

RETURN TO:
Lead Development
104 West Costilla
Colorado Springs, CO 80902

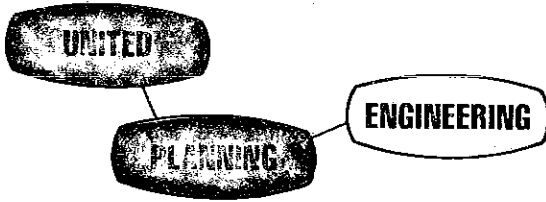
Lee Dutton

OAK HILLS DEVELOPMENT
MASTER DRAINAGE REPORT
for
ROCKRIMMON NORTH PORTION

REVISED
August, 1977

PREPARED BY:
UNITED PLANNING AND ENGINEERING COMPANY
916 North Weber
Colorado Springs, CO 80903

*D. J. ...
8/16/77*



planners · consultants · engineers

916 North Weber
Colorado Springs, Colorado 80902
(303) 471-8222

August 8, 1977

Mr. Dewitt Miller
Director of Public Works
City of Colorado Springs
P. O. Box 1575
Colorado Springs, CO 80901

SUBJECT: Oak Hills Filing #1
Drainage Plan

Dear Deke:

Transmitted herewith is the revised master drainage plan for Oak Hills and for Oak Hills Filing Number One.

This plan is revised to accomodate your revision to the drainage criteria of July 15, 1977. We will revise the street profiles accordingly, however, no revision to the fees previously accepted for recording need be made at this time.

Respectfully submitted,

UNITED PLANNING & ENGINEERING
COMPANY

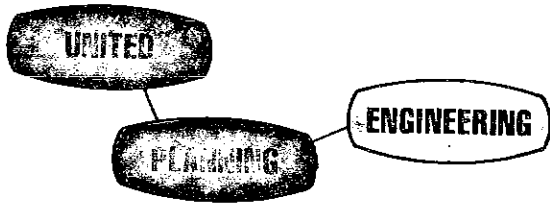
Oliver E. Watts
Partner

OEW:pq
Enclosure

APPROVED:

Donell Tefferies by CA
CITY ENGINEER

8/16/77
DATE



planners · consultants · engineers

916 North Weber
Colorado Springs, Colorado 80902
(303) 471-8222

Mr. Dewitt Miller
Director of Public Works
City of Colorado Springs
Colorado Springs, CO 80903

SUBJECT: Oak Hills Master Drainage Report
& Oak Hills Filing No. 1

Dear Deke:

Transmitted herewith is the Master Drainage Report for the Rockrimmon North Portion of the Oak Hills Development, and for Oak Hills Filing No. 1

Please contact me if I may answer any questions or provide further information.

Respectfully submitted,

UNITED PLANNING AND ENGINEERING
COMPANY

Oliver E. Watts
Partner

OEW:pq
Enclosures

OAK HILLS MASTER PLAN

OAK HILLS FILING NO. 1

DRAINAGE PLAN

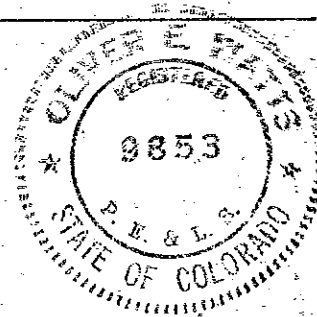
CERTIFICATIONS AND APPROVALS

Registered Engineer:

I, Oliver E. Watts, a registered engineer in the State of Colorado, hereby certify that the attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. I further certify that said drainage report is in accordance with all City of Colorado Springs Ordinances and specifications and criteria.

Oliver E. Watts

Colorado P.E. - LS No. 9853



Owner or developer of the site:

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

OAK HILLS DEVELOPMENT Co, A COLO CORP.

By

Repha E. Bullock

Title

President

APPROVED:

City of Colorado Springs, Department of Public Works

Filing # 1 only

Donell J. J. J.
City Engineer

June 16, 1977
Date

1. GENERAL DESCRIPTION

The Oak Hills Development is located in the Northwest portion of Rockrimmon in Colorado Springs. This report concerns itself with that portion within the Rockrimmon North Drainage Basin.

Filing Number One is located as shown on the enclosed plan and 1:20 adjacent to Comstock Village Filing No. 1. Those drainage structures not yet constructed in Comstock Village are analyzed herein. Filing one occupies 38.825 acres.

2. METHODOLOGY

The method used for all computations is that prescribed by the City of Colorado Springs, as published in March, 1977. This is the SCS Synthetic Hydrograph Method.

Soil types are shown on the enclosed plan. All of Oak Hills lies within the RBI series, Hydrologic Group "D".

All computations are enclosed.

3. FLOW ROUTING

The valleys in this area are well defined and dictate the flow routing. The routing shown is as prescribed in the approved Rockrimmon North Master Plan.

The area Northwest of the Oak Hills area is assumed to someday develop as Oak Hills does and 77.4 CFS will enter the West boundary in Cedar Valley Lane. A storm sewer routes this to Allegheny Drive, down it and to the flood control dam at Hydrograph Point No. 1. The outlet for this ~~Dam~~ will be designed at the time of platting.

Oak Hills Drive is drained by a storm sewer when it becomes necessary, which will connect to previously approved but not constructed facilities.

4. DESIGN DETAILS

a. Street Capacities:

<u>Street</u>	<u>Location</u>	<u>Size</u>	<u>Slope</u>	<u>Runoff CFS</u>	<u>Capacity CFS</u>
Cedar Valley	IB2	28'	3.8%	35.9	46.
Allegheny	IC1	36'	3.1%	36.6	73.5
Oak Hills Dr.	Top St. S.	36'	5.2%	76.8	83.4 @ 4%
	IIC	36'	5.2%	38.0	83.4 @ 4%
	IID	36'	4.1%	27.0	83.4 @ 4%
Night Hawk Dr.	IIE	40'	4.3%	60.9	78.6

b. Storm Sewer Capacities - Proposed:

<u>Street</u>	<u>Location</u>	<u>Design Flow-CFS</u>	<u>Type Pipe</u>	<u>Min. Slope</u>
Cedar Valley Lane	IB2	77.4	30"RCP	3.56%
	IC1	102.1	36"RCP	2.35%
Outfall	IC2	126.1	36"RCP	3.58%
Oak Hills Dr.	IIC	38.8	24"RCP	2.94%
	IID	76.8	30"RCP	3.51%

c. Storm Sewer (Already approved)

<u>Street</u>	<u>Location</u>	<u>Design Flow-CFS</u>	<u>Type & Slope Approved</u>	<u>Capacity CFS</u>
Night Hawk	IIE	95.5	36"RCP, 4.79%	145.9
Night Hawk	IIE	95.5	36"RCP, 4.45%	140.6
Night Hawk	IIE	95.5	36"RCP, 4.28%	137.9
Outfall	Cross Lot	141.7	42"RCP, 2.46%	157.6
Outfall	Cross Lot	141.7	42"RCP, 3.00%	174.1

5. COST ESTIMATES

a. Total Rockrimmon North Facilities:

21-inch RCP	44 LF	\$15.00	\$ 660.00
24-inch RCP	360 LF	16.00	5,760.00
30-inch RCP	1690 LF	22.00	37,180.00
36-inch RCP	1290 LF	27.00	34,830.00
10-foot D-10R	6 ea	1100.00	6,600.00
12-foot D-10R	2 ea	1200.00	2,400.00
12-foot USBR dissipator	1 ea	2400.00	2,400.00
Dam Spillway	LUMP SUM		15,000.00
		Subtotal...	\$104,830.00
		10% Eng'ng & Cont...	10,483.00
		TOTAL...	\$115,313.00

6. FILING NO. ONE FACILITIES

24-inch RCP	288 LF	16.00	\$ 4,608.00
30-inch RCP	540 LF	22.00	11,880.00
10-foot D-10R	4 ea	1100.00	4,400.00
		Subtotal...	\$ 20,888.00
		10% Eng'ng & Cont...	2,088.80
		TOTAL...	\$ 22,976.80

7. FEES

Dry Creek: 0.039 acres @ \$1,008.00 =	\$ 39.31
Filing No. 1 Rockrimmon North, 1977 Fees:	
38.786 acres @ \$1,063.00 =	\$41,229.52
TOTAL 38.825 acres =	\$41,268.83

For Curve #'s

Each lot will contain 6,000 SF average impervious area, based on photogrammetric surveys of similar areas. The remainder of the development, except roads, will remain in their natural state.

Basin	PR in ²	A -SA-	# lots	Size of Street	Total Imp-SF	Range Conver	% Total A	CN	CN x %	Use CN
IBZ also IA #IB1	23.15	0.0332	22	28x1100	162,800	Oak-40%	0.1758	98	17.2	
							0.8242	71	58.5	
							1.0000		75.7	76
ICI also IC2 #IDEF	25.82	0.0370	17	28x800	164,000	Oak-40%	0.1588	98	15.6	
				36x1100			0.8412	71	59.7	
							1.0000		75.3	75
IIA	15.67	0.0225	13	28x570	93,960	Oak-60%	0.1199	98	14.7	
							0.8501	64	54.4	
							1.0000		69.1	69
IIB	19.55	0.0280	18	28x1000	108,000	Oak-60%	0.1381	98	13.5	
				36x2040			0.8619	64	55.2	
							1.0000		68.7	69
IIC	36.40	0.0522	37 1/2	28x940	294,160	Oak-50%	0.2020	98	19.8	
				36x1190			0.7980	68	54.3	74
							1.0000		74.1	74
IID	20.33	0.0292	16	28x780	96,000	Oak-40%	0.1181	98	11.6	
				36x520			0.8819	71	62.6	
							1.0000		74.2	74
IIE	14.71	0.0288				RS/comm Oak-40%	0.7326	92	67.4	
							0.2674	71	19.0	
							1.0000		86.4	86
IIF	10.12		8 1/2	28x1120	51,000	RS Oak-40%	0.4243	92	39.0	
							0.5757	71	50.9	
							1.0000		89.9	80
IIG	7.50					RS Oak-40%	0.6203	92	57.1	
							0.3797	71	27.0	
							1.0000		84.0	84
IIIA also			27	28x82	197,560	Oak-80%	0.1456	98	14.3	
				36x350			0.8544	57	48.7	
IIIB-C	33.91	0.0487					1.0000		63.0	63

$$Q_p = KAQ \quad T_c = \left(\frac{11.9L^3}{H} \right)^{.385} + ST_{S_{\text{down}}} V_s$$

I = 2.1 5yr
3.5" 100yr 6hr storm

MAJOR BASIN	SUB BASIN	AREA		BASIN		T _c	DITCH		V K	FPO CN	FLOW		T _b
		Planim. Read	MILE	LENGTH	HEIGHT		LENGTH	SLOPE			Q	qp	
I	A	33.26	0.0477	2330	176	0.133			1200 2110	76	0.47	47.3	26.9
	B1	25.93	0.0372	1760	194	0.096			1270 2300	76	0.47	40.0	22.2
	B2	23.15	0.0332	1580	188	0.086			1270 2300	76	0.47	35.9	19.8
	C1	25.82	0.0370	1880	211	0.095			1270 2300	75	0.43	36.6	20.2
	A+B1		0.0849			+0.031 = 0.164	920	5% V=8.3	1130 1940	76	0.47	77.4	45.1
	+B2		0.1181			+0.020 = 0.184	1150	V=15.77	1090 1840	76	0.47	102.1	60.5
	+C1		0.1551			+0.0225 0.206	1170	V=14.44	1050 1730	76	0.47	126.1	76.5
	+C2		0.0102							75			
	+E		0.0066							75			
	+F		0.0075							75			
	+D		0.214			+0.022	790	Use V=10		75			
	Total		0.393			0.228			1010 1420	Use 75 75.3	100yr Reservoir 1.30	572	516
II	A	15.67	0.0225	1755	182	0.092			1270 2300	69	0.25	12.9	7.1
	B	19.55	0.0280	1570	169	0.085			1270 2300	69	0.25	16.1	8.9
	C	36.40	0.0522	1770	189	0.090			1270 2300	74	0.40	48.0	26.5
	D	20.33	0.0292	1520	211	0.078			1270 2300	74	0.40	27.0	14.8

HYDROLOGIC COMPUTATION - BASIC DATA

PROJ: Oak Hills Master

By: *SEW*
Date: 5-14-77

Revised *SEW* 8-6-77



planners - consultants - engineers
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4525 Northpark Drive
Colorado Springs, Colo. 80907

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of
4 Pages

Street and Storm Sewer Calculations

$$Q = \frac{0.463}{0.013} D^{8\frac{1}{3}} S^{1\frac{1}{2}} = K S^{1\frac{1}{2}}$$

STREET	LOCATION	DIST	ELEVATION & SLOPE	TOTAL RUNOFF	STREET FLOW CAPACITY	PIPE FLOW	TYPE PIPE, CATCH BASIN & SLOPE %	
Cedar Valley Ln	Bottom I B1	1150	6682 3.83%			45.1	$D.K_o, h_i = 0.0712 = 4.33$ 24" RCP, 3.98% min	
	Bottom I B2	1170	6638 3.08%	19.8	146	45.1	2-6' D-10R's w 24" RCP	
	Bottom I C1	120	6602 Use 5%	20.2	173.5	60.5	30" RCP, 2.18% min 2-6' D-10R's w 24" RCP	
	Outfall		6590			76.5	30" RCP, 3.48% min 9'-3" USBR end TSS	
Oak Hills Drive	Bottom II B	1200	6650 5.17%	16.0	83.4 @ 4%		2-6' D-10R's w 18" RCP's @ 1.02% min	
	Bottom II C	540	6588 4.07%	42.9	-	21.2	18" RCP, 4.08% min 2-6' w 18"	
	Bottom II D			6566 5.56%	14.8	83.4 @ 4%		2-8' D-10R's w 21" RCP's
				4.79%			53.8	27" RCP Cap = 73.0
				4.45%			53.8	✓ ✓ ✓ 67.8
				4.28%			53.8	✓ ✓ ✓ 65.3
Bottom II E		3.4%	33.6	78.6		2-8' D-10R's w 21" RCP		
		2.46%			80.8	36" RCP Cap = 104.6		
		3%			80.8	36" RCP Cap = 115.5		
Allegheny	Bottom II F		4%	25.7	83.4		2-6' w 18", 1-4' w 18"	
	Bottom II G		3.28%	0		25.7	21" RCP, Cap = 28.7	
			4.21%	0		25.7	21" RCP, Cap = 32.5	
		5.28%	18.0		40.8	2-6' w 18" EXIST 24", Cap = 52.0		

UNITED
WESTERN
ENGINEERS

Project Oak Hills Mustang - Page 4 of 4
 Calc. by DEJ/MTS Revises 8-6-77
 Checked by _____ date _____

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