PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

A. Sanitary sewer piping, fittings, and accessories.

B. Manholes, cleanouts, and miscellaneous system components.

1.3 REFERENCES

A. ASTM D3034 - Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings.

B. Applicable portions of Uniform Plumbing Code for materials and installation of the Work of this Section.

C. ASTM C 700-97 - Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated.

D. ASTM C 425-98b - Compression Joints for Vitrified Clay Pipe and Fittings.

E. Standard Specifications for Public Works Construction (SSPWC) ("Green Book"), //State of California, Department of Transportation (CalTrans) Standard Specifications,// latest edition as adopted by serving jurisdictional authority.

F. Regional Standard Drawings, 2006 edition, as amended by serving jurisdictional authority.

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable regulations published by jurisdictional authority regarding flood control and storm water drainage and discharge.

B. Conform to applicable regulations of the California Plumbing Code, Part 5, Title 24, CCR for installation of sanitary sewer system.

1.5 PUBLIC AGENCY STANDARDS

A. Perform all work and related structures and devices indicated in accordance with the Regional Standards Drawings as indicated on the plans and these specifications and the Standard Specifications for Public Works Construction (SSPWC) "Green Book", 2009 Edition

B. Provide water main separation per “Guidance Memo No. 2003-02: Guidance Criteria for the Separation of Water Mains and Non-Potable Pipelines” by the State of California Department of Health Services dated October 16, 2003.

1.6 QUALITY ASSURANCE:

A. Contractor Qualifications

1. Installing Company: Company specializing in installation of storm drainage systems, with minimum 5 years documented experience in installation of projects of similar scale and scope.

2. Installing Foreman: Individual specializing in installation of storm drainage systems, with minimum 5 years documented experience in installation of projects of similar scale and scope.

3. Use only staff who are completely familiar with the manufacturers' recommended methods of installation as well as the requirements of this work.

1.7 PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Section 017719.

B. Accurately record location of pipe runs, connections, manholes, cleanouts, and invert elevations.

1.8 TESTS

A. Public Sewer Connection: Make connections to existing public sewers in accordance with the Standard Specifications.

B. Leakage Testing: Tests for leakage will be conducted as indicated in the Standard Specifications or as specified.

PART 2 - PRODUCTS

2.1 PIPE MATERIALS

A. PVC Pipe:

1. 4 inch - 12 inch diameter: ASTM D 3034, Type PSM SDR 35, bell and spigot end configurations for elastomeric gaskets.

2. 3 inch diameter and larger: ASTM D 2751, SDR 35, with solvent welded joints per ASTM D 2235.

3. 12" diameter and larger: ASTM F 794; large diameter ribbed PVC pipe; bell gasketed joints meeting ASTM D 3212.

2.2 PIPE ACCESSORIES

A. PVC Fittings: Same material as pipe, molded, or formed to suit pipe size and end design, in required 'T', bends, elbows, reducers, traps, and other connections.

B. Joint Gaskets: ASTM F 477

C. Cleanouts - Paving areas: J. R. Smith or equal, 4240/37 Series, scoriated cast-iron lid, tractor type, set flush with surface, with vandal proof screw.

D. Cleanouts - Landscaped/planting areas: J. R. Smith or equal, 4220/4231 Series, scoriated cast-iron lid, set flush with surface, with vandal proof screw.

2.3 BEDDING/BACKFILL MATERIAL

A. As specified in Section 310000.

2.4 MANHOLES

A. Provide Ameron or equal manhole sections, cones, and grade rings.

B. Cast-in-Place concrete as specified in Section 033010, configuration as indicated on the Drawings.

C. Frame and grate or lid as indicated on the Drawings. Where not indicated, comply with referenced Standard Plans/Drawings.

2.5 DESIGN CRITERIA

A. General

1. All improvements shall be constructed per the referenced standards, the contract documents, and as specified in this section.

2. Where criteria shown on drawings or specified in this specification exceed that of the referenced standards, the more stringent criteria shall apply.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection

1. Prior to work of this section, carefully inspect previously installed work. Verify all such work is complete to the point where this installation may properly commence.

2. Verify that work of this section may be installed in strict accordance with the original design, all pertinent codes and regulations, and all pertinent portions of the referenced standards.

a. Verify that survey benchmark and intended elevations for the Work are as indicated.

b. Identify required lines, levels, contours, and datum.

c. Identify known utilities. Stake and flag locations.

d. Maintain and protect existing utilities remaining which pass through work area.

3. In the event of discrepancy, immediately notify the Architect.

4. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 PREPARATION

A. Provide all staking and field engineering required to implement the work as shown on the drawings.

B. Protect all stakes and benchmarks. Replace all stakes and benchmarks damaged during the course of construction at no cost to Owner.

C. Set grade stakes using instrument technology, at 50 foot grid interval at areas with gradients greater than 2 percent.

D. Set grade stakes, using instrument technology, at 25 foot grid interval at areas with gradients less than 2 percent.

E. Provide all equipment of such type, function and design as required to achieve specified values.

F. Connection criteria

1. Before trenching, verify the horizontal location and invert elevations of all sanitary sewer connection points, and the horizontal location of all other utility lines.

2. Reconstruct, repair, or replace all pavements, sidewalk, landscape and other items to the satisfaction of the jurisdictional authority.

3. Arrange for the marking of all utility lines in all areas of trenching and excavation operations. See Section 311200.

3.3 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal joints tight.

B. Lay pipe on bedding and to slope gradients noted on drawings. Begin construction at lowest point of connection or discharge and lay continuously upstream.

C. Lay bell and spigot or tongue and groove pipe with bell end or groove end upstream.

D. Install additional bedding at sides and over top of pipe. Provide top cover to minimum compacted thickness of 12 inches.

E. Backfill trench in accordance with the provisions of Section 312333.

F. Separation

1. All new site water mains shall be located 10-foot horizontally from, and one foot vertically above, any parallel sewer or recycled water pipeline.

2. All new site water mains crossing a sewer or recycled water pipelines in a perpendicular fashion shall be located a minimum of one-foot above the crossed line. No connection joints shall be made in the water main within eight horizontal feet of the crossed line.

3. For alternative configurations or where a sewer line crosses above a water main, reference Department of Health Services document per Section 1.4 for additional requirements.

G. Unless specifically noted otherwise, provide all required concrete work such as pads, bases and kick blocks.

H. Dielectric Isolators: Where incompatible piping materials come in contact except for the use of valves, isolate from each other with dielectric unions, line size.

I. Provide sleeves for all piping crossing walls or footings. Provide Architect approved seals at all footing sleeves to prevent water migration.

3.4 INSTALLATION - MANHOLES AND CLEANOUTS

A. Form bottom of excavation clean and smooth to correct elevation.

B. Form and place cast in place concrete at bottom of manhole, shaped as shown on drawings.

C. Establish elevations and pipe inverts for inlets and outlets as indicated.

D. Mount lid and frame level at elevation indicated.

E. Provide minimum 12 inch clearance on all sides at excavation for manholes and similar structures.

3.5 PROTECTION

A. Protect finished installation under the provisions of Section 015000.

3.6 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 014500 and 014529.

1. Inspection of private sewer work will be performed by Districts Inspector of Record (IOR).

2. Obtain approval of all piping installations from District's Inspector of Record (IOR) prior to covering piping.

B. Alignment Inspection

1. The Contractor shall check the alignment of private sewer lines when backfill has reached the top of the pipe. Both external and internal inspections for alignment may be made at this time.

2. Correct, to the IOR's satisfaction, any section of the line found to be unsatisfactory in material, alignment, grade, or joints

C. Leakage Testing

1. After alignment tests are completed, and before flows are allowed in the line, conduct leakage tests in accordance with Greenbook Specifications.

2. Test entire private sewer system for leakage/exfiltration in the presence of the IOR.

3. Conform to requirements of the "Standard Specifications" for exfilitration limits.

D. Video Inspections

1. Inspect interior of piping with closed circuit television (CCTV) to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project, prior to occupancy.

2. Prior to videotaping, pipes should be jetted to remove all debris. During videoing, provide running water through pipe to identify low points. Immediately fix any damaged sections or low points. Provide complete video inspection to IOR for review and approval.

END OF SECTION