APPENDIX G
NOMOGRAPHS AND CHARTS FOR GUTTER FLOW & INLET DESIGN

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Instructions for Use

1. Connect $\frac{Z}{b}$ ratio with slope $s$, connect discharge $Q$ with point where line crosses turning line. Read depth at curb $d$, $Q$ can be found from $d$ by connecting $d$ with crossing of turning line.

2. For shallow V-shaped channel, use instruction 1, but with $Z = \frac{1}{d}$.

3. To determine discharge $Q_A$ in portion of channel having width $x$, determine depth for the entire section as in instruction 1. Then use nomograph to determine $Q$ in section of width $b$ for depth $d = \frac{x}{Z}$, then $Q_A = Q_B$.

4. To determine discharge $Q_T$ in composite section, follow instruction 3 to obtain discharge $Q_A$ in section $A$ at assumed depth $d$ based on an extension of slope ratio $Z_A$ to intersect water surface. Obtain $Q_B$ for slope ratio $Z_B$ and depth $d' = \frac{x}{Z_A}$. Then $Q_T = Q_A + Q_B$.

Exhibit G.1 Use of Nomograph for Flow in Triangular Channels
Example (see instruction I)
Given: $S=0.03$
      $Z=24$
      $n=0.02$
      $Z/n=1200$
      $q=2.0$ cfs
Find $d=0.22$ by following dashed lines.

\[ Q = 0.56 \left( \frac{Z}{n} \right) S^{\frac{1}{2}} d^{\frac{9}{4}} \]
\[ Q = (0.56/n) S^{\frac{5}{3}} S^{\frac{1}{2}} T^{\frac{9}{5}} \]
Where $d=TS_x$
Exhibit G.3  Capacity Nomograph for Curb Opening Inlets on Continuous Grade

LEGEND

Qa = Total gutter flow
Q = Intercepted gutter flow
La = Length of curb opening necessary to intercept 100% of gutter flow
L = Actual length of curb opening

Q/Qa = the interception ratio for inlets of length, L, less than La

Qa/La is the total discharge divided by length of curb opening necessary to intercept 100% of gutter flow

(A)
Exhibit G.4 Capacity Nomograph for Curb Opening Inlets in a Low Point or Sump

\[ a = \text{Local depression} = 5' \ (\text{Std, Plan No. 443}) \]
\[ H = \text{Height of ponded water above depression limit} \]
\[ h = \text{Height of opening} = 3' \ (\text{Std, Plan No. 443}) \]
Exhibit G.5  Performance Curves for Curb Inlets Standard Plan
(For a cross-slope of 0.02 ft/ft)
Exhibit G.6  Ratio of Frontal Flow to Total Gutter Flow
(Source: Reference G.1)
Exhibit G.7 Grate Inlet Frontal Flow Interception Efficiency
(Source: Reference G.1)
Exhibit G.8  Grate Inlet Side Flow Interception Efficiency
(Source: Reference G.1)
Exhibit G.9  Grate Inlet Capacity in Sump Conditions
(Source: Reference G.1)
Example:
Given:  \( n = 0.016; \ S = 0.01 \)
\( S_x = 0.02; \ Q = 4 \ \text{ft}^3/\text{s} \)
Find:  \( L_T = 34 \ \text{ft} \)

Exhibit G.10  Slotted Inlet Length for Total Interception
(Source: Reference G.1)
Exhibit G.11  Slotted Inlet Interception Efficiency
(Source: Reference G.1)
Exhibit G.12  Slotted Drain Inlet Capacity in Sump Locations
(Source: Reference G.1)
Exhibit G.13  Value of K for Slotted Vane Drain:  
Applicable to Neenah Slotted Vane Drain R-3599 Only  
(Source: Neenah Foundry Company)
REFERENCES
