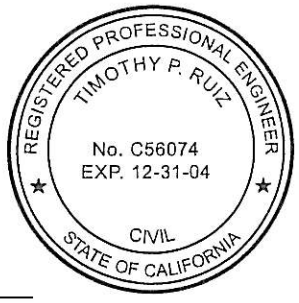
District Specifications
for
Sanitary Sewer System
and
Domestic Water System

for

EAST NILES
COMMUNITY SERVICES DISTRICT

Kern County, California



Timothy P. Ruiz, PE C56074
District Engineer

BK-E01-001-03
April 2003
(Revised March 2005)

BOYLE ENGINEERING CORPORATION
5001 E. Commercenter Dr., Ste. 100, Bakersfield, CA 93309

CONTENTS

GENERAL CONDITIONS

EAST NILES COMMUNITY DISTRICT

DISTRICT SPECIFICATIONS
FOR
SANITARY SEWER SYSTEM AND DOMESTIC WATER SYSTEM

GENERAL CONDITIONS

SECTION 1

DEFINITIONS, TERMS AND ABBREVIATIONS

1-1 DEFINITIONS

Whenever the following terms or abbreviations occur in these specifications, the meaning shall be interpreted as follows:

BOARD OF DIRECTORS OR BOARD – The Board of Directors of the East Niles Community Services District.

CONTRACT – The agreement executed between the Owner and the District covering the water and sanitary sewer system improvements to be constructed and to become a part of the District's facilities.

CONTRACTOR – The person, firm, or corporation constructing the water and sanitary system improvements for the Owner.

DAYS –- When used to designate a period of time, shall be in reference to consecutive calendar days.

DISTRICT – East Niles Community Services District, Kern County, California.

DISTRICT MANAGER – The Manager of East Niles Community Services District as designated by the Board.

ENGINEER, DISTRICT'S ENGINEER, DISTRICT'S REPRESENTATIVE – Boyle Engineering Corporation, 5001 E. Commercenter Drive, Suite 100, Bakersfield, California.

FINAL ACCEPTANCE – That formal action by the District accepting the work as fully completed after certification of full completion by the Inspector and/or Engineer and approval of the District Manager.

INSPECTOR – The Inspector employed by the District to perform inspection during construction of the work undertaken by the Owner.

LABORATORY – The laboratory designated by the Engineer and/or District to test materials and work involved in the contract.

LEGAL ADDRESS OF OWNER AND/OR CONTRACTOR – The address given on the Owner's permit is hereby designated as the place which all notices, letters or other communications to the Owner shall be mailed or delivered.

OWNER – The applicant or Subdivider installing or constructing the sanitary sewer system or water system for integration with the East Niles Community Services District sanitary sewer system or water system.

PERMIT – Authorization by the District in writing allowing the Owner and/or Contractor to do work within the District on sanitary sewer or water facilities. The Owner or Contractor shall have present the permit at the job site and shall present it if demanded by any District agent.

PLANS – The official plans, profiles, typical cross-sections, working drawings, detail drawings and supplemental drawings, or reproduction thereof, approved by the District, which show the locations, character, dimensions and details of the work to be done.

PROJECT, THE WORK – The entire public improvement proposed by the Owner to be constructed in whole or in part pursuant to the Contract.

SPECIFICATIONS – The directions, provisions, and requirements of by the District, pertaining to the method and manner of performing the work, and to the qualities and quantities of materials to be furnished under the contract.

STATE SPECIFICATIONS – The Standard Specifications, State of California, Department of Transportation, latest edition.

SUBCONTRACTOR – The person, firm or corporation supplying labor, or labor and materials at the site of the work as a part of the Contractor's obligation with the Owner and/or Contractor and District.

SURETY – The bondsmen or party or parties who may guarantee the fulfillment of the work or a portion of the work, by bonds, and whose signatures are attached to the bond.

1-2 TERMS

Whenever in the specification or upon the plans the words directed, required, permitted, ordered, designated prescribed or words of like import are used, it shall be understood that the direction, requirements, permission, order, designation, or prescription of the Inspector and/or Engineer is intended. Similarly the terms acceptable, satisfactory, or equal, or words of like import, shall mean acceptable to, or satisfactory to the Inspector and/or Engineer, unless otherwise expressly stated. The word provide shall be understood to mean furnish and install. It will be responsibility of the Owner to see that all provisions of these specifications are met either by the Owner himself or by his Contractor.

1-3 ABBREVIATIONS

Whenever the following abbreviations are used, they shall have the meanings indicated.

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AI	The Asphalt Institute
AISC	American Institute of Steel Construction
AISI	American Iron & Steel Institute
ANSI	American National Standards Institute (formerly USASI, USAS, ASA)
API	American Petroleum Institute
ASA	American Standards Association (Now ANSI)
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CRSI	Concrete Reinforcing Steel Institute
NBFU	National Board of Fire Underwriters

PCA	Portland Cement Association
State Specifications	California Standard Specifications, State of California, Department of Transportation, Division of Highways
SSPC	Steel Structures Painting Council
UBC	Uniform Building Code, Pacific Coast Building Officials Conference of the International Conference of Building Officials
UPC	Uniform Plumbing Code, as adopted by the International Association of Plumbing and Mechanical Officials

SECTION 2

DESIGN CRITERIA AND PLAN CHECKING

2-1 GENERAL

The following, subject to applicable statutes and ordinances of the District, is the procedure for an Owner to obtain approval for construction of water and sewer facilities to be dedicated for operation and maintenance by the East Niles Community Services District.

2-2 PRELIMINARY INVESTIGATION

It is recommended that the applicant meet with the District at the earliest possible date to determine whether the property to be developed is within the District boundaries. At this time, the availability of existing waterlines and sewer lines can also be reviewed. In some areas, a preliminary feasibility investigation and report may be necessary to establish that the District can serve the proposed development. All costs for such an investigation and report shall be borne solely by the Owner.

2-3 PRELIMINARY DESIGN CRITERIA

2-3.1 WATER

Minimum Size – The minimum pipe size for water mains shall be 8 inches in diameter unless specific approval is given by the District for such special conditions as may arise. On dead-end streets, the minimum size main shall be 8 inches to at least the last fire hydrant. All line sizing shall be based on maximum day demand plus fire flow.

Type of Pipe (Distribution Mains) – Only PVC C900, Class 150 or Class 200 is to be used for distribution mains.

Standard Location – Domestic water mains shall normally be located in the roadway 6 feet from the curb face with a minimum cover of 36 inches.

Water Valve Spacing – As a general rule, there should be two valves where one main ties into another. Where two mains cross, there should be three valves, and there shall be four valves at a major distribution point. On long blocks, intermediate valves should be installed so that only a maximum of 600 feet would have to be shut off at any one time.

When water mains pass through easements outside traveled streets, a valve should be located at each end of the easement. The final determination of valves and location should be per the District.

Pipeline High & Low Points and Ends of Main – Combination air release valves shall be installed at all high points in line as directed by District Engineer. Blowoffs shall be installed at end of main and low points where either the flow velocity or the slope of the line may cause sediment to settle in line.

Pipeline Connections – Each project or development shall have at least two connections to waterlines in different streets to form a looped water system. If connection to different streets is impractical or impossible in the opinion of the District, connections to a waterline in the same street will be permitted. Non-looped systems will be permitted only with the permission of the District.

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

Backflow preventive devices shall be installed by and at the expense of the water user, landowner or person requesting service as the case may be.

Water System Design – The water system shall be designed based on the following:

System Demand	Description
Residential – Domestic (3.5 persons per dwelling unit)	
Average	250 gpd per capita
Maximum Day	250% of average daily demand
Peak Hour	350% of average daily demand
Commercial	Varies (Depending on Type)

All line sizing is based on maximum day demand plus fire flow.

In general, private water systems are unacceptable to the District. The Owner shall consult with the District prior to designing any private water system to ascertain if such a system is acceptable to the District.

2-3.2 SEWER

Flows Acceptable and Not Acceptable – The District shall accept flows from the following plumbing fixtures, unless unusual circumstances prevent the District from doing so:

Toilets, urinals, bidets, sinks for domestic faucets, showers, bathtubs, connections for dishwashers, drinking fountains, domestic washing machines and garbage disposals.

Flows which shall not be discharged into the sewerage system and are not acceptable to the District are flows other than sewage, which shall include, but shall not be limited to, any and all liquid or solid waste substance not sewage, from any producing, manufacturing, processing, commercial, or institutional operation of whatever nature. Plumbing fixtures or sources hereafter set forth shall not be discharged into the District's sewer system without specific written permission from District Manager.

All piping from commercial-industrial processing to the sewers.

All floor or stall drains, other than domestic showers.

Swimming pools, ponds, etc., which empty into the sewer system.

Brine from home regenerating water softeners.

Establishments included under the above requirements include, but are not limited to:

Gas stations, car washes, garages, laundromats, etc.

Restaurants, hotels, motels and shopping areas.

The District may require traps, interceptors, pretreatment or other devices on all outlets which may discharge grease, oil, sand or waste material of any kind of a composition or quality deemed harmful by the District.

Pipeline Criteria – Pipeline design shall be based on peak flows and on Manning's formula using coefficient of "n" = 0.013. Flows shall be based upon an average of 100 gallons per person per day.

Design peak flows in pipelines 12 inches in diameter and smaller shall be limited to an approximate liquid depth to pipe diameter ratio of 0.50.

Design peak flow in pipelines 15 inches in diameter and larger to be limited to an approximate liquid depth to pipe diameter ratio of 0.75.

Minimum pipeline diameter to be 8 inches.

Minimum pipeline grades:

Pipe Size Inches	Minimum Grade %
8	0.40
10	0.28
12	0.22
15	0.16
18	0.12
21	0.10
24	0.08

Minimum radius of curvature in feet:

	Length of Pipe Joint				
Nominal Pipe Size Inches	6 feet	5 feet	4 feet	3 feet	2 feet
8-12	175	150	125	85	57
15-24	230	190	150	115	76
27-39	340	235	230	172	114

Pipeline Location – Whenever possible the pipe is to be located 5 feet off the street centerline in the driving lane on the opposite side of the centerline from the water main. In major or secondary highways pipe shall be located in the center of the driving lane nearest to the center of the street. Pipe will not be located in median strips or parking lanes. However, in all cases the pipeline location shall comply with applicable county and state requirements.

Minimum Depth – Minimum depth from finish street grade to top of sewer main pipe shall be 6 feet.

Manhole Criteria – Manhole locations are at:

Changes of slope in sewers.

Changes of direction of sewers.

Junctions of main sewers.

Termination of sewers.

Junction of sewer and lateral if lateral is same size as main sewer.

Pipe size change.

Other locations specified by the District.

Maximum manhole spacing shall be 400 feet.

Allowable head losses in manholes:

Straight run through manholes based on 0.00 foot loss.

Right angle turn in manholes based on 0.5 velocity head loss, or 0.10 foot, whichever is greater.

Invert elevation at manholes shall be calculated and shown projected to the centerline of the manhole. Should there be any drop in elevation, the invert elevation "IN" and the direction, N, S, E, or W, and invert elevation "OUT" and the direction shall be shown. Should the pipeline be joining a sewer of larger diameter, the smaller pipe shall have its crown elevation equal to or higher than the crown elevation of the larger sewer.

Selected material for bedding will be required by the District when siltstone, sandstone or rocky conditions are encountered in the pipe zone or as determined by the District.

Sewer line distance shown in profile is the horizontal distance measured from centerline of manhole to centerline of manhole. Surveyor to stake the locations of all wye fittings. All house laterals not normal to street sewer to have the end of lateral at property line staked and tied to a property corner as shown on plans.

In order to prevent accidental use of the new sewer prior to completion and acceptance, the inlet (or outlet) to existing tie-in manholes shall be sealed with broken brick and mortar. Installation of these plugs shall be approved by the District. Plugs shall be removed at the time of final inspection.

Horizontal Separation – The District, in accordance with State of California, Department of Health Services regulations requires a 10-foot minimum horizontal separation between sewer and water mains.

Vertical Separation – Whenever a sanitary sewer, including house laterals, must cross a pressure water main, the water main shall be at least one foot above the sanitary sewer where they cross.

If the sewer is above the water main, one of the following special construction procedures shall extend a sufficient distance on both sides of the crossing to provide 10 feet of horizontal clearance from the water main. If the sewer is located below the water main and within a vertical distance of 1-foot clearance distance, the special construction shall extend a sufficient distance on both sides of the crossing to provide 4 feet of horizontal clearance with the water main.

1. Vitrified clay pipe within a continuous steel casing which shall have a minimum thickness of 1/4-inch and all voids between sewer pipe and casing pressure grouted with sand-cement grout.

2. Class 150 or heavier cast-iron pipe with hot dip bituminous coating and approved mechanical joints.

3. Water main shall be Class 200 AWWA C-900 PVC pipe.

2-4 PLAN CHECKING

2-4.1 PREPARATION

All water and sewer plans must be prepared under the direct supervision of a registered civil engineer licensed to practice in the State of California. This requirement must be attested to by the Engineer's signature on the plans. The water design criteria and plan checking shall be under the direct control and jurisdiction of the District Engineer or other person whom may be designated from time to time.

2-4.2 PRELIMINARY ENGINEERING PLANS/PLAN CHECKING AND INSPECTION DEPOSIT

Upon completion of the improvement plans, the Owner will submit three (3) copies of plans signed by the Owner's engineer to the District, to be forwarded to the District Engineer for plan checking. The Owner shall at that time make a deposit of the amount specified in the Contract to cover the cost of plan checking and inspection. In the event the plan checking and inspection does not require all of such deposit, then the balance there will be refunded to the Owner. If the plan checking and inspection costs exceed the amount so deposited, the Owner shall forthwith deposit a sum sufficient to cover such deficiency.

2-4.3 PLAN APPROVAL/CONNECTION FEES

Prior to approval of the final water and sewer plans by the District, the applicant shall make a deposit with the District of the prescribed connection fees based on the number of water and sewer service connections.

2-4.4 COPIES OF THE PLANS

Prior to the start of construction, two (2) sets of approved plans shall be furnished to East Niles Community Services District and one (1) set of same to District Engineer.

2-4.5 TIME PERIOD – SIGNED PLANS VALID

Approval of plans by the District will be valid for only one year from date of District approval. If construction has not started within one year from date of approval, the approval shall be "null and void." District will then require the plans be rechecked.

2-4.6 EASEMENTS

In case an easement(s) is required for construction and/or maintenance of sewer and water lines, the minimum width shall be 20 feet unless otherwise determined in writing by the District Engineer. However, there may be instances where easements of a greater width are required which will be determined by the District.

The easement shall be located on one lot and in no case will the District accept an easement split upon two lots. Easements shall be granted and executed prior to approval of the improvement plans. The form of the grant of easement document the subordination agreement, if applicable, shall be similar to the forms shown in the appendix. Such easements shall be granted or obtained at no expense to District.

2-5 CONTRACT/PLAN APPROVAL

The contract between the Owner and the District covering the sanitary sewer and water system improvements shall be executed prior to District approval of the water and sewer improvement plans.

SECTION 3

CONSTRUCTION AND INSPECTION

3-1 GENERAL

The Contractor shall furnish all transportation, materials, equipment, labor and supplies to complete excavation, backfills, street repairing and all other work incidental to the construction of the water mains or sanitary sewer mains and appurtenances.

3-2 GOVERNING SPECIFICATIONS

All facilities to be dedicated to the District shall be constructed in accordance with the District Specifications and the rules and regulations of the District. The rules and regulations, as adopted from time to time, are hereby made a part of these specifications.

3-3 CONNECTION TO EXISTING FACILITIES

No connection shall be made to existing facilities of the District without prior approval and inspection by representatives of the District.

3-4 NOTICE

Notice shall be given to the District at least two working days in advance of commencement of work.

3-5 PERMITS

The Owner shall secure all excavation permits and all licenses, pay all charges and fees, and give all notices as necessary and required for the work. These shall be filed with the District prior to commencement of work.

3-6 CONSTRUCTION WATER

Water used for construction, testing and dust control shall be arranged for and furnished by the Owner at his expense. The Owner shall comply with all regulations of the District relative to connection to fire hydrants.

3-7 INSPECTION

All work shall be subject to inspection by the District and shall be left open and uncovered until the installation is approved by appropriate District authority.

The Owner or his Contractor shall not proceed with any subsequent phase of work until the previous phase has been inspected and approved by the District and other Public Agencies having jurisdiction.

The District shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining full knowledge respecting the progress, workmanship and character of materials used and employed in the work.

No pipe, fittings or other material shall be installed until inspected and approved by the District. Installations which are to be backfilled shall be inspected and approved by the District prior to backfilling, and the Owner shall give due notice in advance of backfilling to the District so that proper inspection may be provided.

The inspection of the work by the District shall not relieve the Owner of his obligation to complete the work as prescribed by the District Specifications. Defective work shall be made good, and unsuitable materials may be rejected notwithstanding the fact that such defective work and unsuitable materials have been previously overlooked by the District and accepted. The installation and inspection of unsuitable materials

shall not be construed as acceptance, and modification to these specifications shall only be made by the District in writing.

All construction shall be done in compliance with the standards as established by the Occupational Health and Safety Act (OSHA) and appropriate State of California regulations.

3-8 RECORD DRAWINGS

The Owner shall provide one (1) complete set of record drawings in black water proof drawing ink on reproducible film (3-mils double matte) of the size 22 inches by 36 inches to the District upon completion of construction. The record drawings shall show all changes in work constituting departures from the original contract drawings.

SECTION 4

CONTROL OF MATERIAL

4-1 QUALITY OF MATERIALS

All equipment, materials and supplies to be incorporated in the work shall be new unless otherwise specified. Unless otherwise specifically provided for in the specifications all workmanship, equipment, material and articles incorporated in the work covered by the contract are to be of the best available grade of their respective kind. Whenever in the specifications any material, process or article is indicated or specified by grade, patent or proprietary name, or by name of manufacture, such specification shall be deemed to be used for the purpose of facilitating description of the materials, process or articles desired, and shall be deemed to be followed by the words "or equal", and the Owner may offer any material or process which shall be substantially equal or better in every respect to that so indicated or specified; however, that if the material or process or article offered by the Owner is not, in the opinion of the Engineer, substantially equal or better in every respect to that specified, then the Owner must furnish the material, process or article specified or one that in the opinion of the Engineer is the substantial equal or better thereof in every respect.

4-2 SAMPLES AND TESTS

All tests of materials furnished by the Owner shall be made in accordance with commonly recognized standards of national organizations and such special methods and tests as are prescribed in the specifications. The Owner shall furnish such samples of materials as are requested by the Inspector without charge. No material shall be used until it has been approved by the Inspector. Samples will be secured and tested whenever necessary to determine the quality of material.

The Owner shall furnish the District in triplicate, certified copies of all required factory and mill test reports. Any materials shipped by the Owner from a factory or mill prior to having satisfactorily passed such testing ad inspection by a representative of the District shall not be incorporated in the work, unless the Inspector shall have notified the Owner in writing that such testing and inspection will not be required.

4-3 DEFECTIVE MATERIALS

All materials not conforming to the requirements of the specifications shall be considered as defective and all such materials, whether in place or not, shall be rejected and shall be removed immediately from the site of the work unless otherwise permitted by the Inspector or Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used until approved in writing by the Inspector or Engineer. Upon failure on the part of the Owner to comply with any order of the District made under the provisions of this article, the District shall have authority to remove and replace defective material at the expense of the Owner.

4-4 STORAGE OF MATERIALS

All materials for use in the work shall be stored in such a manner as to prevent damage from exposure to the elements or from any other cause. The Owner shall be fully responsible for any damage incurred to the materials for the work while being stored, including damage resulting from storing of material in public right-of-way and District acquired easements. The Owner shall also be fully responsible for the preservation of public and private property while storing materials for the work.

SECTION 5

USE OF COMPLETED PORTIONS

When the work or any portion of it is sufficiently complete to be utilized or placed into service, the District shall have the right upon written notification to the Owner to utilize such portions of the work and to place the operable portions into service and to operate same.

Upon said notice of commencement of utilization or operation by the District, the Owner shall be relieved of the duty of maintaining the portions so utilized or placed into operations; provided, however, that nothing in this article shall be construed as relieving the Owner of the full responsibility for completing the work in its entirety, for making good defective work and materials, for protecting the work from damage, and for being responsible for damage and such action shall not relieve the Owner, his Sureties, or insurers of the provisions of the section on INSURANCE REQUIREMENTS.

SECTION 6

LEGAL RELATIONS AND RESPONSIBILITIES

6-1 OBSERVING LAWS AND ORDINANCES

The Owner shall keep himself fully informed of all existing laws, ordinances and regulations which in any manner affect those engaged or employed in the work or the materials used in the work or which in any way affect the conduct of the work and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over same.

If any discrepancy or inconsistency is discovered in the plans, specifications or contract for the work in relation to any such law, ordinance, regulation, order or decree, he shall immediately report the same to the District Manager.

The Owner shall at all times observe and comply with and shall cause all his agents, employees, contractors, subcontractors, and their employees, and suppliers to observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees and shall hold harmless, indemnify and defend the District, the Engineer and each of their directors, officers, employees and agents against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree by the Owner, his employees, agents, contractors and their employees, or suppliers.

6-2 INVENTIONS, PATENTS AND COPYRIGHTS

The Owner shall pay all royalties and assume all costs arising from the use of any invention, design, process, materials, equipment, product or device which is the subject of patent rights or copyrights.

The Owner shall hold harmless, indemnify and defend the District, the Engineer, and their consultants, and each of their directors, officers, employees and agents from and against all claims, damages, losses, expenses and other costs, including costs of defense and attorney's fees, arising out of any infringement of patent rights or copyrights incident to the use in the performance of the work or resulting from the

incorporation in the work of any invention, design, process, materials, equipment, product or device and shall defend all such claims in connection with any alleged infringement of such rights.

6-3 PUBLIC CONVENIENCE AND SAFETY

The Owner shall so conduct his operations as to offer the least possible obstruction and inconvenience to the public, have under construction no greater length or amount of work than he can prosecute properly with due regard to the rights of the public.

Convenient access to driveways, houses and buildings along the line of work shall be maintained and temporary crossings shall be provided and maintained in good condition. Not more than one crossing or intersecting street or road shall be closed at any one time.

The Owner shall provide and maintain such fences, barriers, directional signs, lights and flagmen as are necessary to give adequate warning to the public at all times of any dangerous conditions to be encountered as a result of the construction work and to give directions to the public.

6-4 RESPONSIBILITY FOR LOSS, DAMAGE OR INJURIES

The Owner shall be responsible for all claims, demands or liability from any cause arising out of or resulting from or in connection with the performance of the work, excepting only those as may be caused solely and exclusively by the fault or negligence of the District, the Engineer, or their consultants, or their directors, officers, employees and agents. Such responsibility shall extend to claims, demands, or liability for loss, damage or injuries occurring after completion of the work as well as during the progress of the work and shall include claims by the contractor employees, or subcontractors or their employees.

6-5 RESPONSIBILITY FOR THE WORK

Until the acceptance of the work, the Owner shall have the responsible charge and care of the work and of the materials to be used therein (including materials which have been furnished by the District) and shall bear the risk of injury, loss or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the nonexecution of the work.

The Owner shall rebuild, repair, restore and make good all injuries, losses or damages to any portion of the work or the materials occasioned by any cause before its completion and acceptance and shall bear the expense thereof. Where necessary to protect the work or materials from damage, the Owner shall at his expense, provide suitable drainage and erect such temporary structures as are necessary to protect the work or materials from damage. The suspension of the work or the granting of an extension of time from any cause whatever shall not relieve the Owner of his responsibility for the work and materials as herein specified.

6-6 PRESERVATION OF PROPERTY

The Owner shall exercise due care to avoid injury to existing improvements or facilities, utility facilities, adjacent property, and trees and shrubbery that are not to be removed.

All trees, shrubbery and landscaping that are not to be removed, and pole lines, fences, signs, survey markers and monuments, buildings and structures, conduits, pipelines under or above ground, sewer and waterlines, all highways or street facilities, and any other improvements or facilities within or adjacent to the work shall be protected from injury or damage, and the Owner shall provide and install suitable safeguards to protect such objects from injury or damage. If such objects are injured or damaged by reason of the Owner's operation, they shall be replaced or restored at the Owner's expense to a condition as good as when the Owner entered upon the work or as good as required by the plans and specifications if any such objects are a part of the work being performed.

The fact that any such pipe or other underground facility is not shown on the plans shall not relieve the Owner of his responsibility under this article.

In addition to any requirements imposed by law, the Owner shall shore up, brace, underpin and protect as may be necessary, all foundations and other parts of all existing structures adjacent of and adjoining the site of the work which are in any way affected by the excavations of other operations connected with the performance of the work. Whenever any notice is required to be given by the Owner to any adjacent or adjoining landowner or other party before commencement of any work, such notice shall be given by the Owner.

In an emergency affecting the safety of life or property, including adjoining property, the Owner, without special instructions or authorizations, is authorized to act at his discretion to prevent such threatened loss or injury.

Notwithstanding the foregoing provisions of this article, the Owner shall not be responsible for the cost of repairing or restoring damage to the work, which damage is determined to have been proximately caused by an Act of God, in excess of 5% of the contracted amount, provided that the work damaged is built in accordance with accepted and applicable building standards and the Plans and Specifications. For the purposes of this paragraph, "Acts of God" shall include only the following occurrences or conditions and effect: earthquakes in excess of a magnitude 3.5 on the Richter Scale, wind storms and floods.

6-7 SAFETY

In accordance with generally accepted construction practices, the Owner and Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons and property during performance of the work, and the Owner and Contractor shall full comply with all state, federal and other laws, rules, regulations and orders relating to safety of the public and workers.

The right of the Engineer and/or Inspector to conduct construction review or observation of the Owner and Contractor's performance will not include review or observation or the adequacy of the Owner and Contractor's safety measures in, on or near the construction site.

6-8 PERSONAL LIABILITY

Neither the Board of Directors, the District Manager, Inspector and the Engineer, nor any other officers or agents of the District shall be personally responsible for any liability arising under or by virtue of any agreement or contract between the Owner and the Contractor.

6-9 INDEMNITY

To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the District, the Engineer and their consultants, and each of their directors, officers, agents and employees from and against all claims, damages, losses, expenses and other costs, including costs of defense and attorney's fees, arising out of or resulting from or in connection with the performance of the work, both on and off the jobsite, provided that any of the foregoing (1) is attributable to personal injury, bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself), including the loss of use resulting therefrom and (2) is caused in whole or in part by any act or omission of the Owner, the Contractor, if different from the Owner, any subcontractor, any supplier, anyone directly or indirectly employed by any of them or anyone for whose acts or omissions any of them may be liable, regardless of whether or not it is caused in part by any act or omission (active, passive or comparative negligence included), of a party indemnified hereunder.

In any and all claims against the indemnified parties by any employee of the Owner, the Contractor, any subcontractor, any supplier, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under the first and fourth paragraphs in this article on INDEMNITY shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Owner, the Contractor, or any subcontractor, or any supplier or other person under worker's compensation acts, disability benefit acts or other employee acts.

The obligations of the Owner under the first and fourth paragraphs in this article on INDEMNITY shall not extend to the liability of the Engineer, their consultants, and each of their directors, officers, employees, and agents, arising out of or resulting from or in connection with the preparation or approval of maps, drawings, opinions, reports, surveys, designs or specifications, providing that the foregoing was the sole and exclusive cause of the loss, damage or injury.

The Owner shall also indemnify and hold harmless the District, the Engineer and their consultants, and each of their directors, officers, employees and agents from and against all losses, expenses, damages (including damages to work itself), attorney's fees and other costs, including all costs of defense, which any of them may incur with respect to the failure, neglect, or refusal of Owner to faithfully perform the work and all of the Owner's obligations under the Contract. Such costs, expenses and damages shall include any cost, including attorney's fees, incurred by the indemnified parties in any lawsuit to which they are a party.

6-10 WARRANTY OF TITLE

No materials, supplies or equipment for the work under this contract shall be purchased subject to any chattel mortgage or under a conditional sales contract or other agreement by which an interest therein or any part thereof is retained by the seller or supplier. The Owner warrants clear and good title to all materials, supplies and equipment installed and incorporated in the work and agrees upon completion of all work to deliver the premises together with all improvements and appurtenances constructed or placed thereon by him to the District free from any claims, liens, encumbrances or charges and further agrees that neither he nor any person, firm or corporation furnishing any materials or labor for any work covered by the Contract shall have any right to a lien upon the premises or any improvements or appurtenances thereon, provided that this shall not preclude the Owner from installing metering devices of other equipment of utility companies or of municipalities, the title of which is commonly retained by the utility company or the municipality. Nothing contained in this article, however, shall defeat or impair the right of such persons furnishing materials or labor under any bond given by the Owner for their protection, or any right under any law permitting such persons to look to funds due the Owner in the hands of the District. The provisions of this article shall be inserted in all subcontracts and material contacts, and notices of its provision shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

6-11 TERMINATION FOR BREACH

If the Owner refuses or fails to prosecute the work or any separable part thereof with such diligence as will insure its completion within the time specified in the permit, or any extension thereof, or fails to complete such work within such time, or if the Owner should be adjudged bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he or any of his subcontractors should violate any of the provisions of the permit, the District may serve written notice upon the Owner and his surety of its intention to terminate the permit, said notice to contain the reasons for such intention to terminate the Contract, and unless within ten (10) days after the service of such notice such violations shall cease and satisfactory arrangements for the corrections thereof be made, the permit shall, upon the expiration of said ten (10) days, cease and terminate.

In the event of any such termination, the District shall immediately serve written notice thereof upon the Surety, the Owner, and the Surety shall gave the right to take over and perform the work, providing, however, that if the Surety within fifteen (15) days after the serving upon it of a notice of termination does not give the District written notice of its intention to take over and perform the Contract, or does not commence performance thereof within thirty (30) days from the date of serving said notice, the District may take over the work and prosecute the same to completion by Contract or by any other method it may deem advisable for the account and at the expense of the Owner, and his Surety shall be liable to the District may take over the work and prosecute the same to completion by Contract or by any other method it may deem advisable for the account and at the expense of the Owner, and his Surety shall be liable to the District for any excess cost or other damage occasioned the District hereby, and in such event the District may, without liability for so doing, take possession of and utilize in completing the work such materials, appliances, plants and other property belonging to the Owner that may be on the site of the work and be necessary therefor.

The foregoing provisions are in addition to and not in limitation of any other right or remedies available to the District and shall not be construed as requiring any action whatsoever on the part of the District.

6-12 NOTICE AND SERVICE THEREOF

Any notice required shall be in writing, be dated and signed by the party giving such notice or his duly authorized representative, and be served as follows:

If to the District, by personal delivery or by deposit in the United States mail.

If to the Owner, by personal delivery to the Owner or to his authorized representative at site of the project or by deposit in the Unites States mail.

If to the Surety or any other person, by personal delivery to said Surety or other person or by deposit in the United States mail.

All mailed notices shall be in sealed envelopes, shall be sent by certified mail with postage prepaid and shall be addressed to the addresses in the Contract documents or such substitute addresses which a party designates in writing and serves as set forth herein.

6-13 GUARANTEES

Upon acceptance of the sewer or water system, the Owner shall be responsible for all repairs for any portion of said system which requires repair within one year from the date of acceptance whether repairs are completed during said period so long as Owner is notified of the necessity of said repairs during the period. Owner shall repair and replace any and all such work that may prove defective in workmanship without expense whatsoever to the District, ordinary wear and tear and unusual abuse or neglect expected. In the event of failure to comply with the aforementioned conditions, the District is hereby authorized to proceed to have the defects repaired and made good at the expense of the Owner, who herby agrees to pay the cost and charges therefore immediately upon demand. This article does not in any way limit the guarantee on any items for which a longer guarantee is specified or on any items for which a manufacturer or supplier gives a guarantee for a longer period. The Contractor and Owner agree to act as a co-guarantor with such manufacturer or supplier and shall furnish the District all appropriate guarantee or warranty certificates upon completion of the project. No guarantee period, whether provided for in this article or elsewhere, shall in any way limit the liability of Owner or his sureties or insurers under the indemnify or insurance provisions of these General Conditions.

SECTION 7

INSURANCE REQUIREMENTS

7-1 GENERAL

Construction shall not commence, or continue, until or unless there is in full force and effect all required insurance. The Owner shall not permit any Contractor or subcontractor to perform work on this project unless the Worker's Compensation, Performance and Payment Bond and Liability Insurance requirements have been complied with.

Worker's Compensation Insurance and Liability Insurance shall be maintained in effect for the full guarantee period.

Insurers must be authorized to do business and have an agent for service of process in California and have an "A" policyholder's rating and a financial rating of at least Class XI in accordance with the most current Best's Rating.

As evidence of specified insurance coverage, the Owner shall provide certificates of insurance and endorsements to the District in accordance with and on the form set forth in the appendix hereto. No alteration or substitution of said form in these District Specifications will be allowed.

7-2 WORKER'S COMPENSATION INSURANCE

The Owner shall provide a certificate (s) of insurance certifying that his Contractor has obtained for the period of the contract full Worker's Compensation Insurance coverage for all persons whom he employs or may employ in carrying out the work under the contract. This insurance shall be in strict accordance with the requirements of the most current and applicable state Worker's Compensations Insurance laws.

7-3 LIABILITY INSURANCE

The Owner shall provide a certificate(s) of insurance showing his Contractor has the Liability Insurance coverage stated in the Contract.

Included in such insurance shall be contractual coverage sufficiently broad to insure the matters set forth in the article entitled "INDEMNITY" in the General Provisions except those matters set forth in the fourth paragraph thereof.

Included in such insurance shall be a "Cross Liability" or "Severability of Interest" clause.

The Liability Insurance coverage shall include each of the following types of insurance:

A. General Liability

(1) Comprehensive Form
(2) Premises-Operations
(3) Explosion and Collapse Hazard
(4) Underground Hazard
(5) Products/Completed Operations Hazard
(6) Contractual Insurance
(7) Broad Form Property Damage Including Completed Operations
(8) Independent Contractors
(9) Personal Injury

B. Automobile Liability

(1) Comprehensive Form Including Loading and Unloading
(2) Owned
(3) Hired
(4) Non-Owned

The Liability Insurance shall include as additional insureds: the District, the District's Engineer and their consultants, all other District consultants, and each of their directors, officers, agents and employees. The insurance afforded to these additional insureds shall be primary insurance. If the additional insureds have other insurance which might be applicable to any loss, the amount of the insurance provided under this article on LIABILITY INSURANCE shall not be reduced or prorated by the existence of such other insurance.

SECTION 8

CONSTRUCTION SECURITY

8-1 GENERAL

All bonds, when required by the District and/or by ordinance, shall be secured from a surety company or companies satisfactory to the East Niles Community Services District and whose name is on file with the County Clerk of Kern County as an approved and financially sound surety company, authorized to transact business in this state.

The bonds shall meet all of the requirements and contain all of the conditions required by Section 4200 to 4205, inclusive, of the Government Code of the State of California. The performance and payment bond shall continue in full force and effect for the guarantee period.

The Owner shall submit copies of proposals received from Contractor(s) for the construction of the improvements or other evidence satisfactory to the District to establish the project construction costs for purposes of bonding.

8-2 PERFORMANCE BOND

The Owner shall furnish a performance bond in the amount of one hundred percent (100%) of the construction cost to the benefit of the District, as security for the faithful performance of the work in compliance with the District ordinances, regulations, plans and specifications.

8-3 PAYMENT BOND

The Owner may furnish a separate bond in an amount at least to hundred percent (100%) of the project construction cost to the benefit of the District, as security for the payment of all persons performing labor and furnishing materials in connection with the Contract.

CONTENTS

STANDARD SPECIFICATIONS

STANDARD SPECIFICATIONS
FOR
EARTHWORK

A GENERAL DESCRIPTION

Earthwork shall consist of performing operations necessary to complete all excavation, preparation of subgrade, ditching, structural excavation, trenching, backfill compacting, sloping, trimming the subgrade, and finish grading; all as shown on the Plans or contained in the Specifications.

Earthwork shall also include all clearing and grubbing, removal and disposal of paving, removal of water, excavation of all classes of earth and rock regardless of character and subsurface conditions and disposal of all excess excavation.

A-1 SCOPE OF WORK

The work includes furnishing all services, labor, materials, equipment and perform all operations in connection with all earthwork necessary for the construction of the improvements indicated on the Plans and in the Specifications.

A-2 EARTHWORK IN STATE, COUNTY AND CITY RIGHTS-OF-WAY

Earthwork within the rights-of-way of the State of California, Department of Transportation; the County Road Department; and on City of Bakersfield property shall be done in accordance with requirements and provisions of the permits issued by those agencies for the construction within their respective rights-of-way. Such requirements and provisions, where applicable, shall take precedence and supersede the provisions of the specifications contained herein.

A-3 SAFETY PRECAUTIONS

All excavations shall be performed, protected and supported as required for safety and in the manner set forth in the operating rules, orders and regulations prescribed by the Division of Industrial Safety of the State of California. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrian and vehicular traffic of such excavations.

A-4 BRACING EXCAVATIONS

All excavations shall be properly supported in the manner prescribed by the rules, orders and regulations of the Divisions of Industrial Safety of the State of California. Excavations shall be so braced, sheeted and supported that they will be safe and the ground alongside the excavation will not slide or settle, and all existing improvements of any kind, either on public or private property, will be fully protected from damage. If any damage does result to such improvements, the Owner, at his own expense, shall make the necessary repairs or reconstruction required as directed by the Engineer.

Excavations shall be so braced or sheeted so as to provide conditions under which workmen may work safely and efficiently at all time. The sheeting, shoring and bracing shall be so arranged as not to place any stress on portions of the completed work until the general construction thereof has proceeded far enough to provide ample strength. Any damage to structures occurring through settlements, water or earth pressures, slides, caves or other causes due to failure or lack of sheeting or bracing or improper bracing or through negligence or fault of the Owner or his Contractor in any other manner, shall be repaired before acceptance by the District.

Where timber sheeting extends below the invert of the pipe, it shall be cut off at the top of the pipe and the upper portion removed without harming the support conditions. This requirement will not be necessary where steel sheeting is used for shoring below the invert of the pipe.

Care shall be exercised in the drawing or removing of sheeting, shoring, bracing and timbering to prevent the caving or collapsing of the excavation faces which are being supported. All expenses of sheeting and shoring as herein specified shall be included in the various contract prices and no additional allowance will be made therefor.

A-5 OPEN EXCAVATIONS AND STOCKPILING

Open excavations and stockpiles shall be controlled in a manner to prevent water running into excavations. Obstruction of surface drainage shall be avoided and means shall be provided whereby storm and wastewater can flow uninterruptedly in existing or established flowage courses, other surface drains, or temporary drains. Material for backfill or for protection of excavation in public roads from surface drainage shall be neatly placed and kept shaped so as to cause the least possible interference with public travel. Free access must be provided to all fire hydrants, water valves, meters, private drives, roads or existing access routes. Adequate barricades and lighting shall be provided by Owner to protect all persons from said open excavations.

A-6 SELECTED MATERIAL FOR PIPE BEDDING AND PIPE ZONE

Selected material for pipe bedding and pipe zone backfill shall be selected native material free from clods, stick, vegetation, chunks of asphalt paving, or other deleterious materials and shall be free of rocks or stones which are larger than 3/4-inch in greatest dimension.

A-7 SAND

If sand is to be used for pipe bedding or pipe zone, it shall be free from foreign materials such as rocks, sticks, vegetation, etc., and shall meet the following gradation:

Sieve Size	Percentage Passing (By Weight)
3/8-inch	100
No. 4	75 - 100
No. 30	12 - 50
No. 100	5 - 20
No. 200	0 - 10

A-8 AGGREGATE FOR PIPE BEDDING FOUNDATION

If aggregate is required for pipe bedding foundation, it shall be No. 67 crushed aggregate as defined by ASTM D 448 and shall be free from foreign and organic matter.

A-9 OBSTRUCTIONS

All underground improvements may or may not be shown on the plans. The Owner and his Contractor shall preserve and protect any such improvements whether shown on the plans or not. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute the work, they shall be removed, maintained in operation, and permanently replaced by the Owner at his expense.

A-10 COMPACTION TESTS

Compaction shall be tested in accordance with the methods specified by the ASTM D1557 when the Inspector and/or Engineer feel it is necessary.

Backfill of excavations within the rights-of-way of City streets, County streets and State highways shall be done in accordance with the requirements and to the satisfaction of the Road Department of the City, County and the State Division of Highways, respectively.

The Owner or his Contractor shall make all necessary excavations for compaction tests as directed by the Inspector and/or Engineer.

A-11 CORRECTION OF FAULTY GRADES

Where excavation is inadvertently carried below subgrade and/or foundation elevations due to the Contractor's actions, suitable provision shall be made at the expense of the Contractor for adjustment of the subgrade. It shall be the responsibility of the of the Contractor to restore the subgrade or foundation to a condition similar to the condition existing prior to the over-excavation and be means acceptable to the Engineer.

A-12 CLEARING AND GRUBBING

All trees, brush, roots and other perishable and objectionable material shall be removed from the project.

The ground surface of all areas where material is to be excavated or where embankments, stockpiles, fills or structures are to be placed, shall be cleared of all vegetation and rubbish, and all brush, roots and tree roots shall be grubbed and removed from such areas. All cleared and grubbed areas shall be maintained free from vegetal growth.

Organic material from clearing and grubbing operations will not be incorporated in pipe backfill.

A-13 BLASTING AND EXPLOSIVES

Written permission of the Engineer shall be obtained prior to any blasting or use of explosives. Explosives, if used, shall be of such quantity and power and shall be used in such locations so as to minimize opening of seams and disturbing of the material outside the prescribed limits of excavation. As excavation approaches its final limits, the depths of holes for blasting and the quantity of explosives used for each hole shall be reduced so that the underlying or adjacent material will be disturbed or shattered as little as possible.

Extreme care shall be exercised when blasting in the vicinity of existing structures, utilities or construction facilities of others.

All blasting shall be done in conformance with the provisions of the Construction Safety Orders of the California Department of Industrial Safety, California Administrative Code, Article 5, Title 8.

A-14 DEWATERING

The Contractor shall provide and maintain at all times during construction ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. Said methods may include well points, sump pumps, suitable rock or gravel placed below the required bedding for drainage and pumping purposes, temporary pipelines and other means, all subject to the approval of the Engineer.

Dewatering for structures and pipelines shall commence when groundwater is first encountered and shall be continuous until such times as water can be allowed to rise in accordance with the provisions of this section. 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.

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

B PIPELINE AND TRENCH EARTHWORK

B-1 GENERAL

Work in connection with pipeline and trench earthwork shall include but not be limited to any or all of the following described operations: clearing; excavation of all classes and of whatever substance encountered; backfilling; fine grading; preparation of right-or-way; subgrade for pipe and structures; and paving and performing any other similar, incidental, or appurtenant earthwork operation which may be necessary to properly complete the work indicated.

B-2 EXCAVATION FOR PIPE TRENCHES

Trenches for pipelines shall be excavated to the lines and grades shown on the drawings, as provided in these specifications.

B-3 TRENCH WIDTH

The overall trench width shall not be more than 16 inches or less than 12 inches wider than the largest outside diameter of the pipe to be laid therein, measured at a point 12 inches above the top of the pipe. Excavating and retrenching shall be true to line so that a clear space of not more than 8 inches or less than 6 inches in width is provided on each side of the largest outside diameter of the pipe in place. For the purpose of this article, the largest outside diameter shall be the outside diameter of the bell, on bell and spigot pipe, and outside diameter of coupling for sleeve coupling pipe.

Where the trench width, measured at a point 6 inches above the top of the bell or sleeve of the pipe is wider than the maximum set forth above, the trench area around the pipe shall be reworked to restore a trench condition acceptable to the Engineer. The reworking may result in one or more of the following operations, subject to the approval of the Engineer: (1) Shaping the bottom of the trench to fit the pipe; (2) Placing sand around the pipe and to a point 6 inches above the top of the pipe; (3) Lowering the grade of the pipe until the trench condition can be met; (4) Installing a concrete cradle for the pipe; and (5) Providing concrete encasement for the pipe to a point 3 inches above the top of the pipe.

B-4 LIMIT OF EXCAVATION

Except by special permission of the Engineer, the maximum length of open trench shall not exceed 600 feet in the aggregate at any one location including excavation, construction, pipe laying and backfilling. In addition, at locations where access may be somewhat limited, requiring rerouting of traffic unnecessarily, the Engineer may reduce the maximum length of open trench permitted.

B-5 TRENCH BOTTOM FOR PIPE

The trench bottom shall be graded to provide a smooth, firm foundation at every point throughout the length of the pipe.

The trench shall be excavated to the established grade line of the outside bottom of the pipe. The bottom of the trench shall be scarified to a minimum depth of 3 inches below the bottom of the pipe and uniformly graded to produce a firm but yielding subgrade which will provide uniform support of the pipe along the full length of each section. The bedding materials so prepared throughout a minimum depth of 3 inches shall meet the requirements of Section A-6 of these specifications.

If it becomes necessary to excavate below the established grade line in order to remove boulders or other interfering objects, the voids shall be filled with material meeting Section A-6 requirements densified in the manner specified for bedding materials.

Where excavation is in rock, hardpan, shale, or other similar hard and unyielding materials, the trench shall be excavated to a depth at least 6 inches below the established grade line of the outside bottom of the pipe

and filled with material as specified in Section A-6 to grade line. The subgrade shall then be completed as previously stated. The material so placed shall be compacted to 90% relative compaction.

When excavation is in soft, unstable or excessively wet material which is unsuitable as a foundation for the pipe, such material shall be removed as directed by the Engineer and replaced with aggregate (Section A-8) to a depth approximately 3 inches below the grade line. The subgrade shall then be completed to the underside of the pipe using trench side native material if suitable, or imported sand if so directed by the Engineer.

At each joint in the pipe, the bottom of the trench shall be recessed in such a manner as to relieve the bell of the pipe or the pipe coupling of all load and to ensure continuous bearing along the pipe barrel upon the bedding material.

B-6 TRENCH BACKFILL

All trenches shall be backfilled after pipe, fittings and appurtenances have been installed. Whenever a relative compaction requirement value is specified herein, it shall be a percentage of the maximum density as determined hereafter. Optimum moisture content and maximum density shall be determined in accordance with ASTM D 1557 and density of soil in place shall be determined using methods approved by the Engineer.

All wood and waste material shall be removed from excavation preparatory to backfilling. Backfilling material shall be approved in all cases by the Engineer and shall be free of trash, wood, large rock, or other objectionable debris. Backfilling shall include the refilling and compaction of the fill in trenches of excavations up to the subgrade of the street or to the existing ground surface.

B-7 PIPE BEDDING

The pipe shall be carefully bedded during initial pipe zone backfill operations by hand placing, slicing with a shovel and tamping or "walking in" the material under the lower sector of the pipe to produce firm support for the full length of the barrel with full bearing on said bottom segment of the pipe equal to a minimum of five-tenths of the outside diameter of the barrel.

B-8 PROCEDURE AT PIPE ZONE

Subsequent backfill in the pipe zone shall consist of placing material as specified in Section A-6 simultaneously on each side of the pipe for the full width of the trench and compacting said material to a relative compaction of 90% within the limits of the pipe zone. The pipe zone shall be considered to extend 12 inches above the top of the outside diameter of the pipe.

The pipe shall be carefully bedded by hand placing and compacting selected backfill material or clean imported sand as provided herein from the pipe foundation and/or subgrade to the springline for the pipe prior to backfilling above the pipe within the "pipe zone". Clean imported sand shall be used for the pipe bedding when excavated materials are not suitable for pipe bedding or required by the detail plans.

The pipe bedding, using either selected material or clean imported sand, shall be compacted by approved methods to a relative compaction of 90%. The pipe bedding backfill shall be brought to optimum moisture content and shall be placed in layers not exceeding 6 inches in thickness and each layer shall be solidly tamped with the proper tools so as not to injure, damage or disturb the pipe. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe. Water settling for compaction may be approved by the Engineer in the event the foundation and bedding materials are sufficiently granular and sandy in nature that the required compaction will be obtained.

Where pipe is not very deep and the pipe zone extends into the street zone, that portion of the pipe zone within the street zone shall be compacted as set forth in Section B-11 of these specifications.

B-9 PROCEDURE ABOVE PIPE ZONE

The remaining portion of the trench to within 2-1/2 feet of the finished roadway surface or ground surface, as the case may be, shall be backfilled, compacted and/or consolidated by approved methods to obtain a relative compaction of 90%. Backfilling may be done with native trench side material except that no oil cake, bituminous pavement, concrete, rock or other lumpy material shall be used in the backfill, unless these materials are scattered and do not exceed 3 inches in any dimension. Material or perishable, spongy, or otherwise improper nature shall not be used in backfilling and no material greater than 3 inches in any dimension shall be placed within 1 foot of any pipe, manhole or structure.

B-10 COMPACTION IN OPEN FIELDS

In open fields, where paving or structures will not be above the excavated area, backfill and compaction as specified in Section B-9 hereinbefore shall extend to the top of the trench, leaving the top slightly mounded.

B-11 PROCEDURE AT STREET ZONE

The top 2-1/2 feet of the trench within roadbed area shall be compacted in horizontal layers not exceeding 8 inches in thickness, using approved hand, pneumatic or mechanical type tampers to obtain a relative compaction of 95% with a moisture content within 2% of optimum. Flooding and jetting will not be permitted within roadbed areas. Compaction requirements in the street zone may be modified by the backfill requirements of other government agencies in areas where these agencies have jurisdiction.

The roadbed area as used herein shall be considered as extending two feet beyond the curbs, gutters or paved shoulders.

From existing street grade to 2-1/2 feet below street grade, the material for backfill may contain stones ranging in size up to 2 inches in diameter in quantity, but not exceeding 20% of the volume where said coarse materials are well distributed throughout the finer material and the specified compaction can be obtained.

B-12 EXCESS EXCAVATED MATERIAL

All surplus material not required for backfill shall be disposed of by the Owner outside the limits of the public right-of-way and/or easements.

No excavated material shall be deposited on private property, unless written permission is secured by the Contractor. Before the Owner will accept the work as being completed, the Contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposal of excess excavated material, absolving the District from any liability connected therewith.

B-13 IMPORTED PIPE BACKFILL MATERIAL

Whenever the excavated material is not suitable for backfill, in the opinion of the District, suitable imported material shall be by the Owner at his expense.

C STRUCTURES EARTHWORK

C-1 GENERAL

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

The sides of excavation for structures where all vertical surfaces are formed shall be sufficient to leave at least 2 feet in the clear as measured from the extreme outside of formwork or the structure, as the case may be. Where excavation is inadvertently carried below designated elevations, suitable provision shall be made for adjustment of construction, as directed by the Engineer, to meet requirements incurred by the deeper excavation beneath structures, and overdepth excavation in such locations shall be rectified by backfilling

with sand, graded gravel, or concrete as directed by the Engineer. All overdepth excavation for footings shall be backfilled with Class C concrete.

C-2 SUBBASE FOR STRUCTURES

Where required and as approved by the District, a crushed rock subbase shall extend from firm ground undisturbed by construction operations to the structure base slab for all concrete structures. Any remaining disturbed or loose material shall be removed before the crushed rock subbase is placed. The subbase shall be compacted to the specified compaction, 90% minimum or as approved by the District, by means of a vibratory compactor.

C-3 SUBBASE MATERIALS

Mineral aggregate shall conform with the following gradation requirements:

Sieve Size	Percentage Passing Sieves
3/4-inch	90 - 100
No. 4	40 - 60
No. 30	13 - 23
No. 200	0 - 2

C-4 BACKFILLING

After completion of foundation footings and walls of the structure and of other construction below the elevation of the final grade and prior to backfilling, all forms shall be removed, and the excavation shall be cleared of debris. Backfilling shall not be commenced until the structure and excavation involved shall have been inspected and approved by the Engineer. Material for backfilling shall consist of selected excavation material, imported sand, gravel or other material approved by the Engineer and shall be free of trash, lumber or other debris. No material of a perishable or spongy nature and no stone or piece of rock greater than 4 inches in the greatest dimension shall be used in backfilling.

Compaction shall be obtained by means of mechanical tamping. Backfill of excavated material shall be placed in horizontal layers not exceeding 9 inches in thickness and shall have a moisture content such that the required degree of compaction may be obtained. Each layer shall be compacted by hand or machine tampers or by other suitable equipment or means to the specified relative compaction.

Where backfill or fill is against only one side of a concrete structure, no fill shall be placed until the concrete in place has obtained an acceptable seven-day strength based upon a concrete cylinder test, unless otherwise directed by the Engineer.

Particular care shall be exercised when backfilling at the various structures to obtain adequate compaction beneath pipes connected thereto and to avoid injury or displacement of such pipes or projections of the structure.

STANDARD SPECIFICATIONS
FOR
VITRIFIED CLAY SEWER PIPE AND FITTINGS

A GENERAL

The specification includes the requirements for furnishing, installing and testing vitrified clay pipe (V.C.P.), fittings and appurtenances of the dimensions and to the lines and grades as shown on the plans and herein specified or as covered under the permit. Pipe of other material may be installed when in the opinion of the District vitrified clay pipe would not be suitable for the intended purpose. Approval must first be received from the District to use other materials and shall be installed according to requirements specified by the Engineer. Pipe shall not be stored on the roadways or parkways of residential streets for more than ten days or upon business streets for more than three days.

B EXCAVATION AND BACKFILL

Excavation and backfill, including the pipe bedding, shall conform to provisions of the Standard Specifications for Earthwork.

C QUALITY OF PIPE

All V.C.P. and fittings shall be of one class designated extra strength; of the best quality; vitrified; homogeneous in structure; thoroughly burned throughout their entire thickness; impervious to moisture; sound and free from cracks, checks, blisters, broken extremities, or other imperfections; and must give a metallic ring when struck with a hammer. Pipe shall be bell and spigot pipe or with band seal couplings unless otherwise specified. Pipe ends shall be square with the longitudinal axis and sockets shall be true, circular and concentric with the barrel of the pipe. The thickness of the shell, the depth of the socket and the dimension of the annular space shall be within the limits of permissible variation to dimension of the annular space shall be within the limits of permissible variation to dimension standards of the specifications of the National Clay Pipe Institute, 14700 East Firestone Boulevard, Suite 111, La Mirada, California 90638, and to the applicable provisions of ASTM C 700 for the size of pipe indicated on the plans. All pipe and special fittings shall comply with the applicable provisions of the V.C.P. specifications of the National Clay Pipe Institute with respect to the hydrostatic pressure test, size, shape, three-edge bearing load test and all other requirements of said specifications, unless otherwise specified herein.

C-1 IDENTIFICATION MARKS

All pipe or fittings shall be clearly marked with the name of the manufacturer or with a trademark of a size and type.

C-2 TESTS

Before being used in any work under these specifications, pipe shall be subjected to and shall meet the requirements of the following hydrostatic pressure test and loading test; these tests shall be made by the Owner or his Contractor and shall be witnessed by a reputable testing laboratory approved and selected by the Inspector and Engineer.

The testing laboratory shall select at random for testing as herein specified up to 2% of the number of pipe in each size of pipe furnished, except that in no case shall less than five specimens be tested.

The specimens selected for testing purposes shall be sound pipe having dimensions consistent with these specifications. The lot or lots from which these test samples are taken shall be sufficient to fill the entire order for that size of pipe used in the work under the contract and, if they pass the tests, shall be so designated and marked.

All pipe shall be subject to inspection at the factory, trench or other point of delivery by the Inspector and/or Engineer. The purpose of the inspection shall be to cull and reject any pipe that, independent of the physical tests herein specified, fails to conform to the requirements of these specifications or that may have been damaged during transportation and/or in subsequent handling.

Hydrostatic Tests: In lieu of the standard ASTM absorption test, the following hydrostatic pressure test shall be substituted.

The hydrostatic pressure test shall precede the loading test by not less than one hour nor more than three hours and shall be applied to all the specimens received for testing in each size of pipe.

When subjected to an internal hydrostatic pressure of 10 psi for the time specified hereafter, the accumulated moisture on the exterior surface of the pipe shall not run down the sides in such quantity that it will exceed 10 milliliters.

Thickness of Barrel (inches)	Minimum Testing Time (Minutes)
Up to and including 1	7
Over 1 and including 1-1/2	9
Over 1-1/2 and including 2	12
Over 2 and including 2-1/2	15
Over 2-1/2 and including 3	18
Over 3	21

Loading Test: The loading test shall be the three-edge bearing. The loading test shall conform to the applicable provisions of ASTM C 301 and shall be applied to all specimens selected for testing except that loading to test ultimate strength will not be required. Pipe shall withstand the following loads:

Nominal Pipe Size	Minimum Test Loads (Pounds per Linear Foot)
4 and 6	2,000
8	2,200
10	2,400
12	2,600
15	3,100
18	3,600
21	4,200
24	4,800
27	5,200
30	5,500
33	5,800
36	6,300
39	6,600
42	7,000

The net inside length of the pipe from the bottom of the socket to the spigot end of the pipe shall be used as the divisor to calculate the load per linear foot.

Acceptance of Rejection of Result of Test: If all or the minimum designated percentage or number of the specimens tested meet the requirements of the test, then all of the pipe in the lot, shipment, or delivery corresponding to the sizes and classes so tested shall be considered as complying with the test. If, however, 10% or more of the specimens tested fail to meet the requirements of the test or it more than one specimen fails to meet the requirements of the test when the number to be tested is less than 10, then a second selection of pipe shall be made for the test. The number of specimens to be tested in the second selection of pipe shall be five for each specimen of the first selection that failed to meet the requirements.

If 90% or more of the specimens tested, including those first tested, meet the requirements of the test, all the pipe in the lot, shipment or delivery corresponding to the sizes and classes so tested shall be considered as complying with that test; otherwise, all pipe of these sizes and classes shall be rejected.

C-3 INSPECTION INDEPENDENT OF TESTS

The following imperfections in a pipe or special fitting will be considered injurious and cause for rejection without consideration of the test results hereinabove specified:

A single crack in the barrel of the pipe extending through the entire thickness, regardless of the length of such crack. A single crack which extends through one-fifth of the barrel thickness and is over 3 inches long. Any surface fire crack which is more than 1/32-inch wide at its widest point.

Lumps, blisters, pits or flakes on the interior surface of a pipe or fittings.

When the bore or socket of the pipe varies from a true circle more than 3% of its nominal diameter.

When a pipe or fitting designated to be straight deviates from a straight line more than 1/16-inch per linear foot. The deviation shall be measured from a straightedge at a point midway between the ends of the pipe.

A piece broken from either the socket or spigot end.

Tramp clays, grog or other foreign matter that have fused permanently to the exterior or interior surface of the pipe or fitting.

If, when placed in a vertical position, the pipes do not give a metallic ring when struck with a hammer.

D. JOINTING V.C.P.

D-1 V.C.P. JOINTS

All V.C.P. and fittings shall be furnished with mechanical compression joints equal to Wedge-Lock, as manufactured by MCP Industries; Speed Seal, as manufactured by Gladding, McBean & Company; or plastic coupling for plain end pipe. The compression joint on the spigot and bell ends of the pipe shall be factory made of polyurethane or other approved resilient element bonded onto the outside of the spigot and the inside of the bell to the pipe and molded and cured to a uniform hardness and compressibility to form a tight compression coupling when assembled. Materials for compression joints shall conform to ASTM C 425. An approved lubricant shall be used in the assembling of the pipe, and no further sealing element will be required. Joints shall be made watertight and root tight. All buried metal components shall be stainless steel.

E LAYING V.C.P.

Trenches shall be kept free of water during the laying operation. All pipe shall be laid without break, upgrade from structure to structure, with the socket ends of the pipe upgrade. Pipe shall be laid to the line and grade as shown on the plans and in such a manner as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the flow line. The interior of the sewer pipe shall be cleaned of all dirt and superfluous materials of all description as the work progresses. The provisions of standard specifications for earthwork shall apply to the installation of the pipe.

E-1 PREVENTING FOREIGN MATTER FROM ENTERING THE PIPE

At times when the pipe laying is not in progress, the open end of the pipe shall be closed with a tight-fitting cap or plug to prevent the entrance of foreign matter into the pipe. These provisions shall apply during the

noon hour as well as overnight. In no event shall the sewers be used as drains for removing water which has infiltrated into the trenches.

F TEST FOR LEAKAGE AND INFILTRATION

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

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

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

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

F-1 LEAKAGE TEST

The Owner may, at his option, air test or water test for leakage, except where the difference in elevation between the invert of the upper structure and the invert of the lower structure is more than 10 feet where the air test shall be made.

Water Test: Each section of sanitary sewer between two successive structures shall be tested by closing the lower end of the sewer to be tested and the inlet sewer of the upper structure with plugs or stoppers and filling the pipe and structure with water to a point 4 feet above the invert of the open sewer in the upper structure or to a height of 10 feet above the invert of the sewer in the lower structure, whichever gives the least hydrostatic pressure on the lower structure.

The total leakage shall be the decrease in volume of water in the upper structure. The leakage shall not exceed 0.1 gallon per minute per inch of nominal diameter of pipe per 1,000 feet of sewer pipe being tested. The length of house connections shall not be used in computing the length of sewer main being tested.

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

Air Test Procedure: Each section of sewer between two successive manholes shall be tested by plugging all pipe outlets with suitable test plugs. Air shall be slowly added until the internal pressure is raised to 4.0 pounds per square inch gage (psig). The compressor used to add air to the pie shall have a blowoff valve set at 5 psig to ensure that at no time the internal pressure in the pipe exceeds 5 psig. The internal pressure of 4 psig shall be maintained for at least two minutes to allow the air temperature to stabilize, after which the air supply shall be disconnected and the pressure allowed to decrease to 3.5 psig. The time in minutes that is required for the internal air pressure to drop from 3.5 psig to 2.5 psig shall be measured and the results compared with the values tabulated below:

Pipe Diameter (Inches)	Test Time (Minutes)	Test Time (Seconds)	Minimum Distance Between Manholes (Feet)	K Value
8	3	46	320	.704
10	4	43	260	1.10
12	5	40	215	1.58
15	7	5	170	2.47
18	8	30	145	3.56
21	9	55	125	4.85
24	11	20	105	6.34
27	12	45	95	8.02
30	14	10	85	9.90
33	15	35	75	12.0
36	17	0	70	14.3
39	18	25	65	16.7
42	19	50	60	19.4

The above-tabulated values shall be used for the respective diameter pipes, except where the distance between successive manholes is less than the above tabulated values, in which case the following formula will be used to determine the test time:

T = KL T = test time in seconds L = distance between successive manholes in feet K = appropriate value from above table

If the pressure drop from 3.5 psig to 2.5 psig occurs in less time than the above-tabulated or calculated values, the pipe shall be overhauled and, if necessary, replaced and relaid until the joints and pipe shall hold satisfactorily under this test.

F-2 TEST FOR INFILTRATION

If in the construction of a section of the sewer between structures groundwater is encountered, the end of the sewer at the upper structure shall be closed sufficiently to prevent the entrance of water and pumping of groundwater shall be discontinued for at least three days after which the section shall be tested for infiltration. The infiltration shall not exceed 0.1 gallon per minute per inch of diameter per 1,000 feet of main line sewer being tested and does not include the length of house laterals entering that section. Where any infiltration in excess of this amount is discovered before completion and acceptance of the sewer, the sewer shall be immediately uncovered and the amount of infiltration reduced to a quantity within the specified amount of infiltration, before the sewer is accepted, at the expense of the Owner. Should, however, the infiltration be less than the specified amount, the Owner or his Contractor shall stop any individual leaks that may be observed when ordered to do so by the Inspector and/or Engineer. The Owner shall furnish all labor and materials for making the tests required at his own expense. All tests must be completed before street or trench is resurfaced, unless otherwise determined by the Inspector and/or Engineer.

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

After the pipe has been installed, tested for leakage and/or infiltration, backfilled to existing grade, manholes raised to grade and resurfaced, the pipe shall be "balled" from manhole to manhole with a sewer scrubbing ball of type and size to be approved by the Inspector and/or Engineer. In addition to and after balling the pipe, all straight sewers and inlet/outlet ends of curvilinear sewers shall be "mirrored" by the Inspector and/or Engineer with the assistance of the Owner or his Contractor. All balling and mirroring shall be done in the presence of the Inspector and/or Engineer and shall constitute tests for alignment, grade, damaged or defective pipe in place, or any other type of faulty installation. Should balling and mirroring indicate any faulty installation of the pipe, repairs or replacements shall be made at the Owner's expense, as determined by the Inspector and/or Engineer.

H VITRIFIED CLAY PIPE FITTINGS

V.C.P. fittings shall include branches of every type and stoppers. Fittings shall be furnished and installed at the locations, to the grades, of the type and size shown on the plans, and in conformance with these specifications.

H-1 BRANCHES

Branches of type shown on the plans shall be furnished with connections of the sizes specified and shall be securely and completely fastened to the barrel of the pipe in the process of manufacture. This shall be accomplished by fusion during vitrification. In the case of pipe 15-inches or greater in diameter, fusion during vitrification will not be required, but if not fused, in addition to other fastening materials of approved quality, there shall be a reinforcing collar of cement mortar on the interior surface of the pipe. Tee branches shall have their axes perpendicular to the longitudinal axis of the pipe. Wye branches shall have their axes approximately 45 degrees (unless otherwise specified on the plans) to the longitudinal axis of the pipe measured from the socket end. All branches shall terminate in sockets, and the barrel of the branch shall be of sufficient length to permit making a proper joint when the connection pipe is inserted in the branch socket.

The quality of V.C.P. fittings and the joints for fittings shall conform to the applicable provisions of these specifications.

Installation of Branches: V.C.P. wyes, tees and other types of branches shall be furnished and installed along with V.C.P. sewer. Wyes of size specified on the plans shall be installed for all sewer house connections and for future house connections as shown on the plans or specified in the special provisions. Tees shall be installed for chimneys as shown on the plans. The longitudinal barrel of branch fitting to be placed in line and grade with the sewer mains shall be of the same diameter, quality and type as said sewer. Installation, earthwork and bedding for branches shall conform to the applicable provisions set forth for pipe. Unless otherwise specified, the branch of wye fittings shall be inclined upward at an angle not greater than 45 degrees from a horizontal line. If so shown on the plans, tees with standard tee foundations shall be substituted for wye branches. No wye or tee for sewer house connection branch shall be placed closer than 5 feet in the downstream side to the centerline of any structure.

H-2 STOPPERS

Vitrified clay stoppers shall be 3/4-inch in thickness and shall have a factory-made plasticized polyvinyl chloride compound joint material cast and bonded to the pipe, such as Wedge-Lock, Speed Seal, or approved equal. The material shall be molded and cured to a uniform hardness and compressibility and form a tight compression coupling when assembled. The material used for the compression joint shall conform to ASTM C425.

Neoprene (synthetic rubber) stoppers shall be of the type manufactured by Pacific Clay Product, Interpace Corporation, or approved equal. The joint formed by the stopper and clay pipe shall be a tight compression coupling when assembled.

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

I V.C.P. AT MANHOLES OR STRUCTURES

A 2-foot V.C.P. joint of the same inside diameter as the adjoining pipe shall be placed at inlets and outlets to each manhole or structure as shown on the drawings.

Pipe bells shall not be cast into manholes or structures. The bell shall be cut off so that no recess or offset appears on the exposed face from the inside wall of the pipe to the outside wall of the pipe. The pipe shall have a plain end, flush with the inside wall of the manhole or structure, or as shown on the plans.

J CONNECTING TO EXISTING SEWER FACILITIES AND TEMPORARY SEWAGE DIVERSION

Connections to the existing sewers shall be made at the locations and in accordance with the Plans and these Specifications and/or as covered by the permit.

The Inspector and/or Engineer shall be given notice in writing at least 72 hours in advance of the date on which he intends to start work on any portion of the connection to the existing sewer facilities. No work of a nature that would interfere with the operation of the work of a nature that would interfere with the operation of the existing sewer facilities will be permitted until the all materials, equipment, labor and supervision as determined by the Inspector and/or Engineer necessary for the orderly prosecution of the work are at the site.

All of the work at a connection to existing sewer facilities must be accomplished during the period and at the time and day established by the District Manager.

Existing sewers shall be cut and plugged, sections removed, connected to manholes or new sewers, plugs removed, lampholes removed, cleanouts removed, and all other work of whatever nature in connection therewith as the case may be. Any damage to existing sewers shall be repaired to the satisfaction of the Inspector and/or Engineer. Certain work in connection with tying into existing sewers and manholes may require the temporary handling of sewage either y temporary ditching, pumping, bulkheading at low flows or other means to be approved by the Inspector and/or Engineer. Sewage so diverted shall be handled in a manner so as not to create a public nuisance or health hazard. Any temporary ditching shall be refilled to original ground condition, compacted and resurfaced in accordance with the provisions of these specifications. Sewage flow in existing trunk will be maintained until a new line is completed.

K "WYE" BRANCHES

"Wye" branches for 4-inch and 6-inch sewer house connections and for future sewer house connections shall be furnished and installed of the type and size and at the locations shown on the plans or as covered by the permit along with vitrified clay pipe sewers. "Wye" branches are those fittings used to fasten or affix a sewer house connection to a clay pipe sanitary sewer main. Where sewer house connections are not to be constructed under this contract or permit, the "wye" branch socket shall be plugged with a stopper.

L STUBS

Vitrified clay pipe stubs shall be furnished and installed at manholes for future connections of the type and size and at the locations shown on the plans or covered by the permit. All stubs shall be installed and plugged in conformance with the details shown on the plans and detail drawings and in accordance with the provisions of these specifications or as covered by the permit.

STANDARD SPECIFICATIONS
FOR
HOUSE LATERALS

A GENERAL

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

B MATERIALS AND WORKMANSHIP

B-1 EARTHWORK

Earthwork for house laterals shall conform to the provisions of the Standard Specifications for Earthwork.

B-2 QUALITY OF PIPE AND FITTINGS

All house laterals and fittings shall be constructed of vitrified clay pipe and shall conform in all respects to the provisions of the Standard Specifications for Vitrified Clay Pipe Sewers and Fittings.

B-3 SIZE OF PIPE

House laterals shall be not less than 4 inches internal diameter. If the number of persons to be served is more than 10, a pipe size not less than 6 inches in diameter shall be installed.

B-4 DEPTH OF PIPE

House laterals shall be placed at such depth to give a minimum of 48 inches of cover to the top of the bell at the property line or to edge of the easement. A minimum of 12 inches of clearance shall be maintained at all times between the house lateral and any domestic water pipe.

B-5 CONSTRUCTION

House laterals and "wye" branch fittings shall be of the diameter and of the form shown on the plans.

"Wye" branch fittings for house laterals shall b installed as may be designated on the plans or as covered by the Permit. Each "wye" branch fitting shall have its barrel diameter equal to the diameter of the sanitary sewer main and the spur (or branch) diameter as indicated on the plans. The spur pipe of "wye" branch fittings shall be inclined at an angle of 45 degrees from a horizontal line and shall be supported with compacted clean sand, crushed rock or other material approved by the Inspector and/or Engineer in accordance with the details shown on the plans. All "wye" branch fittings that are to be left unconnected shall be plugged with a vitrified clay disc stopper equal in diameter to the outside of the pipe barrel and affixed securely in place with approved jointing compound.

House laterals shall be jointed to "tee" branch fittings at the sanitary sewer main as set forth above by eighth bends. All house laterals shall be plugged with a stopper in the socket at the last joint of said house laterals which shall be securely jointed and shall lie approximately at the public right-of-way boundary and/or property installation of house laterals shall conform to the applicable provisions of Standard Specifications for Sewer Pipe and Fittings and in accordance with details shown on the plans or as shown on the detail drawings.

C SPECIAL REQUIREMENTS

C-1 LOCATION OF HOUSE LATERALS

The location of each house lateral shall be marked at its upper end by marking a letter "S" 1-1/2-inches high on the top of the curb. If the terminal point of the sewer lateral is more than 8 feet beyond the curb line or curb improvements do not exist, the wood stake shall be furnished and installed at the end of the house lateral in conformance with the detail drawings.

C-2 FITTING AT END OF HOUSE LATERALS

"Tee" branch fittings shall be installed at the end of house laterals and unconnected ends shall be plugged with stoppers as provided herein.

C-3 PRESERVATION OF PROPERTY

Any and all damage to improvements, whether in private property or public right-of-way, which occurs as a result of the Owner or his Contractor's operations in connection with the installation of house laterals shall be repaired and/or restored to the original condition to the satisfaction of the Inspector and/or Engineer. Improvements shall include but not limited to curbs, gutters, paving, driveways, lawns, shrubs, trees, fences, retaining walls and any or all improvements. This provision shall apply whether such obstructions are shown on the plans or not.

C-4 TESTING

All piping of house laterals shall be tested in accordance with the Standard Specifications for Sewer Pipe and Fittings and in the presence of the Inspector and/or Engineer before the line is backfilled and before the final Certificate of Inspection is issued.

If the house lateral has been previously tested subsequent to the last backfill operation such as an installation and compaction of a crossing waterline, the lateral shall be retested.

All openings in the pipe shall be tightly closed except at the highest point and the piping filled with water; but all parts of its length shall be tested with not less than a 4-foot head of water. All dead ends shall be relieved of air during the process of filling. Under this test condition, the water pressure shall remain constant without showing any addition of water or showing any leaks. The Owner shall furnish all materials for making the tests required at his own expense under the direction of the Inspector and/or Engineer.

STANDARD SPECIFICATIONS
FOR
HOUSE CONNECTIONS

A GENERAL

House connections shall be constructed of the type and size and at the locations shown on the plans and as covered by the permit and in conformance with these specifications. The term "house connection" is used in these specifications and on the plans, permit and detail drawings to designate the sewer line extending from the house soil line 2 feet outside the building to and including its connection with the house lateral at the property lie including all necessary fittings as shown on the detail drawings.

House connections shall be installed as specified by the most recent revision of the Uniform Plumbing Code adopted by Kern County.

B MATERIALS AND WORKMANSHIP

B-1 EARTHWORK

Earthwork for house connections shall conform to the provisions of the Standard Specifications for Earthwork.

B-2 QUALITY OF PIPE AND FITTINGS

House connections shall be constructed of the following material subject to the approval of the District Manager for the specific situation:

Vitrified Clay Pipe
Cast Iron Pipe – Asphaltic Coated
ABS Plastic Sewer Pipe
PVC Pipe – RDR 35 (ASTM 3034)

B-3 SIZE OF PIPE

House connections shall be not less than 4 inches internal diameter. If the number of persons to be served is more than ten (10), a pipe size not less than 6 inches in diameter shall be installed.

B-4 DEPTH OF PIPE

House connections shall not laid less than 12 inches below ground surface in open areas, not less than 18 inches under driveways, porches and steps, whether covered or uncovered, breezeways, roofed porte-cocheres, carports, covered walks, covered driveways and similar structures or appurtenances.

C CONSTRUCTION

C-1 LAYING PIPE

All pipe shall be laid upgrade on an unyielding foundation true to line and grade and with a uniform bearing under the full length of barrel of the pipe. Bell and spigot pipe shall be laid with sockets upgrade. Suitable excavations shall be made to receive the bells or collars of the pipe. All adjustments to bring the pipe to line and grade shall be made by scraping away or filling in under the body of the pipe and not be wedging or blocking. The grade of all sewers covered by this specification shall not be less than ¼-inch to the foot towards the outlet except where otherwise permitted in writing by the District Manager. A standard chimney pipe as shown in the detail drawings shall be constructed where the grade of the standard house connection without a chimney pipe would exceed 100%. Where any portion of the sewer line other than cast iron soil

pipe is looted within 10 feet of any tree or hedge, the joints of the pipe shall be entirely encased in 4 inches of concrete. All concrete encasement called for in this specification shall be Class C.

C-2 ALIGNMENT

The house connection shall leave the building in a straight and direct line to the house lateral or shall be run in such a manner that the house drain shall discharge into the house sewer at an angle of 45 degrees. All changes in direction shall be made by the use of "tees", 1/16 bends, 1/8 bends, or by combination fittings that have the same relative sanitary curve and any change from one size of pipe to another size shall be made by the use of a reducer.

C-3 CLEANOUTS

The first section of the house connection laying upgrade from the house lateral shall be a cleanout as shown on the detail drawings. Cleanouts shall be placed in every house connection at the junctions with soil pipe at the building and at intervals of not to exceed 50 feet in straight runs. The cleanout shall be the same diameter as the house connection line.

When a house sewer branch thereof does not exceed 10 feet in length and is a straight-line project from a house drain which is provided with a cleanout, no cleanout will be required at its point of connection to the house drain.

Every change in alignment or grade in excess of 22-1/2 degrees in a house connection shall be served by a cleanout. The extension of house connection cleanouts is required.

Cleanouts shall be installed at points when required by the District. Cleanouts shall be constructed according to the detail drawings.

C-4 JOINTS AND CONNECTIONS

Joints in vitrified clay pipe shall conform to the provisions of the Standard Specifications for Vitrified Clay Pipe Sewer and Fittings.

Caulked joints shall be used for cast iron pipe. The bell and spigot joint shall be firmly packed with oakum or hemp or other approved material and filled with molten pig lead of a standard width to a depth of not less than 1 inch and not to extend more than 1/8-inch below the rim of he hub. No paint or varnish or other coatings shall be permitted on the joining material until after the joint has been tested and approved.

D TESTING

All piping of house connections shall be tested in the presence of the Inspector and/or Engineer before the line is backfilled and before the final Certificate of Inspection is issued. All openings in the pipe shall be tightly closed except at the highest point and the piping filled with water, but no part of its length shall be tested with not less than a 4-foot head of water. All dead ends shall be relieved of air during the process of filling. Under this test conditions, the water pressure shall remain constant without showing any addition of water or showing any leaks. The Owner shall at his own expense furnish all materials for making the tests required under the direction of the Inspector and/or Engineer.

E PRESERVATION OF PROPERTY

Any and all damages to private property which occurs as a result of the Owner or his Contractor's operation in connection with the installation of the house connection shall be repaired and/or restored to the original condition. Prior to final acceptance by the District, a signed release by the Owner is to be witnessed and filed with the Inspector, that all damages incurred have been restored to the original condition or repaired to his satisfaction.

STANDARD SPECIFICATIONS
FOR
SEWER CLEANOUTS

A GENERAL

Sewer cleanouts shall be constructed at the locations as specified herein or as shown on the plans in accordance with the detail drawings.

STANDARD SPECIFICATIONS
FOR
PRECAST CONCRETE MANHOLES

A GENERAL

Precast concrete sewer manholes shall be constructed in accordance with the design, size and details and at the locations shown on the plans. The manholes shall be constructed of precast eccentric or concentric manhole units in accordance with the plans and these specifications. The precast eccentric manhole shall be used, unless otherwise specified on the plans or in the special provisions.

Manhole locations are fixed and cannot be moved to accommodate pipe manufacturing or laying. If necessary, special lengths will have to be provided to meet manhole location requirements.

B MATERIALS AND WORKMANSHIP

B-1 EXCAVATION AND BACKFILL

Excavation and backfill shall be done in accordance with the Standard Specifications for Earthwork.

B-2 CONCRETE

All concrete used in the construction of manholes shall conform to the Standard Specifications for Concrete Construction.

B-3 PRECAST MANHOLES

Precast manholes shall conform to the size, shape, form and details shown on the plans. Concrete for precast manhole units shall be Class A concrete. The precast cylinder units, the precast concrete taper sections and precast eccentric flat top sections shall meet the strength requirements for ASTM C 478. Precast manholes shall be equal in all respects to those as manufactured by Associated Concrete Products or centrifugally spun manhole units as manufactured by Ameron or approved equal. The minimum allowable steel shall be hoops of No. 4 wire to be cast into each unit at adequate places as a precautionary measure for handling. Each manhole section shall be set in a bed of grout to make a watertight joint and shall be neatly pointed on the inside and 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 required elevation.

The precast concrete manhole rings shall be joined with Kent Seal.

Manhole Bases: Manhole bases shall be constructed of Class A concrete to the form and dimensions shown on the details on the plans. Said concrete shall be formed and poured on undisturbed soil and/or on gravel subbases as called for in the special provisions. That portion of the base above the invert elevation of the sewer pipe shall be formed to provide a smooth channel section as shown on the plans. The forms shall be checked and approved by the District's Representative for accuracy of dimensions and relative smoothness prior to pouring the base. Channels shall vary uniformly in size and shape from inlet to outlet, if required. The manhole base shall be poured as one monolithic pour.

B-4 MANHOLE FRAMES AND COVERS

Manholes frame and cover sets of the type, size and quality as indicated in thee specifications or on the plans shall be installed at the locations shown.

Castings for frame and cover sets shall conform to the requirements for gray iron castings in ASTM A48 for Class No. 30 castings. Before leaving the foundry, all castings shall be thoroughly cleaned and subjected to a hammer inspection, after which they shall be dipped twice in a preparation of asphalt or coal tar and oil applied at a temperature of not less than 290ºF, nor more than 310ºF, and in such a manner as to form a

firm and tenacious coating. Each cover shall be ground or otherwise finished so that it will fit in its frame without rocking, and frames and covers shall be match-marked in sets before shipping to the site. Covers shall have the word "SEWER" and the initials "ENCSD" cast thereon as shown in these specifications or on the plans. No other lettering on the topside will be permitted. Shop drawings of all manhole rings and covers shall be submitted to the Engineer for approval.

Setting Manhole Frames and Covers: 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's Representative in the filed. 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 structure is outside the limits of the traveled shoulder but not in the roadside ditch, it should be placed 1/10-foot or more above the existing ground surface. Where the manhole cover falls in the existing roadside ditch or right-of-way, it is to be placed approximately 1-1/2 feet above the existing ground surface or as directed by the Inspector and/or Engineer. 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 fillet as shown on the plans. 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.

B-5 DROP MANHOLES

Drop manholes shall be constructed at the location and in conformance with the details shown on the plans. Materials and construction of drop manholes shall conform in all respects to the applicable provisions of these specifications for standard precast manholes (including frames and covers), with modifications for the addition of drop inlets as set forth on the plans. The inside diameter of the drop inlet pipe shall be the same diameter as the intercepted sewer, unless otherwise noted on the plans or in these specifications.

B-6 STUBS AT MANHOLES

Vitrified clay pipe stubs shall be furnished and installed at manholes at the locations and in conformance with details shown on the plans and as herein specified. All stubs shall be plugged with a vitrified clay stopper or brick plug as shown on the plans. Unless otherwise noted on the plans, vitrified clay stoppers shall be used to plug stubs up to and including 21 inches and brick plugs shall be used on stubs greater than 21 inches.

B-7 SEWER PIPE AND FITTINGS

All sewer pipe fittings, including installation at manholes, shall conform to the provisions of the Standard Specifications of Vitrified Clay Pipe Sewers and Fittings.

B-8 RESURFACING

Resurfacing of all excavations for construction of manholes shall conform to the applicable permits.

B-9 WATERTIGHTNESS OF MANHOLES

It is the intent of these specifications that manholes and appurtenances be watertight and free from infiltration. The adequacy of manholes and appurtenances as to watertightness shall be determined when ordered by the Inspector and/or Engineer by filling the manhole with water. When testing of the manhole is ordered, said test may be made in connection with the leakage test of the sanitary sewer. Any evidence of leakage as a result of testing shall be repaired to the satisfaction of the Inspector and/or Engineer at the sole expense of the Owner.

B-10 RAISING OF MANHOLES WITHIN SURFACED STREETS

After pavement has been completed, the Owner shall be responsible for raising manholes and raising frame and covers to finish grade as shown on the detail drawings within 30 days.

STANDARD SPECIFICATIONS
FOR
CONNECTIONS TO EXISTING WORK
(SEWAGE)

A TEMPORARY HANDLING OF SEWAGE

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

B REMODELING EXISTING MANHOLES

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

STANDARD SPECIFICATIONS
FOR
POLYVINYL CHLORIDE PIPE AND FITTINGS

A GENERAL

Plastic pipe for water distribution systems shall be PVC with elastomeric gasket joints, either gasket bell and spigot type or plain end with gasket coupling type. Nominal diameters: 4 inches through 12 inches. Pipe shall have cast-iron pipe equivalent (CI) outside diameter. Requirements for fittings, pipe embedment, thrust, anchorage and installation shall comply with AWWA C900-75 and the following options and restrictions.

B PIPE CLASSIFICATION

PVC pipe shall be manufactured for use in water service and shall be designated as Class 150 (DR 18) or Class 200 (DR 14).

C SUBMITTALS

1. Provide an affidavit of compliance with AWWA C900 to the District.
2. Copies of the manufacturer-required tests of the following conducted on project pipe:
    a. Quick-burst strength of pipe and couplings.
    b. Flattening resistance of pipe.
    c. Record of additional tests after test sample failure.
3. Manufacturer's literature of gray iron and ductile-iron fittings including dimensions, thickness, weight, coating, lining and a statement of inspection and compliance with the acceptance tests of AWWA C110-77.

D PRODUCT MARKING

Legibly mark pipe at 5-foot intervals and each coupling to identify the nominal diameter, the OD base, cast iron (CI), the material code PVC 1120 for pipe and PVC 1 for couplings; the dimension ration (DR) number, AWWA C900 and the seal of the testing agency that verified the suitability of the material for potable water services (NSF in the United States).

E DELIVERY AND TEMPORARY STORAGE OF PIPE

Ship, store and place pipe at he installation site supporting the pipe uniformly. Avoid scratching the pipe surface. Do not stack higher than 4 feet nor stack with weight on bells. If stored for prolonged period, cover to protect from sun's rays.

F MATERIALS

F-1 POLYVINYL CHLORIDE PIPE

AWWA C900-75, gasket bell end or plain end with elastomeric gasket coupling, Class 150 as detailed, cast iron equivalent OD, material and hydrostatic design stress designation: PVC 1120.

G CAST-IRON FITTINGS

Cast-iron fittings shall be manufactured of gray cast-iron, free of all imperfections conforming to he requirements of ANSI A21.10, 250 psi pressure rating. Bells shall be sized specifically for OD of Class 150 cast iron equivalent PVC pipe including rubber ring retaining groove. All fittings shall be wrapped in plastic film per the Standard Specifications.

Where valves and fittings are directly connected, the fitting shall be flanged. Flanged connections shall be 125 lbs. meeting the requirements of ANSI B16.1. Gaskets for flanged joints shall be fullface, cut from 1/16-inch thick rubber with cloth insert, bolt holes prepunched as manufactured by Crane Company, or equal.

Nuts and bolts for bolting flanged joints shall be standard hexagonal machine bolts and nuts conforming to he requirements of ASTM A307, Grade B. All buried flanged-end fittings shall be bolted with cadmium-plated steel nuts and bolts. All bolts shall be lubricated with graphite and oil. Flanged faces shall be wire brushed and cleaned prior to joining each flange.

H INSTALLATION

H-1 PIPE LAYOUT FOR CURED ALIGNMENT

Pipe may be bent for curved alignment, but at no tighter curve than the following:

Pipe Diameter	Minimum Curve Radius
4 inch	100 feet
6 inch	150 feet
8 inch	200 feet
10 inch	250 feet
21 inch	300 feet

H-2 RECEIVING AND STRINGING THE PIPE

1. Unload pipe close to point of installation to avoid handling damage. Avoid scratching the pipe surface.

2. Observe traffic signing and the requirements of encroachment permits.

3. Characteristic deformation of PVC pipe under higher pressure multiplies stress concentration at minor imperfections leading to early distress of installations subject to surges. Reject pipe that is gouged, scratched forming a clear depression or marred.

H-3 HANDLING OF PIPE

1. To hoist pipe with mechanical equipment use a cloth belt sling or a continuous fiber rope which avoids scratching the pipe. Do not use a chain. Pipes up to 12 inches in diameter may be lowered by rolling on two ropes controlled by snubbing. Pipes up to 6 inches in diameter can be lifted by hand.

2. Unloading shocks, especially to pipes with a factory assembled bell coupling, are a frequent cause of later rupture under pressure.

H-4 PLACEMENT OF PIPE ON PREPARED TRENCH BOTTOM BEDDING

1. Carry excavation to between 4 and 6 inches below the pipe barrel for the placement of embedment material. If foundation is yielding, over-excavate and stabilize.

2. Fill the trench bottom and cover stabilized foundation with embedment material and compact it with several passes of a vibratory of impact-type machine to obtain a relative compaction of 90% at pipe grade. Shovel out a depression to accommodate the pipe coupling and a space to permit removal of the pipe sling.

3. Lower the pipe onto the bedding in the bottom of the trench. If the embedment material has been graded correctly, the pipe will lie within ¼-inch of the design elevation, will slope in the same direction indicated on the drawings, and will rest upon the bedding along the full length of the pipe except at the bell and at the pipe sling depression. If not, remove the pipe and regrade the embedment material.

H-5 ASSEMBLY OF PIPE JOINT

1. The spigot and bell or bell coupling must slide together without displacing the rubber gasket. This requires a dirt-free spigot and bell and is best accomplished by laying the pipe section with the bell coupling facing the direction of laying.

2. Insert the rubber ring into the groove in the bell in the trench just before joining the pipes. First clean the groove. Observe the correct direction of the shaped ring. Feel that the ring is completely seated.

3. Lubricate the spigot over the taper and up to the full insertion mark with the lubricant supplied by the pipe manufacturer. If the lubricated pipe end touches dirt, clean the pipe end and apply lubricant again.

4. Insert the spigot into the bell and force it slowly into position with the aid of:

   a. For Smaller Diameter Pipes: A large bar lever against a wood block across the open pipe end.

   b. For Larger Diameter Pipes: A friction puller or come along that is arranged so that chains or wire cables do not scratch the pipe.

5. Check that the rubber has stayed in the groove during assembly by passing a feeler gage around the completed joint.

H-6 SANITATION OF PIPE INTERIOR

1. During laying operations, do not place tools, clothing or other materials in the pipe.

2. At night and when pipelaying is not in progress, close the open ends of the pipe by a vermin-proof plug secured so as to discourage tampering by children.

H-7 EXCAVATION AND BACKFILL

Excavation and backfill shall conform to the provisions of the Standard Specifications for Earthwork.

I CONCRETE THRUST BLOCKS

Concrete thrust blocks shall be installed at the locations and in accordance with the detail sheets and shall consist of concrete containing not less than six sacks of Portland cement per cubic yard. Thrust blocks shall conform to the applicable provisions of the Standard Specifications for Concrete Construction.

J HYDROSTATIC TEST

After completion of the pipeline installation, the line shall be tested under the hydrostatic pressure test of 200 psi specified in the special provisions for a period of not less than 4 hours for each section of pipe

tested. The pressure shall be maintained by restoring the test pressure whenever it falls an amount of 25 psi. At the conclusion of the 4 hours, the test pressure shall be restored and all water used during the tests shall be accurately measured to determine the actual leakage.

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

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

J-1 ALLOWABLE LEAKAGE RATE

The leakage per inch of internal pipe diameter for a 24-hour period at the pressure specified shall be as follows:

For PVC pipe and fittings – a rate of 10 gallons per day per inch diameter per mile.

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

K DISINFECTION OF WATER LINES

After pressure testing and prior to acceptance of the work, the entire pipeline, including all valves, fittings, hydrants and other accessories shall be disinfected in accordance with AWWA C 601 and as follows:

Chlorine residual shall be determined in accordance with the method specified in AWWA ~~601~~ ***C651-99*** with amounts of applied chlorine to produce a dosage of 40 – 50 ppm and a residual of not less than 5 ppm in all parts at the line after a 24-hour period has elapsed or by the Representative. The Contractor shall provide and keep chlorine residual testing and indicating apparatus available on the site during the disinfection period.

L MANUALLY OPERATED VALVES

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

Following the flushing of the line, the District will require the Owner to have a qualified laboratory perform a bacteriological test. Such a test shall meet the Kern County Health Department requirements for domestic purposes prior to acceptance of the lines by the District for integration and use in the system.

The disinfection of lines and any laboratory testing shall be entirely at the Owner's expense.

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

A GENERAL

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

B MATERIALS

The polyethylene film shall be of virgin polyethylene as produced form DuPont Alathon resin or equal and shall meet the requirements of ASTM D 1248 for Type I, Class A, Grade E-1, and shall have a flow rate or nominal melt index of 0.4 g/min. maximum.

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

Nominal Valve of Flange Size (Inches)	Minimum Flat Sheet Width (Inches)
4	24
6	24
8	24
10	30
12	36
16	48
18	48
20	48

At the Owner's option, he may purchase tubular material and rip one side to fold out to the required width.

Tape for securing the polyethylene wrap shall be 20inch-wide adhesive tape, such as Polyken 900 (polyethylene), Scotchrap 5 (polyvinyl), or approved equal. The tape shall be such that the adhesive will bond securely to both metal surfaces and polyethylene film.

C INSTALLATION

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

STANDARD SPECIFICATIONS
FOR
RESILIENT SEAT GATE VALVES

A GENERAL

These specifications designate the requirements for the manufacture of 3-inch through 12-inch resilient seat gate valves conforming to the latest revision of AWWA C509.

B MATERIALS AND WORKMANSHIP

B-1 GENERAL

Resilient seat gate valves, unless otherwise indicted, shall be the same as the main in which they are installed and shall be flange connected to cast iron fittings. All gate valves shall be nonrising stem, counterclockwise opening. Valves shall have the same type ends as the pipe or fitting on which they are installed. Valves are to have 2-inch-square cast-iron operating nuts. Valves shall be marked with raised lettering cast on the body indicating manufacture and working pressure (minimum 200 psi).

Valves shall be iron bodied, bronze mounted, with modified wedge disc or parallel faced disk with replaceable resilient seats. The bronze stem nut shall be solid bronze conforming to ASTM B-62 (4-6% zinc). The bronze stem shall be cast bronze or forged bronze bar stock containing a maximum of 2% zinc. Valves shall be manufactured by Mueller or Clow and all other valves will not be acceptable even though they meet all other requirements of the specification because of the standardization program adopted by the District.

B-2 EXTERIOR COATING

For buried service, valve bodies and cast-iron portions of the operator bousings and extensions shall be coated at the place of manufacture. Surfaces shall be sandblasted in accordance with SSPC-SP 6 (commercial blast cleaning). Valves shall be coated with fusion-bonded epoxy with a minimum dry-film thickness of 10 mils. The coating manufacturer's application recommendations shall be followed.

B-3 VALVE BOXES

Valve box shall be Christy G-5 or equal with cast-iron cover.

Covers and concrete pad shall be seated 3 inches above natural ground or flush with the paved surface.

B-3 NUTS AND BOLTS

Nuts and bolts used for bolting flanged-end gate valves to steel pipe flanges above ground shall be standard hexagonal bolts and nuts conforming to ASTM A 307, Grade B. All buried flanged-end valves shall be bolted with cadmium plated steel nuts and bolts. All bolt threads shall be lubricated with graphite and oil prior to installation.

STANDARD SPECIFICATIONS
FOR
BUTTERFLY VALVES

A GENERAL

These specifications designate the requirements for the manufacture and installation of butterfly valves.

B MATERIALS AND WORKMANSHIP

B-1 BUTTERFLY VALVES

Butterfly valves shall have the same type and configurations as the pipe or fitting on which they are installed. They shall be tight closing, rubber seated valves conforming to the latest revisions of AWWA C504, except as herein modified. Valves shall be designed for tight shutoff with no water leaks when subjected to a maximum differential pressure across the disc of 150 psi for valves sizes 4 inches and larger. Valve shafts shall consist of a one-piece unit extending completely through the valve disc. Valve shafts shall be 18-8 Type 304 stainless steel. Valve discs shall be of alloy cast iron, conforming to ASTM A 436, Type 1, or cast iron conforming to ASTM A48, Class 40. The valve disc shall rotate 90 degrees from fully open to the tightly shut position. Valves shall be Dresser 450 or approved equal.

B-2 VALVE OPERATORS

Valve operators shall be of manual type. The operators shall be totally enclosed, self-locking, worm hear, or traveling-nut type with adjustable stops to limit disc travel. The number of complete turns of the operator required to rotate the disc 90 degrees shall be approximately the same as an equivalent sized gate valve. All valve operators shall be fully gasketed, weatherproof and factory packed with grease. Operators shall be of the size required for opening and closing the valve against its design water pressure and they shall have a torque rating not less than that shown in AWWA C504, Table 1, Class 150B.

Buried operators shall be worm gear or traveling-nut type and shall be equipped with standard AWWA 2-inch operating nuts. Operators shall be specifically designed and suitable for permanent buried service.

Operators for valves located above ground shall have disc-position indicators and a hand wheel.

B-3 EXTERIOR COATING

Valve bodies and operator housings and extensions shall receive two exterior coats of heavy-duty coal tar equal to Koppers Bitumastic 505. Minimum thickness of 15 mils per coat. Application shall be at the place of manufacture. The coating shall be applied after the surface has been sandblasted to "commercial" standard as defined in SSPC-SP-6. The paint manufacturer's application recommendations shall be followed. Alternatively, the coating shall be fusion-bonded epoxy with a minimum dry-film thickness of 10 mils. The coating manufacturer's application recommendations shall be followed.

Aboveground valves shall be coated the same as adjacent piping.

B-5 VALVE BOXES

Valve box shall be Christy G-5 with cast iron cover or approved equal.

B-6 NUTS AND BOLTS

Nuts and bolts used for bolting flanged-end butterfly valves to steel pipe flanges above ground shall be standard hexagonal machine bolts and nuts conforming to ASTM A 307, Grade B. All buried flanged-end valves shall be bolted with cadmium plated steel nuts and bolts. All bolt threads shall be lubricated with graphite and oil prior to installation.

STANDARD SPECIFICATIONS
FOR
WATER SERVICES

A WATER SERVICES

Water services shall be installed at the location shown on the plans using the type of materials. Valves and appurtenances as shown on the detail drawings. The water services shall be terminated at a lock-wing angle meter stop at the location as shown on the detail drawings.

B METERS

Water meters shall be installed by the District at the location shown on the plans. Water meters (with couplings) are to be purchased by the Owner and stored in the District yard for installation by the District forces for each service connection it the manner shown in the detail drawings. All meters shall be 5/8-inch x 3/4-inch for residential use and shall be manufactured by a District approved meter manufacture. Said meter shall be calibrated to register in cubic feet. All costs incidental to the purchase and supplying of said meter to the District shall be paid for by the Owner. Only District approved meters will be acceptable for installation even though other meters may meet the minimum operating requirements as the District has adopted a program of meter standardization. Larger diameter meters may be installed at owners request and expense.

C METER BOXES

Concrete meter boxes shall be purchased by the Owner for each meter connection as shown on the plans and said boxes shall be installed by Contractor. Meter boxes shall be Christy B-12 or equal with solid concrete lid or approved equal. All costs incidental to the procurement and supplying of said boxes to the District shall be paid for by the Owner.

STANDARD SPECIFICATIONS
FOR
CONNECTIONS AND INSTALLATION OF
VALVES AND HYDRANTS TO EXISTING WATER MAINS

A CONNECTIONS

Whenever the location of existing mains makes it necessary to use a gradual transition on the alignment of the proposed mains, said gradual transition shall be made in the shortest practical distance with the maximum deflection per joint for curves not to exceed 5 degrees. All tie-ins, taps, saddle and connection to existing District mains must be make in the presence of an authorized District representative.

B VALVES AND HYDRANTS

Installation of valves and hydrants to existing mains may be made by use of tapping sleeves, tapping crosses and tapping valves provided that their locations are as shown in the plans and/or specifications. The tapping sleeves and crosses must be mechanical joint type for Class 150 AWWA C900 PVC pipe and must be capable of 150 pounds per square inch working pressure such as Mueller H 611 and H 711 or equal. The tapping valve must have essentially the same construction as the AWWA nonrising stem gate valves as specified in the Standard Specifications for Gate Valves.

STANDARD SPECIFICATIONS
FOR
CONCRETE CONSTRUCTION

A MATERIALS AND WORKMANSHIP

All concrete construction shall conform to the provisions of Sections 40 and 90 of the State of California Specifications, except as herein modified. Unless otherwise noted on the plans or in the specifications, all concrete shall be Class A.

B CONCRETE

B-1 CLASS A

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

B-2 CLASS B

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

B-3 CLASS C

Pipe cradles and cut-off walls shall be Class C concrete containing not less than four sacks of Portland cement per cubic yard and have a minimum compressive strength of 2,000 psi in 28 days.

C CONCRETE DESIGN AND MATERIALS

The Owner shall submit to the Inspector and/or Engineer for approval the design of the mix proposed for use. Said mix design shall set forth weights of cement, sand, coarse aggregate and water to be used together with a grading analysis of sand and coarse aggregate. The source of supply of all materials entering into the mix shall also be given. The mix design and materials shall be approved by the Inspector and/or Engineer prior to placing any concrete.

D REINFORCING

Where reinforced concrete is required as shown on the plans or specified herein, reinforcing steel conforming to the applicable provisions of the State Specification shall be furnished and installed.

STANDARD SPECIFICATIONS
FOR
RAILROAD CROSSINGS

A NOTIFICATION

No work of any character shall be commenced on railroad right-of-way until the railroad company and Owner have entered into an appropriate agreement and the company has issued a permit to the Owner and has been duly notified by the Owner, in writing (with a copy forwarded to the District) of the date he proposes to begin work, and until an authorization representative of the railroad is present, unless the railroad company waives such requirement.

B INSPECTION BY RAILROAD COMPANY

All work performed by the Owner within the right-of-way limits of the railroad shall be subject to the inspection and approval of the Chief Engineer of the railroad company or his authorized representative, and any precautions considered necessary by said Chief Engineer to safeguard the property, equipment, employees and passengers of the railroad company shall be taken by the Owner without extra compensation.

C COOPERATION WITH RAILROAD COMPANY

The Owner shall, with extra compensation, take such precautions and erect and maintain such telltale or warning devices, as the railroad company considers necessary to safeguard the operation of its trains. The temporary vertical and horizontal clearances specified by the Chief Engineer of the railroad company in approving these shall be maintained at all times. No steel, brick, pipe or any other loose material shall be left on the ground in the immediate vicinity of the railroad track. The Owner shall so plan his work as not to delay railroad company operations in making track changes or placing temporary or permanent operations and/or permanent structures or work incidental thereto.

D SURETY BOND

The above-mentioned agreement shall contain a surety bond in an amount of $10,000 to be executed by a reliable surety company and will be held to apply to any inspection, flagging, or related costs to the railroad company during construction period.

E SPECIAL ENDORSEMENT

Each public liability and property damage and motor vehicle public liability and property damage insurance policy as specified in the general conditions shall contain the following endorsement verbatim:

> "The Owner hereby releases and agrees to indemnify Railroad from and against all costs, expense, claims and liability for injuries to or deaths of persons (including, but not limited to, passengers and employees of Railroad), and damage to or loss of property (including, but not limited to property owned, leased, occupied or used by, or in the care, custody or control of Railroad or the employees of Railroad) howsoever the same may be caused, resulting from, arising out of, or in any way connected with the prosecution of the work under said contract upon or adjacent to Railroad's property at said location. For purposes of this section, the term "Railroad" shall include any other Railroad company using Railroad's property at said location with Railroad's consent and any affiliate, subsidiary or lessor of Railroad."

Certified copies of the above policies shall be furnished the railroad company.

STANDARD SPECIFICATIONS
FOR
REMOVAL AND RESURFACING OF
STREET PAVEMENT AND SURFACES

A GENERAL

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

B EARTHWORK

Earthwork shall conform to the provisions of the Standard Specifications for Earthwork of these specifications.

C PAVEMENT REMOVAL

C-1 GENERAL

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

C-2 PORTLAND CEMENT CONCRETE SURFACES

Concrete pavement, including cross-gutters, curbs and gutters, sidewalks, driveways and concrete surfaces of whatever nature shall be saw cut to a minimum depth of 1-1/2-inches prior to removal in accordance with details shown on the plans or as specified herein. Said saw cut shall be made at a point approximately 1 foot beyond the edge of the trench and/or excavation. With the written permission of the Property Owner or the Governing Agency, pneumatic tools or other approved equipment may be used to cut concrete pavement prior to removal at the limits of the excavation. In such an event, the saw cut, as provided herein, shall be made after backfilling, and the additional concrete pavement shall be removed and disposed of by the Contractor prior to resurfacing.

C-3 PLANT MIX SURFACING (ASPHALT CONCRETE PAVEMENT)

Streets and alleys surfaced with asphalt concrete pavement shall be initially cut by means of pneumatic pavement cutters or other approved equipment at the limits of the trench and/or excavation prior to removal of surfacing. After backfilling the excavation, asphalt concrete pavement shall be saw cut to a minimum depth of 2 inches at a point not less than 9 inches outside the limits of excavation or the previous pavement cut (made by pneumatic tools), whichever limits are the greater. The additional surfacing so cut shall be removed and disposed of prior to resurfacing.

C-4 ROAD MIXED SURFACING

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

D RESURFACING

In all streets or alleys in which the surface is removed, broken or damaged by equipment or in which the ground has caved in or settled due to the installation of the improvements, the surface shall be restored to the original grade and crown section by the Contractor. In the absence of specified designation on the plans, and where the street has been improved with roadway surface, base course, curb, sidewalk, or gutter, trenches or damaged sections shall be restored with the type of improvement conforming to that which existed at the time the Contractor entered upon the work. Prior to resurfacing, the existing surfacing shall be removed as provided above. All broken and jagged edges of the trench edge shall be straight. Areas to be cut shall be indicated by the Owner and no permanent pavement shall be placed until these edges have been sawed. If during the initial removal of the existing pavement a method of removal was used which disturbed the adjoining pavement or if during general construction the adjacent pavement was disturbed, then this adjoining pavement must also be removed and replaced. Disturbed or undermined cement treated base shall be removed and replaced with its equivalent aggregate base, and asphalt concrete paving above the cement treated base shall be sawed in a straight line and replaced in kind. Where irregular surfaces are to be surfaced, existing pavement shall be cut parallel to the alignment of the pipe or to the centerline of the street at the Owner's discretion. End cuts shall be perpendicular.

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

STANDARD SPECIFICATIONS
FOR
STEEL CASING PIPE

A GENERAL

Steel casing pipe shall be installed at the locations and to the lines and grades indicated on the plans or detail drawings and as herein specified. All work shall conform to the specifications and requirements of the State of California Division of Highways, County of Kern Road Department, City of Bakersfield and/or the railroad company involved. It shall be the Owner's responsibility to secure all necessary permits for start and prosecution of casing pipe installation and must submit copies to the District Manager prior to issuance of a permit.

B MATERIALS AND WORKMANSHIP

B-1 GENERAL

The equipment, materials and methods used for the construction of the complete installation of the casing pipe and the carrier pipe shall be determined by the Owner to the extent that the final and completed installation receives the approval of the Inspector and/or Engineer and is consistent with the intent of these specifications.

The Owner may present an alternate detailed proposal in lieu of the methods and materials specified herein to jack or bore casing pipe under the locations as shown on the plans. Such proposal shall be subject to the sole approval of the Inspector and/or Engineer and shall be presented sufficiently in advance of the work to allow adequate time for checking and must be in accordance with all the conditions set forth in the necessary permits.

B-2 MATERIALS

Steel casing pipe shall be butt welded of sheets conforming to ASTM Specification A 570 Commercial Grade or of plate conforming to ASTM Specification A 283. All field joints also shall be butt welded full circumference or by other means approved by the Inspector and/or Engineer. Use of a jacking band to reinforce the end of the pipe receiving the jacking thrust will be required. All joints shall be capable of resisting the jacking stresses without failure. Wall thickness of casing pipe shall be a minimum of 3/8-inch and the diameter shall be of the minimum size shown on the plans or as covered by the permit.

B-3 INSTALLATION

B-3.1 GENERAL

Steel casing pipe of the minimum sizes and thickness specified herein shall be installed in place by jacking and/or boring methods, without the use of water or air at the locations shown on the plans and to grades required to install the sewer or water carrier pipe. Care shall be taken in placing the casing pipe so as to permit the construction of the carrier pipe to the lines and grades shown on the plans.

B-3.2 SEWER PIPELINE

The sewer pipelines, which are gravity flow, are designed at grades which will not permit variance from the lines and grades as shown. It shall be the Owner's responsibility for choosing a size of casing at/or above the minimum specified in order that the jacking may be done with a sufficient degree of accuracy to permit installation of the carrier pipe to the grades shown on the plans. Should voids or loss of ground occur during jacking operations, said voids shall be filled with grout consisting of a lean mixture of cement and sand. The carrier pipe shall be supported on wood skids in such a manner as to relieve the pipe bells from all load and bearing. Mechanical compression joints shall be used on all vitrified clay sewer carrier pipe installed within casing pipe. After the sewer carrier pipe has been installed, the space between the pipe and the casing pipe

shall be hydraulically backfilled with sand to provide a firm bedding. The ends of all casings pipe shall be packed to a minimum depth of 6 inches with burlap bags filled with jute and leaving an annular space 6 inches deep inside the end of the encasement. This annular space shall then be filled with Class A concrete except that an opening not less than 2 inches nor more than 4 inches in diameter shall be provided for pressure relief near the top of the conduit. The jute shall be packed sufficiently to prevent the entrance of foreign material into the space between the sewer carrier pipe and the encasement pipe. Where a carrier pipe is not required to be installed, the sand backfilling shall be omitted; however, the ends shall be plugged as herein provided.

B-3.3 WATER PIPELINE

The water pipeline shall be installed in the casing per the detail drawings and shall not require filling of the annular space of the casing.

B-4 EARTHWORK AND RESURFACING

Earthwork and resurfacing shall conform respectively to the provisions for the Standard Specifications for Earthwork and Removal and Resurfacing of Street Pavement and Surfaces.

STANDARD SPECIFICATIONS
FOR
USE OF COMPLETED FACILITIES

A GENERAL

The District shall have the right upon ten (10) days written notice to the Owner and his Surety to take possession of and use any completed or partially completed portion of the work notwithstanding that the time for completing the entire work may not have expired, but such taking possession and use and assumption of maintenance of any portion of the work shall not be deemed an acceptance of any work. It is the intent of this section to provide for the District placing into operation portions of the facilities as the work progresses. It shall be mandatory upon the Owner to test and make ready for operation each section of the sewers between manholes or water mains between intersections within 14 consecutive calendar days following the completion of the pipe laying for any such section.

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

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

STANDARD SPECIFICATIONS
FOR
INSPECTION OF WORK

A GENERAL

All work shall be subject to inspection and shall be left open and uncovered until the installation is approved by appropriate District authority.

The District shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining full knowledge respecting the progress, workmanship and character of materials used and employed in the work.

The Owner shall submit a schedule to the District outlining the proposed construction operation. Whenever the Owner varies the period during which work is carried on each day, he shall give due notice to the District so that proper inspection may be provided. Any work done in the absence of the District Inspector will be subject to rejection.

No pipe, fittings or other materials shall be installed until inspected and approved by the District or its representative. All installations which are to be backfilled shall be inspected and approved by the District prior to backfilling and due notice shall be given to the District in advance of backfilling so that proper inspection may be provided.

The inspection of the work shall not relieve the Owner of any of his obligations to complete the work as prescribed by the District Specifications. Defective work shall be made good and unsuitable materials may be rejected notwithstanding the fact that such defective work and unsuitable materials have been previously overlooked by the District and accepted.

The District shall have the authority to suspend the work wholly or in part for such time as it may deem necessary due to the failure on the part of the Owner to carry out orders given, or to perform any provisions of the plans or specifications. The Contractor shall immediately comply with the written order of the District to suspend the work wholly or in part. The work shall be resumed when methods or defective work are corrected as ordered or approved in writing by the District.

In addition to the requirements of the District ordinance under which these specifications are adopted, the Owner shall bear all costs of construction inspection. The Owner shall also bear the cost of traffic regulations lawfully exacted by the Federal Government, the State of California, or County or City during the time of performing work affecting the property of said Government, State, County, or City.

STANDARD SPECIFICATIONS
FOR
CLEAN-UP

A GENERAL

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

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

STANDARD SPECIFICATIONS
FOR
PERMITS, LICENSES AND NOTIFICATIONS

A GENERAL

The Owner and his Contractor shall comply with the lawful orders, regulations and ordinances of the State of California, County of Kern and City of Bakersfield applying to construction operations affecting property or improvements under the respective jurisdiction of said authorities.

B LICENSES AND PERMITS

The Owner and his Contractor shall at his own expense apply for and procure all licenses and permits as required by the regulations or ordinances of said State, County or City. Copies of said licenses and permits shall be delivered to the District Manager prior to issuance of District permit.

Special attention is directed to the narrow roadways in some streets where work is to be done. Work in such streets shall be arranged so that vehicular traffic of residents to and from their homes will not be interrupted at any time for more than 8 hours, and they shall give advance notice to such residents of the time he expects any street or portion thereof to be closed to traffic.

The District shall be notified in advance when connections are to be made to water consumers. Whenever practical, such connections shall be made during a period of low water usage, but in any event, only after proper authorization from the District.

APPENDIX

CONTRACT

GRANT OF EASEMENT

BOND CERTIFICATES

INSURANCE CERTIFICATES

CONTRACT
SEWER AND WATER SYSTEM IMPROVEMENT

This contract, dated _____, 20____, is made by and between the **East Niles Community Services District**, hereinafter called "District", and _____, hereinafter called "Owner". This contract contains all the terms of the agreement between the District and the Owner concerning domestic water or sanitary sewer system improvements to be constructed and paid for by the Owner and dedicated to and accepted by the District for inclusion into the District's domestic water or sanitary sewer system.

ARTICLE I. SANITARY SEWER AND DOMESTIC WATER SYSTEMS IMPROVEMENTS TO BE CONSTRUCTED

The improvements to be constructed as part of the sewer system shall consist of sewer pipelines, manholes, cleanouts and other appurtenances. The improvements to be constructed as part of the water system shall consist of water pipelines, valves, fittings, service connections, fire hydrants and other appurtenances. These improvements shall serve the subdivision or parcel of land described below:

_____

_____

ARTICLE II. OWNER'S ENGINEER

Owner hereby names as his engineer to prepare the construction documents for the proposed improvements:

_____
Firm's Name

_____
Engineer to Contact PE No.

_____
Street Address

_____
City, State and Zip Code

_____
Phone Number

ARTICLE III. DISTRICT SPECIFICATIONS FOR SANITARY SEWER SYSTEM AND DOMESTIC WATER SYSTEM

The District Specifications for Sanitary Sewer System and Domestic Water System, hereinafter called District Specifications, is hereby made a part of this Contract by reference as though set forth in full in this Contract.

ARTICLE IV. FEES

1. Plan Check and Inspection Fee

As described in Section 2-4.2 of the General Conditions of the District Specifications, the Owner shall deposit with the District the sum of _____ to be used toward payment of plan checking costs and inspection fees for the improvements described in Article I. Said deposit shall be submitted with the plans that are to be checked. In the event the plan checking and inspection does not require all of such deposit then the balance thereof will be returned to the Owner. If the plan checking and inspection costs exceed the amount so deposited, the Owner shall forthwith deposit a sum sufficient to cover such deficiency.

2. Service Connection Fee

Pursuant to the District's General Conditions, Section 2-4.3 of the District Specifications, water service connection fees of $_____ at $_____ per service, and sewer service connection fees of $_____ at $_____ per service, are to be paid to the District by the Owner prior to approval of the Plans and Specifications for the improvements described in Article I.

ARTICLE V. INSURANCE REQUIREMENTS

As required by Section 7 of the General Conditions of the District Specifications, the Owner shall provide to the District proof of his Contractor's Worker's Compensation Insurance and Liability Insurance on the forms provided by the District. No alteration or substitution of said forms will be allowed.

The Liability Insurance shall provide bodily injury coverage of not less than $_____ for one person and for not less than $_____ for one occurrence.

Property damage coverage shall be for not less than $_____.

No work shall be permitted until the required insurance forms have been filed with and accepted by the District.

ARTICLE VI. CONSTRUCTION SECURITY

As required by Section 8 of the General Conditions of the District Specifications, the Owner shall provide to the District proof of Performance Bond and Payment Bond on the forms provided by the District. No alteration or substitution of said forms will be allowed. No work shall be permitted until the bond forms have been filed with and accepted by the District.

ARTICLE VII. ACCEPTANCE OF THE WORK BY THE DISTRICT

After the construction of the improvements described in Article I have been completed to the satisfaction of the District and any sums due have been paid by the Owner to the District, the District will issue a notice of acceptance of the domestic water system and sanitary sewer system improvements.

ARTICLE VIII. TERMINATION OF CONTRACT

Owner may terminate this agreement upon giving written notice to the District. In which event, the District will prepare a statement summarizing the costs to the District and deposits made by the Owner. If cost(s) exceeds the deposit(s), Owner shall pay the sum due to the District within 30 calendar days. If deposit(s) exceeds the cost(s), District shall reimburse the Owner the sum due Owner within 30 calendar days.

ARTICLE IX. GIVING NOTICE

Any notice to be given hereunder by either party to the other party shall be by personal delivery in writing or by registered or certified mail, postage prepaid, return receipt requested.

Either party may change its address by written notice in accordance with this paragraph.

The addresses of the parties to this agreement as of the date of this agreement are:

DISTRICT

EAST NILES COMMUNITY SERVICES DISTRICT
1417 Vale Street
P.O. Box 6038
Bakersfield, CA 93386

OWNER

_____
_____
_____
_____

DISTRICT

_____
President
Board of Directors

_____
District Secretary

_____
Approved as to form
District Counsel

OWNER

_____

Recording Requested By And For The Benefit Of

EAST NILES COMMUNITY SERVICES DISTRICT

When Recorded, Mail to:

EAST NILES COMMUNITY SERVICES DISTRICT
P.O. Box 6038
Bakersfield, CA 93386

GRANT OF EASEMENT

FOR A VALUBLE CONSIDERATION, receipt of which is hereby acknowledged,

_____

hereinafter called "GRANTOR", hereby grants to:

EAST NILES COMMUNITY SERVICES DISTRICT
a political subdivision of the State of California

hereinafter called "GRANTEE",

A permanent easement, to lay, construct, reconstruct, maintain, operate, enlarge, improve, relocate, remove, repair, renew, and use, at any time and from time to time, water conduit(s) and sewer conduit(s), consisting of one or more buried pipelines and/or markers, air valves, manholes, valves, meters, buried communication conduits and all other fixtures, devices and appurtenances connected therewith, in, under, over, along and across those certain parcels of real property located in Section ____, Township _____, Range _____, Mount Diablo Baseline & Meridian, in the County of Kern, State of California, and as shown and described on Exhibits "A" attached hereto, and more particularly described as follows:

"LEGAL DESCRIPTION"

Provided further, that District shall not be liable for any damages incurred by others as a result of District exercising its rights hereunder.

Grantor(s) and its successors further grant to the Grantee the right to trim such trees and other foliage and to cut such roots on said property as may be necessary for the construction, protection, maintenance, operation, renewal and replacement of such conduit(s) necessary to carry water or sewage over, under, across and through said lands, and the full exercise of the rights hereby granted, and covenants that no buildings or permanent improvements will be placed thereon.

IN WITNESS WHEREOF, Grantor has executed this Grant of Easement this _____ day of _____, 20___.

Grantor

_____

_____

_____

Notary

Please have notary complete and attach the California All-Purpose Acknowledgement.

CERTIFICATE OF ACCEPTANCE

THIS IS TO CERTIFY that the interest in the real property conveyed by Right-of-Way Deed dated _____ day of _____, 20__, from _____

_____

to East Niles Community Services District, a political subdivision of the State of California, is hereby accepted by order of the Board of Directors on _____, 20__, and the Grantee consents to the recordation thereof by its duly authorized officer.

_____
President of the Board of Directors
East Niles Community Services District

ATTEST:

_____
Secretary

(Seal)

PERFORMANCE BOND

We, _____ as Owner,

and _____ as Surety, jointly and severally, bind ourselves, our heirs, representatives, successors and assigns, as set forth herein, to the

EAST NILES COMMUNITY SERVICES DISTRICT

(herein called District) for payment of the penal sum of _____

_____

_____Dollars ($_____),
lawful money of the United States. The District's contract is for the construction of

THE CONDITION OF THIS OBLIGATION IS SUCH that if the Owner shall in all things abide by and well and truly keep and perform the covenants, and agreements in the said contract, and any alteration thereof made as therein provided, on his part to be kept and performed at the time and in the manner therein specified, and shall indemnify and save harmless the District, the District's Engineer, and their consultants, and each of their directors, officers, employees, and agents, as therein stipulated, this obligation shall become null and void, otherwise, it shall be and remain in full force and effect.

Surety agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or the work to be performed thereunder, or the plans and specifications shall in any wise affect its obligation on this bond, and it does hereby waive notice thereof.

This obligation shall remain in full force and effect for a period of one year commencing on the date of Final Acceptance by the District of the improvements described in the Contract between the Owner and the District.

Owner and Surety agree that if the District is required to engage the services of an attorney in connection with the enforcement of this bond, each shall pay District's reasonable attorney's fees incurred, with or without suit, in addition to the above sum.

Executed in four original
Counterparts on _____, 20___

_____
OWNER

(Seal if Corporation)

By_____

Title_____

(Attach Acknowledgement of Authorized Representative of Principal)

Any claims under this bond may be addressed to:

_____ (name of address of Surety)

_____

_____

_____ (name and address of Surety's agent for service of process in California, if different from above)

_____

_____

_____ (telephone number of Surety's agent in California)

(Attach Acknowledgment)

_____
SURETY

By_____
(Attorney-in-Fact)

APPROVED:

_____
(Attorney for District)

NOTICE:

No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California. Certified copy of Power or Attorney must be attached.

PAYMENT BOND

We, _____ as Owner,

and _____ as Surety, jointly and severally, bind ourselves, our heirs,, representatives, successors and assigns, as set forth herein, to the

EAST NILES COMMUNITY SERVICES DISTRICT

(herein called District) for payment of the penal sum of _____

_____

_____Dollars ($_____),
lawful money of the United States. District has awarded Owner a contract for the construction of

If Owner or any of his subcontractors fails to pay any of the persons named in Section 3181 of the California Civil Code, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board from the wages of employees of the Contractor and his subcontractors pursuant to Section 18806 of the Revenue and Taxation Code, with respect to such work and labor, then Surety will pay the same in an amount not exceeding the sum specified above, and also will pay, in case suit is brought upon this bond, such reasonable attorney's fees as shall be fixed by the court.

This bond shall insure to the benefit of any of the persons named in Section 3181 of the California Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Surety agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or the work to be performed thereunder, or the plans and specifications shall in any wise affect its obligation on this bond, and it does hereby waive notice thereof.

This obligation shall remain in full force and effect for a period of one year commencing on the date of Final Acceptance by the District of the improvements described in the Contract between the Owner and the District.

Owner and Surety agree that should the District become a party of any action on this bond that each will also pay District's reasonable attorney's fees incurred therein in addition to the above set forth.

Executed in four original
Counterparts on _____ 20____

_____
OWNER

(Seal if Corporation) By_____

Title_____

(Attach Acknowledgement of Authorized Representative of Owner)

Any claims under this bond may be addressed to:

_____ (name of address of Surety)

_____

_____

_____ (name and address of Surety's agent for service of process in California, if different from above)

_____

_____

_____ (telephone number of Surety's agent in California)

(Attach Acknowledgment)

_____
SURETY

By_____
(Attorney-in-Fact)

APPROVED:

_____
(Attorney for District)

NOTICE:

No substitution or revision to this bond form will be accepted. Sureties must be authorized to do business in and have an agent for service of process in California. Certified copy of Power or Attorney must be attached.

CONTRACTOR'S CERTIFICATE
REGARDING WORKERS' COMPENSATION

Description of Contract:

Labor Code Section 3700 Provides (in part):

> "Every employer except the State shall secure the payment of compensation in one or more of the following ways:
>
> (a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this State.
>
> (b) By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his employees."

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

Dated:_____, 20____

_____
(Contractor)

By_____

_____
(Official Title)

(SEAL)

(Labor Code Section 1861 provides that the above certificate must be signed and filed by the Contractor with the Owner prior to performing any work under this contract.)

CERTIFICATE OF INSURANCE

Description of Contract:

Type of Insurance: Workers' Compensation and Employers' Liability Insurance

THIS IS TO CERTIFY that the following policy has been issued by the below-stated company in conformance with the requirements of Section 7-1 and 7-2 of the General Conditions of the East Niles Community Services District Specifications and is in force at this time, and is in a form approved by the Insurance Commissioner.

The Company will give at least 30 days' written notice by certified mail to the District prior to any material change or cancellation of said policy.

POLICY NUMBER EXPIRATION DATE

LIMITS OF LIABILITY

Workers' Compensation:
Statutory Limits Under the Laws of the State of California

Employers' Liability:

$_____ Each Accident

$_____ Disease - Policy Limit

$_____ Disease - Each Employee

_____
Named Insured (Contractor)

_____
Street Number

_____
City and State

_____
Insurance Company

_____
Street Number

_____
City and State

By_____
(Company Representative)

(SEE NOTICE ON PAGE 2)

Insurance Company Agent for Service
of Process in California:

_____
Name

_____
Agency

_____
Street Number

_____
City and State

_____
Telephone Number

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 policy listed herein.

This is to certify that the policy has been issued to the named insured 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 policy described herein is subject to all the terms, exclusions, and conditions of such policy.

NOTICE:

No substitution or revision to the above certificate form will be accepted. If the insurance called for is provided by more than one insurance company, a separate certificate in the exact above form shall be provided for each insurance company.

INSURANCE ENDORSEMENT

Description of Contract:

Type of Insurance: Workers' Compensation and Employers' Liability Insurance

This endorsement forms a part of Policy No. _____.

ENDORSEMENT

It is agreed that with respect to such insurance as is afforded by the policy, the Company waives any right of subrogation it may acquire against the District, the District's Engineer, and their consultants, and each of their directors, officers, and employees by reason of any payment made on account of injury, including death resulting therefrom, sustained by any employee of the insured, arising out of the performance of the above-referenced contract.

The additional premium for this endorsement shall be _____%* of the California Workers' Compensation premium otherwise due on such remuneration.

This endorsement does not increase the Company's total limits of liability.

_____ Named Insured (Contractor)

_____ Insurance Company

_____ Street Number

_____ Street Number

_____ City and State

_____ City and State

By_____ (Company Representative)

(SEE NOTICE ON PAGE 2)

* - Contractor's insurance company to fill in this percentage.

NOTICE:

No substitution or revision to the above endorsement form will be accepted. If the insurance called for is provided by more than one policy, a separate endorsement in the exact above form shall be provided for each policy.

CERTIFICATE OF INSURANCE

Description of Contract:

Type of Insurance: Liability Insurance

THIS IS TO CERTIFY that the following policies have been issued by the below-stated company in conformance with the requirements of Articles 7-1 and 7-3 of the General Conditions of the East Niles Community Services District Specifications and are in force at this time:

POLICY NUMBER	EXPIRATION DATE		LIMITS OF LIABILITY In Thousands (000)	
	A.	GENERAL LIABILITY		
		General Aggregate	$_____	
		Products-Comp Ops Aggregate	$_____	
		Personal and Advertising Injury	$_____	
		Each Occurrence	$_____	
		Fire Damage (any one fire)	$_____	
		Medical Expense (any one person)	$_____	
	B.	EXCESS GENERAL LIABILITY	Each Occurrence $_____	Aggregate $_____
	C.	AUTOMOBILE LIABILITY		
		Bodily Injury (Each Person) Bodily Injury (Each Accident) Property Damage	$_____ $_____ $_____	
		or Bodily Injury and Property damage Combined Single Limit	$_____	
	D.	EXCESS AUTOMOBILE LIABILITY	Each Occurrence $_____	Aggregate $_____

The following types of coverage are included in said policies (indicate by "X" in space):

A. GENERAL LIABILITY

Commercial Form ..... YES___ NO___

Premises-Operations ..... YES___ NO___

Explosion and Collapse Hazard ..... YES___ NO___

Underground Hazard ..... YES___ NO___

Products/Completed Operations ..... YES___ NO___

Contractual Insurance ..... YES___ NO___

Broad Form Property Damage ..... YES___ NO___

Independent Contractors ..... YES___ NO___

Personal Injury and Advertising Injury ..... YES___ NO___

B. EXCESS GENERAL LIABILITY

Following Form ..... YES___ NO___

C. AUTOMOBILE LIABILITY

Business Auto Form Including Loading and Unloading ..... YES___ NO___

Owned ..... YES___ NO___

Hired ..... YES___ NO___

Non-Owned ..... YES___ NO___

D. EXCESS AUTOMOBILE LIABILITY

Following Form ..... YES___ NO___

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 listed herein.

This is to certify that the policy has been issued to the named insured 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.

The Company will give at least 30 days' written notice to the District prior to any cancellation of said policies.

_____
Named Insured (Contractor)

_____
Street Number

_____
City and State

_____
Insurance Company

_____
Street Number

_____
City and State

By_____
(Company Representative)

(SEE NOTICE ON PAGE 4)

Insurance Company Agent for Service of Process in California:

_____
Name

_____
Agency

_____
Street Number

_____
City and State

_____
Telephone Number

NOTICE:

No substitution or revision to the above certificate form will be accepted. If the insurance called for is provided by more than one insurance company, a separate certificate in the exact above form shall be provided for each insurance company.

Insurers must be authorized to do business and have an agent for service of process in California and have a "B+" policyholder's rating and a financial rating of at least Class VIII in accordance with the most current Best's Rating.

INSURANCE ENDORSEMENT

Description of Contract:

Type of Insurance: Liability Insurance

This endorsement forms a part of Policy No. _____.

ENDORSEMENT

The District, the District's Engineer, and their consultants, and each of their directors, officers, and employees are included as additional insureds under said policy but only while acting in their capacity as such and only as respects operations of the named insured. This insurance shall not apply to an additional insured to the degree that the loss or damage is ultimately determined to be the result of the additional insured's negligence (including any connected with the preparation or approval of maps, drawings, opinions, reports, surveys, designs, or specifications). The insurance afforded to these additional insureds is primary insurance. If the additional insureds have other insurance which might be applicable to any loss, the amount of this insurance shall not be reduced or prorated by the existence of such other insurance.

This endorsement does not increase the Company's total limits of liability.

_____
Named Insured (Contractor)

_____
Street Number

_____
City and State

_____
Insurance Company

_____
Street Number

_____
City and State

By_____
(Company Representative)

NOTICE:

No substitution or revision to the above endorsement form will be accepted. If the insurance called for is provided by more than one policy, a separate endorsement in the exact above form shall be provided for each policy.

STANDARD DRAWINGS

CONTENTS

STANDARD DETAILS

SEWER

SEWER NOTES

1. THE SEWER FACILITIES TO BE DEDICATED TO THE E.N.C.S.D. SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE E.N.C.S.D.

2. THE E.N.C.S.D. SHALL BE NOTIFIED AT LEAST TWO (2) WORKING DAYS PRIOR TO START OF CONSTRUCTION. TELEPHONE (661) 871-2011

3. THE CONSTRUCTION PLANS MUST BE APPROVED BY THE E.N.C.S.D. PRIOR TO THE START OF ANY SEWER CONSTRUCTION. TWO (2) SETS OF APPROVED PLANS SHALL BE FURNISHED TO E.N.C.S.D. AND ONE (1) SET OF THE SAME TO THE DISTRICT'S ENGINEER. PRIOR TO DISTRICT APPROVAL, THE PLANS MUST BE SIGNED BY A CALIFORNIA REGISTERED CIVIL ENGINEER.

4. PRIOR TO ACCEPTANCE OF THE SEWER FACILITIES, ALL NECESSARY EASEMENT DOCUMENTS SHALL BE PROPERLY EXECUTED AND RECORDED. THREE (3) COPIES EACH OF THE RECORDED DOCUMENTS SHALL BE FURNISHED TO E.N.C.S.D.

5. THE MANHOLE FRAME AND COVER AND CONCRETE SUPPORT FOR MANHOLES SHALL BE RAISED AND CONSTRUCTED TO FINISHED PAVED GRADE AFTER THE PAVING OPERATION IS COMPLETED. THE RING SECTION SHALL NOT BE MORE THAN 24" FROM THE CONE. THE COMPLETE SEWER SYSTEM SHALL BE COMPLETELY CLEAN PRIOR TO ACCEPTANCE.

6. WORK IN THE STATE OF CALIFORNIA OR THE COUNTY OF KERN RIGHTS-OF-WAY SHALL BE DONE IN ACCORDANCE WITH THE APPROPRIATE ENCROACHMENT PERMITS.

7. THE SEWER SYSTEM, INCLUDING LATERALS, SHALL BE HYDROSTATIC WATER OR AIR TESTED, AFTER ALL UNDERGROUND UTILITIES ARE CONSTRUCTED, AND PRIOR TO PLACING STREET PAVEMENT. CLEANING BALL SHALL BE RAN AFTER MANHOLES ARE ADJUSTED TO FINISH GRADE.

8. EXISTING SEWER LOCATION AND FLOW LINE SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE START OF CONSTRUCTION. THE DISTRICT SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.

9. ONE COMPLETE SET OF DRAWINGS (REPRODUCIBLE 3-MIL. DOUBLE MATTE FILM) SHALL BE FURNISHED TO THE DISTRICT ON COMPLETION OF CONSTRUCTION.

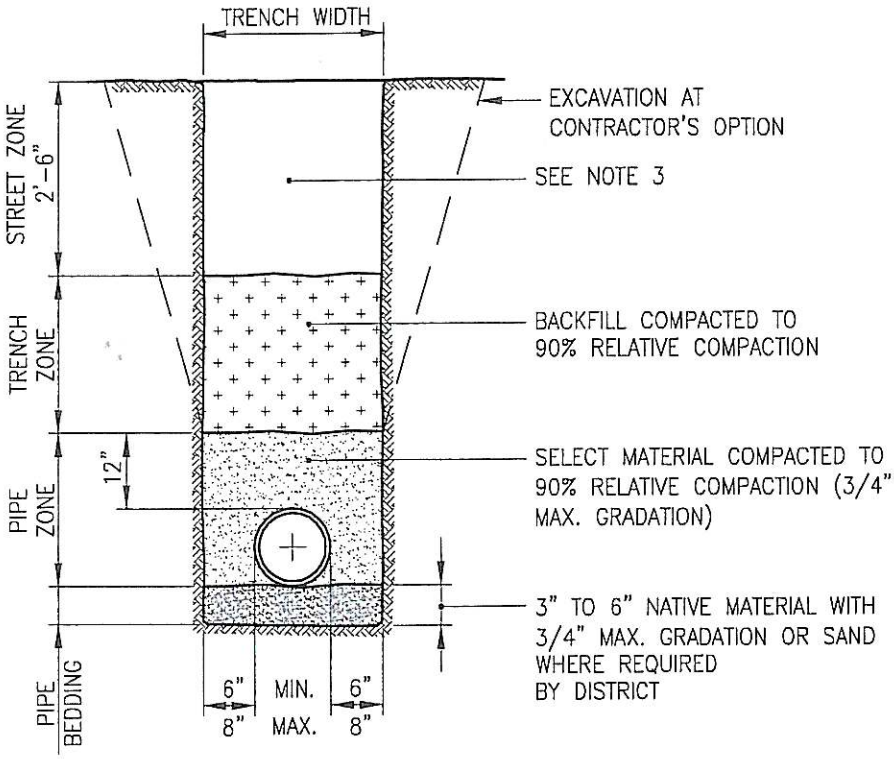
DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

STANDARD SEWER NOTES

BOYLE ENGINEERING CORPORATION

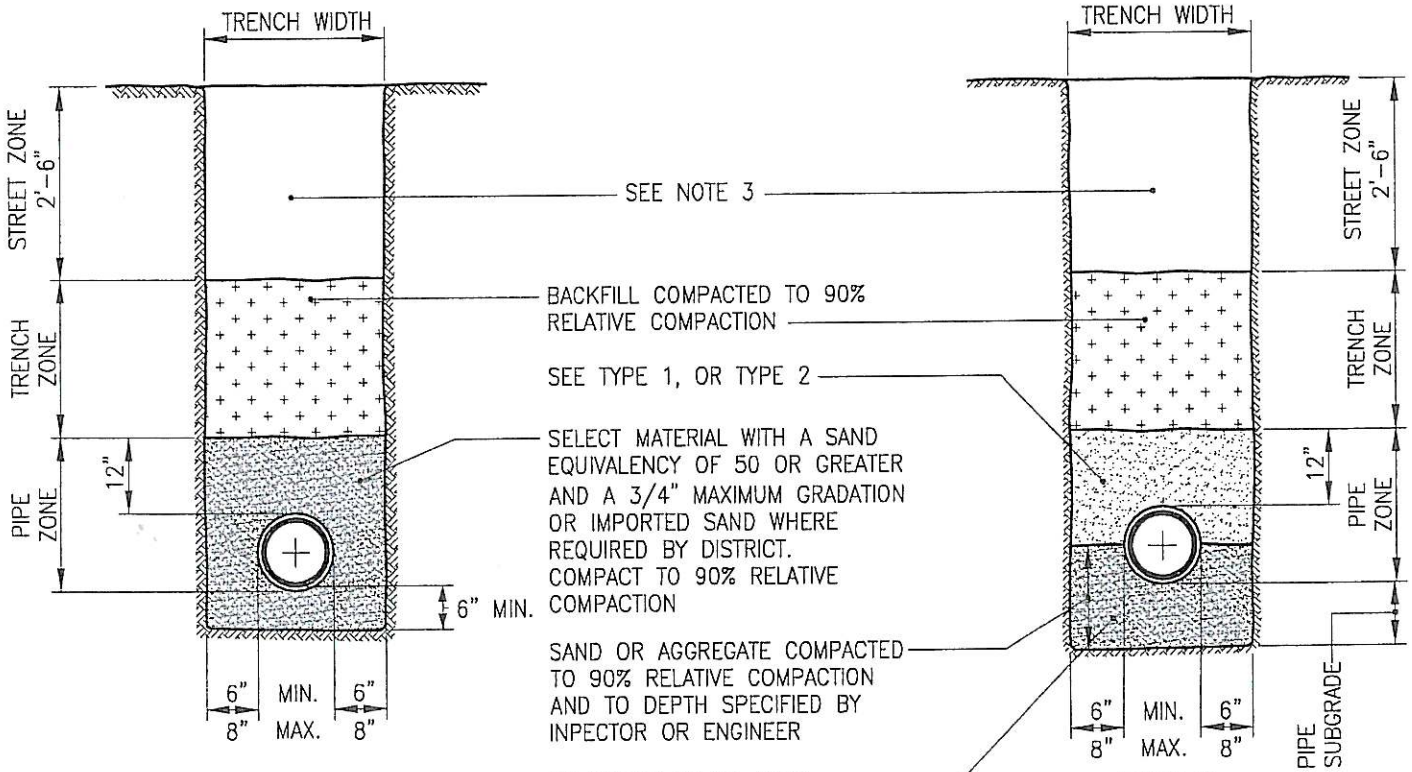
DATE DRAWN	SHEET NO.
04/02	S-1



TYPE 1

NOTES:

1. SAND AND SELECT MATERIAL SHALL BE PER STANDARD SPECIFICATIONS FOR EARTHWORK.
2. SEE STANDARD SPECIFICATIONS FOR EARTHWORK IF TRENCH WIDTH EXCEEDS THE MAXIMUM SHOWN ON THIS DRAWING.
3. STREET ZONE TO BE COMPACTED TO 95% RELATIVE COMPACTION IF WITHIN ROADBED OR TO 90% RELATIVE COMPACTION IF OUTSIDE OF ROADBED. SEE TECHNICAL SPECIFICATIONS FOR EARTHWORK.
4. MINIMUM COVER OVER ALL SEWER MAINS TO BE 6' AS MEASURED FROM FINISHED GRADE.
5. PERCENT RELATIVE COMPACTION IS THE PERCENT OF THE MAX. DRY DENSITY AS DETERMINED BY ASTM D-1557 (5 LAYER)



TYPE 2
ROCKY OR OVER-EXCAVATED

TYPE 3
UNSUITABLE MATERIALS IN SUBGRADE

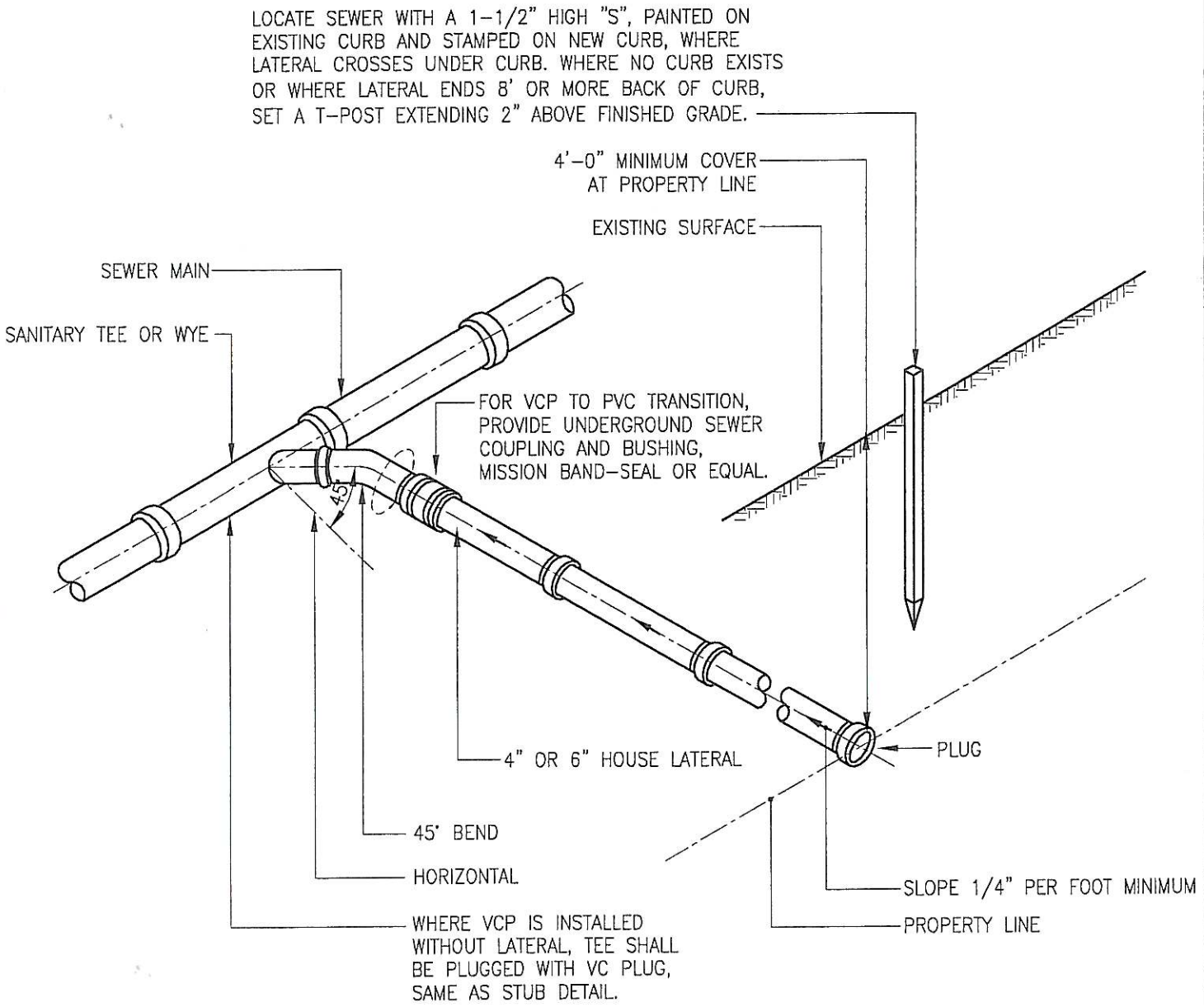
DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

SEWER PIPE BEDDING AND BACKFILL DETAILS

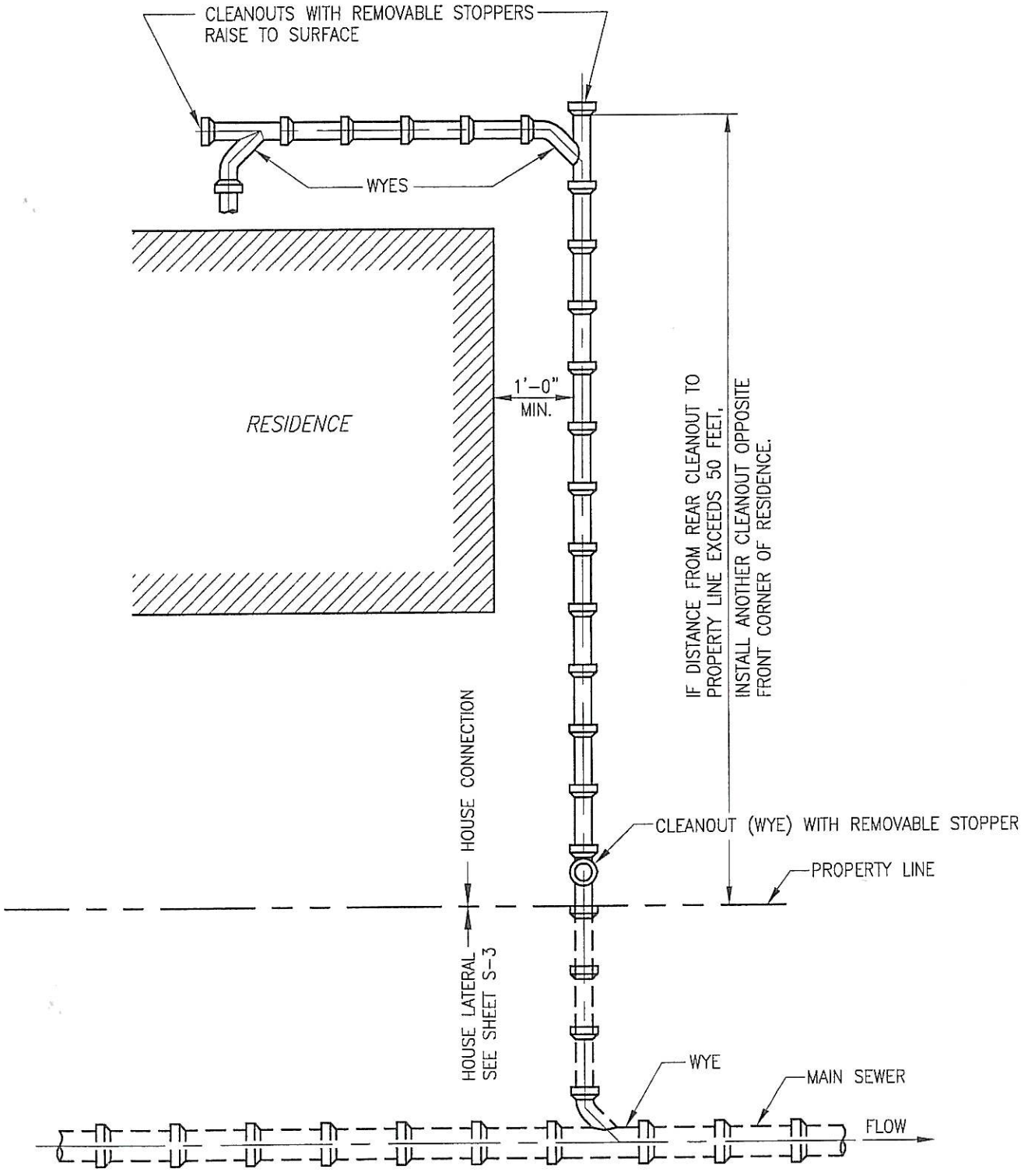
BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
04/02	S-2



ISOMETRIC

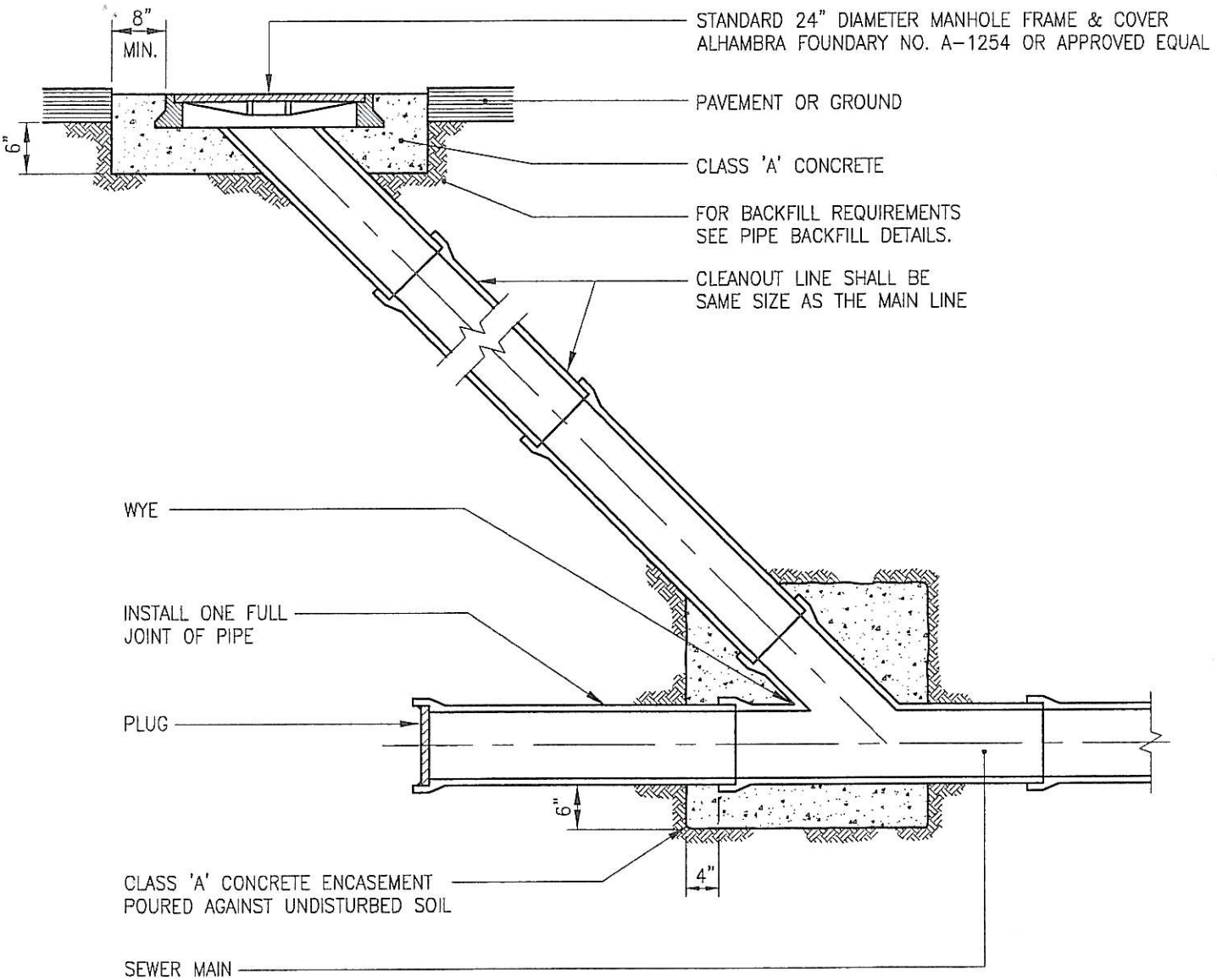
DATE	REVISION	EAST NILES COMMUNITY SERVICES DISTRICT		
		TYPICAL SEWER LATERAL		
		BOYLE ENGINEERING CORPORATION	DATE DRAWN 04/06	SHEET NO. S-3



PLAN

		EAST NILES COMMUNITY SERVICES DISTRICT		
		TYPICAL HOUSE CONNECTION		
DATE	REVISION	BOYLE ENGINEERING CORPORATION	DATE DRAWN 04/02	SHEET NO. S-4

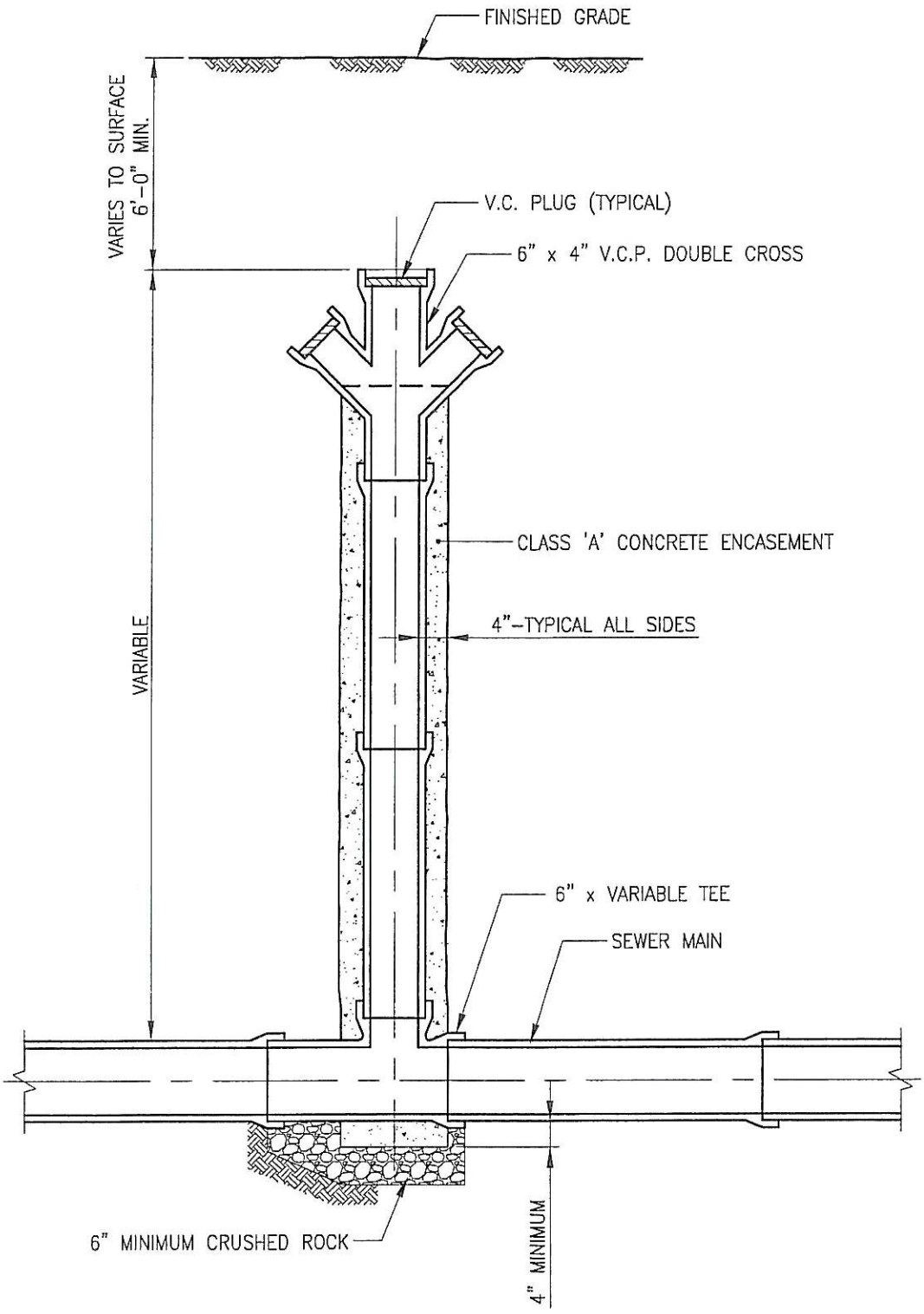
DWG: S:\East Niles Community Services District_standard details\EL1662-S4.dwg USER: dgbilarducci
DATE: Sep 18, 2007 2:31pm XREFS: BORDER



SECTION

		EAST NILES COMMUNITY SERVICES DISTRICT	
		STANDARD CLEANOUT	
DATE	REVISION	BOYLE ENGINEERING CORPORATION	DATE DRAWN 04/02 / SHEET NO. S-5

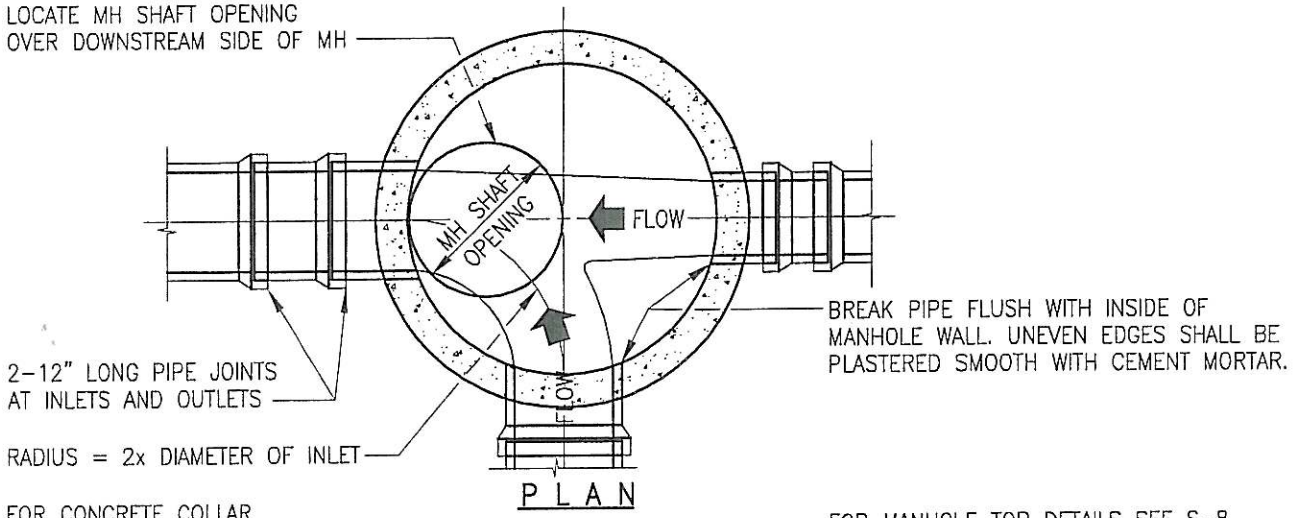
DWG: S:\East Niles Community Services District_standard details\L1662-S5.dwg USER: dghilarducci
DATE: Sep 18, 2007 2:21pm XREFS: BORDER



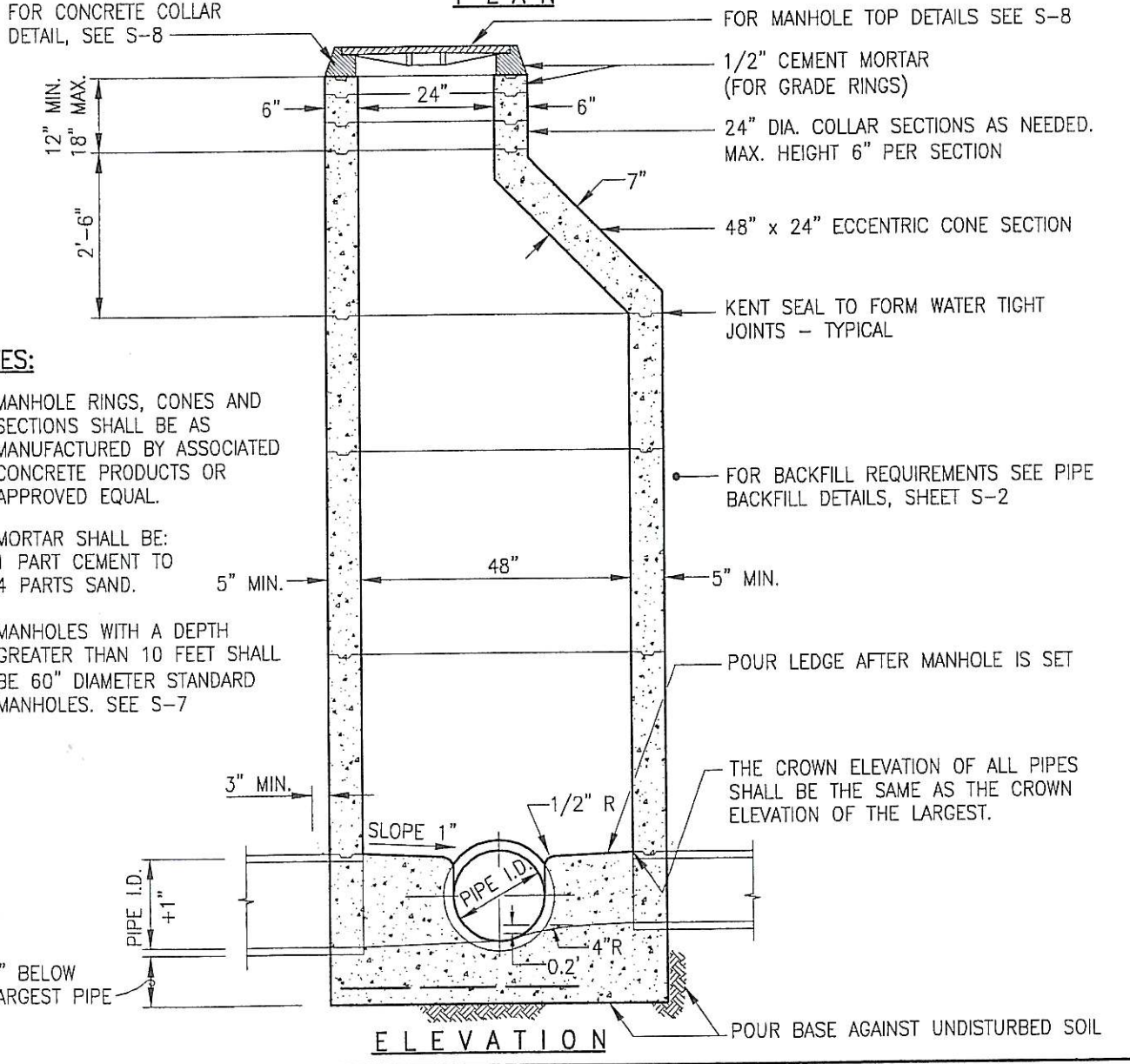
SECTION

		EAST NILES COMMUNITY SERVICES DISTRICT	
		STANDARD CHIMNEY	
DATE	REVISION	BOYLE ENGINEERING CORPORATION	DATE DRAWN 04/03 / SHEET NO. S-6

DWG: S:\East Niles Community Services District_standard details\L1662-S8.dwg USER: dghilarducci
DATE: Sep 18, 2007 2:20pm XREFS: BORDER



PLAN



ELEVATION

NOTES:

1. MANHOLE RINGS, CONES AND SECTIONS SHALL BE AS MANUFACTURED BY ASSOCIATED CONCRETE PRODUCTS OR APPROVED EQUAL.
2. MORTAR SHALL BE: 1 PART CEMENT TO 4 PARTS SAND.
3. MANHOLES WITH A DEPTH GREATER THAN 10 FEET SHALL BE 60" DIAMETER STANDARD MANHOLES. SEE S-7

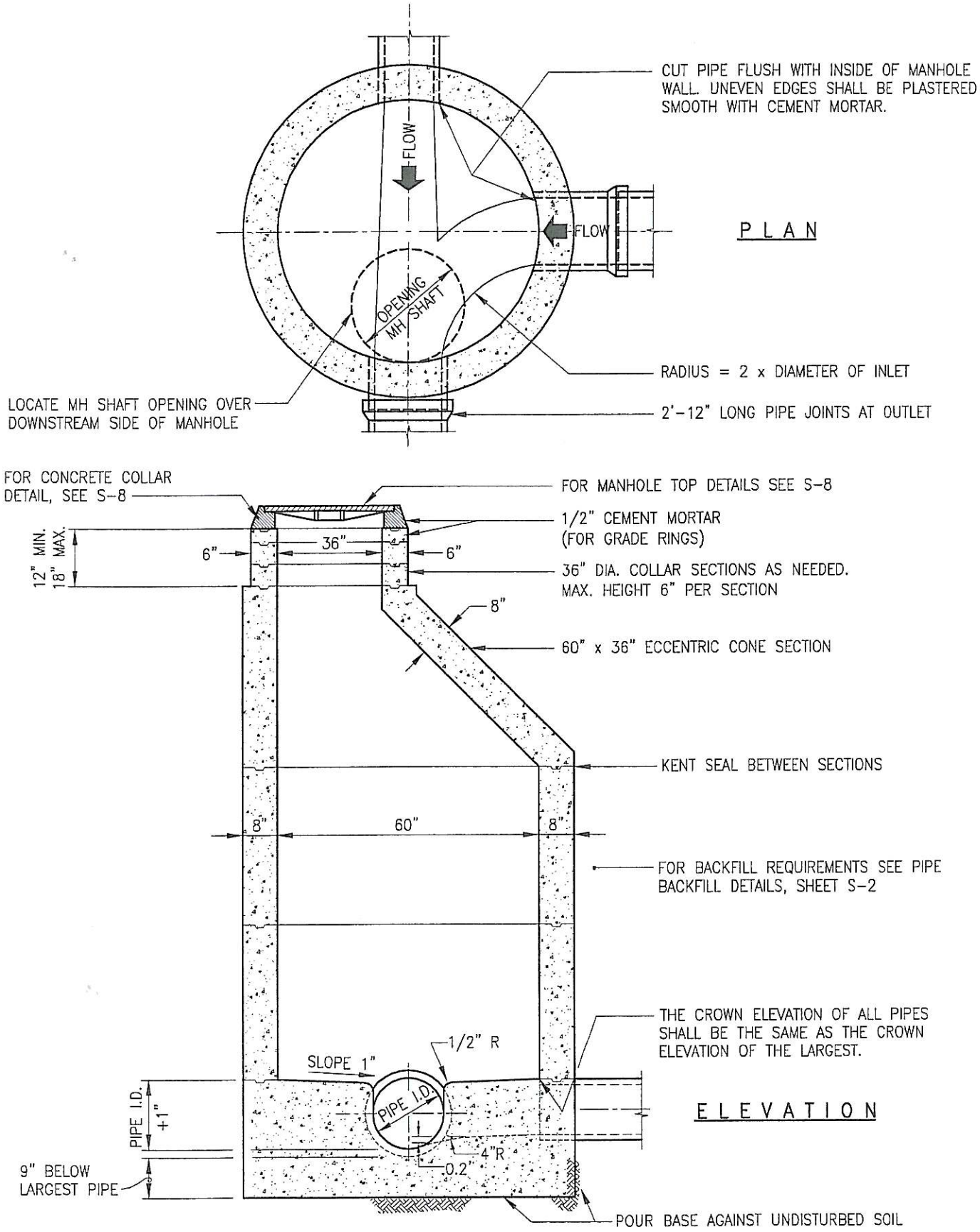
DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

48" I.D. STANDARD MANHOLE

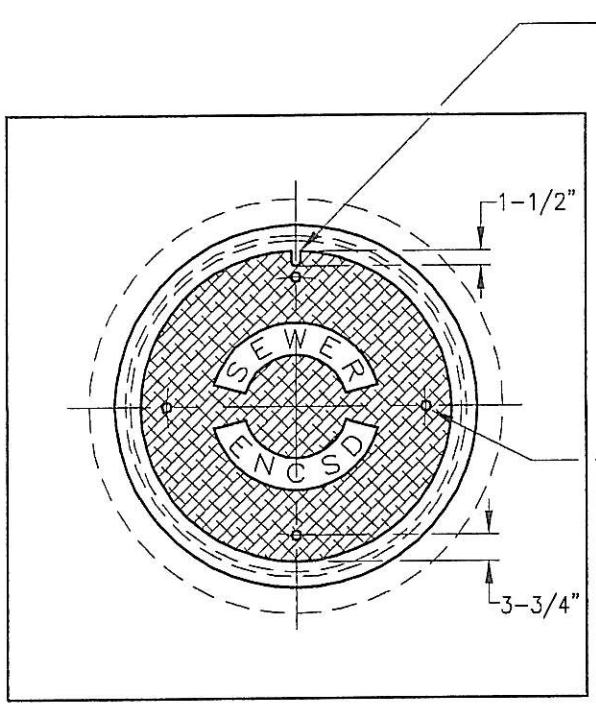
BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
04/02	S-7



		EAST NILES COMMUNITY SERVICES DISTRICT	
		60" I.D. STANDARD MANHOLE	
DATE	REVISION	BOYLE ENGINEERING CORPORATION	DATE DRAWN 04/02 / SHEET NO. S-8

DWG: S:\East Niles Community Services District_standard details\11662-S8.dwg USER: dghilarducci
DATE: Sep 18, 2007 2:20pm XREFS: BORDER



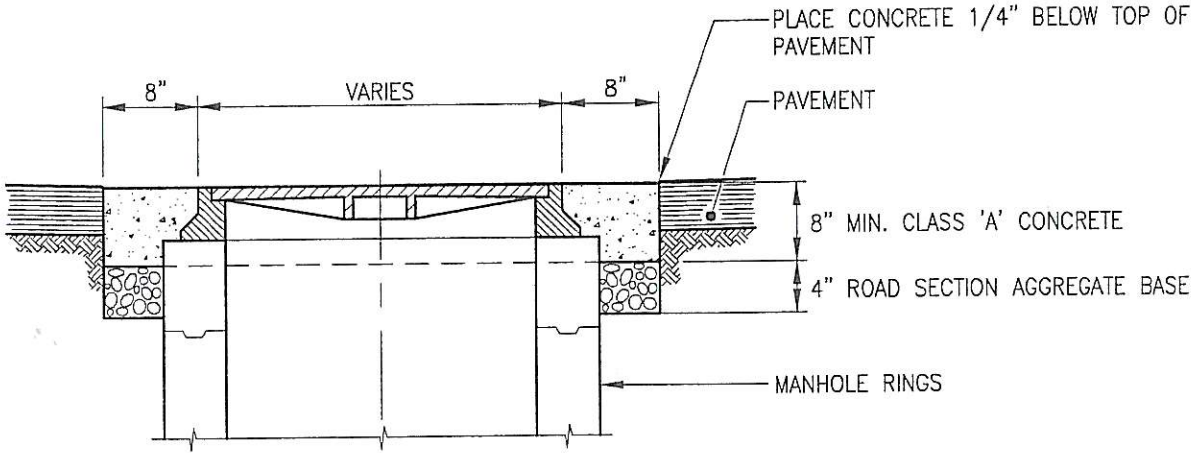
PLAN

MANHOLE FRAME AND COVER

NOTE: LETTERING SHALL BE 3" HIGH

24" DIA. – ALHAMBRA FOUNDARY NO. A-1254 OR APPROVED EQUAL

36" DIA. – ALHAMBRA FOUNDARY NO. A-1251 OR APPROVED EQUAL



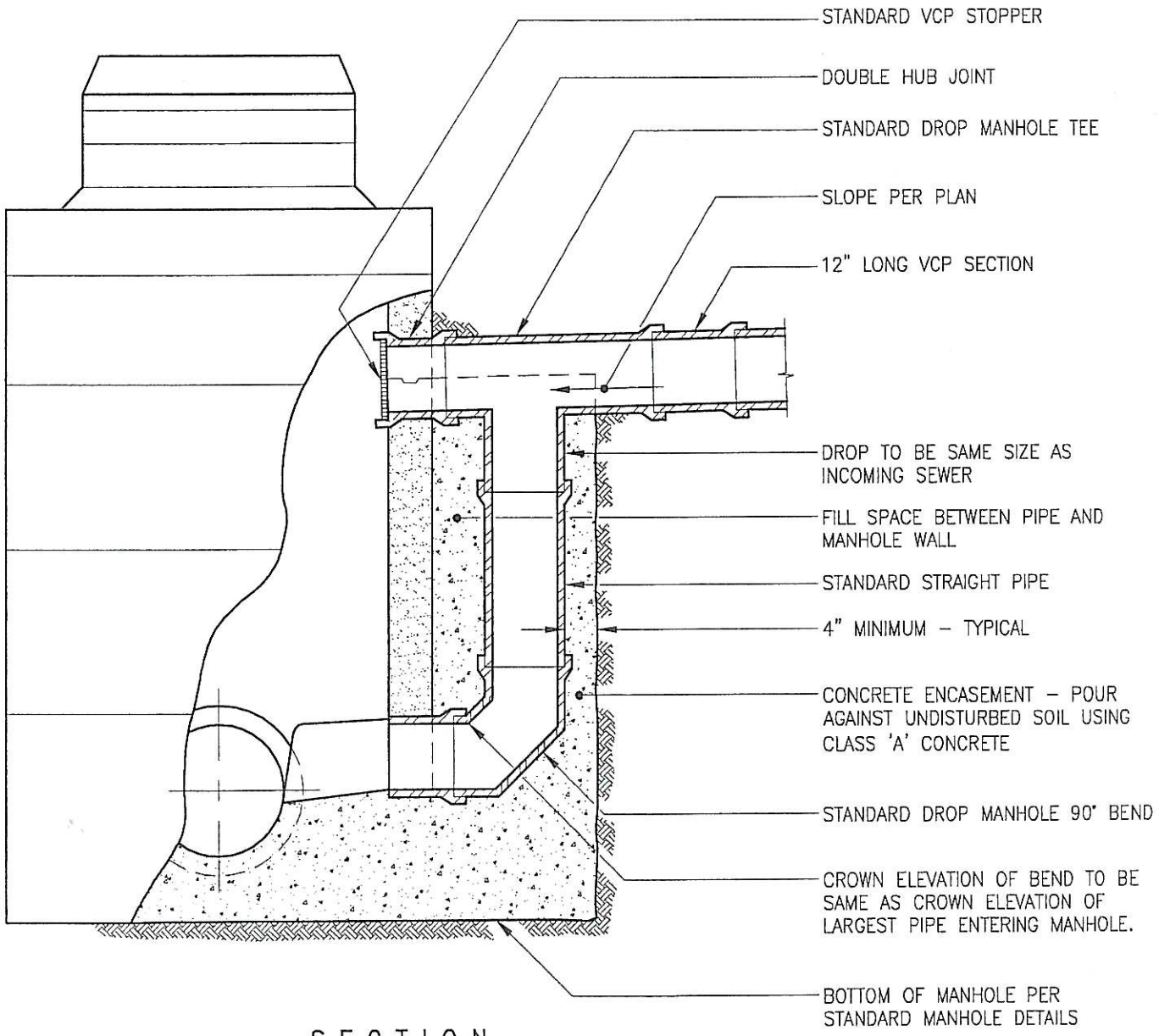
SECTION

		EAST NILES COMMUNITY SERVICES DISTRICT		
		MANHOLE FRAME AND COVER		
		BOYLE ENGINEERING CORPORATION	DATE DRAWN 04/02	SHEET NO. S-9
DATE	REVISION			

DWG: S:\East Niles Community Services District_standard details\LL1662-59.dwg USER: dghilarducci
DATE: Sep 18, 2007 2:29pm XREFS: BORDER

NOTES:

1. DROP CONNECTION SHALL BE USED IF THE DIFFERENCE IN ELEVATION BETWEEN THE MAIN & INTERSECTING PIPES IS GREATER THAN 2.5'
2. THE DROP TYPE MANHOLE IS THE SAME AS THE STANDARD MANHOLE EXCEPT FOR THE DROP TYPE CONNECTION.



SECTION

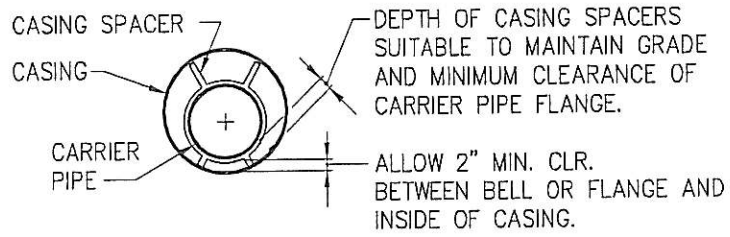
DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

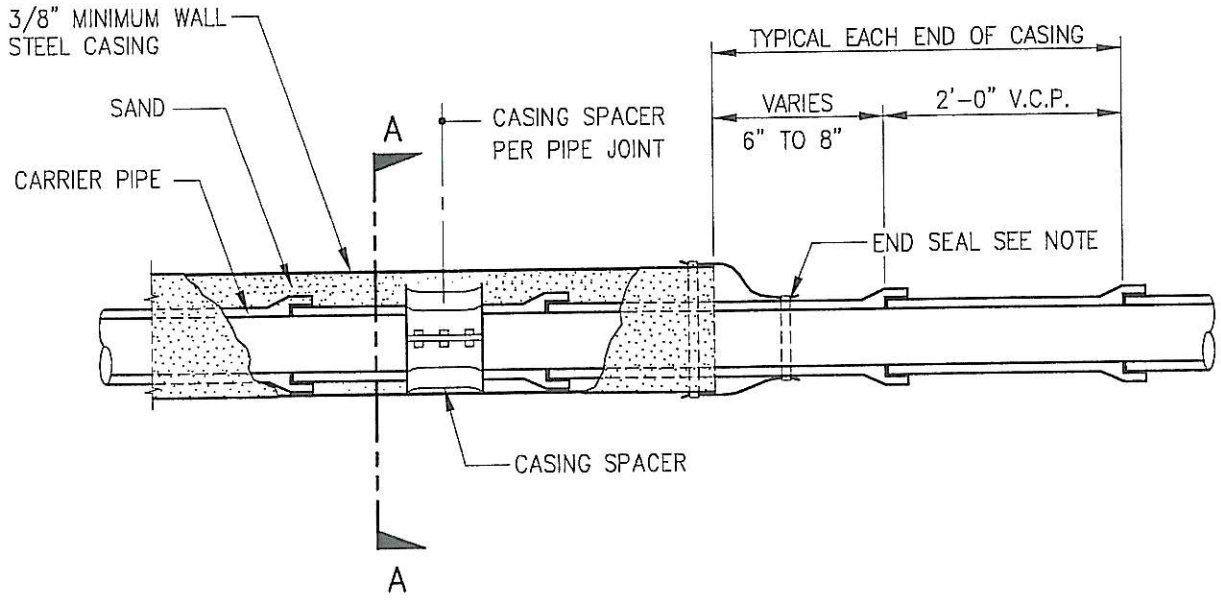
MANHOLE - DROP INLET

BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
04/02	S-10



SECTION A–A



NOTE:

1. CASING SPACER SHALL BE SOLID POLYETHYLENE AS MANUFACTURED BY CALPICO, OR EQUAL.

2. EACH END OF CASING SHALL BE FITTED WITH AN END SEAL, INSTALLED AS SHOWN AND SECURELY FASTENED WITH STAINLESS STEEL CLAMPS. THE END SEAL SHALL BE 1/8" THICK, MINIMUM, NEOPRENE, OR EQUAL.

DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

STEEL CASING FOR SEWER PIPE

BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
04/03	S-11

WATER

WATER NOTES

1. THE WATER FACILITIES TO BE DEDICATED TO THE E.N.C.S.D. SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE E.N.C.S.D. STANDARD SPECIFICATIONS.
2. THE E.N.C.S.D. SHALL BE NOTIFIED AT LEAST TWO (2) WORKING DAYS PRIOR TO START OF CONSTRUCTION. TELEPHONE (661) 871-2011
3. THE CONSTRUCTION PLANS MUST BE APPROVED BY THE E.N.C.S.D. PRIOR TO THE START OF ANY WATER CONSTRUCTION. TWO (2) SETS OF APPROVED PLANS SHALL BE FURNISHED TO E.N.C.S.D. AND ONE (1) SET OF THE SAME TO THE DISTRICT'S ENGINEER. PRIOR TO DISTRICT APPROVAL, THE PLANS MUST BE SIGNED BY A CALIFORNIA REGISTERED CIVIL ENGINEER.
4. PRIOR TO ACCEPTANCE OF THE WATER FACILITIES, ALL NECESSARY EASEMENT DOCUMENTS SHALL BE PROPERLY EXECUTED AND RECORDED. THREE (3) COPIES EACH OF THE RECORDED DOCUMENTS SHALL BE FURNISHED TO E.N.C.S.D.
5. WATER MAINS SHALL BE INSTALLED 6 FEET FROM THE CURB FACE UNLESS OTHERWISE INDICATED ON THE PLANS. ALL WATER SERVICES SHALL BE METERED.
6. WORK IN THE STATE OF CALIFORNIA OR THE COUNTY OF KERN RIGHTS-OF-WAY SHALL BE DONE IN ACCORDANCE WITH THE APPROPRIATE ENCROACHMENT PERMITS.
7. THE WATER SYSTEM, INCLUDING LATERALS, SHALL BE HYDROSTATIC TESTED, AFTER ALL UNDERGROUND UTILITIES ARE CONSTRUCTED, AND PRIOR TO PLACING STREET PAVEMENT.
8. ALL WATER METERS AND METER BOXES SHALL BE APPROVED BY THE DISTRICT AND SHALL BE DELIVERED TO THE E.N.C.S.D. OFFICE.
9. ALL VALVES SHALL BE FLANGE CONNECTED TO FITTINGS.
10. ALL WATER LINES SHALL HAVE A MINIMUM COVER OF 36 INCHES.
11. ONE COMPLETE SET OF DRAWINGS (REPRODUCIBLE 3-MIL DOUBLE MATTE FILM) SHALL BE FURNISHED TO THE DISTRICT ON COMPLETION OF CONSTRUCTION.

DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

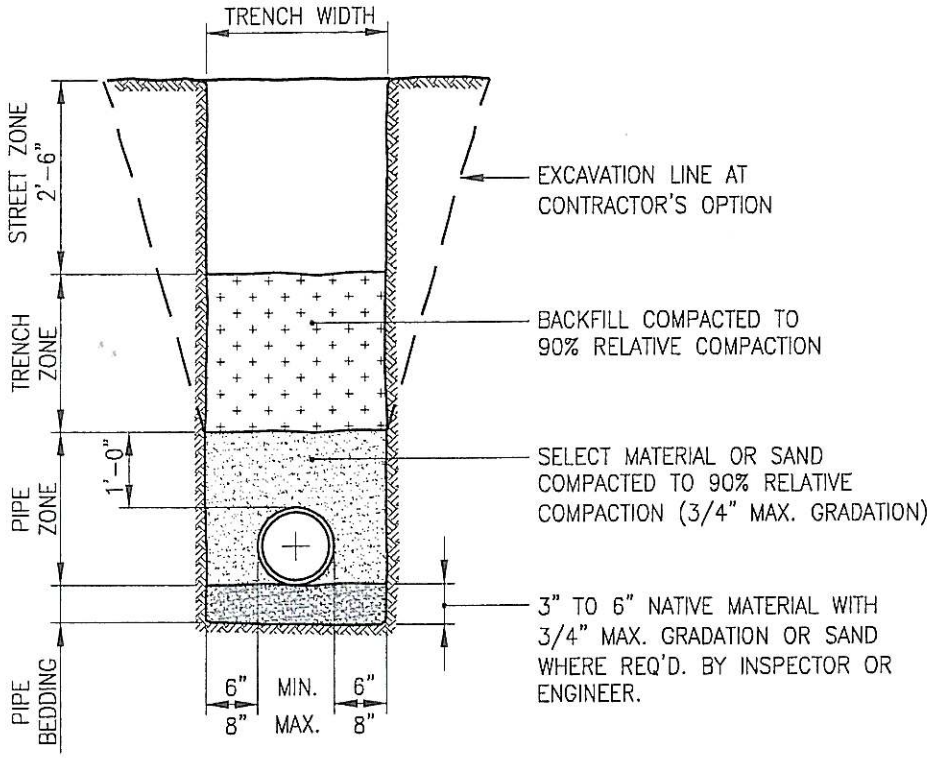
STANDARD WATER NOTES

BOYLE ENGINEERING CORPORATION

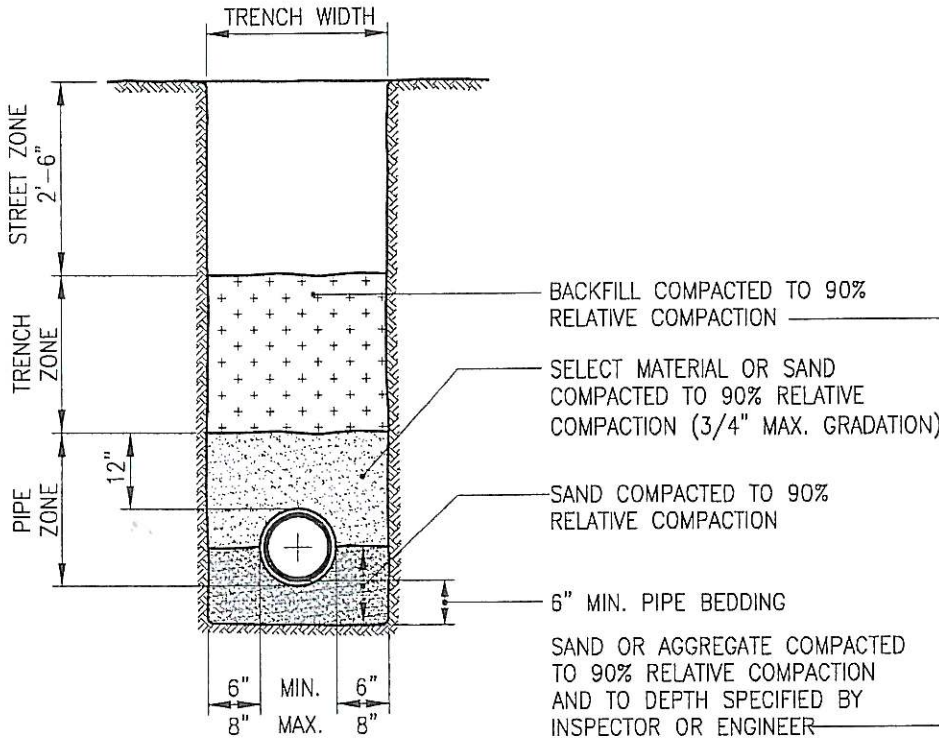
DATE DRAWN	SHEET NO.
04/02	W-1

NOTES:

1. SAND AND SELECT MATERIAL SHALL BE PER STANDARD SPECIFICATIONS FOR EARTHWORK.
2. SEE STANDARD SPECIFICATIONS FOR EARTHWORK IF TRENCH WIDTH EXCEEDS THE MAXIMUM SHOWN ON THIS DRAWING.

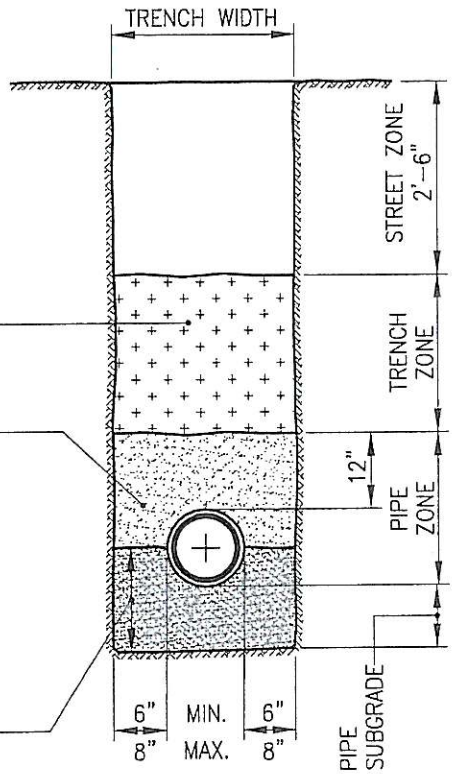


TYPE 1



TYPE 2

ROCKY OR OVER-EXCAVATED



TYPE 3

UNSUITABLE MATERIALS IN SUBGRADE

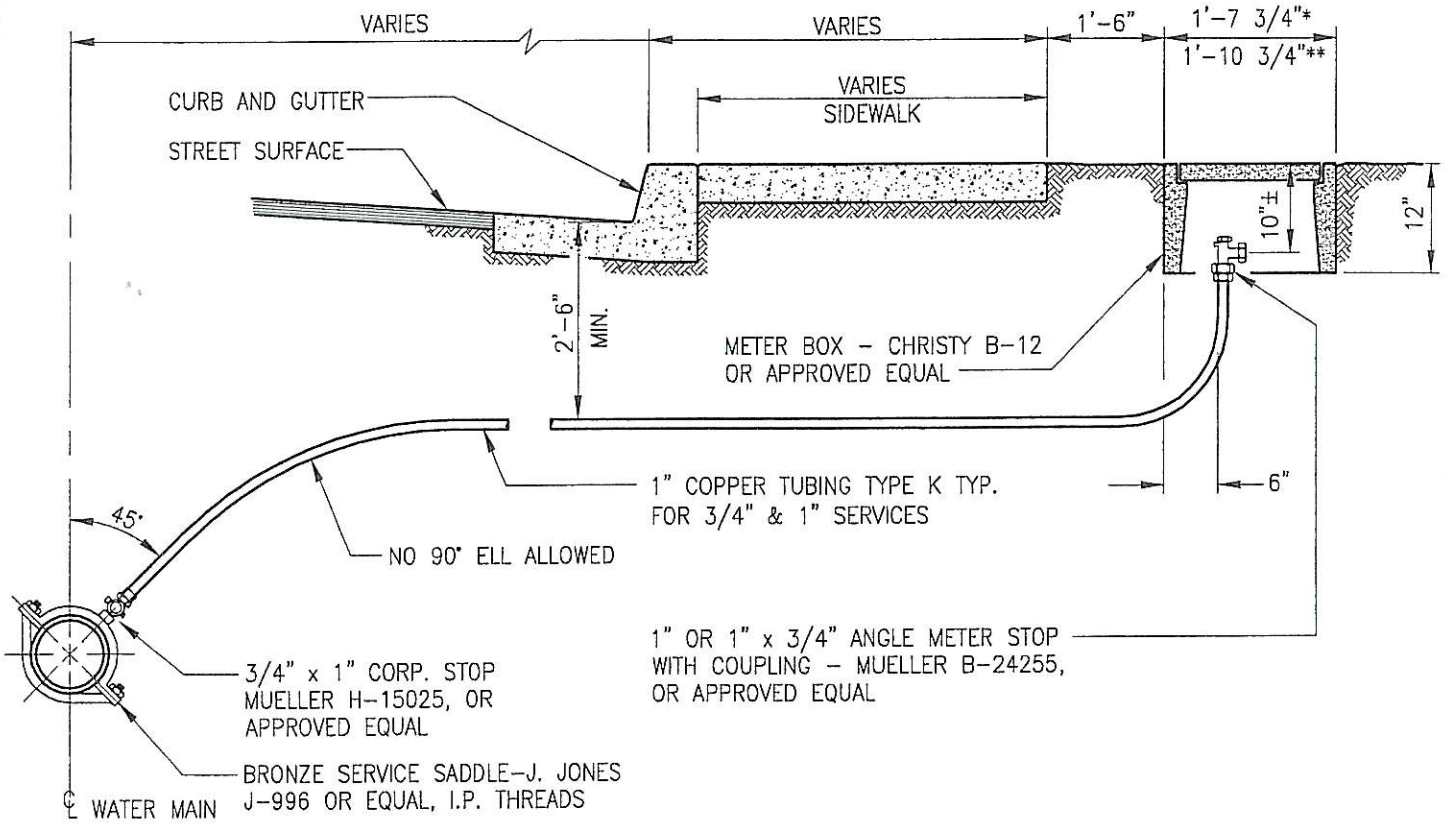
DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

WATER PIPE BEDDING AND BACKFILL DETAILS

BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
04/02	W-2



SECTION

GENERAL NOTES:

1. CORPORATION STOP TAP SHALL BE MADE AS SPECIFIED BY THE PIPE MANUFACTURER'S INSTALLATION GUIDE. ALL DRY TAPS SHALL BE MADE WITH MACHINE WITH GUIDE OR PILOT FOR TAP.
2. THE REQUIRED SIZE OF THE SERVICE MUST BE APPROVED BY THE DISTRICT.
3. THE WATER SERVICE SHALL EXTEND PERPINDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP.
4. METER BOXES SHALL BE CONSTRUCTED IMMEDIATELY BEHIND THE SIDEWALK WHERE SIDEWALKS ARE ADJACENT TO CURB.
5. * INDICATES METER BOX AND DIMENSION FOR 3/4" SERVICE.
   ** INDICATES METER BOX AND DIMENSION FOR 1" SERVICE.

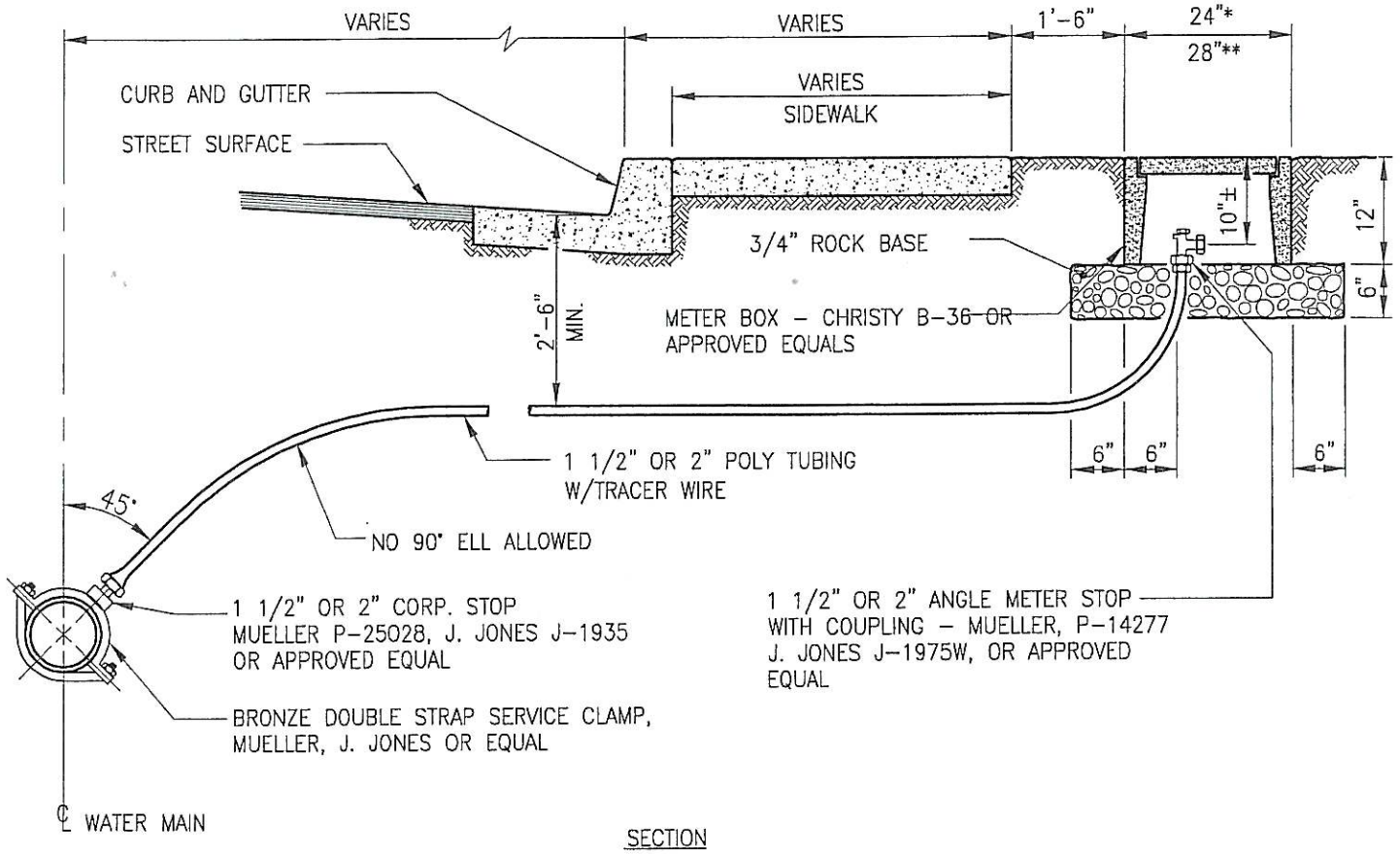
DATE	REVISION
3/05	DELETE DOUBLE SERVICE

EAST NILES COMMUNITY SERVICES DISTRICT

3/4" & 1" STANDARD WATER SERVICES

BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
04/02	W-3



SECTION

GENERAL NOTES:

1. CORPORATION STOP TAP SHALL BE MADE AS SPECIFIED BY THE PIPE MANUFACTURER'S INSTALLATION GUIDE. ALL DRY TAPS SHALL BE MADE WITH MACHINE WITH GUIDE OR PILOT FOR TAP.

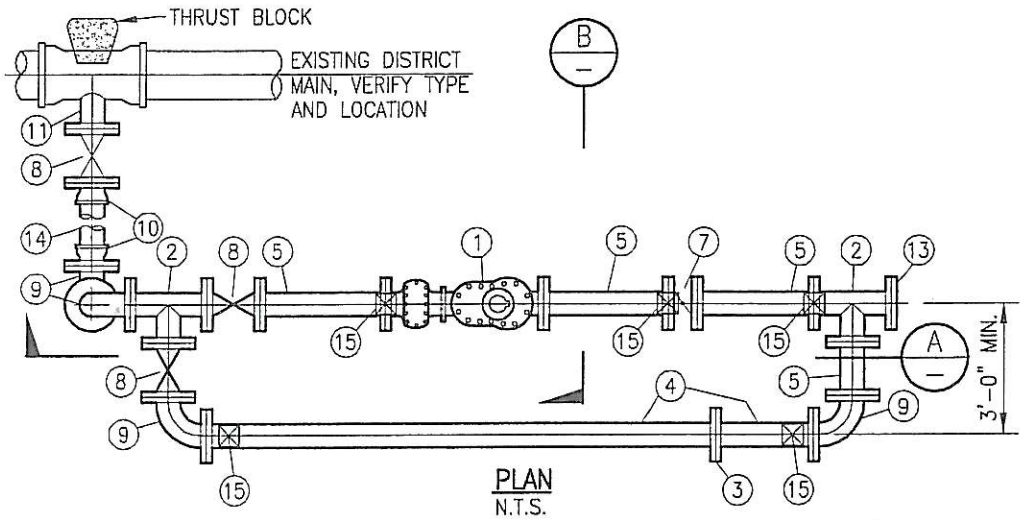
2. THE REQUIRED SIZE OF THE SERVICE MUST BE APPROVED BY THE DISTRICT.

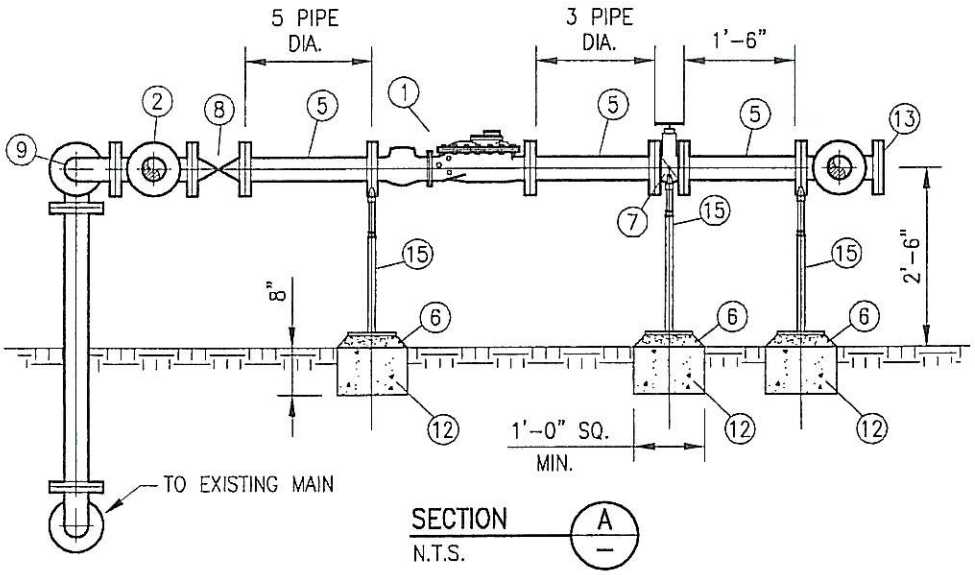
3. THE WATER SERVICE SHALL EXTEND PERPENDICULAR TO THE CENTERLINE OF THE STREET FROM THE WATER MAIN TO THE METER STOP.

4. METER BOXES SHALL BE CONSTRUCTED IMMEDIATELY BEHIND THE SIDEWALK WHERE SIDEWALKS ARE ADJACENT TO CURB.

5. * INDICATES METER BOX AND DIMENSION FOR 1-1/2" SERVICE.
   ** INDICATES METER BOX AND DIMENSION FOR 2" SERVICE.

		EAST NILES COMMUNITY SERVICES DISTRICT	
		1-1/2" & 2" STANDARD WATER SERVICES	
DATE	REVISION	BOYLE ENGINEERING CORPORATION	DATE DRAWN 04/02 / SHEET NO. W-4

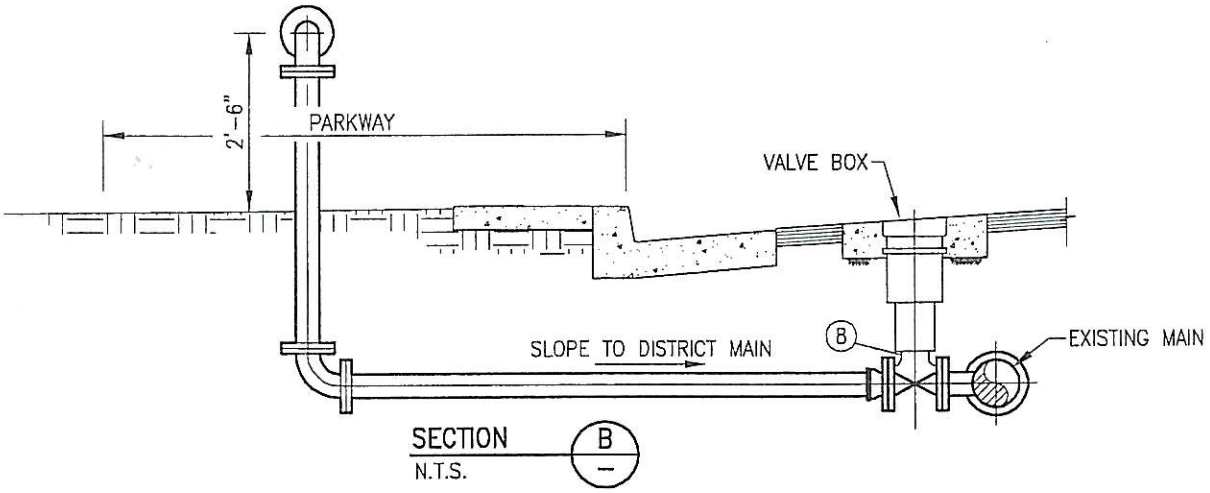




MATERIAL LIST

1. COMPOUND METER W/ PLATE STRAINER, INVENSYS OR APPROVED EQUAL.
2. STANDARD WEIGHT STEEL TEE, FLG.x FLG.x FLG.
3. FLANGE
4. STANDARD WEIGHT STEEL PIPE, FLG.x PE
5. STANDARD WEIGHT STEEL PIPE, FLG.x FLG.
6. NON-SHRINK GROUT
7. GATE VALVE, FLANGED FOR 3" SERVICE, FOR 4" THRU 10" SERVICE USE FLANGED BUTTERFLY VALVE
8. GATE VALVE, FLANGED W/ HAND WHEEL
9. STANDARD WEIGHT STEEL 90° BEND, FLG.x FLG.
10. ADAPTER, FLG.x RT
11. CAST IRON TEE WITH FLANGED OUTLET
12. CLASS "A" CONCRETE SUPPORTS
13. BLIND FLANGE
14. POLYVINYL CHLORIDE PIPE, CLASS 150 FOR 4" THRU 8", 4" PIPE FOR 3" SERVICE.
15. ADJUSTABLE PIPE SUPPORT, GRINNELL OR EQUAL.

NOTE: ALL STEEL PIPE SHALL BE FUSION BONDED EPOXY LINED AND COATED, 100% SOLID THERMOSETTING.



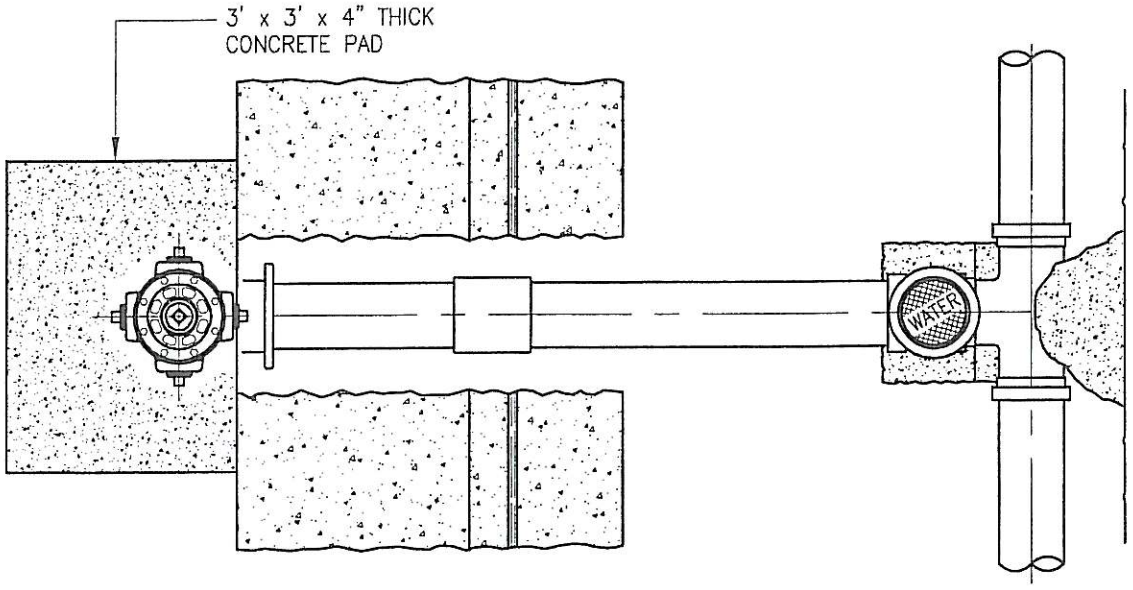
DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

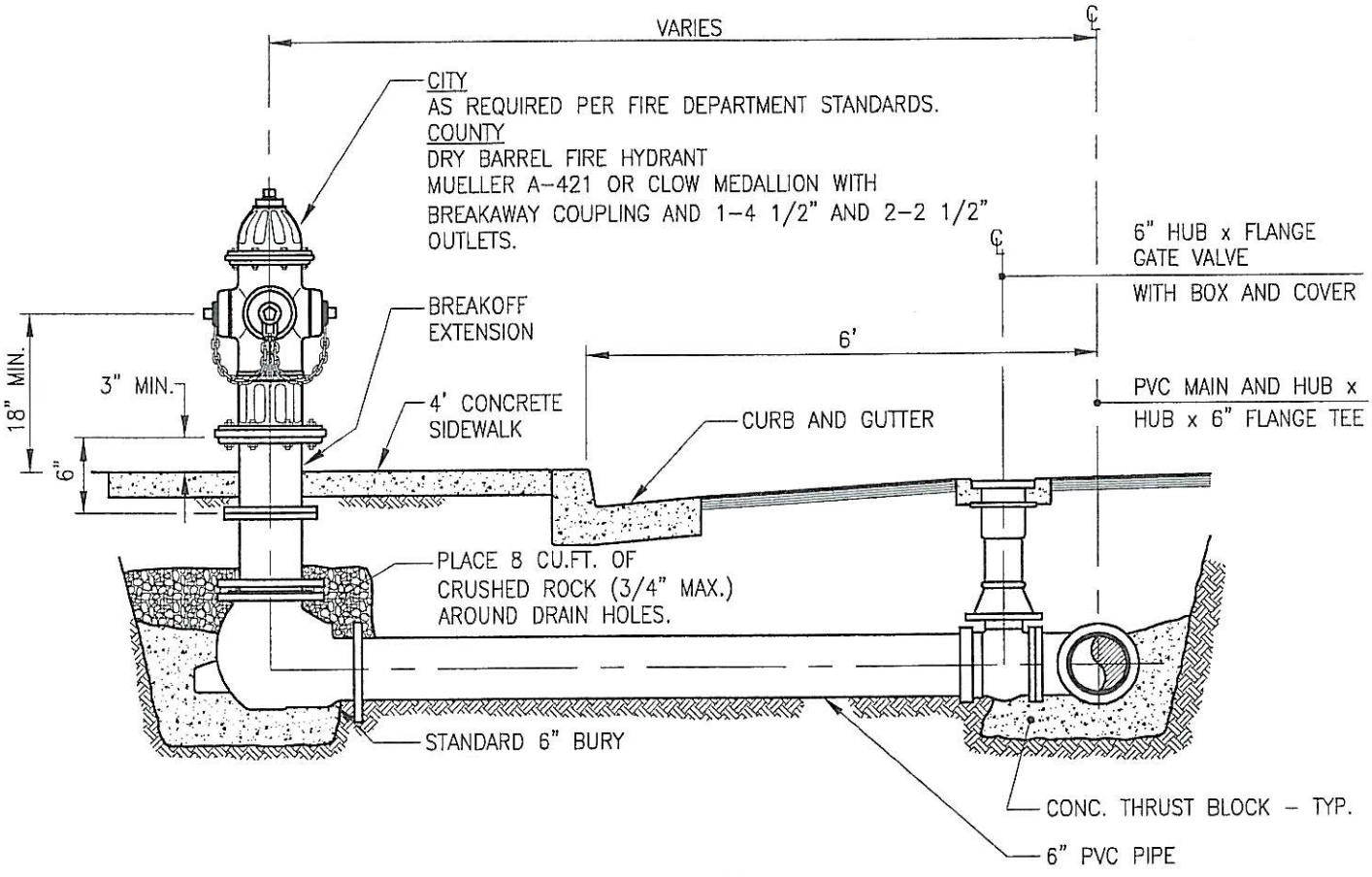
STANDARD WATER METER

BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
3/02	W-5



PLAN



ELEVATION

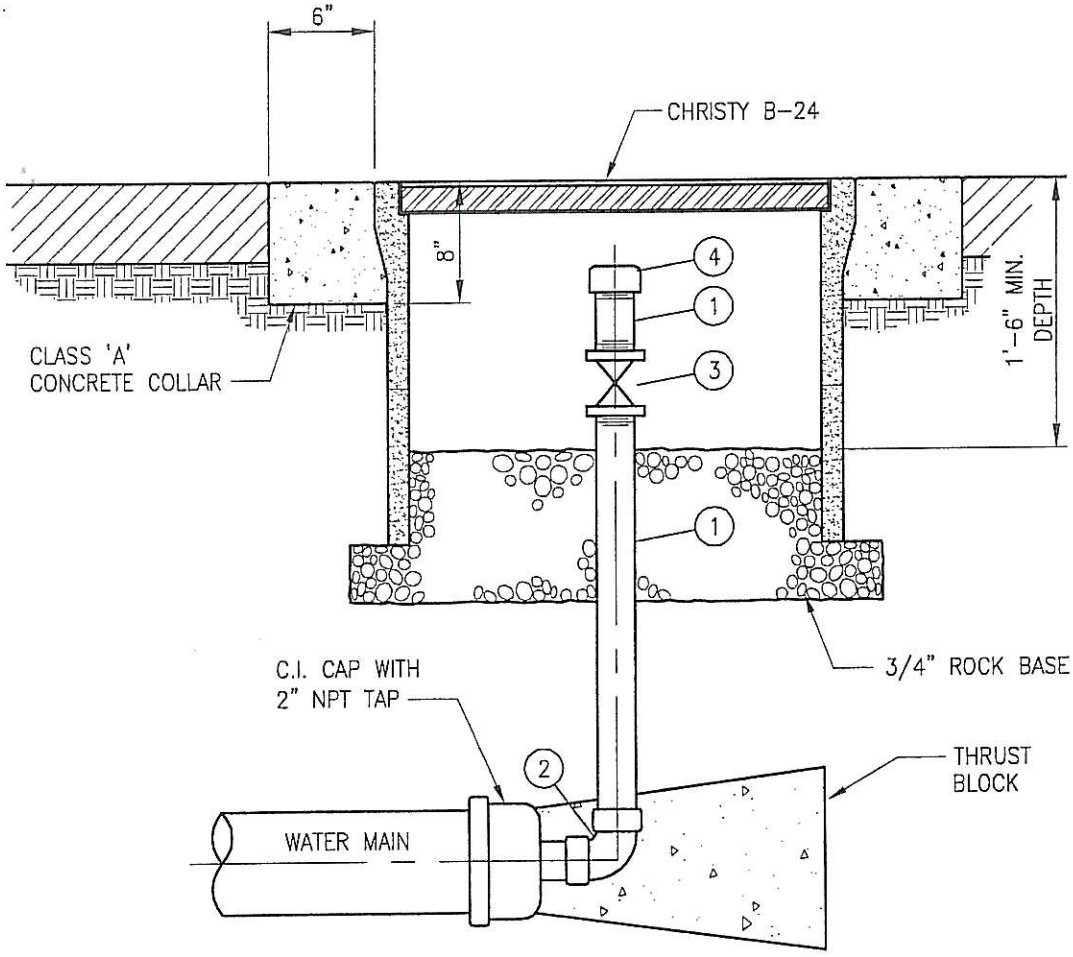
DATE	REVISION
3/05	ADD CRUSHED ROCK

EAST NILES COMMUNITY SERVICES DISTRICT

FIRE HYDRANT ASSEMBLY

BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
04/02	W-6



MATERIAL LIST:

1. 2" SCH. 40 BRASS PIPE
2. 2" SCH. 40 BRASS ELBOW
3. 2" BRONZE BALL VALVE
4. 2" THREADED PVC CAP

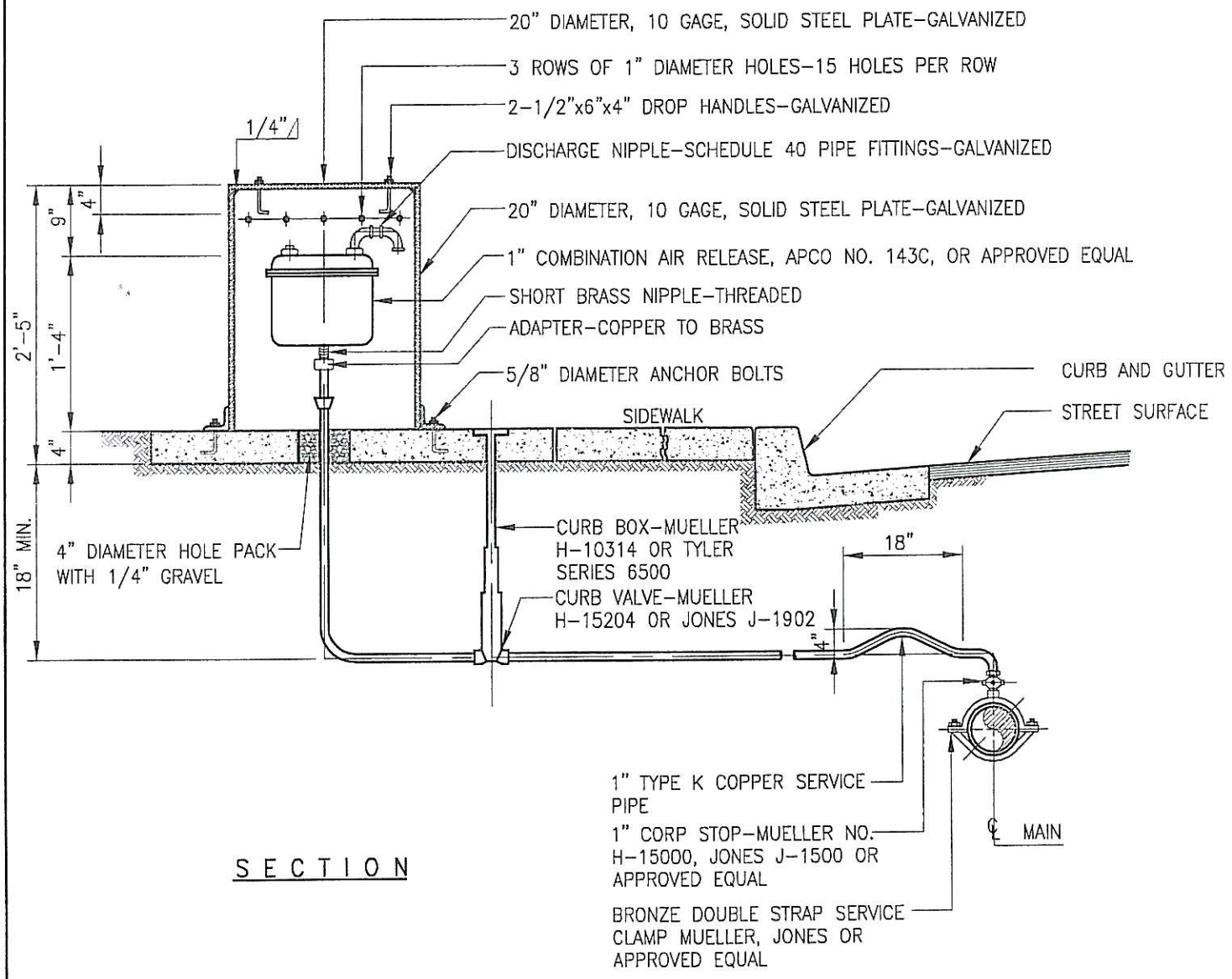
DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

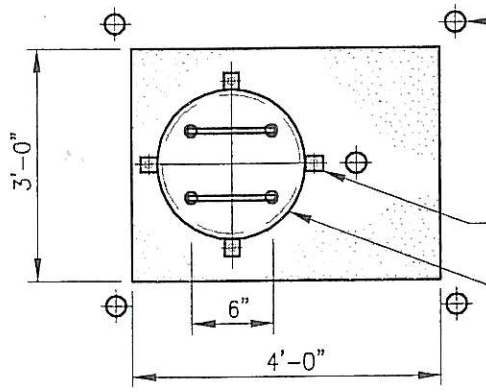
BLOWOFF ASSEMBLY

BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
4/02	W-7



SECTION



WHERE THERE IS NO CURB AND GUTTER, INSTALL 1–3" DIAMETER GALVANIZED STEEL POST AT EACH CORNER OF PAD. POSTS SHALL BE EMBEDDED IN 2' OF CONCRETE AND SHALL EXTEND 3' ABOVE GROUND

ANGLES 3"x3"x1/4" WITH 3/4" HOLES–WELD ANGLES TO PIPE

20" DIAMETER, 10 GAGE STEEL PIPE–GALVANIZED

PLAN

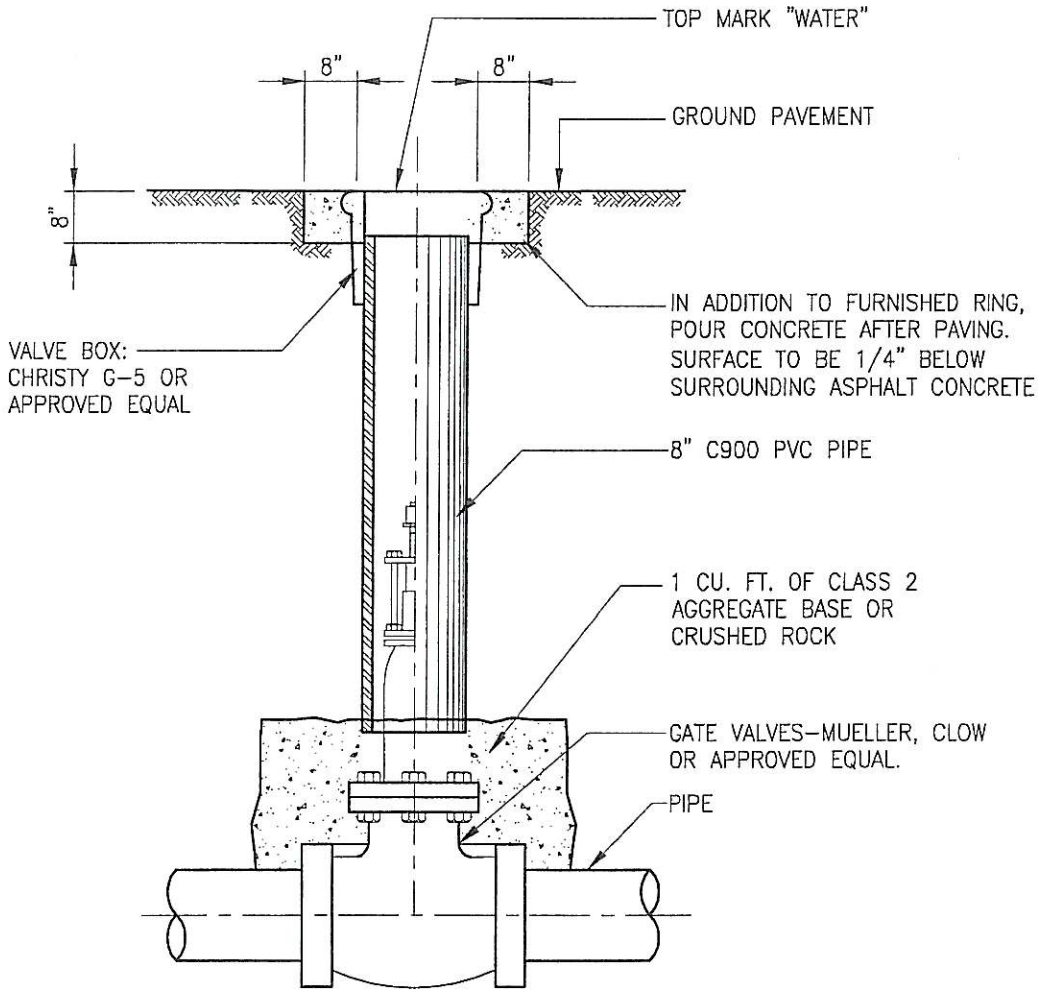
DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

COMBINATION AIR RELEASE VALVE ASSEMBLY

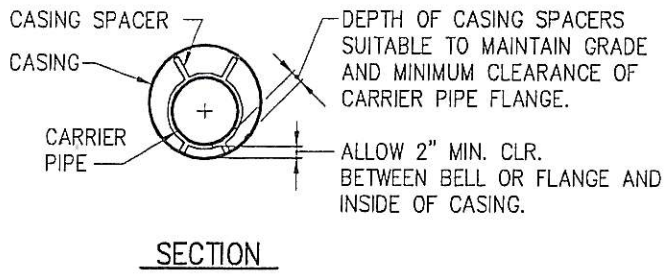
BOYLE ENGINEERING CORPORATION

DATE DRAWN	SHEET NO.
04/02	W-8



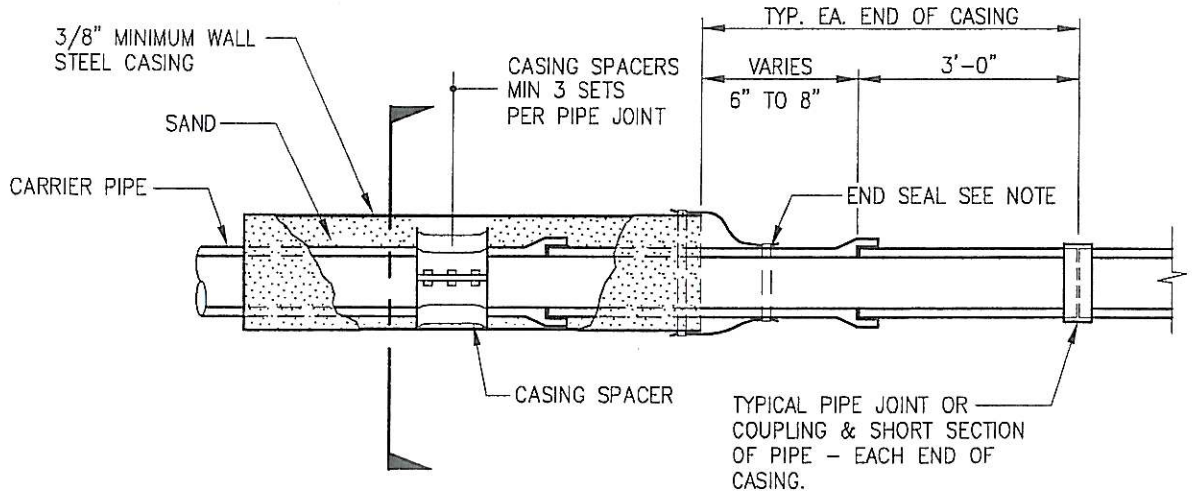
SECTION – ELEVATION

		EAST NILES COMMUNITY SERVICES DISTRICT		
		VALVE BOX ASSEMBLY		
DATE	REVISION	BOYLE ENGINEERING CORPORATION	DATE DRAWN 02/04	SHEET NO. W-9



SECTION

SCHEDULE – STEEL CASING FOR PIPE	
NOMINAL PIPE DIAMETER	MINIMUM CASING DIAMETER
4"	8" I.D.
6"	10" I.D.
8"	16" I.D.
10"	20" I.D.
12"	24" I.D.
16"	30" I.D.
24"	40" I.D.



GENERAL NOTES:

1. CASING SHALL BE INSTALLED BY THE BORE, JACK AND/OR TUNNEL METHOD.
2. CASING SPACER SHALL BE SOLID POLYETHYLENE AS MANUFACTURED BY CALPICO, OR EQUAL.
3. VOIDS AROUND CASING SHALL BE PRESSURE GROUTED, WITH A 4 TO 1 MIX CEMENT GROUT.
4. ALL CASING SECTIONS SHALL BE JOINED BY CONTINUOUS WELDING PROCESS.
5. EACH END OF CASING SHALL BE FITTED WITH AN AND SEAL, INSTALLED AS SHOWN AND SECURELY FASTENED WITH STAINLESS STEEL CLAMPS. THE END SEAL SHALL BE 1/8" THICK, MINIMUM, NEOPRENE, OR EQUAL.
6. INSTALL 6-INCH WIDE FOIL BACK CAUTION TAPE 18-INCHES ABOVE ALL WATERLINES STATING "CAUTION-BURIED PIPELINE."

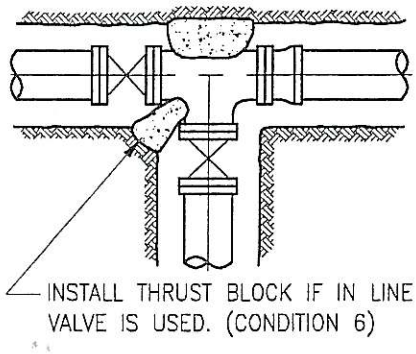
DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

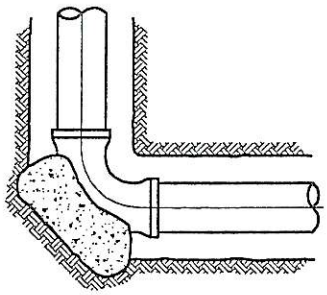
STEEL CASING CONDUCTOR PIPE

BOYLE ENGINEERING CORPORATION

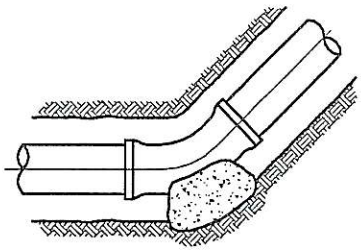
DATE DRAWN	SHEET NO.
04/03	W-10



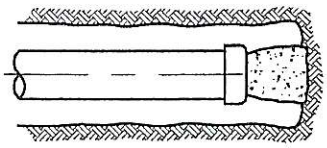
CONDITION 1
(OUTLET OR FIRE HYDRANT)



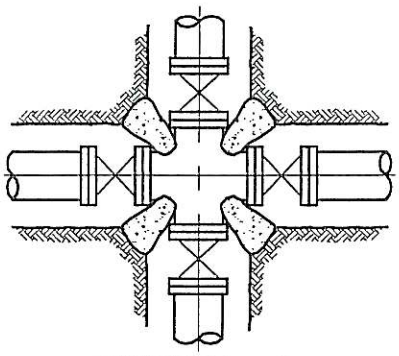
CONDITION 2
(ANGLE = 90°)



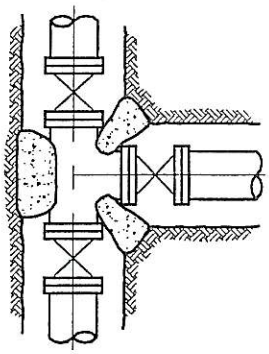
CONDITION 3
(ANGLE = 45°)



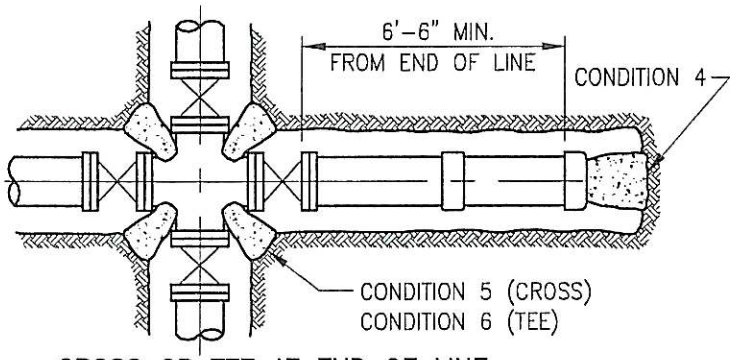
CONDITION 4
(END CAP)



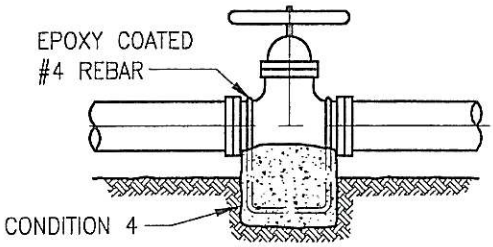
CONDITION 5
(MAINLINE CROSS)



CONDITION 6
(MAINLINE TEE)



CROSS OR TEE AT END OF LINE



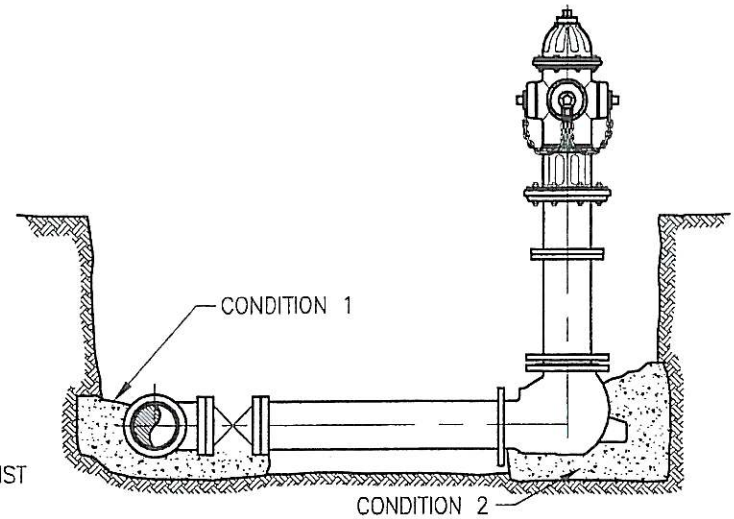
ANCHOR FOR IN LINE
12" VALVES OR LARGER

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

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

NOTES:

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



FIRE HYDRANT

DATE	REVISION

EAST NILES COMMUNITY SERVICES DISTRICT

TYPICAL THRUST BLOCK DETAILS

BOYLE ENGINEERING CORPORATION

DATE DRAWN: 04/02

SHEET NO.: W-11