

EQUATION:  $Q = 0.56 \left(\frac{2}{n}\right) S^{1/2} Y^{2.5}$

N IS ROUGHNESS COEFFICIENT IN MANNING

FORMULA APPROPRIATE TO MATERIAL IN

BOTTOM OF CHANNEL

Z IS RECIPROCAL OF CROSS SLOPE

REFERENCE: H. R. S. PROCEEDINGS 1946,

PAGE 150, EQUATION (14)

EXAMPLE (SEE DASHED LINES)

GIVEN:  $S = 0.03$

$Z = 24$

$N = .02$

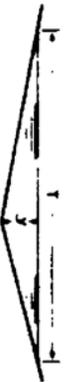
$Y = .032$

FIND:  $Q = 2.0$  CFS

$2/n = 1200$

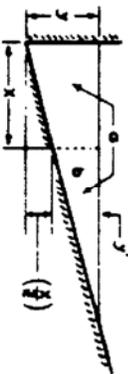
INSTRUCTIONS

1. CONNECT  $Z/n$  RATIO WITH SLOPE (S) AND CONNECT DISCHARGE (Q) WITH DEPTH (Y) THESE TWO LINES MUST INTERSECT AT TURNING LINE FOR COMPLETE SOLUTION.



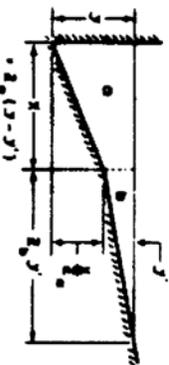
2. FOR SHALLOW V-SHAPED CHANNEL AS SHOWN USE NOMOGRAPH WITH  $Z = \frac{1}{Y}$

3. TO DETERMINE DISCHARGE  $Q_x$  IN PORTION OF CHANNEL HAVING WIDTH X:



DETERMINE DEPTH Y FOR TOTAL DISCHARGE IN ENTIRE SECTION  $Q$ . THEN USE NOMOGRAPH TO DETERMINE  $Q_x$  IN SECTION B FOR DEPTH  $Y = Y - \left(\frac{X}{Z}\right)$

4. TO DETERMINE DISCHARGE IN COMPOSITE SECTION: FOLLOW INSTRUCTION 3. TO OBTAIN DISCHARGE IN SECTION a AT ASSUMED DEPTH Y; OBTAIN  $Q_a$  FOR SLOPE RATIO  $Z_a$  AND DEPTH Y' THEN  $Q_1 = Q_a + Q_b$



Greenwood Village  
Street Drainage Design  
October 2003

Figure 8-2  
Nomograph for Flow  
In Triangular Gutters  
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