considered included in the bid price for the various items, and no additional compensation shall be made therefore.

B. Pavement Cutting

Pavement shall be cut to a straight edge parallel to the pipe alignment prior to excavation. Method of pavement cutting shall be as specified by the Agency having jurisdiction. Under no circumstances shall excavation be started prior to scoring of pavement. If the adjacent pavement is disturbed during the Contractor's operation, the pavement shall be recut on a straight line to remove the damaged pavement before resurfacing. Portland cement concrete pavement and sidewalk shall be saw cut. Pavement cutting shall be considered included in the bid price for pavement removal, disposal and replacement, and no additional compensation shall be made therefore.

C. Permanent Trench Pavement

The permanent trench pavement shall be in accordance with the Agency having jurisdiction. If not specifically addressed by the road agency's permit, the existing pavement shall be saw cut and the permanent trench base paving shall be constructed to be flush with existing so that the asphalt concrete is smooth, true to grade and cross section thus providing an even driving surface without undulations. The completed base paving surface shall be provided as described herein whether an asphalt concrete cap is specified or not specified. Should an asphalt concrete cap be required, Contractor shall grind down the base paving prior to placement of the A.C. cap.

D. Asphalt Concrete Cap

Where required by the agency issuing the Encroachment Permit or other agency having jurisdiction, an asphalt concrete cap shall be placed along the length of the trench. The installation of the asphalt concrete cap shall be in accordance with the specifications and policies of the agency having jurisdiction. Where the asphalt concrete cap is not specifically stated in the applicable permit or on the drawings, and when directed by the District, the minimum cap shall be a grinded

0.10-foot thick, 12-foot wide section centered over the center of the trench or the traveled way, and pulled with a "Barber Greene" or equivalent.

Full compensation for placement of asphalt concrete cap, where required, shall be included in the unit bid price per linear foot of mainline trench. Any required asphalt concrete cap for house connection laterals or other appurtenances shall be considered included in the bid price for the various items, and no additional compensation shall be made therefore.

7. CONNECTIONS TO EXISTING MANHOLES

The Contractor shall make connections to existing manholes at the location and elevation shown on the plans and as verified in the field by the Contractor. Where new flow-through channels have to be cut in the existing manhole base, they shall be cut so that the resulting section is smooth and conforms to the intended shape. Deviation from form and grade shall not be greater than 1/4 inch. The channel surface shall be smoothed with epoxy mortar. The new PVC sewer shall be firmly embedded in epoxy grout where it joins the existing manhole.

Payment for connections to existing manholes shall be included in the contract price paid for the various items of work wherein connections to existing manholes are required, and no additional allowance will be made therefore.

8. TEMPORARY HANDLING OF SEWAGE

Certain work in connection with tying into existing sewers and manholes, may require the temporary handling of sewage either by temporary bypass lines, pumping, bulkheading at low flows, or other means, to be approved by the District. Sewage so diverted shall be handled in a manner such that all sewage shall be contained and properly disposed of so as not to create a public nuisance or health hazard. No extra compensation will be allowed in connection with the temporary diversion of sewage, and all such costs shall be included in the various contract unit prices.

Should the Contractor's operation result in fine(s) from other agency jurisdictions or result in the District's need for cleanup assistance, the payment of such fines and District assistance shall be the responsibility of the Contractor.

9. VIDEO INSPECTION

Upon successful completion of the first leakage test for the sewer and after base rock placement and compaction is complete, the contractor shall notify the District that the pipeline system is ready for video inspection. Said notification shall be made at least five working days in advance of the actual video inspection date. The video inspection will be made by a video inspection company approved by the District and hired by the Contractor. Video inspection shall be made in the presence of the District or District's representative. Prior to the video inspection, the contractor shall be responsible to provide the following items:

- A. Clean sewer pipelines free of all dirt, rock, debris, etc.
- B. Water source with an adequate amount water, pipe, hose, etc. to place enough water in the pipelines to evaluate pipeline alignment "SAGS".
- C. Driveable truck access to each manhole within the system to be videoed.
- D. Provide all traffic control methods required.
- E. Acceptable depth gauge.

Should any of the aforementioned items not be in compliance by the time the video inspection is to occur, the contractor shall be subject to compensating the District for all costs incurred.

Full compensation to the contractor for complying with the above requirements shall be considered as included in the contract lump sum provided for such work and no additional allowance will be made therefore.

Upon completion of the video for the subject sewerlines, the video inspection company will provide the District with the DVD (video file format to be viewable on a standard DVD player/computer and/or as approved by the District) and a written report detailing the condition of the interior of the mainline and joints. Subsequent to review of the DVD and report by the District, the District will notify the Contractor that the Contractor may then proceed with completion of the project; or the District will provide a list of corrective measures that must occur prior to acceptance.

Should remedial activities be necessary, the reconstruction methodology shall be approved by the District prior to commencement of the work. Upon completion of the remedial construction, the contractor shall once again notify the District that the sewerlines

are ready for a video inspection. The District reserves the right to re-video any portions of the sewer system they determine may have been affected by the reconstruction work activities. Further, all related costs including but not limited to reconstruction materials, labor, equipment, video inspection, District and other agency inspection, and administrative costs shall be borne by the contractor.

10. VACUUM TESTING OF MANHOLES

A. General

All manholes shall be vacuum tested unless otherwise waived in writing by the District. Vacuum testing shall be performed either pre or post backfilling in accordance with the criteria stated herein. In all cases vacuum testing shall be performed prior to video inspection.

Contractor shall be solely responsible for safe access to the manholes and all necessary safety measures required for the vacuum testing.

B. Pre versus Post Backfilling Test Criteria

- (1) All manholes with depths from rim to pipe flowline less than or equal to twelve (12) feet shall be vacuum tested prior to backfilling.
- (2) All manholes with depths greater than twelve (12) feet from rim to pipe flowline shall be vacuum test post backfilling unless otherwise approved by the District.

C. Reference Standard

Unless otherwise modified herein, vacuum testing shall be in accordance with ASTM C1244-11.

D. Manhole Preparation

- (1) Plug and seal all lift holes.
- (2) Care shall be taken to effect a seal between the vacuum base and the manhole rim. Pipe plugs shall be secured to prevent movement while the vacuum is drawn.

- (3) All pipe entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into manhole.

E. Basic Field Testing Procedure

- (1) The test head gauge shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.
- (2) A vacuum of 10 inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 inches of mercury.
- (3) The manhole shall pass if the time for the vacuum reading to drop from 10 inches of mercury to 9 inches of mercury meets or exceeds the values indicated in the table under Par. F.
- (4) If the manhole fails the initial test, necessary repairs shall be made in accordance with a submitted plan and method approved by the District. The manhole shall then be re-tested until a satisfactory test is obtained. All repairs shall be the sole responsibility of the Contractor.

F. Minimum Test Times – Standard Manholes

- (1) Testing Criteria

[SEE TABLE ON NEXT PAGE]

<u>Depth of Manhole</u> <u>(feet)</u>	<u>Diameter of manhole (feet)</u>		
	4	5	6
	<u>Time (Sec)</u>		
Up to 8 feet	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	79	97
26	64	85	105
28	69	91	113
30+	74	98	121

For manholes deeper than thirty (30) feet or larger than six (6) feet in diameter contact District for specific requirements.

(2) Testing Form and Certification

Submit testing form to District for approval. Include the following as a minimum:

- Date of Test
- Project Description
- General Contractor
- Agent/Company Performing Test
- Specific Location, Including Station and Manhole Number
- Detailed Test Results
- Certification Signed by Testing Company

G. Inspection and Re-Testing

The Inspector shall be notified when the testing will be performed and by whom. The inspector shall witness testing to verify procedures are being followed correctly, and must be given at least 48 hours notice.

Retesting manholes more than once may result in additional inspection fees chargeable to the Contractor.

H. Approved Vacuum Testing Companies

Vacuum testing shall be performed by Old Castle Precast of Riverside, California or other qualified testing organization approved by the District. Submit qualified testing company along with suitable documentation if alternate is proposed.

VIDEO INSPECTION COMPANY REQUIREMENTS
(Closed Circuit Television Inspection - CCTV)

1. Rotating lens camera with articulating head.
2. Scanning capabilities of 360°.
3. Operative in 100% humidity conditions.
4. Lighting for the camera shall minimize reflective glare.
5. Lighting and camera quality shall be suitable to provide clear, in focus picture of the entire periphery of the pipe for all conditions.
6. Camera focal distance shall be adjustable through a range from 6" to infinity.
7. Remote reading distance (footage) counter shall be accurate to one percent (1%) over the length of the particular section being inspected. Provide depth gauge for SAG measurement acceptable to District.
8. The camera, television monitor, and other components of the color video system shall be capable of producing a minimum of 350 line resolution.
9. Documentation consisting of a DVD (video file format to be viewable on a standard DVD player/computer and/or as approved by the District) and a written report detailing the condition of the mainline and joints shall be submitted to the District inspector immediately following the video inspection. Each disc shall be labeled with the project or subdivision name, number and pipe run numbers it contains. Each disc shall be delivered in a plastic case. District will also accept the following formats: Thumb Drive and Cloud Service.
10. All video equipment used for domestic sewer systems shall be certified for domestic sewerline inspection only.
11. The CCTV camera operator shall stop at each defect and pipe joint and televise the entire joint with the pan and tilt feature on the head of the camera, initially, in a complete counterclockwise direction followed by a complete clockwise direction. If a defect is found, the CCTV operator will "home up" the camera prior to defining the defect and determining it's size and location. The CCTV operator will also stop and record any questionable item such as a stain, crack, paint mark, shadow found or character change in a pipe being inspected. In other words, the CCTV operator must stop, record and note anything questionable no matter how minor. The Engineer, as defined by JCSD Standard Specifications, not the CCTV operator, will decide if a questionable items is a "problem event" when that Engineer reviews the video inspection.

Refer to Appendix P, Closed Circuit Television (CCTV) Inspection Standards for Acceptance of New Sewers for additional requirements.

SECTION VI

STANDARD DRAWINGS

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TABLE OF CONTENTS

SECTION VI - STANDARD DRAWINGS

A. WATER SYSTEM STANDARD DRAWINGS

<u>STANDARD NUMBER</u>	<u>SUBTITLE</u>
A-1	Typical Trench Detail
A-2	Waterline Special Bedding Detail
A-3	Standard Valve and Sewer Manhole Marker Installation
A-4	Standard Guard Post Installation
A-5	Pipe or Flange Support Detail
A-6	Waterline Encasement Detail
A-7	Slope Protection Cut-Off Wall
A-8	Slope Protection Cut-Off Ditch
A-9	Standard Vent Installation
A-10	Typical Watermain Crossing Under Sewer Lateral
A-11	Waterlines Crossing Over Storm Drains/Sewers
A-12	Removable Guard Post Detail
A-13	Water Main Crossing Under Storm Drain
AA-1	Standard Symbols
AA-2	Standard Water/Sewer Location
AA-3	Standard Cul-De-Sac Water And Sewer Services
AA-4	Offset Cul-De-Sac Water And Sewer Services
B-1	Gate Valve Installation
B-2	DELETED
B-3	Butterfly Valve Installation
C-1	Thrust Blocks For D.I.P. Pipelines, Class 200 P.S.I. Max.
C-2	Thrust Blocks For Welded Steel Pipelines, Class 200 P.S.I. Max.
C-2A	Minimum Pipe Welding Length For Thrust Restraint
C-2B	DELETED
C-3	Typical Butt Strap Connection CML/CMC Pipe
C-4	Typical Cut-To-Fit Detail for Types I, II & III
C-5	Typical Shear Ring Detail For Welded Steel Pipe
C-6	Outlet Reinforcement Details
C-7	Formed Bell and Spigot Joint Bonding Detail
C-8	Formed Bell & Spigot Rubber Gasket Joint for CML & CMC Pipe
C-9	Lap Welded Slip Joint Belled-End CML & CMC Pipe
C-10	Carnegie Type Rubber Gasket Joint For CML & CMC Pipe

**STANDARD
NUMBER**

SUBTITLE

D-1	3/4" Or 1" Meter, 1" Water Service Detail
D-1A	DELETED
D-1B	3/4" Or 1" Meter, 1" Water Service Detail (Residential Fire Sprinklers)
D-2	1-1/2 " Meter, 2" Water Service Detail
D-3	2" Meter, 2" Water Service Detail
D-3A	Deep Water Service Connection
D-4	3" Water Service Meter
D-5	4", 6", 8" & 10" Water Service Meter
D-5A	4", 6", 8" & 10" Above Grade Water Service Meter
D-6	Service Outlet Saddle
D-7	DELETED
D-8	Service Manifold Detail
E-1	Air Valve Installation 1" Dia.
E-1A	2" Dia. Air Valve Installation W/ Ball Valve
E-2	3" and 4" Air Valve Installations
F-1	4" Dia. Blow-Off Installation
F-1A	4" Blow-Off Assembly (PVC Pipe)
F-2	6" & 8" Blow-Off Installation
F-3	DELETED
F-4	4" End Of Line Blow-Off Installation
F-4M	DELETED
G-1, G-1A	Typical 6" Fire Hydrant Installation
G-2, G-2A	Typical 6" Fire Hydrant Installation – PVC, DI Pipe
G-3	Construction Meter Installation Detail
H-1	4", 6", 8" & 10" Dia. Fire Service/Double Detector Check Valve Installation
H-2	Reduced Pressure Backflow Device
H-3	DELETED
H-4	DELETED
H-4A	4", 6", 8" & 10" Fire Service Installation (Metered)
I-1	Manway Installation 20" Or 24" Dia.
I-2	Manhole Detail For Manways
I-3	Typical Blow Off Manhole Detail
J-1	Chain Link Fence Detail
J-2	Chain Link Fence Gate Detail

**STANDARD
NUMBER**

SUBTITLE

K-1	Water Sampling Station Construction Details
K-2	DELETED
K-3	Cathodic Protection Test Station Steel Cylinder Pipe
K-4	Thermite Braze Detail

B. SEWER SYSTEM STANDARD DRAWINGS

**STANDARD
NUMBER**

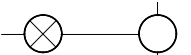
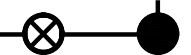
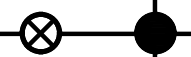
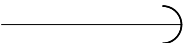
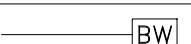
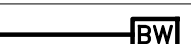
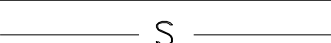
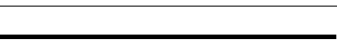
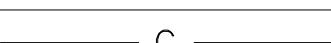
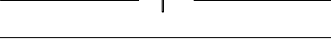
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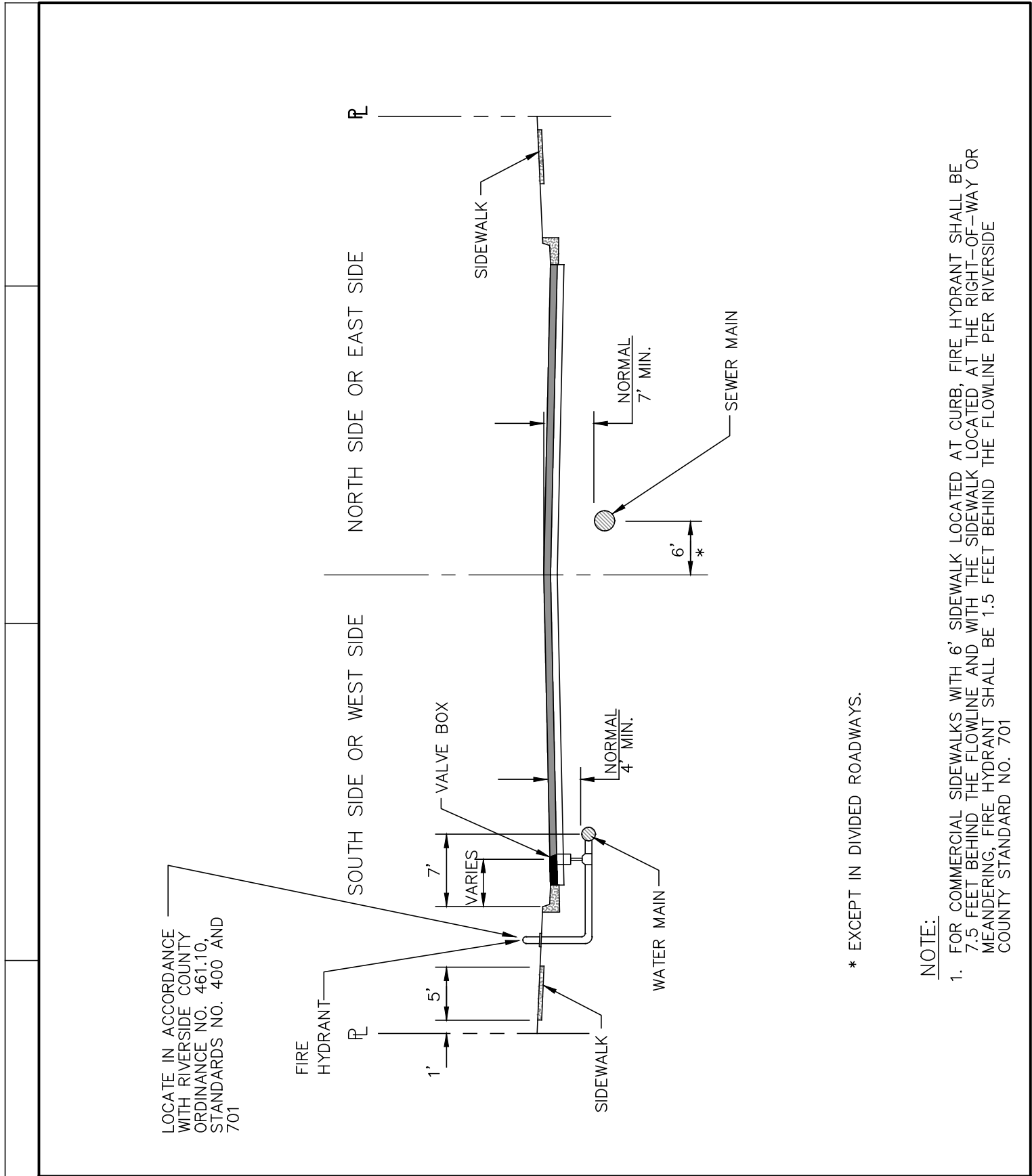
S-1	General Bedding Details
S-2	General Bedding Details Flexible Gravity Pipe
S-3	DELETED
S-4	Typical Sewer Concrete Encasement Detail
S-5	Typical Sewer Lateral
S-6	DELETED
S-6A	Deep Lateral Flexible Gravity Pipe
S-7	Precast Concrete Manhole
S-8	DELETED
S-9	DELETED
S-10	DELETED
S-11	Wastewater Flow Monitoring Station
S-12	Industrial Waste Clarifier Three Compartment
S-13	DELETED
S-14	Building Sewer Sampler Detail
S-15	Precast Shallow Manhole
S-16	Sewer Protection Detail
S-17	Remodeling Details For Sewer Laterals
S-18	DELETED
S-18A	Sewer Lateral Tapping to Existing VCP Main
S-18B	Sewer Lateral Tapping to Existing PVC Main
S-18C	Sewer Lateral Tapping to Existing Truss Pipe
S-19	Grease Interceptor 750 Gal. To 1500 Gal.
S-20	Grease Interceptor 2000 gal. To 3000 Gal.
S-21	72" and 84" Dia. Precast Concrete Manhole (PVC Lined)
S-22	DELETED
S-23	Manhole Covers
S-24	Temporary Manhole Plug
S-25	On-Site Sewer Location

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A. WATER SYSTEM STANDARD DRAWINGS

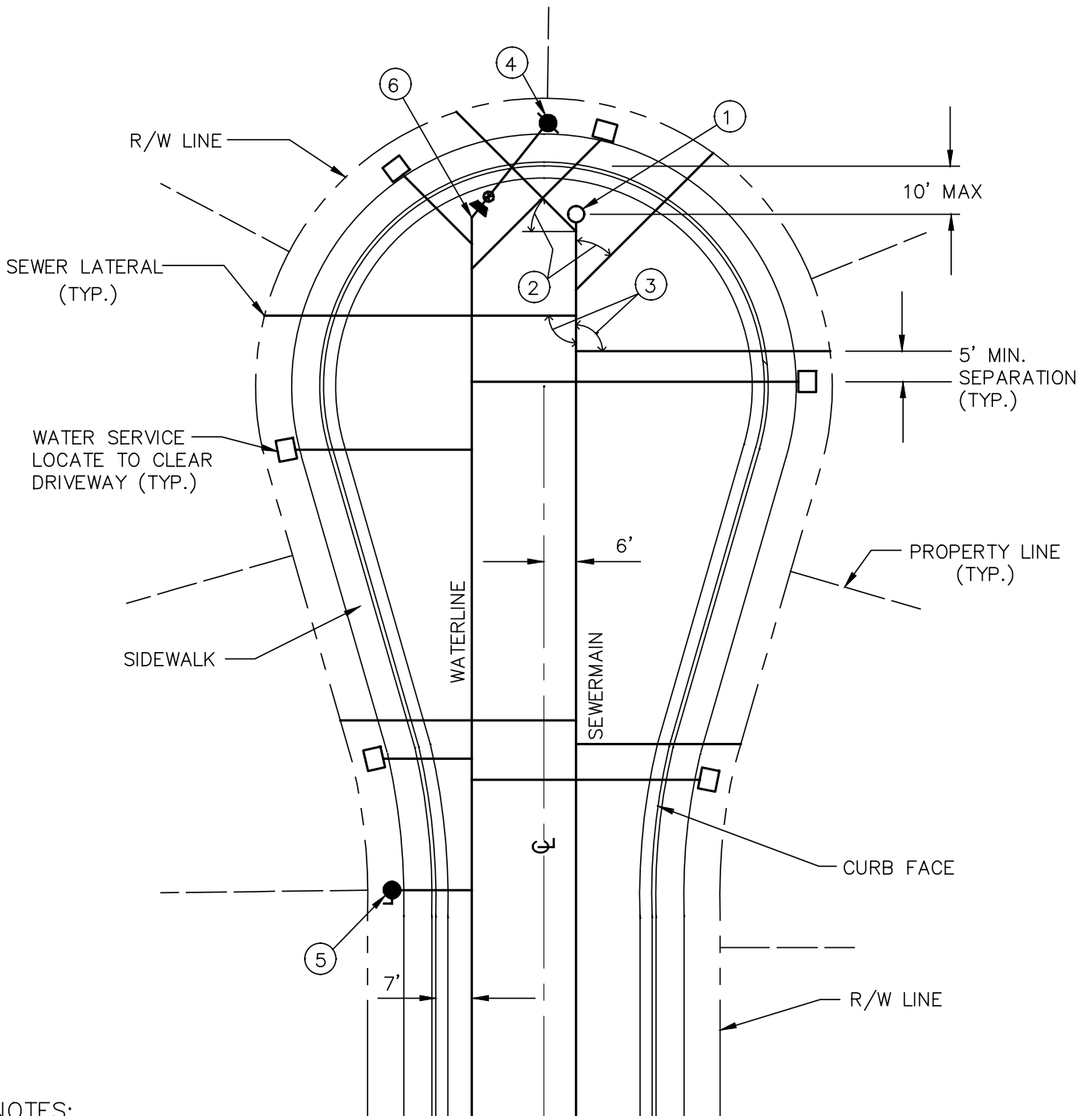
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	SYMBOL FOR:	EXISTING	PROPOSED
	TEE		
	CROSS		
	90° ELBOW		
	45° ELBOW		
	REDUCER		
	RESILENT SEAT GATE VALVE (G.V.)		
	BUTTERFLY VALVE (B.F.V.)		
	STANDARD FIRE HYDRANT PER J.C.S.D. STD. NO. G-1 OR G-2		
	"SUPER" FIRE HYDRANT PER J.C.S.D. STD. NO. G-1A OR G-2A		
	CAP		
	PLUG		
	WATER SERVICE PER STANDARD INDICATED		
	BLOW-OFF PER STANDARD INDICATED		
	AIR VALVE PER STANDARD INDICATED		
	SEWER MANHOLE		
	SEWER CLEANOUT		
	SEWER BACKWATER VALVE		
	WATER PIPELINE		
	SEWER PIPELINE		
	SEWER FORCE MAIN		
	GAS PIPELINE		N/A
	UNDERGROUND TELEPHONE CABLE		N/A
	STORM DRAIN PIPE		N/A
	UNDERGROUND TRAFFIC SIGNAL CABLE		N/A
	UNDERGROUND ELECTRIC CABLE		N/A
JURUPA COMMUNITY SERVICES DISTRICT			
REV.	SCALE: NONE	STANDARD SYMBOLS	DRAWING NO.
	DATE: SEPTEMBER 2020		AA-1
	APPROVED BY: 		
	Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS	W.O. 19-0248
		RIVERSIDE	CALIFORNIA



JURUPA COMMUNITY SERVICES DISTRICT

REV.	SCALE: NONE	STANDARD WATER/SEWER LOCATION	DRAWING NO.
	DATE: SEPTEMBER 2020		AA-2
	APPROVED BY:  Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248



NOTES:

- ① USE EJ COMPOSITE 3200 SERIES 4 LOCK TITUS TWIST LOCK COVER WHERE CUL-DE-SAC CREATES LOW POINT.
- ② 45° ANGLE ONLY IF NECESSARY TO SERVE REAR LOTS (WATER AND SEWER).
- ③ 90° ANGLE (STANDARD) (WATER AND SEWER).
- ④ END OF MAIN FIRE HYDRANT (TO SERVE AS A BLOW-OFF) LOCATE TO CLEAR DRIVEWAYS.
- ⑤ CREATE HIGH POINT (3' MIN. DEPTH OF COVER) AND LOCATE A.V. AT THIS LOCATION.
- ⑥ END OF WATERLINE (MAX. OF 4'+/- DEPTH OF COVER).

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

STANDARD CUL-DE-SAC WATER AND SEWER SERVICES

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

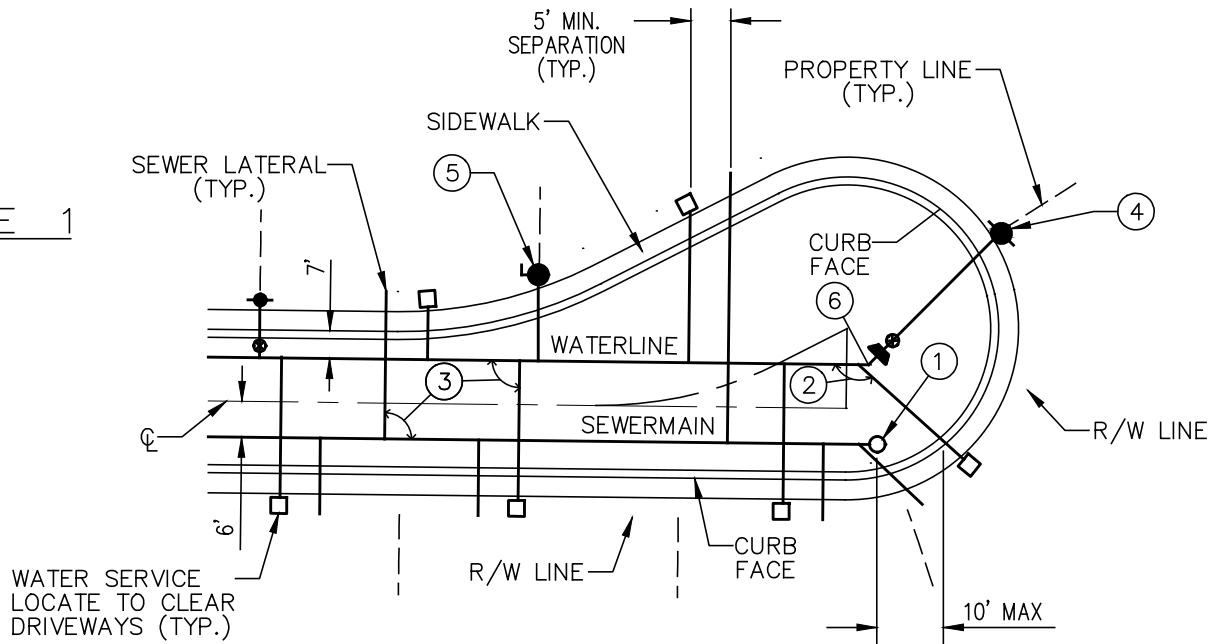
DRAWING NO.

AA-3

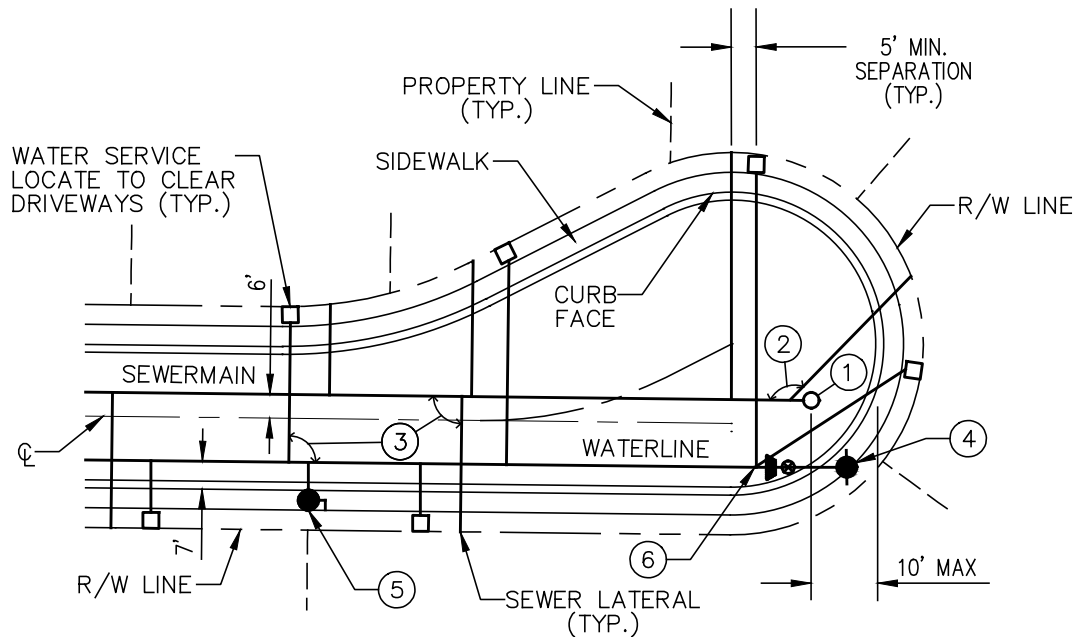
W.O. 19-0248

REV.

CASE 1



CASE 2



NOTES:

- ① USE EJ COMPOSITE 3200 SERIES 4 LOCK TITUS TWIST LOCK COVER WHERE CUL-DE-SAC CREATES LOW POINT.
- ② 45° ANGLE ONLY IF NECESSARY TO SERVE REAR LOTS (WATER AND SEWER).
- ③ 90° ANGLE (STANDARD) (WATER AND SEWER).
- ④ END OF MAIN FIRE HYDRANT (TO SERVE AS A BLOW-OFF) LOCATE TO CLEAR DRIVEWAYS.
- ⑤ CREATE HIGH POINT (3' MIN. DEPTH OF COVER) AND LOCATE A.V. AT THIS LOCATION.
- ⑥ END OF WATERLINE (MAX. OF 4'+/- DEPTH OF COVER).

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

OFFSET CUL-DE-SAC WATER AND SEWER SERVICES

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

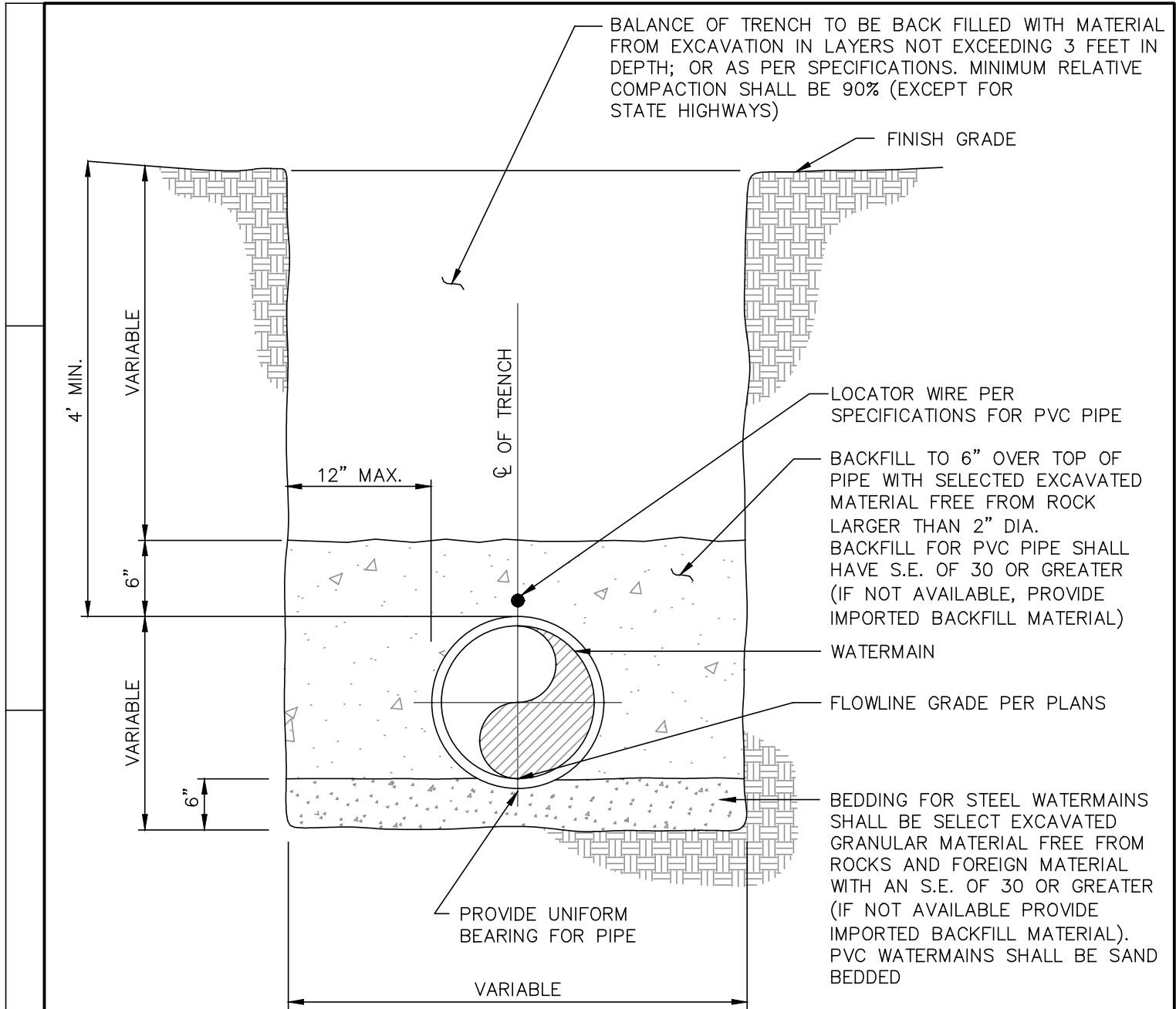
CALIFORNIA

DRAWING NO.

AA-4

W.O. 19-0248

REV.

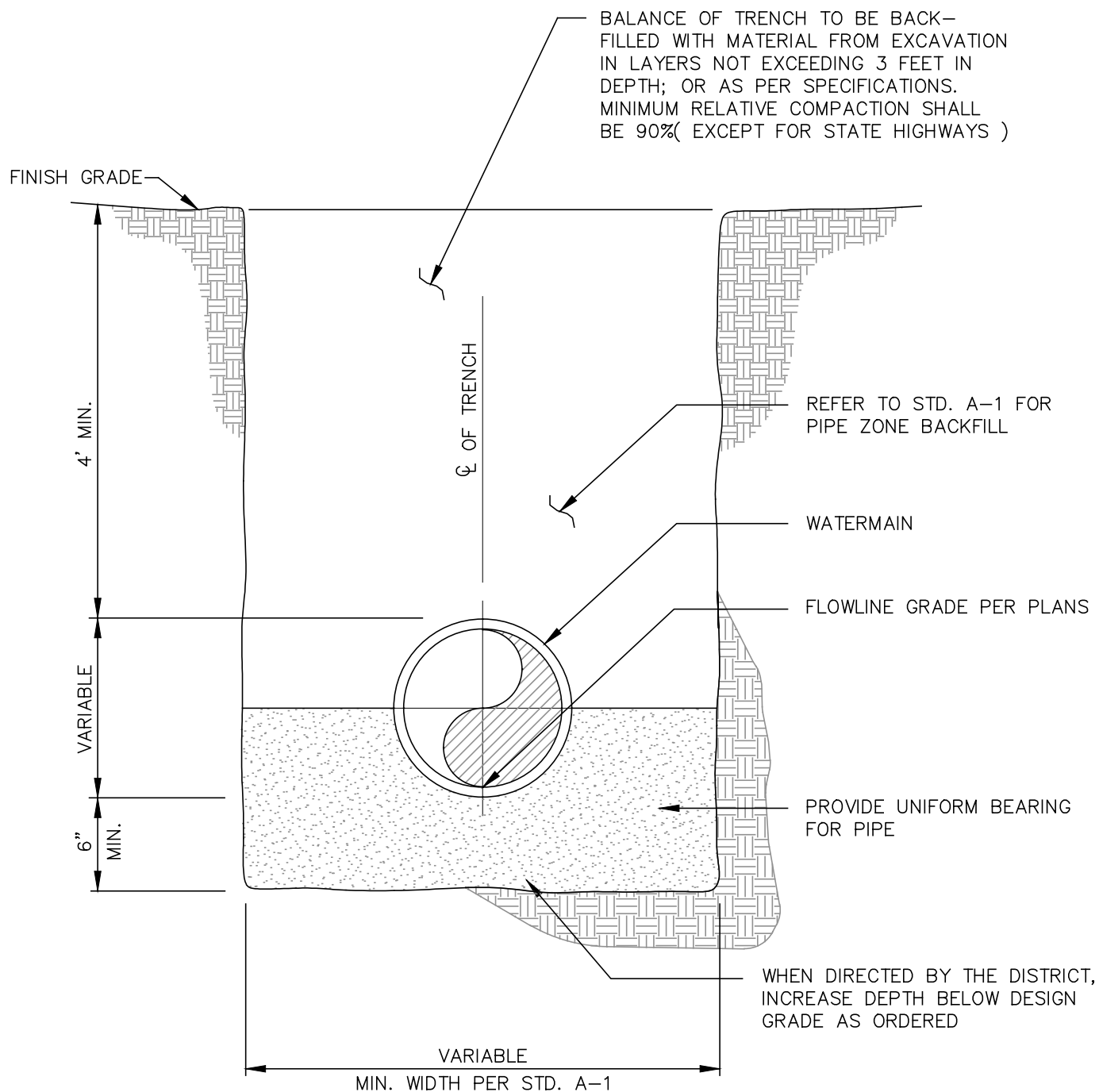


NOTES:

1. WHERE BOTTOM OF EXCAVATION IS IN ROCK WHICH CANNOT BE EXCAVATED TO PROVIDE UNIFORM BEARING FOR THE PIPE, OVEREXCAVATE 6" MINIMUM BELOW DESIGN GRADE, AND REFILL IN 3" THICK COMPACTED LAYERS WITH SELECTED EXCAVATED MATERIAL OR PROVIDE IMPORTED BACKFILL MATERIAL PER SPECIFICATIONS.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE	TYPICAL TRENCH DETAIL	DRAWING NO.
DATE: SEPTEMBER 2020		A-1
REV. APPROVED BY:  Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248



NOTE:

1. WHENEVER TRENCH BOTTOM IS INSUFFICIENTLY STABLE, IN THE OPINION OF THE DISTRICT, TO PROVIDE A SUITABLE FOUNDATION FOR THE PIPE, OVEREXCAVATE BELOW DESIGN GRADE AS ORDERED, AND REFILL WITH CAREFULLY PLACED AND SUFFICIENTLY COMPACTED CRUSHED ROCK; OR AS PER SPECIFICATION.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

WATERLINE SPECIAL BEDDING DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

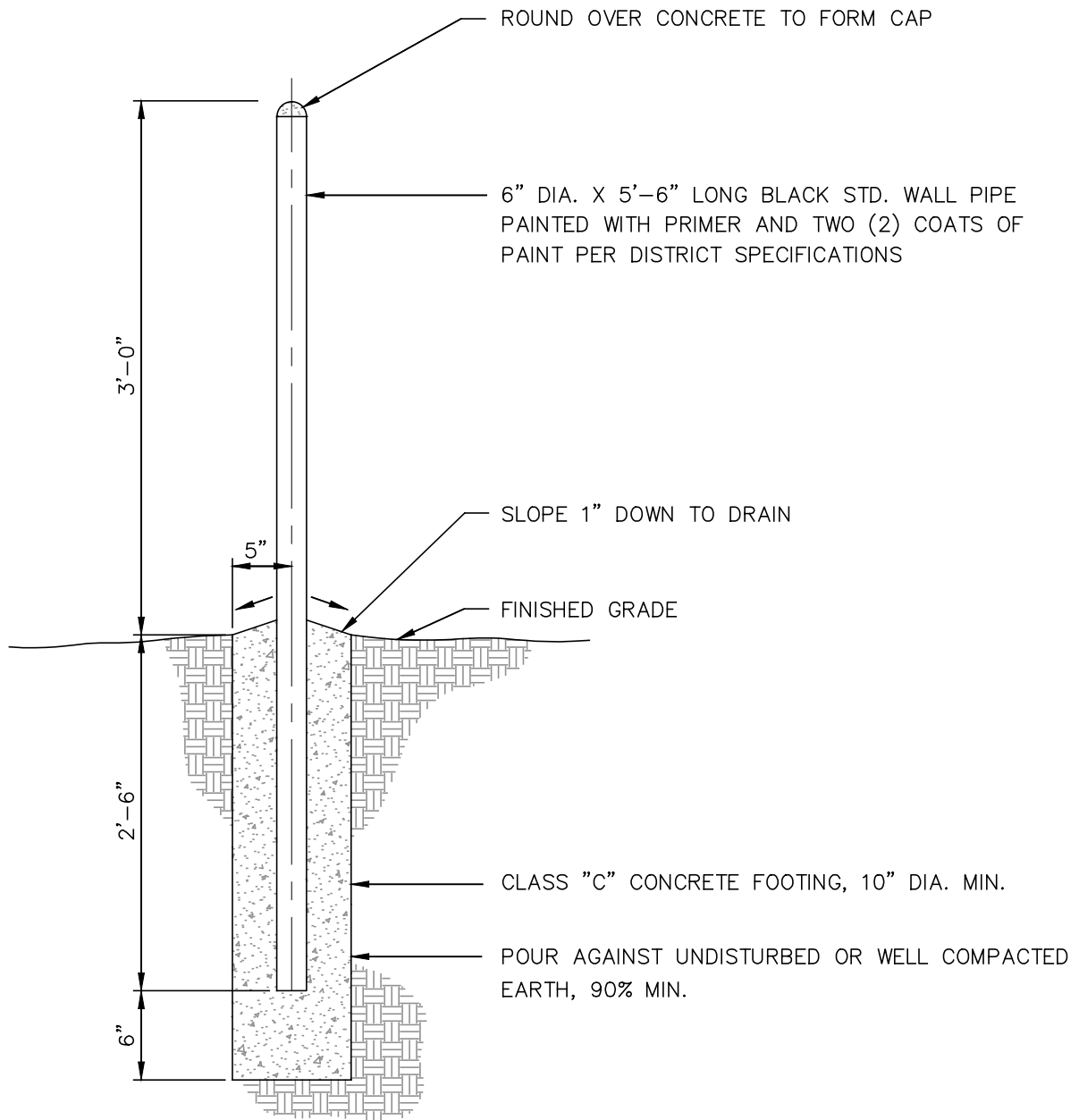
CALIFORNIA

DRAWING NO.

A-2

W.O. 19-0248

REV.



NOTES:

LOCATION SHALL BE AS SHOWN ON PLAN VIEW, OR AS DIRECTED IN THE FIELD
BY INSPECTOR OR ENGINEER.

MINIMUM OF 2 GUARD POSTS ARE TO BE PLACED ON ALL APPURTENANCES
(UNLESS DIRECTED BY JCSD), LOCATION TO BE DETERMINED BY INSPECTOR

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos
Sinnaro Yos, P.E. C68607

STANDARD GUARD POST INSTALLATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

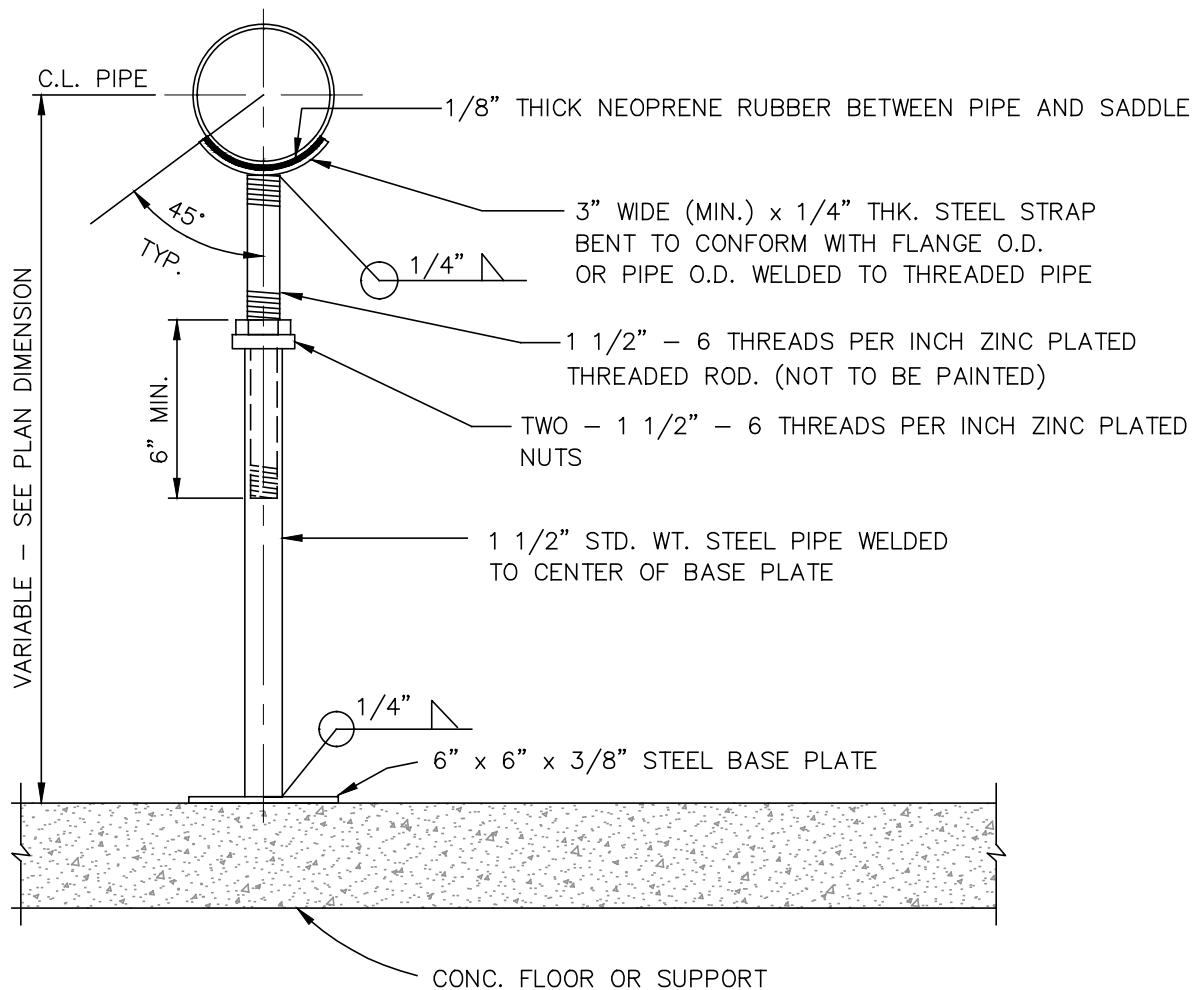
CALIFORNIA

DRAWING NO.

A-4

W.O. 19-0248

REV.



NOTES:

1. 3" x 1/4" STEEL STRAP SHALL BE FORMED TO HAVE FULL & UNIFORM CONTACT FOR ENTIRE LENGTH.
2. PAINT WITH PRIMER & TWO (2) COATS OF PAINT PER DISTRICT SPECIFICATION
3. UPON WRITTEN APPROVAL BY THE DISTRICT, PREFABRICATED ADJUSTABLE PIPE SUPPORTS MY BE USED (PIPE PRODUCTS OR APPROVED EQUAL)

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

PIPE OR FLANGE SUPPORT DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

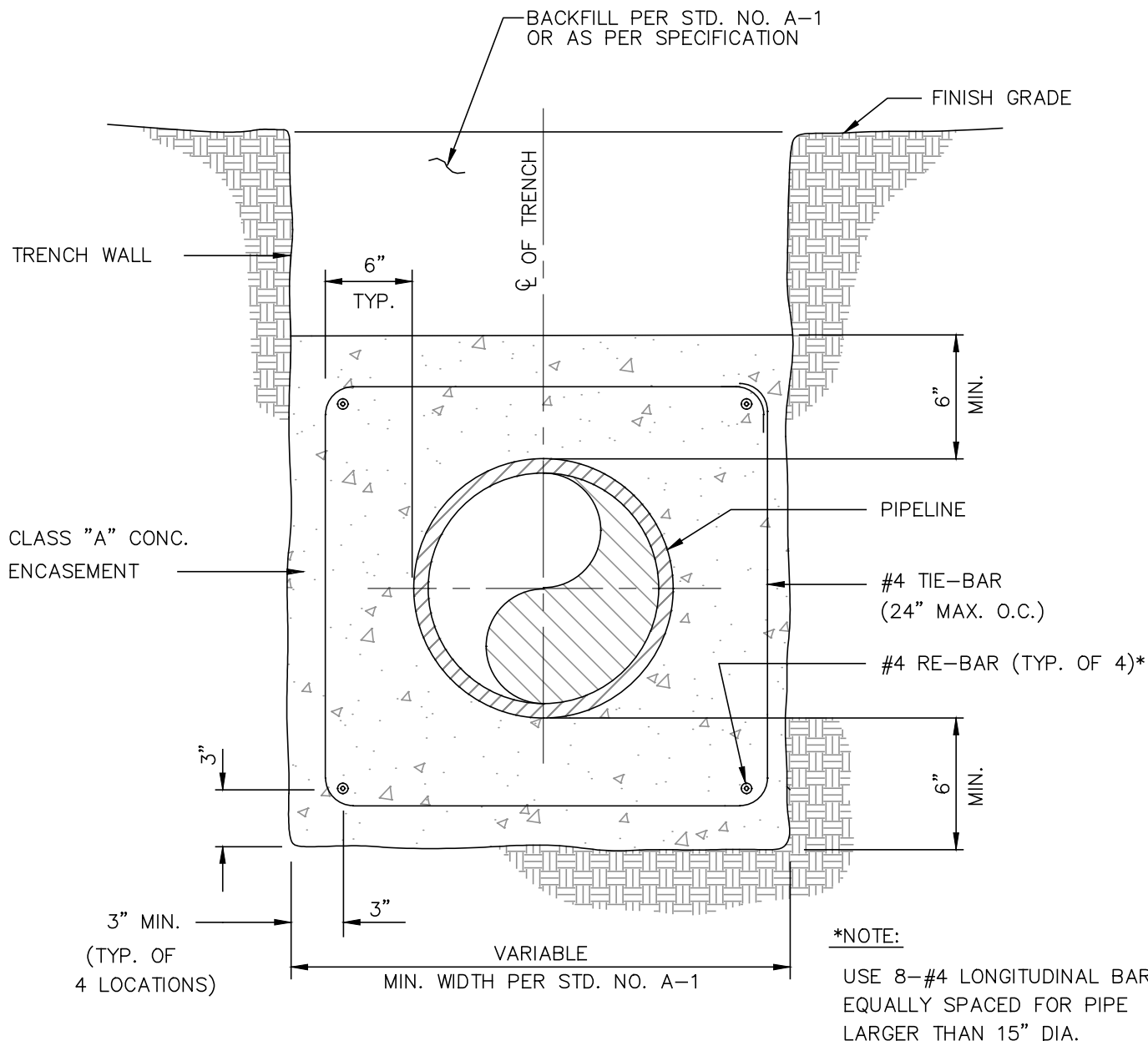
CALIFORNIA

DRAWING NO.

A-5

W.O. 19-0248

REV.



NOTES:

1. PIPE ENCASEMENT TO BE INSTALLED WHERE INDICATED ON THE PLANS AND OR AS DIRECTED IN THE FIELD BY THE DISTRICT.
2. CONTRACTOR SHALL TAKE DUE PRECAUTION AGAINST PIPE FLOATATION DURING THE PLACING OF CONCRETE.
3. IF ANY PIPE APPURTENANCE, SUCH AS OUTLETS, MANWAYS, ETC., ARE REQUIRED IN THE AREA WHERE PIPE ENCASEMENT IS REQUIRED, THE ENCASEMENT SHALL BE FORMED SO THAT REASONABLE ACCESS IS AVAILABLE TO THE PIPE APPURTENANCES.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

WATERLINE ENCASEMENT DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

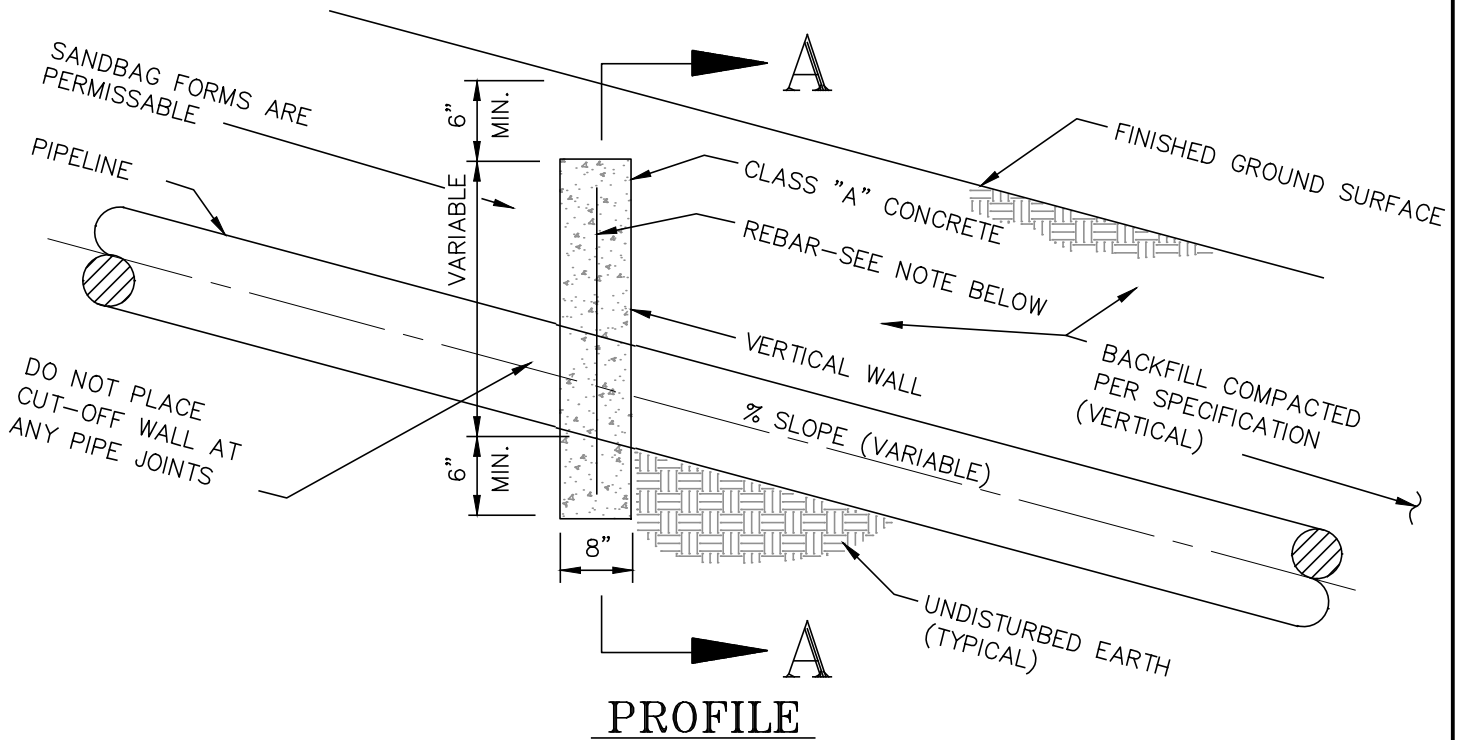
CALIFORNIA

DRAWING NO.

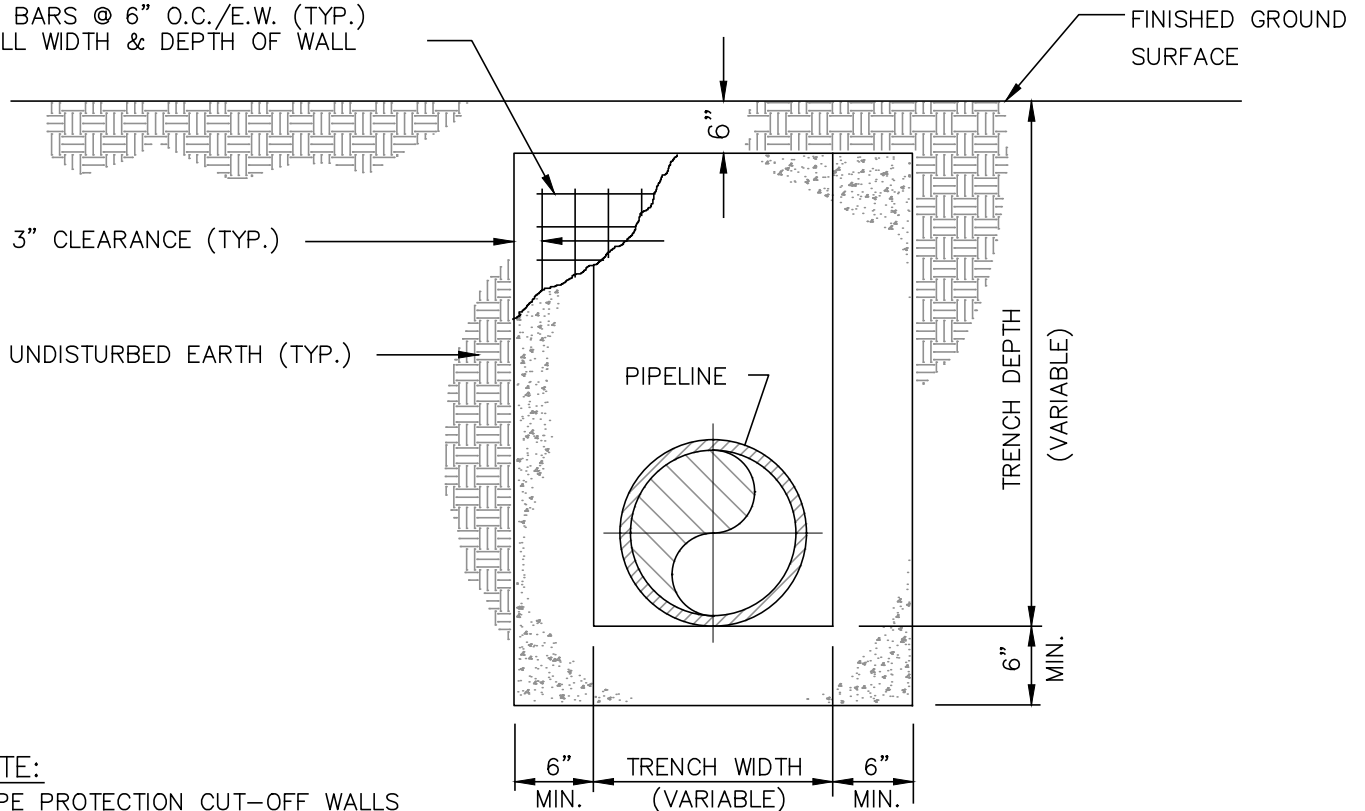
A-6

W.O. 19-0248

REV.



#4 BARS @ 6" O.C./E.W. (TYP.)
FULL WIDTH & DEPTH OF WALL



NOTE:
SLOPE PROTECTION CUT-OFF WALLS
ON THE PLANS OR BY THE DISTRICT.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

SLOPE PROTECTION CUT-OFF WALL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

A-7

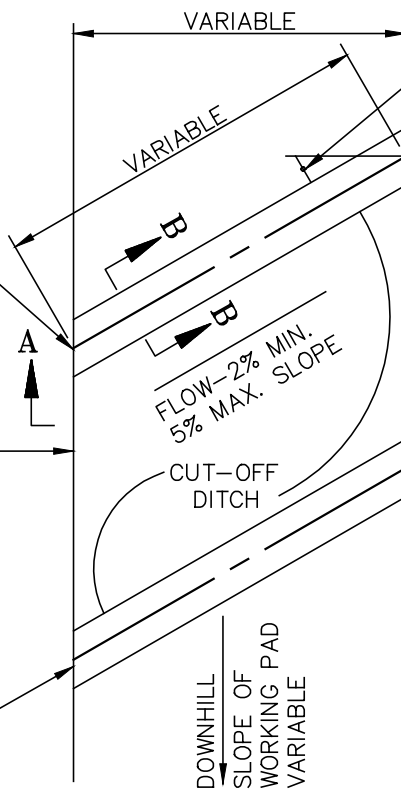
W.O. 19-0248

REV.

ADJUST GRADE AS REQUIRED TO PROVIDE ADEQUATE DRAINAGE FROM END OF CUT-OFF DITCH (TYPICAL)

EDGE OF WORKING PAD

OUTLET TO DISPERSE ONTO ROCKY GROUND OR GROUND WELL COVERED WITH VEGETATION OR UNDISTURBED EARTH AND DISCHARGE INTO NATURAL WATERWAY. IF NONE OF THESE CONDITIONS EXIST, ALTERNATE CUT-OFF DITCHES FROM RIGHT TO LEFT



VARIABLE TO MEET 2% MIN., 5% MAX. FL SLOPE (DEPENDENT UPON DOWN HILL SLOPE OF WORKING PAD)

ADJUST GRADE AS REQUIRED TO PROVIDE ADEQUATE DRAINAGE INTO END OF CUT-OFF DITCH (TYPICAL)

LOCATION, NUMBER AND SPACING OF CUT-OFF DITCHES AS DETERMINED BY THE DISTRICT

EDGE OF WORKING PAD

PLAN VIEW

LEVEL WORKING PAD

WORKING PAD

EDGE OF WORKING PAD

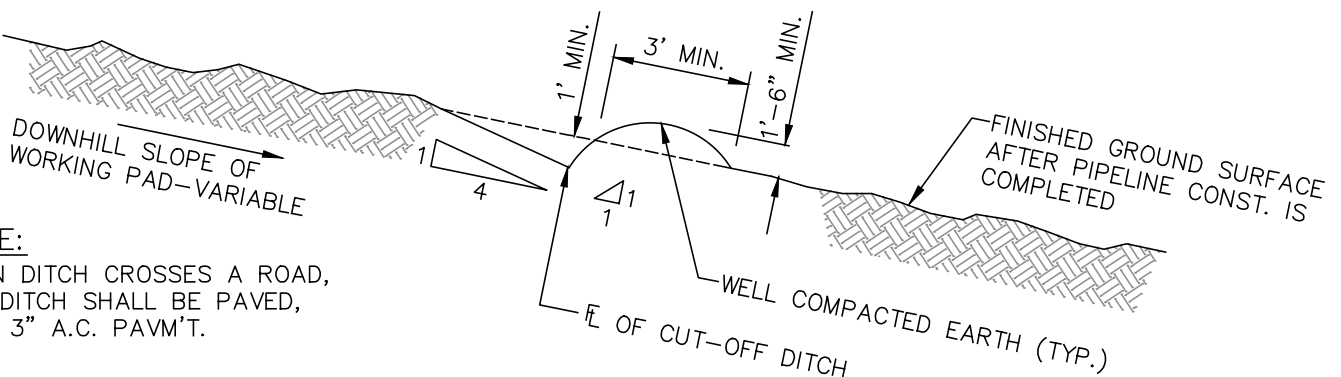
NATURAL GROUND SURFACE

FL CUT-OFF DITCH
2% MIN., 5% MAX. SLOPE

EDGE OF WORKING PAD

"V" DITCHES AS REQ'D. AT THE TOP OF SLOPES—NOT INCLUDED UNDER UNIT PRICE FOR CUT-OFF DITCH CONSTRUCTION

SECTION A-A



NOTE:

WHEN DITCH CROSSES A ROAD, THE DITCH SHALL BE PAVED, WITH 3" A.C. PAVM'T.

SECTION B-B

NOTE:

SLOPE PROTECTION CUT-OFF DITCH TO BE INSTALLED WHERE DIRECTED BY DISTRICT.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

SLOPE PROTECTION CUT-OFF DITCH

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

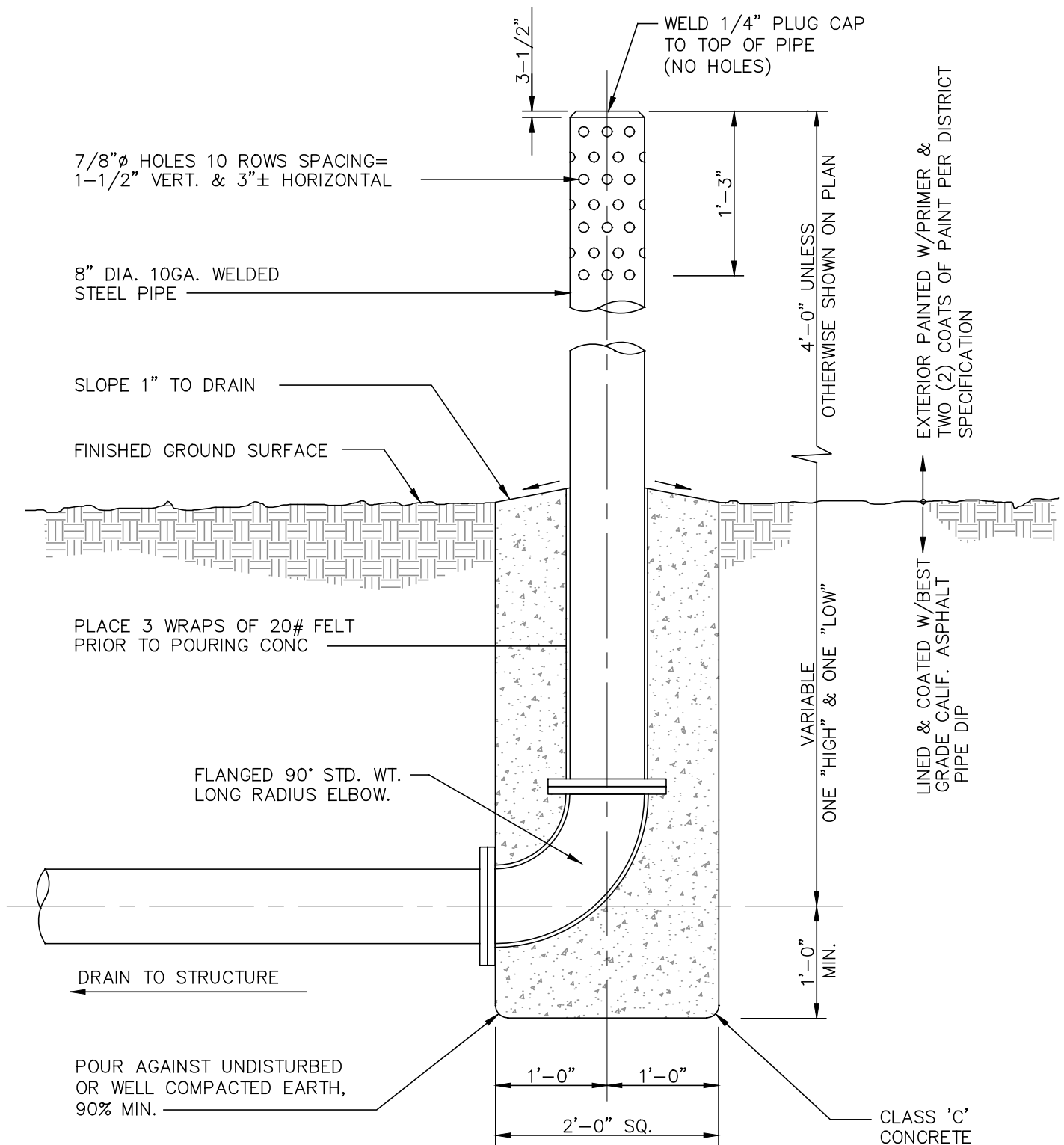
CALIFORNIA

DRAWING NO.

A-8

W.O. 19-0248

REV.



NOTES:

1. FIELD JOINTS MAY BE FLANGED OR WELDED, BUT SHALL NOT PERMANENTLY IMPAIR LINING OR COATING OF PIPE.
2. UPON APPROVAL OF DISTRICT, SCHED. 80 P.V.C. PIPE MAY BE USED FOR VENT IN LIEU OF 10 GA. STEEL.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

STANDARD VENT INSTALLATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

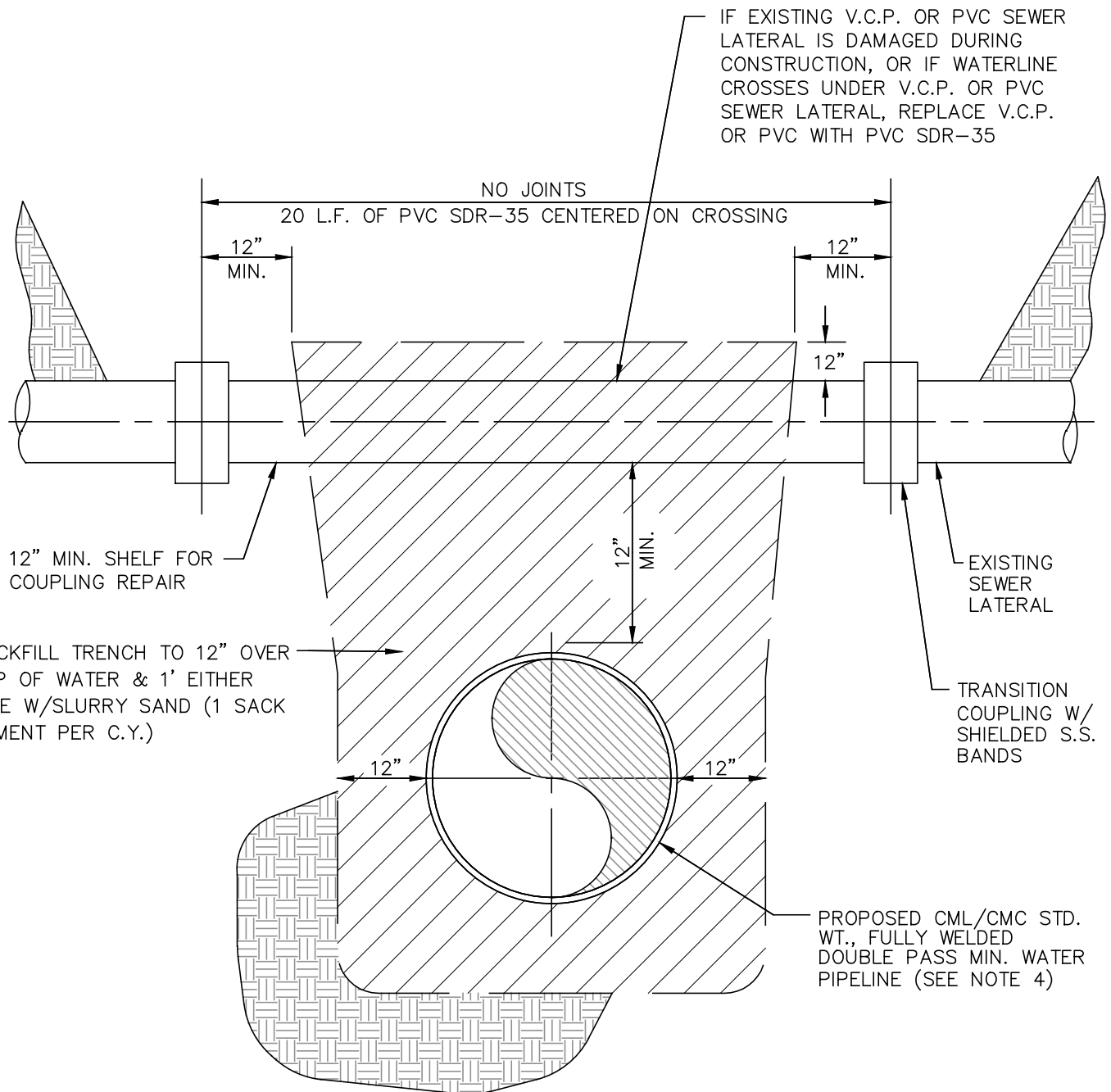
CALIFORNIA

DRAWING NO.

A-9

W.O. 19-0248

REV.



NOTES:

1. TYPICAL CASE SHOWN IS FOR NEW WATER PIPELINE AND EXISTING SEWER LINE.
2. THERE SHALL BE NO JOINTS ALLOWED ON WATER PIPELINE WITHIN 10' EITHER SIDE OF EXISTING SEWER LINE EXCEPT FULLY WELDED (DOUBLE PASS) JOINTS.
3. THIS STANDARD SHALL APPLY TO EXISTING SEWER MAIN LINE CROSSING AS WELL AS EXISTING SEWER LATERALS.
4. WATERLINE CROSSING UNDER A SEWERLINE SHALL MEET ALL DIVISION OF DRINKING WATER, STATE WATER RESOURCES CONTROL BOARD REQUIREMENTS.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

TYPICAL WATERMAIN CROSSING UNDER SEWER LATERAL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

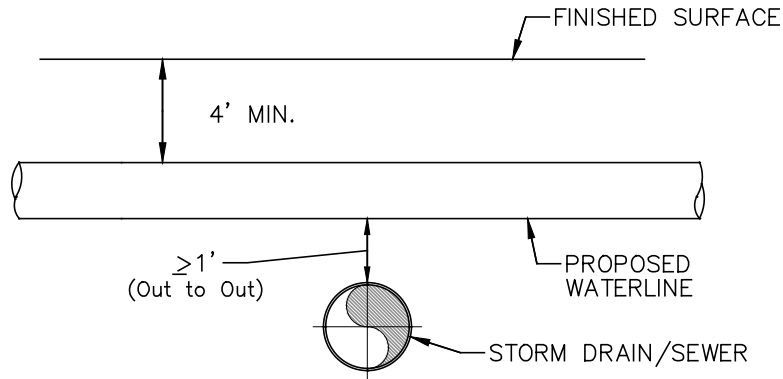
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A-10

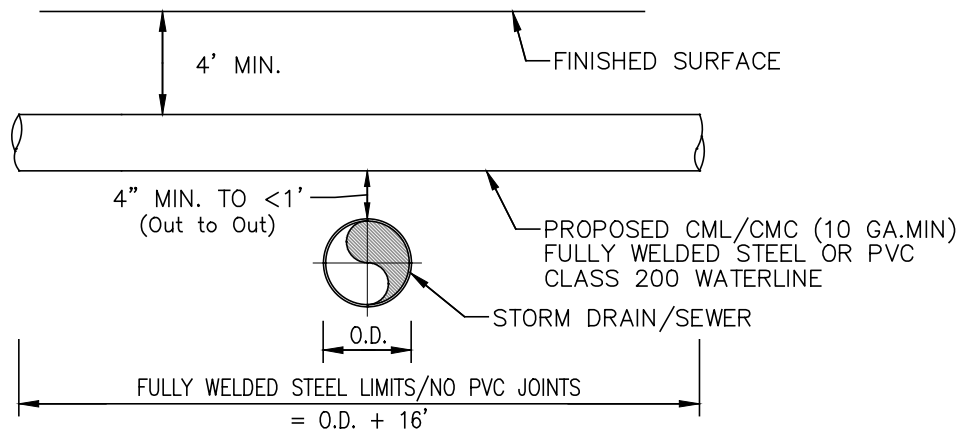
W.O. 19-0248

REV.

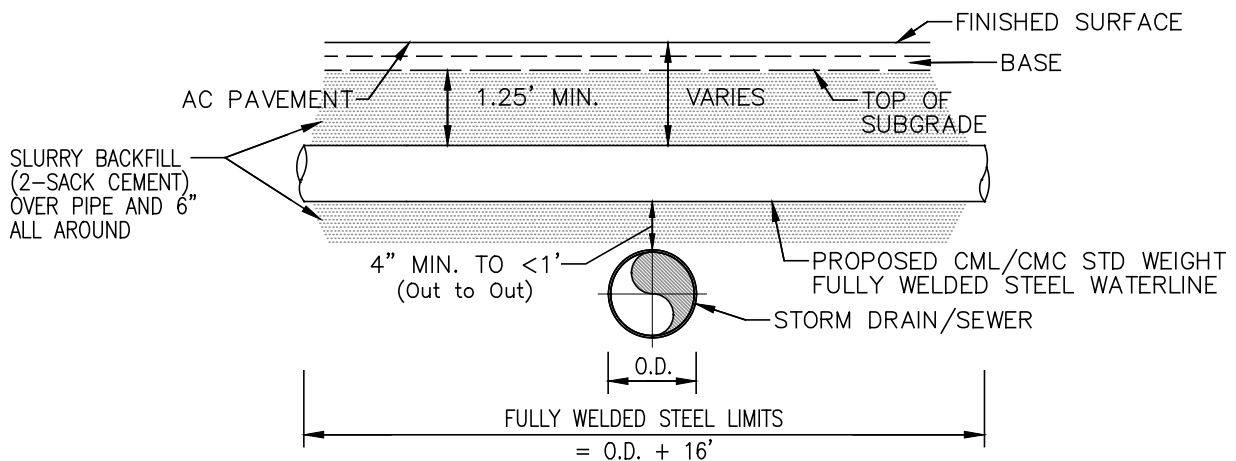
TYPE - 1 STANDARD COVER AND STANDARD SEPARATION



TYPE - 2 STANDARD COVER AND MINIMUM SEPARATION



TYPE - 3 SHALLOW COVER AND MINIMUM SEPARATION



NOTES:

1. WHEN A HIGHPOINT OVER THE STORM DRAIN/SEWER IS CREATED, FOR TYPE-3, A SPECIAL CONSTRUCTION CALLOUT WILL BE NECESSARY ON THE PLANS TO PROTECT IN PLACE THE AIR VALVE DURING CONSTRUCTION.
2. WHEN A CROSSING OCCURS NEAR A TEE OR CROSS, FOR TYPE-3, THE USE OF A BUTTERFLY VALVE IN LIEU OF A GATE VALVE MAY BE REQUIRED, PER DISTRICT APPROVAL.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

WATERLINES CROSSING OVER STORM DRAINS/SEWERS

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

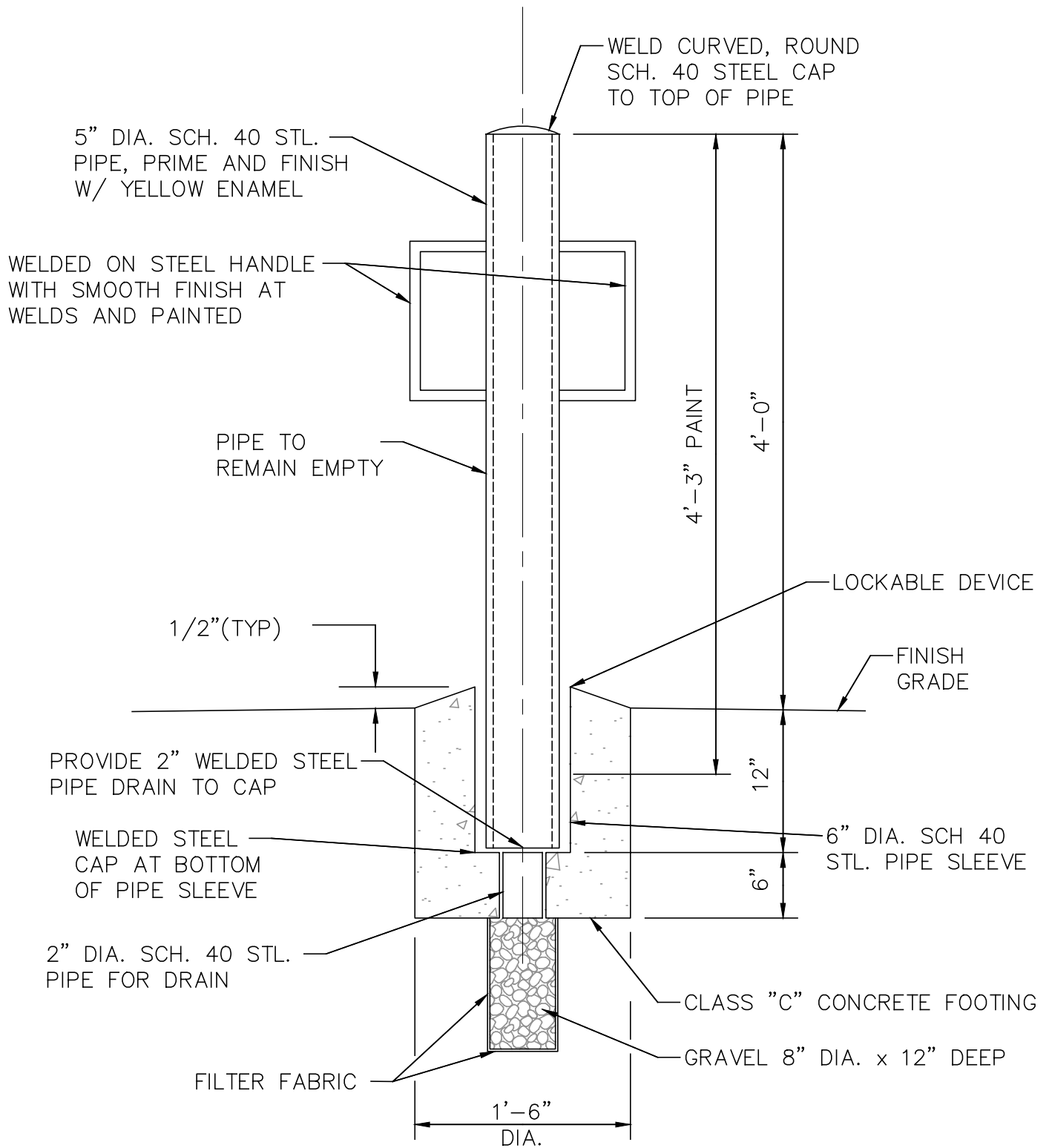
CALIFORNIA

DRAWING NO.

A-11

W.O. 19-0248

REV.



NOTES:

LOCKABLE DEVICE SHALL BE APPROVED BY JCSD

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos
Sinnaro Yos, P.E. C68607

REMOVABLE GUARD POST DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

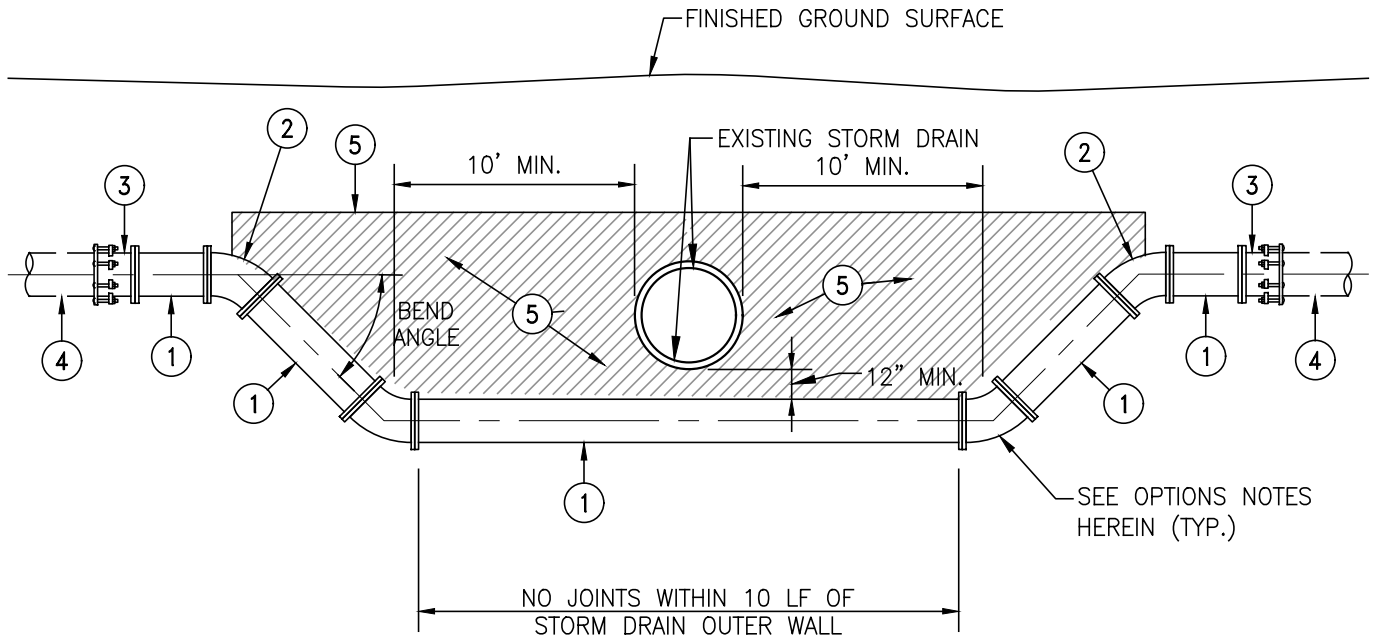
CALIFORNIA

DRAWING NO.

A-12

W.O. 19-0248

REV.



OPTIONS

- (A) NO JOINTS WITHIN 10' OF STORM DRAIN, OR;
- (B) IF JOINTS MUST FALL WITHIN 10' OF STORM DRAIN, JOINTS SHALL BE FULLY WELDED, DOUBLE PASS MINIMUM.

NOTE: JOINTS WITHIN 10" OF STORM DRAIN OUTER WALL MUST BE DOUBLE-PASS WELDED

ITEM	DESCRIPTION
(1)	FLANGED CML & CMC STD. WT. STEEL WATERMAIN
(2)	FLANGED 11.25°, 22.5°, 45° CML & CMC STD. WT. LONG RADIUS ELBOW.
(3)	FULLY-RESTRAINED MJxFL PVC/STEEL TRANSITION COUPLING
(4)	PVC C909 WATERMAIN
(5)	SLURRY BACKFILL (2-SACK CEMENT SLURRY)

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

WATER MAIN CROSSING UNDER STORM DRAIN

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

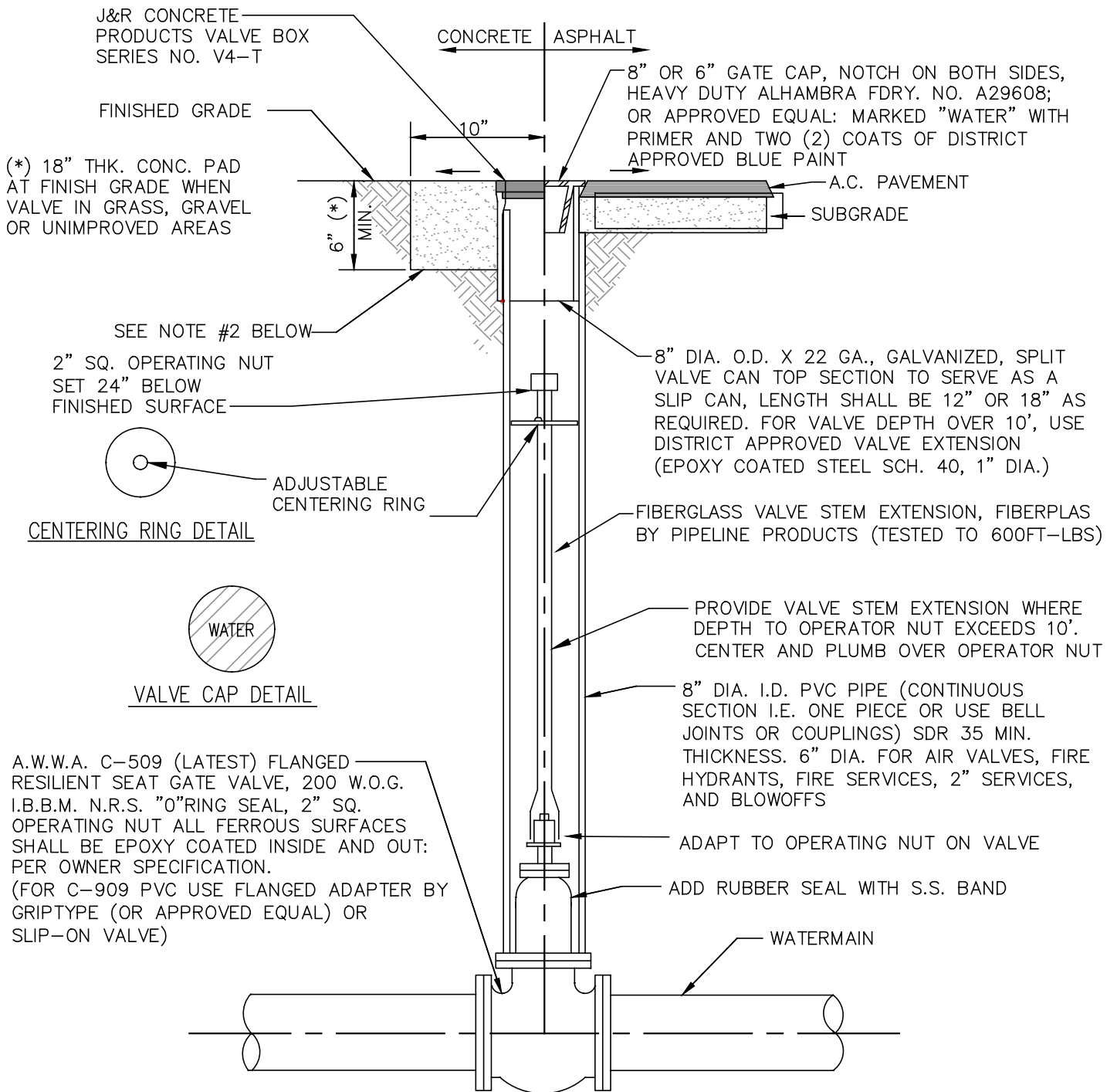
CALIFORNIA

DRAWING NO.

A-13

W.O. 19-0248

REV.



NOTES:

1. VALVE MARKER PER STD. NO. A-3 TO BE INSTALLED AS DIRECTED BY THE DISTRICT.
2. CLASS "B" CONCRETE PAD, 20" SQ. POUR AGAINST WELL COMPACTED EARTH, 90% MIN. RELATIVE COMPACTION AT FINISHED GRADE IN NON-PAVED AREAS.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

GATE VALVE INSTALLATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

B-1

W.O. 19-0248

REV.

STANDARD DRAWING NO. B-2 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

GATE VALVE INSTALLATION FOR
P.V.C. WATERMAINS

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

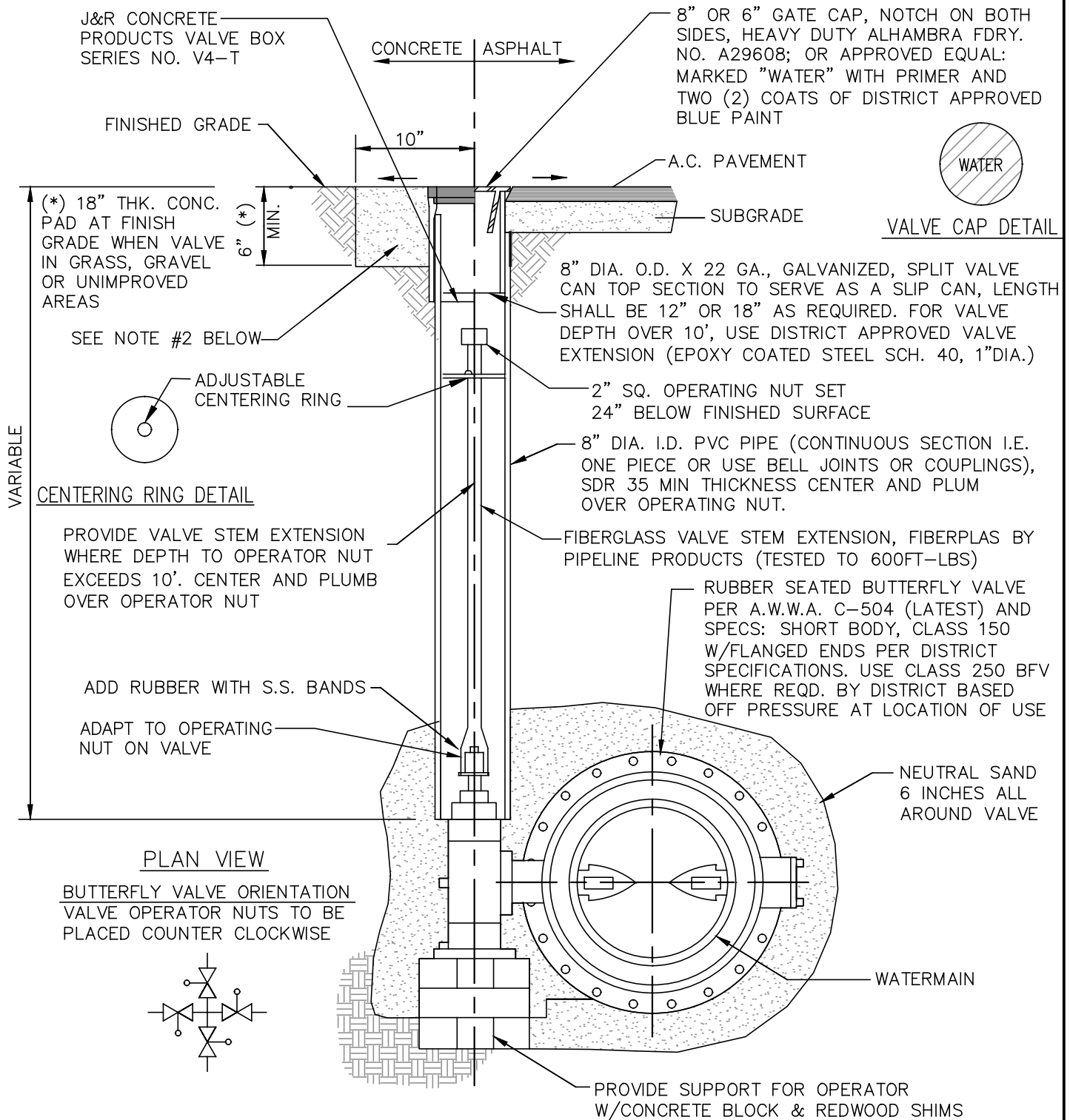
CALIFORNIA

DRAWING NO.

B-2

W.O. 19-0248

REV.



JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos
Sinnaro Yos, P.E. C68607

BUTTERFLY VALVE INSTALLATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

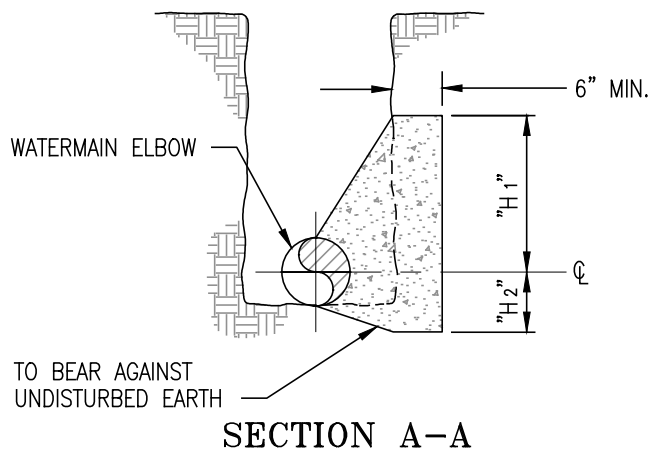
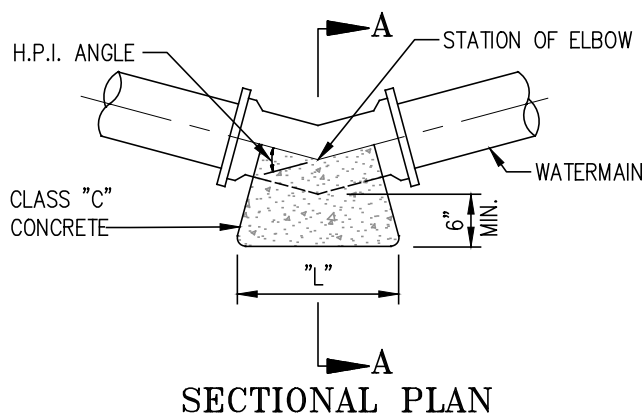
CALIFORNIA

DRAWING NO.

B-3

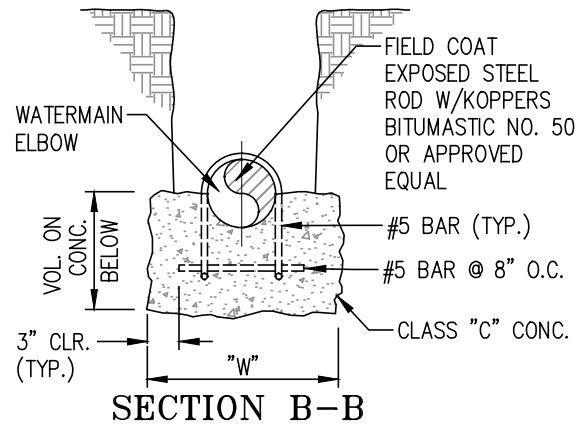
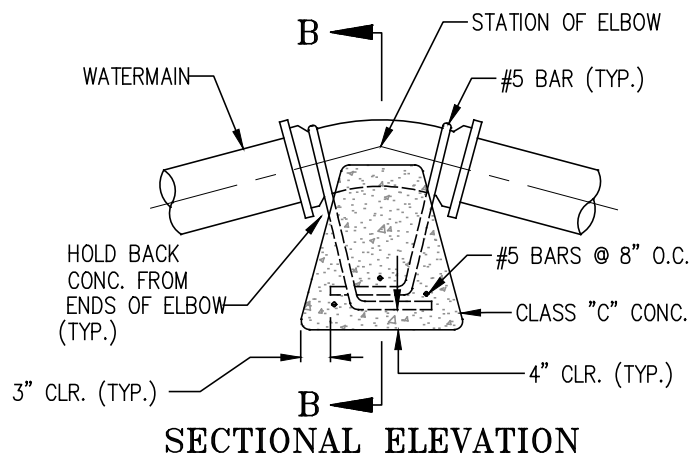
W.O. 19-0248

REV.



HORIZONTAL THRUST BLOCK

PIPE DIA.	"H1"	"H2"	"L"	H.P.I. ANGLE
4"	1/2" OD	1/2" OD	4'-0"	5° TO 41°
4"	4"	4"	4'-0"	42° TO 83°
4"	10"	5"	4'-0"	84° TO 104°
6"	1/2" OD	1/2" OD	4'-0"	5° TO 27°
6"	6"	6"	4'-0"	28° TO 51°
6"	1'-6"	9"	4'-0"	52° TO 90°
8"	1/2" OD	1/2" OD	4'-0"	5° TO 20°
8"	8"	8"	4'-0"	21° TO 36°
8"	1'-8"	10"	4'-0"	37° TO 54°
8"	2'-2"	13"	4'-0"	55° TO 78°
8"	2'-8"	16"	4'-0"	79° TO 111°
10"	1/2" OD	1/2" OD	4'-0"	5° TO 16°
10"	10"	10"	4'-0"	17° TO 28°
10"	1'-10"	11"	4'-0"	29° TO 39°
10"	2'-4"	14"	4'-0"	40° TO 53°
10"	2'-10"	17"	4'-0"	54° TO 70°
10"	2'-10"	17"	6'-0"	71° TO 120°
12"	1/2" OD	1/2" OD	4'-0"	5° TO 13°
12"	12"	12"	4'-0"	14° TO 22°
12"	2'-0"	12"	4'-0"	23° TO 30°
12"	2'-6"	15"	4'-0"	31° TO 40°
12"	3'-0"	18"	4'-0"	41° TO 52°
12"	3'-0"	18"	6'-0"	53° TO 83°



VERTICAL ANCHOR BLOCK

PIPE DIA.	"W"	VOLUME OF CONC. CF	GRADE% DIFFERENCE
4"	1'-6"	4 : 3	5 TO 15
4"	1'-6"	6 : 5	16 TO 25
4"	1'-6"	8 : 6	26 TO 35
4"	1'-6"	10 : 8	36 TO 45
4"	1'-6"	13 : 0	46 TO 55
4"	1'-6"	15 : 1	56 TO 65
6"	2'-0"	7 : 6	5 TO 10
6"	2'-0"	11 : 4	11 TO 25
6"	2'-0"	15 : 2	26 TO 40
6"	2'-0"	22 : 8	41 TO 55
8"	2'-0"	10 : 3	5 TO 10
8"	2'-0"	15 : 5	11 TO 20
8"	2'-0"	20 : 6	21 TO 30
8"	2'-0"	31 : 0	31 TO 40
8"	2'-0"	41 : 3	41 TO 55
10"	2'-6"	20 : 9	5 TO 15
10"	2'-6"	27 : 8	16 TO 25
10"	2'-6"	41 : 7	26 TO 35
10"	2'-6"	55 : 6	36 TO 45
10"	2'-6"	69 : 5	46 TO 55
12"	2'-6"	27 : 6	5 TO 15
12"	2'-6"	36 : 8	16 TO 25
12"	2'-6"	55 : 3	26 TO 35
12"	2'-6"	73 : 7	36 TO 45
12"	2'-6"	92 : 1	46 TO 55

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

THRUST BLOCKS FOR D.I.P. PIPELINES, CLASS 200 P.S.I. MAX.

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

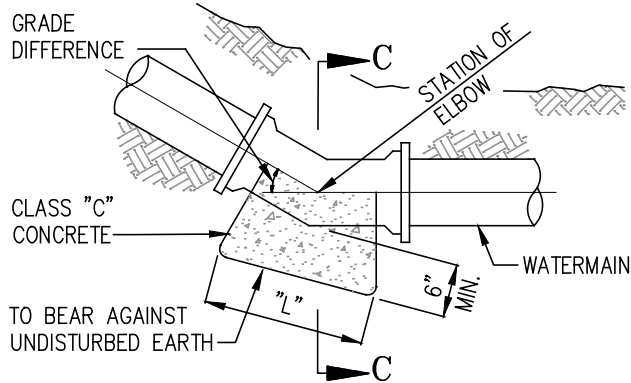
DRAWING NO.

C-1

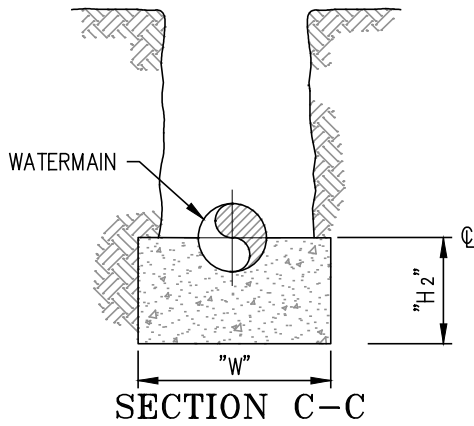
SHEET 1 OF 2

W.O. 19-0248

REV.



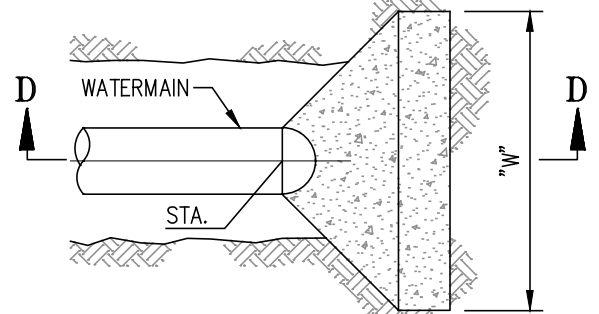
SECTIONAL ELEVATION



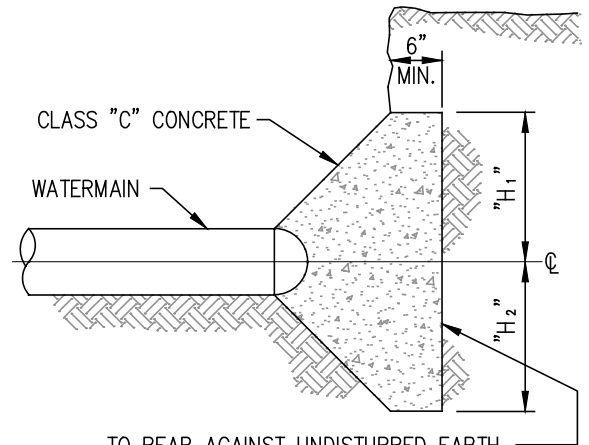
SECTION C-C

VERTICAL BEARER BLOCK

PIPE DIA.	"W"	"H 2"	"L"	GRADE % DIFF.
4"	1'-6"	8"	12"	5 TO 60
6"	2'-0"	9"	12"	5 TO 40
6"	2'-0"	9"	1'-6"	41 TO 55
8"	2'-0"	10"	12"	5 TO 25
8"	2'-0"	10"	1'-6"	26 TO 40
8"	2'-0"	10"	2'-0"	41 TO 55
10"	2'-6"	14"	12"	5 TO 10
10"	2'-6"	14"	2'-0"	11 TO 40
10"	2'-6"	14"	3'-0"	41 TO 60
12"	2'-6"	15"	2'-0"	5 TO 25
12"	2'-6"	15"	3'-0"	26 TO 45
12"	2'-6"	15"	4'-0"	46 TO 60



SECTIONAL PLAN

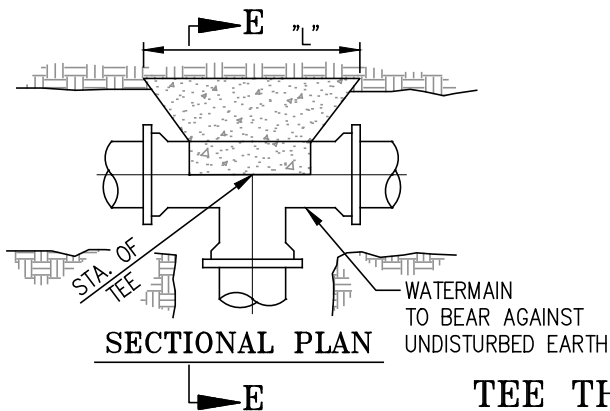


TO BEAR AGAINST UNDISTURBED EARTH

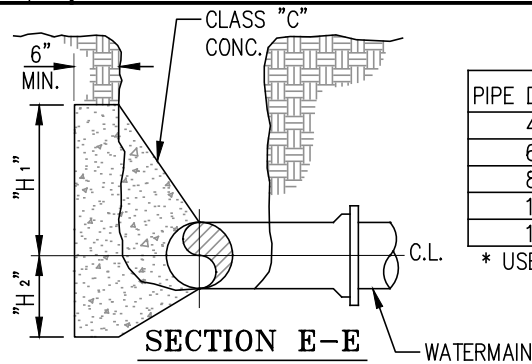
SECTION D-D

END THRUST BLOCK

PIPE DIA.	"H 1"	"H 2"	"W"
4"	9"	6"	3'-6"
6"	1'-6"	9"	4'-0"
8"	2'-2"	13"	4'-0"
10"	2'-10"	17"	4'-0"
12"	3'-0"	1'-6"	5'-0"



SECTIONAL PLAN



SECTION E-E

TEE THRUST BLOCK

PIPE DIA.*	"H 1"	"H 2"	"W"
4"	9"	6"	3'-6"
6"	1'-6"	9"	4'-0"
8"	2'-2"	13"	4'-0"
10"	2'-10"	17"	4'-0"
12"	3'-0"	1'-6"	5'-0"

* USE OUTLET PIPE DIAMETER

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

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THRUST BLOCKS FOR D.I.P. PIPELINES, CLASS 200 P.S.I. MAX.

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

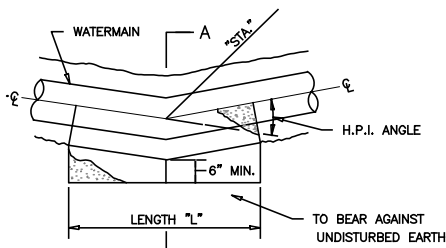
DRAWING NO.

C-1

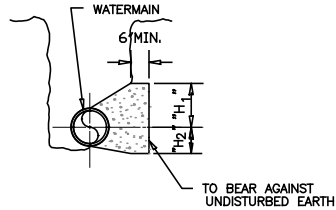
SHEET 2 OF 2

W.O. 19-0248

REV.

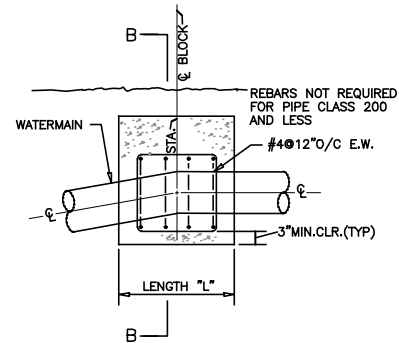


SECTIONAL PLAN

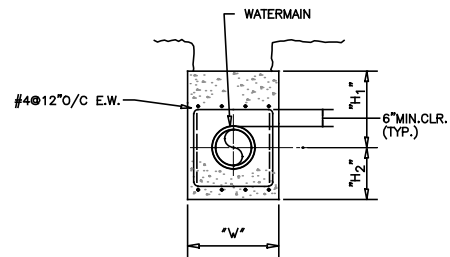


SECTION A-A

HORIZONTAL THRUST BLOCK					
PIPE DIA.	"H ₁ "	"H ₂ "	"L"	H.P.I. ANGLE (DEGREES)	
				CL. 150	GREATER THAN CL.150 UP TO CL.200
				MINIMUM PIPELINE COVER	DESIGN COVER
6"φ & 8"φ	9"	9"	2'-0"	2.5'	2.5'
	9"	9"	4'-0"	5'-21"	5'-16"
	9"	9"	6'-0"	22'-43"	17'-32"
	2'-0"	1'-0"	5'-0"	44'-67"	33'-49"
	2'-0"	1'-3"	7'-0"	68'-101"	50'-70"
10"φ & 12"φ	1'-0"	1'-0"	2'-0"	3.0'	3.0'
	1'-0"	1'-0"	4'-0"	5'-15"	5'-11"
	1'-0"	1'-0"	6'-0"	16'-31"	12'-23"
	3'-0"	1'-6"	4'-0"	32'-48"	24'-36"
	3'-0"	1'-6"	6'-0"	49'-58"	37'-42"
14"φ & 16"φ	1'-6"	1'-6"	2'-0"	3.5'	3.5'
	1'-6"	1'-6"	4'-0"	5'-15"	5'-11"
	1'-6"	1'-6"	6'-0"	16'-32"	12'-24"
	3'-6"	1'-9"	6'-0"	33'-49"	25'-36"
	3'-6"	1'-9"	8'-0"	50'-70"	37'-51"
18"φ & 20"φ	1'-6"	1'-6"	3'-0"	3.5'	3.5'
	1'-6"	1'-6"	6'-0"	4'-15"	4'-11"
	4'-0"	2'-0"	5'-0"	16'-32"	12'-23"
	4'-0"	2'-0"	7'-0"	33'-41"	24'-30"
	4'-0"	2'-0"	9'-0"	42'-59"	31'-43"
21"φ & 24"φ	1'-6"	1'-6"	4'-0"	3.5'	3.5'
	1'-6"	1'-6"	8'-0"	16'-30"	12'-22"
	4'-0"	2'-0"	10'-0"	31'-38"	23'-28"
	4'-0"	2'-0"	12'-0"	39'-48"	29'-36"
	4'-0"	2'-0"	14'-0"	49'-62"	37'-45"
27"φ & 30"φ	1'-6"	1'-6"	4'-0"	3.5'	3.5'
	1'-6"	1'-6"	8'-0"	16'-30"	12'-22"
	4'-0"	2'-0"	10'-0"	31'-38"	23'-28"
	4'-0"	2'-0"	12'-0"	39'-48"	29'-36"
	4'-0"	2'-0"	14'-0"	49'-62"	37'-45"
33"φ & 36"φ	1'-6"	1'-6"	4'-0"	3.5'	3.5'
	1'-6"	1'-6"	8'-0"	16'-30"	12'-22"
	4'-0"	2'-0"	10'-0"	31'-38"	23'-28"
	4'-0"	2'-0"	12'-0"	39'-48"	29'-36"
	4'-0"	2'-0"	14'-0"	49'-62"	37'-45"



SECTIONAL ELEVATION



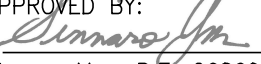
SECTION B-B

VERTICAL ANCHOR BLOCK						
PIPE DIA.	"H ₁ "	"H ₂ "	"W"	"L"	GRADE DIFFERENCE (%)	
					CL. 150	GREATER THAN CL.150 UP TO CL.200
6"φ & 8"φ	2'-0"	2'-0"	2'-0"	1'-6"	4%-24%	4%-17%
	2'-0"	2'-0"	2'-0"	2'-6"	25%-41%	18%-30%
	2'-0"	2'-0"	2'-0"	3'-6"	42%-63%	31%-43%
	2'-0"	2'-0"	2'-0"	5'-6"	64%-154%	44%-81%
	2'-0"	2'-0"	2'-0"	7'-0"		82%-130%
10"φ & 12"φ	2'-6"	2'-6"	3'-0"	2'-0"	4%-25%	4%-19%
	2'-6"	2'-6"	3'-0"	3'-0"	26%-40%	20%-29%
	2'-6"	2'-6"	3'-0"	4'-6"	41%-68%	30%-46%
	2'-6"	2'-6"	3'-0"	6'-6"	69%-141%	47%-77%
	3'-0"	3'-0"	3'-0"	7'-0"		78%-132%
14"φ & 16"φ	3'-0"	3'-0"	4'-0"	2'-0"	4%-23%	4%-17%
	3'-0"	3'-0"	4'-0"	3'-6"	25%-42%	18%-30%
	3'-0"	3'-0"	4'-0"	5'-0"	43%-67%	31%-46%
	3'-0"	3'-0"	4'-0"	7'-0"	68%-127%	47%-73%
	3'-0"	3'-0"	4'-0"	10'-0"		74%-157%
18"φ & 20"φ	3'-0"	3'-0"	4'-6"	3'-0"	4%-24%	4%-18%
	3'-0"	3'-0"	4'-6"	5'-0"	25%-42%	19%-30%
	3'-0"	3'-0"	4'-6"	7'-0"	43%-66%	31%-45%
	3'-0"	3'-0"	4'-6"	10'-0"	67%-128%	46%-73%
	3'-0"	3'-0"	4'-6"	13'-0"		74%-120%
21"φ & 24"φ	3'-0"	3'-0"	5'-0"	3'-0"	4%-18%	4%-13%
	3'-0"	3'-0"	5'-0"	5'-0"	19%-31%	14%-22%
	3'-0"	3'-0"	5'-0"	7'-0"	32%-45%	23%-32%
	3'-0"	3'-0"	5'-0"	9'-0"	46%-63%	33%-43%
	3'-0"	3'-0"	5'-0"	11'-0"	64%-85%	44%-56%
27"φ & 30"φ	3'-0"	3'-0"	5'-0"	14'-0"	86%-148%	57%-79%
	3'-6"	3'-6"	5'-0"	15'-0"		80%-129%
	3'-6"	3'-6"	6'-0"	3'-0"	4%-15%	4%-11%
	3'-6"	3'-6"	6'-0"	5'-0"	16%-27%	12%-20%
	3'-6"	3'-6"	6'-0"	7'-0"	28%-39%	21%-28%
33"φ & 36"φ	3'-6"	3'-6"	6'-0"	9'-0"	40%-53%	29%-37%
	3'-6"	3'-6"	6'-0"	11'-0"	54%-70%	38%-47%
	3'-6"	3'-6"	6'-0"	13'-0"	71%-93%	48%-59%
	3'-6"	3'-6"	6'-0"	15'-0"	94%-127%	60%-73%
	4'-0"	4'-0"	6'-0"	16'-0"		74%-101%
33"φ & 36"φ	4'-0"	4'-0"	6'-0"	18'-0"		102%-133%
	3'-6"	3'-6"	7'-0"	4'-0"	4%-17%	4%-12%
	3'-6"	3'-6"	7'-0"	6'-0"	18%-26%	13%-19%
	3'-6"	3'-6"	7'-0"	8'-0"	27%-35%	20%-26%
	3'-6"	3'-6"	7'-0"	10'-0"	36%-45%	27%-32%
	3'-6"	3'-6"	7'-0"	13'-0"	46%-63%	33%-44%
	4'-0"	4'-0"	7'-0"	14'-0"	64%-91%	45%-58%
	4'-0"	4'-0"	7'-0"	16'-0"	92%-120%	59%-71%
	4'-0"	4'-0"	7'-0"	18'-0"		72%-85%
	4'-0"	4'-0"	7'-0"	21'-0"		86%-116%

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

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Sinnaro Yos, P.E. C68607

THRUST BLOCKS FOR WELDED STEEL PIPELINES, CLASS 200 P.S.I. MAX.

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

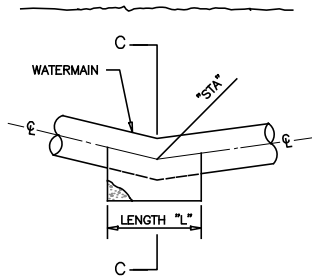
DRAWING NO.

C-2

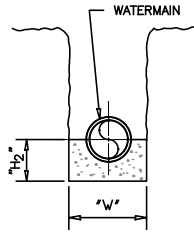
SHEET 1 OF 3

W.O. 19-0248

REV.

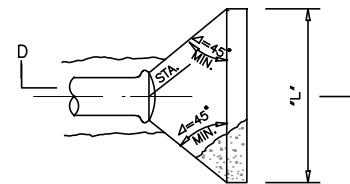


SECTIONAL ELEVATION

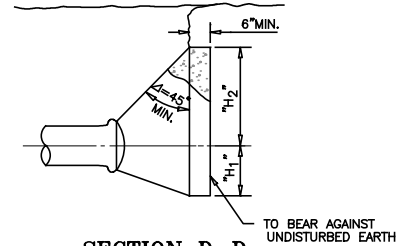


SECTION C-C

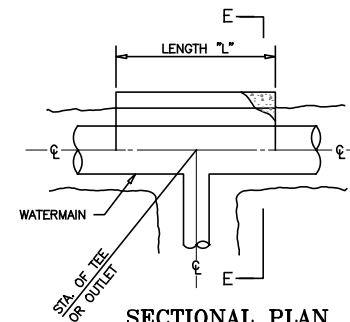
VERTICAL BEARER BLOCK					
PIPE DIA.	"H ₂ "	"W"	"L"	GRADE DIFFERENCE (%)	
				CL. 150	GREATER THAN CL.150 UP TO CL.200
6"φ & 8"φ	1'-0"	2'-0"	0'-6"	4%-43%	4%-31%
	1'-0"	2'-0"	1'-0"	44%-131%	32%-74%
	1'-0"	2'-0"	1'-6"		75%-202%
10"φ & 12"φ	1'-0"	2'-6"	1'-0"	4%-49%	4%-35%
	1'-0"	2'-6"	1'-6"	50%-88%	36%-57%
	1'-0"	2'-6"	2'-0"	89%-189%	58%-88%
14"φ & 16"φ	1'-0"	2'-6"	2'-6"		89%-142%
	1'-6"	3'-0"	1'-0"	4%-31%	4%-22%
	1'-6"	3'-0"	1'-6"	32%-50%	23%-35%
18"φ & 20"φ	1'-6"	3'-0"	2'-0"	51%-74%	36%-50%
	1'-6"	3'-0"	3'-0"	76%-201%	51%-90%
	1'-6"	3'-0"	4'-0"		91%-201%
21"φ & 24"φ	1'-6"	3'-0"	1'-6"	4%-29%	4%-21%
	1'-6"	3'-0"	2'-0"	30%-41%	22%-29%
	1'-6"	3'-0"	2'-6"	42%-54%	30%-38%
27"φ & 30"φ	1'-6"	3'-0"	3'-0"	55%-69%	39%-47%
	1'-6"	3'-0"	4'-0"	70%-118%	48%-69%
	1'-6"	3'-0"	5'-0"		70%-102%
33"φ & 36"φ	1'-6"	3'-0"	6'-0"		103%-168%
	1'-6"	3'-6"	1'-6"	4%-23%	4%-17%
	1'-6"	3'-6"	2'-6"	24%-41%	18%-30%
21"φ & 24"φ	1'-6"	3'-6"	3'-6"	42%-64%	31%-44%
	1'-6"	3'-6"	4'-6"	65%-97%	45%-61%
	1'-6"	3'-6"	5'-6"	98%-162%	62%-82%
27"φ & 30"φ	1'-6"	3'-6"	7'-0"		83%-139%
	2'-0"	4'-6"	2'-0"	4%-26%	4%-19%
	2'-0"	4'-6"	3'-0"	27%-41%	20%-30%
33"φ & 36"φ	2'-0"	4'-6"	4'-0"	42%-59%	31%-41%
	2'-0"	4'-6"	5'-0"	60%-82%	42%-54%
	2'-0"	4'-6"	6'-6"	83%-147%	55%-79%
21"φ & 24"φ	2'-0"	4'-6"	7'-6"		80%-102%
	2'-0"	4'-6"	8'-6"		103%-138%
	2'-0"	5'-6"	2'-0"	4%-22%	4%-16%
27"φ & 30"φ	2'-0"	5'-6"	3'-6"	23%-41%	17%-30%
	2'-0"	5'-6"	5'-0"	42%-64%	31%-44%
	2'-0"	5'-6"	6'-6"	65%-99%	45%-62%
33"φ & 36"φ	2'-0"	5'-6"	8'-0"	100%-172%	63%-85%
	2'-0"	5'-6"	9'-6"		86%-121%



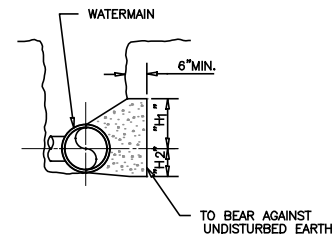
SECTIONAL PLAN



SECTION D-D



SECTIONAL PLAN



SECTION E-E

END THRUST BLOCK & TEE THRUST BLOCK				
PIPE DIA.	"H ₁ "	"H ₂ "	LENGTH "L"	
			CL.150	GREATER THAN CL.150 UP TO CL.200
6"φ & 8"φ	2'-0"	1'-0"	2.5'	2.5'
			3'-0"	4'-0"
10"φ & 12"φ	2'-0"	1'-0"	3.0'	3.0'
			5'-6"	7'-6"
14"φ & 16"φ	3'-0"	1'-6"	3.5'	3.5'
			6'-0"	8'-0"
18"φ & 20"φ	3'-6"	1'-9"	3.5'	3.5'
			7'-6"	10'-0"
21"φ & 24"φ	4'-0"	2'-0"	3.5'	3.5'
			9'-6"	12'-6"
27"φ & 30"φ	4'-6"	2'-3"	4.0'	4.0'
			11'-6"	15'-6"
33"φ & 36"φ	5'-0"	2'-6"	4.0'	4.5'
			14'-6"	17'-6"

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:
Sinnaro Yos, P.E. C68607

THRUST BLOCKS FOR WELDED STEEL PIPELINES, CLASS 200 P.S.I. MAX.

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

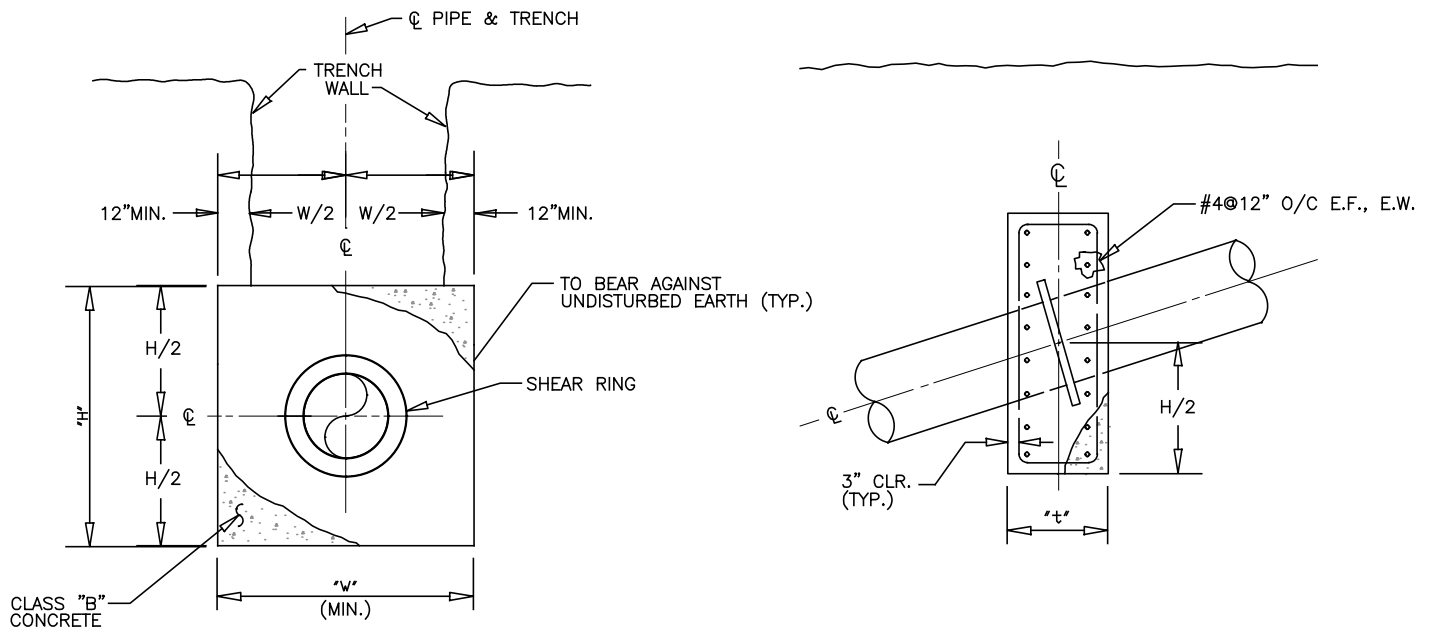
CALIFORNIA

DRAWING NO.

C-2

SHEET 2 OF 3

W.O. 19-0248



SHEAR RING BLOCK						
PIPE DIA.	CL. 150			GREATER THAN CL.150 UP TO CL. 200		
	MINIMUM		DESIGN	PIPELINE COVER		
	"H"	"W"		"H"	"W"	
6"ø & 8"ø	2'-6"	4'-6"	12"	2'-6"	5'-6"	12"*
10"ø & 12"ø	3'-6"	5'-6"	12"	3'-6"	7'-0"	12"*
14"ø & 16"ø	4'-0"	8'-0"	12"	4'-0"	9'-0"	15"*
18"ø & 20"ø	5'-0"	8'-6"	15"*	6'-0"	9'-0"	18"*
21"ø & 24"ø	6'-0"	9'-6"	21"*	7'-0"	10'-6"	21"*
27"ø & 30"ø	8'-0"	9'-6"	22"*	8'-6"	11'-6"	27"*
33"ø & 36"ø	9'-0"	11'-6"	24"*	10'-0"	12'-6"	30"*

* USE REBAR #4 @ 12" O/C E.F. & E.W.

NOTES:

- ALL THRUST BLOCKS SHALL BE A MINIMUM OF CLASS "C" CONCRETE (4.0 SACKS MIX) AS PER SPECIFICATIONS, EXCEPT SHEAR RING BLOCK WHICH SHALL BE A MINIMUM OF CLASS "B" CONCRETE (5.0 SACKS MIX).
- RE-BAR SHALL BE INTERMEDIATE GRADE DEFORMED BARS CONFORMING TO A.S.T.M. SPEC. A-15 & A-305.
- RE-BAR LAP LENGTH = 18" MIN. OR 36 x RE-BAR DIA., WHICHEVER IS GREATER.
- REBARS ARE REQUIRED FOR SHEAR RING BLOCKS AS NOTED.
- HORIZONTAL THRUST BLOCKS, TEE & END BLOCKS, & SHEAR RING BLOCKS.
 - THE ALLOWABLE LATERAL BEARING PRESSURE AGAINST UNDISTURBED EARTH (P_p) USED IN DESIGN OF BLOCKS IS 333 LBS./SQ. FT./FT. OF DEPTH.
 - THE ALLOWABLE LATERAL BEARING PRESSURE WAS DETERMINED BY USING THE MINIMUM DESIGN PIPELINE COVER AS SHOWN IN THE THRUST BLOCK TABLES.
 - THE TOTAL RESULTANT THRUST FOR HORIZONTAL ANGLES WAS DETERMINED USING THE RELATIONSHIP

$$HT = 2P \frac{T}{4} D^2 \sin \frac{\Delta}{2}$$
 WHERE HT= TOTAL HORIZONTAL THRUST, LBS.
 D= INSIDE DIAMETER, IN.
 P= INTERNAL PRESSURE, P.S.I.
 Δ= H.P.I., DEGREES.
- VERTICAL BEARING BLOCK & VERTICAL ANCHOR BLOCK,
 - THE ALLOWABLE FOUNDATION PRESSURE AGAINST UNDISTURBED EARTH (P_p) USED FOR DETERMINING THE REQUIRED BEARING BLOCK IS 3000 LBS./SQ.FT.
 - THE TOTAL RESULTANT THRUST FOR VERTICAL ANGLES WAS APPROXIMATED USING THE RELATIONSHIP

$$VT = P \frac{T}{4} D^2 \sin \Delta$$
 WHERE VT= TOTAL VERTICAL THRUST, LBS.
 D= INSIDE PIPE DIAMETER, IN.
 P= INTERNAL PRESSURE, P.S.I.
 Δ= V.P.I., DEGREES.
 g= GRADE DIFFERENCE (%).

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

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THRUST BLOCKS FOR WELDED STEEL PIPELINES, CLASS 200 P.S.I. MAX.

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

C-2

SHEET 3 OF 3

W.O. 19-0248

REV.

MINIMUM PIPE WELDING LENGTHS FOR RESISTANCE

	INSTALLATIONS FOR CLASS 150 UP TO CLASS 200 (MAX.)			
PIPE DIA.	ANGLE OF BEND*			
	0-22.5°	22.5-45°	45-67.5°	67.5-90°
4"	5'	15'	35'	55'
6"	10'	25'	50'	80'
8"	10'	30'	65'	100'
10"	10'	40'	80'	125'
12"	10'	40'	80'	125'
14"	15'	40'	80'	130'
16"	15'	45'	95'	150'
18"	15'	50'	105'	165'
20"	15'	55'	115'	180'
24"	20'	65'	135'	215'
30"	20'	80'	160'	260'
36"	25'	90'	190'	305'

* AT THE BREAK POINT ANGLES (i.e: 22.5°, 45°, AND 67.5°) THE CONTRACTOR SHALL USE THE THRUST RESTRAINT COLUMN SHOWING THE LONGEST WELD LENGTH.

GENERAL NOTES

1. WELDED PIPE LENGTHS TO BE USED ONLY UPON APPROVAL BY J.C.S.D.
2. WELDED LENGTHS INDICATED ARE TO BE PROVIDED ON EACH SIDE OF BEND.
3. ALL JOINTS WITHIN THE LENGTHS INDICATED SHALL BE FULL WELD, DOUBLE PASS.
4. "DEAD END" THRUST IS EQUIVALENT TO A 90° BEND.
5. FOR SERVICE LATERALS, INCLUDING FIRE HYDRANTS, FIRE SERVICES, BLOW-OFFS ETC., FULLY WELD ALL MAINLINE JOINTS (DOUBLE PASS) 10' MINIMUM EACH SIDE OF TEE OUTLET.

THE FOLLOWING ASSUMPTIONS APPLY

1. LENGTH OF WELDED PIPE IS FOR EACH SIDE OF BEND USING THE FOLLOWING EQUATION:

$$L = 1.5PA (1 - \cos \Delta) / [U(2W_e + W_w + W_p)]$$

WHERE: P = MAXIMUM TEST PRESSURE (PSI)

A = CROSS-SECTION AREA OF THE PIPE (SQ. IN.)

Δ = ANGLE OF BEND (DEGREES)

U = COEFF. OF FRICTION BETWEEN PIPE AND SOIL (ASSUMED 0.3)

W_e = WEIGHT OF THE PRISM OR SOIL OVER THE PIPE (LB/FT.) OF PIPE LENGTH
(WT. OF SOIL ASSUMED TO BE 110 LB/CU. FT.)

W_p = WEIGHT OF THE PIPE (LB/FT)

W_w = WEIGHT OF THE CONTAINED WATER (LB/FT)

2. 3' MINIMUM PIPE COVER FOR PIPE DIAMETERS < 12", 4' MINIMUM PIPE COVER FOR PIPE DIAMETERS > 12".
3. FACTOR OF SAFETY = 1.5 TIMES MAXIMUM DESIGN PRESSURE. (200 PSI)
4. MAXIMUM ANGLE (?) USED FOR EACH RANGE SHOWN.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

MINIMUM PIPE WELDING LENGTH FOR THRUST RESTRAINT

DRAWING NO.

C-2A

APPROVED BY:

Sinnaro Yos
Sinnaro Yos, P.E. C68607

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

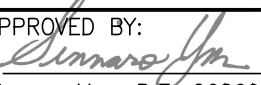
CALIFORNIA

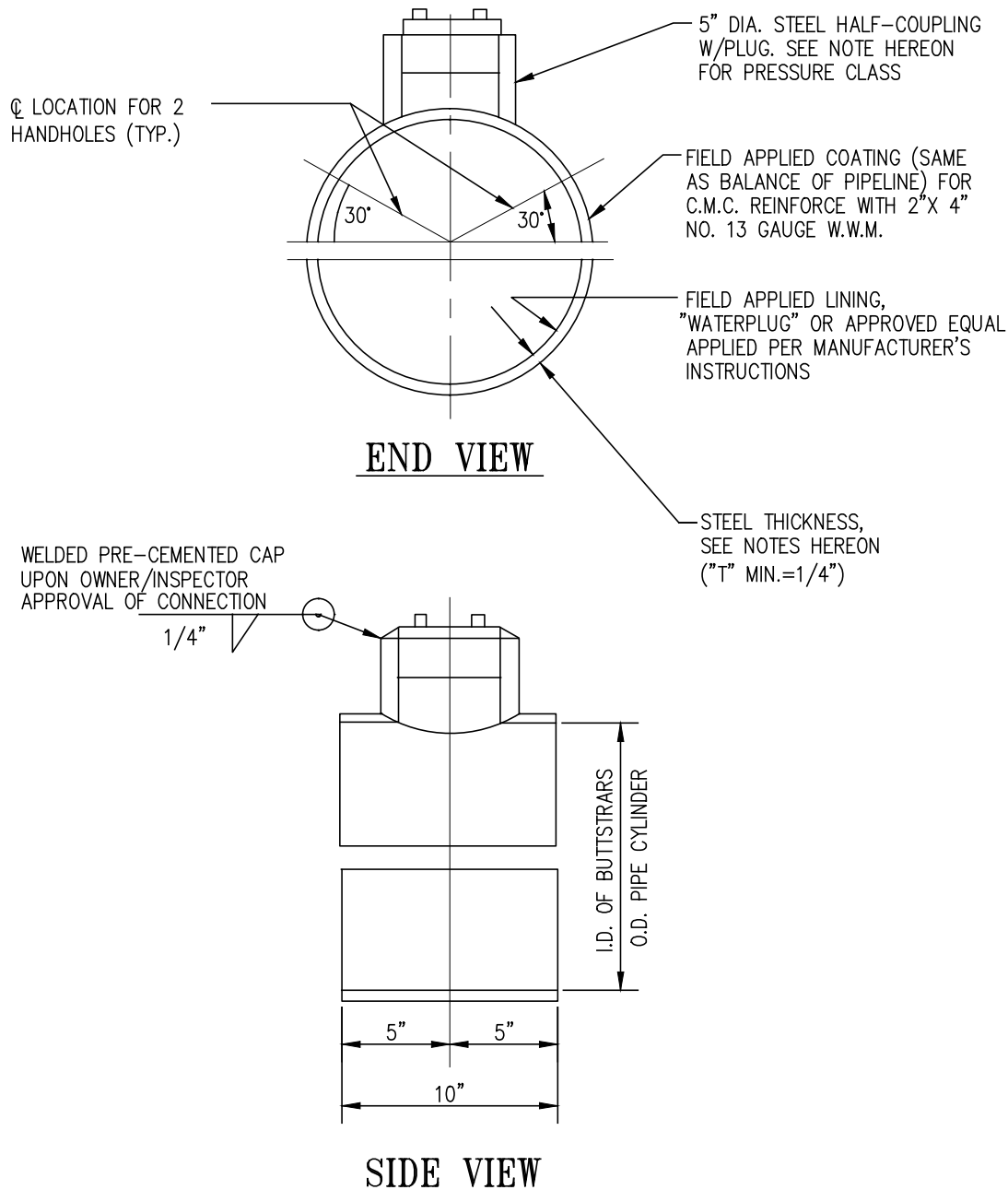
W.O. 19-0248

REV.

STANDARD DRAWING NO. C-2B DELETED

JURUPA COMMUNITY SERVICES DISTRICT

REV.	SCALE: NONE	STANDARD RESTRAINT TEES, DEAD ENDS & BENDS FOR PVC C-909	DRAWING NO.
	DATE: SEPTEMBER 2020		C-2B
	APPROVED BY: 	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248
	Sinnaro Yos, P.E. C68607		



NOTES:

- | | |
|--|---|
| <p>① 1 HANDHOLE REQUIRED FOR 4"Ø PIPE THROUGH 14"Ø PIPE.</p> <p>② 2 HANDHOLES REQUIRED FOR 20"Ø PIPE THROUGH 30"Ø PIPE.</p> <p>③ UP TO CLASS 200 PIPELINES:</p> <p style="padding-left: 20px;">"T" = 1/4" FOR 4" DIA. THROUGH 30" DIA.</p> <p style="padding-left: 20px;">"T" = 5/16" FOR 36" DIA.</p> <p style="padding-left: 20px;">5" - BLACK, HALF-COUPLING, STD. WT.</p> <p style="padding-left: 20px;">5" - BLACK, CORED, BAR PLUG, STD. WT.</p> | <p>④ GREATER THAN CLASS 200 THROUGH CLASS 350 PIPELINES:</p> <p style="padding-left: 20px;">"T" = 1/4" FOR 4" DIA. THROUGH 20" DIA.</p> <p style="padding-left: 20px;">"T" = 5/16" FOR 24" DIA.</p> <p style="padding-left: 20px;">"T" = 3/8" FOR 30" DIA. & 36" DIA.</p> <p style="padding-left: 20px;">5" - BLACK, HALF-COUPLING, EXTRA HEAVY</p> <p style="padding-left: 20px;">5" - BLACK, SOLID, BAR PLUG, EXTRA HEAVY</p> <p>⑤ 4 HANDHOLES REQUIRED FOR PIPE SIZES GREATER THAN 30" DIA.</p> <p>⑥ 4 HANDHOLES REQUIRED FOR PIPE SIZES GREATER</p> <p>⑦ WEDDING BAND NOT ALLOWED</p> |
|--|---|

JURUPA COMMUNITY SERVICES DISTRICT

TYPICAL BUTT STRAP CONNECTION CML/CMC PIPE

DRAWING NO.

C-3

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

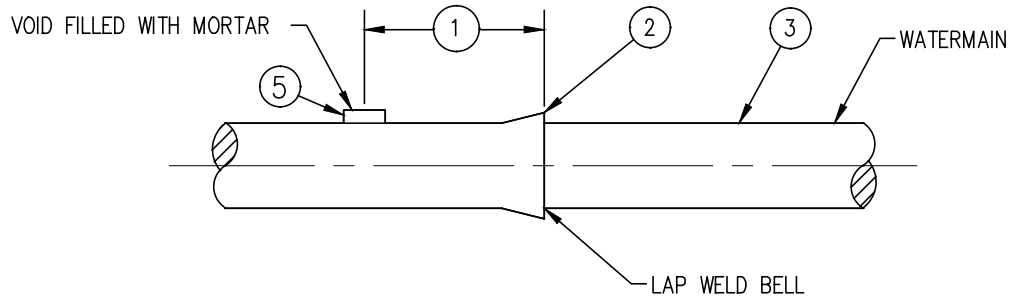
ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

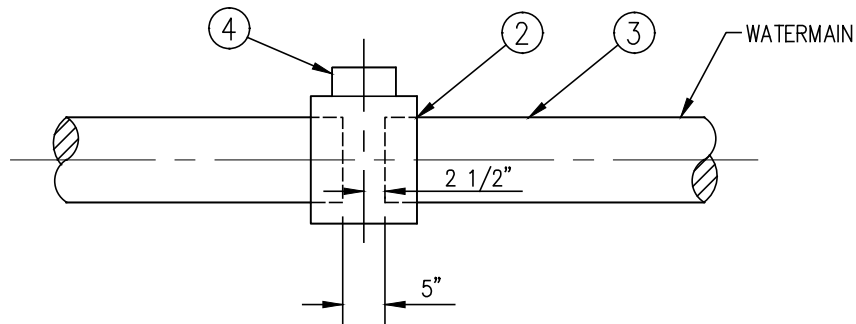
CALIFORNIA

W.O. 19-0248

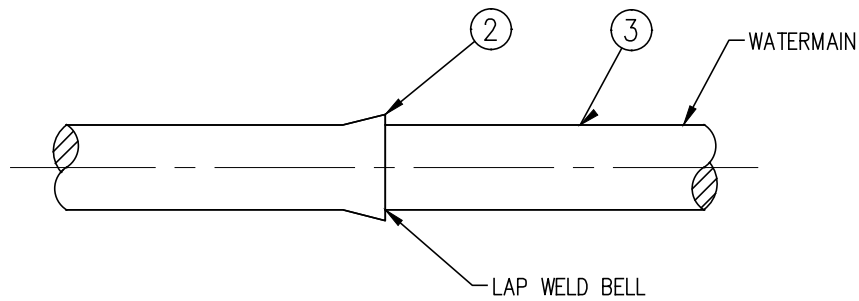
REV.



TYPE - I



TYPE - II



TYPE - III

NOTES:

- ① 1'-0" (12"Ø THRU 36"Ø) AND 6" (LESS THAN 12"Ø) PER STD. NO. C-3.
- ② CUT-TO-FIT OPTIONAL TO THE CONTRACTOR UNLESS OTHERWISE NOTED ON THE PLANS. WELD AS PER SPEC'S.
- ③ CUT-TO-FIT PIPE (LENGTH AS SHOWN ON PLANS). HOLD COATING DISTANCE OF C.T.F. + 6" FIELD APPLIED COATING.
- ④ SPLIT BUTT-STRAP WITH 1 OR 2 HANDHOLES PER STD. NO. C-3.
- ⑤ 5" HALF COUPLING PER STD. NO. C-3 REQUIREMENTS WITH 1/4" PLATE WELDED TO TOP, 10" x 1/4" REINFORCEMENT COLLAR.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

**TYPICAL CUT-TO-FIT DETAIL
FOR TYPES I, II & III**

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

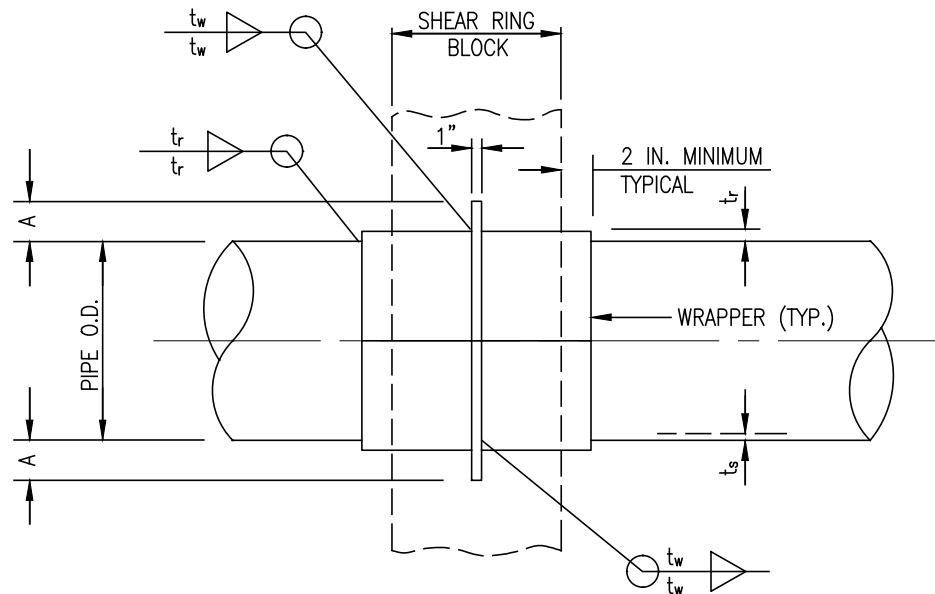
CALIFORNIA

DRAWING NO.

C-4

W.O. 19-0248

REV.



NOM. PIPE DIA. (in.)	MIN. RING WIDTH "A" (in.)	MIN. WELD, t_w (in.)	MIN. WRAPPER THICKNESS, t_r (in.)
-------------------------	------------------------------	---------------------------	--

MAXIMUM DESIGN PIPE PRESSURE OF 200 PSI

6	1.00	0.125	0.135
8	1.25	0.125	0.135
10	1.50	0.125	0.135
12	1.75	0.187	0.135
14	1.75	0.187	0.135
16	2.00	0.187	0.135
18	2.25	0.187	0.187
20	2.50	0.187	0.187
24	3.25	0.187	0.250
30	4.00	0.250	0.312
36	4.75	0.250	0.375

NOTES:

1. SHEAR RINGS SHALL BE 1" THICK FOR ALL PIPE DIAMETERS.
2. t_s = DESIGN PIPE CYLINDER THICKNESS.
3. REFER TO STD. DWG. NO. C-2 FOR SHEAR RING CONCRETE BLOCK DIMENSIONS.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

TYPICAL SHEAR RING DETAIL FOR WELDED STEEL PIPE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

C-5

W.O. 19-0248

REV.

MIN. WRAPPER / COLLAR
REINFORCEMENT THICKNESS

NOM. DIA. RANGE

"t"

4" THRU 18"

3/16"

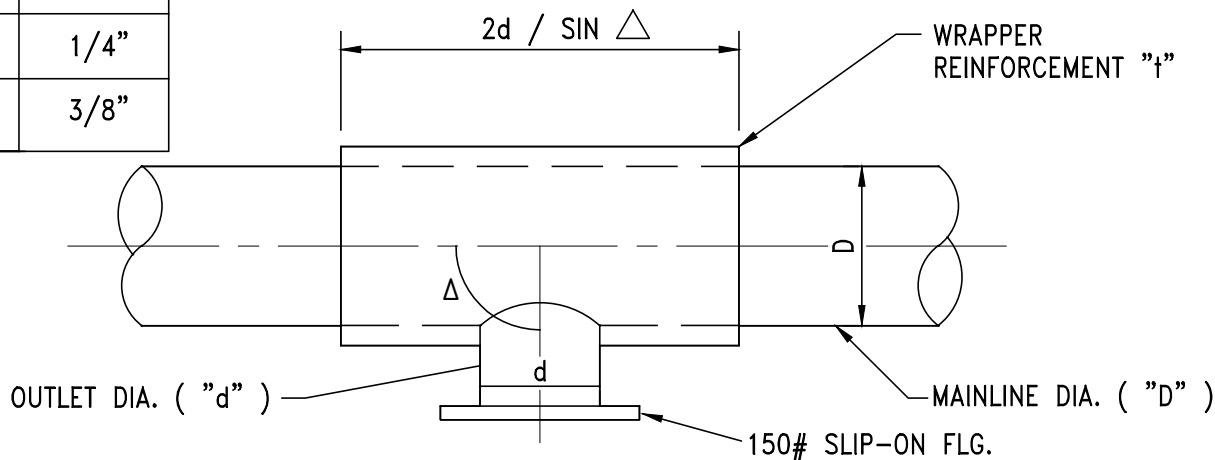
20" THRU 27"

1/4"

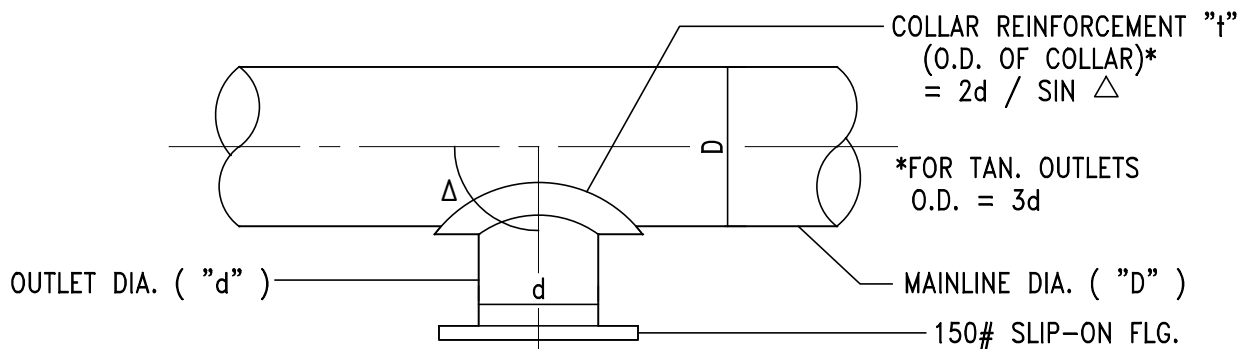
30" THRU 36"

3/8"

D = I.D. OF MAIN PIPE CYLINDER
d = I.D. OF BRANCH PIPE CYLINDER
 Δ = DEFLECTION ANGLE



TYPICAL WRAPPER REINFORCEMENT



ALL FITTINGS, OUTLETS, ETC. SHALL BE CML/CMC W.S.P.

TYPICAL COLLAR REINFORCEMENT

D	$d/D \sin \Delta = X$	REINFORCEMENT
LESS THAN 24"	$X \leq 0.6$	COLLAR
	$0.6 < X \leq 1.0$	WRAPPER
	$1.0 < X$	CROTCH PLATE
24" THRU 36"	$X \leq 0.6$	COLLAR
	$0.6 < X \leq 0.75$	WRAPPER
	$0.75 < X$	CROTCH PLATE

NOTES:

1. OUTLETS ARE DESIGNED FOR MAXIMUM PRESSURE CLASS OF 200 P.S.I.
2. ALL OUTLETS REQUIRING CROTCH PLATES, SHALL BE SUBMITTED TO AGENCY FOR APPROVAL.
3. USE A DISTRICT APPROVED TAPPING SLEEVE FOR CONNECTIONS TO PVC PIPE.
4. DISTRICT WILL DETERMINE THE TYPE OF TEE CONSTRUCTION DEPENDING ON THE EXISTING PIPE MATERIAL AND CONDITIONS AS WELL AS THE PROPOSED VALVE INSTALLATION.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

OUTLET REINFORCEMENT DETAILS

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

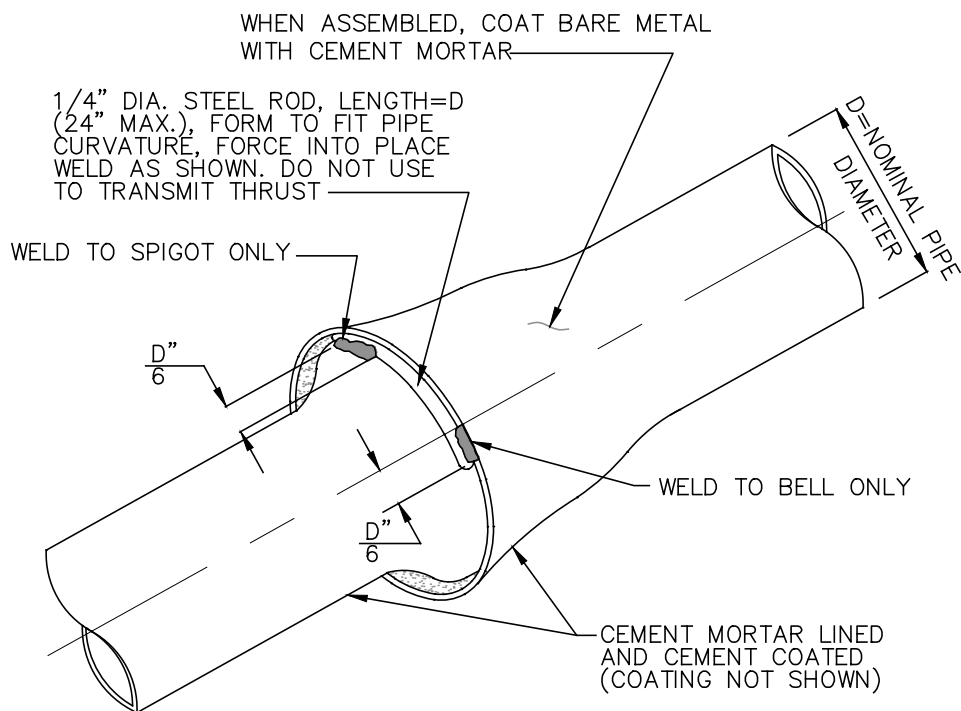
DRAWING NO.

C-6

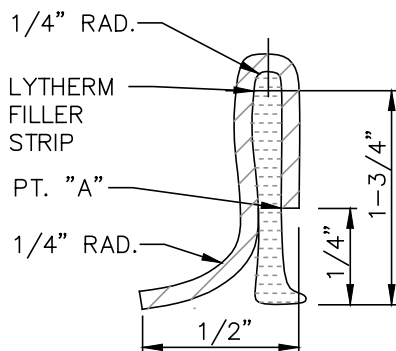
W.O. 19-0248

REV.

NOTE:
DISTRICT DIRECTED
USE ONLY



1/4" DIA. STEEL ROD.
WELD AS SHOWN ABOVE

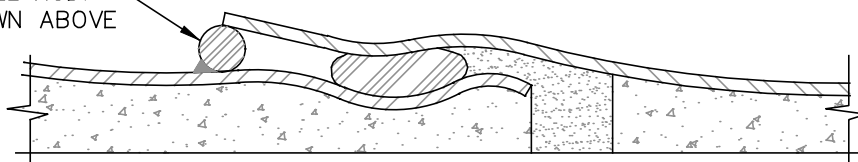


BONDING CLIP DETAIL

MATERIAL PER ASTM A366, COMMERCIAL QUALITY;
10 GA.x2 1/2"LGx1 1/4"WD. LYTHERM STRIP TO
BE 1"± LONG x 1 1/2" WIDE; TO OVERLAP SIDES OF
CLIP. CRIMP CLIP @ POINT "A" TO COMPRESS FILLER.

NOTES:

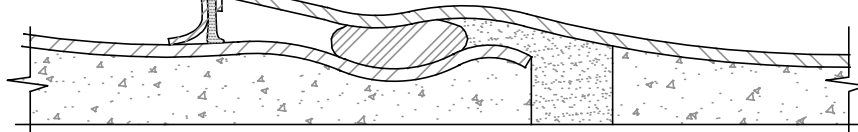
1. OMIT WHERE WELDED PIPE JOINT REQUIRED, OR RING SEAL JOINT IS WELDED FOR THRUST.
2. FORCE 1/4" DIA. ROD INTO PLACE. AT ONE END, WELD TO BELL, AT OTHER, WELD TO SPIGOT. REQUIRED LENGTH OF WELD EACH END = D/6 (1" MIN., 4" MAX.)
3. WELD AS SHOWN, DO NOT WELD EITHER END TO BOTH BELL AND SPIGOT OF PIPE.



BOND DETAIL

COATING NOT SHOWN

2 BONDING CLIPS (MIN) REQUIRED PER
JOINT OR AS RECOMMENDED BY
MANUFACTURER.



ALTERNATE BOND DETAIL

COATING NOT SHOWN

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

FORMED BELL AND SPIGOT JOINT BONDING DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

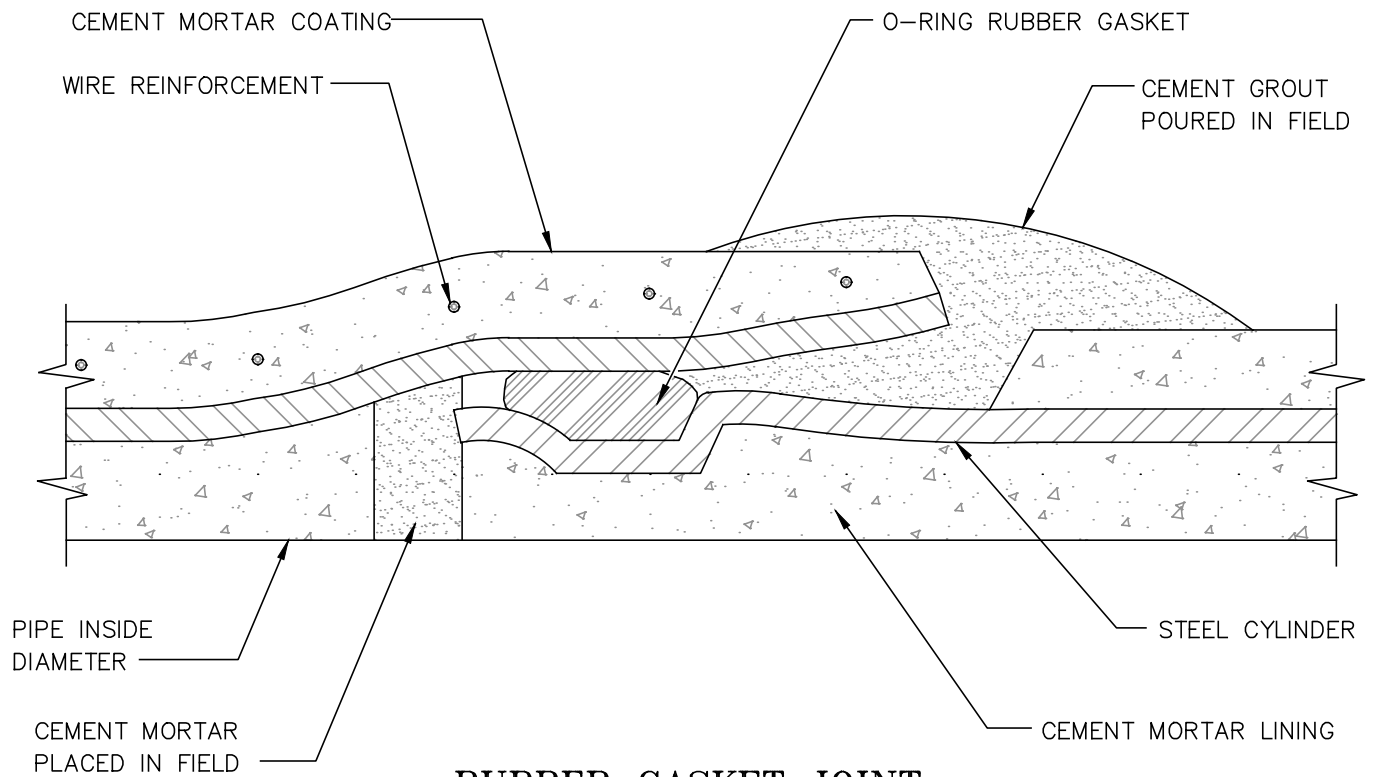
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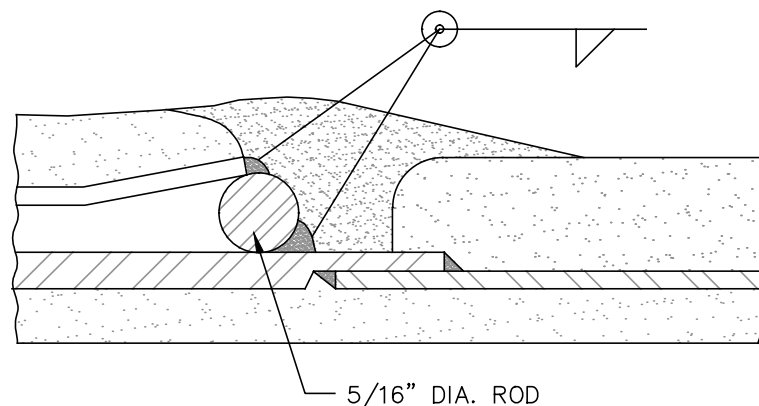
C-7

W.O. 19-0248

REV.



**RUBBER GASKET JOINT
FORMED BELL & SPIGOT JOINT
STEEL CYLINDER PIPE**



WELDED JOINT DETAIL
(DOUBLE PASS, FULL WELD)

REFER TO STD. DWG. C-7 FOR ELECTRICAL CONTINUITY BONDING.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:
Sinnaro Yos
Sinnaro Yos, P.E. C68607

**FORMED BELL & SPIGOT RUBBER GASKET
JOINT FOR CML & CMC PIPE**

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

C-8

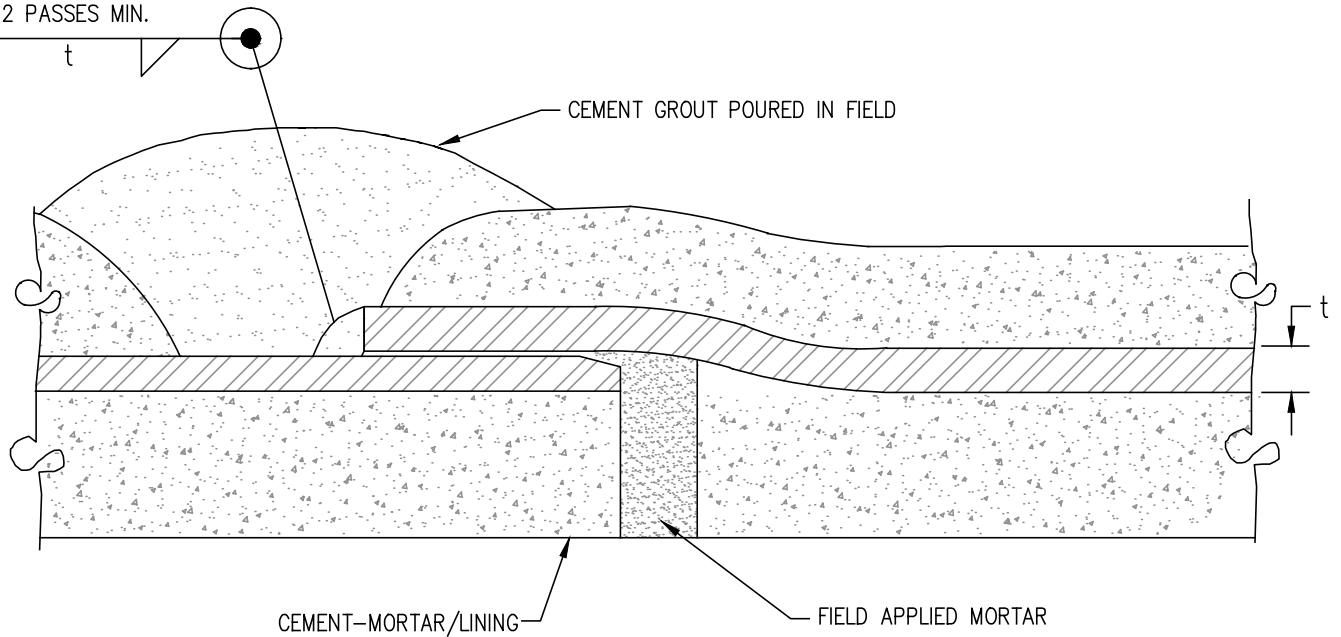
W.O. 19-0248

REV.

2 PASSES MIN.

t

CEMENT GROUT POURED IN FIELD



**LAP WELDED SLIP JOINT
BELLED-END STEEL CYLINDER PIPE**

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

**LAP WELDED SLIP JOINT
BELLED-END CML & CMC PIPE**

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

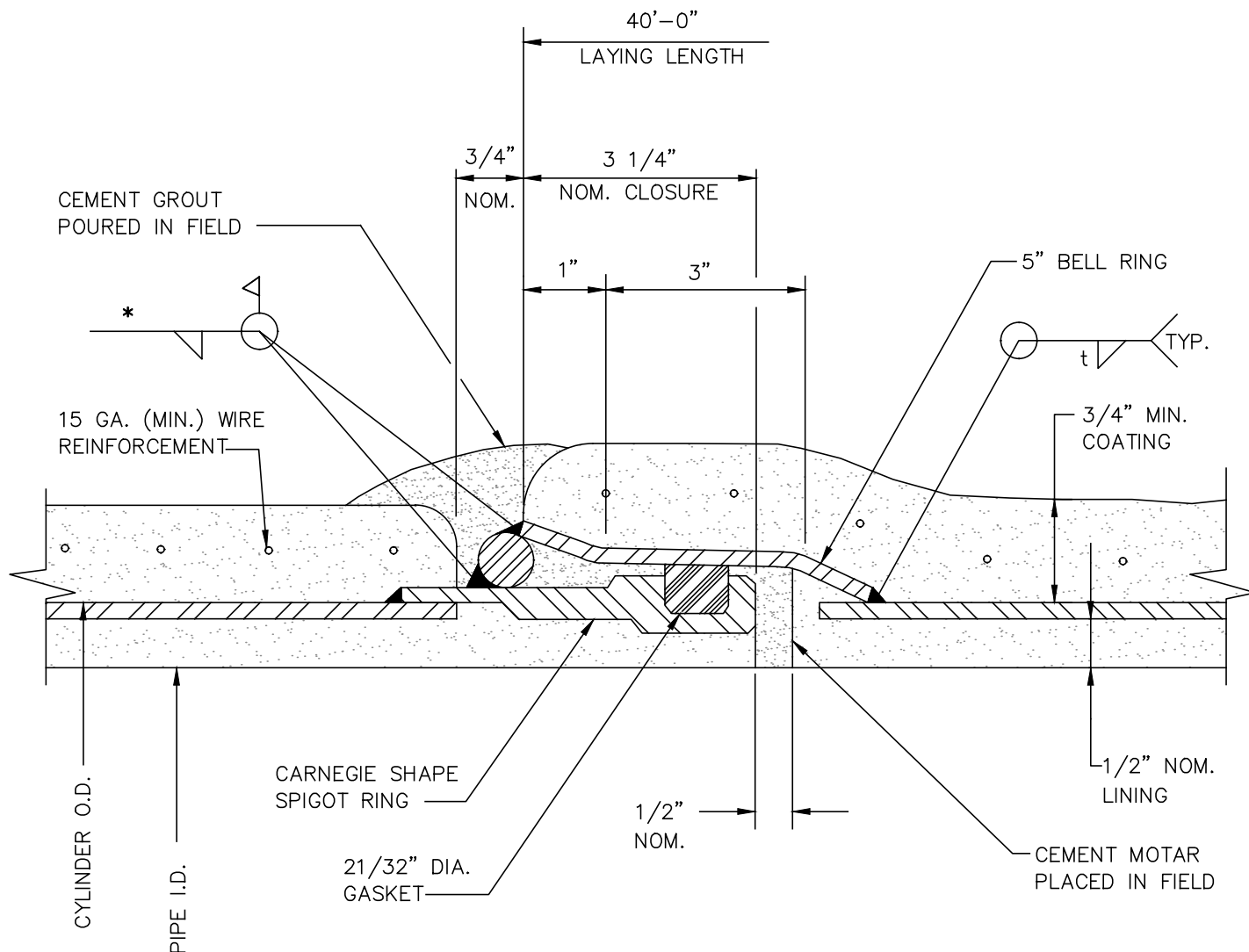
CALIFORNIA

DRAWING NO.

C-9

W.O. 19-0248

REV.



NOTE:

THIS STANDARD SHALL APPLY TO WELDED STEEL PIPE DIAMETERS 27" AND LARGER.

* NOT REQUIRED UNLESS FULL WELD IS SPECIFIED.

REFER TO STD. DWG. C-7 FOR ELECTRICAL CONTINUITY BONDING.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

CARNEGIE TYPE RUBBER GASKET JOINT FOR CML & CMC PIPE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

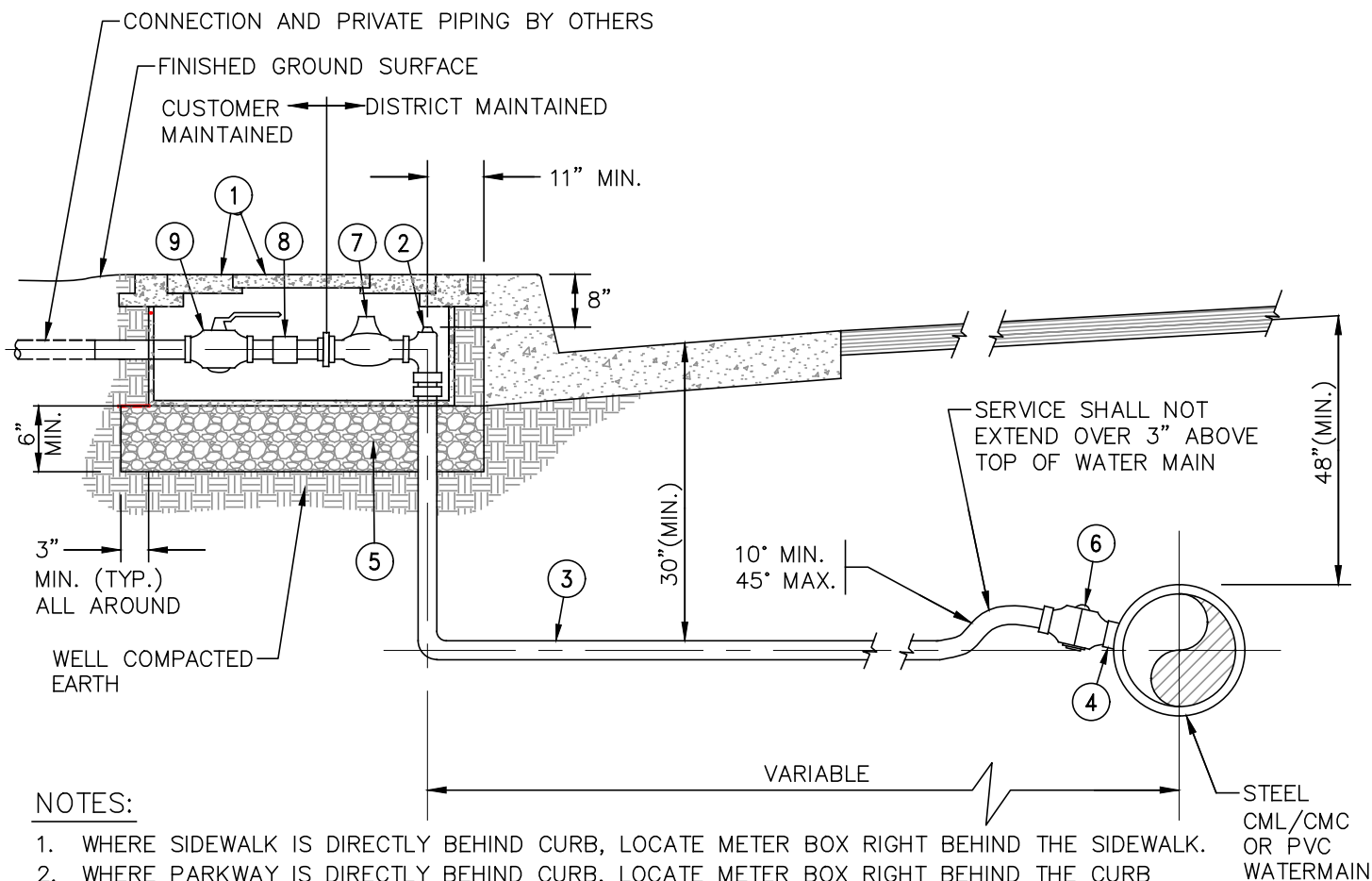
CALIFORNIA

DRAWING NO.

C-10

W.O. 19-0248

REV.



NOTES:

1. WHERE SIDEWALK IS DIRECTLY BEHIND CURB, LOCATE METER BOX RIGHT BEHIND THE SIDEWALK.
2. WHERE PARKWAY IS DIRECTLY BEHIND CURB, LOCATE METER BOX RIGHT BEHIND THE CURB
3. PIPE THREADS SHALL BE CLEAN AND SHARP AND SEALED WITH AN APPROVED JOINT COMPOUND.
4. METER SHALL NOT BE PLACED IN DRAINAGE AREA, DEPRESSIONS OR WITHIN TWO FEET OF A DRIVEWAY APPROACH.
5. DISTRICT MAINTAINED: ANGLE METER, METER, METER TAIL, CHECK VALVE, 2" NIPPLE
6. CUSTOMER MAINTAINED: BRASS BALL VALVE
7. FOR 1" METER INSTALLATION, SUBSTITUTE 1" DIMENSION WHERE 3/4" IS INDICATED.

ITEM	DESCRIPTION
①	J & R POLYMER CONCRETE METER BOX P-W 5-1/2 WITH TWO PIECE COVER OR APPROVED EQUAL. USE METER BOX P-W 5-1/2-20K FOR INCIDENTAL TRAFFIC CONDITIONS, CHECK FOR H2O RATED.
②	1" x 3/4" BALL ANGLE METER STOP W/ LOCK WING
③	1" PLASTIC COATED COPPER TUBE, TYPE K, COPPER SHALL BE CONTINUOUS WITH NO JOINTS FROM SERVICE CONNECTION TO RISER.
④	BLK. STL. STD. COUPLING TO PIPE W/COLLAR PER STD. D-6 (FOR STEEL WATERMAIN) OR WATERMAIN DIA. X 1" SERVICE SADDLE PER DISTRICT SPECIFICATIONS (FOR PVC WATERMAIN)
⑤	3/4" DIA. CRUSHED ROCK
⑥	1" DIA. BALL CORP. STOP, I.P.T. INLET X PACK JOINT
⑦	3/4" METER W/RADIOREAD, FURNISHED BY THE DISTRICT
⑧	1" DIA. BRASS PIPE W/ 1" DIA. BRONZE SPRING CHECK VALVE 1" X 12" BRASS PIPE
⑨	1" BRASS BALL VALVE W/ HANDLE

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

**3/4" OR 1" METER, 1" WATER SERVICE
DETAIL (W/OUT RESIDENTIAL FIRE SPRINKLERS)**

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

D-1

W.O. 19-0248

REV.

STANDARD DRAWING NO. D-1A DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

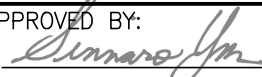
DATE: SEPTEMBER 2020

3/4" OR 1" METER, 1" WATER
SERVICE DETAIL (PE TUBING)

DRAWING NO.

D-1A

APPROVED BY:



Sinnaro Yos, P.E. C68607

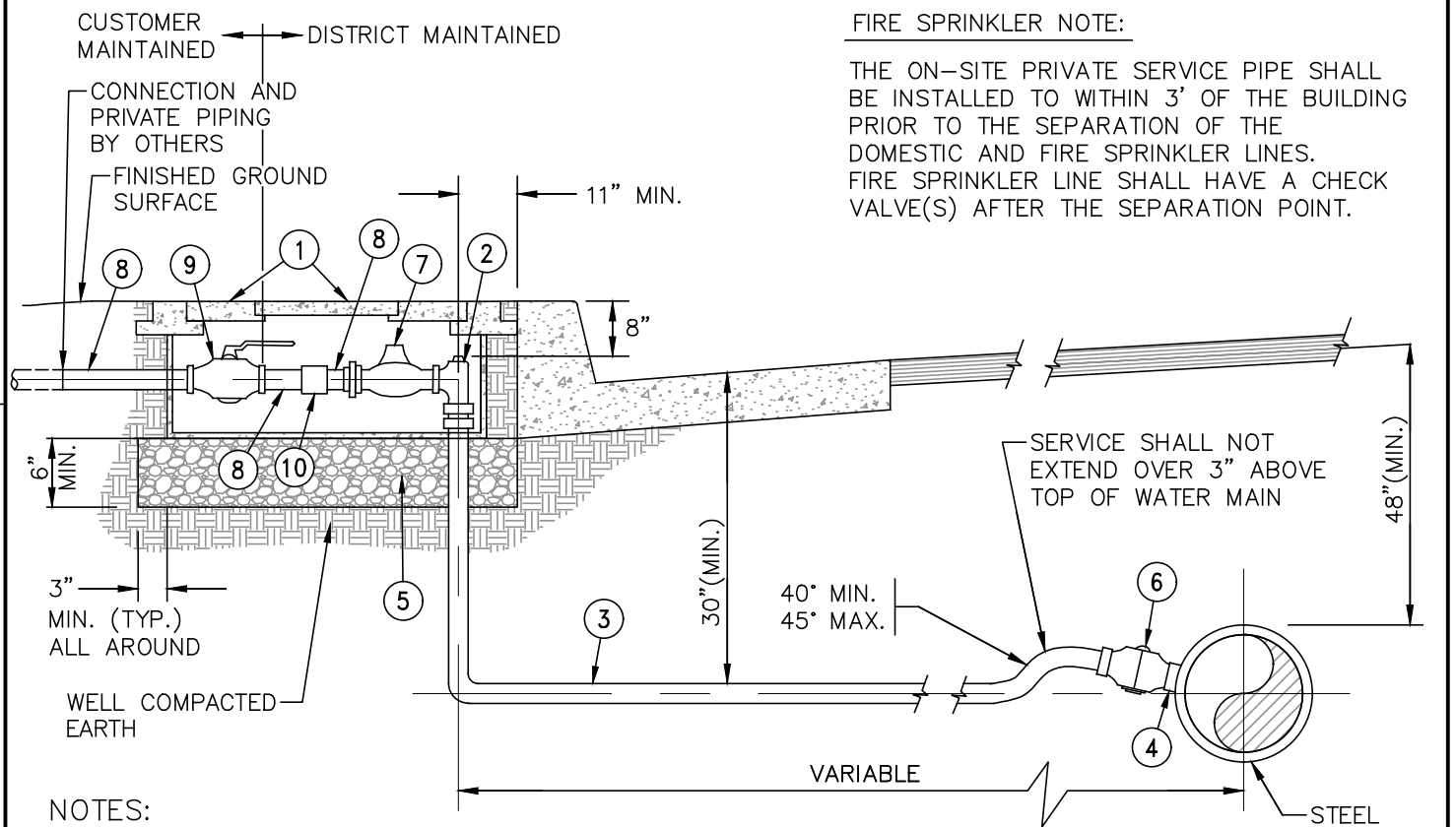
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CONSULTING ENGINEERS

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CALIFORNIA

W.O. 19-0248

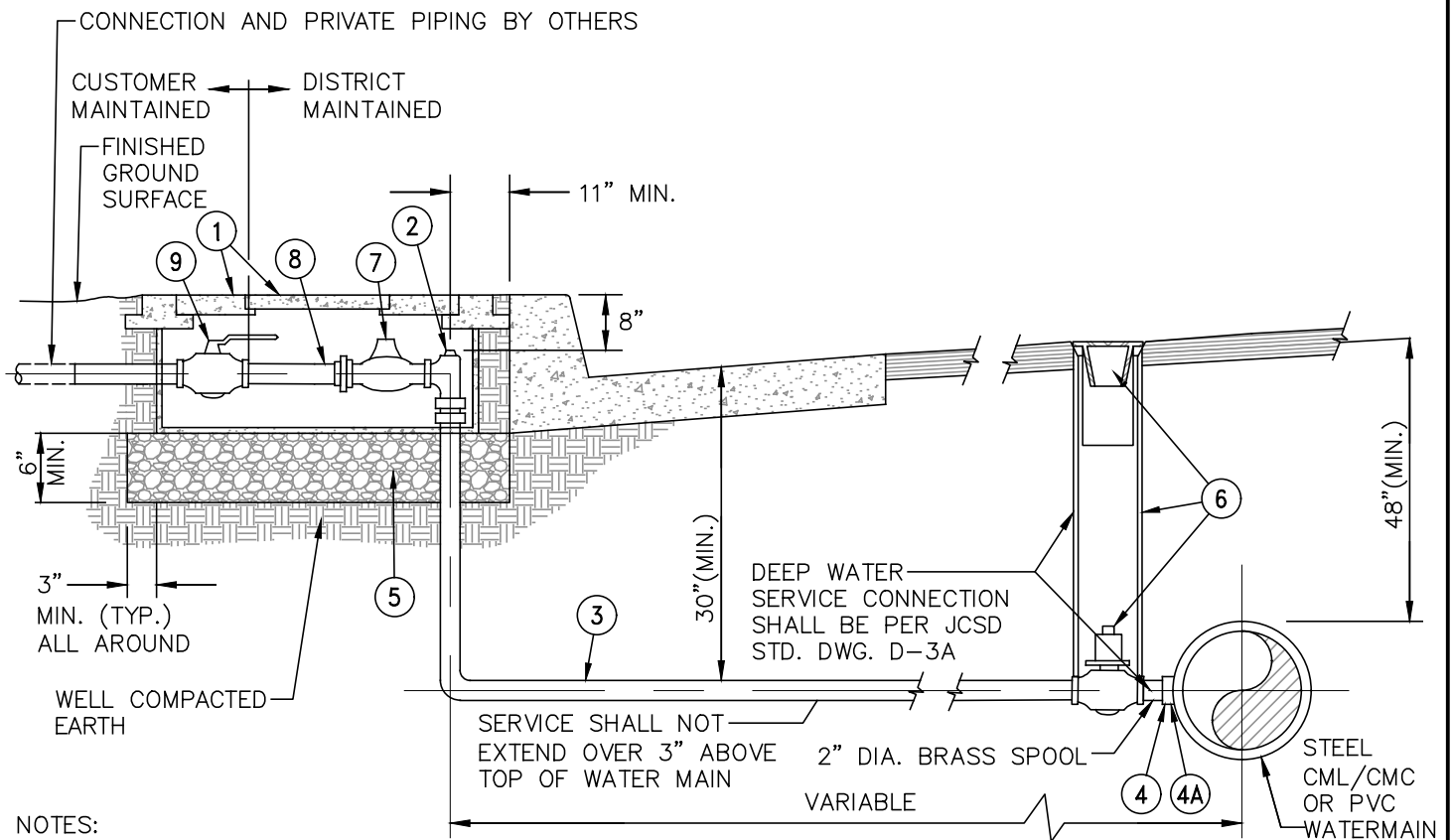
REV.



ITEM	DESCRIPTION
①	J & R POLYMER CONCRETE METER BOX P-W 5-1/2 WITH TWO PIECE COVER OR APPROVED EQUAL. USE METER BOX P-W 5-1/2-20K FOR INCIDENTAL TRAFFIC (H-20) CONDITIONS.
②	1" DIA. BRONZE BALL ANGLE METER STOP W/ LOCK WING
③	1" DIA. PLASTIC COATED COPPER TUBE, TYPE K, COPPER TUBE SHALL BE CONTINUOUS WITH NO JOINTS FROM SERVICE CONNECTION TO RISER.
④	WATERMAIN DIA. x 1", SERVICE SADDLE PER DISTRICT SPECIFICATIONS (FOR PVC WATERMAIN) OR BLK. STL. STD. COUPLING TO PIPE W/ COLLAR PER STD. D-6 (FOR STEEL WATERMAIN)
⑤	3/4" DIA. CRUSHED ROCK
⑥	1" DIA. BALL CORP. STOP I.P.T. INLET X PACK JOINT
⑦	3/4" OR 1" METER W/ RADIOREAD, FURNISHED BY THE DISTRICT
⑧	1" x 3" BRASS PIPE NIPPLE
⑨	1" BRASS BALL VALVE W/ HANDLE
⑩	1" DIA. DUAL CHECK VALVE (WATTS LF07S OR DISTRICT APPROVED EQUAL)

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE	3/4" OR 1" METER, 1" WATER SERVICE DETAIL (RESIDENTIAL FIRE SPRINKLERS)	DRAWING NO. D-1B
DATE: SEPTEMBER 2020	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS	W.O. 19-0248
REV. APPROVED BY: <i>Sinnaro Yos</i> Sinnaro Yos, P.E. C68607	RIVERSIDE CALIFORNIA	



NOTES:

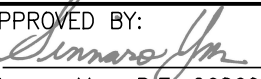
1. WHERE SIDEWALK IS DIRECTLY BEHIND CURB, LOCATE METER BOX RIGHT BEHIND THE SIDEWALK.
2. WHERE PARKWAY IS DIRECTLY BEHIND CURB, LOCATE METER BOX RIGHT BEHIND THE CURB.
3. PIPE THREADS SHALL BE CLEAN AND SHARP AND SEALED WITH AN APPROVED JOINT COMPOUND.
4. METER SHALL NOT BE PLACED IN DRAINAGE AREA, DEPRESSIONS OR WITHIN TWO FEET OF A DRIVEWAY APPROACH.
5. NOTE: FOR 2" SERVICE INSTALLATION, SUBSTITUTE 2" DIMENSION WHERE 1-1/2" IS INDICATED.
6. DISTRICT MAINTAINED: ANGLE METER, METER, METER TAIL, CHECK VALVE, 2" NIPPLE
7. CUSTOMER MAINTAINED: BRASS BALL VALVE

ITEM	DESCRIPTION
①	J & R POLYMER CONCRETE METER BOX P-W 5-1/2 WITH TWO PIECE COVER OR APPROVED EQUAL. USE METER BOX P-W 5-1/2-20K FOR INCIDENTAL TRAFFIC (H-20) CONDITIONS.
②	1-1/2" BALL ANGLE METER STOP. W/ LOCK WING
③	2" DIA. PLASTIC COATED COPPER PIPE, TYPE K, COPPER PIPE SHALL BE CONTINUOUS WITH NO JOINTS FROM SERVICE CONNECTION TO RISER.
④	BLK. STL. STD. COUPLING TO PIPE W/ COLLAR PER STD. D-6 (FOR STEEL WATERMAIN)
④A	WATERMAIN DIA. x 2", SERVICE SADDLE PER DISTRICT SPECIFICATIONS (FOR PVC WATERMAIN)
⑤	3/4" DIA. CRUSHED ROCK
⑥	2" DIA. QUARTER TURN BALL VALVE W/ 2" SQ. OPERATING NUT, 6" DIA. VALVE CAN PER STD. DWG. B-1 (M.I.P. X COMPRESSION)
⑦	1-1/2" METER W/RADIOREAD, FURNISHED BY THE DISTRICT
⑧	1-1/2" DIA. BRASS PIPE
⑨	1-1/2" BRASS BALL VALVE W/ HANDLE. NOTE: NOT REQUIRED IF BACKFLOW ASSEMBLY IS REQUIRED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

 Sinnaro Yos, P.E. C68607

1-1/2" METER, 2" WATER SERVICE DETAIL

ALBERT A. WEBB ASSOCIATES
 CONSULTING ENGINEERS

RIVERSIDE

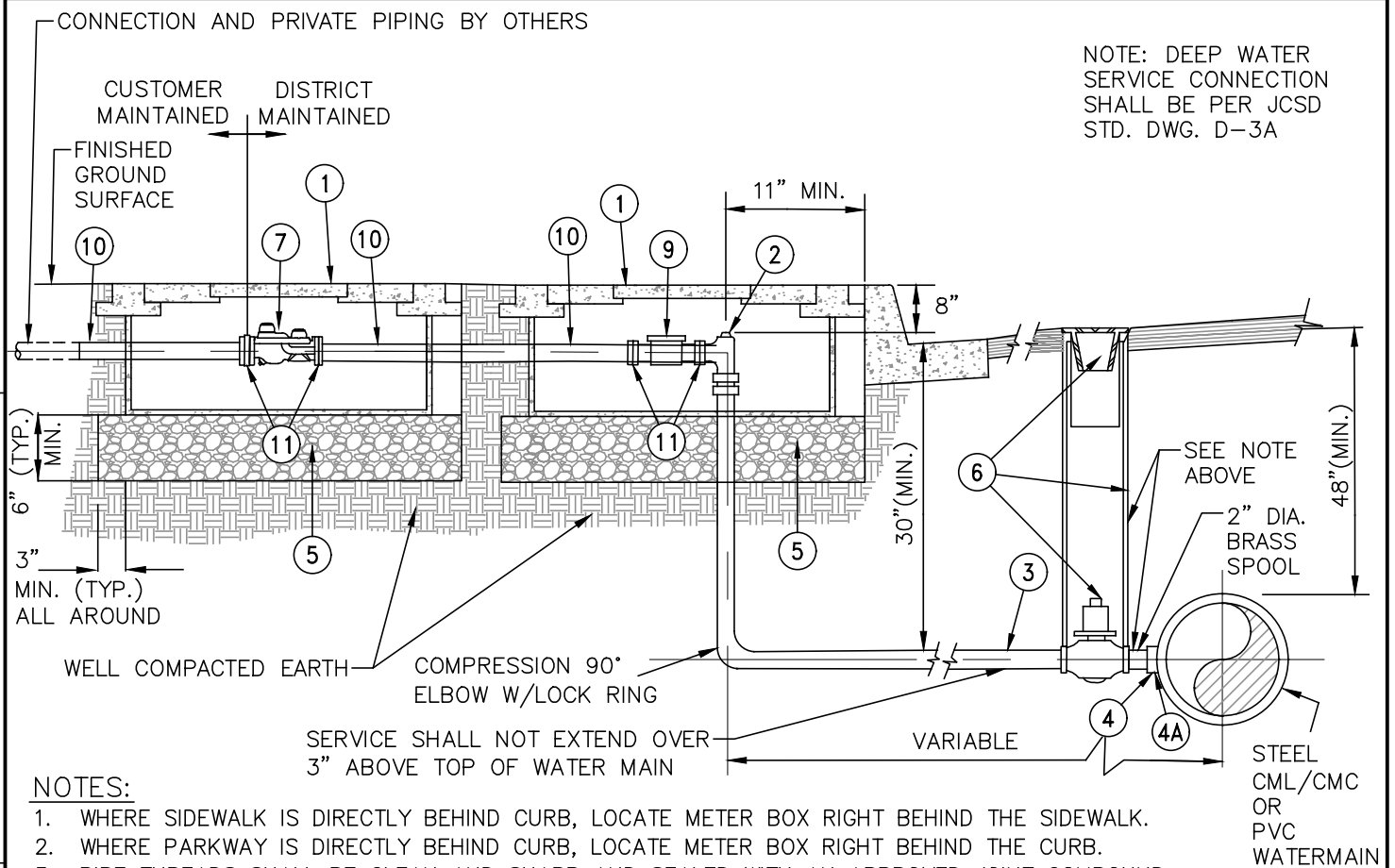
CALIFORNIA

DRAWING NO.

D-2

W.O. 19-0248

REV.



NOTE: DEEP WATER SERVICE CONNECTION SHALL BE PER JCSD STD. DWG. D-3A

NOTES:

1. WHERE SIDEWALK IS DIRECTLY BEHIND CURB, LOCATE METER BOX RIGHT BEHIND THE SIDEWALK.
2. WHERE PARKWAY IS DIRECTLY BEHIND CURB, LOCATE METER BOX RIGHT BEHIND THE CURB.
3. PIPE THREADS SHALL BE CLEAN AND SHARP AND SEALED WITH AN APPROVED JOINT COMPOUND.
4. METER SHALL NOT BE PLACED IN DRAINAGE AREA, DEPRESSIONS OR WITHIN TWO FEET OF A DRIVEWAY APPROACH.
5. PROVIDE 2" BRASS BALL VALVE W/ HANDLE BEHIND METER IN METER BOX IF BACKFLOW DEVICE IS NOT INSTALLED.
6. COMPOUND METER REQUIRES A SEPARATE BOX.

ITEM	DESCRIPTION
①	J & R POLYMER CONCRETE METER BOX P-W 5-1/2 WITH TWO PIECE COVER OR APPROVED EQUAL. USE METER BOX P-W 5-1/2-20K FOR INCIDENTAL TRAFFIC (H-20) CONDITIONS
②	2" BRONZE BALL ANGLE METER STOP W/LOCK WING
③	2" COPPER WATER SERVICE, TYPE 'L', W/PROTECTIVE WRAP PER SPECIFICATIONS
④	BLK. STL. STD. COUPLING TO PIPE W/ COLLAR PER STD. D-6 (FOR STEEL WATERMAIN)
④A	WATERMAIN DIA. x 2", SERVICE SADDLE PER DISTRICT SPECIFICATIONS (FOR PVC WATERMAIN)
⑤	3/4" DIA. CRUSHED ROCK
⑥	2" DIA. QUARTER TURN BALL VALVE W/ 2" SQ. OPERATING NUT, 6" DIA. VALVE CAN PER STD. DWG. B-1 (MIP X COMPRESSION)
⑦	2" COMPOUND METER W/RADIOREAD, FURNISHED BY THE DISTRICT (TURBO SERIES METER FOR IRRIGATION DOES NOT REQUIRE STRAINER AND STRAINER BOX) (PLACE METER IN CENTER OF BOX)
⑧	2" X 12" BRASS PIPE
⑨	2" STRAINER, FURNISHED BY DISTRICT (PLACE STRAINER IN CENTER OF BOX)
⑩	2" BRASS PIPE, FIELD ADJUST (MAINTAIN 12" MIN. BETWEEN STRAINER & METER FLANGES)
⑪	FLANGE TO MATCH STRAINER & METER

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

2" METER, 2" WATER SERVICE DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

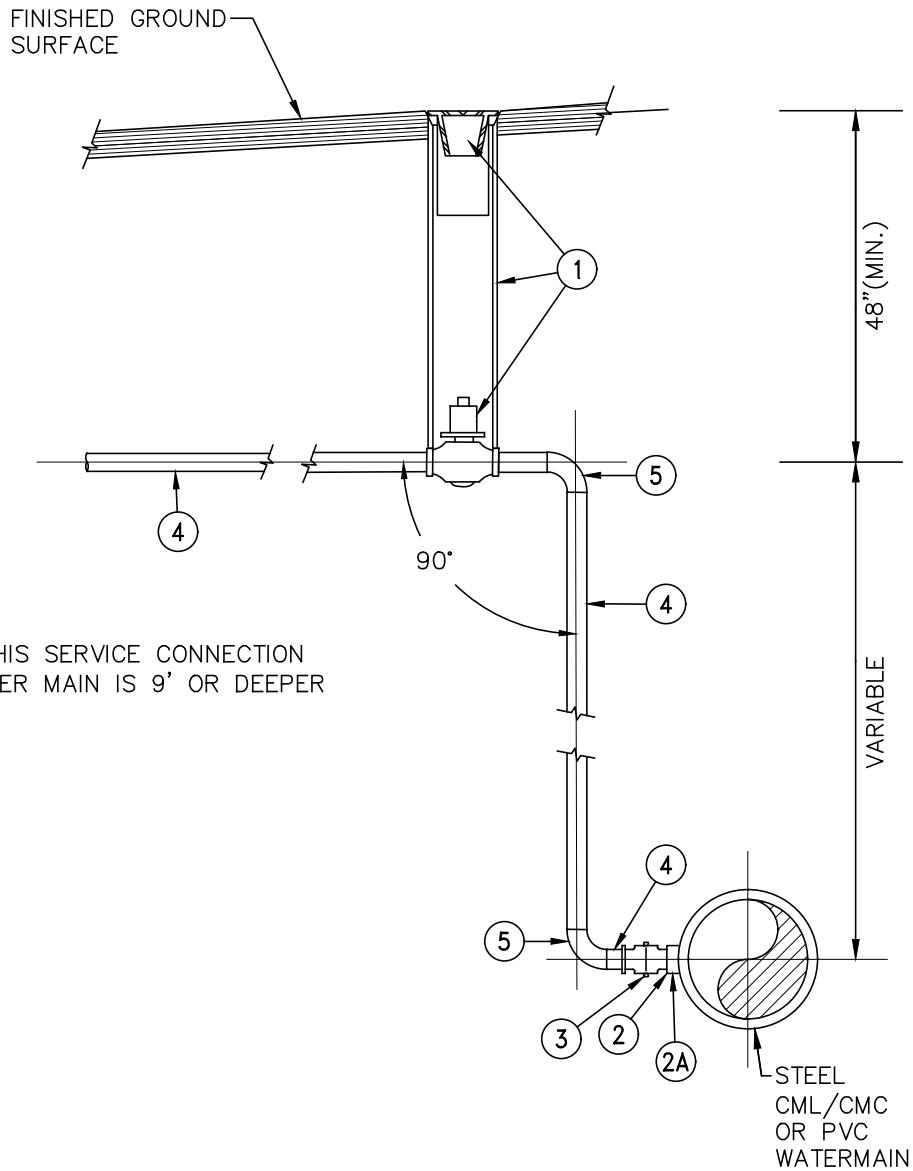
CALIFORNIA

DRAWING NO.

D-3

W.O. 19-0248

REV.



ITEM	DESCRIPTION
①	2" DIA. QUARTER TURN BALL VALVE W/ 2" SQ. OPERATING NUT, 6" DIA. VALVE CAN PER STD. DWG. B-1
②	BLK. STL. STD. COUPLING TO PIPE W/ COLLAR PER STD. D-6 (FOR STEEL WATERMAIN)
②A	WATERMAIN DIA. x 2", SERVICE SADDLE PER DISTRICT SPECIFICATIONS (FOR PVC WATERMAIN)
③	2" DIA. BALL CORP. STOP M.I.P. X COMPRESSION
④	2" COPPER WATER SERVICE, TYPE "K", W/ PROTECTIVE WRAP PER SPECIFICATIONS
⑤	COMPRESSION 90° ELBOW W/ LOCK RING

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

DEEP WATER SERVICE CONNECTION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

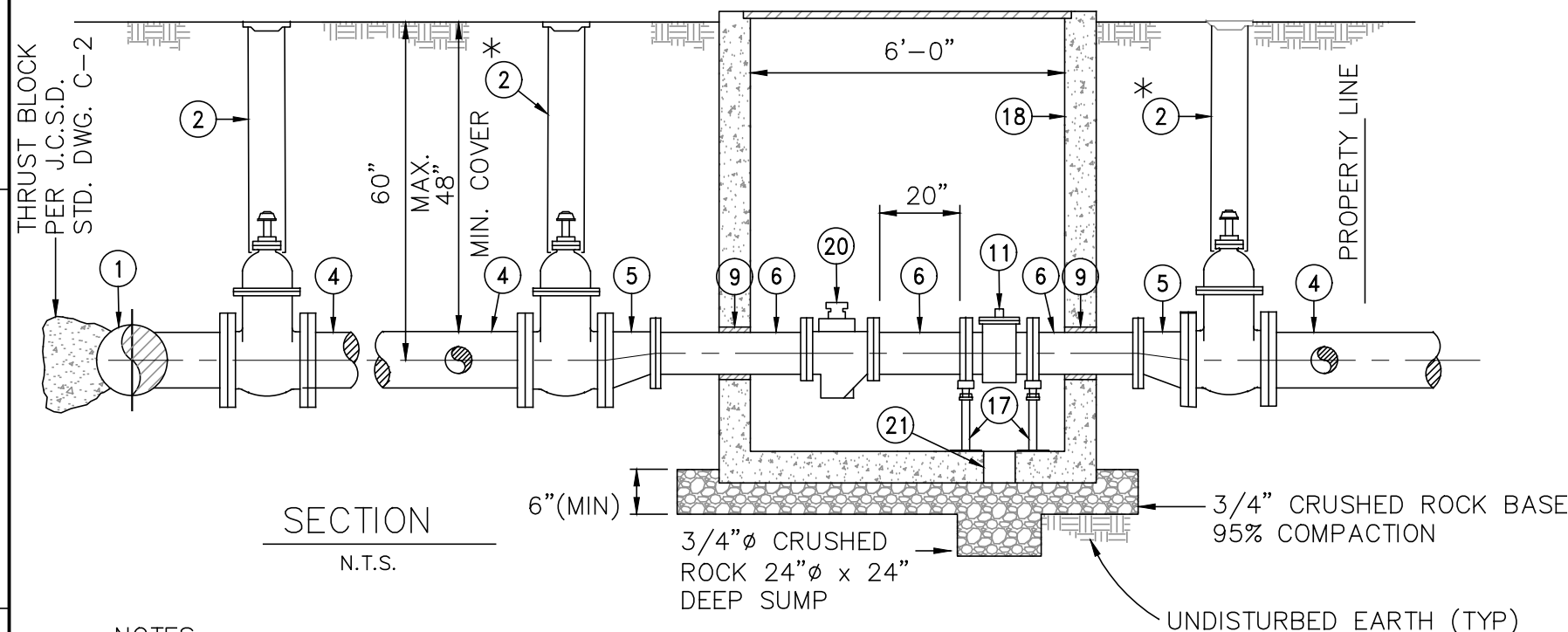
CALIFORNIA

DRAWING NO.

D-3A

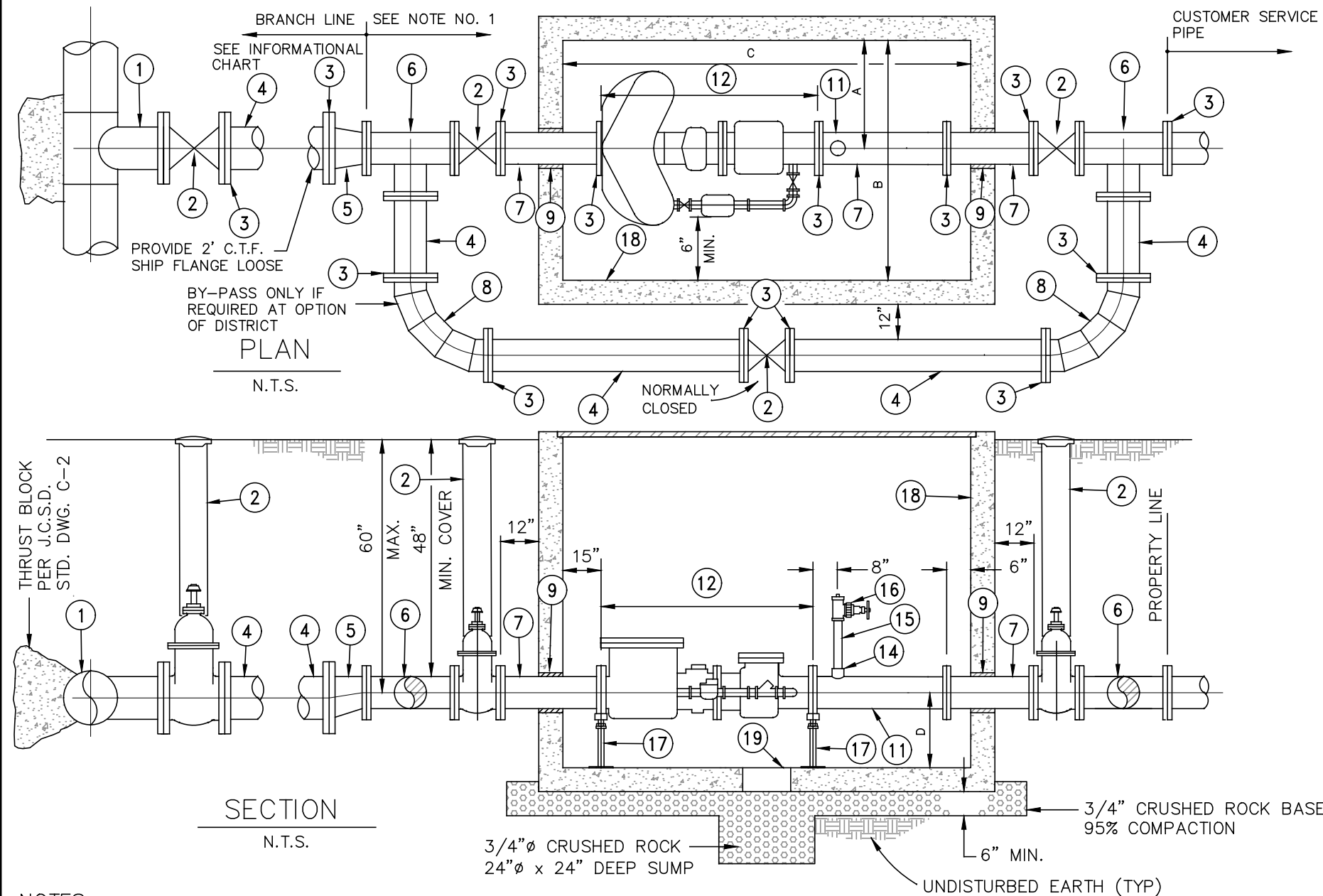
W.O. 19-0248

REV.



- * ONLY IF REQUIRED; AT OPTION OF DISTRICT. IF NO BY-PASS IS INSTALLED THE 4" DIA. GATE VALVE DOWNSTREAM OF THE METER IS NOT REQUIRED AND THE DISTRICT'S MAINTENANCE STOPS AT THE METER.

JURUPA COMMUNITY SERVICES DISTRICT		
SCALE:	3" WATER SERVICE METER	DRAWING NO.
DATE: SEPTEMBER 2020		D-4
APPROVED BY:  Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248



ITEM	DESCRIPTION
1	MAINLINE DIA. x BRANCH DIA. (A.W.W.A.) FLANGED OUTLET TEE.
2	VALVE BOX AND GATE VALVE INSTALLATION PER J.C.S.D. STD. DWG. NO. B-1.
3	150# SLIP ON FLANGE (TYPICAL).
4	CML/CMC W.S.P. (12 GA. MIN.).
5	BRANCH x METER SIZE A.W.W.A. "FLAT TOP" FLANGED REDUCER.
6	CML/CMC W.S.P. (12 GA. MIN.); OR CML/CMC A.W.W.A. FLANGED TEE IF REQUIRED BY DISTRICT.
7	STD. WT. STL. PIPE, CML/CMC.
8	CML/CMC A.W.W.A. FLANGED 90° BEND (CEMENT MORTAR LINED CAST IRON 90° BEND MAY BE SUBSTITUTED UPON APPROVAL BY DISTRICT).
9	KNOCKOUTS AS REQUIRED (2" LARGER THAN PIPE SIZE O.D. ALL AROUND) DRY PACK ALL AROUND PIPE.
10	NOT USED
11	REMOVE AN ADEQUATE AMOUNT OF CMC TO ALLOW PROPER INSTALLATION OF THE FLANGE COUPLING ADAPTOR. PAINT BARE METAL PER NOTE 4.
12	FIRE SERVICE METER WITH ALL BRONZE BY-PASS ASSEMBLY (INCLUDING GATE VALVES, CHECK VALVE & BY-PASS METER FURNISHED BY DEVELOPER AS APPROVED BY DISTRICT.) WITH RADIO READ.
13	NOT USED.
14	2 1/2", 3/16" THICK WALL, COUPLING WELDED TO TOP OF PIPE.
15	2 1/2"Ø x 12" LONG STD. BRASS THREADED NIPPLE.
16	2 1/2"Ø SCREWED FIRE PROTECTION GATE VALVE, IPT x NST, WITH HOSE CAP & SAFETY CHAIN, ALL BRONZE, NRS, WITH MAL. IRON HAND WHEEL, 175 PSI MWWP; NIBCO MODEL NO. T-103-HC OR APPROVED EQUAL.
17	PIPE SUPPORT PER J.C.S.D. STD. DWG. NO. A-5.
18	PRE-CAST CONCRETE VAULT WITH 2 PIECE 6' x 8' TORSION HINGED GALVANIZED OR ALUMINUM COVER. QUICKSET OR APPROVED EQUAL. COVER TO BE SPECIFIED FOR TRAFFIC LOADS WHERE REQUIRED. PROVIDE 6" X 6" METER READING LID IN COVER. NOTE: DEPENDENT UPON SELECTED METER DIMENSIONS VAULT SIZE MAY NEED TO BE INCREASED TO MAINTAIN MINIMUM INTERNAL CLEARANCE DIMENSIONS SHOWN.
19	12" DIA. SUMP

NOTES:

- DIAMETERS FOR PIPELINE & APPURTENANCES SHALL BE EQUAL TO THE METER SIZE.
- THE WATER SERVICE VAULT SHALL BE LOCATED & INSTALLED SUBJECT TO APPROVAL OF THE DISTRICT. WHERE VAULT IS INSTALLED IN PARKWAY WITH CURB AND SIDEWALK, THE VAULT SHALL BE PLACED PARALLEL TO THE CURB LINE AND PIPING.
- ADJUST VAULT AND COVER TO MEET SIDEWALK & CURB GRADE.
- VALVE COVER, POST INDICATOR, AND ALL METAL INSIDE VAULT TO BE PAINTED WITH PRIMER AND TWO (2) COATS OF PAINT PER DISTRICT SPECIFICATION NO PRIMER ON BRASS OR BRONZE.
- ALL FIELD JOINTS SHALL BE FLANGED UNLESS OTHERWISE INDICATED. ALL WELDED JOINTS ON EPOXY LINED STD. WT. PIPE SHALL BE SHOP FABRICATED & ALL EPOXY LINING SHALL BE SHOP APPLIED.
- PIPE THREADS SHALL BE CLEAN AND SHARP, AND SEALED WITH APPROVED JOINT COMPOUND.
- SHOULD THE DEPTH OF THE VAULT EXCEED FOUR (4) FEET, AN OSHA APPROVED LADDER ATTACHED TO AN INSIDE WALL SHALL BE PROVIDED. THE LOCATION OF THE LADDER SHALL BE AS DIRECTED BY THE DISTRICT.
- WHEN A COMPOUND METER IS PROPOSED WITH A SEPARATE STRAINER, PROVIDE MINIMUM 20" FLANGE TO FLANGE SEPARATION BETWEEN THE METER AND STRAINER.

METER SIZE	BRANCH SIZE	I N F O R M A T I O N A L C H A R T					
		D I M E N S I O N S				M A X I M U M F L O W (G P M)	
		A	B	C	D	DOMESTIC *	DOM. + FIRE FLOW
4"	6"	3'-0"	6'-0"	8'-0"	1'-6"	420	1000
6"	8"	3'-0"	6'-0"	8'-0"	1'-8"	920	2000
8"	10"	3'-0"	6'-0"	8'-0"	2'-0"	1600	3500
10"	12"	3'-0"	6'-0"	10'-0"	2'-0"	2500	5500

JURUPA COMMUNITY SERVICES DISTRICT

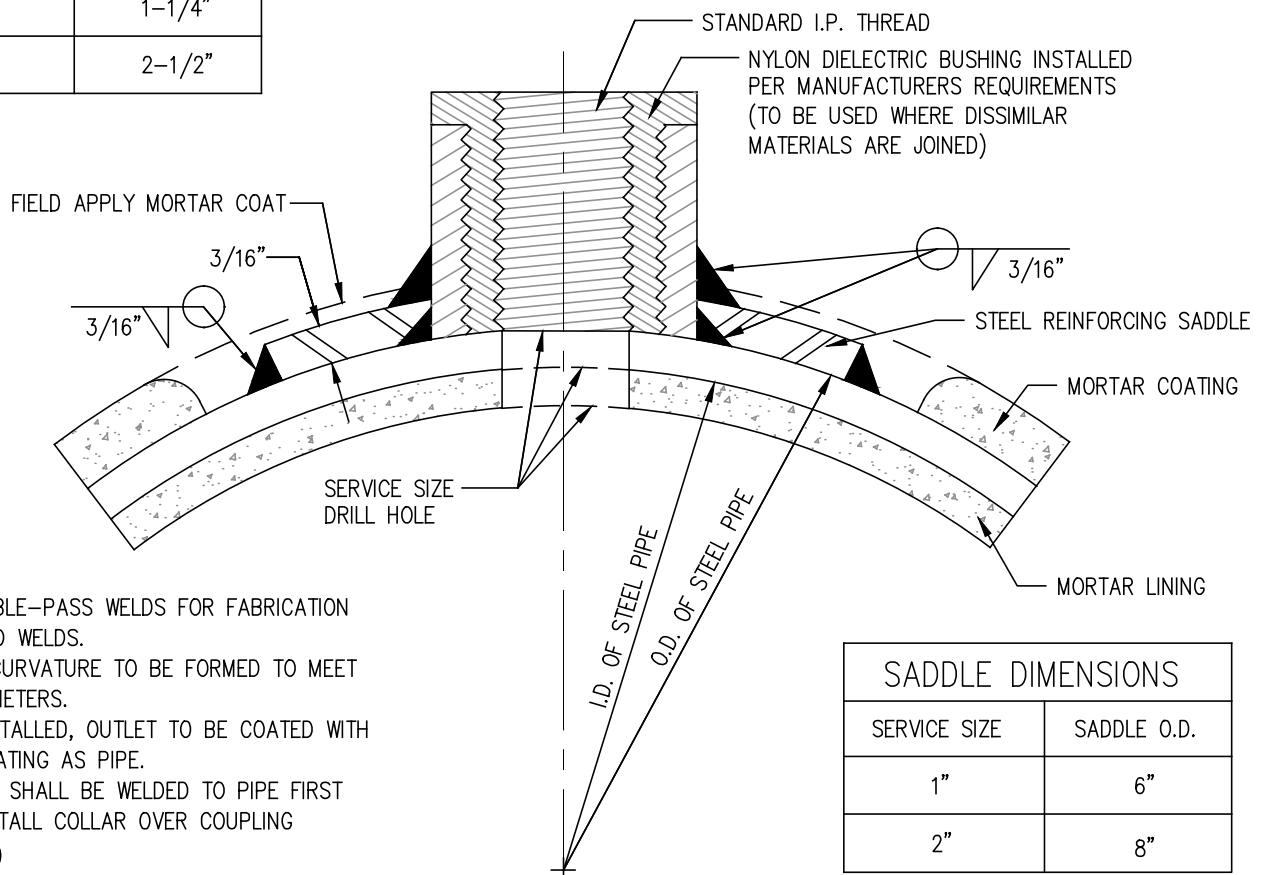
SCALE:	4", 6", 8" & 10" WATER SERVICE METER	DRAWING NO. D-5
DATE: SEPTEMBER 2020		
APPROVED BY:  Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS	W.O. 19-0248
	RIVERSIDE CALIFORNIA	

3000# FORGED STEEL
HALF COUPLING

O.D. OF STEEL REINFORCING SADDLE

TYPICAL COUPLING SIZES FOR DIALECTRIC BUSHING

SERVICE SIZE (FEMALE THREAD)	COUPLING SIZE (MALE THREAD)
1"	1-1/4"
2"	2-1/2"



NOTES:

- USE DOUBLE-PASS WELDS FOR FABRICATION AND FIELD WELDS.
- SADDLE CURVATURE TO BE FORMED TO MEET PIPE DIAMETERS.
- WHEN INSTALLED, OUTLET TO BE COATED WITH SAME COATING AS PIPE.
- COUPLING SHALL BE WELDED TO PIPE FIRST THAN INSTALL COLLAR OVER COUPLING (2-PIECE)
- PLASTIC PIPE DIELECTRIC D6A
- PERFORM CONTINUITY TEST.

SADDLE DIMENSIONS

SERVICE SIZE	SADDLE O.D.
1"	6"
2"	8"

SECTION A-A

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

SERVICE OUTLET SADDLE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

D-6

W.O. 19-0248

REV.

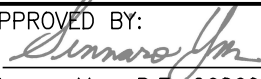
STANDARD DRAWING NO. D-7 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:



Sinnaro Yos, P.E. C68607

COMMERCIAL / INDUSTRIAL
DUAL METER CONFIGURATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

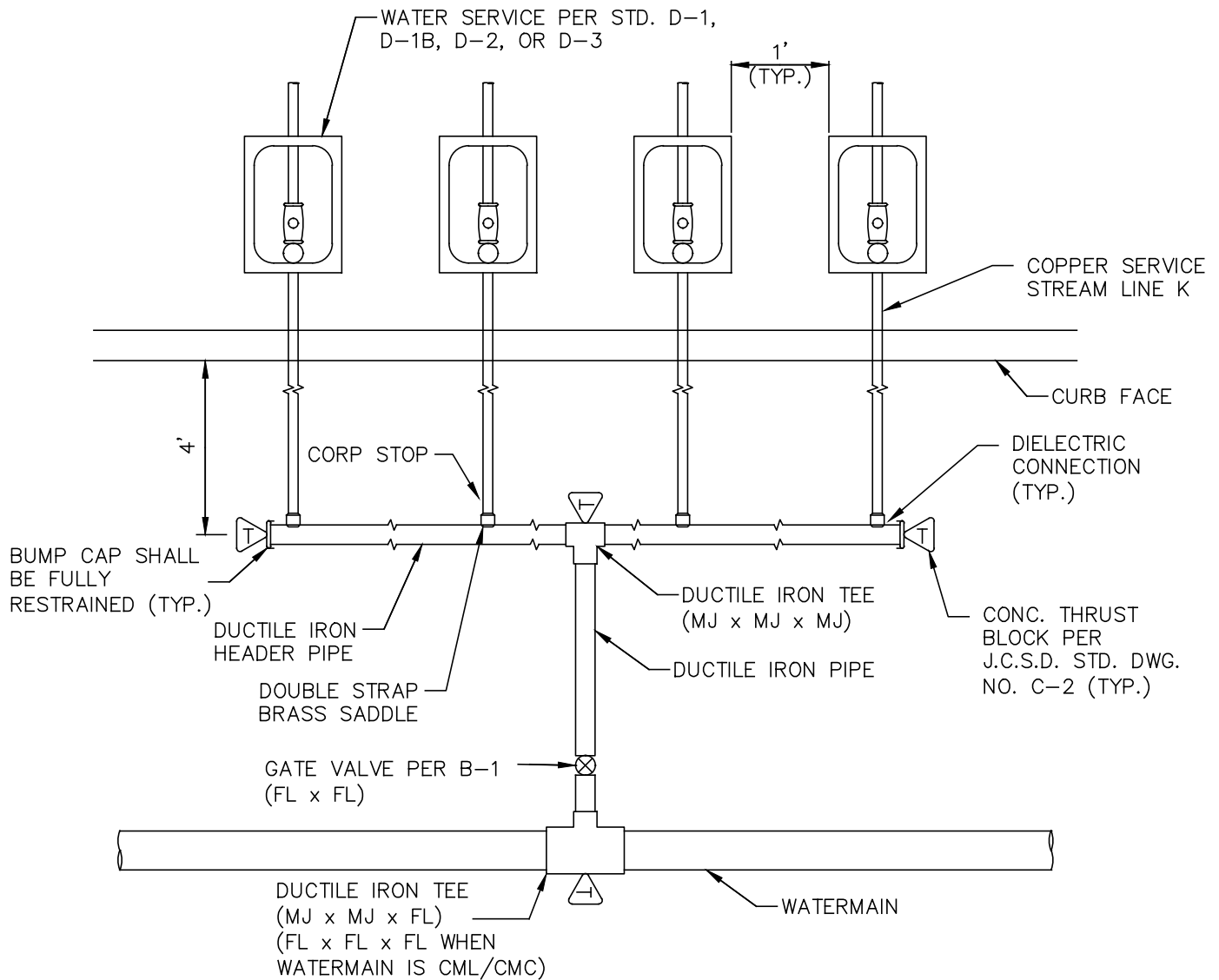
CALIFORNIA

DRAWING NO.

D-7

W.O. 19-0248

REV.



MANIFOLD DESIGN GUIDELINES ¹

MANIFOLD DIA.	MAXIMUM NO. OF 2" (OR SMALLER) WATER SERVICES
4"	4
6"	8

1. SIZING SHOULD BE VERIFIED BY THE DESIGN ENGINEER BASED UPON THE SPECIFIC AVAILABLE PRESSURES IN THE WATERMAIN AND THE ON-SITE WATER SERVICE PRESSURES REQUIRED.
2. SERVICE MANIFOLD SHALL BE APPROVED BY DISTRICT, AND WILL BE ALLOWED ONLY WHERE MULTIPLE INDIVIDUAL SERVICE LATERALS ARE NOT PHYSICALLY POSSIBLE.
3. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE CEMENT MORTAR LINED.
4. MANIFOLD SHALL NOT BE INSTALLED WITHOUT THE DISTRICT'S WRITTEN AUTHORIZATION.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

SERVICE MANIFOLD DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

D-8

W.O. 19-0248

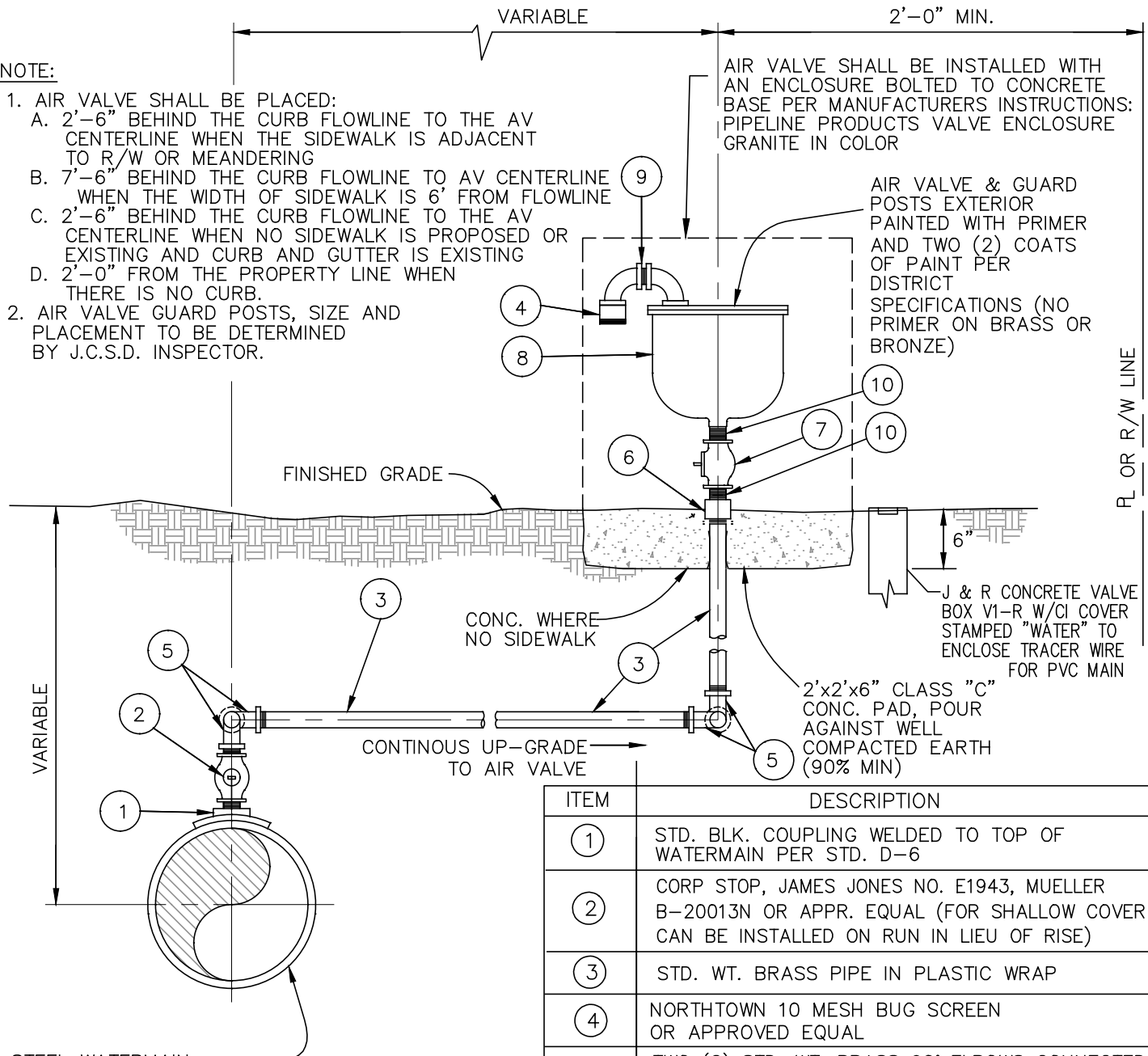
REV.

NOTE:

1. AIR VALVE SHALL BE PLACED:
 - A. 2'-6" BEHIND THE CURB FLOWLINE TO THE AV CENTERLINE WHEN THE SIDEWALK IS ADJACENT TO R/W OR MEANDERING
 - B. 7'-6" BEHIND THE CURB FLOWLINE TO AV CENTERLINE WHEN THE WIDTH OF SIDEWALK IS 6' FROM FLOWLINE
 - C. 2'-6" BEHIND THE CURB FLOWLINE TO THE AV CENTERLINE WHEN NO SIDEWALK IS PROPOSED OR EXISTING AND CURB AND GUTTER IS EXISTING
 - D. 2'-0" FROM THE PROPERTY LINE WHEN THERE IS NO CURB.
2. AIR VALVE GUARD POSTS, SIZE AND PLACEMENT TO BE DETERMINED BY J.C.S.D. INSPECTOR.

AIR VALVE SHALL BE INSTALLED WITH AN ENCLOSURE BOLTED TO CONCRETE BASE PER MANUFACTURERS INSTRUCTIONS: PIPELINE PRODUCTS VALVE ENCLOSURE GRANITE IN COLOR

AIR VALVE & GUARD POSTS EXTERIOR PAINTED WITH PRIMER AND TWO (2) COATS OF PAINT PER DISTRICT SPECIFICATIONS (NO PRIMER ON BRASS OR BRONZE)



STEEL WATERMAIN FOR PVC WATERMAINS USE BRONZE SERVICE SADDLE WITH DOUBLE STAINLESS STEEL STRAPS PER SPECIFICATIONS

NOTE:

ALL PIPE, FITTINGS, AND VALVES SHALL BE SAME DIA. AS AIR VALVE INLET.

PIPE THREADS SHALL BE CLEAN AND SHARP AND SEALED WITH AN APPROVED JOINT COMPOUND.

ITEM	DESCRIPTION
(1)	STD. BLK. COUPLING WELDED TO TOP OF WATERMAIN PER STD. D-6
(2)	CORP STOP, JAMES JONES NO. E1943, MUELLER B-20013N OR APPR. EQUAL (FOR SHALLOW COVER CAN BE INSTALLED ON RUN IN LIEU OF RISE)
(3)	STD. WT. BRASS PIPE IN PLASTIC WRAP
(4)	NORTHTOWN 10 MESH BUG SCREEN OR APPROVED EQUAL
(5)	TWO (2) STD. WT. BRASS 90° ELBOWS CONNECTED END-TO-END TO FORM A SWIVEL JOINT
(6)	EXTRA HEAVY BRASS COUPLING (4" LONG) AT SURFACE AND PARTIALLY RECESSED IN CONCRETE
(7)	BRASS BALL VALVE AS APPROVED BY DISTRICT
(8)	AIR RELEASE VALVE AS APPROVED BY DISTRICT
(9)	STD. BLK. 90° ST. ELBOW, 3" LONG STD. BLK. NIPPLE THREADED TWO ENDS, STD. BLK. 90° ELBOW, & 3" LONG STD. BLK. NIPPLE THREADED ONE END, ORIENTED TO CLEAR AIR VALVE BODY
(10)	EXTRA HEAVY BRASS PIPE NIPPLE THREADED BOTH ENDS 3"

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY: *Sinnaro Yos*
Sinnaro Yos, P.E. C68607

AIR VALVE INSTALLATION 1" DIA.

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

E-1

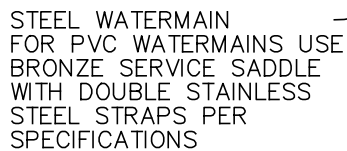
W.O. 19-0248

REV.

1. AIR VALVE SHALL BE PLACED:
 - A. 2'-6" BEHIND THE CURB FLOWLINE TO THE AV CENTERLINE WHEN THE SIDEWALK IS ADJACENT TO R/W OR MEANDERING
 - B. 7'-6" BEHIND THE CURB FLOWLINE TO AV CENTERLINE WHEN THE WIDTH OF SIDEWALK IS 6' FROM FLOWLINE
 - C. 2'-6" BEHIND THE CURB FLOWLINE TO THE AV CENTERLINE WHEN NO SIDEWALK IS PROPOSED OR EXISTING AND CURB AND GUTTER IS EXISTING
 - D. 2'-0" FROM THE PROPERTY LINE WHEN THERE IS NO CURB.
2. AIR VALVE GUARD POSTS, SIZE AND PLACEMENT TO BE DETERMINED BY J.C.S.D. INSPECTOR.



AIR VALVE & GUARD
POSTS EXTERIOR
PAINTED WITH PRIMER
AND TWO (2) COATS
OF PAINT PER DISTRICT
SPECIFICATIONS (NO
PRIMER ON BRASS OR
BRONZE)



PIPE THREADS SHALL BE CLEAN AND SHARP AND SEALED WITH AN APPROVED JOINT COMPOUND.

ITEM	DESCRIPTION
①	STD. BLK. COUPLING WELDED TO TOP OF WATERMAIN PER STD. D-6
②	2" DIA. BALL VALVE W/ 2" SQUARE OPERATING NUT, 6" DIA. VALVE CAN PER STD. DWG. B-1
③	STD. WT. BRASS PIPE IN SLEEVE.
④	NORTHTOWN 10 MESH BUG SCREEN OR APPROVED EQUAL
⑤	TWO (2) STD. WT. BRASS 90° ELBOWS CONNECTED END-TO-END TO FORM A SWIVEL JOINT
⑥	EXTRA HEAVY BRASS COUPLING (4" LONG) AT SURFACE AND PARTIALLY RECESSED IN CONCRETE
⑦	BRASS BALL VALVE AS APPROVED BY DISTRICT
⑧	AIR RELEASE VALVE AS APPROVED BY DISTRICT
⑨	STD. BLK. 90° ST. ELBOW, 3" LONG STD. BLK. NIPPLE THREADED TWO ENDS, STD. BLK. 90° ELBOW, & 3" LONG STD. BLK. NIPPLE THREADED ONE END, ORIENTED TO CLEAR AIR VALVE BODY
⑩	EXTRA HEAVY BRASS PIPE NIPPLE THREADED BOTH ENDS 3"

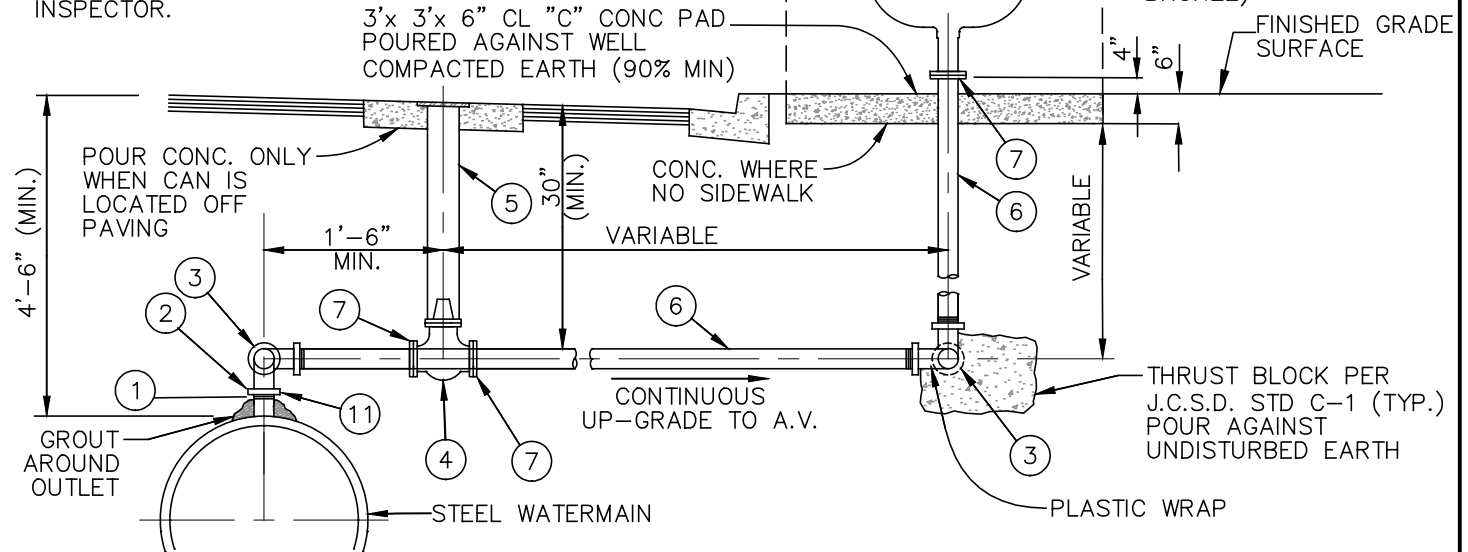
JURUPA COMMUNITY SERVICES DISTRICT

W.O. 19-0248

REV.

NOTE:

1. AIR VALVE SHALL BE PLACED:
 - A. 2'-6" BEHIND THE CURB FLOWLINE TO THE AV CENTERLINE WHEN THE SIDEWALK IS ADJACENT TO R/W OR MEANDERING
 - B. 7'-6" BEHIND THE CURB FLOWLINE TO AV CENTERLINE WHEN THE WIDTH OF SIDEWALK IS 6' FROM FLOWLINE
 - C. 2'-6" BEHIND THE CURB FLOWLINE TO THE AV CENTERLINE WHEN NO SIDEWALK IS PROPOSED OR EXISTING AND CURB AND GUTTER IS EXISTING
 - D. 2'-0" FROM THE PROPERTY LINE WHEN THERE IS NO CURB.
2. (3) AIR VALVE GUARD POSTS SIZE AND PLACEMENT TO BE DETERMINED BY J.C.S.D. INSPECTOR.



ITEM	DESCRIPTION
(1)	4" DIA. STANDARD WEIGHT MIN. OUTLET WELDED TO PIPE PER STD. C-6 WITH A.S.A. 150 LB. SLIP-ON FLANGE (WELDED FLANGE ON-SITE TO VALVE)
(2)	4" DIA. A.S.A. 150 LB WELD NECK FLANGE.
(3)	4" DIA. 90° FLGD. BEND, STD. WT. CML/CMC DOUBLE 90° JOINT
(4)	4" DIA. A.W.W.A. C-509 FLANGED RESILIENT SEAT GATE VALVE, 200 W.O.G. I.B.B.M., N.R.S., "O" RING SEAL, 2" SQ. OPERATING NUT, PER DISTRICT STD. DWG. NO. B-1.
(5)	STANDARD VALVE BOX INSTALLATION PER STD. NO. B-1.
(6)	4" DIA. STEEL PIPE, STANDARD WEIGHT CML/CMC.
(7)	4" DIA. 150 LB. SLIP-ON FLANGE (SHIP LOOSE FOR FIELD WELDING) (PROVIDE FLxFL 3" TO 4" REDUCER FOR 3" AIR VALVE).
(8)	NOT USED
(9)	AIR RELEASE VALVE AS APPROVED BY DISTRICT (3" OR 4").
(10)	STANDARD WEIGHT BLACK 90° STREET ELBOW (3" OR 4").
(11)	A.S.A. 150 FLANGE INSULATING KIT INCLUDE INSULATING GASKET, SLEEVES AND WASHER AS PER SPECS, P.S.I. PRODUCTS INC. TYPE E G.O.S., ONE PIECE S.W. OR APPROVED EQUAL (4" DIA.).

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:
 Sinnaro Yos
 Sinnaro Yos, P.E. C68607

3" AND 4" AIR VALVE INSTALLATIONS

ALBERT A. WEBB ASSOCIATES
 CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

E-2

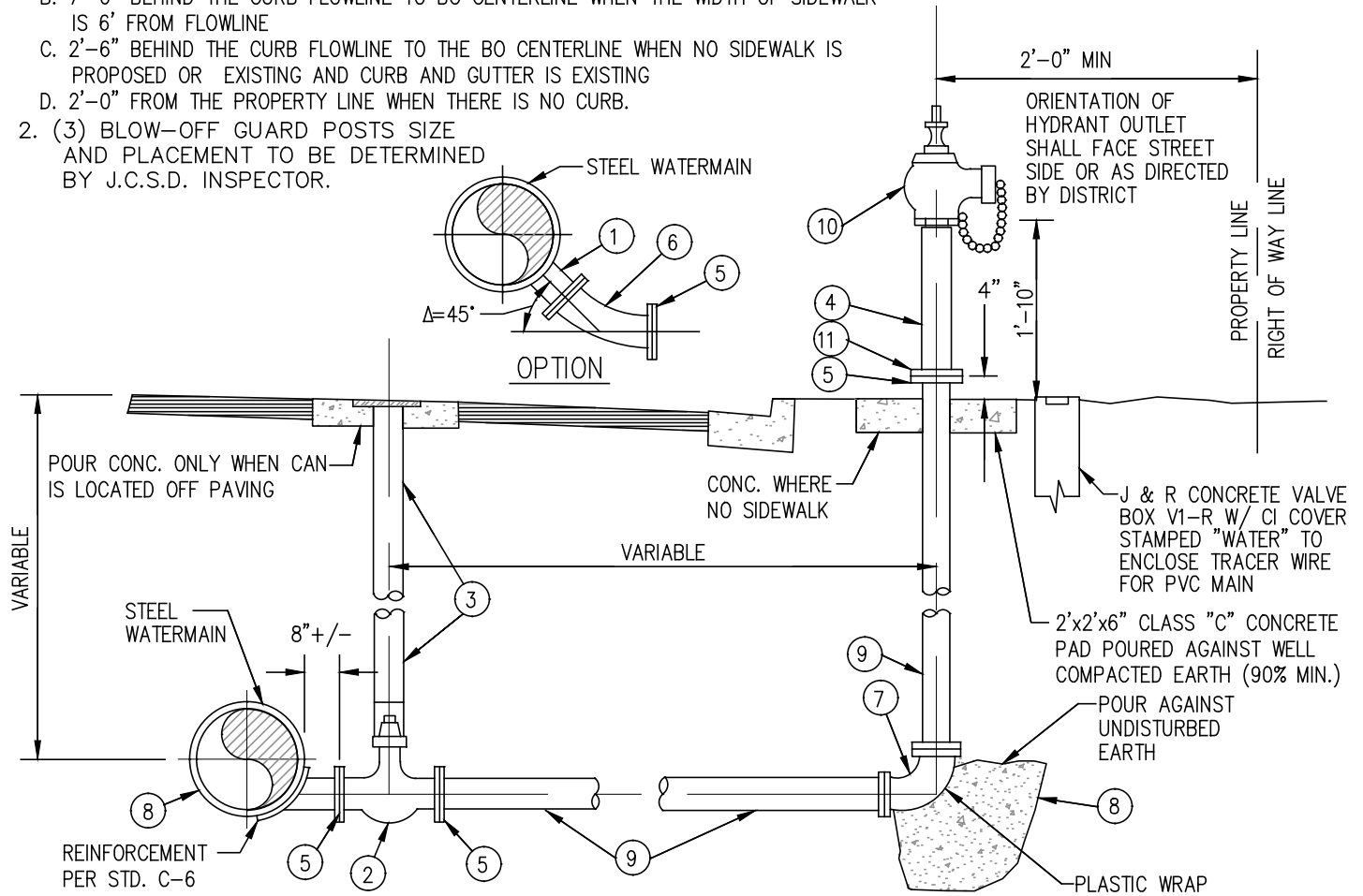
W.O. 19-0248

REV.

NOTE

1. BLOW-OFF SHALL BE PLACED:
 - A. 2'-6" BEHIND THE CURB FLOWLINE TO THE BO CENTERLINE WHEN THE SIDEWALK IS ADJACENT TO R/W OR MEANDERING
 - B. 7'-6" BEHIND THE CURB FLOWLINE TO BO CENTERLINE WHEN THE WIDTH OF SIDEWALK IS 6' FROM FLOWLINE
 - C. 2'-6" BEHIND THE CURB FLOWLINE TO THE BO CENTERLINE WHEN NO SIDEWALK IS PROPOSED OR EXISTING AND CURB AND GUTTER IS EXISTING
 - D. 2'-0" FROM THE PROPERTY LINE WHEN THERE IS NO CURB.
2. (3) BLOW-OFF GUARD POSTS SIZE AND PLACEMENT TO BE DETERMINED BY J.C.S.D. INSPECTOR.

EXTERIOR PAINTED W/PRIMER AND TWO (2) COATS PAINT PER DISTRICT SPECIFICATIONS (NO PRIMER ON BRASS OR BRONZE)



ITEM	DESCRIPTION
(1)	4-1/2" O.D. X 10 GA. CML/CMC PER D-6.
(2)	4" DIA. A.W.W.A. C-509 (LATEST) FLG'D. RESILIENT SEAT GATE VALVE, 200WOG, I.B.B.M., N.R.S., "O" RING SEAL, 2" SQ. OPERATING NUT, PER DISTRICT STD. DWG. B-1.
(3)	STANDARD VALVE BOX INSTALLATION PER STD B-1.
(4)	4" DIA STD BLACK NIPPLE, OUTSIDE PAINTED.
(5)	4" DIA. 150 LB. SLIP-ON FLANGE.
(6)	4" DIA. FLGD. 4 PC A.W.W.A. 10 GA., 45° BEND, LINED AND COATED SAME AS MAIN.
(7)	4" DIA. FLG'D. STD. WEIGHT 90° BEND
(8)	THRUST BLOCK PER STD. C-2.
(9)	4" DIA. CML/CMC, 10 GA. W.S.P.
(10)	4" x 2-1/2" BRONZE WHARF HYDRANT, JAMES JONES MODEL NO. J-344 H.P. OR APPROVED EQUAL.
(11)	A.S.A. 150 LB. SCREWED COMPANION FLANGE.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:
 Sinnaro Yos
 Sinnaro Yos, P.E. C68607

4" DIA. BLOW-OFF INSTALLATION

ALBERT A. WEBB ASSOCIATES
 CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

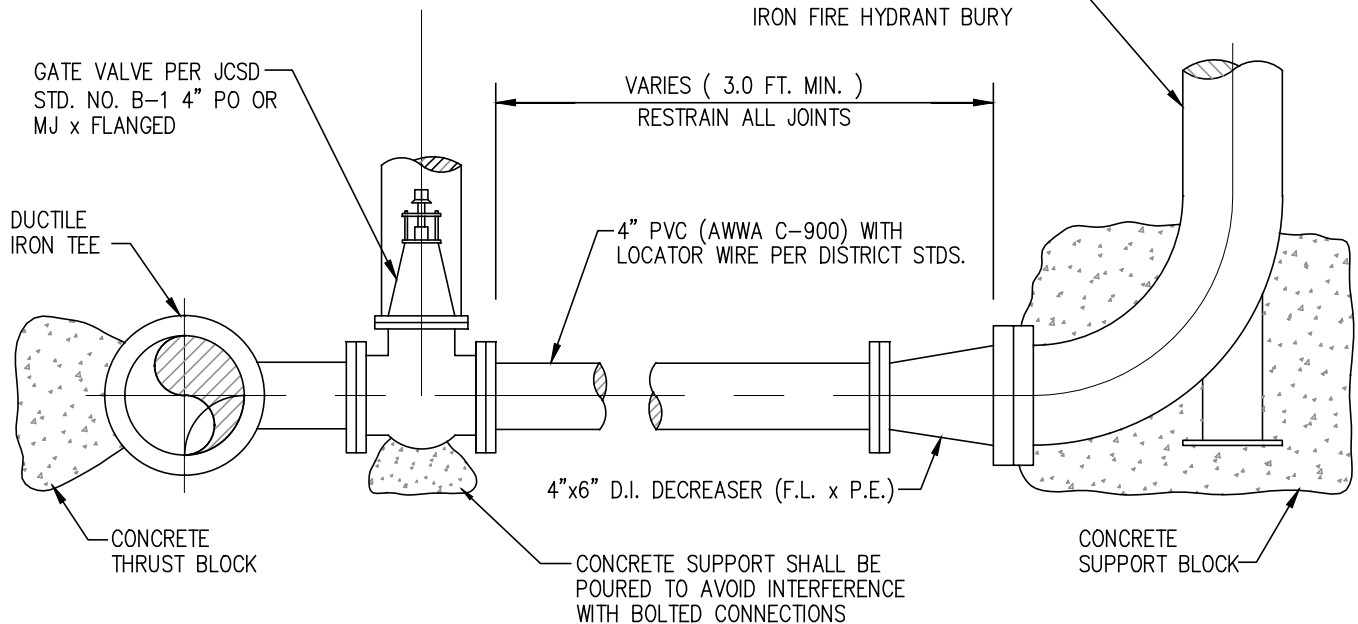
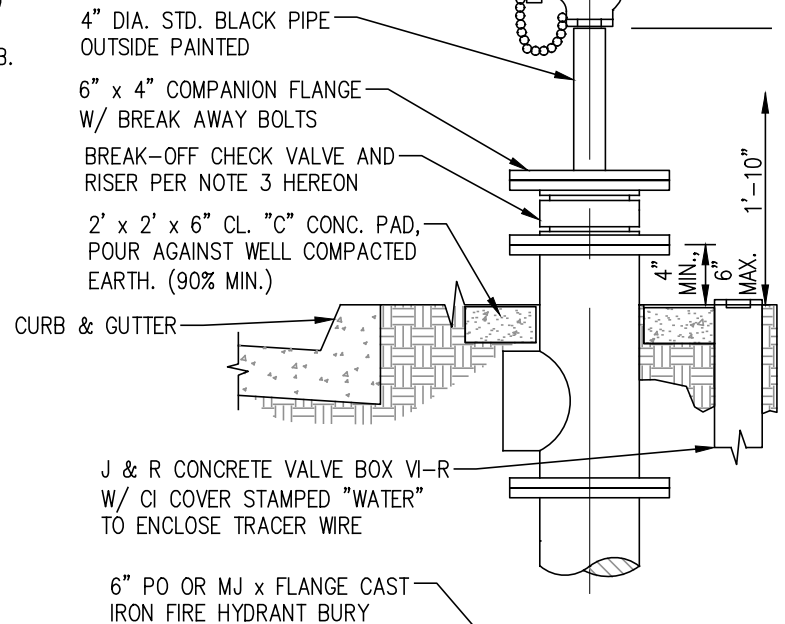
F-1

W.O. 19-0248

REV.

1. BLOW-OFF SHALL BE PLACED:

- 4" x 2 1/2" BRONZE WHARF HYDRANT,
JAMES JONES MODEL NO. J-344 H.P.
OR APPROVED EQUAL



JURUPA COMMUNITY SERVICES DISTRICT

4" BLOW-OFF ASSEMBLY (PVC PIPE)

F-1A

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

W.O. 19-0248

REV.

NOTES:

- (3) BLOW-OFFS GUARD POSTS SIZE AND PLACEMENT TO BE DETERMINED BY J.C.S.D. INSPECTOR.
- BLOW-OFF EXTERIOR (INCLUDING GUARD POSTS) TO BE PAINTED WITH PRIMER AND TWO (2) COATS OF PAINT PER DISTRICT SPECIFICATIONS. (NO PRIMER ON BRASS OR BRONZE).
- 6" DIA. CLOW LBI 400A BREAK-OFF CHECK VALVE AND 6" DIA. C.I. BREAK-OFF EXTENSION RISER, 6" LONG ON END FLG'D TO MATE W/ 6" A.S.A. 150# FLANGE, OTHER END FLG'D TO MATE WITH COMPANION FLANGE.

FINISHED GROUND SURFACE

STEEL WATERMAIN

THRUST BLOCK PER J.C.S.D. STD C-2 (TYP)

2'x 2'x 6" CL. "C" CONC PAD. POUR AGAINST WELL COMPACTED EARTH (90° MIN.)

2'-0" MIN.

1/2 O.D.
MAIN+8"

VARIABLE

TO BE FIELD LOCATED BY DISTRICT

SLOPE DOWN TO 90° BEND

8"x6" D.I. REDUCER FOR 8" BRANCH LINE

CLASS "C" CONCRETE THRUST AND SUPPORT BLOCK

2'-0" MIN.

ORIENTATION OF HYDRANT OUTLET SHALL FACE STREET SIDE OR AS DIRECTED BY DISTRICT

1'-10"

CONCRETE WHERE NO SIDEWALK

BREAK-OFF CHECK VALVE AND RISER PER NOTE 3 HEREON

PROPERTY LINE OR R/W LINE

VARIABLE TO BE FIELD DETERMINED

LOCATION NOTES:

- BLOW-OFF SHALL BE PLACED:
 - 2'-6" BEHIND THE CURB FLOWLINE TO THE BO CENTERLINE WHEN THE SIDEWALK IS ADJACENT TO R/W OR MEANDERING
 - 7'-6" BEHIND THE CURB FLOWLINE TO BO CENTERLINE WHEN THE WIDTH OF SIDEWALK IS 6' FROM FLOWLINE
 - 2'-6" BEHIND THE CURB FLOWLINE TO THE BO CENTERLINE WHEN NO SIDEWALK IS PROPOSED OR EXISTING AND CURB AND GUTTER IS EXISTING
 - 2'-0" FROM THE PROPERTY LINE WHEN THERE IS NO CURB.

ITEM	DESCRIPTION
①	TANGENTIAL OUTLET, 10 GA. CML/CMC AND REINFORCED PER STD. C-6.
②	6" OR 8" GATE VALVE PER STD. B-1 (SIZE AS SPECIFIED ON DRAWING).
③	VALVE BOX INSTALLATION PER STD. B-1.
④	A.S.A. 150 LB. SLIP-ON FLANGES (SHIP LOOSE FOR FIELD WELDING).
④A	INSTALL FLEX COUPLING PER DISTRICT SPECIFICATIONS WHERE WATERMAIN IS 24" DIA. & LARGER.
⑤	WELDED STEEL PIPE, 10 GA. CML/CMC.
⑥	A.S.A. 150 LB. REDUCING SCR. COMPANION FLANGE (4" x 13 1/2").
⑦	4" STD. BLACK PIPE, OUTSIDE PAINTED.
⑧	4" x 2 1/2" BRONZE WHARF HYDRANT, J. JONES MODEL NO. J-344 H.P. OR APPROVED EQUAL.
⑨	6" OR 8" DIA. STD. WT. LONG RADIUS CML/CMC 90° BEND
⑩	6" x 8" STD. WT. CML/CMC REDUCER, IF APPLICABLE

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

6" & 8" BLOW-OFF INSTALLATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

F-2

W.O. 19-0248

REV.

STANDARD DRAWING NO. F-3 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

TEMPORARY END OF LINE
BLOW-OFF

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

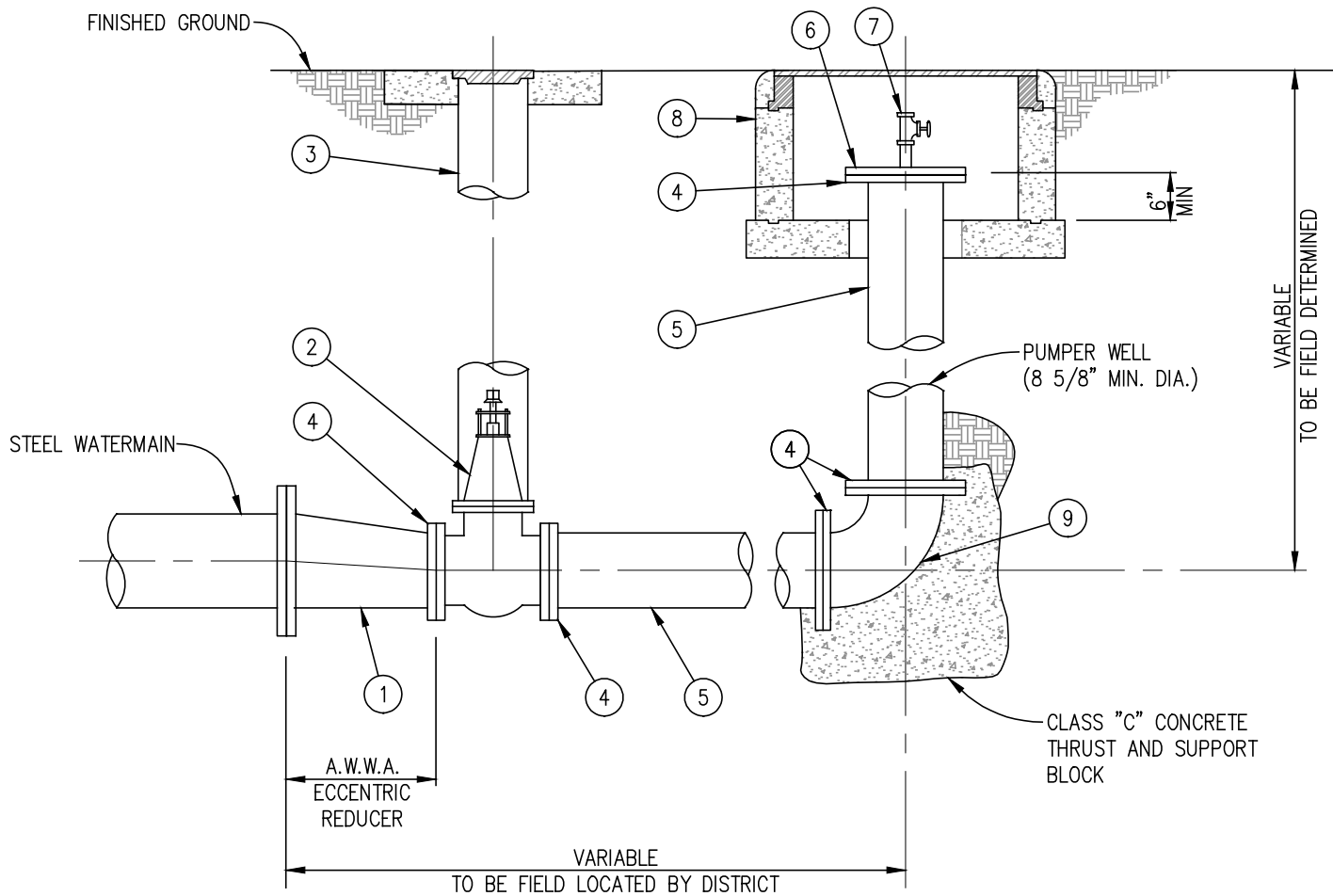
DRAWING NO.

F-3

W.O. 19-0248

REV.

NOTE: DISTRICT DIRECTED USE ONLY



ITEM	DESCRIPTION
①	LINE SIZE x 4" DIA. A.W.W.A. FLGD. REDUCER, 10 GA., CML/CMC
②	4" GATE VALVE PER STD. B-1
③	VALVE BOX INSTALLATION PER STD. B-1
④	A.S.A. 150 LB. SLIP-ON FLANGES (SHIP LOOSE FOR FIELD WELDING)
⑤	WELDED STEEL PIPE, 10 GA. MIN., CML/CMC
⑥	A.S.A. 150 LB. REDUCING SCR. COMPANION FLANGE (2" x 9")
⑦	2-1/2" DIA. SCREWED FIRE PROTECTION G.V. I.P.T. x N.S.T. W/HOSE CAP & SAFETY CHAIN, ALL BRONZE, NRS, W/MAL. IRON HAND WHEEL, 175 PSI MWWP NIBCO MODEL NO T-103-HC OR APPR. EQ.
⑧	TYPICAL BLOW-OFF MANHOLE PER STD. I-3
⑨	4" DIA. STD. WT. LONG RADIUS CML/CMC 90° BEND

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

4" END OF LINE BLOW-OFF INSTALLATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

F-4

W.O. 19-0248

REV.

STANDARD DRAWING NO. F-4M DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

6" BLOW-OFF INSTALLATION

DRAWING NO.

F-4M

APPROVED BY:



Sinnaro Yos, P.E. C68607

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

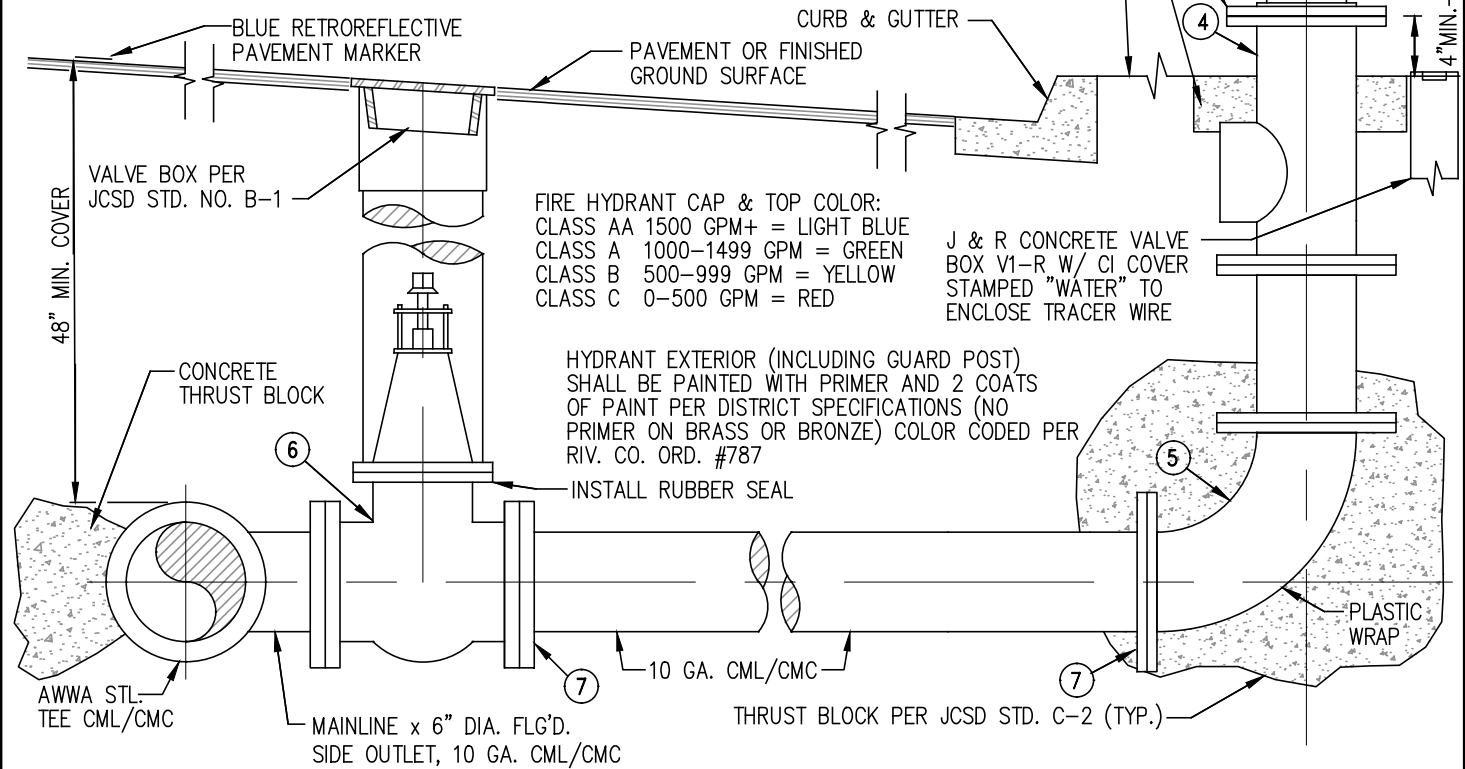
RIVERSIDE

CALIFORNIA

W.O. 19-0248

REV.

1. FIRE HYDRANT SHALL BE PLACED:
 - A. 2'-6" BEHIND THE CURB FLOWLINE TO THE FH CENTERLINE WHEN THE SIDEWALK IS ADJACENT TO R/W OR MEANDERING
 - B. 7'-6" BEHIND THE CURB FLOWLINE TO FH CENTERLINE WHEN THE WIDTH OF SIDEWALK IS 6' FROM FLOWLINE
 - C. 2'-6" BEHIND THE CURB FLOWLINE TO THE FH CENTERLINE WHEN NO SIDEWALK IS PROPOSED OR EXISTING AND CURB AND GUTTER IS EXISTING
 - D. 2'-0" FROM PROPERTY LINE WITH NO CURB.
2. ALL FIRE HYDRANTS SHALL HAVE GUARD POSTS; SIZE AND PLACEMENT BY J.C.S.D. INSPECTOR (LOCATE 3' CLEAR (MIN.) FROM F.H.).
3. FIRE HYDRANT OUTLET ORIENTATION SHALL BE PER RIV. CO. ORD. #787.
4. INSTALL BLUE RETROREFLECTIVE PAVEMENT MARKER ON ALL FIRE HYDRANTS (TWO AT INTERSECTIONS) IN ACCORDANCE WITH RIVERSIDE COUNTY FIRE DEPT. LOCATION RECOMMENDATIONS.



* ITEM	DESCRIPTION
①	STANDARD FIRE HYDRANT, HEAD & FLUTED SPOOL COMPLETE. 1-4" STEAMER HOSE OUTLET & 1-2 1/2" HOSE OUTLET. 6 HOLE PATTERN, JAMES JONES MODEL J-3700, W/BRONZE OR PLASTIC PLASTIC CAPS & CHAIN.
①A	SUPER FIRE HYDRANT, COMPLETE; 1-4" STEAMER HOSE OUTLET AND 2-2 1/2" HOSE OUTLET & 2-2 1/2" HOSE OUTLETS, 8 HOLE PATTERN, JAMES JONES MODEL J-3765, W/BRONZE OR PLASTIC CAPS AND CHAIN.
②	6" DIA. C.I. BREAK-OFF EXTENSION RISER, 6" LONG, ONE END FLG'D. TO MATE W/6" A.S.A. 150# SLIP-ON FLG., OTHER END FLG'D. TO MATE HYDRANT SPOOL.
③	6" A.S.A. 150# SLIP-ON FLG. TO MATE BREAK-OFF SPOOL. SHIP LOOSE FOR FIELD WELDING.
④	6" DIA. CLOW LBIW #400A BREAK-OFF CHECK VALVE.
⑤	6" DIA. STD. WT. LONG RADIUS CML/CMC 90° BEND
⑥	6" F x F R.S. GATE VALVE PER STD. NO. B-1.
⑦	6" A.S.A. 150# SLIP-ON FLG. TO MATE GATE VALVE. SHIP LOOSE FOR FIELD WELDING.

* UNLESS A "SUPER" FIRE HYDRANT IS DESIGNATED ON THE DRAWINGS, FIRE HYDRANT SHALL BE "STANDARD" PER ITEM. ①
 WHERE A "SUPER" FIRE HYDRANT IS SPECIFIED, HYDRANT SHALL BE PER ITEM. ①A

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

TYPICAL 6" FIRE HYDRANT INSTALLATION

ALBERT A. WEBB ASSOCIATES
 CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

G-1

G-1A

W.O. 19-0248

REV.

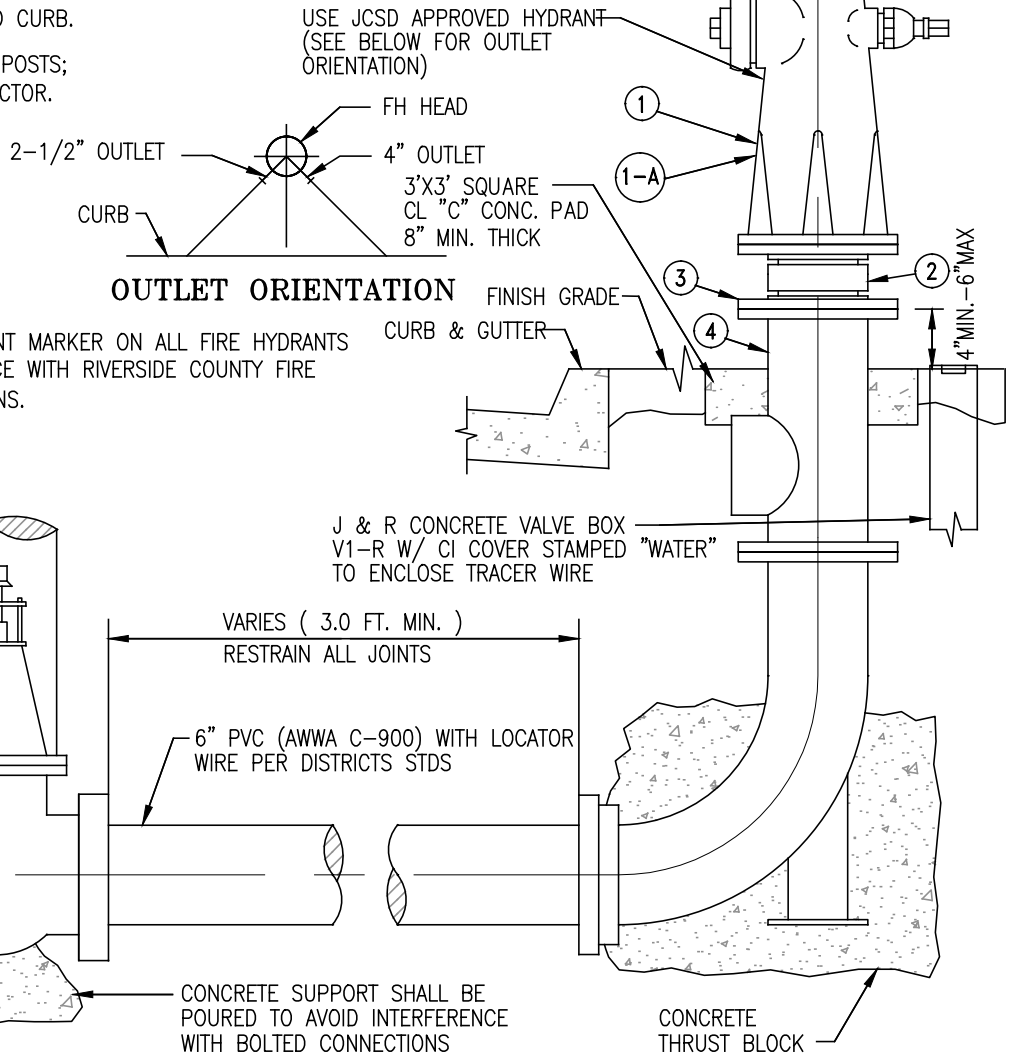
1. FIRE HYDRANT SHALL BE PLACED:
 - A. 2'-6" BEHIND THE CURB FLOWLINE TO THE FH CENTERLINE WHEN THE SIDEWALK IS ADJACENT TO R/W OR MEANDERING
 - B. 7'-6" BEHIND THE CURB FLOWLINE TO FH CENTERLINE WHEN THE WIDTH OF SIDEWALK IS 6' FROM FLOWLINE
 - C. 2'-6" BEHIND THE CURB FLOWLINE TO THE FH CENTERLINE WHEN NO SIDEWALK IS PROPOSED OR EXISTING AND CURB AND GUTTER IS EXISTING
 - D. 2'-0" FROM PROPERTY LINE WITH NO CURB.

2. ALL FIRE HYDRANTS SHALL HAVE GUARD POSTS; SIZE AND PLACEMENT BY J.C.S.D. INSPECTOR. (LOCATE 3' CLEAR (MIN.) FROM F.H.).

3. FIRE HYDRANT CAP AND TOP COLOR;

1500 GPM +	= LIGHT BLUE
1000-1499 GPM	= GREEN
500-999 GPM	= YELLOW
0-499 GPM	= RED

4. INSTALL BLUE RETROREFLECTIVE PAVEMENT MARKER ON ALL FIRE HYDRANTS (TWO AT INTERSECTIONS) IN ACCORDANCE WITH RIVERSIDE COUNTY FIRE DEPARTMENT LOCATION RECOMMENDATIONS.



ITEM	DESCRIPTION
①	STANDARD FIRE HYDRANT, HEAD & FLUTED SPOOL COMPLETE. 1-4" STEAMER HOSE OUTLET & 1-2 1/2 HOSE OUTLET, 6 HOLE PATTERN, JAMES JONES MODEL J-3700, W/BRONZE OR PLASTIC CAPS AND CHAIN.
* ①-A	SUPER FIRE HYDRANT, COMPLETE; 1-4" STEAMER HOSE OUTLET AND 2-2 1/2 HOSE OUTLETS, 8 HOLE PATTERN, JAMES JONES MODEL J-3765, W/BRONZE OR PLASTIC CAPS AND CHAIN.
②	6" DIA. C.I. BREAK-OFF SPOOL, 6" LONG, ONE END FLG'D. TO MATE W/6" A.S.A. 150# SLIP-ON FLG., OTHER END FLG'D. TO MATE HYDRANT SPOOL. (SHOP FABRICATED).
③	6" A.S.A. 150# SLIP-ON FLG. TO MATE BREAK-OFF SPOOL. SHIP LOOSE FOR FIELD WELDING.
④	6" DIA. CLOW LBIW # 400A BREAK-OFF CHECK VALVE.

* UNLESS A "SUPER" FIRE HYDRANT IS DESIGNATED ON THE DRAWINGS, FIRE HYDRANT SHALL BE "STANDARD" PER ① ITEM WHERE A "SUPER" FIRE HYDRANT IS SPECIFIED, HYDRANT SHALL BE PER ITEM. ①-A

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY: 
Sinnaro Yos, P.E. C68607

TYPICAL 6" FIRE HYDRANT INSTALLATION - PVC, DI PIPE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

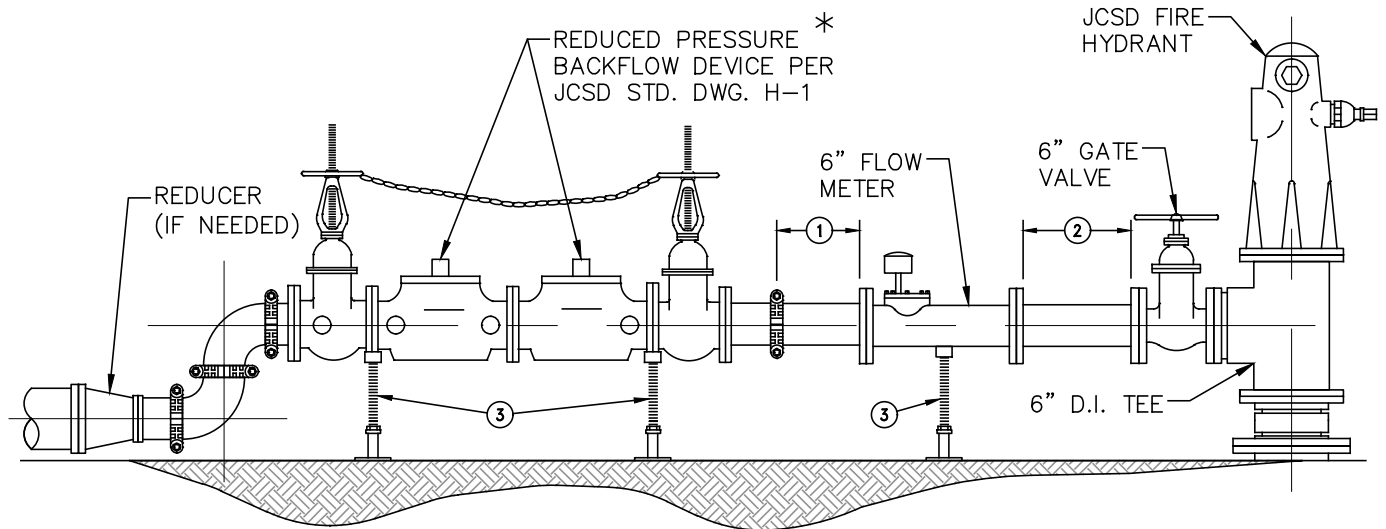
DRAWING NO.

G-2

G-2A

W.O. 19-0248

REV.



NOTE:

OPTIMAL— 10X THE PIPE DIAMETER OF STRAIGHT PIPE BEFORE THE FLOW METER, 5X AFTER
 MINIMUM — 5X THE PIPE DIAMETER OF STRAIGHT PIPE BEFORE THE FLOW METER, 3X AFTER

ITEM	DESCRIPTION
①	5X THE PIPE DIA. OF STRAIGHT PIPE AFTER FLOW METER
②	10X THE PIPE DIA. OF STRAIGHT PIPE BEFORE FLOW METER
③	MIN. 3 PIPE SUPPORTS PER JCSD STD. DWG. A-5 WITH TEMP. CONCRETE

* BACKFLOW SHALL BE RECERTIFIED EVERY TIME THE CONSTRUCTION METER IS RELOCATED.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

CONSTRUCTION METER INSTALLATION DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

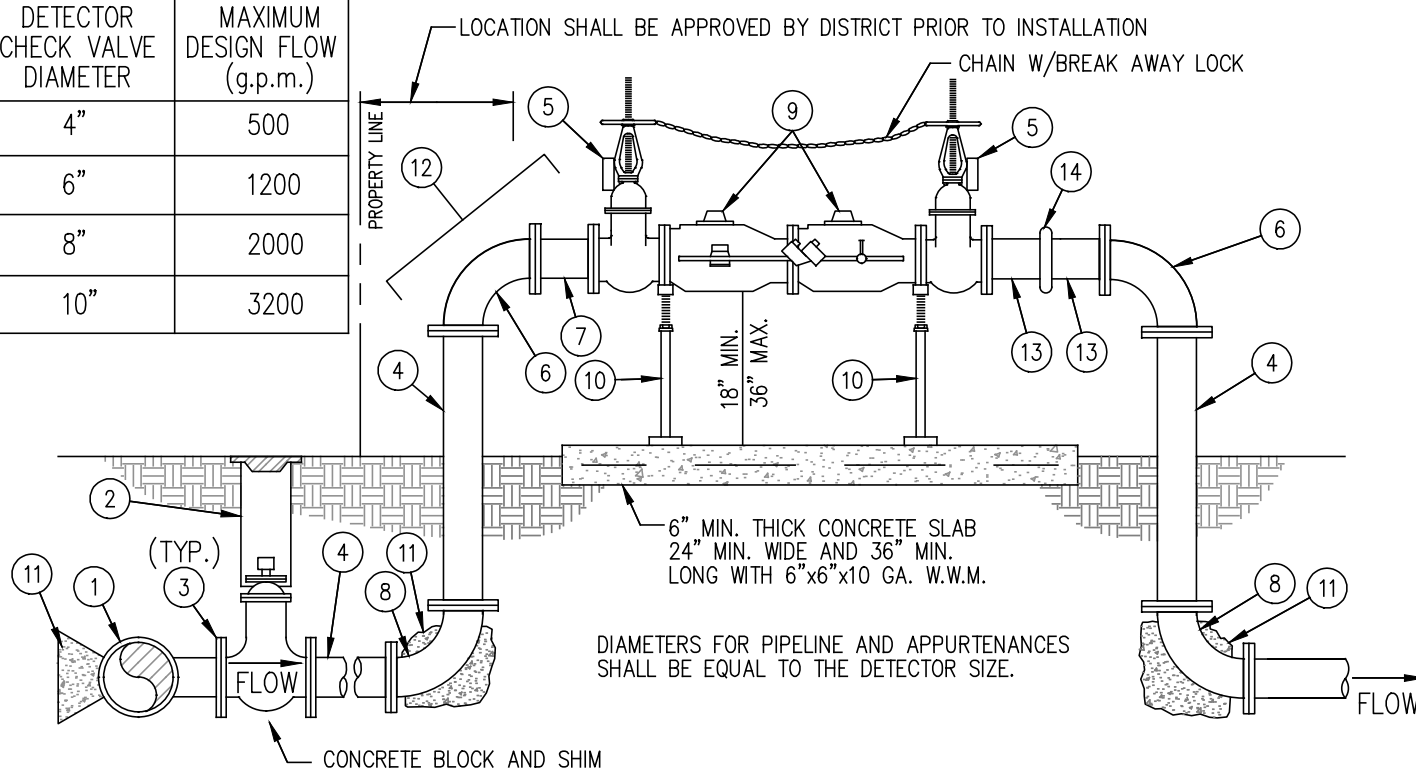
DRAWING NO.

G-3

W.O. 19-0248

REV.

DETECTOR CHECK VALVE DIAMETER	MAXIMUM DESIGN FLOW (g.p.m.)
4"	500
6"	1200
8"	2000
10"	3200



NOTES:

1. THE "APPROVED" FIRE SERVICE SHALL BE LOCATED AND INSTALLED SUBJECT TO THE APPROVAL OF THE DISTRICT.
2. THE FIRE SERVICE MUST BE INSPECTED AND TESTED IMMEDIATELY AFTER INSTALLATION.
3. ALL FIELD JOINTS SHALL BE FLANGED UNLESS OTHERWISE INDICATED. ALL WELDED JOINTS ON EPOXY LINED STD. WT. PIPE SHALL BE SHOP FABRICATED AND ALL EPOXY LINING SHALL BE SHOP APPLIED.
4. PIPE THREADS SHALL BE CLEAN AND SHARP, AND SEALED WITH APPROVED JOINT COMPOUND.
5. PAINT SHALL BE SAFETY RED.

ITEM	DESCRIPTION
①	MAINLINE DIA. x BRANCH DIA. TEE.
②	VALVE BOX & GATE VALVE INSTALLATION PER STD. NO. B-1.
③	ASA 150# SLIP-ON FLG. (TYP.) TO MATE VALVES AND FLANGED FITTINGS.
④	CML & CMC STD. WT. STEEL BELOW GRADE (FLxFL).
⑤	TAMPER SWITCH CONNECTION SHALL BE TO THE NEAREST BUILDING
⑥	90° FLANGED STD. WT. LONG RADIUS (FUSION BONDED EPOXY LINED OUTSIDE PAINTED) ELBOW (FLxFL).
⑦	FUSION BONDED EPOXY LINED, OUTSIDE PAINTED ABOVE GRADE (FLxFL).
⑧	90° FLANGED CML/CMC STD. WT. LONG RADIUS ELBOW.
⑨	DOUBLE CHECK DETECTOR W/BY-PASS METER, W/RADIOREAD PURCHASED FROM THE DISTRICT, (INCLUDING O.S. & Y. VALVES-EPOXY LINED). BY-PASS METER FLOW RATE INDICATOR TO REGISTER IN G.P.M., METER TOTALIZER TO REGISTER IN 100'S CU. FT.
⑩	PIPE SUPPORT PER DISTRICT STANDARDS.
⑪	CONCRETE THRUST BLOCK PER STD. NO. C-2
⑫	PAINT EXTERIOR WITH PRIMER AND TWO (2) COATS OF PAINT. COLOR AND MANUFACTURER AS APPROVED BY THE DISTRICT. (NO PRIMER ON BRASS OR BRONZE).
⑬	FUSION BONDED EPOXY LINED, OUTSIDE PAINTED ABOVE GRADE (FLxGR).
⑭	GROOVED COUPLING.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

4", 6", 8" AND 10" DIA. FIRE SERVICE/ DOUBLE DETECTOR CHECK VALVE INSTALLATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

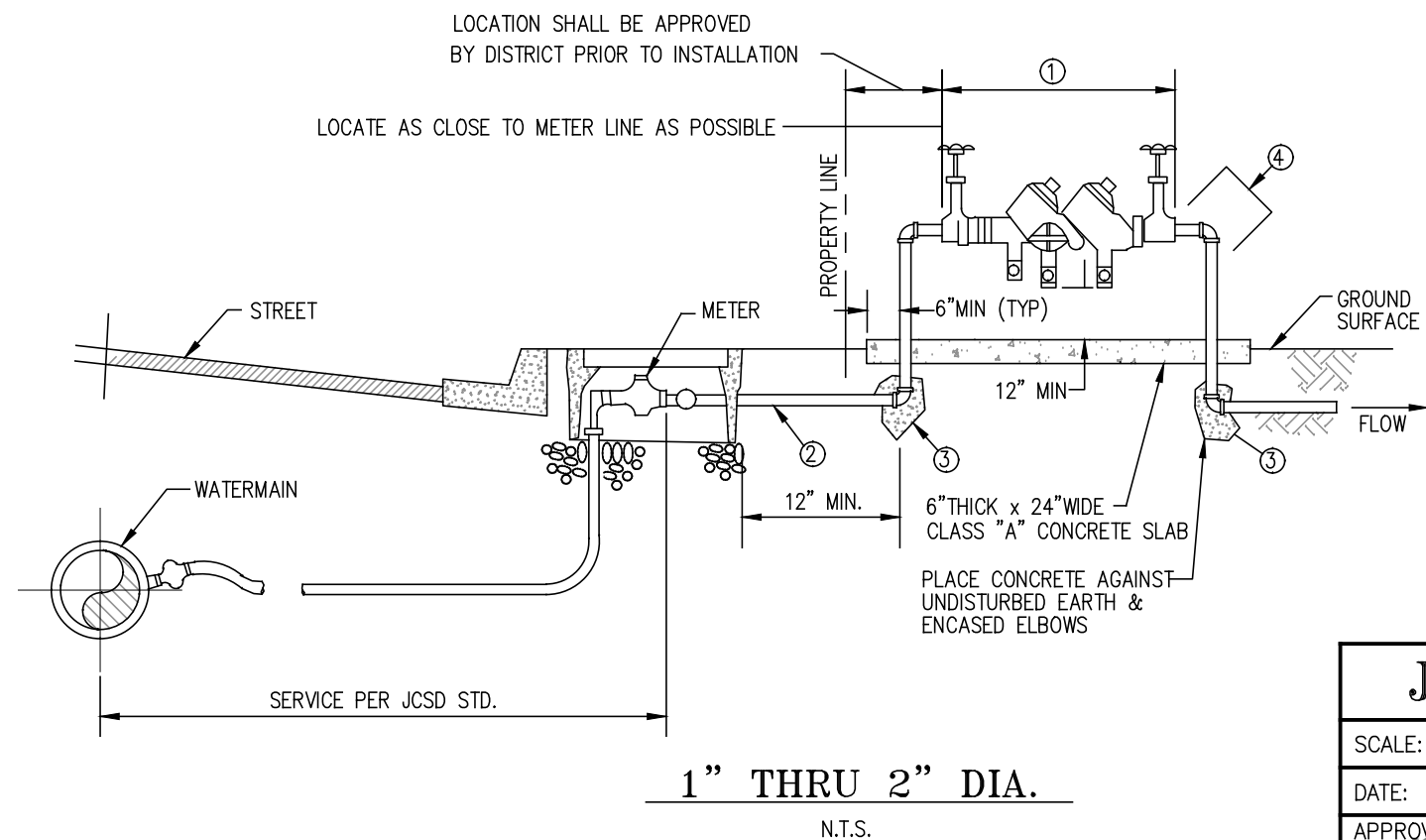
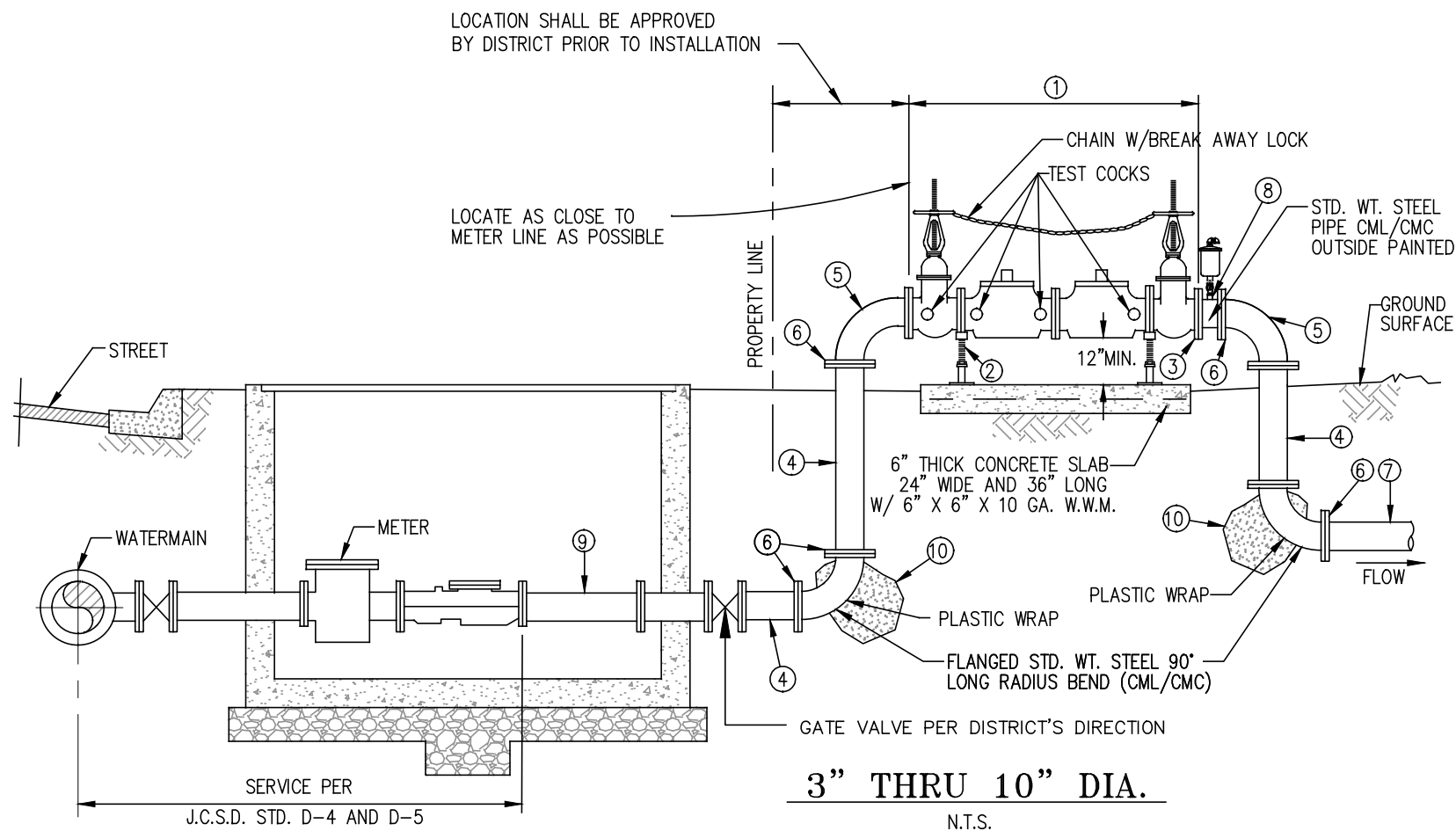
DRAWING NO.

H-1

W.O. 19-0248

REV.

REV.



ITEM	DESCRIPTION
①	REDUCED PRESSURE BACKFLOW PREVENTION DEVICE PER A.W.W.A. C-511-(LATEST) SERVICE LINE WITH FLG'D. ENDS. A.B.I.W.P. #150 P.S.I. M.W.W.P., W/GATE VALVES AND TEST COCKS PER DISTRICT APPROVED MANUFACTURERS LIST.
②	PIPE SUPPORTS PER JCSD STANDARD DRAWING NO A-5 (4 MINIMUM)
③	GROOVE x FLANGE ADAPTOR (VICTAULIC STYLE 741 OR APPR EQ)
④	STD WT STEEL PIPE, CML/CMC
⑤	FLANGED STD WT STEEL 90° LONG RADIUS BEND (FBEL/OUTSIDE PAINTED)
⑥	150# A.S.A. SLIP-ON FLANGE
⑦	CUSTOMER SERVICE PIPE
⑧	1" DIA 3000# THREADED COUPLING WITH 1"x 1/2" BRASS REDUCER BUSHING; 1/2" CORP STOP; 1/2" AIR RELEASE VALVE (APCO MODEL 50 OR, APPR EQ) W/DBL STREET ELL TOP OUTLET
⑨	FOR SERVICE LINE 3" DIA. AND ABOVE SERVICE LINE DIA. x REQ'D. LENGTH STD. WT. WELDED STL. PIPE (CML/COAL TAR EPOXY COATING) W/STD. WT. WELDING FITTINGS AND 150# WELD NECK FLG'S. TO MATE REDUCED PRESSURE BACKFLOW PREVENTION DEVICE.
⑩	3 CU. FT MIN. OF CLASS "C"(2000 PSI) CONCRETE THRUST AND SUPPORT BLOCK

NOTES:

1. THE "APPROVED" REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICE SHALL BE LOCATED AND INSTALLED SUBJECT TO THE APPROVAL OF THE DISTRICT.
2. THE DEVICE MUST BE INSPECTED AND TESTED IMMEDIATELY AFTER INSTALLATION.
3. PIPE THREADS SHALL BE CLEAN AND SHARP, AND SEALED WITH APPROVED JOINT COMPOUND.
4. ALL WELDED JOINTS SHALL BE MADE WITH A MINIMUM OF TWO COMPLETE PASSES.
5. PAINT BARE METAL WITH PRIMER AND TWO (2) COATS OF PAINT PER DISTRICT SPECIFICATIONS. (NO PRIMER ON BRASS OR BRONZE)
6. SERVICE CANNOT BE TURNED ON UNTIL BACKFLOW ASSEMBLY HAS BEEN TESTED BY A CERTIFIED BACKFLOW TESTER.
7. JCSD'S "CROSS CONTROL CONNECTION SPECIALIST" TO INSPECT PIPE BETWEEN METER AND BACKFLOW ASSEMBLY.

ITEM	DESCRIPTION
①	REDUCED PRESSURE BACKFLOW PREVENTION DEVICE PER A.W.W.A. C-511(LATEST) SERVICE LINE SIZED W/SCR. ENDS. THRU 2" DIA. WITH A.B.I.W.P. #150 P.S.I. M.W.W.P. W/GATE VALVES & TEST COCKS.
②	FOR SERVICE LINE THROUGH 2" DIA. SERVICE LINE DIA. x REQ'D. LENGTH STD. WT. BRASS PIPE W/STD. WT. SCR. BRASS FITTINGS.
③	2 CU. FT. MIN. OF CLASS "C" (2000 PSI) CONCRETE THRUST AND SUPPORT BLOCK
④	PAINT EXTERIOR WITH PRIMER AND TWO (2) COATS OF PAINT PER DISTRICT SPECIFICATIONS. (NO PRIMER ON BRASS OR BRONZE)

JURUPA COMMUNITY SERVICES DISTRICT

SCALE:	REDUCED PRESSURE BACKFLOW DEVICE	DRAWING NO. H-2
DATE: SEPTEMBER 2020		
APPROVED BY: <i>Sinnaro</i> Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248

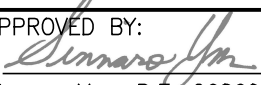
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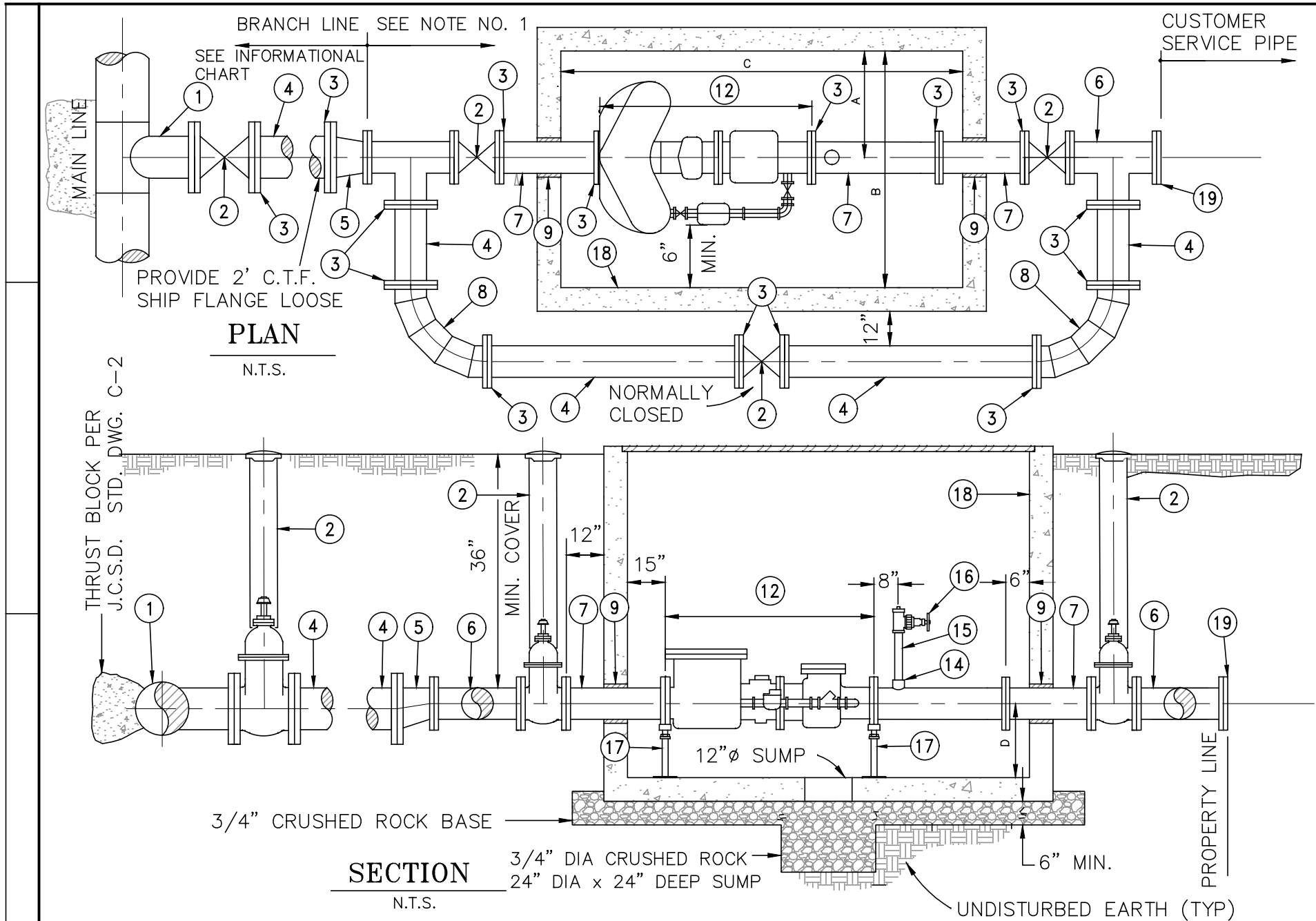
JURUPA COMMUNITY SERVICES DISTRICT

	SCALE: NONE	DOUBLE CHECK VALVE ASSEMBLY	DRAWING NO.
	DATE: SEPTEMBER 2020		H-3
REV.	APPROVED BY: 	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS	
	Sinnaro Yos, P.E. C68607		RIVERSIDE CALIFORNIA W.O. 19-0248

STANDARD DRAWING NO. H-4 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

REV.	SCALE: NONE	4", 6", 8" & 10" FIRE SERVICE INSTALLATION (UN-METERED)	DRAWING NO.
	DATE: SEPTEMBER 2020		H-4
	APPROVED BY: 	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248
	Sinnaro Yos, P.E. C68607		



ITEM	DESCRIPTION
1	MAINLINE DIA. x BRANCH DIA. (A.W.W.A.) FLANGED OUTLET TEE.
2	VALVE BOX & GATE VALVE INSTALLATION PER J.C.S.D. STD. DWG. NO. B-1 (USE 14" BFV PER J.C.S.D. STD. B-3 FOR 14" DIA. BRANCH LATERAL).
3	150# SLIP ON FLANGE (TYPICAL).
4	CML/CMC W.S.P. (12 GA. MIN.).
5	BRANCH x METER SIZE A.W.W.A. "FLAT TOP" FLANGED REDUCER.
6	CML/CMC A.W.W.A. FLANGED TEE.
7	STD. WT. STL. PIPE, CML/CMC.
8	CML/CMC A.W.W.A. FLANGED 90° BEND (CEMENT MORTAR LINED CAST IRON 90° BEND MAY BE SUBSTITUTED UPON APPROVAL BY DISTRICT).
9	KNOCKOUTS AS REQUIRED (2" LARGER THAN PIPE SIZE O.D. ALL AROUND) DRY PACK ALL AROUND PIPE.
10	NOT USED
11	NOT USED
12	METER WITH ALL BRONZE BY-PASS ASSEMBLY (INCLUDING GATE VALVES, CHECK VALVE & BY-PASS METER FURNISHED BY DISTRICT AT DEVELOPERS EXPENSE)
13	NOT USED
14	2 1/2", 3/16" THICK WALL, COUPLING WELDED TO TOP OF PIPE.
15	2 1/2" DIA. x 12" LONG STD. BRASS THREADED NIPPLE.
16	2 1/2" DIA. SCREWED FIRE PROTECTION GATE VALVE, IPT x NST, WITH HOSE CAP AND SAFETY CHAIN, ALL BRONZE, NRS, WITH MAL. IRON HAND WHEEL, 175 PSI MWWP; NIBCO MODEL NO. T-103-HC OR APPROVED EQUAL.
17	PIPE SUPPORT PER J.C.S.D. STD. DWG. NO. A-5.
18	PRE-CAST CONCRETE VAULT WITH 2 PIECE 6' x 8' TORSION HINGED GALVANIZED OR ALUMINUM COVER W/6" X 6" METER READING LID. QUICKSET OR APPROVED EQUAL. COVER TO BE SPECIFIED FOR TRAFFIC LOADS WHERE REQUIRED. NOTE: DEPENDENT UPON SELECTED METER DIMENSIONS VAULT SIZE MAY NEED TO BE INCREASED TO MAINTAIN MINIMUM INTERNAL CLEARANCE DIMENSIONS SHOWN.
19	BLIND FLANGE

NOTES:

- DIAMETERS FOR PIPELINE AND APPURTENANCES SHALL BE EQUAL TO THE METER SIZE.
- THE FIRE SERVICE VAULT SHALL BE LOCATED AND INSTALLED SUBJECT TO APPROVAL OF THE DISTRICT. WHERE VAULT IS INSTALLED IN PARKWAY WITH CURB AND SIDEWALK, THE VAULT SHALL BE PLACED PARALLEL TO THE CURB LINE & PIPING.
- ADJUST VAULT AND COVER TO MEET SIDEWALK AND CURB GRADE.
- VALVE COVER, POST INDICATOR, AND ALL METAL INSIDE VAULT TO BE PAINTED WITH PRIMER AND TWO (2) COATS OF RED ACME PAINT, NO. 2-16012, OR APPROVED EQUAL. NO PRIMER ON BRASS OR BRONZE.
- ALL FIELD JOINTS SHALL BE FLANGED UNLESS OTHERWISE INDICATED. ALL WELDED JOINTS ON EPOXY LINED STD. WT. PIPE SHALL BE SHOP FABRICATED AND ALL EPOXY LINING SHALL BE SHOP APPLIED.
- PIPE THREADS SHALL BE CLEAN AND SHARP, AND SEALED WITH APPROVED JOINT COMPOUND.
- SHOULD THE DEPTH OF THE VAULT EXCEED FOUR (4) FEET, AN OSHA APPROVED LADDER ATTACHED TO AN INSIDE WALL SHALL BE PROVIDED. THE LOCATION OF THE LADDER SHALL BE AS DIRECTED BY THE DISTRICT.

SPECIAL NOTE

WHERE REQUIRED BY DISTRICT: A BACKFLOW PREVENTER PER STD. H-2 SHALL BE INSTALLED.

I N F O R M A T I O N A L C H A R T								
DETECTOR SIZE	BRANCH SIZE	D I M E N S I O N S						NORM. MAX. OPERATING FLOW CAPACITY (GPM)
		A	B	C	D	E	F	
4"	6"	3'-0"	6'-0"	8'-0"	1'-6"	2'-9"	1'-3"	1000
6"	8"	3'-0"	6'-0"	8'-0"	1'-8"	3'-9"	1'-3"	2000
8"	12"	3'-0"	6'-0"	8'-0"	2'-0"	4'-5"	1'-4"	3500
10"	14"	3'-0"	6'-0"	10'-0"	2'-0"	5'-8"	1'-7"	5500

JURUPA COMMUNITY SERVICES DISTRICT

SCALE:

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

4", 6", 8" & 10" FIRE SERVICE
INSTALLATION (METERED)

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

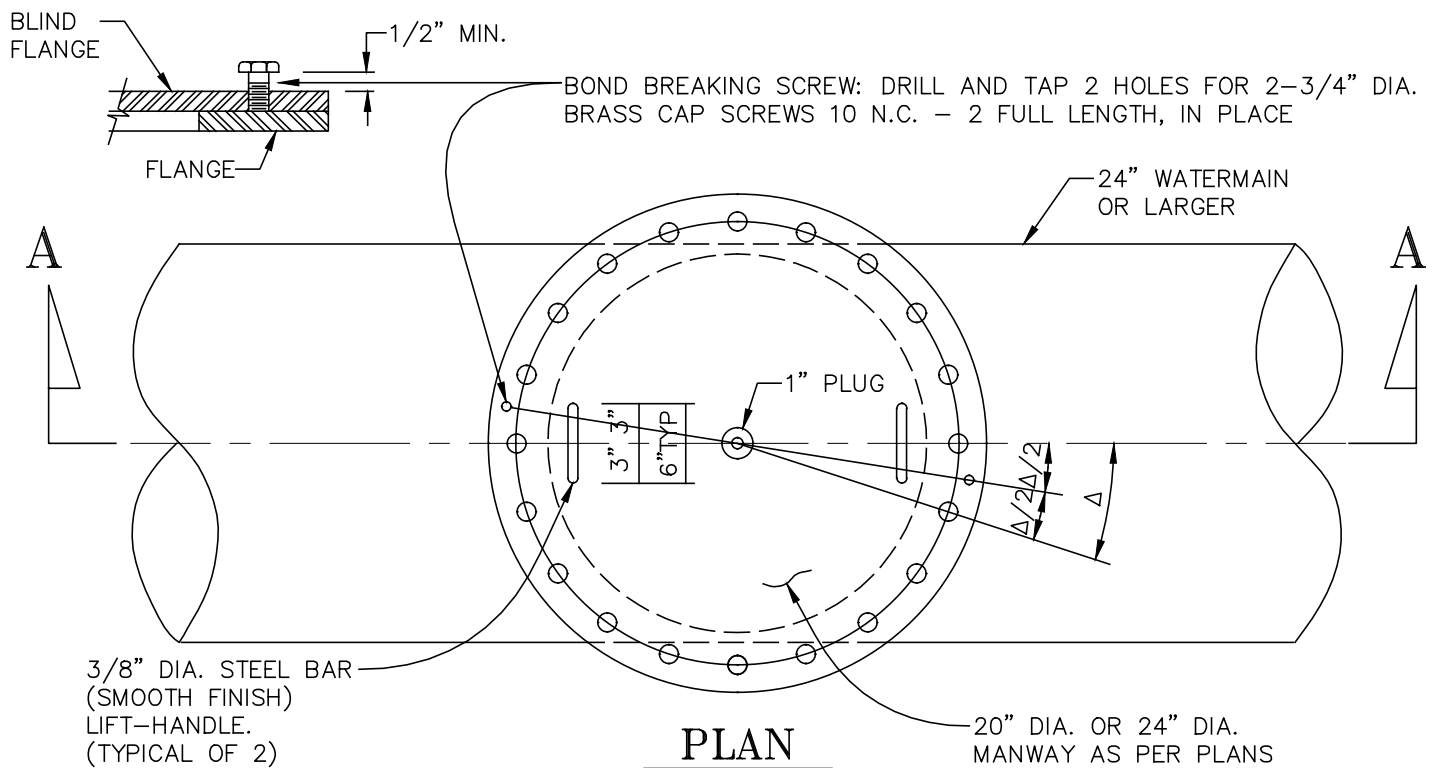
RIVERSIDE

CALIFORNIA

DRAWING NO.

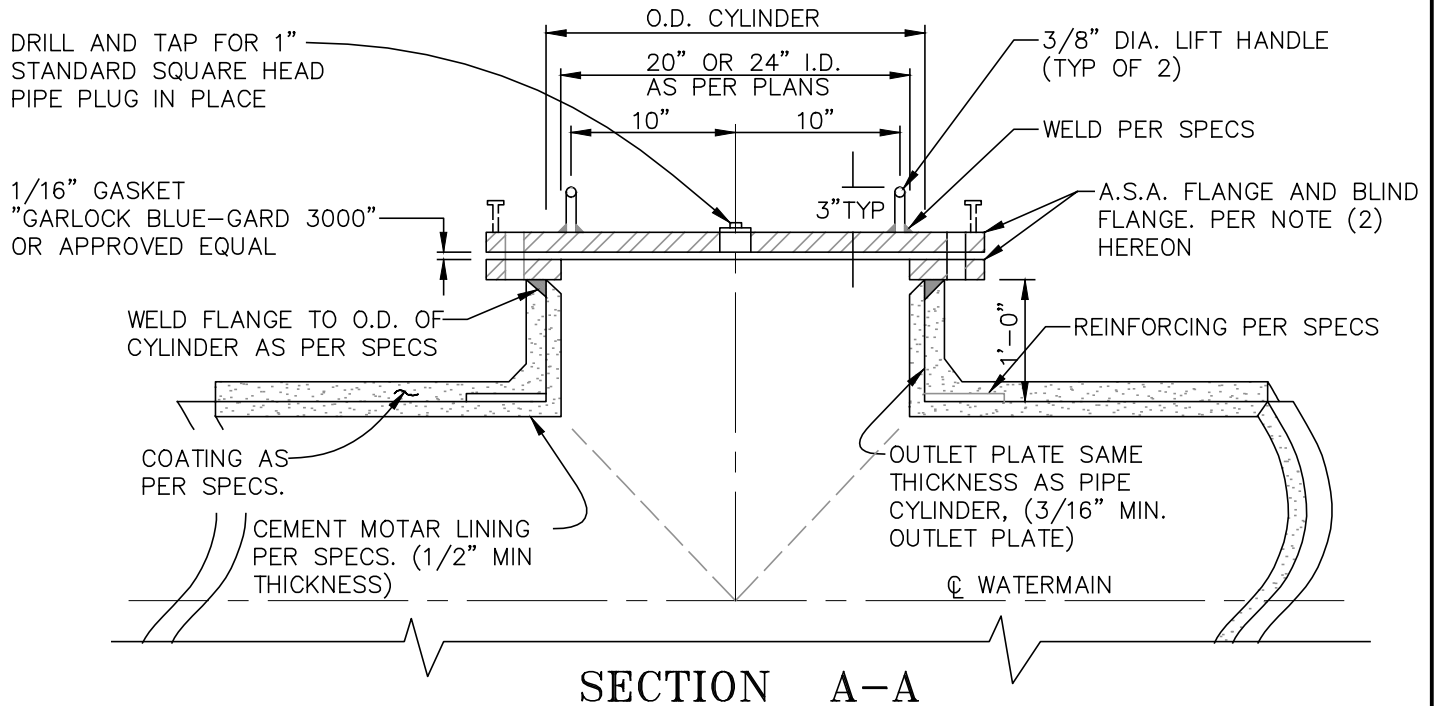
H-4A

W.O. 19-0248



NOTES:

1. PAINT ALL EXPOSED INTERIOR AND EXTERIOR METAL SURFACES OF FLANGES EXCEPT GASKET SURFACES WITH PRIMER.
2. FLANGE AND BLIND FLANGE, SHALL BE A.S.A. 150lb. F.S.S.O. F/F FLANGES.
3. LUBRICATE ALL BOLT THREADS WITH GRAPHITE.



JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

MANWAY INSTALLATION

20" OR 24" DIA.

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

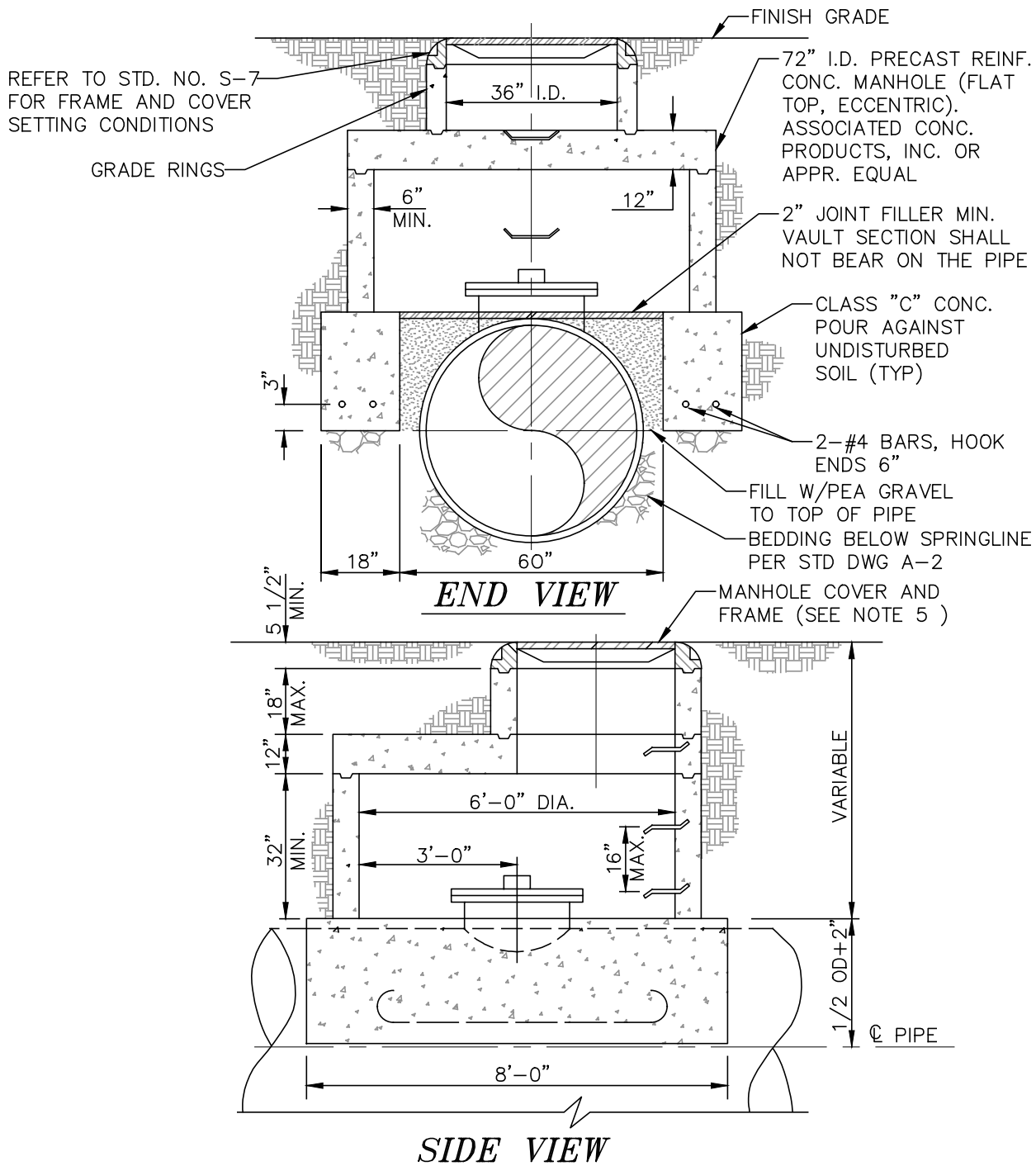
CALIFORNIA

DRAWING NO.

I-1

W.O. 19-0248

REV.



NOTES:

1. WHEN MANHOLE IS IN PAVED AREA, MANHOLE FRAME SHALL BE SET AFTER ADJACENT PAVEMENT HAS BEEN PLACED. TOP SHALL BE FLUSH WITH PAVEMENT.
2. ALL JOINTS SHALL BE SEALED WITH APPROVED JOINT SEALANT.
3. VAULT SHALL BE DESIGNED FOR H-20, S-16 LOADING.
4. ALHAMBRA FOUNDARY TRAFFIC MANHOLE FRAME AND COVER NO. A-1251 OR APPROVED EQUAL. WITH LETTERS J.C.S.D. CAST IN TOP OF COVER AND FRAME PAINTED WITH PRIMER AND TWO (2) COATS OF PAINT PER DISTRICT SPECIFICATIONS

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

MANHOLE DETAIL FOR MANWAYS

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

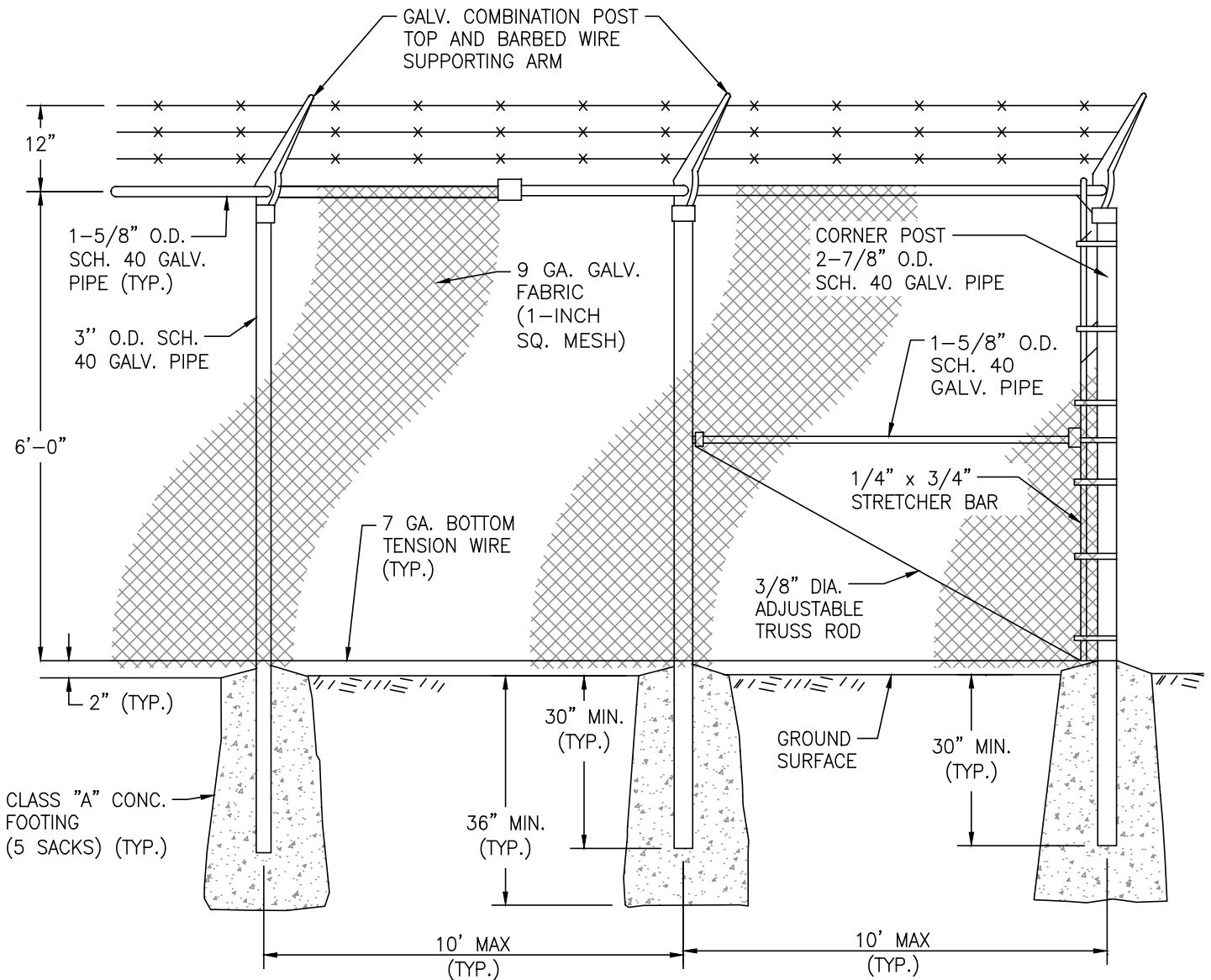
DRAWING NO.

I-2

W.O. 19-0248

REV.

W.O. 19-0248



NOTES:

1. DIAMETER OF CONC. FOOTING SHALL BE 3 TIMES O.D. OF POST; 12" MINIMUM.
2. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND SHALL BE APPROVED BY THE DISTRICT.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

CHAIN LINK FENCE DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

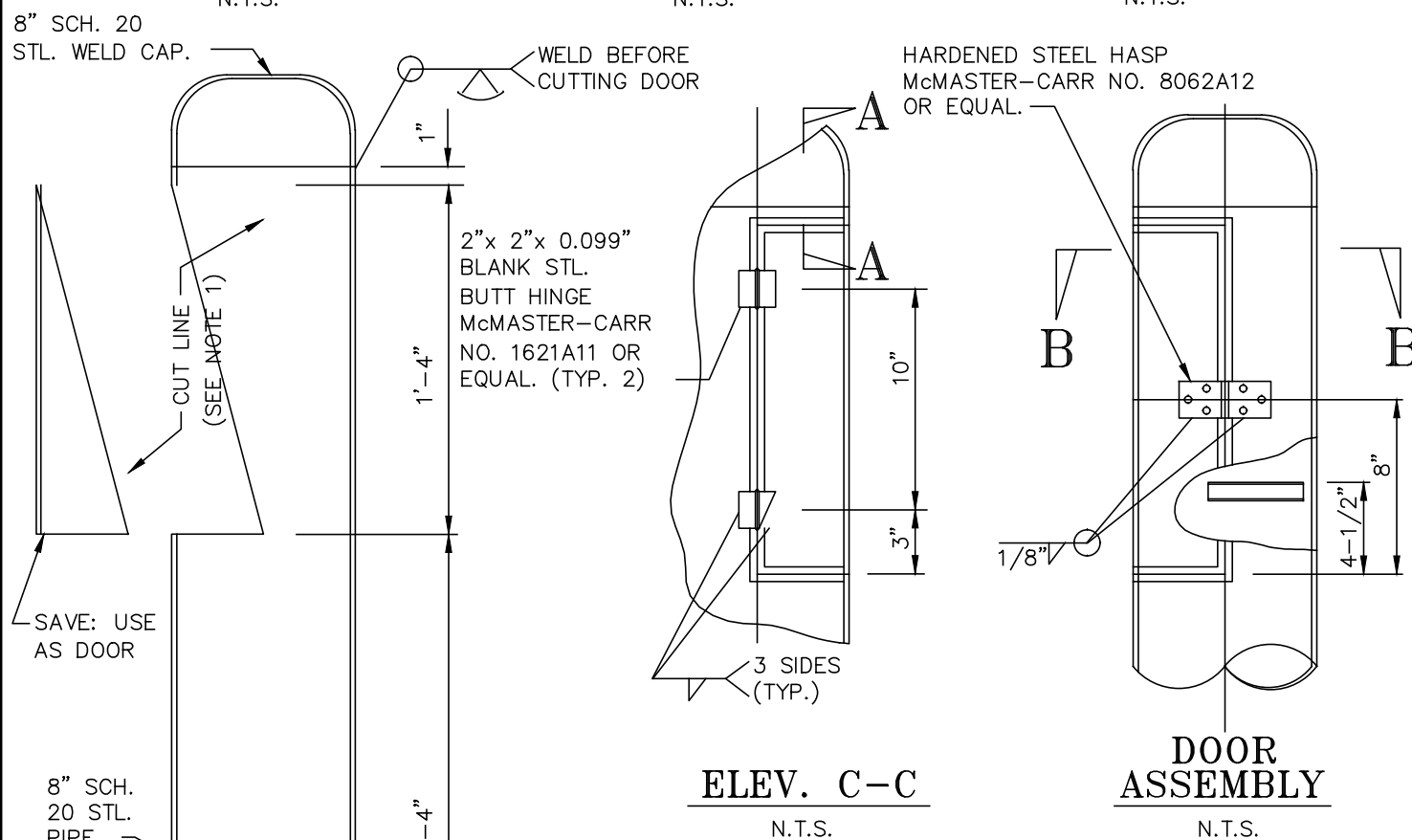
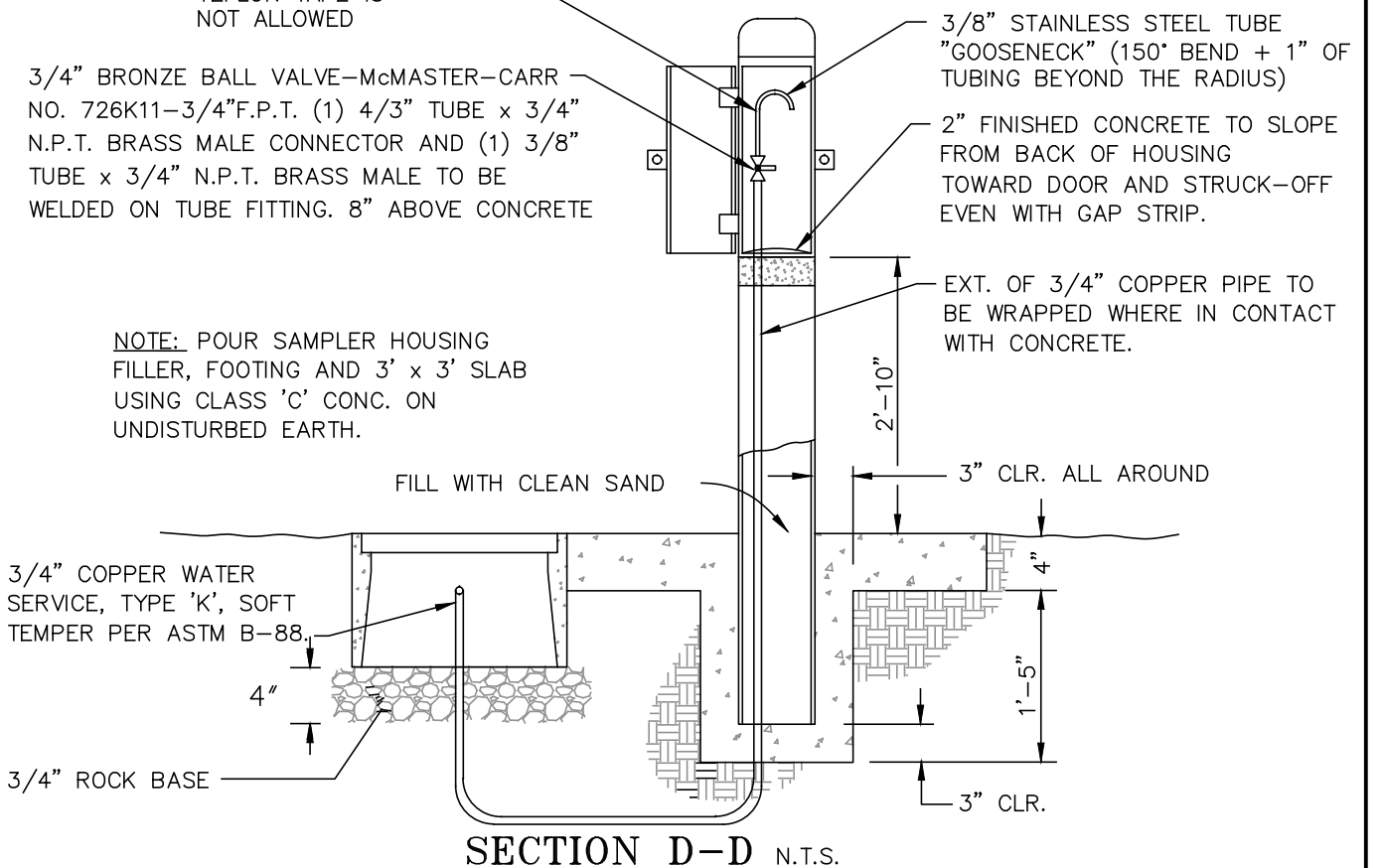
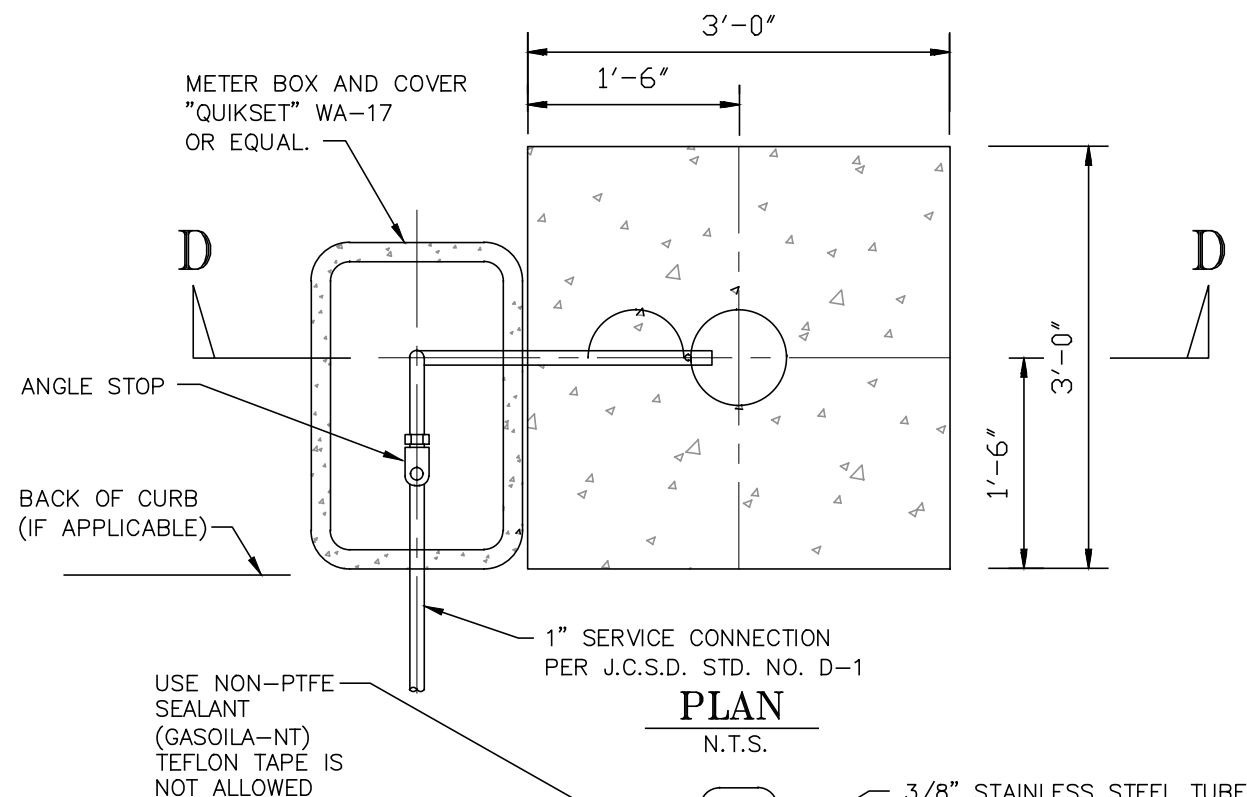
CALIFORNIA

DRAWING NO.

J-1

W.O. 19-0248

REV.



NOTES:

1. SAWCUT IS PREFERRED FOR DOOR OPENING, GRIND CUT SMOOTH AND BREAK ALL SHARP EDGES.
2. HOUSING ASSEMBLY TO BE SANDBLASTED CLEAR AND FREE OF ALL RUST, SCALE AND WELD SPATTER ON ALL SURFACES. HOUSING IS THEN TO BE PAINTED WITH PRIMER AND TWO (2) COATS OF XOP25 LIGHT BLUE PAINT, (COLOR TO BE AS DIRECTED BY DISTRICT.)
3. DISTRICT SHALL DETERMINE EXACT LOCATION OF SAMPLING STATION AND GUARD POSTS WHERE REQUIRED.

HOUSING LAYOUT

N.T.S.

FABRICATION DETAILS

N.T.S.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE:	WATER SAMPLING STATION CONSTRUCTION DETAILS	DRAWING NO.
DATE: SEPTEMBER 2020		K-1
APPROVED BY:  Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248

STANDARD DRAWING NO. K-2 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

PEDESTAL MOUNTED TERMINAL HOUSING
INSTALLATION FOR DIRECT BURIAL CABLE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

K-2

W.O. 19-0248

REV.

NOTES:

1. TEST STATIONS TO BE INSTALLED AT LOCATIONS SHOWN ON JOB DRAWINGS.
2. BOX TO BE FIELD LOCATED PER DISTRICT.

LOCATE GUARD POST PER J.C.S.D. STD. NO. A-4 ADJACENT TO TEST BOX AND LABEL C.T.S.

CONCRETE METER BOX W/C-1 FRAME AND HINGED LOCKING COVER MARKED "J.C.S.D. C.P. TEST" (BROOKS NO. 36-H.F.L. OR APPR. EQ.) PROVIDE 9" EXTENSION

LEAVE SUFFICIENT SLACK TO RAISE WIRES 18" ABOVE GRADE

LONG SWEEPS ELECTRICAL STD. 90

24" MIN.

2" PVC CONDUIT SCH. 40 ENTIRE RUN

SECURE WIRE ENDS TO PIPE (SEE STD. DWG. K-4)

HAND BACKFILL IN AREA OF WIRE

- (1) #6 AWG TYPE THWN WIRE (BLACK)
- (1) #12 AWG TYPE THWN WIRE (RED)

- (1) #10 AWG TYPE THWN WIRE (GREEN) ENCASED IN CSE BAG

LOCATE COPPER-COPPER SULFATE REFERENCE ELECTRODE (CSE) AT CROSSING BETWEEN PROPOSED WATERLINES & EXISTING PIPELINES WHERE INDICATED ON THE DRAWINGS. ELECTRODES TO BE LOCATED NO FURTHER THAN 12" FROM WATERLINE IN A VERTICAL DIRECTION. ELECTRODE MODEL NO. IHRP #802 OR STEALTH 2 CU-CU S04, PART NO. SRE-007-CUY AS MANUFACTURED BY BORIN MANUFACTURING, INC.

STEEL CYLINDER PIPE

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

CATHODIC PROTECTION TEST STATION STEEL CYLINDER PIPE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

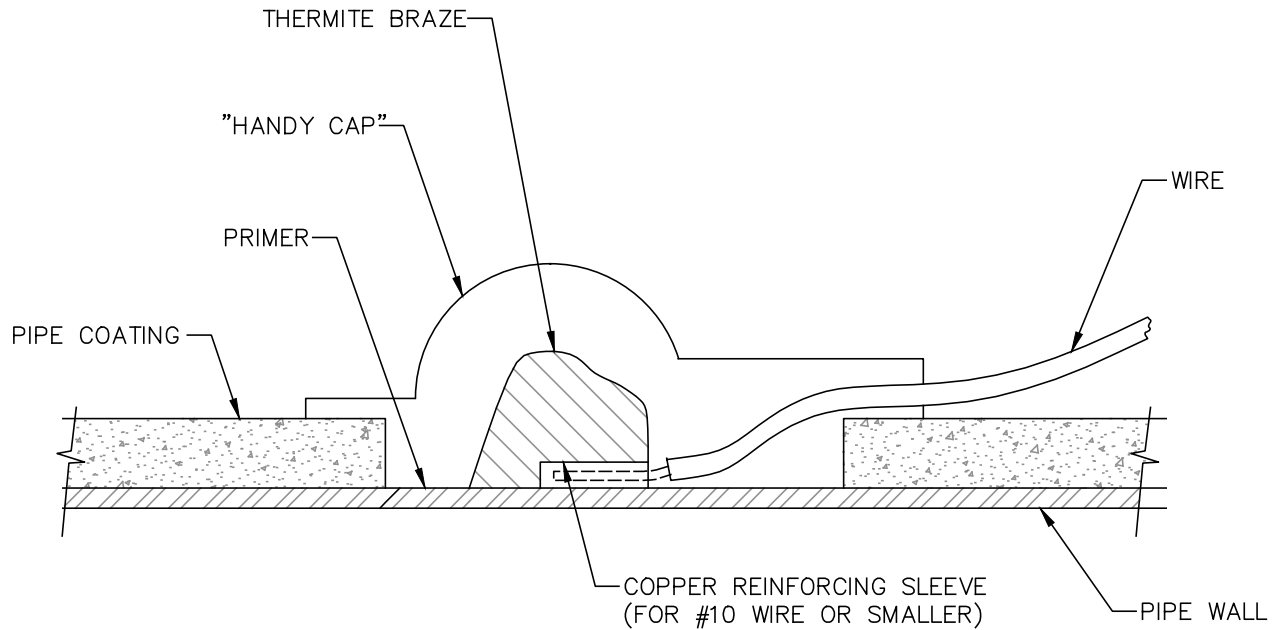
CALIFORNIA

DRAWING NO.

K-3

W.O. 19-0248

REV.



THERMITE BRAZE

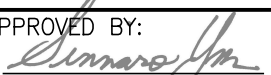
NOTES:

1. CLEAN PIPE TO BRIGHT METAL.
2. THERMITE BRAZE TO BE CADWELL BY ERICO PRODUCTS OR EQUAL.
3. USE PROPER BRAZE ALLOY FOR STEEL.
4. TEST BRAZE BY PULLING ON WIRE AND STRIKING BRAZE.
5. COAT BRAZE WITH ROYSTON PRIMER AND "HANDY CAP".

SPECIAL NOTE:

THERMITE BRAZE KIT SUPPLIED BY FARWEST CORROSION CONTROL
GARDENA, CA. (214) 770-6425.

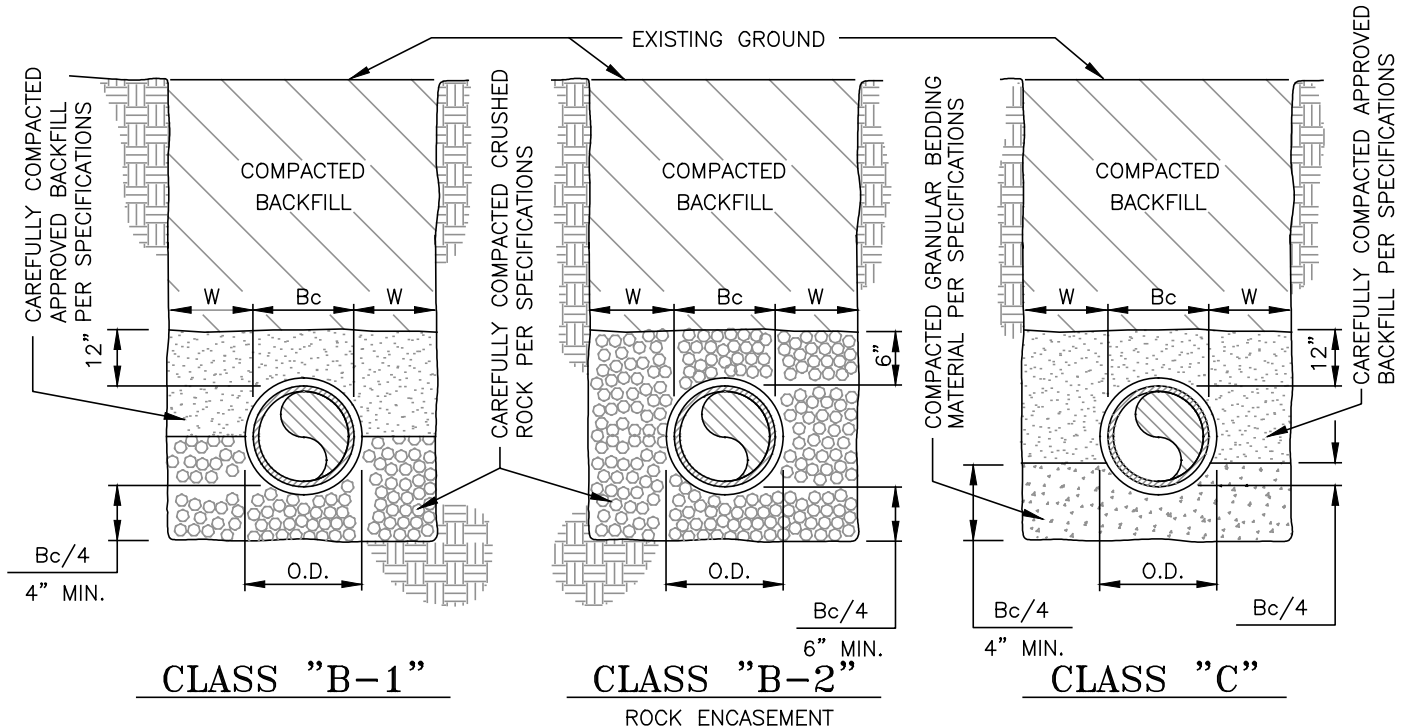
JURUPA COMMUNITY SERVICES DISTRICT

REV.	SCALE: NONE	THERMITE BRAZE DETAIL	DRAWING NO.
	DATE: SEPTEMBER 2020		K-4
	APPROVED BY:  Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248

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B. SEWER SYSTEM STANDARD DRAWINGS

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NOTES:

1. ALL BACKFILL SHALL BE PLACED IN ACCORDANCE WITH THE SPECIFICATIONS.
2. O.D. = OUTSIDE DIAMETER OF BELL.
3. Bc = OUTSIDE DIAMETER OF PIPE BARREL.
4. W = 10 INCHES MAXIMUM.
5. CONCRETE SHALL BE ALLOWED TO DEVELOP SUFFICIENT STRENGTH BEFORE BACKFILLING.
6. WHEN GROUND WATER ENCOUNTERED, ENCASE THE ROCK BEDDING IN FILTER FABRIC.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos
Sinnaro Yos, P.E. C68607

GENERAL BEDDING DETAILS

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

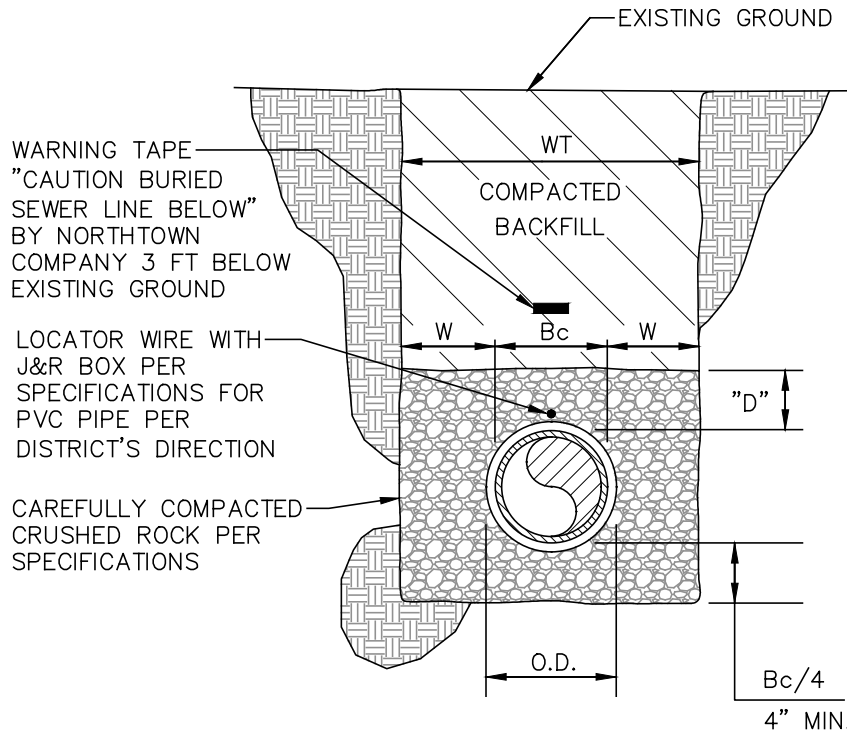
CALIFORNIA

DRAWING NO.

S-1

W.O. 19-0248

REV.



DEPTH "D"	
FOR PIPE DEPTH < 14'	"D" = 6"
FOR PIPE DEPTH > 14'	"D" = 12"

CLASS "I"

DEPTH > 14 FEET
PVC SDR 26 ONLY

NOTES:

1. ALL BACKFILL SHALL BE PLACED IN ACCORDANCE WITH THE SPECIFICATIONS.
2. O.D. = OUTSIDE DIAMETER OF BELL.
3. Bc = OUTSIDE DIAMETER OF PIPE BARREL.
4. WT = TRENCH WIDTH MEASURED AT TOP OF PIPE.
5. W = 10" MAXIMUM.
6. FOR PIPES DEEPER THAN 8', LOCATOR WIRE SHALL BE INSTALLED ABOVE THE PIPE, AT AN 8' MAXIMUM DEPTH.
7. ENCASE CRUSHED ROCK WITH DISTRICT APPROVED FILTER FABRIC WHEN ENCOUNTERING GROUNDWATER.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

GENERAL BEDDING DETAILS FLEXIBLE GRAVITY PIPE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

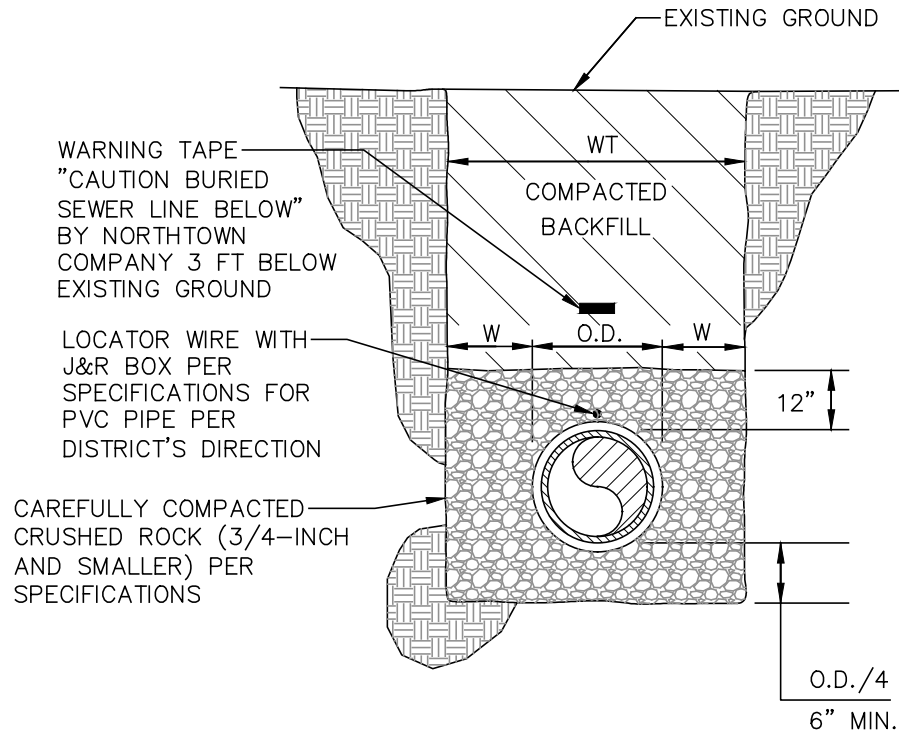
CALIFORNIA

DRAWING NO.

S-2

W.O. 19-0248

REV.



NOTES:

1. ALL BACKFILL SHALL BE PLACED IN ACCORDANCE WITH THE SPECIFICATIONS.
2. O.D. = OUTSIDE DIAMETER OF PIPE.
3. HDPE PIPE SHALL BE MINIMUM OF DR-11.
4. WT = TRENCH WIDTH MEASURED AT TOP OF PIPE.
5. W = 6" MAXIMUM.
6. FOR PIPES DEEPER THAN 8', LOCATOR WIRE SHALL BE INSTALLED ABOVE THE PIPE, AT AN 8' MAXIMUM DEPTH.
7. ENCASE CRUSHED ROCK WITH DISTRICT APPROVED FILTER FABRIC WHEN ENCOUNTERING GROUNDWATER.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

GENERAL BEDDING DETAIL HDPE GRAVITY PIPE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-2A

W.O. 19-0248

REV.

STANDARD DRAWING NO. S-3 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

SPECIAL CRUSHED ROCK BEDDING

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-3

W.O. 19-0248

REV.

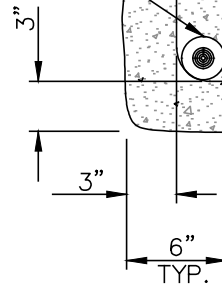
CLASS "A" CONCRETE
(4000 PSI) GREEN
IN COLOR

NO. 4 TIE BAR
24" O.C. MAX.

NO. 4 BAR LONGITUDINAL
(TYP. OF 4)*

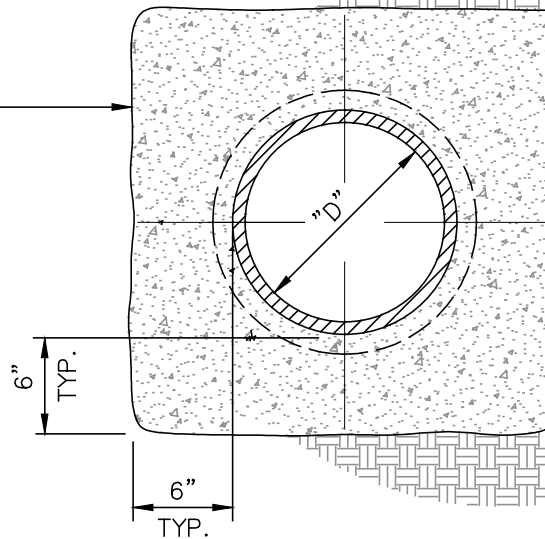
* NOTE:

USE (8) NO. 4 LONGITUDINAL
BARS EQUALLY SPACED FOR
PIPES LARGER THAN 15" DIA.



REINFORCED CONCRETE ENCASEMENT

CLASS "B" CONCRETE
(3500 PSI) GREEN
IN COLOR



CLASS "B" CONCRETE ENCASEMENT

NOTES:

1. ALL REBARS SHALL BE FABRICATED AND PLACED IN POSITION PER A.C.I. SPECIFICATIONS.
2. PROVIDE FLEXIBLE JOINTS AT EACH END OF CONCRETE ENCASEMENT, WITHIN 12" FROM EACH END.
3. EXPANSION JOINTS SHALL BE CONSTRUCTED AT EVERY 50'± INTERVAL FOR THE CONCRETE ENCASEMENT: EACH JOINT SHALL COINCIDE WITH THE BELL AND SPIGOT JOINT OF THE PIPE.
4. CONTRACTOR SHALL TAKE ANY PRECAUTIONARY MEASURES NECESSARY TO PREVENT PIPE FROM FLOTATION.
5. PLACE GREEN DYE ON TOP OF CONCRETE.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

TYPICAL SEWER CONCRETE ENCASEMENT DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

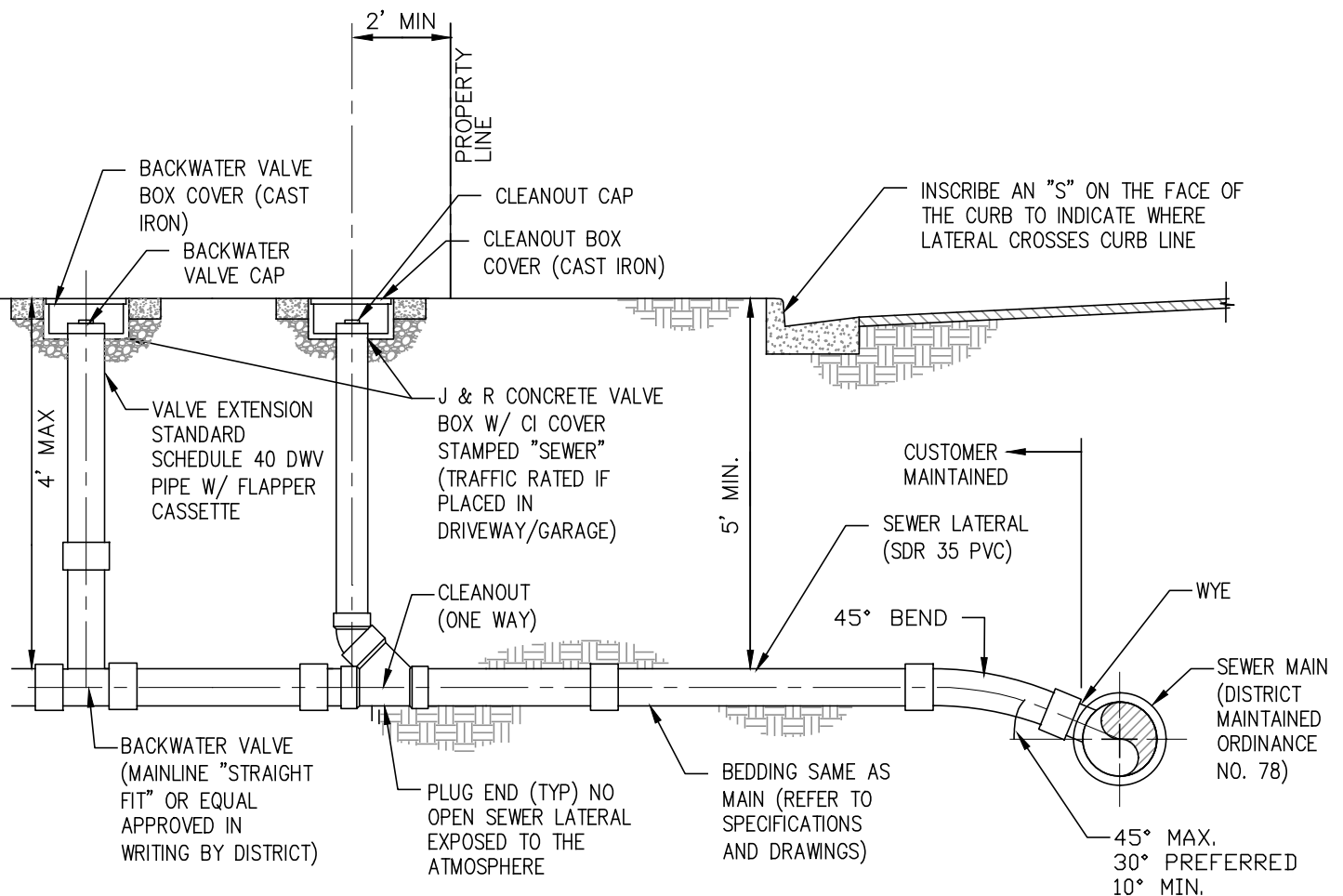
CALIFORNIA

DRAWING NO.

S-4

W.O. 19-0248

REV.



NOTES:

1. 4" PIPE FOR SINGLE DWELLINGS, 6" MIN. FOR ALL OTHER LATERALS.
2. All 8" LATERALS WILL REQUIRE MANHOLE CONNECTION.
3. LATERAL LOCATIONS SHALL BE MEASURED AT RIGHT ANGLES TO STREET CENTERLINE FROM THE CENTERLINE OF THE NEAREST DOWNSTREAM MANHOLE COVER.
4. WHENEVER DEPTH OF COVER OVER LATERAL IS LESS THAN 4'-0", SPECIAL BEDDING OR CONCRETE CRADLE SHALL BE USED.
5. CONTRACTOR SHALL REFERENCE EACH LATERAL IN THE FIELD WITH A SURFACE MARKER. MARKER SHALL BE METAL STAKE PLACED AT TIME OF BACKFILLING. MARKER SHALL BE VERTICAL AND CUT OFF 6" ABOVE GRADE.
6. SEWER LATERALS FOR ALL LOTS WHICH HAVE PAD ELEVATIONS AT OR BELOW STREET GRADE SHALL BE CONSTRUCTED AT 2% SLOPE. IN NO CASE SHALL ANY SEWER LATERAL BE CONSTRUCTED AT LESS THAN 2% SLOPE UNLESS OTHERWISE SHOWN ON DISTRICT APPROVED PLANS.
7. SEWER PLUGS TO BE INSTALLED INTO LATERAL STUBOUTS AND INFLATED WHILE MAKING HOUSE CONNECTIONS TO THE SEWER MAIN. CONNECTIONS TO BE MADE WITH DISTRICT INSPECTOR PRESENT.
8. A MANHOLE PER DISTRICT STANDARD DRAWING NO. S-7 SHALL BE PROVIDED AT THE STREET RIGHT-OF-WAY LINE FOR ALL LATERALS 6" IN DIAMETER AND LARGER UNLESS A WASTEWATER FLOW MONITORING STATION IS PROVIDED OR UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT.
9. A BACKWATER VALVE SHALL BE REMOVABLE TYPE IV WITH INSTRUCTIONS FOR INSTALLATION ON THE REMOVABLE TEE HANDLE.
10. BACKWATER VALVE TO BE INSTALLED AT SHALLOW DEPTH OF THE SEWER LATERAL CLOSE TO THE BUILDING PAD TO PROTECT ALL SEWER FIXTURES DRAINING TO SEWER MAIN.
11. "BACKWATER VALVE DOWNSTREAM" SHALL BE PERMANENTLY MARKED ON THE UPSTREAM CLEANOUTS FROM THE BACKWATER VALVE.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

TYPICAL SEWER LATERAL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-5

W.O. 19-0248

REV.

STANDARD DRAWING NO. S-6 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

DRAWING NO.

S-6

APPROVED BY:



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CONSULTING ENGINEERS

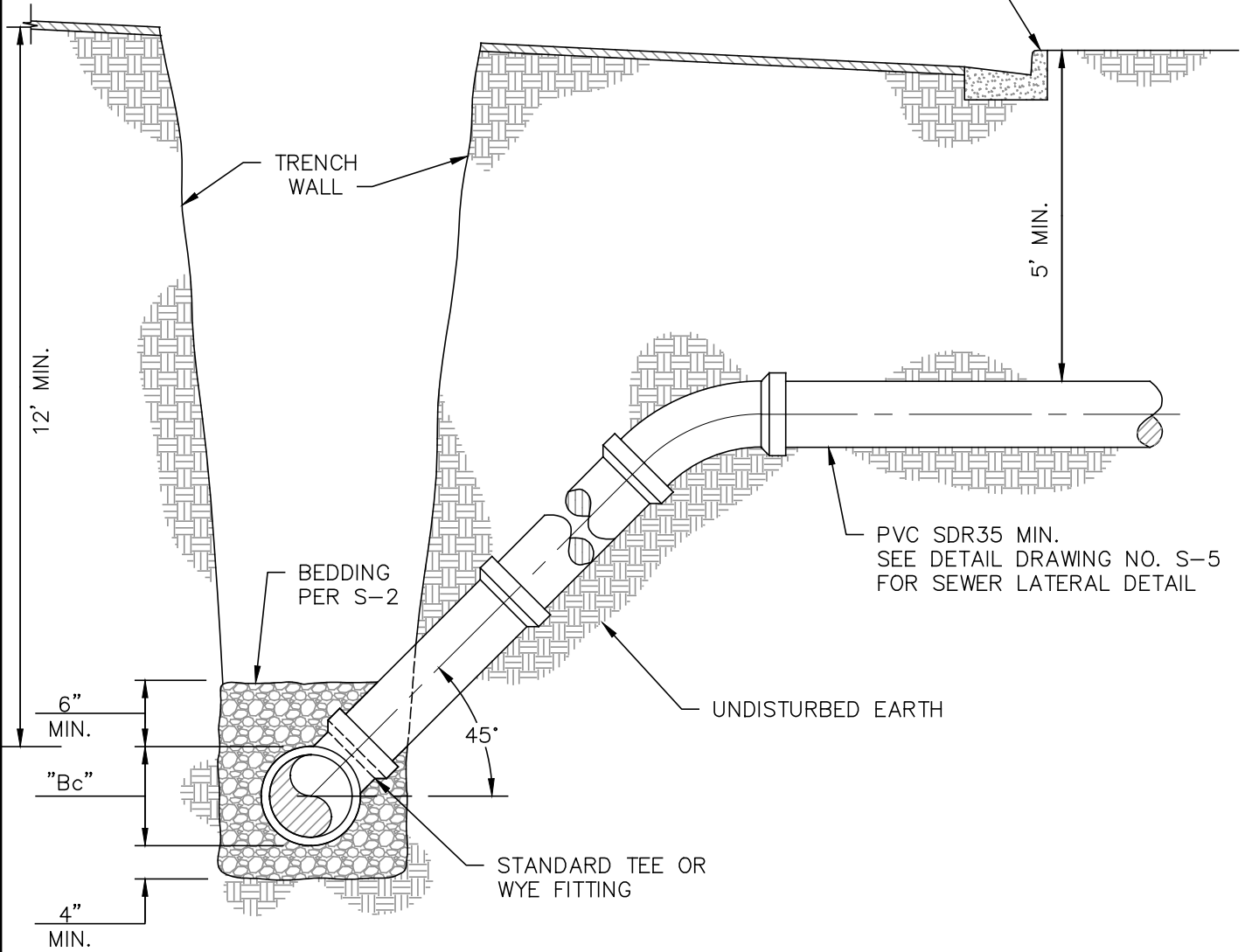
RIVERSIDE

CALIFORNIA

W.O. 19-0248

REV.

INSCRIBE AN "S" ON FACE OF
THE CURB TO INDICATE WHERE
LATERAL CROSSES CURB LINE



Bc = OUTSIDE DIAMETER OF PIPE BARREL.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos

Sinnaro Yos, P.E. C68607

DEEP LATERAL FLEXIBLE GRAVITY PIPE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

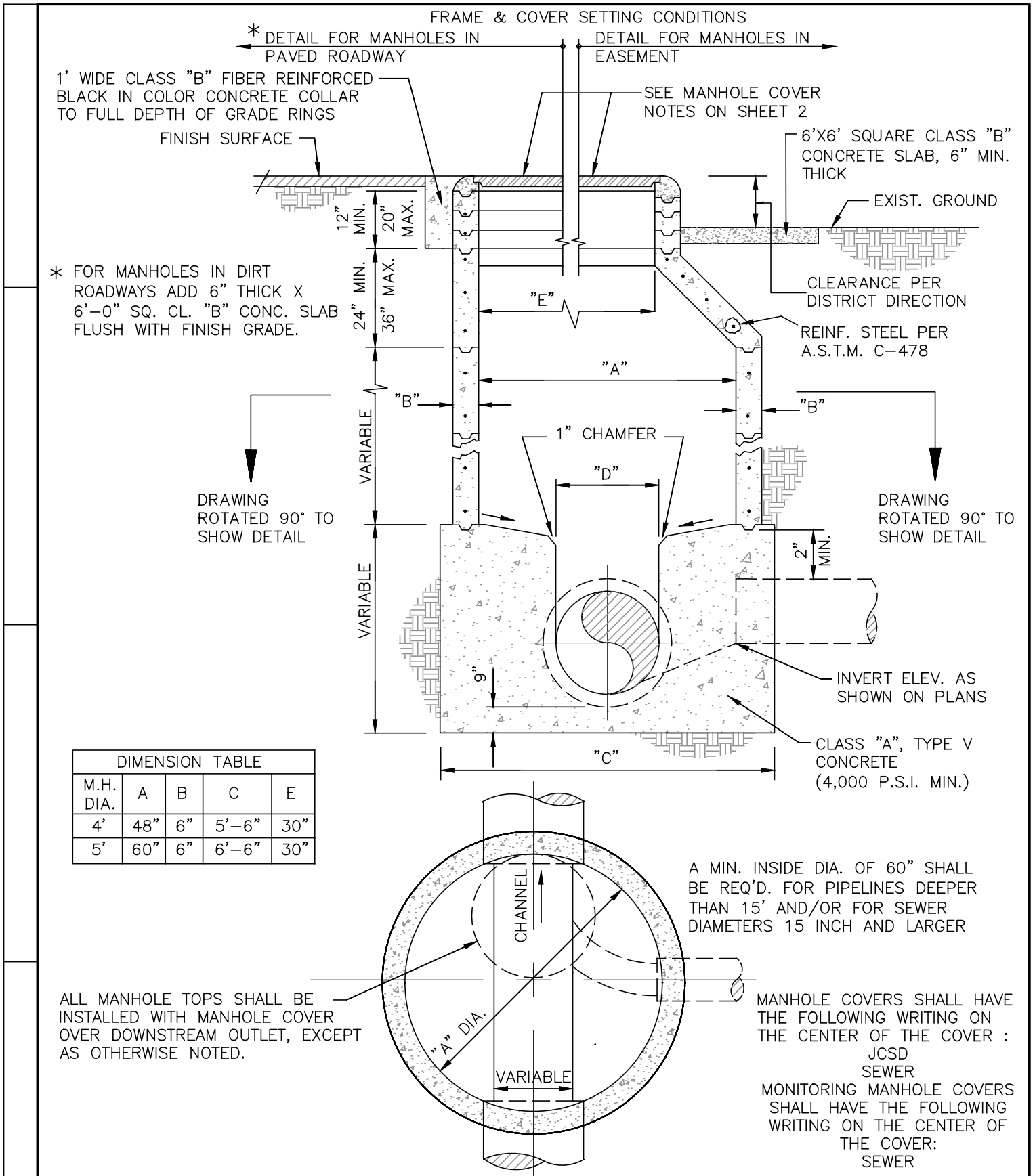
CALIFORNIA

DRAWING NO.

S-6A

W.O. 19-0248

REV.



JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

PRECAST CONCRETE MANHOLE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-7

SHEET 1 OF 2

W.O. 19-0248

REV.

NOTES:

1. ALL SECTIONS TO BE WASHED TO REMOVE ANY LOOSE MATERIAL. PRECAST MANHOLE SECTIONS AND GRADE RINGS SHALL BE SEALED WITH CS-102B BUTYL/BITUMEN BLENDED SEALANT AS MANUFACTURED BY CONSEAL OF NEW CARLISLE, OHIO OR DISTRICT APPROVED EQUAL TO FORM WATERTIGHT JOINTS.
2. CONCRETE FOR MANHOLE SECTIONS SHALL BE 4,000 P.S.I. MIN. USING TYPE V CEMENT.
3. PROVIDE REPAIR BAND COUPLING WITH ADJUSTABLE SHIELDED S.S. SHEAR RING JOINT IN ALL V.C.P. SEWER PIPES OUTSIDE OF MANHOLE BUT WITHIN 12" OF CONCRETE BASE.
4. WHEN INSTALLING REINFORCED CONCRETE GRADE RING(S) 3"-6" THE GRADE RINGS MUST BE CLEAN AND ANCHORED TO BOTH THE FRAME AND GRADE RING(S) OR CONE WITH RAM-NEK JOINT SEALER OR SEALANT AS RECOMMENDED BY MANUFACTURER FOR WATERTIGHT CONNECTION AS APPROVED BY THE DISTRICT. INTERIOR OF GRADE RINGS SHALL BE SMOOTHLY MORTARED.
5. MORTAR AROUND AND UNDER FRAME SHALL BE CURED WITH A PIGMENTED CURING COMPOUND MEETING THE REQUIREMENTS OF SECTION 90-7 OF STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, 2006 EDITION.
6. FOR PVC CONNECTIONS TO EXISTING AND NEW PRECAST REINFORCED CONCRETE MANHOLES. A HOLE SPECIFIC TO THE NEW PIPE'S O.D. DIA. SHALL BE CORED INTO THE CONCRETE MANHOLE WALL TO RECEIVE THE PIPE. A KOR-N-SEAL BOOT OR ENGINEER APPROVED EQUAL SHALL BE CLAMPED INTO THE CORED HOLE AND USED TO MAKE THE CONNECTION.
7. SHELF AND GROOVE SHALL BE FORMED MONOLITHICALLY WITH THE MANHOLE BASE. CHANNELS TO BE SMOOTH FINISH.
8. NO FLY ASH ALLOWED ON CONCRETE COLLAR AS ADDED MIXTURE AGENT.
9. MANHOLE SHALL BE VACUUM TESTED PER DISTRICT SPECIFICATIONS.

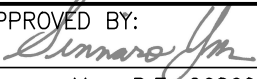
MANHOLE COVER NOTES:

MANHOLE COVER AND FRAME, TO BE COMPOSITE MATERIAL, EJ SERIES, (30") 3200 AND (36") 3800 WITH FOUR (4) TITUS TWISTLIFT STAINLESS STEEL LOCKS, PER COVER. "NOTE" AFTER SETTING A COMPOSITE FRAME IN PLACE AND PRIOR TO POURING THE CONCRETE COLLAR AND/OR CONCRETE SLAB, INSTALL ONE (1) #4 REBAR SHAPED INTO A FULL CIRCLE THREE (3") INCHES LARGER IN O.D. THAN THE COMPOSITE FRAME. AFTER FORMING THE #4 REBAR CIRCLE, IT SHALL THAN BE SET TO THREE (3") INCHES BELOW THE FRAME RIM ELEVATION THEN ENCAPSULATED IN THE CONCRETE COLLAR AND/OR CONCRETE SLAB.

SPECIAL MANHOLE COVER CONDITIONS

1. FOR MANHOLES IN EASEMENTS, UNPAVED AREAS, OR ANY AREA WHERE SECURITY IS A DISTRICT CONCERN BUT WATER INFLOW IS NOT AN ISSUE USE EJ SERIES OR APPROVED EQUAL.
2. FOR MANHOLES IN EASEMENTS, UNPAVED AREAS, STREET OR ANY AREA WHERE WATER INFLOW IS A POTENTIAL ISSUE AND/OR WHERE SECURITY IS A DISTRICT CONCERN AND WHEN DIRECTED AND APPROVED BY DISTRICT, USE DISTRICT STANDARD DRAWING NO. S-23.

JURUPA COMMUNITY SERVICES DISTRICT

REV.	SCALE: NONE	PRECAST CONCRETE MANHOLE	DRAWING NO.
	DATE: SEPTEMBER 2020		S-7
	APPROVED BY: 	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	SHEET 2 OF 2
	Sinnaro Yos, P.E. C68607		W.O. 19-0248

STANDARD DRAWING NO. S-8 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

DRAWING NO.

S-8

APPROVED BY:



Sinnaro Yos, P.E. C68607

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

W.O. 19-0248

REV.

STANDARD DRAWING NO. S-9 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

DRAWING NO.

S-9

APPROVED BY:



Sinnaro Yos, P.E. C68607

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

W.O. 19-0248

REV.

STANDARD DRAWING NO. S-10 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

DRAWING NO.

S-10

APPROVED BY:



Sinnaro Yos, P.E. C68607

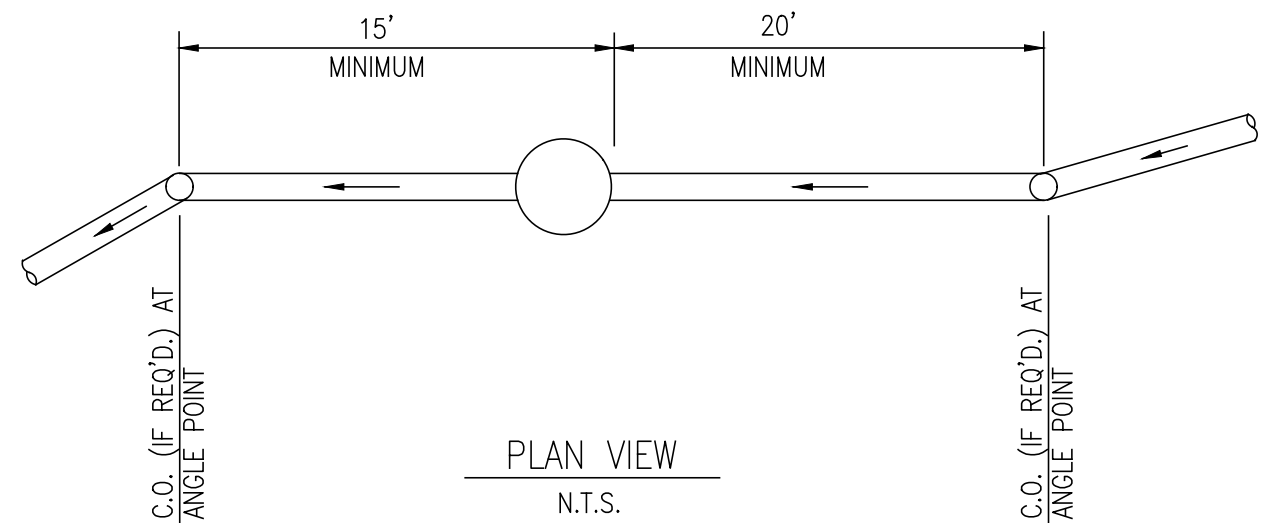
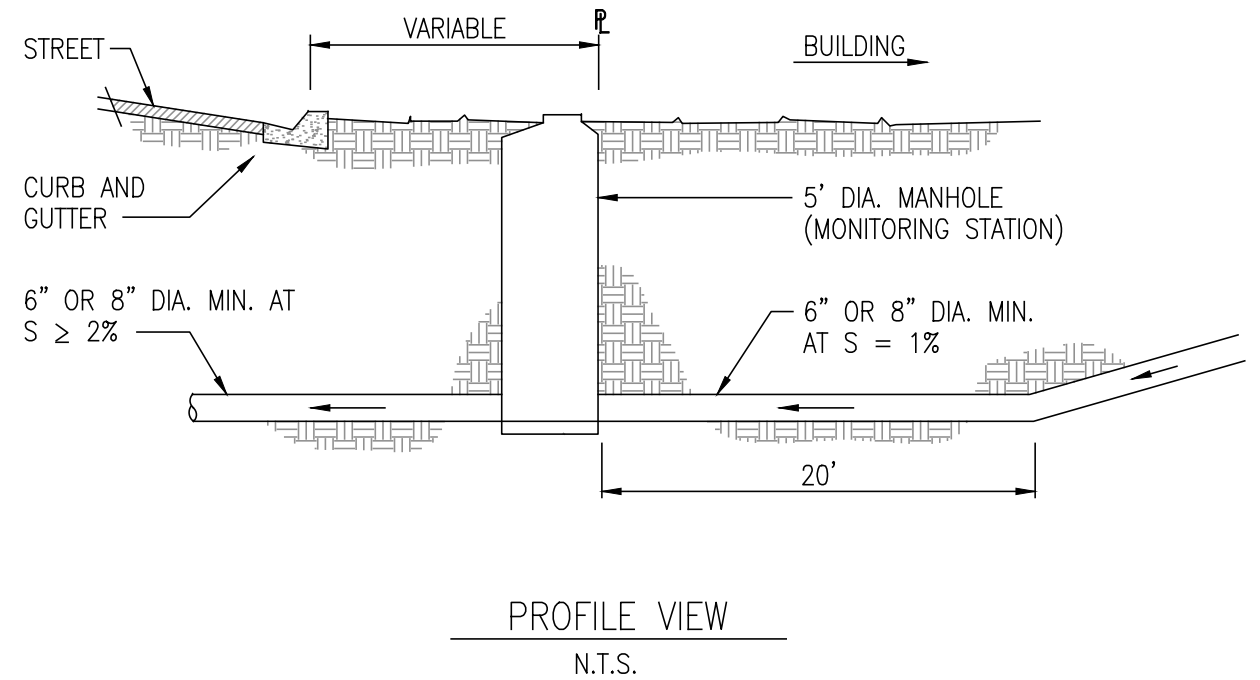
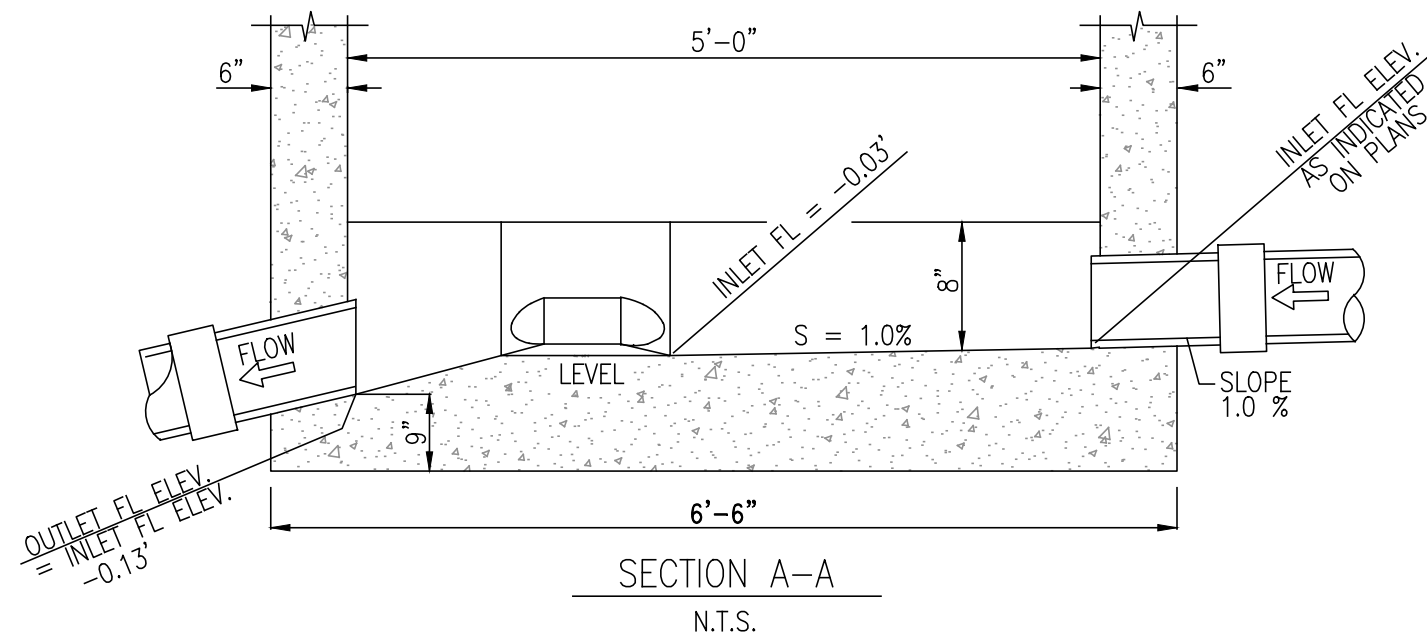
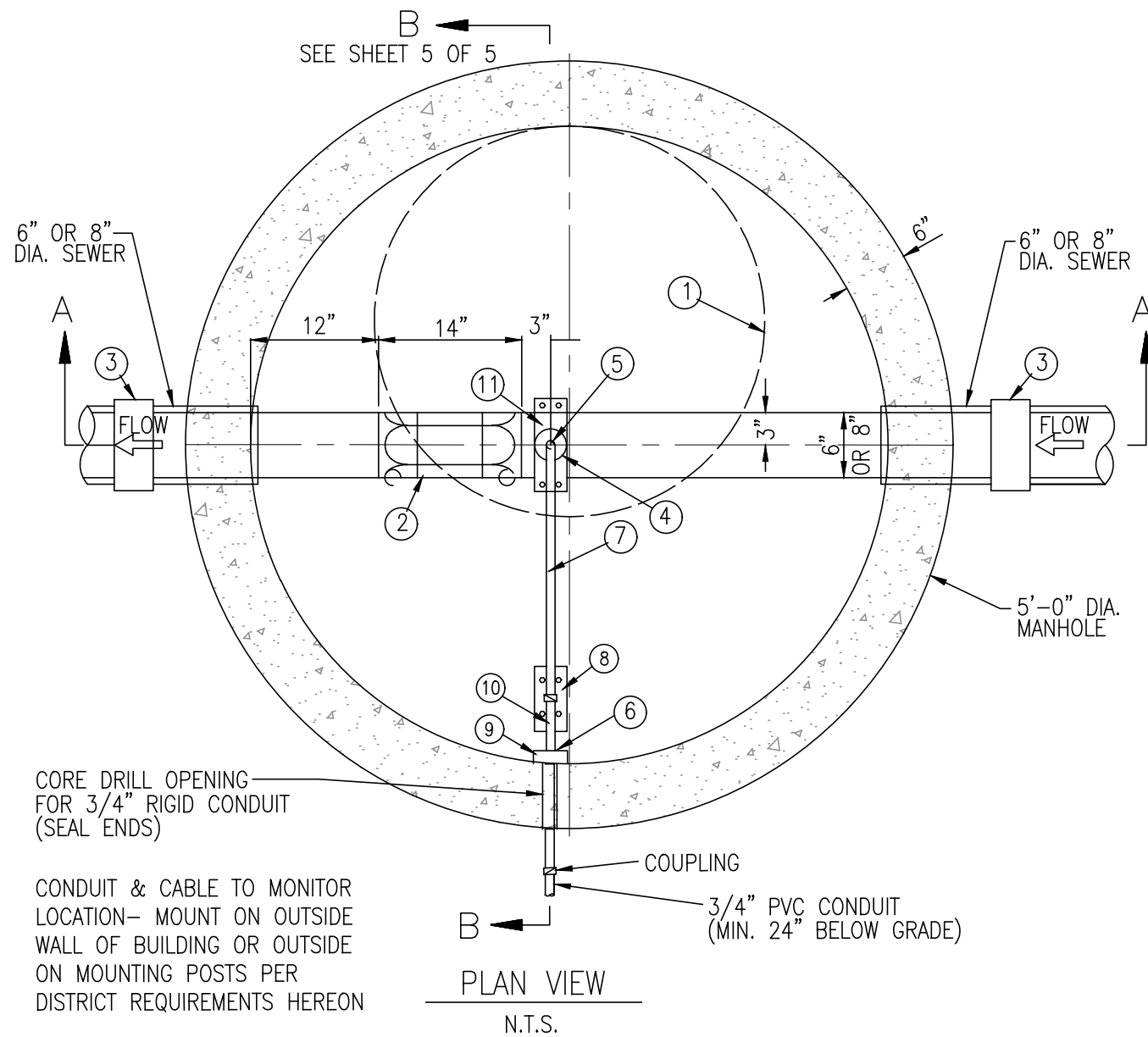
ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

W.O. 19-0248

REV.



WASTEWATER MONITORING STATION'S MAXIMUM FLOW= 0.2658 mgd
SEE SHEET 2 OF 6 FOR GENERAL AND CONSTRUCTION NOTES.

MANHOLE BASE SHALL BE MONOLITHICALLY POURED.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE:

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos
Sinnaro Yos, P.E. C68607

WASTEWATER FLOW MONITORING STATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-11

SHEET 1 OF 6

W.O. 19-0248

REV.

CONSTRUCTION NOTES:

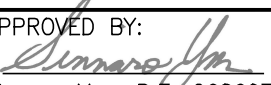
- ① 36" DIA. FRAME AND COVER PER ALHAMBRA FOUNDRY, NO. A-1325 OR APPROVED EQUAL OR MANHOLE COVER REQUIRED BY SPECIAL MANHOLE CONDITIONS IN DISTRICT STANDARD DRAWING NO. S-7.
- ② 6" OR 8" DIA. (TO MATCH SEWER PIPELINE SIZE) PALMER-BOWLUS FLUME INSTALLED PER MANUFACTURER'S RECOMMENDATIONS PLASTI-FAB, INC., OR APPROVED EQUAL.
- ③ REPAIR BAND COUPLING WITH ADJUSTABLE STAINLESS STEEL SHIELDED SHEAR RING.
- ④ FLOW TRANSCEIVER IN AN E.P. NON-CORROSION ENCLOSURE COMPLETE WITH A NON-CONTACT SENSOR WITH HOUSING EQUIPPED WITH CABLE TO THE TRANSCEIVER AND 500' (MAX) CABLE FROM THE TRANSCEIVER TO THE FLOWMETER PANEL. THIS SET SHALL BE APPROVED FOR CLASS 1, DIVISION 1 LOCATION. GREYLINE OCF 5.0 ULTRASONIC FLOW METER OR DISTRICT APPRV'D. EQUAL.
- ⑤ POINT OF MEASUREMENT.
- ⑥ SECURE TRANSENSOR CABLE CONDUIT (RIGID STEEL PVC COATED) TO WALL OF MANHOLE WITH T316 STAINLESS STEEL STRAPS 48"± O.C.
- ⑦ 3/4" DIA. RIGID STEEL PVC COATED CONDUIT WITH PVC COATED COUPLINGS AS REQUIRED.
- ⑧ STAINLESS STEEL (316) CONDUIT SUPPORTS AS REQUIRED.
- ⑨ EXPLOSION PROOF JUNCTION BOX WITH SEALING COVER PVC COATED.
- ⑩ RIGID STEEL PVC COATED SWEEP WITH PVC COATED COUPLINGS AS REQUIRED.
- ⑪ STAINLESS STEEL (316) FLOOR MOUNTING BRACKET SECURED TO FLOOR WITH STAINLESS STEEL BOLTS.

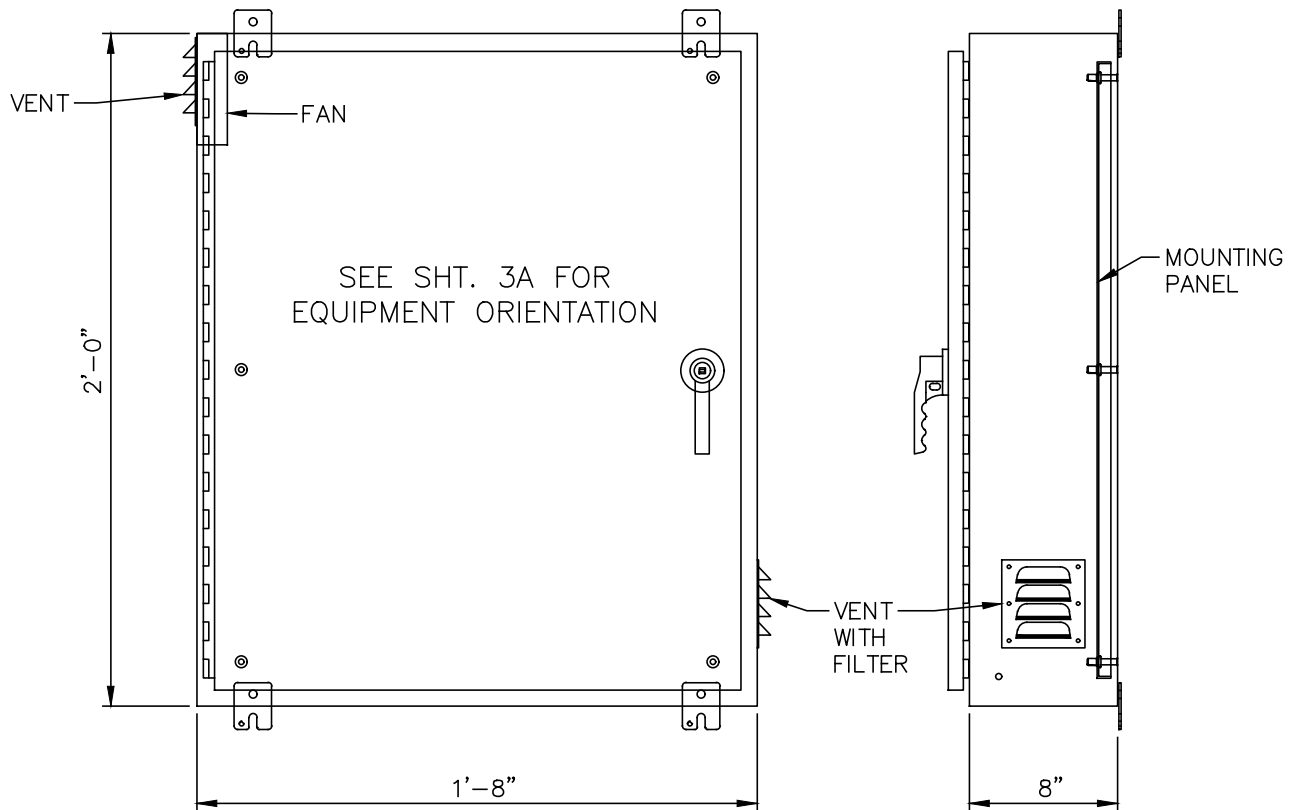
NOTE: FOR MANHOLES IN LANDSCAPED AREAS, ADD 6" THICK x 6'-0" SQ.
CLASS B CONCRETE SLAB, FLUSH W/FINISHED GRADE.

GENERAL NOTES:

1. MANHOLE SHALL BE A PRECAST CONCRETE ECCENTRIC MANHOLE (5'-0" DIA.) WITH A 36" DIA. OPENING.
2. PROVIDE AND INSTALL ALL MATERIALS IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE, CALIFORNIA ADMINISTRATION CODE, TITLE 8, AND LOCAL CODES AND REGULATIONS. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE INSPECTING AUTHORITY AND THE MANUFACTURER'S RECOMMENDATIONS.
3. PROVIDE THE SERVICES OF THE INSTRUMENT AND/OR SYSTEM SUPPLIER TO CHECK THE INSTALLATION, CALIBRATE, START UP AND DEBUG THE SYSTEM AND TRAIN THE OWNER'S PERSONNEL. PROVIDE AT LEAST FOUR (4) SETS OF INSTALLATION, OPERATION, AND MAINTENANCE MANUALS OF THE SYSTEM. PROVIDE CALIBRATION REPORT TO DISTRICT AFTER INSTALLATION.
4. THE SEWER METERING STATION BELOW GRADE IS CLASSIFIED AS CLASS 1, DIVISION 1. ALL EQUIPMENT, DEVICES AND WIRING TO BE INSTALLED SHALL BE APPROVED FOR THE CLASS OF LOCATION AND THE PROPERTIES OF THE GASES PRESENT.
5. ALL CONDUITS ORIGINATING FROM THE SEWER VAULT SHALL BE PROVIDED WITH APPROVED SEALING FITTINGS AND SEALING COMPOUND. INSTALL SEALING FITTINGS AT ALL LOCATIONS IN ACCORDANCE WITH THE N.E.C.
6. ALL CONDUITS IN SEWER MANHOLE SHALL BE RIGID STEEL, PVC COATED.

JURUPA COMMUNITY SERVICES DISTRICT

REV.	SCALE: NONE	WASTEWATER FLOW MONITORING STATION	DRAWING NO.
	DATE: SEPTEMBER 2020		S-11
	APPROVED BY: 	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	SHEET 2 OF 6
	Sinnaro Yos, P.E. C68607		W.O. 19-0248



CABINET NOTES:

1. CABINET SHALL BE FROM HOFFMAN ENCLOSURES, INC MODEL NO. A24H2008SS6LP3PT WITH ASSOCIATED MOUNTING PANEL NO. A24P20SS6 OR APPROVED EQUAL.
2. MASTER LOCK PADLOCK SHOULD BE KEYED TO KEY NUMBER 3882 AND TWO KEYS PROVIDED, ONE FOR OWNER, ONE FOR DISTRICT.
3. CABINET SHALL BE VENTED AND FILTERED (STAINLESS STEEL MESH – WASHABLE) IN THE TOP LEFT AND BOTTOM RIGHT CORNERS. LOUVER PLATE KIT AVK34556, FILTER MEDIA AFT34, AXIAL FAN A4AXFNPG POWER CORD ACORD1, AND FAN FILTER AFLTR4LD MOUNTED TOP LEFT.
4. PANEL SHALL INCLUDE AN ISOLATED 120V 20 AMPS CIRCUIT FOR THE ELECTRICAL OUTLET.

LOCATION NOTES:

1. THE BOTTOM OF PANEL SHOULD BE MOUNTED THREE FEET OFF THE GROUND ON THE OPPOSITE SIDE OF THE MONITORING MANHOLE FROM THE STREET (EIGHT FEET FROM CENTER OF MANHOLE, WHERE PRACTICAL) OR IF NECESSARY, ON THE OUTSIDE WALL OF THE BUILDING NEAREST THE FLOW METER.
2. THE PANEL SHALL BE FREE FROM LANDSCAPING (FOUR FEET IN FRONT OF AND TWO FEET ON EACH SIDE OF THE PANEL ON CONCRETE PAD).
3. ACCESS TO THE PANEL SHALL BE UNOBSTRUCTED AND HAVE A LEVEL WALKING PATH.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

EQUIPMENT ENCLOSURE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

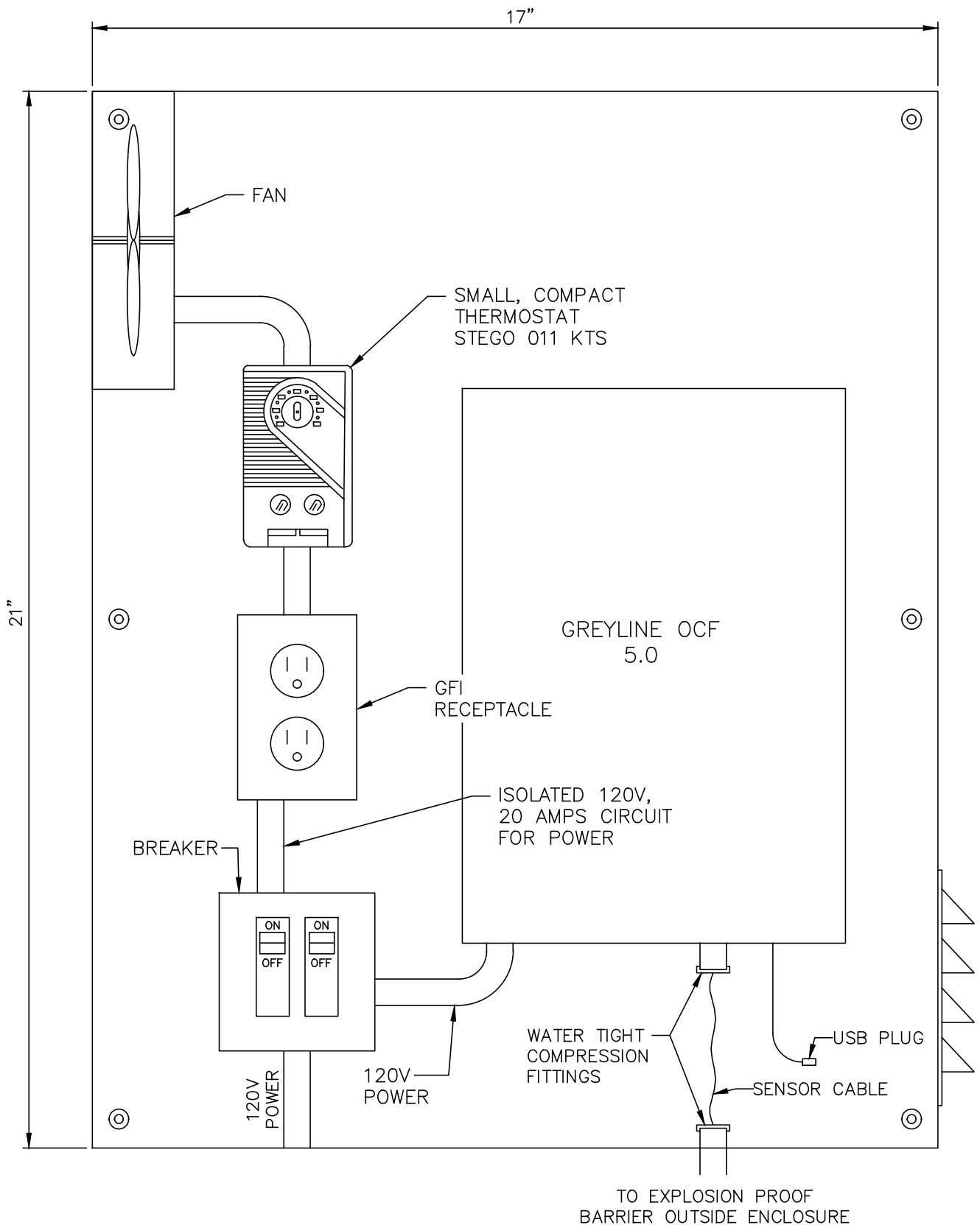
DRAWING NO.

S-11

SHEET 3 OF 6

W.O. 19-0248

REV.



JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

SEWER FLOW METER PANEL MOUNT

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

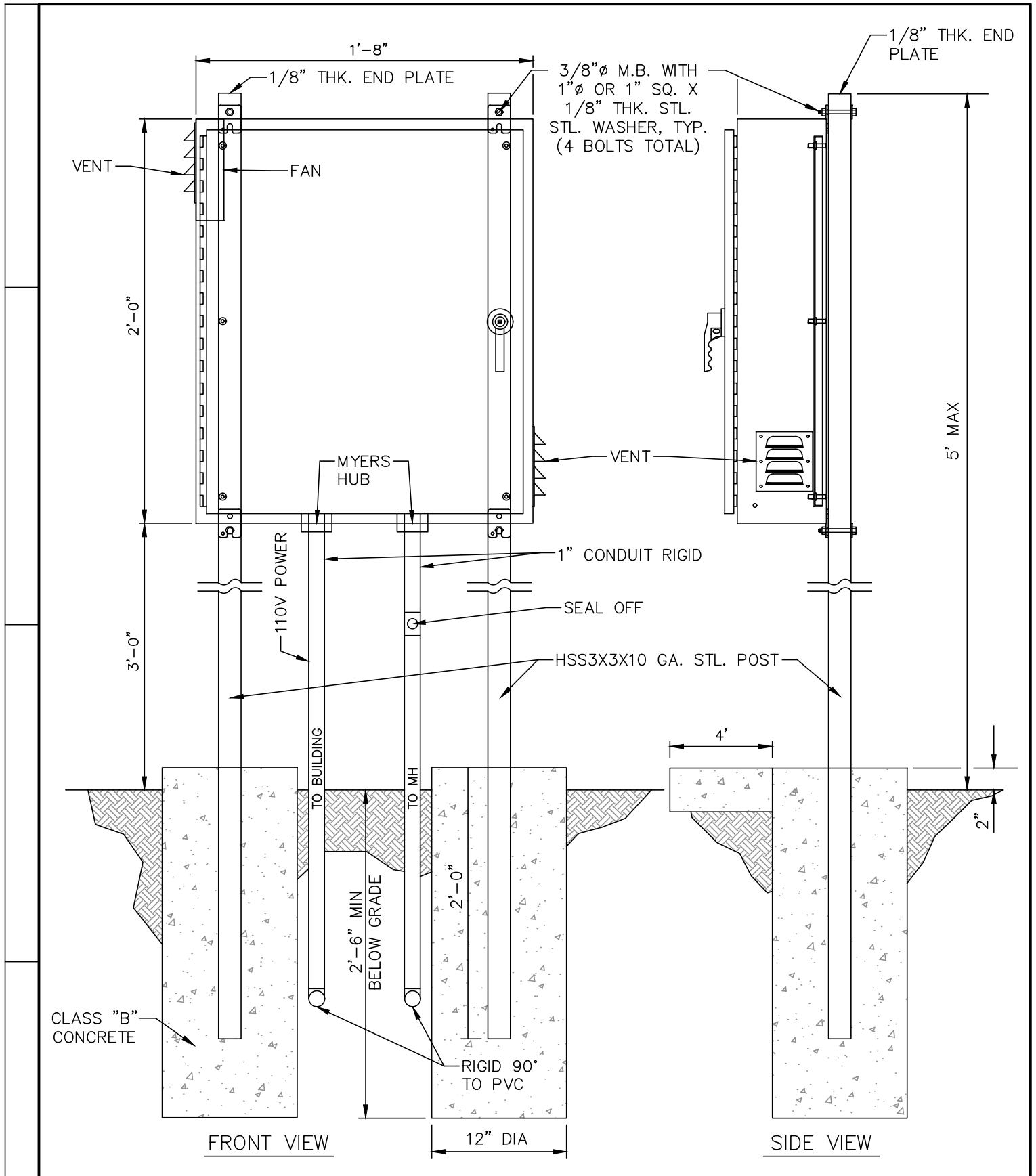
DRAWING NO.

S-11

SHEET 4 OF 6

W.O. 19-0248

REV.



JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

EQUIPMENT ENCLOSURE MOUNTING POSTS

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

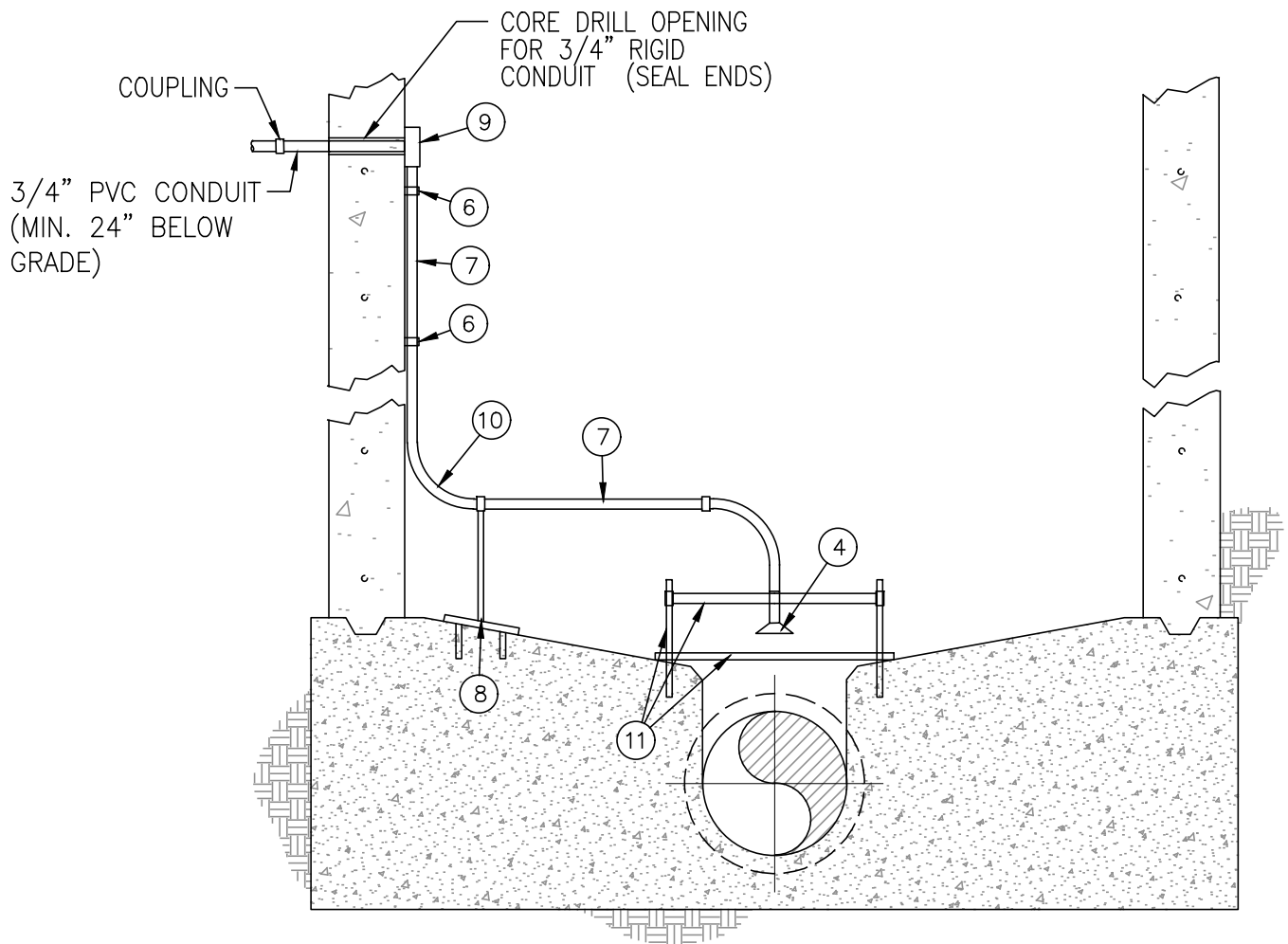
DRAWING NO.

S-11

SHEET 5 OF 6

W.O. 19-0248

REV.



SECTION B-B
N.T.S.

CONSTRUCTION NOTES:

- (4) FLOW TRANSCEIVER IN AN E.P. NON-CORROSION ENCLOSURE COMPLETE WITH A NON-CONTACT SENSOR WITH HOUSING EQUIPPED WITH CABLE TO THE TRANSCEIVER AND 500' (MAX) CABLE FROM THE TRANSCEIVER TO THE FLOWMETER PANEL. THIS SET SHALL BE APPROVED FOR CLASS 1, DIVISION 1 LOCATION.
- (6) SECURE TRANSDUCER CABLE CONDUIT (RIGID STEEL PVC COATED) TO WALL OF MANHOLE WITH T316 STAINLESS STEEL STRAPS 48"± O.C.
- (7) 3/4" DIA. RIGID STEEL PVC COATED CONDUIT WITH PVC COATED COUPLINGS AS REQUIRED.
- (8) STAINLESS STEEL (316) CONDUIT SUPPORTS AS REQUIRED.
- (9) EXPLOSION PROOF JUNCTION BOX WITH SEALING COVER PVC COATED.
- (10) RIGID STEEL PVC COATED SWEEP WITH PVC COATED COUPLINGS AS REQUIRED.
- (11) STAINLESS STEEL (T316) FLOOR MOUNTING BRACKET SECURED TO FLOOR WITH T316 STAINLESS STEEL BOLTS. BRACKETS SHALL BE UNISTRUT CHANNELS AND FITTINGS, TYPICAL PARTS AS FOLLOWS:
 - A. STRUT CHANNEL WALL MOUNT 316 STAINLESS STEEL, 2- FEET LENGTH, NO. 3188T54
 - B. STRUT CHANNEL CONNECTOR ELBOW, 304 STAINLESS STEEL, 5-3/8" LENGTH, NO. 33125T83
 - C. STRUT CHANNEL, SOLID, 316 STAINLESS STEEL, NO. 33085T89
 - D. VIBRATION-DAMPING STRUT-MOUNT ROUTING CLAMP WITHOUT CUSHION, 316 STAINLESS STEEL SCREW AND NUT, 3/4" I.D., NO. 1819T35

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

SECTION B-B

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

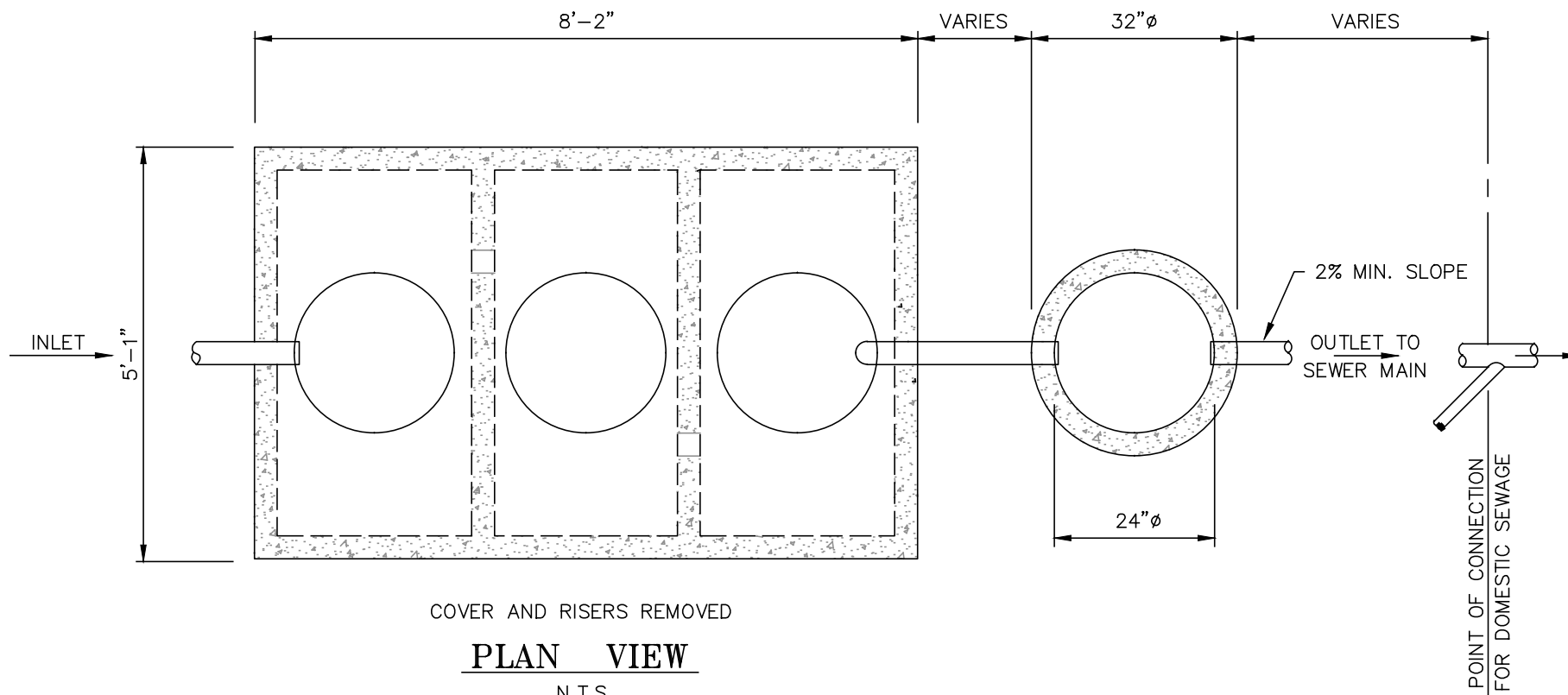
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S-11

SHEET 6 OF 6

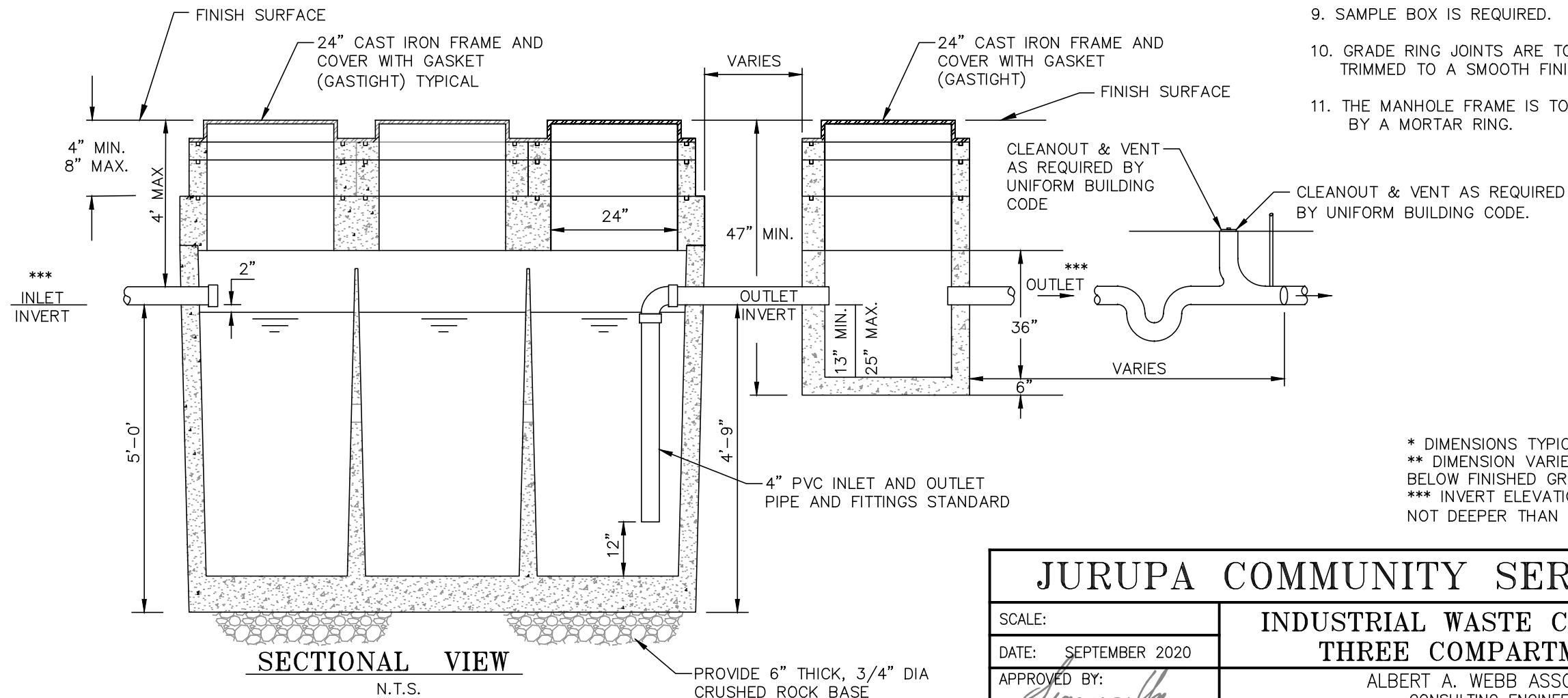
W.O. 19-0248

REV.



NOTES :

1. DOMESTIC SEWAGE CONNECTION IS TO BE MADE DOWNSTREAM OF CLARIFIER'S SAMPLE BOX.
2. PRECAST CONCRETE VAULT INCLUDING TOP AND COVERS TO BE DESIGNED FOR A MIN. H-20 TRAFFIC LOADING. SQUARE COVERS ARE NOT ACCEPTABLE.
3. ALL PIPE AND FITTINGS TO BE CAST IRON OR PVC PIPE.
4. MINIMUM APPROVED CAPACITY IS 750 GALLONS. A LARGER CLARIFIER MAY BE REQUIRED BASED ON INDUSTRIAL EFFLUENT QUANTITY AND QUALITY.
5. WASTE DISCHARGE APPLICANT IS RESPONSIBLE FOR THE PURCHASE, INSTALLATION, OPERATION AND MAINTENANCE OF THE CLARIFIER.
6. APPROVED SUPPLIERS FOR CLARIFIER:
 - a. PYRAMID PRECAST CO. INC. RIALTO, CA.
 - b. M.C. NOTTINGHAM CO., PASADENA, CA.
 - c. UTILITY VAULT CO. FONTANA, CA.
 - d. JENSEN PRECAST CO. FONTANA, CA.
7. UPON DISTRICT APPROVAL, A TWO COMPARTMENT CLARIFIER MAY BE USED IN LIEU OF THE THREE COMPARTMENT.
8. LOCATION OF CLARIFIER IS SUBJECT TO APPROVAL BY DISTRICT.
9. SAMPLE BOX IS REQUIRED.
10. GRADE RING JOINTS ARE TO BE SEALED WITH 1:2 MORTAR, TRIMMED TO A SMOOTH FINISH INSIDE AND OUT.
11. THE MANHOLE FRAME IS TO BE SEALED WITH AND SECURED BY A MORTAR RING.



* DIMENSIONS TYPICAL OF 1000 GALLON CAPACITY CLARIFIER.
 ** DIMENSION VARIES DEPENDING ON DEPTH OF EFFLUENT LINE BELOW FINISHED GRADE.
 *** INVERT ELEVATION SHALL BE AS SHALLOW AS POSSIBLE, NOT DEEPER THAN 4' FROM FINISH SURFACE ELEVATION.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE:

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro
 Sinnaro Yos, P.E. C68607

INDUSTRIAL WASTE CLARIFIER
 THREE COMPARTMENT

ALBERT A. WEBB ASSOCIATES
 CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-12

W.O. 19-0248

REV.

STANDARD DRAWING NO. S-13 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

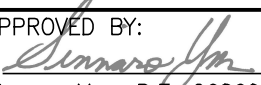
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DATE: SEPTEMBER 2020

DRAWING NO.

S-13

APPROVED BY:


Sinnaro Yos, P.E. C68607

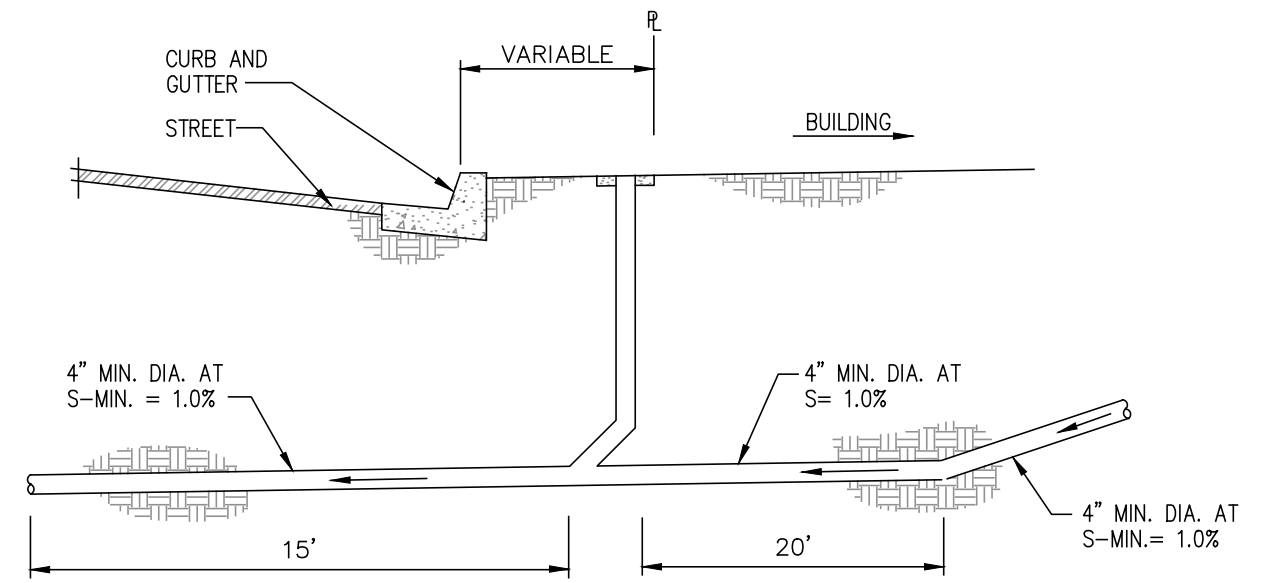
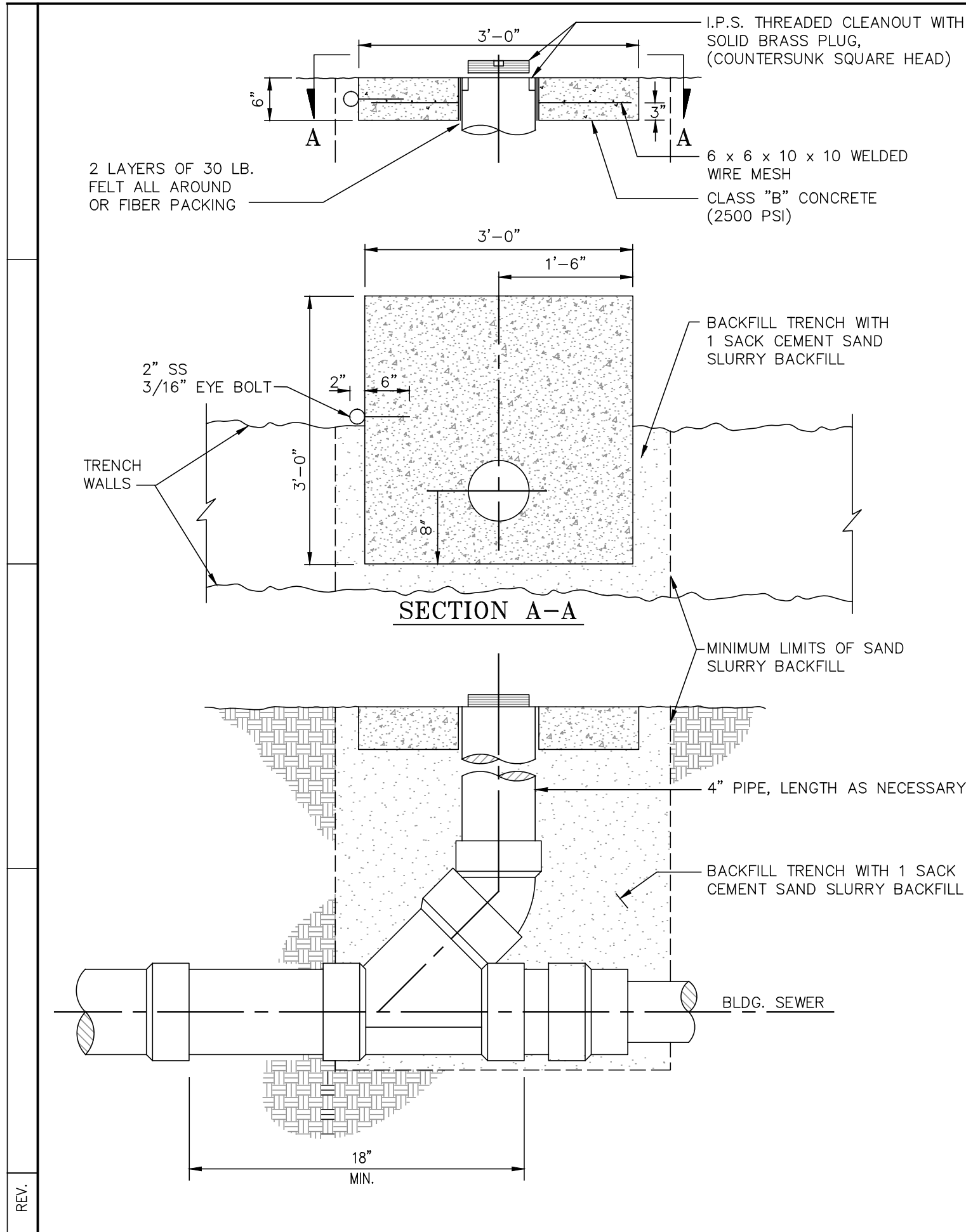
ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

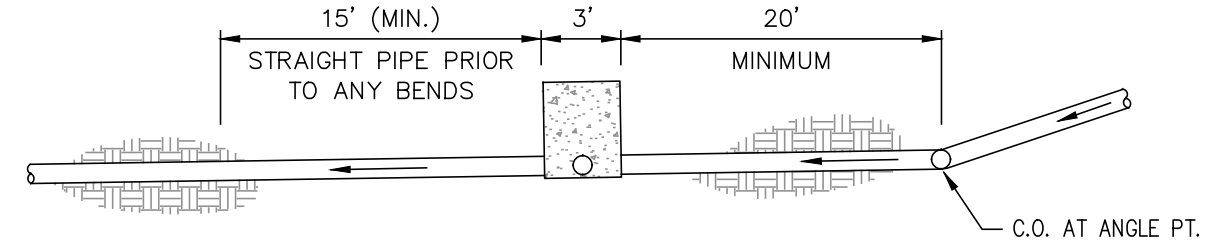
CALIFORNIA

W.O. 19-0248

REV.



PROFILE VIEW



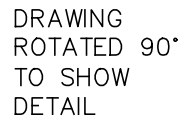
PLAN VIEW

NOTE:

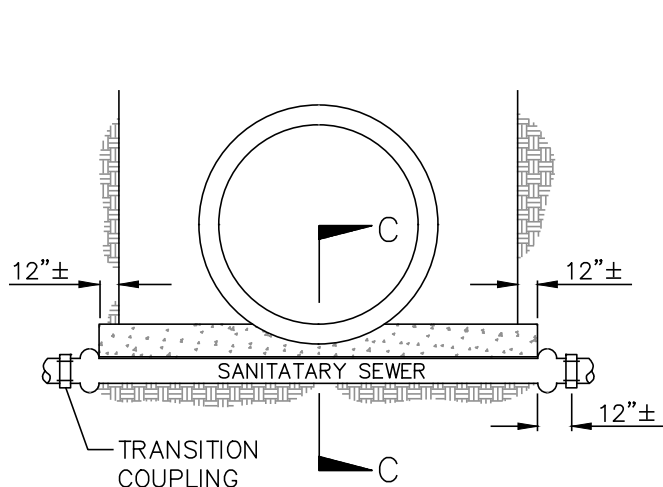
1. BARREL DIAMETER OF SAMPLING WYE SHALL BE A MINIMUM OF 2" LARGER THAN BLDG. DISCHARGE LINE.
2. DIAMETER OF RISER PIPE SHALL BE 4".
3. THE LOCATION OF THE SAMPLING WYE MUST BE ACCESSIBLE AT ALL TIMES TO DISTRICT PERSONNEL.
4. THE SAMPLING WYE SHALL NOT BE LOCATED IN TRAFFIC AREAS.
5. ALL MATERIALS UTILIZED SHALL CONFORM TO DISTRICT STANDARDS.

JURUPA COMMUNITY SERVICES DISTRICT

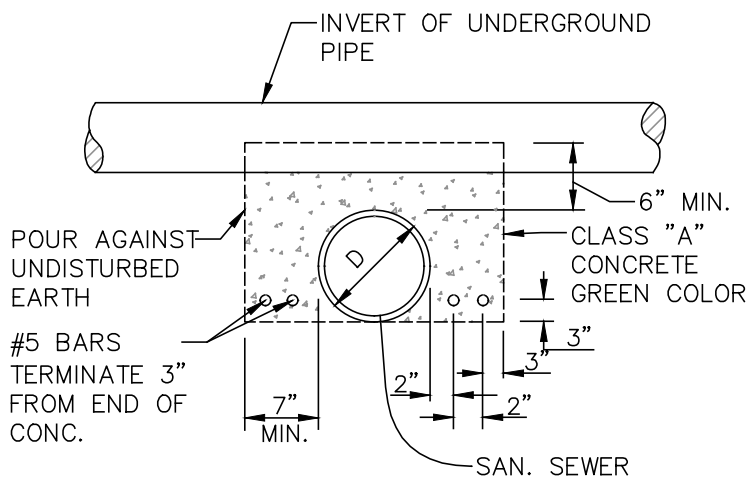
SCALE:	BUILDING SEWER SAMPLER DETAIL	DRAWING NO.
DATE: SEPTEMBER 2020		S-14
APPROVED BY:	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS	W.O. 19-0248
Sinnaro Yos, P.E. C68607	RIVERSIDE CALIFORNIA	



	SCALE: NONE	PRECAST SHALLOW MANHOLE	DRAWING NO.
	DATE: SEPTEMBER 2020		S-15
REV.	APPROVED BY:  Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS	
	RIVERSIDE	CALIFORNIA	W.O. 19-0248



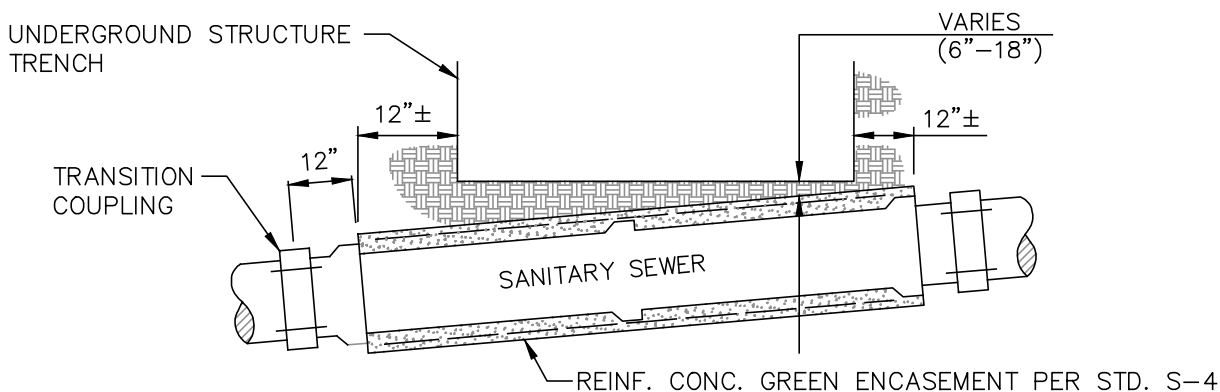
CASE 1



SECTION C-C

CASE 1 NOTES:

1. WHERE CLEARANCE BETWEEN BOTTOM OF UNDERGROUND PIPE OR STRUCTURE AND TOP OF SANITARY SEWER IS LESS THAN 6" CASE 1 APPLIES.
2. SANITARY SEWER SHALL BE IN CONFORMANCE WITH DISTRICT SPECIFICATIONS AS FOLLOWS:
 - A. SDR 35 FOR UP TO 8'FT.
 - B. SDR 26 FOR UP TO 15'FT.
 - C. HDPE WITH EITHER SDR WITH NO JOINTS WITH INNER BEAD REMOVED.



CASE 2

CASE 2 NOTE:

1. WHERE CLEARANCE BETWEEN BOTTOM OF UNDERGROUND PIPE OR STRUCTURE AND TOP OF SEWER IS 6" TO 18", CASE 2 APPLIES.

GENERAL NOTES:

1. THIS STANDARD APPLIES TO LOADING PIPE PROTECTION CASES.
2. NO JOINTS UNDER CROSSINGS AND STRUCTURES.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos
Sinnaro Yos, P.E. C68607

SEWER PROTECTION DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

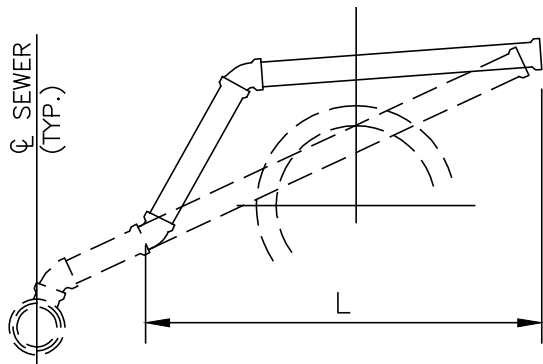
CALIFORNIA

DRAWING NO.

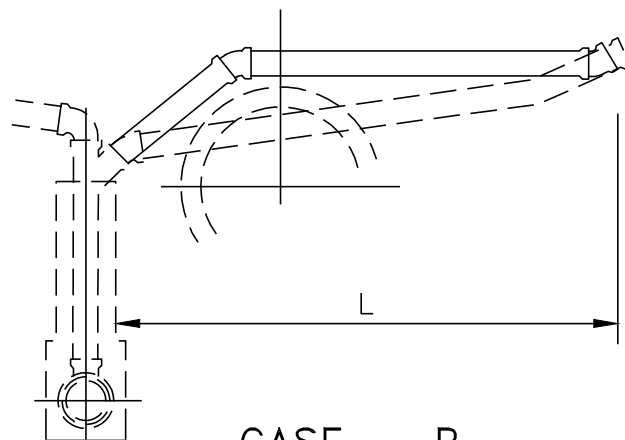
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W.O. 19-0248

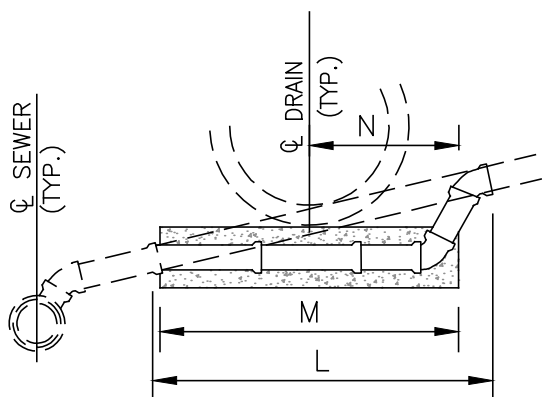
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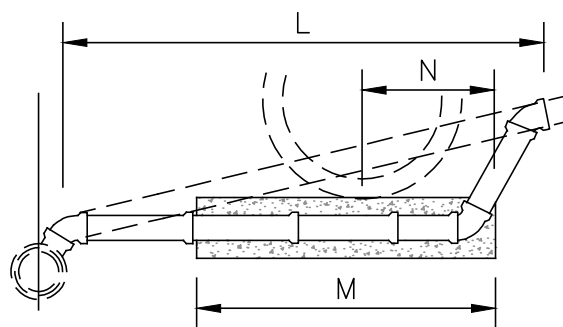
CASE - A



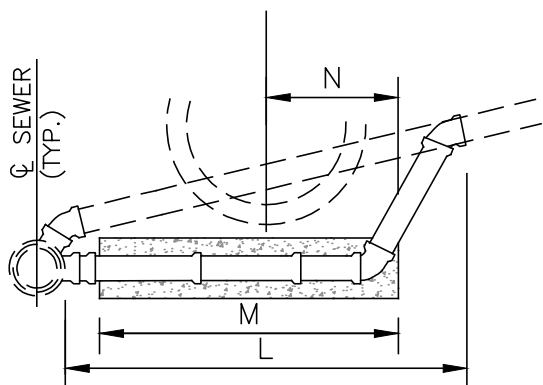
CASE - B



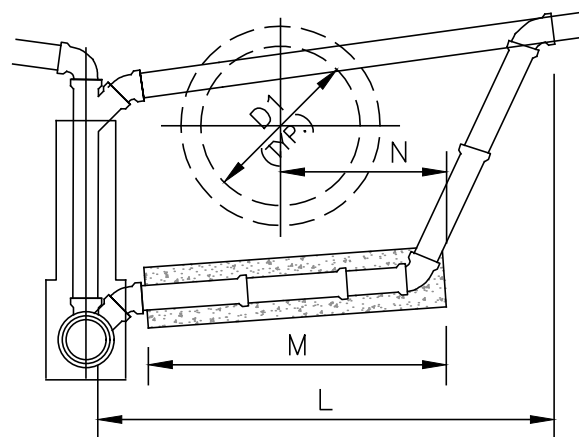
CASE - C



CASE - D



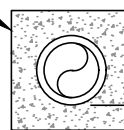
CASE - E



CASE - F

SEE SHEET 2 OF 2 FOR
NOTES AND DESCRIPTION OF
CASES

CLASS "A"
CONC.
(4000 PSI)



CROSS SECTION OF CONCRETE
REINFORCEMENT FOR PIPE,
SEE J.C.S.D. STD. NO. S-4

6" (TYP)

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos

Sinnaro Yos, P.E. C68607

REMODELING DETAILS FOR SEWER LATERALS

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

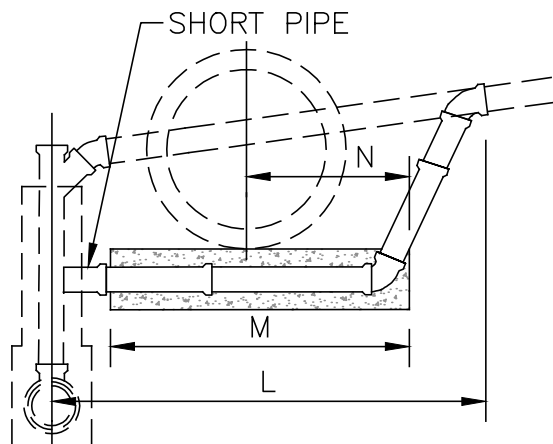
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S-17

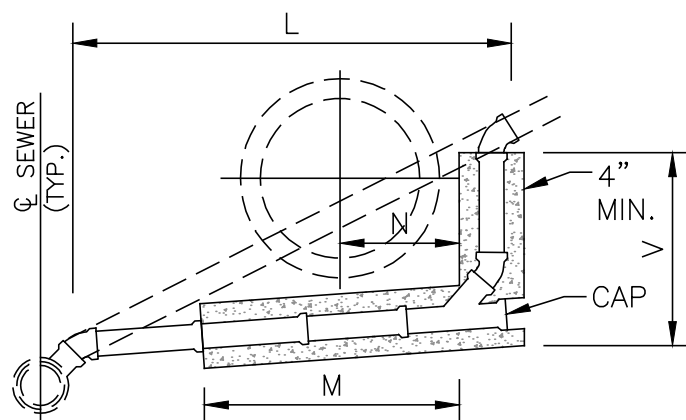
SHEET 1 OF 2

W.O. 19-0248

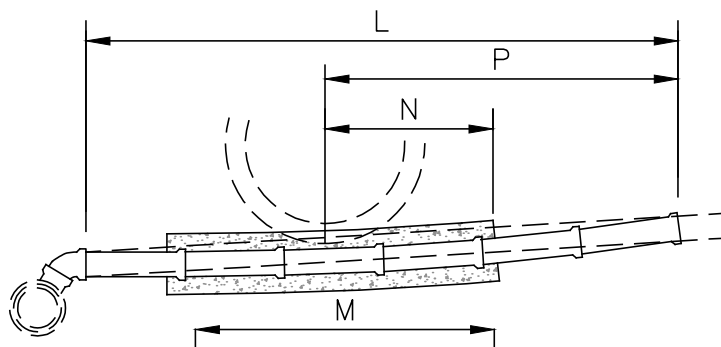
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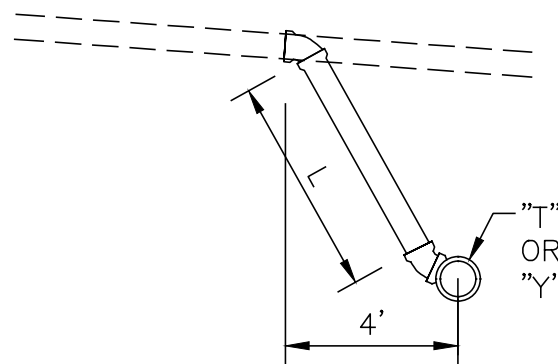
CASE - G



CASE - H



CASE - K



CASE - R

NOTES:

1. THESE DETAILS DO NOT APPLY TO CONFLICTS BETWEEN SEWER LATERALS AND WATERLINES.
2. EXISTING PIPES ARE INDICATED BY BROKEN LINES.
3. PIPES TO BE CONSTRUCTED ARE INDICATED BY SOLID LINES.
4. ALL PIPE DIAMETERS SHALL MATCH EXISTING LATERAL.
5. ALL BENDS SHALL BE 1/8 BENDS UNLESS SPECIFIED OTHERWISE.
6. CONCRETE REINFORCEMENT, CROSS SECTION SHOWN ON SHEET 1, SHALL BE USED ON ALL PIPES TO BE CONSTRUCTED UNDER STORM DRAIN, TOP PORTION WITHIN 1" OF STORM DRAIN TO BE OMITTED.
7. DIMENSIONS:
 L - IS SPECIFIED ON PLAN AS THE AVERAGE TOTAL LENGTH.
 M - (d, + 24") LESS ENOUGH TO AVOID A FRACTION OF A FOOT.
 N - 1/2 M, EXCEPT WHERE SPECIFIED OTHERWISE ON PLAN.
 P - (CASE K) IS SPECIFIED WHERE L DOES NOT EXTEND TO THE BEND.
 V - (CASE H) IS SPECIFIED TO THE NEAREST FOOT AND IN SUMMARY IS ITEMIZED AS CONCRETE REINFORCEMENT FOR 6" PIPE.
8. NEW CONNECTION TO MAIN LINE SHALL CONFORM TO STD. DWG. S-5.

CASES:

- A. ABOVE DRAIN TO HOUSE CONNECTION-SPECIALS REQUIRED: 2 1/8 BENDS.
- B. ABOVE DRAIN TO CHIMNEY - 2 1/8 BENDS.
- C. BELOW DRAIN TO HOUSE CONNECTION-2 1/8 BENDS.
- D. BELOW DRAIN TO "Y" - 3 1/8 BENDS.
- E. BELOW DRAIN TO FLAT SADDLE - 3 1/8 BENDS, 1 SADDLE.
- F. BELOW DRAIN TO SADDLE - 3 1/8 BENDS, 1 SADDLE.
- G. BELOW DRAIN TO CHIMNEY - 2 1/8 BENDS.
- H. BELOW DRAIN TO "Y" - 3 1/8 BENDS, 1 "Y".
- K. BELOW DRAIN TO HOUSE CONNECTION, SLOPE SLIGHTLY MODIFIED.
- R. CONNECTION WITH NEW SEWER - 2 1/8 BENDS WITH "Y" - 14" 1/8 BEND WITH "T".

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos
Sinnaro Yos, P.E. C68607

REMODELING DETAILS FOR SEWER LATERALS

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-17

SHEET 2 OF 2

W.O. 19-0248

REV.

STANDARD DRAWING NO. S-18 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:



Sinnaro Yos, P.E. C68607

SEWER LATERAL CONNECTION
TO EXISTING MAIN

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

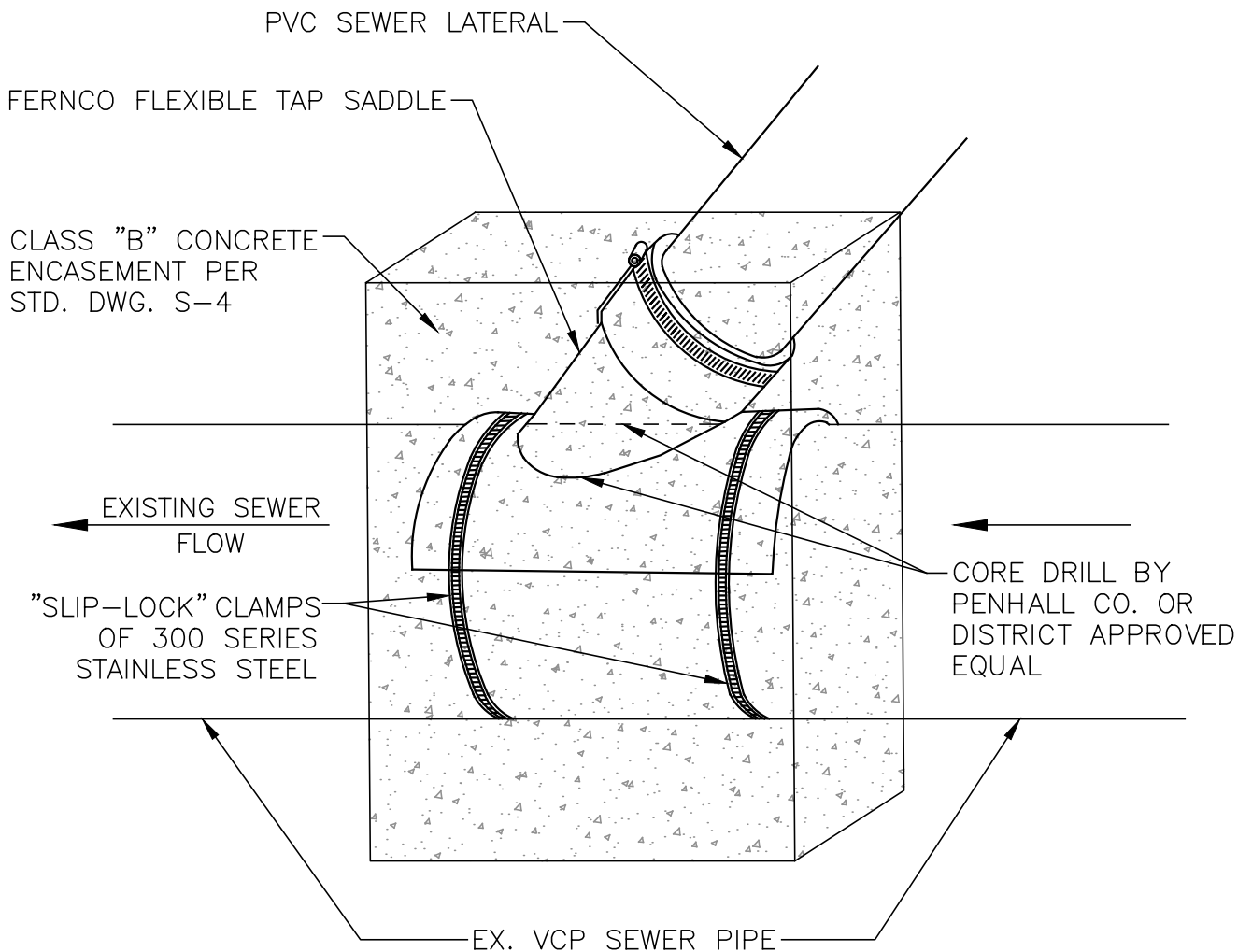
CALIFORNIA

DRAWING NO.

S-18

W.O. 19-0248

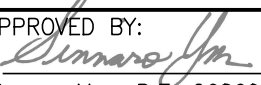
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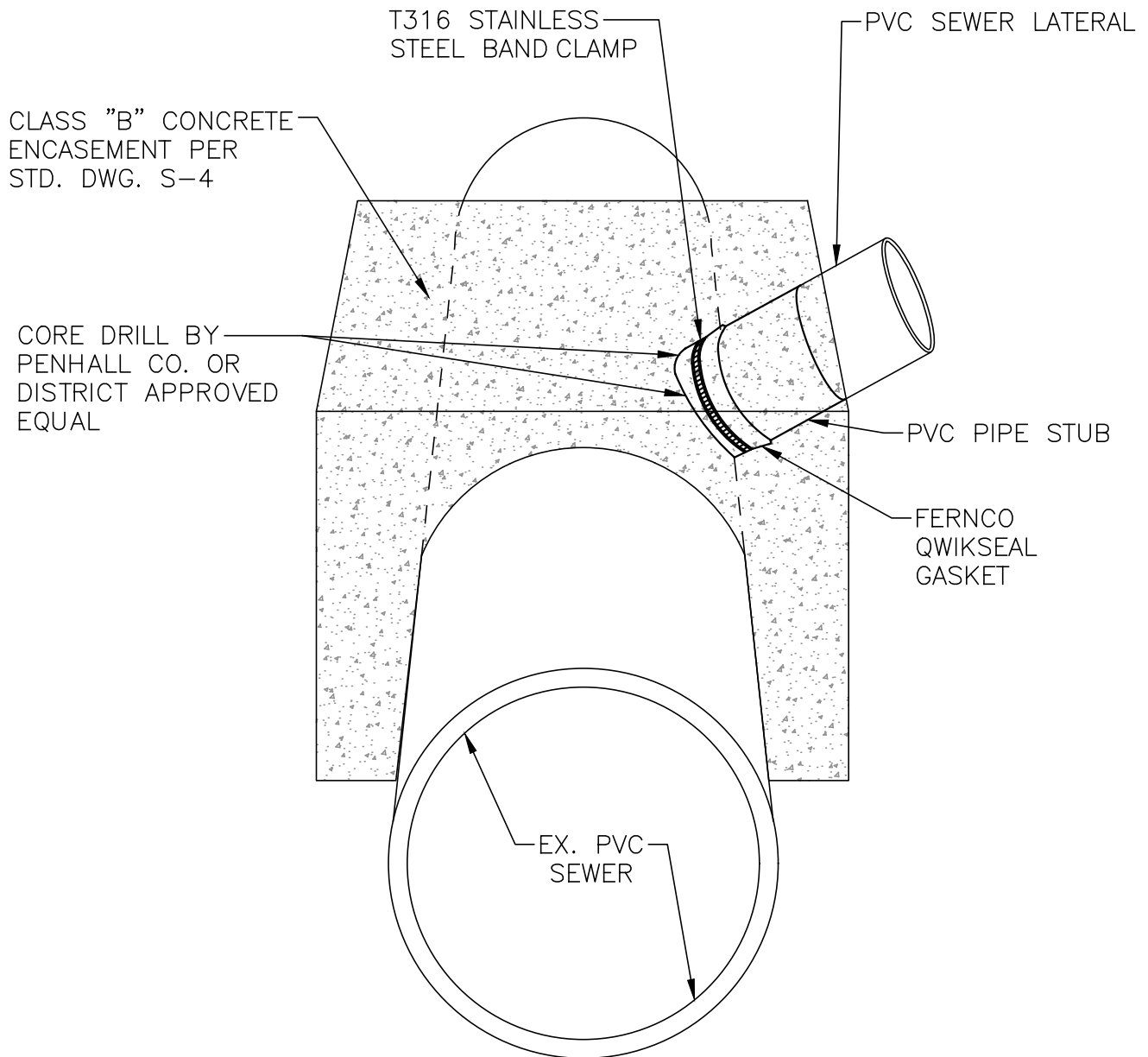


GENERAL NOTES:

1. NO TAPPING OF EXISTING SEWER MAINS WILL BE ALLOWED WITHOUT SPECIFIC APPROVAL BY DISTRICT. IF APPROVAL IS GRANTED, WORK SHALL BE PERFORMED UNDER CONTINUOUS DISTRICT INSPECTION.
2. MAXIMUM SEWER MAIN SIZE FOR TAPPING SHALL BE 15" DIA., UNLESS OTHERWISE APPROVED BY DISTRICT.

JURUPA COMMUNITY SERVICES DISTRICT

REV.	SCALE: NONE	SEWER LATERAL TAPPING TO EXISTING VCP MAIN	DRAWING NO.
	DATE: SEPTEMBER 2020		S-18A
	APPROVED BY:  Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248



GENERAL NOTES:

1. NO TAPPING OF EXISTING SEWER MAINS WILL BE ALLOWED WITHOUT SPECIFIC APPROVAL BY DISTRICT. IF APPROVAL IS GRANTED, WORK SHALL BE PERFORMED UNDER CONTINUOUS DISTRICT INSPECTION.
2. MAXIMUM SEWER MAIN SIZE FOR TAPPING SHALL BE 15" DIA., UNLESS OTHERWISE APPROVED BY DISTRICT.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

SEWER LATERAL TAPPING TO EXISTING PVC MAIN

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

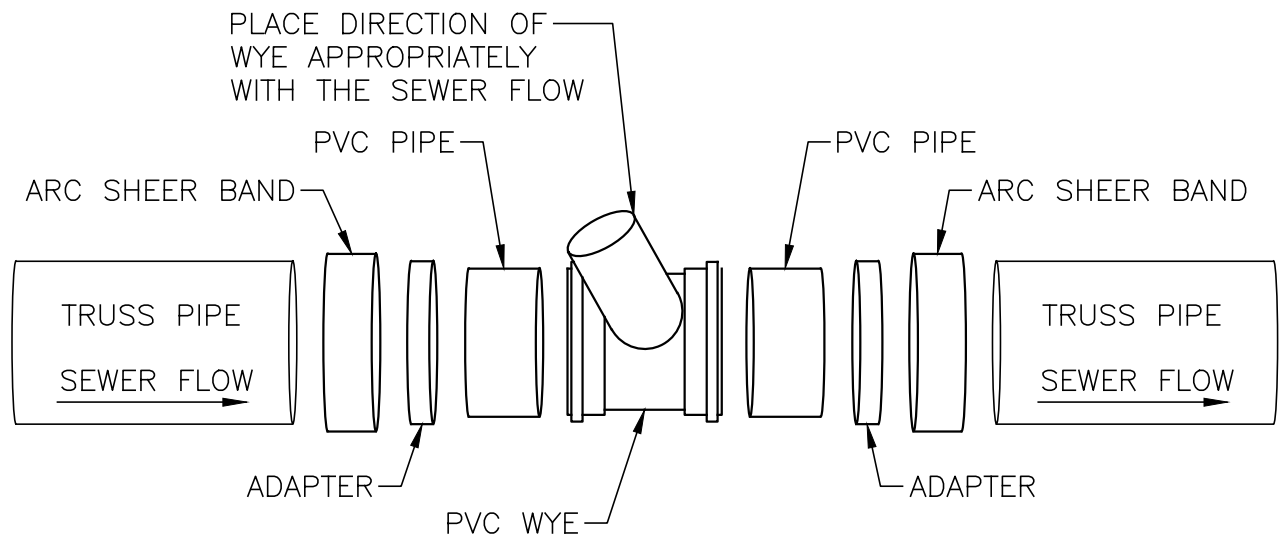
CALIFORNIA

DRAWING NO.

S-18B

W.O. 19-0248

REV.



GENERAL NOTES:

1. NO TAPPING OF EXISTING SEWER MAINS WILL BE ALLOWED WITHOUT SPECIFIC APPROVAL BY DISTRICT. IF APPROVAL IS GRANTED, WORK SHALL BE PERFORMED UNDER CONTINUOUS DISTRICT INSPECTION.
2. MAXIMUM SEWER MAIN SIZE FOR TAPPING SHALL BE 15" DIA., UNLESS OTHERWISE APPROVED BY DISTRICT.
3. WIRE BRUSH 1/4" IN FROM THE END OF PIPE. AFTER WIRE BRUSHING, APPLY A TWO PART EPOXY TO SEAL THE ENDS OF THE PIPES.
4. USE DISTRICT APPROVED TWO PART EPOXY J-B WELD NO. 8280 SPEC. ON EXPOSED HONEYCOMB ENDS AND ALLOW TO SET PRIOR TO ASSEMBLY.

JURUPA COMMUNITY SERVICES DISTRICT

SEWER LATERAL TAPPING TO EXISTING TRUSS MAIN

DRAWING NO.

S-18C

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

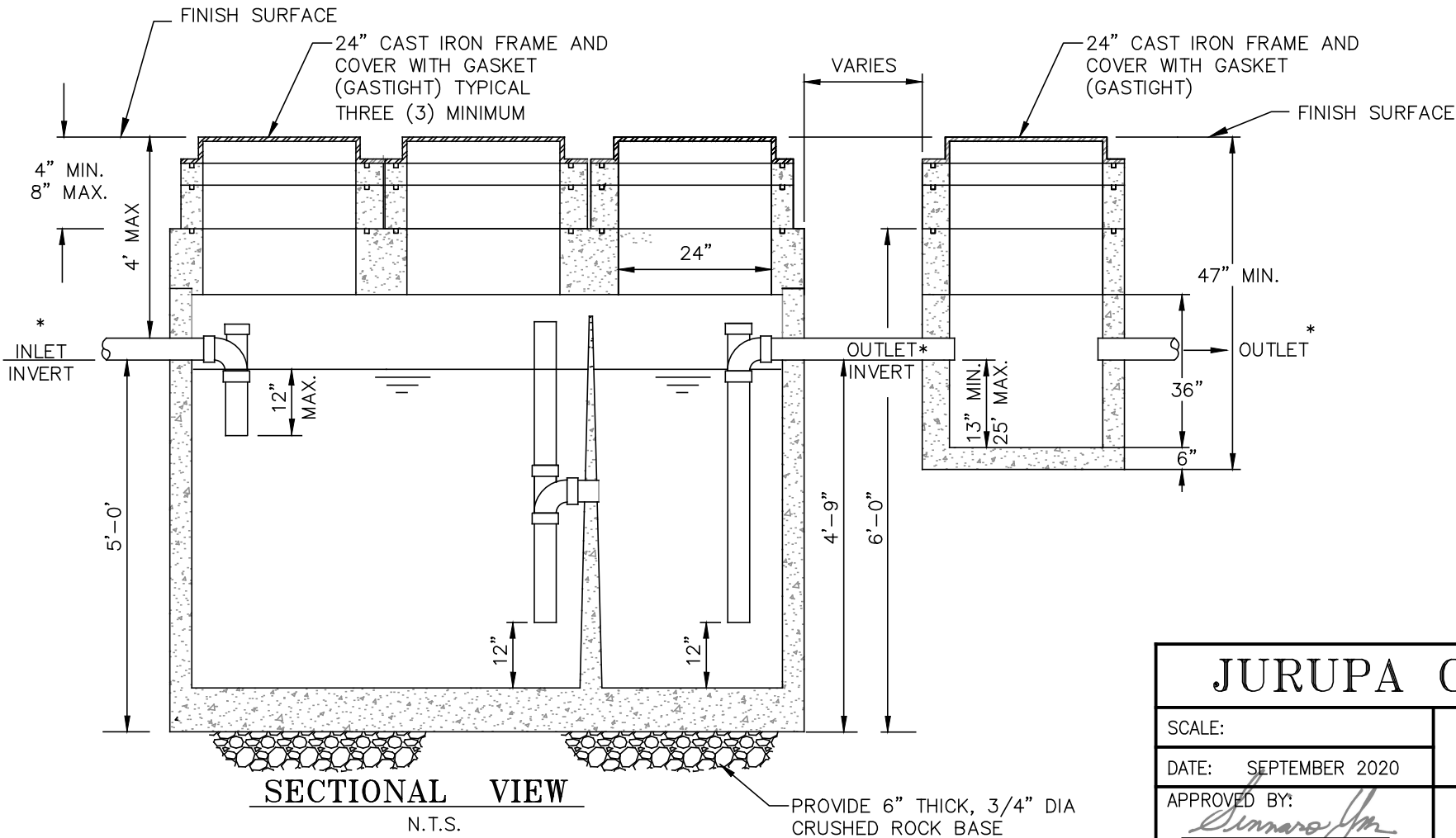
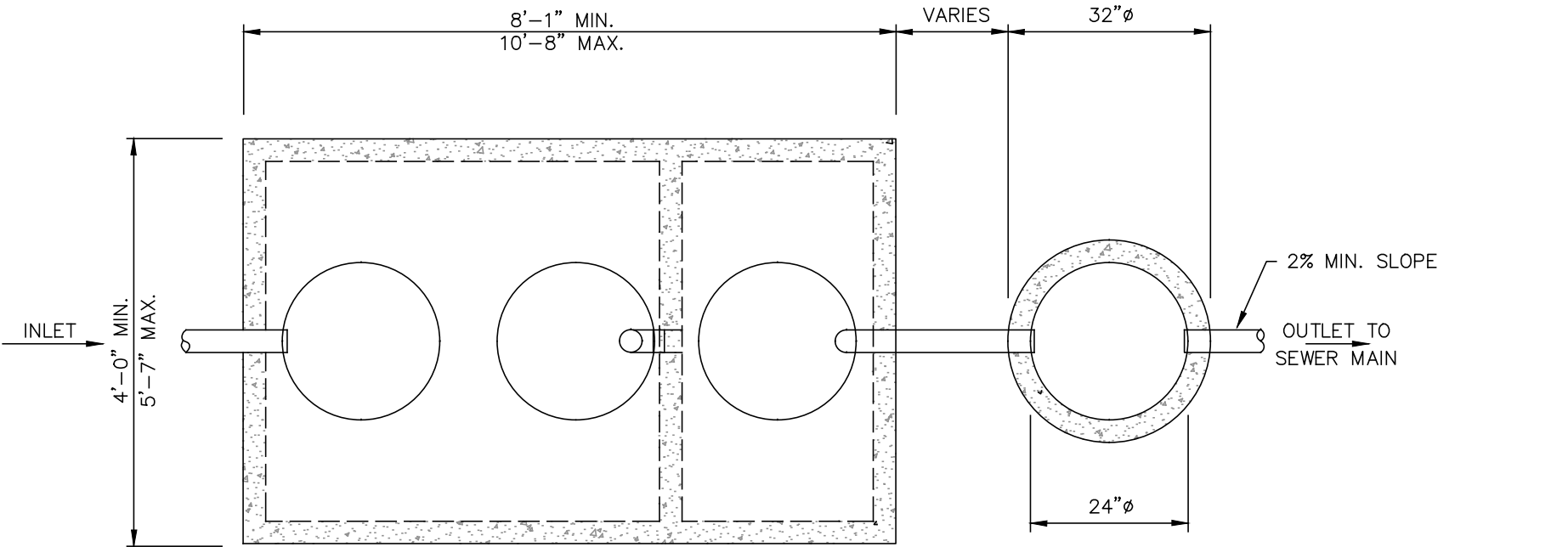
ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

W.O. 19-0248

REV.



NOTES :

1. DOMESTIC SEWAGE CONNECTION IS TO BE MADE DOWNSTREAM OF GRAVITY SEPARATOR SAMPLE BOX.
2. PRECAST CONCRETE VAULT INCLUDING TOP AND COVERS TO BE DESIGNED FOR A MINIMUM H-20 TRAFFIC LOADING. SQUARE COVERS ARE NOT ACCEPTABLE.
3. ALL PIPE AND FITTINGS TO BE CAST IRON OR PVC PIPE.
4. THE REQUIRED CAPACITY FOR THE GRAVITY SEPARATOR SHALL BE BASED UPON APPENDIX H OF THE UNIFORM PLUMBING CODE.
5. WASTE DISCHARGE APPLICANT IS RESPONSIBLE FOR THE PURCHASE, INSTALLATION, OPERATION AND MAINTENANCE OF THE GRAVITY SEPARATOR.
6. APPROVED SUPPLIERS FOR GRAVITY SEPARATOR
 - a. PYRAMID PRECAST CO., INC. RIALTO, CA.
 - b. M.C. NOTTINGHAM CO., PASADENA, CA.
 - c. UTILITY VAULT CO., FONTANA, CA.
7. LOCATION OF GRAVITY SEPARATOR IS SUBJECT TO APPROVAL BY DISTRICT.
8. PROVIDE LABEL INDICATING MANUFACTURER OF GRAVITY SEPARATOR AND CONFORMANCE TO U.P.C.
9. SAMPLE BOX IS REQUIRED.
10. GRADE RING JOINTS ARE TO BE SEALED WITH 1:2 MORTAR, TRIMMED TO A SMOOTH FINISH INSIDE AND OUT.
11. THE MANHOLE FRAME IS TO BE SEALED WITH AND SECURED BY A MORTAR RING.
12. FOR GREASE INTERCEPTOR STRUCTURE, MINIMUM OF 3 MANHOLES REQUIRED, ONE MANHOLE PLACED OVER EACH PIPE (INLET, MIDDLE AND OUTLET PIPE).

* INVERT ELEVATION SHALL BE AS SHALLOW AS POSSIBLE, NOT DEEPER THAN 4' FROM FINISH SURFACE ELEVATION.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE:

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

GREASE INTERCEPTOR
750 GAL. TO 1500 GAL.

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

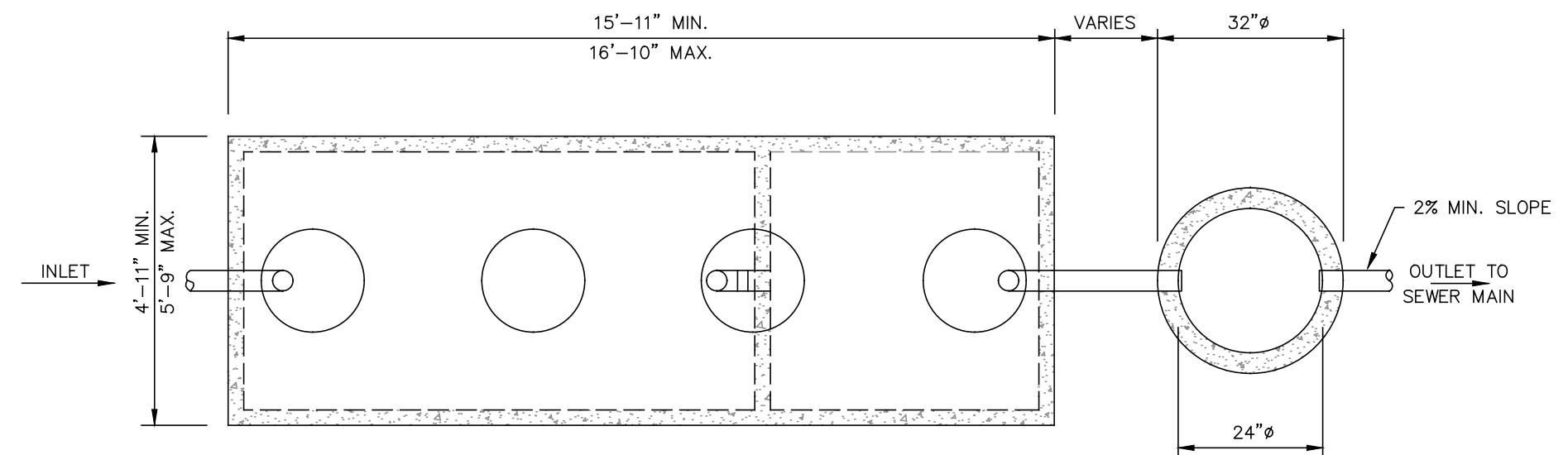
CALIFORNIA

DRAWING NO.

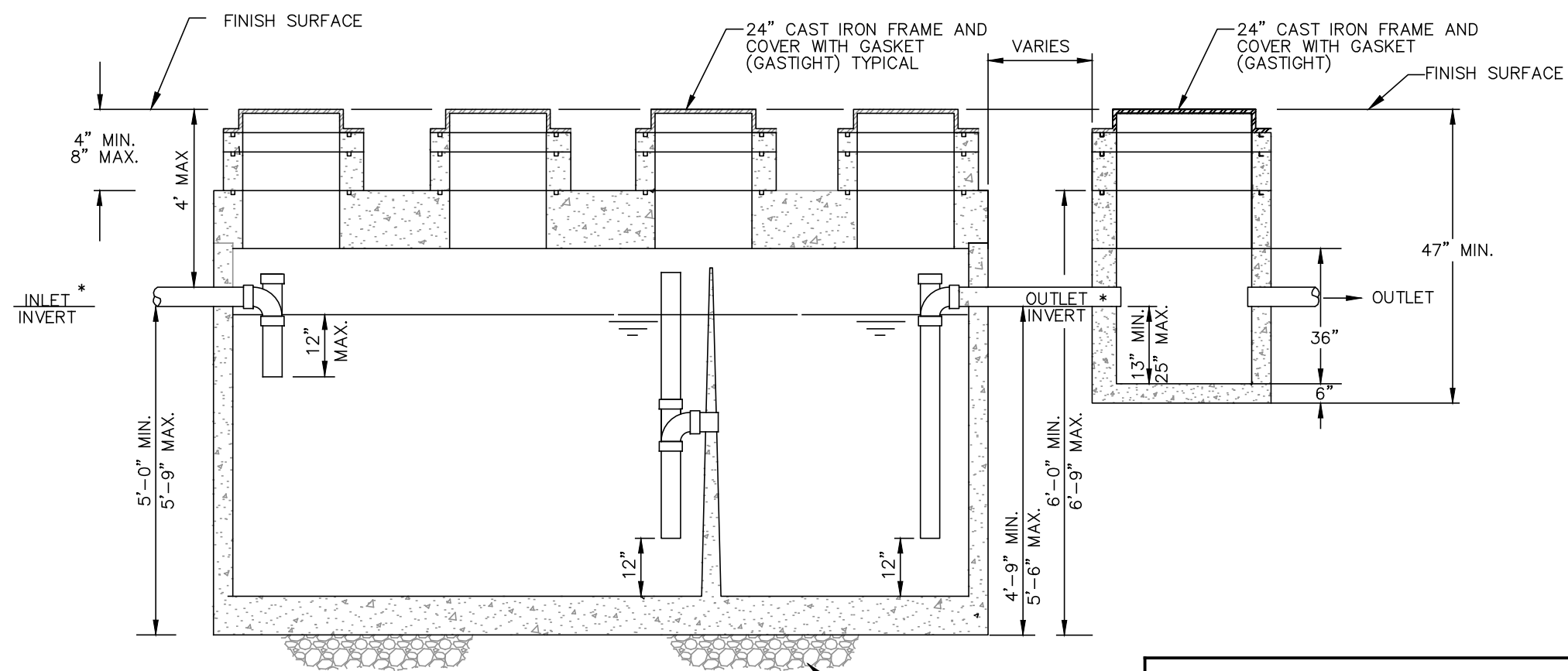
S-19

W.O. 19-0248

REV.



PLAN VIEW
N.T.S.



SECTIONAL VIEW
N.T.S.

NOTES:

1. DOMESTIC SEWAGE CONNECTION IS TO BE MADE DOWNSTREAM OF GRAVITY SEPARATOR SAMPLE BOX.
2. PRECAST CONCRETE VAULT INCLUDING TOP AND COVERS TO BE DESIGNED FOR A MINIMUM H-20 TRAFFIC LOADING. SQUARE COVERS ARE NOT ACCEPTABLE.
3. ALL PIPE AND FITTINGS TO BE CAST IRON OR PVC PIPE.
4. THE REQUIRED CAPACITY FOR THE GRAVITY SEPARATOR SHALL BE BASED UPON APPENDIX H OF THE UNIFORM PLUMBING CODE.
5. WASTE DISCHARGE APPLICANT IS RESPONSIBLE FOR THE PURCHASE, INSTALLATION, OPERATION AND MAINTENANCE OF THE GRAVITY SEPARATOR.
6. APPROVED SUPPLIERS FOR GRAVITY SEPARATOR
 - a. PYRAMID PRECAST CO., INC. RIALTO, CA.
 - b. M.C. NOTTINGHAM CO., PASADENA, CA.
 - c. UTILITY VAULT CO., FONTANA, CA.
 - d. JENSEN PRECAST CO., FONTANA, CA.
7. LOCATION OF GRAVITY SEPARATOR IS SUBJECT TO APPROVAL BY DISTRICT.
8. PROVIDE LABEL INDICATING MANUFACTURE OF GRAVITY SEPARATOR AND CONFORMANCE TO U.P.C.
9. SAMPLE BOX IS REQUIRED.
10. GRADE RING JOINTS TO BE SEALED WITH 1:2 MORTAR, TRIMMED TO A SMOOTH FINISH INSIDE AND OUT.
11. THE MANHOLE FRAME IS TO BE SEALED WITH AND SECURED BY A MOTAR RING.

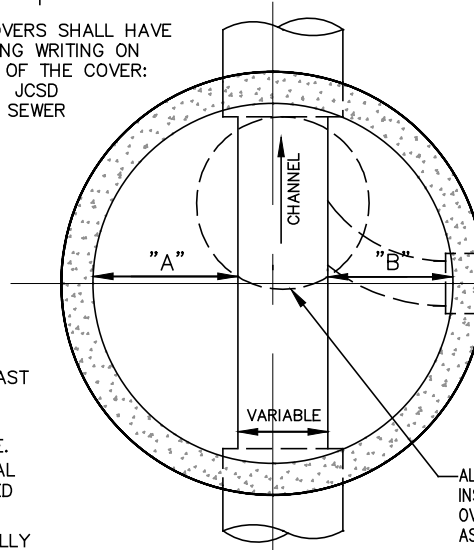
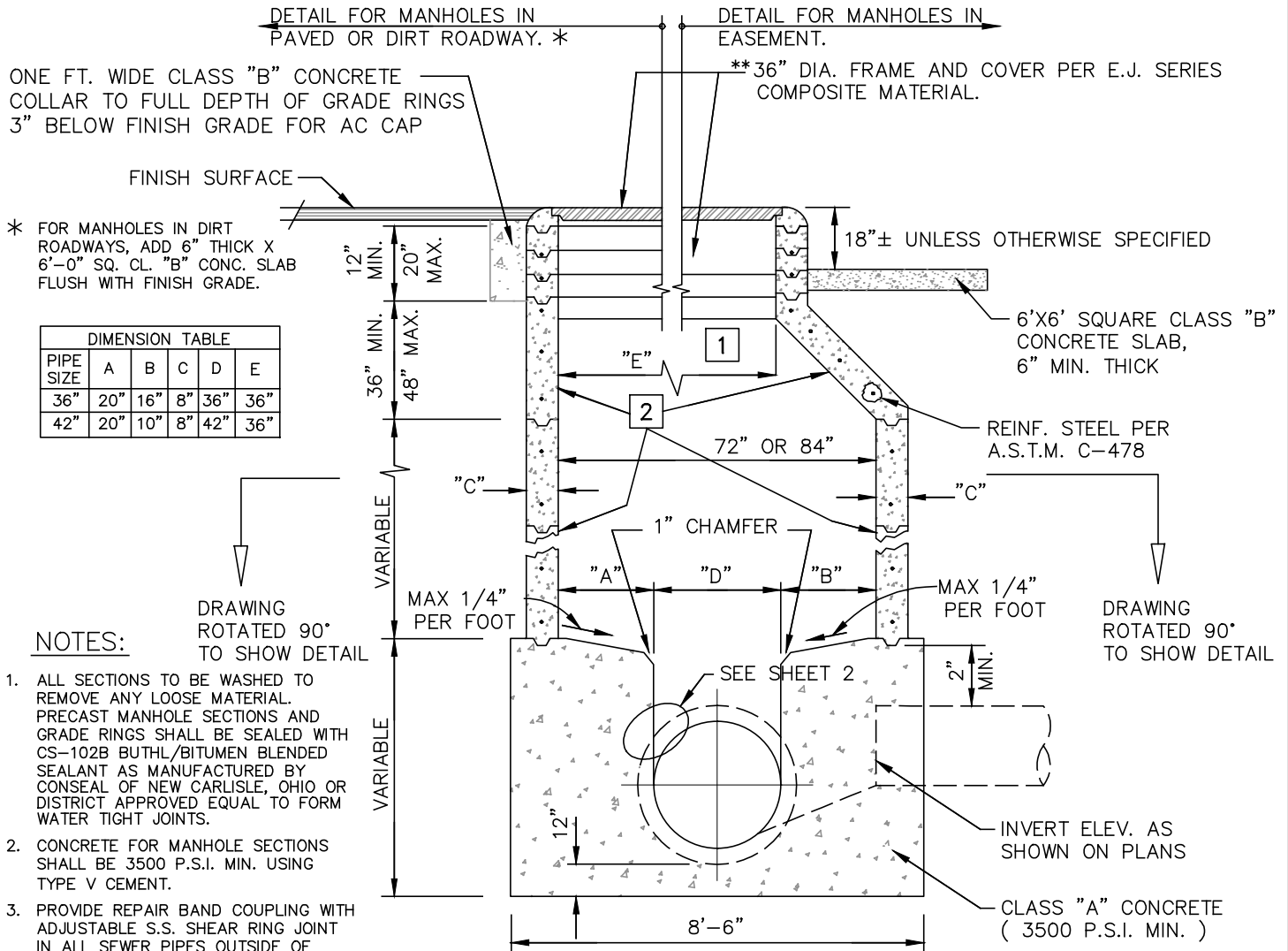
* INVERT ELEVATION SHALL BE AS SHALLOW AS POSSIBLE, NOT DEEPER THAN 4' FROM FINISH SURFACE ELEVATION.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE:	GREASE INTERCEPTOR 2000 GAL. TO 3000 GAL.	DRAWING NO. S-20
DATE: SEPTEMBER 2020		
APPROVED BY: <i>Sinnaro Yos</i> Sinnaro Yos, P.E. C68607	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	W.O. 19-0248

REV.

FRAME & COVER SETTING CONDITIONS



****E.J. SERIES - COMPOSITE MANHOLE COVER AND FRAME, (36") 3800 WITH FOUR (4) TITUS TWISTLIFT STAINLESS STEEL LOCKS, PER COVER. "NOTE" AFTER SETTING A COMPOSITE FRAME IN PLACE AND PRIOR TO POURING THE CONCRETE COLLAR AND/OR CONCRETE SLAB, INSTALL ONE (1) #4 REBAR SHAPED INTO A FULL CIRCLE THREE (3") INCHES LARGER IN O.D. THAN THE COMPOSITE FRAME. AFTER FORMING THE #4 REBAR CIRCLE, IT SHALL THEN BE SET TO THREE (3") INCHES BELOW THE FRAME RIM ELEVATION THEN ENCAPSULATED IN THE CONCRETE COLLAR AND/OR CONCRETE SLAB. REFER TO DISTRICT STANDARD DRAWING NO. S-7 (SHEET 2 OF 2)**

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY: 
Sinnaro Yos, P.E. C68607

72" AND 84" DIA. PRECAST CONCRETE MANHOLE (LINED)

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-21

SHEET 1 OF 2

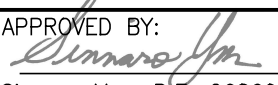
W.O. 19-0248

REV.

COATING AND LINING SCHEDULE

- 1 ALL EXPOSED INTERIOR SURFACES OF MANHOLE BASE TO BE COATED WITH KOPPERS 300-M, COAL TAR EPOXY PER MANUFACTURERS RECOMMENDATIONS, OR APPROVED EQUAL.
- 2 ALL EXPOSED INTERIOR SURFACES OF MANHOLE SHAFT, CONE, AND GRADE RINGS TO BE LINED WITH UTILITHANE 1600 POLYURETHANE COATING (WHITE) AS MANUFACTURED BY UTILITHANE POLYURETHANES. MIN 150 MILS THICKNESS.
- 3 PRIMER COAT TO BE UTILITHANE LTE 900 PRIMER FOR CONCRETE SUBSTRATES.
- 4 REFER TO SPECIFICATIONS FOR DETAILS, PREPARATION, AND APPLICATIONS.

JURUPA COMMUNITY SERVICES DISTRICT

REV.	SCALE: NONE	72" AND 84" DIA. PRECAST CONCRETE MANHOLE (LINED)	DRAWING NO.
	DATE: SEPTEMBER 2020		S-21
	APPROVED BY: 	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS RIVERSIDE CALIFORNIA	SHEET 2 OF 2
	Sinnaro Yos, P.E. C68607		W.O. 19-0248

STANDARD DRAWING NO. S-22 DELETED

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

2" SEWAGE AIR VALVE DETAIL

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

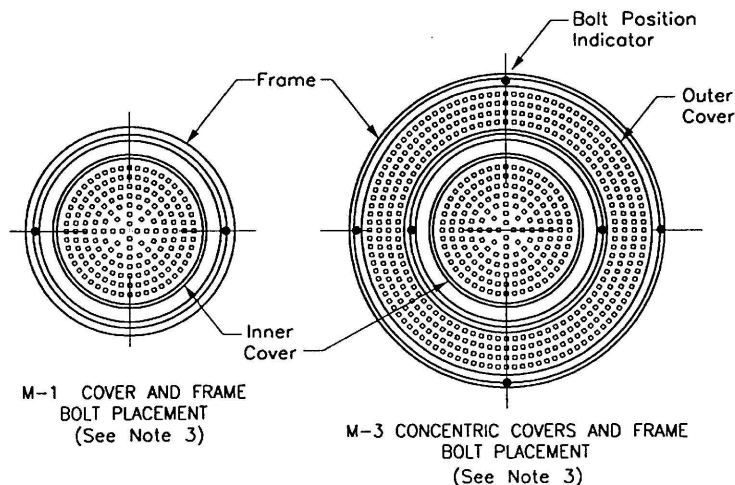
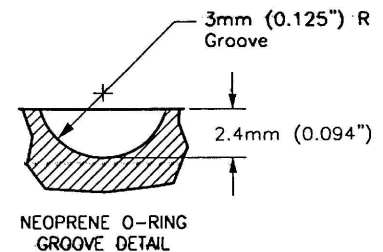
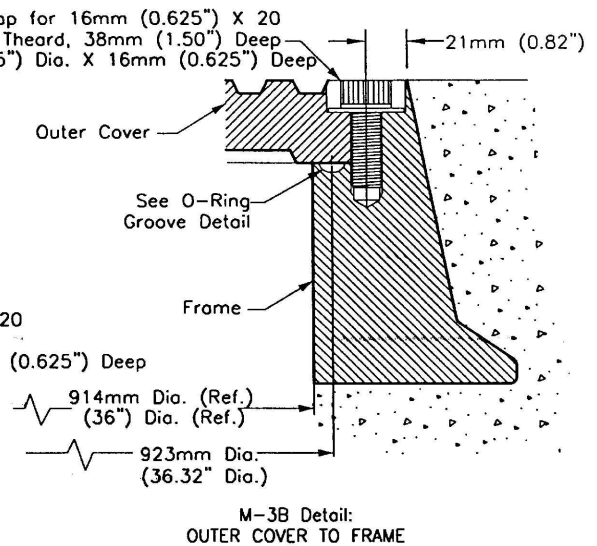
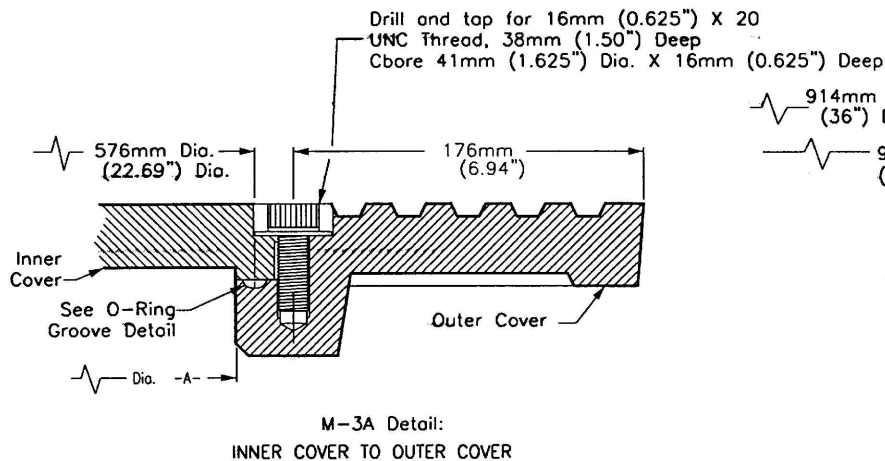
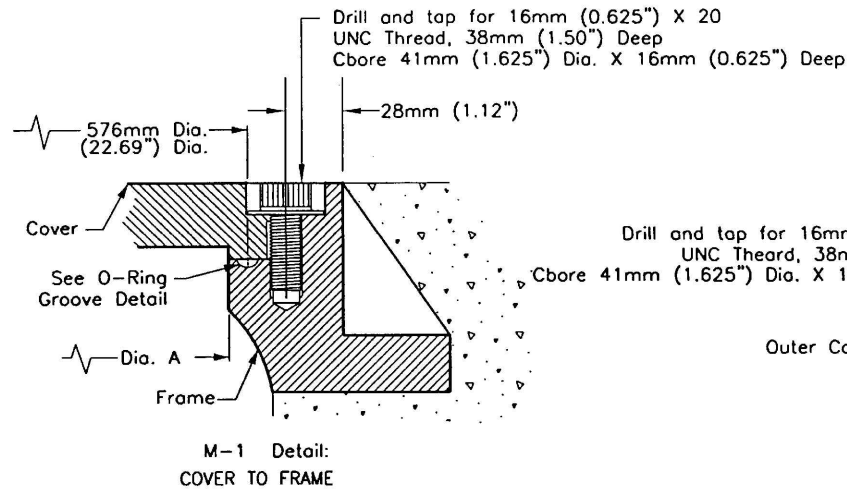
DRAWING NO.

S-22

W.O. 19-0248

REV.

NOTE: DISTRICT DIRECTED USE ONLY



NOTES:

1. 16mm (0.625") X 20 UNC THREAD, 316 STAINLESS STEEL PENTA HEAD SCREW AND 38mm (1.50") O.D. X 17mm (0.687") I.D. X 0.078 THICK 316 STAINLESS STEEL WASHER.
2. 6mm (0.25") NEOPRENE O-RING GASKET SHALL BE GLUED INTO MACHINED GROOVE. GLUE SHALL MEET THE REQUIREMENTS OF MIL-M-81288 (AMEND. 1)
3. BOLTDOWN PATTERNS:
 - M-1 DETAIL (610mm (24") COVER & FRAME): INSTALL TWO (2) BOLTS AT 180 DEGREES.
 - M-3A DETAIL (CONCENTRIC COVERS): BETWEEN INNER AND OUTER COVERS INSTALL TWO (2) BOLTS AT 180 DEGREES.
 - M-3B DETAIL (OUTER COVER & FRAME): BETWEEN OUTER COVER & FRAME INSTALL FOUR (4) BOLTS AT 90 DEGREES.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:
Sinnaro Yos
Sinnaro Yos, P.E. C68607

MANHOLE COVER - LOCKING DEVICE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-23

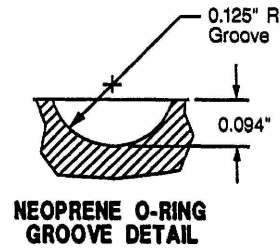
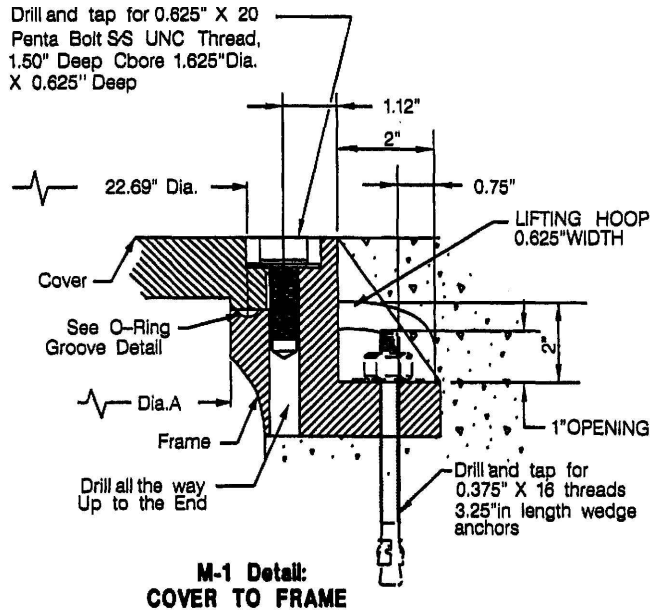
SHEET 1 OF 3

W.O. 19-0248

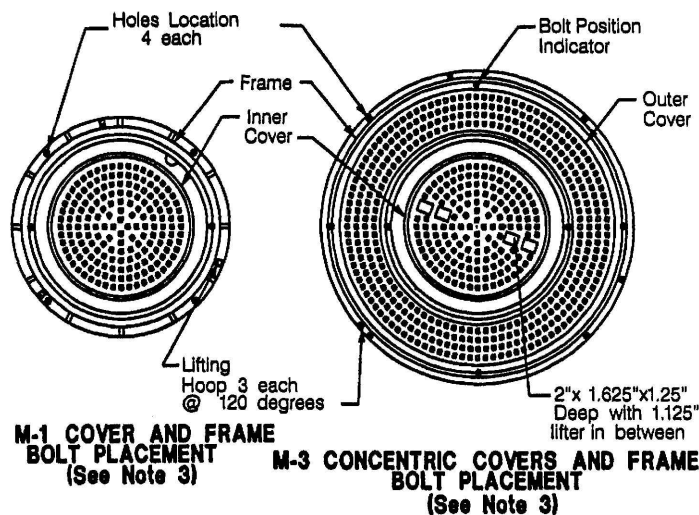
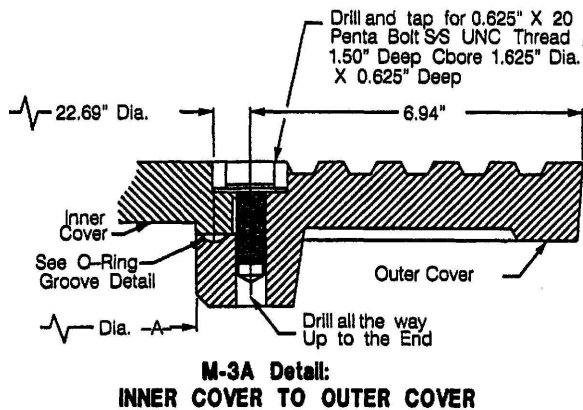
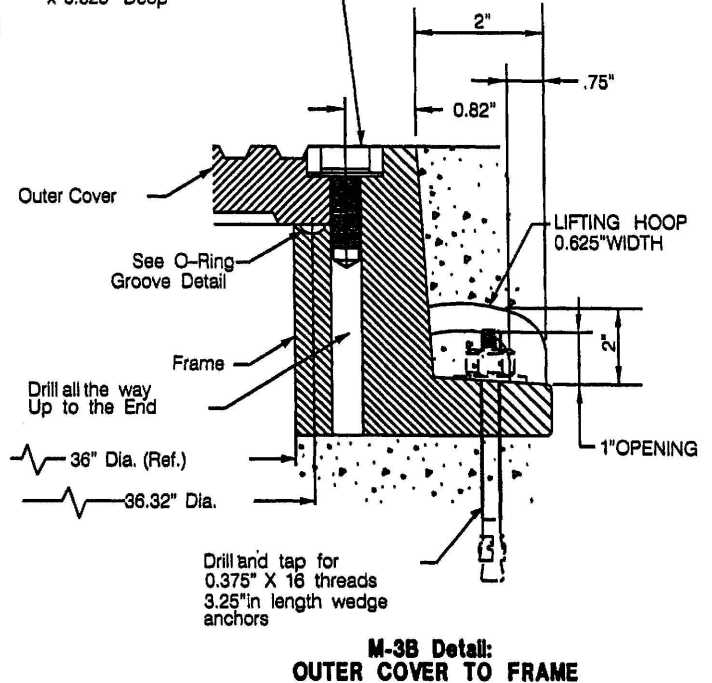
REV.

NOTE: DISTRICT DIRECTED USE ONLY

Drill and tap for 0.625" X 20
Penta Bolt SS UNC Thread,
1.50" Deep Bore 1.625" Dia.
X 0.625" Deep



Drill and tap for 0.625" x 20
Penta Bolt SS UNC Thread,
1.50" deep Bore 1.625" Dia.
x 0.625" Deep



NOTES:

- 0.625" X 20 PENTA BOLT SS UNC THREAD, 316 STAINLESS STEEL PENTA HEAD SCREW AND 1.50" O.D. x 0.687" I.D. x 0.078" THICK 316 STAINLESS STEEL WASHER.
 - 0.25" NEOPRENE O-RING GASKET SHALL BE GLUED INTO MACHINED GROOVE. GLUE SHALL MEET THE REQUIREMENTS OF MIL-M-81288
 - BOLTDOWN PATTERNS:
 - M-1 DETAIL (24" COVER & FRAME): INSTALL TWO (2) BOLTS AT 180 DEGREES.
 - M-3A DETAIL (CONCENTRIC COVERS): BETWEEN INNER AND OUTER COVERS INSTALL TWO (2) BOLTS AT 180 DEGREES.
 - M-3B DETAIL (OUTER COVER & FRAME): BETWEEN OUTER COVER & FRAME INSTALL FOUR (4) BOLTS AT 90 DEGREES.
- FOR M-1 AND M-3 OUTER COVER FRAME DRILL 4 HOLES FOR 0.375"x16 STAINLESS STEEL WEDGE ANCHORS 3.75" IN LENGTH AT 90 DEGREES.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY: *Sinnaro Yos*
Sinnaro Yos, P.E. C68607

MANHOLE COVER - LOCKING DEVICE

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

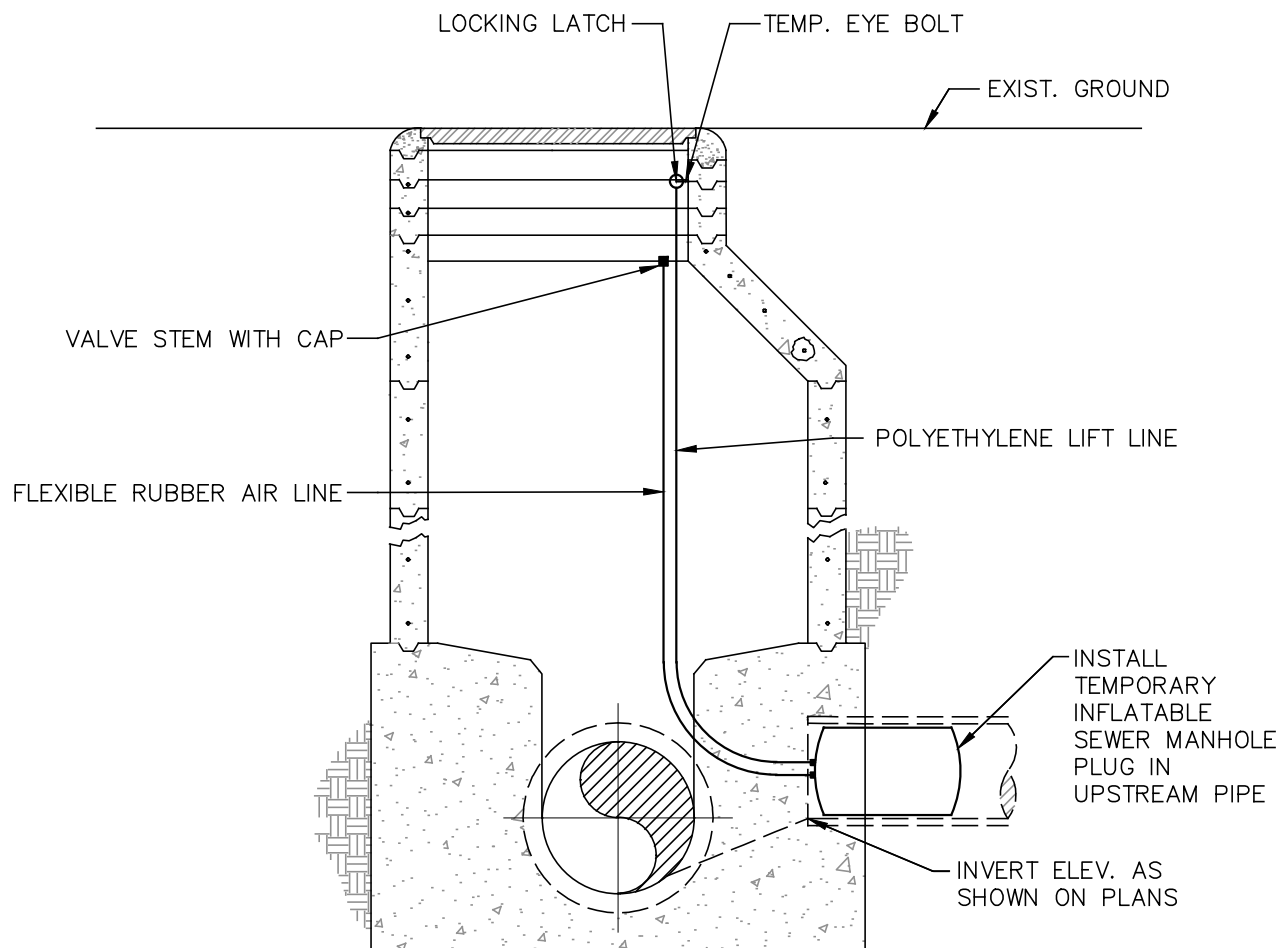
DRAWING NO.

S-23 (M-4)

SHEET 3 OF 3

W.O. 19-0248

REV.



JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

TEMPORARY MANHOLE PLUG

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-24

W.O. 19-0248

REV.

SEWER LATERAL



DIMENSION TABLE

A	
B	
C	
D	

BUILDING FOOTPRINT

ADDRESS

PROPERTY LINE

STREET R/W

CURB/GUTTER

CLEAN-OUT PER
STD. DWG. NO. S-5

STREET NAME

GENERAL NOTES:

1. DEVELOPER SHALL PREPARE ONE PLAT FOR EACH PROPERTY.
2. BUILDING FOOTPRINT SHALL REFLECT THE FLOOR PLAN OF THE HOUSE CONSTRUCTED ON THE PROPERTY.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE

DATE: SEPTEMBER 2020

APPROVED BY:

Sinnaro Yos, P.E. C68607

ONSITE SEWER LOCATION

ALBERT A. WEBB ASSOCIATES
CONSULTING ENGINEERS

RIVERSIDE

CALIFORNIA

DRAWING NO.

S-25

W.O. 19-0248

REV.

SECTION VII

APPENDICES

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TABLE OF CONTENTS

SECTION VII - APPENDICES

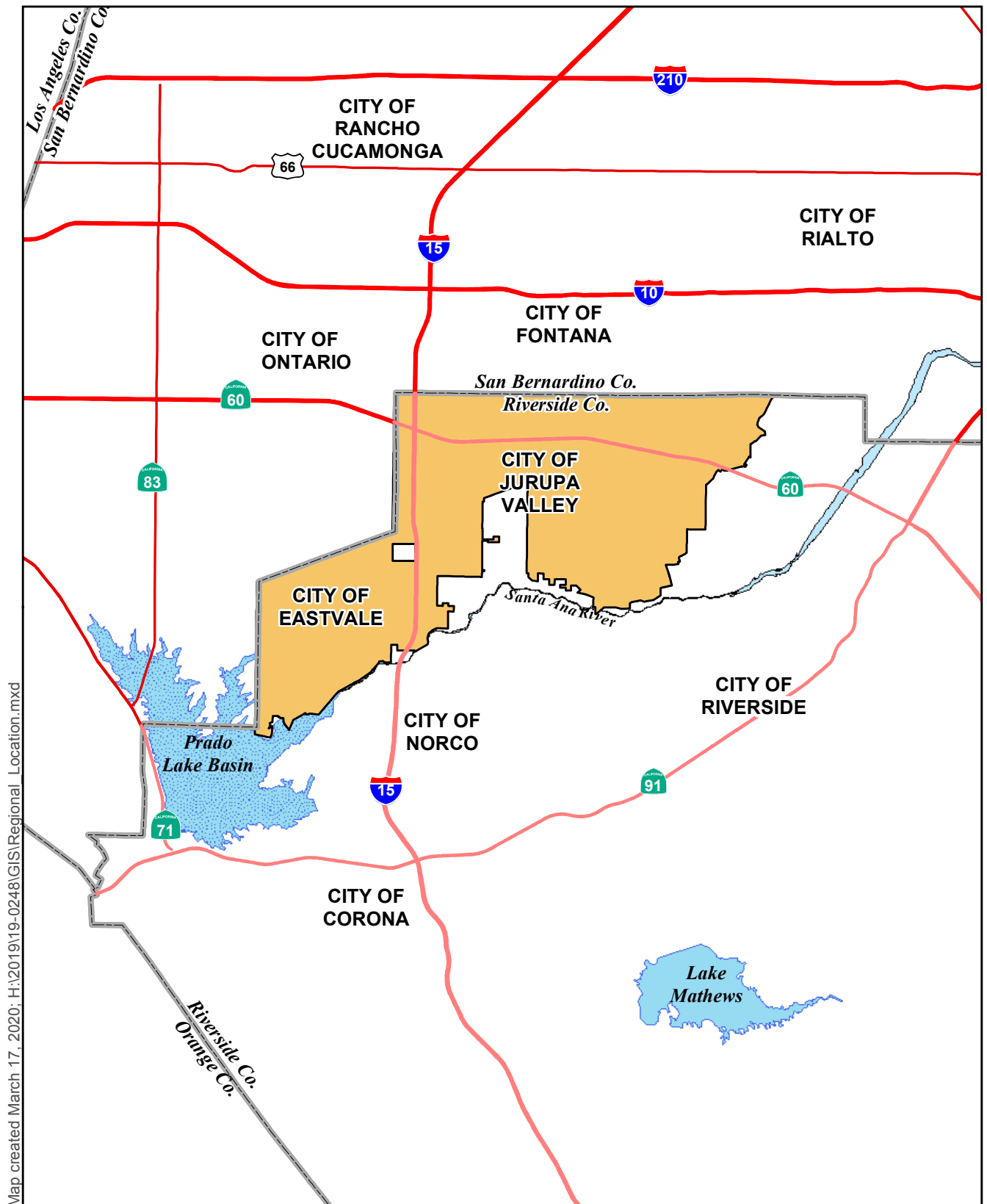
- A. REGIONAL LOCATION MAP/SERVICE AREA MAP
- B. GRANT OF EASEMENT
- C. CERTIFICATE OF ACCEPTANCE OF GRANT OF EASEMENT
- D. WATER AND/OR SEWER SYSTEM CONSTRUCTION AGREEMENT (OMITTED)
- E. CONTRACTOR'S DATA SHEET
- F. DISTRICT STANDARD INSURANCE FORM
- G. CERTIFICATION OF STREETS TO FINAL GRADE
- H. PRECONSTRUCTION CONFERENCE & NOTICE TO PROCEED
- I. STANDARD TITLE BLOCK FORMAT FOR 24" X 36" DESIGN DRAWING
- J. LIST OF APPROVED MANUFACTURED MATERIALS
- K. DIGITAL DATA DISK REQUIREMENTS
- L. ATTACHMENT NO. 1 – PROJECT IDENTIFICATION FORM
- M. DECEMBER 14, 2017 SEPARATION OF WATERMAINS AND NON-POTABLE PIPELINES – REQUESTS FOR ALTERNATIVES TO THE WATER WORKS STANDARDS
- N. ATLAS MAP UPDATING PROCEDURES
- O. CURED-IN-PLACE PIPE (CIPP)
- P. CLOSED CIRCUIT TELEVISION (CCTV) INSPECTION – STANDARDS FOR ACCEPTANCE OF NEW SEWERS

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APPENDIX A

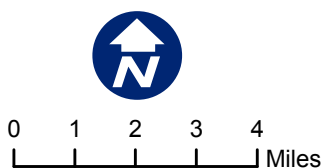
REGIONAL LOCATION MAP/SERVICE AREA MAP

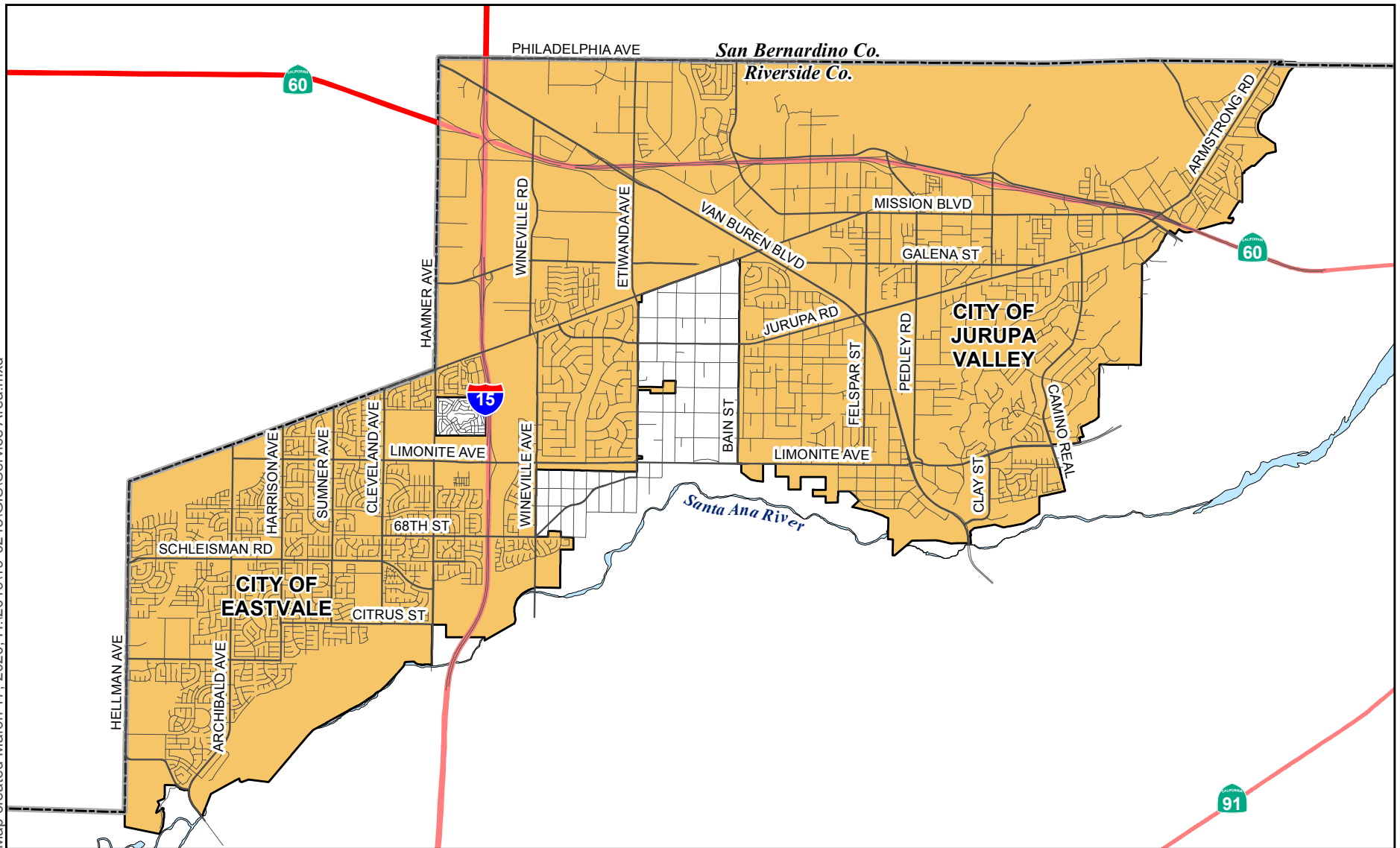
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Sources: JCSD, 2019;
Riverside Co. GIS, 2020.

Regional Location Map





Sources: JCSD, 2019;
Riverside Co. GIS, 2020.



0 1 2 3
Miles



JCSD Service Area



APPENDIX B

GRANT OF EASEMENT

[PAGE INTENTIONALLY LEFT BLANK]

Recording requested by

When recorded mail to:

Jurupa Community Services District
11201 Harrel Street
Jurupa Valley, California 91752

APN

EXEMPT FROM RECORDING FEES PER GOVT. CODE §27383
NO DOCUMENTARY TRANSFER TAX PER R&T CODE §11922

GRANT OF PERMANENT EASEMENT

For valuable consideration, (enter name here) ("**Grantor**"), hereby grants to JURUPA COMMUNITY SERVICES DISTRICT of RIVERSIDE COUNTY, a public agency ("**Grantee**"), its successors and assigns, a permanent easement and right of way in, over, upon, under and across the lands hereinafter described to construct, reconstruct, install replace, remove, repair, alter, operate, maintain, inspect and utilize a sewer lift station, together with any easement roads and appurtenances within the right of way including, but not limited to, cable for communication purposes, and for the ingress and egress throughout the entire easement area and right of way (collectively, "**Easement Area**") in connection with the exercise of any of the foregoing rights. The property subject to this easement is located in the County of Riverside, State of California, described as follows:

See Exhibits "A" (Description) and "B" (Plat) attached hereto and made a part hereof.

It is further understood and agreed that no other easement or easements shall be granted on, under, or over said Easement Area by the Grantor to any person, firm, corporation, or other entity without the previous written consent of said Grantee.

Grantor, and his successors and assigns, shall not increase or decrease, or permit to be increased or decreased, the now existing ground elevations of said Easement Area and right of way without the prior written consent of Grantee.

Grantor, and Grantor's successors and assigns, further agree that no building, fences, walls or other structures of any kind, or trees, shall be installed, constructed, erected, placed planted or maintained in any portion of the Easement Area, and no shrubs or other plants or vegetation shall be placed, planted or maintained in the portion of Easement Area which is included within any travel way, and that no changes in the alignment of grading of any such road will be made without prior written consent of the Grantee.

The Permanent Easement, as applicable, shall include, without limitation, the right and privilege of Grantee and its employees, agents, representatives, contractors, subcontractors, and workmen to: (i) perform all activities as may be necessary to facilitate the purposes of the Permanent Easement; (ii) use, control and occupy the Easement Area (iii) have access to, ingress to, and egress from the Easement Area; (iv) construct and utilize an access road within said Easement Area, and to use gates in all fences which now cross said Easement Area; (v) use and temporarily place and operate tools, equipment, machinery, and materials on the Easement Area, and (vi) trim, cut, remove, or clear away any trees, brush, or other vegetation or flora, including the roots thereof, located within the Easement Area. No additional fences or gates or gates shall be constructed across said Easement Area unless approved in writing by the Grantee. Grantee shall also have the right to mark the location of this easement in a manner which will not interfere with Grantor's reasonable and lawful use of said Easement Area.

The covenants contained herein shall run with the land.

Since the construction and installation of the facilities (the "**Facilities**") provided for under the terms of this Grant of Easement will require incidental entry and construction activities upon a portion of the Grantor's property adjacent to the Easement Area, the purpose of the following Grant of Temporary Easement is to provide for such incidental activities. Therefore, subject to the provisions described below, Grantor hereby grants to Grantee a temporary, non-exclusive easement over the Grantor's adjacent property (the "**Temporary Construction Easement**") described and depicted in Exhibits "C" and "D" for the purposes of enabling Grantee to construct and install the Facilities. This Temporary Construction Easement is intended to be temporary and will remain in effect until completion of the construction and installation of the Facilities, which will occur not later than _____ (____) days after such construction and installation commences. Following completion of such construction and installation of the Facilities, Grantee will execute, acknowledge and provide to Grantor a quitclaim deed or other release to confirm the termination of the Temporary Construction Easement only.

This Grant shall inure to the benefit of and be binding upon the Grantor and Grantee and their respective assigns, heirs and voluntary and involuntary successors in interest.

IN WITNESS WHEREOF, Grantor has executed this instrument this _____ day of _____, 20____.

GRANTOR: (Enter name of entity/person here)

By: (Enter name of authorized person)

Its: (Enter title as stated in paragraph 1)

NOTARY ACKNOWLEDGMENT
(California All-Purpose Acknowledgment)

STATE OF CALIFORNIA)
) ss.
COUNTY OF _____)

On _____, 20____ before me, _____, notary public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature of Notary Public

EXHIBIT “A”

LEGAL DESCRIPTION
OF EASEMENT AREA

[INSERT LEGAL DESCRIPTION HERE]

EXHIBIT “B”

PLAT

[INSERT PLAT HERE]

EXHIBIT “C”

TEMPORARY CONSTRUCTION EASEMENT DESCRIPTION

[INSERT LEGAL DESCRIPTION HERE]

EXHIBIT “D”

PLAT OF TEMPORARY CONSTRUCTION EASEMENT

[INSERT PLAT HERE]

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APPENDIX C

CERTIFICATE OF ACCEPTANCE OF GRANT OF EASEMENT

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CERTIFICATE OF ACCEPTANCE

This is to certify that the interest in real property conveyed by that certain Grant of Easement to which this Certificate is attached from _____, to JURUPA COMMUNITY SERVICES DISTRICT, a public agency ("Grantee"), is hereby accepted by the undersigned officer or agent on behalf of the Grantee, pursuant to authority conferred by resolution of the Board of Directors adopted on January 24, 1994, and the Grantee consents to recordation thereof.

Dated: _____ (insert date)

JURUPA COMMUNITY SERVICES DISTRICT,
a public agency

By: _____
Chris Berch
General Manager

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APPENDIX D

WATER AND/OR SEWER SYSTEM CONSTRUCTION
AGREEMENT

(OMITTED FROM STANDARDS MANUAL –
SEE DISTRICT DEVELOPERS HANDBOOK AND
PROCEDURES MANUAL)

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APPENDIX E

CONTRACTOR'S DATA SHEET

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JURUPA COMMUNITY SERVICES DISTRICT

CONTRACTOR'S DATA SHEET

Name of Contractor or Organization _____

Principal Office Address _____ Corporation
 Phone Number () _____ Partnership
 Individual

Names of Officers of Organization _____
 Name Title

_____ Name Title

License Number(s) _____ Classification _____ Engineering Class "A"
 C-34 Specialty

1. How many years has your organization been in business as a general contractor under your 1) present business name? ____ and 2) present license(s)? ____
2. How many years experience in water and/or sewer pipeline construction work has your organization had (a) as a general contractor ____ (b) as a sub-contractor ____
3. List below the applicable projects your organization has completed most recently.

Project Completed			Pipe Sizes	Total Length	Type of Pipe	Contract Cost
No.	Year	for				
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

(Use additional sheet if necessary)

4. List names and addresses of persons to be contacted for information on projects listed in Item 3.

No.	Name of Owner	Name, Address & Telephone Number of Person to be Contacted
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

(Use additional sheet if necessary)

(see following page)

5. Have you ever failed to complete any work awarded to you? ___ If so, where, when and why? _____

6. Have you ever filed bankruptcy? ___ If so, state details on separate sheet.
7. Have you ever been cited for violation of Cal-OSHA regulations? ___ If so, state on separate sheet where, when, why, and whether a minor or major violation.
8. Have you ever had a lien against you? ___ Have you ever had to obtain a lien against someone? ___ If so, where, when and why? _____

9. Can you provide letters of recommendation from previous contractual agreements? ___ If so, please attach letters to this form.

I hereby authorize JURUPA COMMUNITY SERVICES DISTRICT of Riverside County to obtain information concerning me or my organization from any source including former clients. I certify that the foregoing information obtained in this Experience Questionnaire is true and correct to the best of my knowledge.

Date _____ Signature _____

Type or print name clearly _____

APPENDIX F

DISTRICT STANDARD INSURANCE FORM

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COMMERCIAL GENERAL LIABILITY ENDORSEMENT

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS

Insurer:	<i>This Endorsement Changes The Policy</i> <i>Please Read it Carefully</i>
Policy Number:	
Endorsement Number:	

POLICY TYPE: This endorsement modifies insurance provided under the following:

Commercial General Liability Coverage

SCHEDULE:

Name of Public Entity ("Additional Insured")

If no entry appears above, the information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.

WHO IS AN INSURED is amended to include as an Additional Insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" for that Additional Insured by or for you.

Modifications to Policy:

1. The Additional Insured shown in the Schedule above includes the members of its governing body, its officers, employees, agents and volunteers.
2. This insurance shall be primary as respects the Additional Insured shown in the Schedule above, or if excess, shall stand in an unbroken chain of coverage excess of the Named Insured's scheduled underlying primary coverage. In either event, any other insurance maintained by the Additional Insured shown in the Schedule above shall be in excess of this insurance and shall not be called upon to contribute with it.
3. This insurance shall afford coverage at least as broad as the latest version of Insurance Services Office Commercial General Liability coverage (occurrence form CG 0001).
4. The insurance afforded by this policy shall not be canceled except after thirty days prior written notice by certified mail return receipt requested has been given to the Additional Insured.

AUTHORIZED REPRESENTATIVE:

☐ Broker/Agent ☐ Underwriter ☐ _____

I, _____, (print/type name) warrant that I have authority to bind the above-mentioned insurance company and by my signature hereon do so bind this company to this endorsement.

Signature of Authorized Representative

Address

Phone Number

Date Signed

AUTOMOBILE LIABILITY SPECIAL ENDORSEMENT

For _____ (The Owner)

SUBMIT IN DUPLICATE

	ENDORSEMENT NO.	ISSUE DATE (MM/DD/YY)
PRODUCER	POLICY INFORMATION: Insurance Company: Policy No.: Policy Period: (from) _____ (to) _____ LOSS ADJUSTMENT EXPENSE ☐ Included in Limits ☐ In Addition to Limits	
	☐ Deductible ☐ Self-Insured Retention (check which) of \$ _____	
NAME INSURED	APPLICABILITY. This insurance pertains to the operation and/or tenancy of the named insured under all written agreements and permits in force with the Additional Insured unless checked here ☐ in which case only the following specific agreements and permits with the City are covered: ADDITIONAL INSURED AGREEMENTS/ PERMITS	
TYPE OF INSURANCE	OTHER PROVISIONS	
☐ Commercial Auto Policy ☐ Business Auto Policy ☐ Other _____		
LIMIT OF LIABILITY	CLAIMS: Underwriter's representative for claims pursuant to this insurance.	
\$ _____ per accident, for bodily injury and property damage.	Name: _____ Address: _____ Telephone: (____) _____	
In consideration of the premium charged and notwithstanding any inconsistent statement in the policy to which this endorsement is attached or any endorsement now or hereafter attached thereto, it is agreed as follows: 1. ADDITIONAL INSURED. The Owner, the members of its governing body, its officers, employees, agents and volunteers are included as insureds with regard to damages and defense of claims arising from: the ownership operation, maintenance, use, loading or unloading of any auto owned, leased, hired or borrowed by the Named Insured or for which the Name Insured is responsible. 2. CONTRIBUTION NOT REQUIRED. As respects work performed by the Named Insured for or on behalf of the Additional Insured, the insurance afforded by this policy shall: (a) be primary insurance as respects the Additional Insured; or (b) stand in an unbroken chain of coverage excess of the Named Insured's primary coverage. Any insurance or self-insurance maintained by the Additional Insured shall be excess of the Named Insured's insurance and not contribute with it. 3. CANCELLATION NOTICE. With respect to the interests of the Additional Insured, this insurance shall not be canceled, except after thirty (30) days prior written notice, by receipted delivery, has been given to the Additional Insured. 4. SCOPE OF COVERAGE. This policy affords coverage at least as broad as: (1) If primary, Insurance Services Office form number CA0001, Code 1 ("any auto"); or (2) If excess, affords coverage which is at least as broad as the primary insurance forms referenced in the preceding section (1). Except as stated above, nothing herein shall be held to waive, alter or extend any of the limits, conditions, agreements or exclusions of the policy to which this endorsement is attached.		
ENDORSEMENT HOLDER		
OWNER	AUTHORIZED REPRESENTATIVE ☐ Broker/Agent ☐ Underwriter ☐ _____ I, _____ (print/type name) warrant that I have authority to bind the above mentioned insurance company and by my signature hereon do so bind this company to this endorsement. Signature _____ (original signature required) Telephone: (____) _____ Date Signed: _____	

WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY SPECIAL ENDORSEMENT**WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY
SPECIAL ENDORSEMENT**

SUBMIT IN DUPLICATE

SUBMIT IN DUPLICATE

For _____ (The Owner)

ENDORSEMENT NO.

ISSUE DATE (MM/DD/YY)

PRODUCER

POLICY INFORMATION:

Insurance Company:

Policy No.:

Policy Period: (from) _____ (to) _____

NAMED INSURED

OTHER PROVISIONS

CLAIMS: Underwriter's representative for claims pursuant to this insurance.

Name: _____

Address: _____

Telephone: _____

EMPLOYERS LIABILITY LIMITS

\$ _____ (Each Accident)

\$ _____ (Disease – Policy Limit)

\$ _____ (Disease – Each Employee)

In consideration of the premium charged and notwithstanding any inconsistent statement in the policy to which this endorsement is attached or any endorsement now or hereafter attached thereto, it is agreed as follows:

1. CANCELLATION NOTICE. This insurance shall not be canceled, except after thirty (30) days prior written notice, by receipted delivery, has been given to the Owner.
2. WAIVER OF SUBROGATION. This insurance company agrees to waive all rights of subrogation against the Owner, the members of its governing body, its officers, employees and volunteers for losses paid under the terms of this policy which arise from the work performed by the Named Insured for the Owner.

Except as stated above, nothing herein shall be held to waive, alter or extend any of the limits conditions, agreements or exclusions of the policy to which this endorsement is attached.

ENDORSEMENT HOLDER

OWNER

AUTHORIZED

REPRESENTATIVE ☐ Broker/Agent ☐ Underwriter ☐

I, _____, (print/type name) warrant that I have authority to bind the above-mentioned insurance company and by my signature hereon do so bind this company to this endorsement.

Signature _____
(original signature required)

Telephone: (_____) _____ Date Signed: _____

CERTIFICATE OF INSURANCE					ISSUE DATE (MM/DD/YY)	
PRODUCER		THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.				
		COMPANIES AFFORDING COVERAGE				
		Company Letter A				
		Company Letter B				
INSURED		Company Letter C				
		Company Letter D				
		Company Letter E				
COVERAGES						
THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.						
CO LTR	TYPE OF INSURANCE	POLICY NO.	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
	GENERAL LIABILITY ☐ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS MADE ☐ OCCURANCE ☐ OWNER'S & CONTRACTOR'S PROT. ☐ _____ ☐ _____				GENERAL AGGREGATE	\$
					PRODUCTS-COMP/OP AGG.	\$
					PERSONAL & ADV. INJURY	\$
					EACH OCCURRENCE	\$
					FIRE DAMAGE (Any one fire)	\$
					MED. EXPENSE (Any one person)	\$
					COMBINED SINGLE LIMIT	\$
	AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS ☐ HIRED AUTOS ☐ NON-OWNED AUTOS ☐ GARAGE LIABILITY ☐ _____				BODILY INJURY (Per Person)	\$
					BODILY INJURY Per Accident	\$
					PROPERTY DAMAGE	
	EXCESS LIABILITY ☐ UMBRELLA FORM ☐ OTHER THAN UMBRELLA FORM				EACH OCCURRENCE	\$
					AGGREGATE	\$
	WORKER'S COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY LIMITS	
					EACH ACCIDENT	\$
					DISEASE -- POLICY LIMIT	\$
					DISEASE -- EACH EMPLOYEE	\$
THE FOLLOWING PROVISIONS APPLY: 1. None of the above-described policies will be canceled until after 30 days' written notice has been given to the Owner at the address indicated below. 2. The Owner, the members of its governing body, its officers, employees, agents and volunteers are added as insured on all liability insurance policies listed above. 3. It is agreed that any insurance or self-insurance maintained by the Owner will apply in excess of and not contribute with the insurance described above. 4. The Owner is named as a loss payee on the property insurance described above, if any. 5. All rights of subrogation under the property insurance policy listed above have been waived against the Owner. 6. The worker's compensation insurer named above, if any, agrees to waive all rights of subrogation against the Owner for injuries to employees of the insured resulting from work for the Owner or use of the Owner's premises or facilities.						
CERTIFICATE HOLDER ("OWNER")		CANCELLATION SHOULD ANY OF THE ABOVE-DESCRIBED POLICIES BE CANCELED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL MAIL THIRTY (30) DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES AUTHORIZED REPRESENTATIVE				

APPENDIX G

CERTIFICATION OF STREETS TO FINAL GRADE

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TO: JURUPA COMMUNITY SERVICES DISTRICT
11201 Harrel Street
Jurupa Valley, CA 91752

SUBJECT: CERTIFICATION OF STREETS TO FINAL GRADE
TRACT NO. _____
CONTRACT NO. _____

1. There has been executed a "WATER AND/OR SEWER SYSTEM CONSTRUCTION AGREEMENT" for the water and/or sewer mains described above; said Agreement being between the Jurupa Community Services District, hereinafter designated as the "District"; _____ hereinafter designated as the "Developer"; and, _____ hereinafter designated as the Contractor.
2. Pursuant to Section 6 of said Agreements, the Developer certifies that all streets requiring water and/or sewer mains are to Final Grade and ready for installation of water and/or sewer mains; wherein the Final Grade shall be defined as the finished grade of the street base or sub-base required by the Riverside County Transportation Department or the District.
3. Developer agrees that if there is a change required in the alignment or final grade of the street which occurs prior to acceptance by the District (Grant Deed) of the water and/or sewer mains, and which requires the relocation of any District facilities, the developer will make full payment for all costs necessary to relocate said facilities.

Developer:

Authorized Agent:

(Sign) _____
(Type) _____
(Title) _____
Date: _____

Contractor:

Authorized Agent:

(Sign) _____
(Type) _____
(Title) _____
Date: _____

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APPENDIX H

PRECONSTRUCTION CONFERENCE AND
NOTICE TO PROCEED

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**JURUPA COMMUNITY SERVICES DISTRICT
DEVELOPMENT PROJECT
PRECONSTRUCTION CONFERENCE REQUIREMENTS**

All construction projects involving facilities that will be owned and operated by the Jurupa Community Services District shall require a preconstruction conference. A preconstruction conference shall always be held prior to issuance of a Notice to Proceed. Prior to the District scheduling a preconstruction conference, the District requires the following information:

1. Project Name _____
(Tract, P.M., P.P. #, etc.)

2. Developers Name _____
Address _____

Phone No. _____
License Type & No. _____
Contact's Name _____

3. Contractors Name _____
Address _____

Phone No. _____
License Type & No. _____
Contact's Name _____

Has the Contractor completed a Contractor Qualification Experience Questionnaire as provided in Appendix E of the District's Standards Manual? YES NO
(Circle One)

If No, it is necessary for the Contractor to complete the questionnaire and submit it to the District prior to scheduling the preconstruction conference.

4. Subcontractors Name(s) _____
Address _____

Phone No. _____
License Type & No. _____
Name _____
Address _____

Phone No. _____
License Type & No. _____
5. Attach copies of all applicable permits (i.e. Encroachment Permits, OSHA, etc.)
6. Provide 3 sets of District Approved Plans.
7. Provide 3 sets of District Approved Submittals.
8. Provide 24 hr. emergency phone no. of the Contractor's responsible party.
- Name of Contact _____
Phone No. _____
Relationship to Project (i.e. Contractor, Project Manager,
Superintendent, etc.) _____
9. Geotechnical Consultants Name _____
 Address _____

 Phone No. _____
 Contact _____
10. Provide all applicable information as delineated in Appendix H of the Standards Manual.

Subsequent to District review and approval of the required information, the District will contact the developer and inform him/her that a preconstruction conference may be scheduled at his/her convenience during normal District office hours.

PRECONSTRUCTION CONFERENCE AND NOTICE TO PROCEED

The following outlines the general requirements and the expectations of the Pre-construction Conference and Notice to Proceed and shall apply to all developer-paid water and/or sewer facility construction within the District's jurisdiction.

1. Sequence of Events: A Pre-construction Conference shall always be held prior to issuance of a Notice to Proceed. Prior to the Pre-construction Conference, the District must have the following applicable items indicated as complete and checked off:
 - a. WATER AND/OR SEWER PLANS: Drawings, complete, signed as approved by the District, and signed by the required officials of Riverside County (Health Department, Road Department, Fire Marshall, etc.).
 - b. Recorded Tract Map/Parcel Map and applicable street improvement plans and grading plans.
 - c. Applicable fees and deposits made to the District, Deposit Agreement signed, and appropriate Work Order Numbers opened and assigned.
 - d. Environmental Assessment completed.
 - e. A fully signed construction Agreement with signatures of the Developer, Contractor, and the District's General Manager.
 - f. Agreement for PARTICIPATION/REFUND WAIVER OR AGREEMENT for participation and refund SIGNED.
 - g. Streets shall have been constructed to final subgrade and Certification signed by the Developer that streets are to final subgrade.
 - h. Easements shall be properly obtained, if required, and dedicated to the District.
 - i. Property corners shall be surveyed and set by owner/developer's surveyor to identify lot lines which will assist in proper location of mains and appurtenances.
 - j. District certification of contractor for intended size job.
 - k. A copy of tentative Bid between contractor and developer shall be submitted to the District.
 - l. Necessary permits have been obtained.
 - m. Required 100% Performance Bond and 100% Labor & Materials Bond must be posted and District approved. (See Appendix D).
 - n. Required Insurance form naming District as additionally insured must be executed and on file with the District (See Appendix F).

2. Pre-construction Conference: A pre-construction conference shall be scheduled by the District prior to issuance of Notice to Proceed and commencement of work. The Pre-construction Conference shall allow all parties to present their views and requirements, and provide a forum for satisfactory solution to all anticipated problems.
- a. Parties to be invited:
 - 1) District:
 - District Inspector
 - District Representative
 - 2) Developer (and owner if different)
 - 3) Developer's Engineer
 - 4) Contractor and Foreman
 - 5) County Construction Inspector
 - 6) Other affected agencies and utilities: (if their facilities are involved)
 - 7) Material Suppliers (If Required)
 - b. Items to be Discussed:
 - 1) Review of plans and fabrication drawings. Verify main footage and location of fittings and appurtenances.
 - 2) Material deliveries, quantities, and problems
 - 3) Construction schedule
 - 4) Connection to existing facilities
 - 5) Street grading. Verification for final subgrade elevations and satisfactory subgrade compaction
 - 6) Curb and gutter/berm placement
 - 7) Project phasing
 - 8) Temporary water services
 - 9) Other Public Agency requirements. Check compliance with standard requirements for other public agencies.
 - 10) Plans for testing and disinfection, bacterial samples
 - 11) Clearance of other utilities
 - 12) Blasting/rock removal
 - 13) Traffic control
 - 14) Dust control
 - 15) Safety and OSHA requirements. (Contractor's responsibility)
 - 16) Review of possible field conflicts and method of solution
 - 17) As-built dimensions and drawings

3. Notice to Proceed: If all the District requirements have been met and no outstanding problems exist, the District will issue a written Notice to Proceed to the Developer and Contractor with copy to District Inspector at the Pre-construction conference.

If any requirements remain to be completed or if there is any problem with the above-listed items, such problems shall be resolved by cognizant parties. When completed to District satisfaction, a written Notice to Proceed will be issued to the Developer and Contractor.

No water and/or sewer system construction shall commence until the written Notice to Proceed is issued. After the Notice to Proceed is issued, the Developer may then finalize bid requirements with contractor or sub-contractors, sign the acceptance of bid and forward a copy of the firm BID CONTRACT to the District.

ITEMS REQUIRED PRIOR TO SCHEDULING PRE-CONSTRUCTION MEETING

- ☐ Updated Availability Letter
- ☐ Blacklines/Mylars
- ☐ Easements (if applicable)
- ☐ Electronic Copy of Plans on CD
- ☐ Maps with Street Names and Addresses of Lots
- ☐ Fees Paid
- ☐ Inspector Assigned
- ☐ Letter of Credit
- ☐ Contractor Data Sheet Complete
- ☐ Water/Sewer Construction Agreement
- ☐ Material Submittals Approved
- ☐ Water/Sewer Facility Agreement
- ☐ Park Obligation
- ☐ CFD Formation
- ☐ LMD Annexation
- ☐ Cut Sheets (minimum of 300 Ft. for each start point)
- ☐ Confined Space Certification
- ☐ Safety Manual
- ☐ AG Well Agreement

APPENDIX I

STANDARD TITLE BLOCK FORMAT FOR
24" X 36" DESIGN DRAWING

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JURUPA COMMUNITY SERVICES DISTRICT

TRACT MAP/PARCEL MAP NO. XXXXXX

SEWER PLANS

GENERAL NOTES AND REQUIREMENTS (WATER AND SEWER):

1. THE CONTRACTOR SHALL NOTIFY J.C.S.D. AT LEAST TWO WORKING DAYS PRIOR TO CONSTRUCTION.
2. SEPARATION REQUIREMENTS BETWEEN WATER AND SEWER LINES (10" MINIMUM, 5' FOR LATERALS) SHALL CONFORM TO THE COUNTY OF RIVERSIDE HEALTH DEPARTMENT AND THE STATE WATER RESOURCES CONTROL BOARD REQUIREMENTS. THE AGENCY'S SPECIFICATIONS THAT ARE MORE RESTRICTIVE SHALL GOVERN IN ALL CASES.
3. ALL CONSTRUCTION AND MATERIALS SHALL COMPLY WITH J.C.S.D. STANDARDS AND SPECIFICATIONS. ANY CONSTRUCTION AND/OR MATERIALS NOT COVERED IN J.C.S.D. STANDARDS SHALL BE APPROVED BY THE DISTRICT PRIOR TO CONSTRUCTION.
4. PRIOR TO CONSTRUCTION OF THE WATER AND/OR SEWER LINES, THE CONTRACTOR SHALL EXPOSE THE EXISTING WATER AND/OR SEWER LINES WHERE CONNECTIONS WILL OCCUR AND VERIFY THEIR ELEVATION AND LOCATION. APPROVAL OF J.C.S.D. OF A PROPOSED CONNECTION TO A J.C.S.D. FACILITY DOES NOT IMPLY APPROVAL OF THE CORRECTNESS OF THE ELEVATION AND/OR LOCATION SHOWN ON THE PLANS.
5. CONTRACTOR SHALL NOT BACKFILL TRENCH UNTIL THE INSPECTOR HAS OBTAINED AS-BUILT STATIONING ON ALL STRUCTURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ACCURATE "RECORD DRAWINGS" TO THE DISTRICT IMMEDIATELY AFTER CONSTRUCTION.
6. APPROVAL BY J.C.S.D. IMPLIES NO PERMISSION OTHER THAN THAT WITHIN THE DISTRICT'S JURISDICTION. ALL PERMITS REQUIRED BY LAW SHALL BE ACQUIRED BY THE APPLICANT OR HIS CONTRACTOR. REQUIREMENTS OF J.C.S.D. SHALL TAKE PRECEDENCE OVER REQUIREMENTS OF OTHER AGENCIES ONLY WHERE J.C.S.D. REQUIREMENTS ARE MORE STRINGENT.
7. CONTRACTOR SHALL SHORE ALL TRENCHES AND CONDUCT ALL CONSTRUCTION AND OPERATIONS IN ACCORDANCE WITH CAL-OSHA REQUIREMENTS AND HAVE ALL ENCROACHMENT AND EXCAVATION PERMITS PRIOR TO THE START OF WORK.
8. PIPE JOINTS SHALL NOT BE PULLED AT ANY ANGLE GREATER THAN ONE-HALF THE MAXIMUM ANGLE RECOMMENDED BY THE PIPE MANUFACTURER.
9. THE PROPOSED WORK SHALL BE SUBORDINATED TO ANY OPERATIONS J.C.S.D. MAY CONDUCT, AND SHALL BE COORDINATED WITH SUCH OPERATIONS AS DIRECTED BY J.C.S.D.
10. A PREJOB MEETING SHALL OCCUR PRIOR TO CONSTRUCTION. ATTENDEES SHALL INCLUDE A DISTRICT INSPECTOR, REPRESENTATIVE FROM THE OPERATIONS DEPARTMENT, TRACT SUPERINTENDENT, CITY OF JURUPA VALLEY / EASTVALE REPRESENTATIVE AND THE CONTRACTOR WHO WILL PERFORM THE WORK. "CUT-SHEETS" SHALL BE PROVIDED TO THE DISTRICT AT THIS MEETING FOR ITS REVIEW.
11. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (U.S.A.) AND HAVE ALL UNDERGROUND UTILITIES MARKED TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION, PER U.S.A. REQUIREMENTS.
12. CONTRACTOR SHALL FURNISH AND INSTALL ALL FACILITIES IN ACCORDANCE WITH THE DISTRICT'S STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR WATER AND SANITARY SEWER FACILITIES (LATEST REVISION). THE SPECIFICATIONS AND STANDARD DRAWINGS ARE AVAILABLE FROM THE DISTRICT. CONTRACTOR SHALL BE IN POSSESSION OF DISTRICT'S SPECIFICATIONS AND STANDARD DRAWINGS ON THE JOB SITE AT ALL TIMES.
13. ALL PERMITS REQUIRED BY LAW SHALL BE ACQUIRED BY THE APPLICANT OR THEIR CONTRACTOR. COPIES OF THE EXCAVATION AND ENCROACHMENT PERMITS WILL BE GIVEN TO J.C.S.D. PRIOR TO THE PREJOB.
14. ALL CONSTRUCTION SHALL CONFORM TO CURRENT CAL OSHA SAFETY REQUIREMENTS.
15. CONTRACTOR SHALL DESIGNATE A QUALIFIED SUPERINTENDENT WITH FULL AUTHORITY TO ACT ON BEHALF OF THE CONTRACTOR. SAID SUPERINTENDENT SHALL BE ON THE JOB SITE AT ALL TIMES.
16. THE DISTRICT'S ABILITY TO PROVIDE WATER AND/OR SEWER SERVICES TO THIS TRACT MAY DEPEND ON THE DEVELOPERS OF OTHER TRACTS COMPLETING THE CONSTRUCTION OF FACILITIES. THE DISTRICT ASSUMES NO RESPONSIBILITY FOR THE CONSTRUCTION OF THE FACILITIES, WHICH ARE TO BE CONSTRUCTED BY SUCH DEVELOPERS.
17. IF DISTRICT FACILITIES ARE LOCATED ON LAND WHICH ARE PRIVATE (I.E. OUTSIDE PUBLIC RIGHTS-OF-WAY) LEGAL DESCRIPTIONS AND PLATS (EASEMENT DOCUMENTS) SHALL BE PREPARED IN ACCORDANCE WITH DISTRICT STANDARDS BY THE ENGINEER OR LAND SURVEYOR OF RECORD. THE EASEMENT DOCUMENTS SHALL BE REVIEWED AND APPROVED BY THE DISTRICT PRIOR TO FINAL ACCEPTANCE OF THE FACILITIES BY THE DISTRICT.
18. IMMEDIATELY UPON COMPLETION OF CONSTRUCTION OF THE WATER AND/OR SEWER PIPELINES, THE DEVELOPER SHALL HIRE A DISTRICT APPROVED VIDEO COMPANY TO VIDEO THE PIPELINES IN THE PRESENCE OF A DISTRICT REPRESENTATIVE IN DVD FORMAT (VIDEO FILE FORMAT TO BE VIEWABLE ON A STANDARD DVD PLAYER/COMPUTER AND/OR AS APPROVED BY THE DISTRICT). DISTRICT OR DISTRICT REPRESENTATIVE SHALL REVIEW SAID DVD'S FOR POTENTIAL CONSTRUCTION DEFECTS PRIOR TO ACCEPTANCE OF THE PROJECT. PAYMENT FOR ALL SUCH SERVICES SHALL BE BORNE BY THE DEVELOPER. FINAL DVD SUBMITTED TO THE DISTRICT SHALL BE EDITED, IF NECESSARY, TO INCLUDE ONLY ACCEPTED REACHES OF THE PIPELINE.
19. INSCRIBE AN "S" AND "W" ON THE FACE OF THE CURB TO INDICATE WHERE SEWER LATERALS AND WATER SERVICES CROSS THE CURBLINE.
20. COMPACTION TESTS FOR WATER AND SEWER FACILITIES SHALL BE PERFORMED BY A GEOTECHNICAL FIRM PAID FOR BY THE DEVELOPER. ALL COMPACTION TESTS SHALL BE MADE IN ACCORDANCE WITH DISTRICT SPECIFICATIONS. SOILS TESTING RESULTS SHALL BE GIVEN TO THE DISTRICT INSPECTOR ON A DAILY BASIS. AT THE CONCLUSION OF THE PROJECT, A FINAL COMPACTION REPORT SHALL BE GIVEN TO THE DISTRICT.

DRIVEWAY LOCATION NOTE:

LOCATION OF RESIDENTIAL DRIVEWAYS SHALL BE BASED ON FINAL HOUSE PLOTTING WHICH IS NOT AVAILABLE AT THIS TIME. PLEASE REFER TO THE APPROVED PRECISE GRADING PLANS FOR FINAL DRIVEWAY LOCATIONS.

SEWER SERVICE LOCATION NOTE:

SEWER SERVICE LOCATIONS SHOWN ARE CONCEPTUAL LOCATIONS ONLY. FINAL LOCATIONS OF SEWER SERVICES WILL BE SET/ADJUSTED BASED ON FINAL HOUSE PLOTTING AND DRIVEWAY PLACEMENT.

GENERAL NOTES AND REQUIREMENTS (SEWER):

1. THE SEWER LINE SHALL BE INSTALLED BY A PRIVATE CONTRACTOR IN ACCORDANCE WITH J.C.S.D. STANDARDS, PLANS AND SPECIFICATIONS. THE CONTRACTOR SHALL BE APPROVED BY J.C.S.D.
2. TYPE OF SEWER PIPE UNLESS OTHERWISE APPROVED, SHALL BE PVC PLASTIC PIPE, SDR 35 MINIMUM WALL THICKNESS PER SECTION 207-17 OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION.
3. ALL WORK AND MATERIALS SHALL CONFORM TO REQUIREMENTS OF THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT SPECIFICATIONS FOR THE IMPROVEMENTS OF SUBDIVISION STREETS, COUNTY ORDINANCE NO 461 AND SUBSEQUENT AMENDMENTS.
4. GRADING OVER SEWER MAINS SHALL BE DONE IN SUCH A MANNER AS TO PREVENT THE PONDING OF WATER.
5. THE TOP OF ALL MANHOLES LOCATED IN PAVEMENT SHALL BE RAISED TO PAVEMENT GRADE (WITHIN 5 WORKING DAYS) AFTER STREETS ARE PAVED AND/OR CAPPED.
6. HOUSE CONNECTIONS, WYES, AND LATERALS SHALL BE LOCATED IN THE FIELD AT THE DIRECTION OF THE SUBDIVIDER.
7. THE MINIMUM CLASS BEDDING FOR PVC SEWER SHALL BE CLASS "I" IN ACCORDANCE WITH J.C.S.D. STD. DWG. NO. S-2.
8. SEWER CONTRACTOR SHALL SUCCESSFULLY PERFORM TWO AIR TESTS AT NO ADDITIONAL COST TO THE DISTRICT. THE FIRST AIR TEST SHALL BE COMPLETED IMMEDIATELY AFTER INSTALLATION, BACKFILL AND COMPACTION OF THE SEWAGE SYSTEM. THE SECOND AIR TEST SHALL BE CONDUCTED AFTER INSTALLATION OF ALL THE OTHER UTILITIES AND PRIOR TO PAVING OF THE STREETS.
9. SEWER LATERALS CROSSING EXISTING CURB AND GUTTER SHALL BE BACKFILLED WITH A 1 SACK CEMENT, SAND SLURRY BACKFILL.
10. CONNECTIONS TO EXISTING PIPELINES SHALL ONLY BE MADE WITH DISTRICT INSPECTOR PRESENT. TEST PLUGS SHALL BE REMOVED ONLY UPON DIRECTION OF THE DISTRICT OR ITS REPRESENTATIVE.
11. SHOULD MODIFICATION AND/OR RECONSTRUCTION (INCLUDING RAISING MANHOLES TO GRADE) OF AN EXISTING MANHOLE BE REQUIRED, PRIOR TO THE REMOVAL OF THE FRAME OF THE SEWER MANHOLE, THE CHANNEL OF THE MANHOLE SHALL BE COMPLETELY COVERED WITH PLANKING OR OTHER SUITABLE MATERIAL SO AS TO PREVENT DEBRIS FROM ENTERING THE CHANNEL. AFTER THE MANHOLE RECONSTRUCTION HAS BEEN COMPLETED, ALL DEBRIS SHALL BE REMOVED FROM WITHIN THE MANHOLE AND THE COVER OVER THE CHANNEL SHALL BE REMOVED.
12. DEPTH OF GRADING RINGS AFTER MODIFICATION AND/OR RECONSTRUCTION (INCLUDING RAISING MANHOLES TO GRADE) OF AN EXISTING MANHOLE SHALL BE PER J.C.S.D. STD. DWG. NO. S-7.
13. ALL MANHOLES THAT ARE INSTALLED OR MODIFIED SHALL BE VACUUM TESTED PER J.C.S.D. STANDARDS.
14. SEWER PLUG(S) SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF SEWER CONSTRUCTION AND SHALL BE INSPECTED ON A WEEKLY BASIS TO ENSURE THAT SEWER PLUGS ARE IN PLACE. IN ADDITION, THE LOCATION OF THE SEWER PLUG(S) SHALL BE IDENTIFIED ON THE PLANS.
15. FOR A RESIDENTIAL DEVELOPMENT, A BACKWATER VALVE SHALL BE INSTALLED IN ALL NEW SEWER LATERALS. THE VALVE SHALL BE LOCATED CLOSER TO HOUSE, SO IT CAN BE AS SHALLOW AS POSSIBLE FOR EASE OF MAINTENANCE.

SEWER CERTIFICATION:

JURUPA COMMUNITY SERVICES DISTRICT

I CERTIFY THAT THE DESIGN OF THE SEWER SYSTEM FOR _____ IS IN ACCORDANCE WITH THE SEWER SYSTEM EXPANSION PLANS OF THE JURUPA COMMUNITY SERVICES DISTRICT AND THAT THE WASTE DISPOSAL SYSTEM IS ADEQUATE AT THIS TIME TO TREAT THE ANTICIPATED WASTES FROM THE PROPOSED DEVELOPMENT. THIS CERTIFICATION DOES NOT CONSTITUTE A GUARANTEE THE WASTE DISPOSAL SYSTEM CAN TRANSPORT OF TREAT FLOWS THAT EXCEED THE DISTRICT ESTIMATED FLOWS FOR THE SPECIFIC TYPE OF LAND USE PROPOSED FOR THIS DEVELOPMENT.

GENERAL MANAGER
CERTIFICATION VOID 24 MONTHS FROM ABOVE DATE.
J.C.S.D. P.N. XXXXXXX

DATE

NOTICE TO CONTRACTOR:

CONTRACTOR TO VERIFY BY POTHOLING THE EXISTING ELEVATION AND HORIZONTAL LOCATION OF ALL POINTS OF CONNECTIONS AND CROSSINGS PRIOR TO CONSTRUCTION. THE ENGINEER MUST BE NOTIFIED OF ANY DISCREPANCY IMMEDIATELY.

THE EXISTENCE AND LOCATIONS OF ALL UNDERGROUND UTILITIES (UTILITY PIPES, STRUCTURES, ETC.) SHOWN ON THESE PLANS (MAIN LINES ONLY - NO SERVICE LATERALS) WERE ASCERTAINED BY A REVIEW OF RECORDS PROVIDED BY THESE MEMBER AGENCIES AND ARE APPROXIMATE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. LOCATIONS OF UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION.

THE QUANTITY ESTIMATE SHOWN HEREON IS FOR THE USE OF GOVERNING AGENCIES IN DETERMINING BOND AMOUNTS AND/OR FEES AND IS NOT TO BE USED FOR BID PURPOSES.

VICINITY MAP

QUANTITY TABLE

LEGEND

PRIVATE CERTIFICATION: (FOR OFFSITE PLANS ONLY)

THE JURUPA COMMUNITY SERVICES DISTRICT HAS REVIEWED THE SEWER FACILITIES WITHIN THE PUBLIC RIGHT-OF-WAY FOR THIS PROJECT, SAID FACILITIES ARE IN CONFORMANCE WITH DISTRICT STANDARDS AND ARE APPROVED. SAID APPROVAL DOES NOT INCLUDE ANY ON-SITE/PRIVATE FACILITIES.

GENERAL MANAGER
CERTIFICATION VOID 24 MONTHS FROM ABOVE DATE.
J.C.S.D. P.N. XXXXXXX

DATE

J.C.S.D. DEPARTMENT OF ENGINEERING & OPERATIONS APPROVED BY:	J.C.S.D. ENGINEERING DEPARTMENT REVIEWED BY:	J.C.S.D. DEVELOPMENT ENGINEERING RECOMMENDED BY:	CITY OF EASTVALE / JURUPA VALLEY REVIEWED BY:				
DIRECTOR OF ENGINEERING & OPERATIONS	DATE	ENGINEERING MANAGER	DATE	DEVELOPMENT ENGINEER	DATE	CITY ENGINEER	DATE
INSERT DEVELOPER'S ENGINEER NAME AND ADDRESS		BENCHMARK: INSERT BENCHMARK INFORMATION		JURUPA COMMUNITY SERVICES DISTRICT		SHEET NO.	
				CITY OF EASTVALE/JURUPA VALLEY, CALIFORNIA		1	
PREPARED BY:		SCALE:		PARCEL NO / TRACT NO XXXX SEWER PLANS TITLE SHEET		OF X SHEETS	
		HORIZONTAL: VERTICAL:		FOR: INSERT DEVELOPER NAME		W.O. CITY FILE NO.	
R.C.E. NO.: DATE:							

	NOTE:							SEAL -- ENGINEER
	WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.							
	THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER JCSD APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY JCSD.	MARK	BY	DATE		REVISIONS	APPR. DATE JCSD	

APPENDIX J

LIST OF APPROVED MANUFACTURED MATERIALS

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LIST OF APPROVED MANUFACTURED MATERIALS

A. GENERAL

Jurupa Community Services District maintains a list of Approved Manufactured Materials for both water and sewer system improvements. Only those indicated on the most current list have been approved for use within the District. It is the sole responsibility of the user to assure that the product proposed for use is currently approved. The District may require installation of a different product in special circumstances.

Manufacturers may request approval by (1) submitting formal written request for approval, along with the necessary deposit for District and consultant review time, (2) providing detailed drawings and technical information on their product, and (3) providing a non-returnable sample of the product for District use. Documentation of use by other local water purveyors (with phone numbers and contact names) will assist the District in evaluating such requests. The District will evaluate the product and make a determination within 90 days. If determined as being suitable for District use, the product will be placed on this approved Manufactured Materials list. Inventory of spare parts is a consideration. All products shall always comply with District Standard Specifications.

B. LIST OF APPROVED MANUFACTURED MATERIALS

1. Steel Water Pipe (AWWA C200 - CML/CML WSP, 12 ga. Min.)

- a. Ameron, Pipe Division, Southern California
P.O. Box 2024, Monterey Park, CA 91754
- b. Northwest Pipe & Casing Company
12351 Rancho Road, Adelanto, CA 92301
- c. West Coast Pipe Linings Inc.
8621 Beech Avenue, Fontana, CA 92335

The following manufacturer is only approved for new residential development's pipelines of diameters less than 12" and requires District shop inspection of the pipe prior to job site delivery.

- d. Southland Pipe
13989 Santa Ana Avenue, Fontana, CA 92335

The following manufacturer is only approved for 12" or less.

- e. Imperial Pipe

2. Approved Pipe Fabricators

- a. Ameron, Pipe Division, Southern California
4700 Ramona Blvd., Monterey Park, CA 91754
- b. Northwest Pipe & Casing Company
12351 Rancho Road, Adelanto, CA 92301
- c. West Coat Pipe Linings, Inc.
8621 Beech Ave., Fontana, CA 92335
- d. West Coast Welding
P.O. Box 4799, Rancho Cucamonga, CA 91729-4799

The following manufacturer is only approved for subdivision pipelines of diameters less than 12".

- e. Southland Pipe
13989 Santa Ana Avenue, Fontana, CA 92335

3. PVC Water Pipe (AWWA C900)

- a. Pacific Western Extruded Plastics Company (PVC Pipe)
P.O. Box 10049, Eugene, OR 97440
- b. J-M Manufacturing (Formosa Plastics)
1051 Sperry Road, Stockton, CA 95026
- c. Vinyltech Corporation
201 South 61st Ave., Phoenix, AZ 85043
- d. Diamond Plastics

4. Ductile Iron Pipe

- a. United States Pipe & Foundry Co.
P. O. Box 939, Brea, CA 92622
- b. Pacific States Cast Iron Pipe Co.
1375 Magnolia Ave., Corona, CA 91765

5. PVC Sewer Force Main Pipe (AWWA C900)

- a. Pacific Western Extruded Plastics Company (PVC Pipe)
P.O. Box 10049, Eugene, OR 97440
- b. J-M Manufacturing (Formosa Plastics)
1051 Sperry Road, Stockton, CA 95026
- c. Vinyltech Corporation

201 South 61st Ave., Phoenix, AZ 85043

6. Clay Sewer Pipe
 - a. Gladding McBean, Inc.
4301 East Firestone Blvd., South Gate, CA 90280
 - b. Mission Clay Products (Compression Joint Pipe Only)
28835 Temescal Canyon Rd., Corona, CA 91720
7. Gate Valves (Standard No. B-1)
 - a. AVK American
 - b. Kennedy
 - c. M&H
 - d. Mueller
 - e. U.S. Pipe
8. Butterfly Valves (Standard No. B-3)
 - a. Pratt
 - b. Dezurik
 - c. Mueller
 - d. K-Flo 500 Series (3" – 20")
 - e. K-Flo 47 Series (24" – 72")
9. Water Service Materials (Standard Nos. D-1 thru D-5)
 - a. Double strap service saddle (brass only)
 - 1) R.H. Baker
 - 2) James Jones
 - 3) Smith-Blair
 - b. Ball Corporate Stops
 - 1) Mueller (NP-25028) Std. D-1, D-2 & D-3
(NB-20013) Std. D-1A & D-1B
 - 2) James Jones
 - 3) Ford
 - c. Service Stops
 - 1) James Jones
 - 2) Ford
 - 3) Mueller

- d. Angle Meter Stops
 - 1) Mueller (NP-14258) Std. D-1 & D-2
(NH-14266) Std. D-1A & D-1B
(NP-24276) Std. D-3
 - 2) James Jones
 - 3) Ford
- e. Bronze Spring Check Valve
 - 1) Milwaukee (UP548T)
- f. Brass Ball Valve
 - 1) Mueller
- g. Meter Boxes
 - 1) Brooks
 - 2) Quikset
 - 3) J&R
- h. Precast Concrete Vaults
 - 1) Associated Concrete Products (Quikset)
 - 2) Utility Vault Co.
 - 3) Brooks
 - 4) Eisel Products
 - 5) Old Castle
- i. Meters (all with radio reads)
 - 1) $\leq 2''$ furnished by District
 - 2) $\geq 3''$ furnished by Developer as approved by District
- 10. Air Valves (Standard Nos. E-1 & E-2)
 - a. APCO
 - b. Crispin
- 11. Blow-offs (Standard Nos. F-1 thru F-2)
 - a. James Jones
- 12. Standard and Super Fire Hydrants (Standard No. G-1 thru G-2)
 - a. James Jones
 - b. Long Beach Iron Works

13. Reduced Pressure Backflow Device (Standard No. H-2)
 - a. Any device approved by the California Department of Public Health (latest list) and USC approved.
14. Double Check Valve Assembly (Standard Nos. H-1 & H-3)
 - a. Any device approved by the California Department of Health Services Office of Drinking Water (latest list) and USC approved.
15. Pressure Reducing/regulating Valves, Altitude Valves
 - a. CLA-VAL Co.
 - b. Ames
16. Water Sampling Station (Standard No. K-1)
 - a. Koraleen Enterprises (only as approved in writing by District)
17. Approved Video Companies
 - a. Houston & Harris
 - b. National Plant Services
 - c. Morrison Testing
18. Appurtenance Paint (Devoe or Tnemec)
 - a. Color as selected or approved by District
 - b. Surface preparation per manufacturer's recommendations

Devoe

 - c1. Zinc primer – ICI Paints – Devoe Cathacoat ® 302H (3.0 mils DFT)
 - d1. Primer – ICI Paints – Devoe Bar-Rust ® 231 (6.0 mils DFT)
 - e1. Finish Coat: ICI Paints – Devoe Devthane ® 378H (3.0 mils DFT)
 - f1. Total Min. DFT: 12 mils

Tnemec

 - c2. Primer: Tnemec Series L69 (6 mils DFT)
 - d2. Second and Finish (Third) Coats: Tnemec 1081 Polyurthane (2.5 mils DFT each coat)
 - e2. Total Min. DFT: 11.0 mils

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APPENDIX K

DIGITAL DATA DISK REQUIREMENTS

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INTRODUCTION

In addition to mylar plans, JCSD requires submission of a digital copy of all "As-Built" plans of Tracts, **Plot Plans, Parcel Maps, etc.** The data will be utilized to update water and wastewater atlas maps in the JCSD Geographic Information System. The digital plans should be of the entire project with boundary points tied to State Plane Coordinates. **A digital format of the profile views and individual design sheets are also required.** This project map will be submitted on a computer disk, containing data as outlined below. The "As-Built" mylar plans and the digital data must be received at the same time.

A fee payable to the District will be required for the work effort to update the District's atlas maps. The amount of the fee will be the actual costs to perform the required work.

DIGITAL DATA DISK REQUIREMENTS

- 1) All files transmitted will be in DXF (Drawing Exchange Format) **or DWG (AutoCAD Drawing)** format.
- 2) Data Layering – Data layers will be divided into specified data categories:
 - A) Project boundary.
 - B) Street centerlines.
 - C) Township and Range section and quarter section coordinate ties.
 - D) Lot lines.
 - E) Right-of-way, street alignments.
 - F) Utility lines and associated utility features.

Drawing elements are to be placed in every layer for which they belong; i.e., if a line is both a lot line and a boundary line, the line must be placed on both the lot line layer and the boundary layer.

- 3) Data Integrity - Digital data checking criteria

- A) Common points and coordinates must be coincident within .001'.

- B) A tie to a known location point is required, such as a section, quarter section, street intersection, etc.
- C) **Base drawings are required** to be consistent with State Plane **NAD 1983 CA Zone VI** Coordinates. Units will be in feet.

These specifications regarding data integrity are format independent, although the layering must be consistent. Specific information regarding graphic elements, mapping index grids, etc. can be specified for each format.

4) Specific Layer Information

- A) All lines representing individual lots will be on the same layer. Every lot will be a closed polygon feature.
- B) **Water and Wastewater utility lines will be represented by polylines.**
- C) Water and Wastewater utility features, such as fire hydrants, manholes and valves, will be represented by points.

5) Acceptable Digital Disks

- A) CD-ROM compatible with Windows (NT/95/98/2000/**XP**) environment.
- B) **All reference files shall be imbedded into the drawing format.**
- C) No other project file shall exist on the disk, and no additional information is to exist in the file aside from data being specifically transmitted to JCSD.
- D) All diskettes will be submitted with labels indicating the following data information:

DATE:	(Date submitted)
MAP NAME:	(TR, PM, PP, CUP #'s)
DISTRICT IDENTIFICATION:	(JCSD Project No.)
COMPANY:	(Engineering Firm)
MEDIA CREATOR:	(Person creating CD)
FILE NAME:	(.DXF or .DWG)

APPENDIX L

ATTACHMENT NO. 1

PROJECT IDENTIFICATION FORM

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ATTACHMENT NO. 1

PROJECT IDENTIFICATION: _____

For First (1ST) Check Only: "All information required pursuant to Section II.B.3 of the District's Standards Manual is attached."

Name of Registered Engineer

Signature of Registered Engineer

R.C.E. No. and Expiration Date

Date

For Subsequent Plan Checks: The attached plan set(s) is/are being submitted to the Jurupa Community Services District.

I certify that the following statements are correct:

Yes No N/A

1. All "redlined" corrections from the previous plan check have been made or the reason they have not been made has been explained directly on the previous plan check sheets.
2. Changes made by the Developer's Engineer to the water and sewer plans, other than those corrections indicated by the District during plan check, have been highlighted.
3. Revisions to the reference plans (i.e. street plans, storm drain plans, grading plans, etc.) have been made. If changes have been made, the revised plans are attached.

☐	☐	☐
☐	☐	☐
☐	☐	☐

This Submittal is for Plan Check Number: ☐

Name of Registered Engineer

Signature of Registered Engineer

R.C.E. No. and Expiration Date

Date

The District plan check process and approvals on improvement plans are not a guarantee or warranty that the design is complete and without error, but that an appropriate amount of time was spent on reviewing the plans for general engineering designs commensurate with the engineering standards of the District. Pursuant to state law, the civil engineer of records is the engineer of work and bears full responsibility for their design. This is signified by State law that requires the design engineer to apply their "seal" to the plans. Please refer to the Business and Professions Code (Engineers' Act) Section 6703, Responsible Charge; Section 6735, Preparation of Plans and Other Documents, et. al.

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APPENDIX M

DECEMBER 14, 2017 SEPARATION OF WATER MAINS AND NON-POTABLE PIPELINES – REQUESTS FOR ALTERNATIVES TO THE WATER WORKS STANDARDS

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State Water Resources Control Board

Division of Drinking Water

December 14, 2017

Separation of Water Mains and Non-Potable Pipelines – Requests for Alternatives to the Waterworks Standards

Dear Public Water System Owners and Operators:

This letter supersedes prior guidance regarding the separation of water mains and non-potable pipelines, including Guidance Memo 2003-02, dated October 16, 2003. Guidance Memo 2003-02 and previous versions should be discarded.

The California Waterworks Standards (California Code of Regulations (CCR), Title 22, Division 4, Chapter 16, Section 64572) establish criteria for the separation of new water mains from non-potable pipelines. Public water systems should ensure that these distances are met, whenever feasible, for all new construction. The Division of Drinking Water (Division) recognizes that certain conditions may call for the installation of pipelines with less separation distance than what is required by the regulations. In these situations, the water system may propose an alternative pursuant to CCR, Title 22, Section 64551:100:

§64551.100. Waivers and Alternatives.

- (a) A water system that proposes to use an alternative to a requirement in this chapter shall:
- (1) Demonstrate to the State Board that the proposed alternative would provide at least the same level of protection to public health; and
 - (2) Obtain written approval from the State Board prior to implementation of the alternative.

In proposing an alternative to the Waterworks Standards, water systems should observe the following:

- The water system must accept responsibility for the adequacy of the proposed alternative. The Division may require a written statement, signed by the water system's management, certifying that the proposed alternative adequately protects public health.
- In most circumstances, the Division cannot offer technical assistance with pipeline or infrastructure design. The water system proposing an alternative must demonstrate adequate expertise on the part of its own personnel or its hired consultants.
- The water system should describe how the proposed alternative provides at least the same level of protection to public health as the minimum separation distances prescribed in the regulation.
- While exorbitant cost may present a hardship in meeting the regulatory separation requirements and can be considered, public health must be prioritized above construction costs in determining an acceptable alternative.

The Division has prepared an application checklist that may be used by water systems in proposing an alternative to the Waterworks Standards (Enclosure). The purpose of the checklist is to ensure that the Division has sufficient information to evaluate the proposal. **The water system may submit the information in a different format from the checklist, provided that the submittal provides adequate information.** The checklist may also be used to provide written certification that the proposed alternative adequately protects public health.

If you have any questions, please contact the Division office that oversees your water system.

Sincerely,



Darrin Polhemus, P.E.
Deputy Director
Division of Drinking Water

Enclosure: Waterworks Standards Main Separation Alternative Request Example Checklist

STATE WATER RESOURCES CONTROL BOARD
Division of Drinking Water
Waterworks Standards Main Separation Alternative
Request Checklist

Water System Name/Number: [Click here to enter text.](#)

Name of Applicant: [Click here to enter text.](#)

Phone Number and Email Address: [Click here to enter text.](#)

Project Name and Location: [Click here to enter text.](#)

Attach plans or field drawings to show the standard installation and the proposed installation for which the alternative is being requested. (e.g. vertical profile and horizontal alignment, specifications, and other exhibits, as appropriate).

The Waterworks Standards in the California Code of Regulations (CCR) Title 22, Chapter 16, Section 64572 provide separation criteria for new construction. When buried water mains are in close proximity to non-potable pipelines, the water mains are vulnerable to contamination that can pose a risk of waterborne disease outbreaks.

Per CCR Title 22, Chapter 16, Section 64551.100, a water system that proposes to use an alternative to a requirement in Chapter 16 shall: 1) demonstrate to the State Board that the proposed alternative would provide at least the same level of protection to public health; and 2) obtain written approval from the State Board prior to implementation of the alternative. Requests for alternatives to the Waterworks Standards must consist of information outlined in at least four of the attachments below. Information contained in Attachments A, B and E will be required for all alternative requests. Information contained in Attachments C and/or D will also be needed depending on your particular situation. Please review all the attachments and submit the information for your specific project. The information must be submitted to your local Division of Drinking Water District Office for review and approval prior to construction.

Attachment A represents the standard pipe material and construction that would be used if the standard separation criteria can be met by the utility.

Attachment B represents information on the current pipe in the ground that is being crossed by a new pipeline or being paralleled by a new pipeline.

Attachments C and D represent information on the new pipeline being installed. Attachment C is for parallel construction and Attachment D is for crossings.

Attachment E is certification language that is needed to consider the Waterworks Standard alternative application.

Please Note: The information may be submitted using this checklist or another format, but all relevant information must be provided to the Division of Drinking Water District Office for consideration. If multiple crossings or parallel pipelines in multiple locations are part of the application, please indicate in the comments field of the applicable attachment or submittal. Alternatively, the applicant can provide an attachment or separate submittal for each location.

Attachment A (All Cases)

Water System's Standard Pipe Material and Construction Details

Attach the water system's standard pipe specification and construction details to this as Exhibit 1 and describe below.

Liquid Conveyed By New Pipeline:

- ☐ Domestic Water ☐ Raw Water ☐ Recycled Water
☐ Sewer ☐ Force Sewer ☐ Storm Drain
☐ Other (describe) [Click here to enter text.](#)

Nominal Size: [Click here to enter text.](#) inches

Operating Pressure: [Click here to enter text.](#) psi or ☐ Gravity flow/atmospheric

Pipe Material: ☐ Ductile Iron ☐ Cast Iron ☐ Welded Steel
☐ HDPE ☐ PVC ☐ Concrete ☐ Clay
☐ Other describe [Click here to enter text.](#)

AWWA Material Designation Code: [Click here to enter text.](#)

Pressure Class/Thickness/Coating [Click here to enter text.](#)

Joint Type Construction: ☐ Push On ☐ Restrained ☐ Welded Joints ☐ Fused
☐ Other describe [Click here to enter text.](#)

Depth of Cover: [Click here to enter text.](#)

Comments:

[Click here to enter text.](#)

Attachment B (All Cases)

Existing Pipeline Material – Paralleling or Crossing the Proposed Pipe

List the condition of the existing pipeline being paralleled or crossed.

Liquid Conveyed By Existing Pipeline:

- ☐ Domestic Water ☐ Raw Water ☐ Recycled Water
☐ Sewer ☐ Force Sewer ☐ Storm Drain
☐ Other (describe) [Click here to enter text.](#)

Nominal Size: [Click here to enter text.](#) inches

Operating Pressure: [Click here to enter text.](#) psi or ☐ Gravity flow/atmospheric

Pipe Material: ☐ Ductile Iron ☐ Cast Iron ☐ Welded Steel
☐ HDPE ☐ PVC ☐ Concrete ☐ Clay
☐ Other (describe) [Click here to enter text.](#)

AWWA Material Designation Code: [Click here to enter text.](#)

Pressure Class/Thickness/Coating [Click here to enter text.](#)

Joint Type Construction: ☐ Push On ☐ Restrained ☐ Welded Joints ☐ Fused
☐ Other (describe) [Click here to enter text.](#)

Length of Project: [Click here to enter text.](#)

Age/Condition: [Click here to enter text.](#)

Depth of Cover: [Click here to enter text.](#)

Separation from proposed pipeline

Note: all distances are measured from the outside walls of both pipelines.

Vertical: [Click here to enter text.](#)

Horizontal: [Click here to enter text.](#)

Have there been many repairs on the existing pipeline in this area? ☐ Yes ☐ No

If yes, explain: [Click here to enter text.](#)

COMMENTS:

Click here to enter text.

Attachment C

Proposed Parallel Pipeline Material and Construction Information

Where the Waterworks Standards cannot be met, it is the responsibility of the water system proposing an alternative to demonstrate that its proposed construction will have at least the “same level of protection to public health” as the minimum separation distances prescribed in the regulations.

Intended Use of New Pipeline: ☐ Distribution ☐ Transmission ☐ Storage
☐ Other (describe) [Click here to enter text.](#)

Liquid Conveyed:

☐ Domestic Water ☐ Raw Water ☐ Recycled Water
☐ Sewer ☐ Force Sewer ☐ Storm Drain
☐ Other (describe) [Click here to enter text.](#)

Nominal Size: [Click here to enter text.](#) inches Flow rate: [Click here to enter text.](#) gpm
Operating Pressure: [Click here to enter text.](#) psi or ☐ Gravity flow/atmospheric

Pipe Material: ☐ Ductile Iron ☐ Cast Iron ☐ Welded Steel
☐ HDPE ☐ PVC ☐ Concrete ☐ Clay
☐ Other describe [Click here to enter text.](#)

AWWA Material Designation Code: [Click here to enter text.](#)

Pressure Class/Thickness/Coating [Click here to enter text.](#)

Joint Type Construction: ☐ Push On ☐ Restrained ☐ Welded Joints ☐ Fused
☐ Other describe [Click here to enter text.](#)

Length of Project: [Click here to enter text.](#)

Depth of Cover: [Click here to enter text.](#)

Separation From Existing Non- Potable Pipeline

Note: all distances are measured from the outside walls of both pipelines.

Vertical: [Click here to enter text.](#)

Horizontal: [Click here to enter text.](#)

Is this a temporary installation? ☐ Yes ☐ No

If yes, how long will it be in place? [Click here to enter text.](#)

Attachment C

Can the new pipeline be installed in accordance with the Waterworks Standards? If not explain below:

[Click here to enter text.](#)

Proposed additional protective measures (*material construction methods, operational considerations, etc.*):

[Click here to enter text.](#)

Attach additional exhibits as necessary

Attachment D

Proposed Pipeline Crossing Material and Construction Information

Where the Waterworks Standards cannot be met, it is the responsibility of the water system proposing an alternative to demonstrate that its proposed construction will have at least the “same level of protection to public health” as the minimum separation distances prescribed in the regulations.

Intended Use of New Pipeline: ☐ Distribution ☐ Transmission ☐ Storage
☐ Other (describe)_[Click here to enter text.](#)

Liquid Conveyed:

☐ Domestic Water ☐ Raw Water ☐ Recycled Water
☐ Sewer ☐ Force Sewer ☐ Storm Drain
☐ Other (describe) [Click here to enter text.](#)

Nominal Size: [Click here to enter text.](#) inches
Operating Pressure: [Click here to enter text.](#) psi or ☐ Gravity flow/atmospheric

Pipe Material: ☐ Ductile Iron ☐ Cast Iron ☐ Welded Steel
☐ HDPE ☐ PVC ☐ Concrete ☐ Clay
☐ Other describe [Click here to enter text.](#)

AWWA Material Designation Code: [Click here to enter text.](#)

Pressure Class/Thickness/Coating [Click here to enter text.](#)

Joint Type Construction: ☐ Push On ☐ Restrained ☐ Welded Joints ☐ Fused
☐ Other describe [Click here to enter text.](#)

Length of Project: [Click here to enter text.](#)

Depth of Cover: [Click here to enter text.](#)

Number of Crossings: [Click here to enter text.](#)

Angle of Crossings: [Click here to enter text.](#)

Description of crossing pipelines:
[Click here to enter text.](#)

Attachment D

Can the new pipeline be installed in accordance with the Waterworks Standards? If not explain below:

[Click here to enter text.](#)

Proposed additional protective measures (*material construction methods, operational considerations, etc.*):

[Click here to enter text.](#)

Attach additional exhibits as necessary

Attachment E Certification

CERTIFYING SIGNATURE:

For consultants, contractors, and developers: attach written concurrence from the governing water system and pipeline owners stating that the selected project alternative is the preferred alternative.

Attached concurrence?: ☐ YES ☐ NO ☐ N/A

I certify that the forgoing information is true and correct to the best of my ability, and that I believe this alternative would provide at least the same level of protection to public health as the minimum separation distances prescribed in the California Waterworks Standards (CCR, Title 22, Section 64572)..

Signature

Name and Title [Click here to enter text.](#)

Date [Click here to enter a date.](#)

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APPENDIX N

ATLAS MAP UPDATING PROCEDURES

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ATLAS MAP UPDATING PROCEDURES

1. Original design drawings (mylars) are signed by the District and other appropriate agencies.
2. Developer's Engineer submits original design drawings disk to District's development representative in conformance with District requirements.
3. District's development representative transmits disk to District's GIS department and District updates the atlas maps with line work indicating facilities are "as designed".
4. Project construction commences.
5. Project construction complete.
6. Developer submits "red-lined record drawings" to District's development representative.
7. District's development representative has District project inspector confirm Contractor's "red-lined record drawings" plans are accurate and inspector signs cover sheet indicating such.
8. "Final walk" of constructed improvements is performed and District recommends acceptance of the facilities.
9. District's development representative has duplicate copy made of "red-lined record drawings" that they retain until entire process is complete.
10. District's development representative contacts District's GIS department to verify existence of electronic copies (i.e. "PDF's") of original fully signed mylars.
11. District's development representative transmits "red-lined record drawings" and original mylars (if electronic version discussed in Item 10 exists; if not, an electronic copy needs to be created prior to transmitting original mylars) to developer's design engineer for preparation of "record drawings".
12. Design engineer makes as-built revisions to plans and transmits "red-lined record drawings", record drawing mylars, and corresponding CD (2 copies) of record drawing mylars back to District's development representative within 15 working days.

13. District's development representative has District inspector verify accurate transfer of revisions from red-line plans to mylars and CD.
14. District's development representative transmits CD of record drawing mylars to District's GIS Department.
15. District GIS Department updates atlas maps and changes line work to indicate facilities are existing.

APPENDIX O

CURED-IN-PLACE PIPE (CIPP)

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SPECIFICATIONS FOR CURED-IN-PLACE PIPE (CIPP)

1. INTENT

- 1.1 It is the intent of this specification to provide for the reconstruction of pipelines and conduits by the installation of a resin-impregnated flexible tube, which is tightly formed to the original conduit. The resin is cured using either hot water under hydrostatic pressure or steam pressure within the tube. The Cured-In-Place Pipe (CIPP) will be continuous and tight fitting.

2. REFERENCED DOCUMENTS

- 2.1 This specification references standards from the American Society for Testing and Materials, such as: ASTM F1216 (Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube), ASTM F1743 (Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)), ASTM D5813 (Cured-in-Place Thermosetting Resin Sewer Pipe), ASTM D790 (Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials), and D2990 (Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics) which are made a part hereof by such reference and shall be the latest edition and revision thereof. In case of conflicting requirements between this specification and these referenced documents, this specification will govern.

3. PRODUCT, MANUFACTURER/INSTALLER QUALIFICATION REQUIREMENTS

- 3.1 Since sewer products are intended to have a 50-year design life, and in order to minimize the Owner's risk, only proven products with substantial successful long-term track records will be approved. All trenchless rehabilitation products and installers must be pre-approved prior to the formal opening of proposals.

Products and Installers seeking approval must meet all of the following criteria to be deemed Commercially Acceptable:

- 3.1.1 For a Product to be considered Commercially Proven, a minimum of 50 successful wastewater collection system projects of a similar size and scope of work and 500,000 linear feet shall have been completed in the U.S. **with the exact product intended for use on this project** and documented to the satisfaction of the Owner to assure commercial viability.
- 3.1.2 For the Bidding Company to be considered as a Commercially Proven Installer, the Company must satisfy all insurance, financial, and bonding requirements of the Owner, and must have had at least 5 (five) years active experience in the commercial installation. In addition, the Installer must have successfully installed at least 500,000 feet of **the exact cured-in-place product intended for use on this project** in wastewater collection systems in the U.S. with at least 300,000 feet installed in the State. Acceptable

documentation of these minimum installations must be submitted to the Owner. Installer's project manager must have a minimum of 5 years of CIPP installation experience, while under the employment of the Bidding Company.

- 3.1.3 Sewer rehabilitation products submitted for approval must provide third party test results supporting the structural performance (short-term and long-term) of the product and such data shall be satisfactory to the Owner. No product will be approved without independent third party testing verification.
- 3.1.4 Both the rehabilitation manufacturing and installation processes shall operate under a quality management system which is third-party certified to ISO 9000 or other recognized third-party certified organization standards. Proof of certification shall be required for approval.
- 3.1.5 Proposals must be labeled clearly on the outside of the proposal envelope, listing the exact CIPP product intended for use on this project and Bidding/Installer name. Only proposals using pre-approved products and Installing Companies will be opened and read. Proposals submitted on products and/or from Installing Companies that have not been pre-approved will be returned unopened
- 3.1.6 The owner authorizes the use of proven materials that serve to enhance the pipe performance specified herein. Proven materials have passed independent laboratory testing, not excluding long-term (10,000 hour) structural behavior testing, and have been successfully installed to repair failing host pipes in the U. S. for at least 4 years. In addition to the aforementioned, the owner may require that the contractor demonstrate that the enhancements proposed exceed the specifications herein, prior to the installation of the enhanced material systems. This section in no way shall be interpreted as authorization to deviate from the minimum standard practices set forth herein.
- 3.1.7 The Bidding/Installing Company must own and operate its own permitted wet-out facility where the resin impregnation of the CIPP tube will be carried out. Documentation of such facility shall be submitted for pre-approval. **No wet-out of purchased materials (tube & resin) may be completed through 3rd party companies.**

Documentation for products and installers seeking pre-approved status must be submitted no less than one weeks prior to proposal due date to allow time for adequate consideration. The Owner will advise of acceptance or rejection a minimum of two days prior to the due date. All required submittals must be satisfactory to the Owner.

4. MATERIALS

- 4.1 Tube - The sewn Tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216, Section 5.1 or ASTM F1743, Section 5.2.1 or ASTM D 5813, Sections 5 and 6. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections.

- 4.1.1 The wet out Tube shall have a relatively uniform thickness that when compressed at installation pressures will equal or exceed the calculated minimum design CIPP wall thickness.
- 4.1.2 The Tube shall be manufactured to a size that when installed will tightly fit the internal circumference and length of the original pipe. Allowance should be made for circumferential stretching during installation.
- 4.1.3 The outside layer of the Tube shall be coated with an impermeable, flexible membrane that will contain the resin and allow the resin impregnation (wet out) procedure to be monitored.
- 4.1.4 The Tube shall contain no intermediate or encapsulated elastomeric layers. No material shall be included in the Tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.
- 4.1.5 The wall color of the interior pipe surface of CIPP after installation shall be a relatively light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
- 4.1.6 Seams in the Tube shall be stronger than the non-seamed felt material.
- 4.1.7 The Tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the Manufacturers name or identifying symbol. The tubes must be manufactured in the USA.
- 4.2 Resin - The resin system shall be a corrosion resistant polyester or vinyl ester system including all required catalysts, initiators that when cured within the tube create a composite that satisfies the requirements of ASTM F1216, ASTM D5813 and ASTM F1743, the physical properties herein, and those which are to be utilized in the submitted and approved design of the CIPP for this project. The resin shall produce a CIPP that will comply with the structural and chemical resistance requirements of this specification.

5. STRUCTURAL REQUIREMENTS

- 5.1 The CIPP shall be designed as per ASTM F1216, Appendix X.1. The CIPP design shall assume no bonding to the original pipe wall.
- 5.2 The Contractor must have performed long-term testing for flexural creep of the CIPP pipe material installed by his Company. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (Tube and Resin) and general workmanship of the installation and curing as defined within the relevant ASTM standard. A percentage of the instantaneous flexural modulus value (as measured by ASTM D790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, will be verified by this testing. Retention values exceeding 50% of the short-term test results shall not be applied unless substantiated by qualified third party test data to the Owner's satisfaction. The materials utilized for the contracted project shall

be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in the CIPP design.

- 5.3 The Enhancement Factor 'K' to be used in 'Partially Deteriorated' Design conditions shall be assigned a value of 7.
- 5.4 The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If the layers separate during field sample testing, new samples will be required to be obtained from the installed pipe. Any reoccurrence may cause rejection of the work.
- 5.5 The cured pipe material (CIPP) shall conform to the structural properties, as listed below.

MINIMUM CIPP PHYSICAL PROPERTIES

Property	Test Method	Cured Polyester Composite	
		min. per ASTM F1216	Enhanced Resin
Modulus of Elasticity	ASTM D790	250,000 psi	400,000 psi
Flexural Stress	ASTM D790	4,500 psi	4,500 psi

- 5.6 The required structural CIPP wall thickness shall be based as a minimum, on the physical properties in Section 5.5, or greater values if substantiated by independent lab testing and in accordance with the design equations in the Appendix X1. Design Considerations of ASTM F1216, and the following design parameters:

Design Safety Factor (typically used value)	=2.0
Retention Factor for Long-Term Flexural Modulus to be used in Design	=50% - 75%
<i>(As determined by long-term tests described in Section 5.2 and approved by the Owner)</i>	
Ovality* (calculated from (X1.1 of ASTM F1216)	=2%
Enhancement Factor, K	=See Section 5.3
Groundwater Depth (above invert of existing pipe)*	=1/2 Soil Depth (ft.)
Soil Depth (above crown of existing pipe)*	=Field Conditions (ft.)
Soil Modulus**	=120 psi
Soil Density**	=1000 pcf
Live Load**	=H20 Highway
Design Condition (partially or fully deteriorated)***	=FD

* Denotes information, which can be provided here or in inspection videotapes or project construction plans. Multiple line segments may require a table of values.

** Denotes information required only for fully deteriorated design conditions.

*** Based on review of video logs, conditions of pipeline can be fully or partially deteriorated. (See ASTM F1216 Appendix) The Owner will be sole judge as to pipe conditions and parameters utilized in design.

- 5.7 Any layers of the tube that are not saturated with resin prior to insertion into the existing pipe shall not be included in the structural CIPP wall thickness computation.

6. TESTING REQUIREMENTS

- 6.1 Chemical Resistance - The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical-testing requirements.
- 6.2 Hydraulic Capacity - Overall, the hydraulic cross-section shall be maintained as large as possible. The CIPP shall have a minimum of the full flow capacity of the original pipe before rehabilitation. Calculated capacities may be derived using a commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.
- 6.3 CIPP Field Samples - When requested by the Owner, the Contractor shall submit test results from field installations of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified in Section 5.5 have been achieved in previous field applications. Samples for this project shall be made and tested as described in Section 10.1.

7. INSTALLATION RESPONSIBILITIES FOR INCIDENTAL ITEMS

- 7.1 It shall be the responsibility of the Owner to locate and designate all manhole access points open and accessible for the work, and provide rights-of-access to these locations. If a street must be closed to traffic because of the orientation of the sewer, the Owner shall institute the actions necessary to provide access during this for the mutually agreed time period. The Owner shall also provide free access to water hydrants for cleaning, installation and other process related work items requiring water.
- 7.2 Cleaning of Sewer Lines - The Contractor, when required, shall remove all internal debris out of the sewer line that will interfere with the installation of CIPP. The Owner shall also provide a dumpsite for all debris removed from the sewers during the cleaning operation. Unless stated otherwise, it is assumed this site will be at or near the sewage treatment facility to which the debris would have arrived in absence of the cleaning operation. Any hazardous waste material encountered during this project will be considered as a changed condition.
- 7.3 Bypassing Sewage - The Contractor, when required, shall provide for the flow of sewage around the section or sections of pipe designated for repair. Plugging the line at an existing upstream manhole and pumping the flow into a downstream manhole or adjacent system shall make the bypass. The pump(s) and bypass line(s) shall be of adequate capacity to accommodate the sewage flow. The Owner may require a detail of the bypass plan to be submitted.

- 7.4 Inspection of Pipelines - Inspection of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles and service connections using close circuit television (CCTV) inspection techniques. The pipeline interior shall be carefully inspected to determine the location of any conditions that may prevent proper installation of CIPP. These shall be noted and corrected. A videotape and suitable written log for each line section shall be produced for later reference by the Owner.
- 7.5 Line Obstructions - It shall be the responsibility of the Contractor to clear the line of obstructions such as solids and roots that will prevent the insertion of CIPP. If pre-installation inspection reveals an obstruction such as a protruding service connection, dropped joint, or a collapse that will prevent the installation process, that was not evident on the pre-bid video and it cannot be removed by conventional sewer cleaning equipment, then the Contractor shall make a point repair excavation to uncover and remove or repair the obstruction. Such excavation shall be approved in writing by the Owner's representative prior to the commencement of the work and shall be considered as a separate pay item.
- 7.6 Public Notification - The Contractor shall make every effort to maintain sewer service usage throughout the duration of the project. In the event that a connection will be out of service, the longest period of no service shall be 8 hours. A public notification program shall be implemented, and shall as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off-line. The Contractor shall also provide the following:
- A. Written notice to be delivered to each home or business the day prior to the beginning of work being conducted on the section, and a local telephone number of the Contractor they can call to discuss the project or any potential problems.
 - B. Personal contact with any home or business, which cannot be reconnected within the time stated in the written notice.
- 7.7 The Contractor shall be responsible for confirming the locations of all branch service connections prior to installing the CIPP.

8. INSTALLATION

- 8.1 CIPP installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, with the following modifications:
- 8.1.1 Resin Impregnation - The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the potential loss of resin during installation through cracks and irregularities in the original pipe wall, as applicable.
- 8.1.2 Tube Insertion – The wet out tube shall be positioned in the pipeline using either inversion or a pull-in method as defined within relevant ASTM standards previously stipulated. If pulled into place, a power winch or its equivalent should be utilized and care should be

exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.

- 8.1.3 Temperature gauges shall be placed between the tube and the host pipe's invert position to monitor the temperatures during the cure cycle.
- 8.1.4 Curing shall be accomplished by utilizing hot water under hydrostatic pressure or steam pressure in accordance with the manufacturer's recommended cure schedule. A cool-down process shall be conducted that complies with the resin manufacturer's specification.

9. REINSTATEMENT OF BRANCH CONNECTIONS

- 9.1 It is the intent of these specifications that branch connections to buildings be re-opened without excavation, utilizing a remotely controlled cutting device, monitored by a CCTV. The Contractor shall certify a minimum of two complete functional cutters plus key spare components are on the job site before each installation or are in the immediate area of the jobsite and can be quickly obtained. Unless otherwise directed by the Owner or his authorized representative, all laterals will be reinstated. No additional payment will be made for excavations for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.

10. INSPECTION

- 10.1 CIPP samples shall be prepared for each installation designated by the owner/engineer or approximately 20% of the project's installations. Pipe physical properties will be tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. The flexural properties must meet or exceed the values listed in the table on page 4 of this specification, Table 1 of ASTM F1216 or the values submitted to the Owner/engineer by the contractor for this project's CIPP wall design, whichever is greater.
- 10.2 Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743. The minimum wall thickness at any point shall not be less than 87½% of the submitted minimum design wall thickness as calculated in paragraph 5.6 of this document.
- 10.3 Visual inspection of the CIPP shall be in accordance with ASTM F1743, Section 8.6.

11. CLEAN-UP

- 11.1 Upon acceptance of the installation work and testing, the Contractor shall restore the project area affected by the operations to a condition at least equal to that existing prior to the work.

12. PAYMENT

- 12.1 Payment for the work included in this section will be in accordance with the prices set forth in the proposal for the quantity of work performed. Progress payments will be made monthly based on the work performed during that period.

APPENDIX P

CLOSED CIRCUIT TELEVISION (CCTV) INSPECTION – STANDARDS FOR ACCEPTANCE OF NEW SEWERS

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CLOSED CIRCUIT TELEVISION (CCTV) INSPECTION

STANDARDS FOR ACCEPTANCE OF NEW SEWERS

March 2020

JURUPA COMMUNITY SERVICES DISTRICT

Sewer CCTV Technical Specifications

Table of Contents

	<u>Page</u>
1. General Description Of The Work.....	3
2. Work And Materials Provided By The Contractor	3
General.....	3
Sewer Cleaning	3
Sag Measurement	3
Sewer Inspection	4
Operator Certification.....	4
Equipment.....	4
Observations.....	6
Video	6
Sewer Lateral Inspection	8
Operator Certification.....	8
Observations.....	9
Lateral Camera	9
Photographs	10
Additional Inspection Procedures	11
3. Received Videos.....	11
Received Submittals.....	14
Deliverables.....	15
Video Quality – Acceptance/Rejection.....	16
4. Additional Responsibilities Of The Contractor	16
Typical Inspection Procedure	17
File Naming	19
Section Header Data	19
Example Label.....	20
Screen Overlays	20
Initial Text Screen	20
Running Screen Text	21
Observation Screen Text	21
PACP Codes	22
Example Summary Table	23
Example Observation Table	23
Submittal Check List.....	24

Sewer CCTV Technical Specifications

1. GENERAL DESCRIPTION OF THE WORK

- 1.1. The Sewer CCTV inspection work must be completed by a certified National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP) operator(s) using established PACP coding and observations. Current certification is to be provided at the time work is performed.

2. WORK AND MATERIALS PROVIDED BY THE CONTRACTOR

GENERAL:

- 2.1. The Contractor shall provide and setup all required traffic control devices, including warning signs, lights, arrow boards and traffic cones, as required in accordance with the latest edition of the Work Area Traffic Control Handbook Manual (W.A.T.C.H. Manual), as well as following any City required encroachment permits or traffic control plans.
- 2.2. The Contractor shall obtain and comply with all permits required by local jurisdiction.

SEWER CLEANING:

- 2.3. Sewers will be clean, remove grit, loosen solids, grease, and any construction debris that are present.
- 2.4. Cleaning shall be completed by the Contractor within 24 hours and no less than one hour prior to inspection to reduce the impact of the natural flow within the pipeline during inspection. **Operation of cleaning equipment downstream of the CCTV inspection is not permitted and will result in rejection of the CCTV inspection of the sewer main segment(s).**
- 2.5. The Contractor shall trap and remove all debris at the downstream manhole and legally dispose and haul away debris when cleaning pipe segments. **No disposal or decanting of waste recovered from the sewer is permitted to be discharged back into Jurupa Community Services District's (JCSD) Sewer System.**

SAG MEASUREMENT:

- 2.6. The Sag Gauge must be pre-approved by JCSD. The Gauge must be clearly marked with the first minimum mark at 0.5" increments from 0.5", 1", 1.5", 2.0", etc. Gauge must be independent of tractor's frame (operating under its own weight) traversing the invert of the pipe. Still pictures of the Gauge used with a steel tape measure as a

comparison must be recorded before televising of the sewer begins. Gauge must be free of debris at all times. If Depth Gauge is not clear the video will be rejected. A picture of an acceptable depth gauge is presented at the end of this Appendix).

- 2.7. This section regarding sag measurement does not apply to laterals being video'ed by push camera.
- 2.8. Introduce an adequate amount of clean water at the upstream manhole to produce flow at the downstream manhole immediately prior to inspection; witness by a JCSD representative is required. If a sewer main segment is cleaned between CCTV inspections water will be re-introduced to the upstream manhole to produce flow in the downstream manhole.
- 2.9. The maximum amount of Sag permitted by JCSD is 0.5". All sags are required to be measured and video recorded on observation logs during the inspection. Tractor speed should be slow, with pauses at regular intervals, to properly measure sag depth through the sag's duration.

SEWER INSPECTION:

OPERATOR CERTIFICATION:

- 2.10. CCTV inspection shall be performed by a certified NASSCO PACP certified operator; certification to be presented at the time work is performed and shall be submitted with the report.

EQUIPMENT:

- 2.11. The Contractor's CCTV equipment shall include video cameras, a video monitor cable, power sources, water source (must be on hand) and all equipment necessary to perform a CCTV inspection as outlined in this Technical Specification.
- 2.12. The cameras shall meet NASSCO requirements for operating in the sanitary sewer environment. All equipment must be in good repair and properly attached to the cable.
- 2.13. The cameras shall have Pan-and-Tilt capabilities, and shall have a minimum of 360 x 270 degree rotation and illumination sensitivity shall be three lux or less and provide a minimum of 460 lines of resolution. The focal distance shall be adjustable through a range from 25 mm (1 inch) to infinity.

- 2.14. During CCTV inspection, lighting intensity shall be adjusted to minimize glare. Lighting and picture quality shall be adjusted to provide a clear, in-focus picture of the entire periphery of the pipeline for all conditions encountered.
- 2.15. All camera systems shall be able to navigate around minor objects and debris. The system used to move the camera through the pipe shall not obstruct the camera's view or interfere with proper documentation of the sewer conditions.
- 2.16. The camera cable shall be retracted to remove slack and to ensure an accurate footage reading.
- 2.17. All inspections of manholes start at the upstream manhole and televise to the downstream manhole, any deviation must have written JCSD approval.
- 2.18. The distance shall be measured between the exit of the start manhole and the entrance of the finish manhole for a true measurement of the length of the pipe segment, as required by PACP. It shall be recorded in standard units and the video display readout shall display units to one-tenth of a foot.
- 2.19. The cable footage-counter shall be accurate to plus or minus 2 feet per 1,000 feet, plus or minus 1% per 100ft.
- 2.20. Video inspection and reporting shall be submitted in a NASSCO-compatible format; videos shall be viewable on any standard computer system (PC).
- 2.21. The camera lens shall be kept clear of condensation and debris during the CCTV inspection. RainX or equal to ensure lens is clear.
- 2.22. Must be able to pan entire joint with a 360-degree rotation. If the lens becomes dirty, the inspection shall halt, clean the lens and re-start the inspection. An inspection performed with a dirty lens will result in rejection of the CCTV inspection for that sewer main segment(s).
- 2.23. Begin all inspections from center of manhole, video to start from inside manhole and inspect outlet, sheer ring, joints, laterals and end in center of downstream manhole and pan upward to inspect inside of structure.

OBSERVATIONS:

- 2.24. All observations and defects shall be documented in a database and shall include digital video recording and digital photographs as defined in Sections 2.24 and 2.25.
- 2.25. Each video clip and photograph provided shall correspond to inspection data in the database, and each set of inspection data listed in the database shall be properly linked to the appropriate video clip and photos.
- 2.26. All observations shall be selected from a standard table of descriptions incorporated in the inspection reporting software, as required by PACP. Any additional comments regarding the observation shall be indicated in the remarks box. The video shall show all joints, shear rings, laterals, etc.
- 2.27. The severity of each defect or observation shall be recorded and rated per the PACP method. Examples of potential defects include sags, cracks, rolled gaskets, debris, offset joints, missing shear ring joints, etc.
- 2.28. All observations shall be recorded using PACP codes as outlined in NASSCO's PACP Reference Manual, and in this document.
 - 2.28.1. Cured-In Place Pipe (CIPP) inspection process is different from the traditional pipe inspections: the video shall show all delamination of any layers or tube coating, tight fit in the existing pipe, foreign inclusions, abrasion, blistering, pinholes, bulging, major wrinkles, folds, dry spots, lifts, and Lateral connections reinstated.
 - 2.28.2. High Density Polyethylene (HDPE) and fusible PVC inspection process follows the traditional pipe material inspections however there are differences: they are normally a continuous jointless pipe except for the sheer rings, the inspection is to include the inner beads of the fused joint (the beads are required to be removed after the installation has been completed) Saddle Fusion Joints, defects such as grooves, pits, hollows, etc.

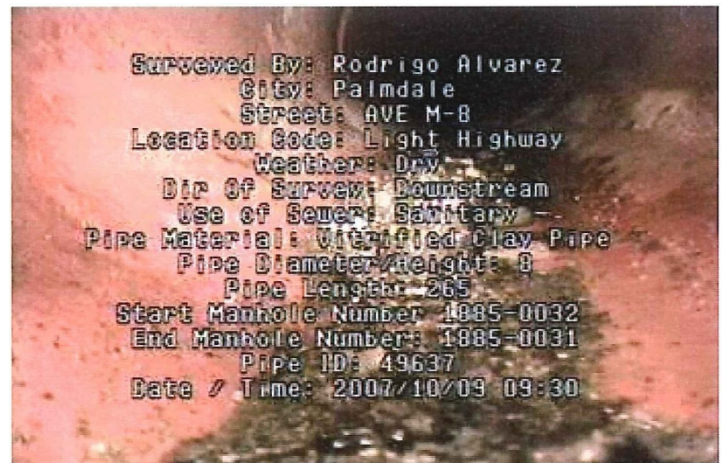
VIDEO:

- 2.29. The Contractor shall make a continuous color digital recording in MPEG 4 format for each pipe segment inspected, unless otherwise specified by JCSD.

- 2.30. Video files shall have a minimum resolution of 352 x 240 pixels and an interlaced frame rate at a minimum of 24 frames per second.
- 2.31. Audio reporting will be avoided to prevent inconsistent operator subjectivity.
- 2.32. Video inspection will not exceed a traverse rate of 30 feet per minute.
- 2.33. The Contractor shall pause the digital recording at any time there is a delay in the inspection and restart the digital video recording in the same digital file. The pause shall in no way affect, freeze, or interrupt the replay of the video and shall not close the video file during the inspection.
- 2.34. Each pipe segment (manhole to manhole) shall be identified with an initial text screen and completed in accordance with PACP's CCTV inspection form header Instructions and shall be as follows:

Line Number & Description

Line 1: Surveyed By
Line 2: JCSD
Line 3: Street
Line 4: Location
Line 5: Code*
Line 6: Weather*
Line 7: Direction of Survey
Line 8: Use of sewer*
Line 9: Pipe Material
Line 10: Pipe Diameter/Height
Line 11: Pipe Length (on plans)*
Line 12: Start Manhole Number GIS #
Line 13: End Manhole Number GIS #
Line 14: Pipe ID (GIS, PSR or MMS #)
Line 15: Inspection Time/Date
Line 16: Depth of invert



Line items noted with an asterisk (*) are optional depending on the editing capacity of the text overlay equipment.

- 2.35. This data must completely match the data entered in the database header information.
- 2.36. The initial text screen shall appear no more than 30 seconds at the beginning of the video footage, and shall appear before the 360-degree pan of the starting manhole.
- 2.37. During the CCTV inspection, the video shall show the following text at all times:

Line Number & Description

Line 1: JCSD

Line 2: Street, Start Manhole Number/Direction of Inspection/End Manhole Number

Line 3: Pipe Material/Pipe Size

Line 4: Inspection Time/Date/Running Total

- 2.38. During the CCTV inspection, the camera shall stop at all defects and significant observations to ensure a clear and focused view of the pipe condition and shall rotate the camera head at the defect to allow for adequate evaluation at a later time.
- 2.39. All defects and significant observations shall include a text overlay of the recorded observation.
- 2.40. The video recording shall include on-screen observation text for every observation recorded in the database, including AMH, in addition to the text in Section 2.36.
- 2.41. The naming of the video file shall consist of the "FROM MANHOLE STATION or GIS NUMBER", "TO MANHOLE STATION or GIS NUMBER", and the eight-digit inspection date, as shown in the following example, or as pre-approved by JCSD:

0+00_3+45_20050101.mp4

(From MH Station_ to MH Station_ YYYYMMDD)

Note: "Manhole Station Number" may consist of survey station numbers as indicated on the design plans.

SEWER LATERAL INSPECTION

OPERATOR CERTIFICATION:

- 2.42. CCTV inspection shall be performed by a CCTV inspection shall be performed by a certified NASSCO PACP certified operator; certification to be presented at the time work is performed and shall be submitted with the report.
- 2.43. The Contractor's CCTV equipment shall include video cameras, a video monitor cable, power sources, water source (must be on hand) and all equipment necessary to perform a CCTV inspection as outlined in this Technical Specification.
- 2.44. The cameras shall meet NASSCO requirements for operating in the sanitary sewer environment. All equipment must be in good repair and properly attached to the cable.

- 2.45. During CCTV inspection, lighting intensity shall be adjusted to minimize glare. Lighting and picture quality shall be adjusted to provide a clear, in-focus picture of the entire periphery of the pipeline for all conditions encountered.
- 2.46. The camera cable shall be retracted to remove slack and to ensure an accurate footage reading.
- 2.47. Video inspection and reporting shall be submitted in a NASSCO-compatible format; videos shall be viewable on any standard computer system (PC).
- 2.48. The camera lens shall be kept clear of condensation and debris during the CCTV inspection. RainX or equal to ensure lens is clear.

OBSERVATIONS:

- 2.49. All observations and defects shall be documented in a database and shall include digital video recording and digital photographs as defined in Sections 2.24 and 2.25.
- 2.50. Each video clip and photograph provided shall correspond to inspection data in the database, and each set of inspection data listed in the database shall be properly linked to the appropriate video clip and photos.

LATERAL CAMERA:

- 2.51. CCTV of the lateral from the C/O at the point of transition/property line to the Main Line sewer connection.
- 2.52. Self-leveling (upright) small diameter pipe color television camera designed to operate in 2" to 8" pipe and negotiate multiple bends, design maintains proper camera orientation at all times with on screen footage (Prefer 360-degree rotation).
- 2.53. Camera is able to pass through a short 90-degree turn or a single tee connection in 4" pipe.
- 2.54. The lighthouse at minimum contains 12 light emitting diodes equaling 78 foot candella to illuminate pipeline interiors from 2" to 8".
- 2.55. Minimum 460 lines horizontal, 400 lines vertical resolution (NTSC) 450 h x 450 v (PAL); higher resolution means sharper pictures with greater details.

- 2.56. Minimum 379,392 picture element solid state sensor 768 h x 494 v (NTSC); the greater number of picture elements, the more detail is displayed in the picture.
- 2.57. Minimum 437,664 picture element solid state sensor 752 h x 582 v (PAL); lux sensitivity provides better pictures with less light.
- 2.58. 3 lux minimum sensor illumination sensitivity; no sensor distortion.
- 2.59. Camera is equipped with centering skid(s) for use in 4" to 8" pipe, skid mounts directly to the camera housing.
- 2.60. Recording devices: A portable hard drive or high capacity USB Thumb Drive containing the digital database, video and photo files.
- 2.61. Push cable (rod) reel 200' minimum with footage counter.

PHOTOGRAPHS:

- 2.62. Digital photographs in JPEG format shall be made of all recorded defect observations. These photographs will be computer generated with the use of the inspection reporting system software.
- 2.63. JPEG images shall be captured at a minimum resolution of 640x480 pixels.
- 2.64. At a minimum, all photographs shall be named consisting of the following descriptions: "FROM MANHOLE STATION or GIS NUMBER", "TO MANHOLE STATION or GIS NUMBER", eight-digit inspection dates, and the defect distance location along the pipe. It is in the Contractor's discretion as to additional data information that may be needed in the naming of the files to make each file unique within the file naming constraints of their inspection software.

0+00_3+45_20050101_125_A.jpg
(From MH Station or GIS Number_ To MH Station_ or GIS Number
YYYYMMDD_Defect Position_UniqueData)
- 2.65. Any additional information shall be included after the mandatory info specified above. The naming convention shall be consistent throughout the project.
- 2.66. A minimum of TWO photographs of each defect shall be taken, one with a perspective view and one with a close-up view.

- 2.67. ONE photograph is required for each lateral connection looking directly at the connection and each AMH observation from the bottom of the manhole looking up.

ADDITIONAL INSPECTION PROCEDURES:

- 2.68. Bulkheads/mechanical plugs shall temporarily be removed as necessary along the entire segment of the sewer line from manhole to manhole. Otherwise, the segment will be considered incomplete. The Contractor shall reinstall the temporarily removed bulkhead/mechanical plugs until the sewer line is accepted.
- 2.69. A full 360-degree pan of all manholes is required. This video footage shall occur at the beginning of each pipe segment survey inspection from the bottom of the manhole panning up the manhole shaft. The Contractor shall cover the manhole opening to prevent too much light from entering the structure and to ensure a clear and focused view of the manhole interior. In instances when the manhole is the terminating manhole, then the pan shall occur at the end of the pipe segment survey inspection.
- 2.70. Video footage shall be taken from the center of the pipe. The camera shall run along the invert of the pipe and not at its side, unless it is passing a point obstacle. If extended driving on the side of the pipe is required, then either the pipe needs a more thorough cleaning or an observation should be noted from the PACP codes describing the nature of the obstacle.
- 2.71. Obstructions may be encountered during the course of the CCTV inspection that prevents the travel of the camera. In instances when obstructions are not passable, the Contractor shall withdraw the equipment and clean the sewer line and reschedule the televising.
- 2.72. If a particular line is inspected more than once, then the Contractor shall include all versions of the inspections in the database. The MGO observation shall be used on all inspections except at the first occurrence. The Contractor shall provide an explanation for the additional inspections in the Remarks section.

3. RECEIVED VIDEOS

Two sewer CCTV inspections shall be performed in the course of construction:

- first upon completion of construction of the new sewer main line;
- second serviceability review shall occur prior to occupancy and introducing flow to the sewer system.

Initial sewer main videos shall be approved by the JCSD's Sewer Operations Department prior to base paving operations. Sewer Videos shall be prepared by a JCSD approved sewer CCTV inspection vendor. A Representative from Sewer Operations may be present during the CCTV inspection. Within seven (7) working days of completion of the sewer video work for the Tract or portion thereof. The Developer's Superintendent shall prepare a transmittal letter along with the complete digital sewer video file for JCSD review and approval. JCSD Staff will review and comment on or approve the digital file within seven (7) working days from the receipt of the transmittal from the Developer.

The Procedure for the Sewer Construction Video Inspection is as follows:

1. Within five (5) working days after the completion of the sewer system including the laterals, the Tract Superintendent shall notify the JCSD's Inspector that they request JCSD approval on the completed sewer system.
2. The JCSD's Inspector notifies the JCSD's Development Representative to schedule the CCTV inspection. The JCSD's Development Representative coordinates the inspection with Sewer Operations Supervisor to notify Operations of a pending CCTV Request.
3. JCSD's Sewer Operation's Staff may observe the post-construction video using the post-construction video inspection check sheet. If there are no items listed for correction, the JCSD's Sewer Operations Staff will sign the video inspection sheet verifying the main lines and laterals are acceptable. The inspector will provide the completed and signed check sheet to the JCSD's Development Representative for the project file. If there are any items listed for correction, the JCSD's Inspector will ensure that the listed items are corrected and a new full video inspection of the sewer main section (performed under the observation of the Sewer Operations Staff) is completed to document the acceptable conditions prior to signing the video inspection sheet certifying that the sewer system is in compliance with JCSD Standards.
4. The Developer will submit the complete package of video reports along with the complete digital video files to Development Engineering.
5. Development Engineering will submit the complete report to the Sewer Systems Supervisor for review and written final approval prior to filing in the Project folder; the Development Representative shall provide compaction reports for sewer trenches at that time.
6. The JCSD's Sewer Operations Staff will review and comment or approve the complete digital video file within seven (7) working days. If approved, the Developer may proceed with paving operations. If rejected, Sewer Operations Staff will provide a list of deficiencies for correction prior to re-videoing and re-inspection. Deficient work shall begin within five (5) working days of the notice of deficiencies and shall be completed within sixty (60) working days. Steps 1 – 6 shall be repeated until acceptance has been achieved.

A secondary CCTV inspection of the sewer mains and laterals (serviceability review) will be required prior to the first occupancy request for each phase of development; this shall occur when front yard landscaping is installed at the first home in the phase. The Serviceability Review CCTV Inspection will be required to ensure that sewer facilities that serve the homes are complete, operational, and ready for service – sewer main and lateral plugs shall not be removed until authorized in writing by the JCSD. The serviceability review shall check that the lines are free of debris and construction materials, that mainline pipe and laterals have not been compromised, and that sags have not developed due to settlement or construction related activities; this review will not require the panning of joints or shear rings. The area covered under this review will consist of that section of sewer main and lateral(s) for the home(s) for which landscaping has been installed, from the upper sewer manhole to the discharge point of connection to the JCSD's active sewer line.

It is the Developer's responsibility to properly show evidence that the sewer main and sewer laterals are clean and free from debris prior to removing the sewer plug to either the manhole or sewer lateral. The Grant of Occupancy will not be issued until the sewer plugs in the manhole and lateral have been removed.

Once the homes are approved for occupancy, it is JCSD's responsibility to operate the facilities servicing those homes. The "Serviceability Review Video Inspection Check Sheet" (Appendix X) details the items to be inspected. The Serviceability Review Video Inspection is one of the discussion points listed on the pre-construction meeting agenda for tract projects. The JCSD's Inspector will provide a copy of this check sheet to the Tract Superintendent (upon request) as a guide to prepare for move-ins. Serviceability Review Video Inspections are typically not performed on Parcel Map or Plot Plan Projects.

As part of the serviceability review process, the Developer will provide a Sewer Map for each lot to be released for occupancy. The Sewer Map will show the location of the sewer lateral to the home and will include all distances, bends and depths. The Developer is strongly encouraged to keep track of the installation and prepare each Sewer Map as the sewer later is connected from the house to the street connection.

The Procedure for the Serviceability Review Inspection is as follows:

1. When the first home in the Tract Phase receives its front yard landscaping, the Tract Superintendent notifies the JCSD's Inspector that they request JCSD Sewer Operations Staff to observe the serviceability review video inspection of the designated homes.
2. The JCSD's Inspector notifies the JCSD's Development Representative to schedule the CCTV inspection. The JCSD's Development Representative coordinates the inspection with Sewer Operations Supervisor to notify Operations of a pending CCTV Request.
3. JCSD's Sewer Operations Staff may perform the serviceability review video inspection using the serviceability review video inspection check sheet. If there are no items listed for correction, the JCSD's Sewer Operations Staff will sign the video inspection sheet verifying the sewer main and lateral(s) are ready to be put into active service; and provide the completed and signed check sheet to the JCSD's Development Representative for the project file. If there are any items listed for correction, the JCSD's Inspector, in conjunction with Sewer Operations Staff, will ensure that the listed

items are corrected and re-inspected to document correction prior to signing the video inspection sheet, verifying the sewer main and lateral(s) are ready for active service.

4. The JCSD's Inspector provides the completed and signed check sheet to the JCSD's Development Representative for the project file and notifies them that the homes are ready for occupancy.
5. After being notified that the homes are ready for occupancy, the JCSD's Development Representative will send a letter to the County/City in which the JCSD is approving the occupancy of the designated homes.
6. Within five (5) working days of the completion of video inspection for the Tract Phase, the Developer will submit the complete package of video reports along with the complete digital video files to Development Engineering.
7. Development Engineering will submit the complete report to the Sewer Systems Supervisor for review and written final approval prior to filing in the Project folder.
8. The JCSD's Sewer Operations Staff will review and comment or approve the complete digital video file within seven (7) working days. If approved, the Developer may proceed with Occupancy. If rejected, Sewer Operations Staff will provide a list of deficiencies for correction prior to re-videoing and re-inspection. Deficient work shall begin within five (5) working days of the notice of deficiencies and shall be completed within sixty (60) working days. Steps 1 – 8 shall be repeated until acceptance has been achieved.
9. Submission of all required CCTV Reports will be a condition of final tract acceptance.

RECEIVED SUBMITTALS

- 3.1. Submittals will consist of:
- 3.2. A portable hard drive or high capacity USB Thumb Drive containing the digital database, video, and photo files.
- 3.3. A printed report in a hardcover white clear view 3-ring binder labeled as described in Section 4.4, containing the following information:
- 3.4. Footage calibration report for each camera used.
- 3.5. PACP Certificate copies of all operators.

- 3.6. Summary table of all pipeline segments inspected with the following fields in the order listed:

Column Number & Description

Column 1: Date of Inspection

Column 2: Start Manhole GIS

Column 3: Stop Manhole GIS

Column 4: Total Pipe Length (per as-built plan)

Column 5: Televised Length

Column 6: Quick Maintenance Rating (per PACP)

Column 7: Quick Structure Rating (per PACP)

Column 8: Section Number

(*NOTE: The table shall be sorted by Start Manhole GIS)

- 3.7. An observation table of all pipeline segments inspected with the following fields in the order listed:

Column Number & Description

Column 1: Section Number

Column 2: Position of Defect

Column 3: Observation Code (per PACP)

Column 4: Observation Description (per PACP)

Column 5: Structural Grade (per PACP) Column 6: O&M Grade (per PACP)

(*NOTE: The table shall be sorted by Section Number)

DELIVERABLES:

- 3.8. As part of the Submittal, the Contractor shall submit all video recordings, image files, and databases on a high capacity USB thumb drive or a rectangular shaped external hard drive with USB 2.0/3.0 connection, or similar, as pre- approved by the JCSD. If a hard drive is submitted, the submittal shall include the power cord and USB connection cable. The external hard drive and cables will become property of the JCSD unless otherwise indicated.

- 3.9. High capacity USB thumb drive(s) or External hard drive(s), binder cover and binder spine label shall include the following information on computer-generated labels:

3.9.1. Jurupa Community Services JCSD - Sewer Operations Division

3.9.2. General Contractor Name and Sub-Contractor Name

3.9.3. Project Name (e.g. PC 123456 Tract 15423-02)

3.9.4. Start Date of CCTV Inspections (e.g. MM/DD/YYYY)

3.9.5. Finish Date of CCTV Inspections (e.g. MM/DD/YYYY)

3.9.6. All files included as part of the deliverables shall be contained within one single folder on the High capacity USB thumb drive or hard drive and labeled with the project name, and the date as:

VIDEO QUALITY – ACCEPTANCE/REJECTION:

- 3.10. The video recordings, photographs, and data shall be reviewed by the JCSD for focus, lighting, clarity of view, and technical quality.
- 3.11. Video recording without the use of a JCSD approved Sag Gauge and/or a pipeline that was not preloaded with adequate clean water prior to the start of the televising will not be reviewed or approved.
- 3.12. Videos or photographs recorded while a camera has flipped over in the process of traveling or the viewing of laterals, obstructions, or defects are blocked by cables, skids or other equipment will not be accepted.
- 3.13. Shape, focus, proper lighting, and clear, distortion-free viewing during the camera operations shall be maintained. Failure to maintain these conditions will result in the rejection of the video and/or photographs by the JCSD.
- 3.14. Videos or photographs recorded showing steam, inadequate lighting, or other poor image quality will be cause for rejection by the JCSD.
- 3.15. Any reach of sewer where recording quality, inspection, and/or report is not acceptable, according to this Technical Specifications to the JCSD shall be re-televised, or data modified.

4. ADDITIONAL RESPONSIBILITIES OF THE CONTRACTOR

- 4.1. In the event of any Contractor-related overflow or interruption/backup of customer service, the Contractor shall immediately notify the JCSD through the assigned Inspector, and shall contain and eliminate the overflow.
- 4.2. The Contractor shall be responsible for any fines levied by others, reimbursement of any agency incurred costs, damage, cleanup, restoration of flow, and any disruption of service costs to customers as, a result of the Contractor's work. This is in addition to any, and all costs incurred by the customer.
- 4.3. The Contractor shall respect the rights of property owners, and not enter upon private property without obtaining written permission from the owner of the property.

EMERGENCY RESPONSE

The Contractor shall observe and comply with JCSD'S policy of "ZERO SPILLS" and shall be in full charge and be responsible for the Jobsite, the construction work and subject to the directions of the JCSD/Project Inspector, Sewer Service & Maintenance Foreman, Sewer Systems Supervisor.

In the event of any contractor related sewer overflow, interruption and/or back up of customer service the contractor shall immediately contact JCSD personnel on the project and assist in first response on any emergency situation.

In case of a sewage spill, the Contractor shall, without instructions from JCSD, act immediately to contain and control the spill and take all appropriate steps to mitigate the overflow. Again, the Contractor shall immediately notify JCSD personnel assigned to the project.

In the event of a sewage spill or the potential of a spill to occur, adequate protection (containment) of all Storm Drains, Catch Basins and open channels are essential.

The Contractor shall provide for an emergency response unit that will be immediately dispatched to the job site in case of sewage spill(s). The emergency response unit shall consist of emergency response equipment and personnel trained in its use.

The Contractor shall provide digital photographs of all areas impacted and documentation on all corrective actions taken.

TYPICAL INSPECTION PROCEDURE:

1. Display Overlay with Segment details.
2. Start manhole inspection from center of manhole, pan manhole 360 degrees, from bottom looking up.
3. Start pipe inspection from edge of pipe, resetting the footage to zero at the start of pipe inspection.
4. Indicate AMH (Manhole) and MH Number in Remarks to start survey.
5. Indicate MWL (Water Level).
6. Indicate MWM (Water Mark) if visible.
7. Conduct survey.
 - a. Record all defects & taps

i. Close-up



ii. Perspective View (looking down the pipe at the defect).



- iii. Take 1 Photo of each tap



8. End Inspection

- a. If the camera reaches the end Manhole:
 - i. Indicate AMH and MH number in Remarks
 - ii. Display Ending Screen Text
 - iii. 360-degree Pan of Manhole, if the manhole is the terminal manhole.

FILE NAMING:

Database File Name: PrivateContractNumber TractNumber_YYYYMMDD_Acceptance Review Submittal# .mdb

Ex. PC45123_52369-02_20071220_AcceptanceReview_1.mdb

Photo Name(s): From MH Station –To MH Station -YYYYMMDD –Defect Position_ Unique Data .jpg
Ex. 0+00_3+45_20050101_125_A.jpg

*NOTE: Photographs shall be taken as follows: 2 photographs of each defect & 1 photograph of each lateral connection

Video Name(s): MH Station_ To MH Station_ YYYYMMDD .mp4
Ex. 0+00_3+45_20050101 .mp4 From

SECTION HEADER DATA:

Dates: YYYYMMDD (4-digit year, 2-digit month, 2-digit day)

Manhole Names: ##-+##- (Station Number) GIS
Ex. 12+00

Feet Televised: This distance shall be measured from the exit of the start manhole and the entrance of the finish manhole. (i.e. only the distance of the pipe)

EXAMPLE LABEL:

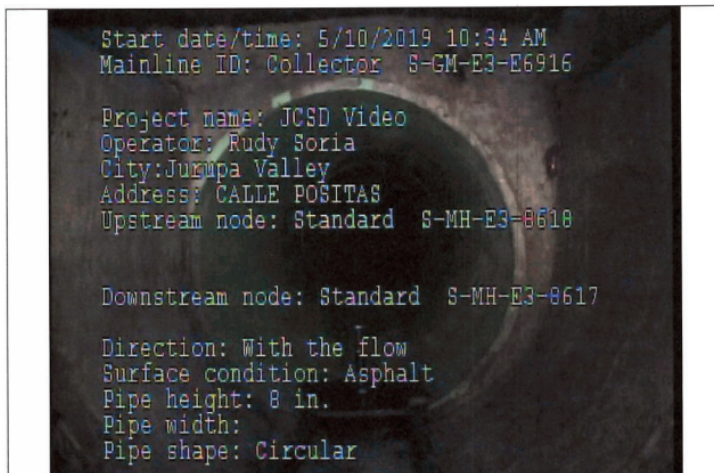
JCSD- Sewer Operations Division
General Contractor and CCTV
Co PC 123456 Tract 15423-02
Start: 01/05/2016
Finish: 02/07/2016

SCREEN OVERLAYS:

INITIAL TEXT SCREEN:

Include all of the following lines of text in the order listed; if your software/hardware does not allow for 13 lines of text, the lines marked OPTIONAL can be omitted as needed.

Line 1: Surveyed By
Line 2: JCSD
Line 3: Street
Line 4: Location Code (OPTIONAL)
Line 5: Weather (OPTIONAL)
Line 6: Direction of Survey
Line 7: Use of Sewer (OPTIONAL)
Line 8: Pipe Material
Line 9: Pipe Diameter/Height
Line 10: Start Manhole Number GIS*
Line 11: End Manhole Number GIS*
Line 12: Inspection Time/Date/Feet CCTV'd



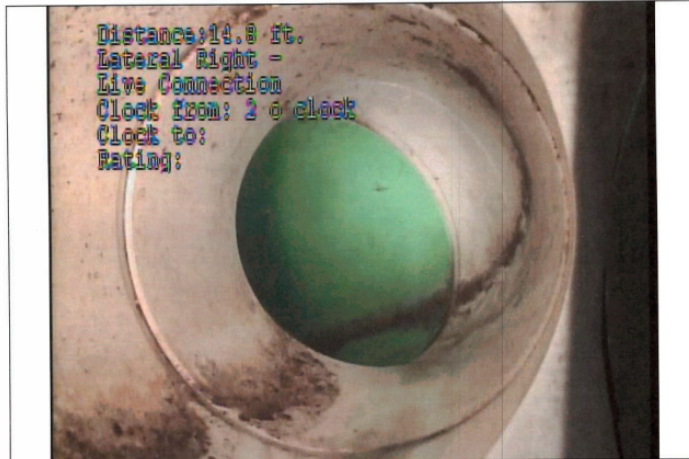
RUNNING SCREEN TEXT:

During the CCTV inspection, the video shall show the following text at all times:

Line 1: Date/Time

Line 2: Start Manhole Number/End Manhole Number

Line 3: Current Footage



OBSERVATION SCREEN TEXT:

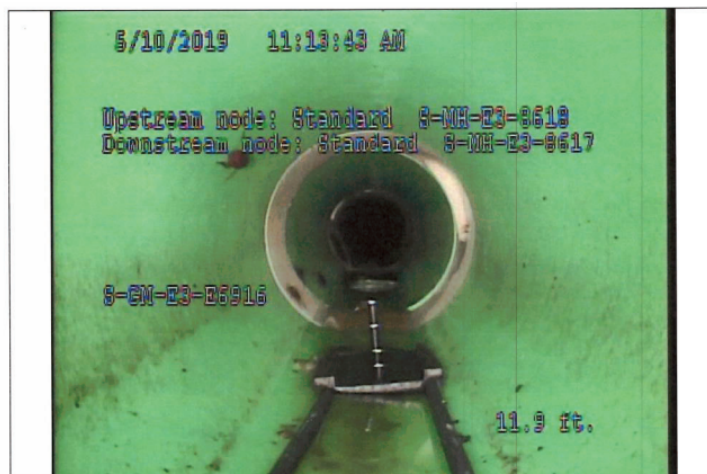
The video shall the display the following screen when an observation is recorded.

Line 1: Date/Time

Line 2: Start Manhole Number/End Manhole Number

Line 3: Observation Code – Observation Text Description

Line 4: Current Footage



PACP CODES:

AMH - All inspections shall start with AMH, or other appropriate code for access point. (Refer to PACP Reference manual page 7-13)

MSA - All inspections where a segment is abandoned due to a blockage, obstruction, or collapsed sewer shall end with this code, and a reverse inspection shall be attempted. (Refer to PACP Reference manual page 1-4, 8-2, and 8-7)

MGO - This code shall be used when additional remarks are necessary . . . such as, reverse inspection, re-inspected during low flow, segment excused by DPW. Also, any defects in Manholes, such as a hole in the trough shall be recorded as an MGO.

MWL - This code shall be used at the beginning of each survey to indicate the water level, and shall be used throughout the survey if the water level changes by 5% or more. (Refer to PACP Reference manual page 8-2)

MWM - This code shall be used when there is an obvious mark on the side of the sewer line, where the water regularly reaches. (Refer to PACP Reference manual page 8-2)

RBL - This code shall be used when roots have formed a mass and, in doing so, are restricting the flow. This code should be used when the cross-sectional area lost is greater than 50% INSIDE the service pipe connection ONLY (i.e. lateral or tap connections) (Refer to PACP Reference manual page 6-7)

RBC - This code shall be used when roots have formed a mass and, in doing so, are ' restricting the flow. This code should be used when the cross-sectional area lost is greater than 50% and the roots extend OUTSIDE the service pipe connection and into the main sewer pipe. (Refer to PACP Reference manual page 6-7)

RBB - This code shall be used when roots have formed a mass and, in doing so, are restricting the flow. This code should be used when the cross-sectional area lost is greater than 50% and the roots are ENTIRELY WITHIN the main sewer pipe. (Refer to PACP Reference manual page 6-7)

EXAMPLE SUMMARY TABLE:

	Date	Start MH	Stop MH	Total Pipe Length	Tot. Length	Quick main! rate	Quick struct rate	Section No
1	01/05/2020	0+00	3+15	315	314.01	0000	1100	1
2	01/05/2020	3+15	6+40	325	322.02	2211	3100	2
3	01/05/2020	6+40	9+40	300	301.01	0000	0000	3
4	01/05/2020	9+40	12+00	320	320.99	1300	1300	4

EXAMPLE OBSERVATION TABLE:

	Section No	Position	oc	Observation	Struct Gr	O+M Grade
1	4	0	AMH	Upstream Manhole, Survey Begins		
2	4	0	MWL	Water Level, 15 % of cross sectional area, from 05 to 07 o'clock		
3	4	22.24	TFA	Tap Factory Made Active, at 10 o'clock, 6", within 8 inch: NO		
4	4	38.47	CM	Crack Multiple, from 10 to 04 o'clock, within 8 inch: YES	3	
5	4	71.32	TFA	Tap Factory Made Active, at 03 o'clock, 6", within 8 inch: NO		
6	4	114.58	TFA	Tap Factory Made Active, at 03 o'clock, 6", within 8 inch: NO		
7	4	137.54	TFA	Tap Factory Made Active, at 03 o'clock, 6", within 8 inch: NO		
8	4	245.94	AMH	Downstream Manhole, Survey Ends		
9	5	0	AMH	Upstream Manhole, Survey Begins		
10	5	0	MWL	Water Level, 15 % of cross sectional area, from 05 to 07 o'clock		
11	5	10.01	TFA	Tap Factory Made Active, at 03 o'clock, 6", within 8 inch: NO		
12	5	51.02	MWM	Water Mark 10 % of cross sectional area		2
13	5	100.7	TFA	Tap Factory Made Active, at 03 o'clock, 6", within 8 inch: NO		
14	5	115.94	AMH	Downstream Manhole, Survey Ends		

SUBMITTAL CHECK LIST:

The following items shall be included in your submittal to JCSD before it will be processed for the Acceptance of Sewer into the JCSD.

_____ High capacity USB thumb drive(s) or a rectangular shaped hard drive or containing:

_____ WinCan database file (mdb),
_____ Video files (mp4), and
_____ Photo files (jpg).

(NOTE: VHS video tapes, CDs and DVDs will not be accepted)

_____ A hardcover white clear view 3-ring binder labeled as described in Section 4 .3 including the following items:

_____ Footage calibration report for each CCTV camera used.
_____ PACP Certificate copies of all operators.
_____ Summary table of all pipeline segments inspected with the following fields in the order listed:

Column 1: Date of Inspection
Column 2: Start Manhole GIS
Column 3: Stop Manhole GIS
Column 4: Total Pipe Length (per as-built plan)
Column 5: Feet CCTV'd Televised Length
Column 6: Quick Maintenance Rating (per PACP)
Column 7: Quick Structure Rating (per PACP)
Column 8: Section Number

(*NOTE: The table shall be sorted by Start Manhole)

_____ An observation table of all pipeline segments inspected with the following fields in the order listed:

Column 1: Section Number
Column 2: Position of Defect
Column 3: Observation Code (per PACP)
Column 4: Observation Description (per PACP)
Column 5: Structural Grade (per PACP)
Column 6: O&M Grade (per PACP)

(*NOTE: The table shall be sorted by Section Number)