

TABLE 4-1 (Continued)

Type of Channel and Description	Minimum	Normal	Maximum
B. Lined or Built-up Channels			
B-1. Metal			
a. Smooth steel surface			
1. Unpainted	0.011	0.012	0.014
2. Painted	0.012	0.013	0.017
b. Corrugated	0.021	0.025	0.030
B-2. Nonmetal			
a. Cement			
1. Neat, surface	0.010	0.011	0.013
2. Mortar	0.011	0.013	0.015
b. Wood			
1. Planed, untreated	0.010	0.012	0.014
2. Planed, creosoted	0.011	0.012	0.015
3. Unplaned	0.011	0.013	0.015
4. Plank with battens	0.012	0.015	0.018
5. Lined with roofing paper	0.010	0.014	0.017
c. Concrete			
1. Trowel finish	0.011	0.013	0.015
2. Float finish	0.013	0.015	0.016
3. Finished, with gravel on bottom	0.015	0.017	0.020
4. Unfinished	0.014	0.017	0.020
5. Gunite, good section	0.016	0.019	0.023
6. Gunite, wavy section	0.018	0.022	0.025
7. On good excavated rock	0.017	0.020	
8. On irregular excavated rock	0.022	0.027	
d. Concrete bottom float finished with sides of			
1. Dressed stone in mortar	0.015	0.017	0.020
2. Random stone in mortar	0.017	0.020	0.024
3. Cement rubble masonry, plastered	0.016	0.020	0.024
4. Cement rubble masonry	0.020	0.025	0.030
5. Dry rubble or riprap	0.020	0.030	0.035
e. Gravel bottom with sides of			
1. Formed concrete	0.017	0.020	0.025
2. Random stone in mortar	0.020	0.023	0.026
3. Dry rubble or riprap	0.023	0.033	0.036
f. Brick			
1. Glazed	0.011	0.013	0.015
2. In cement mortar	0.012	0.015	0.018
g. Masonry			
1. Cemented rubble	0.017	0.025	0.030
2. Dry rubble	0.023	0.032	0.035
h. Dressed ashlar	0.013	0.015	0.017
i. Asphalt			
1. Smooth	0.013	0.013	
2. Rough	0.016	0.016	
j. Vegetal lining	0.030	...	0.500
C. Excavated or Dredged			
a. Earth, straight and uniform			
1. Clean, recently completed	0.016	0.018	0.020

Type of Channel and Description	
2. Clean, after weathering	
3. Gravel, uniform section	
4. With short grass, few weeds	
b. Earth, winding and sluggish	
1. No vegetation	
2. Grass, some weeds	
3. Dense weeds or aquatic plants	
deep channels	
4. Earth bottom and rubble	
5. Stony bottom and weedy	
6. Cobble bottom and clean	
c. Dragline excavated or dredged	
1. No vegetation	
2. Light brush on banks	
d. Rock cuts	
1. Smooth and uniform	
2. Jagged and irregular	
e. Channels not maintained, with brush uncut	
1. Dense weeds, high as flow	
2. Clean bottom, brush on banks	
3. Same, highest stage of flow	
4. Dense brush, high stage of flow	
D. Natural Streams	
D-1. Minor streams (top width at flow stage < 100 ft)	
a. Streams on plain	
1. Clean, straight, full stage or deep pools	
2. Same as above, but more brush and weeds	
3. Clean, winding, some pools, shoals	
4. Same as above, but some brush and stones	
5. Same as above, lower stage, ineffective slopes and some brush	
6. Same as 4, but more brush	
7. Sluggish reaches, weed growth	
8. Very weedy reaches, deep floodways with heavy brush, timber and underbrush	
b. Mountain streams, no vegetation	
channel, banks usually steep and brush along banks subsides at high stages	
1. Bottom: gravels, cobbles, few boulders	
2. Bottom: cobbles with few boulders	
D-2. Flood plains	
a. Pasture, no brush	
1. Short grass	