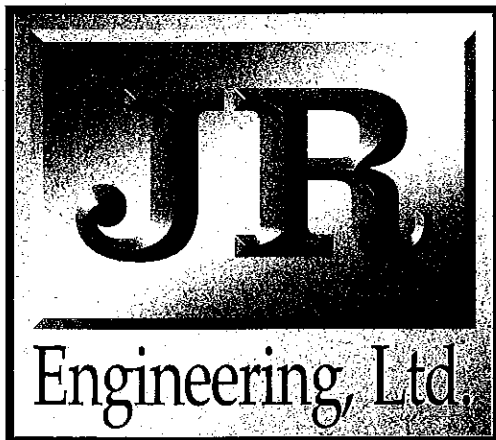


**MASTER DEVELOPMENT
DRAINAGE PLAN (MDDP)
FOR
MOUNTAIN SHADOWS
CENTENNIAL CORRIDOR**



~~RETURN WITHIN 2 WEEKS TO:
CITY OF COLORADO SPRINGS
STORM WATER & SUBDIVISION
101 W. COSTILLA, SUITE 113
COLORADO SPRINGS, CO 80903
(719) 385-5979~~

RETURN WITHIN 2 WEEKS TO:
CITY OF COLORADO SPRINGS
SUBDIVISION ENGINEERING
30 SOUTH NEVADA AVE., SUITE 702
COLORADO SPRINGS, CO 80903
(719) 385-5979

JR Engineering, Ltd.

4935 North 30th Street
Colorado Springs, Colorado 80919
(719) 593-2593 • FAX (719) 528-6613
www.jreng.com

MASTER DEVELOPMENT DRAINAGE PLAN (MDDP) FOR MOUNTAIN SHADOWS CENTENNIAL CORRIDOR

August 1998
Revised September 1998

Prepared For:

SCHUCK COMMUNITIES, INC.
2 North Cascade Avenue, Suite 1280
Colorado Springs, CO 80903
(719) 633-4500

Prepared By:

JR ENGINEERING, LTD.
4935 North 30th Street
Colorado Springs, CO 80919
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Job No. 8503.51

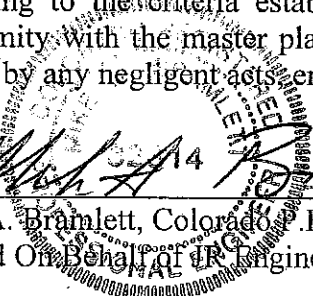
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MASTER DEVELOPMENT DRAINAGE PLAN (MDDP) FOR MOUNTAIN SHADOWS CENTENNIAL CORRIDOR DRAINAGE REPORT STATEMENT

ENGINEER'S STATEMENT:

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


Mike A. Bramlett
Mike A. Bramlett, Colorado P.E. No. 32314
For and On Behalf of JR Engineering, Ltd.

10/5/98
Date

DEVELOPER'S STATEMENT:

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

Business Name: Ute Valley LLC, by
Schuck Communities, Inc., as manager

By: Walter Schuck

Title: Pres.

Address: 2 North Cascade Avenue, Suite 1280

Colorado Springs, CO 80903

CITY OF COLORADO SPRINGS ONLY:

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

W.R. Johnson
City Engineer

10/9/98
Date

Conditions:

**MASTER DEVELOPMENT DRAINAGE PLAN (MDDP)
FOR
MOUNTAIN SHADOWS CENTENNIAL CORRIDOR**

TABLE OF CONTENTS

Purpose	Page 1
General Description	Page 1
Existing Drainage Conditions	Page 2
Proposed Drainage Characteristics	Page 2
Hydrologic Calculations	Page 6
Erosion Control Plan	Page 7
Floodplain Statement	Page 7
Construction Cost Opinion	Page 7
Drainage and Bridge Fees	Page 7
Summary	Page 8
References	Page 9

APPENDIX

VICINITY MAP

S.C.S. SOIL MAP

F.E.M.A. FLOODPLAIN MAP

HYDROLOGIC CALCULATIONS

DRAINAGE MAP

**MASTER DEVELOPMENT DRAINAGE PLAN (MDDP)
FOR
MOUNTAIN SHADOWS CENTENNIAL CORRIDOR**

PURPOSE

This document is the Master Development Drainage Plan for Mountain Shadows Centennial Corridor. The purpose of this report is to identify the area tributary to the proposed site, major drainageways, culverts, storm drain systems, and inlets. This report will analyze overall routing for developed flows based upon the current Concept Plan and specify outfall locations to discharge stormwater runoff. This report does not attempt to size or locate the minor storm facilities due to the unknown nature of the development within the individual basins. At the time of Development Plan, a Preliminary Drainage Report will be submitted which addresses drainage requirements.

GENERAL DESCRIPTION

Centennial Boulevard is located in Section 14, 15, and 16, Township 13 South, Range 67 West of the Sixth Principal Meridian in the City of Colorado Springs, El Paso County, Colorado. The proposed corridor in this report lies along the Centennial Boulevard improvements beginning at the north edge of Mountain Shadows Filing No. 28 and terminating just south of Wickes Road. Mountain Shadows Centennial Corridor is within the Douglas Creek Drainage Basin.

The proposed development in this corridor is part of the Mountain Shadows Master Planned Community. Chuckwagon Road is to be extended from the existing intersection of Centennial Boulevard and Mule Deer Road west to Wilson Road. Atherton Way will also be extended from its existing intersection with Centennial Boulevard west and intersect the proposed Chuckwagon Road (see map). Land uses in this proposed development include single-family residential, office, commercial, research and development, community, park, and open space.

EXISTING DRAINAGE CONDITIONS

The soils within the western drainage basin and along Centennial Boulevard consist of Bresser (Soil Unit #13), Chaseville (Soil Unit #16 and #17), and Chaseville Part (Soil Unit #18), as outlined in the SCS Soil Survey for El Paso County. These soil units lie within Hydrologic Soil Groups 'A' and 'B'. These soil groups have high infiltration rates and low to moderately low runoff potential.

Approximately 227-acres of land along the western side of Centennial Boulevard drain into Centennial Boulevard at various locations. Developments that are currently in place in the western Centennial Boulevard corridor include Mountain Shadows Filing No. 28, Mountain Shadows Filing No. 24, Vantage Heights at Mountain Shadows Filing No. 1, Mountain Shadows Filing No. 35, and Mountain Shadows Filing No. 27. All of these developments are single-family residential and are currently in place or under construction. The rest of the land to the west of Centennial Boulevard is currently undeveloped. This drainage flows east into the existing Centennial Boulevard and during large storm events flows will overtop the road and cause flooding problems to the east.

Existing conditions to the east of the Centennial Boulevard corridor include Pinon Valley Filing No. 7, Pinon Valley Filing No. 6, and Westlink Filing No. 2. These developments are currently in place or under construction. The drainage from these areas is picked up by existing storm drain systems that convey the flow into Douglas Creek.

PROPOSED DRAINAGE CONDITIONS

The development of land on the west side of Centennial Boulevard will require installation of storm drain improvements. The size and location of future storm drain systems is contingent upon the specific characteristics of each of the proposed developments. One plan for improvements along the future Chuckwagon Road can be found in the "Final Drainage Report for Mountain Shadows Commercial Filing No. 1," prepared by JR Engineering, Ltd. in November 1994. These improvements will function to convey the proposed flows east to Centennial Boulevard and into two main outfall systems in this area, the outfall in Mule Deer Drive and the outfall in Atherton Way.

Mule Deer Outfall System

The outfall in Mule Deer Drive consists of an existing 36" R.C.P. and an existing 48" R.C.P. Both discharge into Douglas Creek. This system will convey developed flows from Basin A, B, C, and D (see map).

Basin A is a 12.8-acre of open space, landscaping, buildings, paved parking lots, and paved roads. This basin produces flows of $Q_5 = 26.8$ cfs and $Q_{100} = 52.6$ cfs at Design Point 1. The site slopes east toward Centennial Boulevard. A 36" R.C.P. stub from Centennial Boulevard has been provided for storm water runoff (see map). A proposed on-site storm drain system will route flows from this basin to the existing 36" R.C.P. stub. This existing 36" R.C.P. storm drain runs to the north in Centennial Boulevard to Design Point 2.

Design Point 2 is the outlet for Basin B. Basin B consists of open space, landscaping, buildings, paved parking lots, and paved roads. Flows of $Q_5 = 28.6$ cfs and $Q_{100} = 57.6$ cfs travel by sheet flow and a proposed storm drain system to Design Point 2. Design Point 2 is an existing 30" R.C.P. storm drain stub from Centennial Boulevard. This 30" R.C.P. stub combines with the 36" R.C.P. from Design Point 1 and yields combined flows of $Q_5 = 49.6$ cfs and $Q_{100} = 100.0$ cfs. This flow travels north in an existing 42" R.C.P. in Centennial Boulevard to Design Point 3.

Design Point 3 is the outlet for Basin C. Basin C consists of open space, landscaping, buildings, paved parking lots, and paved roads. The stub provided at Design Point 3 is an existing 42" R.C.P. An on-site storm sewer system will be required to convey runoff ($Q_5 = 53.8$ cfs and $Q_{100} = 114.4$ cfs) to this existing 42" R.C.P. stub. The existing 42" R.C.P. combines with the existing 42" R.C.P. from Design Point 2 and existing 14' and 25' inlets in Centennial Boulevard to produce a combined flow of $Q_5 = 118.0$ cfs and $Q_{100} = 240.1$ cfs. This combined flow is carried by an existing 48" R.C.P. east in Mule Deer Drive to Douglas Creek.

This storm drain system was sized according to the "Final Drainage Report for Centennial Boulevard (1500-ft South of Mule Deer North to Wickes)," prepared by JR Engineering, Ltd. in April 1997. This previous report anticipated the combined flow at Mule Deer Drive to be $Q_5 = 119.6$ cfs and $Q_{100} = 254.2$ cfs and proposed a 48" R.C.P. to carry this flow to Douglas Creek. The flows calculated in this report ($Q_5 = 118.0$ cfs and $Q_{100} = 240.1$ cfs) correspond to the actual concept plan and do not exceed the flows used to size the existing storm drain system.

Basin D consists of 11.3-acres of open space, landscaping, buildings, paved parking lots, and paved roads. Flows in this basin ($Q_5 = 23.7$ cfs and $Q_{100} = 46.4$ cfs) will be routed via a proposed storm drain system to Design Point 4. Design Point 4 is an existing 30" R.C.P. stub. This stub is connected to the existing 36" R.C.P. outfall in Mule Deer. Flows from Design Point 4 combine with flows from the existing 27' inlet in Centennial Boulevard for a total of $Q_5 = 26.9$ cfs and $Q_{100} = 51.9$ cfs. The existing 36" R.C.P. was sized according to the "Final Drainage Report for Centennial Boulevard (1500-ft South of Mule Deer North to Wickes)," prepared by JR Engineering in April 1997. This previous report predicted flows of $Q_5 = 28.6$ cfs and $Q_{100} = 55.5$ cfs within the existing 36" R.C.P. Flows calculated according to the current concept plan ($Q_5 = 26.9$ cfs and $Q_{100} = 51.9$ cfs) do not exceed the flows used to size the existing storm drain system.

Atherton Outfall System

The Atherton Outfall System consists of an existing 60" R.C.P. and an existing 36" R.C.P. Both discharge into Douglas Creek. This system will convey developed flows from Basins E, F, G, H, OS-1, Mountain Shadows Filing No. 35, and Mountain Shadows Filing No. 27 (see map).

Basin E consists of open space, landscaping, buildings, paved parking lots, and paved roads including the proposed Chuckwagon Road. Chuckwagon Road is proposed to extend from the intersection of Atherton Way and Centennial Boulevard west to Wilson Road (see map). A proposed storm drain system in the proposed Chuckwagon Road will be required to carry flows from Basin E and developed flows from Basin OS-1, Mountain

Shadows Filing No. 27, and Mountain Shadows Filing No. 35. Flows generated by Mountain Shadows Filing No. 27 ($Q_5 = 24$ cfs and $Q_{100} = 44$ cfs) were calculated in the "Preliminary and Final Drainage Report for Mountain Shadows Filing No. 27," prepared by JR Engineering, Ltd. in August of 1993. Flows generated by Mountain Shadows Filing No. 35 ($Q_5 = 34$ cfs and $Q_{100} = 70$ cfs) were calculated in the "Final Drainage Report for Mountain Shadows Filing No. 35," prepared by JR Engineering, Ltd. in July of 1997. Once the proposed storm drain system in Chuckwagon Road is connected to the existing 36" R.C.P. outlet for Mountain Shadows Filing No. 35, then the existing temporary detention pond is to be removed (Design Point 35). The total combined peak flow generated by this basin ($Q_5 = 102.5$ cfs and $Q_{100} = 226.9$ cfs) will be conveyed by a proposed storm drain system in the proposed Chuckwagon Road to Design Point 5. Design Point 5 is an existing 42" R.C.P. stub. Flow in this existing stub combines with flow from the existing 14' inlet in Centennial Boulevard for a total of $Q_5 = 103.9$ cfs and $Q_{100} = 229.4$ cfs. This existing 60" R.C.P. outfall was sized in the "Final Drainage Report for Centennial Boulevard (1500-ft South of Mule Deer North to Wickes)," prepared by JR Engineering, Ltd. in April 1997. This previous report calculated combined flows in the 60" R.C.P. outfall to $Q_5 = 107.2$ cfs and $Q_{100} = 222.2$ cfs. Flows calculated from the Concept Plan ($Q_5 = 103.9$ cfs and $Q_{100} = 229.4$ cfs) do not exceed the flows used to size the existing storm drain system by enough to adversely affect the system.

Basin H is 8.1-acres of mostly open space and the playing fields of the adjacent elementary school property. Development of this basin is already in place. The drainage from this basin ($Q_5 = 10.9$ cfs and $Q_{100} = 23.2$ cfs) is routed to Design Point 8. Design Point 8 is an existing 30" R.C.P. stub. This leads to an existing 30" storm drain system traveling south in Centennial Boulevard to Design Point 7.

Design Point 7 is the existing 30" R.C.P. stub outlet for Basin G. Basin G is 16.1-acres of open space and zoned multi-family residential area. Developed flows from this basin are anticipated to be $Q_5 = 29.3$ cfs and $Q_{100} = 59.4$ cfs. These flows will be routed via a proposed storm drain system to Design Point 7. The existing 30" R.C.P. stub of Design

Point 7 combines with the flows from Design Point 8 for a total of $Q_5 = 38.1$ cfs and $Q_{100} = 77.7$ cfs in an existing 34" x 53" HE R.C.P. This existing storm drain continues south in Centennial Boulevard to Design Point 6.

Design Point 6 is the outlet for Basin F. Basin F is mostly zoned multi-family residential land and some open space. Anticipated developed flows of $Q_5 = 17.2$ cfs and $Q_{100} = 34.6$ cfs will be collected in a proposed storm drain system and connect to the existing 30" R.C.P. stub at Design Point 6. This flow combines with the flow from Design Point 7 and the existing 27" inlet in Centennial Boulevard for a total flow of $Q_5 = 64.0$ cfs and $Q_{100} = 128.4$ cfs.

The existing 36" R.C.P. outfall in Atherton Way was sized by the "Final Drainage Report for Centennial Boulevard (1500-ft South of Mule Deer North to Wickes)," prepared by JR Engineering, Ltd. in April 1997. This previous report predicted flows of $Q_5 = 57.9$ cfs and $Q_{100} = 129.2$ cfs within the existing 36" R.C.P. Flows calculated according to the current Concept Plan ($Q_5 = 64.0$ cfs and $Q_{100} = 128.4$ cfs) do not exceed the flows used to size the existing storm drain system enough to have an adverse impact. Upon final development within the Corridor the Final Drainage Report(s) will need to describe how developed flows will be routed to the appropriate outfall facilities in Centennial Boulevard.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and 1994. The Rational Method was used to estimate storm water runoff anticipated from design storms with 5-year and 100-year recurrence intervals.

EROSION CONTROL

The City of Colorado Springs Drainage Criteria Manual specifies that an Erosion Control Plan and associated cost estimate be submitted in conjunction with the Final Drainage Report. We respectfully request the Erosion Control Plan be submitted in conjunction with the Overlot Grading Plan and construction assurances posted prior to obtain the grading permit for each individual development within the Concept Plan.

FLOODPLAIN STATEMENT

No portion of this site is within a designated F.E.M.A. floodplain as determined by Flood Insurance Rate Map Community Panel Numbers 080060-s11F, effective March 17, 1997. See the Appendix for a Floodplain Information Map, which shows the location of the site of the proposed Mountain Shadows Centennial Corridor.

CONSTRUCTION COST OPINION

Private Drainage Facilities

There are no specific private drainage facilities designed for this Concept Plan. Assurances for drainage facilities should be posted for specific developments in accordance with the Final Drainage Report for that development.

DRAINAGE AND BRIDGE FEES

This area lies within Douglas Creek Drainage Basin boundaries. When parcels within the Concept Plan are platted then the fees and/or credits are due prior to plat recordation. Prior to issuance of building permits, appropriate private storm system assurances will need to be posted.

SUMMARY

Runoff from the proposed Mountain Shadows Centennial Corridor will be routed via proposed storm drain systems to the existing storm drain system in Centennial Boulevard. This existing storm drain system was sized to account for developed flows from the Mountain Shadows Centennial Corridor as well as Mountain Shadows Filing No. 27, Mountain Shadows Filing No. 35, and other off-site basins and open space areas. Runoff calculations for the proposed concept plan in Mountain Shadows Centennial Corridor verify that proposed development will not exceed the capacity of the existing storm drain system in Centennial Boulevard, and therefore, will not adversely impact surrounding developments.

The final drainage reports for specific developments within the Mountain Shadows Centennial Corridor Concept Plan must not exceed their allotted flows as calculated by this report. These specific developments must also route the runoff from their site to the existing stub in Centennial Boulevard as dictated by the basin layout in this report. The allotted flows for a specific development should be determined as follows:

$$\frac{\text{(Area of specific site) [\%]}}{\text{(Total planned development within basin)}} = \frac{\text{(Allotted discharge from specific) site [\%]}}{\text{(Total peak flow from developed area within basin)}}$$

PREPARED BY:



Chad D. Kuzbek, E.I.
Design Engineer II
Land Development
For and On Behalf of JR Engineering, Ltd.

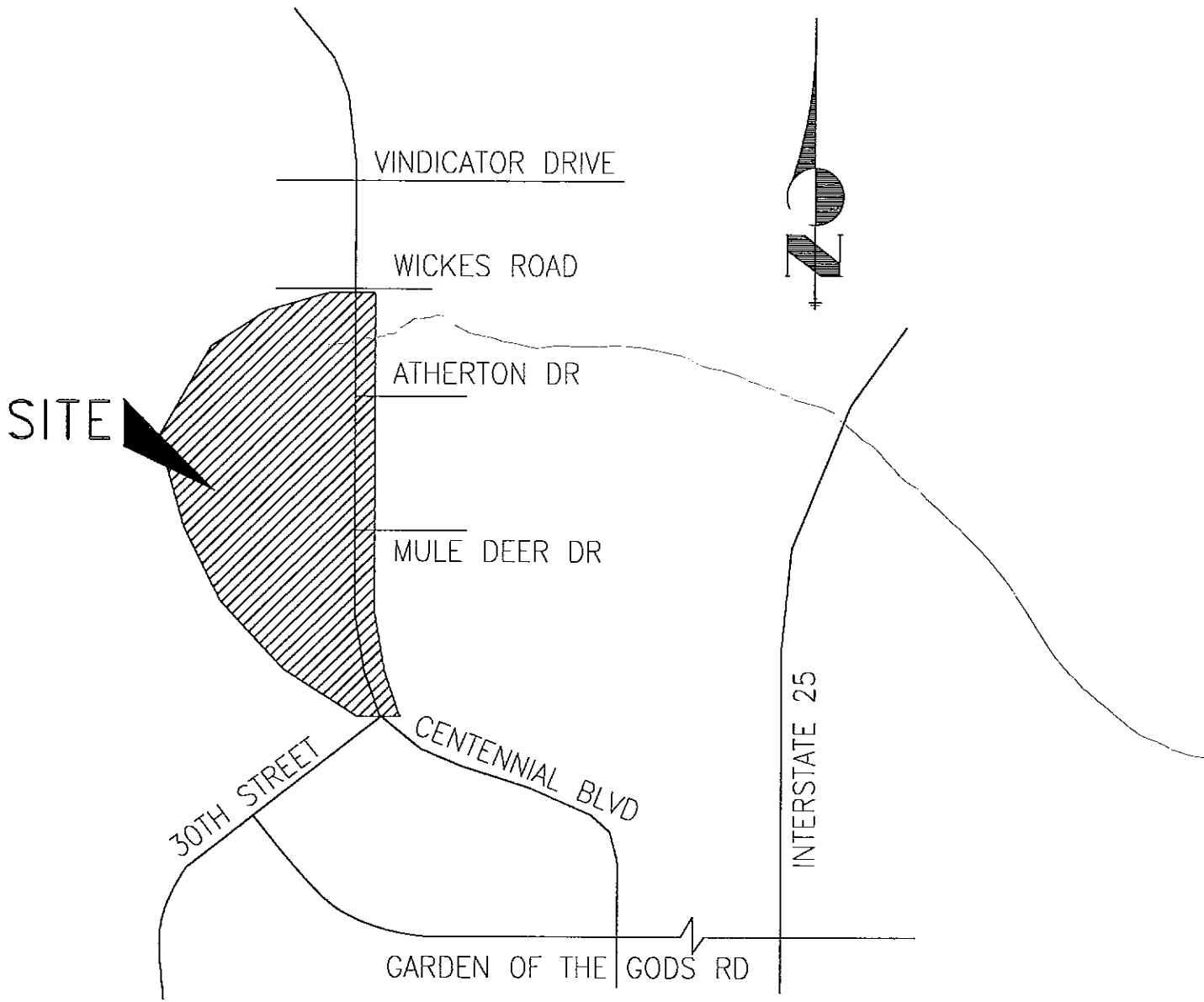
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REFERENCES

1. City of Colorado Springs/County of El Paso Drainage Criteria Manual, dated November 1991.
2. "Soil Survey for El Paso County Area," Soil Conservation Service.
3. "Final Drainage Report for Centennial Boulevard (1500-ft South of Mule Deer North to Wickes)," prepared by JR Engineering, Ltd., April 1997.
4. "Preliminary/Final Drainage Report for Mountain Shadows Commercial Filing No. 1," prepared by JR Engineering, Ltd., November 1994.
5. "Preliminary and Final Drainage Report for Mountain Shadows Filing No. 24," prepared by URS, March 27, 1992.
6. "Preliminary and Final Drainage Report for Mountain Shadows Filing No. 27," prepared by JR Engineering, Ltd., August 1993.
7. "Final Drainage Report for Mountain Shadows Filing No. 35," prepared by JR Engineering, Ltd., July 1997.
8. "Preliminary/Final Drainage Report for Mountain Shadows Filing No. 28," prepared by JR Engineering, Ltd., July 1993

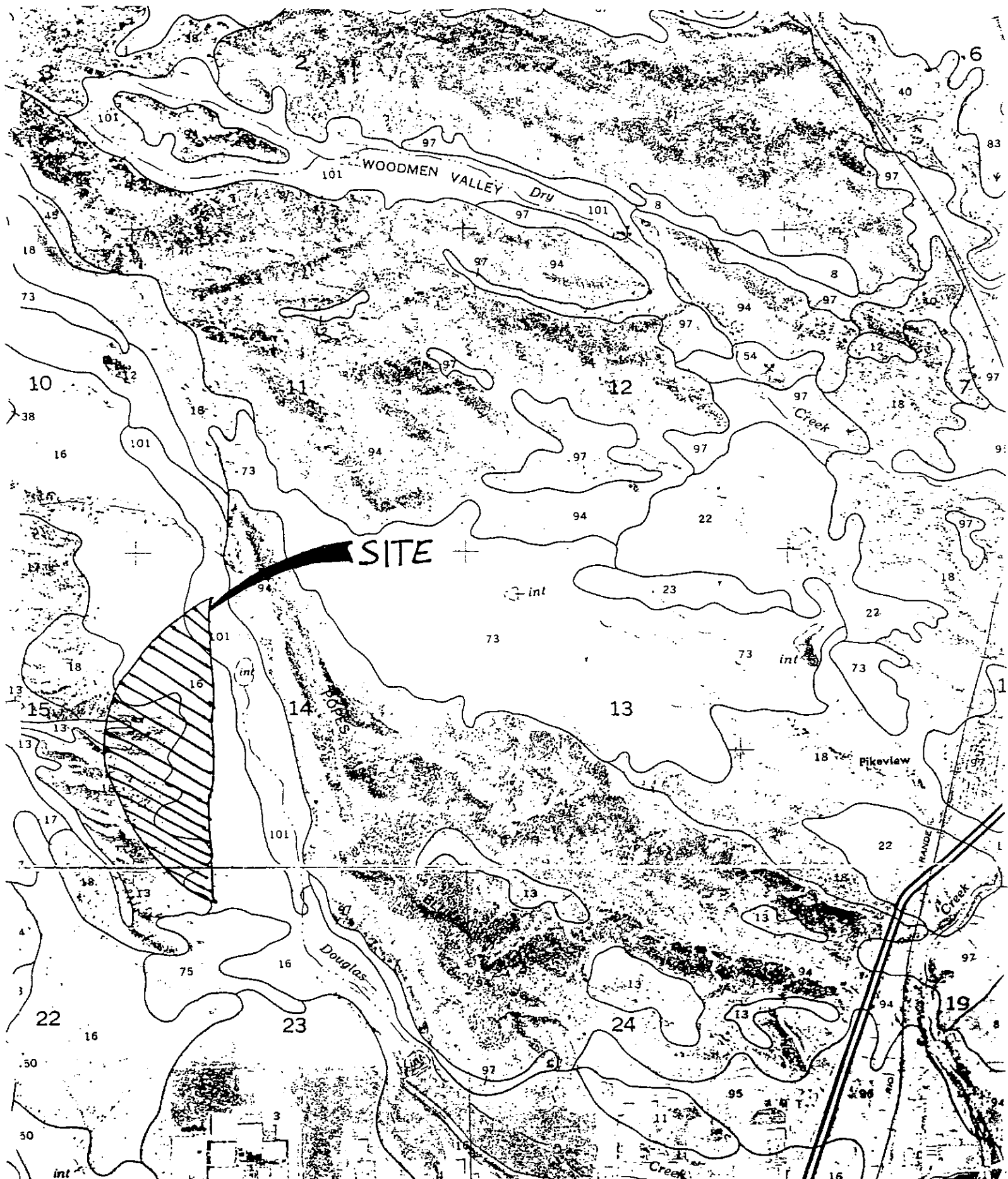
APPENDIX

VICINITY MAP



VICINITY MAP
N.T.S.

S.C.S. SOIL MAP



F.E.M.A. FLOODPLAIN MAP

HYDROLOGIC CALCULATIONS

Rational Method: Q=CIA [cfs]

Sub-Basin Design Pt.	Area [ac.]	Composite Runoff Coef, C				Time of Concentration, Tc [min.]					Intensity, I [in/hr]		Peak Flows, Q [cfs]		
		Surface	%Area	Value	Product	Flowline	L [ft.]	S [%]	v [ft/s]	Tc [min.]	5-yr	100-yr	5-yr	100-yr	
<u>A</u> 1	12.8	open-space	30	0.25	0.08	overland	300	13.0		11.7					
		developed	70	0.70	0.49	street	850	6.5	8.92	1.6					
		*C ₁₀₀ = 0.65			C ₁₀ = 0.57	Total Tc = 13.3					3.7	6.3	26.8	52.6	
<u>B</u> 2	16.7	open-space	40	0.25	0.10	overland	300	12.0		12.0					
		developed	60	0.70	0.42	street	1500	4.0	7.00	3.6					
		*C ₁₀₀ = 0.61			C ₁₀ = 0.52	Total Tc = 15.6					3.3	5.7	28.6	57.6	
<u>C</u> 3	45.1	open-space	70	0.25	0.175	overland	300	6.7		14.6					
		developed	30	0.70	0.21	street	2250	14.0	13.10	2.9					
		*C ₁₀₀ = 0.47			C ₁₀ = 0.39	Total Tc = 17.5					3.1	5.4	53.8	114.4	
<u>D</u> 4	11.3	open-space	30	0.25	0.08	overland	300	18.0		10.5					
		developed	70	0.70	0.49	street	1000	4.0	7.00	2.4					
		*C ₁₀₀ = 0.65			C ₁₀ = 0.57	Total Tc = 12.9					3.7	6.3	23.7	46.4	
<u>OS-1</u> OS1	6.7	comm.	75	0.70	0.53	overland	50	10.0		5.2					
		roadway	25	0.90	0.23	street	400	4.0	7.00	1.0					
		*C ₁₀₀ = 0.83			C ₁₀ = 0.75	Total Tc = 6.2					5.0	8.6	25.1	47.8	
												Combined Peak Flow =			
												S(C _n A _n)I _m =		n/a	n/a

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4935 NORTH 30TH STREET
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Project: Mountain Shadows Centennial Corridor

Job No.: 8503.51

Date: 8/7/98

Engineer: Chad Kuzbek

Page: 1 of 4

Rational Method: Q=CIA [cfs]

Sub-Basin Design Pt.	Area [ac.]	Composite Runoff Coef, C				Time of Concentration, Tc [min.]					Intensity, I [in/hr]		Peak Flows, Q [cfs]		
		Surface	%Area	Value	Product	Flowline	L [ft.]	S [%]	v [ft/s]	Tc [min.]	5-yr	100-yr	5-yr	100-yr	
<u>E</u> 5	42.5	open-space	65	0.25	0.16	overland	300	10.0		12.8					
		developed	35	0.70	<u>0.25</u>	street	1200	6.0	8.57	<u>2.3</u>					
		*C ₁₀₀ = 0.49		C ₁₀ = 0.41		Total Tc = 15.1					3.4	5.9	58.9	123.5	
<u>F</u> 6	10.0	open-space	40	0.25	0.10	overland	300	11.0		12.4					
		developed	60	0.70	<u>0.42</u>	street	1600	5.5	8.21	<u>3.2</u>					
		*C ₁₀₀ = 0.61		C ₁₀ = 0.52		Total Tc = 15.6					3.3	5.7	17.2	34.6	
<u>G</u> 7	16.1	open-space	40	0.25	0.10	overland	300	12.0		12.0					
		developed	60	0.70	<u>0.42</u>	street	1000	7.5	9.59	<u>1.7</u>					
		*C ₁₀₀ = 0.61		C ₁₀ = 0.52		Total Tc = 13.8					3.5	6.1	29.3	59.4	
<u>H</u> 8	8.1	open-space	70	0.25	0.18	overland	300	10.0		12.8					
		developed	30	0.70	<u>0.21</u>	street	630	6.3	8.78	<u>1.2</u>					
		*C ₁₀₀ = 0.47		C ₁₀ = 0.39		Total Tc = 14.0					3.5	6.1	10.9	23.2	
		open-space		0.25	0.00	overland		1.0		0.0					
		developed		0.70	<u>0.00</u>	street		1.0	3.50	<u>0.0</u>					
		*C ₁₀₀ = 0.09		C ₁₀ = 0.00		Total Tc = 0.0							0.0	0.0	
Combined Peak Flow =															
S(C _n A _n)I _m =												n/a		n/a	

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Project: Mountain Shadows Centennial Corridor

Job No.: 8503.51 Date: 8/7/98
 Engineer: Chad Kuzbek Page: 2 of 4

Rational Method Flow Routing

Basin	Design Point	A [acres]	C ₅	C ₁₀₀	CA ₍₅₎	CA ₍₁₀₀₎	Tc [min]	I ₅ [in/hr]	I ₁₀₀ [in/hr]	Combined Peak Flow	
										Q ₅ [cfs]	Q ₁₀₀ [cfs]
A	1	12.8	0.57	0.65	7.32	8.35	13.3			22.7	45.1
B	2	16.7	0.52	0.61	8.68	10.18	15.6			49.6	100.0
C	3	45.1	0.39	0.47	17.58	21.18	17.5	3.1	5.4	104.1	214.4
Cent. 1	ex inlets	5.0	0.90	0.95	4.50	4.75	9.4			118.0	240.1
Combined Peak Flow in 48" RCP in Mule Deer Dr. =										118.0	240.1
Allowable Peak Flow =										<u>119.6</u>	<u>254.2</u>
Difference (actual - allow) =										(-) 1.6 ✓	(-) 14.1 ✓
D	4	11.32	0.57	0.65	6.45	7.36	12.9	3.7	6.3	23.9	46.4
Cent. 2	ex inlet	0.92	0.90	0.95	0.83	0.87	7.7			26.9	51.9
Combined Peak Flow in 36" RCP in Mule Deer Dr. =										26.9	51.9
Allowable Peak Flow =										<u>28.6</u>	<u>55.5</u>
Difference (actual - allow) =										(-) 1.7 ✓	(-) 3.6 ✓

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 Engineer: Chad Kuzbek

Date: 8/10/98
 Page: 3 of 4

Rational Method Flow Routing

Basin	Design Point	A [acres]	C ₅	C ₁₀₀	CA ₍₅₎	CA ₍₁₀₀₎	T _c [min]	I ₅ [in/hr]	I ₁₀₀ [in/hr]	Combined Peak Flow	
										Q ₅ [cfs]	Q ₁₀₀ [cfs]
OS-1	OS1	6.7	0.75	0.77	5.03	5.16	3.1			12.1	22.2
MS #27	27	14.6	0.50	0.60	7.30	8.76	22.3			29.6	59.9
MS #35	35	31.6	0.41	0.57	12.96	18.01	28.0	2.4	4.3	60.7	137.3
E	5	42.5	0.41	0.49	17.43	20.83	15.1			102.5	226.9
Cent. 3	ex inlet	0.6	0.90	0.95	0.57	0.60	5.0			103.9	229.4
Combined Peak Flow in 60" RCP in Atherton Way =										103.9	229.4
Allowable Peak Flow =										<u>107.2</u>	<u>222.2</u>
Difference (actual - allow) =										(-) 3.3 √	(+) 7.2
H	8	8.1	0.39	0.47	3.16	3.81	14.0			10.4	21.7
G	7	16.1	0.52	0.61	8.37	9.82	13.8			38.1	77.7
F	6	10.0	0.52	0.61	5.22	6.12	15.6	3.3	5.7	55.3	112.6
Cent. 4	ex inlet	2.93	0.90	0.95	2.64	2.78	9.4			64.0	128.4
Combined Peak Flow in 36" RCP in Atherton Way =										64.0	128.4
Allowable Peak Flow =										<u>57.9</u>	<u>129.2</u>
Difference (actual - allow) =										(+) 6.1	(-) 0.8 √

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Project: Mountain Shadows Centennial Corridor

Job No.: 8503.51
 Engineer: Chad Kuzbek

Date: 8/10/98
 Page: 4 of 4

DRAINAGE MAP