May 12, 1988

Office of the City Engineer
City Hall-Seventh Floor
455 North Main
Wichita, Kansas 67202

Subject: Base Flood Elevation
for Woodland at the Park Addn.

Attention: Ms. Vicky Huang

Dear Ms. Huang:

At the suggestion of Mr. Brent Wooten, of Baughman Company, I am writing you to point out an error on one of the cross section plots submitted with my report for subject addition. The plotted cross section for Station 335.0 shows the calculated Base Flood Elevation (BFE) to be 1306.89 (National Geodetic Vertical Datum - NGVD) which is correct and which agrees with the BFE calculated by MKEC; however, the elevation shown for the "With Floodway" condition is shown as 1308.3 which is incorrect. The correct water surface elevation for a calculated floodway width of 499 feet is 1307.9 which would also be the City of Wichita Regulatory Elevation under the ordinance requirement that the Regulatory Elevation be one foot higher than the BFE. When the NGVD elevation of 1307.9 is converted to City of Wichita elevation datum by subtracting 1187.4 a City Datum Regulatory Elevation of 120.5 results.

If you have any questions, please call me.

Yours truly,

M. S. Mitchell

M. S. Mitchell
Flood Plain Management & Land Development Specialist
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BAUGHMAN COMPANY, P.A.
SURVEYING, ENGINEERING & CONSULTING
316/262-7271 • 315 ELLIS • WICHITA, KANSAS 67211

CONFIRMATION MEMO

PROJECT Woodlands at the Park

JOB NO.

TO Vicki Huang, P.E.

FROM N. Brent Wooten, P.E.

REFERENCE Drainage Plan

DATE 4-26-83

COPIES TO:

Provided herein is the final drainage plan and exhibit for Woodland at the Park Addition. This plat is scheduled at the subdivision hearing for May 5, 1988.

Please review the plan and the attached calculations and advise if you should have any questions.

4/27/86
CB

Drainage for Kloodland @ the Park 1/4

From SCS "Soil Survey for Sedgwick County"
Soil Type = Mo = Milan loam (Map 49)
Soil Type "B"
From City of Wichita Attachment "D"; Drainage Criteria
and using Avg. lot size of 65'x120' = 0.2 Ac
(Assume 1/4 Acre); Type B soil;

$C_2 = 0.44$
$C_{100} = 0.61$

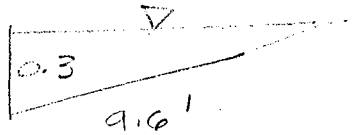
for Yellowstone Court $Q = CiA$

$D_A = 2.4$ Ac
$i_2 = 3.63$ $C_2 = 0.44$ $Q_2 = (2.4)(3.63)(0.44) = 4.0$ cfs
$i_{100} = 7.37$ $C_{100} = 0.61$ $Q_{100} = (2.4)(7.37)(0.61) = 10.8$ cfs

for Maywell / Fairway / Severna

$D_A = 6.7$ Ac
$i_2 = 3.63$ $C_2 = 0.44$ $Q_2 = (6.7)(3.63)(0.44) = 11.3$ cfs
$i_{100} = 7.37$ $C_{100} = 0.61$ $Q_{100} = (6.7)(7.37)(0.61) = 30.1$ cfs

Check Initial Storm Depth for Yellowstone Ct.
$Q_2 = 4.0$ cfs; assume 2.0 cfs / side Maximum (North)
$S = 0.005$
$n = 0.016$ @ 0.3' (Roll Cb)



$A = (0.3)(9.6)(1/2) = 1.44$ ft^2
$WP = 9.6 + 0.3 = 9.9$
$R = 1.44/9.9 = 0.145$
$V = \frac{1.49}{0.016}(0.145)^{0.67}(0.005)^{1/2} = 1.8$ ft/sec

$Q_{Anal} = VA = 1.44(1.8) = 2.6$ cfs
Curb should hold the initial storm O.K.

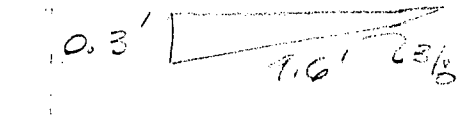
4/27/88
CB

2/4

for Maxwell/Fairway/Swannah

$\text{Slope} = \frac{128-120}{720} = 1.1\%$

Use 1% street slope, roll curb



$A = 1.44\ ft^2$
$wp = 9.9'$

$V = 1.49/0.016\,(0.145)^{0.67}(0.01)^{1/2} = 2.55\ ft/sec$
$Q = VA = 2.55(1.44) = 3.7\ cfs$

Initial storm here = 11.3 cfs
About 70% from the South = 0.7(11.3) = 7.9 cfs
Per Curb = 7.9/2 = 3.95 → 4.0 cfs.

A bit shy for initial storm, check w/ Neenah Foundary Flo Calculator; Flo in triangular gutter sections

Slope	N	trans slope (3/8"/ft)	D	Q(chart)	C2 1c
0.005	0.016	0.0313	0.3'	3.3 cfs	3.2 cfs
0.01	0.016	0.0313	0.3'	4.7 cfs	4.5 cfs

(Note; Neenah Equ = $Q = \frac{0.56}{N} z D^{8/3} S^{1/2}$
D = Depth (ft)
z = trans slope

Since gutter section using Manning Equ is close, and using Neenah Equation both work well, No other inlets are necessary for initial storm, except those needed @ sump locations.

4/27/88
CB

3/4

Inlets @ Yellowstone Ct.
for Initial Storm $Q_2 = 4.0$ cfs
Use 1A Inlets in sump condition.
Depth of sump: 0.3' + 2" = 0.47' Deep
1A Inlet @ 0.47' Depth; Cap = 3.2 cfs → Use 2
(See Fig 1 for Inlet Capacity)

for 100 yr. storm; $Q_{100} = 10.8$ cfs
Depth = 0.3' (Cb. Ht.) + 2" depression + 0.3' (E/W Elev)
Depth = 0.77'
1A Inlet @ D = 0.77; Q = 6.9 cfs
Again; Use 2 inlets or 1 long Inlet.

Use 4'-6" x 11'-6" Type 1A Inlet

Inlets @ Maxwell Street.
For Initial storm; $Q_2 = 11.3$ cfs
D_i = 0.47' (See Above) Q = 3.2 cfs
Need 11.3/3.2 = 3.5 → 4 inlets
for 100 yr storm; $Q_{100} = 30.1$ cfs
D_i = 0.77'; $Q_{1A} = 6.9$ cfs
Need 30.1/6.9 = 4.3 → Use 4 inlets
(Note; E/W Elevation Based on 0.3' minimum needed above T.C.; Should have more like 0.4 to 0.5' depth available @ E/W.)

Use 2 - 4'-6" x 11'-6" Type 1A Inlets
one each side

Pipe Sizing: Since both sumps are 100 yr sump areas, pipes must be sized for 100 yr storm.

4/27/88
CB

4/4

@ Yellowstone Ct. $Q_{100} = 10.8$ cfs
From "Design Data 4" Conc. Pipe Association
@ Q = 12.1 ; Use 18" @ 1.06%

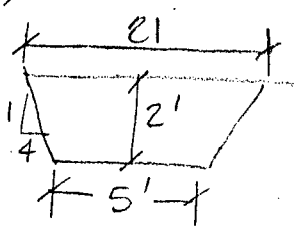
@ Maxwell ; $Q_{100} = 30.1$ cfs

Cross pipe = use 1/2 flo = 15 cfs
or 21" @ 0.89%
18" @ 2.04%

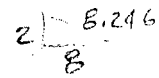
Outlet Pipe @ 30.1 cfs
24" @ 1.77%
30" @ 0.53%

@ Manhole Junction ; $Q_T = 30.1 + 10.8 = 40.9$ cfs
30" @ 0.99%

Ditch section past outlet pipe
Q = 40.9 cfs
slope = 0.005% (Assumed)
n = 0.03 (grass)
Depth = 2'
Side Slope = 4/1



Area = $(21+5/2)2 = 26$ ft²
WP = $(2)(6.246)+5 = 21.49$
R = $26/21.49 = 1.21$
$V = \frac{1.49}{.03}(1.21)^{0.67}(0.005)^{1/2} = 3.99 \rightarrow 4.0$ ft/sec



$Q = VA = (4)(26) = 104$ cfs O.K.

for final design - see attached final drainage plan.

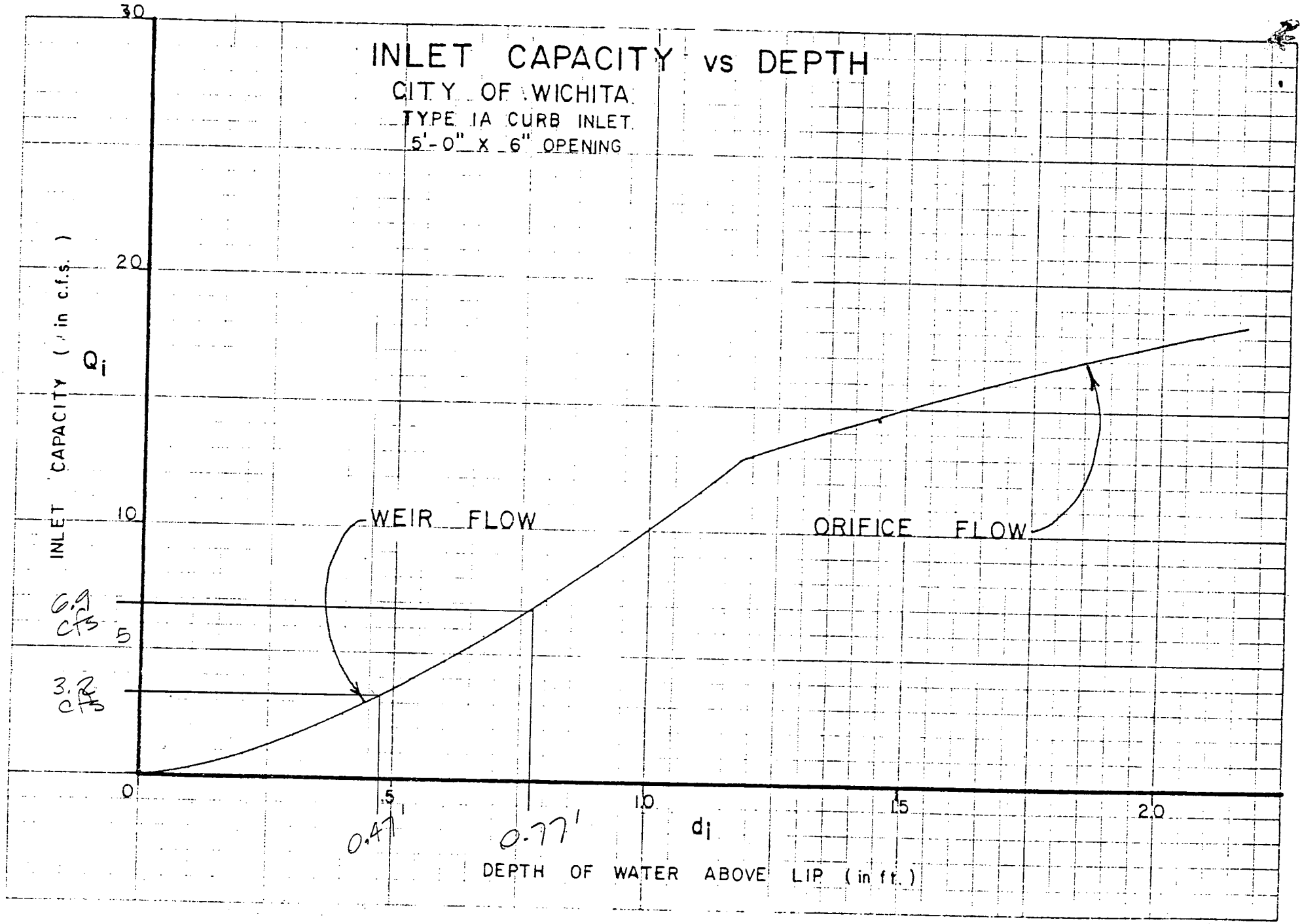

INLET CAPACITY vs DEPTH
CITY OF WICHITA
TYPE IA CURB INLET
5'-0" X 6" OPENING
INLET CAPACITY (in c.f.s.)
Q_i
30
20
10
5
0
6.9 CFS
3.8 CFS
WEIR FLOW
ORIFICE FLOW
.5
1.0
1.5
2.0
0.47'
0.77'
d_i
DEPTH OF WATER ABOVE LIP (in ft.)

FIGURE 1