MEMO

TO: Don Schneiders, P.E. Design Engineer City of Wichita ATTN: Wichita, KS 67202	PROJECT NO. 36-82427-1-1549 PROJECT: Georgetown Detention Pond DATE: March 18, 1985
COPIES TO: Wm. E. Morris	FROM: Dick Linn REFERENCE: Project Final Inspection

PLEASE ADVISE IMMEDIATELY OF ANY MISCONCEPTIONS OR OMISSIONS YOU BELIEVE TO BE CONTAINED HEREIN

Attached is the Certificate of Completion for the above-referenced project. The project has been reshaped, regraded, seeded and mulched. Minor maintenance of rip-rap areas will be performed later this year after construction activity on the adjacent properties has been completed. The bank slopes will be checked at that time to correct any erosion problems or areas which may require additional seeding.

The required volume of detention is 3.7 acre feet which is provided at elevation 137.35 (0.64' below the top of the curb at the low point adjacent to the pond).

Also attached is a mylar of the plan for regrading and seeding.

CERTIFICATE

Re: Lot 1, Block One, Georgetown II Addition, Wichita, Sedgwick County, Kansas

I certify to Columbia Savings Association, F.A., and to Mid Kansas Federal Savings and Loan Association of Wichita that a drainage facility consisting of a storm water detention system and related outfall has been substantially completed in Reserve "A", Georgetown II Addition to Wichita, Sedgwick County, Kansas; that the facility is sufficient to substantially fulfill the requirements contained in that certain Covenant dated August 22, 1980, by Comm.-South-Shadowood Theatre Corp., as Declarant, recorded on Film 439 at page 1488, and that certain Restrictive Covenant dated October 27, 1981, by Georgetown Partnership, recorded on Film 627 at page 364, and with the Community Unit Plan referred to therein; and that the construction completed to date with respect to the drainage facility has been inspected and approved by all governmental authorities having jurisdiction as being in conformance with the foregoing requirements.

Dated this 19th day of March, 1985.

No.	Revision	By	Date
1	Revised per City Comments	WEM	3-18-85

FILE 627 PAGE 364

PROTECTIVE COVENANT

This Covenant, executed this 27th day of October, 1983.

WITNESSETH: That,

WHEREAS, the undersigned is in the process of platting that certain real property to be known as Georgetown II Addition to Wichita, Sedgwick County, Kansas; and

WHEREAS, as a part of the platting process certain requirements have been made by the City of Wichita regarding the establishment of an owners' association and other matters.

NOW, THEREFORE, the undersigned does hereby subject Georgetown II Addition to Wichita, Sedgwick County, Kansas, to the following covenants and restrictions:

1. At such time as the said property shall become developed by erection of improvements thereon, the undersigned agrees to cause an association to be formed to provide for the care, maintenance and upkeep of the reserves, sidewalk and fence [illegible] Griffith School and the drainage facilities consisting of [illegible]ion pond and related outfall.

2. The reserves located in said addition will be conveyed to the association at such time as the project is sold to or occupied by owners or tenants other than the undersigned.

3. Until said reserves are so conveyed the ownership and maintenance thereof shall be by the undersigned.

4. Paved access to any lot will be provided prior to the occupancy of said lot, said access to be constructed pursuant to the requirements of the City of Wichita.

FILE 627 PAGE 365

5. In the event said association, its successors or assigns, or the undersigned, shall fail at any time to maintain the drainage facilities consisting of the detention pond and related outfall, the City of Wichita may serve a written Notice of Delinquency upon the association setting forth the manner in which the association has failed to fulfill its obligations. Said Notice shall grant 20 days within which the association may fulfill the obligation. If said obligation is not fulfilled within the time specified, the City of Wichita, in order to preserve the taxable value of the properties within the addition and to prevent said facilities from becoming a nuisance, may enter upon said common area and perform the obligations listed in the Notice of Delinquency. All costs incurred by the City of Wichita in carrying out the obligations of the undersigned or the association may be assessed against all the lots within the addition in the same manner as provided by law for special assessments and said assessments may be established as liens upon said lots. Should the undersigned or the association, their successors or assigns, upon receipt of said Notice of Delinquency, believe the obligations described in said Notice are not proper for any reason, it may, within the 20 day period to be provided in said notice, apply for a hearing before the Board of City Commissioners to appeal said obligations, and the Board of City Commissioners to appeal said obligations, and further proceedings under said Notice shall be suspended pending the outcome of any proceedings with respect to such appeal.

This Covenant executed as of the date first above written.

GEORGETOWN PARTNERSHIP,

By: Kansas General Properties, Inc., a partner

By: [illegible]
William E. Morris

[illegible]
Horst E. Miller
Partner

State of Kansas
County of Sedgwick

Be it remembered that on this 19th day of October, 1983, before me, a notary public in aforesaid State and County, came William E. Morris, Vice-President of Kansas General Properties, Inc., Partner, and Horst E. Miller, Partner, all of the Partners of Georgetown Partnership, a Kansas General Partnership, to me personally known to be the same persons who executed the foregoing instrument of writing and duly acknowledged the execution of same for and on behalf and as the voluntary act and deed of said partnership. In testimony whereof I have hereto set my hand and

[illegible]

Commonwealth - Slothower Theatre Corp.

Project: Slothower C.U.P. Amendment

Item: Drainage Plan Summary

1) Hydrology by SCS TR-55 Methods. Hydrographs by tabular method (Chapter 5, TR-55)

2) Pre-developed conditions assumed to be pasture in good condition. Pre-developed Q_{100} 32 cfs with runoff volume = 3.6 Ac-Ft.

3) Developed condition assumptions:
Parcels 1 & 2: 9.1 Acres, Commercial w/ 85% Impervious Area
Parcels 3 & 4: 10.6 Acres, Apt/Multi-family w/ 80% Impervious Area

Composite CN = 86
Q_{100} = 135 cfs with runoff volume = 7.3 Ac-Ft.

4) Detention Facility

Minor Storms: Flr Elev = 1266.5, Top Elev = 1310, 5:1 slope, Vol = 2.3 Ac-Ft

Major Storms: Flr Elev = 1310 (Tennis Court), Top Elev = 1319.0, W.S.E. = 1317.0, 2:1 Slope, Vol = 3.6 Ac-Ft

Total Avail. Storage = 3.7 Ac-Ft

5) Outlet Control Structure

H.G.L. = 0.0234 Ft/Ft (Assume 100-yr peak on Dry Creek does not coincide)

24" RCP: K = 22.6 (n=0.013) $Q = K\sqrt{S} = 35$ cfs

30" CMP: K = 33.3 (n=0.024) $Q = K\sqrt{S} = 34$ cfs

RECEIVED

Computation of Peak Discharge
Date: 07-05-1983

Title: Slothower C.U.P. Amendment Drainage Plan - Undeveloped Conditions

Rainfall 7.8 inches
Recurrence Interval (yrs.) 100
Runoff Curve Number 61
Hyd. Len. 1500 feet
Slope 1.5 %
% of HLM 0 %
% Imp. 0 %
Area of basin 12.7 acres

Computed Data
Basic Lag Factor (hrs.) 0.61
Hydr. Length Adj. 1.00
Imp. Area Adj. 1.00
Runoff Volume (in.) 3.29
Computed Time of Conc. (hrs.) 1.01

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs)= 31.97
Csm/in. = 315.40
Tc (hrs.) = 1.01

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 100 year freq.

Time of Conc. (Tc) = 60.60 minutes
Intensity = 3.90 inches/hr.
C factor = 0.21
Peak Dis. (cfs)= 16.37

Project No: 36-82522-1 Date: 7/5/83 Sht No. 5 of
Project: Slothower CUP Amendment By: Child By:

TR-55 LAG-T_c METHOD PEAK DISCHARGE COMPUTATION SHEET

Location: Watersned Condition AMC

Remarks: Developed Conditions: Comp Imp = 66% Comp CN = 86

INPUT

1. Rainfall: 7.8 in (24-hour) -yr. freq.; Table 2-1 or Figure 1-9
2. Runoff Curve No.: CN 86; S; Max. Loss, Retention; T_c FACTOR: 1.67 Constant
3. Hydraulic Length: 1500 ft; Figure 3-3; 9. 0.29 hr Basic Lag L
4. Watershed Slope: 1.5 %; Figure 3-4; 10. 0.63 F_{Imp} Hydr. Length Adj.
5. Hydr. Length Modified: 75 %; 11. 0.68 F_{Imp} Imp. Area Adj.
6. Impervious Area: 66 %; Figure 3-5; 12. 0.21 hr Tc; Figure 5-2; 14. 729 cfs/sq mi Basic Peak Disch.
7. Drainage Area (DA): 19.7 ac x 640 = 0.0308 sq. mi.; 15. 0.63 Drainage Area Adj.
8. Ponds, Swamps: 0 %; Table 5-2, E-3 or E-4 (Location determines table); 16. 1.0 Ponds, Swamps Adj.

ADJUSTED PEAK DISCHARGE: 17. = 132 cfs

$Q = \frac{(P-.225)^2}{P+0.85}$

$S = \frac{1000}{CN} - 10$

$L = \frac{3.3 (S+1)^{0.7}}{1900\sqrt{Y}}$

$T_c = 1.67 L F_{Imp} F_{Imp}$

PEAK FACTOR 13. 6.14 cfs/sq mi/in Q Runoff Volume

$K = \frac{6.14 \times 19.7}{640} = 0.1890$

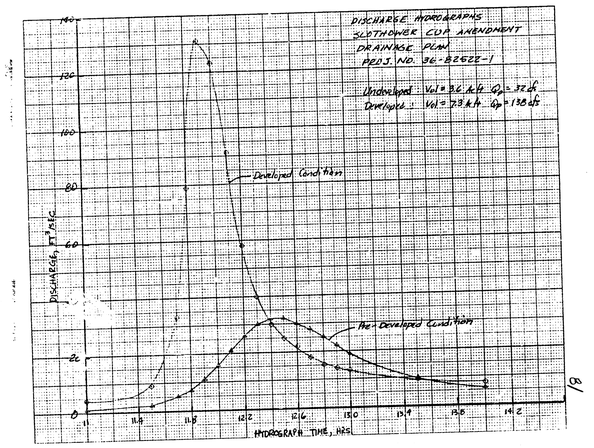
Location: Slothower CUP Amendment

Notes: Undeveloped: Pasture Good Condition
Developed: 66% Imp.

HYDROGRAPH COMPUTATION BY TR-55 METHOD

Project No. 36-82522-1
Project Slothower CUP Amend.
Date 7/5/83 By MWB

Subarea	T_c hr	T_t hr	K	11.0 hrs.	11.5 hrs.	11.7 hrs.	11.8 hrs.	11.9 hrs.	12.0 hrs.	12.1 hrs.	12.2 hrs.	12.3 hrs.	12.4 hrs.	12.5 hrs.	12.6 hrs.	12.7 hrs.	12.8 hrs.	12.9 hrs.	13.0 hrs.	13.5 hrs.	14.0 hrs.	16.0 hrs.	20.0 hrs.
UNDEVELOPED 0.25	0.25		0.1013	1	2	5	7	11	16	21	26	30	32	32	30	28	25	22	19	10	6	3	2
DEVELOPED 0.25	0.25	HP	0.1890	4	9	33	79	131	123	91	58	40	30	25	22	18	15	14	13	9	8	5	3



Date 7/5/83 MWB Page 10 of

Project: Slothower CUP Amendment

Item: Outfall Control Structure - Node A

HW Elev = 137 for 100-yr
TW Elev @ top of pipe = 130.5 = 1' Head @ Node B grate

L = 275'

S = 0.0226 Ft/Ft

Q = 32 cfs max

Try metal pipe
$Q = K\sqrt{S}$

$K = \frac{Q}{\sqrt{S}}$

$\frac{1.49}{n} AR^{2/3} = \frac{Q}{\sqrt{S}}$

$\frac{nQ}{1.49\sqrt{S}} = AR^{2/3}$

$\frac{(0.024 \times 32)}{1.49\sqrt{0.0226}} = AR^{2/3} = 3.36$

use 30" CMP

Try RCP
$Q = K\sqrt{S}$

$K = \frac{Q}{\sqrt{S}} = \frac{32}{\sqrt{0.0226}} = 209$

Use 24" RCP.

Check inlet control

30" CMP

$\frac{HW}{D} = 1.3$

HW = 1.3 x 2.5 + 12" = 131 < 137 ok

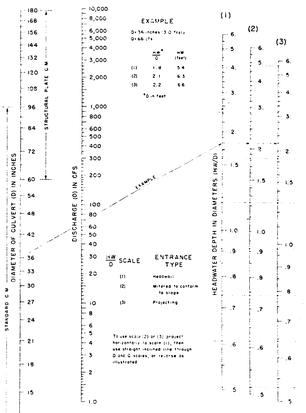
24" RCP

$\frac{HW}{D} = 2.15$

HW = 2.15 x 2 + 12" = 132" < 137 ok

Use 24" RCP or 30" CMP

CHART 5



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

Date 7/6/83 MWB Page of

Project Slothower CUP Amendment

Item D.I. Design

DA: 20 Ac Multi-fam. 50% Imp
12 Ac Golf course 5% Imp

CN = (20 x 98 + 12 x 61)/32
CN = 73

% Hill = 50%
% Imp = 33%

L = 2400'
Y = 1.5%

From Chart 15 HDS #3
2 Year 6-hr = 2.8"

Computation of Peak Discharge
Date: 07-06-1983

Title: Slothower C.U.P. Amendment - Drainage Ditch Design

Rainfall 4.5 inches
Recurrence Interval (yrs.) 5
Runoff Curve Number 73
Hyd. Len. 2400 feet
Slope 1.5 %
% of HLM 50 %
% Imp. 33 %
Area of basin 32 acres

Computed Data
Basic Lag Factor (hrs.) 0.64
Hydr. Length Adj. 0.67
Imp. Area Adj. 0.78
Runoff Volume (in.) 1.90
Computed Time of Conc. (hrs.) 0.56

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs)= 44.83
Csm/in. = 473.02
Tc (hrs.) = 0.56

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 5 year freq.

Time of Conc. (Tc) = 33.66 minutes
Intensity = 3.60 inches/hr.
C factor = 0.31
Peak Dis. (cfs)= 36.26

Computation of Peak Discharge
Date: 07-06-1983

Title: Slothower C.U.P. Amendment - Drainage Ditch Design

Rainfall 7.8 inches
Recurrence Interval (yrs.) 100
Runoff Curve Number 73
Hyd. Len. 2400 feet
Slope 1.5 %
% of HLM 50 %
% Imp. 33 %
Area of basin 32 acres

Computed Data
Basic Lag Factor (hrs.) 0.64
Hydr. Length Adj. 0.67
Imp. Area Adj. 0.78
Runoff Volume (in.) 4.63
Computed Time of Conc. (hrs.) 0.56

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs)= 109.58
Csm/in. = 473.02
Tc (hrs.) = 0.56

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 100 year freq.

Time of Conc. (Tc) = 33.66 minutes
Intensity = 6.22 inches/hr.
C factor = 0.42
Peak Dis. (cfs)= 84.19

DIRECTORS

PROFESSIONAL ENGINEERING CONSULTANTS

July 7, 1983

Don Schneider, Design Engineer
7th Floor, City Hall
455 N. Main
Wichita, KS 67202

Reference: Georgetown C.U.P.
Drainage Plan
PEC File No. 36-82522-1-154C

Dear Mr. Schneider:

The above referenced C.U.P. is a proposed amendment to the Meadowlark C.U.P. (platted as Slothower Addition). The existing approved Drainage Plan for Slothower Addition provides for a detention pond to detain the difference between developed 100 year storm water runoff and 'un-developed' 100 year storm water runoff. Attached are copies of the previous correspondence outlining the criteria, requirements and plan.

The Georgetown C.U.P. revises the development plan which will increase the detention volume required from 2.8 acre/feet to 3.7 acre/feet. Attached are copies of design calculations and the revised Drainage Plan.

The C.U.P. is scheduled on CPO Council 'F' agenda on Monday, July 11 and the Metropolitan Area Planning Commission agenda on Thursday, July 14.

We will appreciate your review and approval of the revised Drainage Plan prior to the above meetings if possible. Please contact me if additional information is desired.

Very truly yours.

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

Dick Linn, P.E.
Manager, Land Development

THE CITY OF WICHITA

OFFICE OF PUBLIC WORKS ENGINEERING DATE July 22, 1980

TO Jack Galbraith, Chief Planner

FROM Steve Lackey, Design Chief Engineer

SUBJECT Slothower Addition
Drainage Plan

Professional Engineering Consultants have submitted a satisfactory drainage plan for the Slothower Addition. The design consists of a detention pond, which will limit the flow downstream. The flow will be either equal to or less than predeveloped flow.

If you have any questions, please advise.

Steve Lackey
Design Chief Engineer

SL:nd

cc: Kristen Hart, P.E.C.

MEMO

TO: Steve Lackey
Design Chief Engineer
City Hall - 7th Floor
455 N. Main
Wichita, Kansas 67202

PROJECT NO. 30-79151-1081

PROJECT: Slothower Addition

ATTN:

DATE: July 16, 1980

COPIES TO:
Paul Johnston
Louise Olivarez
Mike Lindebak
Dick Linn

FROM: Kristen Ware

REFERENCE: Drainage Plan

PLEASE ADVISE IMMEDIATELY OF ANY MISCONCEPTIONS OR OMISSIONS YOU BELIEVE TO BE CONTAINED HEREIN.

Enclosed is the Drainage Plan for Slothower Addition. The drainage plan is based on the calculations as submitted with the drainage concept. We anticipate filing the Final Plat on July 25, 1980, and would appreciate any comments prior to the above date. Should any additional information be required in your review of the plan, please contact Dick Linn or myself.

July 1, 1980

Steve Lackey, Design Chief Engineer
Engineering Division, Department of Public Works
7th Floor - City Hall
455 N. Main
Wichita, Kansas 67202

RE: Meadowlark Addition - Drainage Concept
PEC File No. 30-79151-1081

Dear Mr. Lackey:

The Meadowlark C.U.P. has been approved with the following general Provision #4:

Drainage: At the time of platting, the applicant shall submit a Drainage plan for the entire development and guarantee drainage improvements as may be required.
The difference between developed 100 year storm water runoff and undeveloped 100 year storm water runoff shall be detained on the property and released at a rate not to exceed the undeveloped 100 year storm water runoff.

The "undeveloped" runoff has been calculated based on the area soil type and as a pasture in good condition. This would be identical to the adjacent golf course condition. The runoff flow rate is 31 cfs.

The proposed multi-family residential development is assumed to be 50% impervious and 50% open area. The flow rate is calculated to be 58 cfs for the design storm (100 year, 6 hour).

The detention volume required is 2.8 acre - feet. Attached are copies of the calculations. Also attached are calculations for the outlet pipe.

The attached Drainage Concept provides for a detention pond with a minimum capacity of 2.8 acre feet, and 1' freeboard. The entire site is to be graded to drain into the pond (except a 10' strip adjacent to the west and east property lines).

The Drainage Plan will be submitted for review and approval prior to submission of the Final Plat.

Very Truly Yours,

Richard W. Linn, P.E.
Manager, Land Development

cc: Mike Lindebak
Tom Allen
Louise Olivarez

Date 7/15/80 MJS Page 1 of

Project Slothower C.U.P. Amendment

Item Drainage Plan Summary

1) Hydrology by SCS TR-55 Methods. Hydrographs by tabular method (Chapter 5, TR-55)

2) Pre-developed conditions assumed to be pasture in good condition.
Pre-developed Q_{25} 32 cfs with runoff volume = 3.6 Ac-ft.

3) Developed condition assumptions:
Areas 1 & 2: 9.1 Acres Commercial w/ 85% Impervious Area
Areas 3 & 4: 10.6 Acres Apt/Multi-Family w/ 80% Impervious Area

Composite CN = 86
Q_{100} = 135 cfs with runoff volume = 7.3 Ac-ft.

4) Detention Facility

Major Storage: Flr Elev = 1266.5
Top Elev = 1280
5:1 Slopes
Vol = 2.3 Ac-Ft

Major Storage: Flr Elev = 1267.0 (Tennis Court)
Top Elev = 1280
10-Yr W.S. Elev = 1277.0
2:1 Slopes
Vol = 3.4 Ac-Ft

Total Avail. Storage = 5.7 Ac-Ft

5) Outlet Control Structure

$H.G.L. = 1280 - 11 ft/ft$ (Assume 100-Yr peak on Hydro does not coincide)

24" RCP: K = 22.6 (n=0.013) $Q = K\sqrt{S} = 35$ cfs

30" CMP: K = 33 (n=0.024) $Q = K\sqrt{S} = 54$ cfs

Project No: 30-82622-1 Date: 7/15/83 Sht No. 2 of

Project: Slothower C.U.P. Amendment By: MJS Chkd By:

TR-55 LAG - T_c METHOD PEAK DISCHARGE COMPUTATION SHEET

Location:

Remarks: Pre-developed - Pasture Good Condition

Watershed Condition AMC II

INPUT

1. 7.5 in (24-hour) (100-yr. freq.) Rainfall — Table 2-1 or Figure 10
2. CN 61 Runoff Curve No. — S — Max. 20% Retention — T_c FACTOR 167 Constant
3. 1800 ft Hydraulic Length — Figure 3-3 — Basic Lag — L
4. 1.5 % Watershed Slope — Y — Figure 3-4
5. C % Hydr. Length Modified
6. 0 % Impervious Area — Figure 3-5
7. 10.7 ac. Drainage Area (DA) — X 640 = 6660 sq. mi.
8. 0 % Ponds, Swamps — Table E-2, E-3 or E-4 (location determines table)

Hydr. Length Adj. — F_{LM} 1.00
Imp. Area Adj. — F_{IMP} 1.00
= T_c — Figure 5-2 — Basic Peak Disch. — X
Drainage Area — X
Ponds, Swamps Adj. — X
Runoff Volume — X — Q

$Q = \frac{(P-.2S)^2}{P+0.8S}$

$S = \frac{1000}{CN} - 10$

$L = \frac{2.0 (S+1)^{0.7}}{1900\sqrt{Y}}$

$T_c = 1.67 L F_{LM} F_{IMP}$

PEAK FACTOR

ADJUSTED PEAK DISCHARGE = cfs

Computation of Peak Discharge
Date: 07-15-1983

Slothower C.U.P. Amendment: Drainage Plan - Developed Condition
Use = Undeveloped Area = 85% - Comp. CN = 86

Rainfall 7.0 inches
Recurrence Interval (yrs.) 100
Runoff Curve Number 86
Hyd. Len. 1500 feet
Slope 1.5 %
% of H.M. 75 %
% Imp. 85 %
Area of basin 19.7 acres

Computed Data:
Basic Lag Factor (hrs.) 0.20
Hydr. Length Adj. 0.53
Imp. Area Adj. 0.68
Runoff Volume (in.) 6.14
Computed Time of Conc. (hrs.) 0.21

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs)= 137.65
Qu/Qm = 720.00
Tc (hrs.) = 0.28

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 100 year frequency.

Time of Conc. (Tc) = 15.00 minutes
Intensity = 8.97 inches/hr.
C factor = 0.71
Peak Dis. (cfs)= 124.90

Location: Slothower C.U.P. Amendment

Notes: Undeveloped: Pasture, Good Condition
Developed: 66% Imp.

Project No. 36-82622-1
Project Slothower C.U.P. Amend.
Date 7/15/83 By MJS

HYDROGRAPH COMPUTATION BY TR-55 METHOD

Discharge, cfs

Subarea	T_c hr	T_t hr	K	mi^2	mi^2-in	11.0 hrs.	11.5 hrs.	11.7 hrs.	11.8 hrs.	11.9 hrs.	12.0 hrs.	12.1 hrs.	12.2 hrs.	12.3 hrs.	12.4 hrs.	12.5 hrs.	12.6 hrs.	12.7 hrs.	12.8 hrs.	12.9 hrs.	13.0 hrs.	13.5 hrs.	14.0 hrs.	16.0 hrs.	20.0 hrs.
UNDEVELOPED	0.28	0.0	0.0113	1	2	5	7	11	16	21	26	30	32	32	30	28	25	22	19	16	10	6	3	2
DEVELOPED	0.25	0.0	0.0140	4	9	33	79	131	123	91	58	40	30	25	22	18	15	14	13	9	8	5	3	

Date 7/15/83 MJS Page 4 of

Project Slothower C.U.P. Amendment

Item Drainage Plan Summary

Pasture Cond.

T_c = 0.4 hr

T_{conc} = 0.4 hr

T_t = 0 hr

T_t = 0 ft

Slope = 0 %

Comp. CN = Undeveloped Area =

= 85% Pasture =

Area: DA = 10.6 ac x 85% = 9.34 ac = 85%

Project No: 36-82622-1 Date: 7/15/83 Sht No. 3 of

Project: Slothower C.U.P. Amendment By: Chkd By:

TR-55 LAG - T_c METHOD PEAK DISCHARGE COMPUTATION SHEET

Location:

Remarks: Developed - 66% Imp. Comp. CN = 86

Watershed Condition AMC

INPUT

1. 7.5 in (24-hour) (100-yr. freq.) Rainfall — Table 2-1 or Figure 10
2. CN 86 Runoff Curve No. — S — Max. 20% Retention — T_c FACTOR 167 Constant
3. 1800 ft Hydraulic Length — Figure 3-3 — Basic Lag — L
4. 1.5 % Watershed Slope — Y — Figure 3-4
5. 66 % Hydr. Length Modified
6. 66 % Impervious Area — Figure 3-5
7. 10.7 ac. Drainage Area (DA) — X 640 = 6848 sq. mi.
8. 0 % Ponds, Swamps — Table E-2, E-3 or E-4 (location determines table)

Hydr. Length Adj. — F_{LM} 1.00
Imp. Area Adj. — F_{IMP} 1.00
= T_c — Figure 5-2 — Basic Peak Disch. — X
Drainage Area — X
Ponds, Swamps Adj. — X
Runoff Volume — X — Q

$Q = \frac{(P-.2S)^2}{P+0.8S}$

$S = \frac{1000}{CN} - 10$

$L = \frac{2.0 (S+1)^{0.7}}{1900\sqrt{Y}}$

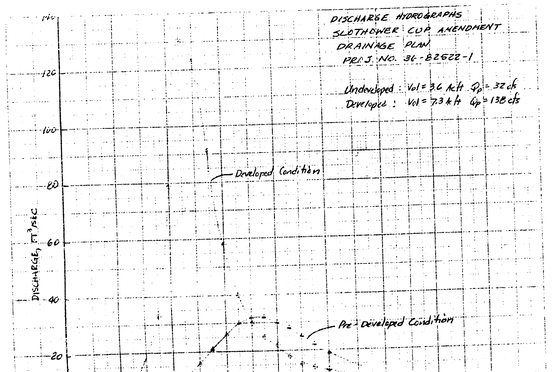
$T_c = 1.67 L F_{LM} F_{IMP}$

PEAK FACTOR

ADJUSTED PEAK DISCHARGE = cfs

DISCHARGE HYDROGRAPHS
SLOTHOWER C.U.P. AMENDMENT
DRAINAGE PLAN
PROJ. NO. 36-82622-1

Undeveloped: Vol = 3.6 Ac-ft Q_p = 32 cfs
Developed: Vol = 7.3 Ac-ft Q_p = 136 cfs



Date 7/15/83 MJS Page 9 of

Project Slothower C.U.P. Amendment

Item Detention Pond Design

Pre-developed Conditions:

Q_p = 32 cfs
Vol = 3.6 Ac-FT

Developed Conditions:

T_c = 0.4 hr.
Q_p = 136 cfs
Vol = 7.3 Ac-ft

Storage required = 3.7 Ac-FT

Lower level storage

Elev 1266 = Top of Pond
Top of Low Flow Pipe Elev 1263.5

Vol = 3.7 − 3.4 = 0.3 Ac-Ft

0.3 / 0.1 = 3.0'

Use 3' out = 12 cfs

"Trial" Storage"

Elev 1280 (-3) = 1277 (1' Above 1st FFE)

Top Area = 0.57 Ac
Bot. Area = 0.41 Ac
Mid Area = 0.5 (0.57 + 0.41) = 0.49

$V = \frac{h}{6}(T + 4M + B)$

$= \frac{3}{6}(0.57 + 4 \times 0.49 + 0.41)$

= 3.4 Ac-Ft

Date 7/15/83 MJS Page 10 of

Project Slothower C.U.P. Amendment

Item Outlet Control Structure - Inlet Control

HW Elev = 1277 (Trial "H")
TW Elev = Crown of Pipe = 1266.5 = 1' Above 10 Year Peak

L = 275'

Set Slope = 1%

Q_{25} = 32 cfs

$\frac{T_W}{D} = \frac{1.5}{1.5}$

$K = \frac{Q}{\sqrt{S}}$

$\frac{H_W}{D^{1.25}} = \frac{K}{\sqrt{S}}$

$\frac{10.5}{1.5^{1.25}} = AR^{.75}$

$\frac{(0.024)(22)}{1.49\ (0.01)^{.5}} = AR^{.75} = 3.36$

Use 24" CMP

Try RCP

$Q = K\sqrt{S}$

$K = \frac{Q}{\sqrt{S}} = \frac{32}{\sqrt{.01}} = 320$

Use 24" RCP

Check Inlet Control

30" CMP

$\frac{HW}{D} = 1.3$

$HW = 1.3 \times 2.5 + 1.5 = 131 < 137$ o.k.

24" RCP

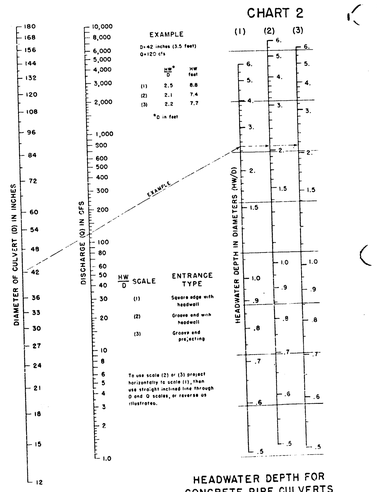
$\frac{HW}{D} = 2.15$

$HW = 2.15 \times 2 + 1.5 = 132.3 < 137$ o.k.

Use 24" RCP or 30" CMP

11/

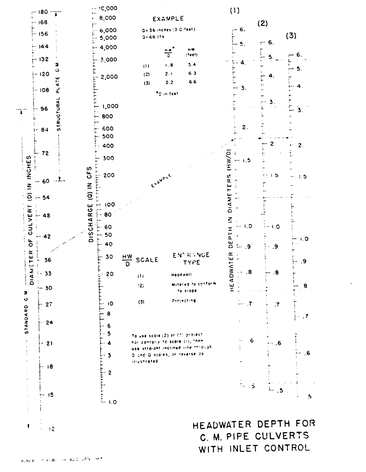
CHART 2



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS

12/

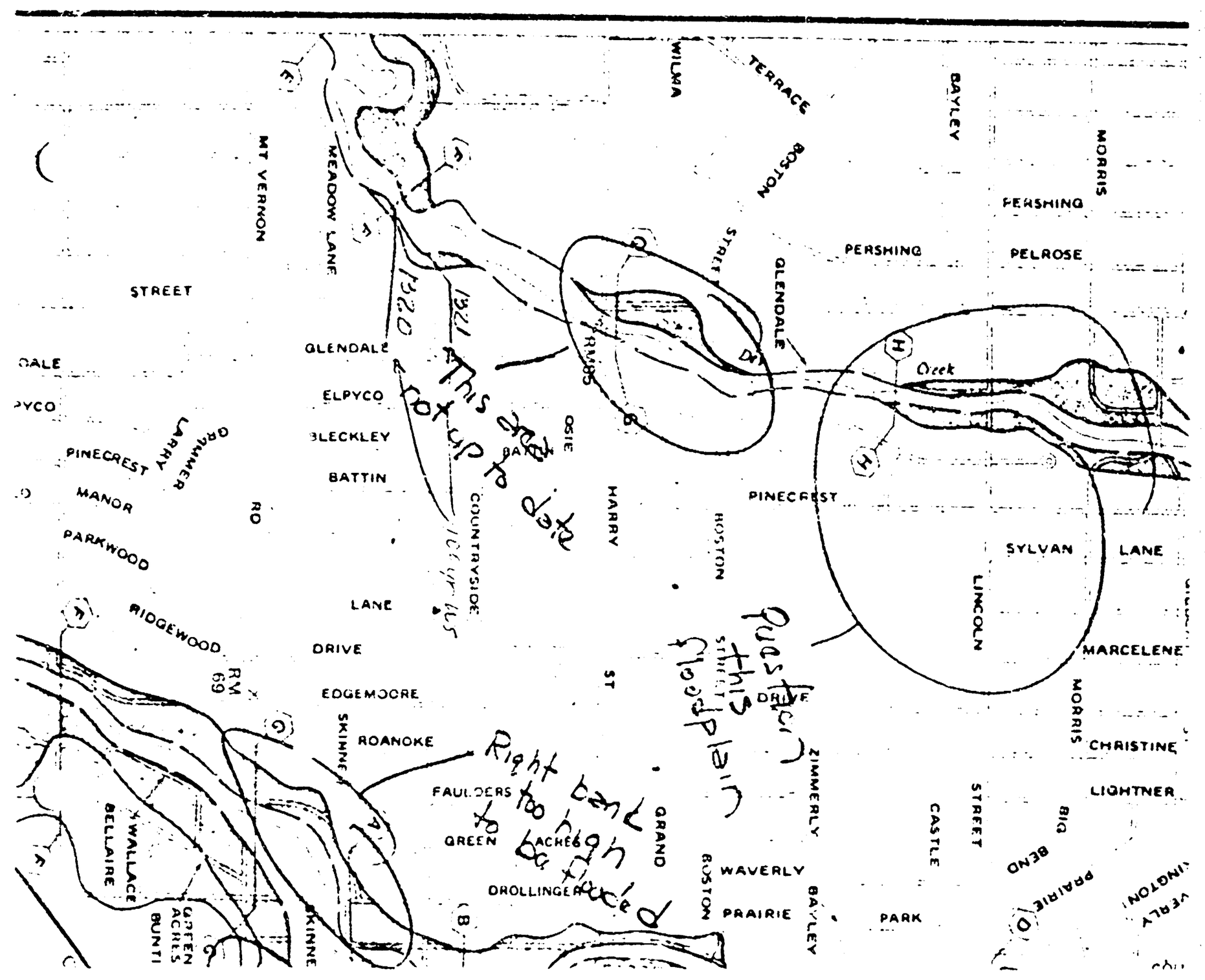
CHART 5



HEADWATER DEPTH FOR C.M. PIPE CULVERTS WITH INLET CONTROL

1" = 1000'

FOLD



PROFESSIONAL ENGINEERING CONSULTANTS

Date 7/[illegible] 1983 Page ____ of ____
Project Slothower CUP Amendment
Item Ditch design

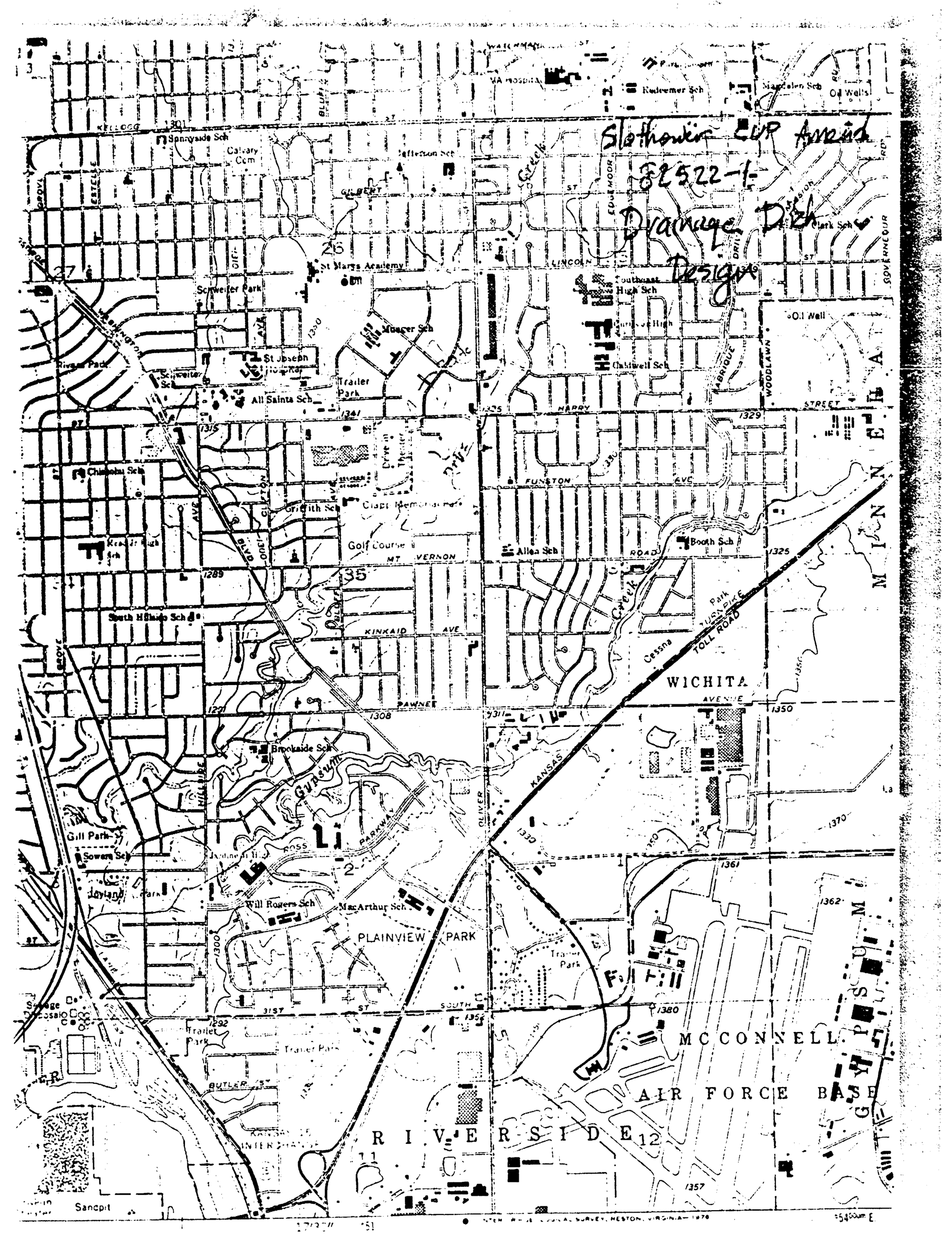
DA: [illegible] from 50% Imp
[illegible] 5% Imp

CN = ([illegible])/32
CN = 73

% [illegible] = 50%
% Imp = 33%

L = 2400'
Y = 1.2 %

From Chart [illegible]



(Drainage)

Computation of Peak Discharge

Title: Slothower C.U.P. Amendment - Drainage Ditch Design

Rainfall 3.1 inches
Recurrence Interval (yrs.) 25
Runoff Curve Number 73
Hyd. Len. 2400 feet
Slope 1.5 %
% of HLM 50 %
% Imp. 33 %
Area of basin 32 acres

Computed Data

Basic Lag Factor (hrs.)	0.64
Hydr. Length Adj.	0.67
Imp. Area Adj.	0.78
Runoff Volume (in.)	[illegible]
Computed Time of Conc. (hrs.)	0.56

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs) =	[illegible]
Csm/in. =	473.[illegible]
Tc (hrs.) =	0.56

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 25 year freq.

Time of Conc. (Tc) =	[illegible] minutes
Intensity =	4.[illegible] inches/hr.
C factor =	0.37
Peak Dis. (cfs)=	57.70

Computation of Peak Discharge
Date: 07-06-1983

Title: Slothower C.U.P. Amendment - Drainage Ditch Design

Rainfall 7.8 inches
Recurrence Interval (yrs.) 100
Runoff Curve Number 73
Hyd. Len. 2400 feet
Slope 1.5 %
% of HLM 50 %
% Imp. 33 %
Area of basin 32 acres

Computed Data

Basic Lag Factor (hrs.)	0.64
Hydr. Length Adj.	0.67
Imp. Area Adj.	0.78
Runoff Volume (in.)	4.63
Computed Time of Conc. (hrs.)	0.56

Peak Discharge by Technical Release No. 55 (1975)

Peak Dis. (cfs) =	[illegible].58
Csm/in. =	[illegible]
Tc (hrs.) =	0.56

Peak Discharge by Modified Rational Formula (Rossmiller)
Discharge for 100 year freq.

Time of Conc. (Tc) =	33.66 minutes
Intensity =	6.22 inches/hr.
C factor =	0.42
Peak Dis. (cfs)=	84.19

EOF

SLOTHOWER ADDITION OUTFALL LINE MWB 7/6/83

* * * HYDROLOGY * * *

STORM FREQUENCY = 100-YEAR

NODE TO NODE	C	AREA (AC)	SLOPE (%)	LENGTH (FT)	TC(2) (MIN)	I(2) (IN/HR)	Q(2) (CFS)	TC (MIN)	I (IN/HR)	Q (CFS)	SUM Q (CFS)	SIZE	VELOCITY (FT/SEC)	LENGTH (FT)	TT (MIN)	[illegible] (MIN)
1 2	0.[illegible]	19.70	0.00	0.0	15.00	8.97	34.00	15.00	8.97	34.00	34.00	24"	10.82	275.[illegible]	.[illegible]	15.40
1 3	0.[illegible]	0.00	0.00	0.0	0.00	0.00	0.00	15.40	8.8[illegible]	0.00	34.[illegible]	24"	10.82	2[illegible]	.[illegible]	15.75

SLOTHOWER ADDITION OUTFALL LINE MWB 7/6/83

* * * HYDRAULICS * * *

NODE	HYD-SLOPE (FT/FT)	FRICTION (FT)	BEND (FT)	TRANSITION (FT)	MANHOLE (FT)	DEFLECTION (FT)	JUNCTION (FT)	TOTAL (FT)	HYD-GL ELEVATION	DESIRED ELEVATION	DIFF. (FT)
1	.02259	6.2117	0.0000	0.0000	0.0000	0.0000	0.0000	[illegible]	[illegible]	126.6000	-5.06
2	.02259	4.7470	0.0000	0.0000	.2909	.2909	.1131	5.45[illegible]	129.4[illegible]	129.5000	.03
3	0.00000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	[illegible]	[illegible]	[illegible]