Type of Channel and Description	Minimum	Normal	Maximum
LINED CHANNELS (Selected Linings)			
a. Concrete			
Trowel Finish	0.011	0.013	0.015
Float Finish	0.013	0.015	0.016
Gunite, good section	0.016	0.019	0.023
b. Asphalt			
Smooth	0.013	0.013	-
Rough	0.016	0.016	-
EXCAVATED OR DREDGED			
a. Earth, straight and uniform			
Clean, recently completed	0.016	0.018	0.020
Clean, after weathering	0.018	0.022	0.025
Gravel, uniform section, clean	0.022	0.025	0.030
With short grass, few weeds	0.022	0.027	0.033
b. Earth, winding and sluggish			
No vegetation	0.023	0.025	0.030
Grass, some weeds	0.025	0.030	0.033
Dense weeds or aquatic plants in deep channels	0.030	0.035	0.040
Earth bottom and rubble sides	0.025	0.030	0.035
Stony bottom and weedy sides	0.025	0.035	0.045
Cobble bottom and clean sides	0.030	0.040	0.050
c. Dragline excavated or dredged			
No vegetation	0.025	0.028	0.033
Light brush on banks	0.035	0.050	0.060
d. Rock Cuts			
Smooth and uniform	0.025	0.035	0.040
Jagged and irregular	0.035	0.040	0.050
e. Channels not maintained, uncut weeds and brush			
Dense weeds as high as flow depth	0.050	0.080	0.120
Clean bottom, brush on sides	0.040	0.050	0.080
Same, highest stage of flow	0.045	0.070	0.110
Dense brush, high stage	0.800	0.100	0.140
NATURAL STREAMS			
1. Minor streams (top width at flood stage<100 ft)			
a. Streams on Plain			
1. Clean, straight, full stage, no rifts or deep pools	0.025	0.030	0.033
2. Same as above, but more stones and weeds	0.030	0.035	0.040
3. Clean, winding, some pools and shoals	0.033	0.040	0.045
4. Same as above, but some weeds and stones	0.035	0.045	0.050
5. Same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055

Table 5A-1
Values of Roughness
Coefficient 'n' (Uniform Flow)
Reference: Chow, Ven T., *Open Channel Hydraulics* (1959)
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