KENTUCKY TRANSPORTATION CABINET
Department of Highways
**DIVISION OF HIGHWAY DESIGN**

TC 61-120
Rev. 01/2003
Page 1 of 2

TEAM
**KENTUCKY**®
TRANSPORTATION
CABINET

# INLET SPACING: CURB-OPENING, GRATED AND SLOTTED PIPE INLETS

## SECTION 1:  PROJECT INFORMATION

| COUNTY | ROUTE | PROJECT # | DISTRICT #<br>Select | ITEM # |
|--------|-------|-----------|----------------------|--------|
| | | | | |

## SECTION 2:  INLET INFORMATION

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Sta. Loc. | CA | Q | Qc | Qa | Sx | Sw/Sx | So | T/W | T | d | V | W/T | Eo | Se | Lt | L/Lt | Rf | 1-Eo | Rs | E | Qi | Qc |
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**ALL INLETS**   da=          Ta=          I=          n=          Wg=          Lg=          a=          Li=

**SAG INLETS**  Qsum=          Cw=          Co=          h=          do=          A/2=          P/2=

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Page 2 of 2

## INLET SPACING: CURB-OPENING, GRATED AND SLOTTED PIPE INLETS

### SECTION 3: INSTRUCTIONS

| COLUMN | ITEM | INSTRUCTIONS |
|---|---|---|
| 1 | STA/LOC | Station and Location of Inlet |
| 2 | CA | C X A:  Weighted Runoff Coefficient times Drainage Area to Inlet in Acres |
| 3 | Q | Rational Discharge = (2) x I (Intensity) |
| 4 | Qc | Carryover from Previous Inlet Upstream |
| 5 | Qa | Total Gutter Flow Available = (3) + (4) |
| 6 | Sx | Pavement Cross-Slope at Inlet; use minimum of 0.001 for inlet placed 50 feet back of flat spot in Superelevated Roadway. |
| 7 | Sw / Sx | Ratio of Gutter Cross Slope (Sw) to (6) |
| 8 | So | Longitudinal Slope; use minimum of 0.001 for inlet in Sag Vertical Curve. |
| 9 | T / W | Ratio of Top Width (Spread) to Gutter Width |
| 10 | T | Top Width Flow at Inlet (Spread) |
| 11 | d | Depth of Flow at Inlet |
| 12 | V | Velocity at Inlet = (3) / Area |
| 13 | W / T | Ratio of Gutter Width to Top Width |
| 14 | Eo | Ratio of Gutter Flow to Total Flow = Qw / (3) = $1-(1-W/T)^{2.67}$ |
| 15 | Se | Equivalent Cross Slope at Depressed Inlets = Sx + Sw x Eo |
| 16 | Lt | Length of Curb Opening Inlet required for Total Interception = $0.6Q^{0.42}So^{0.3}(1/nSe)^{0.6}$ |
| 17 | L / LT | Ratio of Length of Inlet to Curb Opening Length required for Total Interception |
| 18 | Rf | Ratio of Grate Frontal Flow intercepted to Total Frontal Flow = 1 - 0.09(V - Vo), where Vo = gutter velocity where grate splash-over first occurs (see HEC-12) |
| 19 | 1-Eo | Ratio of Grate Side Slow, Qs, to Total Gutter Flow = Qs/Q = 1-Qw/W = 1-Eo |
| 20 | Rs | Ratio of Grate Side Flow intercepted to Total Side Flow = $1/[1+(0.15V^{1.8})/(SxLg^{2.3})]$, where Lg is length of grate |
| 21 | E | Efficiency of:          Grate            = RfEo + Rs(1-Eo)<br>          Curb Opening      = $1 - (1 - L/Lt)^{1.8}$ |
| 22 | Qi | Total Discharge intercepted by inlet,  Qi = EQ |
| 23 | Qc | Carryover Discharge (not intercepted) to next  inlet, Qc = Q - Qi |
|  | da | Depth at Curb Face times Gutter Depression |
|  | Ta | Top Width times Gutter Depression |
|  | I | Rainfall Intensity |
|  | n | Manning's Roughness Coefficient for Pavement |
|  | Wg | Width of Grate |
|  | Lg | Length of Grate |
|  | a | Gutter Depression at Inlet in feet |
|  | Li | Length of Curb Opening Inlet |
|  | Qsum | Sum of Total Gutter Flow in Sag |
|  | Cw | Weir Coefficient |
|  | Co | Office Coefficient |
|  | h | Height of curb opening |
|  | do | Effective Head on Center of Orifice Throat of Curb Opening Inlet,  do = d - (h/2)Sinϴ, where h is height of curb opening orifice and ϴis angle of orifice opening (see HEC-12) |
|  | A/2 | Area of Clear Grate Opening divided by 2 |
|  | P/2 | Perimeter of Grate divided by 2 |