



VALUES OF THE MANNING  
ROUGHNESS COEFFICIENT, n

DESCRIPTION OF CHANNEL	MINIMUM	NORMAL	MAXIMUM
<u>I. Closed conduit - Partly full</u>			
A. Metal			
1. Steel			
a. Lockbar and welded	0.010	0.011	0.013
b. Riveted and spiral	0.013	0.016	0.017
2. Cast Iron			
a. Coated	0.010	0.013	0.014
b. Uncoated	0.011	0.014	0.016
3. Wrought Iron			
a. Black	0.012	0.014	0.015
b. Galvanized	0.013	0.016	0.017
4. Corrugated			
a. Subdrain	0.017	0.019	0.021
b. Storm drain	0.021	0.024	0.030
B. Nonmetal			
1. Acrylic	0.008	0.009	0.010
2. Glass	0.009	0.010	0.013
3. Wood			
a. Stave	0.010	0.012	0.014
b. Laminated, treated	0.015	0.017	0.020
4. Clay			
a. Common drainage tile	0.011	0.013	0.017
b. Vitrified sewer	0.011	0.014	0.017
c. Vitrified sewer with manholes, inlets, etc.	0.011	0.013	0.015
d. etc.	0.013	0.015	0.017
5. Brick			
a. Glazed	0.011	0.013	0.015
b. Lined with cement	0.012	0.015	0.017



DESCRIPTION OF CHANNEL	MINIMUM	NORMAL	MAXIMUM
<b>6. Concrete</b>			
a. Culvert, straight and free of debris	0.010	0.011	0.013
b. Culvert with bends, connections, and some debris	0.011	0.013	0.014
c. Sewer with manholes, inlet, etc., straight	0.013	0.015	0.017
d. Unfinished, steel form	0.012	0.013	0.014
e. Unfinished, smooth wood form	0.012	0.014	0.016
f. Unfinished, rough wood form	0.015	0.017	0.020
<b>7. Sanitary sewers coated with sewage slimes</b>	0.012	0.013	0.016
<b>8. Paved invert, sewer, smooth bottom</b>	0.016	0.019	0.020
<b>9. Rubble masonry, cemented</b>	0.018	0.025	0.030
<b><u>II. Lined or Built-up Channels</u></b>			
<b>A. Metal</b>			
<b>1. Smooth steel surface</b>			
a. Painted	0.011	0.012	0.014
b. Unpainted	0.012	0.013	0.017
<b>2. Corrugated</b>	0.021	0.025	0.030
<b>B. Nonmetal</b>			
<b>1. Cement</b>			
a. Neat surface	0.010	0.011	0.013
b. Mortar	0.011	0.013	0.015



DESCRIPTION OF CHANNEL	MINIMUM	NORMAL	MAXIMUM
2. Concrete			
a. Trowel finish	0.011	0.013	0.015
b. Float finish	0.013	0.015	0.016
c. Finished, with gravel on bottom	0.015	0.017	0.020
d. Unfinished	0.014	0.017	0.020
3. Wood			
a. Planed, untreated	0.010	0.012	0.014
b. Planed, creosoted	0.011	0.012	0.015
c. Unplaned	0.011	0.013	0.015
d. Plank with battens	0.012	0.015	0.018
4. Brick			
a. Glazed	0.011	0.013	0.015
b. In cement mortar	0.012	0.015	0.018
5. Masonry			
a. Cemented rubble	0.017	0.025	0.030
b. Dry rubble	0.023	0.032	0.035
6. Asphalt			
a. Smooth	0.013	0.013	----
b. Rough	0.016	0.016	----
7. Vegetal lining	0.030	----	0.500
<u>III. Excavated or Dredged</u>			
A. Earth, straight and uniform	0.016	0.022	0.035
B. Earth, winding and sluggish	0.023	0.030	0.040
C. Rock cuts	0.030	0.040	0.050
D. Unmaintained channels	0.040	0.070	0.140
<u>IV. Natural Channels</u> (Minor streams, top width at flood 100 ft.)			
A. Fairly regular section	0.030	0.050	0.070
B. Irregular section with pools	0.040	0.070	0.100