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Land Development
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# DRAINAGE REPORT

# FOR

# HUCKLEBERRY KNOLL SUBDIVISION

# COLORADO SPRINGS, COLORADO

DREXEL, BARRELL & CO.
ENGINEERS — SURVEYORS
1700 38TH STREET BOULDER, COLORADO 80301 (303) 442-4338

# DRAINAGE REPORT

# FOR

# HUCKLEBERRY KNOLL SUBDIVISION

# COLORADO SPRINGS, COLORADO





Prepared for:

Gates Land Company
155 West Lake Avenue
Colorado Springs, Colorado 80907

Prepared by:

Drexel, Barrell & Company
1700 38th Street
Boulder, Colorado 80301

June 3, 1983

E-2451

CERTIFICATIONS

The attached drainage plan and report for Huckleberry Knoll Subdivision 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 the negligent acts, errors, or omissions on my part in preparing this report.

For: DREXEL, BARRELL & CO.

By: _____
John Common, P.E. 11956

The developer has read and will comply with all of the requirements specified in this drainage report as approved by the City Engineer.

By: _____
Robert F. Svejkovsky
Director of Engineering

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

_____ 8-1-83
City Engineer Date

# DRAINAGE REPORT

# FOR

# HUCKLEBERRY KNOLL SUBDIVISION

# COLORADO SPRINGS, COLORADO

Huckleberry Knoll Subdivision is located in the SE¼ of Section 32, T14S, R66W of the 6th P.M., City of Colorado Springs, County of El Paso. This subdivision contains approximately 17.5 acres and is intended for residential use.

Huckleberry Knoll Subdivision is located in Basins C and T of a Master Drainage Study prepared by Drexel, Barrell & Co. entitled "Master Drainage Report for a Portion of Area II, Cheyenne Mountain Ranch, Colorado Springs, Colorado", dated October 15, 1982. The subdivision is also part of a drainage study prepared by Drexel, Barrell & Co., entitled "Drainage Report, Storm Runoff in Cheyenne Meadows Boulevard", dated September 3, 1980.

As of now, runoff from the site is split, with the eastern half of the site draining into Cheyenne Meadows Road, where it is picked up by inlets and a 30" and 36" storm sewer that runs along the site's eastern property line. The western half of the site drains to the north, where that flow is picked up by an existing swale that runs from the outlet of Quail Lake East to a bridge under Colorado Highway 85-87.

The modified S.C.S. methodology was used to determine the flows developed. This methodology was taken from the City of Colorado Springs Runoff Criteria Manual, March, 1977. The design storm is the 5 year - 6 hour duration storm.

After the proposed development, runoff from the southeastern portion of Huckleberry Knoll Subdivision will flow into Cheyenne Meadows Road and be picked up by an existing 5' inlet on the west side of the road. The flow developed from this area has been calculated at 4.00 c.f.s. The rest of the site will drain into the proposed Witches Willow Lane. This runoff will flow towards Cheyenne Meadows Road where most of it will be picked up by a proposed 5' outlet at the southern corner of the intersection of Witches Willow Lane and Cheyenne Meadows Road. The flows developed in this area are calculated at 6.65 c.f.s. along the southern half of Witches Willow Lane and 1.5 c.f.s. along the northern half. Both inlets direct flow into a 36" R.C.P. ultimately flowing to a bridge at Highway 85-87 below Quail Lake.

Overflow from inlets at Huckleberry Knoll drains along to Cheyenne Meadows Road to Highway 85-87. Future construction plans at this intersection include placement of two 10' inlets and pipes connecting to the proposed 100 year capacity pipe projected to be placed northeast of Highway 85-87. Flows from a major storm, 100 year, will be contained within street rights-of-way and ultimately shall reach the above mentioned pipe along Highway 85-87.

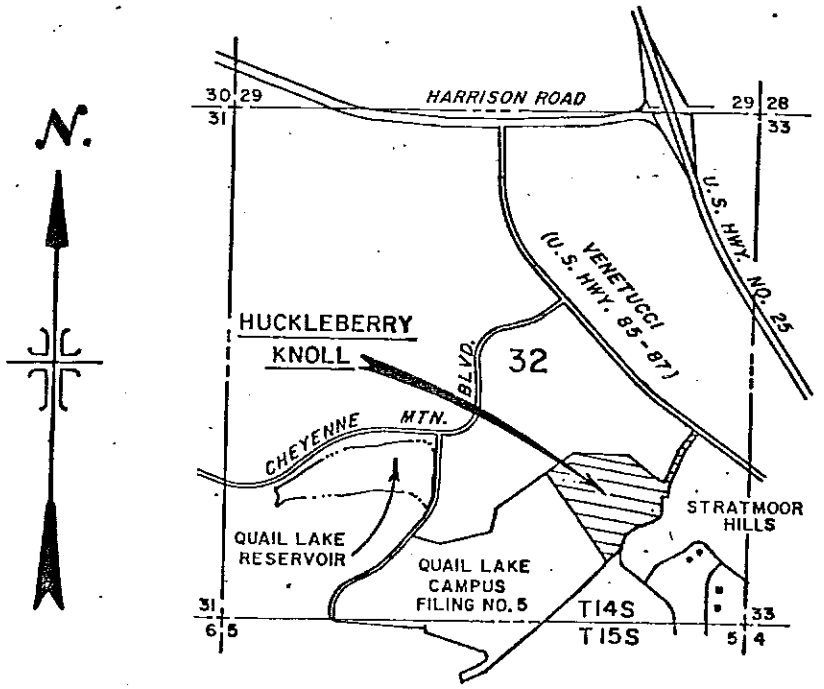
By agreement between the City of Colorado Springs and Gates Land Company, no drainage fees will be required. A drainage plan, vicinity map, soils map and calculations are included for review.

Reviewed by,

Barbara Weiss
P.E. No. 15471

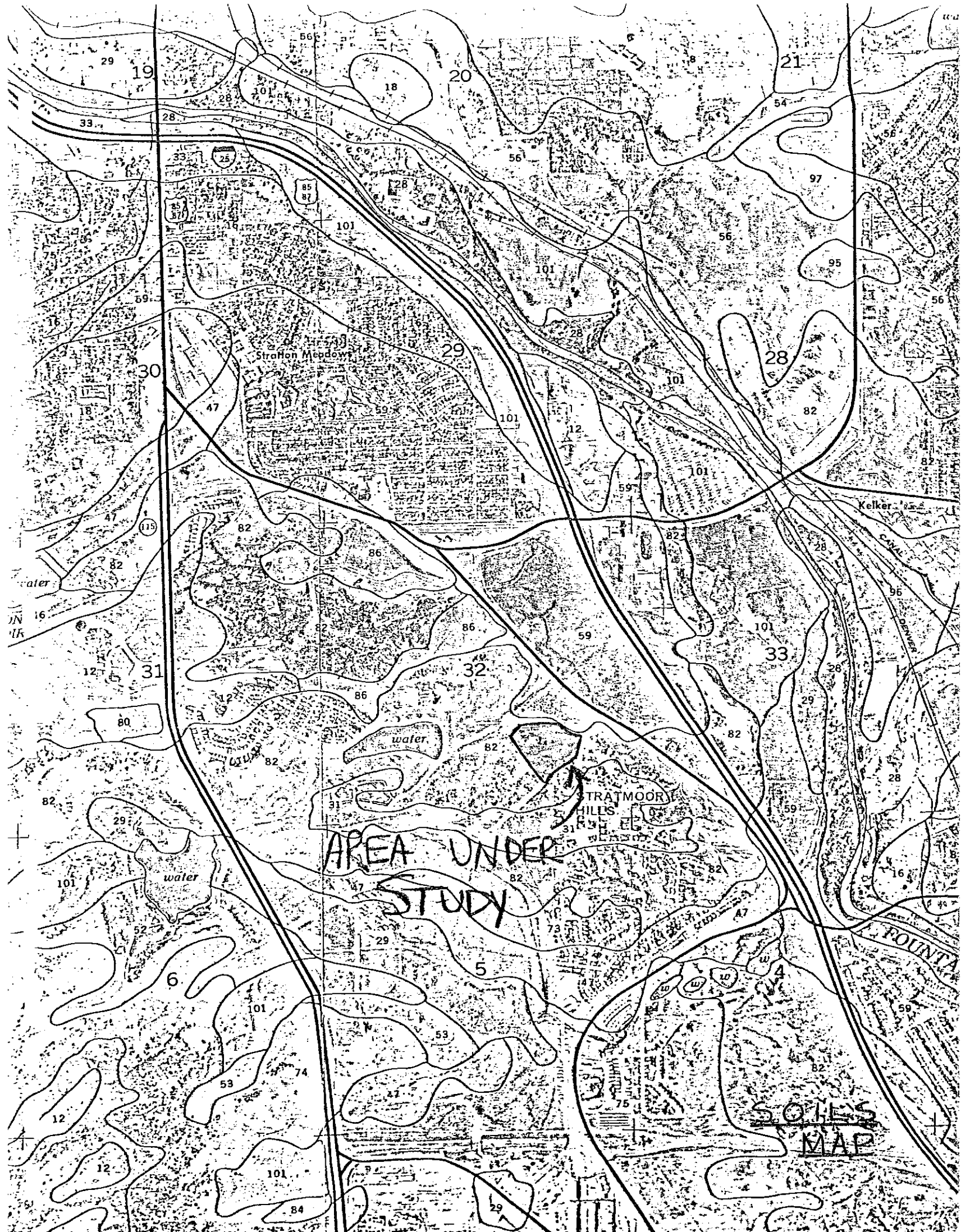
Respectfully submitted,

Kurt Rollin




VICINITY MAP

SCALE: 1" = 2000'


AREA UNDER STUDY
SOILS MAP
Stratton Meadows
STRATMOOR HILLS
Kelker
water
water
19
20
21
30
29
28
31
32
33
6
5
4

SUBDIVISION Huckleberry Knoll.
LOCATION SE¼ of Sec. 32, T1S, R66W
JOB NO. E-2451
DESIGN STORM 5 YR. RECURRENCE INTERVAL
MAJOR STORM 100 YR.
COMPUTATIONS BY KR DATE 5/20/83

DREXEL, BARRELL & CO.
REGISTERED SURVEYORS
CONSULTING ENGINEERS
BOULDER, COLORADO

RUNOFF COMPUTATIONS
(Rational Method)

SHEET ___ OF ___

| AREA DESIGNATION | A (Acres) | c | $c_f$ | $\bar{c}$ = (c x $c_f$) | A·$\bar{c}$ | ΣA·$\bar{c}$ | tc (min) | I (in/hr) | SCS METHOD Q = (ΣA·$\bar{c}$)xI (cfs) | STREET CAPACITY (cfs) | FLOW IN PIPE | PIPE DIA. (in) | SLOPE (%) | LENGTH (ft) | VEL V (fps) | Δt (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Δtc=5.9 | | | | | | | | | |
| 1 | 1.40 | .56 | | | | | 5.9 | | 1.20 | | | | | | | |
| | | | | | | | Δtc=2.25 | | | | | | | | | |
| 2 | 2.21 | .56 | | | | | 5.5 | | 1.891 | | | | | | | |
| | | | | | | | Δtc=0. | | | | | | | | | |
| 3 | 0.47 | .56 | | | | | 4.5 | | 0.40 | | | | | | | |
| | | | | | | | Δtc=2.25 | | | | | | | | | |
| 4 | 1.35 | .56 | | | | | 6.0 | | 1.16 | | | | | | | |
| | | | | | | | Δtc=6.1 | | | | | | | | | |
| 5 | 0.62 | .56 | | | | | 6.1 | | 0.53 | | | | | | | |
| | | | | | | | Δtc=1.14 | | | | | | | | | |
| 6 | 1.86 | .56 | | | | | 5.4 | | 1.59 | | | | | | | |
| | | | | | | | Δtc=0 | | | | | | | | | |
| 7 | 2.38 | .56 | | | | | 6.5 | | 2.04 | | | | | | | |
| | | | | | | | Δtc=1.5 | | | | | | | | | |
| 8 | 1.18 | .56 | | | | | 5.1 | | 1.01 | | | | | | | |
| | | | | | | | Δtc=0 | | | | | | | | | |
| 9 | 1.91 | .56 | | | | | 5.1 | | 1.64 | | | | | | | |
| | | | | | | | Δtc=.60 | | | | | | | | | |
| 10 | 0.66 | .56 | | | | | 5.0 | | 0.57 | | | | | | | |
| 11 | 2.01 | .56 | | | | | 10.7 | 4.5 | 4.50 | | | | | | | |
| 12 | 0.18 | | | | | | 4.0 | | 0.15 | | | | | | | |

DREXEL, BARRELL & CO.
LAND SURVEYORS
CIVIL ENGINEERS

Project: DRAINAGE PLAN - 17 ACRE SITE
Job Nº: E-2451
Client: GATES LAND CO.
By: KE
Date: 5-20-83

## COMPOSITE RUNOFF COEFFICIENT - "C"

| | | | |
|---|---|---|---|
| AVG LOT SIZE | = .25 ACRES | = 100% |
| IMPERVIOUS AREA | = .11 ACRES | = 44% |
| LANDSCAPED AREA | = .14 ACRES | = 56% |

"C" VALUES —

FOR IMPERVIOUS AREA = 0.90

FOR LANDSCAPED AREA = 0.30

COMPOSITE "C" —

$$C = \frac{(44)(.90) + (56)(.30)}{100} = .56$$

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COLORADO SPRINGS, COLORADO 80907

Project: DRAINAGE PLAN - 17 ACRE SITE. Job No: E-2451

Client: GATES LAND CO. By: KR Date: 5-20-83

SUBBASIN 1

TIME OF CONCENTRATION —

TIME TO GET OFF ROOF — 3.5 MIN (ASSUMED)

OVERLAND FLOW TIME —

SLOPE = 3.75 %

LENGTH = 80 FT

VELOCITY = 3 fps

$T_c$ = .44 MIN.

STREET FLOW —

LENGTH = 350'

H = 4'

$T_c$ = 1.93 MIN.

TOTAL $T_c$ = 3.50 + 0.44 + 1.93 = 5.87 MIN.
= 5.90 MIN.

SUBBASIN 2

TIME OF CONCENTRATION —

ROOF TIME = 3.5 MIN (ASSUMED)

OVERLAND FLOW TIME —

SLOPE = 9.29 %

LENGTH = 140 FT.

VELOCITY = 4.6 fps

$T_c$ = .51 MIN

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LAND SURVEYORS
CIVIL ENGINEERS

Project: DRAINAGE PLAN - 17 ACRE SITE | Job No: F-2451
Client: GATES LAND CO. | By: KR | Date: 5-20-83

## SUBBASIN 2 (CONT.)

### STREET FLOW —

LENGTH = 360 FT
H = 1.8 FT
$T_C$ = 1.5 MIN

TOTAL $T_C$ = 3.50 + 0.51 + 1.50 = 5.51 MIN.
= 5.50 MIN

## SUBBASIN 3

ROOF TIME = 3.5 MIN (ASSUMED)

### OVERLAND FLOW TIME —

SLOPE = 8.28 %
LENGTH = 145 FT.
VELOCITY = 4.4 FPS
$T_C$ = 0.55 MIN.

### STREET FLOW —

LENGTH = 100 FT
H = 6
$T_C$ = 0.40 MIN.

TOTAL $T_C$ = 3.5 + 0.55 + 0.40 = 4.45 MIN
= 4.50 MIN

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LAND SURVEYORS
CIVIL ENGINEERS

Project: DRAINAGE PLAN - 17 ACRE SITE
Job No: E-2451
Client: GATES LAND CO.
By: KL
Date: 5-23-83

## SUBBASIN 4

ROOF TIME = 3.5 MIN

OVERLAND FLOW TIME -
SLOPE = 13.33 %
LENGTH = 180 FT
VELOCITY = 5.5 FPS
$T_c$ = .55 MIN.

STREET FLOW -
LENGTH = 540 FT
H = 22 FT
$T_c$ = 1.95 MIN

TOTAL $T_c$ = 3.5 + .55 + 1.95 = 6.00 MIN

## SUBBASIN 5

ROOF TIME = 3.5 MIN.

OVERLAND FLOW TIME -
SLOPE = 3.33%
LENGTH = 60 FT
VELOCITY = 2.7 fps
$T_c$ = 0.37 MIN

STREET FLOW -
LENGTH = 350 FT.
H = 4 FT.
$T_c$ = 2.19 MIN

TOTAL $T_c$ = 3.5 + .37 + 2.19 = 6.06 MIN
= 6.1 MIN

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Project: DRAINAGE PLAN - 17 ACRE SITE | Job No: F-2451

Client: GATES LAND CO. | By: KR | Date: 5-23-83

SUBBASIN 6

ROOF TIME = 3.5 MIN

OVERLAND FLOW TIME -

SLOPE = 7.50 %
LENGTH = 320 FT.
VELOCITY = 4.2 fps
$T_c$ = 1.27 MIN.

STREET FLOW -

LENGTH = 150 FT
H = 7 FT
$T_c$ = 0.160 MIN

TOTAL $T_c$ - 3.5 + 1.27 + 0.160 = 5.37 MIN
= 5.40 MIN.

SUBBASIN 7 ?

ROOF TIME = 3.5 MIN.

OVERLAND FLOW TIME -

SLOPE = 10.23 %
LENGTH = 215 FT.
VELOCITY = 4.8 fps
$T_c$ = 0.75 MIN

STREET FLOW -

LENGTH = 520 FT.
H = 11 FT
$T_c$ = 2.25 MIN

TOTAL $T_c$ = 3.5 + 0.75 + 2.25 = 6.50 MIN.

**DREXEL, BARRELL & CO.** LAND SURVEYORS CIVIL ENGINEERS

Project: DRAINAGE PLAN - 17 ACRE SITE | Job Nº: E-2451

Client: GATES LAND CO. | By: KR | Date: 5-20-83

## SUBBASIN 8

ROOF TIME = 3.5 MIN.

OVERLAND FLOW TIME —

SLOPE = 13.91 %
LENGTH = 230 FT
VELOCITY = 5.75 fps
$T_c$ = 0.67 MIN

STREET FLOW —

LENGTH = 220 FT.
H = 8 FT.
$T_c$ = 0.90 MIN

TOTAL $T_c$ = 3.5 + 0.67 + 0.90 = 5.07 MIN
= 5.1 MIN.

## SUBBASIN 9

ROOF TIME = 3.5 MIN

OVERLAND FLOW TIME —

SLOPE = 12.73 %
LENGTH = 220 FT.
VELOCITY = 5.5 fps
$T_c$ = 0.67 MIN.

STREET FLOW

LENGTH = 260 FT
H = 14 FT
$T_c$ = 0.90

TOTAL $T_c$ = 3.5 + .67 + .90 = 5.07 MIN.
= 5.1 MIN

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LAND SURVEYORS
CIVIL ENGINEERS

Project: DRAINAGE RUN - 17 ACRE SITE
Job No: E-2451
Client: GATES LAND CO.
By: KR
Date: 5-23-83

## SUBBASIN 10

**ROOF TIME = 3.5 MIN.**

**OVERLAND FLOW TIME —**

SLOPE = 7.73%
LENGTH = 220 FT
VELOCITY = 4.25 fps
$T_c$ = 0.86 MIN

**STREET FLOW —**

LENGTH = 115'
H = 4 FT.
$T_c$ = 0.60 MIN

**TOTAL $T_c$** = 3.5 + 0.86 + 0.60 = 4.96 MIN.
= 5.0 MIN.

## SUBBASIN 11

**ROOF TIME = 3.5 MIN**

**OVERLAND FLOW TIME —**

SLOPE - 11.43 %
LENGTH - 70 FT.
VELOCITY - 5.25 fps
$T_c$ - 0.22 MIN

**STREET FLOW —**

LENGTH 80 FT.
H = 4 FT.
$T_c$ = 0.3 MIN

**TOTAL $T_c$** — 3.5 + 0.22 + 0.3 = 4.02 MIN
= 4.0 MIN.

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Project: DRAINAGE PLAN - 17 ACRE SITE | Job No: E-2451

Client: GATES | By: VR | Date: 5-25-83

## SCS MODIFIED -

FOR TOTAL AREA = 17

SOIL TYPE - SCHAMBER - RAZOR COMPLEX

SOIL TYPE = 40% - SCHAMBER
30% RAZOR
30% OTHER

SCHAMBER - SOIL GROUP A
RAZOR - SOIL GROUP C

| LAND USE | % | CN (A) | CN (C) |
|---|---|---|---|
| RESIDENTIAL WITH LOT SIZE = 1/4 ACRE | 83 | 61 | 83 |
| STREET W/ CURB | 17 | 98 | 98 |
| WEIGHTED CN's | - | 67.29 | 85.55 |

WEIGHTED CN's (SOIL) $\frac{(40)(67.29)+(30)(85.55)}{70}$

$= 75.12$ USE CN = 75

FROM TABLE 1 - CN = 75 P = 2.1

Q = 0.43 IN.

$T_c$ -

Project: DRAINAGE PLAN - 17 ACRE SITE | Job No: E-2451

Client: GATES | By: KE | Date: 5-25-83

SUB-BASINS 1+2+3+4

$T_c$ = 10.5 MIN = .18 HRS

$q_p$ = 1100 CSM/IN.

$q = q_p A Q$ = (1100) CSM/IN (5.55 AC/640 AC/SM)(.43 IN)

= 4.10 CFS.

TOTAL AREA

$T_c$ = 11.2 M = .19 HR.

$q_p$ = 1090 CSM/IN

$q = q_p A Q$ = $(1090)\left(\frac{16.23}{640}\right)(.43)$

= 11.89 CFS.

DREXEL, BARRELL & CO.
LAND SURVEYORS
CIVIL ENGINEERS

Project: DRAINAGE PLAN - 17 ACRE SITE | Job No: E-2451

Client: GATES | By: KR | Date: 6-1-83

## FLOW RATES BY SCS METHOD —

(CHANGED SUB-BASINS) 6-1-83

FROM PAGE 1 — CN = 75

FROM TABLE 1 C.S DRAINAGE CRITERIA —

FOR CN = 75 → P = 2.1

∴ Q = 0.43 IN

### FOR SUB-BASINS 1+2+3+4

$T_c$ = 10.5 MIN = 0.18 HRS

A = 5.43 AC.

$q_p$ = 1100 CSM/IN.

$q = q_p A Q = (1100)^{CSM/IN} (5.43^{AC}/640\ A/SM) (.43\ IN)$

= 4.01 CFS = 4 CFS.

### FOR SUB-BASINS 5+6+7+8+9+10

$T_c$ = 9.3 MIN = 0.16 HR.

A = 8.61 AC.

$q_p$ = 1150 CSM/IN

$q = q_p A Q = (1150)^{CSM/IN} (8.61^{AC.}/640\ AC/SM) (.43\ IN)$

= 6.65 CFS.

### FOR SUB-BASIN 11

$T_c$ = 10.7 MIN = 0.18 HR.

A = 2.01 AC.

$q_p$ = 1100 CSM/IN.

$q = q_p A Q = (1100)^{CSM/IN} (2.01/640)^{AC/A/SM} (.43)IN = 1.49 = 1.50$ CFS.

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Project: DRAINAGE PLAN – 17 ACRE SITE
Job No: E-2451
Client: GATES
By: KR
Date: 6-1-83

## FLOW IN EACH SUB-BASIN

### FOR ALL SUB-BASINS —

$q_p = 1275$ CSM/IN

$Q = 0.43$ IN

$q = q_p \frac{A}{640} Q = 1275 \frac{A}{640} (.43) = 0.86\ A$

| | | | |
|---|---|---|---|
| SB1 | A = 1.40 Ac. | q = | 1.20 CFS |
| SB2 | A = 2.21 Ac. | q = | 1.89 CFS |
| SB3 | A = 0.47 Ac. | q = | 0.40 CFS |
| SB4 | A = 1.35 Ac. | q = | 1.16 CFS |
| SB5 | A = 0.62 Ac. | q = | 0.53 CFS |
| SB6 | A = 1.86 Ac. | q = | 1.59 CFS |
| SB7 | A = 2.38 Ac. | q = | 2.04 CFS. |
| SB8 | A = 1.18 Ac. | q = | 1.01 CFS. |
| SB9 | A = 1.91 Ac. | q = | 1.64 CFS. |
| SB10 | A = 0.66 Ac. | q = | 0.57 CFS. |
| SB11 | ALLUVIAL POND | (PAGE 3) | |
| SB12 | A = 0.18 Ac. | q = | 0.15 CFS. |

DREXEL, BARRELL & CO.
LAND SURVEYORS
CIVIL ENGINEERS

Project: Huckleberry Knoll | Job No: E-2451

Client: Gates | By: BNW | Date: 6/2/83

Revise flows entering inlets - Refer to Drainage Report Storm Runoff in Cheyenne Meadows Boulevard Sept. 3, '80 sht 8 & 9 of 10 attached & revised

prior to Sept '81 inlet sizing @ D'B was based on Table 6 City of C. Springs "Determination of Runoff Criteria" & discussions w/ C. Arnold in 76-77

after Sept '81 we decided this method was not conservative enough & have revised our method to assume that 60% of flows on chart will be picked up by "X" size inlet

(Capacity MH H to J = 53 c/s)

Check pipe Capacity

@ MH C $Q = 6.4^{(B)} + 18.1^{\text{In mos}} + 4.5^{(A)} = 29$ c/s

to

inlet F $Q = 29 + 4.8^{F} + 6.8^{G} = 40.6$ c/s

∴ 53 - 40.6 = 12 c/s remaining

**DREXEL, BARRELL & CO.** LAND SURVEYORS CIVIL ENGINEERS

| Project | Job Nº |
|---|---|
| Huckleberry Knoll | E-2451 |

| Client | By | Date |
|---|---|---|
| Gates | BNW | 6/2/83 |

Assume capacity Cheyenne Meadows Rd
@ Hwy 85-87 - 30 c/s
assumption - add flows - (conservative)
southside rd Q = 13.8 c/s
North side allowable = 30 - 13.8 = 16.2 c/s

place 5' inlet @ W side Witches Willow Lane
Q = .6(7.7) = 4.4 c/s into inlet
Total Pipe Q = 4.4 + 40.6 = 45 c/s < 53 c/s OK
Overflow = 6.7 - 4.4 = 2.3 c/s

{Existing 24" culvert CMP & HW/D = 1 under 85-87
Q = 12 c/s OK for remainder Area C (2D746)}
@ HWY 85-87
size inlet south side Cheyenne Meadows Dr
S = 1.5% Q = 13.8 c/s
* Place 10' inlet Q = 6.9 c/s & 18" RCP (6.9 c/s overflow)
size inlet north side (assumed pt area C)
S = 1.5% Q = 2.3 + 7.7 + 5 = 15 c/s < 16.2 allow
* Place 10' inlet Q = 6.9 c/s (24" RCP) (8.1 c/s overflow)
overflow drains to 85-87 borrow ditch presently

* - To be constructed when 100 yr capacity pipe along 85-87 is constructed

Project: Cheyenne Meadows Blvd. Storm Sewer | Job No: E-2214

Client: Gates Land Company | By: R.P | Date: 2 Sept. 80

REV 2 OCT 80
REV 8 OCT 80

## INLET SIZING ALONG CHEY. MEAD. BLVD.

INLET (A) AREA (A), NORTHWESTERLY SIDE STREET:

STREET GRADE = 3.8%

FLOW TO INLET = $A_1$ & $A_3$ = 12.9

~~(12.9)(0.60) = 7.7 cfs, 5.2 cfs overflow~~

12.9 − 4.5 = 8.4 cfs overflow

USE 5' INLET

INLET (F) AREA (C1), NORTHWESTERLY SIDE STREET:

STREET GRADE = 3.6%

FLOW TO INLET = ~~5.8 cfs + 5.2 cfs, FROM INLET, AREA (A)~~

= ~~11.0 cfs~~ ASSUME $T_c$'s ARE EQUAL (CONSERVATIVE)

~~(11.0)(.60) = 6.6 cfs, 4.4~~ cfs OVERFLOW (SEE BASIN 4)

USE 5' INLET — 8.4 + 4.1 = 12.5 to inlet

12.5 − 4.8 = 7.7 cfs overflow

AREA (C), NORTHWESTERLY SIDE STREET (CHECK STREET CAPACITY)

STREET GRADE = 1.50% min.

2.5 Ac. FROM AREA (C), $T_c$ = 6 min, ASSUME $T_c$'s ARE EQUAL

ASSUME CN = 93.9

Q = 1.49, $S^{\frac{1}{2}}$ = 1270 $\quad (1270)\left(\frac{2.5}{640}\right)(1.49) = 7.4$ cfs

FLOW TO INTERSECTION = ~~7.4 cfs + 5.1~~ cfs, FROM INLET, AREA (C)

= ~~12.5~~ cfs

< 26.1 cfs (CAPACITY, TABLE 5) OK

Project: CHEYENNE MEADOWS BLVD STORM SEWER | Job No: E-2214

Client: Gates LAND Company | By: R.P. | Date: 3 Sept. 80

Rev 20 Oct 80
Rev 8 Oct 80
rev 6/2/83

# INLET SIZING ALONG CHEY. MEAD. BLVD.

## INLET AREA (B), SOUTHEASTERLY SIDE STREET

STREET GRADE = 3.8%

FLOW TO INLET = .18

~~(.18)(.60) = 10.8 cfs, 7.2 OVERFLOW~~

18 − 6.4 = 11.6 cfs overflow

USE 6' INLET

## INLET (A) AREA (D), SOUTHEASTERLY SIDE STREET

STREET GRADE = 3.60%

FLOW TO INLET = 8.0 cfs + 7.2 OVERFLOW FROM INLET AREA (B)

= 15.2

(15.2)(.60) = 9.1 cfs, 6.1 cfs OVERFLOW.

USE 6' INLET

11.6 + 8.0 = 19.6 cfs

19.6 − 6.8 = 12.8 cfs overflow

## AREA (E), SOUTHEASTERLY SIDE STREET

STREET GRADE = 1.50% min.

FLOW = ~~1.0 + 6.1~~ cfs OVERFLOW, FROM AREA (D) INLET

= ~~7.1 cfs~~

< 26.1 cfs (CAPACITY, TABLE 5) OK

Q = 12.8 + 1 = 13.8 cfs