Bound Reports

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ADDENDUM TO

STORMWATER MANAGEMENT STUDY

NORTH RIDGE RESIDENTIAL SUBDIVISION

Sec. 20; Twp. 22 S; Rge. 26 E, Lake County, Fl.

OCTOBER 1994

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10/5/94

North Ridge Subdivision
SJRWMD RAI Responses
October 3, 1994
Question #1

STORMWATER MANAGEMENT STUDY

NORTH RIDGE - 194 LOT S/F RESIDENTIAL SUBDIVISION
Sec. 20; Twp. 22 S; Rge. 26 E, Lake County, Fl.

TABLE OF CONTENTS

I. STAGE ONE INFILTRATION VOLUME AND RECOVERY:

BOTTOM AREA= 880 sf
Vu = 880sf(5ft)(0.20)= 880 cf (Equation 26-3)
Kvu = 2/3(Kvs)= 2/3(40)= 26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day /2 = 13.33 ft/day (Equation 26-1)
tsat= (5ft)(0.20)/13.33 ft/day = 0.075 days (Equation 26-2)

II. STAGE TWO INFILTRATION VOLUME AND RECOVERY:

Vs = Vt - Vu = 7,812 - 880 = 6,932 cf

TREATMENT VOLUME ELEV.= 93.00 + (6932-6598)(0.25)/(7504-6598)
= 93.00 + 0.09
= 93.09 ft. NGVD (@ Start of Stage 2)

Ht = 5.0 + 3.09 = 8.09 ft (Equation 26-9)
Fy = 5/8.09 = 0.62 (Equation 26-7)
L/W = 70/15 = 4.67

From Figure 26-6: Fx=1.05 (For f=0.2, L/W=4.67 and Fy=0.62)
H = 0 ft
D = 0 + 5/2 = 2.50 ft (Equation 26-8)
t = $(15 \text{ ft})^2/(4)(80 \text{ ft/day})(2.50 \text{ ft})(1.05)^2$ (Equation 26-10)
= 0.255 days

TOTAL RECOVERY TIME= 0.075 + 0.255 = 0.330 days = 7.92 hours

B6. VEGETATED NATURAL BUFFERS

Vegetative Natural Buffers, VNB's, are an alternative treatment methodology allowed by the April 1994 revision of the SJRWMD Stormwater Management Systems Applicant's Handbook, Section 21.0. VNB's are an effective treatment method under certain conditions because they provide opportunities for filtration, deposition, infiltration, absorption, adsorption, decomposition and volatilization. The VNB's for North Ridge subdivision are limited to Basins "B-4" and "C-4" around Lake Willow and Jack's Lake.

Both the Basin "B-4" and Basin "C-4" VNB would consist of the average 75' width of natural vegetation between the wetlands jurisdiction line, approximate elevation 85, and the 100 year flood plain at elevation 90.0. The areas would be encumbered by a conservation easement dedicated to the City of Clermont and would prohibit the construction of all structures, including private docks, along the lakefront. The average buffer area slope is estimated as [(90.0-85.0)/75'] = 0.067 ft/ft = 6.67%. The Basin "C-4" buffer would include the removal of the existing Jack's Lake Road claybase and sodding of the reclaimed area with bahia sod. However, the buffer area can not be reclaimed until construction of the proposed subdivision roads are completed and the local traffic re-routed through the project.

Based upon the SJRWMD recommended design methodology, Section 32.2, and the following parameter estimates, Travel Time, T_t, across the 75' buffer area can be shown to exceed the 200 seconds recommended for Class III waters and even the 300 seconds recommended for OFW's.

Mannings Roughness Coefficient,	n = 0.24
Buffer Width,	W = 75'
P_2 = 2-year, 24-hour Rainfall,	P_2= 4.5"
Land Slope,	S = 0.067 ft/ft

$$T_t = |((0.007)(0.24 \times 75')^{0.8})/((4.5")^{0.5} \times (0.067)^{0.4})|$$
$$= 0.098 \text{ hrs} = 5.88 \text{ min.} = 352.8 \text{ seconds}$$

C. COMPUTER SIMULATIONS:

C1. PROGRAM DESCRIPTION

Stormwater runoff simulations for the project were achieved with "Watershed Modeling", (Version 7.0S), a computer program by Engineering Data Systems Corporation, EDSC. The program calculates the peak discharge and runoff hydrograph for the pre and the post-development conditions using the Santa Barbara Urban Hydrograph method.

C2. FLOOD ROUTING SUMMARIES

EDSC's "Watershed Modeling" also combines and routes the computed hydrographs to simulate the peak attenuation effects of the proposed WRA's on the post-development discharge rates and volumes. The EDSC program produces a complete summary of basin inputs and resulting discharge rates (cfs), discharge volumes (ac-ft), WRA Stage-Storage-Discharge relationships and peak WRA elevations. Note that soil infiltration was not considered in the storm routing analysis. The EDSC results, compiled into a Hydrograph Summary Table, and the Hydrograph Flowchart used for the computer model are included on the following pages for your review. The complete EDSC analysis, including the appropriate hydrograph outputs, are included in **Appendix "D"**.

BASIN	AREA	CN	T_c	PEAK RATE	DISCH. VOLUME	TIME to PEAK
PRE "A"	4.15	49	25.27	7.27	1.43	60.00
PRE "B"	34.25	49	32.67	52.56	11.84	60.08
PRE "C"	35.52	49	22.98	65.39	12.28	60.08
"A-1"	4.86	60	34.47	3.37	1.43	61.08
"B-1"	13.40	60	33.60	6.19	3.41	61.50
"B-2"	12.68	60	25.61	---	---	---
"B-3"	0.72	60	10.00	29.45	5.31	60.17
"B-4"	5.09	55	10.00	15.62	1.71	60.00
TOTAL "B"	31.89	--	---	51.26	10.43	---
"C-1"	14.31	62	31.45	4.08	3.29	62.33
"C-2"	12.06	60	26.33	20.62	4.41	60.25
"C-3"	3.69	67	10.00	14.16	1.48	60.00
"C-4"	5.81	55	10.00	17.82	1.96	60.00
TOTAL "C"	35.87	--	--	56.68	11.14	---

BASIN HYDROGRAPH SUMMARY TABLE

D. PROJECT SUMMARY

The preceding analysis demonstrates that the stormwater retention volumes for this project will meet or exceed the volumes required for 40C-42 pollution abatement for the entire project and will limit post-development peak discharge rates and volumes to pre-development peak rates. When constructed as designed, this project will be consistent with the objectives and policies of the City of Clermont, the Lake County Pollution Control Department and the St. Johns River Water Management District.

HYDROGRAPH REPORT

RECORD NUMBER : 19
TYPE : SANTA BARBARA
DESCRIPTION : POST "B-4" BASIN

[HYDROGRAPH INFORMATION]

Peak Discharge	=	15.62 (cfs)
Volume	=	1.71 (acft)
Time Interval	=	0.05 (hr)
Time to Peak	=	60.00 (hr)
Time of Base	=	72.00 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	5.09 (ac)
Curve Number	=	55

[TIME CONCENTRATION -- USER DEFINED]

Time of Concentration	=	10.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH
Total Precipitation	=	11.04 (in)
Return Period	=	25 (yr)
Storm Duration	=	96.00 (hr)
Impervious Fraction	=	0.00000 (hr)

HYDROGRAPH REPORT

RECORD NUMBER : 20
TYPE : SANTA BARBARA
DESCRIPTION : POST "C-4" BASIN

[HYDROGRAPH INFORMATION]

Peak Discharge	=	17.82 (cfs)
Volume	=	1.96 (acft)
Time Interval	=	0.05 (hr)
Time to Peak	=	60.00 (hr)
Time of Base	=	72.00 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	5.81 (ac)
Curve Number	=	55

[TIME CONCENTRATION -- USER DEFINED]

Time of Concentration	=	10.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH
Total Precipitation	=	11.04 (in)
Return Period	=	25 (yr)
Storm Duration	=	96.00 (hr)
Impervious Fraction	=	0.00000 (hr)

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BASIN "A-1" (WRA "A-1")

Total Drainage Area = 4.86 ac.

On-Line Treatment System
f = 0.2; Kvs = 40.0 ft/day; Kh = 80 ft/day; FS = 2.0
Bottom Elev. = 100.0 ft. NGVD
Seasonal High GWT Elev. = 95.0 ft. NGVD
Impervious (confining) Layer Elev. = 95.0 ft. NGVD
Provided Retention Volume = 39,441 cf

Retention Volume Elev. = 104.00 ft. NGVD

I. **Stage One Infiltration Volume and Recovery**

Bottom Area = 5,250 sf
Vu = 5,250 sf(5.0 ft)(0.20)=5,250 cf (Equation 26-3)
kvu = 2/3(Kvs)=2/3(40.0)=26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day/2 = 13.33 ft/day (Equation 26-1)
t_{sat} = (5 ft)(0.20)/13.33 = 0.075 days (Equation 26-2)

II. **Stage Two Infilitration Volume and Recovery**

Vs = Vt - Vu = 39,441 - 5,250 = 34,191 cf
Retention Volume Elev. = 103.50 +(34191-32494)(0.25)/(35895-32494)
= 103.50 + 0.12
= 103.62 ft NGVD (@ start of stage 2)
Ht = 5.0 + 3.62 = 8.62 ft (Equation 26-9)
Fy = 5/8.62 = 0.58 (Equation 26-7)
L/W = 165/24 = 6.9

From Figure 26-6; Fx = 0.90 (For f=0.2;L/W=6.9 and Fy=0.58)
H = 0 ft
D = 0 + 5/2 = 2.5 ft (Equation 26-8)
$t = (24 \text{ ft.})^2/(4)(80 \text{ ft/day})(2.5 \text{ ft})(0.90)^2$ (Equation 26-10)
= 0.889 days

TOTAL RECOVERY TIME = 0.075 + 0.889 = 0.964 day = 23.13 hours

BASIN "B-1" (WRA "B-1")

Total Drainage Area = 13.40 ac.

On-Line Treatment System
f = 0.2; Kvs = 40.0 ft/day; Kh = 80 ft/day; FS = 2.0
Bottom Elev. = 90.0 ft. NGVD
Seasonal High GWT Elev. = 85.0 ft. NGVD
Impervious (confining) Layer Elev. = 85.0 ft. NGVD
Provided Retention Volume = 131,382 cf

Retention Volume Elev. = 97.00

I. **Stage One Infiltration Volume and Recovery**

Bottom Area = 10,100 sf
Vu = 10,100 sf(5.0 ft)(0.20)=10,100 cf (Equation 26-3)
kvu = 2/3(Kvs)=2/3(40.0)=26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day/2 = 13.33 ft/day (Equation 26-1)
t_{sat} = (5 ft)(0.20)/13.33 = 0.075 day (Equation 26-2)

II. **Stage Two Infilitration Volume and Recovery**

Vs = Vt - Vu = 131,382 - 10,100 = 121,282 cf
Retention Volume Elev. = 96.50 + (121282-117970)(0.25)/(124598-117970)
= 96.50 + 0.12
= 96.62 ft NGVD (@ start of stage 2)
Ht = 5.0 + 6.62 = 11.62 ft (Equation 26-9)
Fy = 5/11.62 = 0.43 (Equation 26-7)
L/W = 125/50 = 2.50

From Figure 26-6; Fx = 0.80 (For f=0.2;L/W=2.50 and Fy=0.43)
H = 0 ft
D = 0 + 5/2 = 2.5 ft (Equation 26-8)
$t = (50 \text{ ft.})^2/(4)(80 \text{ ft/day})(2.50 \text{ ft})(0.80)^2$ (Equation 26-10)
= 4.883 days

TOTAL RECOVERY TIME = 0.075 + 4.883 = 4.958 day = 118.99 hours

BASIN "B-2" (WRA "B-2")

Total Drainage Area = 12.68 ac.

On-Line Treatment System
f = 0.2; Kvs = 50 ft/day; Kh =100 ft/day; FS = 2.0
Bottom Elev. = 104.0 ft. NGVD
Seasonal High GWT Elev. = 85.0 ft. NGVD
Impervious (confining) Layer Elev. = 85.00 ft. NGVD
Provided Retention Volume = 41,220 cf

Retention Volume Elev. = 108.75 ft. NGVD

I. **Stage One Infiltration Volume and Recovery**

Bottom Area = 3,430 sf
Vu = 3,430 sf(19 ft)(0.20)= 13,034 cf (Equation 26-3)
kvu = 2/3(Kvs)=2/3(50)= 33.33 ft/day (Equation 26-5)
Id = 33.33 ft/day/2 = 16.67 ft/day (Equation 26-1)
t_{sat} = (9 ft)(0.20)/16.67 ft/day = 0.108 days (Equation 26-2)

II. **Stage Two Infilitration Volume and Recovery**

Vs = Vt - Vu = 41,220 cf - 13,034 cf = 28,186 cf
Treatment Volume Elev. = 107.50 + (28186-25540)(0.25)/(28400-25540)
= 107.50 + 0.23
= 107.73 ft NGVD (@ start of stage 2)
Ht = 19.0 + 3.73 = 22.73 ft (Equation 26-9)
Fy = 19.0/22.73 = 0.83
L/W = 230/20 = 11.50

From Figure 26-6; Fx = 2.20 (For f=0.2;L/W=11.50 and Fy=0.83)
H = 0 ft
D = 0 + 19/2 = 9.5 ft (Equation 26-8)
t = $(20 \text{ ft})^2/(4)(100 \text{ ft/day})(9.50 \text{ ft})(2.20)^2$ (Equation 26-10)
= 0.073 days

TOTAL RECOVERY TIME = 0.108 + 0.022 = 0.130 days = 3.11 hours

BASIN "B-3" (WRA "B-3")

Total Drainage Area = 0.72 ac.

On-Line Treatment System
f = 0.2; Kvs = 50.0 ft/day; Kh = 100 ft/day; FS = 2.0
Bottom Elev. = 95.0 ft. NGVD
Seasonal High GWT Elev. = 85.0 ft. NGVD
Impervious (confining) Layer Elev. = 85.0 ft. NGVD
Provided Retention Volume = 5,057 cf

Retention Volume Elev. = 98.75 ft. NGVD

I. **Stage One Infiltration Volume and Recovery**

Bottom Area = 295 sf
Vu = 295 sf(10.0 ft)(0.20)=590 cf (Equation 26-3)
kvu = 2/3(Kvs)=2/3(50.0)=33.33 ft/day (Equation 26-5)
Id = 33.33 ft/day/2 = 16.67 ft/day (Equation 26-1)
t_{sat} = (10 ft)(0.20)/16.67 = 0.120 day (Equation 26-2)

II. **Stage Two Infilitration Volume and Recovery**

Vs = Vt - Vu = 5,057 - 590 = 4,467 cf
Retention Volume Elev. = 98.25 + (4467-3926)(0.25)/(4474-4467)
= 98.25 + 0.25
= 98.50 ft NGVD (@ start of stage 2)
Ht = 10.0 + 3.50 = 13.50 ft (Equation 26-9)
Fy = 10.0/13.50 = 0.74 (Equation 26-7)
L/W = 24/12 = 2.00

From Figure 26-6; Fx = 2.05 (For f=0.2;L/W=2.00 and Fy=0.74)
H = 0 ft
D = 0 + $10/2_2$ = 5.0 ft (Equation 26-8)
t = $(12 \text{ ft.})^2/(4)(100 \text{ ft/day})(5.00 \text{ ft})(2.05)^2$ (Equation 26-10)
= 0.017 days

TOTAL RECOVERY TIME = 0.120 + 0.017 = 0.137 days = 3.29 hours

BASIN "C-1" (WRA "C-1")

Total Drainage Area = 14.31 ac.

On-Line Treatment System
f = 0.2; Kvs = 40.0 ft/day; Kh = 80 ft/day; FS = 2.0
Bottom Elev. = 90.0 ft. NGVD
Seasonal High GWT Elev. = 85.0 ft. NGVD
Impervious (confining) Layer Elev. = 85.0 ft. NGVD
Provided Retention Volume = 170,550 cf

Retention Volume Elev. = 97.00 ft. NGVD

I. **Stage One Infiltration Volume and Recovery**

Bottom Area = 16,160 sf
Vu = 16,160 sf(5.0 ft)(0.20)=16,160 cf (Equation 26-3)
kvu = 2/3(Kvs)=2/3(40.0)=26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day/2 = 13.33 ft/day (Equation 26-1)
t_{sat} = (5 ft)(0.20)/13.33 = 0.075 day (Equation 26-2)

II. **Stage Two Infilitration Volume and Recovery**

Vs = Vt - Vu = 170,550 - 16,160 = 154,390 cf
Treatment Volume Elev. = 96.25 + (154390-146782)(0.25)/(154558-146782)
= 96.25 + 0.25
= 96.50 ft NGVD (@ start of stage 2)
Ht = 5.0 + 6.5 = 11.50 ft (Equation 26-9)
Fy = 5/11.50 = 0.43 (Equation 26-7)
L/W = 120/120 = 1.00

From Figure 26-6; Fx = 1.20 (For f=0.2;L/W=1.00 and Fy=0.43)
H = 0 ft
D = 0 + 5/2 = 2.5 ft (Equation 26-8)
t = $(120 \text{ ft.})^2/(4)(80 \text{ ft/day})(2.5 \text{ ft})(1.20)^2$ (Equation 26-10)
= 12.50 days

TOTAL RECOVERY TIME = 0.075 + 12.50 = 12.575 days = 301.8 hours

BASIN "C-2" (WRA "C-2")

Total Drainage Area = 12.06 ac.

On-Line Treatment System
f = 0.2; Kvs = 40 ft/day; Kh = 80 ft/day; FS = 2.0
Bottom Elev. = 90.50 ft. NGVD
Seasonal High GWT Elev. = 87.0 ft. NGVD
Impervious (confining) Layer Elev. = 87.00 ft. NGVD
Provided Retention Volume = 59,920 cf

Retention Volume Elev. = 104.50 ft. NGVD

I. **Stage One Infiltration Volume and Recovery**

Bottom Area = 9,900 sf
Vu = 9,900 sf(3.5 ft)(0.20)=6,930 cf (Equation 26-3)
kvu = 2/3(Kvs)=2/3(40)=26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day/2 = 13.33 ft/day (Equation 26-1)
t_{sat} = (3.5 ft)(0.20)/13.33 ft/day = 0.053 days (Equation 26-2)

II. **Stage Two Infilitration Volume and Recovery**

Vs = Vt - Vu = 59,920 cf - 6,930 cf = 52,990 cf
Treatment Volume Elev. = 94.0 + (52990-50204)(0.25)/(54982-50204)
= 94.0 + 0.15
= 94.15 ft NGVD (@ start of stage 2)
Ht = 3.50 + 3.64 = 7.14 ft (Equation 26-9)
Fy = 3.50/7.14 = 0.49
L/W = 250/32 = 7.81

From Figure 26-6; Fx = 0.70 (For f=0.2;L/W=7.81 and Fy=0.49)
H = 0 ft
D = 0 + 3.5/2 = 1.75 ft (Equation 26-8)
t = $(32 \text{ ft})^2/(4)(80 \text{ ft/day})(1.75 \text{ ft})(0.70)^2$ (Equation 26-10)
= 3.732 days

TOTAL RECOVERY TIME = 0.053 + 3.732 = 3.785 days = 90.84 hours

BASIN "C-3" (WRA "C-3")

Total Drainage Area = 3.69 ac.

On-Line Treatment System
f = 0.2; Kvs = 40.0 ft/day; Kh = 80 ft/day; FS = 2.0
Bottom Elev. = 90.0 ft. NGVD
Seasonal High GWT Elev. = 85.0 ft. NGVD
Impervious (confining) Layer Elev. = 85.0 ft. NGVD
Provided Retention Volume = 10,555 cf

Retention Volume Elev. = 94.00 ft. NGVD

I. **Stage One Infiltration Volume and Recovery**
Bottom Area = 880 sf
Vu = 880 sf(5.0 ft)(0.20)= 880 cf (Equation 26-3)
kvu = 2/3(Kvs)=2/3(40)=26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day/2 = 13.33 ft/day (Equation 26-1)
t_{sat} = (5 ft)(0.20)/13.33 = 0.075 day (Equation 26-2)

II. **Stage Two Infilitration Volume and Recovery**
Vs = Vt - Vu = 10,555 - 880 = 9,675 cf
Treatment Volume Elev. = 93.75 + (9675-9483)(0.25)/(10555-9483)
= 93.75 + 0.05
= 93.80 ft NGVD (@ start of stage 2)
Ht = 5.0 + 3.80 = 8.80 ft (Equation 26-9)
Fy = 5.0/8.80 = 0.57 (Equation 26-7)
L/W = 70/15 = 4.67

From Figure 26-6; Fx = 0.90 (For f=0.2;L/W=4.67 and Fy=0.57)
H = 0 ft
D = 0 + 5/2 = 2.5 ft (Equation 26-8)
t = $(15 \text{ ft.})^2/(4)(80 \text{ ft/day})(2.50 \text{ ft})(0.90)^2$ (Equation 26-10)
= 0.347 days

TOTAL RECOVERY TIME = 0.075 + 0.347 = 0.422 day = 10.13 hours

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BASIN "A-1" (WRA "A-1")

Total Drainage Area = 4.86 ac.

On-Line Treatment System
f = 0.2; Kvs = 40.0 ft/day; Kh = 80 ft/day; FS = 2.0
Bottom Elev. = 100.0 ft. NGVD
Seasonal High GWT Elev. = 95.0 ft. NGVD
Impervious (confining) Layer Elev. = 95.0 ft. NGVD
Required Treatment Volume = 7,750 cf

Treatment Volume Elev. = 101.00 + (7750-6401)(0.25)/(8362-6401)
= 101.00 + 0.17 = 101.17 ft. NGVD

I. **Stage One Infiltration Volume and Recovery**

Bottom Area = 5,250 sf
Vu = 5,250 sf(5.0 ft)(0.20)=5,250 cf (Equation 26-3)
kvu = 2/3(Kvs)=2/3(40.0)=26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day/2 = 13.33 ft/day (Equation 26-1)
t_{sat} = (5 ft)(0.20)/13.33 = 0.075 day (Equation 26-2)

II. **Stage Two Infilitration Volume and Recovery**

Vs = Vt - Vu = 7,750 - 5,250 = 2,500 cf
Treatment Volume Elev. = 100.25 +(2912-2500)(0.25)/(2912-1384)
= 100.32 ft NGVD (@ start of stage 2)
Ht = 5.0 + 0.32 = 5.32 ft (Equation 26-9)
Fy = 5/5.32 = 0.94 (Equation 26-7)
L/W = 165/24 = 6.9

From Figure 26-6; Fx = 5.00 (For f=0.2;L/W=6.9 and Fy=0.94)
H = 0 ft
D = 0 + 5/2 = 2.5 ft (Equation 26-8)
t = $(24)^2$/(4)(80 ft/day)(2.5 ft)$(5.0)^2$ (Equation 26-10)
= 0.029 days

TOTAL RECOVERY TIME = 0.075 + 0.029 = 0.104 day = 2.49 hours

BASIN "C-2" (WRA "C-2")

Total Drainage Area = 12.06 ac.

On-Line Treatment System
f = 0.2; Kvs = 40 ft/day; Kh = 80 ft/day; FS = 2.0
Bottom Elev. = 90.50 ft. NGVD
Seasonal High GWT Elev. = 87.0 ft. NGVD
Impervious (confining) Layer Elev. = 87.0 ft. NGVD
Required Treatment Volume = 18,333 cf

Treatment Volume Elev. = 92.00 + (18333-17701)(0.25)/(21208-17701)
= 92.00 + 0.05 = 92.05 ft. NGVD

I. **Stage One Infiltration Volume and Recovery**
Bottom Area = 9,900 sf
Vu = 9,900 sf(3.5 ft)(0.20)=6,930 cf (Equation 26-3)
kvu = 2/3(Kvs)=2/3(40)=26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day/2 = 13.33 ft/day (Equation 26-1)
t_{sat} = (3.5 ft)(0.20)/13.33 ft/day = 0.053 days (Equation 26-2)

II. **Stage Two Infilitration Volume and Recovery**
Vs = Vt - Vu = 18,333 cf - 6,930 cf = 11,403 cf
Treatment Volume Elev. = 91.50 + (11403-11165)(0.25)/(14354-11165)
= 91.50 + 0.02
= 91.52 ft NGVD (@ start of stage 2)
Ht = 3.5 + 1.02 = 4.52 ft (Equation 26-9)
Fy = 3.5/4.52 = 0.77
L/W = 250/32 = 7.81

From Figure 26-6; Fx = 1.75 (For f=0.2;L/W=7.81 and Fy=0.77)
H = 0 ft
D = 0 + 5.5/2 = 2.75 ft (Equation 26-8)
t = $(32 \text{ ft})^2/(4)(80 \text{ ft/day})(2.75 \text{ ft})(1.75)^2$ (Equation 26-10)
= 0.380 days

TOTAL RECOVERY TIME = 0.053 + 0.380 = 0.433 days = 10.39 hours

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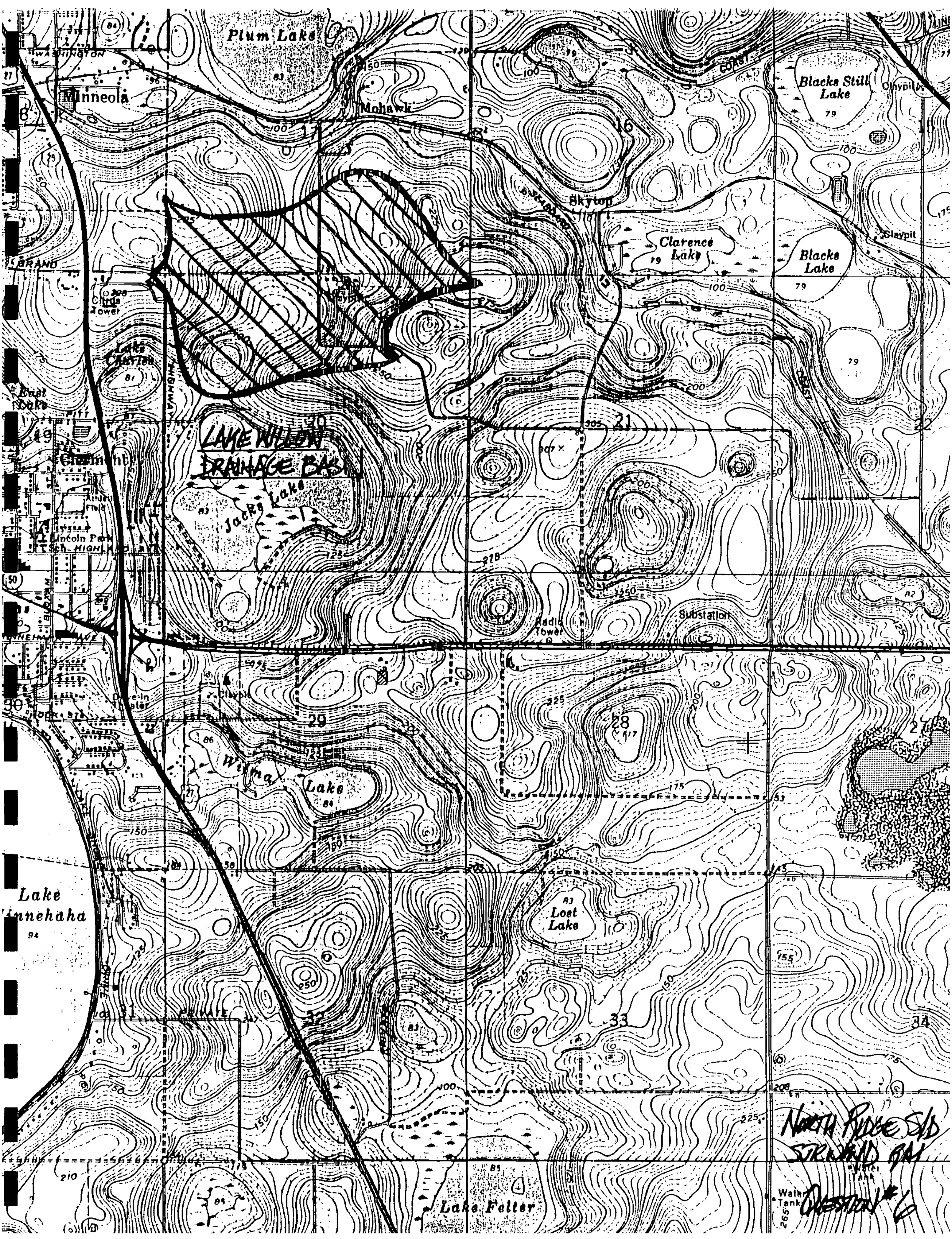
Plum Lake
Minneola
Mohawk
Skytop
Blacks Still Lake
Clarence Lake
Blacks Lake
Claypit
Lake Charles
East Lake
LAKE WILLOW
DRAINAGE BAS
Jacks Lake
Lincoln Park Sch.
Radio Tower
Substation
Drive-In Theater
Wilma Lake
Lost Lake
Lake
innehaha
Lake Felter
Water Tank
NORTH RIDGE S/D
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Question #8

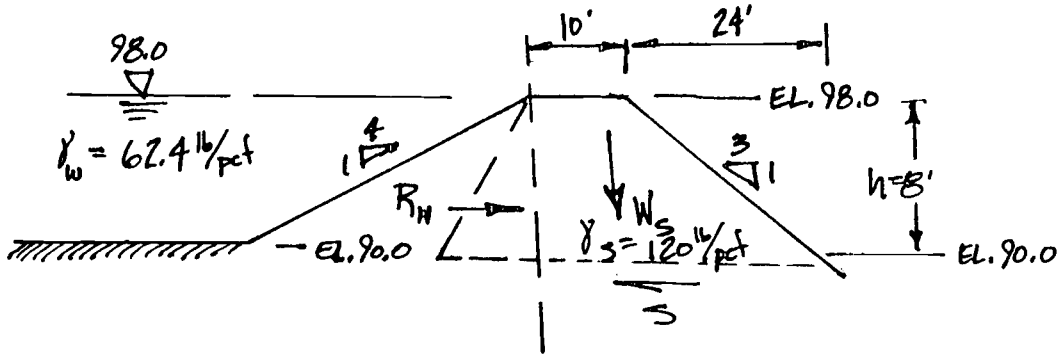
WRA # B-1 & C-1

NORTH RIDGE S/D
SJRWMD RAI RESPONSE
9/28/94

(QUESTION # 8)

SLOPE STABILITY ANALYSIS:

Ref. - BASIC SOILS ENGINEERING, B.K. HOUGH; 2nd Ed.
SLIDING BLOCK ANALYSIS, 8-24, pg. 285



ASSUMPTIONS:

$\gamma_w = 62.4$ lb/pcf

$\gamma_s = 120$ lb/pcf

$\phi = 26°$ to $30°$ (FINE to MEDIUM SAND)

$S = W_s \tan\phi = [(10')(8') + \frac{1}{2}(24')(8')] \times (120 \text{ lb/pcf}) (\tan 26°) = (21{,}120 \text{ lb/l.f.})(0.488)$

$= 10{,}300$ lb/l.f.

$R_W = \frac{1}{2} \gamma_w h^2$

$= \frac{1}{2}(62.4)(8')^2 = 1996.8$ lb ≈ 2000 lb

$$\text{FACTOR of SAFETY} = \frac{S}{R_W} \approx \frac{10{,}000}{2000} = 5$$

OK

STORMWATER MANAGEMENT STUDY

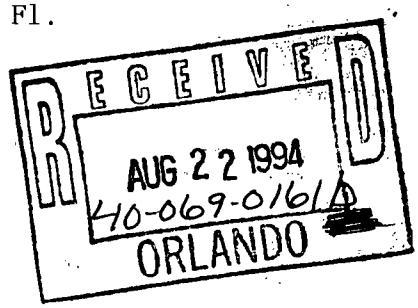
for

NORTH RIDGE RESIDENTIAL SUBDIVISION

Sec. 20; Twp. 22 S; Rge. 26 E, Lake County, Fl.

City of Clermont

AUGUST 1994



Prepared by:
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STORMWATER MANAGEMENT STUDY

NORTH RIDGE - 194 LOT S/F RESIDENTIAL SUBDIVISION
Sec. 20; Twp. 22 S; Rge. 26 E, Lake County, Fl.

TABLE OF CONTENTS

STORMWATER MANAGEMENT STUDY

PROJECT: NORTH RIDGE - 194 LOT S/F RESIDENTIAL SUBDIVISION
Sec. 20; Twp. 22 S; Rge. 26 E, Lake County, Fl.
(#93-028)

A. PROJECT INTRODUCTION

A1. GENERAL

The project site is a burned-out citrus grove located between Jack's Lake and Lake Willow in east Clermont. The property is bounded by Grand Highway along the western property line; Jack's Lake Road along the southern property line and burned-out citrus groves to the north and east. Native grasses, weeds and oak trees are the predominant upland vegetation. The peak on-site elevation is at 180 feet NGVD and is located near the middle of the East property line. Jack's Lake Road, along the southern property line, is an existing clay-based county maintained road. The road right-of-way is to be vacated, the clay roadbase is to be removed and the area restored to natural conditions. The local traffic currently using the clay road will be re-routed through the paved project roads.

The minimum lot size for the proposed 74 acre residential subdivision will be 10,000 square feet. Drinking water and sewage disposal services will be provided by the City of Clermont. Access to the individual lots will be provided by sixty (60) foot wide right-of-ways and twenty foot wide roadways with curbs and gutters.

A2. SOILS

The Lake County SCS Soil Survey, Index Sheet number 59, indicate the on-site upland soils to be exclusively Astatula Series Sand, "AtB" and "AtD". Astatula sand is described as a rapidly permeable, coarse sand with the water table depth in excess of 120". Astatula sand is classified in the Hydrological Soil Group "A" by the SCS TR-55, "Urban Hydrology for Small Watersheds", June 1986, page A-4. Based on a "pasture" cover in fair condition, i.e. 50 to 75% ground cover and steep slopes, the pre-development SCS Runoff Curve Number for the project has been estimated to be $CN_{pre}=49$.

A3. PERMEABILITY

The SCS Soils Survey estimates the permeability of the Astatula Series Sand to be in excess of 20"/hour. In June, 1994, LJ Nordarse & Associates, Inc. performed six (6) soil borings at the project site and five (5) falling head permeability tests on undisturbed samples from the boring locations. The laboratory tests yielded Coefficients of Vertical Permeability, K_v, ranging from of 40 feet per day, (20"/hr) to 50 feet per day, (25"/hr). All six borings were extended to a depth of ten feet, but no groundwater tables were encountered. The normal seasonal high water levels were estimated to be below the ten foot boring depths for all six borings. A complete soils report is included in Appendix "B".

A4. S.W.M. CRITERIA:

The primary objective of this report is to demonstrate that the water-quality treatment volume required by Chapter 40C-42 F.A.C. will be provided and that the post-development discharge rates and volumes from the development will not exceed the pre-development discharge rates for the 25yr-96hr storm events. The City of Clermont also requires analysis of the 50yr-24hr storm event.

The project site currently drains in three different directions. Basin "A" drains westerly to Lake Charles. Basin "B" drains northerly to Lake Willow and Basin "C" drains southerly toward Jack's Lake. All three basins are all considered landlocked and therefore subject to the 25-year/96-hour runoff volume limitations.

The Post-Development Stormwater Management Plan proposes to intercept, collect, and convey the stormwater runoff from the hillside lots to the water retention areas (WRAs) via curb and gutter flow to curb inlets and storm culverts. Stormwater runoff from the lakefront lots in Basin "B" and Basin "C" are to be treated by a lakefront vegetated natural buffer, VNB, in accordance with the approved 40C-42 methodology. The VNB's are to include all areas below the designated 100-Year Flood Plain. Except for the erection of the erosion control silt barrier, there are to be no other encroachments within the 100-year flood plain of Lake Willow. The existing clay base for Jack's Lake Road within the 100-year flood plain of Jack's Lake is to be removed and the area restored to natural conditions.

B. PROJECT STATISTICS

B1. PROJECT DATA

TOTAL PROJECT AREA (ABOVE 100-YEAR FLOOD LINES). . . . . 73.97 ac.

TOTAL NUMBER OF LOTS PROPOSED 194
MINIMUM LOT SIZE . . . . . 10,000 sf
ROAD DEDICATION . . . . . City of Clermont
TYPICAL ROAD CONSTRUCTION . . . . . 20' Asphalt & 2' Curbing Each Side
TOTAL LENGTH OF INTERIOR ROADS . . . . . +/-13,865 l.f.
TYPICAL RIGHT-OF-WAY WIDTH . . . . . 60'
TOTAL RIGHT-OF-WAY AREA . . . . . 17.76 ac.
COMMUNITY PARK / RECREATION AREA . . . . . 1.04 ac.
WATER RETENTION AREAS, (WRA), (7) TOTAL . . . . . 4.61 ac.

TOTAL NON-RESIDENTIAL LAND USE.....23.41 ac.
GROSS DENSITY (194 d.u. / 73.97 ac.).....2.62 lots/acre
= 0.38 acres/lot

NET DENSITY (194 d.u. / (73.97 - 23.41 ac.)).....3.84 lots/acre
= 0.26 acres/lot

CONSTRUCTION PHASES.....3
NUMBER OF LOTS AND LENGTH OF ROADWAY PER PHASE:

PHASE I	: 34.33 ac. ---	82 Lots ---	5,300 lf Road
PHASE II	: 21.75 ac. ---	64 Lots ---	3,600 lf Road
PHASE III	: 17.89 ac. ---	48 Lots ---	5,000 lf Road

1. **PRE-DEVELOPMENT:**

PRE-DEV. LAKE CHARLES BASIN AREA..... 4.15 ac.
PRE-DEV. LAKE WILLOW BASIN AREA.....34.25 ac.
PRE-DEV. JACK'S LAKE BASIN AREA.....35.52 ac.

TOTAL PRE-DEV. AREA 73.92 ac.

2. **POST-DEVELOPMENT**

POST-DEV. LAKE CHARLES BASIN AREA..... 4.86 ac.
POST-DEV. LAKE WILLOW BASIN AREA..... 31.89 ac.
POST-DEV. JACK'S LAKE BASIN AREA..... 45.87 ac.

TOTAL POST-DEV. AREA 73.62 ac.

10' GRAND HIGHWAY RIGHT-OF-WAY DEDICATION..... 0.30 ac.

LENGTH OF LAKE WILLOW ON-SITE SHORELINE.....+/- 2,100 lf
LENGTH OF JACK'S LAKE ON-SITE SHORELINE.....+/- 2,350 lf

B2. PRE-DEVELOPMENT SCS RUNOFF CURVE NUMBERS

SCS CURVE NUMBER = 49 (TR-55 - Pasture, Fair Condition, HSG "A")

B3. PROPOSED IMPERVIOUS AREAS and CN CALCULATIONS

Assume average single family residence structure and driveway area = 3,000 sf

BASIN "A": Total Drainage Area = 4.86 ac

13 Lots @ 3,000 sf/lot	= 39,000 sf	= 0.90 ac.	= 18.42 %
1100 lf - 24' Roadway Pavement	= 26,400 sf	= 0.60 ac.	= 12.47 %
1800 lf - 5' Sidewalk	= 9,000 sf	= 0.21 ac.	= 4.25 %
TOTAL IMPERVIOUS AREA	= 74,400 sf	= 1.71 ac.	= 35.14 %

CN_{post} = (0.3514)(98) + (1 - 0.3514)(39) = 59.73; **USE CN = 60**

BASIN "B-1": Total Drainage Area = 13.40 ac.

32 Lots @ 3,000 sf/lot	= 96,000 sf	= 2.20 ac.	= 16.45 %
300 lf - 68' Roadway Pavement	= 20,400 sf	= 0.47 ac.	= 3.49 %
500 lf - 36' Roadway Pavement	= 18,000 sf	= 0.41 ac.	= 3.08 %
1700 lf - 24' Roadway Pavement	= 40,800 sf	= 0.94 ac.	= 6.99 %
4300 lf - 5' Sidewalk	= 21,500 sf	= 0.49 ac.	= 3.68 %
1 Cul-de-Sac @ 5,500 sf/ea	= 5,500 sf	= 0.13 ac.	= 0.94 %
TOTAL IMPERVIOUS AREA	= 202,200 sf	= 4.64 ac.	= 34.64 %

CN_{post} = (0.3464)(98) + (1 - 0.3464)(39) = 59.43; **USE CN = 60**

BASIN "B-2" : Total Drainage Area = 12.68 ac.

29 Lots @ 3,000 sf/lot	= 87,000 sf	= 2.00 ac.	= 15.75 %
1100 lf - 36' Roadway Pavement	= 39,600 sf	= 0.91 ac.	= 7.17 %
2200 lf - 24' Roadway Pavement	= 52,800 sf	= 1.21 ac.	= 9.56 %
3300 lf - 5' Sidewalk	= 16,500 sf	= 0.38 ac.	= 2.99 %
TOTAL IMPERVIOUS AREA	= 195,900 sf	= 4.50 ac.	= 35.47 %

CN_{post} = (0.3547)(98) + (1 - 0.3547)(39) = 59.93; **USE CN = 60**

BASIN "B-3" : Total Drainage Area = 0.72 ac.

300 lf - 24' Roadway Pavement	= 7,200 sf	= 0.17 ac.	= 22.96 %
600 lf - 5' Sidewalk	= 3,000 sf	= 0.07 ac.	= 9.56 %
TOTAL IMPERVIOUS AREA	= 10,200 sf	= 0.23 ac.	= 32.52 %

CN_{post} = (0.3252)(98) + (1 - 0.3252)(39) = 58.19; **USE CN = 60**

BASIN "B-4" : Total Drainage Area = 5.09 ac.

19 Lots @ 3,000 sf/lot	= 57,000 sf	= 1.31 ac.	= 25.71 %
TOTAL IMPERVIOUS AREA	= 57,000 sf	= 1.31 ac.	= 25.71 %

CN_{post} = (0.2571)(98) + (1 - 0.2571)(39) = 54.17; **USE CN = 55**

BASIN "C-1" : Total Drainage Area = 14.31 ac.

34 Lots @ 3,000 sf/lot	= 102,000 sf	= 2.34 ac.	= 16.36 %
1200 lf - 36' Roadway Pavement	= 43,200 sf	= 0.99 ac.	= 6.93 %
1700 lf - 24' Roadway Pavement	= 40,800 sf	= 0.94 ac.	= 6.55 %
5800 lf - 5' Sidewalk	= 29,000 sf	= 0.67 ac.	= 4.65 %
Clubhouse/Recreation Area	= 20,000 sf	= 0.46 ac.	= 3.21 %
TOTAL IMPERVIOUS AREA	= 235,000 sf	= 5.39 ac.	= 37.70 %

CN_{post} = (0.3770)(98) + (1 - 0.3770)(39) = 61.24; **USE CN = 62**

BASIN "C-2" : Total Drainage Area = 12.06 ac.

36 Lots @ 3,000 sf/lot	= 108,000 sf	= 2.48 ac.	= 20.56 %
2000 lf - 24' Roadway Pavement	= 48,000 sf	= 1.10 ac.	= 9.14 %
4000 lf - 5' Sidewalk	= 20,000 sf	= 0.46 ac.	= 3.81 %
TOTAL IMPERVIOUS AREA	= 176,000 sf	= 4.04 ac.	= 33.50 %

CN_{post} = (0.3350)(98) + (1 - 0.3350)(39) = 58.77; **USE CN = 60**

BASIN "C-3" : Total Drainage Area = 3.69 ac.

8 Lots @ 3,000 sf/lot	= 24,000 sf	= 0.55 ac.	= 14.93 %
1500 lf - 24' Roadway Pavement	= 36,000 sf	= 0.83 ac.	= 22.40 %
3000 lf - 5' Sidewalk	= 15,000 sf	= 0.34 ac.	= 9.33 %
TOTAL IMPERVIOUS AREA	= 75,000 sf	= 1.72 ac.	= 46.66 %

CN_{post} = (0.4666)(98) + (1 - 0.4666)(39) = 66.53; **USE CN = 67**

BASIN "C-4" : Total Drainage Area = 5.81 ac.

23 Lots @ 3,000 sf/lot	= 69,000 sf	= 1.58 ac.	= 27.26 %
TOTAL IMPERVIOUS AREA	= 69,000 sf	= 1.58 ac.	= 27.26 %

CN_{post} = (0.2726)(98) + (1 - 0.2726)(39) = 55.08; **USE CN = 55**

B4. RETENTION VOLUME REQUIREMENTS

In accordance with 40C-42.026(1)(a)4, F.A.C., an On-Line Retention system discharging to Class III Surface Waters shall provide retention of the runoff from the first one-inch of rainfall or 1.25 inches of runoff from the impervious area, whichever is greater, for systems serving a basin with less than 40% impervious surface and contain only SCS hydrologic group "A" soils. The 1.25" of runoff from the impervious areas always controls when the post-development curve number is less than CN=67. For project sites greater than forty (40) acres, the SJRWMD also requires that the peak discharge rate in the post-development condition be less than that in pre-development for the specified design storms of 25yr-24hr for open basins and 25yr-96hr for closed basins.

BASIN ID	BASIN AREA (ac)	CN	TOTAL IMPERV. AREA (sf)	40C-42 TREATMENT VOLUME (cf)	RETENTION VOLUME PROVIDED @ OVERFLOW ELEVATION		
					EL.	(cf)	(ac-ft)
A-1	4.86	60	74,400	7,750	104.00	39,441	0.905
B-1	13.40	60	202,200	21,062	97.00	131,382	3.016
B-2	12.68	60	195,900	20,406	108.75	41,220	0.946
B-3	0.72	60	10,200	1,062	98.75	5,057	0.116
TOTAL "B"	26.80	--	408,300	42,530	---	177,659	4.078
C-1	14.31		235,000	24,479	97.00	170,551	3.915
C-2	12.06		176,000	18,333	94.50	59,920	1.376
C-3	3.69		75,000	7,812	94.00	10,555	0.242
TOTAL "C"	30.06		486,000	93,154	---	241,026	5.533

BASIN TREATMENT vs. RETENTION VOLUME SUMMARY TABLE

B5. TREATMENT VOLUME DRAWDOWN CALCULATIONS

The following design procedure is based on Example 26.4 Design Example of Retention Basin Recovery of "Applicants Handbook, Regulation of Stormwater Management Systems, Chapter 40C-42, F.A.C." DRAFT, Pages 26-7 26-8, 26-9 & 26-10.

BASIN "A-1" (WRA "A-1")
DRAINAGE AREA = 4.86 ac.

ON-LINE TREATMENT SYSTEM
f=0.2; Kvs=40.0 ft/day; Kh=80.0 ft/day; FS=2.0
BOTTOM ELEV.= 100.0 ft. NGVD
SEASONAL HIGH GWT ELEV.= 90.0 ft. NGVD
IMPERVIOUS (CONFINING) LAYER ELEV.= 90.0 ft. NGVD
REQUIRED TREATMENT VOLUME= 7,750 cf

TREATMENT VOLUME ELEV.= 101.00 + (7750-6401)(0.25)/(8362-6401)
= 101.00 + 0.17 = 101.17 ft. NGVD

I. STAGE ONE INFILTRATION VOLUME AND RECOVERY:

BOTTOM AREA= 5,250 sf
Vu = 5,250sf(10.0ft)(0.20)= 10,500 cf (> 7,750)(Equation 26-3)
Kvu = 2/3(Kvs)= 2/3(40.0)= 26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day /2= 13.33 ft/day (Equation 26-1)
tsat= (10ft)(0.20)/13.33 ft/day= 0.150 day (Equation 26-2)

II. STAGE TWO INFILTRATION VOLUME AND RECOVERY:

N/A: ENTIRE TREATMENT VOLUME WILL BE INFILTRATED IN STAGE I

TOTAL RECOVERY TIME= 0.150 days = 3.60 hours

BASIN "B-1" (WRA "B-1")
DRAINAGE AREA = 13.40 ac.

ON-LINE TREATMENT SYSTEM
f=0.2; Kvs=40 ft/day; Kh=80 ft/day; FS=2.0
BOTTOM ELEV.= 90.0 ft. NGVD
SEASONAL HIGH GWT ELEV.= 85.0 ft. NGVD
IMPERVIOUS (CONFINING) LAYER ELEV.= 85.0 ft. NGVD
REQUIRED TREATMENT VOLUME= 21,062 cf

TREATMENT VOLUME ELEV.= 91.50 + (21062-17928)(0.25)/(21458-17928)
= 91.50 + 0.22 = 91.72 ft. NGVD

I. STAGE ONE INFILTRATION VOLUME AND RECOVERY:

BOTTOM AREA= 10,100 sf
Vu = 10,100sf(5ft)(0.20)= 10,100 cf (Equation 26-3)
Kvu = 2/3(Kvs)= 2/3(40)= 26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day /2 = 13.33 ft/day (Equation 26-1)
tsat= (5ft)(0.20)/13.33 ft/day = 0.075 days (Equation 26-2)

II. STAGE TWO INFILTRATION VOLUME AND RECOVERY:

Vs = Vt - Vu = 21,062 - 10,100 = 10,962 cf

TREATMENT VOLUME ELEV.= 90.75 + (10962-8267)(0.25)/(11332-8267)
= 90.75 + 0.22
= 9.97 ft. NGVD (@ Start of Stage 2)

Ht = 5.0 + 0.97 = 5.97 ft (Equation 26-9)
Fy = 5.0/5.97 = 0.84 (Equation 26-7)
L/W = 125/50 = 2.50

From Figure 26-6: Fx=2.95 (For f=0.2, L/W=2.50 and Fy=0.84)
H = 0 ft
D = 0 + 5/2 = 2.50 ft (Equation 26-8)
t = $(50\ ft)^2/(4)(80\ ft/day)(2.50\ ft)(2.95)^2$ (Equation 26-10)
= 0.359 days

TOTAL RECOVERY TIME= 0.075 + 0.359 = 0.434 days = 10.42 hours

BASIN "B-2" (WRA "B-2")
DRAINAGE AREA = 12.68 ac.

ON-LINE TREATMENT SYSTEM
f=0.2; Kvs=50 ft/day; Kh=100 ft/day; FS=2.0
BOTTOM ELEV.= 104.0 ft. NGVD
SEASONAL HIGH GWT ELEV.= 85.0 ft. NGVD
IMPERVIOUS (CONFINING) LAYER ELEV.= 85.0 ft. NGVD
REQUIRED TREATMENT VOLUME= 20,406 cf

TREATMENT VOLUME ELEV.= 107.00 + (20406-20234)(0.25)/(22818-20234)
= 107.00 + 0.02 = 107.02 ft. NGVD

I. STAGE ONE INFILTRATION VOLUME AND RECOVERY:

BOTTOM AREA= 3,430 sf
Vu = 3,430sf(19ft)(0.20)= 13,034 cf (Equation 26-3)
Kvu = 2/3(Kvs)= 2/3(50)= 33.33 ft/day (Equation 26-5)
Id = 33.33 ft/day /2 = 16.66 ft/day (Equation 26-1)
tsat= (5ft)(0.20)/16.66 ft/day = 0.060 days (Equation 26-2)

II. STAGE TWO INFILTRATION VOLUME AND RECOVERY:

Vs = Vt - Vu = 20,406 - 13,034 = 7,372 cf

TREATMENT VOLUME ELEV.= 105.25 + (7372-6014)(0.25)/(7631-6014)
= 105.25 + 0.21
= 105.46 ft. NGVD (@ Start of Stage 2)

Ht = 19.0 + 1.56 = 20.56 ft (Equation 26-9)
Fy = 19.0/20.56 = 0.92 (Equation 26-7)
L/W = 230/20 = 11.50

From Figure 26-6: Fx=4.00 (For f=0.2, L/W=11.50 and Fy=0.92)
H = 0 ft
D = 0 + 19/2 = 9.5 ft (Equation 26-8)
t = $(20 \text{ ft})^2/(4)(100 \text{ ft/day})(9.5 \text{ ft})(4.00)^2$ (Equation 26-10)
= 0.026 days

TOTAL RECOVERY TIME= 0.060 + 0.026 = 0.086 days = 2.06 hours

BASIN "B-3" (WRA "B-3")
DRAINAGE AREA = 0.72 ac.

ON-LINE TREATMENT SYSTEM
f=0.2; Kvs=50 ft/day; Kh=100 ft/day; FS=2.0
BOTTOM ELEV.= 95.0 ft. NGVD
SEASONAL HIGH GWT ELEV.= 85.0 ft. NGVD
IMPERVIOUS (CONFINING) LAYER ELEV.= 85.0 ft. NGVD
REQUIRED TREATMENT VOLUME= 1,060 cf

TREATMENT VOLUME ELEV.= 96.25 + (1062-807)(0.25)/(1074-807)
= 96.25 + 0.24 = 96.49 ft. NGVD

I. STAGE ONE INFILTRATION VOLUME AND RECOVERY:

BOTTOM AREA= 295 sf
Vu = 295sf(10ft)(0.20)= 590 cf (Equation 26-3)
Kvu = 2/3(Kvs)= 2/3(50)= 33.33 ft/day (Equation 26-5)
Id = 33.33 ft/day /2 = 16.66 ft/day (Equation 26-1)
tsat= (10ft)(0.20)/16.66 ft/day = 0.12 days (Equation 26-2)

II. STAGE TWO INFILTRATION VOLUME AND RECOVERY:

Vs = Vt - Vu = 1,062 - 590 = 472 cf
TREATMENT VOLUME ELEV.= 95.75 + (472-379)(0.25)/(575-379)
= 95.75 + 0.12
= 95.87 ft. NGVD (@ Start of Stage 2)

Ht = 10.0 + 0.87 = 10.87 ft (Equation 26-9)
Fy = 10.0/10.87 = 0.92 (Equation 26-7)
L/W = 24/12 = 2.00

From Figure 26-6: Fx=5.20 (For f=0.2, L/W=2.00 and Fy=0.92)
H = 0 ft
D = 0 + 10/2 = 5.0 ft (Equation 26-8)
t = $(12 \text{ ft})^2/(4)(100 \text{ ft/day})(5.0 \text{ ft})(5.20)^2$ (Equation 26-10)
= 0.003 days

TOTAL RECOVERY TIME= 0.120 + 0.003 = 0.123 days = 2.95 hours

BASIN "C-1" (WRA "C-1")
DRAINAGE AREA = 14.31 ac.

ON-LINE TREATMENT SYSTEM
f=0.2; Kvs=40 ft/day; Kh=80 ft/day; FS=2.0
BOTTOM ELEV.= 90.0 ft. NGVD
SEASONAL HIGH GWT ELEV.= 85.0 ft. NGVD
IMPERVIOUS (CONFINING) LAYER ELEV.= 85.0 ft. NGVD
REQUIRED TREATMENT VOLUME= 24,479 cf

TREATMENT VOLUME ELEV.= 91.25 + (24479-22030)(0.25)/(26876-22030)
= 91.25 + 0.13 = 91.38 ft. NGVD

I. STAGE ONE INFILTRATION VOLUME AND RECOVERY:

BOTTOM AREA= 16,160 sf
Vu = 16,160sf(5ft)(0.20)= 16,160 cf (Equation 26-3)
Kvu = 2/3(Kvs)= 2/3(40)= 26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day /2 = 13.33 ft/day (Equation 26-1)
tsat= (5ft)(0.20)/13.33 ft/day = 0.075 days (Equation 26-2)

II. STAGE TWO INFILTRATION VOLUME AND RECOVERY:

Vs = Vt - Vu = 24,479 - 16,160 = 8,319 cf
TREATMENT VOLUME ELEV.= 90.25 + (8319-4113)(0.25)/(8372-4113)
= 90.25 + 0.25
= 90.50 ft. NGVD (@ Start of Stage 2)

Ht = 5.0 + 0.50 = 5.50 ft (Equation 26-9)
Fy = 5/5.5 = 0.91 (Equation 26-7)
L/W = 120/120 = 1.00

From Figure 26-6: Fx=6.20 (For f=0.2, L/W=1.00 and Fy=0.91)
H = 0 ft
D = 0 + 5/2 = 2.5 ft (Equation 26-8)
t = $(120 \text{ ft})^2/(4)(80 \text{ ft/day})(2.50 \text{ ft})(6.20)^2$ (Equation 26-10)
= 0.468 days

TOTAL RECOVERY TIME= 0.075 + 0.468 = 0.543 days = 13.03 hours

BASIN "C-2" (WRA "C-2")
DRAINAGE AREA = 12.06 ac.

ON-LINE TREATMENT SYSTEM
f=0.2; Kvs=40 ft/day; Kh=80 ft/day; FS=2.0
BOTTOM ELEV.= 90.50 ft. NGVD
SEASONAL HIGH GWT ELEV.= 85.0 ft. NGVD
IMPERVIOUS (CONFINING) LAYER ELEV.= 85.0 ft. NGVD
REQUIRED TREATMENT VOLUME= 18,333 cf

TREATMENT VOLUME ELEV.= 92.00 + (18333-17701)(0.25)/(21208-17701)
= 92.00 + 0.05 = 92.05 ft. NGVD

I. STAGE ONE INFILTRATION VOLUME AND RECOVERY:

BOTTOM AREA= 9,900 sf
Vu = 9,900sf(5.5ft)(0.20)= 10,890 cf (Equation 26-3)
Kvu = 2/3(Kvs)= 2/3(40)= 26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day /2 = 13.33 ft/day (Equation 26-1)
tsat= (5.5ft)(0.20)/13.33 ft/day = 0.083 days (Equation 26-2)

II. STAGE TWO INFILTRATION VOLUME AND RECOVERY:

Vs = Vt - Vu = 18,333 - 10,890 = 7,443 cf
TREATMENT VOLUME ELEV.= 91.00 + (7443-5264)(0.25)/(8135-5264)
= 91.00 + 0.19
= 91.19 ft. NGVD (@ Start of Stage 2)

Ht = 5.5 + 0.69 = 6.19 ft (Equation 26-9)
Fy = 5.5/6.19 = 0.89 (Equation 26-7)
L/W = 250/32 = 7.81

From Figure 26-6: Fx=3.35 (For f=0.2, L/W=7.81 and Fy=0.89)
H = 0 ft
D = 0 + 5.5/2 = 2.75 ft (Equation 26-8)
t = $(32 \text{ ft})^2/(4)(80 \text{ ft/day})(2.75 \text{ ft})(3.35)^2$ (Equation 26-10)
= 0.104 days

TOTAL RECOVERY TIME= 0.083 + 0.104 = 0.187 days = 4.49 hours

BASIN "C-3" (WRA "C-3")
DRAINAGE AREA = 3.69 ac.

ON-LINE TREATMENT SYSTEM
f=0.2; Kvs=40 ft/day; Kh=80 ft/day; FS=2.0
BOTTOM ELEV.= 90.0 ft. NGVD
SEASONAL HIGH GWT ELEV.= 85.0 ft. NGVD
IMPERVIOUS (CONFINING) LAYER ELEV.= 85.0 ft. NGVD
REQUIRED TREATMENT VOLUME= 7,812 cf

TREATMENT VOLUME ELEV.= 93.25 + (7812-7504)(0.25)/(8466-7504)
= 93.25 + 0.08 = 93.33 ft. NGVD

I. STAGE ONE INFILTRATION VOLUME AND RECOVERY:

BOTTOM AREA= 880 sf
Vu = 880sf(5ft)(0.20)= 880 cf (Equation 26-3)
Kvu = 2/3(Kvs)= 2/3(40)= 26.67 ft/day (Equation 26-5)
Id = 26.67 ft/day /2 = 13.33 ft/day (Equation 26-1)
tsat= (5ft)(0.20)/13.33 ft/day = 0.075 days (Equation 26-2)

II. STAGE TWO INFILTRATION VOLUME AND RECOVERY:

Vs = Vt - Vu = 7,812 - 880 = 6,932 cf

TREATMENT VOLUME ELEV.= 93.00 + (6932-6598)(0.25)/(7504-6598)
= 93.00 + 0.09
= 93.09 ft. NGVD (@ Start of Stage 2)

Ht = 5.0 + 3.09 = 8.09 ft (Equation 26-9)
Fy = 5/8.09 = 0.62 (Equation 26-7)
L/W = 70/15 = 4.67

From Figure 26-6: Fx=1.05 (For f=0.2, L/W=4.67 and Fy=0.62)
H = 0 ft
D = 0 + 5/2 = 2.50 ft (Equation 26-8)
t = $(15\ ft)^2/(4)(80\ ft/day)(2.50\ ft)(1.05)^2$ (Equation 26-10)
= 0.255 days

TOTAL RECOVERY TIME= 0.075 + 0.255 = 0.330 days = 7.92 hours

C. COMPUTER SIMULATIONS:

C1. PROGRAM DESCRIPTION

Stormwater runoff simulations for the project were achieved with "Watershed Modeling", (Version 7.0S), a computer program by Engineering Data Systems Corporation, EDSC. The program calculates the peak discharge and runoff hydrograph for the pre and the post-development conditions using the Santa Barbara Urban Hydrograph method.

C2. FLOOD ROUTING SUMMARIES

EDSC's "Watershed Modeling" also combines and routes the computed hydrographs to simulate the peak attenuation effects of the proposed WRA's on the post-development discharge rates and volumes. The EDSC program produces a complete summary of basin inputs and resulting discharge rates (cfs), discharge volumes (ac-ft), WRA Stage-Storage-Discharge relationships and peak WRA elevations. Note that soil infiltration was not considered in the storm routing analysis. The EDSC results, compiled into a Hydrograph Summary Table, and the Hydrograph Flowchart used for the computer model are included on the following pages for your review. The complete EDSC analysis, including the appropriate hydrograph outputs, are included in **Appendix "D"**.

BASIN	AREA	CN	T_c	PEAK RATE	DISCH. VOLUME	TIME to PEAK
PRE "A"	4.15	49	25.27	7.27	1.43	
PRE "B"	34.25	49	32.67	52.56	11.84	
PRE "C"	35.52	49	22.98	65.39	12.28	
"A-1"	4.86	60	34.47	3.37	1.43	61.08
"B-1"	13.40	60	33.60	6.19	3.41	61.50
"B-2"	12.68	60	25.61	---	---	---
"B-3"	0.72	60	10.00	29.45	5.31	60.17
TOTAL "B"	26.80	--	---	35.64	8.72	---
"C-1"	14.31	62	31.45	4.08	3.29	62.33
"C-2"	12.06	60	26.33	20.62	4.41	60.25
"C-3"	3.69	67	10.00	14.16	1.48	60.00
TOTAL "C"	30.06	--	--	38.86	9.18	---

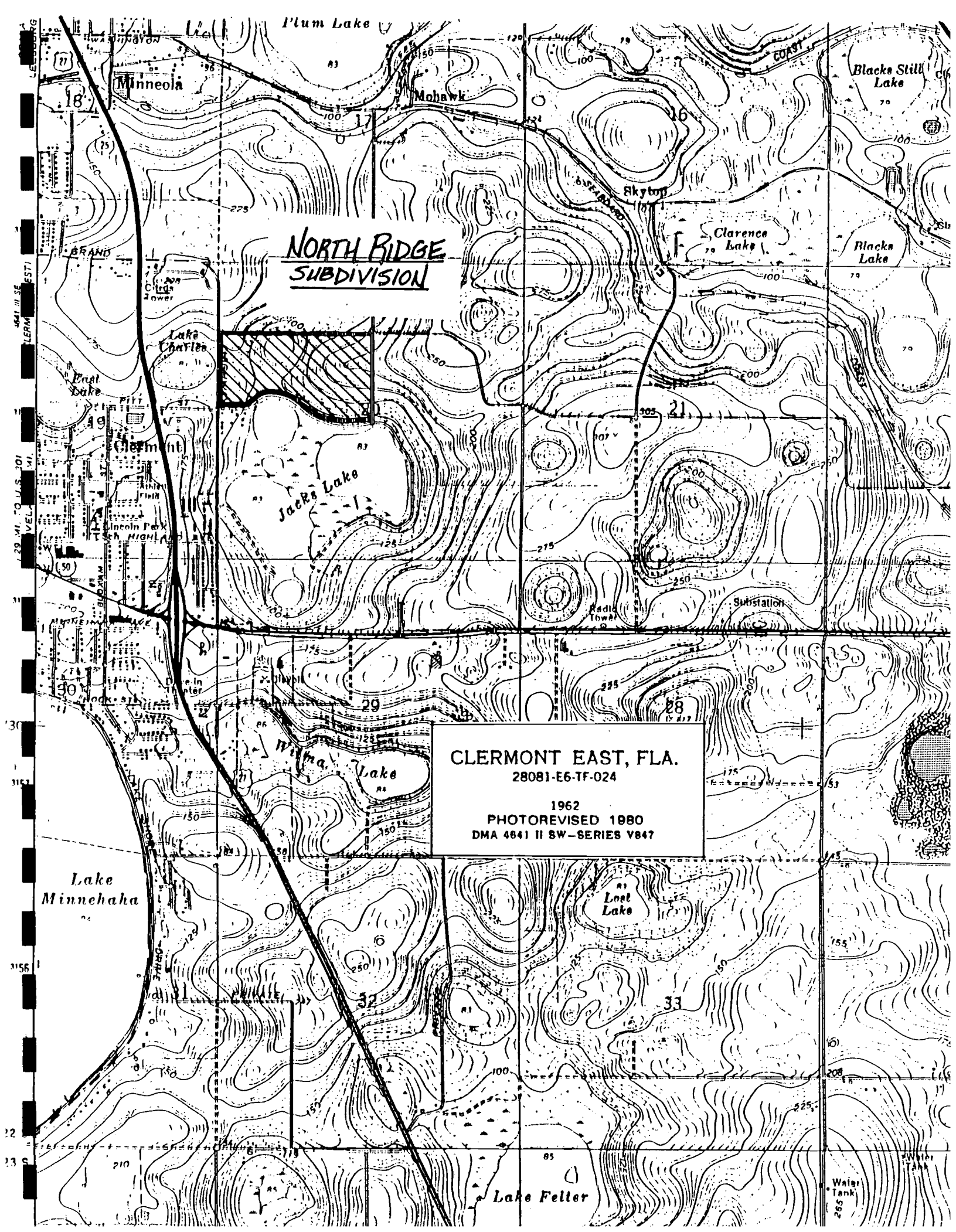
BASIN HYDROGRAPH SUMMARY TABLE

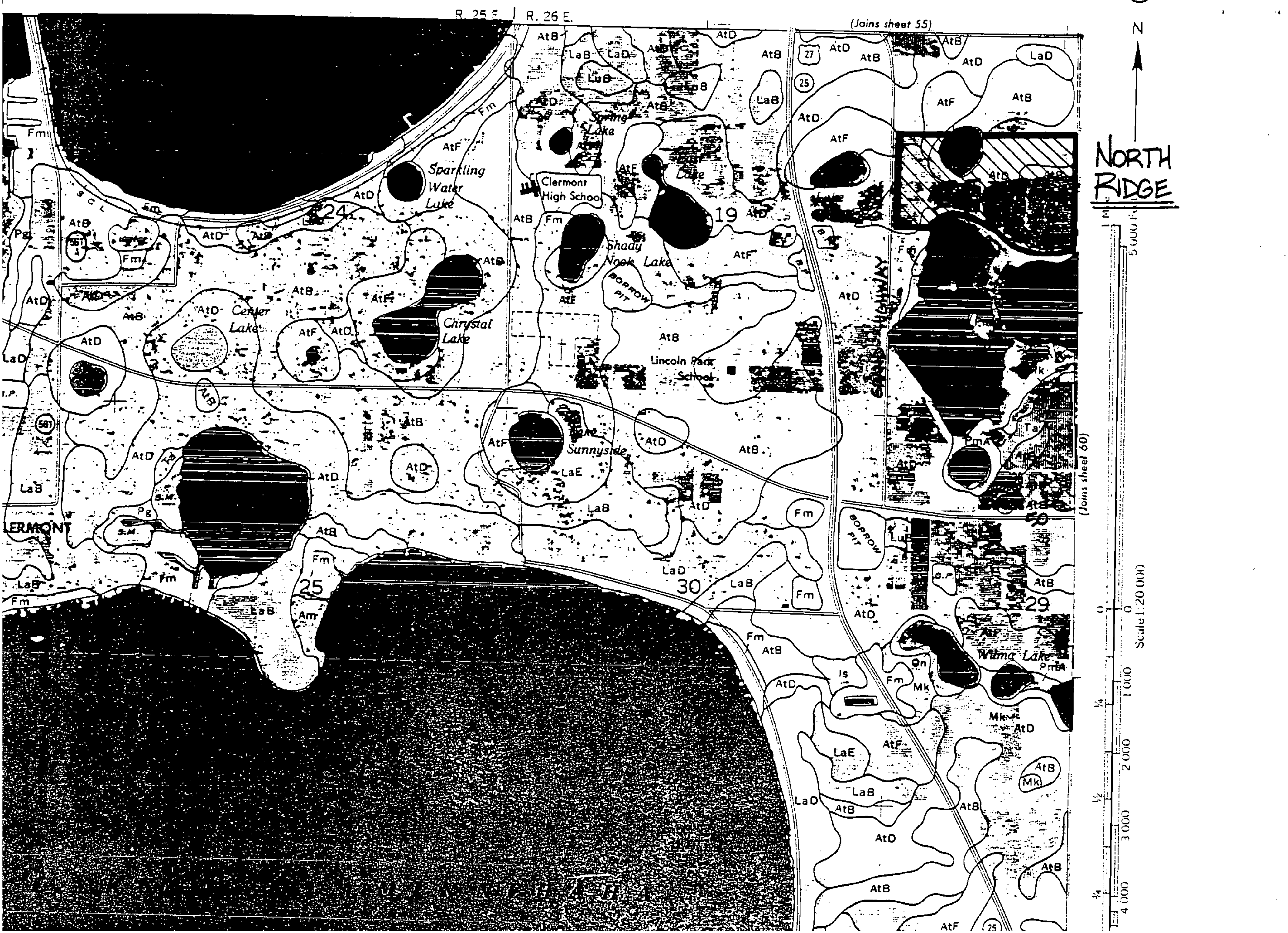
D. PROJECT SUMMARY

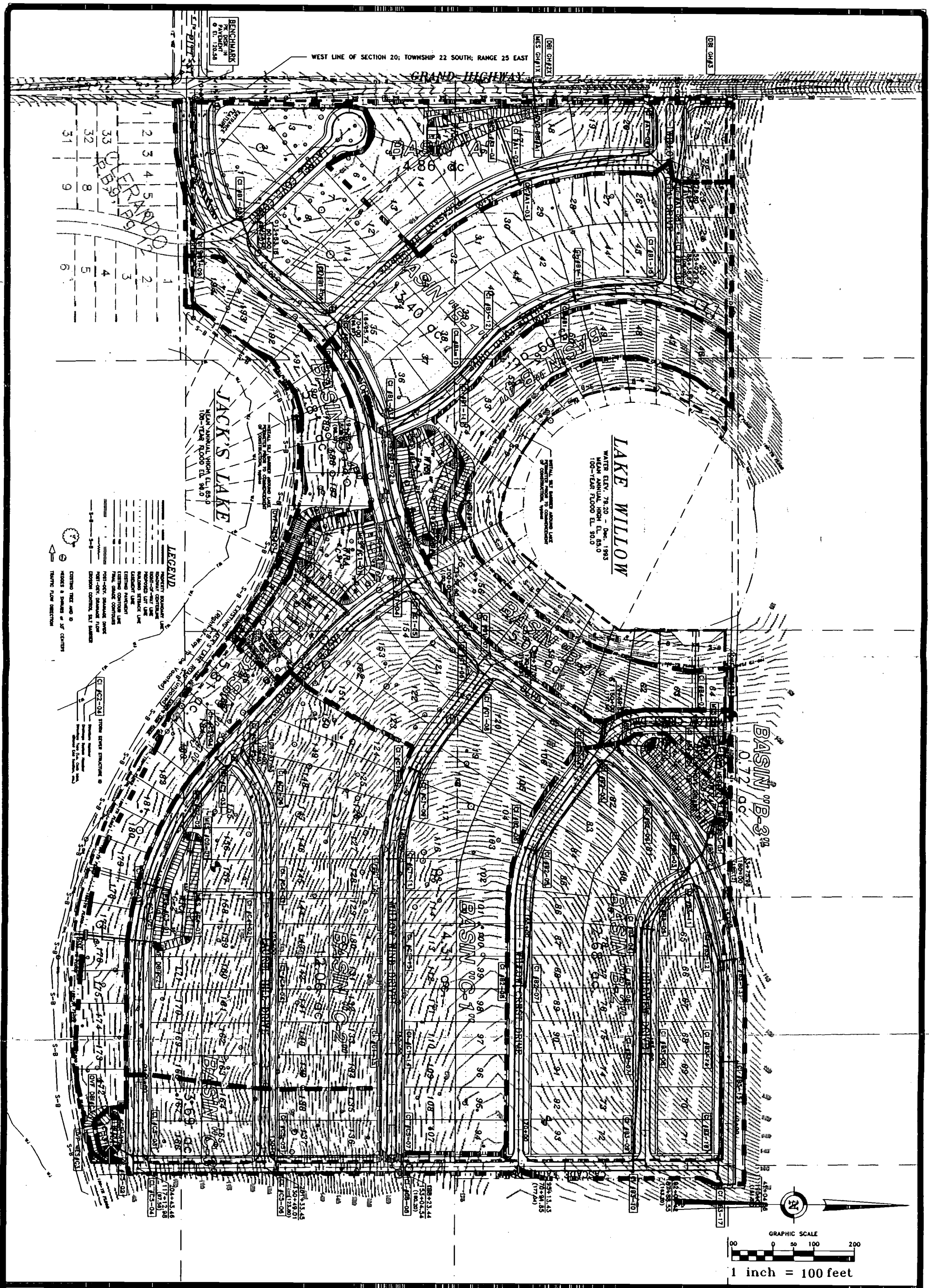
The preceding analysis demonstrates that the stormwater retention volumes for this project will meet or exceed the volumes required for 40C-42 pollution abatement for the entire project and will limit post-development peak discharge rates and volumes to pre-development peak rates. When constructed as designed, this project will be consistent with the objectives and policies of the City of Clermont, the Lake County Pollution Control Department and the St. Johns River Water Management District.

APPENDIX "A"

MAPS AND PROJECT DETAILS


NORTH RIDGE
SUBDIVISION
CLERMONT EAST, FLA.
28081-E6-TF-024
1962
PHOTOREVISED 1980
DMA 4641 II SW—SERIES V847
Plum Lake
Minneola
Mohawk
Skytop
Clarence Lake
Blacks Still Lake
Blacks Lake
Lake Charles
East Lake
Clermont
Jacks Lake
Lincoln Park
Substation
Radio Tower
Wilma Lake
Lake Minnehaha
Lost Lake
Lake Felter
Water Tank


59
N
NORTH RIDGE
R. 25 E. | R. 26 E.
(Joins sheet 55)
(Joins sheet 60)
Sparkling Water Lake
Clermont High School
Spring Lake
Shady Nook Lake
Center Lake
Chrystal Lake
Lincoln Park School
Sunnyside
Wilma Lake
BORROW PIT
CLERMONT
24
19
25
30
29
Scale 1:20 000
0 1 000 2 000 3 000 4 000 5 000 Feet
0 ¼ ½ ¾ 1 Mile



MASTER DRAINAGE PLAN

SHEET OF

DRAWN BY: R.Mc
CHECKED BY:

DATE: August 1994
SCALE: 1" = 100'
JOB NO. 93-028

McCoy & Associates
CONSULTING ENGINEERS
P.O. Box 121374
721 West Avenue
Clermont, Florida 34712-1374
(904) 394-5756
(904) 394-1305 FAX

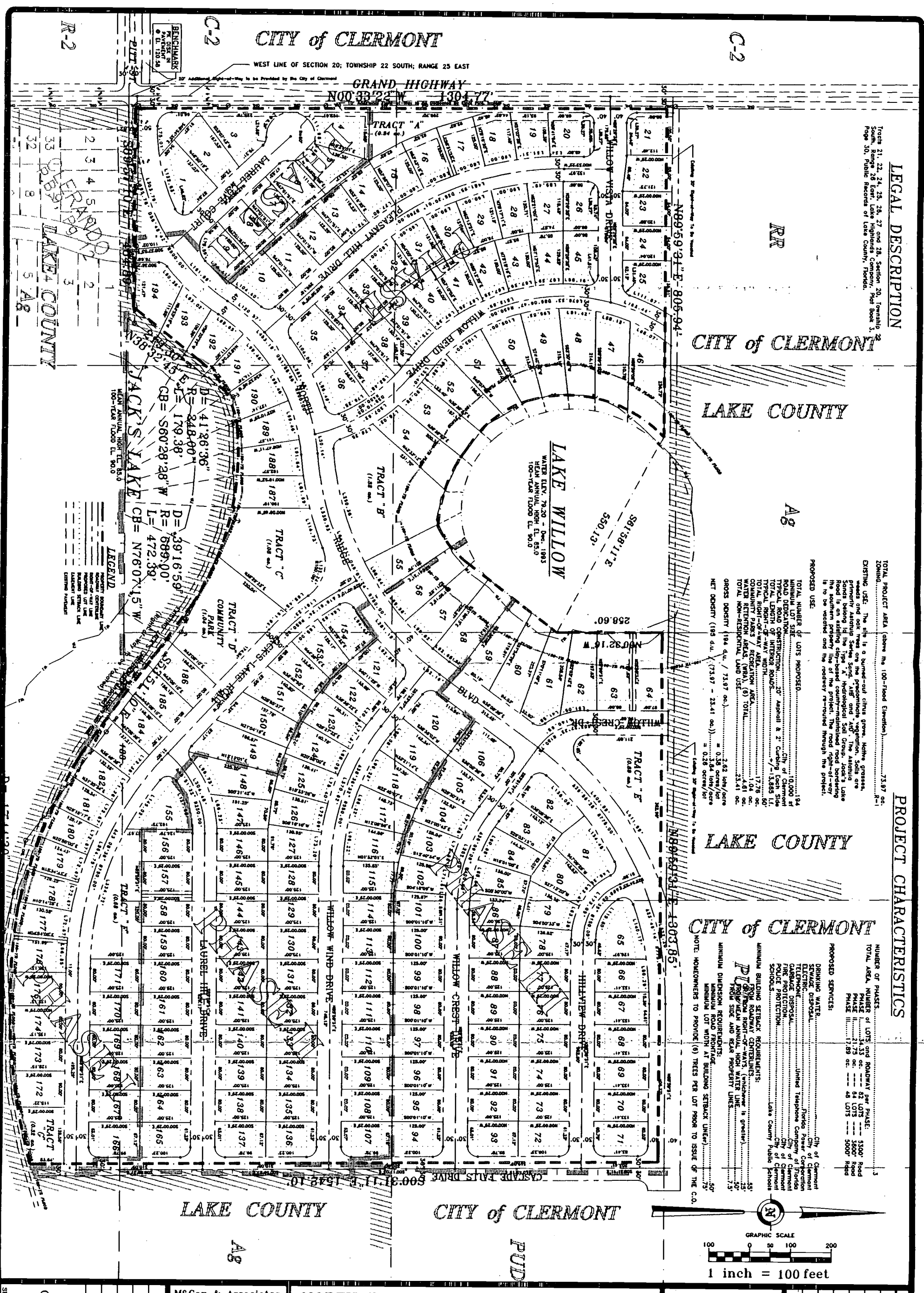
NORTH RIDGE RESIDENTIAL SUBDIVISION

Sec. 20; Twp. 22 S; Rge. 26 E, City of Clermont, Lake County, Florida

OWNER / DEVELOPER: Star Development, Inc.
7829 Greenbriar Parkway Orlando, Florida 32819
TEL: (407) 354-0055 FAX: (407) 354-0056

Florida Geodetic Surveying, Inc.
P.O. Box 121442
719 West Avenue
Clermont, Florida 34712-1442
(904) 394-1061
(904) 394-1305 FAX

REVISIONS DATE



LEGAL DESCRIPTION

Tracts 21, 22, 24, 25, 26, 27 and 28, Section 20, Township 22 South, Range 26 East, Lake Highlands Company, Plat Book 3, Page 30, Public Records of Lake County, Florida.

PROJECT CHARACTERISTICS

TOTAL PROJECT AREA (above the 100-Flood Elevation).....73.97 ac.
ZONING.....R-1

EXISTING USE: The site is a burned-out citrus grove. Native grasses, weeds and oak trees are the predominate vegetation. Soils are primarily Astatula Series Sand, A/B and A/D. The Astatula Sand belongs to the Type 'A' Hydrological Soil Group. Jack's Lake Road is an existing clay-based county-maintained road bordering the southern property line of the project. The road right-of-way is to be vacated and the roadway re-routed through the project.

PROPOSED USE:

TOTAL NUMBER OF LOTS PROPOSED.....194
MINIMUM LOT SIZE.....10,000 sf
ROAD DEDICATION.....City of Clermont
TYPICAL ROAD CONSTRUCTION.....20' Asphalt & 2' Curbing Each Side
TOTAL LENGTH OF INTERIOR ROADS.....+/- 13,885 l.f.
TYPICAL RIGHT-OF-WAY WIDTH.....60'
COMMUNITY PARKS / RECREATION AREA.....17.76 ac.
WATER RETENTION AREAS, (WRA), (6) TOTAL.....1.04 ac.
TOTAL NON-RESIDENTIAL LAND USE.....4.61 ac.
.....23.41 ac.

GROSS DENSITY (194 d.u. / 73.97 ac.).....= 2.62 lots/acre
.....= 0.38 acres/lot
NET DENSITY (193 d.u. / (73.97 - 23.41 ac.)).....3.84 lots/acre
.....= 0.26 acres/lot

NUMBER OF PHASES.....3
TOTAL AREA, NUMBER of LOTS and ROADWAY per PHASE:
PHASE I.....34.33 ac. --- 82 LOTS --- 5300' Road
PHASE II.....21.75 ac. --- 64 LOTS --- 3800' Road
PHASE III.....17.89 ac. --- 48 LOTS --- 5000' Road

PROPOSED SERVICES:

DRINKING WATER.....City of Clermont
SEWAGE DISPOSAL.....City of Clermont
ELECTRIC.....Florida Power Corporation
TELEPHONE.....United Telephone Company of Florida
GARBAGE DISPOSAL.....City of Clermont
FIRE PROTECTION.....City of Clermont
POLICE PROTECTION.....City of Clermont
SCHOOLS.....Lake County Public Schools

MINIMUM BUILDING SETBACK REQUIREMENTS:
FROM ROADWAY CENTERLINES.....55'
OR FROM RIGHT-OF-WAYS, (whichever is greater).....25'
FROM MEAN ANNUAL HIGH WATER LINE.....50'
FROM SIDE AND REAR PROPERTY LINES.....7.5'

MINIMUM DIMENSION REQUIREMENTS:
MINIMUM ROAD FRONTAGE.....50'
MINIMUM LOT WIDTH AT BUILDING SETBACK LINE).....75'

NOTE: HOMEOWNERS TO PROVIDE (6) TREES PER LOT PRIOR TO ISSUE OF THE C.O.

GRAPHIC SCALE
100 0 50 100 200
1 inch = 100 feet

MASTER GEOMETRY PLAN

SHEET 1 OF 1

DRAWN BY: R.Mc
CHECKED BY:
DATE: August 1994
SCALE: 1" = 100'
JOB NO.: 93-028
DESCRIPTION

McCoy & Associates
CONSULTING ENGINEERS
P.O. Box 121374
721 West Avenue
Clermont, Florida 34712-1374
(904) 394-5756
(904) 394-1305 FAX

NORTH RIDGE RESIDENTIAL SUBDIVISION

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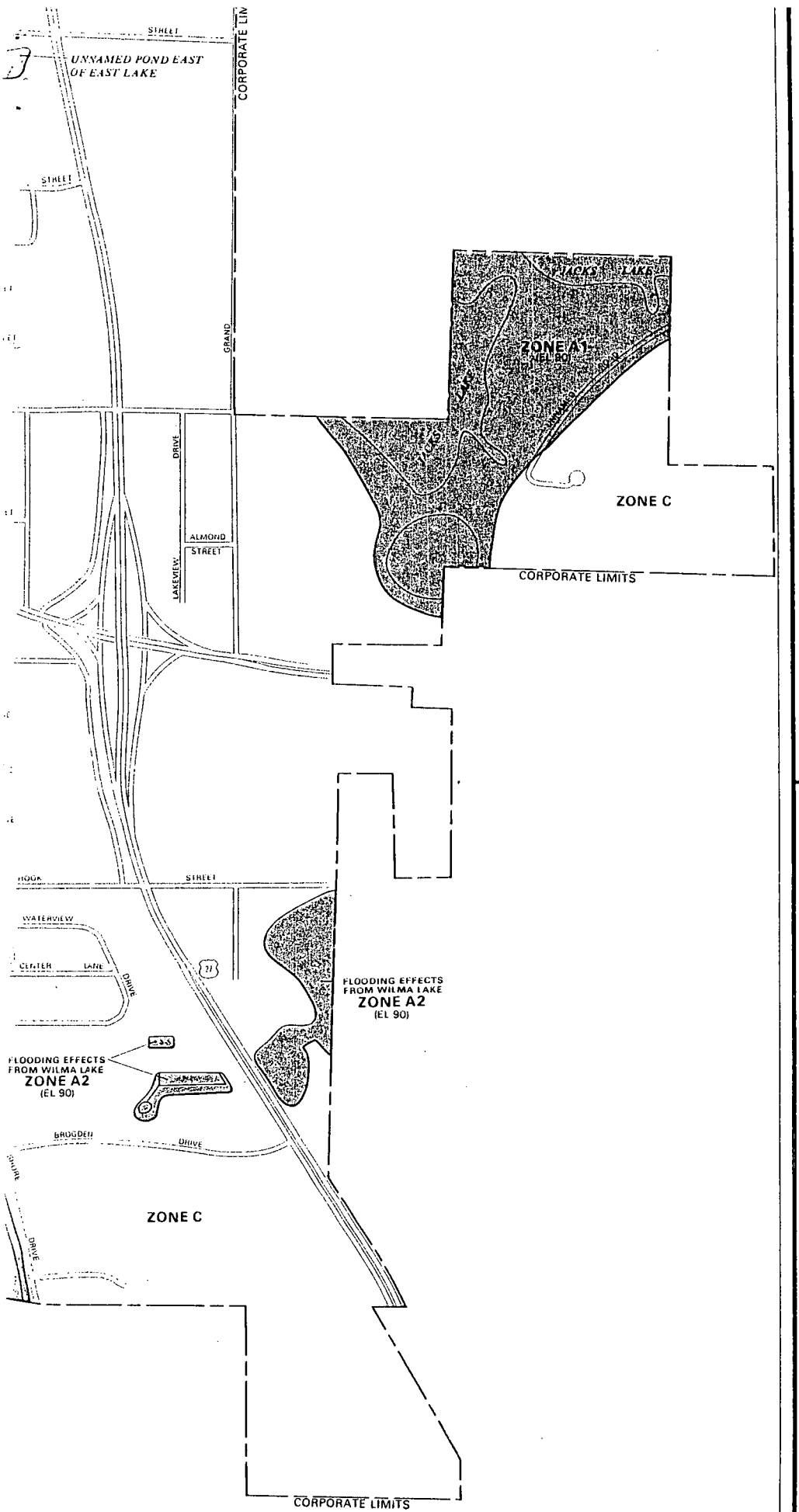
(904) 394-1061
(904) 394-1305 FAX

REVISIONS | DATE



INITIAL IDENTIFICATION:
MAY 31,1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
JANUARY 30,1976

FLOOD INSURANCE RATE MAP EFFECTIVE:
AUGUST 15,1984

Refer to the FLOOD INSURANCE RATE MAP EFFECTIV date shown on this map to determine when actuarial rates apply structures in the zones where elevations or depths have be established.

To determine if flood insurance is available in this communit contact your insurance agent, or call the National Flood Insuran Program at (800) 638-6620.

APPROXIMATE SCALE

600 0 600 FEET

NATIONAL FLOOD INSURANCE PROGI

FIRM

FLOOD INSURANCE RATE MA

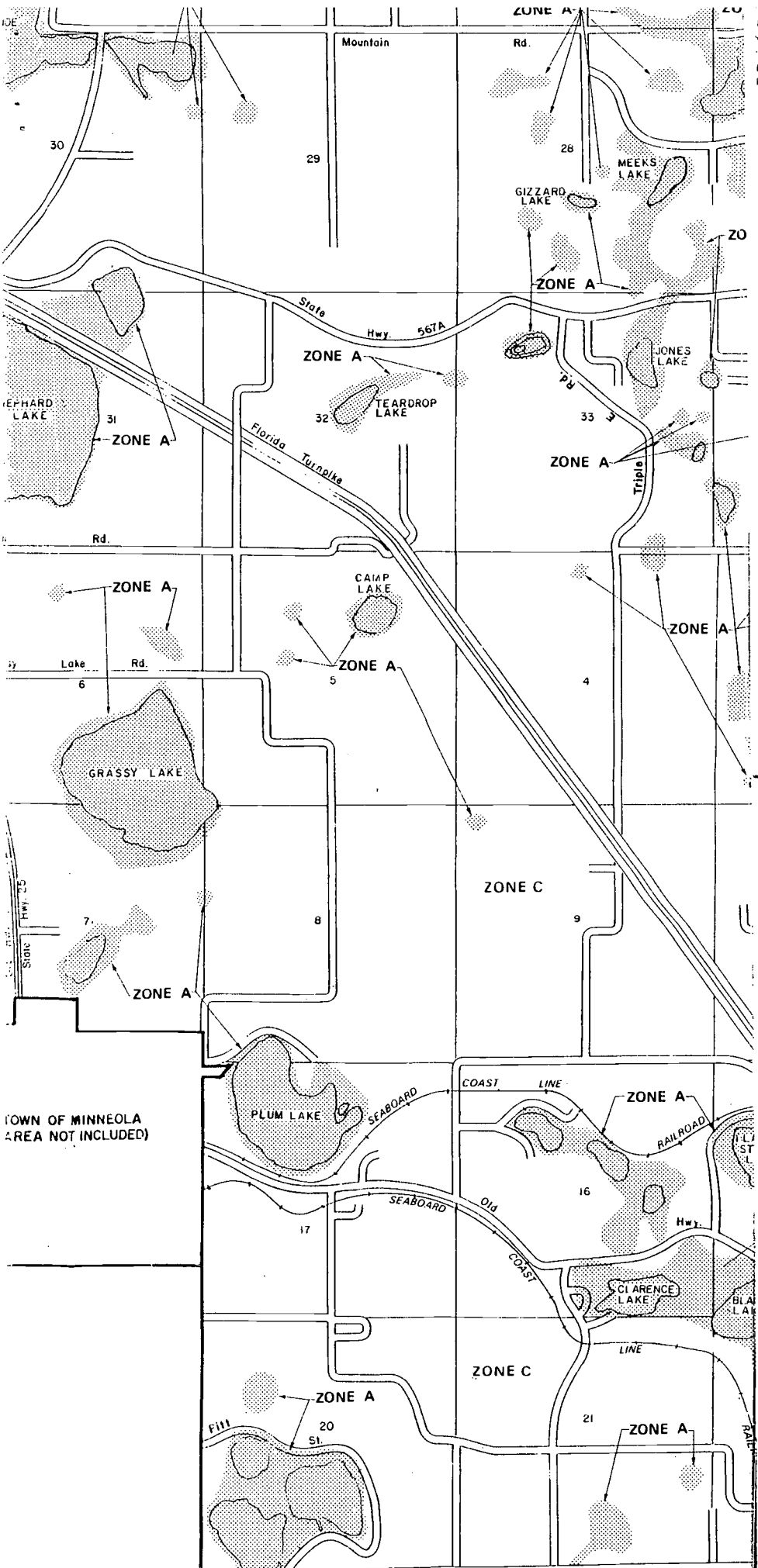
CITY OF
CLERMONT, FLORIDA
LAKE COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBI
120133 0001

EFFECTIVE DAT
AUGUST 15, 198

Federal Emergency Management Age



This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
MAY 26, 1978

FLOOD INSURANCE RATE MAP EFFECTIVE:
APRIL 1, 1982

For description of Elevation Reference Marks see Panel 120421 0425 B

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

LAKE COUNTY, FLORIDA
(UNINCORPORATED AREAS)

PANEL 325 OF 425

COMMUNITY-PANEL NUMBER
120421 0325 B

EFFECTIVE DATE:
APRIL 1, 1982

Federal Emergency Management Agency

APPENDIX "B"

SOIL PERMEABILITY TEST RESULTS

LJ Nodarse
& Associates, Inc.

June 22, 1994
Project No. 94G-0314

TO: CENTRE CORP, INC.
c/o Rick E. McCoy, P.E.
721 West Avenue
Clermont, Florida 34712

RE: Soil and Groundwater Evaluation for Roadways/Ponds
North Ridge PUD - Residential Subdivision, Lake County, Florida

---

Dear Mr. McCoy:

In accordance with your request, L.J. Nodarse & Associates, Inc. (LJN) has conducted a shallow soil and groundwater exploration and evaluation at the planned North Ridge Development in Lake County, Florida.

The following report represents the results of our field exploration, evaluation of the shallow groundwater conditions, and recommendations for roadway construction. In summary, upon normal site preparation, the encountered subsurface conditions are considered suitable for the proposed development.

We appreciate the opportunity to provide our services on this project and trust that the information presented is sufficient for your immediate needs. If you have any questions concerning the contents of this report, or if we may be of further service, please feel free to call.

Sincerely,

L.J. NODARSE & ASSOCIATES, INC.

Leila Jamnal Nodarse, P.E.
President
FL Registration No. 38675
6/22/94

Gabi Stephan
Senior Project Engineer

94G-0314.GWE:kk

SITE AND PROJECT DESCRIPTION

The project site is located on the north side of Grand Highway, north of Jacks Lake in Lake County, Florida. North Ridge is a single family residential development consisting of about 200 lots. Several stormwater retention ponds are planned within the development . Sewer services are to be provided by Lake County.

PURPOSE AND SCOPE

The purpose of our investigation was to generally define the shallow soil and groundwater conditions within the proposed roadways and ponds of the North Ridge development and make recommendations for roadway and pond design. Borings were made along the proposed roadway alignment and within several of the ponds for the purpose of identifying the shallow soil and groundwater conditions. Recommendations for roadway design are provided.

FIELD EXPLORATION AND LABORATORY TESTING

Soil Borings

The subsurface soil and groundwater conditions at this site were explored by performing six (6) manual auger borings in the proposed roadways and pond areas. The approximate soil boring locations are shown on Sheet 1. Representative soil samples of each strata were obtained during the field exploration program and returned to our laboratory for visual classification and testing. Measurements of the shallow groundwater table were attempted in the boreholes prior to filling.

Soil Classification/Laboratory Tests

Representative soil samples obtained during the field exploration program were reviewed in the laboratory for visual stratification and classification by a geotechnical engineer. The soil stratigraphy for each soil boring is presented on the attached soil profiles (Sheet 2). The borings are presented on a depth below ground surface basis.

Permeability tests were conducted on undisturbed samples retrieved from five (5) of the boring locations. Falling head test methods in the vertical direction (KV) were obtained. The test results are presented adjacent to the soil profiles on Sheet 2.

SOIL AND GROUNDWATER CONDITIONS

Site Stratigraphy

The soils encountered throughout the site generally consist of a topsoil cover underlain by light brown fine sand (Stratum 1). Two of the borings AB-1 & AB-2 encountered a light brown clayey fine sand (Stratum 2).

Shallow Groundwater Conditions

Attempts to record the depth to the shallow groundwater table at each test boring were made. However, groundwater levels were not encountered within 10 foot depths at each of the borehole locations. Based on the boring depths, the time of our investigation (June, 1993) and antecedent rainfall conditions, we estimate that normal seasonal high water levels will occur below a depth of 10 feet, although some temporary perching may occur above clayey soils (Stratum 2).

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on the project characteristics previously described, the data obtained in our field exploration and our experience with similar subsurface conditions and construction types. If subsurface conditions different from those disclosed by the borings are encountered during construction, we should be notified immediately so that we might review the following recommendations in light of such changes.

General Roadway Subgrade Preparation: The initial step in routine roadway subgrade preparation should be the complete removal of all topsoil, trees, major root systems and other deleterious materials from beneath and to 5 feet beyond proposed pavement areas.

After this initial stripping process, the entire site should be inspected by a Geotechnical Engineer. At that time, the exposed roadway subgrade should be proofrolled using a large vibratory roller (Dynapac CA-25 or equivalent). Proofrolling of the pavement areas should consist of at least five (5) overlapping five passes in each of two perpendicular directions and should be observed by a Geotechnical Engineer. The purposes of the proofrolling will be to detect any areas where unsuitable soils are present as well as to densify the near-surface loose soils for support of shallow foundations. Materials which yield excessively during the proofrolling should be undercut and replaced with well-compacted structural fill. The Geotechnical Engineer, based on his observations, can recommend the nature and extend of any remedial work.

Proofrolling of the pavement areas should continue for the required number of passes and until the soil at a depth of 12 inches below the compaction surface has attained a minimum of 95% of the soil's modified Proctor maximum dry density as determined by ASTM Specification D-1557 (AASHTO T-180). In-place density tests should be performed by an experienced geotechnical engineering technician working under the direction of a registered Geotechnical Engineer to verify the required degree of compaction. A test frequency of one test per 300 lineal feet of alignment is recommended.

Fill Placement: After the site has been proofrolled and accepted by the Geotechnical Engineer, any fill required to bring the site to final grade may be placed and properly compacted. All fill should be inorganic, non-plastic, granular soil (clean sands). The fill should be placed in level lifts not to exceed 12 inches loose thickness if the compactor recommended above to proofroll the site is also used to compact the fill. The fill should be compacted to a minimum of 95% of the soil's modified Proctor maximum dry density as determined by ASTM Specification D-1557. In-place density tests should be performed on each lift by an experienced engineering technician working under the direction of a registered Geotechnical Engineer to verify that the recommended degree of compaction has been achieved. We suggest a minimum testing frequency of one test per lift per 2500 square feet of area within structural limits and for every 5000 square feet of area in proposed pavement areas. This fill should extend a minimum of 5 feet beyond building lines to prevent possible erosion or undermining of footing bearing soils. Further, fill slopes should not exceed 2 horizontal to 1 vertical. All fill placed in utility line trenches and adjacent to footings beneath slabs on grade should also be properly placed and compacted to the specifications stated above. However, in these restricted working areas, compaction should be accomplished with lightweight, hand-guided compaction equipment and lift thicknesses should be limited to a maximum of 4 inches loose thickness.

Pavement Subgrade: Although a comprehensive pavement design is not within the scope of this study, we recommend that the 12-inch soil subgrade beneath the pavement base be compacted to a minimum density of 98% of the soil's modified Proctor maximum dry density (ASTM D-1557). Based on the soil and groundwater conditions encountered in the borings, either a limerock or soil-cement base should be suitable at this site depending on final grades. A limerock base is recommended if the vertical separation between the seasonal high groundwater elevation and pavement base bottom elevation is between the seasonal high groundwater elevation and pavement base bottom elevation is at least 24 inches. This separation should be at least 12 inches for a soil-cement base. If these separations cannot be provided, pavement underdrains would be required. If a limerock base is used, the soil subgrade should be stabilized as required to achieve a minimum Limerock Bearing Ratio (LBR) of 40. Stabilized of sub-base below soil-cement base courses is not required. We would be happy to provide more detailed

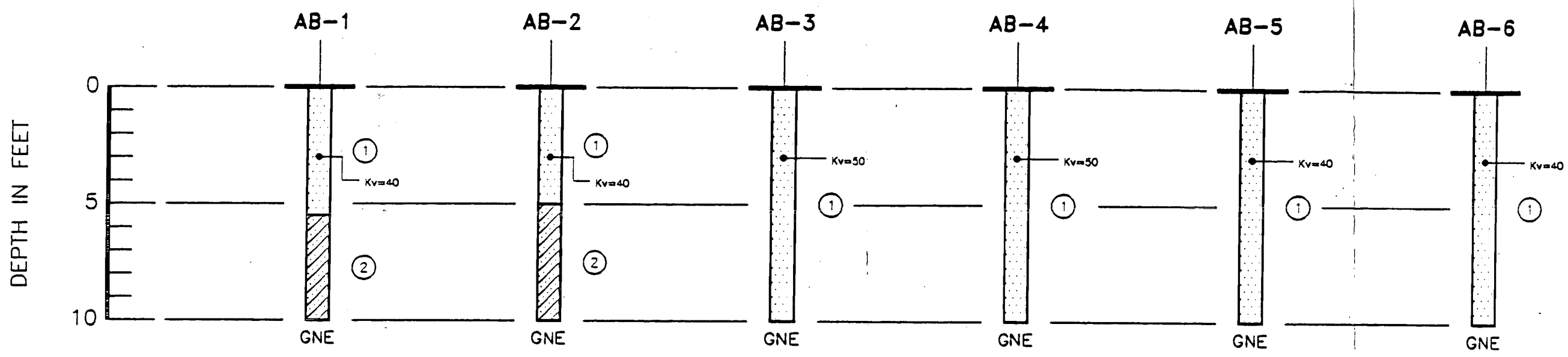
pavement design recommendations, if requested, after final traffic loading and site grading information becomes available.

Stormwater Pond: The borings in the pond areas encountered fine sand (SP). Groundwater was not encountered within a depth of 10 feet. Permeability tests performed on the fine sand stratum resulted in values of 40 to 50 feet per day. Based on these results, properly designed dry bottom ponds should perform satisfactorily. LJN would be pleased to perform a stormwater volume recovery analysis for these ponds if you so desire.

Plan Review

As soon as engineering plans are available, we would like the opportunity to review these with particular emphasis on roadway grading to ensure that the recommendations made in this report have been appropriately considered.

APPENDIX



SOIL PROFILES

SCALE IN FEET

0 1.25 2.5 5

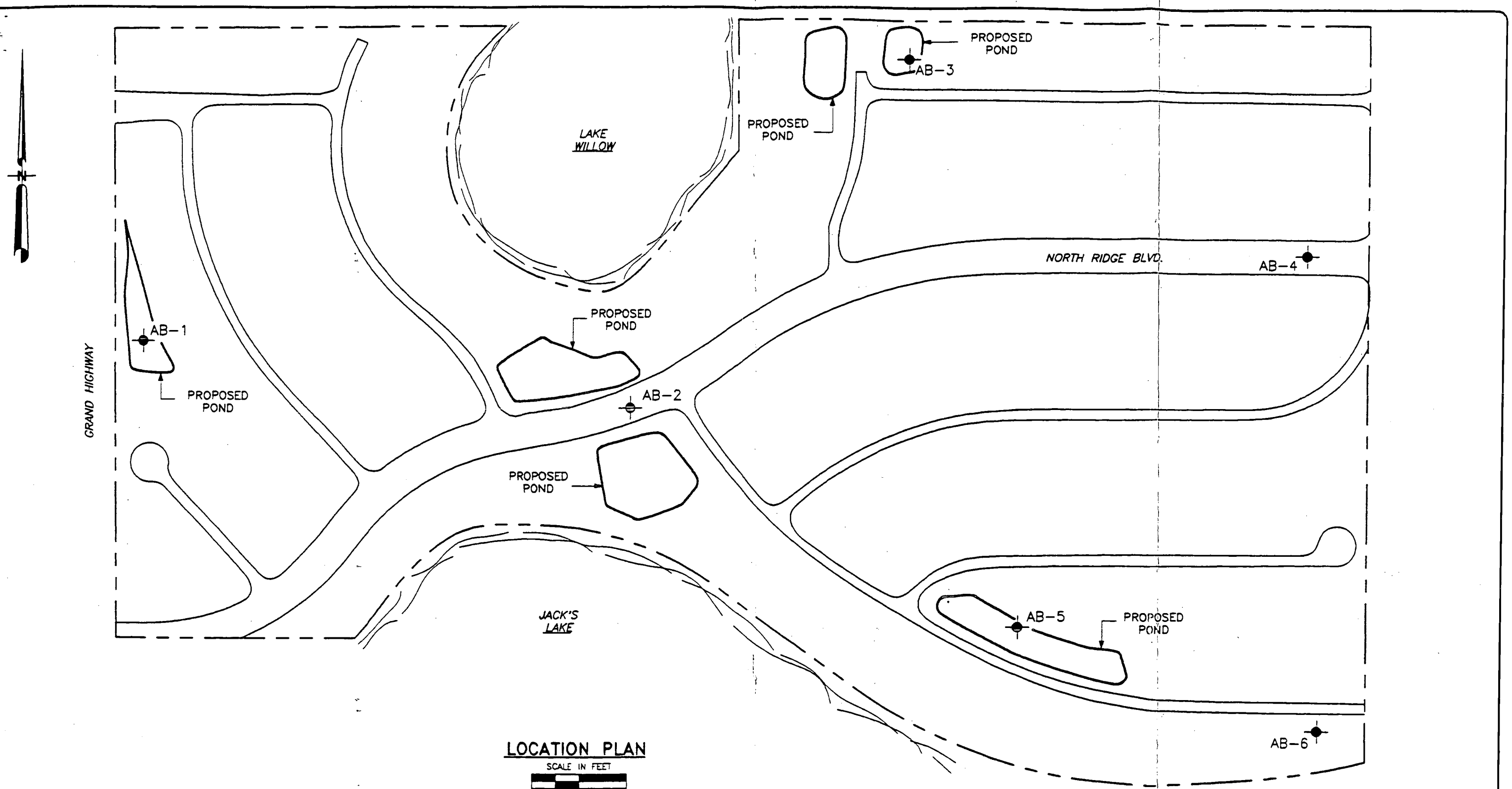
LEGEND

①	LIGHT BROWN FINE SAND, (SP)
②	LIGHT BROWN CLAYEY FINE SAND, (SC)
(SP)	UNIFIED SOIL CLASSIFICATION GROUP SYMBOL AS DETERMINED BY VISUAL EXAMINATION
GNE	GROUNDWATER NOT ENCOUNTERED TO DEPTH OF BORING
Kv	COEFFICIENT OF VERTICAL PERMEABILITY (FT./DAY)

GEOTECHNICAL ENGINEERING EVALUATION
PROPOSED NORTH RIDGE
SUBDIVISION
LAKE COUNTY, FLORIDA

LJ Nodarse & Associates, Inc.

DRAWN:	MG	SCALE:	NOTED	PROJ. NO:	94G-0314
CHKD:	LJN	DATE:	6-20-94	SHEET:	2



LOCATION PLAN

SCALE IN FEET

0 50 100 200

LEGEND

✦ APPROXIMATE LOCATION OF AUGER BORING

GEOTECHNICAL ENGINEERING EVALUATION
PROPOSED NORTH RIDGE
SUBDIVISION
LAKE COUNTY, FLORIDA

LJ Nodarse & Associates, Inc.

DRAWN:	MG	SCALE:	NOTED	PROJ. NO:	94G-0314
CHKD:	LJN	DATE:	6-20-94	SHEET:	1

APPENDIX "C"

RETENTION VOLUME CALCULATIONS AND SUMMARIES

OUTLET STRUCTURE REPORT

RECORD NUMBER : 1
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "A-1" OVERFLOW

[RATING CURVE LIMIT]

Minimum Elevation	=	104.00 (ft)
Maximum Elevation	=	105.00 (ft)
Elevation Increment	=	0.25 (ft)

[OUTLET STRUCTURE INFORMATION]

Crest Length	=	4.00 (ft)
Crest Elevation	=	104.00 (ft)
Coefficient Cw	=	3.33000
Exponential	=	1.50000

[RECTANGULAR SUPPRESSED EQUATION]

Q = Cw*L*H^exp
H = Headwater depth above inlet control section invert, (ft)
L = Crest length, (ft)

[Culvert Weir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE	ELEVATION (ft)	FLOW (cfs)
0.25	104.25	1.66
0.50	104.50	4.71
0.75	104.75	8.65
1.00	105.00	13.32

RESERVOIR REPORT

RECORD NUMBER : 1
STORAGE TYPE : MAN STAGE/AREA

DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "A-1"

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
1.75	101.75	9283.92	12716.28	0.00
2.00	102.00	9860.34	15109.31	0.00
2.25	102.25	10436.76	17646.45	0.00
2.50	102.50	11013.19	20327.70	0.00
2.75	102.75	11589.61	23153.04	0.00
3.00	103.00	12166.03	26122.50	0.00
3.25	103.25	12742.45	29236.06	0.00
3.50	103.50	13318.87	32493.73	0.00
3.75	103.75	13895.29	35895.50	0.00
4.00	104.00	14471.71	39441.37	0.00
4.25	104.25	15048.14	43131.35	1.66
4.50	104.50	15624.56	46965.44	4.71
4.75	104.75	16200.98	50943.63	8.65
5.00	105.00	16777.40	55065.93	13.32

RESERVOIR REPORT

RECORD NUMBER : 1
STORAGE TYPE : MAN STAGE/AREA
DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "A-1"

[RATING CURVE LIMIT]

Minimum Elevation..... = 100.00 (ft)
Maximum Elevation..... = 105.00 (ft)
Elevation Increment..... = 0.25 (ft)

[STAGE STORAGE INFORMATION]

Input file = NULL
Output file = NULL

[Manual Contour Area vs. Elevation]

ELEVATION (ft)	CONTOUR AREA (sqft)
100.00	5248.97
105.00	16777.40

[STAGE DISCHARGE INFORMATION]

OUTLET STRUCTURE:
STR # : 1
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "A-1" OVERFLOW

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
0.00	100.00	5248.97	0.00	0.00
0.25	100.25	5825.39	1384.30	0.00
0.50	100.50	6401.81	2912.70	0.00
0.75	100.75	6978.23	4585.20	0.00
1.00	101.00	7554.66	6401.81	0.00
1.25	101.25	8131.08	8362.53	0.00
1.50	101.50	8707.50	10467.35	0.00

OUTLET STRUCTURE REPORT

RECORD NUMBER : 2
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "B-1" OVERFLOW

[RATING CURVE LIMIT]

Minimum Elevation	=	90.00 (ft)
Maximum Elevation	=	98.00 (ft)
Elevation Increment	=	0.25 (ft)

[OUTLET STRUCTURE INFORMATION]

Crest Length	=	8.00 (ft)
Crest Elevation	=	97.00 (ft)
Coefficient Cw	=	3.33000
Exponential	=	1.50000

[RECTANGULAR SUPPRESSED EQUATION]

Q = Cw*L*H^exp
H = Headwater depth above inlet control section invert, (ft)
L = Crest length, (ft)

[Culvert Weir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE	ELEVATION (ft)	FLOW (cfs)
7.25	97.25	3.33
7.50	97.50	9.42
7.75	97.75	17.30
8.00	98.00	26.64

RESERVOIR REPORT

RECORD NUMBER : 2
STORAGE TYPE : MAN STAGE/AREA

DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "B-1"

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
1.75	91.75	14431.06	21458.72	0.00
2.00	92.00	15050.75	25143.95	0.00
2.25	92.25	15670.44	28984.10	0.00
2.50	92.50	16290.14	32979.17	0.00
2.75	92.75	16909.83	37129.17	0.00
3.00	93.00	17529.53	41434.09	0.00
3.25	93.25	18149.22	45893.93	0.00
3.50	93.50	18768.91	50508.70	0.00
3.75	93.75	19388.61	55278.39	0.00
4.00	94.00	20008.30	60203.00	0.00
4.25	94.25	20627.99	65282.54	0.00
4.50	94.50	21247.69	70516.99	0.00
4.75	94.75	21867.38	75906.38	0.00
5.00	95.00	22487.08	81450.68	0.00
5.25	95.25	23106.77	87149.91	0.00
5.50	95.50	23726.46	93004.06	0.00
5.75	95.75	24346.16	99013.14	0.00
6.00	96.00	24965.85	105177.14	0.00
6.25	96.25	25585.54	111496.06	0.00
6.50	96.50	26205.24	117969.91	0.00
6.75	96.75	26824.93	124598.68	0.00
7.00	97.00	27444.63	131382.38	0.00
7.25	97.25	28064.32	138321.00	3.33
7.50	97.50	28684.01	145414.55	9.42
7.75	97.75	29303.71	152663.02	17.30
8.00	98.00	29923.40	160066.41	26.64

RESERVOIR REPORT

RECORD NUMBER : 2
STORAGE TYPE : MAN STAGE/AREA
DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "B-1"

[RATING CURVE LIMIT]

Minimum Elevation.....	=	90.00 (ft)
Maximum Elevation.....	=	98.00 (ft)
Elevation Increment.....	=	0.25 (ft)

[STAGE STORAGE INFORMATION]

Input file = NULL
Output file = NULL

[Manual Contour Area vs. Elevation]

ELEVATION (ft)	CONTOUR AREA (sqft)
90.00	10093.20
98.00	29923.40

[STAGE DISCHARGE INFORMATION]

OUTLET STRUCTURE:
STR # : 2
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "B-1" OVERFLOW

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
0.00	90.00	10093.20	0.00	0.00
0.25	90.25	10712.89	2600.76	0.00
0.50	90.50	11332.59	5356.45	0.00
0.75	90.75	11952.28	8267.06	0.00
1.00	91.00	12571.98	11332.59	0.00
1.25	91.25	13191.67	14553.04	0.00
1.50	91.50	13811.36	17928.42	0.00

RESERVOIR REPORT

RECORD NUMBER : 3
STORAGE TYPE : MAN STAGE/AREA
DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "B-2"

[RATING CURVE LIMIT]

Minimum Elevation.....	=	104.00 (ft)
Maximum Elevation.....	=	110.00 (ft)
Elevation Increment.....	=	0.25 (ft)

[STAGE STORAGE INFORMATION]

Input file = NULL
Output file = NULL

[Manual Contour Area vs. Elevation]

ELEVATION (ft)	CONTOUR AREA (sqft)
104.00	3430.80
110.00	16686.70

[STAGE DISCHARGE INFORMATION]

OUTLET STRUCTURE:
STR # : 3
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "B-2" OVERFLOW

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
0.00	104.00	3430.80	0.00	0.00
0.25	104.25	3983.13	926.74	0.00
0.50	104.50	4535.46	1991.56	0.00
0.75	104.75	5087.79	3194.47	0.00
1.00	105.00	5640.12	4535.46	0.00
1.25	105.25	6192.45	6014.53	0.00
1.50	105.50	6744.77	7631.68	0.00

RESERVOIR REPORT

RECORD NUMBER : 3
STORAGE TYPE : MAN STAGE/AREA

DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "B-2"

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
1.75	105.75	7297.10	9386.92	0.00
2.00	106.00	7849.43	11280.23	0.00
2.25	106.25	8401.76	13311.63	0.00
2.50	106.50	8954.09	15481.11	0.00
2.75	106.75	9506.42	17788.68	0.00
3.00	107.00	10058.75	20234.32	0.00
3.25	107.25	10611.08	22818.05	0.00
3.50	107.50	11163.41	25539.86	0.00
3.75	107.75	11715.74	28399.76	0.00
4.00	108.00	12268.07	31397.73	0.00
4.25	108.25	12820.40	34533.79	0.00
4.50	108.50	13372.72	37807.93	0.00
4.75	108.75	13925.05	41220.15	0.00
5.00	109.00	14477.38	44770.46	3.33
5.25	109.25	15029.71	48458.84	9.42
5.50	109.50	15582.04	52285.31	17.30
5.75	109.75	16134.37	56249.86	26.64
6.00	110.00	16686.70	60352.50	37.23

OUTLET STRUCTURE REPORT

RECORD NUMBER : 3
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "B-2" OVERFLOW

[RATING CURVE LIMIT]

Minimum Elevation	=	104.00 (ft)
Maximum Elevation	=	110.00 (ft)
Elevation Increment	=	0.25 (ft)

[OUTLET STRUCTURE INFORMATION]

Crest Length	=	8.00 (ft)
Crest Elevation	=	108.75 (ft)
Coefficient Cw	=	3.33000
Exponential	=	1.50000

[RECTANGULAR SUPPRESSED EQUATION]

Q = Cw*L*H^exp
H = Headwater depth above inlet control section invert, (ft)
L = Crest length, (ft)

[Culvert Weir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE	ELEVATION (ft)	FLOW (cfs)
5.00	109.00	3.33
5.25	109.25	9.42
5.50	109.50	17.30
5.75	109.75	26.64
6.00	110.00	37.23

RESERVOIR REPORT

RECORD NUMBER : 4
STORAGE TYPE : MAN STAGE/AREA
DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "B-3"

[RATING CURVE LIMIT]

Minimum Elevation..... = 95.00 (ft)
Maximum Elevation..... = 100.00 (ft)
Elevation Increment..... = 0.25 (ft)

[STAGE STORAGE INFORMATION]

Input file = NULL
Output file = NULL

[Manual Contour Area vs. Elevation]

ELEVATION (ft)	CONTOUR AREA (sqft)
95.00	294.80
100.00	3105.10

[STAGE DISCHARGE INFORMATION]

OUTLET STRUCTURE:
STR # : 4
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "B-3" OVERFLOW

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
0.00	95.00	294.80	0.00	0.00
0.25	95.25	435.32	91.26	0.00
0.50	95.50	575.83	217.66	0.00
0.75	95.75	716.35	379.18	0.00
1.00	96.00	856.86	575.83	0.00
1.25	96.25	997.38	807.61	0.00
1.50	96.50	1137.89	1074.52	0.00

RESERVOIR REPORT

RECORD NUMBER : 4
STORAGE TYPE : MAN STAGE/AREA

DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "B-3"

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
1.75	96.75	1278.41	1376.55	0.00
2.00	97.00	1418.92	1713.72	0.00
2.25	97.25	1559.44	2086.01	0.00
2.50	97.50	1699.95	2493.44	0.00
2.75	97.75	1840.47	2935.99	0.00
3.00	98.00	1980.98	3413.67	0.00
3.25	98.25	2121.50	3926.48	0.00
3.50	98.50	2262.01	4474.42	0.00
3.75	98.75	2402.53	5057.48	0.00
4.00	99.00	2543.04	5675.68	3.33
4.25	99.25	2683.56	6329.00	9.42
4.50	99.50	2824.07	7017.46	17.30
4.75	99.75	2964.59	7741.04	26.64
5.00	100.00	3105.10	8499.75	37.23

OUTLET STRUCTURE REPORT

RECORD NUMBER : 4
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "B-3" OVERFLOW

[RATING CURVE LIMIT]

Minimum Elevation	=	95.00 (ft)
Maximum Elevation	=	100.00 (ft)
Elevation Increment	=	0.25 (ft)

[OUTLET STRUCTURE INFORMATION]

Crest Length	=	8.00 (ft)
Crest Elevation	=	98.75 (ft)
Coefficient Cw	=	3.33000
Exponential	=	1.50000

[RECTANGULAR SUPPRESSED EQUATION]

Q = Cw*L*H^exp
H = Headwater depth above inlet control section invert, (ft)
L = Crest length, (ft)

[Culvert Weir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE	ELEVATION (ft)	FLOW (cfs)
4.00	99.00	3.33
4.25	99.25	9.42
4.50	99.50	17.30
4.75	99.75	26.64
5.00	100.00	37.23

RESERVOIR REPORT

RECORD NUMBER : 5
STORAGE TYPE : MAN STAGE/AREA
DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "C-1"

[RATING CURVE LIMIT]

Minimum Elevation..... = 90.00 (ft)
Maximum Elevation..... = 98.00 (ft)
Elevation Increment..... = 0.25 (ft)

[STAGE STORAGE INFORMATION]

Input file = NULL
Output file = NULL

[Manual Contour Area vs. Elevation]

ELEVATION (ft)	CONTOUR AREA (sqft)
90.00	16159.10
98.00	34914.00

[STAGE DISCHARGE INFORMATION]

OUTLET STRUCTURE:
STR # : 5
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "C-1" OVERFLOW

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
0.00	90.00	16159.10	0.00	0.00
0.25	90.25	16745.19	4113.04	0.00
0.50	90.50	17331.28	8372.59	0.00
0.75	90.75	17917.37	12778.68	0.00
1.00	91.00	18503.46	17331.28	0.00
1.25	91.25	19089.55	22030.41	0.00
1.50	91.50	19675.64	26876.05	0.00

RESERVOIR REPORT

RECORD NUMBER : 5
STORAGE TYPE : MAN STAGE/AREA

DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "C-1"

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
1.75	91.75	20261.73	31868.23	0.00
2.00	92.00	20847.82	37006.92	0.00
2.25	92.25	21433.92	42292.14	0.00
2.50	92.50	22020.01	47723.88	0.00
2.75	92.75	22606.10	53302.14	0.00
3.00	93.00	23192.19	59026.93	0.00
3.25	93.25	23778.28	64898.24	0.00
3.50	93.50	24364.37	70916.07	0.00
3.75	93.75	24950.46	77080.42	0.00
4.00	94.00	25536.55	83391.30	0.00
4.25	94.25	26122.64	89848.70	0.00
4.50	94.50	26708.73	96452.62	0.00
4.75	94.75	27294.82	103203.06	0.00
5.00	95.00	27880.91	110100.03	0.00
5.25	95.25	28467.00	117143.52	0.00
5.50	95.50	29053.09	124333.54	0.00
5.75	95.75	29639.18	131670.08	0.00
6.00	96.00	30225.28	139153.14	0.00
6.25	96.25	30811.37	146782.72	0.00
6.50	96.50	31397.46	154558.83	0.00
6.75	96.75	31983.55	162481.45	0.00
7.00	97.00	32569.64	170550.59	0.00
7.25	97.25	33155.73	178766.27	3.33
7.50	97.50	33741.82	187128.45	9.42
7.75	97.75	34327.91	195637.17	17.30
8.00	98.00	34914.00	204292.41	26.64

OUTLET STRUCTURE REPORT

RECORD NUMBER : 5
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "C-1" OVERFLOW

[RATING CURVE LIMIT]

Minimum Elevation	=	90.00 (ft)
Maximum Elevation	=	98.00 (ft)
Elevation Increment	=	0.25 (ft)

[OUTLET STRUCTURE INFORMATION]

Crest Length	=	8.00 (ft)
Crest Elevation	=	97.00 (ft)
Coefficient Cw	=	3.33000
Exponential	=	1.50000

[RECTANGULAR SUPPRESSED EQUATION]

Q = Cw*L*H^exp
H = Headwater depth above inlet control section invert, (ft)
L = Crest length, (ft)

[Culvert Weir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE	ELEVATION (ft)	FLOW (cfs)
7.25	97.25	3.33
7.50	97.50	9.42
7.75	97.75	17.30
8.00	98.00	26.64

RESERVOIR REPORT

RECORD NUMBER : 6
STORAGE TYPE : MAN STAGE/AREA
DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "C-2"

[RATING CURVE LIMIT]

Minimum Elevation..... = 90.50 (ft)
Maximum Elevation..... = 95.50 (ft)
Elevation Increment..... = 0.25 (ft)

[STAGE STORAGE INFORMATION]

Input file = NULL
Output file = NULL

[Manual Contour Area vs. Elevation]

ELEVATION (ft)	CONTOUR AREA (sqft)
90.50	9893.51
95.50	22609.80

[STAGE DISCHARGE INFORMATION]

OUTLET STRUCTURE:
STR # : 6
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "C-2" OVERFLOW

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
0.00	90.50	9893.51	0.00	0.00
0.25	90.75	10529.32	2552.85	0.00
0.50	91.00	11165.14	5264.66	0.00
0.75	91.25	11800.95	8135.42	0.00
1.00	91.50	12436.77	11165.14	0.00
1.25	91.75	13072.58	14353.81	0.00
1.50	92.00	13708.40	17701.43	0.00

RESERVOIR REPORT

RECORD NUMBER : 6
STORAGE TYPE : MAN STAGE/AREA

DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "C-2"

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
1.75	92.25	14344.21	21208.01	0.00
2.00	92.50	14980.03	24873.54	0.00
2.25	92.75	15615.84	28698.02	0.00
2.50	93.00	16251.66	32681.46	0.00
2.75	93.25	16887.47	36823.85	0.00
3.00	93.50	17523.29	41125.19	0.00
3.25	93.75	18159.10	45585.49	0.00
3.50	94.00	18794.91	50204.74	0.00
3.75	94.25	19430.73	54982.95	0.00
4.00	94.50	20066.54	59920.11	0.00
4.25	94.75	20702.36	65016.22	3.33
4.50	95.00	21338.17	70271.28	9.42
4.75	95.25	21973.99	75685.30	17.30
5.00	95.50	22609.80	81258.27	26.64

OUTLET STRUCTURE REPORT

RECORD NUMBER : 6
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "C-2" OVERFLOW

[RATING CURVE LIMIT]

Minimum Elevation	=	90.00 (ft)
Maximum Elevation	=	95.50 (ft)
Elevation Increment	=	0.25 (ft)

[OUTLET STRUCTURE INFORMATION]

Crest Length	=	8.00 (ft)
Crest Elevation	=	94.50 (ft)
Coefficient Cw	=	3.33000
Exponential	=	1.50000

[RECTANGULAR SUPPRESSED EQUATION]

Q = Cw*L*H^exp
H = Headwater depth above inlet control section invert, (ft)
L = Crest length, (ft)

[Culvert Weir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE	ELEVATION (ft)	FLOW (cfs)
4.75	94.75	3.33
5.00	95.00	9.42
5.25	95.25	17.30
5.50	95.50	26.64

RESERVOIR REPORT

RECORD NUMBER : 7
STORAGE TYPE : MAN STAGE/AREA
DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "C-3"

[RATING CURVE LIMIT]

Minimum Elevation.....	=	90.00 (ft)
Maximum Elevation.....	=	95.00 (ft)
Elevation Increment.....	=	0.25 (ft)

[STAGE STORAGE INFORMATION]

Input file = NULL
Output file = NULL

[Manual Contour Area vs. Elevation]

ELEVATION (ft)	CONTOUR AREA (sqft)
90.00	881.59
95.00	5274.21

[STAGE DISCHARGE INFORMATION]

OUTLET STRUCTURE:
STR # : 7
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "C-3" OVERFLOW

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
0.00	90.00	881.59	0.00	0.00
0.25	90.25	1101.22	247.85	0.00
0.50	90.50	1320.85	550.61	0.00
0.75	90.75	1540.48	908.28	0.00
1.00	91.00	1760.11	1320.85	0.00
1.25	91.25	1979.74	1788.33	0.00
1.50	91.50	2199.38	2310.72	0.00

RESERVOIR REPORT

RECORD NUMBER : 7
STORAGE TYPE : MAN STAGE/AREA

DISCHARGE TYPE : COMP STAGE/DISC
DESCRIPTION : WRA "C-3"

[Reservoir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE (ft)	ELEVATION (ft)	CONTOUR AREA (sqft)	STORAGE (cuft)	DISCHARGE (cfs)
1.75	91.75	2419.01	2888.02	0.00
2.00	92.00	2638.64	3520.23	0.00
2.25	92.25	2858.27	4207.34	0.00
2.50	92.50	3077.90	4949.36	0.00
2.75	92.75	3297.53	5746.29	0.00
3.00	93.00	3517.16	6598.13	0.00
3.25	93.25	3736.79	7504.87	0.00
3.50	93.50	3956.42	8466.52	0.00
3.75	93.75	4176.06	9483.08	0.00
4.00	94.00	4395.69	10554.55	0.00
4.25	94.25	4615.32	11680.93	3.33
4.50	94.50	4834.95	12862.21	9.42
4.75	94.75	5054.58	14098.40	17.30
5.00	95.00	5274.21	15389.50	26.64

OUTLET STRUCTURE REPORT

RECORD NUMBER : 7
TYPE : RECTANGULAR WEIR SUPPRESSED
DESCRIPTION : WRA "C-3" OVERFLOW

[RATING CURVE LIMIT]

Minimum Elevation.....	=	90.00 (ft)
Maximum Elevation.....	=	95.00 (ft)
Elevation Increment.....	=	0.25 (ft)

[OUTLET STRUCTURE INFORMATION]

Crest Length.....	=	8.00 (ft)
Crest Elevation.....	=	94.00 (ft)
Coefficient Cw.....	=	3.33000
Exponential.....	=	1.50000

[RECTANGULAR SUPPRESSED EQUATION]

Q = Cw*L*H^exp
H = Headwater depth above inlet control section invert, (ft)
L = Crest length, (ft)

[Culvert Weir Discharge Value vs. Stage]
(the elevation increment is 0.3)

STAGE	ELEVATION (ft)	FLOW (cfs)
4.25	94.25	3.33
4.50	94.50	9.42
4.75	94.75	17.30
5.00	95.00	26.64

APPENDIX "D"

COMPUTER FLOOD ROUTING HYDROGRAPHS

HYDROGRAPH REPORT

RECORD NUMBER : 1
TYPE : SANTA BARBARA
DESCRIPTION : PRE "A" BASIN (LAKE CHARLES)

[HYDROGRAPH INFORMATION]

Peak Discharge	=	7.27 (cfs)
Volume	=	1.43 (acft)
Time Interval	=	5 (min)
Time to Peak	=	3600.00 (min)
Time of Base	=	5945.00 (min)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	4.15 (ac)
Curve Number	=	49

HYDROGRAPH REPORT

RECORD NUMBER : 1
TYPE : SANTA BARBARA
DESCRIPTION : PRE "A" BASIN (LAKE CHARLES)

[TIME CONCENTRATION -- TR-55]

SHEET FLOW

Manning's Roughness Coef. (n)	=	0.20000	
Flow Length (L)	=	300.00	(ft)
2-yr 24-hr Rainfall (R)	=	4.50	(in)
Land Slope (S)	=	0.02500	
Travel Time of Sheet Flow	=	22.91	(min)

SHALLOW FLOW

K_Coef (surface description) (K)	=	0.75000	
Watercourse Slope (S)	=	0.02000	
Velocity (V)	=	1.06	(ft/s)
Flow Length (L)	=	150.00	(ft)
Travel Time of Shallow Flow	=	2.36	(min)

CHANNEL FLOW

Hydraulic Radius (R)	=	0.00	(ft)
Channel Slope (S)	=	0.00000	
Manning's Roughness Coef. (n)	=	0.20000	
Channel Velocity (V)	=	0.00	(ft/s)
Flow Length (L)	=	0.00	(ft)
Travel Time of Shallow Flow	=	0.00	(min)

TIME OF CONCENTRATION

Time of Concentration	=	25.27	(min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH	
Total Precipitation	=	11.04	(in)
Return Period	=	25	(yr)
Storm Duration	=	96.00	(hr)
Impervious Fraction	=	0.00000	(hr)

HYDROGRAPH REPORT

RECORD NUMBER : 2
TYPE : SANTA BARBARA
DESCRIPTION : PRE "B" BASIN - (LAKE WILLOW)

[HYDROGRAPH INFORMATION]

Peak Discharge	=	52.56 (cfs)
Volume	=	11.84 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.08 (hr)
Time of Base	=	101.17 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	34.25 (ac)
Curve Number	=	49

HYDROGRAPH REPORT

RECORD NUMBER : 2
TYPE : SANTA BARBARA
DESCRIPTION : PRE "B" BASIN - (LAKE WILLOW)

[TIME CONCENTRATION -- TR-55]

SHEET FLOW

Manning's Roughness Coef. (n)	=	0.20000	
Flow Length (L)	=	300.00	(ft)
2-yr 24-hr Rainfall (R)	=	4.50	(in)
Land Slope (S)	=	0.02000	
Travel Time of Sheet Flow	=	25.05	(min)

SHALLOW FLOW

K_Coef (surface description) (K)	=	0.75000	
Watercourse Slope (S)	=	0.08500	
Velocity (V)	=	2.19	(ft/s)
Flow Length (L)	=	1000.00	(ft)
Travel Time of Shallow Flow	=	7.62	(min)

CHANNEL FLOW

Hydraulic Radius (R)	=	0.00	(ft)
Channel Slope (S)	=	0.00000	
Manning's Roughness Coef. (n)	=	0.20000	
Channel Velocity (V)	=	0.00	(ft/s)
Flow Length (L)	=	0.00	(ft)
Travel Time of Shallow Flow	=	0.00	(min)

TIME OF CONCENTRATION

Time of Concentration	=	32.67	(min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH	
Total Precipitation	=	11.04	(in)
Return Period	=	25	(yr)
Storm Duration	=	96.00	(hr)
Impervious Fraction	=	0.00000	(hr)

HYDROGRAPH REPORT

RECORD NUMBER : 3
TYPE : SANTA BARBARA
DESCRIPTION : PRE "C" BASIN - (JACK'S LAKE)

[HYDROGRAPH INFORMATION]

Peak Discharge	=	65.39 (cfs)
Volume	=	12.28 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.00 (hr)
Time of Base	=	99.67 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	35.52 (ac)
Curve Number	=	49

HYDROGRAPH REPORT

RECORD NUMBER : 3
TYPE : SANTA BARBARA
DESCRIPTION : PRE "C" BASIN - (JACK'S LAKE)

[TIME CONCENTRATION -- TR-55]

SHEET FLOW

Manning's Roughness Coef. (n)	=	0.20000	
Flow Length (L)	=	300.00	(ft)
2-yr 24-hr Rainfall (R)	=	4.50	(in)
Land Slope (S)	=	0.05000	
Travel Time of Sheet Flow	=	17.36	(min)

SHALLOW FLOW

K_Coef (surface description) (K)	=	0.75000	
Watercourse Slope (S)	=	0.10000	
Velocity (V)	=	2.37	(ft/s)
Flow Length (L)	=	800.00	(ft)
Travel Time of Shallow Flow	=	5.62	(min)

CHANNEL FLOW

Hydraulic Radius (R)	=	0.00	(ft)
Channel Slope (S)	=	0.00000	
Manning's Roughness Coef. (n)	=	0.20000	
Channel Velocity (V)	=	0.00	(ft/s)
Flow Length (L)	=	0.00	(ft)
Travel Time of Shallow Flow	=	0.00	(min)

TIME OF CONCENTRATION

Time of Concentration	=	22.98	(min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH	
Total Precipitation	=	11.04	(in)
Return Period	=	25	(yr)
Storm Duration	=	96.00	(hr)
Impervious Fraction	=	0.00000	(hr)

HYDROGRAPH REPORT

RECORD NUMBER : 4
TYPE : SANTA BARBARA
DESCRIPTION : POST "A" BASIN

[HYDROGRAPH INFORMATION]

Peak Discharge	=	10.05 (cfs)
Volume	=	2.33 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.08 (hr)
Time of Base	=	100.42 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	4.86 (ac)
Curve Number	=	60

HYDROGRAPH REPORT

RECORD NUMBER : 4
TYPE : SANTA BARBARA
DESCRIPTION : POST "A" BASIN

[TIME CONCENTRATION -- TR-55]

SHEET FLOW

Manning's Roughness Coef. (n)	=	0.20000	
Flow Length (L)	=	300.00	(ft)
2-yr 24-hr Rainfall (R)	=	4.50	(in)
Land Slope (S)	=	0.02000	
Travel Time of Sheet Flow	=	25.05	(min)

SHALLOW FLOW

K_Coef (surface description) (K)	=	0.50000	
Watercourse Slope (S)	=	0.02000	
Velocity (V)	=	0.71	(ft/s)
Flow Length (L)	=	400.00	(ft)
Travel Time of Shallow Flow	=	9.43	(min)

CHANNEL FLOW

Hydraulic Radius (R)	=	0.00	(ft)
Channel Slope (S)	=	0.00000	
Manning's Roughness Coef. (n)	=	0.20000	
Channel Velocity (V)	=	0.00	(ft/s)
Flow Length (L)	=	0.00	(ft)
Travel Time of Shallow Flow	=	0.00	(min)

TIME OF CONCENTRATION

Time of Concentration	=	34.47	(min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH	
Total Precipitation	=	11.04	(in)
Return Period	=	25	(yr)
Storm Duration	=	96.00	(hr)
Impervious Fraction	=	0.00000	(hr)

HYDROGRAPH REPORT

RECORD NUMBER : 5
TYPE : RESER MOD. PULS
DESCRIPTION : WRA "A" ROUTED

[HYDROGRAPH INFORMATION]

Peak Discharge	=	3.37 (cfs)
Volume	=	1.43 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	61.08 (hr)
Time of Base	=	100.50 (hr)
Peak Elevation	=	104.39 (ft)

[RESERVOIR STRUCTURE INFORMATION]

Reservoir #	=	1
Description	=	WRA "A-1"
Storage type	=	MAN STAGE/AREA
Max storage	=	55065.93 Cuft
Discharge type	=	COMP STAGE/DISC
Max discharge	=	13.32 cfs

[RESERVOIR INFORMATION]

Reservoir #	=	1
Reservoir Description	=	WRA "A-1"

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #	=	4
Hydrograph Description	=	POST "A" BASIN

HYDROGRAPH REPORT

RECORD NUMBER : 6
TYPE : SANTA BARBARA
DESCRIPTION : POST "B-1" BASIN

[HYDROGRAPH INFORMATION]

Peak Discharge	=	28.08 (cfs)
Volume	=	6.43 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.08 (hr)
Time of Base	=	100.83 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	13.40 (ac)
Curve Number	=	60

HYDROGRAPH REPORT

RECORD NUMBER : 6
TYPE : SANTA BARBARA
DESCRIPTION : POST "B-1" BASIN

[TIME CONCENTRATION -- TR-55]

SHEET FLOW

Manning's Roughness Coef. (n)	=	0.30000	
Flow Length (L)	=	300.00	(ft)
2-yr 24-hr Rainfall (R)	=	4.50	(in)
Land Slope (S)	=	0.04000	
Travel Time of Sheet Flow	=	26.26	(min)

SHALLOW FLOW

K_Coef (surface description) (K)	=	0.00000	
Watercourse Slope (S)	=	0.00000	
Velocity (V)	=	0.00	(ft/s)
Flow Length (L)	=	0.00	(ft)
Travel Time of Shallow Flow	=	0.00	(min)

CHANNEL FLOW

Hydraulic Radius (R)	=	0.47	(ft)
Channel Slope (S)	=	0.01000	
Manning's Roughness Coef. (n)	=	0.20000	
Channel Velocity (V)	=	0.45	(ft/s)
Flow Length (L)	=	200.00	(ft)
Travel Time of Shallow Flow	=	7.35	(min)

TIME OF CONCENTRATION

Time of Concentration	=	33.60	(min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH	
Total Precipitation	=	11.04	(in)
Return Period	=	25	(yr)
Storm Duration	=	96.00	(hr)
Impervious Fraction	=	0.00000	(hr)

HYDROGRAPH REPORT

RECORD NUMBER : 7
TYPE : RESER MOD. PULS
DESCRIPTION : WRA "B-1" ROUTED

[HYDROGRAPH INFORMATION]

Peak Discharge	=	6.19 (cfs)
Volume	=	3.41 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	61.50 (hr)
Time of Base	=	100.92 (hr)
Peak Elevation	=	97.37 (ft)

[RESERVOIR STRUCTURE INFORMATION]

Reservoir #	=	2
Description	=	WRA "B-1"
Storage type	=	MAN STAGE/AREA
Max storage	=	160066.41 Cuft
Discharge type	=	COMP STAGE/DISC
Max discharge	=	26.64 cfs

[RESERVOIR INFORMATION]

Reservoir #	=	2
Reservoir Description	=	WRA "B-1"

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #	=	6
Hydrograph Description	=	POST "B-1" BASIN

HYDROGRAPH REPORT

RECORD NUMBER : 8
TYPE : SANTA BARBARA
DESCRIPTION : POST "B-2" BASIN

[HYDROGRAPH INFORMATION]

Peak Discharge	=	30.70 (cfs)
Volume	=	6.09 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.00 (hr)
Time of Base	=	99.67 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	12.68 (ac)
Curve Number	=	60

HYDROGRAPH REPORT

RECORD NUMBER : 8
TYPE : SANTA BARBARA
DESCRIPTION : POST "B-2" BASIN

[TIME CONCENTRATION -- TR-55]

SHEET FLOW

Manning's Roughness Coef. (n)	=	0.30000	
Flow Length (L)	=	300.00	(ft)
2-yr 24-hr Rainfall (R)	=	4.50	(in)
Land Slope (S)	=	0.06000	
Travel Time of Sheet Flow	=	22.32	(min)

SHALLOW FLOW

K_Coef (surface description) (K)	=	0.00000	
Watercourse Slope (S)	=	0.00000	
Velocity (V)	=	0.00	(ft/s)
Flow Length (L)	=	0.00	(ft)
Travel Time of Shallow Flow	=	0.00	(min)

CHANNEL FLOW

Hydraulic Radius (R)	=	0.47	(ft)
Channel Slope (S)	=	0.05000	
Manning's Roughness Coef. (n)	=	0.20000	
Channel Velocity (V)	=	1.01	(ft/s)
Flow Length (L)	=	200.00	(ft)
Travel Time of Shallow Flow	=	3.29	(min)

TIME OF CONCENTRATION

Time of Concentration	=	25.61	(min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH	
Total Precipitation	=	11.04	(in)
Return Period	=	25	(yr)
Storm Duration	=	96.00	(hr)
Impervious Fraction	=	0.00000	(hr)

HYDROGRAPH REPORT

RECORD NUMBER : 9
TYPE : RESER MOD. PULS
DESCRIPTION : WRA "B-2" ROUTED

[HYDROGRAPH INFORMATION]

Peak Discharge	=	27.86 (cfs)
Volume	=	5.14 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.17 (hr)
Time of Base	=	99.17 (hr)
Peak Elevation	=	109.78 (ft)

[RESERVOIR STRUCTURE INFORMATION]

Reservoir #	=	3
Description	=	WRA "B-2"
Storage type	=	MAN STAGE/AREA
Max storage	=	60352.50 Cuft
Discharge type	=	COMP STAGE/DISC
Max discharge	=	37.23 cfs

[RESERVOIR INFORMATION]

Reservoir #	=	3
Reservoir Description	=	WRA "B-2"

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #	=	8
Hydrograph Description	=	POST "B-2" BASIN

HYDROGRAPH REPORT

RECORD NUMBER : 10
TYPE : SANTA BARBARA
DESCRIPTION : POST "B-3" BASIN

[HYDROGRAPH INFORMATION]

Peak Discharge	=	2.49 (cfs)
Volume	=	0.28 (acft)
Time Interval	=	0.05 (hr)
Time to Peak	=	60.00 (hr)
Time of Base	=	72.00 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	0.72 (ac)
Curve Number	=	60

[TIME CONCENTRATION -- USER DEFINED]

Time of Concentration	=	10.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH
Total Precipitation	=	11.04 (in)
Return Period	=	25 (yr)
Storm Duration	=	96.00 (hr)
Impervious Fraction	=	0.00000 (hr)

HYDROGRAPH REPORT

RECORD NUMBER : 11
TYPE : COMBINE
DESCRIPTION : WRA "B-2" & BASIN "B-3" COMBINED

[HYDROGRAPH INFORMATION]

Peak Discharge	=	29.51 (cfs)
Volume	=	5.42 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.08 (hr)
Time of Base	=	99.17 (hr)

[COMBINE HYDROGRAPH RECORD #]

HYDROGRAPH # 9 TYPE : RESER MOD. PULS
DESCRIPTION : WRA "B-2" ROUTED

Peak Discharge	=	27.86 (cfs)
Time to Peak	=	60.17 (hr)
Time Interval	=	0.08 (hr)

HYDROGRAPH # 10 TYPE : SANTA BARBARA
DESCRIPTION : POST "B-3" BASIN

Peak Discharge	=	2.49 (cfs)
Time to Peak	=	60.00 (hr)
Time Interval	=	0.05 (hr)

HYDROGRAPH REPORT

RECORD NUMBER : 12
TYPE : RESER MOD. PULS
DESCRIPTION : WRA "B-3" ROUTED

[HYDROGRAPH INFORMATION]

Peak Discharge	=	29.45 (cfs)
Volume	=	5.31 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.17 (hr)
Time of Base	=	99.17 (hr)
Peak Elevation	=	99.82 (ft)

[RESERVOIR STRUCTURE INFORMATION]

Reservoir #	=	4
Description	=	WRA "B-3"
Storage type	=	MAN STAGE/AREA
Max storage	=	8499.75 Cuft
Discharge type	=	COMP STAGE/DISC
Max discharge	=	37.23 cfs

[RESERVOIR INFORMATION]

Reservoir #	=	4
Reservoir Description	=	WRA "B-3"

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #	=	11
Hydrograph Description	=	WRA "B-2" & BASIN "B-3" COMBINED

HYDROGRAPH REPORT

RECORD NUMBER : 13
TYPE : SANTA BARBARA
DESCRIPTION : POST "C-1" BASIN

[HYDROGRAPH INFORMATION]

Peak Discharge	=	32.42 (cfs)
Volume	=	7.21 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.08 (hr)
Time of Base	=	100.58 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	14.31 (ac)
Curve Number	=	62

HYDROGRAPH REPORT

RECORD NUMBER : 13
TYPE : SANTA BARBARA
DESCRIPTION : POST "C-1" BASIN

[TIME CONCENTRATION -- TR-55]

SHEET FLOW

Manning's Roughness Coef. (n)	=	0.30000	
Flow Length (L)	=	300.00	(ft)
2-yr 24-hr Rainfall (R)	=	4.50	(in)
Land Slope (S)	=	0.04000	
Travel Time of Sheet Flow	=	26.26	(min)

SHALLOW FLOW

K_Coef (surface description) (K)	=	0.00000	
Watercourse Slope (S)	=	0.00000	
Velocity (V)	=	0.00	(ft/s)
Flow Length (L)	=	0.00	(ft)
Travel Time of Shallow Flow	=	0.00	(min)

CHANNEL FLOW

Hydraulic Radius (R)	=	0.47	(ft)
Channel Slope (S)	=	0.02000	
Manning's Roughness Coef. (n)	=	0.20000	
Channel Velocity (V)	=	0.64	(ft/s)
Flow Length (L)	=	200.00	(ft)
Travel Time of Shallow Flow	=	5.20	(min)

TIME OF CONCENTRATION

Time of Concentration	=	31.45	(min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH	
Total Precipitation	=	11.04	(in)
Return Period	=	25	(yr)
Storm Duration	=	96.00	(hr)
Impervious Fraction	=	0.00000	(hr)

HYDROGRAPH REPORT

RECORD NUMBER : 14
TYPE : RESER MOD. PULS
DESCRIPTION : WRA "C-1" ROUTED

[HYDROGRAPH INFORMATION]

Peak Discharge	=	4.08 (cfs)
Volume	=	3.29 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	62.33 (hr)
Time of Base	=	101.42 (hr)
Peak Elevation	=	97.28 (ft)

[RESERVOIR STRUCTURE INFORMATION]

Reservoir #	=	5
Description	=	WRA "C-1"
Storage type	=	MAN STAGE/AREA
Max storage	=	204292.41 Cuft
Discharge type	=	COMP STAGE/DISC
Max discharge	=	26.64 cfs

[RESERVOIR INFORMATION]

Reservoir #	=	5
Reservoir Description	=	WRA "C-1"

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #	=	13
Hydrograph Description	=	POST "C-1" BASIN

HYDROGRAPH REPORT

RECORD NUMBER : 15
TYPE : SANTA BARBARA
DESCRIPTION : POST "C-2" BASIN

[HYDROGRAPH INFORMATION]

Peak Discharge	=	28.78 (cfs)
Volume	=	5.79 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.00 (hr)
Time of Base	=	99.75 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	12.06 (ac)
Curve Number	=	60

HYDROGRAPH REPORT

RECORD NUMBER : 15
TYPE : SANTA BARBARA
DESCRIPTION : POST "C-2" BASIN

[TIME CONCENTRATION -- TR-55]

SHEET FLOW

Manning's Roughness Coef. (n)	=	0.30000	
Flow Length (L)	=	300.00	(ft)
2-yr 24-hr Rainfall (R)	=	4.50	(in)
Land Slope (S)	=	0.09000	
Travel Time of Sheet Flow	=	18.98	(min)

SHALLOW FLOW

K_Coef (surface description) (K)	=	0.00000	
Watercourse Slope (S)	=	0.00000	
Velocity (V)	=	0.00	(ft/s)
Flow Length (L)	=	0.00	(ft)
Travel Time of Shallow Flow	=	0.00	(min)

CHANNEL FLOW

Hydraulic Radius (R)	=	0.47	(ft)
Channel Slope (S)	=	0.01000	
Manning's Roughness Coef. (n)	=	0.20000	
Channel Velocity (V)	=	0.45	(ft/s)
Flow Length (L)	=	200.00	(ft)
Travel Time of Shallow Flow	=	7.35	(min)

TIME OF CONCENTRATION

Time of Concentration	=	26.33	(min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH	
Total Precipitation	=	11.04	(in)
Return Period	=	25	(yr)
Storm Duration	=	96.00	(hr)
Impervious Fraction	=	0.00000	(hr)

HYDROGRAPH REPORT

RECORD NUMBER : 16
TYPE : RESER MOD. PULS
DESCRIPTION : WRA "C-2" ROUTED

[HYDROGRAPH INFORMATION]

Peak Discharge	=	20.62 (cfs)
Volume	=	4.41 (acft)
Time Interval	=	0.08 (hr)
Time to Peak	=	60.25 (hr)
Time of Base	=	99.67 (hr)
Peak Elevation	=	95.34 (ft)

[RESERVOIR STRUCTURE INFORMATION]

Reservoir #	=	6
Description	=	WRA "C-2"
Storage type	=	MAN STAGE/AREA
Max storage	=	81258.27 Cuft
Discharge type	=	COMP STAGE/DISC
Max discharge	=	26.64 cfs

[RESERVOIR INFORMATION]

Reservoir #	=	6
Reservoir Description	=	WRA "C-2"

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #	=	15
Hydrograph Description	=	POST "C-2" BASIN

HYDROGRAPH REPORT

RECORD NUMBER : 17
TYPE : SANTA BARBARA
DESCRIPTION : POST "C-3" BASIN

[HYDROGRAPH INFORMATION]

Peak Discharge	=	14.61 (cfs)
Volume	=	1.73 (acft)
Time Interval	=	0.05 (hr)
Time to Peak	=	60.00 (hr)
Time of Base	=	72.00 (hr)
Multiplication factor	=	1.00

[BASIN DESCRIPTION]

Watershed Area	=	3.69 (ac)
Curve Number	=	67

[TIME CONCENTRATION -- USER DEFINED]

Time of Concentration	=	10.00 (min)

[RAINFALL DESCRIPTION]

Distribution Type	=	MAN HYETOGRAPH
Total Precipitation	=	11.04 (in)
Return Period	=	25 (yr)
Storm Duration	=	96.00 (hr)
Impervious Fraction	=	0.00000 (hr)

HYDROGRAPH REPORT

RECORD NUMBER : 18
TYPE : RESER MOD. PULS
DESCRIPTION : WRA "C-3" ROUTED

[HYDROGRAPH INFORMATION]

Peak Discharge	=	14.16 (cfs)
Volume	=	1.48 (acft)
Time Interval	=	0.05 (hr)
Time to Peak	=	60.00 (hr)
Time of Base	=	72.00 (hr)
Peak Elevation	=	94.65 (ft)

[RESERVOIR STRUCTURE INFORMATION]

Reservoir #	=	7
Description	=	WRA "C-3"
Storage type	=	MAN STAGE/AREA
Max storage	=	15389.50 Cuft
Discharge type	=	COMP STAGE/DISC
Max discharge	=	26.64 cfs

[RESERVOIR INFORMATION]

Reservoir #	=	7
Reservoir Description	=	WRA "C-3"

[INFLOW HYDROGRAPH INFORMATION]

Hydrograph #	=	17
Hydrograph Description	=	POST "C-3" BASIN

APPENDIX "E"

STORM SEWER DESIGN REPORT

STORM SEWER SUMMARY REPORT
DRAINAGE SYSTEM "A1"
FILE: 93-028A1.STM

RAINFALL FILE: 93-028A1.RND

10 YEAR DESIGN STORM

I = 129.310/ (Tc + 20.750) ^ 0.840

LINE TO		FLOW RATE INFO						PIPE INFO					HYDRAULIC INFO		
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INFUTO TOTALQ (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
1	CI #A1-02	1.4	0.55	15.00	6.41	5.01	0.00		24D	102.00	148	0.013	0.014	102.87	7.89
	DNLN = 0	2.7	0.63	17.23	6.09	10.42	10.42	26.3	24D	100.00		0.014	1.00	100.87	7.89
2	CI #A1-03	0.5	0.75	10.00	7.28	2.51	0.00		18D	103.00	31	0.013	-0.001	103.81	2.59
	DNLN = 1	0.5	0.75	10.00	7.28	2.51	2.51	13.3	18D	102.50		0.016	1.00	103.84	1.51
3	CI #A1-04	0.7	0.85	10.00	7.28	0.99	0.00		18D	115.50	331	0.013	0.038	116.23	4.31
	DNLN = 1	0.9	0.69	15.53	6.33	3.70	3.70	21.2	18D	102.00		0.041	1.00	103.84	2.09
4	CI #A1-05	0.7	0.65	15.00	6.41	2.88	0.00		18D	116.50	102	0.013	0.009	117.39	3.94
	DNLN = 3	0.7	0.65	15.00	6.41	2.88	2.88	10.4	18D	115.50		0.010	1.00	116.52	2.24

STORM SEWER SUMMARY REPORT
DRAINAGE SYSTEM "B1"
FILE: 93-028B1.STM

RAINFALL FILE: 93-028B1.RND

10 YEAR DESIGN STORM

I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO						PIPE INFO					HYDRAULIC INFO		
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INPUTQ TOTALQ (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
1	CI #B1-02	0.2	0.61	10.00	7.28	0.71	0.00		30D	91.00	67	0.013	0.015	92.21	10.09
	DNLN = 0	12.7	0.50	46.92	3.75	23.79	23.79	50.2	30D	90.00		0.015	1.00	91.21	10.09
2	CI #B2-03	0.6	0.61	15.00	6.41	2.19	0.00		30D	91.50	52	0.013	0.001	93.83	2.89
	DNLN = 1	7.0	0.52	46.64	3.76	13.74	13.74	40.3	30D	91.00		0.010	1.00	93.79	2.80
3	CI #B1-04	1.3	0.45	30.00	4.78	2.79	0.00		30D	92.00	239	0.013	0.001	94.15	2.83
	DNLN = 2	6.4	0.52	45.20	3.83	12.68	12.68	18.7	30D	91.50		0.002	1.00	93.96	2.59
4	CI #B1-05	0.4	0.61	10.00	7.28	1.78	0.00		18D	92.50	54	0.013	0.000	94.29	1.00
	DNLN = 3	0.4	0.61	10.00	7.28	1.78	1.78	10.1	18D	92.00		0.009	1.00	94.27	1.00
5	CI #B1-06	1.9	0.45	45.00	3.84	3.25	0.00		24D	93.00	52	0.013	-0.001	94.20	4.83
	DNLN = 3	4.7	0.53	45.00	3.84	9.53	9.53	22.3	24D	92.50		0.010	1.00	94.27	3.24
6	CI #B1-07	0.4	0.60	10.00	7.28	1.70	0.00		24D	97.00	242	0.013	0.014	97.99	5.03
	DNLN = 5	2.8	0.58	30.30	4.75	7.77	7.77	29.1	24D	93.00		0.017	1.00	94.56	2.95
7	CI #B1-08	1.9	0.55	30.00	4.78	4.89	0.00		24D	97.75	72	0.013	0.004	98.67	4.77
	DNLN = 6	2.4	0.57	30.00	4.78	6.69	6.69	23.1	24D	97.00		0.010	1.00	98.38	2.89
8	CI #B1-09	0.6	0.65	10.00	7.28	2.74	0.00		18D	99.25	112	0.013	0.008	99.88	3.88
	DNLN = 7	0.6	0.65	10.00	7.28	2.74	2.74	9.9	18D	98.25		0.009	1.00	99.02	3.01
9	CI #B1-10	1.7	0.45	45.00	3.84	2.89	0.00		24D	95.50	229	0.013	0.013	96.61	5.51
	DNLN = 1	5.5	0.47	45.46	3.82	9.91	9.91	31.7	24D	91.00		0.020	1.00	93.79	3.16
10	CI #B1-11	0.2	0.60	10.00	7.28	1.00	0.00		18D	96.50	31	0.013	-0.001	97.07	1.63
	DNLN = 9	0.2	0.60	10.00	7.28	1.00	1.00	13.4	18D	96.00		0.016	1.00	97.09	0.73
11	CI #B1-12	1.4	0.45	45.00	3.84	2.46	0.00		18D	97.00	144	0.013	0.006	97.98	5.38
	DNLN = 9	3.6	0.47	45.00	3.84	6.55	6.55	8.7	18D	96.00		0.007	1.00	97.09	4.78
12	CI #B1-13	0.8	0.45	30.00	4.78	1.61	0.00		18D	98.00	205	0.013	0.002	98.92	4.39
	DNLN = 11	2.2	0.48	31.57	4.65	4.96	4.96	7.3	18D	97.00		0.005	1.00	98.43	2.86
13	CI #B1-14	0.3	0.60	10.00	7.28	1.18	0.00		18D	98.50	31	0.013	0.001	99.24	1.43
	DNLN = 12	0.3	0.60	10.00	7.28	1.18	1.18	13.4	18D	98.00		0.016	1.00	99.22	0.77

DRAINAGE SYSTEM "B1"

FILE: 93-028B1.STM

RAINFALL FILE: 93-028B1.RND 10 YEAR DESIGN STORM I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO						PIPE INFO				HYDRAULIC INFO			
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INPUTQ TOTALQ (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
14	CI #B1-15	0.2	0.60	10.00	7.28	0.92	0.00		18D	102.50	208	0.013	0.019	103.13	3.85
	DNLN = 12	1.2	0.48	30.36	4.75	2.69	2.69	15.5	18D	98.00		0.022	1.00	99.22	1.75
15	CI #B1-16	1.0	0.45	30.00	4.78	2.11	0.00		18D	103.00	65	0.013	0.006	103.75	3.55
	DNLN = 14	1.0	0.45	30.00	4.78	2.11	2.11	9.2	18D	102.50		0.008	1.00	103.36	2.02

07/25/94

STORM SEWER SUMMARY REPORT
DRAINAGE SYSTEM "B2"
FILE: 93-028B2.STM

RAINFALL FILE: 93-028B2.RND

10 YEAR DESIGN STORM

I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO						PIPE INFO					HYDRAULIC INFO		
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INPUTQ TOTALQ (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
1	CI #B2-02	0.3	0.61	10.00	7.28	1.51	0.00		24D	110.00	85	0.013	0.072	110.52	13.77
	DNLN = 0	3.8	0.52	31.58	4.65	9.05	9.05	60.1	24D	104.00		0.070	1.00	104.52	13.77
2	CI #B2-03	1.4	0.45	30.00	4.78	3.07	0.00		24D	111.50	62	0.013	0.001	113.50	2.59
	DNLN = 1	3.4	0.51	31.21	4.68	8.13	8.13	35.2	24D	110.00		0.024	1.00	113.47	2.59
3	CI #B2-04	0.2	0.60	10.00	7.28	0.92	0.00		18D	112.75	54	0.013	0.000	113.60	0.89
	DNLN = 2	0.2	0.60	10.00	7.28	0.92	0.92	12.4	18D	112.00		0.014	1.00	113.60	0.52
4	CI #B2-05	0.2	0.60	10.00	7.28	1.05	0.00		18D	140.50	273	0.013	0.102	141.31	4.61
	DNLN = 2	1.1	0.60	12.16	6.87	4.45	4.45	33.9	18D	112.00		0.104	1.00	113.60	2.52
5	CI #B2-06	0.2	0.60	10.00	7.28	1.05	0.00		18D	141.00	31	0.013	0.000	141.62	1.51
	DNLN = 4	0.2	0.60	10.00	7.28	1.05	1.05	13.3	18D	140.50		0.016	1.00	141.63	0.73
6	CI #B2-07	0.3	0.60	10.00	7.28	1.31	0.00		18D	161.50	333	0.013	0.062	162.12	3.81
	DNLN = 4	0.6	0.60	10.21	7.23	2.60	2.60	26.4	18D	140.50		0.063	1.00	141.63	1.82
7	CI #B2-08	0.3	0.60	10.00	7.28	1.31	0.00		18D	162.00	31	0.013	0.009	162.58	3.06
	DNLN = 6	0.3	0.60	10.00	7.28	1.31	1.31	13.3	18D	161.50		0.016	1.00	162.34	1.28
8	CI #B2-09	0.7	0.45	30.00	4.78	1.53	0.00		18D	114.00	152	0.013	0.007	114.63	3.21
	DNLN = 2	0.7	0.45	30.00	4.78	1.53	1.53	12.0	18D	112.00		0.013	1.00	113.60	0.86

RAINFALL FILE: 93-02883.RND

10 YEAR DESIGN STORM

I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO						PIPE INFO					HYDRAULIC INFO		
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INFUTO TOTALO (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
1	CI #B3-02	0.3	0.61	10.00	7.28	1.15	0.00		30D	110.00	95	0.013	0.064	110.73	15.99
	DNLN = 0	8.6	0.48	32.78	4.57	19.05	19.05	102.8	30D	104.00		0.063	1.00	104.73	15.99
2	CI #B3-03	0.9	0.45	30.00	4.78	1.98	0.00		30D	112.50	54	0.013	0.001	114.77	3.93
	DNLN = 1	8.4	0.48	32.57	4.58	18.39	18.39	88.3	30D	110.00		0.046	1.00	114.70	3.75
3	CI #B3-04	1.1	0.45	30.00	4.78	2.32	0.00		18D	127.00	187	0.013	0.071	128.15	6.26
	DNLN = 2	4.1	0.48	31.31	4.67	9.13	9.13	28.7	18D	113.00		0.075	1.00	115.01	5.17
4	CI #B3-05	0.2	0.60	10.00	7.28	0.92	0.00		18D	128.00	31	0.013	0.000	128.77	1.02
	DNLN = 3	0.2	0.60	10.00	7.28	0.92	0.92	18.8	18D	127.00		0.032	1.00	128.76	0.52
5	CI #B3-06	1.2	0.45	30.00	4.78	2.47	0.00		18D	134.50	150	0.013	0.046	135.46	5.30
	DNLN = 3	2.8	0.48	30.76	4.72	6.32	6.32	23.5	18D	127.00		0.050	1.00	128.76	3.58
6	CI #B3-07	1.1	0.45	30.00	4.78	2.30	0.00		18D	140.50	158	0.013	0.035	141.26	4.40
	DNLN = 5	1.6	0.50	30.00	4.78	3.93	3.93	20.5	18D	134.50		0.038	1.00	135.90	2.30
7	CI #B3-08	0.2	0.60	10.00	7.28	0.79	0.00		18D	141.50	31	0.013	0.014	141.95	2.63
	DNLN = 6	0.2	0.60	10.00	7.28	0.79	0.79	13.3	18D	141.00		0.016	1.00	141.56	1.31
8	CI #B3-09	0.2	0.60	10.00	7.28	0.87	0.00		18D	158.50	255	0.013	0.067	159.00	3.31
	DNLN = 6	0.4	0.60	10.31	7.22	1.69	1.69	27.9	18D	140.50		0.071	1.00	141.56	1.27
9	CI #B3-10	0.2	0.60	10.00	7.28	0.83	0.00		18D	161.00	38	0.013	0.067	161.46	2.67
	DNLN = 8	0.2	0.60	10.00	7.28	0.83	0.83	27.1	18D	158.48		0.066	1.00	159.17	1.04
10	CI #B3-11	0.7	0.45	30.00	4.78	1.55	0.00		24D	114.50	56	0.013	0.009	115.47	4.98
	DNLN = 2	3.4	0.49	32.33	4.60	7.57	7.57	37.2	24D	113.00		0.027	1.00	115.01	2.41
11	CI #B3-12	1.1	0.45	30.00	4.78	2.41	0.00		24D	117.50	186	0.013	0.014	118.38	4.64
	DNLN = 10	2.7	0.50	31.51	4.66	6.17	6.17	28.7	24D	114.50		0.016	1.00	115.86	2.71
12	CI #B3-13	0.2	0.60	10.00	7.28	1.00	0.00		18D	119.00	43	0.013	0.020	119.51	2.83
	DNLN = 11	0.2	0.60	10.00	7.28	1.00	1.00	16.0	18D	118.00		0.023	1.00	118.71	1.21
13	CI #B3-14	0.7	0.45	30.00	4.78	1.50	0.00		24D	127.50	248	0.013	0.039	128.14	3.76
	DNLN = 11	1.3	0.52	30.00	4.78	3.25	3.25	45.4	24D	117.50		0.040	1.00	118.71	1.63

DRAINAGE SYSTEM "B3"

FILE: 93-028B3.STM

RAINFALL FILE: 93-028B3.RND 10 YEAR DESIGN STORM I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO							PIPE INFO			HYDRAULIC INFO			
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INPUTQ TOTALQ (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
14	CI #B3-15	0.3	0.61	10.00	7.28	1.20	0.00		18D	128.50	43	0.013	0.020	129.10	4.17
	DWLN = 13	0.3	0.61	10.00	7.28	1.20	1.20	11.3	18D	128.00		0.012	1.00	128.33	4.17
15	CI #B3-16	0.1	0.61	10.00	7.28	0.62	0.00		18D	143.50	214	0.013	0.074	143.96	3.15
	DWLN = 13	0.3	0.61	10.58	7.16	1.44	1.44	28.7	18D	127.50		0.075	1.00	128.36	1.38
16	CI #B3-17	0.2	0.61	10.00	7.28	0.84	0.00		18D	146.00	72	0.013	0.035	146.46	2.69
	DWLN = 15	0.2	0.61	10.00	7.28	0.84	0.84	19.6	18D	143.50		0.035	1.00	144.11	1.24

DRAINAGE SYSTEM "C1"
FILE: 93-028C1.STM

RAINFALL FILE: 93-028C1.RND 10 YEAR DESIGN STORM I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO						PIPE INFO					HYDRAULIC INFO		
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INPUTQ TOTALQ (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
1	C1 #C1-02	0.6	0.61	10.00	7.28	2.49	0.00		30D	92.00	56	0.013	0.037	93.01	14.39
	DNLN = 0	12.7	0.48	35.14	4.40	26.90	26.90	77.7	30D	90.00		0.036	1.00	91.01	14.39
2	C1 #C1-03	0.6	0.61	10.00	7.28	2.49	0.00		18D	93.00	43	0.013	0.001	96.28	1.41
	DNLN = 1	0.6	0.61	10.00	7.28	2.49	2.49	11.3	18D	92.50		0.012	1.00	96.23	1.41
3	C1 #C1-04	0.3	0.60	10.00	7.28	1.13	0.00		30D	94.00	137	0.013	0.003	96.69	4.90
	DNLN = 1	11.6	0.47	34.68	4.43	24.06	24.06	49.5	30D	92.00		0.015	1.00	96.23	4.90
4	C1 #C1-05	2.2	0.45	30.00	4.78	4.79	0.00		30D	94.50	53	0.013	0.003	97.22	4.77
	DNLN = 3	11.3	0.47	34.51	4.45	23.42	23.42	40.0	30D	94.00		0.010	1.00	97.06	4.77
5	C1 #C1-06	0.2	0.60	10.00	7.28	0.96	0.00		30D	103.00	237	0.013	0.030	104.46	6.43
	DNLN = 4	9.1	0.47	33.76	4.50	19.18	19.18	77.7	30D	94.50		0.036	1.00	97.57	3.91
6	C1 #C1-07	0.3	0.61	10.00	7.28	1.38	0.00		18D	104.00	50	0.013	0.000	105.12	0.98
	DNLN = 5	0.3	0.61	10.00	7.28	1.38	1.38	10.5	18D	103.50		0.010	1.00	105.10	0.78
7	C1 #C1-08	2.8	0.45	30.00	4.78	6.00	0.00		24D	104.50	54	0.013	0.018	105.99	7.07
	DNLN = 5	8.5	0.46	33.64	4.51	17.77	17.77	30.9	24D	103.50		0.019	1.00	105.10	6.58
8	C1 #C1-09	1.4	0.45	30.00	4.78	3.07	0.00		18D	125.00	286	0.013	0.069	126.34	7.35
	DNLN = 7	5.8	0.47	32.98	4.55	12.24	12.24	27.8	18D	105.00		0.070	1.00	106.77	6.93
9	C1 #C1-10	0.2	0.60	10.00	7.28	0.70	0.00		18D	125.50	31	0.013	0.000	127.18	0.40
	DNLN = 8	0.2	0.60	10.00	7.28	0.70	0.70	13.3	18D	125.00		0.016	1.00	127.18	0.40
10	C1 #C1-11	1.1	0.45	30.00	4.78	2.39	0.00		18D	137.50	221	0.013	0.053	138.64	6.21
	DNLN = 8	4.2	0.47	32.34	4.60	8.96	8.96	25.0	18D	125.00		0.057	1.00	127.18	5.07
11	C1 #C1-12	0.3	0.60	10.00	7.28	1.44	0.00		18D	138.00	31	0.013	0.000	139.25	0.92
	DNLN = 10	0.3	0.60	10.00	7.28	1.44	1.44	13.3	18D	137.50		0.016	1.00	139.24	0.82
12	C1 #C1-13	1.5	0.45	30.00	4.78	3.18	0.00		18D	146.50	238	0.013	0.035	147.42	5.12
	DNLN = 10	2.7	0.46	31.41	4.67	5.84	5.84	20.4	18D	137.50		0.038	1.00	139.24	3.30
13	C1 #C1-14	1.1	0.45	30.00	4.78	2.28	0.00		18D	152.50	240	0.013	0.022	153.14	3.90
	DNLN = 12	1.2	0.47	30.00	4.78	2.79	2.79	16.6	18D	146.50		0.025	1.00	147.83	1.69

RAINFALL FILE: 93-028C1.RND 10 YEAR DESIGN STORM I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO						PIPE INFO					HYDRAULIC INFO		
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INFUTO TOTALQ (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
14	C1 #C1-15	0.2	0.60	10.00	7.28	0.79	0.00		18D	153.00	31	0.013	0.003	153.45	2.56
	DNLN = 13	0.2	0.60	10.00	7.28	0.79	0.79	13.3	18D	152.50		0.016	1.00	153.37	0.73

STORM SEWER SUMMARY REPORT
DRAINAGE SYSTEM "C2"
FILE: 93-028C2.STM

RAINFALL FILE: 93-028C2.RND | 10 YEAR DESIGN STORM | I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO							PIPE INFO				HYDRAULIC INFO		
LINE#	DESCRIPTION / DOWNLINE#	INC AR / TOT AR (ac)	RUNOFFC / WEIGHTD C	INLTIME / Tc (min)	INLT I / TOTL I (in/h)	INC CIA / TOT CIA (cfs)	INPUTO / TOTALO (cfs)	UNIFORM / FLOWCAP (cfs)	SIZE/ / TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL / INVSLOP (ft/ft)	HGLSLOPE / JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
1	MH #C2-02	0.0	0.00	0.00	10.12	0.00	0.00		18D	91.00	38	0.013	0.028	91.78	9.78
	DNLN = 0	4.2	0.47	31.57	4.66	9.04	9.04	17.0	18D	90.00		0.026	1.00	90.78	9.78
2	CI #C2-03	0.2	0.60	10.00	7.28	1.05	0.00		18D	94.50	180	0.013	0.014	95.65	6.26
	DNLN = 1	4.2	0.47	31.06	4.69	9.12	9.12	14.6	18D	91.00		0.019	1.00	93.26	5.16
3	CI #C2-04	0.2	0.60	10.00	7.28	0.87	0.00		18D	95.50	36	0.013	0.000	96.26	0.99
	DNLN = 2	0.2	0.60	10.00	7.28	0.87	0.87	17.5	18D	94.50		0.028	1.00	96.26	0.49
4	CI #C2-05	2.4	0.45	30.00	4.78	5.18	0.00		18D	96.00	61	0.013	0.014	97.07	5.84
	DNLN = 2	3.7	0.45	30.88	4.71	7.90	7.90	16.4	18D	94.50		0.025	1.00	96.26	4.47
5	CI #C2-06	1.3	0.45	30.00	4.78	2.84	0.00		18D	104.00	149	0.013	0.050	104.88	3.92
	DNLN = 4	1.3	0.45	30.00	4.78	2.84	2.84	24.3	18D	96.00		0.054	1.00	97.60	1.61

07/28/94

STORM SEWER SUMMARY REPORT
DRAINAGE SYSTEM "C3"
FILE: 93-028C3.STM

RAINFALL FILE: 93-028C3.RND

10 YEAR DESIGN STORM

I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO							PIPE INFO				HYDRAULIC INFO		
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INPUTQ TOTALQ (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
1	C1 MC3-02	2.5	0.45	30.00	4.78	5.37	0.00		18D	91.00	36	0.013	0.030	91.26	9.39
	DNLN = 0	3.1	0.48	30.00	4.78	7.04	7.04	17.6	18D	90.00		0.028	1.00	90.66	9.39
2	C1 MC3-03	0.6	0.60	10.00	7.28	2.53	0.00		18D	91.50	31	0.013	0.002	93.08	1.43
	DNLN = 1	0.6	0.60	10.00	7.28	2.53	2.53	13.3	18D	91.00		0.016	1.00	93.03	1.43

DRAINAGE SYSTEM "C4"

FILE: 93-026C4.STM

RAINFALL FILE: 93-026C4.RNF 10 YEAR DESIGN STORM I = 129.310/ (Tc + 29.750) ^ 0.840

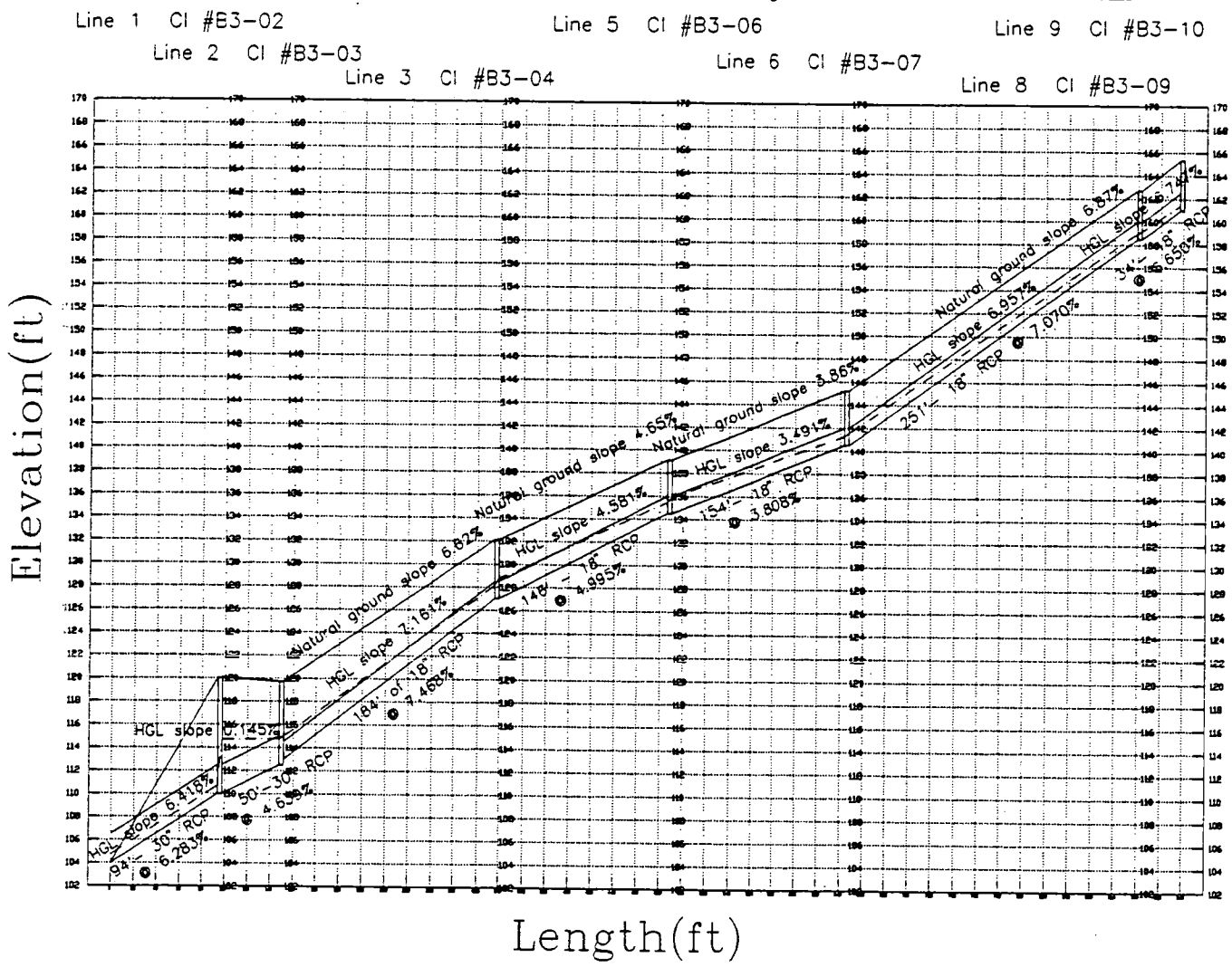
LINE ID		FLOW RATE INFO							PIPE INFO				HYDRAULIC INFO		
LINE#	DESCRIPTION / DOWNLINE#	INC AR / TOT AR (ac)	RUNOFFC / WEIGHTD C	INLTIME / Tc (min)	INLT I / TOTL I (in/h)	INC CIA / TOT CIA (cfs)	INFLOW / TOTALQ (cfs)	ORIFORM / FLOWCAP (cfs)	SIZE / TYPE (in)	INVERT / UP/DOWN (ft)	PIPE / LEN (ft)	NVAL / INVSLOP (ft/ft)	HGLSLOPE / JLC (ft/ft)	HYD GRD / UP/DOWN (ft)	VEL / UP/DOWN (ft/s)
1	CI #C4-02	0.3	0.60	10.00	7.28	1.48	0.00		18D	108.00	178	0.013	0.101	108.46	14.77
	DNLN = 0	3.1	0.47	31.67	4.65	6.72	6.72	33.3	18D	90.00		0.101	1.00	90.46	14.77
2	CI #C4-03	1.4	0.45	30.00	4.78	3.09	0.00		18D	110.00	31	0.013	0.003	111.92	1.75
	DNLN = 1	2.8	0.45	31.41	4.78	3.09	3.09	26.7	18D	108.00		0.064	1.00	111.85	1.75
3	CI #C4-04	1.3	0.45	30.00	4.78	2.84	0.00		18D	115.00	237	0.013	0.017	115.88	3.92
	DNLN = 2	1.3	0.45	30.00	4.78	2.84	2.84	15.2	18D	110.00		0.021	1.00	111.96	1.61

STORM SEWER SUMMARY REPORT
DRAINAGE SYSTEM "C5"
FILE: 93-028C5.STM

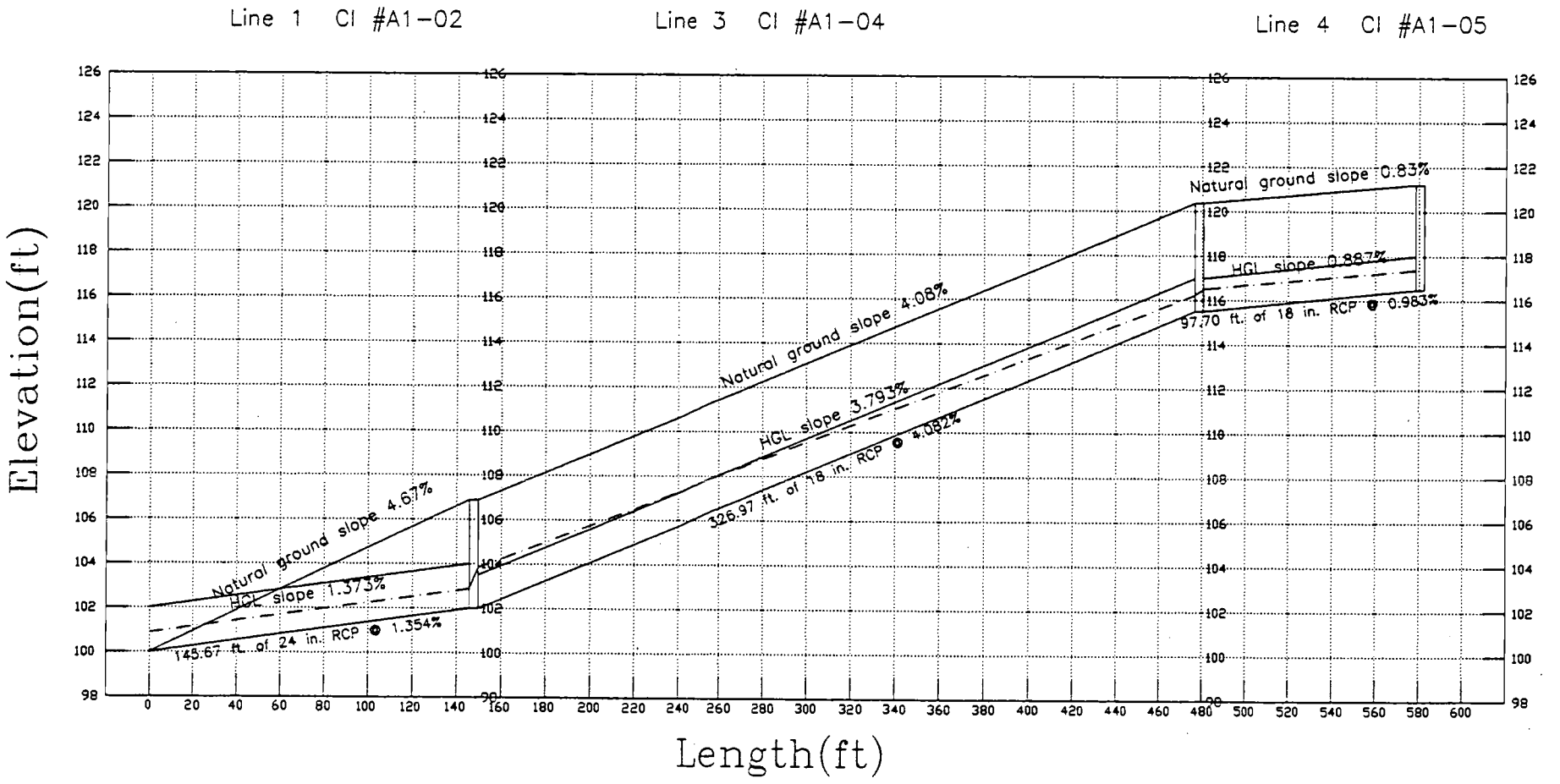
RAINFALL FILE: 93-028C5.RND 10 YEAR DESIGN STORM I = 129.310/ (Tc + 20.750) ^ 0.840

LINE ID		FLOW RATE INFO						PIPE INFO				HYDRAULIC INFO			
LINE#	DESCRIPTION DOWNLINE#	INC AR TOT AR (ac)	RUNOFFC WEIGHTD C	INLTIME Tc (min)	INLT I TOTL I (in/h)	INC CIA TOT CIA (cfs)	INPUTO TOTALQ (cfs)	UNIFORM FLOWCAP (cfs)	SIZE/ TYPE (in)	INVERT UP/DOWN (ft)	PIPE LEN (ft)	NVAL INVSLOP (ft/ft)	HGLSLOPE JLC (ft/ft)	HYD GRD UP/DOWN (ft)	VEL UP/DOWN (ft/s)
1	C1 #C5-02	0.2	0.60	10.00	7.28	0.79	0.00		18D	90.50	62	0.013	0.009	91.72	6.08
	DNLN = 0	3.5	0.48	21.50	5.57	9.37	9.37	9.5	18D	90.00		0.008	1.00	91.17	6.35
2	C1 #C5-03	1.5	0.45	20.00	5.74	3.93	0.00		18D	91.00	38	0.013	0.006	92.50	4.97
	DNLN = 1	3.3	0.47	21.39	5.58	8.79	8.79	12.1	18D	90.50		0.013	1.00	92.30	4.97
3	C1 #C5-04	0.1	0.60	10.00	7.28	0.48	0.00		18D	91.50	47	0.013	0.000	92.88	0.28
	DNLN = 2	0.1	0.60	10.00	7.28	0.48	0.48	10.8	18D	91.00		0.011	1.00	92.88	0.27
4	C1 #C5-05	1.3	0.45	20.00	5.74	3.28	0.00		18D	118.00	311	0.013	0.084	118.83	4.71
	DNLN = 2	1.7	0.49	20.00	5.74	4.73	4.73	30.9	18D	91.00		0.087	1.00	92.88	2.68
5	C1 #C5-06	0.1	0.60	10.00	7.28	0.48	0.00		18D	118.50	46	0.013	0.000	119.18	0.62
	DNLN = 4	0.1	0.60	10.00	7.28	0.48	0.48	11.0	18D	118.00		0.011	1.00	119.17	0.32
6	C1 #C5-07	0.2	0.60	10.00	7.28	0.83	0.00		18D	155.50	317	0.013	0.117	155.94	3.08
	DNLN = 4	0.3	0.60	10.36	7.20	1.34	1.34	35.9	18D	118.50		0.117	1.00	119.17	1.74
7	C1 #C5-08	0.1	0.60	10.00	7.28	0.52	0.00		18D	156.00	38	0.013	0.008	156.36	2.34
	DNLN = 6	0.1	0.60	10.00	7.28	0.52	0.52	12.1	18D	155.50		0.013	1.00	156.09	0.81

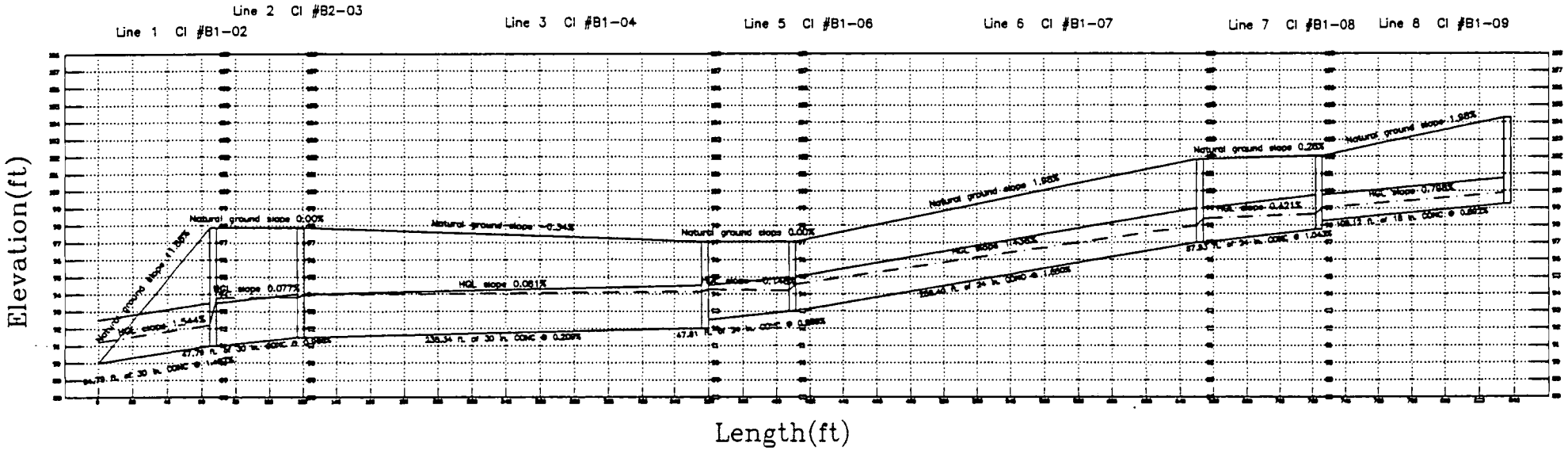
Hydraulic Profile System "B3"

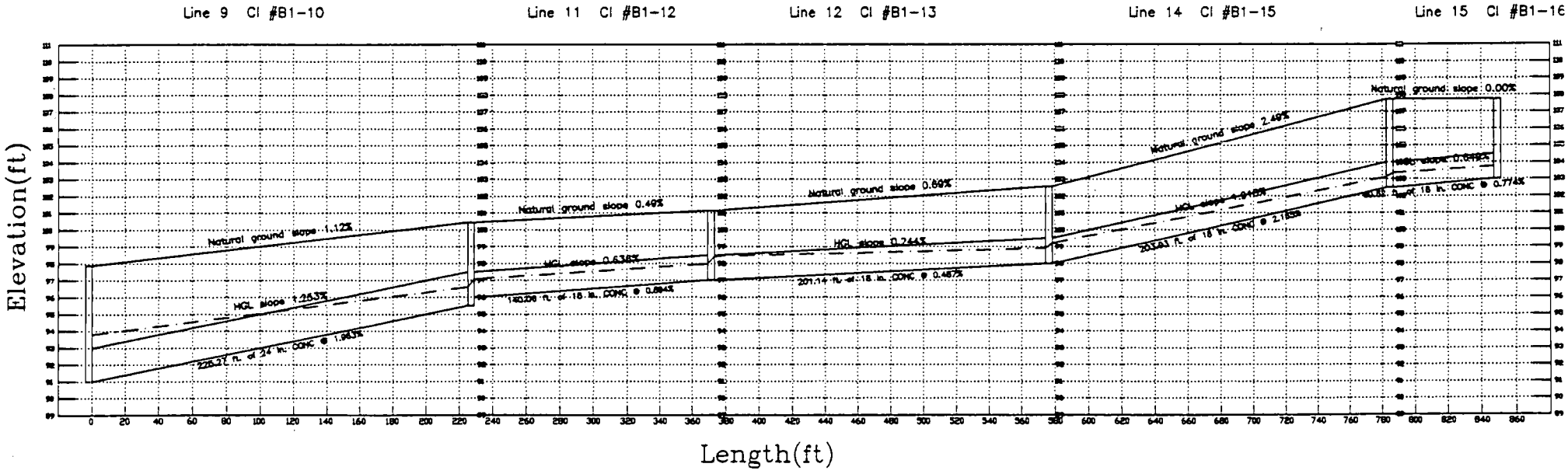


Hydraulic Profile – System "A1"



Hydraulic Profile – System "B1"

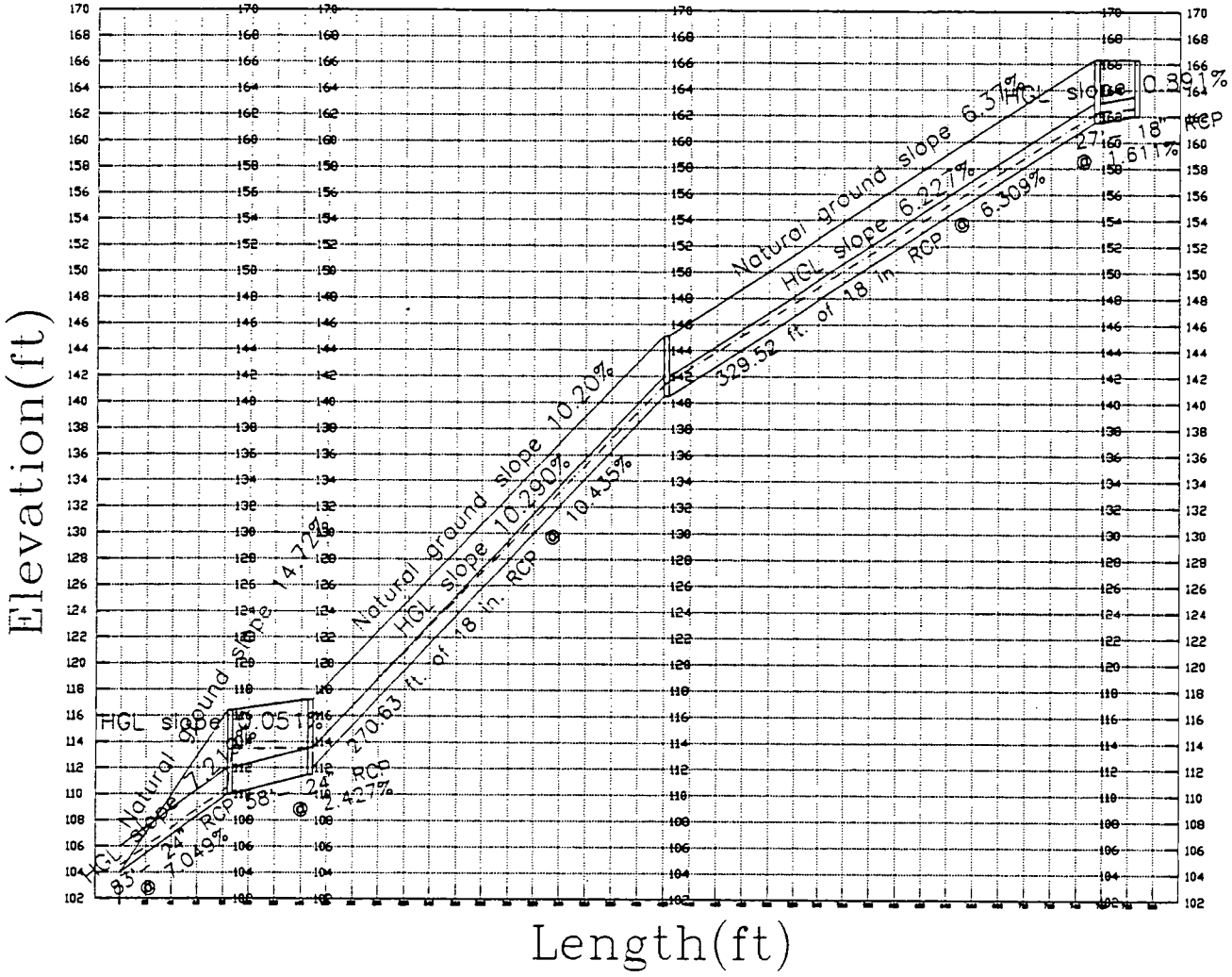




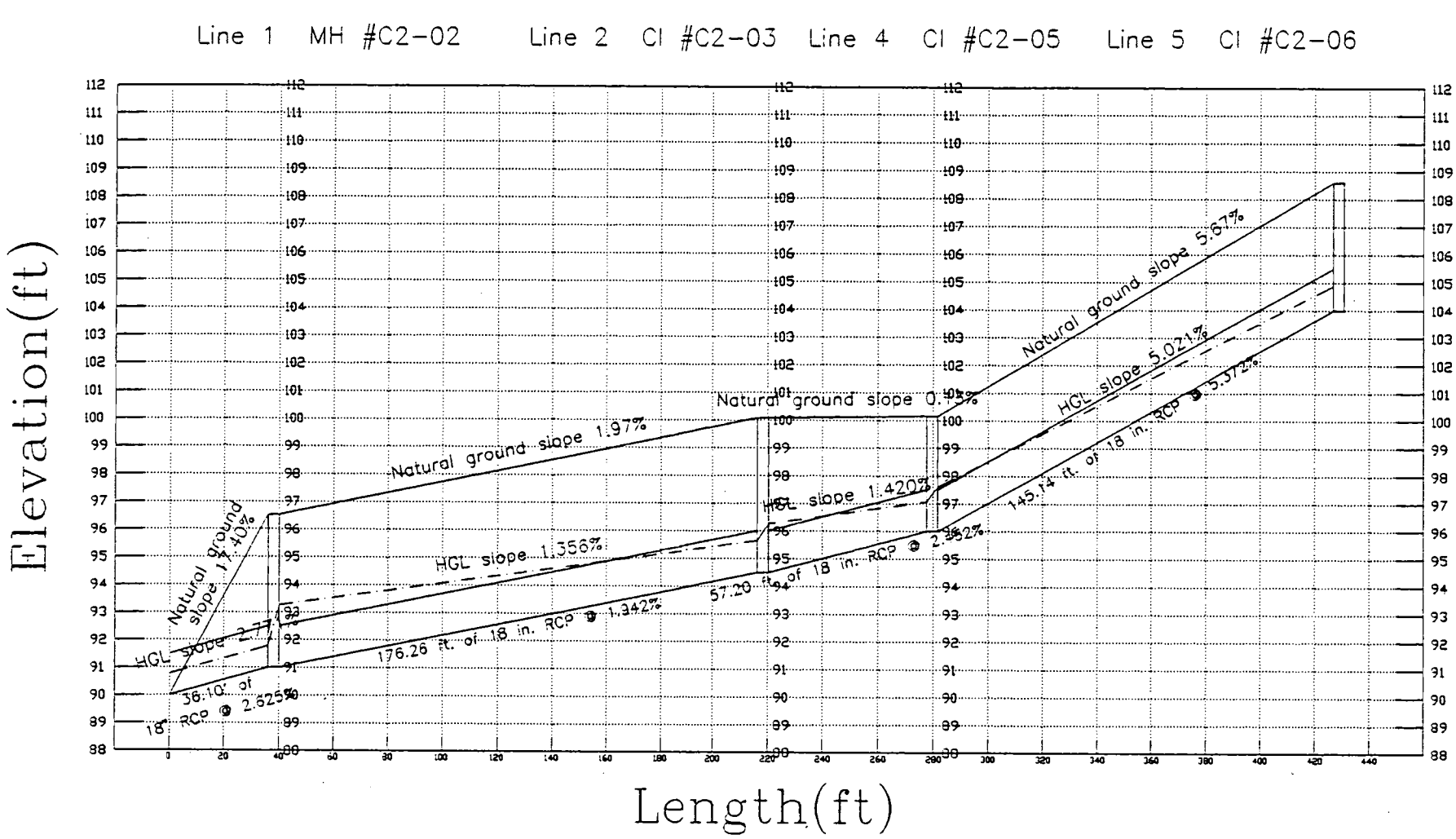
Hydraulic Profile System "B2"

Line 1 CI #B2-02 Line 4 CI #B2-05 Line 7 CI #B2-08

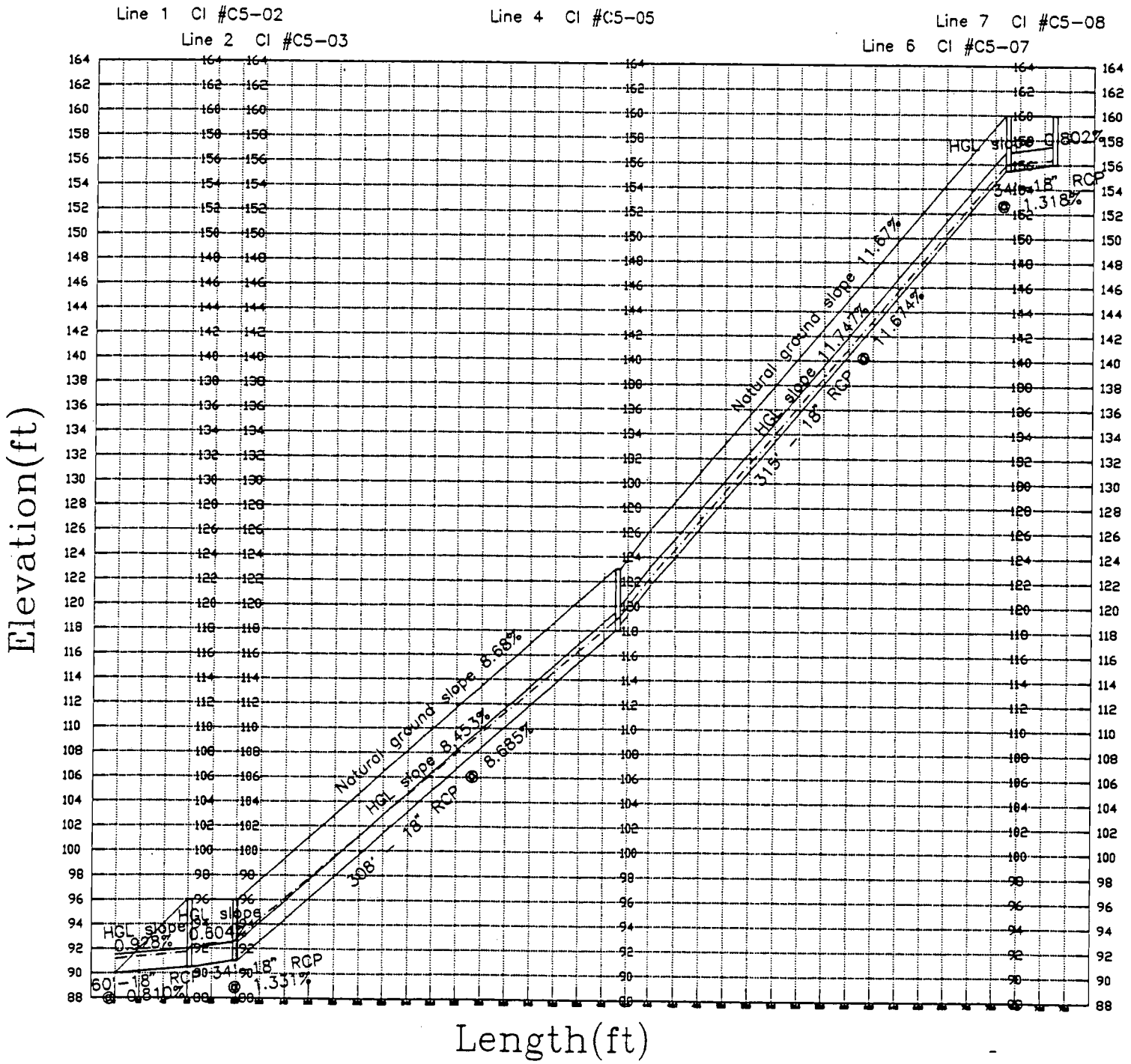
Line 2 CI #B2-03 Line 6 CI #B2-07



Hydraulic Profile – System "C2"



Hydraulic Profile System "C5"



DRAINAGE SYSTEM "A1"

Data File : 93-028A1.STM Return Period: 10 Yrs
Rainfall file: 93-028A1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT
CL #A1-02 Downstream Line # = OUTFALL

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 13.72
Plan Length (ft) = 147.66 Pipe Length (ft) = 145.67 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	102.00	10.49	102.87	103.84	104.00	106.89	1.32	7.89
DNSTREAM	100.00	10.49	100.87	101.84	102.00	100.00	1.32	7.89
SLOPE(%)	1.354		1.373	1.373		4.730		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.4	2.7		
Drainage Time (min) =	15.00	17.23		
Intensity (in/h) =	6.41	6.09	TOTAL	UNIFORM
Runoff Coefficient =	0.55	0.63	FLOW	CAPACITY
Rational Flow (cfs) =	5.01	10.42	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	10.42	26.32

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 5.01
Carryover from previous inlet = 0.00
Total flow to current inlet = 5.01
Intercepted by current inlet = 5.01
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.56
DEPTH AT CURB (ft) = 0.21
EFFICIENCY (%)
Curb = 100.00
Grate = * Total = 100.00
Slot = *

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 0
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "A1"

Data File : 93-028A1.STM Return Period: 10 Yrs

Rainfall file: 93-028A1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT

CI #A1-03 Downstream Line # = 1

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 7.25

Plan Length (ft) = 31.11 Pipe Length (ft) = 27.11 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	103.00	9.67	103.81	103.91	104.50	106.89	0.97	2.59
DNSTREAM	102.50	16.10	103.84	103.88	104.00	106.89	1.67	1.51
SLOPE(%)	1.607		-0.131	0.124		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.5	0.5		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.75	0.75	FLOW	CAPACITY
Rational Flow (cfs) =	2.51	2.51	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	2.51	13.31

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment =	2.51	PONDING WIDTH (ft) =	1.85
Carryover from previous inlet =	0.00	DEPTH AT CURB (ft) =	0.13
Total flow to current inlet =	2.51	EFFICIENCY (%)	
Intercepted by current inlet =	2.51	Curb = 100.00	
Bypassed by current inlet =	0.00	Grate = *	Total = 100.00
		Slot = *	

INPUT PARAMETERS:

Inlet Type =	CURB IN SAG	Longitudinal Slope (ft/ft) =	0.000
Gutter Width (ft) =	1.500	Pavement Cross Slope (ft/ft) =	0.021
Inlet n-value =	0.013	Gutter Cross Slope (ft/ft) =	0.083
Downstream Inlet Number =	1	Gutter depression (in) =	10.00
Curb Throat Type =	Inclined		
Inlet Opening Ht (in) =	6.00		
Curb Length (ft) =	20.00		
Curb Weir Coeff. =	2.300		
Curb Orifice Coeff. =	0.670		
Incline Angle (deg) =	41.00		

DRAINAGE SYSTEM "A1"

Data File : 93-028A1.STM Return Period: 10 Yrs

Rainfall file: 93-028A1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 3 STORM SEWER HYDRAULIC REPORT

CI #A1-04 Downstream Line # = 1

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 8.81

Plan Length (ft) = 330.69 Pipe Length (ft) = 326.97 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	115.50	8.81	116.23	116.52	117.00	120.38	0.86	4.31
DNSTREAM	102.00	18.00	103.84	103.91	103.50	106.89	1.77	2.09
SLOPE(%)	4.082		3.790	3.857		4.126		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.9		
Drainage Time (min) =	10.00	15.53		
Intensity (in/h) =	7.28	6.33	TOTAL	UNIFORM
Runoff Coefficient =	0.85	0.69	FLOW	CAPACITY
Rational Flow (cfs) =	0.99	3.70	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	3.70	21.22

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	= 0.99	PONDING WIDTH (ft)	= 4.58
Carryover from previous inlet	= 0.00	DEPTH AT CURB (ft)	= 0.19
Total flow to current inlet	= 0.99	EFFICIENCY (%)	
Intercepted by current inlet	= 0.99	Curb = 100.00	
Bypassed by current inlet	= 0.00	Grate = *	Total = 100.00
		Slot = *	

INPUT PARAMETERS:

Inlet Type	= CURB ON GRADE	Longitudinal Slope (ft/ft)	= 0.020
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 2	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Curb Length (ft)	= 13.00		

DRAINAGE SYSTEM "A1"

Data File : 93-028A1.STM Return Period: 10 Yrs

Rainfall file: 93-028A1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 4 STORM SEWER HYDRAULIC REPORT

CI #A1-05 Downstream Line # = 3

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 7.76

Plan Length (ft) = 101.70 Pipe Length (ft) = 97.70 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	116.50	7.76	117.39	117.63	118.00	121.22	0.73	3.94
DNSTREAM	115.50	12.26	116.52	116.60	117.00	120.38	1.28	2.24
SLOPE(%)	0.983		0.887	1.054		0.860		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.7	0.7		
Drainage Time (min) =	15.00	15.00		
Intensity (in/h) =	6.41	6.41	TOTAL	UNIFORM
Runoff Coefficient =	0.65	0.65	FLOW	CAPACITY
Rational Flow (cfs) =	2.88	2.88	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	2.88	10.41

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	2.88	
Carryover from previous inlet	=	0.00	
Total flow to current inlet	=	2.88	
Intercepted by current inlet	=	2.88	
Bypassed by current inlet	=	0.00	

PONDING WIDTH (ft) = 6.27

DEPTH AT CURB (ft) = 0.22

EFFICIENCY (%)

Curb = 100.00

Grate = * Total = 100.00

Slot = *

INPUT PARAMETERS:

Inlet Type	= CURB ON GRADE	Longitudinal Slope (ft/ft)	= 0.050
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 3	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Curb Length (ft)	= 13.00		

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs
Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT
CI #B1-02 Downstream Line # = OUTFALL

Diameter (in) = 30 N = 0.013 Critical Depth (in) = 19.56
Plan Length (ft) = 66.79 Pipe Length (ft) = 64.79 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	91.00	14.54	92.21	93.79	93.50	97.88	2.36	10.09
DNSTREAM	90.00	14.54	91.21	92.79	92.50	90.00	2.36	10.09
SLOPE(%)	1.497		1.543	1.543		12.162		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	12.7		
Drainage Time (min) =	10.00	46.92		
Intensity (in/h) =	7.28	3.75	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.50	FLOW	CAPACITY
Rational Flow (cfs) =	0.71	23.79	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	23.79	50.18

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 0.71
Carryover from previous inlet = 0.00
Total flow to current Inlet = 0.71
Intercepted by current inlet = 0.71
Bypassed by current Inlet = 0.00

PONDING WIDTH (ft) = 0.68
DEPTH AT CURB (ft) = 0.06
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 0
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00
Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs
Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT
CI #B2-03 Downstream Line # = 1

Diameter (in) = 30 N = 0.013 Critical Depth (in) = 14.86
Plan Length (ft) = 51.78 Pipe Length (ft) = 47.79 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	91.50	27.94	93.83	93.96	94.00	97.88	4.76	2.89
DNSTREAM	91.00	30.00	93.79	93.91	93.50	97.88	4.91	2.80
SLOPE(%)	0.966		0.077	0.093		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.6	7.0		
Drainage Time (min) =	15.00	46.64		
Intensity (in/h) =	6.41	3.76	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.52	FLOW	CAPACITY
Rational Flow (cfs) =	2.19	13.74	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	13.74	40.30

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 2.19
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 2.19
- Intercepted by current inlet = 2.19
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.45
DEPTH AT CURB (ft) = 0.12
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB IN SAG
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 1
- Curb Throat Type = Inclined
- Inlet Opening Ht (in) = 6.00
- Curb Length (ft) = 20.00
- Curb Weir Coeff. = 2.300
- Curb Orifice Coeff. = 0.670
- Incline Angle (deg) = 41.00
- Longitudinal Slope (ft/ft) = 0.000
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs

Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 3 STORM SEWER HYDRAULIC REPORT

CI #B1-04 Downstream Line # = 2

Diameter (in) = 30 N = 0.013 Critical Depth (in) = 14.28

Plan Length (ft) = 239.34 Pipe Length (ft) = 235.34 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	92.00	25.78	94.15	94.27	94.50	97.06	4.49	2.83
DNSTREAM	91.50	29.49	93.96	94.06	94.00	97.88	4.89	2.59
SLOPE(%)	0.209		0.081	0.089		-0.348		

		CATCHMENT	CUMULATIVE		
Area (ac)	=	1.3	6.4		
Drainage Time (min)	=	30.00	45.20		
Intensity (in/h)	=	4.78	3.83	TOTAL	UNIFORM
Runoff Coefficient	=	0.45	0.52	FLOW	CAPACITY
Rational Flow (cfs)	=	2.79	12.68	(cfs)	(cfs)
Known Flow (cfs)	=	0.00	0.00	12.68	18.75

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	2.79	PONDING WIDTH (ft)	= 2.32
Carryover from previous inlet	=	0.00	DEPTH AT CURB (ft)	= 0.14
Total flow to current inlet	=	2.79	EFFICIENCY (%)	
Intercepted by current inlet	=	2.79	Curb = 100.00	
Bypassed by current inlet	=	0.00	Grate = *	Total = 100.00
			Slot = *	

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 2	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs
Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 4 STORM SEWER HYDRAULIC REPORT
CI #B1-05 Downstream Line # = 3

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 6.10
Plan Length (ft) = 53.66 Pipe Length (ft) = 49.66 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	92.50	18.00	94.29	94.30	94.00	97.37	1.77	1.00
DNSTREAM	92.00	18.00	94.27	94.29	93.50	97.06	1.77	1.00
SLOPE(%)	0.932		0.029	0.029		0.624		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.4	0.4		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.61	FLOW	CAPACITY
Rational Flow (cfs) =	1.78	1.78	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	1.78	10.14

Note: Upstream surcharge (ft) = 0.29

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 1.78
Carryover from previous inlet = 0.00
Total flow to current inlet = 1.78
Intercepted by current inlet = 1.78
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.26
DEPTH AT CURB (ft) = 0.10
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 2
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

Data File : 93-028B1.STM
Rainfall file: 93-028B1.RND

Return Period: 10 Yr
I = 129.310/ (Tc + 20.750) ^ 0.84(

LINE 5
CI #B1-06

STORM SEWER HYDRAULIC REPORT

Downstream Line # = 3

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 13.12
Plan Length (ft) = 51.61 Pipe Length (ft) = 47.61 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft²)	VEL (ft/s)
UPSTREAM	93.00	14.42	94.20	94.56	95.00	97.06	1.97	4.83
DNSTREAM	92.50	21.27	94.27	94.44	94.50	97.06	2.94	3.24
SLOPE(%)	0.969		-0.148	0.272		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.9	4.7		
Drainage Time (min) =	45.00	45.00		
Intensity (in/h) =	3.84	3.84	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.53	FLOW	CAPACITY
Rational Flow (cfs) =	3.25	9.53	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	9.53	22.26

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 3.25
Carryover from previous inlet = 0.00
Total flow to current inlet = 3.25
Intercepted by current inlet = 3.25
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 3.05
DEPTH AT CURB (ft) = 0.16
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 4
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

Data File : 93-028B1.STM Return Period: 10 Yrs
Rainfall file: 93-028B1.RND 1 = 129.310/ (Tc + 20.750) ^ 0.840

LINE 6 STORM SEWER HYDRAULIC REPORT
CI #B1-07 Downstream Line # = 5

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 11.84
Plan Length (ft) = 242.36 Pipe Length (ft) = 238.40 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	97.00	11.84	97.99	98.38	99.00	101.85	1.54	5.03
DNSTREAM	93.00	18.77	94.56	94.70	95.00	97.06	2.64	2.95
SLOPE(%)	1.650		1.436	1.544		2.009		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.4	2.8		
Drainage Time (min) =	10.00	30.30		
Intensity (in/h) =	7.28	4.75	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient =	0.60	0.58		
Rational Flow (cfs) =	1.70	7.77		
Known Flow (cfs) =	0.00	0.00	7.77	29.06

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 1.70
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 1.70
- Intercepted by current inlet = 1.70
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.23
DEPTH AT CURB (ft) = 0.10
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB IN SAG
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 5
- Curb Throat Type = Inclined
- Inlet Opening Ht (in) = 6.00
- Curb Length (ft) = 20.00
- Curb Weir Coeff. = 2.300
- Curb Orifice Coeff. = 0.670
- Incline Angle (deg) = 41.00
- Longitudinal Slope (ft/ft) = 0.000
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs
Rainfall file: 93-028B1.RND 1 = 129.310/ (Tc + 20.750) ^ 0.840

LINE 7 STORM SEWER HYDRAULIC REPORT
CI #B1-08 Downstream Line # = 6

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 10.99
Plan Length (ft) = 71.92 Pipe Length (ft) = 67.93 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	97.75	10.99	98.67	99.02	99.75	102.04	1.40	4.77
DNSTREAM	97.00	16.55	98.38	98.51	99.00	101.85	2.31	2.89
SLOPE(%)	1.043		0.421	0.750		0.280		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.9	2.4		
Drainage Time (min) =	30.00	30.00		
Intensity (in/h) =	4.78	4.78	TOTAL	UNIFORM
Runoff Coefficient =	0.55	0.57	FLOW	CAPACITY
Rational Flow (cfs) =	4.89	6.69	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	6.69	23.10

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 4.89
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 4.89
- Intercepted by current inlet = 4.89
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.40
DEPTH AT CURB (ft) = 0.21
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 6	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM
Rainfall file: 93-028B1.RND

Return Period: 10 Yrs
I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 8 STORM SEWER HYDRAULIC REPORT
CI #B1-09

Downstream Line # = 7

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 7.58
Plan Length (ft) = 112.11 Pipe Length (ft) = 108.12 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	99.25	7.58	99.88	100.12	100.75	104.26	0.71	3.88
DNSTREAM	98.25	9.22	99.02	99.16	99.75	102.04	0.91	3.01
SLOPE(%)	0.892		0.798	0.884		2.053		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.6	0.6		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient =	0.65	0.65		
Rational Flow (cfs) =	2.74	2.74		
Known Flow (cfs) =	0.00	0.00	2.74	9.92

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 2.74
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 2.74
- Intercepted by current inlet = 2.74
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 2.24
DEPTH AT CURB (ft) = 0.14
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 7	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs
Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 9 STORM SEWER HYDRAULIC REPORT
CI #B1-10 Downstream Line # = 1

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 13.38
Plan Length (ft) = 229.23 Pipe Length (ft) = 225.27 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	95.50	13.38	96.61	97.09	97.50	100.45	1.80	5.51
DNSTREAM	91.00	24.00	93.79	93.95	93.00	97.88	3.14	3.16
SLOPE(%)	1.963		1.253	1.394		1.141		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.7	5.5		
Drainage Time (min) =	45.00	45.46		
Intensity (in/h) =	3.84	3.82	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	2.89	9.91	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	9.91	31.69

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 2.89
Carryover from previous inlet = 0.00
Total flow to current inlet = 2.89
Intercepted by current inlet = 2.89
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 7.11
DEPTH AT CURB (ft) = 0.24
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 8
Curb Throat Type = Inclined
Curb Length (ft) = 13.00

Longitudinal Slope (ft/ft) = 0.030
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yr

Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.84

LINE 10 STORM SEWER HYDRAULIC REPORT

CI #B1-11 Downstream Line # =

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.59

Plan Length (ft) = 30.84 Pipe Length (ft) = 26.85 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	96.50	6.84	97.07	97.11	98.00	100.45	0.62	1.63
DNSTREAM	96.00	13.03	97.09	97.09	97.50	100.45	1.37	0.73
SLOPE(%)	1.621		-0.059	0.064		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient =	0.60	0.60		
Rational Flow (cfs) =	1.00	1.00	1.00	13.37
Known Flow (cfs) =	0.00	0.00		

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	1.00	
Carryover from previous inlet	=	0.00	
Total flow to current inlet	=	1.00	
Intercepted by current inlet	=	1.00	
Bypassed by current inlet	=	0.00	

PONDING WIDTH (ft) = 4.08

DEPTH AT CURB (ft) = 0.18

EFFICIENCY (%)

Curb = 100.00

Grate = *

Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB ON GRADE	Longitudinal Slope (ft/ft)	= 0.030
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 9	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Curb Length (ft)	= 13.00		

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM
Rainfall file: 93-028B1.RND

Return Period: 10 Yrs
I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 11
CI #B1-12

STORM SEWER HYDRAULIC REPORT

Downstream Line # = 9

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 11.72
Plan Length (ft) = 144.06 Pipe Length (ft) = 140.06 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	97.00	11.72	97.98	98.43	98.50	101.15	1.22	5.38
DNSTREAM	96.00	13.03	97.09	97.44	97.50	100.45	1.37	4.78
SLOPE(%)	0.694		0.636	0.703		0.500		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.4	3.6		
Drainage Time (min) =	45.00	45.00		
Intensity (in/h) =	3.84	3.84	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	2.46	6.55	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	6.55	8.75

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 2.46
Carryover from previous inlet = 0.00
Total flow to current inlet = 2.46
Intercepted by current inlet = 2.46
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 6.58
DEPTH AT CURB (ft) = 0.23
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 10
Curb Throat Type = Inclined
Curb Length (ft) = 13.00

Longitudinal Slope (ft/ft) = 0.030
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs

Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 12 STORM SEWER HYDRAULIC REPORT

CI #B1-13 Downstream Line # = 11

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 10.20

Plan Length (ft) = 205.14 Pipe Length (ft) = 201.14 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	98.00	11.00	98.92	99.22	99.50	102.57	1.13	4.39
DNSTREAM	97.00	17.11	98.43	98.55	98.50	101.15	1.73	2.86
SLOPE(%)	0.487		0.244	0.329		0.706		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.8	2.2		
Drainage Time (min) =	30.00	31.57		
Intensity (in/h) =	4.78	4.65	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.48	FLOW	CAPACITY
Rational Flow (cfs) =	1.61	4.96	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	4.96	7.33

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	1.61	
Carryover from previous inlet	=	0.00	
Total flow to current inlet	=	1.61	
Intercepted by current inlet	=	1.61	
Bypassed by current inlet	=	0.00	

PONDING WIDTH (ft) = 4.32

DEPTH AT CURB (ft) = 0.21

EFFICIENCY (%)

Curb = 100.00

Grate = * Total = 100.00

Slot = *

INPUT PARAMETERS:

Inlet Type	= CURB ON GRADE	Longitudinal Slope (ft/ft)	= 0.030
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.030
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 11	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Curb Length (ft)	= 13.00		

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs

Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 13 STORM SEWER HYDRAULIC REPORT

FI #B1-14 Downstream Line # = 12

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.97

Plan Length (ft) = 30.84 Pipe Length (ft) = 26.85 KJ (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL. (ft/s)
UPSTREAM	98.50	8.51	99.24	99.27	100.00	102.57	0.82	1.43
DNSTREAM	98.00	14.59	99.22	99.22	99.50	102.57	1.53	0.77
SLOPE(%)	1.621		0.096	0.180		0.000		

		CATCHMENT	CUMULATIVE		
Area (ac)	=	0.3	0.3		
Drainage Time (min)	=	10.00	10.00		
Intensity (in/h)	=	7.28	7.28	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient	=	0.60	0.60		
Rational Flow (cfs)	=	1.18	1.18		
Known Flow (cfs)	=	0.00	0.00	1.18	13.37

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	1.18	PONDING WIDTH (ft)	=	3.68
Carryover from previous inlet	=	0.00	DEPTH AT CURB (ft)	=	0.19
Total flow to current inlet	=	1.18	EFFICIENCY (%)		
Intercepted by current inlet	=	1.18	Curb = 100.00		
Bypassed by current inlet	=	0.00	Grate = *	Total =	100.00
			Slot = *		

INPUT PARAMETERS:

Inlet Type	= CURB ON GRADE	Longitudinal Slope (ft/ft)	= 0.030
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.030
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 12	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Curb Length (ft)	= 13.00		

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs

Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 14 STORM SEWER HYDRAULIC REPORT

CI #B1-15 Downstream Line # = 12

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 7.51

Plan Length (ft) = 207.88 Pipe Length (ft) = 203.93 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	102.50	7.51	103.13	103.36	104.00	107.75	0.70	3.85
DNSTREAM	98.00	14.59	99.22	99.26	99.50	102.57	1.53	1.75
SLOPE(%)	2.165		1.918	2.007		2.540		

		CATCHMENT	CUMULATIVE		
Area (ac)	=	0.2	1.2		
Drainage Time (min)	=	10.00	30.36		
Intensity (in/h)	=	7.28	4.75	TOTAL	UNIFORM
Runoff Coefficient	=	0.60	0.48	FLOW	CAPACITY
Rational Flow (cfs)	=	0.92	2.69	(cfs)	(cfs)
Known Flow (cfs)	=	0.00	0.00	2.69	15.45

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	0.92	PONDING WIDTH (ft)	=	0.81
Carryover from previous inlet	=	0.00	DEPTH AT CURB (ft)	=	0.07
Total flow to current inlet	=	0.92	EFFICIENCY (%)		
Intercepted by current inlet	=	0.92	Curb = 100.00		
Bypassed by current inlet	=	0.00	Grate = *	Total =	100.00
			Slot = *		

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 13	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "B1"

Data File : 93-028B1.STM Return Period: 10 Yrs

Rainfall file: 93-028B1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 15 STORM SEWER HYDRAULIC REPORT

CI #B1-16 Downstream Line # = 14

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 6.65

Plan Length (ft) = 64.62 Pipe Length (ft) = 60.62 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	103.00	6.65	103.75	103.95	104.50	107.75	0.59	3.55
DNSTREAM	102.50	10.28	103.36	103.42	104.00	107.75	1.04	2.02
SLOPE(%)	0.774		0.649	0.868		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.0	1.0		
Drainage Time (min) =	30.00	30.00		
Intensity (in/h) =	4.78	4.78	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.45	FLOW	CAPACITY
Rational Flow (cfs) =	2.11	2.11	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	2.11	9.24

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	2.11	
Carryover from previous inlet	=	0.00	
Total flow to current inlet	=	2.11	
Intercepted by current inlet	=	2.11	
Bypassed by current inlet	=	0.00	

PONDING WIDTH (ft) = 1.41

DEPTH AT CURB (ft) = 0.12

EFFICIENCY (%)

Curb = 100.00

Grate = * Total = 100.00

Slot = *

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 14	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "B2"

Data File : 93-028B2.STM Return Period: 10 Yrs

Rainfall file: 93-028B2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT

CI #B2-02 Downstream Line # = OUTFALL

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 12.78

Plan Length (ft) = 85.12 Pipe Length (ft) = 83.33 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	110.00	6.29	110.52	113.47	112.00	116.43	0.66	13.77
DNSTREAM	104.00	6.29	104.52	107.47	106.00	104.00	0.66	13.77
SLOPE(%)	7.049		7.200	7.200		14.916		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.3	3.8		
Drainage Time (min) =	10.00	31.58		
Intensity (in/h) =	7.28	4.65	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.52	FLOW	CAPACITY
Rational Flow (cfs) =	1.51	9.05	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	9.05	60.05

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	1.51	
Carryover from previous inlet	=	0.00	
Total flow to current inlet	=	1.51	
Intercepted by current inlet	=	1.51	
Bypassed by current inlet	=	0.00	

PONDING WIDTH (ft) = 1.45

DEPTH AT CURB (ft) = 0.12

EFFICIENCY (%)

Curb = 100.00

Grate = *

Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 0	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 13.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "B2"

Data File : 93-028B2.STM Return Period: 10 Yrs
Rainfall file: 93-028B2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT
CI #B2-03 Downstream Line # = 1

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 12.12
Plan Length (ft) = 61.81 Pipe Length (ft) = 57.83 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	111.50	24.00	113.50	113.60	113.50	117.25	3.14	2.59
DNSTREAM	110.00	24.00	113.47	113.57	112.00	116.43	3.14	2.59
SLOPE(%)	2.427		0.051	0.051		1.418		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.4	3.4		
Drainage Time (min) =	30.00	31.21		
Intensity (in/h) =	4.78	4.68	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.51	FLOW	CAPACITY
Rational Flow (cfs) =	3.07	8.13	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	8.13	35.23

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 3.07
Carryover from previous inlet = 0.00
Total flow to current inlet = 3.07
Intercepted by current inlet = 3.07
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 4.79
DEPTH AT CURB (ft) = 0.19
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 1
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 13.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B2"

Data File : 93-028B2.STM Return Period: 10 Yrs
Rainfall file: 93-028B2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 3 STORM SEWER HYDRAULIC REPORT
CI #B2-04 Downstream Line # = 2

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.38
Plan Length (ft) = 53.61 Pipe Length (ft) = 49.62 K,j (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft²)	VEL (ft/s)
UPSTREAM	112.75	10.18	113.60	113.61	114.25	117.25	1.03	0.89
DNSTREAM	112.00	18.00	113.60	113.61	113.50	117.25	1.77	0.52
SLOPE(%)	1.399		-0.012	0.005		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	0.92	0.92	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	0.92	12.42

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 0.92
Carryover from previous inlet = 0.00
Total flow to current inlet = 0.92
Intercepted by current inlet = 0.92
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.04
DEPTH AT CURB (ft) = 0.09
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 2
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 13.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B2"

Data File : 93-028B2.STM Return Period: 10 Yr
Rainfall file: 93-028B2.RND I = 129.310/ (Tc + 20.750) ^ 0.84

LINE 4 STORM SEWER HYDRAULIC REPORT
CI #B2-05 Downstream Line # =

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 9.66
Plan Length (ft) = 273.12 Pipe Length (ft) = 270.63 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	140.50	9.66	141.31	141.63	142.00	145.12	0.97	4.61
DNSTREAM	112.00	18.00	113.60	113.70	113.50	117.25	1.77	2.52
SLOPE(%)	10.435		10.236	10.321		10.298		

	CATCHMENT	CUMULATIVE	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Area (ac) =	0.2	1.1		
Drainage Time (min) =	10.00	12.16		
Intensity (in/h) =	7.28	6.87		
Runoff Coefficient =	0.60	0.60		
Rational Flow (cfs) =	1.05	4.45		
Known Flow (cfs) =	0.00	0.00	4.45	33.92

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 1.05
Carryover from previous inlet = 0.00
Total flow to current inlet = 1.05
Intercepted by current inlet = 1.05
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 2.96
DEPTH AT CURB (ft) = 0.16
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 3
Curb Throat Type = Inclined
Curb Length (ft) = 13.00
Longitudinal Slope (ft/ft) = 0.080
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B2"

Data File : 93-028B2.STM
Rainfall file: 93-028B2.RND

Return Period: 10 Yr
I = 129.310/ (Tc + 20.750) ^ 0.84

LINE 5 STORM SEWER HYDRAULIC REPORT
CI #B2-06

Downstream Line # =

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.69
Plan Length (ft) = 31.09 Pipe Length (ft) = 27.09 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	141.00	7.48	141.62	141.66	142.50	145.12	0.69	1.51
DNSTREAM	140.50	13.62	141.63	141.64	142.00	145.12	1.43	0.73
SLOPE(%)	1.608		-0.043	0.057		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	1.05	1.05	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	1.05	13.32

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 1.05
Carryover from previous inlet = 0.00
Total flow to current inlet = 1.05
Intercepted by current inlet = 1.05
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 2.96
DEPTH AT CURB (ft) = 0.16
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 4
Curb Throat Type = Inclined
Curb Length (ft) = 13.00

Longitudinal Slope (ft/ft) = 0.080
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B2"

Data File : 93-028B2.STM
Rainfall file: 93-028B2.RND

Return Period: 10 Yrs
I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 6
CI #B2-07

STORM SEWER HYDRAULIC REPORT

Downstream Line # = 4

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 7.39
Plan Length (ft) = 332.85 Pipe Length (ft) = 329.52 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	161.50	7.39	162.12	162.34	163.00	166.32	0.68	3.81
DNSTREAM	140.50	13.62	141.63	141.69	142.00	145.12	1.43	1.82
SLOPE(%)	6.309		6.215	6.268		6.434		

		CATCHMENT	CUMULATIVE		
Area (ac)	=	0.3	0.6		
Drainage Time (min)	=	10.00	10.21		
Intensity (in/h)	=	7.28	7.23	TOTAL	UNIFORM
Runoff Coefficient	=	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs)	=	1.31	2.60	(cfs)	(cfs)
Known Flow (cfs)	=	0.00	0.00	2.60	26.38

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 1.31
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 1.31
- Intercepted by current inlet = 1.31
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 4.79
DEPTH AT CURB (ft) = 0.19
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 5
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.030
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B2"

Data File : 93-028B2.STM Return Period: 10 Yrs
Rainfall file: 93-028B2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 7 STORM SEWER HYDRAULIC REPORT
CI #B2-08 Downstream Line # = 6

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 5.24
Plan Length (ft) = 31.04 Pipe Length (ft) = 27.04 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	162.00	5.24	162.58	162.73	163.50	166.32	0.43	3.06
DNSTREAM	161.50	10.10	162.34	162.37	163.00	166.32	1.02	1.28
SLOPE(%)	1.611		0.891	1.335		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.3	0.3		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	1.31	1.31	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	1.31	13.33

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 1.31
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 1.31
- Intercepted by current inlet = 1.31
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 4.79
DEPTH AT CURB (ft) = 0.19
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *
- Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 6
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.030
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "B2"

Data File : 93-028B2.STM Return Period: 10 Yrs

Rainfall file: 93-028B2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 8 STORM SEWER HYDRAULIC REPORT

CI #B2-09 Downstream Line # = 2

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 5.66

Plan Length (ft) = 152.11 Pipe Length (ft) = 148.12 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	114.00	5.66	114.63	114.79	115.50	119.02	0.48	3.21
DNSTREAM	112.00	18.00	113.60	113.62	113.50	117.25	1.77	0.86
SLOPE(%)	1.315		0.694	0.794		1.195		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.7	0.7		
Drainage Time (min) =	30.00	30.00		
Intensity (in/h) =	4.78	4.78	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.45	FLOW	CAPACITY
Rational Flow (cfs) =	1.53	1.53	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	1.53	12.04

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment =	1.53
Carryover from previous inlet =	0.00
Total flow to current inlet =	1.53
Intercepted by current inlet =	1.53
Bypassed by current inlet =	0.00

PONDING WIDTH (ft) = 6.83

DEPTH AT CURB (ft) = 0.24

EFFICIENCY (%)

Curb = 100.00 Grate = * Slot = * Total = 100.00

INPUT PARAMETERS:

Inlet Type =	CURB ON GRADE	Longitudinal Slope (ft/ft) =	0.010
Gutter Width (ft) =	1.500	Pavement Cross Slope (ft/ft) =	0.021
Inlet n-value =	0.013	Gutter Cross Slope (ft/ft) =	0.083
Downstream Inlet Number =	7	Gutter depression (in) =	10.00
Curb Throat Type =	Inclined		
Curb Length (ft) =	13.00		

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT
CI #B3-02 Downstream Line # = OUTFALL

Diameter (in) = 30 N = 0.013 Critical Depth (in) = 17.50
Plan Length (ft) = 95.49 Pipe Length (ft) = 93.68 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	110.00	8.75	110.73	114.70	112.50	120.06	1.19	15.99
DNSTREAM	104.00	8.75	104.73	108.70	106.50	104.00	1.19	15.99
SLOPE(%)	6.283		6.405	6.405		17.143		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.3	8.6		
Drainage Time (min) =	10.00	32.78		
Intensity (in/h) =	7.28	4.57	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.48	FLOW	CAPACITY
Rational Flow (cfs) =	1.15	19.05	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	19.05	102.80

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 1.15
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 1.15
- Intercepted by current inlet = 1.15
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.56
DEPTH AT CURB (ft) = 0.21
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.016
- Downstream Inlet Number = 0
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.020
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT
CI #B3-03 Downstream Line # = 1

Diameter (in) = 30 N = 0.013 Critical Depth (in) = 17.19
Plan Length (ft) = 53.90 Pipe Length (ft) = 49.96 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	112.50	27.26	114.77	115.01	115.00	119.73	4.69	3.93
DNSTREAM	110.00	30.00	114.70	114.92	112.50	120.06	4.91	3.75
SLOPE(%)	4.639		0.145	0.187		-0.661		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.9	8.4		
Drainage Time (min) =	30.00	32.57		
Intensity (in/h) =	4.78	4.58	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.48	FLOW	CAPACITY
Rational Flow (cfs) =	1.98	18.39	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	18.39	88.33

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 1.98
Carryover from previous inlet = 0.00
Total flow to current inlet = 1.98
Intercepted by current inlet = 1.98
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.35
DEPTH AT CURB (ft) = 0.11
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.016
Downstream Inlet Number = 1
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 3 STORM SEWER HYDRAULIC REPORT
CI #B3-04 Downstream Line # = 2

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 13.83
Plan Length (ft) = 187.47 Pipe Length (ft) = 184.00 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	127.00	13.83	128.15	128.76	128.50	132.14	1.46	6.26
DNSTREAM	113.00	18.00	115.01	115.43	114.50	119.73	1.77	5.17
SLOPE(%)	7.468		7.142	7.248		6.745		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.1	4.1		
Drainage Time (min) =	30.00	31.31		
Intensity (in/h) =	4.78	4.67	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient =	0.45	0.48		
Rational Flow (cfs) =	2.32	9.13		
Known Flow (cfs) =	0.00	0.00	9.13	28.70

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 2.32
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 2.32
- Intercepted by current inlet = 2.32
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.56
DEPTH AT CURB (ft) = 0.21
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.016
- Downstream Inlet Number = 2
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.080
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 4 STORM SEWER HYDRAULIC REPORT
CI #B3-05 Downstream Line # = 3

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.38
Plan Length (ft) = 31.15 Pipe Length (ft) = 27.17 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	128.00	9.10	128.77	128.79	129.50	132.14	0.90	1.02
DNSTREAM	127.00	18.00	128.76	128.77	128.50	132.14	1.77	0.52
SLOPE(%)	3.210		0.047	0.091		0.000		

	CATCHMENT	CUMULATIVE
Area (ac) =	0.2	0.2
Drainage Time (min) =	10.00	10.00
Intensity (in/h) =	7.28	7.28
Runoff Coefficient =	0.60	0.60
Rational Flow (cfs) =	0.92	0.92
Known Flow (cfs) =	0.00	0.00

TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
0.92	18.82

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 0.92
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 0.92
- Intercepted by current inlet = 0.92
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 3.13
DEPTH AT CURB (ft) = 0.16
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB ON GRADE	Longitudinal Slope (ft/ft)	= 0.080
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.016	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 3	Gutter depression (in)	= 6.00
Curb Throat Type	= Inclined		
Curb Length (ft)	= 13.00		

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 5 STORM SEWER HYDRAULIC REPORT
FI #B3-06 Downstream Line # = 3

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 11.52
Plan Length (ft) = 150.16 Pipe Length (ft) = 146.35 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	134.50	11.52	135.46	135.90	136.00	139.12	1.19	5.30
DNSTREAM	127.00	18.00	128.76	128.96	128.50	132.14	1.77	3.58
SLOPE(%)	4.995		4.576	4.738		4.769		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.2	2.8		
Drainage Time (min) =	30.00	30.76		
Intensity (in/h) =	4.78	4.72	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.48	FLOW	CAPACITY
Rational Flow (cfs) =	2.47	6.32	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	6.32	23.47

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 2.47
Carryover from previous inlet = 0.00
Total flow to current inlet = 2.47
Intercepted by current inlet = 2.47
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 7.25
DEPTH AT CURB (ft) = 0.24
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.016
Downstream Inlet Number = 4
Curb Throat Type = Inclined
Curb Length (ft) = 13.00
Longitudinal Slope (ft/ft) = 0.030
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 6 STORM SEWER HYDRAULIC REPORT
CI #B3-07 Downstream Line # = 5

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 9.08
Plan Length (ft) = 157.57 Pipe Length (ft) = 153.69 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	140.50	9.08	141.26	141.56	142.00	145.21	0.89	4.40
DNSTREAM	134.50	16.74	135.90	135.98	136.00	139.12	1.71	2.30
SLOPE(%)	3.808		3.488	3.631		3.963		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.1	1.6		
Drainage Time (min) =	30.00	30.00		
Intensity (in/h) =	4.78	4.78	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.50	FLOW	CAPACITY
Rational Flow (cfs) =	2.30	3.93	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	3.93	20.49

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 2.30
Carryover from previous inlet = 0.00
Total flow to current inlet = 2.30
Intercepted by current inlet = 2.30
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 7.04
DEPTH AT CURB (ft) = 0.24
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.016
Downstream Inlet Number = 5
Curb Throat Type = Inclined
Curb Length (ft) = 13.00
Longitudinal Slope (ft/ft) = 0.030
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 7 STORM SEWER HYDRAULIC REPORT
CI #B3-08 Downstream Line # = 6

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.06
Plan Length (ft) = 31.04 Pipe Length (ft) = 27.04 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	141.50	4.06	141.95	142.05	143.00	145.21	0.30	2.63
DNSTREAM	141.00	6.69	141.56	141.58	142.50	145.21	0.60	1.31
SLOPE(%)	1.611		1.436	1.735		0.000		

		CATCHMENT	CUMULATIVE		
Area (ac)	=	0.2	0.2		
Drainage Time (min)	=	10.00	10.00		
Intensity (in/h)	=	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient	=	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs)	=	0.79	0.79	(cfs)	(cfs)
Known Flow (cfs)	=	0.00	0.00	0.79	13.33

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 0.79
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 0.79
- Intercepted by current inlet = 0.79
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 3.94
DEPTH AT CURB (ft) = 0.18
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.016
- Downstream Inlet Number = 5
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.030
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 8 STORM SEWER HYDRAULIC REPORT
CI #B3-09 Downstream Line # = 6

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 5.95
Plan Length (ft) = 254.60 Pipe Length (ft) = 251.25 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft²)	VEL (ft/s)
UPSTREAM	158.50	5.95	159.00	159.17	160.00	162.71	0.51	3.31
DNSTREAM	140.50	12.69	141.56	141.58	142.00	145.21	1.33	1.27
SLOPE(%)	7.070		6.941	6.999		6.965		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.4		
Drainage Time (min) =	10.00	10.31		
Intensity (in/h) =	7.28	7.22	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	0.87	1.69	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	1.69	27.92

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 0.87
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 0.87
- Intercepted by current inlet = 0.87
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 0.78
DEPTH AT CURB (ft) = 0.07
EFFICIENCY (%)
Curb = 100.00 Grate = * Total = 100.00
Slot = *

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.016	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 6	Gutter depression (in)	= 6.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 9 STORM SEWER HYDRAULIC REPORT
CI #B3-10 Downstream Line # = 8

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.17
Plan Length (ft) = 37.96 Pipe Length (ft) = 34.05 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	161.00	4.17	161.46	161.57	162.50	165.35	0.31	2.67
DNSTREAM	158.48	8.28	159.17	159.18	159.98	162.71	0.79	1.04
SLOPE(%)	6.650		6.732	7.008		7.752		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	0.83	0.83	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	0.83	27.08

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 0.83
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 0.83
- Intercepted by current inlet = 0.83
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 0.76
DEPTH AT CURB (ft) = 0.06
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.016	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 7	Gutter depression (in)	= 6.00

Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yr
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.84

LINE 10 STORM SEWER HYDRAULIC REPORT
CI #B3-11 Downstream Line # =

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 11.69
Plan Length (ft) = 55.55 Pipe Length (ft) = 51.57 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft²)	VEL (ft/s)
UPSTREAM	114.50	11.69	115.47	115.86	116.50	119.73	1.52	4.98
DNSTREAM	113.00	24.00	115.01	115.10	115.00	119.73	3.14	2.41
SLOPE(%)	2.700		0.899	1.472		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.7	3.4		
Drainage Time (min) =	30.00	32.33		
Intensity (in/h) =	4.78	4.60	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.49	FLOW	CAPACITY
Rational Flow (cfs) =	1.55	7.57	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	7.57	37.17

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 1.55
Carryover from previous inlet = 0.00
Total flow to current inlet = 1.55
Intercepted by current inlet = 1.55
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.15
DEPTH AT CURB (ft) = 0.10
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.016
Downstream Inlet Number = 8
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 11 STORM SEWER HYDRAULIC REPORT
CI #B3-12 Downstream Line # = 10

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 10.55
Plan Length (ft) = 185.72 Pipe Length (ft) = 181.74 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	117.50	10.55	118.38	118.71	119.50	122.53	1.33	4.64
DNSTREAM	114.50	16.32	115.86	115.97	116.50	119.73	2.28	2.71
SLOPE(%)	1.615		1.386	1.507		1.541		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.1	2.7		
Drainage Time (min) =	30.00	31.51		
Intensity (in/h) =	4.78	4.66	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient =	0.45	0.50		
Rational Flow (cfs) =	2.41	6.17	6.17	28.75
Known Flow (cfs) =	0.00	0.00		

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 2.41
- Carryover from previous Inlet = 0.00
- Total flow to current Inlet = 2.41
- Intercepted by current Inlet = 2.41
- Bypassed by current Inlet = 0.00

PONDING WIDTH (ft) = 7.89
DEPTH AT CURB (ft) = 0.26
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.016
- Downstream Inlet Number = 9
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.020
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 12 STORM SEWER HYDRAULIC REPORT
CI #B3-13 Downstream Line # = 11

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.59
Plan Length (ft) = 43.09 Pipe Length (ft) = 39.11 Kj (JIC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	119.00	4.59	119.51	119.63	120.50	122.53	0.36	2.83
DNSTREAM	118.00	8.56	118.71	118.74	119.50	122.53	0.83	1.21
SLOPE(%)	2.321		2.029	2.288		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL FLOW	UNIFORM CAPACITY
Runoff Coefficient =	0.60	0.60	(cfs)	(cfs)
Rational Flow (cfs) =	1.00	1.00	1.00	16.00
Known Flow (cfs) =	0.00	0.00		

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 1.00
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 1.00
- Intercepted by current inlet = 1.00
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.14
DEPTH AT CURB (ft) = 0.20
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *
- Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.016
- Downstream Inlet Number = 10
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.020
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 13 STORM SEWER HYDRAULIC REPORT
CI #B3-14 Downstream Line # = 11

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 7.66
Plan Length (ft) = 247.95 Pipe Length (ft) = 244.15 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	127.50	7.66	128.14	128.36	129.50	132.59	0.86	3.76
DNSTREAM	117.50	14.56	118.71	118.75	119.50	122.53	1.99	1.63
SLOPE(%)	4.033		3.861	3.934		4.120		

		CATCHMENT	CUMULATIVE		
Area (ac)	=	0.7	1.3		
Drainage Time (min)	=	30.00	30.00		
Intensity (in/h)	=	4.78	4.78	TOTAL	UNIFORM
Runoff Coefficient	=	0.45	0.52	FLOW	CAPACITY
Rational Flow (cfs)	=	1.50	3.25	(cfs)	(cfs)
Known Flow (cfs)	=	0.00	0.00	3.25	45.42

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 1.50
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 1.50
- Intercepted by current inlet = 1.50
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 4.08
DEPTH AT CURB (ft) = 0.18
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.016
- Downstream Inlet Number = 11
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.100
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs
Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 14 STORM SEWER HYDRAULIC REPORT
CI #B3-15 Downstream Line # = 13

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 5.01
Plan Length (ft) = 42.98 Pipe Length (ft) = 38.99 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	128.50	3.95	129.10	129.37	130.00	132.59	0.29	4.17
DNSTREAM	128.00	3.95	128.33	128.60	129.50	132.59	0.29	4.17
SLOPE(%)	1.163		1.974	1.974		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.3	0.3		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.61	FLOW	CAPACITY
Rational Flow (cfs) =	1.20	1.20	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	1.20	11.33

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 1.20
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 1.20
- Intercepted by current inlet = 1.20
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 3.52
DEPTH AT CURB (ft) = 0.17
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.016
- Downstream Inlet Number = 12
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.100
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 6.00

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs

Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 15 STORM SEWER HYDRAULIC REPORT

CI #B3-16 Downstream Line # = 13

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 5.50

Plan Length (ft) = 213.90 Pipe Length (ft) = 210.51 KJ (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	143.50	5.50	143.96	144.11	145.00	148.16	0.46	3.15
DNSTREAM	127.50	10.30	128.36	128.39	129.00	132.59	1.05	1.38
SLOPE(%)	7.480		7.410	7.470		7.396		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.1	0.3		
Drainage Time (min) =	10.00	10.58		
Intensity (in/h) =	7.28	7.16	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.61	FLOW	CAPACITY
Rational Flow (cfs) =	0.62	1.44	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	1.44	28.72

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	0.62	
Carryover from previous inlet	=	0.00	
Total flow to current inlet	=	0.62	
Intercepted by current inlet	=	0.62	
Bypassed by current inlet	=	0.00	

PONDING WIDTH (ft) = 0.63

DEPTH AT CURB (ft) = 0.05

EFFICIENCY (%)

Curb = 100.00

Grate = * Total = 100.00

Slot = *

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.016	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 13	Gutter depression (in)	= 6.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "B3"

Data File : 93-028B3.STM Return Period: 10 Yrs

Rainfall file: 93-028B3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 16 STORM SEWER HYDRAULIC REPORT

CI #B3-17 Downstream Line # = 15

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.20

Plan Length (ft) = 72.05 Pipe Length (ft) = 68.10 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	146.00	4.20	146.46	146.57	147.50	151.27	0.31	2.69
DNSTREAM	143.50	7.35	144.11	144.14	145.00	148.16	0.68	1.24
SLOPE(%)	3.470		3.451	3.580		4.567		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.61	FLOW	CAPACITY
Rational Flow (cfs) =	0.84	0.84	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	0.84	19.56

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment =	0.84	PONDING WIDTH (ft) =	0.77
Carryover from previous inlet =	0.00	DEPTH AT CURB (ft) =	0.06
Total flow to current inlet =	0.84	EFFICIENCY (%)	
Intercepted by current inlet =	0.84	Curb = 100.00	
Bypassed by current inlet =	0.00	Grate = *	Total = 100.00
		Slot = *	

INPUT PARAMETERS:

Inlet Type =	CURB IN SAG	Longitudinal Slope (ft/ft) =	0.000
Gutter Width (ft) =	1.500	Pavement Cross Slope (ft/ft) =	0.021
Inlet n-value =	0.016	Gutter Cross Slope (ft/ft) =	0.083
Downstream Inlet Number =	14	Gutter depression (in) =	6.00
Curb Throat Type =	Inclined		
Inlet Opening Ht (in) =	6.00		
Curb Length (ft) =	20.00		
Curb Weir Coeff. =	2.300		
Curb Orifice Coeff. =	0.670		
Incline Angle (deg) =	41.00		

DRAINAGE SYSTEM "B4"

Data File : 93-028B4.STM Return Period: 10 Yrs
Rainfall file: 93-028B4.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT
I #B4-02 Downstream Line # = OUTFALL

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 6.25
Plan Length (ft) = 53.79 Pipe Length (ft) = 51.79 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	95.50	5.23	95.94	96.23	97.00	99.08	0.43	4.38
DNSTREAM	95.00	5.23	95.44	95.73	96.50	95.00	0.43	4.38
SLOPE(%)	0.930		0.965	0.965		7.878		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.4		
Drainage Time (min) =	10.00	10.23		
Intensity (in/h) =	7.28	7.23	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	0.92	1.87	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	1.87	10.12

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 0.92
Carryover from previous inlet = 0.00
Total flow to current inlet = 0.92
Intercepted by current inlet = 0.92
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 0.81
DEPTH AT CURB (ft) = 0.07
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 0
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 1.50

DRAINAGE SYSTEM "B4"

Data File : 93-028B4.STM Return Period: 10 Yrs
Rainfall file: 93-028B4.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT
CL #B4-03 Downstream Line # = 1

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.49
Plan Length (ft) = 31.03 Pipe Length (ft) = 27.04 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	96.00	4.49	96.49	96.62	97.50	99.08	0.34	2.79
DNSTREAM	95.50	8.80	96.23	96.25	97.00	99.08	0.86	1.13
SLOPE(%)	1.611		0.968	1.344		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient =	0.60	0.60		
Rational Flow (cfs) =	0.96	0.96	0.96	13.33
Known Flow (cfs) =	0.00	0.00		

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 0.96
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 0.96
- Intercepted by current inlet = 0.96
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 0.84
DEPTH AT CURB (ft) = 0.07
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *
- Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB IN SAG
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 1
- Curb Throat Type = Inclined
- Inlet Opening Ht (in) = 6.00
- Curb Length (ft) = 20.00
- Curb Weir Coeff. = 2.300
- Curb Orifice Coeff. = 0.670
- Incline Angle (deg) = 41.00
- Longitudinal Slope (ft/ft) = 0.000
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 1.50

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs

Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT

CI #C1-02 Downstream Line # = OUTFALL

Diameter (in) = 30 N = 0.013 Critical Depth (in) = 20.79

Plan Length (ft) = 55.69 Pipe Length (ft) = 53.73 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	92.00	12.18	93.01	96.23	94.50	97.93	1.87	14.39
DNSTREAM	90.00	12.18	91.01	94.23	92.50	90.00	1.87	14.39
SLOPE(%)	3.591		3.722	3.722		14.760		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.6	12.7		
Drainage Time (min) =	10.00	35.14		
Intensity (in/h) =	7.28	4.40	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.48	FLOW	CAPACITY
Rational Flow (cfs) =	2.49	26.90	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	26.90	77.72

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	2.49	
Carryover from previous inlet	=	0.00	
Total flow to current inlet	=	2.49	
Intercepted by current inlet	=	2.49	
Bypassed by current inlet	=	0.00	

PONDING WIDTH (ft) = 1.81

DEPTH AT CURB (ft) = 0.13

EFFICIENCY (%)

Curb = 100.00

Grate = * Total = 100.00

Slot = *

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 0	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs
Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT
CI #C1-03 Downstream Line # = 1

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 7.22
Plan Length (ft) = 42.93 Pipe Length (ft) = 38.94 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	93.00	18.00	96.28	96.31	94.50	97.93	1.77	1.41
DNSTREAM	92.50	18.00	96.23	96.26	94.00	97.93	1.77	1.41
SLOPE(%)	1.165		0.135	0.135		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.6	0.6		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.61	0.61	FLOW	CAPACITY
Rational Flow (cfs) =	2.49	2.49	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	2.49	11.33

Note: Upstream surcharge (ft) = 1.78

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 2.49
Carryover from previous inlet = 0.00
Total flow to current inlet = 2.49
Intercepted by current inlet = 2.49
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.81
DEPTH AT CURB (ft) = 0.13
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 1
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00
Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs
Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 3 STORM SEWER HYDRAULIC REPORT
CI #C1-04 Downstream Line # = 1

Diameter (in) = 30 N = 0.013 Critical Depth (in) = 19.66
Plan Length (ft) = 137.46 Pipe Length (ft) = 133.48 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	94.00	30.00	96.69	97.06	96.50	100.23	4.91	4.90
DNSTREAM	92.00	30.00	96.23	96.60	94.50	97.93	4.91	4.90
SLOPE(%)	1.455		0.344	0.344		1.723		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.3	11.6		
Drainage Time (min) =	10.00	34.68		
Intensity (in/h) =	7.28	4.43	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	1.13	24.06	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	24.06	49.47

Note: Upstream surcharge (ft) = 0.19

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 1.13
Carryover from previous inlet = 0.00
Total flow to current inlet = 1.13
Intercepted by current inlet = 1.13
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 0.94
DEPTH AT CURB (ft) = 0.08
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 2
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs
Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 4 STORM SEWER HYDRAULIC REPORT
CI #C1-05 Downstream Line # = 3

Diameter (in) = 30 N = 0.013 Critical Depth (in) = 19.40
Plan Length (ft) = 52.57 Pipe Length (ft) = 48.58 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	94.50	30.00	97.22	97.57	97.00	100.23	4.91	4.77
DNSTREAM	94.00	30.00	97.06	97.42	96.50	100.23	4.91	4.77
SLOPE(%)	0.951		0.326	0.326		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	2.2	11.3		
Drainage Time (min) =	30.00	34.51		
Intensity (in/h) =	4.78	4.45	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	4.79	23.42	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	23.42	40.00

Note: Upstream surcharge (ft) = 0.22

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 4.79
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 4.79
- Intercepted by current inlet = 4.79
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.28
DEPTH AT CURB (ft) = 0.20
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 3	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs
Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 5 STORM SEWER HYDRAULIC REPORT
ID #C1-06 Downstream Line # = 4

Diameter (in) = 30 N = 0.013 Critical Depth (in) = 17.56
Plan Length (ft) = 237.03 Pipe Length (ft) = 233.19 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	103.00	17.56	104.46	105.10	105.50	109.79	2.99	6.43
DNSTREAM	94.50	30.00	97.57	97.81	97.00	100.23	4.91	3.91
SLOPE(%)	3.586		2.954	3.128		4.100		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	9.1		
Drainage Time (min) =	10.00	33.76		
Intensity (in/h) =	7.28	4.50	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	0.96	19.18	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	19.18	77.66

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 0.96
Carryover from previous inlet = 0.00
Total flow to current inlet = 0.96
Intercepted by current inlet = 0.96
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 0.84
DEPTH AT CURB (ft) = 0.07
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 5
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs

Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 6 STORM SEWER HYDRAULIC REPORT

CI #C1-07 Downstream Line # = 5

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 5.37

Plan Length (ft) = 49.95 Pipe Length (ft) = 45.95 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	104.00	13.27	105.12	105.14	105.50	109.64	1.40	0.98
DNSTREAM	103.50	18.00	105.10	105.11	105.00	109.79	1.77	0.78
SLOPE(%)	1.001		0.037	0.049		-0.326		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.3	0.3		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL FLOW	UNIFORM CAPACITY
Runoff Coefficient =	0.61	0.61	(cfs)	(cfs)
Rational Flow (cfs) =	1.38	1.38		
Known Flow (cfs) =	0.00	0.00	1.38	10.51

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	1.38	
Carryover from previous inlet	=	0.00	
Total flow to current inlet	=	1.38	
Intercepted by current inlet	=	1.38	
Bypassed by current inlet	=	0.00	

PONDING WIDTH (ft) = 4.89

DEPTH AT CURB (ft) = 0.20

EFFICIENCY (%)

Curb = 100.00

Grate = * Total = 100.00

Slot = *

INPUT PARAMETERS:

Inlet Type	= CURB ON GRADE	Longitudinal Slope (ft/ft)	= 0.030
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 6	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Curb Length (ft)	= 13.00		

DRAINAGE SYSTEM "C1"

ata File : 93-028C1.STM Return Period: 10 Yrs
ainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

INE 7 STORM SEWER HYDRAULIC REPORT
I #C1-08 Downstream Line # = 5

Diameter (in) = 24 N = 0.013 Critical Depth (in) = 17.91
lan Length (ft) = 53.57 Pipe Length (ft) = 49.58 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft²)	VEL (ft/s)
UPSTREAM	104.50	17.91	105.99	106.77	106.50	109.79	2.51	7.07
DNSTREAM	103.50	19.25	105.10	105.78	105.50	109.79	2.70	6.58
SLOPE(%)	1.867		1.791	2.000		0.000		

		CATCHMENT	CUMULATIVE		
Area (ac)	=	2.8	8.5		
Drainage Time (min)	=	30.00	33.64		
Intensity (in/h)	=	4.78	4.51	TOTAL	UNIFORM
Runoff Coefficient	=	0.45	0.46	FLOW	CAPACITY
Rational Flow (cfs)	=	6.00	17.77	(cfs)	(cfs)
Known Flow (cfs)	=	0.00	0.00	17.77	30.90

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 6.00
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 6.00
- Intercepted by current inlet = 6.00
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 6.85
DEPTH AT CURB (ft) = 0.24
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB IN SAG
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 7
- Curb Throat Type = Inclined
- Inlet Opening Ht (in) = 6.00
- Curb Length (ft) = 20.00
- Curb Weir Coeff. = 2.300
- Curb Orifice Coeff. = 0.670
- Incline Angle (deg) = 41.00
- Longitudinal Slope (ft/ft) = 0.000
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs
Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 8 STORM SEWER HYDRAULIC REPORT
I #C1-09 Downstream Line # = 7

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 16.07
Plan Length (ft) = 286.06 Pipe Length (ft) = 282.76 KJ (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	125.00	16.07	126.34	127.18	126.50	130.30	1.67	7.35
DNSTREAM	105.00	18.00	106.77	107.51	106.50	109.79	1.77	6.93
SLOPE(%)	6.992		6.921	6.955		7.253		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.4	5.8		
Drainage Time (min) =	30.00	32.98		
Intensity (in/h) =	4.78	4.55	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	3.07	12.24	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	12.24	27.77

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 3.07
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 3.07
- Intercepted by current inlet = 3.07
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.77
DEPTH AT CURB (ft) = 0.21
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 9
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.080
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs
Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 9 STORM SEWER HYDRAULIC REPORT
GI #C1-10 Downstream Line # = 8

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 3.83
Plan Length (ft) = 31.09 Pipe Length (ft) = 27.10 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	125.50	18.00	127.18	127.18	127.00	130.30	1.77	0.40
DNSTREAM	125.00	18.00	127.18	127.18	126.50	130.30	1.77	0.40
SLOPE(%)	1.608		0.013	0.013		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	0.70	0.70	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	0.70	13.32

Note: Upstream surcharge (ft) = 0.18

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 0.70
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 0.70
- Intercepted by current inlet = 0.70
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.97
DEPTH AT CURB (ft) = 0.13
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 10
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.080
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs

Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 10 STORM SEWER HYDRAULIC REPORT

CI #C1-11 Downstream Line # = 8

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 13.71

Plan Length (ft) = 220.63 Pipe Length (ft) = 216.99 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	137.50	13.71	138.64	139.24	139.00	141.92	1.44	6.21
DNSTREAM	125.00	18.00	127.18	127.58	126.50	130.30	1.77	5.07
SLOPE(%)	5.666		5.283	5.375		5.355		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.1	4.2		
Drainage Time (min) =	30.00	32.34		
Intensity (in/h) =	4.78	4.60	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	2.39	8.96	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	8.96	25.00

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	= 2.39	PONDING WIDTH (ft)	= 6.06
Carryover from previous inlet	= 0.00	DEPTH AT CURB (ft)	= 0.22
Total flow to current inlet	= 2.39	EFFICIENCY (%)	
Intercepted by current inlet	= 2.39	Curb = 100.00	
Bypassed by current inlet	= 0.00	Grate = *	Total = 100.00
		Slot = *	

INPUT PARAMETERS:

Inlet Type	= CURB ON GRADE	Longitudinal Slope (ft/ft)	= 0.040
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 11	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Curb Length (ft)	= 13.00		

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs

Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 11 STORM SEWER HYDRAULIC REPORT

CI #C1-12 Downstream Line # = 10

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 5.50

Plan Length (ft) = 31.04 Pipe Length (ft) = 27.05 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	138.00	14.87	139.25	139.27	139.50	141.92	1.56	0.92
DNSTREAM	137.50	18.00	139.24	139.25	139.00	141.92	1.77	0.82
SLOPE(%)	1.611		0.044	0.054		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.3	0.3		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	1.44	1.44	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	1.44	13.33

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	= 1.44	PONDING WIDTH (ft)	= 4.65
Carryover from previous inlet	= 0.00	DEPTH AT CURB (ft)	= 0.19
Total flow to current inlet	= 1.44	EFFICIENCY (%)	
Intercepted by current inlet	= 1.44	Curb = 100.00	
Bypassed by current inlet	= 0.00	Grate = *	Total = 100.00
		Slot = *	

INPUT PARAMETERS:

Inlet Type	= CURB ON GRADE	Longitudinal Slope (ft/ft)	= 0.040
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 12	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Curb Length (ft)	= 13.00		

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs
Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 12 STORM SEWER HYDRAULIC REPORT
CI #C1-13 Downstream Line # = 10

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 11.06
Plan Length (ft) = 237.98 Pipe Length (ft) = 234.15 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	146.50	11.06	147.42	147.83	148.00	151.10	1.14	5.12
DNSTREAM	137.50	18.00	139.24	139.41	139.00	141.92	1.77	3.30
SLOPE(%)	3.782		3.494	3.596		3.921		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.5	2.7		
Drainage Time (min) =	30.00	31.41		
Intensity (in/h) =	4.78	4.67	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.46	FLOW	CAPACITY
Rational Flow (cfs) =	3.18	5.84	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	5.84	20.42

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 3.18
Carryover from previous inlet = 0.00
Total flow to current inlet = 3.18
Intercepted by current inlet = 3.18
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 6.97
DEPTH AT CURB (ft) = 0.24
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 13
Curb Throat Type = Inclined
Curb Length (ft) = 13.00

Longitudinal Slope (ft/ft) = 0.040
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs
Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 13 STORM SEWER HYDRAULIC REPORT
CI #C1-14 Downstream Line # = 12

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 7.65
Plan Length (ft) = 240.23 Pipe Length (ft) = 236.31 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	152.50	7.65	153.14	153.37	154.00	157.35	0.72	3.90
DNSTREAM	146.50	15.96	147.83	147.87	148.00	151.10	1.66	1.69
SLOPE(%)	2.498		2.246	2.328		2.645		

		CATCHMENT	CUMULATIVE		
Area (ac)	=	1.1	1.2		
Drainage Time (min)	=	30.00	30.00		
Intensity (in/h)	=	4.78	4.78	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient	=	0.45	0.47		
Rational Flow (cfs)	=	2.28	2.79		
Known Flow (cfs)	=	0.00	0.00	2.79	16.60

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 2.28
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 2.28
- Intercepted by current inlet = 2.28
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.92
DEPTH AT CURB (ft) = 0.22
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 14
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.040
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C1"

Data File : 93-028C1.STM Return Period: 10 Yrs
Rainfall file: 93-028C1.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 14 STORM SEWER HYDRAULIC REPORT
C1 #C1-15 Downstream Line # = 13

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.06
Plan Length (ft) = 31.04 Pipe Length (ft) = 27.04 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	153.00	4.13	153.45	153.55	154.50	157.35	0.31	2.56
DNSTREAM	152.50	10.49	153.37	153.38	154.00	157.35	1.07	0.73
SLOPE(%)	1.611		0.267	0.614		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	0.79	0.79	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	0.79	13.33

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 0.79
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 0.79
- Intercepted by current inlet = 0.79
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 3.10
DEPTH AT CURB (ft) = 0.16
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 15
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.040
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C2"

Data File : 93-028C2.STM Return Period: 10 Yrs
Rainfall file: 93-028C2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT
MH #C2-02 Downstream Line # = OUTFALL

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 13.77
Plan Length (ft) = 38.09 Pipe Length (ft) = 36.10 KJ (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	91.00	9.33	91.78	93.26	92.50	96.53	0.92	9.78
DNSTREAM	90.00	9.33	90.78	92.26	91.50	90.00	0.92	9.78
SLOPE(%)	2.625		2.770	2.770		18.087		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.0	4.2		
Drainage Time (min) =	0.00	31.57		
Intensity (in/h) =	0.00	4.66	TOTAL	UNIFORM
Runoff Coefficient =	0.00	0.00	FLOW	CAPACITY
Rational Flow (cfs) =	0.00	9.04	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	9.04	17.02

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 0.00
Carryover from previous inlet = 0.00
Total flow to current inlet = 0.00
Intercepted by current inlet = 0.00
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 0.00
DEPTH AT CURB (ft) = 0.00
EFFICIENCY (%)
Curb = *
Grate = * Total = -nan
Slot = *

INPUT PARAMETERS:
Inlet Type = NONE IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 0

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C2"

Data File : 93-028C2.STM Return Period: 10 Yrs
Rainfall file: 93-028C2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT
CB #C2-03 Downstream Line # = 1

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 13.83
Span Length (ft) = 180.23 Pipe Length (ft) = 176.26 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	94.50	13.83	95.65	96.26	96.00	100.08	1.46	6.26
DNSTREAM	91.00	18.00	93.26	93.67	92.50	96.53	1.77	5.16
SLOPE(%)	1.942		1.356	1.467		2.014		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	4.2		
Drainage Time (min) =	10.00	31.06		
Intensity (in/h) =	7.28	4.69	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	1.05	9.12	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	9.12	14.63

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 1.05
Carryover from previous inlet = 0.00
Total flow to current inlet = 1.05
Intercepted by current inlet = 1.05
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 0.89
DEPTH AT CURB (ft) = 0.07
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 1
Curb Throat Type = Inclined
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C2"

Data File : 93-028C2.STM Return Period: 10 Yrs
Rainfall file: 93-028C2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 3 STORM SEWER HYDRAULIC REPORT
CI #C2-04 Downstream Line # = 2

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 4.28
Plan Length (ft) = 36.19 Pipe Length (ft) = 32.20 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	95.50	8.98	96.26	96.28	97.00	99.94	0.88	0.99
DNSTREAM	94.50	18.00	96.26	96.26	96.00	100.08	1.77	0.49
SLOPE(%)	2.763		0.009	0.045		-0.435		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	0.2		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient =	0.60	0.60		
Rational Flow (cfs) =	0.87	0.87		
Known Flow (cfs) =	0.00	0.00	0.87	17.46

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 0.87
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 0.87
- Intercepted by current inlet = 0.87
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 4.23
DEPTH AT CURB (ft) = 0.18
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 2
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.020
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C2"

Data File : 93-028C2.STM Return Period: 10 Yrs
Rainfall file: 93-028C2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 4 STORM SEWER HYDRAULIC REPORT
CI #C2-05 Downstream Line # = 2

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 12.87
Plan Length (ft) = 61.18 Pipe Length (ft) = 57.20 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	96.00	12.87	97.07	97.60	97.50	100.16	1.35	5.84
DNSTREAM	94.50	18.00	96.26	96.57	96.00	100.08	1.77	4.47
SLOPE(%)	2.452		1.420	1.804		0.140		

	CATCHMENT	CUMULATIVE		
Area (ac) =	2.4	3.7		
Drainage Time (min) =	30.00	30.88		
Inteneity (in/h) =	4.78	4.71	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.45	FLOW	CAPACITY
Rational Flow (cfs) =	5.18	7.90	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	7.90	16.44

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 5.18
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 5.18
- Intercepted by current inlet = 5.18
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.80
DEPTH AT CURB (ft) = 0.21
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 3	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "C2"

Data File : 93-028C2.STM Return Period: 10 Yrs
Rainfall file: 93-028C2.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 5 STORM SEWER HYDRAULIC REPORT
I #C2-06 Downstream Line # = 4

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 7.71
Plan Length (ft) = 148.92 Pipe Length (ft) = 145.14 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GRD (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	104.00	7.71	104.88	105.12	105.50	108.60	0.72	3.92
DNSTREAM	96.00	18.00	97.60	97.64	97.50	100.16	1.77	1.61
SLOPE(%)	5.372		5.015	5.152		5.815		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.3	1.3		
Drainage Time (min) =	30.00	30.00		
Intensity (in/h) =	4.78	4.78	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.45	FLOW	CAPACITY
Rational Flow (cfs) =	2.84	2.84	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	2.84	24.34

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 2.84
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 2.84
- Intercepted by current inlet = 2.84
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 5.56
DEPTH AT CURB (ft) = 0.21
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 4
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.080
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C3"

Data File : 93-028C3.STM Return Period: 10 Yrs
Rainfall file: 93-028C3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT
CI #C3-02 Downstream Line # = OUTFALL

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 12.14
Plan Length (ft) = 35.75 Pipe Length (ft) = 33.76 KJ (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	91.00	7.93	91.66	93.03	92.50	95.32	0.75	9.39
DNSTREAM	90.00	7.93	90.66	92.03	91.50	90.00	0.75	9.39
SLOPE(%)	2.797		2.962	2.962		15.756		

	CATCHMENT	CUMULATIVE		
Area (ac) =	2.5	3.1		
Drainage Time (min) =	30.00	30.00		
Intensity (in/h) =	4.78	4.78	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.48	FLOW	CAPACITY
Rational Flow (cfs) =	5.37	7.04	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	7.04	17.56

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 5.37
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 5.37
- Intercepted by current inlet = 5.37
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 6.05
DEPTH AT CURB (ft) = 0.22
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.013	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 0	Gutter depression (in)	= 10.00
Curb Throat Type	= Inclined		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "C3"

Data File : 93-028C3.STM Return Period: 10 Yrs
Rainfall file: 93-028C3.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT
CI #C3-03 Downstream Line # = 1

Diameter (in) = 18 N = 0.013 Critical Depth (ft) = 7.29
Plan Length (ft) = 31.04 Pipe Length (ft) = 27.05 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	91.50	18.00	93.08	93.11	93.00	95.32	1.77	1.43
DNSTREAM	91.00	18.00	93.03	93.06	92.50	95.32	1.77	1.43
SLOPE(%)	1.611		0.176	0.176		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.6	0.6		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	2.53	2.53	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	2.53	13.33

Note: Upstream surcharge (ft) = 0.08

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 2.53
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 2.53
- Intercepted by current inlet = 2.53
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.89
DEPTH AT CURB (ft) = 0.13
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB IN SAG
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 1
- Curb Throat Type = Inclined
- Inlet Opening Ht (in) = 6.00
- Curb Length (ft) = 20.00
- Curb Weir Coeff. = 2.300
- Curb Orifice Coeff. = 0.670
- Incline Angle (deg) = 41.00
- Longitudinal Slope (ft/ft) = 0.000
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

Data File : 93-028C4.STM Return Period: 10 Yrs
Rainfall file: 93-028C4.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT
CI #C4-02 Downstream Line # = OUTFALL

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 11.87
Plan Length (ft) = 178.49 Pipe Length (ft) = 177.41 KJ (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	108.00	5.48	108.46	111.85	109.50	115.00	0.46	14.77
DNSTREAM	90.00	5.48	90.46	93.85	91.50	90.00	0.46	14.77
SLOPE(%)	10.084		10.146	10.146		14.092		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.3	3.1		
Drainage Time (min) =	10.00	31.67		
Intensity (in/h) =	7.28	4.65	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	1.48	6.72	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	6.72	33.35

Note: Supercritical flow detected - Normal depth assumed

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 1.48
Carryover from previous inlet = 0.00
Total flow to current inlet = 1.48
Intercepted by current inlet = 1.48
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 4.44
DEPTH AT CURB (ft) = 0.19
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 0
Curb Throat Type = Inclined
Curb Length (ft) = 13.00

Longitudinal Slope (ft/ft) = 0.050
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C4"

Data File : 93-028C4.STM Return Period: 10 Yrs
Rainfall file: 93-028C4.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT
CB #C4-03 Downstream Line # = 1

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 8.06
Plan Length (ft) = 31.04 Pipe Length (ft) = 27.11 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	110.00	18.00	111.92	111.96	111.50	115.00	1.77	1.75
DNSTREAM	108.00	18.00	111.85	111.89	109.50	115.00	1.77	1.75
SLOPE(%)	6.443		0.263	0.263		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.4	2.8		
Drainage Time (min) =	30.00	31.41		
Intensity (in/h) =	4.78	4.78	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.45	FLOW	CAPACITY
Rational Flow (cfs) =	3.09	3.09	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	3.09	26.66

Note: Upstream surcharge (ft) = 0.42

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 3.09
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 3.09
- Intercepted by current inlet = 3.09
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 6.51
DEPTH AT CURB (ft) = 0.23
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB ON GRADE
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.013
- Downstream Inlet Number = 1
- Curb Throat Type = Inclined
- Curb Length (ft) = 13.00
- Longitudinal Slope (ft/ft) = 0.050
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C4"

Data File : 93-028C4.STM Return Period: 10 Yrs
Rainfall file: 93-028C4.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 3 STORM SEWER HYDRAULIC REPORT
I #C4-04 Downstream Line # = 2

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 7.71
Plan Length (ft) = 237.32 Pipe Length (ft) = 233.37 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	115.00	7.71	115.88	116.12	116.50	120.00	0.72	3.92
DNSTREAM	110.00	18.00	111.96	112.00	111.50	115.00	1.77	1.61
SLOPE(%)	2.107		1.679	1.764		2.142		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.3	1.3		
Drainage Time (min) =	30.00	30.00		
Intensity (in/h) =	4.78	4.78	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.45	FLOW	CAPACITY
Rational Flow (cfs) =	2.84	2.84	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	2.84	15.24

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 2.84
Carryover from previous inlet = 0.00
Total flow to current inlet = 2.84
Intercepted by current inlet = 2.84
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 6.27
DEPTH AT CURB (ft) = 0.22
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.013
Downstream Inlet Number = 2
Curb Throat Type = Inclined
Curb Length (ft) = 13.00
Longitudinal Slope (ft/ft) = 0.050
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C5"

Data File : 93-028C5.STM Return Period: 10 Yrs

Rainfall file: 93-028C5.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 1 STORM SEWER HYDRAULIC REPORT

C1 #C5-02 Downstream Line # = OUTFALL

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 14.01

Span Length (ft) = 61.71 Pipe Length (ft) = 59.71 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	90.50	14.67	91.72	92.30	92.00	96.00	1.54	6.08
DNSTREAM	90.00	14.01	91.17	91.79	91.50	90.00	1.48	6.35
SLOPE(%)	0.810		0.928	0.841		10.049		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.2	3.5		
Drainage Time (min) =	10.00	21.50		
Intensity (in/h) =	7.28	5.57	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.48	FLOW	CAPACITY
Rational Flow (cfs) =	0.79	9.37	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	9.37	9.45

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)

Flow from Catchment	=	0.79	
Carryover from previous inlet	=	0.00	
Total flow to current inlet	=	0.79	
Intercepted by current inlet	=	0.79	
Bypassed by current inlet	=	0.00	

PONDING WIDTH (ft) = 0.73

DEPTH AT CURB (ft) = 0.06

EFFICIENCY (%)

Curb = 100.00

Grate = * Total = 100.00

Slot = *

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.016	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 0	Gutter depression (in)	= 10.00
Curb Throat Type	= Horizontal		
Inlet Opening Ht (in)	= 6.00		
Curb Length (ft)	= 20.00		
Curb Weir Coeff.	= 2.300		
Curb Orifice Coeff.	= 0.670		
Incline Angle (deg)	= 41.00		

DRAINAGE SYSTEM "C5"

Data File : 93-028C5.STM Return Period: 10 Yrs
Rainfall file: 93-028C5.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 2 STORM SEWER HYDRAULIC REPORT
C #C5-03 Downstream Line # = 1

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 13.57
Run Length (ft) = 37.56 Pipe Length (ft) = 33.57 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	91.00	17.98	92.50	92.88	92.50	96.00	1.77	4.97
DNSTREAM	90.50	18.00	92.30	92.68	92.00	96.00	1.77	4.97
SLOPE(%)	1.331		0.604	0.605		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.5	3.3		
Drainage Time (min) =	20.00	21.39		
Intensity (in/h) =	5.74	5.58	TOTAL	UNIFORM
Runoff Coefficient =	0.45	0.47	FLOW	CAPACITY
Rational Flow (cfs) =	3.93	8.79	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	8.79	12.12

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 3.93
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 3.93
- Intercepted by current inlet = 3.93
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 4.06
DEPTH AT CURB (ft) = 0.18
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:
- Inlet Type = CURB IN SAG
- Gutter Width (ft) = 1.500
- Inlet n-value = 0.016
- Downstream Inlet Number = 1
- Curb Throat Type = Horizontal
- Inlet Opening Ht (in) = 6.00
- Curb Length (ft) = 20.00
- Curb Weir Coeff. = 2.300
- Curb Orifice Coeff. = 0.670
- Incline Angle (deg) = 41.00
- Longitudinal Slope (ft/ft) = 0.000
- Pavement Cross Slope (ft/ft) = 0.021
- Gutter Cross Slope (ft/ft) = 0.083
- Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C5"

Data File : 93-028C5.STM Return Period: 10 Yrs
Rainfall file: 93-028C5.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 3 STORM SEWER HYDRAULIC REPORT
CI #C5-04 Downstream Line # = 2

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 3.17
Plan Length (ft) = 47.01 Pipe Length (ft) = 43.02 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	91.50	16.60	92.88	92.88	93.00	100.00	1.70	0.28
DNSTREAM	91.00	18.00	92.88	92.88	92.50	96.00	1.77	0.27
SLOPE(%)	1.064		0.003	0.003		9.299		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.1	0.1		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	0.48	0.48	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	0.48	10.83

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 0.48
Carryover from previous inlet = 0.00
Total flow to current inlet = 0.48
Intercepted by current inlet = 0.48
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.58
DEPTH AT CURB (ft) = 0.13
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.016
Downstream Inlet Number = 2
Curb Throat Type = Horizontal
Curb Length (ft) = 13.00
Longitudinal Slope (ft/ft) = 0.080
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C5"

Data File : 93-028C5.STM Return Period: 10 Yrs
Rainfall file: 93-028C5.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 4 STORM SEWER HYDRAULIC REPORT
I #C5-05 Downstream Line # = 2

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 9.96
Plan Length (ft) = 310.87 Pipe Length (ft) = 308.06 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	118.00	9.96	118.83	119.17	119.50	123.00	1.00	4.71
DNSTREAM	91.00	18.00	92.88	92.99	92.50	96.00	1.77	2.68
SLOPE(%)	8.685		8.423	8.499		8.765		

	CATCHMENT	CUMULATIVE		
Area (ac) =	1.3	1.7		
Drainage Time (min) =	20.00	20.00		
Intensity (in/h) =	5.74	5.74	TOTAL FLOW (cfs)	UNIFORM CAPACITY (cfs)
Runoff Coefficient =	0.45	0.49		
Rational Flow (cfs) =	3.28	4.73		
Known Flow (cfs) =	0.00	0.00	4.73	30.95

Note: Transitional flow exists in this line

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 3.28
Carryover from previous inlet = 0.00
Total flow to current inlet = 3.28
Intercepted by current inlet = 3.28
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 3.09
DEPTH AT CURB (ft) = 0.16
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB IN SAG
Gutter Width (ft) = 1.500
Inlet n-value = 0.016
Downstream Inlet Number = 3
Curb Throat Type = Horizontal
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00
Longitudinal Slope (ft/ft) = 0.000
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C5"

Data File : 93-028C5.STM Return Period: 10 Yrs
Rainfall file: 93-028C5.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 5 STORM SEWER HYDRAULIC REPORT
ID #C5-06 Downstream Line # = 4

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 3.17
Plan Length (ft) = 45.57 Pipe Length (ft) = 41.58 KJ (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	118.50	8.15	119.18	119.19	120.00	123.00	0.78	0.62
DNSTREAM	118.00	14.10	119.17	119.18	119.50	123.00	1.49	0.32
SLOPE(%)	1.097		0.011	0.021		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.1	0.1		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	0.48	0.48	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	0.48	11.00

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 0.48
Carryover from previous inlet = 0.00
Total flow to current inlet = 0.48
Intercepted by current inlet = 0.48
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.42
DEPTH AT CURB (ft) = 0.12
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.016
Downstream Inlet Number = 4
Curb Throat Type = Inclined
Curb Length (ft) = 13.00
Longitudinal Slope (ft/ft) = 0.120
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00

DRAINAGE SYSTEM "C5"

Data File : 93-028C5.STM Return Period: 10 Yrs
Rainfall file: 93-028C5.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 6 STORM SEWER HYDRAULIC REPORT
CI #C5-07 Downstream Line # = 4

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 5.30
Plan Length (ft) = 316.95 Pipe Length (ft) = 315.13 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	155.50	5.30	155.94	156.09	157.00	160.00	0.43	3.08
DNSTREAM	118.50	8.10	119.17	119.22	120.00	123.00	0.77	1.74
SLOPE(%)	11.674		11.667	11.699		11.741		

		CATCHMENT	CUMULATIVE		
Area (ac)	=	0.2	0.3		
Drainage Time (min)	=	10.00	10.36		
Intensity (in/h)	=	7.28	7.20	TOTAL	UNIFORM
Runoff Coefficient	=	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs)	=	0.83	1.34	(cfs)	(cfs)
Known Flow (cfs)	=	0.00	0.00	1.34	35.88

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
- Flow from Catchment = 0.83
- Carryover from previous inlet = 0.00
- Total flow to current inlet = 0.83
- Intercepted by current inlet = 0.83
- Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 0.76
DEPTH AT CURB (ft) = 0.06
EFFICIENCY (%)
- Curb = 100.00
- Grate = *
- Slot = *

Total = 100.00

INPUT PARAMETERS:

Inlet Type	= CURB IN SAG	Longitudinal Slope (ft/ft)	= 0.000
Gutter Width (ft)	= 1.500	Pavement Cross Slope (ft/ft)	= 0.021
Inlet n-value	= 0.016	Gutter Cross Slope (ft/ft)	= 0.083
Downstream Inlet Number	= 5	Gutter depression (in)	= 10.00

Curb Throat Type = Horizontal
Inlet Opening Ht (in) = 6.00
Curb Length (ft) = 20.00
Curb Weir Coeff. = 2.300
Curb Orifice Coeff. = 0.670
Incline Angle (deg) = 41.00

DRAINAGE SYSTEM "C5"

Data File : 93-028C5.STM Return Period: 10 Yrs
Rainfall file: 93-028C5.RND I = 129.310/ (Tc + 20.750) ^ 0.840

LINE 7 STORM SEWER HYDRAULIC REPORT
CI #C5-08 Downstream Line # = 6

Diameter (in) = 18 N = 0.013 Critical Depth (in) = 3.31
Plan Length (ft) = 37.92 Pipe Length (ft) = 33.93 Kj (JLC) = 1.0

	INVERT (ft)	DEPTH (in)	HGL (ft)	EGL (ft)	CROWN (ft)	NAT GND (ft)	AREA (ft^2)	VEL (ft/s)
UPSTREAM	156.00	3.31	156.36	156.45	157.50	160.00	0.22	2.34
DNSTREAM	155.50	7.07	156.09	156.10	157.00	160.00	0.64	0.81
SLOPE(%)	1.318		0.802	1.023		0.000		

	CATCHMENT	CUMULATIVE		
Area (ac) =	0.1	0.1		
Drainage Time (min) =	10.00	10.00		
Intensity (in/h) =	7.28	7.28	TOTAL	UNIFORM
Runoff Coefficient =	0.60	0.60	FLOW	CAPACITY
Rational Flow (cfs) =	0.52	0.52	(cfs)	(cfs)
Known Flow (cfs) =	0.00	0.00	0.52	12.06

STORM SEWER INLET REPORT

FLOW RESULTS (cfs)
Flow from Catchment = 0.52
Carryover from previous inlet = 0.00
Total flow to current inlet = 0.52
Intercepted by current inlet = 0.52
Bypassed by current inlet = 0.00

PONDING WIDTH (ft) = 1.46
DEPTH AT CURB (ft) = 0.12
EFFICIENCY (%)
Curb = 100.00
Grate = *
Slot = *
Total = 100.00

INPUT PARAMETERS:
Inlet Type = CURB ON GRADE
Gutter Width (ft) = 1.500
Inlet n-value = 0.016
Downstream Inlet Number = 6
Curb Throat Type = Inclined
Curb Length (ft) = 13.00
Longitudinal Slope (ft/ft) = 0.120
Pavement Cross Slope (ft/ft) = 0.021
Gutter Cross Slope (ft/ft) = 0.083
Gutter depression (in) = 10.00