MODEL SEWER LATERAL STANDARD

SEWERAGE AGENCY OF SOUTHERN MARIN

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SECTION 1 SEWER LATERAL GENERAL INFORMATION

1-01 Introduction and Scope.

This SEWER LATERAL MODEL STANDARD are standards repeated from the STANDARD SPECIFICATIONS which govern and shall apply to the design and construction of all public sewerage facilities and side sewers in the Agency, whether privately financed and constructed under permits issued by the Agency, or whether publicly financed and constructed under contract with the Agency.

The jurisdiction of the Agency is defined in the STANDARD SPECIFICATIONS and by Agency Ordinances. Individual JPEA members may have additional Ordinances and requirements that supersede the referenced STANDARD SPECIFICATIONS and therefore supersede this document.

1-02 Agency Ordinances.

The Ordinances of the Agency comprise the rules and regulations of the Agency with respect to the construction and use of sanitary sewerage facilities. In general, the Ordinances provides the authority of the Agency Manager, Agency Engineer and Agency Construction Inspectors, adopts the "Standard Specifications," provides regulations for side sewer construction and for the use and construction of public sewers, fixes annexation, plan checking, and permit and inspection fees, and provides for the establishment of connection charges. Any construction work funded with Agency money shall meet Prevailing Wage requirements of the State of California, including the Department of Industrial Relations requirements and provide certificates of insurance with the Agency and its representatives and agents listed at additional insured. Acknowledgement of Ordinance provisions and policies is essential to those proposing to design or construct sewerage facilities under permit in the Agency. The Agency, or Joint Exercise of Power Agency (JEPA) members, may adopt side sewer or lateral ordinances which are more stringent than what is set forth in these STANDARD SPECIFICATIONS. However the Sewer Lateral construction standards defined in these STANDARD SPECIFICATIONS are repeated in Part D MODEL SEWER LATERAL STANDARDS to serve as a Model Sewer Lateral Standard for individual JEPS's to use or modify as their specific needs require. Copies of pertinent Ordinance sections may be obtained at the Agency or JEPA's respective office as applicable upon request.

1-03 Design and Permit General Guidelines and Requirements.

The Ordinances of the Agency defined in MODEL SEWER LATERAL STANDARD sections 1-01 and 1-02 shall govern specific lateral requirements where they are not superseded by the County Department of Public Health.

SECTION 2 DEFINITIONS AND TERMS

2-01 Definitions and Terms.

Whenever in these specifications, or in any documents or instruments where these specifications govern, the following terms, abbreviations or definitions are used, the intent and meaning shall be interpreted as follows:

Applicant - The person making application for a permit and who shall be the occupant and/or owner of his/her/their authorized representative of the premises to be served by the sewer for which a permit is requested.

Building - Any structure used for human habitation or a place of business, recreation or other purpose.

Building Sewer - That portion of any drainage pipes for interior fixtures inside or under a building or structure and ending at a point two (2) feet outside the foundation line of any building, See Plumbing System.

Building Sewer Permit - The written authorization from the Agency for the connection of a building to a sewer by the installation of a side sewer at a specific location and under specific conditions of the permit, see Side Sewer and Sewer Lateral below.

Lateral Sewer - That portion of the side sewer lying within a street or sewer right-of-way. (Normally that portion of the side sewer between the main sewer and property line.) The lateral sewer is privately owned and maintained.

Main Sewer - A public sewer which has been or is being constructed to accommodate more than one side sewer and has been accepted by the Agency Board of Directors. (Normally eight (8) inches in diameter or larger.) The Agency will accept and maintain main sewers which are constructed to these standards and installed under an Agency public sewer extension permit with Agency supervision and inspection.

Sewer Lateral - See Side Sewer.

Side Sewer - The side sewer begins at its point of connection with the main sewer and terminates at its point of connection to the sanitary or waste plumbing. The point of connection to the sanitary or waste plumbing shall be two (2) feet or less from the building foundation at the point where the plumbing first extends outside the foundation (minimum four (4) inches inside diameter).

The side sewer is privately owned and maintained, including the lateral sewer, which links the sanitary or waste plumbing of a house or other building with the main sewer. All side sewers shall have a “clean out safety relief valve” or a “Contra Costa overflow valve” (see SD 5, SD 6 and SD 7).

SECTION 3 DESIGN CALCULATIONS AND PLAN PREPARATION

3-01 Design Calculations.

When requested to do so by the Agency, the Job Engineer shall submit design calculations for Agency review and approval. Design calculations shall be submitted in duplicate and shall be in a neat, acceptable hard copy form and shall also be submitted in electronic form and shall indicate the date, signature of the Job Engineer and his stamp with his State of California registration number and expiration date.

Calculations for sewers shall be presented in tabular form and shall include the following information for each section of sewer: Terminal manhole designation, ground elevations at terminal manholes, incremental and cumulative tributary population, incremental average and maximum domestic sewage flow, incremental infiltration allowance, cumulative design flow,

invert elevations of terminal manholes, length of sewer run, and sewer size, slope, capacity and velocity. Design calculation for pumping stations shall include soils data, structural design calculations, and hydraulic calculations including the basis for average and peak flows, calculations for wet well volume, curves indicating force main characteristics, and individual and combined pump head capacity curves.

All calculations shall be accompanied by a small scale map showing and identifying proposed sewerage facilities and tributary areas, etc.

3-02 Size of Plans and Data Required.

Sheet sizes for plans for all sanitary sewerage facilities (including sewer main(s), side sewer(s) and lateral(s)) shall be 11 inches by 17 inches, 22 inches by 34 inches, and electronic .pdf format, unless otherwise specifically approved in advance by the Agency, and the plans shall include as a minimum the following information and data:

A. General - The plans shall show the name of the project, subdivision, and each sheet shall bear the Job Engineer's signature and registration stamp with expiration date. Each map and plan sheet shall have a north arrow, appropriate scale or scales and date of preparation indicated thereon.

B. Sewer Plans - The sewer plans shall show the true horizontal relationship between the proposed sewer improvements and the existing and/or proposed field conditions, including all existing or proposed utilities and other facilities in accordance with available information (see Section 11-02). Plans shall include sewer pipe sizes and designations and shall show all structures and their respective numbers, the property lines and corners adjacent to the sewer alignment, laterals and ties to property corners, all necessary required stationing, horizontal curve data and street names. Horizontal scale must be 20 feet to the inch with a vertical scale of 5 feet to the inch unless another scale is specifically permitted by the Agency.

C. Sewer Profiles - The sewer, side sewer and lateral profiles shall show the vertical relationship between the sewer line invert and the ground surface at the time of sewer construction and the finished ground and/or paving surface. The sewer pipe size, pipe type and pipe class shall be shown between each pair of consecutive structures on the profiles. Sewer profiles shall also show all existing and/or proposed utilities and/or other facilities in accordance with available information (see Section 11-02), which cross the alignment of the sewer and shall accurately indicate clearance when less than twelve (12) inches. Sewer profiles must be prepared at the same horizontal scale as the plans and a vertical scale of five (5) feet to the inch, unless another scale is specifically permitted by the Agency.

D. Easements - All existing and proposed easements and rights-of-way shall be shown on the plans.

E. Vicinity Map - A small scale vicinity map showing the location of the development within the town or city, together with the streets and downstream sewer, shall be shown on the first sheet of the plans.

F. Location Map - A location map at a scale of 100 feet to the inch shall be included on the first sheet of the plans showing the entire development, the overall sewer layout and appropriately indexing each plan sheet.

G. Line Stationing - Each sewer line with a separate designation shall be stationed continuously upgrade from 0+00 at its point of connection to another line.

H. Ties to Existing System - Horizontal and vertical ties to the existing Agency sewerage system shall be indicated on the plans.

I. Structure Numbers - Manholes, rodding inlets, and all other sewer structures shall be numbered or stationed consecutively upgrade by type of structure. The structure number shall appear on the plans and profiles whenever the structure is shown or referred to.

J. Side Sewer Locations and Elevations - All side sewers or laterals shall be shown on the plans with ties given to nearby property corners. The elevation of the lateral at the property line shall be shown on the plans and staked in the field by the Job Engineer.

Where properties are fronting on a cul-de-sac, the laterals for these properties shall be connected to a manhole. Normally, the lateral shall be shown to a point ten (10) feet from the lower lot corner at the property line on hillside lots (3%+ slope), and to the approximate center of the lot in relatively level terrain. The Job Engineer may locate laterals to fit building conditions, but the plans must show proper ties, and the completed lateral must be permanently marked with an "S" on the curb or a stake and accurately shown on the record drawings.

K. Elevation Datum - The elevation datum used shall be USC & GS mean sea level (National Geodetic Vertical Datum NGVD). The plans shall include a note indicating the elevation datum and describing the location of one or more benchmarks in the area of the work.

L. Standard Notes - In addition to any other notes which may be appropriate or required, the following notes shall be included on all plans:

1. "All sewer construction shall be in accordance with the Sewerage Agency of Southern Marin 2019 (or current edition) Standard Specifications and Drawings."
2. "The Contractor shall notify the Agency 48 hours prior to starting any sewer work."
3. "For any work in a public street, the Contractor shall obtain an encroachment permit from the agency having jurisdiction."
4. "The locations of utilities shown on these plans are approximate only, and it is the Contractor's responsibility to verify locations and depths with appropriate agencies

   or by potholing. The Contractor shall call USA Underground Service Alert at least 72 hours prior to commencing work."
5. "The Contractor shall pothole all underground utilities and sewers prior to any trenching operation.
6. "The Contractor shall notify the Agency immediately of any conflict between sewers and other underground facilities."

7. "The Contractor shall shore all excavations in accordance with applicable safety orders."
8. “All sewer laterals shall be a minimum 4 inches inside diameter and shall have a minimum slope of 1.0% and a minimum depth of cover at the property line of 3.0 feet (measured from the top of curb), unless otherwise noted on these plans.”

SECTION 4 DESIGN STANDARDS

4-01 Design Criteria.

See STANDARD SPECIFICATIONS

4-02 Prohibited Wastes

See STANDARD SPECIFICATIONS

4-03 Sewer Pipes.

A. Pipe Materials - All main sewer and lateral sewer pipes shall be PVC plastic pipe, polyethylene pipe, ductile iron pipe, cast iron pipe, or reinforced concrete (large diameter - special situations), unless otherwise specifically required or approved by the Agency. Selection of the pipe type for a given project shall be made by the Job Engineer, subject to the approval of and final selection by the Agency. The type of pipe used for side sewer installations shall conform to the "Approved Side Sewer Pipe Materials List," on file in the Agency office. The type of pipe used for force mains shall be PVC plastic pipe, polyethylene pipe, cast iron pipe or concrete steel cylinder pipe, as specifically approved for the particular project by the Agency. Special pipe and/or design provisions may be required by the Agency.

B. Minimum Pipe Sizes - The minimum pipe size for main sewers shall be eight (8) inches in diameter unless otherwise specifically allowed by the Agency. The minimum pipe size for side sewers shall be four (4) inches or the same size as the building plumbing stub, whichever is greater. Side sewer pipes serving triplexes or more must have a minimum of six (6) inches. Multiple properties are not permitted to be share (be connected to) one side sewer. Under special circumstances, when more than one property is allowed by the Agency to be connected to a single side sewer, the side sewer from the point of intersection of one or more building sewers to the main sewer shall be not less than six (6) inches in diameter.

C. Minimum Slope - Main Sewers – See STANDARD SPECIFICATIONS

D. Minimum Slope - Side Sewers - The minimum slope for four (4) inch diameter side sewers shall be 2.0 feet per 100 feet (2.0%). The minimum slope for side sewers greater than four (4) inches shall be 1.5 feet per 100 feet (1.5%).

E. Steep Slopes - For pipes installed in areas with steep ground slopes, special design features may be required. Depending upon conditions of the specific installation, such items as check dams, trench dams, rip-rap, trench dams, special anchorage or special pipe materials may be required by the Agency (see SD 15 and SD 16).

F. Minimum Pipe Cover - The following minimum pipe covers shall be attained in design and construction of sanitary sewers. If certain conditions exist which make it impractical to meet the minimum cover and clearance requirements, special pipe, bedding, encasement, rip-rap, and/or backfill will be required as directed by the Agency Engineer.

   1. Main Sewers – See STANDARD SPECIFICATIONS.

   2. Side Sewers - That portion of a side sewer within a street right-of-way (lateral sewer) shall have a minimum cover of 3.0 feet. The minimum cover for side sewers from the property line to the building drain (building sewer) shall be three (3) feet. However, when the cover over the side sewer is less than twenty-four (24) inches, special pipe, bedding and/or concrete encasement may be required by the Agency (see SD 13).

G. Pipe Strengths and Maximum Depths - The minimum pipe strengths and classes given as standard in these specifications (see Sections 14-02) and in the "Approved Side Sewer Pipe Materials List," are based upon the attainment of standard bedding conditions (see Section 13-02), maximum allowable trench widths (see Section 13-02B), and upon the assumption of average pipe depths (depths up to 12 feet). Where, for any reason, the standard bedding conditions cannot be attained, or the maximum allowable trench width is exceeded, or the pipe depth is greater than average, special pipe, bedding, backfill and/or encasement may be required as directed by the Agency. Where pipe depths or other known conditions required pipe strengths other than those specified as standard, the Job Engineer shall indicate the required pipe classes on the plans.

H. Pipe Clearance - All sewer pipes and structures shall be designed and contracted to have a minimum of ten (10) feet from domestic water lines and twenty-four (24) inches clearance from all other utilities and/or improvements, unless a special approval is received from the Agency. In the event this clearance cannot be maintained for water mains, a sewer pipe will require a casing minimum ten (10) feet either side of crossing or other precautionary protections in accordance with California Department of Public Health water-sewer separation requirements. For existing conditions were private sewer laterals and water service separation of ten (10) feet cannot be maintained, the Agency manager or engineer may elect to refer to the California Plumbing Code Section 609.2-Trenches, latest edition, for consideration of construction methods and guidelines. Common trench installation of water pipes and sewer pipes are not allowed.

I. Horizontal and Vertical Curves - Horizontal curves may be used on curved streets when the alignment can be kept concentric with street improvements and when pipe deflection requirements can be met. Vertical curves may be used in hilly terrain, when permitted by the Agency, in order to reduce the number of required manholes. The deflection in the joint between any two successive pipe sections shall not exceed 70% of the maximum deflection as recommended in writing by the pipe manufacturer. Shorter pipe joint lengths may be used for vertical or horizontal curves with approval by the Agency.

J. Sewer Connections to Existing System - Connection of new main sewers to the existing sewer system shall be made at existing manholes or by constructing a new manhole at the point of connection. The elevation of new sewer mains or laterals connecting to a manhole shall be set so that the pipe crowns match. Side sewer connections to existing main sewers shall be accomplished by connecting to wye or tee branches or laterals where they exist, by installing a spliced-in-wye, by installing a Tap-Tite, or Inserta-Tee, drilled connection when the tap is minimum 4 inches smaller than the main pipe, or by connecting to an existing manhole. Inserta tee lateral connection requires Agency approval and may not be used on sewer mains with a diameter less than 12 inches. Side sewers eight (8) inches and larger shall be connected with manholes only.

K. Individual Sewage Ejector Pumps - Special application must be made for installation of an individual sewage pump where gravity service is not feasible. All pumping systems shall be installed in accordance with all applicable codes. Whole house ejector systems must have a duplex pump system. The Agency will inspect the pump station and pressure line from the sewage pump to the point of connection to the Agency sewer system.

   The gravity discharge line from the building outlet to the sewage pump holding tank shall be gravity flow. When the distance between the building outlet and the sewage pump holding tank is greater than five (5) feet, the Agency shall have jurisdiction, and the gravity line to the tank shall be inspected by the Agency Inspector.

   The holding tank, pumps and electrical controller (see SD 17) are under the jurisdiction of the Agency. The County or City may also require the owner to obtain a separate building permit to inspect ejector pump and electrical connections.

L. Sewer Alignment - Where sewer lines are to be installed within street rights-of-way, they shall, wherever practical, be designed and installed five (5) feet off the center line of the existing or future street (usually the side opposite the water line). In streets in hilly areas, the sewer shall be installed on the uphill side of the street where possible. Where practical, all sewer lines within easements shall be designed and installed with not less than five (5) feet between the center line of sewer and the edge of the easement. All sewer lines and structures shall be designed and installed well in the clear of all other improvements and utilities (see "Pipe Clearance" above).

M. Sampling Manhole - Dischargers of non-domestic wastes may be required to install a sampling manhole at the location where the lateral sewer connects to the sewer main as designated by the Agency.

N. Manhole Accessibility - Insofar as possible, all manholes shall be situated so that they are accessible to the Agency's cleaning vehicles.

O. Sewer Pipe Stubs - Sewer pipe stubs shall be designed and installed in all manholes from which future sewer line extensions are anticipated. Pipe stubs shall be minimum eight (8) inches in size or as directed by the Agency and shall be of an approved type of pipe. Stubs shall protrude a minimum of five (5) feet outside of the manhole base and shall be channeled as though a regular sewer line within the manhole. A rubber coupling on the outside of the pipe shall be encased in the manhole base to prevent

leakage. The outboard end of stubs shall be a standard bell joint end and shall be plugged with a standard watertight plug and cap, as supplied by the pipe manufacturer.

P. Sewer Line Extensions - In all new streets, where sewer lines are expected to be extended, the sewer line shall be designed and installed to the end of the proposed street improvements, prior to street construction. The sewer extension shall terminate with a
manhole, at a location which will minimize the amount of pavement to be disturbed by future sewer extensions.

Sewer extensions require a main line sewer extension Developer Agreement which is approved by Resolution of the Agency Board.

Q. Sewers to be Installed in Existing Improved Streets - Where sewers are being designed for installation in existing City and/or County streets, the Job Engineer shall submit the plans for the proposed work to the City and/or County Public Works Department for location and encroachment permit approval.

R. Sewers to be Installed in or Across Utility, Highway, Railroad Rights-of-Way or Creeks - Where sewers are to be constructed across or within utility, railroad rights-of-way, or creeks requiring tunnels, bores and/or special pipe, the special pipe or construction shall extend the full length of the sewer line within the particular right-of-way. The Permittee shall secure all necessary encroachment permits or joint use permits for utility, highway, railroad rights-of-way or creek crossings. Pipe may be required to be in a casing (see Section 14-010).

S. Separate Side Sewers Required - Each individual building site shall be connected to the main sewer with a separate side sewer. Combined side sewers for buildings under the same ownership will be permitted only on specific approval of the Agency when the property is not likely to be subdivided in the future. A common side sewer may be used for connected buildings (i.e., buildings with common walls or multi-story buildings) under different ownership where the Covenants, Conditions and Restrictions (CC&R's) provide that the homeowners' association maintains all common laterals.

T. Side Sewer Connections - Side sewers shall be installed into manholes where possible. Side sewers shall connect near the bottom of the manhole, matching pipe crowns, unless a formal external drop connection is provided.

U. Side Sewer Cleanouts Required - Cleanouts shall be installed in the side sewer as provided in the Uniform Plumbing Code. The cleanout riser shall be equal in size to the side sewer (see Drawing SD-5).

Cleanouts shall be installed at the following locations:

1. At the junction of the house plumbing and side sewer two (2) feet outside the building.
2. After bends or change of directions witch combine to more than 90*
3. Where a run of pipe without bends exceeds ninety (90) feet.

Note: All cleanouts, except the blowoff (Backwater prevention Device) cleanout, shall be brought to grade, properly capped and completely watertight.

V. Backwater Prevention Devices - All side sewers shall be equipped with an approved backwater prevention device, as detailed on the Standard Drawings (see Drawing SD 6). The preferred installation is above grade, but may be in a box or offset to the side if clearance conflicts occur.

W. Check Valve -Unless prohibited by the Agency, a check valve shall be use if the difference between the elevation of the lowest fixture and the backwater prevention device is less than six (6) inches, a check valve shall be installed between the backwater prevention device and house (see Drawing SD 7).

X. Abandoned or Unused Side Sewers - Any abandoned or unused side sewers connected to Agency mains, including side sewers from homes or buildings that are demolished, or any side sewer from property line to Agency mains shall be dug out and followed to the

Agency main, and the old wye or tee or old connection area shall be cut away and spliced with a solid piece of pipe of the same size and dimension. The Agency Inspector shall be present when this procedure is done.

4-04 Sewer Structures.

A. See STANDARD SPECIFICATIONS

B. See STANDARD SPECIFICATIONS

C. See STANDARD SPECIFICATIONS

D. Test Fittings - All test fittings shall, unless otherwise approved, be tees or wye branches of the same size, type and quality as that of the line in which they are being installed. The branch of all test fittings shall be installed in an upright position and shall be brought to grade as a cleanout or removed after testing.

E. See STANDARD SPECIFICATIONS

F. Remodeling may be a trigger by the JPEA member that a sewer lateral will require testing and inspection.

G. See STANDARD SPECIFICATIONS

H. See STANDARD SPECIFICATIONS

SECTION 5 PLAN APPROVAL AND PERMIT ISSUANCE

See STANDARD SPECIFICATIONS FOR ENTIRE SECTION 5.

SECTION 6 CONSTRUCTION ENGINEERING

6-01 Staking Requirements.

The Job Engineer shall be responsible for providing all necessary field surveys and construction staking. Grade and alignment stakes shall be set in advance of any trenching or excavation and, in general, stakes for straight sewers shall be set at either 25 or 50 foot intervals, depending upon topography and grade of the sewer. Intervals of 25 feet, or less, shall be used through all horizontal and vertical curves and for sewer mains with a grade flatter than 0.005 and Laterals flatter than 0.010. Stakes shall be approximately marked to show the Engineer's station, the offset, and the cut to sewer invert.

6-02 Side Sewer Locations.

Prior to installation of lateral sewers, the lateral location and elevation at the property line shall be staked and flagged in the field by the Job Engineer.

6-03 Survey Authorization and Responsibility.

When a survey is to be made on private property for a public sewer, permission of the property owner shall be obtained by the Job Engineer or his representatives prior to entry. The Agency will not be answerable or accountable in any manner for any loss or damage that may come about during or as a result of survey work by others.

6-04 Field Changes.

During construction the Agency, through the Agency Manager, Agency Engineer or Agency Inspector, may request the Job Engineer to make changes in the work. The Job Engineer shall review such changes and prepare the necessary drawings and descriptions for execution by the Construction Contractor.

6-05 Soil Compaction Tests.

For all works in public streets and works not in public streets as required by the Agency, the Applicant shall retain a Soils Engineer to take compaction tests in the trench backfill or embankment construction. On Agency projects, the Agency will retain a Soils Engineer.

The Soils Engineer shall take compaction tests at intervals and depths as required by the agency having jurisdiction on the right of way or as required by the Agency; as a minimum, one compaction test shall be taken midway in the intermediate backfill and on the surface every 50 feet of sewer line length or as required by the County or City encroachment permit. The Soils Engineer shall immediately provide the Agency Inspector the results of the soils tests. At the end of the job, the Soils Engineer shall provide the Agency with a summary of the soils tests taken.

6-06 Record Drawings.

Upon completion of the work and prior to acceptance by the Agency, the Job Engineer shall provide "record drawings" to the Agency. Record drawings shall consist of all details shown on the original approved plans, corrected and/or expanded to reflect all design or construction changes from the approved plans. Particular attention should be paid to changes in the following items:

1. Sewer line and structure locations.
2. Surface and invert elevations of structures.
3. Slope, size, type of pipe, and length between structures.
4. Wye and lateral locations.

The Job Engineer shall submit a preliminary copy of the record drawings for review by the Agency. After review and approval by the Inspector or other Agency representative, the Job Engineer shall submit one (1) complete set of high quality prints and one (1) complete set of high quality duplicate tracings, noted and signed by the Job Engineer as "Record Drawings".

SECTION 7 AGENCY PERMITS, LICENSES AND BONDS

7-01 Permits.

All work performed in relation to and for connection to the Agency sewer system requires a specific permit in accordance with Agency rules and regulations. In the case of Agency contract work, the contract is considered to be the Agency permit for all work included in the contract under Agency jurisdiction.

A. Main Sewer, Structure and Manhole Installation Permits – See STANDARD SPECIFICATIONS.

B. Side Sewer, Lateral and Building Sewer Connection Permits - Location plans and elevation verification are required when side sewer is to be installed and at any other time when specifically required by the Agency.

7-02 Licenses.

Contractors performing work requiring a permit by the Agency shall be licensed by the State of California. Work on public property, streets, roads and other rights-of- way shall be performed only by duly licensed Contractors. Property owners may perform side sewer work on their own property.

7-03 Bonds.

Prior to the issuance of a permit for a sewer main extensions (public sewer construction), the applicant shall furnish to the Agency a 100% faithful performance bond, cash, or other improvement security acceptable to the Agency, in the amount of the total estimated cost of the work as determined by the Agency, based on the Agency's Table of Current Construction Costs. Such faithful performance bond, cash deposit, or other improvement security shall be conditioned upon the performance of the work in accordance with the terms and conditions of the permit, and unless more stringent requirements are otherwise specified by the Agency Board, and 10% of the bond shall remain in effect to guarantee the correction of faulty workmanship and the replacement of defective materials for a period of one (1) year from and after the date of acceptance of the work by the Agency Board.

SECTION 8 CONTROL OF WORK

8-01 Authority of Agency.

All work shall be done in a workmanlike manner and shall be performed to the reasonable satisfaction of the Agency, which shall have general control of all work included hereunder. To prevent disputes and litigation, the Agency shall in all cases determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are provided; shall decide all questions relative to the true construction, meaning, and intent of the

specifications and drawings; and shall have the power to reject or condemn all work or material which does not conform to the plans and specifications. Side Sewers/Laterals are under the authority of the JPEA member between the District Main and to within 2’ (two feet) of the Bulding footing, connection to the building sewer. The Side Sewers/Laterals may also be governed by the County Department of Public Health.

For the Permit Process and all additional information described in this section, please see the STANDARD SPECIFICATIONS.

SECTION 9 CONTROL OF MATERIAL

9-01 Source of Supply and Quality of Materials.

Prior to commencement of any work, the Contractor shall submit to the Agency, a list of the suppliers or sources of all materials to be incorporated in the work. This list shall be approved by the Agency before any of the materials are delivered to the job site.

Only new materials conforming to the requirements of these specifications and approved by the Agency shall be used in the work. All materials proposed for use may be inspected or tested at any time during their preparation and use. After trial, if it is found that sources of supply which have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved material from other approved sources. No material which, after approval, has in any way become unfit for use shall be used in the work. Manufacturer's guarantees, instructions and parts lists shall be delivered to the Agency before acceptance of the work. All materials shall be manufactured, handled, and used in a workmanlike manner to insure completed work in accordance with the plans and specifications.

For the Permit Process and all additional information described in this section, please see the STANDARD SPECIFICATIONS.

SECTION 10 LEGAL RELATIONS AND RESPONSIBILITY

10-01 Laws to be Observed.

The Contractor shall keep himself fully informed of all State and National laws and County, Agency and municipal ordinances and regulations which in any manner effect those engaged or employed in the work, or the materials used in the work, or which in any way effect the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same.

The Contractor shall at all times observe and comply with, and shall cause all his agents and employees to observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Agency, and all of its officers and agents against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by himself or his employees. If any discrepancy or inconsistency is discovered in the plans, drawings, specifications, or contract for the work in relation to any such law, ordinance, regulation, order or decree, the Contractor shall forthwith report the same to the Agency in writing.

10-02 Permits and Licenses.

The Contractor shall, prior to beginning any work, procure all permits and licenses, pay all inspection charges and permit fees, give all notices necessary and incident to the due and lawful prosecution of the work and shall furnish to the Agency written proof of compliance of this section.

For the Permit Process and all additional information including safety standards described this section, please see the STANDARD SPECIFICATIONS.

SECTION 11 UTILITIES, OBSTRUCTIONS AND CONCRETE REMOVAL

11-01 Preservation of Property.

The Contractor shall determine the actual condition of the site and the site preparation that will be necessary for completion of their work and conformance to this specification. Site preparation shall not damage existing structures or cause obstruction and/or contamination to the property.

Attention is directed to Sections 10-08 and 10-09, "Preservation of Property", and "Responsibility for Damage or Injury" of these specifications. Due care shall be exercised to avoid damage to existing improvements, utility facilities, and adjacent property. When any railroad, street, highway, private or public utility is crossed, all precautionary construction measures required by the owner of said crossing shall be followed by the Contractor.

The Contractor shall repair or replace any damaged property at no additional cost to the Agency.

For the Permit Process and all additional information described this section, please see the STANDARD SPECIFICATIONS.

SECTION 12 REFERENCES TO STANDARD SPECIFICATIONS

12-01 State Standard Specifications.

Whenever the words State Standard Specifications" are referred to in the specifications, the reference is to the State of California, Business, Transportation and Housing Agency, Department of Transportation, (Caltrans) Standard Specifications, latest edition. All work shall be done in conformance with applicable provisions of the State Standard Specifications, except as modified in these Specifications and in the Special Provisions. Where the terms "State" or "Engineer" are used in the State Standard Specifications or State Plumbing Code, they shall be considered as meaning the "Agency" as defined herein. In case of a conflict between these specifications and the State Standard Specifications or State Plumbing Code, these specifications will apply.

12-02 County Specifications.

Whenever the words "County Specifications" are referred to the specifications, the reference is to the Cities of Marin, and County of Marin, Department of Public Works, Standard Specifications dated June 1992 and Uniform Construction Standards dated June 1979, or each as superseded by their the latest edition. County of Marin Department of Environmental Health may

implement restrictions on private laterals that supersede these Agency or JPEA Standards when they are more stringent.

SECTION 13 EARTHWORK

13-01 Description

Earthwork shall consist of performing all operations necessary to excavate earth, rock and/or other materials from the trench or excavation; to excavate all material, of whatever nature, necessary for the construction of foundations for structures, sewers, and drainage facilities; to construct embankments; to place backfill around structures, sewers and drainage facilities; and over sewers, culverts and drainage pipes; to backfill ditches, holes, pits and other depressions within the work area; to construct temporary and permanent trench surfacing; to remove unsuitable material and replace with suitable material; to construct earth protection dikes.

13-02 Encroachment Permits

For all work within public right of ways, the Contractor shall secure all necessary encroachment permits from the agencies having jurisdiction and shall comply with all requirements of the encroachment permits.

For the Permit Process and all additional information described this section, please see the STANDARD SPECIFICATIONS.

SECTION 14 SEWER PIPELINES

14-01 Description.

Sewer pipelines shall be installed as shown on the plans and in accordance with the following provisions, the Special Provisions, and as directed by the Agency.

14-02 Approved Sewer Pipe Materials.

The approved pipe materials for laterals and for private side sewer/lateral construction are listed in Table 1 and approved pipe materials for public sewer mains and force mains are listed in Table 2. The specific use of pipe and pipe products is subject to approval by the Agency. Use of pipe other than those specified herein below must be reviewed by the Agency and specifically authorized in writing.

All pipe shall be of the size, materials, and strength classifications shown on the plans or specified herein.

TABLE 1 PRIVATE SIDE SEWER/LATERAL

(Specific Use Subject to Agency Approval)

Pipe Specifications	Can be Used for Gravity Sewers	Can be Used for Ejector Pump Discharge Pipelines
Ductile Iron Pipe w/Rubber Ring Joints, DIP	Yes[2]	No
PVC ASTM D-2241, SDR=26	Yes[1]	Yes[1]

PVC AWWA C-900, SDR=21 Or SDR=18	Yes[2]	Yes[2]
PVC Schedule 40	Yes[1]	Yes[1]
PVC Schedule 80	Yes[2]	Yes[2]
HDPE Pipe, min. SDR=17	Yes[1]	Yes[1]

Notes:

1. Requires minimum 3-foot cover with imported bedding and pipe zone backfill.
2. Requires minimum 18-inch cover on private property with imported bedding and pipe zone backfill.
3. HDPE Pipe must be de-beaded and all connections and cut ends shall be de-burred..
4. ABS lateral materials are not allowed.
5. New pipe of VCP (Vitrified Clay Pipe) material is not allowed.

14-03 Pipe and Joint Materials see STANDARD SPECIFICATIONS

14-04 Vitrified Clay Pipe and Fittings, VCP (For Repair of Existing VCP Pipe Only) see STANDARD SPECIFICATIONS

14-05 Ductile Iron Pipe and Fittings, DI see STANDARD SPECIFICATIONS

14-06 Reinforced Concrete Pipe RCP see STANDARD SPECIFICATIONS

14-07 Reinforced Concrete Water Pipe – Steel Cylinder Type, Pretensioned see STANDARD SPECIFICATIONS

14-08 Polyvinyl Chloride Pipe, PVC see STANDARD SPECIFICATIONS

14-09 High Density Polyethylene Pipe HDPE see STANDARD SPECIFICATIONS

T. Side sewers to be connected to an HDPE sewer main line shall be connected by use of electrofusion saddles. The pipe must be fused into the saddle or connected with an electrofusion coupler. Lateral connections to sanitary sewer mains 12 inch in diameter (nominal) or smaller shall be with an electrofusion "wye" type saddle unless a tee is approved by the Agency. Lateral connections to sanitary sewer mains greater than 12 inch in diameter (nominal) may be with a "tee" type saddle if the "wye" type electrofusion saddle is not available. HDPE Side Sewer/Lateral pipes shall be electrofused with an electrofusion wye or butt coupler to an HPDE main.

14-010 Encasement Pipe

When designated on the plans, permit, or by the Agency in writing, approved encasement pipe shall be placed in a bored hole under, or spanned over, the area to be crossed. The encasement pipe shall be plain steel and shall be of the length, diameter and thickness specified on the plans or in the Special Provisions. Plain metal pipe shall conform to the requirements of AWWA C-201 or AWWA C-202 for steel water pipe, butt welded and shall conform to the thickness given in the following table:

Protective Casings*

Inside Diameter (Inches)	Smooth Steel Thickness (Inches)
6” - 18”	¼

**Sewer main or lateral may require casing*

14-011 Backflow Prevention/Relief Valve.

Backflow prevention/relief valve shall be Contra Costa Type or Sewer Popper or equivalent as approved by the Agency. The backflow preventer/relief valve shall be installed at an elevation at least six (6) inches lower than the lowest home fixture as approved by the Agency. If the backflow preventer/relief valve cannot be installed six (6) inches below the lowest fixture then a PVC check valve shall be installed in the lateral. Plumbest sewer vent cap may not be used unless approved by the Agency and hinge pin and float ball pin shall be replaced with stainless steel.

14-019 Side Sewer Pipeline Installation

A. All side sewer pipe shall be laid in conformance with the requirements set forth herein for sewer mains and trunk sewers and to the following requirements. All side sewers shall be equipped with clean outs, backflow prevention devices, and test fittings required in the Uniform Plumbing Code, by Agency Ordinance, and as shown in the Standard Drawings herein.

B. It shall be the responsibility of the Contractor to determine the exact location and depth of the existing sewers prior to the installation of any sewer pipe. In the case of side sewer work, the Contractor shall also determine the elevation of the plumbing outlet at the building to be connected and decide whether the required grade and cover can be maintained between the outlet and the main sewer prior to construction of any portion of the side sewer. Where the connection is to be made in an existing manhole, the Contractor shall make the connection by carefully breaking through the manhole wall, cutting the floor or concrete base, installing the pipe through the wall with minimum 1-1/2" and maximum 2" protrusion, and forming a new channel, and repairing and damage to the structure. The floor and channel of the manhole shall be finished with a smooth finish. Where the connection is to be made by constructing a new manhole on an existing sewer, the connection and manhole shall conform to the details shown on the Standard Drawings.

C. Where wyes, tees and/or laterals were previously installed on the main sewer, the side sewer or building sewer shall be connected to the wye, tee, or lateral as provided for the particular connection. See Section 14-022 for Connections to Existing Sewerage Systems.

D. The side sewers shall be left uncovered until after the inspection has been made.

14-022 Connections to Existing Sewerage Systems

It shall be the responsibility of the Contractor to determine the exact location and depth of the existing sewers prior to the installation of any sewer pipe. In the case of side sewer work, the Contractor shall also determine the elevation of the plumbing outlet at the building to be connected and decide whether the required grade and cover can be maintained

between the outlet and the main sewer prior to construction of any portion of the side sewer. Where the connection is to be made in an existing manhole, the Contractor shall make the connection by carefully breaking through the manhole wall, cutting the floor or concrete base, installing the pipe through the wall with minimum 1-1/2" and maximum 2" protrusion, and forming a new channel, and repairing and damage to the structure. The floor and channel of the manhole shall be finished with a smooth finish. Where the connection is to be made by constructing a new manhole on an existing sewer, the connection and manhole shall conform to the details shown on the Standard Drawings.

B. Side Sewers - All new side sewer connections must have Agency written permission prior to installation. Where wyes, tees and/or laterals were previously installed on the main sewer, the side sewer or building sewer shall be connected to the wye, tee, or lateral as provided for the particular connection. Where a wye, tee, or lateral has not been installed at the point of desired connection, either a standard wye or tee fitting shall be "cut-in" to the main sewer using approved couplings and fittings of the same material as the main sewer, or the connection shall be made using the slope of the last twenty (20) feet of a side sewer connecting to a sewer main. This slope shall be less than 30 degreed from the horizontal. A "Tap Tite", “Inserta Tee” or equal method may only be used on sewer mains 12” in diameter or larger.

14-025 Trenchless Sewer Installation

When shown on the Plans and as specified in the Special Provisions, sewer pipe may be installed by trenchless methods as specified herein below:

A. Boring and Tunneling – This is a special case for side sewers, see STANDARD SPECIFICATIONS.

B. Pipe Bursting - Trenchless sewer installation by pipe bursting involves the shattering of an existing sewer and pushing the broken pieces into the surrounding soil and then inserting a polyethylene pipe liner.

1. Methods - Pipe bursting methods may include a hydraulic expanding head or a conical head pulled through the sewer to be burst with sufficient force to break the existing sewer and insert the new liner pipe supplemented by the use of a pneumatic percussive head. Contractor must take all required precautions to protect structures and improvements and other utilities.

   The Contractor shall be certified by the Pipe Bursting System Manufacturer that such firm is a licensed installer of their system. Polyethylene pipe jointing shall be performed by personnel trained in the use of joint fusion and stab joint equipment and recommended methods for pipe liner connections.

2. Preparation - Prior to commencing the pipe bursting procedure, the Contractor shall televise the existing sewer to determine the location of each house laterals and to determine if there are any obstructions or special problems in the sewer to be pipe burst. Each lateral shall be exposed and the Contractor shall verify that each one is live prior to pipe bursting. The Contractor shall also determine

whether or not extra laterals which are found during the televising are live or dead, since some houses may have more than one lateral.

3. Access Excavations - The Contractor shall construct access excavations as necessary for the pipe bursting and liner insertion. When practicable, access excavations shall be located where interference to vehicular traffic and inconvenience to the public is minimized. Excavations for pulling or pushing equipment shall have adequate support provided to prevent damage to adjacent areas.

   Existing manholes shall be excavated for access excavations wherever practical. Manhole inverts and bottoms shall be removed to permit access for installation equipment.

1. Bypassing Sewage - During pipe bursting of a live sewer, the Contractor shall bypass the sewage around the section or sections of sewer line to be rehabilitated. The bypass shall be made by plugging existing upstream manhole and pumping the sewage into a downstream manhole or adjacent system or other method as may be approved by the Agency. The pump and bypass lines shall be of adequate capacity and size to handle the flow without backing up the sewage to a point that threatens connected homes.

   The Contractor shall be responsible for continuity of sanitary sewer service to each facility connected to the section of sewer during the execution of the work. If it is necessary to continue the bypass during non-working hours, the Contractor shall provide a high water alarm. Support equipment used to perform the work shall be located away from buildings so as not to create a noise impact. Provide silencers or other devices to reduce machine noise as required to meet applicable noise ordinances.

2. Pipe Installation Thread the necessary lines through sewer section to be rehabilitated and then pull the bursting head followed by the liner pipe. After the pipe has been installed in the entire length of the sewer section, the liner pipe shall be anchored at manholes. The pipe shall protrude in the manholes for enough distance to allow sealing and trimming. Sealing the pipe at manholes providing a flexible gasket connector shall be installed in the manhole wall at the end of the pipe, centered in the existing manhole wall. Grout the flexible connector in the manhole wall filling all voids the full thickness of the manhole wall. Restore manhole bottom and invert. Trench dam or check boards may be required.

3. Sewer House Connections Sewer house connections shall be connected to the liner pipe by heat fusion saddles. Once the saddle is secured in place, drill hole full inside diameter of saddle outlet in pipe. The existing house sewer shall be connected to the saddle using a flexible coupling. After connection to the saddle, the side sewer connection pipe shall have a slope toward the newly lined sewer equal to the slope of the existing lateral pipe or a minimum of two percent.

C. Directional Drilling Procedure

   i. General - Horizontal directional drilling is a special case for side sewer applications, see STANDARD SPECIFICATIONS.

14-026 Cleaning and Testing - Gravity Mains and Trunk Sewers (and Laterals).

A. After installation, all gravity and trunk sewers shall be tested and cleaned as herein specified, in the presence of the Agency inspector. The Contractor shall notify the Agency Inspector twenty-four (24) hours prior to any testing during normal working hours. The program for testing and cleaning shall fit the conditions as mutually determined by the Agency and the Contractor.

B. The Contractor shall furnish all labor, tools, equipment and water necessary to make all tests, clean the lines and to perform any work incidental thereto. The Contractor shall take all necessary precautions to prevent any joints from pulling while the pipelines or their appurtenances are being tested. He shall, at his own expense, correct any excess leakage and repair any damage to the pipe and its appurtenances or to any structures, resulting from or caused by these tests. Materials and methods used for any necessary repair work shall be specifically approved by the Agency.

C. The Contractor shall flush all sewer lines prior to testing and accumulated materials shall be removed at each manhole and no materials shall be allowed to enter the existing sewer system. A plug shall be installed and maintained by the Contractor in the line connecting to the existing system until all cleaning and testing is completed and the lines

   are approved for operation. All side sewers shall be plugged at their ends until hooked up to the building sewer.

D. Each section of sewer line shall be tested as provided herein using either water or air at the option of the Agency.

E. The infiltration test described below may be required by the Agency in addition to either the water or air tests. All testing specified herein below shall be done after the placing and compaction of intermediate trench backfill and placement of the road subbase, but prior to final paving. If a new street is being constructed involving the placement of cement treated or lime treated base, the testing and repair of all sewers shall be completed prior to installation of such base.

F. Water Test

   1. Each section of sewer shall be tested between successive manholes by plugging the lower end of the sewer to be tested and the inlet sewer of the upper manhole and filling the pipe and manhole with water to a point four (4) feet above the crown of the sewer in the upper manhole, or, if ground water is present, four (4) feet above the average adjacent ground water level.

   2. For the convenience of the Contractor, where grades are slight, two (2) or more sections between manholes may be tested at once. However, when testing more than one section, the allowable leakage for the total length shall be that computed for the shortest section of pipeline between manholes tested.

   3. Where grades are steep and excessive test heads would result by testing from one manhole to another, test fittings the full size of the main shall be installed at

intermediate points so the maximum head on any section under test will not exceed twelve (12) feet.

4. The lines shall be filled at least two (2) hours prior to testing and shall be tested at least one (1) hour maintaining the head specified above by measured additions of water. The sum of these additions shall be the leakage for the test period. The allowable leakage shall be figured as fifty (50) gallons per day per inch of sewer diameter per mile of main sewer being tested. After that time the leakage shall be measured and, if any leakage exists, the Contractor shall discover the cause and remedy it before the sewer is accepted.
5. Where the actual leakage is less than the allowable and leaks are observed, such leaks shall be repaired at the Contractor's expense, as directed by the Agency.

G. Air Test

1. Low pressure air tests for sewers between structures shall be accomplished by carefully placing test plugs at each end of the section of line to be tested. Air test shall be allowed on lines only up to 10" in diameter. When all necessary test equipment is in place, a compressed air supply shall be attached to the air fitting on the equipment and the air pressure within the line increased to the test pressure.
2. After the air supply is securely turned off or disconnected, there shall be a two (2) minute waiting period to allow stabilization of air within the sewer line before the actual test period begins. The test pressure shall be four (4) pounds per square inch, +/- one half (1/2) pounds per square inch, at the beginning of the test. The air pressure must not drop over a ten (10) minute period.
3. The maximum length of a sewer line that may be tested at one time shall be five hundred (500) feet, exclusive of length of laterals which may be connected. After completion of a test, the air pressure shall be released slowly through the valve, which is incorporated in the test equipment. Air test plugs shall not be removed until the air pressure is no longer measurable. Laterals shall be tested at the same time as the main is tested during new construction or rehabilitation of the main sewer, but laterals may also be required to be tested separately.
4. If groundwater is known to be present, the beginning test pressure shall be increased as directed by the Agency.

H. Infiltration Test. If in the construction of a sewer, excessive ground water is encountered, the tests for leakage described above may, at the discretion of the Agency, be supplemented by the infiltration test described herein.

1. Test sections shall be isolated and any pumping of groundwater shall be discontinued for at least three (3) days and the groundwater shall be allowed to rise to maximum level. The infiltration rate shall then be measured at the low end of the test section.
2. The infiltration rate shall not exceed fifty (50) gallons per day per inch of sewer diameter per mile of main sewer being tested. No additional allowance shall be

made for manholes or other structures. If the observed infiltration rate exceeds the allowed limit, the required repairs shall be made and the section shall be retested.

3. Repairs and retesting shall be repeated until the observed infiltration falls within the allowed limit. Notwithstanding satisfactory passing of other than leakage tests or infiltration tests, where infiltration is later discovered in excess of the allowed limit before completion and acceptance of the sewer, the sewer shall be immediately uncovered where necessary and repairs made to reduce the infiltration rate within the allowed limit before the sewer is accepted. However, should the infiltration be less than the specified amount, the Contractor shall stop any individual leaks that may be observed when ordered to do so by the Agency.

I. Cleaning - After gravity main and trunk sewers have been tested for leakage and after either temporary or permanent surfacing replacement has been installed, but prior to acceptance, they shall be tested for obstructions and cleaned by hydro-flushing with high pressure water using hydrovac equipment or balling with a Wayne ball. The Agency reserves the right to ask the Contractor to clean downstream sewer lines if, in the opinion of the Agency, there is reason to believe dirt and debris may have entered the Agency's system.

14-028 Television Inspection

After the sewers have been backfilled, completed, tested and cleaned, but before acceptance of the job, the Contractor shall arrange and pay for closed circuit television inspection of the sewer mains and each lateral. All televising shall be performed by a firm experienced in closed circuit televising of sewer lines acceptable to the Agency. Televising shall be in color and done in the presence of the Agency Inspector, and the Contractor shall furnish to the Agency a videotape and DVD/Digital files (sewer main and lateral) of the complete television inspection.

The television camera shall be equipped with a measuring device so that the depth of any sags can be accurately determined. The television camera shall be equipped with an articulating camera head which would allow the camera to inspect the lateral stub connection and pipe joints. Defects, including but not limited to sags, leaks, breaks, excessive pipe deflection, etc., which are in excess of the limits specified above, revealed by the television inspection shall be promptly corrected by the Contractor at no expense to the Agency.

Television inspection will be paid for on a lineal foot basis in accordance with the bid item therefor. The grade of all gravity sewers shall be within "0.05 feet of the elevations and grades shown on the plans with the provision that, in no event, shall a gravity sewer, drain, or air vent line be allowed to have a sag or standing water greater than 0.10 feet deep.

Defects, including but not limited to sags that are in excess of the limits specified above, leaks, breaks, excessive pipe deflection, etc., as revealed by the television inspection shall be promptly corrected by the Contractor at no expense to the Agency. After correction of the defect or defects found by the television inspection, the pipeline where the corrections were made shall be re-televised at the Contractor's expense. The re-televising shall be performed by a firm experienced in closed circuit televising of sewer lines acceptable to the Agency.

14-029 Warranty Inspection

All sewer mains and laterals constructed or rehabilitated may be required to be re-televised and or re-pressure tested eleven (11) months after acceptance by the Agency as a warranty inspection. Any and all defects revealed by this re-televising shall be corrected.

14-030 Side Sewer Testing

All side sewers (Laterals) shall be tested and cleaned in the same manner as that specified for main sewers, in the presence of the Agency Inspector. An approved test fitting and plug shall be installed at or near the point of connection to the main sewer, or lateral sewer if existing, and at the connection with the building plumbing. The pipe shall be tested after it has been bedded and shaded. Any leaks discovered shall be repaired by the Contractor at his expense. Test fittings shall be wye branches or tees of the same type, size and quality as that of the side sewer, unless otherwise approved, and shall be installed where required. The branch of each test fitting shall be laid in an upright position. After the test is completed and the test plug has been removed, the test wye shall be capped or completed per Standard Drawing SD 6.

For more specific details about materials, fittings, PVC and HDPE standards and all additional information described this section, please see STANDARD SPECIFICATIONS.

SECTION 15 DEMOLITION AND ABANDONMENT OF LINES AND STRUCTURES

In some cases a lateral side sewer needs to be moved or abandoned. For more specific details demolition and abandonment, please see STANDARD SPECIFICATIONS.

SECTION 16 MANHOLES

16-01 Description

Manholes shall be installed at location shown on the plans and approved by the Agency Engineer and in accordance with the following provisions, the Special Provisions and the Standard Drawings. For more specific details about manhole construction, please see STANDARD SPECIFICATIONS.

SECTION 17 STRUCTURAL CONCRETE

For more specific details this section, please see STANDARD SPECIFICATIONS.

SECTION 18 CASTINGS AND METAL FABRICATIONS

For more specific details this section, please see STANDARD SPECIFICATIONS.

SECTION 19 PAINTING

This section is typically not used, see STANDARD SPECIFICATIONS.

SECTION 20 SURFACE RESTORATION

20-01 Description.

Surface restoration shall include the furnishing of all labor, material, equipment, tools, and services required for the performance of paving and surfacing operations, including repair of curbs, gutters, sidewalks, as well as public and private driveway and sidewalk areas, as specified here and/or as shown on the drawings or as necessary to complete the project. Any concrete curbs, gutters or sidewalks damages by the work shall be repaired or replaced in kind.

No surface restoration shall be performed until all compaction tests have been made and passed and until approved by the Agency.

20-02 Air Quality Control Board Regulations

The Contractor shall use materials which comply with the Bay Area Air Quality Management Agency.

20-03 Pavement Restoration

Pavement restoration for public roads shall conform to the requirements of the agency having jurisdiction over the roadway right-of-way. Materials for paving and surfacing shall conform to the applicable provisions of the State Standard Specifications and the County Specifications.

Pavement thickness shall match the thickness of the adjoining pavement or the thickness indicated on the drawings, whichever is greater.

20-04 Pavement Cutting

Trenches and other excavations in asphalt paved areas shall be cut by means of a saw or jackhammer equipped with a spade tool to the full depth of the pavement as required by the agency having jurisdiction over the street. Pavement cuts shall be laid out by a chalk line and care shall be taken to ensure neat, straight edges.

After the Agency has approved a section of trench for final paving, the Contractor shall strip out all temporary pavement to the full depth of the new pavement section as specified. Spalled or cracked sections of pavement beyond the excavation limits which, in the opinion of the Agency, show signs of having separated from the adjoining pavement or are moveable, shall be removed and replaced with new pavement. Broken edges of pavement shall be trimmed along lines parallel to the trench edges. Exposed subgrade materials shall be compacted to the same standards as the adjoining trench backfill.

20-05 Pavement Grinding

Where required, existing pavement shall be ground down to make a smooth joint with existing gutters and joints with existing pavement. All pavement grinding shall be done in accordance with Section 42 of the State Standard Specifications.

20-06 Aggregate Base

Aggregate base shall be Class 2, conforming to Section 26 of the State Standard Specifications. Minimum relative compaction shall be 95%. Base shall be placed and compacted prior to placing of temporary paving. Recycles Class 2 may be used only when approved by the Agency, or by the County or City encroachment permit, and may not contain AC grindings.

20-07 Asphalt Concrete

Asphalt concrete shall conform to the applicable requirements of Section 39 of the State Standard Specifications for Type B aggregate or as modified by the agency with jurisdiction over the street. Paragraph 39-8 is not applicable. Surface courses shall be constructed using 1/2-inch maximum graded aggregate. Lower courses shall be constructed using 3/4-inch maximum graded aggregate.

Paving asphalt shall be Grade AR-4000, conforming to the requirements of Section 92 of the State Standard Specifications. Four to six percent (4-6%) bituminous binder shall be provided.

Bituminous mixtures shall be delivered to the roadbed at temperatures specified in Section 39 of the State Standard Specifications. Spreading of the mixture shall be in accordance with Section 39 of the State Standard Specifications. All loads shall be covered with tarpaulin or other material during transportation.

Initial or breakdown rolling and the final rolling of the uppermost layer of the asphalt concrete shall be compacted in accordance with Section 39 of the State Standard Specifications. Compaction by vehicular traffic shall not be permitted.

The joints between old and new pavements or between successive days' work shall be carefully made in such manner as to insure a continuous bond between old and new sections of the course. After the trench has been backfilled, edges of the existing pavement shall be exposed and cleaned and retrimmed to straight, vertical surfaces. All joints shall be painted with a uniform coat of tack coat before the fresh mixture is placed. Each lift of asphalt concrete shall be allowed to cool down before the next lift is placed. Before the final lift of asphalt concrete is placed, the edges of the trench shall be tacked with RS-1 asphaltic emulsion.

20-08 Slurry Seal

Where shown on the plans, the Contractor shall place a slurry seal. Slurry seal materials shall conform to the requirements of the State Standard Specifications, Section 37-2.

20-09 Conformance to Existing Improvements

Asphalt concrete overlays shall be tapered to conform to existing paving, gutters, catch basins, etc.

20-010 Raising Existing Castings to Grade

After the final paving is placed, the Contractor shall raise all existing monuments, valves, manholes and other castings to the final surface elevation. The method of raising the castings to grade shall conform the requirements of the agency having jurisdiction over the street.

20-011 Restoration of Striping and Pavement Markers

After the final paving is complete, the Contractor shall stripe the new pavement and provide new pavement markers and delineators to replace the old ones. Traffic stripes and pavement markings shall conform to Sections 84 and 85 of the State Standard Specifications. Markers and delineators shall conform to Section 82 of the State Standard Specifications. No work shall be done until the layout is approved by the agency having jurisdiction over the street. Restoration of striping and pavement markings shall be included in the cost of pavement restoration.

20-012 Unpaved Travel Surfaces

Trenches in unpaved areas of private streets shall be surfaced with a minimum of twelve (12) inches of Class 2 Aggregate Base.

20-013 Concrete Surfaces

All concrete curbs, gutters, aprons, patios, driveways and sidewalks which are broken, cracked or damaged by installation of the improvements shall be reconstructed by and at the expense of the Contractor, of the same kind of material and of the same dimensions as the original work, conforming to the requirements of Section 43 of the County Specifications. The repairs shall be made by removing and replacing the entire portions between joints or by removing the damaged portions by concrete saw and not be merely refinishing the damaged part. All work shall match the appearance of the existing improvements as nearly as practicable. Lamp black or other pigments may be added to the concrete to obtain the necessary result.

20-014 Landscaped or Cultivated Areas

All excavations or trenches in landscaped or cultivated areas shall have the top twelve (12) inches backfilled with top soil. The top soil shall consist of fertile, friable soil of loamy character conforming to the requirements of Section 20-2.01 of the State Standard Specifications or as specified in the Special Provisions. With specific approval from the Agency, the Contractor may use top soil taken from the excavation. After installation, the top soil and any adjacent unimproved land which has been compacted by the operations of the Contractor shall be thoroughly scarified and the surface cleared of all large clods, stones or debris.