PART 4

CITY OF CHINO HILLS

STANDARD SPECIFICATIONS

FOR

CONSTRUCTION OF WASTEWATER SYSTEMS

PART 4

TABLE OF CONTENTS

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WASTEWATER STANDARD SPECIFICATIONS

1-00 GENERAL

The installation of wastewater facilities shall comply to the latest edition of Standard Specifications for Public Works Construction, “GREENBOOK”, and the following standard specifications.

In cases of conflict of information, the following documents will have precedence in the order listed”

1. Permits and licenses from affected agencies issued for the improvements.

2. Special Provisions (modifying the City Standard Plans, the City Standard Specifications, or the Standard Specifications for Public Works Construction) for the improvements.

3. Construction plans for the improvements.

4. City of Chino Hills Standard Specifications

5. City of Chino Hills Standard Plans.

6. Standard Specifications for Public Works Construction (SSPWC), “Green Book”.

Conflicts and discrepancies noted by the Contractor shall be brought to the attention of the CITY Engineer. The City Engineer will review the conflicts or discrepancies and determine the appropriate course of action to follow, if any. Unless otherwise determined by the City Engineer, the most stringent/restricted conditions shall govern over all.

Provisions of reference specifications noted in these specifications and plans shall have the same effect as if written herein, unless expressly modified by these specifications.

Any reference specification, in the absence of designation to the contrary, shall be understood to refer to the latest revision at the time the plans and specifications are approved by the City Engineer.

If construction of the project does not commence within one year after approval of the plans and specifications by the City Engineer, the City Engineer’s approval is void. The plans and specifications shall refer to the latest revision at the time the plans and specifications are re-approved by the City Engineer.

PART 4
WASTEWATER STANDARD SPECIFICATIONS

1-01 EARTHWORK

1-01.1 PIPELINE EXCAVATION

a. Excavation. Excavation for pipelines, fittings, valves and appurtenances shall be open trench to the depth and in the direction necessary for the proper installation of the same as shown on the plans or as otherwise directed by the Engineer, except where another method is specifically called for on the plans or in these specifications.

b. Limit of Excavation. Except with specific approval of the Engineer, no more than 400 feet of open trench shall be excavated in advance of laying of pipe. All operations shall be carried out in an orderly fashion. Backfilling and clean-up work shall be accomplished as sections of the pipe installation are approved. Public travel through the work shall be impeded or obstructed as little as possible. At the end of each working day, there shall be a maximum of 50 feet of open trench, excluding manhole excavations, for each operation. The remainder of the trench excavated that day shall be backfilled, compacted and the roadway opened to the public.

   At the end of each week, all trenches, including manhole excavations, shall be backfilled, compacted, and the roadway opened to the public on Saturday, Sunday, and holidays.

   The Contractor shall make the necessary arrangements for, and shall remove and dispose of, all excess waste material from the site of the work as portions of the pipeline and appurtenances are installed.

c. Correction of Faulty Grades. Should the excavation for the pipeline be carried below grade without instruction from the Engineer, it shall be refilled to proper grade with pipe zone material compacted to 90 percent or crushed rock, at the expense of the Contractor. If compaction tests are required, they shall be at the expense of the Contractor.

1-01.2 PIPE FOUNDATION AND/OR SUBGRADE

a. Foundations in Good Soil. The trench shall have a flat bottom conforming to the grade to which the pipe is to be laid.

b. Foundations in Poor Soil. All soft, spongy, or unstable material in the bottom of the trench shall be removed and replaced with approved material to a depth as determined in the field by the Engineer. The approved material shall be compacted to 90 percent to provide an

unyielding foundation for the pipe. The removal and replacement of material from depths greater than 2 feet below the grade shown on the plans will be considered as Extra Work.

1-01.3 TRENCH BACKFILL

a. General. All trenches shall be backfilled after pipe, fittings, valves, and appurtenances have been installed. Whenever a relative compaction requirement value is specified hereunder, the optimum moisture content and density shall be determined in accordance with the State of California, Department of Transportation, Test Method No. California 216-F, or ASTM D1557, "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort"

   All wood and waste material shall be removed from excavation preparatory to backfilling. Backfill 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 compacting of the fill in trenches or excavations up to the subgrade of the street or to the existing ground surface.

b. Procedure in Pipe Zone. Selected backfill material consisting of granular material free from stone, clods, clay, or other deleterious material shall be placed in the trench simultaneously on each side of the pipe for the full width of the trench in layers of about 6-inches in depth. Granular backfill with a minimum sand equivalent of 30, when tested in accordance with the California Department of Transportation, Test Method No. California 217, will be required in the pipe zone and the water densification method shall be used to densify the material in the pipe zone. When the excavated material is not granular as mentioned above, the Contractor shall import, at their own expense, and place a suitable granular backfill material. Particular attention is to be given to the underside of the pipe and fittings to provide a firm bedding support along the full length of the pipe. Care shall be exercised in backfilling to avoid damage to the pipe. The pipe zone shall be considered to extend to 12-inches above the top of pipe.

c. Procedure Above Pipe Zone. From the top of the pipe zone backfill to ground surface, the material for backfill may contain stones ranging in size up to 6-inches in diameter, in quantity not exceeding 40 percent of the volume when said coarse materials are well distributed throughout the finer materials and the specified compaction may be attained.

d. Compaction Above Pipe Zone

d.1 Subgrade Zone. This zone is from the bottom of the AC base paving to the top of the pipe zone. Backfill in this zone shall be compacted to 90 percent relative compaction except the upper twelve (12) inches which shall be compacted to 95 percent relative compaction.

d.2 Compaction in Easements. Easements in open terrain where the degree of compaction is less important, the backfill, if sufficiently granular in nature (sand equivalent of 20 or greater), shall be consolidated by a water densification method. If the backfill shall be consolidated by a method approved by the City, backfill in easements and open terrain shall be compacted to 85 percent relative compaction except where easements enter public streets, in which case, the last 50 feet shall be compacted per street work requirements.

e. Mechanically Compacted Backfill. Mechanically compacted backfill shall be placed in horizontal layers of such depths compatible to the material being placed and the type of equipment being used. All such equipment shall be of a size and type approved by the soils engineer. Each layer shall be evenly spread, moistened (or dried, if necessary), and then tramped or rolled until the specified relative compaction has been attained. Permission to use specific compaction equipment shall not be construed as guaranteeing or implying that the use of such equipment will not result in damage to adjacent ground, existing improvements, or improvements installed under the contract. The Contractor shall make his own determination in this regard. Any damage which results shall be the responsibility of the Contractor and repaired or replaced at the Contractor's expense.

f. Water Densified Backfill. As used in these specifications, flooding shall mean the inundation of backfill with water, puddled with poles or bars to insure saturation of the backfill material for its full depth.

g. Jetting. Jetting of backfill in public right-of-way will not be permitted unless the Contractor complies with one of the following:

1) The Contractor imports "river-bottom" material for the entire backfill.

2) The Contractor imports material from borrow pits having prior approval of the soils engineer.

3) The soils engineer determines that a reach of pipeline (1,000 feet minimum) has soil material suitable for jetting as determined by

actual field conditions and confirmed by the Preliminary Soils Report.

If jetting is approved as stated above, the Contractor shall apply water in a quantity and at a rate sufficient to thoroughly saturate the entire thickness of the lift being densified. Water for jetting shall be from a continuous supply of water under pressure. The lift of backfill shall not exceed that which can be readily densified by the jetting procedure, but in no case shall the undensified lift exceed 6 feet for jetting.

h. Compaction Test. Compaction shall be tested in accordance with the methods specified by the State of California Department of Transportation Method No. California 216, or ASTM D1557.

Compaction test of the backfill will be required approximately every 250 feet, or more often if tests indicate the need, along the alignment on the main pipeline and, in addition, approximately 33 percent of all laterals within the street rights-of-way. The tests shall be made at varying depths.

The Contractor, at his expense, shall excavate the holes for all of the tests, backfill the holes, compact this backfill, and pave the surface after the test.

Compaction tests of the backfill which meet the specified requirements shall be at the Owner's expense. All compaction tests which do not meet the specified requirements shall be at the Contractor's expense without any compensation therefore.

1-02 CLEANING AND TESTING FOR SEWER PIPELINE

1-02.1 TESTING – FORCE MAIN AND OUTFALL PIPELINE

Upon completion of the laying, jointing, and backfilling, the pipeline or portions thereof shall be hydrostatically tested for a period of four (4) hours. For convenience of testing, the pipeline shall be divided into sections with maximum elevation difference for each test section of 80 feet, not exceeding 3,000 lineal feet, and each section tested separately. Bulkheads shall be constructed to safely withstand the hydraulic pressures imposed upon them. No payment will be made expressly for the work and materials required for the bulkheads, closing sections, or other appurtenances needed for testing sections and any compensation desired by the Contractor for this work shall be included in the price bid for the installation of pipe.

The test pressure shall be the maximum working pressure of the pipe plus 75 psi. The duration of the test shall be four (4) hours, unless otherwise specified. Each section of the pipeline shall be slowly filled with water and all air expelled by means of taps (contractor's responsibility) at high points.

Care shall be taken to expel all air from the pipeline as the line is filled with water for the test. The water necessary to maintain this pressure shall be measured by means satisfactory to the Engineer. The leakage shall be considered as the amount of water entering the pipe during the test. Leakage shall not exceed the rate of 12 gallons per inch of diameter per 24 hours per mile of pipe. Any noticeable leaks shall be stopped, and any defective pipe shall be repaired or replaced with new sections and retested as specified above, before final approval and acceptance of the work by the Engineer. All labor, materials, taps, equipment and water for tests shall be furnished by the Contractor.

1-02.2 CLEANING

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

1-02.3 T.V. INSPECTION

During the performance of the work, the Contractor shall secure the services of a firm for viewing and recording on video tape, newly installed sewer pipelines. The sections to be viewed and the time to perform the work shall be as determined by the City. The total length of pipeline shall be inspected by television. The pipeline shall be tested after backfill is complete and in-place density tests approved, but prior to final AC paving cap operations. The firm doing the T.V. inspection shall be approved by the City.

T.V. testing shall include a verbal tape and a written log of conditions encountered at various locations along the pipeline, and digital readouts of locations of any laterals or tees. Particular attention shall be given to the magnitude of offsets at joints. The maximum allowable vertical offset between the inverts of adjacent pipes shall be 3/8-inch for 8-inch through 12-inch pipe and 1/2-inch for 15-inch through 24-inch pipe.

Where, in the opinion of the City excessive offsets exist, the Contractor will identify and repair each location by the use of methods acceptable to the City. After any repair is made, the Contractor shall have the section of sewer main between manholes re-televised as specified above.

The cost for providing the above service (including re-televising, if necessary) and furnishing tapes and logs to the Owner, shall be included in the unit prices bid for the various sizes of sewer pipeline, and no additional allowance will be made therefore.