

**MASTER DEVELOPMENT DRAINAGE STUDY FOR THE
MCI DEVELOPMENT
COLORADO SPRINGS, COLORADO
April 1993**

Prepared for:

**GENSLER AND ASSOCIATES, ARCHITECTS
MCI**

Prepared by:

**KLH Engineering, Inc.
208 Sutton Lane
Colorado Springs, CO 80907
(719) 594-4200**

KLH
ENGINEERING, INC.

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April 20, 1993
KLH JN. 9154600

Mr. Dave Lethbridge
City of Colorado Springs
Engineering Division
30 South Nevada Avenue
Colorado Springs, CO 80903

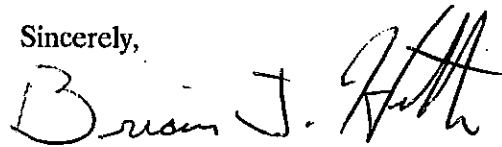
Re: Master Development Drainage Study for the MCI Development

Dear Dave:

In accordance with the subdivision regulations for the City of Colorado Springs, a Master Development Drainage Study has been completed for the above referenced project. The results of the study are included herein.

Please contact us if you have any questions or desire further information.

Sincerely,



Brian J. Huth, P.E.
KLH Engineering, Inc.

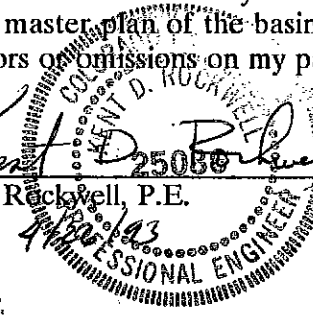
Enclosure
mci\mddp2.doc



DRAINAGE PLAN STATEMENTS
MCI - Master Development Drainage Plan

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/County for drainage reports and said report is in conformity with the master plan of the basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.


Kent D. Rockwell, P.E.
Kent D. Rockwell, P.E.

DEVELOPER'S STATEMENT:

I, the developer, have read and will comply with all the requirements in this drainage report and plan.

BY: Knall Kenner Date: 4/22/93

TITLE: SR. MANAGER

ADDRESS: 2424 GARDEN OF THE GODS RD.

COL. SPRINGS CO. 80919

CITY OF COLORADO SPRINGS

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

J. [Signature]
CITY ENGINEER

4/29/93

DATE

MCI
MASTER DEVELOPMENT DRAINAGE STUDY
April 1993

I. INTRODUCTION

This study, titled the "Master Development Drainage Study for the MCI Development", was authorized by MCI. This study has been prepared and submitted in conjunction with the approval process for this development, and fulfills the drainage and flood plain management requirements for the City of Colorado Springs.

Two Final Drainage Studies have been previously prepared for completed phases of the development. The approved "Drainage Study for the MCI Development, Phase No. 1", dated September 20, 1991, and the approved "Drainage Study for the MCI Development, Phase No. 5", dated July 12, 1992, by KLH preceded this study and are on file with the City of Colorado Springs. These MCI drainage studies will be referred to in this study as the "phase 1 study" and the "phase 5 study".

STUDY AREA DESCRIPTION

The site is located within the southeast quarter of section 22, Township 13 South, Range 67 West of the 6th P.M., City of Colorado Springs, El Paso County, Colorado (see Vicinity Map, Figure 1). The site is bounded on the west and south by unplatted/undeveloped land, on the north by Mountain Shadows Filings No. 2, 3 and 20 (single family residential) and on the east by Flying W Ranch Road and 30th Street. The site is located within Colorado Springs. The area is drained by South Douglas Creek and is zoned "Planned Industrial Park No. 1" (PIP-1).

In 1991, MCI acquired and began re-development of the Rolm facility which consisted of a 15 acre office park on a 61.26 acre site. At the time of this MDDP, MCI has acquired additional property to the south and west the original site consisting of approximately 61 acres.

SOILS DESCRIPTION

According to the Soil Survey of El Paso County, the underlying soils on the site consists of the Chaseville series (No. 16), Manvel series (No.50), the Midway series (No. 54) and the Penrose series (No. 64) (see Soils Map, Figure 2). These soil types fall within the hydrological groups A, C, D, and C/D, respectively.

DRAINAGE CRITERIA

The current City of Colorado Springs/El Paso County Drainage Criteria was utilized in the preparation of this study. Calculations were performed to determine the runoff quantities generated during the 10 year and 100 year frequency storms for both the historic and developed conditions. The Rational Method was used according to criteria for basins less than 100 acres.

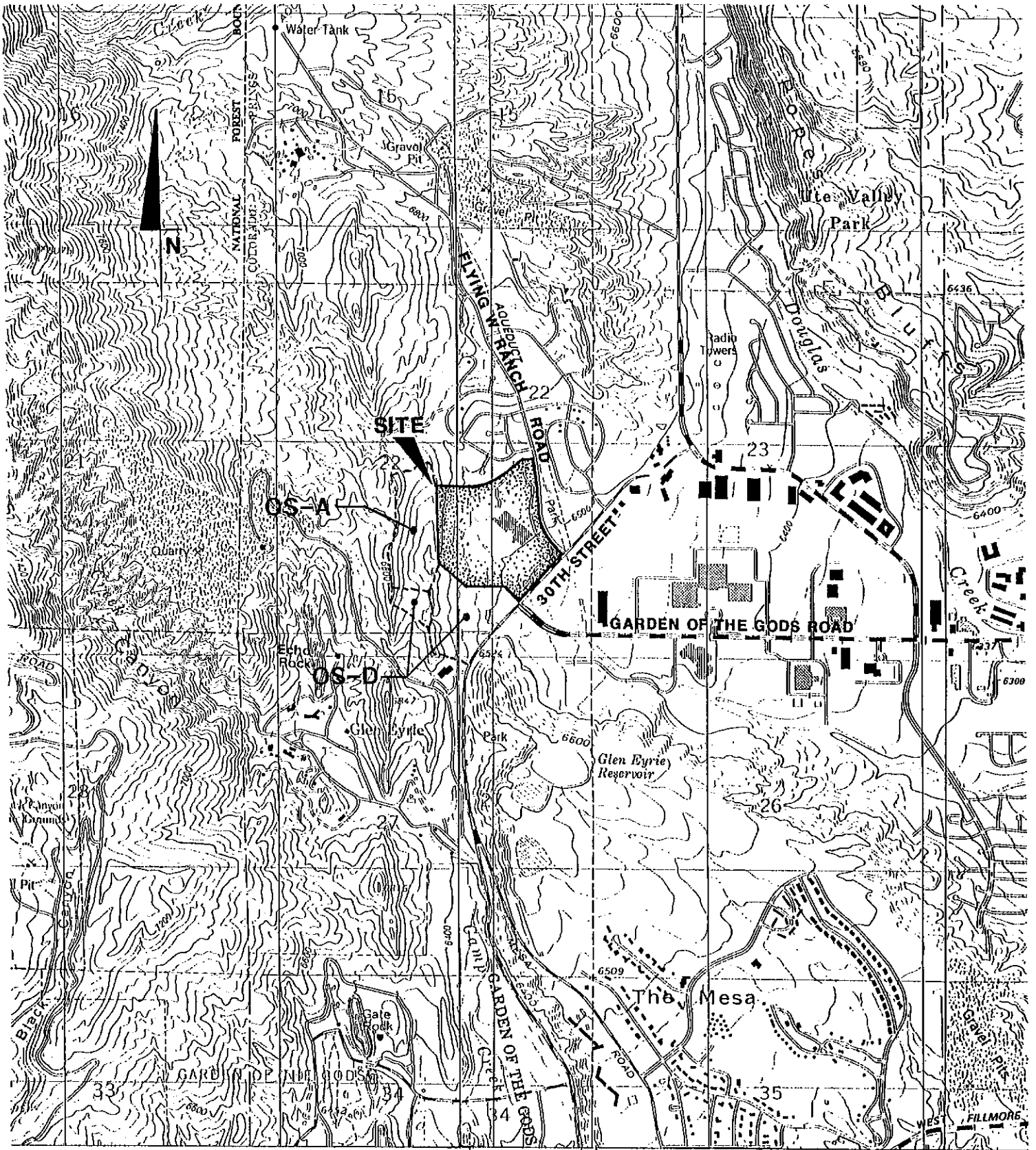
FLOOD PLAIN

Flood Insurance Rate Map (FIRM) Community Panel Number 080060 - 0145 B, indicates that no portion of this site is located within or adjacent to a flood hazard area.

SUMMARY OF DATA

The sources of information used in the development of this study are listed below:

1. City of Colorado Springs and El Paso County "Drainage Criteria Manual", October 1987.
2. Soil Survey for El Paso County, Colorado, U.S. Department of Agriculture, Soil Conservation Service, June 1980.
3. "Flood Insurance Studies for Colorado Springs and El Paso County, Colorado", prepared by the Federal Emergency Management Agency (FEMA), 1985.
4. "Preliminary and Final Drainage Report for Mountain Shadows Filing No. 20", prepared by URS Consultants, April 123 1989.
5. "Mountain Shadows Filing No. 1, Master Drainage Analysis", prepared by KKBNA, Inc., November 9, 1982.
6. "Mountain Shadows Filing No. 1, Drainage Report and Plan", prepared by Leigh Whitehead and Associates, September 12, 1980.
7. "Mountain Shadows Filing No. 2 and 3, Drainage Report and Plan", prepared by Leigh Whitehead and Associates, April 10, 1981.
8. "Drainage Report and Plan, Garden of the Gods Road Realignment", prepared by Leigh Whitehead and Associates, July 28, 1981.
9. "Drainage Study for the MCI Development, Phase No. 1", prepared by KLH Engineering, Inc., September 20, 1991.
10. "Drainage Study for the MCI Development, Phase No. 5", prepared by KLH Engineering, Inc., July 12, 1992.

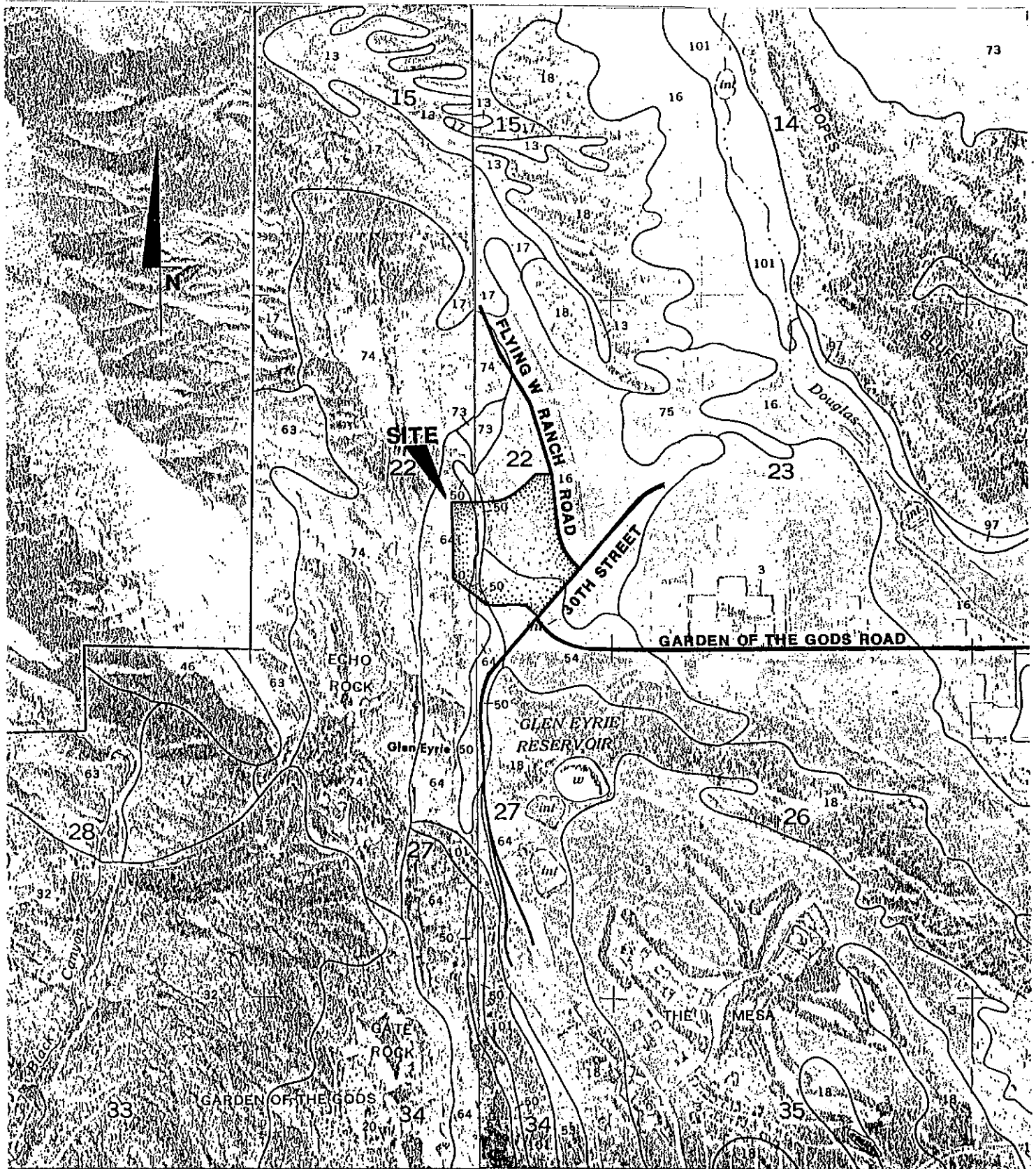


VICINITY MAP

SCALE: 1"=2000'

Off-Site Basins 

FIGURE 1



SOILS MAP

SCALE: 1"=2000'

FIGURE 2

II. HYDROLOGIC ANALYSIS

EXISTING DRAINAGE PATTERNS

ON-SITE FLOWS:

The terrain of the site slopes gently to the east with approximate slopes of three to twenty percent (3% - 20%) on the buildable portions of the site (see Existing Drainage Plan). The site is situated at the base of a hogback with the steep east face of the hogback located along the west side of the site. This hogback has slopes that reach 1.3h to 1v. The existing ground cover consists of sparse native grasses. The existing development consists of a 3-story building (2.6 acres), several parking lots and landscaping.

Phase 1 development has been completed and consists of the addition of buildings C+ and D and a new parking lot located west of the existing buildings and includes expansion of the existing west parking lot, (see the Phase 1 Drainage Study). Phase 5 is similar to Phase 1 with the addition of building F and adjacent parking.

For this MDDP, the existing condition represents the pre-phase 1 (pre 1991) construction, when just the original building and parking occupied the site.

For the historic condition runoff calculations, the site is described by fifteen on-site basins and four off-site basins (see Existing Drainage Plan, Exhibit 1). The existing basins are described with alphabetic designators (A, B, C, etc.). See Table 1, Historic Sub-basin Flow Summary, for more hydrologic sub-basin information.

The existing flows are discharged from the site at two primary locations. One is at the intersection of 30th Street and Garden of the Gods Road (South Outfall). The other is at the eastern most tip of the site (at the southwest corner of 30th Street and Flying W Ranch Road) (East Outfall).

South Outfall: Historic sub-basins; F, K, OS-A and OS-C flow to the low point located just northwest of the intersection of 30th Street and Garden of the Gods Road. This low point is drained by a 30 inch Reinforced Concrete Pipe (RCP) into a 42 inch RCP that continues east down Garden of the Gods Road to the South Douglas Creek drainage channel. The historic 10/100 year flows are 35/79 cubic-feet-per-second (cfs) to this low point. Basin OS-D (30.4 acres, 21/49 cfs) is south of the site and drains to the intersection of 30th Street and Garden of the Gods Road.

East Outfall: Basins; A through E, G, H, J, and L drain by way of surface and pipe flow to the sump area in the eastern parking lot. From here it crosses 30th Street in a 36 inch RCP and discharges into the South Douglas Creek drainage channel. The 10/100 year flows are 38/63 cfs.

Basin M along the north edge of the site drains directly into the existing concrete channel also running along the north edge of the site. This basin receives off-site flow from the rear half of house lots located adjacent to the north property line (OS-E). This drainage does not change due to the improvements proposed with this site. These basins were not analyzed in this study.

Basin N is direct flow onto Flying W Ranch Road. The two 15 foot inlets installed in Flying W Ranch Road will pick up any increase in flow due to the increased size of this basin. Basin P is direct flow onto 30th Street. Basin Q is a thin basin at the south west corner of the site which sheet flows off-site to the undeveloped land to the south.

OFF-SITE FLOWS:

Runoff from the "Hole-in-the-Wall" (Basin OS-A, 21/47 cfs), flows into the southwest corner of the site. This concentrated flow becomes sheet flow as it runs over a natural alluvial fan and continues to flow east to the sump in the southeast corner of the site.

Off-site basin B (OS-B), is a large (294 acres) area northwest of the site. This area is primarily national forest land but includes Mountain Shadows Filing No. 20 (MS Filing #20). This area discharges 484.6 cfs (100 year/2 hour), according to the MS Filing #20 drainage study (April, 1989). According to this study, Filing #20 drainage improvements will utilize the existing concrete channel along the north side of the site to its fullest extent. The improvements proposed for the MCI facility will not affect the hydrology or hydraulics associated with this channel and the drainage associated with this channel should not impact the MCI site unless a storm occurs with an intensity greater than a 100 year storm.

Off-site basin E (OS-E), is the rear half of the house lots adjacent to the north side of the site. This drains onto basin M as described above.

Off-Site basin C (OS-C), contains 1.6 acres of undeveloped land along the southeast side of the site. This sheet-flows onto basin F and is tributary to the low point at the south outfall.

PROPOSED DRAINAGE PATTERNS

North Outfall:

Phase 1 development, as described above, has been completed. Phase 5 is under construction (see the Developed Drainage Plan). The basins for the fully developed site will be described with numeric designators (1, 2, 3, etc.). See Table 2, Developed Sub-basin Flow Summary, for additional hydrologic basin information. The fully developed site will include two new building wings and parking to accommodate approximately 3000 vehicles.

A new storm sewer was installed with the Phase 1 improvements and was extended in the Phase 5 improvements. This system drains basins 9.1, 9.2, 14, 16, 17, 18 and 21. This discharges into the South Douglas Creek channel located north and east of Flying W Ranch Road. The connection to the channel is approximately 350 feet northeast of the main entrance to the site. The pipe was designed such that it would accommodate the 100 year flow. Building H was originally routed into the north outfall storm sewer, but it seems that the roof drains will more easily access the storm sewer in the reserve area so the south outfall system will also accommodate this building.

There have been two public 15 foot off-site inlets installed, one along each side of Flying W Ranch Road, that will utilize this north outfall storm sewer. The 10/100 year fully developed discharge from this site into the channel will be 57/101 cfs. It is estimated the two inlets in Flying W Ranch Road will collect about 30 cfs. This flow will be accommodated by upsizing the outfall pipe from a 42 inch to a 48 inch RCP. These two inlets in Flying W Ranch Road and the 48 inch RCP in the road Right-of-Way and in the park are public facilities. The remainder of this system is private.

East Outfall:

Drainage to the existing outfall area located at the east end of the east parking lot will be modified as a result of the existing phase 1 development and as a result of other parking lot improvements. This discharge point will lose basin D. Basin E will have a minor reduction in size and basin G will lose 75% of its area. Historic basin A will remain essentially the same. These changes will reduce the 10/100 year flows at this outfall from 38/63 to 29/48 cfs. No structural improvements are required for the 36" RCP outfall. The inlet at Design Point 11 will probably undergo modification.

South Outfall:

The "Garden of the Gods Road Realignment, Drainage Study" by Leigh Whitehead, July 1981, studied this area for the design of the storm sewer that was built from the intersection of Garden of the Gods Road (GG Road) and 30th Street to the South Douglas Creek Channel. That study limited the total amount of flow from the Rolm site to 40 cfs to allow the remaining pipe capacity to service the remaining tributary area.

MCI has acquired 61.16 acres in addition to the original 61.26 acre site. MCI now controls 76.4 acres (94%) of the total 81 acres tributary to the "South Outfall" location. The remaining 4.6 acres is along MCI's south boundary and is included in OS-D. This area is about 250' wide by 800' long and is situated along the steep face of a ridge. This area will be difficult to develop. A portion of this area drains directly to 30th Street. If developed, this 4.6 acre area will be able to drain to 30th Street and ultimately to the "South Outfall".

The flow patterns for the "south outfall" originate with the historic flows from basin OS-A (the "Hole-in-the-Wall"), as discussed above. MCI does not intend on developing this area. These flows will spill down a protected bank to the top end of the "loop road" and continue down the loop road to the Garden of the Gods entrance. A portion of this flow in the loop road will be captured in a driveway cut and conveyed through the "south parking lot". A sump inlet will capture the 100 year flows tributary to low point in the northeast corner of this south lot. The remainder of this flow will continue down the main entrance drive which is an extension of the Garden of the Gods Road. This entrance drive is at a 2 to 4% slope without any low points. Several on-grade inlets will be installed to capture the 100 year flow down this drive. There should not be any 100 year flow passing these inlets and continuing to 30th Street.

The "reserve area" located between the two proposed building wings will be drained with several grated area inlets. These inlets will capture the 10 year flows. The 100 year overflow will be conveyed in a wide shallow grassed swale. The roof flow from the east wing of the proposed building (buildings C, C+, E, and G) and building H will be piped to the system draining the reserve area.

This system will continue to the intersection of the loop road and the main entry drive where it will capture the remaining 100 year overflow. This 100 year flow will continue to the south outfall.

The 100 year storm from basin 27 (the south half of the east parking lot) will be captured in sump inlets and conveyed to the south outfall point. The parking lot scheme and final grading plan has not been prepared for this parking area, although, it has been determined that the south half of this parking lot can be conveyed to the south outfall without exceeding its capacity. At this stage in the development process it seems that this is the desired plan. In a previous analysis of the allowable tributary area to the east outfall, it was determined that this entire east parking lot could also drain to the east outfall if so required.

The total flows to this south outfall point (DP26.1) were increased from the historic flows of 52/117 cfs (96 acres) to the developed flows of 78/155 cfs (81 acres). This includes the on and off-site areas.

Downstream flow analysis:

The hydrologic or hydraulic properties of the two public 15 foot inlets added to the Phase 1 storm sewer (North Outfall) have not been analyzed. They were installed at the request of the city. These inlets should reduce the runoff draining to the inlets at the intersection of 30th Street and Flying W Ranch Road and the inlets at the low point in 30th Street. The hydrologic or hydraulic aspects of the flows in 30th Street or Flying W Ranch Road were not analyzed due to the fact that the MCI development did not increase flows to these streets relative to the previous Rolm site. This reduction of flows is a result of; 1) reduced area of direct runoff to the streets, 2) the installation of the phase 1 diversion storm sewer and 3) the maximization of the existing 36 inch RCP at the east outfall and the upsizing of the existing 30 inch RCP at the south outfall.

III. HYDRAULIC ANALYSIS

North Outfall:

The South Douglas Creek channel is concrete lined, has a 15' bottom-width, is 3.5 feet deep and has 1.5h:1v side slopes. The slope is 4.42%. Above the concrete on the west side of the channel is several feet of grass lined freeboard. According to the Mountain Shadows Filing 1 drainage report, prepared by Leigh Whitehead, the flow at the nearest design point below our outfall location is 1261 cfs. The channel will flow 2.07' deep with a velocity of 34 feet-per-second (fps) at this design flow. The full MCI development will discharge 101 cfs into the channel during the 100 year storm. Adding the 101 cfs flow to the 1261 cfs flow gives 1362 cfs. At this discharge rate the depth of flow in the South Douglas Creek channel will be 2.16' deep with a velocity of 35 fps. The required freeboard is 2.13'.

The storm sewer serving the north outfall of the MCI development, is designed to convey the 100 year fully developed flows. Reach 1, from the outfall at the channel to design point 14 (DP14), is designed for 101 cfs and would require a 42 inch RCP. For the additional flow generated by Flying W Ranch Road, a 48 inch RCP will be installed from the channel to the inlets in Flying W Ranch Road. Reach 2, from DP14 to DP16, will use a 42 inch RCP to convey the 100 year fully developed flow of 83 cfs. Reach 3, from DP16 to DP17, will use a 42 inch RCP to convey 65 cfs. From here, a 36 inch RCP will continue to DP18 for a flow of 41 cfs. The connection of the pipe into the channel incorporates a special transition design. An easement has been provided where the pipe crosses the park area, between the channel and Flying W Ranch Road.

East Outfall:

An existing storm sewer system tributary to the east outfall currently collects runoff from the loading dock area (basin 15), the roof of buildings A and B (basin 13), and the parking lots northeast and southeast of buildings A and B (basins 12 and 11). According to discussions with the facilities director for MCI, this system seems to be functioning properly. From the combination curb-opening/grated inlet at the low point of basin 11, a 36 inch RCP conveys these flows to the South Douglas Creek channel. The discharge point is located just east of 30th Street. Two pipes drain into the combination inlet, a 30 inch RCP from basins 12, 13 and 15 and a 36 inch RCP stub that extends southwest approximately 230 feet.

The flows to this outfall have slightly decreased from 38/63 cfs existing condition to 29/48 cfs developed condition. This change is a result of a decrease in tributary area from 18.7 acres to 11.6 acres, primarily from the loss of basin D and E and the reduction of basin G. The 36 inch outfall pipe can pond to top of curb with 5.9 feet of head. The pipe capacity is 70 cfs based on entrance conditions. The outlet pipe is 230 feet long with an average slope of 2.4%, allowing about 103 cfs of flow. The controlling capacity is 70 cfs, therefore this existing system has 100 year capacity.

South Outfall:

The southern portion of the site is currently drained by a 30 inch RCP which connects into the Garden of the Gods storm sewer. The existing inlet is located in a well defined sump which can produce 7.5 feet of headwater which can accommodate about 60 cfs. The historic flow to this point is 35/79 cfs while upon development of the site the total design flow to the south outfall area will be 78/155 cfs (including the historic flow from the "Hole-in-the-Wall"). This 100 year flow will be captured in private inlets within the site.

The private inlets and private laterals from the South Outfall area of MCI that connect to the 42" RCP will be sized in the final phased drainage studies. This connection will be made at the junction box in the intersection of 30th Street and Garden of the Gods Road where the 42" RCP starts. This junction box has three receiving pipes (a 30" RCP from the northwest, a 18" RCP from the west and a 30" RCP from the southwest) and one 42" RCP discharge pipe to the east. The existing 8' and 4' sump D-10-R inlets in 30th Street contribute no more than 36 cfs to this system. This inlet flow enters the 42" RCP about 50 feet downstream of the junction box and should not impact the hydraulics in the junction box. The 42" RCP has additional capacity at this connection.

The Mannings capacity of this 42" RCP is 205 cfs (minimum design slope = 4.16%). The headwater depth to this 42" RCP is 11.3' to the manhole rim which allows 140 cfs (square headwall) or 165 cfs (grooved entrance). The entrance of this 42" RCP will be modified to accommodate a grooved entrance condition. This existing system has available capacity for the 100 year flow from the tributary area west of 30th Street with 10 cfs to spare.

A small portion of the undeveloped runoff from the 4.6 acre area south of MCI drains directly onto 30th Street. This will remain unchanged and will be tributary to the low point of 30th Street.

IV. EROSION CONTROL PLAN

GENERAL DESCRIPTION

The objectives of this plan are to analyze the drainage characteristics of the site and to provide necessary designs so as to prevent damage to adjacent properties due to sediment, or storm water runoff and to regulate the on-site effects of erosion. The specific erosion control improvements will be provided in each of the final phased drainage studies. This study will present the general methods to be used to control erosion.

STRUCTURAL EROSION CONTROL

Structural erosion control in the form of hay-bale dams will be provided at locations of concentrated flow to provide temporary sediment control.

NON-STRUCTURAL EROSION CONTROL

Non-Structural erosion control would be accomplished by reseeding the disturbed portions of the site.

APPENDIX

HYDROLOGIC AND HYDRAULIC DESIGN INFORMATION

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	I	SOIL GROUP	DEV. TYPE	C	FLOW		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	q _p	
	A		2.592			5.2	6.0 9.0	A	PARKING LOT & LANDSCAPING	.76 .82		12 19	10 100
	B		0.804			5.4	5.9 8.8	A	"	.74 .80		3.5 5.7	
	C		1.339			10.4	4.5 6.9	A	"	.64 .71		3.9 6.6	
	D		3.339			22	3.3 4.8	A	"	.78 .85		8.6 13.6	
	E		4.219			22.7	3.2 4.8	A	"	.43 .51		5.8 10.3	
	F		35.260			42.1	2.2 3.3	A, C, D	RANGE	.30 .45		23 52	
	G		3.560			16.4	3.75 5.7	A	NATURAL & LEADING DRAIN	.41 .50		5.5 10.1	
	H		2.614			5	6.0 9.0	~	ROOF	.90 .95		14 22	
	J		NOT USED										
	K		2.124			19.4	3.45 5.2	A	NATURAL & GRASS	.25 .35		1.8 3.9	
	L		0.247			6.4	5.4 8.3	A	DRIVE & LANDSCAPE	.45 .53		0.6 1.1	
	M		1.224						LANDSCAPE CHANNEL			NA	
	N		1.852						LANDSCAPE ALONG F.W.R.			NA	
	P		1.157						LANDSCAPE ALONG 30 TH ST			NA	
	Q		0.253			15.4	3.85 5.8	C	RANGE	.30 .45		0.3 0.7	
	R		NOT USED										

HYDROLOGIC COMPUTATION - BASIC DATA
RATIONAL METHOD Q=CIA

PAGE 1 of 2

KLF Engineering Consultants, Inc.
PROJECT: MCI - MDOP

By: BJH
Date: 9-6-91

- HISTORIC SUB-BASIN FLOW SUMMARY

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	I	SOIL GROUP	DEV. TYPE	C	FLOW		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	q _p	
	S	NOT USED											10 100
	T												
	U												
	W												
	Y												
	Z												
	OS-A		26			31.1	2.7 4.05	C,D	PASTURE	.30 .45		21 47	
	OS-B	FLOW TO CONC. CHANNEL FROM N.										SEE TEXT	
	OS-C		1.626 ✓			17	3.7 5.6	D	PASTURE	.30 .45		1.8 4.1	
	OS-D		30.4 ✓			32.3	2.3 3.6	C,D	PASTURE	.30 .45		21 49	
	OS-E		1.807						RESIDENTIAL LN OF SITE			NA	
	D.P.-A	SUB:A SUB:E	6.811			22.7	3.2 4.8	A	PARKING LANDSCAPING	.55 .63		12 21	
	D.P.-A-TOTAL	SUBS: A,B,C,D E,G,H,L	18.71			22.7	3.2 4.8	A	PARKING LANDSCAPING ROOF	.63 .70		38 63	
	D.P.-F	SUBS: F K OS-A OS-C	65.01			61.1	1.8 2.7	C,D	RANGE	.30 .45		35 79	✓

HYDROLOGIC COMPUTATION -- BASIC DATA
RATIONAL METHOD Q=CIA

PAGE 2 of
2

KLH Engineering Consultants, Inc.
PROJECT: MCI-MDDP

By: BTH
Date: 9-6-91

HISTORIC SUB-BASIN FLOWS, CONT'D

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	l	SOIL GROUP	DEV. TYPE	C	FLOW		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	q _p	
<u>EAST OUTFALL:</u>													
	11		5.73			12.4	4.25 6.4	AC/D	ROOFS PARKING LANDSCAPING	.51 .59		12 22	10 100
	12		2.39			11.4	4.5 6.8		"	.64 .71		6.9 11.5	
	13		2.61			5.0	6.0 9.0		ROOF	.90 .95		14.1 22.4	
	15		0.89			12.4	4.3 6.4		PARKING LANDSCAPING	.67 .74		2.5 4.1	
	DP11	DP12 D11	11.61			15	3.9 5.85		ROOF PARKING LS	.64 .71		29 48	
	DP12	D12 B13 B15	5.88			14.2	4.0 6.0		"	.76 .82		18 29	

MAJOR BASIN	SUB BASIN	AREA		BASIN		Tc Min.	I	SOIL GROUP	DEV. TYPE	C	FLOW		RETURN PERIOD
		PLANIMETER READING	Ac.	LENGTH	HEIGHT						Q	q _p	
SOUTH OUTFALL:													
	22												10 100
	23		1.8			18.7	3.5 5.3	C/D	OPENSACE	.30 .45		1.9 4.3	
	24		4.5			18.4	3.5 5.3	"	"	.30 .45		4.7 10.7	
	25		29.7			20.2	3.4 5.1	A/C/D	OPENSACE PARKING	.40 .53		40 80	
	26		1.6			9.1	4.7 7.2	A/C/D	OPENSACE STREET	.59 .69		4.4 8.0	
	27		7.5			11.6	4.4 6.6	A/C/D	LANDSCAPE PARKING	.75 .82		25 41	
	DP 24	D24 OS-A	30.5			34.6	2.5 3.8	C/D	OPENSACE	.30 .45		23 52	
	DP 25	D25 DP24	52.7 (10YR) (INCLUDES 90% OF DP24) 45.0 (100YR) " " 50% " "			37.4	2.4 3.6	A/C/D	OPENSACE PARKING	.35 .50		48 81	
	DP 26	D22, 23, 26 DP24 OS-A	33.7 AC (100YR) (INCLUDES 50% OF DP24)			37.4	2.4 3.6	C/D	OPENSACE ROOFS STREETS	.37 .51		30 62	
	DP26.1	D22, 23 24, 25, 26, 27, OSA	81			37.4	2.4 3.6	A/C/D	OPENSACE ROOF PARKING	.40 .53		78 155	