JR ENGINEERING, LTD.
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Colorado Springs
Denver
Phoenix

Engineering
Planning
Surveying

MASTER DEVELOPMENT DRAINAGE PLAN

BEACON HILL

APRIL, 1991

JOB NO. 8128.40

Prepared For:

THE OLIVE COMPANY
5450 Tech Center Dr., #400
Colorado Springs, Colorado 80916
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Prepared By:

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Colorado Springs, Colorado 80918
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MASTER DEVELOPMENT DRAINAGE PLAN
BEACON HILL
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 directly caused by the negligent acts, errors or omissions on my part in preparing this report.

4.17.91

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

COLORADO REGISTERED JOSEPH W DESJARDIN 24207 PROFESSIONAL ENGINEER

Developer's Statement:

The developer has read and will comply with all the requirements specified in this drainage report.

The Olive ~~Company~~ Real Estate Group. Inc., Agent for Center for Creative Leadership
Business Name

By: [signature]

Title: Development Manager

5450 Tech Center Drive, #400
Address

Colorado Springs, CO 80916

City of Colorado Springs:

Filed in accordance with Section 15-3-906 of the Code of the City of Colorado Springs, 1980, as amended.

[signature] for City Engr.
City Engineer

4-23-91
Date

Conditions:

*POND A TO BE PRIVATELY OWNED AND MAINTAINED. NO REIMBURSEMENT.

*POND B TO BE MAINTAINED BY A PRIVATE MAINTENANCE AGREEMENT WITH THE CITY. PARTIAL REIMBURSEMENT BASED ON PERCENT INCREASE IN DEVELOPED FLOW.

*DRAINAGE EASEMENTS REQUIRED FOR ALL FACILITIES.

TABLE OF CONTENTS

	Page
Purpose	1
General Description	1
Existing Drainage Characteristics	2
Proposed Drainage Characteristics	3
Existing & Proposed Outfall Facilities	6
Hydrologic Calculations	9
Summary	10

APPENDIX

USGS Map	Exhibit A
SCS Soils Map	Exhibit B
Hydrologic Calculations	Tables 1 - 2 Sheets 1 - 5
Hydraulic Calculations	Sheets 1 - 2
Preliminary Pond Sizing/Routing	Sheets 1 - 20
Onsite Drainage Plan	Back Pocket
Preliminary Design for Pond 'B'	Back Pocket

MASTER DEVELOPMENT DRAINAGE PLAN
BEACON HILL
APRIL, 1991

PURPOSE:

The purpose of this Master Development Drainage Plan is to identify major drainageways, ponding/detention areas, locations of drainage facilities, and areas which are tributary to the proposed development. This report presents alternative solutions to the drainage problems identified in the drainage basin planning study entited "Engineering Study Of Southwest Area Drainage Basin", by Lincoln Devore, Inc., dated February 24, 1984.

GENERAL DESCRIPTION:

Beacon Hill is accessed by 8th Street to the east and Skyway Boulevard to the west. It is located immediately south of Bear Creek Park and north of Arcturus Drive.

The site, which contains approximately 84 acres, was previously master planned under the "Polo Point Master Plan" and is currently being amended to provide office/educational, commercial, and open space development. Portions of the Polo Point Master Plan have previously been platted and include "Polo Point Filing No. 1", an 18 acre single family residential subdivision, and "Polo Point Filing No. 2", a 0.34 acre site for public street purposes. The enclosed drainage plan represents one possible land use configuration. It is not intended to be the final layout, but rather be used to calculate runoff quantities representative of that land use. Please refer to Hydrologic Calculations for further explanation.

The parcel is located in both the "Bear Creek Drainage Basin" and the "Southwest Area Drainage Basin". No designated F.E.M.A. floodplains encumber the site.

EXISTING DRAINAGE CHARACTERISTICS:

The site presently consists of gentle slopes in the southern portion and moderate to steep slopes in the northern areas. All the site is covered with native grasses typical of range land in fair condition.

As shown on the enclosed drainage plan, Basins 1, 2, and OS-1 in the Bear Creek Drainage Basin are located at the uppermost end of minor tributaries to Bear Creek. Basins A through D are tributary to the Southwest Area Drainage Basin.

Basin A runoff combines with the runoff from Polo Point Filing No. 1 (Basin OS-A) and discharges through a 36" storm pipe to an existing detention pond located on the Center for Creative Leadership (CCL) site and is routed through a 21" outfall. Runoff then continues south in an earth swale where it combines with runoff from other onsite and offsite basins detailed below.

The offsite basin (OS-B), Exhibit "A", runoff discharges onto the site via Parkview Boulevard. Within Basin OS-B, storm water flows eastward in Morning Star Drive, Parkview Boulevard, and Milky Way Drive. It is then collected centrally via Skyway Boulevard and flows east along the last 100 feet of Parkview Boulevard before entering the site as surface flow.

Portions of onsite future design Basins B and D and all of Basin C discharge runoff in a southerly direction as historic sub-basins combining with the offsite storm water mentioned above. The combined runoff discharges into a minor existing pond along the south property line. The pond is a result of man-made fill material stockpiled on the tract south of Polo Point. During design storms, the runoff then meanders south across private undeveloped land owned by others towards the existing three 36" CMP culverts beneath Arcturus Drive.

The remaining portions of future design Basins B and D combine and currently discharge to 8th Street and continue south (see historic boundaries).

PROPOSED DRAINAGE CHARACTERISTICS:

Bear Creek Drainage Basin

The runoff from Basin 1 will decrease due to the construction of the 60 foot public street which will effectively channel runoff from the upper portions of the historic basin to the low point in the 60 foot public street located in Basin 2. Anticipated peak runoff from this basin is Q_{10}=2 CFS, Q_{100}=3 CFS.

Development of Basin 2 will cause an increase over historic run-off in Bear Creek Park. The effects of the increased runoff are greatly reduced by considering the following:

1. Portions of the developed basin will remain as "open" space;
2. The increase at Bear Creek Drainage Basin design points as detailed in the engineering study by Lincoln-Devore will be immeasurable since the developed areas and time of concentrations will be insignificant compared to hundreds of upstream acres and miles of travel path.

In addition, it is recommended the developer install a riprap stilling basin adequate to slow the pipe discharge velocity to less than 5 FPS and restore vegetation in all disturbed offsite areas due to construction of improvements. Public drainage easements will be required for offsite drainage improvements and routing developed runoff through the adjacent northerly property to Bear Creek, via an existing natural channel.

The adjacent northerly property is currently owned by the City of Colorado Springs and leased to El Paso County. Maintenance agreements will be required with these adjacent interests to ensure channel maintenance and stabilization. Velocity checks may be required along the length of the channel to ensure non-erosive velocities downstream.

Alternative solutions to mitigate the impacts from developed runoff would include onsite detention to attenuate the discharge to below historic levels. The final solution will be detailed in the preliminary and final drainage reports for this area.

Southwest Area Drainage Basin

Basin A runoff flows overland and combines with the runoff from Basin OS-A. This combined runoff is intercepted by 2 existing 18 foot inlets at the low point in Beacon Hill Drive where it is carried by an existing storm sewer system to a detention pond located in Basin B. The calculated developed peak flow from this combined runoff is Q_{10}=28 CFS, Q_{100}=49 CFS.

The runoff from Basin B (proposed office and educational use) flows south toward the existing detention pond. This pond will be enlarged in order to detain the additional discharge from Basin B (Pond 'A'). The calculated developed peak flow from Basin B is Q_{10}=26 CFS, Q_{100}=49 CFS.

The existing outlet works (21" RCP) of the pond will be upgraded to control these combined flows and reduce the discharge to below historic levels. The combined peak historic flows at the point of outfall are Q_{10}=25 CFS, Q_{100}=54 CFS. The combined peak developed flows were calculated to be Q_{10}=51 CFS, Q_{100}=90 CFS. After routing through the proposed detention pond (Pond 'A'), the peak flows will be reduced to 19 CFS and 45 CFS for the 10-year and 100-year storms, respectively.

The developed flow from Basin OS-B discharges onto the site at the east property line where it combines with runoff from Basin C. The calculated peak flow for this offsite Basin (OS-B) is Q_{10}=138 CFS, Q_{100}=246 CFS.

The runoff from Basin C, which will consist primarily of undeveloped open space and proposed commercial development, will flow to a proposed detention pond (Pond 'B'). The peak flow calculated for this basin is Q_{10}=38 CFS, Q_{100}=71 CFS.

Runoff from Basin D will flow south to the existing street right-of-way of Headland Way where it will be intercepted by 2 existing curb inlets and conveyed to the proposed detention pond (Pond 'B') by a 42" RCP. The 42" RCP has been previously constructed to the westerly right-of-way line of Headland Way. Additional pipe construction will be necessary to convey runoff to the proposed detention pond. The peak flow calculated from this basin is Q_{10}=22 CFS, Q_{100}=38 CFS. Combined inlet capacity was calculated to be Q_{10}=32 CFS, Q_{100}=50 CFS. Under fully developed conditions, no flowby will continue south along Eighth Street right-of-way.

Under fully developed conditions, and assuming enlargement of Pond 'A' is complete, the calculated peak flow to Pond 'B' is Q_{10}=217 CFS, Q_{100}=385 CFS.

EXISTING AND PROPOSED OUTFALL FACILITIES:

Developed runoff from offsite Basin OS-A currently is conveyed to an existing detention pond (Pond 'A') located in onsite Basin B. After routing through the pond, runoff is reduced to below historic levels. It is presently conveyed by an earth swale to a natural drainage channel where it continues to the south property line.

Development of Basins A and B will require that this detention pond be enlarged in order to ensure that developed runoff will be attenuated to levels below that of historic levels. Calculated historic peak runoff from the contributing basins is Q_{10}=25 CFS, Q_{100}=54 CFS. The combined developed peak at Pond 'A' is 51 CFS and 90 CFS for the 10-year and 100-year events, respectively.

Existing detention pond volume is aproximately 0.9 acre-feet with an existing 21" RCP outfall. With additional developed flow from Basins A and B, it is anticipated that the volume will have to be increased to approximately 2.2 acre-feet and the outfall upgraded to a 30" RCP with a 36" stand pipe in order to attenuate the developed runoff to below historic. Calculations indicate developed runoff routed through the pond will be Q_{10}=19 CFS, Q_{100}=45 CFS. The existing riprap protection will also have to be upgraded to ensure runoff will be discharged at non-erosive velocities and to provide adequate emergency overflow capability.

Developed runoff from offsite Basin OS-B currently enters the site from Parkview Boulevard at the west property line. This runoff combines with onsite runoff and discharges at the south property line where it flows south in a natural drainageway. A public drainage easement will be required for this developed offsite runoff and the natural drainageway will have to be improved and stabilized. Calculations indicate that a grass lined channel with a bottom width of 10 feet and 4:1 side slopes at a 1% longitudinal slope will convey the developed runoff at non-erosive velocities to the proposed Pond 'B'. This channel shall be privately maintained.

Alternatively, other types of drainage improvements may be utilized to convey this developed runoff to Pond 'B', such as a hard lined channel or the construction of an RCP culvert from the existing improvements at Parkview Boulevard. Final design will be detailed in the preliminary and final drainage reports for this area.

Development of onsite Basins C and D will generate runoff greater than historic levels at the south property line. In order to decrease this combined developed runoff, it is proposed that a "sub-regional" detention pond will be constructed at the south property line. This pond will be privately owned and maintained.

Historic runoff at the south property line is calculated to be Q_{10}=90 CFS, Q_{100}=190 CFS. It was assumed that all contributing basins were undeveloped, including Parkview Boulevard, Morning Star Drive, and Milky Way Drive. Fully developed runoff quantities are estimated to be Q_{10}=217 CFS, Q_{100}=385 CFS.

In order to reduce the developed runoff to 10% below historic levels, the necessary volume for Pond 'B' is calculated to be approximately 9.2 acre-feet assuming a 42" RCP with a 48" standpipe and 60" outfall. Such a configuration would reduce the 10-year and 100-year runoff to approximately 77 CFS and 163 CFS, respectively. A future 48" RCP storm sewer will connect to the outfall of the 60" pipe and convey the runoff to the three 36" CMP culverts at Arcturus Drive. This pipe will be constructed by others.

Detention ponds outlined in this report are conceptual only and represent possible configurations. They are not intended to be final pond designs. Final pond parameters will be detailed in the preliminary and final drainage reports for the respective drainage areas.

HYDROLOGIC CALCULATIONS:

The method used for calculating the anticipated quantities of peak runoff is the Rational method as detailed in the City of Colorado Springs/El Paso County Drainage Criteria Manual, October 1987. Design storms of 10-year and 100-year events were analyzed at all design points.

All factors influencing generation of peak runoff quantities have been analyzed and are tabulated in the Appendix. Specific analysis will be required for individual parcel uses during final drainage studies. These specific calculations will not substantially deviate from those presented in this study. Small changes in basin hydrology will not effect proposed outfall improvements.

At Design Point #3, with 140 tributary acres, the Rational method was checked with the SCS method (TR-20 computer model) and found to give a reliable estimate of peak runoff. No appreciable difference was indicated (+/- 10 CFS) from the 2 modeling techniques.

Soil type and hydrologic group information was obtained from the SCS "Soil Survey of El Paso County Area, Colorado" and summarized in the following table:

Identity Number	Soil Type	Hydrologic Group
18	Chaseville-Midway Complex	B
75	Razor-Midway Complex	C

SUMMARY:

Onsite improvements consisting of parking lot swales, curb and gutter, inlets, and associated minor storm sewer systems will be necessary to safely channel 10-year and 100-year runoff to adequate outfall facilities (Ponds 'A' and 'B'). No credit or reimbursement is available for private onsite improvements as described above.

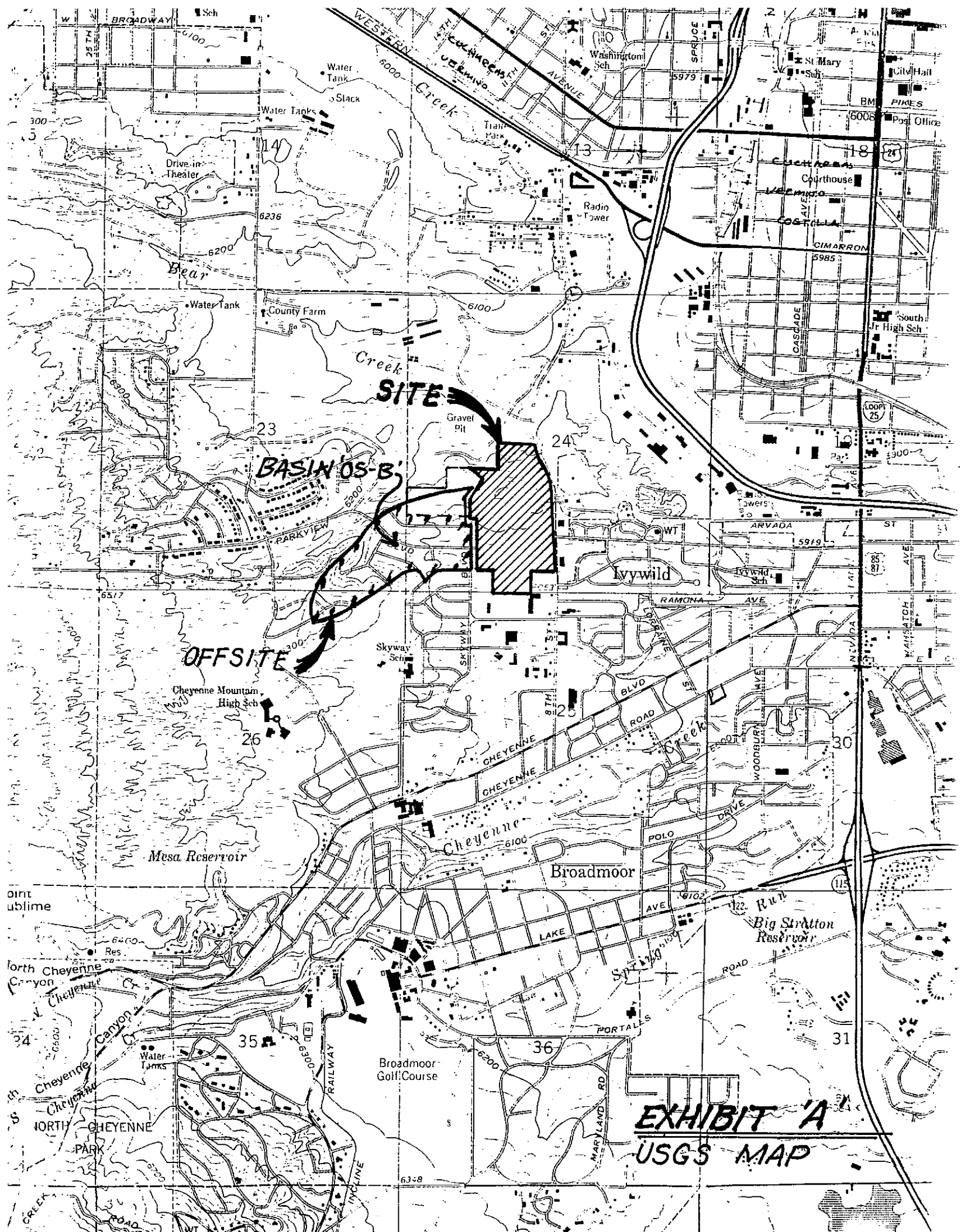
The large areas of undeveloped land associated with the proposed Master Plan make this site amenable to the use of onsite detention. Developed flow from offsite and onsite basins will be routed through proposed detention facilities to reduce the peak flow to below historic levels, ensuring no increased impacts to downstream facilities. The existing facilities downstream of the south property line will benefit due to the fact that currently developed flow from Parkview Boulevard will also be routed through the detention pond (Pond 'B') and released at below historic rates. Drainage credits are available for facilities which accept contributing runoff from the Parkview Boulevard basin. Credits will be based upon the percentage of increased runoff (developed less historic) from the Parkview Boulevard basin impacting the proposed drainage facilities; i.e., if 50% of the increased (due to development) runoff to the proposed drainage channel and Pond 'B' is from the Parkview Boulevard basin, then 50% of the total cost to construct these facilities will be eligible for credit against the southwest basin drainage fee. (100% CHANNEL, 50±20 POND B) FA

Respectfully submitted,

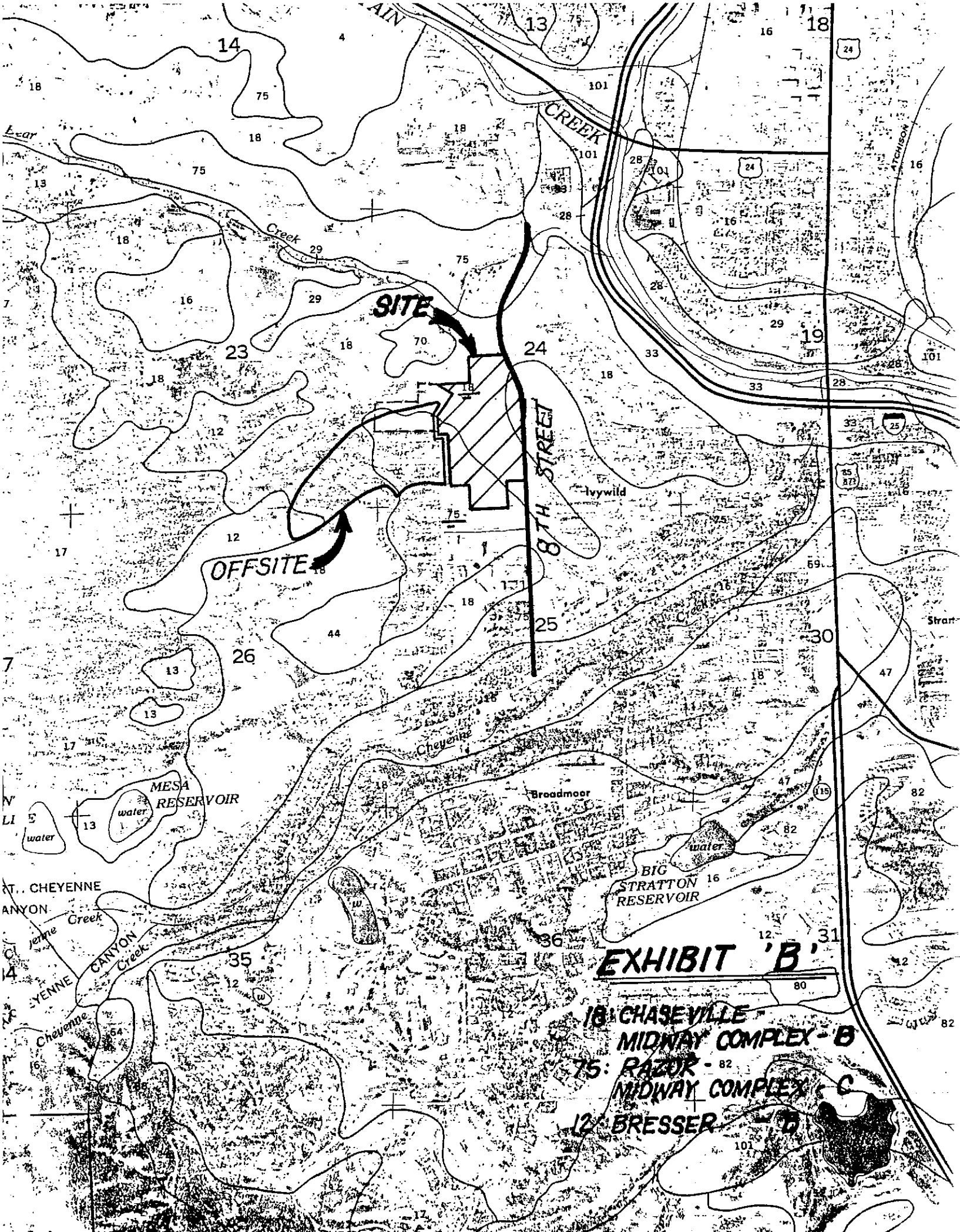
Timothy E. Marshall, Project Manager
For and on Behalf of JR Engineering, Ltd.

A P P E N D I X

USGS Map - EXHIBIT A


SITE
BASIN 'OS-B'
OFFSITE
EXHIBIT 'A
USGS MAP
Mesa Reservoir
Big Stratton Reservoir
Broadmoor
Ivywild
Cheyenne Mountain High Sch
Broadmoor Golf Course
Drive-in Theater
Water Tanks
Water Tank
County Farm
Gravel Pit
Radio Tower
Courthouse
Post Office
Washington Sch
South Jr High Sch
Skyway Sch
Ivywild Sch
Cheyenne Creek
Bear Creek
Cheyenne Canyon Cr
North Cheyenne Canyon
NORTH CHEYENNE PARK
Broadmoor Golf Course
BROADWAY
WESTERN
CIMARRON
COSTILLA
ARVADA
RAMONA AVE
CHEYENNE BLVD
CHEYENNE ROAD
POLO DRIVE
LAKE AVE
PORTALES
MARYLAND RD
PARKVIEW
SKYWAY
CASCADE
NEVADA AVE
WOODBURN AVE
RAILWAY
INCLINE
6100
6200
6300
6400
6236
6517
5979
5985
5919
6008
6102
6348

SCS Soils Map - EXHIBIT B


SITE
OFFSITE
8TH STREET
CREEK
Ivywild
Broadmoor
MESA RESERVOIR
BIG STRATTON RESERVOIR
CANYON Creek
Cheyenne
EXHIBIT 'B'
18: CHASEVILLE - MIDWAY COMPLEX - B
75: RAZOR - 82 MIDWAY COMPLEX - C
12: BRESSER - D

Hydrologic Calculations - TABLES 1 - 2

SHEETS 1 - 5

BASIN	AREA in ACRES	BASIN LENGTH	BASIN HEIGHT	Tc (min.)	I_{10}	I_{100}	SOIL GROUP	LAND USE	C_{10}	C_{100}	FLOW Q_{10}	FLOW Q_{100}
A	2.3	500'	19%	14 min	4.0	6.0	B	Com Res/Open	0.34	0.44	3 cfs	6 cfs
OS-A	15	250 100 700	20% = 9 2% = 12 5% = 0.9	21 min	3.4	5.0	B & C	Com Res/Open	0.51	0.62	26 cfs	47 cfs
DP 1	A + OS-A 17.3	OS-A + PIPE		23 min	3.2	4.6	B & C	Comb Res/Open	0.50	0.60	28 cfs	48 cfs
B	17.3	900 800 300	10% = 15.2 4% = 6.5 4% = 6.5	17 min	3.7	5.6	B & C	Comb Off/Open	0.41	0.51	26 cfs	49 cfs
HISTORIC TO DP #2	27	900	13% = 19	21	3.4	5.0	B & C	OPEN	0.27	0.40	25 cfs	54 cfs
	1 + B =											
DEVELOP TO DP #2	34.6			23	3.2	4.6	B & C	Res - Off/Open	0.46	0.56	51 cfs	90 cfs
HISTORIC OS-B	73.5	2500	9	38	2.3	3.5	B & C	OPEN	0.28	0.40	47 cfs	103 cfs
DEVELOPED OS-B	73.5	550 550 1400	18 = 14.4 8 = 0.5 8 = 2.3	18	3.6	5.4	B & C	Res/Open	0.52	0.62	138 cfs	246 cfs
C	24	350 950	6 = 16.5 9 = 0.6	17	3.7	5.6	B & C	Comm/Open	0.43	0.53	38 cfs	71 cfs
D	13			21	3.4	5.0	B & C	Comm/Open	0.50	0.59	22 cfs	38 cfs

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BASIN	AREA In ACRES	BASIN LENGTH	BASIN HEIGHT	Tc (min.)	I_{10}	I_{100}	SOIL GROUP	LAND USE	C_{10}	C_{100}	FLOW Q_{10}	FLOW Q_{100}
HISTORIC												
[3]	140	3000	8.9%	42	2.3	3.4	B&C	OPEN	0.28	0.40	90cfs	190cfs
DEVELOPED	– FLOW FROM PHASE I POND AT HISTORIC LEVELS											
[3]		+ BASINS OS-B + C + D										
	145			20	3.4	5.1	B&C	RES/COMM OPEN	0.44	0.52	217 cfs	385 cfs
OS-1	0.6			10	4.6	7.0	B	RES	0.64	0.71	2cfs	3cfs
HISTORIC 1	3.6	600	19%	15	3.9	5.8	B	OPEN	0.25	0.35	4cfs	7cfs
DEVELOPED 1	1.2			9	4.7	7.2	B	OPEN/RES	0.36	0.45	2cfs	4cfs
2	16.3			15	3.9	6.3	B	COMM/OPEN	0.58	0.65	37cfs	68cfs
HISTORIC [4]	14	800	18	17	3.7	5.6	B	OPEN	0.25	0.35	13cfs	27cfs
DEVELOPED [4]	16.9			15	3.9	6.3	B	RES COM OPEN	0.58	0.65	38cfs	69cfs

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PROJECT CCL @ B.H. BY TEM CHK. BY DATE 3/18/91

SUBJECT Tc / C CALCS SHEET NO. 1 OF 5

BASIN A

$T_c = 1.87(1.1 - 0.25)\, 500^{1/2}\, 19^{-0.33}$

$= 14$ mins

$C_{10} = 0.7(0.55) + 1.6(0.25) / 2.3$

$= 0.34$

$C_{100} \quad 0.7(0.65) + 1.6(0.35) / 2.3$

$= 0.44$

BASIN OS-A

$T_c = 1.87(1.1 - 0.28)\, 250^{1/2}\, 20^{-0.33} = 9$ min

$T_c = 1.87(1.1 - 0.28)\, 100^{1/2}\, 2^{-0.33} = 12$ min

$V = 58.7\sqrt{0.02} = 8$ '/SEC 200' 0.4

21 min

$C_{10} = 4(0.3) + 1.5(0.5) + 9.5(0.6) / 15 = 0.51$

$C_{100} = 4(0.45) + 1.5(0.6) + 9.5(0.7) / 15 = 0.62$

BASIN 'B'

$T_c = 1.87\,(1.1 - 0.25)\, 400^{1/2}\, 10^{-0.33}$

350

$= 15$ min

$V = 58.7\sqrt{0.09} = 12$ '/s $\approx$ 800' OUTFLOW $= 1.1$ min

300' PIPE/CHANNEL FLOW - ASSUME 10'/SEC $= 0.5$ m

$= 17$ min

C_{10} = 4 (0.9) + 5 (0.3) + 8.3 (0.25) / 17.3 = 0.41

C_{100} = 4 (0.9) + 5 (0.45) + 8.3 (0.35) / 17.3 = 0.51

DEVELOPED ⇨ #1

Tc = 21 MIN TO INLETS + 750' PIPE @ 7'/s = 1.8 -

Tc = 23 mins

C_{10} = 17.3 (0.5) + 17.3 (0.41) / 34.6 = 0.46

C_{100} = 17.3 (0.6) + 17.3 (0.51) / 34.6 = 0.56

OS-B (DEVELOPED)

$Tc = 1.87(1.1 - 0.25)\, 550^{1/2}\, 18^{-0.33}$

= 14.4 min

GUTTER 550 @ 8%

$V = 58.7\sqrt{0.08} = 16.6$ '/s ∴ T_T = 0.5 min

700 @ 6%

V = 14 '/s T_T = 0.83

1700 @ 9.4%

V = 12 '/s T_T = 2.3 Tc = 18 mins

1/4 AC. RES

C_{10} = 37 (0.6) + 26.5 (0.5) + 10 (0.25) / 73.5 37 AC = 'C' 36.5 = 'B'

10 AC OPEN

C_{100} = 37 (0.7) + 26.5 (0.6) + 10 (0.35) / 73.5

BASIN C

350' OVERLAND @ 6%

$Tc = 1.87(1.1 - 0.25)\,350^{1/2}\,6^{-0.33} = 16.5$ MINS

ASSUME GUTTER FLOW 450' @ 4%

$V = 58.7\sqrt{0.04} = 11.7$ f/s = 0.6 MIN Tc = 17 MINS

$C_{10} = .6(0.75) + 2.5(0.6) + 7(0.125) + 8.5(0.3)/24$ 6 AC COMML 15.5 OPEN
2.5 1/4 ACRES

$C_{100} = 6(0.8) + 2.5(0.7) + 7(0.35) + 8.5(0.45)/24$

BASIN D

400' OVERLAND @ 4%

$Tc = 1.87(1.1 - 0.25)\,400^{1/2}\,4^{-0.33} = 20.1$

ASSUME GUTTER FLOW 500' @ 4%

V = 11.7 f/s = 0.7M = 21 MINS

$C_{10} = 1(0.94\ 5(0.75) + 2(0.3) + 5(0.125)/13$

$C_{100} = 1(0.95 + 5(0.8) + 2(0.45) + 5(0.35)/13$

1 AC STREETS
5 AC COMML
2 AC OPEN 'C'
5 AC OPEN 'B'

⇨ DP#3 HIST. 140 AC

3000' OVERLAND @ 8.4%

$Tc = 1.87(1.1 - 0.28)\,3000^{1/2}\,8.4^{-0.33} = 42$ MINS

$C_{10} = 70(0.25) + 70(0.3)/140$

$C_{100} = 70(0.35) + 70(0.45)/140$

70 AC - 'B'
70 AC - 'C'

DEVELOPED TO DP [3]

Tc= OS-B (18 min) + OVERLAND TO POND (ASSUME CHANNEL FLOW @ 5'/SEC)

600/5 = 120 = 2 min Tc = 20 MINS

C_{10} = 73.5 (0.52) + 24 (0.43) + 13 (0.5) + 34.6 (0.27) / 145

C_{100} = 73.5 (0.62) + 24 (0.53) + 13 (0.59) + 34.6 (0.4) / 145

BASIN OS-1

Tc = 1.87 (1.1 - 0.25) 50 ½ 2 $^{-.33}$ = 9 mins

400' GUTTER FLOW @ 4%

V = 58.7 $\sqrt{0.04}$ = 11.7'/sec = 0.6

C_{10} = .136 (.9) + .24 (0.25) / .6 — 60% IMP, 40% LANDS

C_{100} = .136 (.95) + .24 (0.35) / .6

BASIN 1

Tc = 1.87 (1.1 - 0.25) 200 ½ 16 $^{-0.33}$ = 9 mins

C_{10} = 1 (0.25) + .2 (0.9) / 1.2 — 85% OPEN, 15% IMP

C_{100} = 1 (0.35) + .2 (0.95) / 1.2

BASIN 2

$T_c = 1.87(1.1 - 0.25)500^{1/2}\,17^{-.33} = 14$ min

500' PIPE FLOW ASSUME 10'/sec = 0.8 m.

T_c = 15 mins

$C_{10} = 9(0.75) + 1(0.9) + 5.8(0.25) + .7(.55)/16.3$

$C_{100} = 9(0.8) + 1(0.95) + 5.8(0.35) + .7(.65)/16.3$

.7 AC RES
9 AC OFFICE/COMM
1 AC STREETS
5.6 AC OPEN

HISTORIC TO DP 4

$T_c = 1.87(1.1 - 0.25)800^{1/2}\,18^{-.33} = 17$ mins

Hydraulic Calculations - SHEETS 1 - 2

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PROJECT CCL @ BH BY TEM DATE

SUBJECT EXIST INLET CAPACITIES SHEET NO. 1 OF 2

- INLET CONSTRUCTED W/ 3" DEPRESSION
- 10YR: LIMIT OF PONDING DEPTH TO INLET

d MAX = 0.67'

- 100YR: LIMIT PONDING DEPTH TO INLET =

d MAX = 1.00'

- ASSUME RUNOFF WILL CROSS CROWN DURING STORMS

$Q_{10_{CAP}} = 3.0 \, L \, d^{1.5}$

$= 3.0 \; 6 \; 0.92^{1.5}$

$Q_{10_{CAP}} = 16$ cfs FOR EACH INLET

∴ COMBINED INLET CAPACITY = 32 cfs - Q10 TO INLET = 20cfs ✓OK

$Q_{100_{CAP}} = 3.0 \; 6 \; 1.25^{1.5}$

$Q_{100_{CAP}} = 25$ cfs FOR EACH INLET

THERFORE COMBINED INLET CAPACITY = 50 cfs - Q100 TO INLETS = 38 cfs ✓ O.K.

BASIN	AREA In ACRES	BASIN LENGTH	BASIN HEIGHT	Tc (min.)	I_{10}	I_{100}	SOIL GROUP	LAND USE	C_{10}	C_{100}	FLOW Q_{10}	FLOW Q_{100}
GRASS		CHANNEL		DESIGN								
(TO	CONVEY	FLOW	FROM	PARKVIEW		TO	POND	'B')				
OS-B;	12 AC	OF BASIN 'C'										
BASINS 'A', 'B' &	'OS-A'	AS	HISTORIC									
HISTORIC	120			42	2.3	3.4	B&C	OPEN	0.28	0.40	77	163
DEVELOPED	120			20	3.4	5.1	B&C	RES/OPEN	0.43	0.53	175	324
GRASS	CHANNEL			B=10', Z=4:1, n=0.04								
			d	V		TOP=(T×1.25)						
S=	2%		2.4	7.12	f/s	36.5'						
S=	1%		2.8'	5.48 f/s		40.5'						
S=	0.75%		3.0'	4.94 f/s		42.5						

HYDRAULIC CALCULATIONS

GRASS LINED SWALE

SHEET 2 OF 2

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

Preliminary Pond Sizing/Routing - SHEETS 1 - 20

POND 'A'

JR ENGINEERING, LTD.
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL

UNIVERSAL RATIONAL HYDROGRAPH

Q(PEAK) = C*I*A
10 YEAR STORM FREQUENCY

BASIN IDENTIFIER BASIN TO POND 'A'
DISCHARGES INTO POND 'A'

BASIN AREA	=	34.60	ACRES
RUNOFF COEFF.	=	0.46	
RAINFALL INT.	=	3.19	IN/HR

TIME (MIN)	RUNOFF (C.F.S.)
0.0	0.0
11.5	1.5
23.0	3.1
34.5	5.7
46.0	8.3
57.5	29.5
69.0	50.8 ✓
80.5	32.9
92.0	15.1
103.5	12.7
115.0	10.3
126.5	6.8
138.0	3.3
149.5	2.9
161.0	2.6
172.5	1.5
184.0	0.3
195.5	0.2
207.0	0.0
218.5	0.0
230.0	0.0
241.5	0.0
253.0	0.0
264.5	0.0
276.0	0.0
287.5	0.0
299.0	0.0
310.5	0.0
322.0	0.0
333.5	0.0

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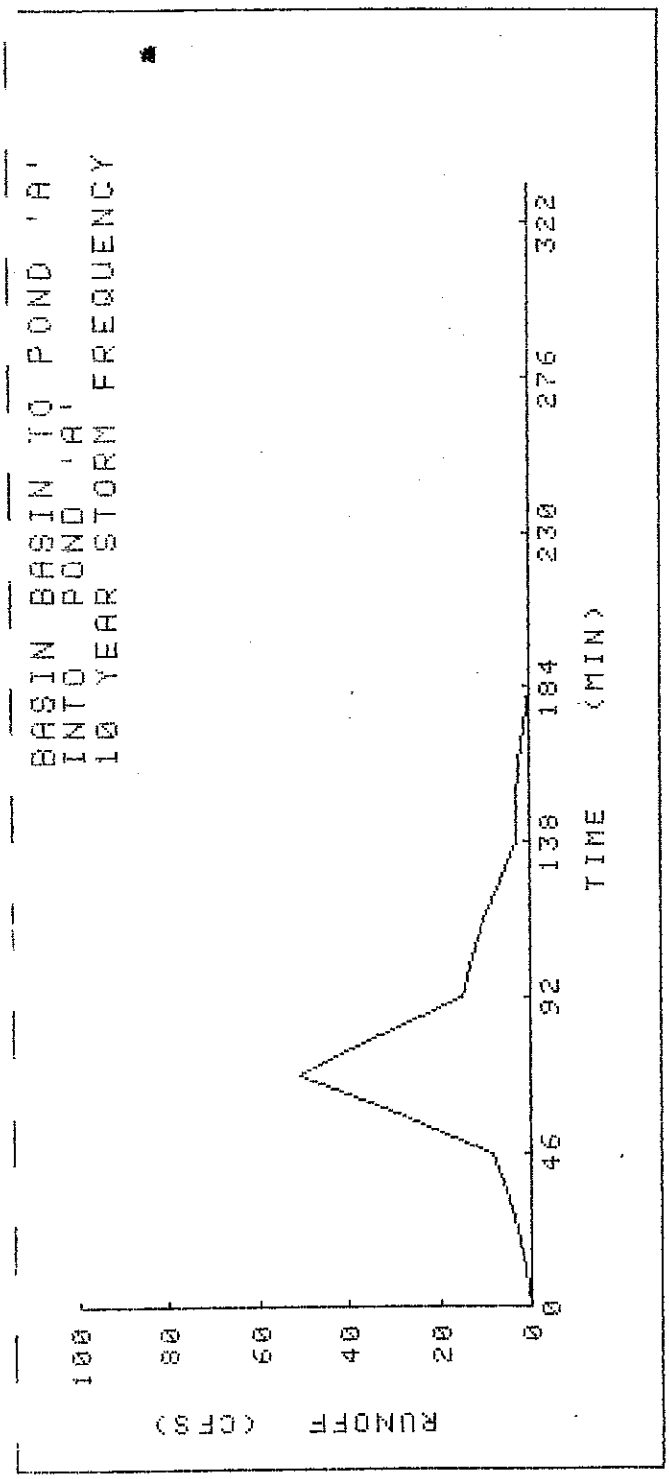
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR BEACON HILL



JR ENGINEERING, LTD.
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR
BEACON HILL
STAGE, STORAGE & DISCHARGE

POND IDENTIFIER POND 'A'

30" RCP W/36" STAND PIPE
EMERGENCY SPILLWAY ELEV. = 80.0

ELEV	STORAGE (CU.FT.)	OUTFLOW (CFS)	2S/T+O (CFS)
76.0	0.0	0.0	0.0
77.0	12300.0	6.0	41.7
78.0	41000.0	15.0	133.8
79.0	73900.0	23.0	237.2
80.0	111200.0	57.0	379.3
81.0	153000.0	77.0	520.5
82.0	199000.0	100.0	676.8

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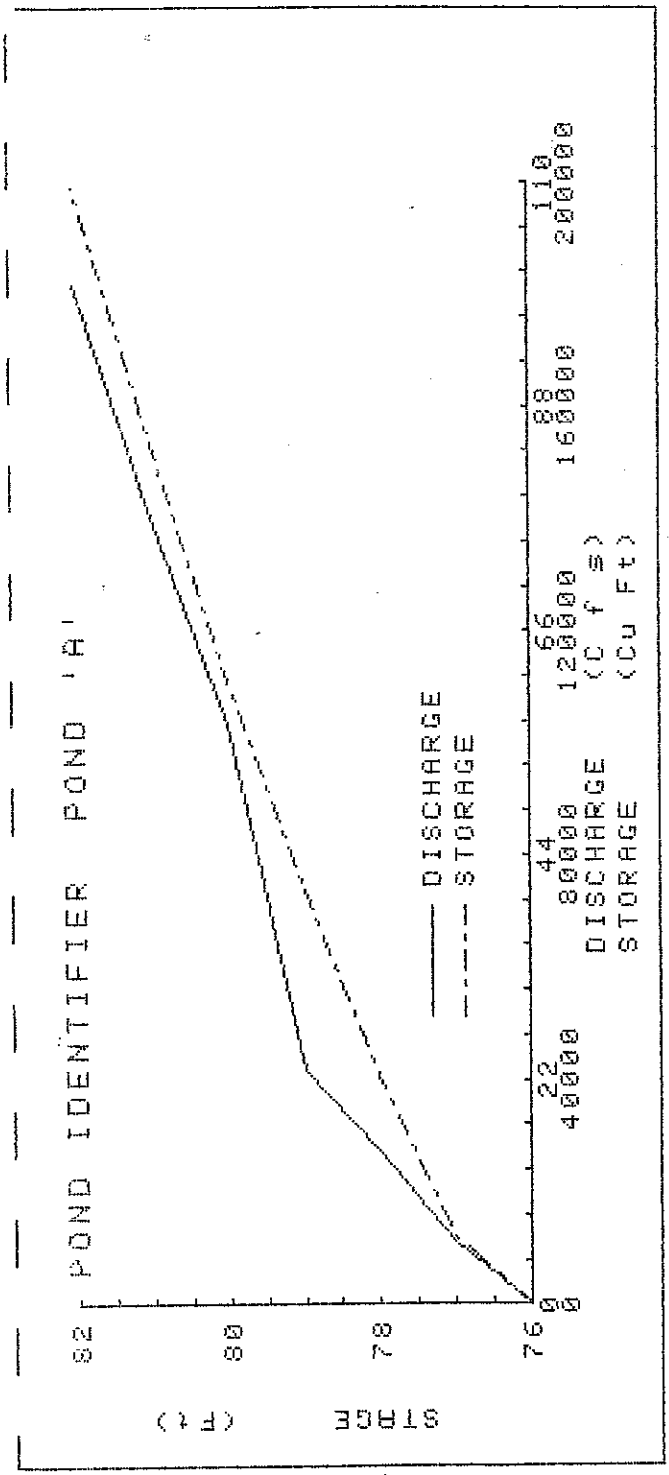
APRIL 15, 1991

HYDROLOGIC REPORT FOR BEACON HILL



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COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL

HYDROGRAPH RESERVOIR ROUTING

BASIN IDENTIFIER BASIN TO POND 'A'
POND IDENTIFIER POND 'A'
10 YEAR STORM FREQUENCY

T	I1	I2	2S1/T	O1	2S2/T +O2	O2	2S2/T
11.5	0.0	1.5	0.0	0.0	1.5	0.2	1.3
23.0	1.5	3.1	1.3	0.2	5.7	0.8	4.9
34.5	3.1	5.7	4.9	0.8	12.8	1.8	11.0
46.0	5.7	8.3	11.0	1.8	23.1	3.3	19.8
57.5	8.3	29.5	19.8	3.3	54.3	7.2	47.0
69.0	29.5	50.8	47.0	7.2	120.1	13.7	106.5
80.5	50.8	32.9	106.5	13.7	176.5	18.3	158.2
92.0	32.9	15.1	158.2	18.3	188.0	19.2	168.8
103.5	15.1	12.7	168.8	19.2	177.4	18.4	159.0
115.0	12.7	10.3	159.0	18.4	163.6	17.3	146.3
126.5	10.3	6.8	146.3	17.3	146.0	15.9	130.1
138.0	6.8	3.3	130.1	15.9	124.2	14.1	110.1
149.5	3.3	2.9	110.1	14.1	102.2	11.9	90.3
161.0	2.9	2.6	90.3	11.9	84.0	10.1	73.8
172.5	2.6	1.5	73.8	10.1	67.8	8.6	59.2
184.0	1.5	0.3	59.2	8.6	52.5	7.1	45.4
195.5	0.3	0.2	45.4	7.1	38.8	5.6	33.2
207.0	0.2	0.0	33.2	5.6	27.8	4.0	23.8
218.5	0.0	0.0	23.8	4.0	19.8	2.8	16.9
230.0	0.0	0.0	16.9	2.8	14.1	2.0	12.1
241.5	0.0	0.0	12.1	2.0	10.0	1.4	8.6
253.0	0.0	0.0	8.6	1.4	7.1	1.0	6.1
264.5	0.0	0.0	6.1	1.0	5.1	0.7	4.3
276.0	0.0	0.0	4.3	0.7	3.6	0.5	3.1
287.5	0.0	0.0	3.1	0.5	2.6	0.4	2.2
299.0	0.0	0.0	2.2	0.4	1.8	0.3	1.6
310.5	0.0	0.0	1.6	0.3	1.3	0.2	1.1
322.0	0.0	0.0	1.1	0.2	0.9	0.1	0.8
333.5	0.0	0.0	0.8	0.1	0.7	0.1	0.6

MAXIMUM ELEVATION = 78.5 FT
MAXIMUM STORAGE = 58232.7 CU FT
MAXIMUM DISCHARGE = 19.2 CFS ✓OK.

HISTORIC Q_{10} = 25cfs

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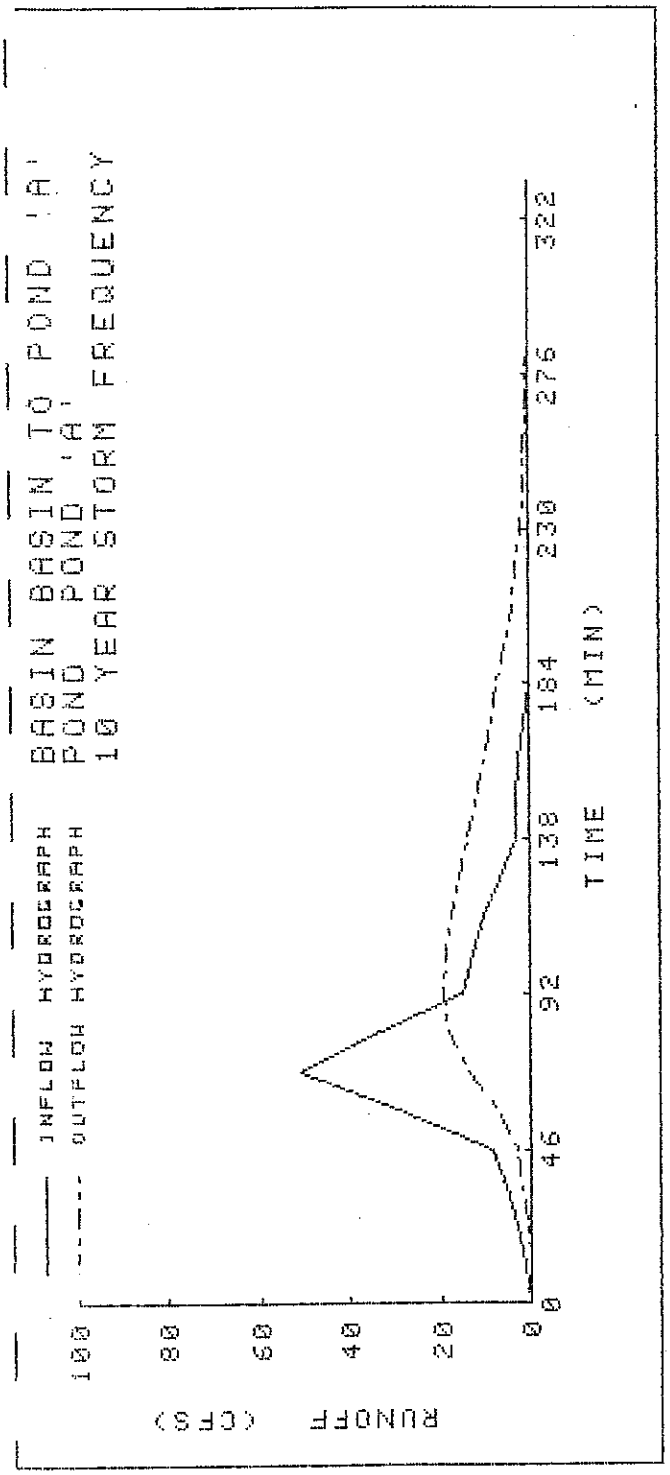
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR BEACON HILL



JR ENGINEERING, LTD.
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL

UNIVERSAL RATIONAL HYDROGRAPH

Q(PEAK) = C*I*A
100 YEAR STORM FREQUENCY

BASIN IDENTIFIER — BASIN TO POND 'A'
DISCHARGES INTO — POND 'A'

BASIN AREA	=	34.60	ACRES
RUNOFF COEFF.	=	0.56	
RAINFALL INT.	=	4.77	IN/HR

TIME (MIN)	RUNOFF (C.F.S.)	
0.0	0.0	
11.5	2.2	
23.0	4.4	
34.5	8.7	
46.0	13.1	
57.5	52.7	
69.0	92.4	PEAK
80.5	61.5	
92.0	30.6	
103.5	24.6	
115.0	18.7	
126.5	11.9	
138.0	5.2	
149.5	4.6	
161.0	4.0	
172.5	2.0	
184.0	0.0	
195.5	0.0	
207.0	0.0	
218.5	0.0	
230.0	0.0	
241.5	0.0	
253.0	0.0	
264.5	0.0	
276.0	0.0	
287.5	0.0	
299.0	0.0	
310.5	0.0	
322.0	0.0	

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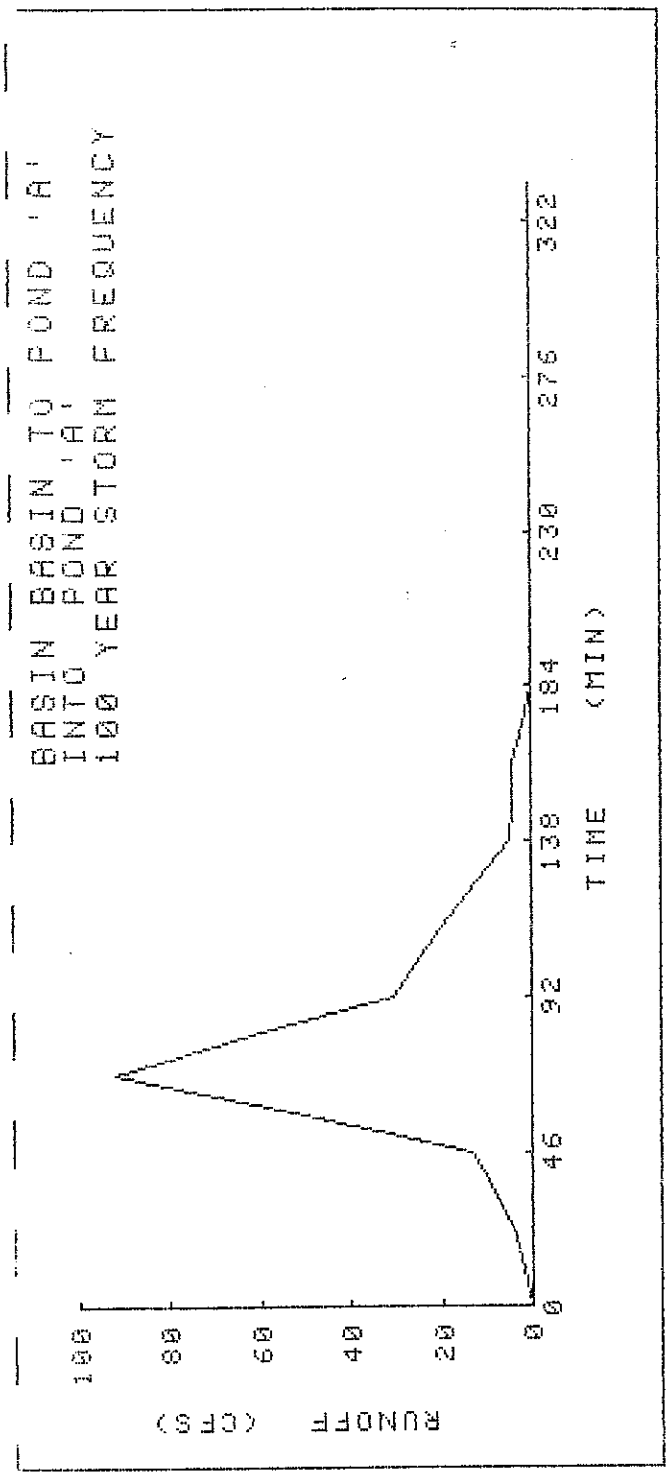
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL



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COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL

HYDROGRAPH RESERVOIR ROUTING

BASIN IDENTIFIER BASIN TO POND 'A'
POND IDENTIFIER POND 'A'
100 YEAR STORM FREQUENCY

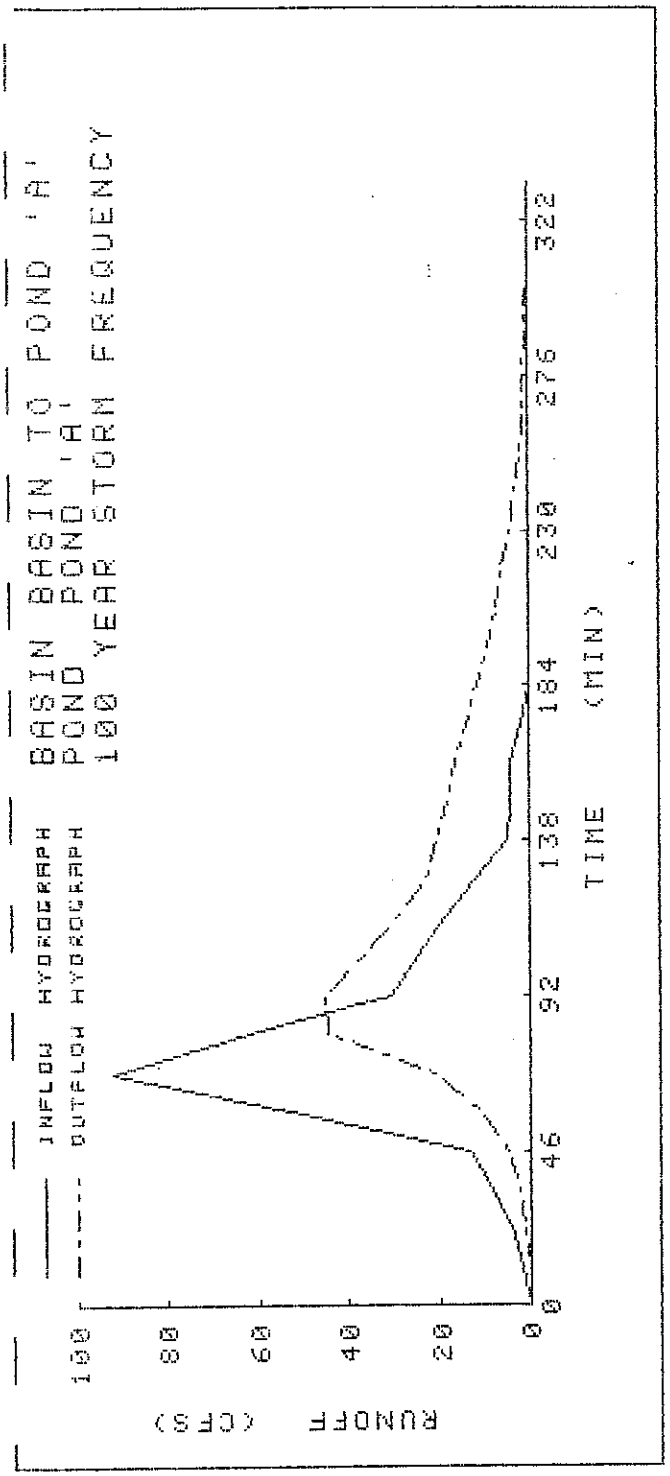
T	I1	I2	2S1/T	O1	2S2/T +O2	O2	2S2/T
11.5	0.0	2.2	0.0	0.0	2.2	0.3	1.9
23.0	2.2	4.4	1.9	0.3	8.1	1.2	6.9
34.5	4.4	8.7	6.9	1.2	18.8	2.7	16.1
46.0	8.7	13.1	16.1	2.7	35.2	5.1	30.1
57.5	13.1	52.7	30.1	5.1	90.8	10.8	80.0
69.0	52.7	92.4	80.0	10.8	214.4	21.2	193.2
80.5	92.4	61.5	193.2	21.2	325.9	44.2	281.6
92.0	61.5	30.6	281.6	44.2	329.5	45.1	284.4
103.5	30.6	24.6	284.4	45.1	294.6	36.7	257.8
115.0	24.6	18.7	257.8	36.7	264.4	29.5	234.9
126.5	18.7	11.9	234.9	29.5	236.0	22.9	213.1
138.0	11.9	5.2	213.1	22.9	207.3	20.7	186.6
149.5	5.2	4.6	186.6	20.7	175.7	18.2	157.4
161.0	4.6	4.0	157.4	18.2	147.8	16.1	131.7
172.5	4.0	2.0	131.7	16.1	121.6	13.8	107.8
184.0	2.0	0.0	107.8	13.8	96.0	11.3	84.7
195.5	0.0	0.0	84.7	11.3	73.4	9.1	64.3
207.0	0.0	0.0	64.3	9.1	55.2	7.3	47.9
218.5	0.0	0.0	47.9	7.3	40.6	5.8	34.7
230.0	0.0	0.0	34.7	5.8	28.9	4.2	24.7
241.5	0.0	0.0	24.7	4.2	20.6	3.0	17.6
253.0	0.0	0.0	17.6	3.0	14.6	2.1	12.5
264.5	0.0	0.0	12.5	2.1	10.4	1.5	8.9
276.0	0.0	0.0	8.9	1.5	7.4	1.1	6.3
287.5	0.0	0.0	6.3	1.1	5.3	0.8	4.5
299.0	0.0	0.0	4.5	0.8	3.8	0.5	3.2
310.5	0.0	0.0	3.2	0.5	2.7	0.4	2.3
322.0	0.0	0.0	2.3	0.4	1.9	0.3	1.6
333.5	0.0	0.0	1.6	0.3	1.4	0.2	1.2

MAXIMUM ELEVATION = 79.6 FT
MAXIMUM STORAGE = 98127.8 CU FT
MAXIMUM DISCHARGE = 45.1 CFS ✓ O.K.

HISTORIC Q100 = 54cfs

JR ENGINEERING, LTD.
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR BEACON HILL



POND 'B'

JR ENGINEERING, LTD.
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL

UNIVERSAL RATIONAL HYDROGRAPH

Q(PEAK) = C*I*A
10 YEAR STORM FREQUENCY

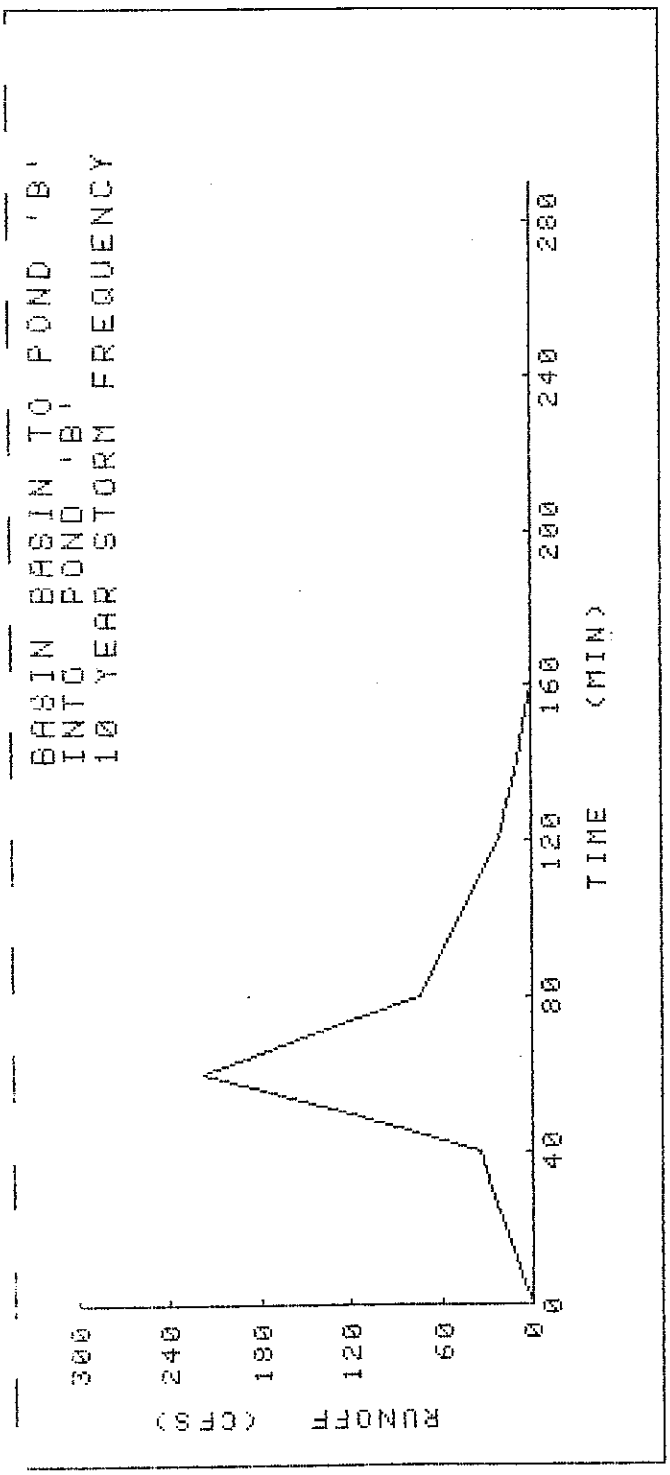
BASIN IDENTIFIER — BASIN TO POND 'B'
DISCHARGES INTO — POND 'B'

BASIN AREA = 145.00 ACRES
RUNOFF COEFF. = 0.44
RAINFALL INT. = 3.40 IN/HR

TIME (MIN)	RUNOFF (C.F.S.)	
0.0	0.0	
10.0	9.6	
20.0	19.1	
30.0	26.8	
40.0	34.5	
50.0	125.7	
60.0	216.9	PEAK
70.0	145.5	
80.0	74.0	
90.0	61.5	
100.0	48.9	
110.0	35.5	
120.0	22.1	
130.0	16.2	
140.0	10.2	
150.0	5.1	
160.0	0.0	
170.0	0.0	
180.0	0.0	
190.0	0.0	
200.0	0.0	
210.0	0.0	
220.0	0.0	
230.0	0.0	
240.0	0.0	
250.0	0.0	
260.0	0.0	
270.0	0.0	
280.0	0.0	
290.0	0.0	

HYDROLOGIC REPORT FOR

BEACON HILL



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COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL

STAGE, STORAGE & DISCHARGE

POND IDENTIFIER ~~POND~~ POND 'B'

42" RCP W/48" STANDPIPE

✓ EMERGENCY SPILLWAY ELEV. = 6050.0

ELEV	STORAGE (CU.FT.)	OUTFLOW (CFS)	2S/T+O (CFS)
6043.0	0.0	0.0	0.0
6044.0	7775.0	12.0	37.9
6045.0	40000.0	28.0	161.3
6046.0	98800.0	45.0	374.3
6047.0	171000.0	68.0	638.0
6048.0	249000.0	82.0	912.0
6049.0	331700.0	132.0	1237.7
6050.0	419600.0	173.0	1571.7
6051.0	515000.0	361.0	2077.7
6052.0	614000.0	676.0	2722.7

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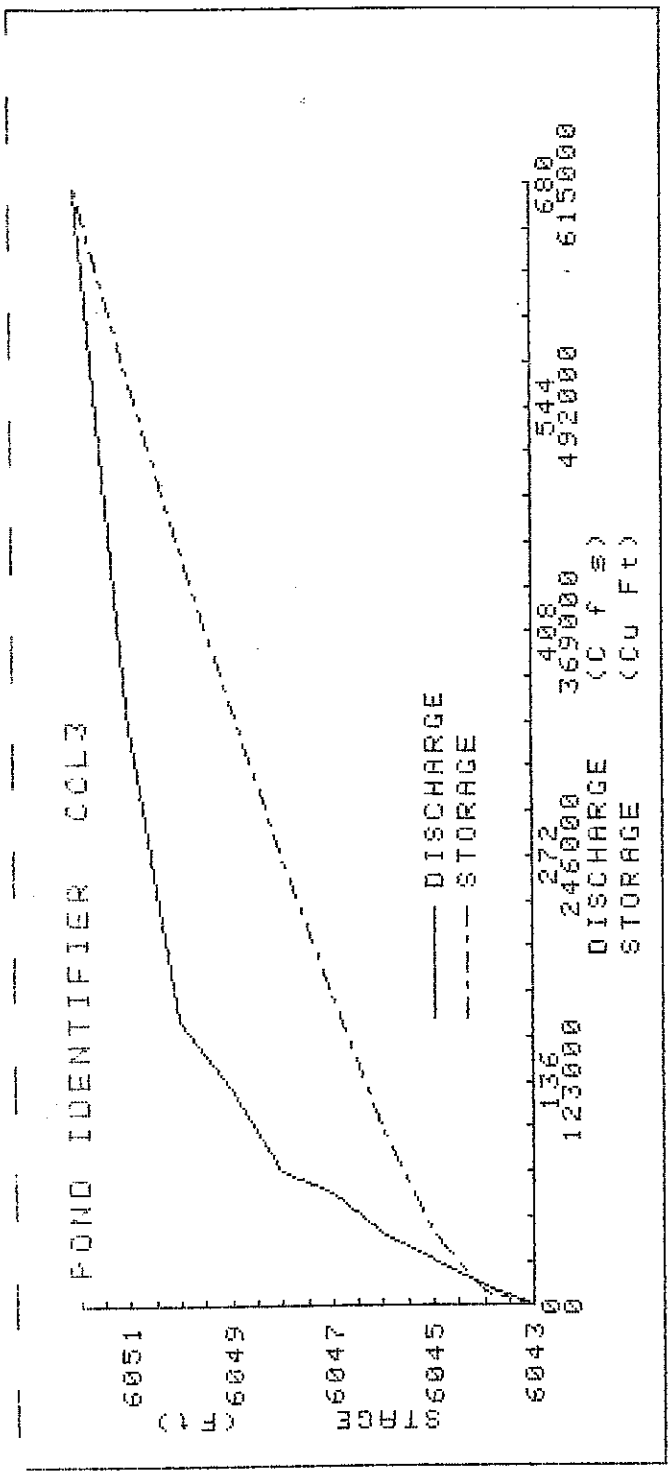
APRIL 15, 1991

HYDROLOGIC REPORT FOR BEACON HILL



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COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL

HYDROGRAPH RESERVOIR ROUTING

BASIN IDENTIFIER BASIN TO POND 'B'
POND IDENTIFIER CCL3
10 YEAR STORM FREQUENCY

T	I1	I2	2S1/T	O1	2S2/T +O2	O2	2S2/T
10.0	0.0	9.6	0.0	0.0	9.6	3.0	6.5
20.0	9.6	19.1	6.5	3.0	32.2	10.2	22.0
30.0	19.1	26.8	22.0	10.2	57.8	14.6	43.2
40.0	26.8	34.5	43.2	14.6	89.9	18.7	71.1
50.0	34.5	125.7	71.1	18.7	212.5	32.1	180.4
60.0	125.7	216.9	180.4	32.1	491.0	55.2	435.8
70.0	216.9	145.5	435.8	55.2	743.0	73.4	669.6
80.0	145.5	74.0	669.6	73.4	815.7	77.1	738.7
90.0	74.0	61.5	738.7	77.1	797.0	76.1	720.9
100.0	61.5	48.9	720.9	76.1	755.2	74.0	681.2
110.0	48.9	35.5	681.2	74.0	691.6	70.7	620.9
120.0	35.5	22.1	620.9	70.7	607.8	65.4	542.4
130.0	22.1	16.2	542.4	65.4	515.3	57.3	458.0
140.0	16.2	10.2	458.0	57.3	427.1	49.6	377.5
150.0	10.2	5.1	377.5	49.6	343.2	42.5	300.7
160.0	5.1	0.0	300.7	42.5	263.3	36.1	227.1
170.0	0.0	0.0	227.1	36.1	191.0	30.4	160.6
180.0	0.0	0.0	160.6	30.4	130.3	24.0	106.3
190.0	0.0	0.0	106.3	24.0	82.3	17.8	64.6
200.0	0.0	0.0	64.6	17.8	46.8	13.2	33.7
210.0	0.0	0.0	33.7	13.2	20.5	6.5	14.0
220.0	0.0	0.0	14.0	6.5	7.5	2.4	5.1
230.0	0.0	0.0	5.1	2.4	2.8	0.9	1.9
240.0	0.0	0.0	1.9	0.9	1.0	0.3	0.7
250.0	0.0	0.0	0.7	0.3	0.4	0.1	0.3
260.0	0.0	0.0	0.3	0.1	0.1	0.0	0.1
270.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0
280.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
290.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MAXIMUM ELEVATION = 6047.6 FT
MAXIMUM STORAGE = 221598.8 CU FT
MAXIMUM DISCHARGE = 77.1 CFS

HISTORIC Q_{10} = 90 cfs ✓ O,K

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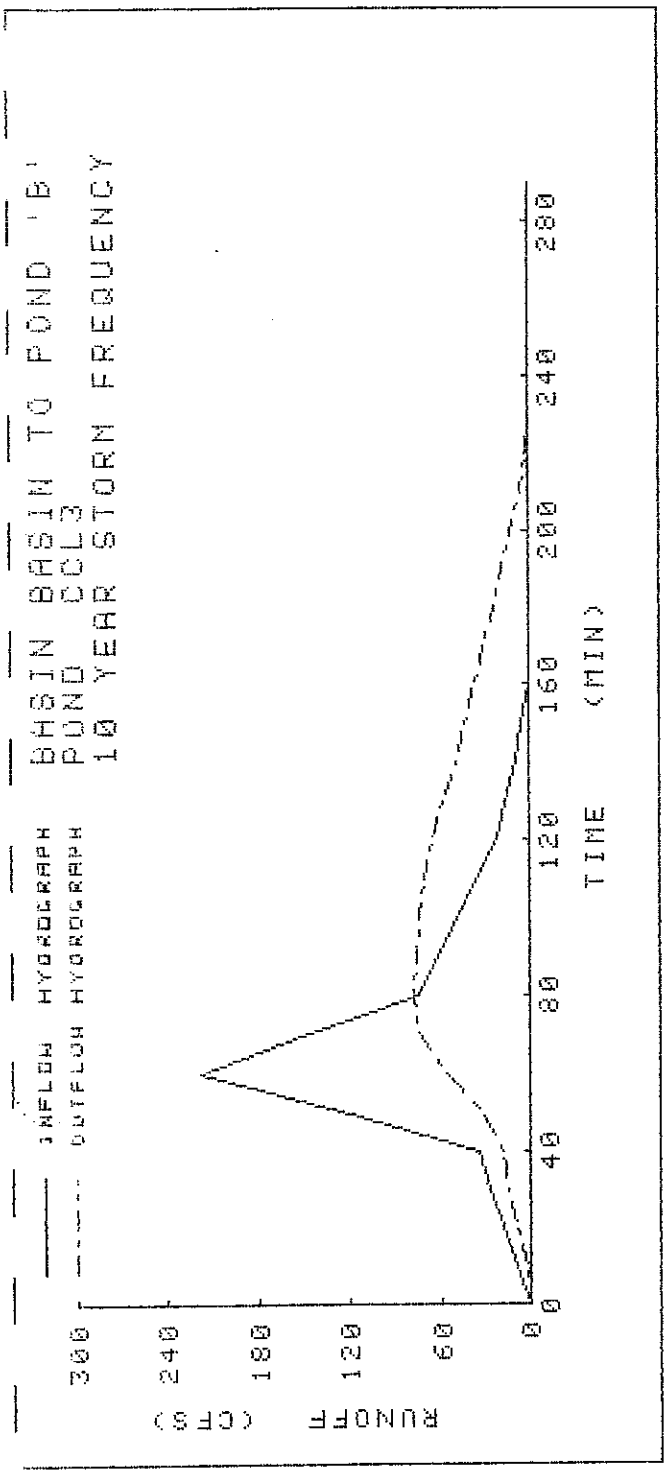
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR BEACON HILL



JR ENGINEERING, LTD.
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL

UNIVERSAL RATIONAL HYDROGRAPH

Q(PEAK) = C*I*A
100 YEAR STORM FREQUENCY

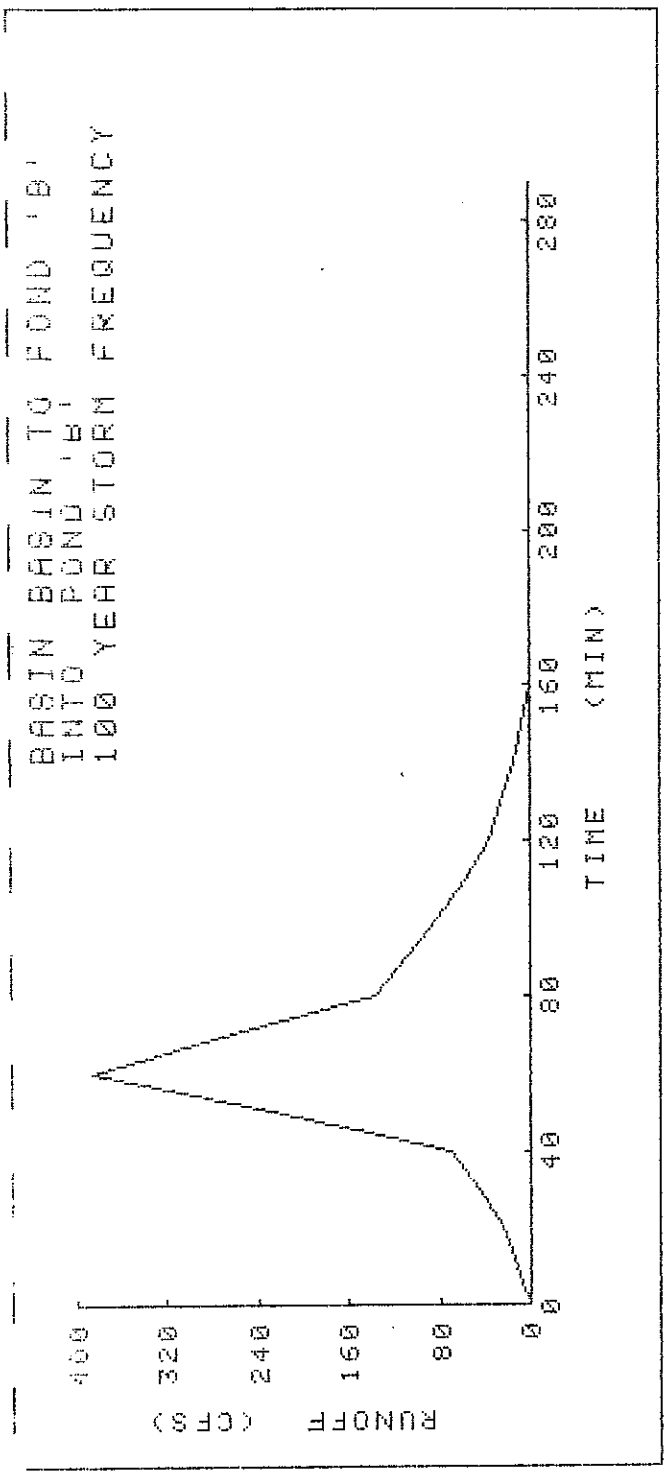
BASIN IDENTIFIER — BASIN TO POND 'B'
DISCHARGES INTO — POND 'B'

BASIN AREA = 145.00 ACRES
RUNOFF COEFF. = 0.52
RAINFALL INT. = 5.10 IN/HR

TIME (MIN)	RUNOFF (C.F.S.)	
0.0	0.0	
10.0	11.7	
20.0	23.4	
30.0	46.7	
40.0	70.1	
50.0	227.3	
60.0	384.5	PEAK
70.0	260.1	
80.0	135.7	
90.0	108.5	
100.0	81.2	
110.0	58.7	
120.0	36.2	
130.0	25.6	
140.0	15.1	
150.0	7.5	
160.0	0.0	
170.0	0.0	
180.0	0.0	
190.0	0.0	
200.0	0.0	
210.0	0.0	
220.0	0.0	
230.0	0.0	
240.0	0.0	
250.0	0.0	
260.0	0.0	
270.0	0.0	
280.0	0.0	
290.0	0.0	

HYDROLOGIC REPORT FOR

BEACON HILL



JR ENGINEERING, LTD.
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR

BEACON HILL

HYDROGRAPH RESERVOIR ROUTING

BASIN IDENTIFIER BASIN TO POND 'B'
POND IDENTIFIER CCL3
100 YEAR STORM FREQUENCY

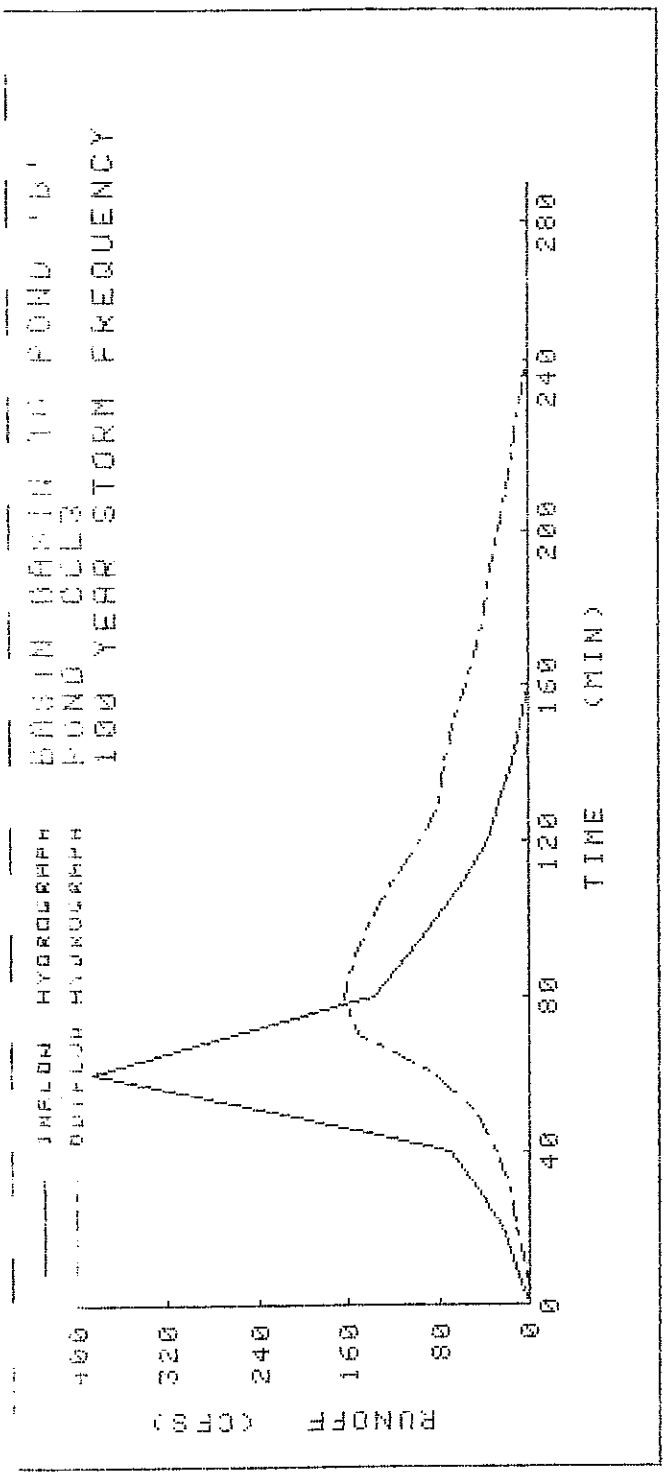
T	I1	I2	2S1/T	O1	2S2/T +O2	O2	2S2/T
10.0	0.0	11.7	0.0	0.0	11.7	3.7	8.0
20.0	11.7	23.4	8.0	3.7	39.4	12.2	27.2
30.0	23.4	46.7	27.2	12.2	85.1	18.1	67.0
40.0	46.7	70.1	67.0	18.1	165.7	28.4	137.4
50.0	70.1	227.3	137.4	28.4	406.5	47.8	358.7
60.0	227.3	384.5	358.7	47.8	922.7	83.7	839.1
70.0	384.5	260.1	839.1	83.7	1400.1	151.9	1248.2
80.0	260.1	135.7	1248.2	151.9	1492.1	163.2	1328.9
90.0	135.7	108.5	1328.9	163.2	1409.8	153.1	1256.7
100.0	108.5	81.2	1256.7	153.1	1293.2	138.8	1154.4
110.0	81.2	58.7	1154.4	138.8	1155.4	119.4	1036.0
120.0	58.7	36.2	1036.0	119.4	1011.5	97.3	914.3
130.0	36.2	25.6	914.3	97.3	878.8	80.3	798.5
140.0	25.6	15.1	798.5	80.3	758.9	74.2	684.7
150.0	15.1	7.5	684.7	74.2	633.2	67.6	565.6
160.0	7.5	0.0	565.6	67.6	505.6	56.4	449.1
170.0	0.0	0.0	449.1	56.4	392.7	46.6	346.1
180.0	0.0	0.0	346.1	46.6	299.5	39.0	260.4
190.0	0.0	0.0	260.4	39.0	221.4	32.8	188.6
200.0	0.0	0.0	188.6	32.8	155.8	27.3	128.5
210.0	0.0	0.0	128.5	27.3	101.3	20.2	81.0
220.0	0.0	0.0	81.0	20.2	60.8	15.0	45.9
230.0	0.0	0.0	45.9	15.0	30.9	9.8	21.1
240.0	0.0	0.0	21.1	9.8	11.3	3.6	7.7
250.0	0.0	0.0	7.7	3.6	4.2	1.3	2.8
260.0	0.0	0.0	2.8	1.3	1.5	0.5	1.0
270.0	0.0	0.0	1.0	0.5	0.6	0.2	0.4
280.0	0.0	0.0	0.4	0.2	0.2	0.1	0.1
290.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1

MAXIMUM ELEVATION = 6049.8 FT
MAXIMUM STORAGE = 398656.1 CU FT
MAXIMUM DISCHARGE = 163.2 CFS

HISTORIC Q_{100} = 190 cfs ✓ O.K

JR ENGINEERING, LTD.
COLORADO SPRINGS, COLORADO
APRIL 15, 1991

HYDROLOGIC REPORT FOR BEACON HILL



BEACON HILL MASTER PLAN

AMENDMENT TO THE POLO POINT MASTER PLAN

SCALE: 1"=100'-0"
CONTOUR INTERVAL: 1'
DATE: FEBRUARY 15, 1991

0 50 100 200 300 500

NORTH

OFFICE/EDUCATIONAL/ PRIVATE OPEN SPACE	44 AC
OFFICE	5.5 AC
COMMERCIAL	14 AC
SINGLE FAMILY RESIDENTIAL 4-6 DU/AC, 59-62 DU POPULATION : 177- 186, 3 PERSONS/UNIT	15 AC
OPEN SPACE	5.5 AC
TOTAL	84 AC

VICINITY MAP
NTS

APPLICANT:
CENTER FOR CREATIVE LEADERSHIP

DEVELOPMENT CONSULTANT :
OLIVE REAL ESTATE GROUP, INC.

PREPARED BY:
THOMAS & THOMAS
Planning · Urban Design · Landscape Architecture
313 East Costilla Colorado Springs, Colorado 80903
(719) 578-8777

LEGEND
- MAJOR DRAINAGE BASIN BOUNDARY
- MINOR DRAINAGE BASIN BOUNDARY
- HISTORIC BASIN BOUNDARY
- SOIL GROUP BOUNDARY
- BASIN DESIGNATION / AREA IN ACRES
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- BASIN RUNOFF
- COMBINED RUNOFF AT DESIGN POINT
- RUNOFF DIRECTION
- NATURAL CHANNEL FLOW
- POLO POINT MASTER PLAN BOUNDARY
- BEACON HILL MASTER PLAN BOUNDARY
- LAND USE BOUNDARY

No.	REVISION	By	Date
1	CITY REVIEW COMMENTS	TEM	4-16-91

BEACON HILL
MASTER DEVELOPMENT/DRAINAGE PLAN

DATE	DRAWN BY RC
CHECK BY	SCALE 1"=100'
DATE	SHT 1 of 1 JOB No. 8128.40

JR ENGINEERING, LTD.
6455 N. UNION BLVD. Suite 202
COLORADO SPRINGS, COLO. 80918
593-2593

PRELIMINARY POND SIZING
FOR BEACON HILL
POND 'B'

SCALE: 1" = 50'