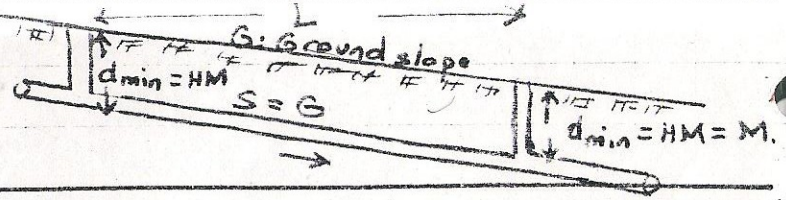
SANITARY SEWER DESIGN

Guidelines for sewer slope selection: The prgm is designed for less excavation. (not for less manhole)

Case # 1/A.

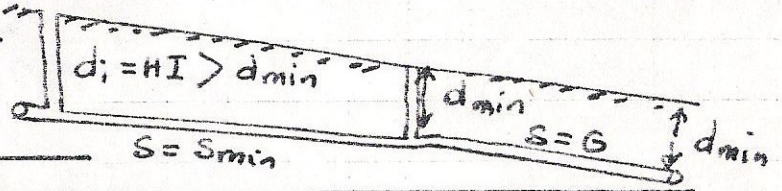
$S_{min} \leq G < S_{max}$

$W \leq G < X$



Case # 1/B.

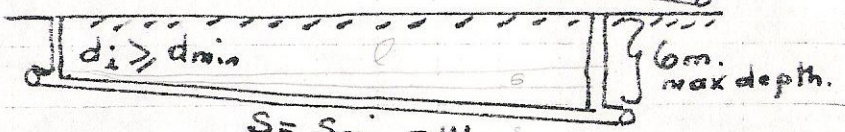
$S_{min} \leq G < S_{max}$



Case # 2.

$G < S_{min}$

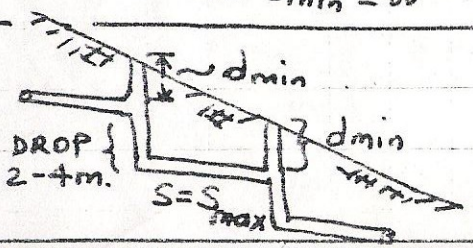
or $G < W$



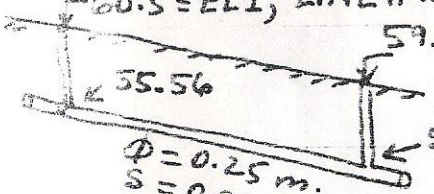
Case # 3

$G > S_{max}$

or $G > X$



EXAMPLES: METCALF & EDDY / COLLECTION p.123, Table 4-8



HI = (60.5 - 55.56) = 4.94m

HM = 2.75m (9ft)

N = 0.013

SD = 0.25m.

OUTPUT: CASE # 1B, L = 44m.
S = SMIN = 0.0025
QF = 0.029 m³/s
VF = 0.60 m/s
V = 0.683 m/s
H/D = 0.78

Line 6, Table 4-8 p 123

INPUT:
Q = 0.0123 m³/s
L = 28 m
EL1 = 61.45m.
EL2 = 61.60m
HI = 61.4 - 57.10 = 4.35m
HM = 2.75m.
N = 0.013
SD = 0.20m

OUTPUT: CASE # 2, L = 190.6m
S = G = 0.0033
QF = 0.019 m³/s
VF = 0.60 m/s
V = 0.64 m/s
H/D = 0.60

Sanitary Sewer Design.

```
10  INP "Q", Q, "L", L, "EL1", A, "EL2",
      "HM", M, "N", N, "SD", D.
20  U = .397/N * D↑(2/3)
30  W = 0.36/U↑2 : X = 3/U↑2
40  G = (K-P)/L
50  IF G > W THEN 90
60  S = W : L = (Y-6)/(G-S)
70  PRT " #2, L="; L; ", S=SMIN = "
80  GO TO 160
90  IF G < X THEN 130
100 S = X : L = (Y-M)/(G-S)
110 PRT "#3, L="; L; ", S=SMAX = "
120 GOTO 160
130 IF Y = M THEN 150
140 S = W : L = (Y-M)/(G-S) : PRT "#1
    "S = SMIN = "; S : GOTO 160
150 S = G : PRT "#1/A, L SAME"; "
160 J = U * S↑(1/2) : F = π * D↑2/4 *
170 FOR I = .02 TO 1 STEP .02
180 E = 1 - 2*I : Z = E * (1 - E↑
190 B = ((ACS E)/180 - Z/π) : C = (
200 IF H ≤ B*C THEN 220
210 NEXT I
220 V = J*C
230 IF V ≥ .6 THEN 240
240 PRT "QF = "; F, "VF = "; J, "V = "
250 END.
```

Definitions: W = Smin, X = Smax, HI =
dmin = HM = Min Depth. Smin is based
Smax is based on 3m/s (see Line # 1
B = A/Af ; C = V/Vf , J = Vreal , F

```
231  IF S=W THEN 240
232  IF H>0.3 THEN 234
233  PRT "FLUSH"
234  PRT " @ SMALL I/M CHANGE
```