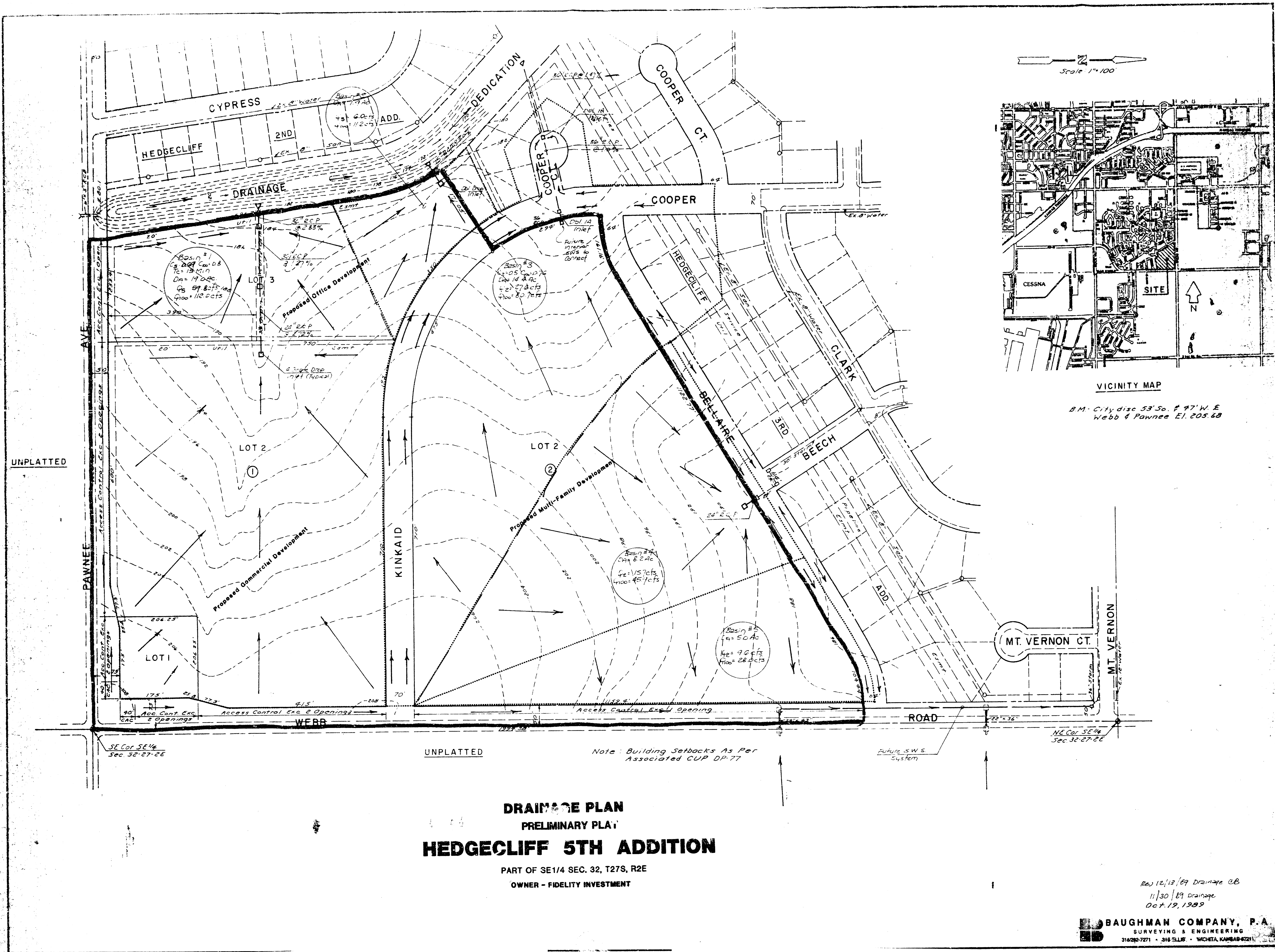

DRAINAGE PLAN

PRELIMINARY PLAT

HEDGECLIFF 5TH ADDITION

PART OF SE1/4 SEC. 32, T27S, R2E

OWNER - FIDELITY INVESTMENT

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From "[illegible] Soil Survey of [illegible]" Soil Types include:

Ce → Hydro Group C
La → Hydro Group C
Rd → Hydro Group C

Majority [illegible]

Basin	Use	Area	C2	C100	Q2	Q100
1	Commercial	19.0 Ac	0.68	[illegible]	49.5	112.0
2	Commercial	1.9 Ac	0.63	[illegible]	4.9	11.2
3	Multi Family	14.4 Ac	0.5	0.6	27.6	60.7
4	Multi Family	8.2 Ac	0.5	0.6	15.7	45.7
5	Multi Family	5.0 Ac	0.5	[illegible]	9.6	26.0

Q Values Based on Time of [illegible] of [illegible] From City of Wichita Drainage [illegible]
Dj $i_2 = 3.83$"/hr $i_{100} = 7.37$"/hr.

BASIN 1 19.0 Ac $Q_2 = 49.5$ cfs $Q_{100} = 112.0$ cfs

Assume 100 yr Sump Condition; [illegible] Parking Area.

Assume Ponding Depth of 2.5' Available At Sump Inlets.

Orifice Flow Equation $Q = 0.6A\sqrt{2gh}$

City of Wichita Drop Inlet open Area:

Deeter # 2433 = 184 Sq. in. = 1.28 ft²

For 1 Inlet: $Q = 0.6(1.28\ ft^2)\sqrt{2(32.2)(2.5)}$

$Q = 9.7$ cfs

For 112 cfs: Need = 112/9.7 = 11.5 → 12 Inlets

Use 3 groups of 4 Inlets

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Q_p = 112 cfs (36" @ 2.83%)
Q_p = 75 cfs (36" @ 1.27%)
Q_p = 37.3 cfs (24" @ 2.72%)

BASIN #1

55' 145' 160' 186 top 183± 173 174.6 175.1 177.0 177.5 360'

Basin 1 will work as shown.

BASIN #2 DA = 1.9 Ac Q_2 = 4.9 cfs Q_{100} = 11.2 cfs

Use Double Drop Inlet ; Q_p = 11.2 cfs

Q_p = 11.2 cfs
Use 15" RCP @ 3.0%

NOTE: Pipes Sized from Data In "Design Data 4" "Concrete Pipe Association"

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BASIN # 3 Area = 14.4 Ac Q_2 = 27.6 cfs Q_{100} = 60.7 cfs

Flow thru Pavement Section - Check Street Capacity

Pvmt. Slope = 0.7% 40' Fc-Fc

100.55 100 100 99.45

@T.C. Elev $A = 1/2(0.55)(20) = 5.5\ ft^2$ (1/2 street)

WP = 20.55' n = 0.016 (Conc/Asph)

$V = 1.49/0.016\ (5.5/20.55)^{0.67}(0.007)^{1/2} = 3.65$ f/sec

$Q = VA = (3.65)(5.5) = 20.1$ cfs → Full Street = (20.1)(2)

$Q_{street_2} = 40.2$ cfs > 27.6 cfs O.K.

@R/W Elev: $A = (15)(0.3)1/2 + (0.85+0.3)/2 \cdot 20 = 13.75\ ft^2$ (1/2 st.)
Total = 27.5 ft²

$wp = 2(15) + 2(0.55) + 40 = 71.1$ ft n = 0.02 (Grass; Asph; Conc)

$V = 1.49/0.02\ (27.5/71.1)^{0.67}(0.007)^{1/2} = 3.74$ f/sec

$Q = VA = (3.74)(27.5) = 102.9$ cfs > 60.7 cfs O.K.

Inlets need to be designed for 100 yr storm.

Cooper ct. (B)

Both Inlets In Sump Conditions:

Inlet A 100 yr Sump Depth:

4" Depression + 0.55' + 0.3' = 1.18 feet

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BASIN # 3 (Con't)

Use Dbl. Inlets @ Locations A & B.

Q_{100} = 60.7 cfs

170 Fl ±

Q_p = 60.7 cfs (36" @ 1.47%)

Use 36" RCP @ 1.4% ±

184 TC ±
171.50 Fl ±

Future Inlets will be Installed Upstream to Increase System Inlet Capacity.

BASIN # 4 DA = 8.2 Ac Q_2 = 15.7 cfs Q_{100} = 45.7 cfs

NOTE: THIS AREA WAS ALREADY [illegible] BY THE CITY TO DRAIN INTO THE EXISTING SWS ALONG BEECH!

BASIN # 5 DA = 5.0 Ac Q_2 = 9.6 cfs Q_{100} = 26 cfs

Basin #5 will Drain Along Webb Road to A future SWS Extended South from Mt. Vernon