JR Engineering, Ltd.
6455 N. Union Blvd., Ste. 202
Colorado Springs, Colorado 80918
(719) 593-2593 • FAX (719) 528-6613

6857 South Spruce Street
Englewood, Colorado 80112
(303) 740-9393 • FAX (303) 721-9019

USE This Copy BUT Not for lending out of office

MASTER DEVELOPMENT DRAINAGE PLAN

FOR

SUMMERFIELD AT BRIARGATE

March, 1993
REVISED NOVEMBER 1993
Job No. 8418.44

City Engr. Copy - Not Signed but most current copy!

Prepared For:

VINTAGE COMMUNITIES, INC. DRL
7710 North Union Blvd.
Colorado Springs, CO 80920
(719) 528-5000

Prepared By:

JR ENGINEERING, LTD.
6455 North Union Boulevard, Suite 202
Colorado Springs, CO 80918
(719) 593-2593

RETURN WITHIN 2 WEEKS TO:
CITY OF COLORADO SPRINGS
STORM WATER & SUBDIVISION
101 W. COSTILLA, SUITE 113
COLORADO SPRINGS, CO 80903
(719) 578-6212

Recycled

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CITY ENGINEERING DIVISION
Subdivision Development & Improvement District Section

CITY OF COLORADO SPRINGS

June 8, 1993

Mr. Mark Heine
J.R. Engineers
593-2593

RE: MDDP Summer Field

I have completed my review of the revised report which I received on April 7, 1993. One of the reasons it has taken this long to return comments is that your office had me switch it with other submittals which were a higher priority for review and I consequently exchanged submittal dates with the other items.

There are some comments written in the report and on the plan for your consideration. I don't think any of those comments will be too difficult to address.

There are some other matters which will prevent me from signing off on this MDDP at this time and the purpose of this letter is to document those matters clearly.

As you recall The City allowed filings 1 and 2 to proceed prior to the acceptance of a MDDP in an attempt to allow some lots to develop and allow you enough time to prepare a detailed MDDP. Per that agreement we will not approve any subsequent filings until the MDDP has been signed accepted.

Since most of Summer Field is tributary to the regional detention pond at Briargate Parkway, the Summer Field MDDP will not be signed until the design report for the regional detention pond is signed by the City Engineer. A comment letter was sent to the design engineer on March 30, 1993 and to my knowledge there has been no resubmittal of a revised design report at this time.

The northerly portions of Summer Field are tributary to the Pine Creek drainageway through the golf course below Chapel Hills Drive. A comment letter on the design report for this section of channel (Pine Creek Corridor Study - Phase I) was sent to the design engineer on February 3, 1993 and there has been no revised report submitted at this time. Until that design report is accepted by the City Engineer, the Summer Field MDDP cannot be signed.

In accordance with the proposed design report for the regional detention pond and the City Engineer's comments dated March 30, the interim pond design will not accommodate development of the portion of Summer Field east of Lexington Drive. This needs to be stated in your report and noted on the plan.

Please be advised that until the above matters are resolved, the Summer Field MDDP and the drainage reports for filings 3 & 4 will be considered "on hold." Please feel free to call me to discuss in more detail.

Sincerely,

David R. Lethbridge
Subdivision Specialist

DRL

c. Gary R. Haynes, City Engineer
Chris Smith, Subdivision Administrator

101 West Costilla, Suite 122 • TEL 719-578-6208
Mailing Address: Post Office Box 1575, Mail Code 1110 • Colorado Springs, Colorado 80901-1575

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Colorado Springs, Colorado 80918
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6857 South Spruce Street
Englewood, Colorado 80112
(303) 740-9393 • FAX (303) 721-9019

September 27, 1993

City of Colorado Springs
City Engineering Division
101 W. Costilla
Colorado Springs, CO 80903

ATTN: Mr. Dave Lethbridge

RE: Research Parkway at Lexington Drive
Storm Drain Facilities

Dear Mr. Lethbridge:

Per The City of Colorado Springs request, JR Engineering, Ltd. is examining the existing storm sewer inadequacies of the intersection of Research Parkway and Lexington Drive. With the proposed storm facilities (sump inlet at intersection and 20' at-grade to the east), all existing and future 10-year flows will be directed to the Cottonwood Creek Basin (the correct outfall) and 37 cfs of the future 100-year flows will continue down Research Parkway (crossing into Pine Creek Basin).

If you are in agreement with the above statements, please sign below.

Sincerely,

Kyle R Campbell

Kyle R. Campbell
Project Manager
For and On Behalf of
JR Engineering, Ltd.

/js

Based on the most recent information discussed in our meeting this date, It is my impression that maximum utilization of the existing pipes crossing Research Parkway will NOT allow for full conveyance of Q100 into the Cottonwood outfall. The proposed pick-up will maximize the capacity of the existing pipes but about 37 cfs. will "escape" into Pine Creek during Q100 peak. Although I wanted to see all of Q100 picked up, this is better than what would have been the case if the former approved street and drainage plans had been constructed when they were originally signed.

If flooding were to become a problem prior to development of the Briargate 37 site, I suppose we could discuss some detention on that site to reduce the flows in the future system.

This system sizing is accepted subject to posting of financial assurances for the future extension and I request you follow-up by submitting a summary of flows and your back-up calcs for the file.

For the City Engineer: _____ Date 9/27/93

Recycled

CITY ENGINEERING DIVISION
Stormwater and Subdivision

CITY OF COLORADO SPRINGS

October 5, 1993

Mark Heine
J.R. Engineers
593-2593

Dear Mark:

SUMMER FIELD MDDP

This letter is a follow-up to my June 8, 1993 letter and our recent phone conversations about the MDDP for the Summer Field development. Per our agreement on the phone, the Final Drainage Report for Summer Field #4 was signed on October 1, 1993 with a condition that the MDDP will be finalized before November 1, 1993.

In June, The MDDP was acceptable but the design report for the outfall detention pond wasn't approved and I would not sign off on the MDDP. At the present time the City Engineer has resolved most of the design issues pertaining to the detention pond and acceptance of that design report seems close. I have been advised by Obering, Wurth & Assoc. that they are confident based on the hydrology runs that all portions of Summer Field can be developed with minimal impact on the interim pond design and if needed they will adjust the boundary of allowable development to exclude other areas of the tributary basin.

You have agreed to provide the final MDDP for approval by November 1, 1993. You will update the plan as needed and you will add the crossover flows from the Research/Lexington intersection as we discussed. The crossover flow (about 30 cfs) from the Cottonwood basin is a result of the final design of Research Parkway not being able to convey the full future Q100 to the south side of Research. There is no crossover flow today because of the natural retention on the Filing 37 site.

The approval of the MDDP should allow the remainder of the Summer Field developments which are tributary to the "Focus" outfall to proceed without any delays. Keep in mind that there is another outfall issue for the developed flows tributary to the "golf course" outfall which was described in my June letter. A comment letter went to Obering Wurth & Assoc. in March 1993. I suspect we will be discussing this matter with them once the design report for the pond is finalized.

Sincerely,

Dave Lethbridge, Specialist

c. Bruce Thorson, Subdivision Manager
Roland Obering, OWA
Jerry Novak, Vintage Communities

DRL-/SUMMERFI.3

101 West Costilla, Suite 122 • TEL 719-578-6212 Stormwater Management/719-578-6208 Subdivision FAX 719-578-6161
Mailing Address: Post Office Box 1575, Mail Code 1110 • Colorado Springs, Colorado 80901-1575

INTEROFFICE MEMORANDUM

CITY OF COLORADO SPRINGS

SUBDIVISION DEVELOPMENT

DATE: July 27, 1993

TO: Chris Smith, Subdivision Administrator

FROM: Dave Lethbridge, Specialist

SUBJECT: Summer Field Filings 3 & 4

Several days ago Gary Haynes instructed me to release filings 3 and 4 of the Summer Field @ Briargate subdivision. This is directly in contrast to the attached letter which I sent to J.R. Engineers on June 8, 1993. Gary's decision was based on his reaction to a letter from Jerry Novak dated July 15, 1993 and a conversation he had with Dave Nickerson.

I need some direction from you. To approve any further drainage reports in Summer Field without an accepted MDDP is not in acordance with our policies and criteria. I cannot accept the MDDP because of the same issues noted in my attached June 8, 1993 letter.

It also makes me nervous to associate my signature with the acceptance of filings 3 and 4 based on verbal communications from Gary with nothing in writing to defend my actions.

Unless I recieve some direction in writing, I will complete my review of the filing 3 and 4 reports and plans, but I will not sign off. I will forward them to you for your action.

OK

CITY ENGINEERING DIVISION
Subdivision Development & Improvement District Section

CITY OF COLORADO SPRINGS

June 8, 1993

Mr. Mark Heine
J.R. Engineers
593-2593

RE: MDDP Summer Field

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Sincerely,

David R. Lethbridge
Subdivision Specialist

DRL

c. Gary R. Haynes, City Engineer
Chris Smith, Subdivision Administrator

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MASTER DEVELOPMENT DRAINAGE PLAN
SUMMERFIELD AT BRIARGATE

DRAINAGE REPORT STATEMENT

ENGINEER'S STATEMENT:
The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the City for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

_____ _____

Joseph W. DesJardin, Colorado P.E. #24207 Date
For and On Behalf of JR Engineering, Ltd.

DEVELOPER'S STATEMENT:
I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: Vintage Communities, Inc.

By: _____
Bobby L. Ingels

Title: Land Development Manager

Address: 7710 North Union Boulevard

Colorado Springs, CO 80920

CITY OF COLORADO SPRINGS ONLY:
Filed in accordance with Section 15-3-906 of the Code of the City of Colorado Springs, 1980, as amended.

_____ _____

City Engineer Date

Conditions:

TABLE OF CONTENTS

MASTER DEVELOPMENT DRAINAGE PLAN
SUMMERFIELD AT BRIARGATE

MARCH, 1993

PURPOSE:

The purpose of this Master Development Drainage Plan is to identify major drainageways, ponding/detention facilities, and locations of drainage facilities/areas tributary to proposed developments. This report will analyze routing for developed flows and the ability of downstream facilities to convey developed runoff from the proposed developments and tributary areas.

GENERAL DESCRIPTION:

Summerfield at Briargate is located within Sections 33 and 34, Township 12 South, Range 66 West of the Sixth Principal Meridian in the City of Colorado Springs, County of El Paso, State of Colorado. This property is bounded by Research Parkway on the south, Briargate Parkway on the north, Focus on the Family development on the west, and Lexington Drive/Sanguine Drive to the east.

Areas covered in this study include the following:

- Approximately 90 acres east of the proposed extension of Lexington Drive.
- Approximately 120 acres north of Dynamic Drive, south of the proposed extension of Briargate Parkway, east of the proposed extension of Chapel Hills Road, and west of the proposed extension of Lexington Parkway.
- Approximately 35 acres west of proposed filings, east of the proposed extension of Chapel Hills Road, north of Research Parkway, and south of Dynamic Drive.
- Approximately 20 acres west of the proposed extension of Chapel Hills Road and east of Briargate Filing No. 10 (Focus site).
- A portion of Lexington Drive, Research Parkway, Briargate Parkway, and Chapel Hills Drive.

For further information regarding tributary areas, please reference the enclosed Drainage Map and Land Use Summaries.

SOIL TYPE:

Soil type information was obtained from the S.C.S. "Soil Survey of El Paso County Area, Colorado." This report indicates Hydrologic Soils Group 'A', Blakeland soil for Summerfield and tributary areas.

HYDROLOGIC CRITERIA/CHARACTERISTICS:

The methodology and hydrologic basin characteristics used in this report conform with standards as set forth in the "City of Colorado Springs and County of El Paso Drainage Criteria Manual."

Runoff flows for storm sewer facilities were calculated using the Rational Method. Design storms are of 24-hour duration with reoccurrence intervals of 10 years and 100 years. Basin hydrologic characteristics are detailed in the Basin Summaries and Land Use Summaries.

All areas included within this drainage study are within the Pine Creek Basin. As indicated in the Pine Creek Master Basin Study, those areas zoned for commercial or other than residential use, as indicated on the Briargate Master Drainage Plan, will detain approximately 35% of the difference between developed runoff and the historic runoff associated with each basin.

Some basins defined within this study have no preliminary layouts for interior streets or building designs. The only controls available are the approximate property lines, land use designations, and existing terrain. For time of concentration calculations the length of overland flow may have exceeded the maximum length as designated within the "City of Colorado Springs Drainage Manual." Although this deviates from established drainage criteria, the resulting time of concentrations obtained were <u>low</u> which produces conservative results and are considered adequate at this time.

BASIN OUTFALL DESIGNATIONS:

There are three major outfall points for the developed runoffs. These outfalls have been previously addressed and identified within the Pine Creek Master Basin Study and subsequent addenda. For this report the outfall points will be designated as follows for reference:

PINE CREEK DETENTION BASIN '1-A'

The addendum to the Pine Creek Master Basin Study prepared by Obering, Wurth and Associates designates a detention basin north of the intersection of Briargate Parkway and Lexington Drive. Runoff from areas adjacent to and within Lexington Drive will flow north within Lexington Drive and cross Briargate Parkway via storm sewer to the proposed detention facility. Ultimately this runoff will be detained within a regional facility north of Briargate Parkway.

CHAPEL HILLS DRIVE OUTFALL

Runoff from areas adjacent to and within portions of Chapel Hills Drive and portions of Briargate Parkway will be channeled, within storm sewer, north from the intersection of Chapel Hills Drive and Briargate Parkway to an outfall into Pine Creek. No runoff from the proposed developments and/or streets will flow westerly of this intersection. Ultimately this runoff will be detained within a regional facility north of Briargate Parkway.

FOCUS OUTFALL

Runoff will be channeled into storm sewer through Summerfield Filing No.s 1 and 2 and into a storm sewer system within Research Parkway. The outfall for the proposed Research Parkway storm sewer system is an existing 48" RCP storm sewer within the "Focus on the Family" development. Ultimately this runoff will be detained within a regional facility north of Briargate Parkway.

Note: All preliminary storm sewer facilities designated within this report were calculated to adequately convey runoff for a 100-year event. Some street and lot layouts shown are preliminary only and will be subject to change with future development.

SUMMARY - PINE CREEK DETENTION BASIN '1-A'

Developed runoff from Basins 49, 51, and a portion of runoff from Basins 40-A, 40-B, 40-C, and 22-B can be routed via street flows northerly and westerly to the intersection with Lexington Drive. At the intersection of Lexington Drive a 10' at-grade inlet can intercept a portion of the runoff proceeding north within Lexington Drive. Flowby can then proceed north within Lexington Drive and combine with developed runoff from Basin 52-B. Runoff from Basins 50 and 54-A can flow to and north within Lexington Drive. Two 10' at-grade curb inlets can intercept a portion of the flow within Lexington Drive. Flowby will continue north within Lexington Drive and intercepted runoff within Lexington Drive and from Basin 54-B can be routed via storm sewer north within Lexington Drive. A developed runoff of Q_{10}=4 cfs and Q_{100}=5 cfs should be detained on-site within Basin 54-A and Q_{10}=3 cfs and Q_{100} =5 cfs detained onsite within Basin 54-B. Runoff from Basin 52 can be routed via surface streets and collected within a 6' sumped curb inlet. The collected runoff can be routed via storm sewer north to a 10' at-grade inlet which will partially intercept runoff from Basin 52-A. The storm sewer can continue to the two 10' at-grade curb inlets within Lexington Drive and proceed north. Flowby from the 10' at-grade curb inlet for Basin 52-A will turn west and proceed to Lexington Drive where it will join flowby from the two 10' at-grade inlets. Runoff from Basin 53 can be routed via street flows north to an 8' sumped curb inlet. Collected runoff from Basin 53 can then be routed via storm sewer north and west to an 8' sumped curb inlet at the southeast curb return of the intersection of future Briargate Parkway and Lexington Drive which will collect runoff within Lexington Drive and Briargate Parkway from Basins 53-A and flowby. This collected runoff can be routed via storm sewer to the storm sewer system proceeding north within Lexington Drive. The remaining runoff within Lexington Drive from Basin 53-B and flowby from the 10' at-grade curb inlet can be totally intercepted within a 16' at-grade inlet. The collected runoff can be routed via storm sewer to the storm sewer system proceeding north within Lexington Drive.

The collected runoff within the storm sewer system in Lexington Drive will proceed north, crossing Briargate Parkway and discharging into Pine Creek Detention Basin "1-A".

The proposed basins and street alignments presented within this study are preliminary and subject to change. The storm sewer system outlined within the attached appendices will adequately convey a 100-year event developed runoff.

SUMMARY - CHAPEL HILLS OUTFALL

Developed runoff from Basin 58 can be routed via proposed Foxtail Drive and intercepted within a 6' and 4' sumped curb inlets. A developed runoff of Q_{10}=6 cfs and Q_{100}=9 cfs should be detained onsite. This runoff can then be routed north via storm sewer within the proposed road. Developed runoff from Basins 16, 17, 18, and 20 can be routed within Dynamic Drive and partially intercepted within a 20' at-grade curb inlet within Dynamic Drive. Developed runoff from Basins 19 and 57-B can be routed within Dynamic Drive and partially intercepted within a 20' at-grade curb inlet within Dynamic Drive. These intercepted flows can be combined with the flow from Basin 58 and routed via storm sewer west within Dynamic Drive. Flowby can continue within Dynamic Drive and combine with Basins 41 and 42 within the southerly curb line and be intercepted within a 16' sumped curb inlet east of the proposed intersection of Dynamic Drive and Chapel Hills Drive. A developed runoff of Q_{10}=2 and 7 cfs, and Q_{100}=2 and 11 cfs should be detained on-site within Basins 41 and 42 respectively. Flowby within the northerly curb line can combine with developed runoff from Basins 43 and 44 and can be intercepted within an 8' sumped curb inlet east of the proposed intersection of Dynamic Drive and Chapel Hills Drive. A developed runoff of Q_{10}=4 and 2 cfs, and Q_{100}=6 and 4 cfs should be detained on-site within Basins 43 and 44 respectively. These inlet flows can combine with the flows from storm sewer within Dynamic Drive and proceed north via storm sewer within Chapel Hills Drive. Developed flow from Basins 45 and 46 can be partially intercepted within 20' at-grade inlets along Chapel Hills Drive. This flow can be routed northerly via storm sewer within Chapel Hills Drive. Developed flows from Basin 55 can be intercepted onsite within a 4' sump curb inlet. Runoff of Q_{10}=1 and Q_{100}=5 cfs should be detained onsite. Collected runoff can proceed north within storm sewer and join with runoff collected from Basin 56 within a 10' sumped curb inlet. This intercepted runoff can then be routed north and westerly via storm sewer within Briargate Parkway. Developed flows from Basin 57-A, 48, and 47 can be intercepted on-site and routed westerly via storm sewer within Briargate Parkway. A developed runoff of Q_{10}=4 cfs, and Q_{100}=5 and 6 cfs should be detained on-site within Basins 47 and 48

sewer within the proposed trail system. Note, the proposed trail system can also serve as an emergency overflow channel for the above mentioned inlets. Storm sewer flows from Lexington Drive and the proposed streets north of the trail system can combine and continue westerly to a ponding location which will also collect runoff from Basin 34. Developed runoff routed to and collected within Basin 34 can be released via storm sewer at a controlled rate, thus requiring storage within Basin 34. The rate of 90 cfs total discharge south via storm sewer to the existing system within Summerfield Filing No. 1 has been determined by the previously approved Final Drainage Study for Summerfield Filing No.s 1 and 2. Detained runoff within Basin 34 will be stored within a detention facility.

Runoff flow from the proposed detention pond will enter the proposed storm sewer system within Summerfield Filing No. 1 and proceed southerly with previously determined developed flows to a storm sewer system within Research Parkway. Proposed storm sewer within Research Parkway discharges into an existing storm sewer within the "Focus on the Family" development. The rate of discharge from the detention pond calculated within this study will not adversely impact previously determined runoff rates and storm sewer sizing for Filing No.s 1 and 2.

Basin characteristics and developed runoffs from the approved Final Drainage Study for Summerfield Filings No.s 1 and 2 are provided in this report for reference. See Appendix III.H-III.L. Basin RP-9 has been modified to reflect Office Park/Light Industrial zoning.

Proposed street alignments and basins, other than those shown on the approved Final Drainage Study for Summerfield Filing No.s 1 and 2, are preliminary and subject to change. The storm sewer systems outlined within this report will adequately convey a 100-year event runoff.

respectively. Developed flow from Basin 60 can be partially intercepted within a 20' at-grade curb inlet. This intercepted flow can be combined with flow from Basin 57-A, 48, 55, and 56 and routed via storm sewer westerly within Briargate Parkway. Flowby from Basin 60 and Basin 45 can be intercepted within a 4' sumped curb inlet at the southeasterly curb return of the proposed intersection of Briargate Parkway and Chapel Hills Drive. Developed flow from Basin 59 can be partially intercepted with a 20' at-grade inlet at the northeasterly intersection of Briargate Parkway and Chapel Hills Drive. A portion of street flow will flowby this inlet and continue north within Chapel Hills Drive. Flowby from Basin 46 can be totally intercepted with a 4' sumped inlet at the southwesterly curb return of Briargate Parkway and Chapel Hills Drive. Note, no street flows will continue west within Briargate Parkway.

SUMMARY - FOCUS OUTFALL

Developed runoff from Basin 40-A, 40-B, and 40-C can be routed via street flows westerly. A portion of those flows will turn north within the proposed street with the remaining flows in Sanguine Drive proceeding west towards the intersection of Lexington Drive and combining with flows from Basin 22-B. Developed runoff of Q_{10}=4 and 1 cfs and Q_{100}=6 and 2 cfs should be detained within Basins 40-A and 40-B respectively. Developed runoff from Basin 21-A, 21-B, and 22 can be routed via street flows westerly to the intersection of Sanguine Drive and Lexington Drive. A developed runoff of Q_{10}=6 cfs and Q_{100}=8 cfs should be detained on-site within Basin 21-B. Developed runoff from Basin 22-A can be routed via street flows to a 10' sumped curb inlet. The collected runoff can be routed via storm sewer north and west to a sump within Lexington Drive. Developed runoff from Basins 23 will combine with runoff from Basins 40-A, 40-B, 40-C, 22-B, 21-A, and 21-B within Lexington Drive. This street flow will proceed to a sump within Lexington Drive where two 28' sumped curb inlets will intercept the runoff. The collected runoff flows can combine with collected runoff from Basin 22-A and be routed via storm sewer westerly across Lexington Drive and within the proposed trail system. Note, the proposed trail system will serve as an emergency overflow channel for the above mentioned sump inlets within Lexington Drive. Developed runoff from Basins 29, 30, and 31 can be routed via street flow and intercepted within a 10' sumped curb inlet. Developed flow from a portion of Basin 28 can be routed via street flow and intercepted within a sumped 4' curb inlet. These flows can be routed southerly via storm

APPENDICES

APPENDIX I.A

LAND USE SUMMARY

PINE CREEK DETENTION POND "1-A" OUTFALL

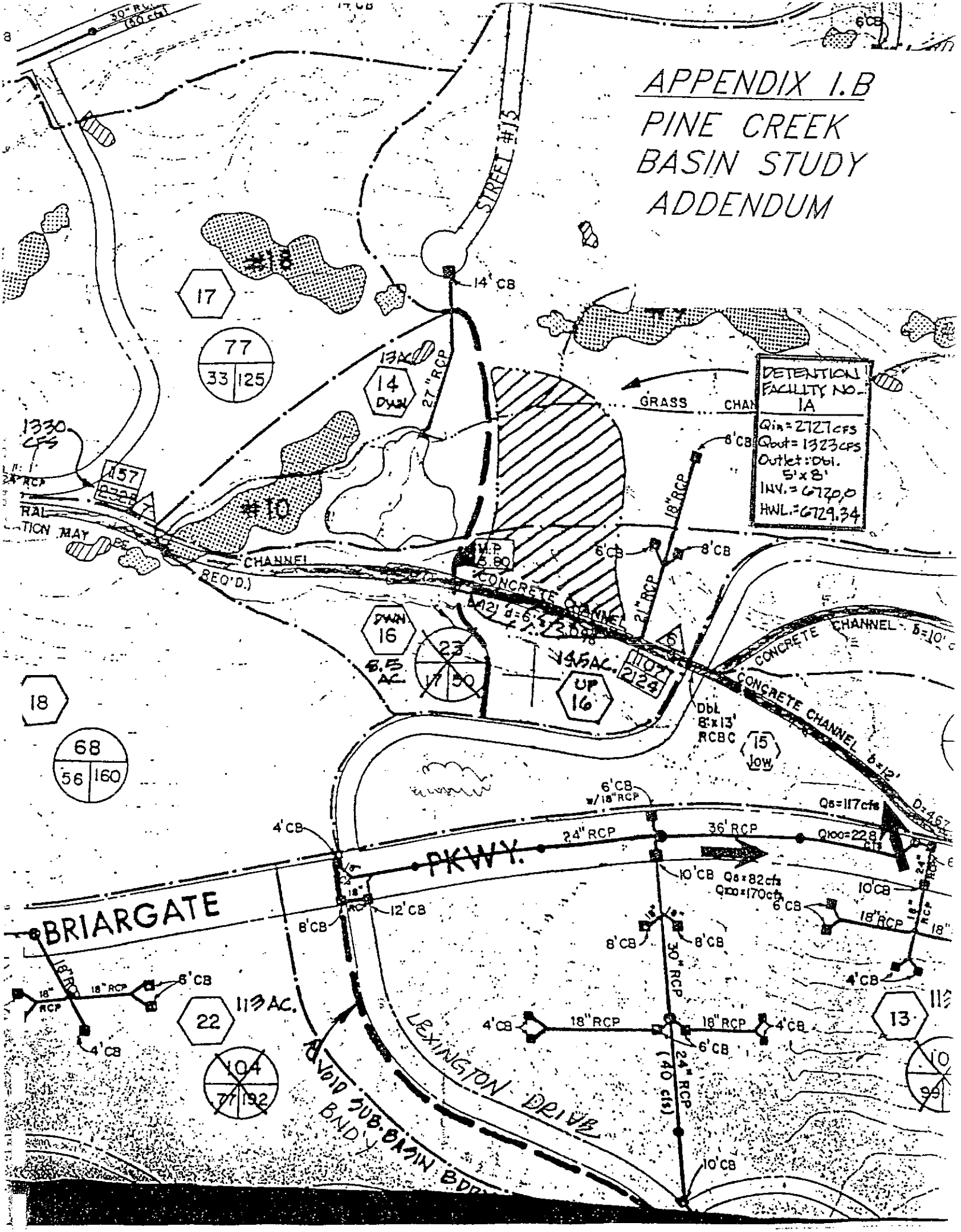
BASIN	LAND USE	C(10)	C(100)
49	1/5 ACRE LOTS	0.52	0.62
50	1/5 ACRE LOTS	0.52	0.62
51	1/5 ACRE LOTS	0.52	0.62
52	1/5 ACRE LOTS	0.52	0.62
52A	1/5 ACRE LOTS	0.55	0.65
52B	STREET / BACKYARDS	0.68	0.76
53	1/5 ACRE LOTS	0.55	0.65
53A	STREET / BACKYARDS	0.76	0.83
53B	MAJOR ARTERIAL	0.90	0.95
54A	SCHOOL SITE	0.70	0.80
54B	SCHOOL SITE	0.70	0.80

WEIGHTED 'C' FOR BASIN 52B WHICH INCLUDES 1.2 ACRES OF YARD
AND 0.9 ACRES OF ROADWAY.

C(10) = (1.2/2.1)(0.52) + (0.9/2.1)(0.90) = 0.68
C(10) = (1.2/2.1)(0.62) + (0.9/2.1)(0.95) = 0.76

WEIGHTED 'C' FOR BASIN 53A

C(10) = (1.0/2.7)(0.52) + (1.7/2.7)(0.90) = 0.76
C(100) = (1.0/2.7)(0.62) + (1.7/2.7)(0.95) = 0.83


APPENDIX I.B
PINE CREEK
BASIN STUDY
ADDENDUM
STREET #15
#18
#10
17
77
33 | 125
14
DWN
27" RCP
13 AC.
14' CB
1330 CFS
157
Q=33
GRASS
CHAN
DETENTION FACILITY NO. 1A
Qin = 2727 cfs
Qout = 1323 cfs
Outlet: Dbl. 5'x8'
INV. = 6720.0
HWL. = 6729.34
8'CB
18" RCP
6'CB
8'CB
21" RCP
M.P. 6.80
CHANNEL
REQ'D.)
CONCRETE CHANNEL
Q=2727 cfs
DWN
16
23
17 | 50
8.5 AC.
14.5 AC.
110
212
UP
16
CONCRETE CHANNEL b=10'
CONCRETE CHANNEL b=12'
Dbl. 8'x13' RCBC
15
low
18
68
56 | 160
6'CB w/18" RCP
Qs=117 cfs
4'CB
24" RCP
36" RCP
Q100=228 cfs
PKWY.
10'CB Qs=82 cfs
Q100=170 cfs
10'CB
6'CB
18" RCP
BRIARGATE
12'CB
8'CB
30" RCP
4'CB
22
113 AC.
104
77 | 192
AVOID SUB-BASIN BNDY
LEXINGTON DRIVE
(40 cfs)
24" RCP
10'CB
13
99

APPENDIX	I.C

PINE CREEK DETENTION BASIN "1-A" OUTFALL - BASIN SUMMARY

BASIN	AREA (Ac)	C(10)	C(100)	OVER LAND HEIGHT (ft.)	OVER LAND LENGTH (ft.)	Tc (min.)	STREET FLOW SLOPE (ft./ft.)	STREET FLOW LENGTH (ft.)	Tc (min.)	TOTAL Tc (min.)	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
49	3.2	0.52	0.62	2	100	8.6	0.0100	1700	8.1	16.7	3.8	5.7	6	11
50	1.1	0.52	0.62	2	100	8.6	0.0100 0.0450	1200 750	5.7 1.7	16.0	3.9	5.8	2	4
51	7.7	0.52	0.62	2	100	8.6	0.0100	1700	8.1	16.7	3.8	5.7	15	27
52	6.0	0.52	0.62	4	200	12.2	0.0100	650	3.1	15.3	3.9	5.9	12	22
52A	2.1	0.52	0.62	2	100	8.6	0.0100	850	4.0	12.7	4.2	6.4	5	8
52B	2.1	0.68	0.76	-	-	-	0.0100	1000	4.8	4.8	5.9	8.9	8	14
54A	5.3	0.70	0.80	5	500	16.7	-	-	-	16.7	3.8	5.7	14	24
54A(H)	5.3	0.25	0.35	12 2	160 80	10.3 13.6	-	-	-	23.9	3.2	4.8	4	9
54B	5.3	0.70	0.80	7	650	18.6	-	-	-	18.6	3.6	5.4	13	23
54B(H)	5.3	0.25	0.35	16	400	20.1	-	-	-	20.1	3.5	5.2	5	10
53	6.4	0.52	0.62	2	100	8.6	0.0100	1300	6.2	14.8	4.0	6.0	13	24
53A	2.7	0.76	0.83	1.5	75	4.4	0.0400	700	1.7	6.0	5.5	8.3	11	19
53B	0.85	0.90	0.95	-	-	-	0.0400 0.0530	500 400	1.2 0.8	5.0	5.8	8.8	4	7

BASIN	DETAINED FLOW Q(10)	DETAINED FLOW Q(100)	EQUIVALENT CA CA(10)	EQUIVALENT CA CA(100)
54A	4	5	1.05	0.88
54B	3	5	0.83	0.93

NOTES: 1.) THE LETTER 'H' FOLLOWING A BASIN NUMBER INDICATES CALCULATIONS FOR HISTORIC FLOW.
2.) DETAINED FLOW IS 35% OF DEVELOPED FLOW LESS HISTORIC FLOW.

TOTAL ACREAGE	42.75		
SUM CA(10)	25.45	AVE. 'C'	0.60
SUM CA(100)	29.55	AVE. 'C'	0.69
CA(10) FLOWBY	4.00	CA(10) DETAINED	1.88
CA(100) FLOWBY	2.67	CA(100) DETAINED	1.81

CONTRIBUTION TO PINE CREEK DETENTION / @ Tc = 38.9 min.

CA(10)	27.57	Q(10) =	65 (c.f.s.)
CA(100)	30.41	Q(100) =	108 (c.f.s.)

APPENDIX	I.E

PINE CREEK DETENTION BASIN "1-A" OUTFALL - SURFACE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	STREET SLOPE (ft./ft.)	FLOW LENGTH (ft.)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
FB	4.00	2.67	-	-	-	26.7	26.7	3.0	4.5	12	12
49,51	9.67	9.43	0.0100 0.045	1200 750	5.7 1.7	26.7	34.1	2.6	3.9	25	37
--- SIZE A 10' CURB INLET AT GRADE. INTERCEPT Q(10)=13/Q(100)=14 c.f.s. FLOWBY NORTH W/IN LEXINGTON DRIVE, Q(10)=12/Q(100)=23 c.f.s. CA(EQ)-CA(10)=4.62/CA(100)=5.90.											
\/											
52B & FB	6.05	7.50	0.0100	1000	4.8	34.1	38.9	2.4	3.6	14	27
--- SIZE A 10' CURB INLET AT GRADE. INTERCEPT Q(10)=9/Q(100)=13 c.f.s. FLOWBY NORTH W/IN LEXINGTON DRIVE, Q(10)=5/Q(100)=14 c.f.s. CA(EQ)-CA(10)=2.08/CA(100)=3.89.											
50	0.57	0.68	-	-	-	12.6	12.6	4.3	6.4	2	4
\/											
54A	3.23	4.04	-	-	-	16.7	16.0	3.9	5.8	12	24
--- SIZE A 10' CURB INLET AT GRADE. INTERCEPT Q(10)=8/Q(100)=12 c.f.s. FLOWBY NORTH W/IN LEXINGTON DRIVE, Q(10)=4/Q(100)=12 c.f.s. CA(EQ)-CA(10)=1.03/CA(100)=2.07.											
54B	2.88	3.31	-	-	-	18.6	16.0	3.9	5.8	11	19
--- SIZE A 4' SUMP CURB INLET, TOTAL INTERCEPTION ON SITE.											
52	3.12	3.72	-	-	-	15.3	15.3	3.9	5.9	12	22
---- SIZE AN 6' CURB INLET WITHIN A SUMP, NO FLOWBY											
52A	1.09	1.30	-	-	-	12.6	12.6	4.3	6.4	5	8
---- SIZE A 10' INLET AT GRADE. FLOWBY - Q(10)=0 /Q(100)=2 EQUIV. CA(10)=0.0 / CA(100)=0.31											
53A,FB	4.13	6.44	0.0530 0.0400	300 500	0.6 1.2	38.9	40.7	2.3	3.4	9	22
---- SIZE AN 8' RADIAL CURB INLET WITHIN A SUMP, NO FLOWBY.											
53B,FB	1.80	2.88	0.0530 0.0400	300 500	0.6 1.2	18.6	20.4	3.4	5.2	6	15
---- SIZE A 16' INLET AT GRADE, TOTAL INTERCEPTION.											
53	3.33	3.97	-	-	-	14.8	14.8	4.0	6.0	13	24
---- SIZE A 4' SUMP CURB INLET. TOTAL INTERCEPTION.											

APPENDIX	I.F

PINE CREEK DETENTION BASIN "1-A" - PIPE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
49,51,FB	5.05	3.53	-	34.1	34.1	2.6	3.9	13	14
---- SIZE 800' - 24" RCP @ 1% ----									
52	3.12	3.72	-	15.3	15.3	3.9	5.9	12	22
---- SIZE 500' - 24" RCP @ 1% ----									
52,52A	4.21	4.71	0.8	15.3	16.1	3.8	5.8	16	27
---- SIZE 150' - 24" RCP @ 1% ----									
49,51,FB 52,52A 52B,FB 50,54A,54B	18.31	17.13	1.3	34.1	35.4	2.5	3.8	46	65
---- SIZE 800' - 30" RCP @ 2.5% ----									
\/									
53,53A,53B	27.57	30.42	-	38.9	38.9	2.4	3.6	65	108
\/									
TO PINE CREEK DETENTION POND "1-A"									

APPENDIX II.A

LAND USE SUMMARY

CHAPEL HILLS OUTFALL

BASIN	LAND USE	C(10)	C(100)
16	1/5 ACRE LOTS	0.52	0.62
17	1/5 ACRE LOTS	0.52	0.62
18	1/5 ACRE LOTS	0.52	0.62
19	1/5 ACRE LOTS	0.52	0.62
20	1/5 ACRE LOTS	0.52	0.62
41	OFFICE PARK / LT. INDUSTRIAL	0.70	0.80
42	OFFICE PARK / LT. INDUSTRIAL	0.70	0.80
43	OFFICE PARK / LT. INDUSTRIAL	0.70	0.80
44	OFFICE PARK / LT. INDUSTRIAL	0.70	0.80
45	MINOR ARTERIAL	0.78	0.86
46	MINOR ARTERIAL	0.90	0.95
47	OFFICE PARK / LT. INDUSTRIAL	0.70	0.80
48	OFFICE PARK / LT. INDUSTRIAL	0.70	0.80
55	SCHOOL / PARK	0.30	0.55
56	MEDIUM HIGH RESIDENTIAL	0.60	0.70
57A	MEDIUM HIGH RESIDENTIAL	0.60	0.70
57B	MEDIUM HIGH RESIDENTIAL	0.60	0.70
58	OFFICE PARK / LT. INDUSTRIAL	0.70	0.80
59	MAJOR ARTERIAL	0.90	0.95
60	MAJOR ARTERIAL	0.71	0.83

WEIGHTED 'C' FOR BASIN 45:

C(10) = (3.0/5.2)(0.70) + (2.2/5.2)(0.90) = 0.78
C(100)= (3.0/5.2)(0.80) + (2.2/5.2)(0.95) = 0.86

WEIGHTED 'C' FOR BASIN 60:

C(10) = (1.9/6.13)(0.30) + (4.23/6.13)(0.90) = 0.71
C(100)= (1.9/6.13)(0.55) = (4.23/6.13)(0.95) = 0.83

APPENDIX	II.B

CHAPEL HILLS DRIVE OUTFALL - BASIN SUMMARY

BASIN	AREA (Ac)	C(10)	C(100)	OVER LAND HEIGHT (ft.)	OVER LAND LENGTH (ft.)	Tc (min.)	STREET FLOW SLOPE (ft./ft.)	STREET FLOW LENGTH (ft.)	Tc (min.)	TOTAL Tc (min.)	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
16	2.47	0.52	0.62	2	100	8.6	0.0400	600	1.4	10.1	4.6	7.0	6	11
19	2.25	0.52	0.62	-	-	0.0	0.0100	1500	7.1	7.1	5.2	7.9	6	11
17	4.37	0.52	0.62	2	100	8.6	0.0450	750	1.7	10.3	4.6	6.9	10	19
18	1.51	0.52	0.62	2	100	8.6	0.0450	800	1.8	10.4	4.6	6.9	4	6
20	1.30	0.52	0.62	31.4	570	14.7	-	-	-	14.7	4.0	6.0	3	5
41	2.20	0.70	0.80	8	400	11.9	0.0150	100	0.4	12.3	4.3	6.5	7	11
41H	2.20	0.25	0.35	22	450	20.0	-	-	-	20.0	3.5	5.3	2	4
58	7.70	0.70	0.80	11	500	12.9	-	-	-	12.9	4.2	6.4	23	39
58H	7.70	0.25	0.35	50	600	19.3	-	-	-	19.3	3.5	5.3	7	14
42	12.60	0.70	0.80	11	1000	22.9	-	-	-	22.9	3.2	4.9	29	49
42H	12.60	0.25	0.35	24	750	29.7	-	-	-	29.7	2.8	4.2	9	19
57A	7.90	0.60	0.70	16	800	21.0	-	-	-	21.0	3.4	5.1	16	28
57B	7.60	0.60	0.70	16	800	21.0	-	-	-	21.0	3.4	5.1	15	27
43	5.30	0.70	0.80	12	600	14.6	-	-	-	14.6	4.0	6.1	15	26
43H	5.30	0.25	0.35	27	600	23.7	-	-	-	23.7	3.2	4.8	4	9
48	5.64	0.70	0.80	14	700	15.7	-	-	-	15.7	3.9	5.9	15	26
48H	5.64	0.25	0.35	12	450	24.4	-	-	-	24.4	3.1	4.7	4	9
47	5.20	0.70	0.80	16	800	16.8	-	-	-	16.8	3.8	5.7	14	24
47H	5.20	0.25	0.35	22	500	21.8	-	-	-	21.8	3.3	5.0	4	9
44	3.25	0.70	0.80	7	350	11.1	0.0200	350	1.2	12.3	4.3	6.5	10	17
44H	3.25	0.25	0.35	24	400	17.6	-	-	-	17.6	3.7	5.6	3	6
45	5.20	0.78	0.86	3.4 -	170 -	6.2 -	0.0110 0.0300	650 350	3.0 1.0	10.1	4.6	7.0	19	31

(cont.)

APPENDIX	II.B

CHAPEL HILLS DRIVE OUTFALL - BASIN SUMMARY

BASIN	AREA (Ac)	C(10)	C(100)	OVER LAND HEIGHT (ft.)	OVER LAND LENGTH (ft.)	Tc (min.)	STREET FLOW SLOPE (ft./ft.)	STREET FLOW LENGTH (ft.)	Tc (min.)	TOTAL Tc (min.)	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
46	1.90	0.90	0.95	-	-	-	0.0110	900	4.1	5.0	5.8	8.8	10	16
				-	-	-	0.0300	350	1.0					
59	4.04	0.90	0.95	-	-	-	0.0200	500	1.7	6.5	5.4	8.1	20	31
				-	-	-	0.0400	1000	2.4					
				-	-	-	0.0600	400	0.8					
				-	-	-	0.0200	500	1.7					
60	6.13	0.71	0.83	-	-	-	0.0400	1200	2.9	5.3	5.7	8.6	25	44
							0.0600	400	0.8					
							0.0200	500	1.7					
55	9.20	0.30	0.55	26	300	12.7	0.0100	530	1.0	13.7	4.1	6.2	11	31
55H	9.20	0.25	0.35	46	700	22.6	-	-	-	22.6	3.3	4.9	8	16
56	7.90	0.60	0.70	2	100	8.6	0.0500	600	1.3	10.4	4.6	6.9	22	38
							0.0100	300	0.5					

BASIN	DETAINED FLOW Q(10)	DETAINED FLOW Q(100)	EQUIVALENT CA CA(10)	EQUIVALENT CA CA(100)
41	2	2	0.57	0.38
58	6	9	1.71	1.70
42	7	11	2.19	2.24
43	4	6	1.00	0.98
48	4	6	1.03	1.02
47	4	5	1.05	0.88
44	2	4	0.47	0.62
55	1	5	0.24	0.81

TOTAL ACREAGE	103.66		
SUM CA(10)	64.57	SUM CA(10) DETAINED	8.26
SUM CA(100)	73.68	SUM CA(100) DETAINED	8.63
AVE. CA(10) =	0.62		
AVE. CA(100) =	0.71		

CONTRIBUTION TO PINE CREEK @ Tc = 27.5 min.

CA(10) =	56.31	Q(10) =	163
CA(100)=	65.05	Q(100)=	286

NOTES : 1.) THE LETTER 'H' FOLLOWING A BASIN BUMBER INDICATES CALCULATIONS FOR HISTORIC FLOW.

2.) DETAINED FLOW IS 35% OF THE DEVELOPED FLOW LESS HISTORIC FLOW.

3.) FOR BASIN 55, STREET FLOW IS A CONCRETE CHANNEL @ 1.0% SLOPE

APPENDIX	II.D

CHAPEL HILLS DRIVE OUTFALL - SURFACE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	STREET SLOPE (ft./ft.)	FLOW LENGTH (ft.)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
16&17	3.56	4.24	0.0450	350	0.8	10.3	11.1	4.5	6.8	16	29
16,17&18	4.35	5.18	-	-	-	-	11.1	4.5	6.8	19	35
16,17,18&20	5.03	5.99	0.0400 0.0400 0.0400	250 250 250	0.6 0.6 0.6	11.1	12.8	4.2	6.4	21	38
---- SIZE A 20' INLET AT GRADE. FLOWBY - Q(10)=2 / Q(100)=10 EQUIV. CA(10)=0.48 / CA(100)=1.56											
41&FLOWBY	1.45	2.94	-	-	-	-	12.8	4.2	6.4	6	19
41,FLOWBY&42	8.08	10.78	-	-	-	24.8	24.8	3.1	4.7	25	51
---- SIZE A 16' CURB INLET WITHIN A SUMP. NO FLOWBY.											
58	3.68	4.46	-	-	-	12.9	12.9	4.2	6.4	16	28
---- SIZE A 6' CURB INLET WITHIN A SUMP. NO FLOWBY.											
19	1.17	1.40	-	-	-	7.1	7.1	5.2	7.9	6	11
19&57B	5.73	6.72	-	-	-	21.0	21.0	3.4	5.1	19	34
---- SIZE A 20' INLET AT GRADE. FLOWBY - Q(10)=1 / Q(100)=7 EQUIV. CA(10)= 0.29/ CA(100)=1.37											
43&FLOWBY	3.00	4.63	0.0120	700	3.0	21.0	24.0	3.2	4.8	10	22
43,FLOWBY&44	4.81	6.61	-	-	-	24.0	24.0	3.2	4.8	15	32
---- SIZE AN 8' CURB INLET WITHIN A SUMP. NO FLOWBY.											
59	3.64	3.84	-	-	-	5.5	5.5	5.7	8.5	21	33
---- SIZE A 20' INLET AT GRADE. FLOWBY - Q(10)=6 / Q(100)=12 EQUIV. CA(10)=1.05 / CA(100)=1.76											
POR. 60	3.64	4.26	-	-	-	5.3	5.3	5.7	8.6	21	37
---- SIZE A 20' INLET AT GRADE. FLOWBY - Q(10)=6 / Q(100)=10 EQUIV. CA(10)=1.05 / CA(100)=1.15 (NOTE: 5.13 Acres Contributing)											

(cont.)

APPENDIX	II.D

CHAPEL HILLS DRIVE OUTFALL - SURFACE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	STREET SLOPE (ft./ft.)	FLOW LENGTH (ft.)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
POR. 45	2.96	3.27	-	-	-	-	9.2	4.8	7.2	14	24
---- SIZE A 20' INLET AT GRADE. FLOWBY - Q(10)=2 / Q(100)=6 EQUIV. CA(10)=0.42 / CA(100)=0.83 (NOTE: 3.80 Acres Contributing)											
46	1.71	1.81	0.0120	900	3.9	3.9	5.0	5.8	8.8	10	16
---- SIZE A 20' INLET AT GRADE. FLOWBY - Q(10)=1 / Q(100)=3 EQUIV. CA(10)=0.17 / CA(100)=0.34											
POR.60,FB	1.76	1.98	0.0400	450	1.1	5.3	6.4	5.4	8.2	10	16
---- SIZE A 4' CURB INLET WITHIN A SUMP. NO FLOWBY. (NOTE: BASIN AREA = 1.0 Ac + FLOWBY FROM UPSTREAM INLET)											
FB FROM 46	0.17	0.34	0.0300	350	1.0	5.3	6.3	5.4	8.2	1	3
---- SIZE A 4' AT GRADE INLET. NOTE, NO RUNOFF TO PROCEED WEST OF THIS INTERSECTION.											
55	2.52	2.41	-	-	-	13.7	13.7	4.1	6.2	10	15
---- SIZE A 4' SUMP INLET OR EQUAL.											
56	4.74	5.53	-	-	-	10.4	10.4	4.6	6.9	22	38
---- SIZE A 10' SUMP INLET OR EQUAL.											
57A	4.74	5.53	-	-	-	21.0	21.0	3.4	5.1	16	28
---- SIZE A 6' SUMP INLET OR EQUAL.											
48	2.92	3.49	-	-	-	24.4	24.4	3.1	4.7	9	17
---- SIZE A 4' SUMP INLET OR EQUAL.											
47	2.59	3.28	-	-	-	16.8	16.8	3.8	5.7	10	19
---- SIZE A 4' SUMP INLET OR EQUAL.											
59	3.64	3.84	-	-	-	6.5	6.5	5.4	8.1	20	31
---- SIZE A 20' INLET AT GRADE. FLOWBY - Q(10)=8 / Q(100)=12 c.f.s. EQUIV. CA(10)=1.48 / CA(100)= 1.48											

APPENDIX	II.E

CHAPEL HILLS OUTFALL - PIPE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
58	3.68	4.46	-	12.9	12.9	4.2	6.4	16	28
\/ ---- SIZE 450' - 30" RCP @ 0.5% ----									
16,17,18,20 19,57B	13.67	14.24	-	21.0	21	3.4	5.1	46	73
\/ ---- SIZE 700' - 36" RCP @ 1% ----									
41,42,43,44	26.56	31.63	-	24.0	24.0	3.2	4.8	84	151
\/ ---- SIZE 800' - 42" RCP @ 2.2% ----									
POR. 45,POR. 46	30.64	35.54	0.9	25.1	26	3.0	4.6	93	163
---- SIZE 400' - 42" RCP @ 2.6% ----									
55	2.52	2.41	-	13.7	13.7	4.1	6.2	10	15
---- SIZE 600' - 24" RCP @ 0.5%									
\/									
55,56	7.26	7.94	1.0	13.7	14.7	4.0	6.0	29	48
---- SIZE 100' - 24" R.C.P. @ 4.5%									
57A	4.74	5.53	-	21.0	21.0	3.4	5.1	16	28
---- SIZE 100' 24" R.C.P. @ 1.5% ---									
48	2.92	3.49	-	24.4	24.4	3.1	4.7	9	17
---- SIZE 100' - 18" R.C.P. @ 6.6% ---									
47	2.59	3.28	-	16.8	16.8	3.8	5.7	10	19
---- SIZE 100' - 18" R.C.P. @ 8.2% ---									
55,56,57A	12.00	13.47	-	21.0	21.0	3.4	5.1	41	69
---- SIZE 350' - 30" R.C.P. @ 2.8% ---									
55,56,57A 48,POR. 60	17.51	20.07	-	21.0	21.0	3.4	5.1	59	103
---- SIZE 450' - 36" R.C.P. @ 2.4% ---									

(cont.)

APPENDIX	II.E

CHAPEL HILLS OUTFALL - PIPE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
55,56,57A 48,POR. 60	17.51	20.07	-	21.0	21.0	3.4	5.1	59	103
---- SIZE 450' - 36" R.C.P. @ 2.4% ---									
TOTAL AT THE INTERSECTION	52.67	61.21	-	27.5	27.5	2.9	4.4	153	269
\/ ---- SIZE - 48" RCP @ 3.5% ----									
59	54.83	63.57	-	27.5	27.5	2.9	4.4	159	280
---- SIZE - 48" RCP @ 4.0% ----									

FLOWBY NORTH WITHIN CHAPEL HILLS DRIVE IS...CA(10)=1.48, CA(100)=1.48

APPENDIX III.A

LAND USE SUMMARY

FOCUS OUTFALL

BASIN	LAND USE	C(10)	C(100)	
40A	OFFICE PARK / LIGHT INDUSTRIAL	0.70	0.80	WEIGHTED 'C' FOR BASIN 23 C(10) = (4.8/8.6)(0.52) + (3.8/8.6)(0.90) = 0.69
40B	OFFICE PARK / LIGHT INDUSTRIAL	0.70	0.80	C(100)= (4.8/8.6)(0.62) + (3.8/8.6)(0.95) = 0.77
40C	SINGLE FAMILY RESIDENTIAL	0.50	0.60	
21A	EXISTING WATER TOWER	0.47	0.54	
21B	OFFICE PARK / LIGHT INDUSTRIAL	0.70	0.80	WEIGHTED 'C' FOR BASIN 21A. THE AREA SURROUNDING THE W WILL BE PERMANENTLY LANDSCAPED.NO DETENTION PROVIDED F
22	1/5 ACRE LOTS	0.52	0.62	C(10) = (1.5/5.2)(1.00) + (3.7/5.2)(0.25) = 0.47 C(100)= (1.5/5.2)(1.00) + (3.7/5.2)(0.35) = 0.54
22A	1/5 ACRE LOTS	0.52	0.62	
22B	1/5 ACRE LOTS	0.52	0.62	WEIGHTED 'C' FOR BASIN 40. C(10)=(2.5/14.4)(0.52) + (11.9/14.4)(0.70) = 0.67 C(100)=(2.5/14.4)(0.62) + (11.9/14.4)(0.80)=0.77
23	STREET W/ SLOPES	0.69	0.77	
28	1/5 ACRE LOTS	0.52	0.62	
29	1/5 ACRE LOTS	0.52	0.62	
30	1/5 ACRE LOTS	0.52	0.62	
31	1/5 ACRE LOTS	0.52	0.62	
34	PARK / BACKYARDS	0.30	0.55	

APPENDIX	III.B

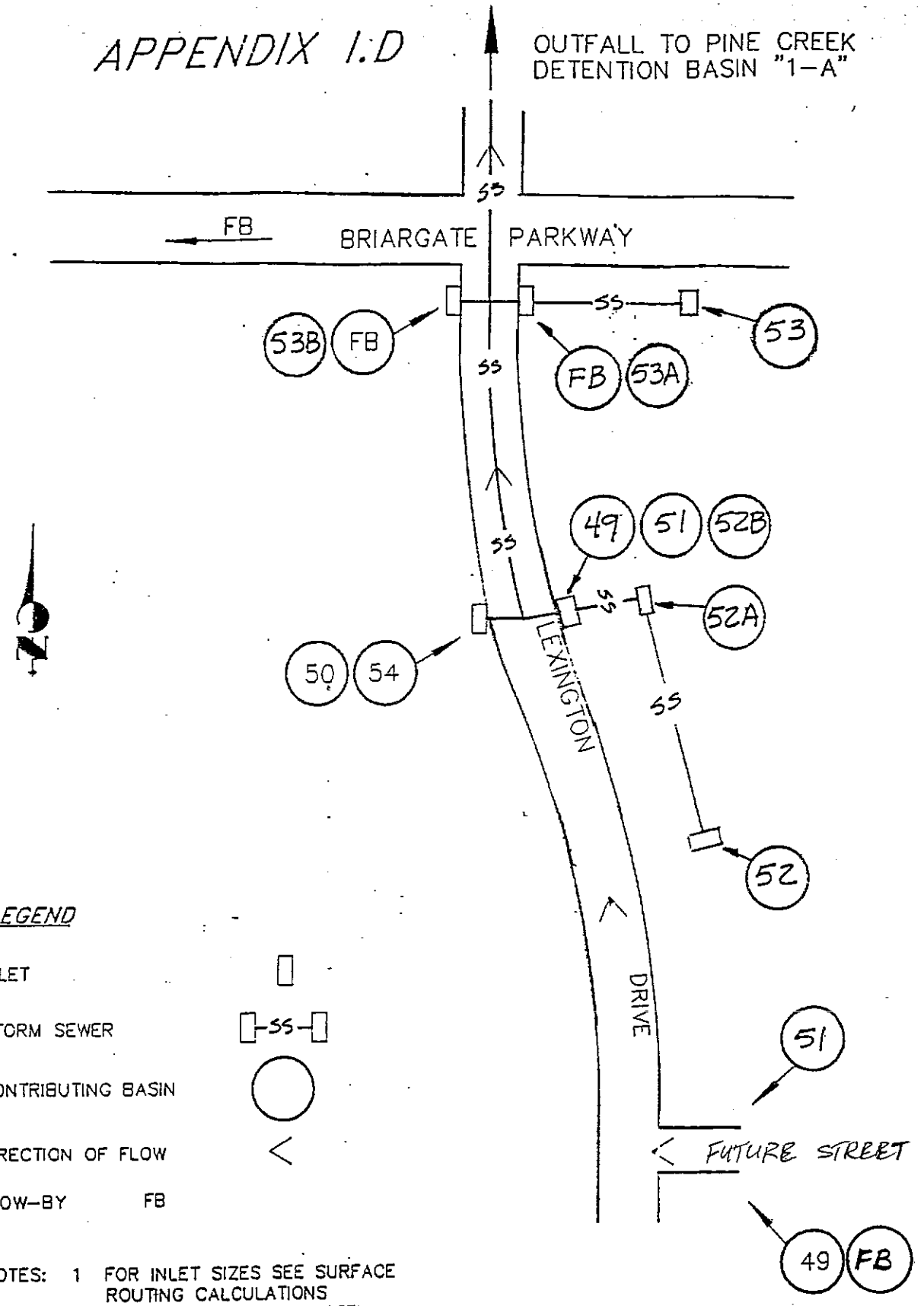
FOCUS OUTFALL - BASIN SUMMARY

BASIN	DETAINED FLOW Q(10)	Q(100)	EQUIVALENT CA CA(10)	CA(100)
21B	6	8	1.71	1.51
40A	4	6	1.03	1.02
40B	1	2	0.30	0.40

NOTES: 1.) THE LETTER 'H' FOLLOWING A BASIN NUMBER INDICATES CALCULATIONS FOR HISTORIC FLOW.
2.) DETAINED FLOW IS 35% OF DEVELOPED FLOW LESS HISTORIC FLOW.

TOTAL ACREAGE	100.35 Ac		
SUM CA(10)	52.94	AVE. C(10)	0.53
SUM CA(100)	63.54	AVE. C(100)	0.63

APPENDIX I.D



NOTES:
1. FOR INLET SIZES SEE SURFACE ROUTING CALCULATIONS
2. FOR PREL. PIPE SIZES SEE PIPE ROUTING CALCULATIONS

EXHIBIT: PINE CREEK DETENTION BASIN "1-A" OUTFALL SYSTEM

NOT TO SCALE

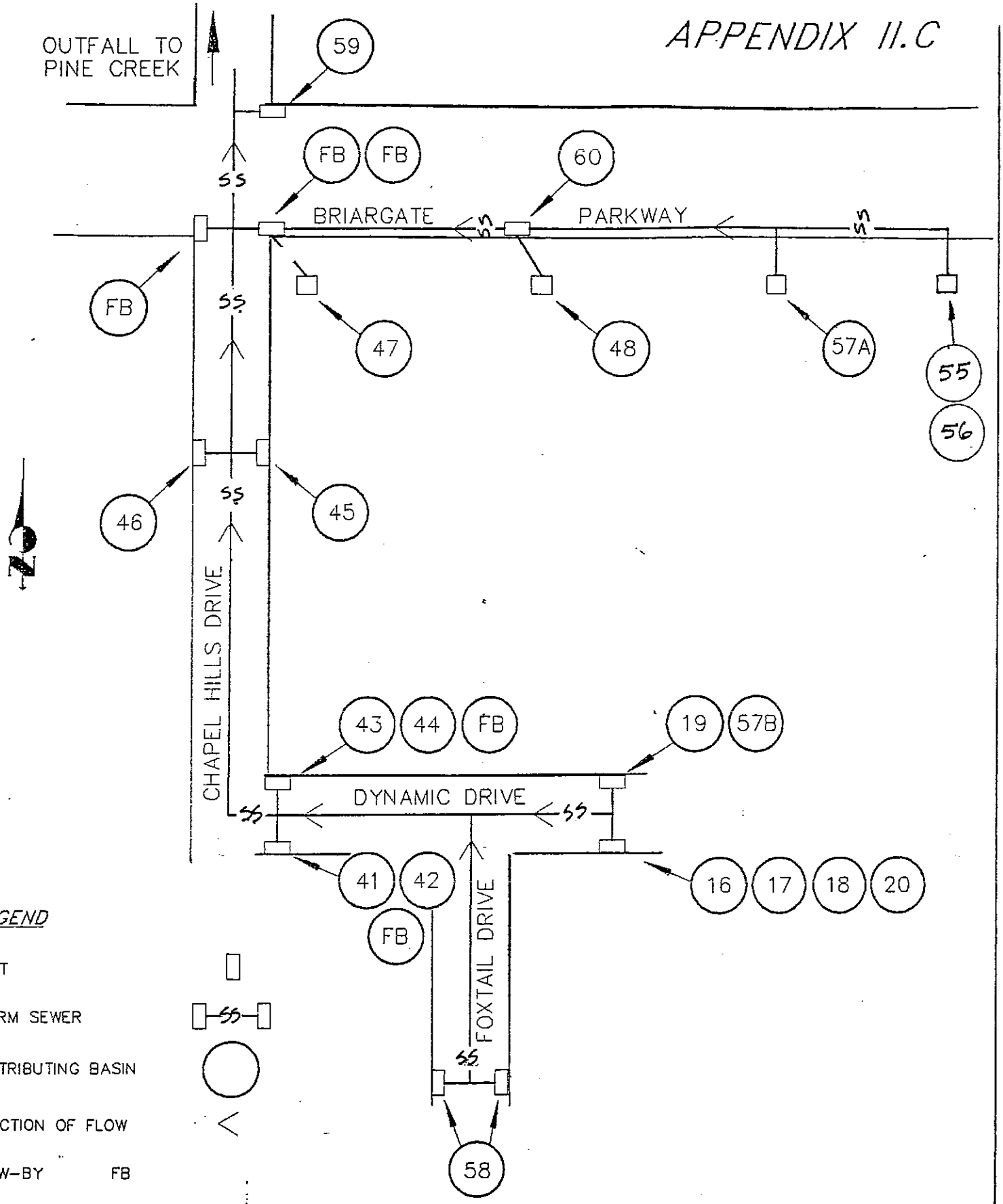


EXHIBIT: CHAPEL HILLS DRIVE OUTFALL SYSTEM

NOT TO SCALE

NOTES: 1 FOR INLET SIZES SEE SURFACE ROUTING CALCULATIONS
2 FOR PREL. PIPE SIZES SEE PIPE ROUTING CALCULATIONS

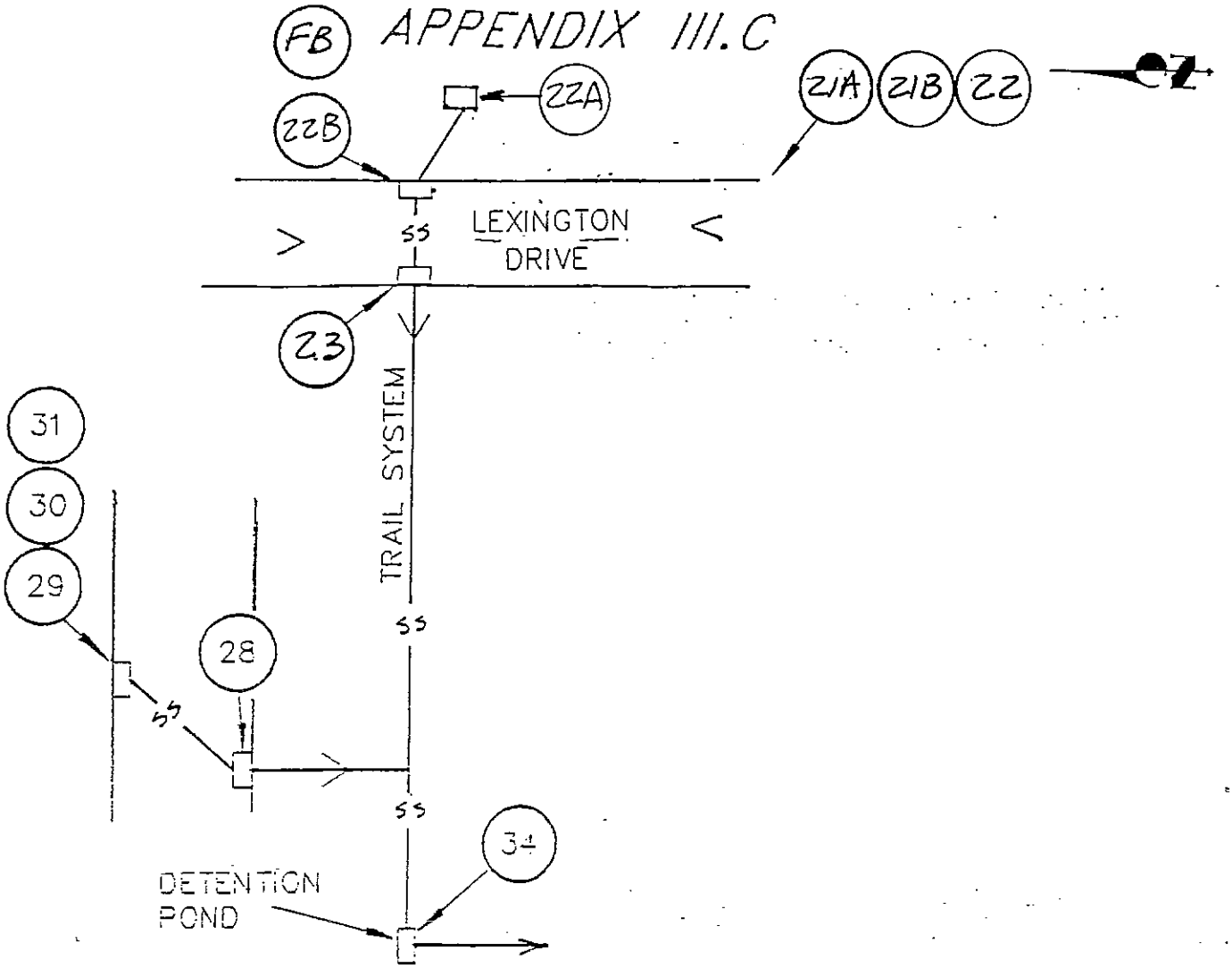
APPENDIX	III.B

FOCUS OUTFALL - BASIN SUMMARY

BASIN	AREA (Ac)	C(10)	C(100)	OVER LAND HEIGHT (ft.)	OVER LAND LENGTH (ft.)	Tc (min.)	STREET FLOW SLOPE (ft./ft.)	STREET FLOW LENGTH (ft.)	Tc (min.)	TOTAL Tc (min.)	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
21A	5.20	0.47	0.54	50	200	7.8	0.0100	450	2.1	9.9	4.7	7.0	11	20
21B	9.60	0.70	0.80	20	300	14.7	0.0300 0.0100	930 450	2.6 2.1	19.4	3.5	5.3	24	41
21B-H	9.60	0.25	0.35	-	-	-	-	-	-	19.4	3.5	5.3	8	18
40A	6.60	0.70	0.80	25	300	13.7	0.0200	530	1.8	15.5	3.9	5.9	18	31
40A-H	6.60	0.25	0.35	-	-	-	-	-	-	15.5	3.9	5.9	6	14
40B	3.10	0.70	0.80	6	300	21.9	-	-	-	21.9	3.3	5.0	7	12
40B-H	3.10	0.25	0.35	-	-	-	-	-	-	21.9	3.3	5.0	3	5
40C	2.60	0.50	0.60	2	100	12.6	0.0100	800	5.0	17.6	3.7	5.6	5	9
22	11.80	0.52	0.62	2	100	8.6	0.0300	1500	4.1	12.8	4.2	6.4	26	47
22A	7.80	0.52	0.62	2	100	8.6	0.0300	900	2.5	11.1	4.5	6.8	18	33
22B	20.30	0.52	0.62	2	100	8.6	0.0300	1600	4.4	13.0	4.2	6.3	44	80
27	3.70	0.70	0.78	2	100	6.0	0.0100	850	4.0	10.0	4.6	7.0	12	20
23	8.60	0.66	0.74	4	50	2.9	0.0100	850	4.0	7.0	6.0	9.0	34	57
34	6.79	0.30	0.55	60	1200	30.5	-	-	-	30.5	2.6	3.9	5	15
29	4.14	0.52	0.62	2	100	8.6	0.0300	600	1.6	10.3	4.6	7.0	10	18
28	3.42	0.52	0.62	2.2	220	16.1	0.0100 0.0200 0.0400 0.0300	450 350 350 300	2.1 1.2 0.8 0.8	21.1	3.4	5.0	6	11
30	3.00	0.52	0.62	2	100	8.6	0.0300	500	1.4	10.0	4.6	7.0	7	13
31	3.70	0.52	0.62	2	100	8.6	0.0300 0.0200	500 250	1.4 0.8	10.8	4.4	6.8	8	16

(cont.)

APPENDIX III.C



LEGEND

INLET

STORM SEWER SS

CONTRIBUTING BASIN

DIRECTION OF FLOW

FLOW-BY FB

EXHIBIT: FOCUS OUTFALL SYSTEM

NOT TO SCALE

NOTES:
1. FOR INLET SIZES SEE SURFACE ROUTING CALCULATIONS
2. FOR PREL. PIPE SIZES SEE PIPE ROUTING CALCULATIONS

APPENDIX	III.D

FOCUS OUTFALL - SURFACE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	STREET SLOPE (ft./ft.)	FLOW LENGTH (ft.)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
21A,21B,22	13.59	16.29	-	-	-	19.4	19.4	3.5	5.3	48	87
\/											
23	19.52	22.91	0.0110 0.0600	900 150	4.1 0.3	19.4	23.8	3.2	4.8	62	110
40A,40B,40C	6.76	7.90	0.0100	1050	5.0	21.9	26.9	3.0	4.5	20	36
Q10=12 / Q100=12 TO NORTHERLY STREET, REMAINDER TO LEXINGTON FLOWBY Q10=8 / Q100=24 ; CA(10)=2.67 / CA(100)=5.33											
\/											
FB,22B	13.23	17.92	0.0400	850	2.0	26.9	28.9	2.9	4.3	38	77
FB,22B 21A,21B,22,23	32.75	40.83	-	-	-	28.9	28.9	2.9	4.3	94	176
---- SIZE (2)- 28' CURB INLETS WITHIN A SUMP, EACH SIDE OF ROAD.											
22A	4.06	4.84	-	-	-	11.1	11.1	4.5	6.8	18	33
---- SIZE A 10' CURB INLET WITHIN A SUMP.											
29	2.1	2.57	-	-	-	10.3	10.3	4.6	7.0	10	18
29,30	3.66	4.43	-	-	-	10.3	10.3	4.6	7.0	17	31
29,30,31	5.58	6.72	0.0100 0.0200	200 200	1.0 0.7	10.3	11.9	4.2	6.3	23	42
---- SIZE A 10' CURB INLET WITHIN A SUMP. NO FLOWBY.											
28 (1/2 AREA)	0.89	1.06	0.0100 0.0200	450 350	2.1 1.2	16.1	19.4	3.4	5.2	3	6
---- SIZE A 4' CURB INLET WITHIN A SUMP. NO FLOWBY.											

APPENDIX	III.E

FOCUS OUTFALL - PIPE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
22A	4.06	4.84	-	11.1	11.1	4.5	6.8	18	33
\/ ---- SIZE 170' - 36" RCP @ 2% ----									
1/2(40,22B,21 22,23,27)	16.38	20.42	-	28.9	28.9	2.9	4.3	47	88
\/ ---- SIZE 80' - 36" RCP @ 4% ----									
1/2(40,22B,21 22,23,27)	32.75	40.83	-	28.9	28.9	2.9	4.3	94	176
---- SIZE 1100' - 42" RCP @ 5% ----									
29,30,31	5.64	6.72	-	11.9	11.9	4.4	6.6	25	44
\/ ---- SIZE 70' - 24" RCP @ 4.5% ----									
28 (1/2 AREA)	6.53	7.78	-	20.0	20.0	3.5	5.2	23	41
---- SIZE 130' - 24" RCP @ 4.5% ----									
\/									
LEXINGTON SUMP	39.28	48.61	1.0	28.9	29.9	2.8	4.2	110	205
---- SIZE 650' - 48" RCP @ 3.5% ----									
\/									
TO DETENTION AREA									

APPENDIX III.F

Quick TR-55 Ver.5.46 S/N:
Executed: 12:17:00 11-03-1993

MODIFIED RATIONAL METHOD
---- Summary for Single Storm Frequency ----

First peak outflow point assumed to occur at Tc hydrograph recession leg.

SUMMERFIELD DETENTION POND

RETURN FREQUENCY: 100 yr `C' Adjustment = 0.850 Allowable Q = 90.00 cfs

Hydrograph file duration= 34.00 minutes
Hydrograph file: SUMMER .HYD Tc = 30.00 minutes

Weighted `C'	Adjusted 'C'	Duration minutes	Intens. in/hr	Areas acres	Qpeak cfs	VOLUMES Inflow (ac-ft)	Storage (ac-ft)
0.630	0.535	30	4.100	100.00	219.55	9.073	5.354
**********							Storage Maximum
0.630	0.535	34	3.820	100.00	204.56	9.580	5.421
**********							
0.630	0.535	40	3.450	100.00	184.75	10.179	5.364
0.630	0.535	50	3.000	100.00	160.65	11.064	5.145
0.630	0.535	60	2.600	100.00	139.23	11.507	4.508

Quick TR-55 Ver.5.46 S/N:
Executed: 12:17:00 11-03-1993

SUMMERFIELD DETENTION POND

**** Modified Rational Hydrograph *****
Weighted C = 0.630 Area= 100.000 acres Tc = 30.00 minutes

Adjusted C = 0.535 Td= 34.00 min. I= 3.82 in/hr Qp= 204.56 cfs

RETURN FREQUENCY: 100 year storm Adj.factor = 0.85
Output file: SUMMER .HYD

HYDROGRAPH FOR MAXIMUM STORAGE
For the 100 Year Storm

Time Hours	Time increment = 0.017 Hours Time on left represents time for first Q in each row.						
0.000	0.00	6.82	13.64	20.46	27.27	34.09	40.91
0.117	47.73	54.55	61.37	68.19	75.01	81.82	88.64
0.233	95.46	102.28	109.10	115.92	122.74	129.56	136.37
0.350	143.19	150.01	156.83	163.65	170.47	177.29	184.10
0.467	190.92	197.74	204.56	204.56	204.56	204.56	204.56
0.583	197.74	190.92	184.10	177.29	170.47	163.65	156.83
0.700	150.01	143.19	136.37	129.56	122.74	115.92	109.10
0.817	102.28	95.46	88.64	81.82	75.01	68.19	61.37
0.933	54.55	47.73	40.91	34.09	27.27	20.46	13.64
1.050	6.82	0.00					

Quick TR-55 Ver.5.46 S/N:
Executed: 12:17:00 11-03-1993

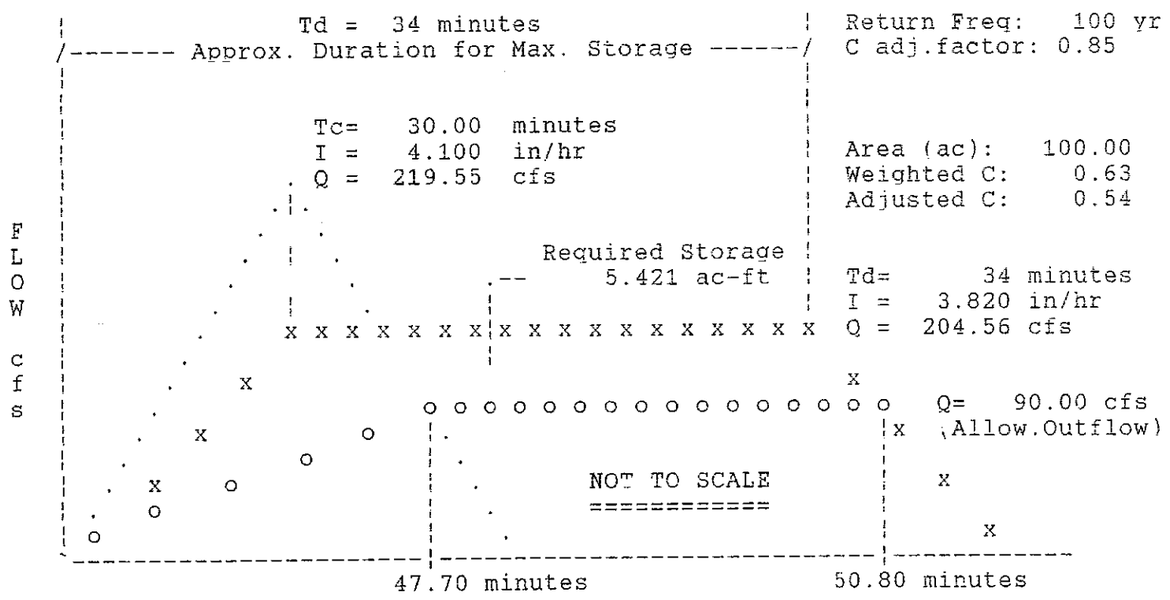
APPENDIX III.G

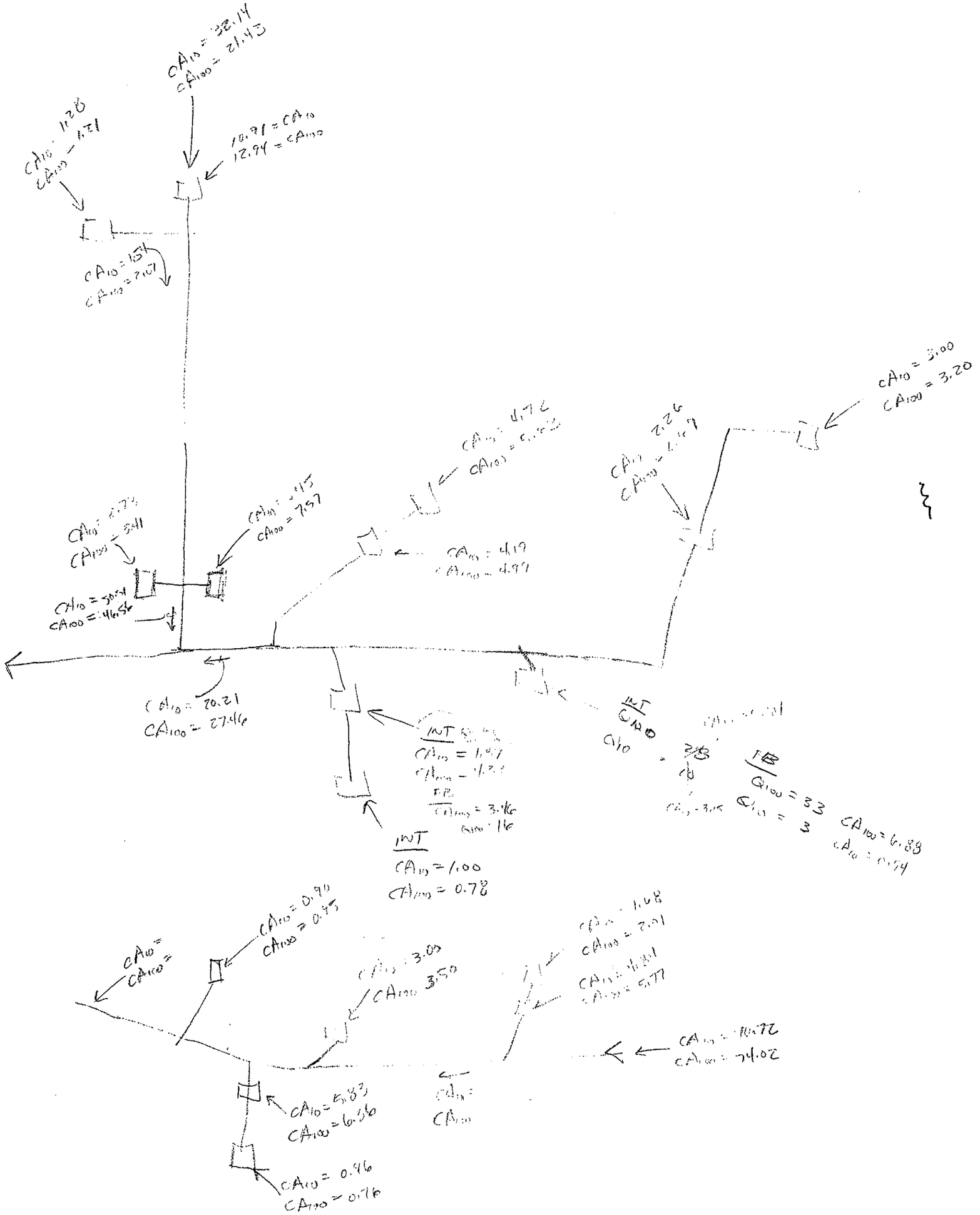
MODIFIED RATIONAL METHOD
---- Graphical Summary for Maximum Required Storage ----

First peak outflow point assumed to occur at Tc hydrograph recession leg.

SUMMERFIELD DETENTION POND

RETURN FREQUENCY: 100 yr	Allowable Outflow: 90.00 cfs
'C' Adjustment: 0.850	Required Storage: 5.421 ac-ft
Peak Inflow: 204.56 cfs	Inflow .HYD stored: SUMMER .HYD

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INT
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33	1/5 ACRE LOTS	0.52	0.62
RP-1	MAJOR ARTERIAL/ FLOWBY	0.77	0.83
RP-1A	MAJOR ARTERIAL	0.90	0.95
RP-2	MAJOR ARTERIAL	0.90	0.95
RP-3	MAJOR ARTERIAL	0.90	0.95
RP-4	MAJOR ARTERIAL	0.90	0.95
RP-8	MAJOR ARTERIAL	0.90	0.95
RP-9	OFFICE PARK / LIGHT INDUSTRIAL	0.70	0.80
RP-10	MAJOR ARTERIAL	0.90	0.95

APPENDIX III.H

LAND USE SUMMARY

FOCUS OUTFALL

BASIN	LAND USE	C(10)	C(100)
1	1/5 ACRE LOTS	0.52	0.62
2	1/5 ACRE LOTS	0.52	0.62
3	1/5 ACRE LOTS	0.52	0.62
4	1/5 ACRE LOTS	0.52	0.62
5	1/5 ACRE LOTS	0.52	0.62
6	1/5 ACRE LOTS	0.58	0.65
7	1/5 ACRE LOTS	0.52	0.62
8	1/5 ACRE LOTS	0.52	0.62
9	1/5 ACRE LOTS	0.52	0.62
10	1/5 ACRE LOTS	0.52	0.62
11	1/5 ACRE LOTS	0.58	0.65
12	1/5 ACRE LOTS	0.52	0.62
13	1/5 ACRE LOTS	0.52	0.62
14	1/5 ACRE LOTS	0.58	0.65
51	CHURCH SITE	0.75	0.80
OS-2	1/5 ACRE LOTS	0.52	0.62
24	1/6 ACRE LOTS	0.55	0.65
25	1/6 ACRE LOTS	0.55	0.65
26	1/6 ACRE LOTS	0.55	0.65
32	1/5 ACRE LOTS	0.52	0.62

(cont.)

APPENDIX	III.I

FOCUS OUTFALL - BASIN SUMMARY

BASIN	AREA (Ac)	C(10)	C(100)	OVER LAND HEIGHT (ft.)	OVER LAND LENGTH (ft.)	STREET FLOW SLOPE (ft./ft.)	STREET FLOW LENGTH (ft.)	TOTAL Tc (min.)	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
OS-2	1.84	0.52	0.62	22	280	-	-	13.0	4.1	6.2	4	7
51	4.00	0.75	0.80	-	-	-	-	8.0	5.0	8.0	15	26
32	4.40	0.52	0.62	2	100	0.0300 0.0200 0.0300	450 350 200	11.2	4.4	6.8	10	19
24	6.23	0.55	0.65	2	100	0.0400	1300	11.3	4.4	6.8	15	28
25	2.74	0.55	0.65	2	100	0.0200 0.0500 0.0300	800 400 400	12.8	4.2	6.3	6	11
26	3.85	0.55	0.65	2	100	0.0200 0.0500 0.0300	800 400 400	12.8	4.2	6.3	9	16
33	1.32	0.52	0.62	2	100	0.0400	350	9.5	4.7	7.2	3	6
1	2.50	0.52	0.62	2.6	130	0.0200	240	15.0	3.9	5.8	5	9
2	4.61	0.52	0.62	4	200	0.0250	930	21.0	3.3	5.0	8	14
3	3.44	0.52	0.62	2.6	130	0.0250	650	16.0	3.8	5.7	7	12
4	2.43	0.52	0.62	3.6	180	0.0200	920	20.0	3.4	5.1	4	8
5	6.65	0.52	0.62	3.6	180	0.0200	930	20.0	3.4	5.1	12	21
6	4.09	0.52	0.62	1	50	0.0290	1650	14.0	4.0	6.0	9	15
7	2.54	0.52	0.62	1.4	70	-	-	12.0	4.3	6.5	6	10
8	0.69	0.52	0.62	2	100	-	-	13.0	4.1	6.2	1	3
9	2.76	0.52	0.62	1.4	70	0.0600	500	12.0	4.3	6.5	6	11
10	2.44	0.52	0.62	12.6	210	0.0200	700	15.0	3.9	5.8	5	9
11	2.06	0.58	0.65	-	-	0.0270	730	5.0	6.0	9.0	7	12
12	9.30	0.52	0.62	2.5	250	0.0300	360	13.0	4.1	6.2	20	36
13	3.24	0.52	0.62	2.6	130	0.0200	750	17.0	3.7	5.5	6	11
14	1.51	0.58	0.65	-	-	0.0400	200	14.0	4.0	6.0	4	6

(cont.)

APPENDIX	III.I

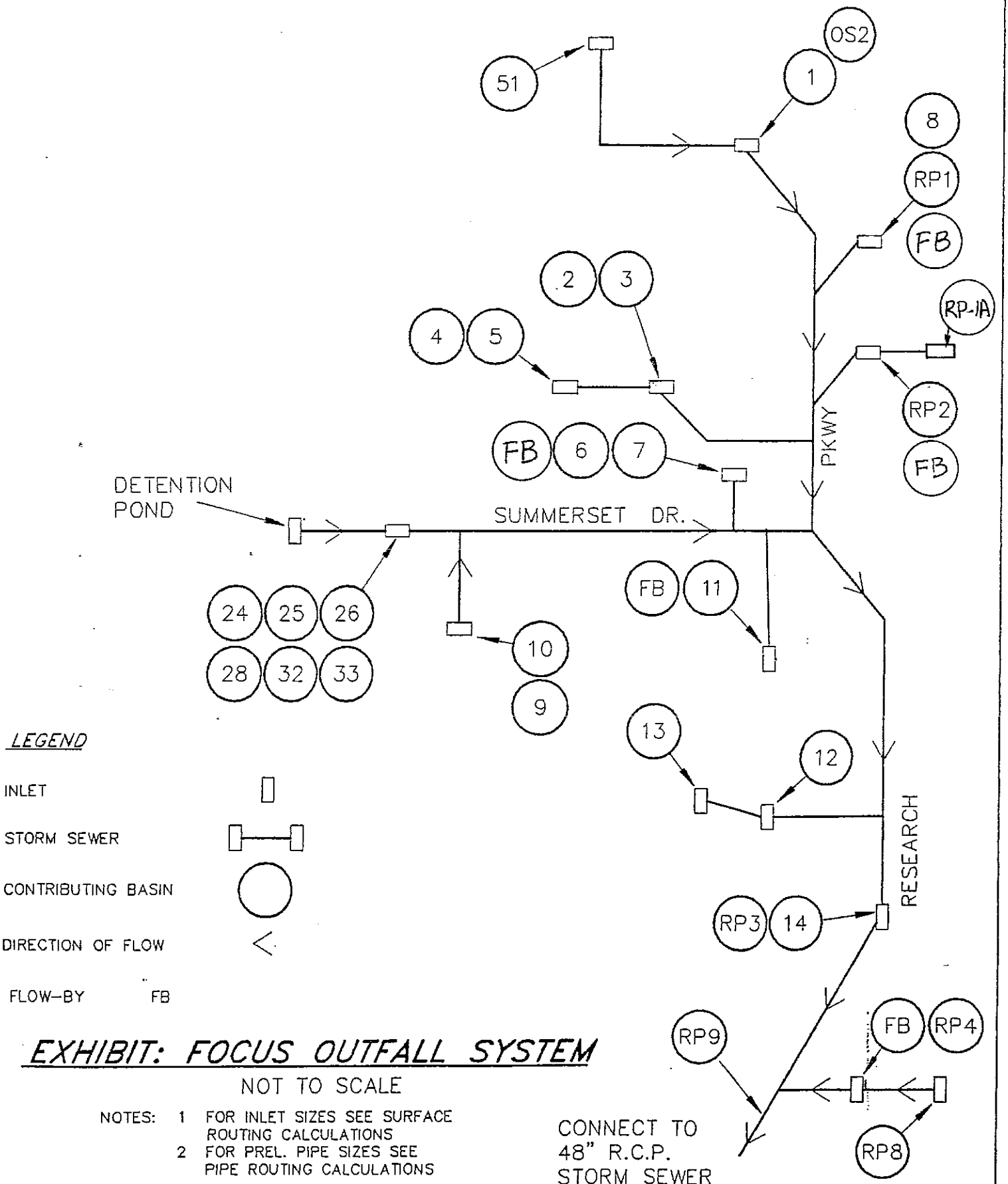
FOCUS OUTFALL - BASIN SUMMARY

BASIN	AREA (Ac)	C(10)	C(100)	OVER LAND HEIGHT (ft.)	OVER LAND LENGTH (ft.)	STREET FLOW SLOPE (ft./ft.)	STREET FLOW LENGTH (ft.)	TOTAL Tc (min.)	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
RP-1	4.69	0.77	0.83	1	50	0.0500	1900	13.0	4.1	6.2	15	24
RP-1A	2.60	0.90	0.95	-	-	0.0500 0.0260	620 850	5.0	6.0	9.0	14	22
RP-2	1.05	0.90	0.95	-	-	0.0500	780	5.0	6.0	9.0	6	9
RP-3	6.96	0.90	0.90	26	300	0.0156	600	5.0	6.0	9.0	38	56
RP-3H	6.96	0.35	0.45	12	300	-	-	15.0	3.9	5.8	10	18
RP-4	5.75	0.90	0.90	18	300	0.0100	500	9.0	4.7	7.2	24	37
RP-4H	5.75	0.35	0.45	18	300	-	-	16.0	3.8	5.7	8	15
RP-8	2.32	0.90	0.95	-	-	0.0167	1800	7.0	5.2	7.9	11	17
RP-9	8.70	0.70	0.80	14	700	-	-	15.7	3.8	5.7	23	40
RP-9H	8.70	0.25	0.35	14	500	-	-	25.0	3.0	4.5	7	14
RP-10	1.00	0.90	0.95	-	-	0.0060	630	3.9	6.0	9.0	5	9

BASIN	DETAINED FLOW EQUIVALENT CA			
	Q(10)	Q(100)	CA(10)	CA(100)
RP-3	10	13	4.67	4.78
RP-4	6	8	3.83	4.03
RP-9	6	9	4.47	5.44

NOTES: 1.) THE LETTER 'H' FOLLOWING A BASIN NUMBER INDICATES CALCULATIONS FOR HISTORIC FLOW.
2.) DETAINED FLOW IS 35% OF DEVELOPED FLOW LESS HISTORIC FLOW.

APPENDIX III.J



LEGEND

INLET

STORM SEWER

CONTRIBUTING BASIN

DIRECTION OF FLOW

FLOW-BY FB

EXHIBIT: FOCUS OUTFALL SYSTEM

NOT TO SCALE

NOTES: 1 FOR INLET SIZES SEE SURFACE ROUTING CALCULATIONS
2 FOR PREL. PIPE SIZES SEE PIPE ROUTING CALCULATIONS

APPENDIX	III.K

FOCUS OUTFALL - SURFACE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	STREET SLOPE (ft./ft.)	FLOW LENGTH (ft.)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
28	0.89	1.06	0.0400	350	0.8	8.6	10.3	4.6	7.0	4	7
(1/2 AREA)			0.0300	300	0.8						
28,32,33	3.86	4.61	0.0280	500	1.4	11.2	12.6	4.2	6.3	16	29
24,25,26	7.05	8.33	-	-	-	12.8	12.8	4.2	6.3	30	52
24,25,26 28,32,33	10.91	12.94	0.0300	700	1.9	12.8	14.7	3.9	5.8	43	75
---- SIZE A 12' CURB INLET WITHIN A SUMP. NO FLOWBY.											
9,10	2.7	3.22	-	-	-	15	15	3.9	5.8	11	19
---- 10' CURB INLET @ GRADE. INT.) Q10=5 / Q100=7 ; FB) Q10=6 / Q100=12											
11,FB	2.73	3.41	-	-	-	15	15	3.9	5.8	11	20
---- SIZE A 8' CURB INLET WITHIN A SUMP. NO FLOWBY.											
1,OS-2	2.26	2.69	-	-	-	15	15	3.9	5.8	9	16
---- SIZE A 4' CURB INLET WITHIN A SUMP. NO FLOWBY.											
4,5	4.72	5.63	0.0200	650	2	20	22	3.2	4.8	15	27
---- SIZE A 12' CURB INLET WITHIN A SUMP. NO FLOWBY.											
2,3	4.19	4.99	0.0250	650	2	21	23	3.1	4.7	13	23
---- SIZE A 10' CURB INLET WITHIN A SUMP. NO FLOWBY.											
13	1.68	2.01	-	-	-	17	17	3.7	5.5	6	11
] SIZE A 4' CURB INLET WITHIN A SUMP. NO FLOWBY.											
6,7,FB	3.45	7.57	-	-	-	25.6	25.6	3.1	4.6	11	35
---- SIZE AN 8' CURB INLET WITHIN A SUMP. NO FLOWBY.											
RP-8	2.09	2.20	-	-	-	7.0	7.0	5.2	7.9	11	17
---- EXIST. 10' CURB INLET @ GRADE. INT.) Q10=5 / Q100=6 ; FB) Q10=6 / Q100=11											

(cont.)

APPENDIX	III.K

FOCUS OUTFALL - SURFACE ROUTING

CONTRIBUTING BASINS	CA(10) (Ac)	CA(100) (Ac)	STREET SLOPE (ft./ft.)	FLOW LENGTH (ft.)	TRAVEL Tc (min.)	BASIN Tc (min.)	TOTAL CONCENTRATION TIME	I(10) (in./hr.)	I(100) (in./hr.)	Q(10) (c.f.s.)	Q(100) (c.f.s.)
12	4.84	5.77	-	-	-	13	13	4.1	6.2	20	36
---- SIZE A 14' CURB INLET WITHIN A SUMP. NO FLOWBY.											
8,RP-1	3.97	12.80	0.0500	400	0.9	23.0	23.9	3.2	4.8	13	61
---- SIZE A 20' CURB INLET @ GRADE. INT.) Q10=10 / Q100=28 ; FB) Q10=3 / Q100=33 EQUIV. FB: CA(10)=0.94 / CA(100)=6.88											
14,RP-3	5.55	5.76	-	-	-	14	14	4.0	6.0	22	35
---- SIZE A 20' CURB INLET @ GRADE. FLOWBY - Q(10)=8 / Q(100)=14 EQUIV. FB; CA(10)=2.00 / CA(100)=2.33											
RP-4,FB	5.83	6.36	-	-	-	20	20	3.4	5.1	20	32
---- EXIST. INLET W/IN CURB RETURN.NO FLOWBY.											
RP1-A	2.34	2.47	-	-	-	5	5	6.0	9.0	14	22
---- EXIST. 8' INLET. INT.) Q10=6 / Q100=7; FB) Q10=8 / Q100=15. EQUIV. FB; CA(10)=1.33 / CA(100)=1.67											
FB, RP2	1.89	7.88	0.0500	800	1.7	23.9	25.6	3.1	4.6	6	36
---- SIZE AN 8' SUMP INLET. NO FLOWBY.											

+---------------+
¦APPENDIX III.L¦
+---------------+

FOCUS OUTFALL - PIPE ROUTING

CONTRIBUTING BASINS	CA(100) (Ac)	TOTAL CONCENTRATION TIME	I(100) (in./hr.)	Q(100) (c.f.s.)
POND	21.43	30	4.2	90
\/				
+24,35,26 28,32,33	34.37	30	4.2	144
\/				
+9,10	35.58	30	4.2	150
\/				
+6,7,FB	43.15	30	4.2	182
\/				
+11,FB	46.56	30	4.2	196
51,OS-2,1 8,RP-1,RP-2 RP-1A	16.84	26	4.6	77
\/				
2,3,4,5	27.46	26	4.6	126

CONTRIBUTING BASINS	CA(100) (Ac)	TOTAL CONCENTRATION TIME	I(100) (in./hr.)	Q(100) (c.f.s.)
POND,24,25 26,28,32,33 9,10,6,7,FB 51,OS-2,1 8,RP-1,RP-2 2,3,4,5	74.02	30	4.2	311
\/				
+12,13	81.80	31	4.1	335
\/				
+14,RP-3	85.30	32	3.9	333
\/				
+RP-4.RP-8,FB	92.42	35	3.75	347
\/				
+RP-10	93.37	36	3.75	350
\/				
+RP-9	98.81	36	3.75	371

NOTE: THE 100-YR. FLOWS REFLECTED IN THIS STUDY WERE DERIVED USING THE RATIONAL METHOD, HOWEVER, THE TOTAL AREA AT THE SUMMATION POINT EXCEEDS THE CITY OF COLORADO SPRINGS CUT-OFF POINT OF 100 ACRES FOR USE OF RATIONAL METHOD VS. THE S.C.S. METHOD OF ANALYSIS.

PREVIOUS ANALYSIS OF THIS BASIN USING COMPUTER MODELING HAS BEEN COMPLETED AND DOCUMENTED IN THE PRELIMINARY AND FINAL DRAINAGE REPORT FOR SUMMER FIELD NO.'S 1 AND 2. THE COMBINED RUNOFF VALUE FOR THIS BASIN WAS SHOWN TO BE 275 c.f.s.

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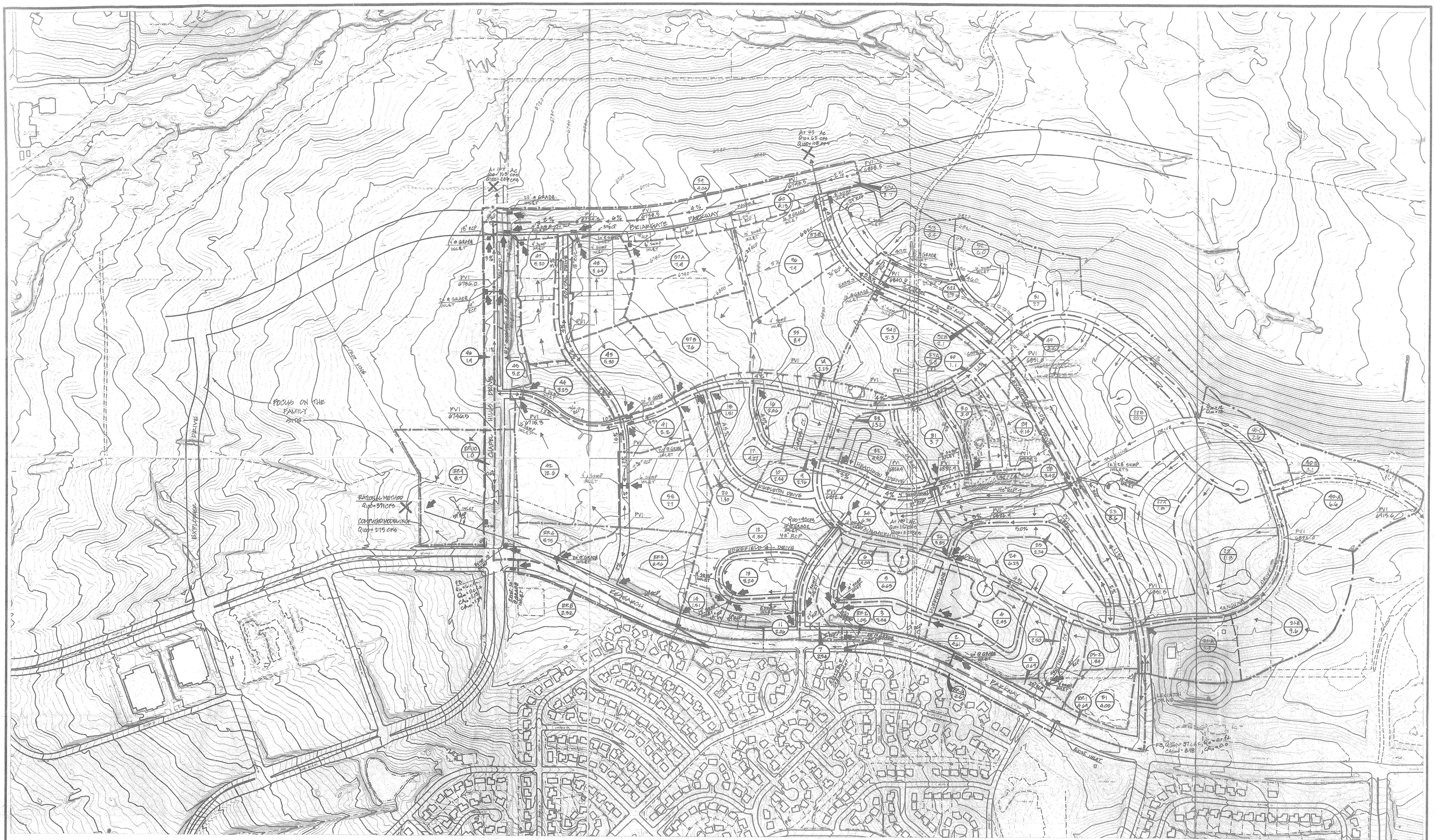

LEGEND

- MAJOR DRAINAGE BASIN BOUNDARY
- SUB BASIN BOUNDARY
- FLOW DIRECTION
- CONCENTRATION POINT
- STORM SEWER STRUCTURE AND PIPE
- BASIN DESIGNATION
- AREA IN ACRES
- DESIGN POINT

SCALE: 1" = 200'

NO	REVISION	BY	DATE
4			
3			
2	REV. BASINS	MH	5-97
1	ADD DESIGN POINTS / BASIN	MH	1-95

MASTER DEVELOPMENT DRAINAGE PLAN
SUMMERFIELD AT BRIARGATE FILINGS 1 AND 2

DES. BY MH | DWN. BY RC | CHK. BY
SCALE 1" = 200 | DATE
JOB NO. 8410.44 | SHT. 1 OF 1

JR ENGINEERING, LTD.
6455 N. Union Blvd., Ste. 202
Colorado Springs, CO 80918
TEL: (719) 593-2593
FAX: (719) 528-6613