

31904 Slope-area measurement of Skagit River near Concrete Wash for flood of Dec. 13, 1921

Reach between sections.....	A-B.....	B-C.....	C-D.....	Gage height at gaging station,..... feet.
Length of reach, feet,.....		2190'		Discharge,..... second-feet.
Fall in reach (F), feet,.....		2.62'		Drainage area,..... square miles.

SECTION PROPERTIES

Section	n	1.486/n	a	r	r ^{2/3}	K = 1.486/n or r ^{2/3}	K ² /a	C _m ²	Verification	
									K S ^{1/2}	v
B	.030	49.5	19,000	24.35	8.40	790,000	2,890,000			
C	.030	49.5	16,900	23.80	8.27	6,920,000				
Q = 6,920,000				2.62'			= 2,250,000			
				2.62'						

Weighted conveyance (K_w), A-B..... B-C..... C-D.....

COMPUTATION OF DISCHARGE

Section	Assumed Q	C _m V ² /2g	Δ C _m V ² /2g	h _f	S	S ^{1/2}	Computed Q = K _w S ^{1/2}	Weight
A	—	—	—	—	—	—	—	—
B	—	—	—	—	—	—	—	—
B	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—
C	—	—	—	—	—	—	—	—
D	—	—	—	—	—	—	—	—

FORMULAS

² C_m = $\frac{\sum v^2 a}{V^2 A} = \frac{\sum (K^2/a)}{K_{Total}^2/A_{Total}}$

³ S V² at any section is final discharge divided by K for that section.

⁴ K_w = $\sqrt{K_{upstr.} K_{downstr.}}$

⁵ $\Delta \frac{C_m V^2}{2g} = \frac{C_m V^2}{2g} - \frac{C_m V^2}{2g}$

⁶ h_f = F + $\Delta \frac{C_m V^2}{2g}$ - h_i

V_{upstr.} > V_{downstr.}; h_i = $\frac{1}{2} \Delta \frac{C_m V^2}{2g}$

V_{upstr.} < V_{downstr.}; h_i = 0

⁷ S = $\frac{h_f}{\text{Length of reach}}$

⁸ Computed Q must equal assumed Q.

DISCHARGE (the weighted average of computed discharges)

Summary of factors influencing measuring conditions (floodmarks, surge, scour, fill, channel configuration, angle of flow, selection of n, etc.):

Only reach B-C used. Reach A-B is expanding and "n" for that portion of the channel is not well verified. Value of "n" for reach B-C is from verification using data from flood of Nov. 27, 1949.