

SECTION 400

DESIGN CRITERIA SEWER FACILITIES

400.1 MINIMUM SIZE

The District will not accept for maintenance sewerline smaller than 8 inches nor any sewerline that is within a common trench (two or more utilities in the same trench).

400.2 MINIMUM AND MAXIMUM SLOPE DESIGN

400.2.1 Slopes

All sewers shall be so designed and constructed to give mean velocities, when flowing half full, of not less than 2.0 fps, based on Manning's formula using an "n" value of 0.013. The following are minimum slopes; however, slopes greater than these are desirable:

<u>Sewer Size (inches)</u>	<u>Minimum Slope in Feet per 100 Feet</u>
8	0.40
10	0.32
12	0.28

Maximum slopes shall be 15% unless authorized by the Director of Engineering.

400.2.2 Peak Flows

Design peak flows in pipelines 12 inches in diameter and smaller are to be limited to approximately $d/D = 0.5$. Pipes over 12 inches are to be limited to approximately $d/D = 0.75$.

400.2.3 Generation Rates

Sewerage generation rates for various developments within the District shall be as established by the Director of Engineering.

400.2.4 High Velocity Protection

Where flow velocities greater than 15 fps are attained, special provision shall be made to protect against displacement by erosion and shock for pipe entering a manhole and for concrete manhole base and flow channels.

400.3 STANDARD LOCATION AND ALIGNMENT

400.3.1 Location

Wherever possible, in local residential and industrial streets, pipe is to be located 5 feet off the street centerline. In major, primary, and secondary highways, pipe will be located in the center of the driving lane nearest to the center of the street. Pipe will not be located in median strips or parking lanes. On curvilinear streets, pipe shall parallel as nearly as possible the street centerline by means of horizontal curves.

400.3.2 Alignment

Barring other limiting design and construction considerations, a maximum separation between sewer and domestic water mains in new subdivisions shall be achieved by the following construction procedures:

1. On curvilinear streets, the sewers shall parallel as nearly as possible the street centerline by means of horizontal curves.
2. Sewer mains should be installed on the opposite side of the centerline from the domestic water mains.

400.3.3 Radius of Curvature

Minimum radius of curvature in feet (horizontal) per type of pipe:

V.C.P Nominal Pipe Size (inches)	Minimum Radius of Curvature	
	(5' joints)	(6' joints)
8-12	120'	144'

PLASTIC PIPE Nominal Pipe Size (inches)	Minimum Radius of Curvature (For Standard Joint Length)
8	280'
10	350'
12	420'

400.4 STATIONING PROCEDURE

Sewer centerline stationing shall be shown (example: 0+00) and be independent of street stationing with the stationing starting at the most downstream manhole or connection to existing sewer. All manholes are to be numbered (example MH no. 1).

400.5 MINIMUM COVER

Minimum cover from finish street grade to top of sewer main pipe is to be 7 feet.

400.6 MANHOLE SPACING AND LOCATION

Manholes shall be installed at the end of each line; at all changes in grade size, or alignment; at all intersections; and at distances not greater than 400 feet for 8- through 15-inch sewers and 500 feet for 18- to 30-inch sewers. If sewer is curved, closer spacing of manholes will be required. Greater spacing may be permitted in larger sewers. Only one curve (horizontal or vertical) shall be allowed between any two manholes.

400.7 MANHOLE TYPE, MINIMUM SIZE AND DEPTH

400.7.1 Manhole Depth

Manhole depth is calculated from finish grade to lowest pipe invert. Minimum manhole depth is to be 8 feet.

The standards for the District sewers call for a depth criteria of about 8 feet to 12 feet for manholes. However, if larger-depth manholes are required and approved by the District, the following criteria will govern. Manholes shall be pre-cast reinforced concrete with eccentric cone style. The minimum diameter of manholes shall be as follows:

<u>Depth</u>	<u>Size</u>
<12 ft	48 in
12 ft to 16 ft	60 in
16 ft and over	72 in

Depth of manhole shall be measured from the pipe invert to the finished surface of the street with a tolerance of ± 6 inches.

For larger sized sewer mains or special circumstances, the manhole size will be as shown on plans.

400.7.2 Allowable Head Losses

Allowable head loss in manholes shall be as follows:

1. Straight run through manholes based on 0.10 foot loss
2. Right angle turn in manholes based on 0.5 velocity head loss or 0.20 foot, whichever is greater

400.8 MANHOLE COVERS

400.8.1 Type of Covers

Cast-iron covers and frames shall be 24 inches or 36 inches in diameter with the word “sewer” and the initials “MNWD” cast in the cover. Larger size covers may be specified for special conditions on plans. See Standard Drawings S-3 and S-4.

400.8.2 Position of Covers

In new street developments, the manhole top shall be left at least 6 inches below subgrade. A heavy metal top with cleats the size of the manhole opening shall be mortared tight to the top. Specially cut plywood shall be placed in the bottom of the manhole before the temporary cover is installed. At the completion of final paving, the manholes shall be raised to final grade by using the necessary sized grade rings and plywood shall be removed prior to occupancy.

400.9 PAVED ACCESS TO MANHOLE

All sewer manholes shall be designed and constructed with a direct paved access to them.

400.10 SEPARATION BETWEEN WATERLINES AND SEWERLINES

See Subsection 400.3 herewith, and Section 500.7.

400.11 HOUSE LATERALS AND MINIMUM DEPTH AT CURB

All sewer laterals shall be located by the applicant and shown (with stationing) on the improvement plans.

House connections shall be constructed to the property line. There shall be one house sewer lateral constructed for each individually owned dwelling unit and it shall have a minimum diameter of 4 inches.

Four-inch sewer house connections shall be laid to the grade as established by the applicant so that the 4-inch house connection will have a minimum cover of 6 feet from the top of the curb to the top of the pipe per Standard Drawing S-6.

400.12 TOWNHOUSES AND CONDOMINIUM LATERALS

For buildings containing two to four units, either one 4-inch diameter lateral to each unit or one 6-inch diameter, or larger, lateral to the building shall be used. For buildings containing more than four units, either one 4-inch diameter lateral to each unit or one 8-inch diameter, or larger, lateral to the building shall be used. A lateral shall serve only one building regardless of number of units per building.

400.13 INDUSTRIAL TREATMENT

Requirements for industrial pretreatment will be determined as a result of processing the Industrial Waste Questionnaire in Section 300.2.3.4 through the South Orange County Wastewater Authority (SOCWA) office. Design requirements will be dependent upon those industrial pretreatment requirements.

400.14 GREASE INTERCEPTORS

All restaurants and other facilities which discharge an excess amount of grease into the District's sewers shall be required to use grease interceptors to minimize grease problems in collection systems and treatment plants. The minimum interceptor size shall be 750 gallons. All interceptors shall be equipped with automatic draw-off devices for easier removal of accumulated grease.

It will be the responsibility of the owner of each facility to maintain proper operating order of the interceptor unit and to remove accumulated grease at suitable intervals to avoid excessive buildup in the unit. The Orange County Health Care Agency specifies the location of the interceptor unit. SOCWA will periodically inspect the interceptor.

400.15 STANDARD SEWER NOTES

Standard sewer notes to be included on all street improvement plans or sewer system construction plans shall be as follows:

1. The sewer system as shown on these plans shall be constructed in accordance with the standard drawings and specifications of the Moulton Niguel Water District. Contractor shall keep a copy of the standard specifications and drawings and drawings on the jobsite at all times.
2. Sewer Connection: 4-inch house connection are to be constructed from the sewer main to the property line for each lot.
3. All sewer house connections shall be placed prior to surfacing of streets.
4. The District shall be notified at least 48 hours prior to commencing work on the sewers. **Phone: (949) 425-3532**, for inspection. A preconstruction meeting shall be held 24 hours before starting construction.
5. All sewer lengths are calculated on horizontal distances along the centerline of the sewer.
6. Pressure testing of sewers shall be in accordance with the standard specifications of the Moulton Niguel Water District.
7. 0+00 shown on sewer profile denotes stationing along centerline sewer from downstream manhole.

8. In order to prevent accidental use of the new sewer prior to completion and acceptance, the outlet or inlet to existing tie-in manhole(s) shall be sealed with broken brick and mortar. Installation of these plugs shall be approved by the District. Plugs shall be removed at the time of final acceptance.
9. Contractor shall verify the horizontal and vertical location of all utility crossings before constructing any sewers in this project.
10. Contractor's surveyor shall stake the location of all wye fittings. All house laterals not normal to street sewer to have end of lateral at property line staked and tied to a property corner as shown on the plans.
11. The Moulton Niguel Water District will inspect and maintain all 8-inch main line sewers and manholes. The District will not inspect nor maintain 4, 6, or 8-inch laterals to the buildings. The Orange County Department of Building and Safety or appropriate governing agency will inspect and verify all 4, 6, and 8-inch laterals to the buildings.
12. Any work to be performed inside a live manhole shall be done in accordance with Cal OSHA "Confined Spaces" and District manhole entry regulations. Manhole entry without District personnel present is not allowed.
13. All sewer manhole lids are to have "MNWD" cast thereon as shown in Standard Drawings S-3 and S-4 of Moulton Niguel Water District's "Standard Specifications for Construction of Domestic Water, Sewer and Recycled Water Facilities."
14. The applicant is to provide the Moulton Niguel Water District with an record drawings set of job prints with tie-down measurements for all laterals and manholes.
15. Curbs shall be inscribed with an "S" indicating location of all sewer laterals.

END OF SECTION