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File FPP-1996-174 Name: Entrada Townhomes II – Rana Road and Ridge Circle Drive

Present	Scanned	
		A few items are denoted with an asterisk (*), which means they are to be scanned for permanent record on the ISYS retrieval system. In some instances, items are found on the list but are not present in the scanned electronic development file because they are already scanned elsewhere on the system. These scanned documents are denoted with (**) and will be found on the ISYS query system in their designated categories. Documents specific to certain files, not found in the standard checklist materials, are listed at the bottom of the page. Remaining items, (not selected for scanning), will be listed and marked present. This index can serve as a quick guide for the contents of each file.
X	X	**Table of Contents**
		***Review Sheet Summary**
X	X	***Application form**
X		Review Sheets
X		Receipts for fees paid for anything
X	X	***Submittal checklist**
X	X	***General project report**
		Reduced copy of final plans or drawings
X		Reduction of assessor's map.
		Evidence of title, deeds, easements
X	X	***Mailing list to adjacent property owners**
		Public notice cards
		Record of certified mail
X	X	Legal description
		Appraisal of raw land
		Reduction of any maps – final copy
		***Final reports for drainage and soils (geotechnical reports)**
		Other bound or non-bound reports
		Traffic studies
X	X	***Review Comments**
X	X	***Petitioner's response to comments**
X	X	***Staff Reports**
		***Planning Commission staff report and exhibits**
		***City Council staff report and exhibits**
		***Summary sheet of final conditions**

DOCUMENT DESCRIPTION:

X		Declaration of Covenants, Conditions and Restrictions-Bk 2342/Pg 741	X	X	Utility Coordinating Approval – 12/11/96
X	X	Correspondence	X	X	Final Inspection Checklist – 7/14/97
X	X	Final Drainage Report – 6/28/96	X	X	Certification of Plat – 7/18/97
X		Warranty Deed – Bk 1147 / Pg 466	X	X	Planning Clearance - ** - issued 7/28/97
X	X	Final Drainage Calculations	X	X	Entrada Townhouses II Plat – GIS Historical Maps - **
X		Articles of Incorporation – Bk 2342/Pg 747			
X		Agreement – not completed			
X	X	Development Improvements Agreement - ** - Released 12/30/02			
X	X	Subsurface Soils Exploration – 8/1/96			
X		Posting of Public Notice Signs – 8/2/196			
X	X	Planning Commission Minutes – 9/3/96 - **			
X		Fill Density Tests			

DEVELOPMENT APPLICATION

Community Development Department
250 North 5th Street, Grand Junction, CO 81501
(303) 244-1430

Receipt _____
Date _____
Rec'd By _____

File No. _____

We, the undersigned, being the owners of property situated in Mesa County, State of Colorado, as described herein do hereby petition this:

PETITION	PHASE	SIZE	LOCATION	ZONE	LAND USE
☒ Subdivision Plat/Plan	☐ Minor ☒ Major ☒ Resub	3.6 ACRE	Rana Road & Ridge Cir Dr	PR-4	Townhome
☐ Rezone				From: To:	
☒ Planned Development	☐ ODP ☐ Prelim ☒ Final				
☐ Conditional Use					
☐ Zone of Annex					
☐ Variance					
☐ Special Use					
☐ Vacation					☐ Right-of Way ☐ Easement
☐ Revocable Permit					

☒ PROPERTY OWNER	☒ DEVELOPER	☒ REPRESENTATIVE
ENTRADA TOWNHOUSES LTD.	ENTRADA TOWNHOUSES LTD.	CRISTOPHER CARUSO
Name	Name	Name
200 EAST MAIN STREET	200 EAST MAIN STREET	200 EAST MAIN STREET
Address	Address	Address
ASPEN, CO 81611	ASPEN, CO 81611	ASPEN, CO 81611
City/State/Zip	City/State/Zip	City/State/Zip
(970) 925-2122	(970) 925-2122	(970) 925-2122
Business Phone No.	Business Phone No.	Business Phone No.

NOTE: Legal property owner is owner of record on date of submittal.

We hereby acknowledge that we have familiarized ourselves with the rules and regulations with respect to the preparation of this submittal, that the foregoing information is true and complete to the best of our knowledge, and that we assume the responsibility to monitor the status of the application and the review comments. We recognize that we or our representative(s) must be present at all required hearings. In the event that the petitioner is not represented, the item will be dropped from the agenda, and an additional fee charged to cover rescheduling expenses before it can again be placed on the agenda.

X _____ 7/24/96
Signature of Person Completing Application — Date

X _____ 7/24/96
Signature of Property Owner(s) - attach additional sheets if necessary — Date

SUBMITTAL CHECKLIST

Separate check to Colorado Hydrological Survey - $295

MAJOR SUBDIVISION: FINAL

Location: Ridge Project Name: Estrada Townhomes

Date Received 8-1-96

Receipt # 4376

File # FPP-96-174

ITEMS DESCRIPTION	SSID REFERENCE	● City Community Development	● City Dev. Eng.	● City Utility Eng.	● City Property Agent	● City Parks/Recreation	● City Fire Department	● City Attorney	● City G.J.P.C. (8 sets)	O City Downtown Dev. Auth.	● City Police	● County Planning	O County Building Department	~~● County Surveyor~~	O Walker Field	● School Dist. #51	● Irrigation District Midland	O Drainage District WSP	O Water District	O Sewer District	● U.S. West	● Public Service	~~● CVFPD~~ Ridge ACC	O CDOT	O Corps of Engineers	● Colorado Geologic Survey	● U.S. Postal Service	~~● Persigo WWTF~~ City Sanitation	● TCI Cable			TOTAL REQ'D.
● Application Fee $740 + $15/acre	VII-1	1																													
● Submittal Checklist*	VII-3	1																													
● Review Agency Cover Sheet*	VII-3	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
● Application Form*	VII-1	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
● Reduction of Assessor's Map	VII-1	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
● Evidence of Title	VII-2	1			1			1																							
O Appraisal of Raw Land	VII-1	1			1	1																									
● Names and Addresses*	VII-2	1																													
● Legal Description*	VII-2	1			1																										
O Deeds	VII-1	1			1			1																							
O Easements	VII-2	1	1	1	1			1													1	1	1						1		
O Avigation Easement	VII-1	1			1			1							1																
O ROW	VII-2	1	1	1	1			1													1	1	1						1		
● Covenants, Conditions & Restrictions	VII-1	1	1					1																							
O Common Space Agreements	VII-1	1	1					1																							
● County Treasurer's Tax Cert.	VII-1	1																													
● Improvements Agreement/Guarantee*	VII-2	1	1	1				1																							
O CDOT Access Permit	VII-3	1	1																												
O 404 Permit	VII-3	1	1																												
O Floodplain Permit*	VII-4	1	1																												
● General Project Report	X-7	1	1	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1		
● Composite Plan	IX-10	1	2	1	1																										
● 11"x17" Reduction Composite Plan	IX-10	1				1	1	1	8	1	1	1	1				1	1	1	1	1	1	1	1	1	1		1	1		
● Final Plat	IX-15	1	2	1	1	1	1	1	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
● 11"X17" Reduction of Final Plat	IX-15	1							8	1	1	1			1	1	1	1	1	1	1	1	1				1		1		
● Cover Sheet	IX-11	1	2																												
● Grading & Stormwater Mgmt Plan	IX-17	1	2															1							1	1			1		
● Storm Drainage Plan and Profile	IX-30	1	2															1			1	1	1						1		
● Water and Sewer Plan and Profile	IX-34	1	2	1			1												1	1	1	1	1					1	1		
● Roadway Plan and Profile	IX-28	1	2															1													
● Road Cross-sections	IX-27	1	2																												
● Detail Sheet	IX-12	1	2																												
● Landscape Plan	IX-20	2	1	1					8																						
● Geotechnical Report	X-8	1	1																							1					
O Phase I & II Environmental Report	X-10,11	1	1																												
● Final Drainage Report	X-5,6	1	2															1													
O Stormwater Management Plan	X-14	1	2															1							1						
O Sewer System Design Report	X-13	1	2	1																1											
O Water System Design Report	X-16	1	2	1															1												
O Traffic Impact Study	X-15	1	2																					1							
● Site Plan	IX-29	1	2	1	1		1		8																						

NOTES: * An asterisk in the item description column indicates that a form is supplied by the City.

FPP-96-174

Eagle Crest LLC
759 Horizon Dr.
Grand Junction, CO 81506

James Pulsipher
526 Tiara Dr.
Grand Junction, CO 81503

Jean Wilson
419 ½ Prospectors Pt.
Grand Junction, CO 81503

Richard Provenza
1043 Rowland Ave.
Camarillo, CA 93010

Ronald Hedrick
412 ½ Prospectors Pt.
Grand Junction, CO 81503

Barbara Courtney
417 Prospectors Pt.
Grand Junction, CO 81503

Bill Marsh
192 Edlund Rd.
Grand Junction, CO 81503

Steven Harkness
415 Prospectors Pt.
Grand Junction, CO 81503

Robert Bennett
847 Garnet Ave.
Delta, CO 81416

Carl Tenpas
413 Prospectors Pt.
Grand junction, CO 81503

Helen Boothe
411 ½ Prospectors Pt.
Grand Junction, CO 81503

Marvin Stevenson
411 Prospectors Pt.
Grand Junction, CO 81503

Deena Fimbres
1111 Horizon Dr., #112
Grand Junction, CO 81506

Mark Reeves
2369 ½ Rana Rd.
Grand Junction, CO 81503

Dynamic Investments Inc.
391 ½ Hillyiew Dr.
Grand Junction, CO 81503

Thomas Rolland
870 Gambels Rd.
Grand Junction, CO 81505

Bruce Beechwood
2373 Ridge Circle Dr.
Grand Junction, CO 81503

Carson Ince
2371 Ridge Circle Dr.
Grand Junction, CO 81503

Diana Birdashaw
2369 ½ Ridge Circle Dr.
Grand Junction, CO 81503

Carol Swingle
392 ½ Ridge Circle Dr.
Grand Junction, CO 81503

Jose Trevino
396 Ridge Circle Dr.
Grand Junction, CO 81503

Raymond Haag
393 ½ Valley View Way
Grand Junction, CO 81503

Stephen C Ward
395 Valley View Way
Grand Junction, CO 81503

Gregory Monger
2379 Ridge Circle Dr.
Grand Junction, CO 81503

Randy Schwartz
2377 Ridge Circle Dr.
Grand Junction, CO 81503

Donald Castle
396 Valley View Way
Grand Junction, CO 81503

Patrick William Hanley
2383 Ridge Circle Dr.
Grand Junction, CO 81503

John Korbe
2385 Ridge Circle Dr.
Grand Junction, CO 81503

Mark Abbott
399 W Valley Circle
Grand Junction, CO 81503

PRE-APPLICATION CONFERENCE

Date: 7/12/96
Conference Attendance: Kathy L., Trevor Brown
Proposal: Zone
Location: Entrada

Tax Parcel Number: 2945-174-24-
Review Fee: _____
(Fee is due at the time of submittal. Make check payable to the City of Grand Junction.)

Additional ROW required? _____
Adjacent road improvements required? _____
Area identified as a need in the Master Plan of Parks and Recreation? _____
Parks and Open Space fees required? _____ Estimated Amount: _____
Recording fees required? _____ Estimated Amount: _____
Half street improvement fees/TCP required? _____ Estimated Amount: _____
Revocable Permit required? _____
State Highway Access Permit required? _____
On-site detention/retention or Drainage fee required? _____

Applicable Plans, Policies and Guidelines _____

Located in identified floodplain? FIRM panel # _____
Located in other geohazard area? _____

Located in established Airport Zone? Clear Zone, Critical Zone, Area of Influence? _____
Avigation Easement required? _____

While all factors in a development proposal require careful thought, preparation and design, the following "checked" items are brought to the petitioner's attention as needing special attention or consideration. Other items of special concern may be identified during the review process.

O Access/Parking	O Screening/Buffering	O Land Use Compatibility
O Drainage	O Landscaping	O Traffic Generation
O Floodplain/Wetlands Mitigation	O Availability of Utilities	O Geologic Hazards/Soils

O Other _____
Related Files: _____

It is recommended that the applicant inform the neighboring property owners and tenants of the proposal prior to the public hearing and preferably prior to submittal to the City.

PRE-APPLICATION CONFERENCE

WE RECOGNIZE that we, ourselves, or our representative(s) must be present at all hearings relative to this proposal and it is our responsibility to know when and where those hearings are.

In the event that the petitioner is not represented, the proposed item will be dropped from the agenda, and an additional fee shall be charged to cover rescheduling expenses. Such fee must be paid before the proposed item can again be placed on the agenda. Any changes to the approved plan will require a re-review and approval by the Community Development Department prior to those changes being accepted.

WE UNDERSTAND that incomplete submittals will not be accepted and submittals with insufficient information, identified in the review process, which has not been addressed by the applicant, may be withdrawn from the agenda.

WE FURTHER UNDERSTAND that failure to meet any deadlines as identified by the Community Development Department for the review process may result in the project not being scheduled for hearing or being pulled from the agenda.

Signature(s) of Petitioner(s)

Signature(s) of Representative(s)

Timothy M Grimsby
397 W Valley Circle
Grand Junction, CO 81503

Dennis T Hepting
395 ½ W Valley Circle
Grand Junction, CO 81503

Stanley E Schroder
395 W Valley Circle
Grand Junction, CO 81503

John H Crawford
393 W Valley Circle
Grand Junction, CO 81503

Robert Van Iderstine
513 Tiara Dr.
Grand Junction, CO 81503

Karl Topper
394 Valley View Way
Grand Junction, CO 81503

Larry Catt
1090 7th Ave. NW, #5
Hickory, NC 28601

Barbara Gadeken
398 W Valley Circle
Grand Junction, CO 81503

Holly Effajane Starbuck
396 W Valley Circle
Grand Junction, CO 81503

Daniel Mason
394 W Valley Circle
Grand Junction, CO 81503

Dale N Smith
397 Ridges Blvd.
Grand junction, CO 81503

Smith M McCuistion
398 N Dale Ct.
Grand Junction, CO 81503

Dos Padres Development, Inc.
640 S 12th St.
Grand junction, CO 81501

Christopher Caruso
Entrada Townhouses Ltd.
200 East Main Street
Aspen, CO 81611

Rolland Engineering
405 Ridges Blvd.
Grand Junction, CO 81503

City of Grand Junction
Community Development Dept.
250 N 5th St.
Grand Junction, CO 81501

FPP-96-174

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2385 Ridge Circle Dr.
Grand Junction, CO 81503

Mark Abbott
399 W Valley Circle
Grand Junction, CO 81503

EAGLE CREST LLC
759 HORIZON DR
GRAND JUNCTION, CO 81506-8737

JAMES D PULSIPHER
526 TIARA DR
GRAND JUNCTION, CO 81503-9762

JEAN A WILSON
419 1/2 PROSPECTORS PT
GRAND JUNCTION, CO 81503

RICHARD A PROVENZA
1043 ROWLAND AVE
CAMARILLO, CA 93010-4568

RONALD E HEDRICK
412 1/2 PROSPECTORS PT
GRAND JUNCTION, CO 81503-1580

BARBARA Y COURTNEY
417 PROSPECTORS PT
GRAND JUNCTION, CO 81503-1576

BILL MARSH
192 EDLUN RD
GRAND JUNCTION, CO 81503-3224

STEVEN L HARKNESS
415 PROSPECTORS PT
GRAND JUNCTION, CO 81503-1576

ROBERT J BENNETT
847 GARNET AVE
DELTA, CO 81416-2216

CARL G TENPAS
413 PROSPECTORS PT
GRAND JUNCTION, CO 81503-1527

HELEN E BOOTHE
411 1/2 PROSPECTORS PT
GRAND JUNCTION, CO 81503-1527

MARVIN D STEVENSON
411 PROSPECTORS PT
GRAND JUNCTION, CO 81503-1527

DEENA R FIMBRES
1111 HORIZON DR APT 112
GRAND JUNCTION, CO 81506-1452

MARK F REEVES
2369 1/2 RANA RD
GRAND JUNCTION, CO 81503-1585

DYNAMIC INVESTMENTS INC
391 1/2 HILLVIEW DR
GRAND JUNCTION, CO 81503-4606

THOMAS D ROLLAND
870 GAMBELS RD
GRAND JUNCTION, CO 81505-8618

DYNAMIC INVESTINC
391 1/2 HILLVIEW DR
GRAND JUNCTION, CO 81503-4606

BRUCE R BEECHWOOD
2373 RIDGE CIRCLE DR
GRAND JUNCTION, CO 81503-1641

CARSON INCE
2371 RIDGE CIRCLE DR
GRAND JUNCTION, CO 81503-1641

DIANA R BIRDASHAW
2369 1/2 RIDGE CIRCLE DR
GRAND JUNCTION, CO 81503-1641

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GRAND JUNCTION, CO 81503-4613

JOSE E TREVINO
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393 1/2 VALLEY VIEW WAY
GRAND JUNCTION, CO 81503-1656

STEPHEN C WARD
395 VALLEY VIEW WAY
GRAND JUNCTION, CO 81503-1656

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GRAND JUNCTION, CO 81503-1641

RANDY J SCHWARTZ
2377 RIDGE CIRCLE DR
GRAND JUNCTION, CO 81503-1641

DONALD R CASTLE
396 VALLEY VIEW WAY
GRAND JUNCTION, CO 81503-1657

PATRICK WILLIAM HANLEY
2383 RIDGE CIRCLE DR
GRAND JUNCTION, CO 81503-1625

JOHN KORBE
2385 RIDGE CIRCLE DR
GRAND JUNCTION, CO 81503-1625

MARK ABBOTT
399 W VALLEY CIR
GRAND JUNCTION, CO 81503-4624

TIMOTHY M GRIMSBY
397 W VALLEY CIR
GRAND JUNCTION, CO 81503-4624

DENNIS T HEPTING
395 1/2 W VALLEY CIR
GRAND JUNCTION, CO 81503-4624

STANLEY E SCHRODER
395 W VALLEY CIR
GRAND JUNCTION, CO 81503-4624

JOHN H CRAWFORD
393 W VALLEY CIR
GRAND JUNCTION, CO 81503-4624

ROBERT M VAN IDERSTINE
513 TIARA DR
GRAND JUNCTION, CO 81503-8735

KARL F TOPPER
394 VALLEY VIEW WAY
GRAND JUNCTION, CO 81503-1657

LARRY W CATT
1090 7TH AVE NW APT 5
HICKORY, NC 28601-3471

BARBARA L GADEKEN
398 W VALLEY CIR
GRAND JUNCTION, CO 81503-4622

HOLLY EFFAJANE STARBUCK
396 W VALLEY CIR
GRAND JUNCTION, CO 81503-4622

DANIEL C MASON
394 W VALLEY CIR
GRAND JUNCTION, CO 81503-4622

DALE N SMITH
397 RIDGES BLVD
GRAND JUNCTION, CO 81503-4630

DYNAMIC INVESTMENTS INC
391 1/2 HILLVIEW DR
GRAND JUNCTION, CO 81503-4606

SMITH M MCCUISTION
398 N DALE CT
GRAND JUNCTION, CO 81503-1664

DOS PADRES DEVELOPMENT, INC
640 S 12TH ST
GRAND JUNCTION, CO 81501-3750

FINAL DRAINAGE REPORT
FOR
ENTRADA TOWNHOUSES SUBDIVISION

PREPARED FOR:
THE FLEISHER COMPANY, INC.
200 EAST MAIN STREET
ASPEN, CO 81611

PRESENTED TO:
THE CITY OF GRAND JUNCTION

ROLLAND ENGINEERING

---

405 RIDGES BLVD., SUITE A
GRAND JUNCTION, CO 81503
(970)-243-8300

ROLLAND ENGINEERING

405 RIDGES BOULEVARD, SUITE A
GRAND JUNCTION, COLORADO 81503
(970) 243-8300

JUNE 28, 1996

Ms. Jody Kliska
Development Engineer
City of Grand Junction
Public Works Department
250 North 5th St
Grand Junction, CO 81501

RE: FINAL DRAINAGE REPORT FOR ENTRADA TOWNHOUSES SUBDIVISION

Dear Jody;

Enclosed you will find the Final Drainage Report for ENTRADA TOWNHOUSES SUBDIVISION. Drainage computations for 2-Year and 100-Year design storms were performed for this report.

Please call us if you have any questions or need any additional information. Thank you very much for your time and consideration regarding this report.

Respectfully submitted

ROLLAND ENGINEERING

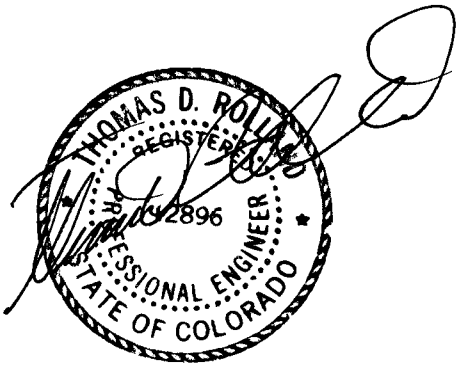
WEI LI; EIT

Enclosures

I HEREBY CERTIFY THAT THIS REPORT (PLAN) FOR THE FINAL DRAINAGE

DESIGN OF "ENTRADA TOWNHOUSES SUBDIVISION" WAS PREPARED UNDER MY DIRECT SUPERVISION.

REGISTERED PROFESSIONAL ENGINEER
STATE OF COLORADO,NUMBER 12896



FINAL DRAINAGE REPORT
FOR
ENTRADA TOWNHOUSES SUBDIVISION

PREPARED FOR:
THE FLEISHER COMPANY, INC.
200 EAST MAIN ST.
ASPEN, CO 81611
(970)-925-2122

PREPARED BY:

ROLLAND ENGINEERING
405 RIDGES BLVD., SUITE A
GRAND JUNCTION, CO 81503
JUNE 28, 1996

TABLES OF CONTENTS

ENTRADA TOWNHOUSES SUBDIVISION

GENERAL LOCATION AND DESCRIPTIONS

Entrada Townhouses Subdivision is an approximate 3.60 acres site located at Lot 1 in Block 9 of Ridges Filing Number Two, Grand Junction, Colorado. The project site is bounded on the south by Ridge Circle Drive, the west by Rana Road, and the north by a natural channel along the northern boundary of the site. The east property line is approximately 300 feet west of Ridges Blvd. The property to the north is the City of Grand Junction open space. The property to the south and west is development residential property. There is approximately 2.5 acres of developed and undeveloped commercial lots between the eastern property line and Ridges Blvd..

The site slopes generally north and east with slopes ranging from 3% to 10%. Vegetation consists of natural grasses, weeds and shrubs. The site has soils consisting of a Mesa Gravelly Clay Loam (Me) derived from mainly from old alluvium deposits, a Rough Broken Land, Mesa, Chipeta, and Persayo Soil Materials (Rr) derived from weathered Mancos shale.

The site lies in a main drainage basin that discharges into the Redlands Water & Power spillway channel about 1000 feet downstream from their power plant. This basin is composed of two major sub-basins that confluence just prior to the discharge into the spillway. The subject property lies within a tributary basin (Sub-basin A1) of Sub-basin A which is almost entirely within the Ridges Subdivision.

EXISTING DRAINAGE CONDITIONS

The site mainly drains north to the natural channel that was improved by the development of the Ridges Subdivision and a small part of the site drains to Ridge Circle Drive on the south edge of the site and then into the big drainage course on Ridges Boulevard. This natural channel which also drains to the big drainage course on Ridges Boulevard runs along the northern boundary of the site between Ridges Blvd. and Rana Road. A diversion ditch which drains the west side of the Rana Road join the natural channel at west end of the channel. The big drainage course on Ridges Boulevard is part of the natural drainage channel for Sub-basin A and has been improved by the development of Ridges Subdivision.

The proposed Entrada Townhouses Subdivision site has virtually no runoff contribution from beyond the property boundaries that are not confined to the natural drainage channel flowing along the northern boundary. There are no outside runoffs to the site due to Ridge Circle Drive along the southern property line, Rana Road along the west property line, and the natural channel along the north property line. Runoffs originating southwest of the site is conveyed into the natural channel at the northwest corner of the site via a diversion ditch, which has relatively flat grades and is considerably smaller in cross-section than the natural channel into which it flows along the site boundary.

PROPOSED DRAINAGE CONDITIONS

No change to the general drainage pattern of the site are proposed. However, improvement and/or minor alignment modifications to the natural channel along the north property boundary were proposed to improve conveyance, prevent erosion, and protect the development. The drainage course is to be located within an easement where it encroaches on the site. Two new 36" diameter CMP culverts were proposed at where the proposed bike paths crossing the natural drainage channel. The natural and upstream diversion ditch should be owned and maintained by the City of Grand Junction. This is due to the drainage course conveys stormwater from an area that is mostly developed upstream from the site and the upstream area did not historically discharge into this basin. Since the impact of the development on the runoff rates is relatively small, no on-site detention was proposed.

DESIGN CRITERIA AND APPROACH

We are not aware of any Master Plan or any other limitations on this site.
The Hydrology and Hydraulic computations conducted for this site utilized the STORMWATER MANAGEMENT MANUAL (JUNE, 1994 Edition). The Rational Method was used to perform the analysis for the 2 and 100 Year Design Events.

ENTRADA TOWNHOUSES SUBDIVISION

SUMMARY

Summarized below are the drainage calculations for this project:

Project Area: A =3.60 acres

Drainage Calculation Method: Rational Method

Design Storm Events: 2-Year and 100-Year Storms

Pre-development Runoff Rates:

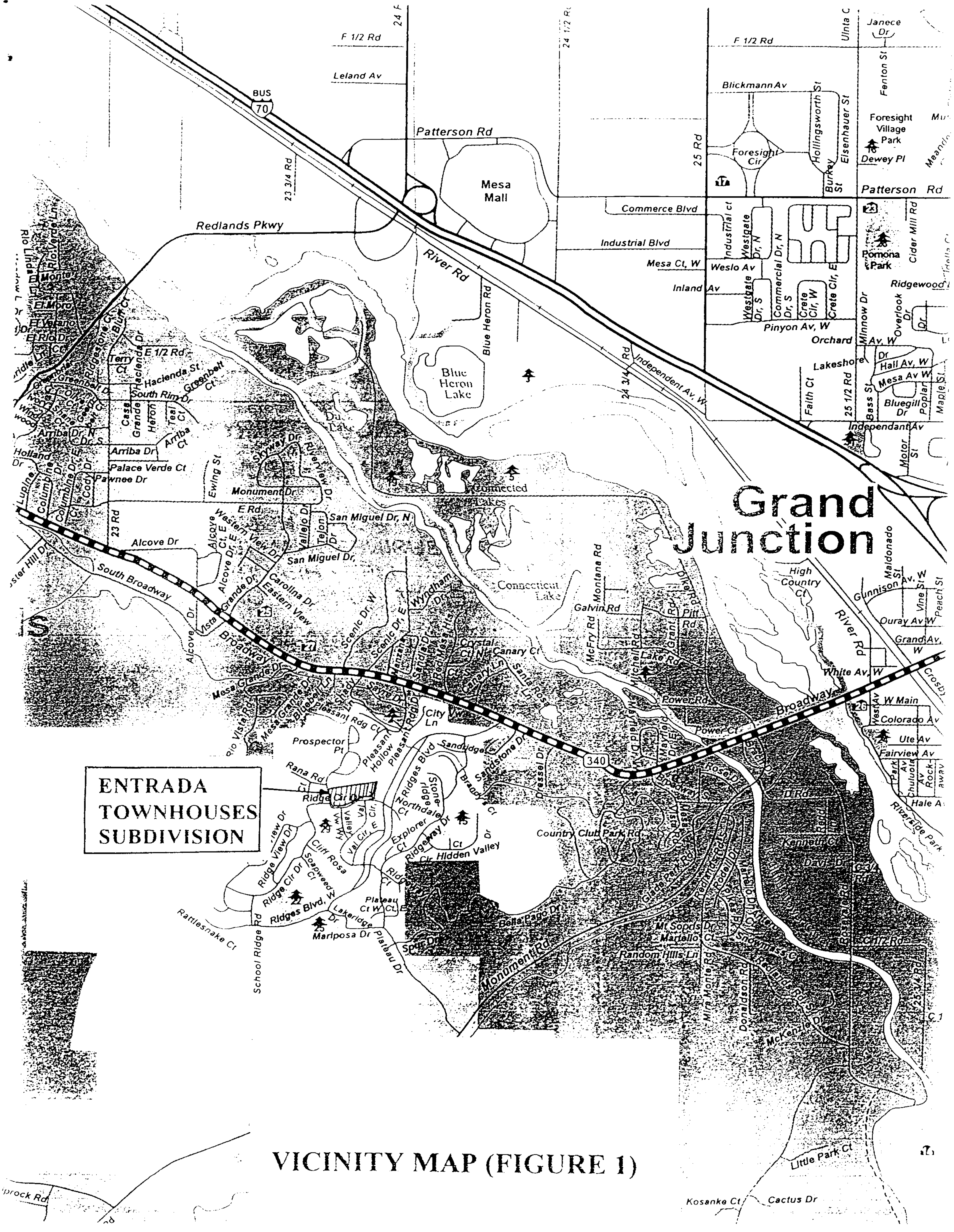
2-Year Historic Storm:
Q_{2h} = 2.10 cfs

100-Year Historic Storm:
Q_{100h} = 6.84 cfs

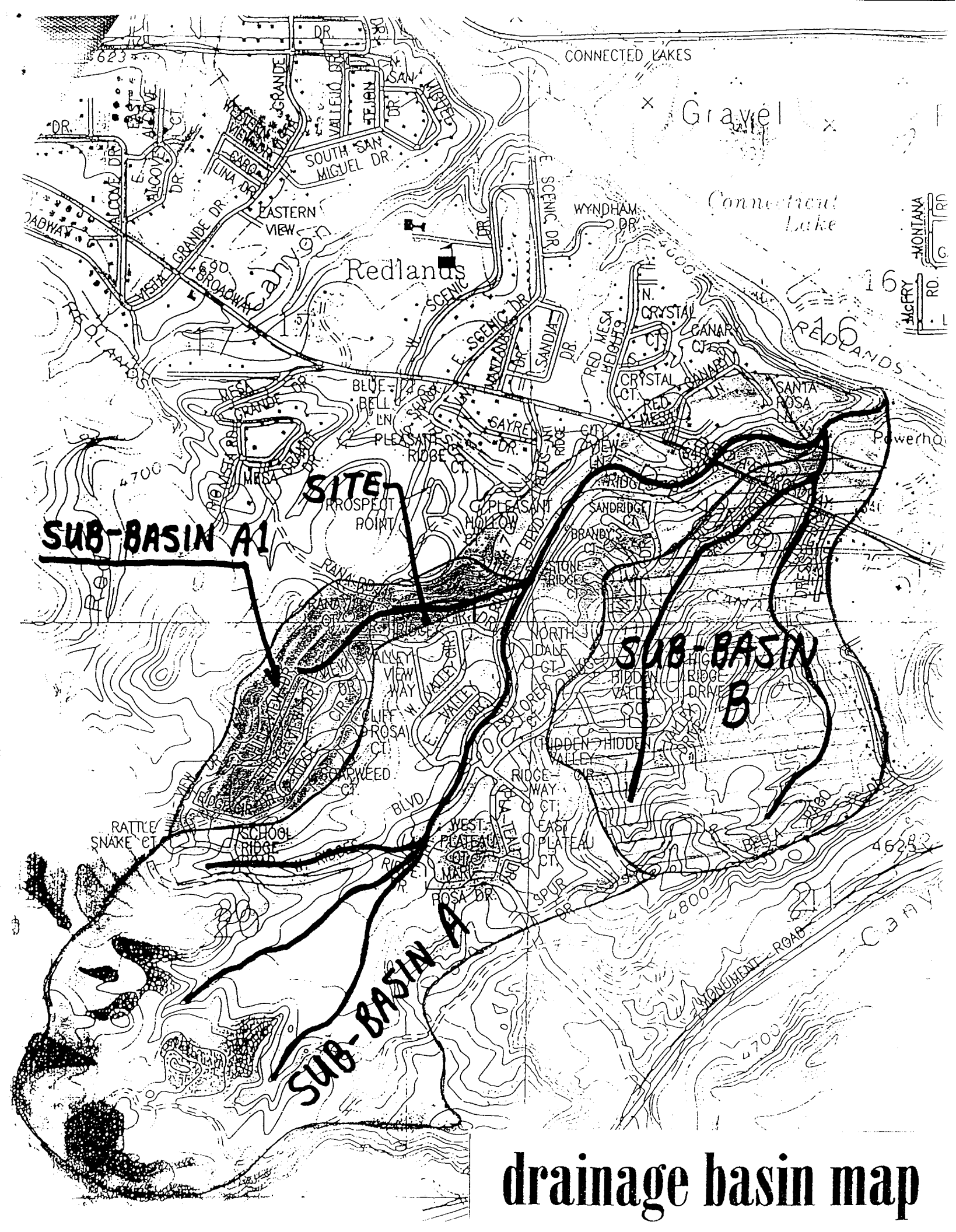
Post-development Runoff Rates:

2-Year Developed Storm:
Q_{2d} = 2.63 cfs

100-Year Developed Storm:
Q_{100d} =8.21 cfs



VICINITY MAP (FIGURE 1)



drainage basin map

APPENDIX A

ENTRADA TOWNHOUSES SUBDIVISION DRAINAGE

HISTORIC CONDITION

1. Drainage Area A = 3.60 Acre

(1) 2-Year Storm:

Hydrological soil group: C

Runoff Coefficient C_{2h} = 0.40 (pasture/2-6%)

Overland Flow Length L_o = 160 ft

Overland flow slope S_o =7.5%

Overland flow Time To = $1.8(1.1-C)(L)^{0.5}/(S)^{0.33}$

$=1.8(1.1-0.40)(160)^{0.5}/(7.5)^{0.33} \approx 8.2$ min

Concentrated Flow L= 749 ft

Slope S=5%

Velocity V=4.9 ft/s (Gullies, from Figure E-3 of the Manual)

Flow time Ts = 749/4.9/60 = 2.8 min

Tc= To + Ts =8.2+2.8 =11 min

Intensity I_{2h} = 1.46 in/hr (From Table A-1 of the Manual)

Runoff Q_{2h} =CIA=0.40*1.46*3.6 =**2.10 cfs**

(2) 100-Year Storm:

Hydrological soil group: C

Runoff Coefficient C_{100h} = 0.50 (pasture/2-6%)

Overland Flow Length L_o = 160 ft

Overland flow slope S_o =7.5%

Oberland Time To = $1.8(1.1-C)(L)^{0.5}/(S)^{0.33}$

$=1.8(1.1-0.50)(160)^{0.5}/(7.5)^{0.33} \approx 7$ min

Concentrated Flow L= 749 ft

Slope S=5%

Velocity V=4.9 ft/s (Gullies, from Figure E-3 of the Manual)

Flow time Ts = 749/4.9/60 = 2.8 min

Tc= To + Ts =7+2.8 =9.8 min≈ 10 min

Intensity I_{100h} = 3.80 in/hr

(From Table A-1 of the Manual)

Runoff Q_{100h} =CIA=0.50*3.8*3.6 =**6.84 cfs**

DEVELOPED CONDITION

1. Drainage Area A = 3.60 Acres

ENTRADA TOWNHOUSES SUBDIVISION DRAINAGE

DEVELOPED CONDITION

(1)2-Year Storm:
Hydrological soil group: C
Runoff Coefficient C_{2d} = 0.5 (Residential area, 3.6/23=0.16 acre per unit)

Overland Flow Time
Overland Flow Length L_o = 182 ft
Overland flow slope S_o = 6%
To = $1.8(1.1-C)(L)^{0.5}/(S)^{0.33}$=$1.8(1.1-0.50)(182)^{0.5}/(6)^{0.33}$ ≈8 min

Concentrated flow Length Lc =778 ft
Slope S=5.4 %
Flow Velocity =4.7 ft/s (Gullies, from Figure E-3 of Manual)
Flow time Ts=778/4.7/60 =2.8 min

Time of Concentration Tc =To+Ts=8+2.8= 10.8min ≈11 min
Intensity I_{2d} = 1.46 in/hr(From Table A-1 of the Manual)
Runoff Q_{2d} =CIA=0.50*1.46*3.6=**2.63 cfs**

(1)100-Year Storm:
Hydrological soil group: C
Runoff Coefficient C_{100d} = 0.60 (Residential area, 3.6/23=0.16 acre per unit)

Overland Flow Time
Overland Flow Length L_o = 182 ft
Overland flow slope S_o = 6%
To = $1.8(1.1-C)(L)^{0.5}/(S)^{0.33}$=$1.8(1.1-0.60)(182)^{0.5}/(1)^{0.33}$ ≈6.7 min

Concentrated flow Length Lc =778 ft
Slope S=5.4 %
Flow Velocity =4.7 ft/s (Gullies, from Figure E-3 of Manual)
Flow Time Ts=778/4.7/60 =2.8 min

Time of Concentration Tc =To+Ts =6.7+2.8≈ 10 min
Intensity I_{100d} = 3.8 in/hr(From Table A-1 of the Manual)

Runoff Q_{100d} =CIA=0.60*3.8*3.6=**8.21 cfs**

ENTRADA TOWNHOUSES SUBDIVISION DRAINAGE

SUMMARY OF RUNOFF RATES

	HISTORIC CONDITION	DEVELOPED CONDITION:
2-YEAR STORM:	Q_{2h} = 2.10 cfs;	Q_{2d} = 2.63 cfs;
100-YEAR STORM:	Q_{100h} = 6.84 cfs;	Q_{100d} = 8.21 cfs;

INLET CAPACITY CHECKING

According to Table "G-1" (from City of Grand Junction Stormwater Management Manual, June, 1994) attached in the "References" of this report, single combination inlet has a capacity of 6.4 cfs for 2-Year storm and 13 cfs for 100-Year storm. Three single combination inlets were proposed for this subdivision. The combined inlet capacity for this subdivision is 19.2 cfs for 2-Year storm (19.2 cfs>Q_{2d} = 2.63 cfs) and 24.63 cfs for 100-Year storm (24.63 cfs> Q_{100d} = 8.21 cfs).

STORM SEWER CAPACITY CHECKING

Inlet A has a drainage area about 25% of the entire site, therefore runoff to the Inlet A was estimated to be 2.1 cfs (0.25* Q_{100d} = 2.1 cfs). The 185 LF 12" PVC SDR-35 storm sewer from inlet A to the natural drainage channel has a slope of 0.5%, the capacity of this storm sewer is 3.8 cfs. (according to "Flow Chart for Pipe Flowing Full" attached in the "References" of this report)

Inlet B also has a drainage area about 25% of the entire site, therefore runoff to the Inlet A was estimated to be 2.1 cfs (0.25* Q_{100d} = 2.1 cfs). The 65 LF 8" PVC SDR-35 storm sewer from inlet B to the natural drainage channel has a slope of 2.5%, the capacity of this storm sewer is 3.0 cfs. (according to "Flow Chart for Pipe Flowing Full" attached in the "References" of this report)

Inlet C has a drainage area about 25% of the entire site, therefore runoff to the Inlet A was estimated to be 2.1 cfs (0.25* Q_{100d} = 2.1 cfs). The 84 LF 8" PVC SDR-35 storm sewer from inlet A to the natural drainage channel has a slope of 2%, the capacity of this storm sewer is 2.6 cfs. (according to "Flow Chart for Pipe Flowing Full" attached in the "References" of this report)

STORM SEWER CAPACITY CHECKING

Two new 36" diameter CMP culverts was proposed at where the proposed bike paths crossing the natural channel along the north property line. Since both upstream (crossing Rana Rd) and downstream (crossing Ridges Blvd) culverts are 36" diameter CMP culverts, no calulations was performed to verify these two new culverts' capacity in this report.

APPENDIX B

DRAINAGE SUMMARY

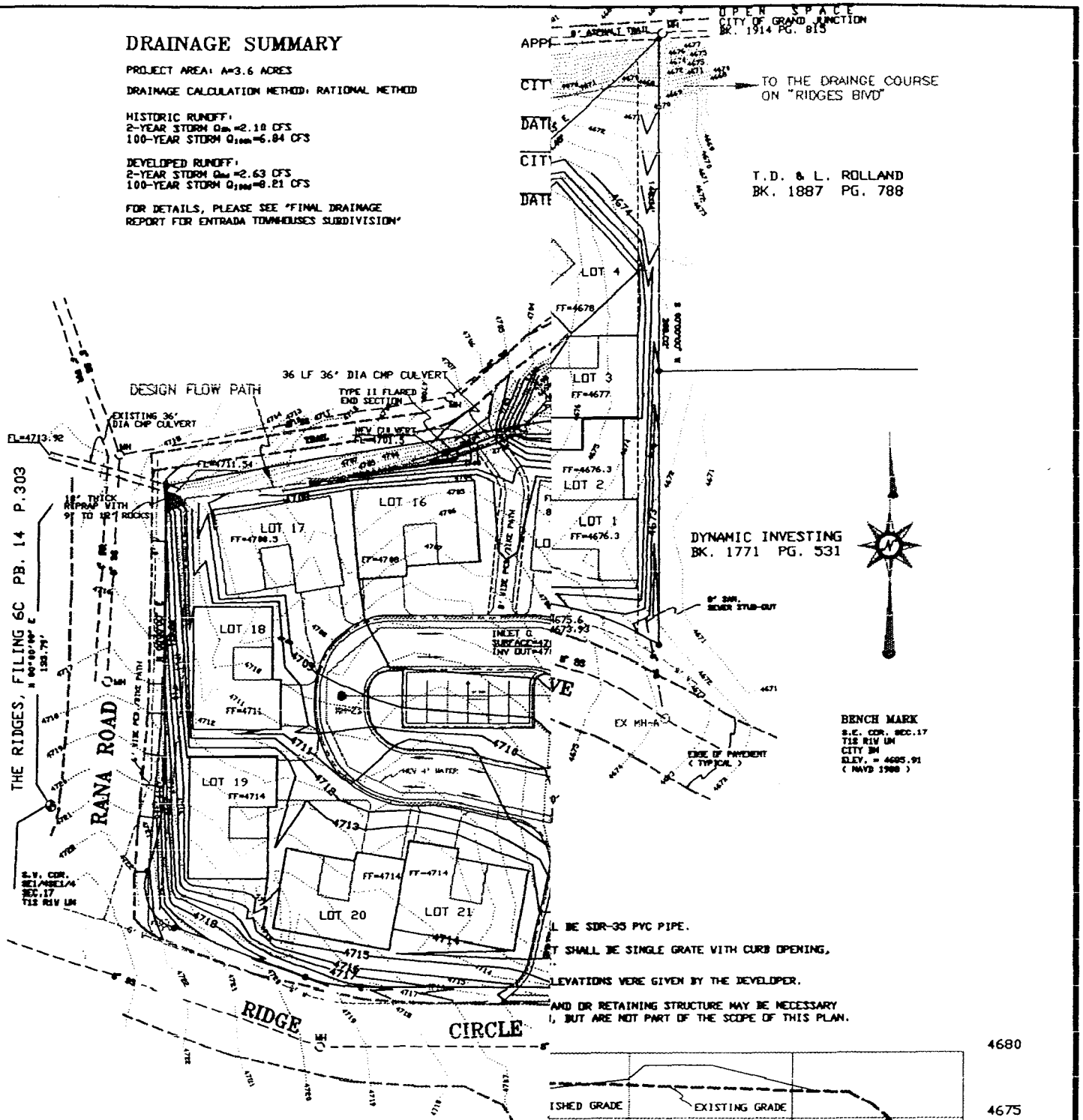
PROJECT AREA: A=3.6 ACRES

DRAINAGE CALCULATION METHOD: RATIONAL METHOD

HISTORIC RUNOFF:
2-YEAR STORM Q_{2yr} =2.18 CFS
100-YEAR STORM Q_{100yr}=6.84 CFS

DEVELOPED RUNOFF:
2-YEAR STORM Q_{2yr} =2.63 CFS
100-YEAR STORM Q_{100yr}=8.21 CFS

FOR DETAILS, PLEASE SEE "FINAL DRAINAGE REPORT FOR ENTRADA TOWNHOUSES SUBDIVISION"

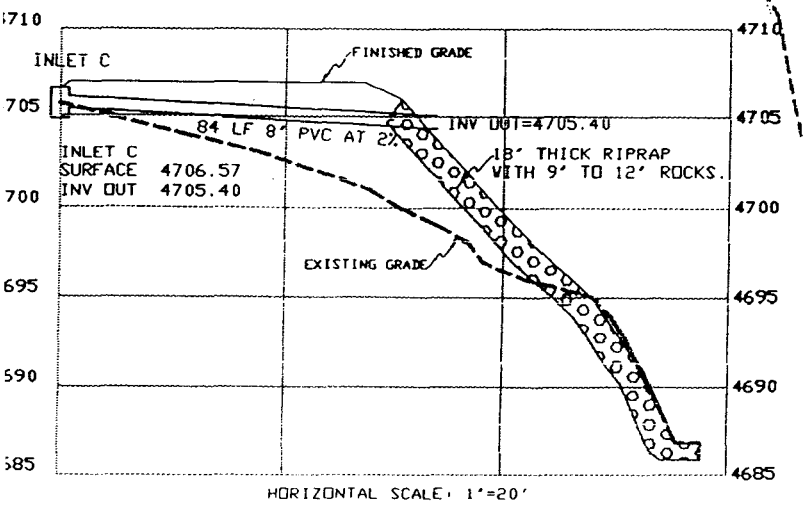


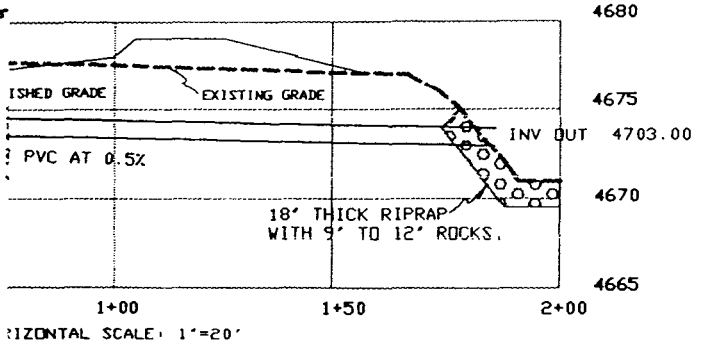
BE SDR-35 PVC PIPE.

T SHALL BE SINGLE GRATE WITH CURB OPENING,

LEVATIONS WERE GIVEN BY THE DEVELOPER.

AND OR RETAINING STRUCTURE MAY BE NECESSARY
, BUT ARE NOT PART OF THE SCOPE OF THIS PLAN.





ROLLAND ENGINEERING
405 Ridges Blvd
Grand Jct, CO 81503
(970) 243-8300

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ENTRADA TOWNHOUSE SUBDIVISION

GRADING & STORMWATER MANAGEMENT PLAN

GRAND JUNCTION, COLORADO

Designed	Checked	SDPLAN.PLT	Sheet
ML	TJR		7
Drawn	Date		OF
ML	8/13/96	REV 7/26/96	12

DRAINAGE SUMMARY

PROJECT AREA: A=3.6 ACRES

DRAINAGE CALCULATION METHOD: RATIONAL METHOD

HISTORIC RUNOFF:
2-YEAR STORM Q_{2yr} =2.18 CFS
100-YEAR STORM Q_{100yr} =6.84 CFS

DEVELOPED RUNOFF:
2-YEAR STORM Q_{2yr} =2.63 CFS
100-YEAR STORM Q_{100yr} =8.21 CFS

FOR DETAILS, PLEASE SEE "FINAL DRAINAGE REPORT FOR ENTRADA TOWNHOUSES SUBDIVISION"

APPROVED FOR CONSTRUCTION

CITY DEVELOPMENT ENGINEER

DATE

CITY UTILITY ENGINEER

DATE

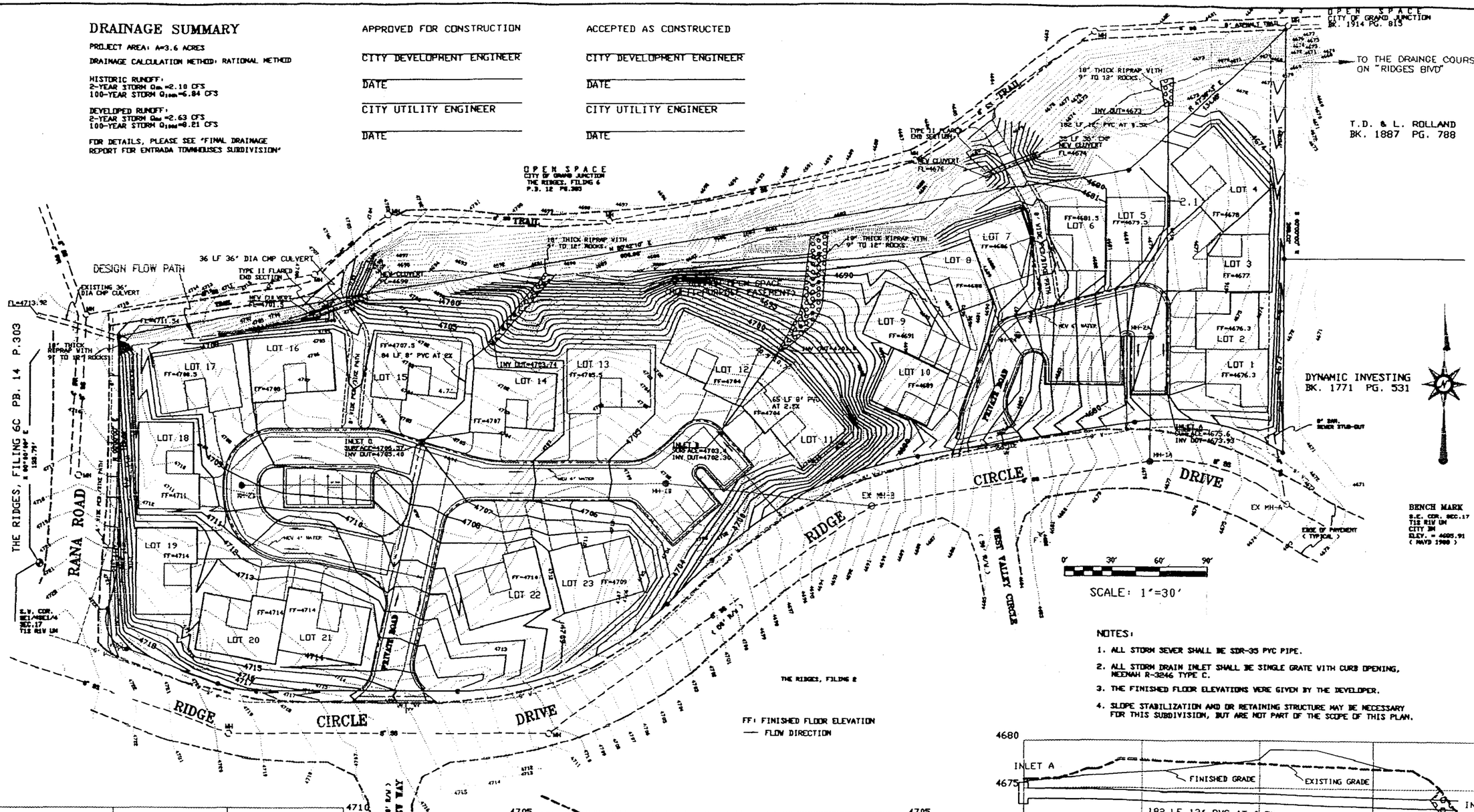
ACCEPTED AS CONSTRUCTED

CITY DEVELOPMENT ENGINEER

DATE

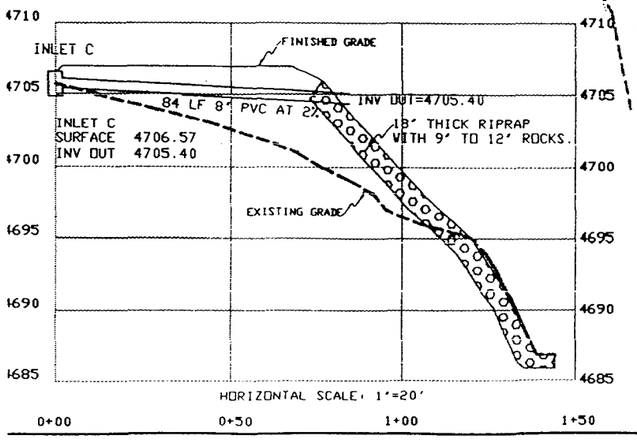
CITY UTILITY ENGINEER

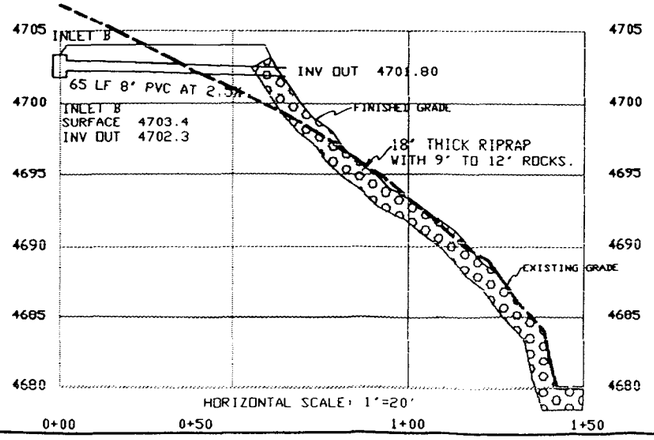
DATE

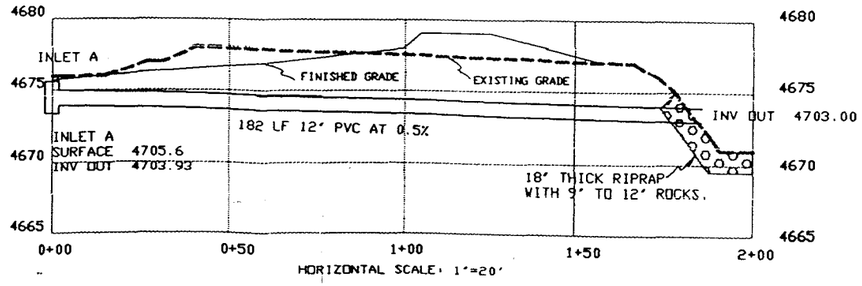


NOTES:

1. ALL STORM SEWER SHALL BE SDR-35 PVC PIPE.
2. ALL STORM DRAIN INLET SHALL BE SINGLE GRATE WITH CURB OPENING, NEENAH R-3246 TYPE C.
3. THE FINISHED FLOOR ELEVATIONS WERE GIVEN BY THE DEVELOPER.
4. SLOPE STABILIZATION AND OR RETAINING STRUCTURE MAY BE NECESSARY FOR THIS SUBDIVISION, BUT ARE NOT PART OF THE SCOPE OF THIS PLAN.







ROLLAND ENGINEERING
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(970) 243-8300

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ENTRADA TOWNHOUSE SUBDIVISION

GRADING & STORMWATER MANAGEMENT PLAN

GRAND JUNCTION, COLORADO

Designed	ML	Checked	TDR	ESPLAN.PLT	Sheet 7
Drawn	ML	Date 8/13/96	REV 7/24/96		OF 12

OPEN SPACE
CITY OF GRAND JUNCTION
BK. 1914 PG. 815

TO THE DRAINGE COURSE ON THE "RIDGES BLVD"

T.D. & L. ROLLAND
BK. 1887 PG. 788

DYNAMIC INVESTING
BK. 1771 PG. 531

0' 30' 60' 90'

FL 36" CMP
FL. = 4618.90

4' BRAIN LINES FROM DRIVE & CULIN. WATER DRAINS TO OPEN DRAIN

8' ASPHALT TRAIL

TRAIL

DESIGN FLOW PATH

RANA ROAD

RIDGE CIRCLE

DRIVE

RIDGE

WEST VALLEY CIRCLE

VALLEY VIEW WAY (40' R/W)

EDGE OF PAVEMENT (TYPICAL)

THE RIDGES, FILING 6C PB. 14 P.303

THE RIDGES, FILING 2

FINISHED CONTOURS WILL BE SMOOTHER THAN THOSE SHOWN BUT WILL FOLLOW THE SAME GENERAL ELEVATION LAYOUT. THE ENTRADA TOWNHOUSE SUBDIVISION HAS BEEN DESIGNED TO FOLLOW THE CONTOURS OF THE EXISTING SITE.

C:\ENTRADA\ENT-SITE Thu Jun 13 17:48:37 1996 ROLLAND ENGINEERING

ROLLAND ENGINEERING
405 Ridges Blvd
Grand Jct, CO 81503
(970) 243-8300

ENTRADA TOWNHOUSE SUBDIVISION

PRE-DEVELOPMENT DRAINAGE MAP

GRAND JUNCTION, COLORADO

Designed	Checked		Sheet
Drawn	Date 6/13/96		Of

SUPPLEMENT

5. **Hydrologic Soil Group** In addition to values being listed by ARC classification, they are also listed according to a hydrologic soil group (HSG). Infiltration varies considerably with soil type, and the difference is accounted for by selecting a CN value under the appropriate soil type. The four HSGs are defined by SCS TR-55 as follows:

Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission (greater than 0.30 in/hr).

Group B soils have moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (0.15-0.30 in/hr).

Group C soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05-0.15 in/hr).

Group D soils have high runoff potential. They have low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0.-0.05 in/hr).

The SCS has published Soil Surveys for most areas, which map out soil "names" along with hydraulic properties allowing one to classify the HSG. Most soil surveys already contain a listing of the HSG, however. Another source that classifies the HSG once the soil "name" is known is the SCS TR-55 or NEH-4 (SCS 1972 & 1986).

In initial selection of the Hydrologic Soil Group (A, B, C, or D), care should be taken in matching soil profile conditions. Hydrologic Soil Groups (HSGs) taken from SCS Soil Surveys generally consider the profile to a depth to 60 inches, which is adequate. But they only reflect information found at the time of the survey. Earthwork in the area may have changed conditions, and there may have been changes in groundwater levels as well. These should be considered.

Some areas may not be mapped by an SCS Soil Survey. HSG must be selected by other general descriptions such as those summarized below.

HSG	Soil textures
A	Sand, loamy sand, or sandy loam
B	Silt loam or loam
C	Sandy clay loam
D	Clay loam, silty clay loam, sandy clay, silty clay, or clay

ments of sandstone. Variation in the various alluvial layers is apparent, but not so pronounced as in the areas north of Palisade. Several peach orchards bordering the bluffs east of Palisade contain sandstone boulders 5 to 15 feet in diameter. Most of the smaller rocks and boulders have been removed from these orchards. About 30 acres northeast of Palisade has slopes of 5 to 10 percent.

Considering this soil as a whole, it is moderately permeable to plant roots, air, and moisture but low in water-holding capacity. The successive soil layers are friable and moderately calcareous.

Use and management.—Practically all of this soil lying below the irrigation canals is cultivated. About 99 percent of it is in peaches. In a few places where shale is within 4 or 5 feet of the surface, the trees are not uniform in size, and some have had to be replaced. Although yields generally compare favorably with those from the Ravola soils, the average yield is lower. Considering the favorable climate, peach growing is one of the best uses for this soil.

Mesa clay loam, 0 to 2 percent slopes (Mc).—This soil occupies a former flood plain or high terrace immediately south of the Colorado River. It is largely derived from acid igneous soil-forming materials the streams have brought down from a higher watershed.

In cultivated fields the 8- or 10-inch surface soil consists of very pale-brown, pale-brown, or light-brown calcareous clay loam. It merges with a reddish-yellow to light reddish-brown calcareous clay loam showing white or pinkish-white segregations of lime. Below depths of 12 to 14 inches, the reddish-yellow to light-brown clay loam exhibits numerous white streaks or splotches that have a comparatively vertical or jagged outline along road cuts. A few scattered cobbles and pieces of gravel are common. Beginning at depths of 3 or 4 feet or in places below 6 or 7 feet, about 40 to 50 percent of the soil mass is made up of pieces of gravel, cobbles, and stones derived largely from granite and basalt but to some extent from lava and sandstone. Most of the sandstone is crumbly or partly disintegrated. Mancos shale underlies the gravel-and-cobble substratum in most places at depths below 8 to 12 feet. In some places, however, the shale may be as near the surface as 4 or 5 feet, and in others as far down as 20 feet.

The high lime content of this soil doubtless offers some resistance to penetration of water and plant roots but the entire profile is friable when moist. Judging from many orchards and alfalfa fields, its permeability to deep-rooted crops is sufficient to permit healthy and vigorous plant growth. Underdrainage is adequate; harmful concentrations of salt are negligible.

Because a considerable part of this soil consists of material washed from higher places, the depth to the noticeably lime-splotched zone is variable. Generally, however, the depth ranges from 1½ to 3 feet. Leveling of the soil also accounts for part of the variation in depth to lime splotching. On the whole, the variations in depth to lime have little, if any, agricultural significance.

Use and management.—About 97 percent of this soil is cultivated. It is highly productive and much of it is well-suited to fruit growing. At least 40 percent of the acreage is in orchard fruits, mainly peaches. About 20 percent is in alfalfa, 15 percent in corn, 10 percent in beans, and 8 percent in truck crops, including cantaloups, melons, and tomatoes. The rest is used for small grains and other field crops.

These percentages show the relative importance of the various kinds of crops, though the area used for field crops fluctuates from year to year.

Many of the orchards have been planted in the past 15 years. If well cared for and not severely injured by low temperatures, they should give good yields until the trees reach 30 or 40 years of age. A few orchards more than 50 years old are still producing good yields. The areas having the best climatic location for orchard crops begin south and southeast of Palisade and extend 5 or 6 miles southwestward. Under practices designed to increase the organic-matter content and to control erosion, this soil should remain productive indefinitely.

Mesa clay loam, 2 to 5 percent slopes (Md).—Except for its greater slope and the appearance of lime splotches nearer the surface, this soil is very similar to Mesa clay loam, 0 to 2 percent slopes. The lime splotches normally are 10 or 15 inches from the surface. Small quantities of gravel and cobblestones strewn over the surface in most places indicate that there is a slight continuous removal of the surface soil by sheet erosion. Tilth and workability are good. In most places the soil is underlain by shale at depths of 6 to 20 feet.

Use and management.—The area of this soil occurring below the irrigation canals is about 87 percent under cultivation. It is a productive soil, and practically all field crops of the area can be grown successfully. About 32 percent of the acreage is in orchard fruits, mainly peaches but also some sweet cherries and pears. The fairly large percentage in orchard fruits is accounted for mainly by several rather large areas south and southwest of Palisade that are within a climatic zone well suited to tree fruits. Not including these specialized fruit areas, the proportion of the soil in various crops is about the same as for Mesa clay loam, 0 to 2 percent slopes. Yields are also about the same, but in a few small areas shale occurs at depths of 3½ to 4 feet and yields from deep-rooted crops such as orchard fruits and alfalfa may be slightly lower over a period of years.

If erosion is controlled and the soil is planted to legumes to build up its supply of organic matter, it should be productive indefinitely. In some fields the content of organic matter already has decreased appreciably from that in the virgin soil.

A few small areas (about 12 acres) of this soil located just below Orchard Mesa irrigation canal No. 2 are not suited to deep-rooted field crops or tree fruits. In these areas, Mancos shale is at depths between 2 and 3½ feet and the soil does not have a porous gravelly layer over this shale. Beans, wheat, barley, and oats probably are as suited to these areas as any other crops that could be selected.

Mesa gravelly clay loam, 2 to 5 percent slopes (Me).—This soil is derived from old alluvium deposited on Orchard Mesa. The alluvium consists mainly of materials weathered from acid igneous and mixed igneous rocks, largely granite and basalt, but includes smaller quantities of material from sandstone and shale. The alluvial mantle, for the most part, ranges from 5 to 8 feet deep but it is deeper in places.

The 8- or 10-inch surface soil in cultivated fields is light brown when dry and brown when moist; its organic-matter content is very low. The subsurface layer is light-brown or pale-brown clay loam containing a considerable amount of cobblestones, rounded pieces of gravel, and

chert fragments. Beginning at depths below 12 to 14 inches the subsoil is very pale brown to reddish yellow and shows a considerable amount of white lime splotching. Lime encrustations appear on the lower sides of the pieces of gravel, cobblestones, and stones that make up about 50 percent of the soil mass. In some places the cobbly material is more abundant than the gravelly, but in others smaller cobblestones and gravel are more abundant. In a few places the subsoil material is weakly cemented into a semihardpan. Generally, however, it is permeable enough to permit the downward growth of deep-rooted plants.

Surface runoff is medium, and underdrainage is adequate. The excess of gravel, cobblestones, and stones makes workability less favorable than on Mesa clay loam soils. Saline areas occur only in a very few places bordering shale soils.

Included with this soil are areas totaling about 30 acres that have slopes of less than 2 percent but are not appreciably different in tilth, workability, and crop yields. These areas occur 1 to 1½ miles southeast of Grand Junction, in the northeast quarter of section 25, and the northwest quarter of section 30, range 1 west, township 1, south.

Use and management.—Nearly 77 percent of Mesa gravelly clay loam, 2 to 5 percent slopes, is cultivated. Of the cultivated area, 14 percent is used for orchard fruits, mostly peaches but also cherries, apricots, pears, and plums. Alfalfa far surpasses fruit as the principal crop. Lesser crops, in order of their importance, are corn, pinto beans, small grains, and truck crops.

Crop yields on this soil do not average so high as on Mesa clay loam, 2 to 5 percent slopes, probably because of the excess gravel, cobbles, and stones. Orchard fruits and alfalfa produce fairly well. As is true for other soils in the eastern part of Orchard Mesa, this soil is widely used for peach orchards because it is in an area where the climate is favorable.

Mesa gravelly clay loam, 5 to 10 percent slopes (MF).—This soil occurs principally on terrace slopes or escarpments. Several areas of it are on the outliers, or edges, of three benches that front the broader part of the terrace southeast of Grand Junction. Scattered areas begin about 4 miles west of Grand Junction and extend nearly to the eastern limit of Orchard Mesa. A small belt also occurs north of the Colorado River, 1½ miles southwest of Palisade.

Except for its greater slope, this soil closely resembles Mesa gravelly clay loam, 2 to 5 percent slopes. Its workability is somewhat less favorable, however, as it is more gravelly and cobbly. Harmful concentrations of salts are negligible.

Use and management.—About 62 percent of this soil is cultivated. Most of the cultivated acreage is used for orchard fruits, chiefly peaches. The trees, particularly the older ones, are not quite so vigorous or so uniform in size as those on Mesa clay loam soils. The fruit is more highly colored, and this somewhat offsets the lower average yield. Probably, however, the trees may not live so long on this soil as on the deeper Mesa clay loam soils.

Alfalfa, corn, and beans are the chief field crops on areas not climatically well suited to orchard fruits. Smaller acreages are in tomatoes, melons, grapes, and other truck crops.

The soil is not so productive as the Mesa clay loams, because the excess gravel, cobbles, and stones in the surface soil and throughout the profile reduce the moisture-holding capacity. Painstaking application of irrigation water, with special care in regulating rate of flow, is required to prevent unnecessary loss of surface soil. Otherwise, workability becomes increasingly difficult as the finer material washes away and leaves the coarse material behind. Some farmers already have spent considerable time and money in removing cobbles and stones brought up in plowing.

Mesa gravelly clay loam, moderately deep, 2 to 5 percent slopes (MG).—Except for moderate depth to shale, this inextensive soil is essentially the same as Mesa gravelly clay loam, 2 to 5 percent slopes. Its tilth and workability are similar to but less favorable than for the Mesa clay loam soils. The soil is adequate for shallow-rooted plants, but its moderate depth to shale (2 to 4 feet) does not provide the root zone needed for best results in growing alfalfa and orchard fruits. Both crops yield less on this soil, and orchard trees do not live so long. The soil is low in organic matter. About 30 percent of it is under cultivation, and of this approximately 12 percent is used for orchard fruits.

Mesa gravelly clay loam, moderately deep, 5 to 10 percent slopes (MH).—This soil is associated with other Mesa soils but generally lies at higher level where the original alluvial deposits were thinner. Aside from having a thinner mantle overlying Mancos shale, the soil differs little from Mesa gravelly clay loam, 5 to 10 percent slopes. The principal areas are scattered over Orchard Mesa from southwest of Palisade to southwest of Grand Junction.

The soil is gravelly and cobbly; hence, its water-holding capacity is low. Some places, however, are seepy because water from Orchard Mesa Canal No. 2 passes through and over the underlying shale. Erosion continues to remove the soil mantle; the soil is becoming thinner and more cobbly all the time.

Use and management.—Only about 15 percent of the soil area below Orchard Mesa Canal No. 2 is cultivated. Several areas are in the climatic zone south and southwest of Palisade that favors fruit growing. About 10 percent of the soil in this location is in orchards.

The underlying shale material restricts growth of deep-rooted plants, so this soil is not well suited to orchard fruits or alfalfa. Other crops respond fairly well, though not so well as on the deeper Mesa gravelly clay loams. Peach trees are apparently healthy when young, but they probably do not live so long as those on the deeper Mesa soils. If it is economically feasible, this soil is best used for irrigated pasture most of the time.

Naples clay loam, 0 to 2 percent slopes (NA).—This soil occurs in association with Naples fine sandy loam, 0 to 2 percent slopes, in low positions on the alluvial fan. The alluvial parent material, derived from sandstone and shale and 6 feet or more deep in most places, has been deposited on soils of the river flood plain.

The surface 10 or 12 inches consists of light-brown, slightly hard, light clay loam. The subsoil consists of layers of light-brown loam, fine sandy loam, and very pale-brown loamy fine sand. The thickness and arrangement of these subsoil layers vary from place to place. The soil is calcareous, though no lime is visible in the profile.

The surface soil and subsoil consist largely of intermixed material derived from sandstone, shale, and granite. Their reddish color is partly accounted for by the reddish color of the shale material in the alluvial deposit. Sandstone boulders, rocks, and gravelly material are scattered over and through the soil. Nevertheless, the soil can be cultivated if the surface stones are removed.

Use and management.—Slopes and stoniness make management difficult. Only about 65 percent of the soil is irrigated. Alfalfa, pinto beans, corn, and truck crops are most commonly grown. There are a few orchards, but most areas of this soil are not so well suited climatically to tree fruits as other soils in parts of the Redlands farther from the Colorado River. Crops on this soil yield somewhat less than on the more gently sloping Redlands soils, mainly because it is more difficult to spread irrigation water and to prevent erosion on this soil. Careful management is necessary to maintain or to increase the productivity of this soil.

Redlands and Thoroughfare soils, shallow over bedrock, 5 to 10 percent slopes (RN).—These undifferentiated shallow soils occupy uneven topography along the base of the Uncompahgre uplift escarpment and small isolated areas occurring principally in the valleys of the intermittent streams that cross the alluvial fans and terraces of the Redlands.

Where these soils occur in association with Thoroughfare fine sandy loam, 5 to 10 percent slopes, they have the same profile characteristics as that soil but are shallower (2 feet or less) to bedrock of sandstone or shale. Areas 2 to 5 feet deep to bedrock are included, but these are inextensive and occur principally adjoining deeper soils. Outcroppings of bedrock sandstone and shale occur along the outer margin of the alluvial fans adjacent to areas of Rough broken land, Mesa, Chipeta, and Persayo soils materials.

The Redlands member of this undifferentiated unit occupies older parts of the alluvial fans and is generally associated with adjoining areas of Redlands loams. The profile characteristics are the same as have been described for Redlands loam, 5 to 10 percent slopes, but the soil is shallower (2 feet or less) over bedrock sandstone or shale.

Use and management.—Only a very small percentage of this undifferentiated unit is cultivated. Where it occurs on slopes above the irrigation system, it supports a sparse cover of rabbitbrush, some greasewood, and a few annual grasses and weeds. Where it is on slopes below irrigated areas of the associated Redlands loams and Thoroughfare fine sandy loams, it has become poorly drained and saline. In these places the vegetation is saltgrass, fireweed, and greasewood. Because of the shallow depth of the soil and the uneven topography, farmers have not attempted to drain these seepy areas. These soils afford poor grazing. Probably 50 to 80 acres under native cover would be needed to graze one animal through the season.

Redlands and Thoroughfare soils, shallow over bedrock, 2 to 5 percent slopes (RM).—Aside from having more gentle slopes, this undifferentiated unit is the same as Redlands and Thoroughfare soils, shallow over bedrock, 5 to 10 percent slopes. It has about the same potential use.

Riverwash, 0 to 2 percent slopes (Ro).—This is a miscellaneous land type consisting of fine sand, gravel, cobblestones, and water-worn

stones. It occurs along the Gunnison and Colorado Rivers and is subject to occasional partial overflow because it lies only 4 to 8 feet above the normal water level of the streams. As a rule, the deposits at the higher levels have somewhat hummocky relief and consist mainly of sand, loamy fine sand, and fine sand with a few strips or patches of gravel in places. At lower levels the gravelly and cobbly materials are normally more evident. The sandy layers vary in thickness, and the gravelly and cobbly layers vary both in thickness and in the depth at which they occur.

The cobblestones and gravel evident in this unit are only part of the vast deposit that extends back from the Colorado River, under the Green River soils, and, for indefinite distances, under the Billings soils. The cobbly deposit ranges from 8 to 15 feet or more in thickness. On the north side of the Colorado River the belt of this material ranges from ¼ to ½ mile wide and, except along the sharp bluffs, is found under most of the soils. On the south side of the Colorado River the cobbly material underlies practically all of the soils on Orchard Mesa.

The pale-brown deposit of sandy material lying on the gravel, cobbles, and stones is porous and absorbs water so rapidly that irrigation would not be practical, even if small areas could be found that were smooth enough to be irrigated. Except for a few small patches used as gardens, little of this land is cultivated. Many of the areas have almost no vegetation, but some of the larger ones support a scant growth of grasses, cottonwood trees, willows, and a few shrubs.

At present, this land is used mainly as a source of material used for road building and in concrete mixing. The smooth, rounded, water-worn rocks and cobblestones in attractive shades of green, gray, red, and black, have been used to limited extent for building or veneering residences in the area. The cobblestones consist mainly of basalt and granite but some are from hard sandstone and lava.

Rough broken land, Mesa, Chipeta, and Persayo soil materials (RR).—Except for small areas northeast and south of Palisade, all of this miscellaneous land type occurs south of the Colorado River. It occupies very steep escarpments—25 to 140 feet high—along the south bank of the Colorado River and rough, rugged terrain along tributary drainageways or arroyos. Slopes generally range from 12 to 30 percent along the drainageways but are much steeper along the escarpment adjoining the Colorado River. The soil materials, 10 to 20 feet deep over the Mancos shale, include a layer of sand gravel, cobbles, and stones 6 to 15 feet thick that immediately overlies the shale.

Use and management.—With few exceptions, this land type is too rough, stony, and steep to be leveled for irrigation. The area adjoining the upper irrigation canal southwest of Palisade is partly cultivated to alfalfa and peaches, but the shale is too near the surface to permit entirely satisfactory production of these deep-rooted crops. Moreover, after a decade or more, continued erosion may necessitate use of these areas only for irrigated pasture. The very steep, or precipitous, areas are of little agricultural value; their sparse cover of saltbush, shadscale, cheatgrass, Indianwheat, hopsage, rabbitbrush, and greasewood provides sparse periodic grazing in places that are accessible to livestock.

335914—55——6

REFERENCES

TABLE "A-1"
INTENSITY-DURATION-FREQUENCY (IDF) TABLE

Time (min)	2-Year Intensity (in/hr)	100-Year Intensity (in/hr)	Time (min)	2-Year Intensity (in/hr)	100-Year Intensity (in/hr)
5	1.95	4.95	33	0.83	2.15
6	1.83	4.65	34	0.82	2.12
7	1.74	4.40	35	0.81	2.09
8	1.66	4.19	36	0.80	2.06
9	1.59	3.99	37	0.79	2.03
10	1.52	3.80	38	0.78	2.00
11	1.46	3.66	39	0.77	1.97
12	1.41	3.54	40	0.76	1.94
13	1.36	3.43	41	0.75	1.91
14	1.32	3.33	42	0.74	1.88
15	1.28	3.24	43	0.73	1.85
16	1.24	3.15	44	0.72	1.82
17	1.21	3.07	45	0.71	1.79
18	1.17	2.99	46	0.70	1.76
19	1.14	2.91	47	0.69	1.73
20	1.11	2.84	48	0.68	1.70
21	1.08	2.77	49	0.67	1.67
22	1.05	2.70	50	0.66	1.64
23	1.02	2.63	51	0.65	1.61
24	1.00	2.57	52	0.64	1.59
25	0.98	2.51	53	0.63	1.57
26	0.96	2.46	54	0.62	1.55
27	0.94	2.41	55	0.61	1.53
28	0.92	2.36	56	0.60	1.51
29	0.90	2.31	57	0.59	1.49
30	0.88	2.27	58	0.58	1.47
31	0.86	2.23	59	0.57	1.45
32	0.84	2.19	60	0.56	1.43

Source: Mesa County 1991

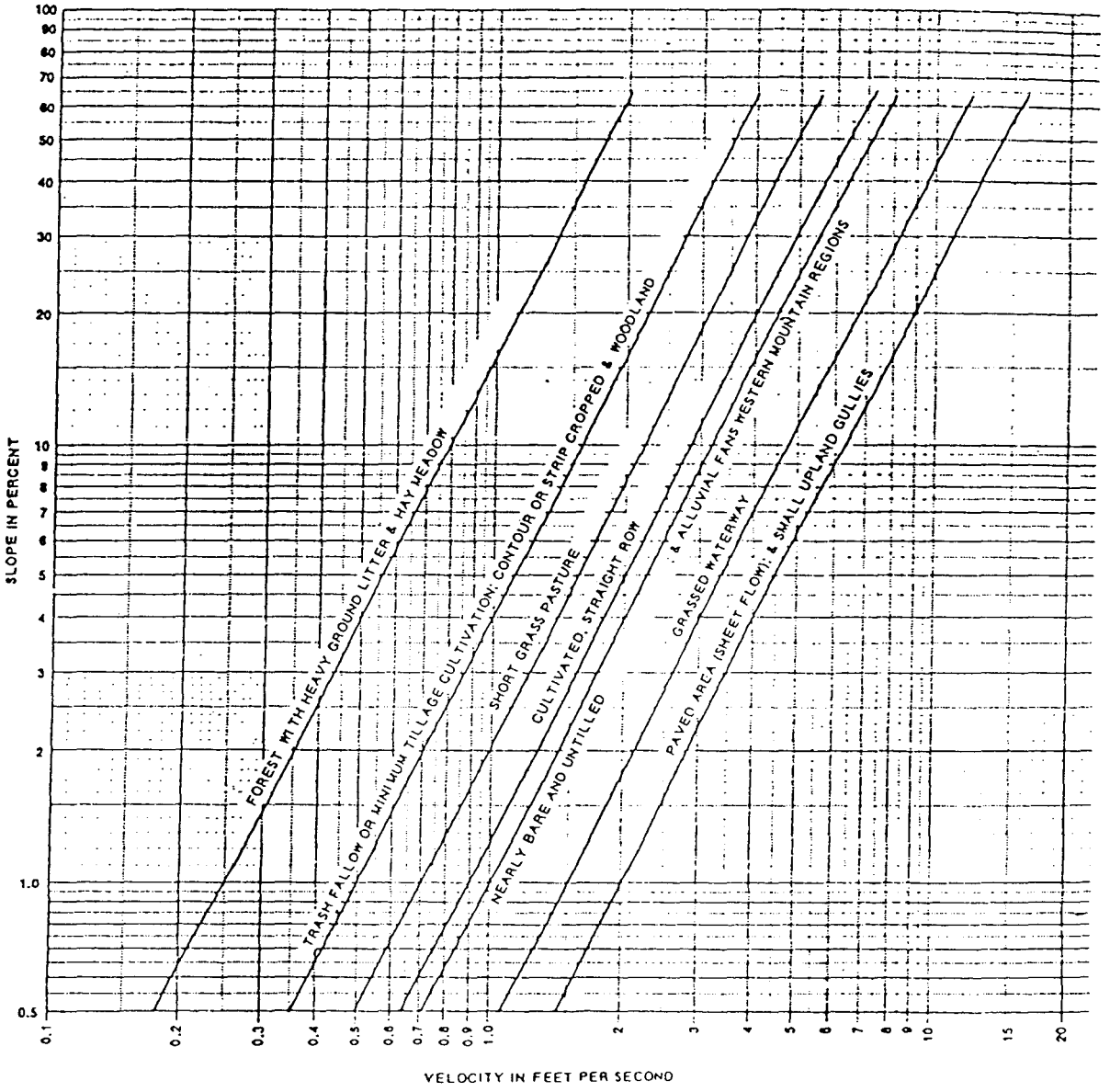
LAND USE OR SURFACE CHARACTERISTICS	SCS HYDROLOGIC SOIL GROUP (SEE APPENDIX "C" FOR DESCRIPTIONS)											
	A			B			C			D		
	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
UNDEVELOPED AREAS Bare ground	.10 - .20 .14 - .24	.16 - .26 .22 - .32	.25 - .35 .30 - .40	.14 - .22 .20 - .28	.22 - .30 .28 - .36	.30 - .38 .37 - .45	.20 - .28 .26 - .34	.28 - .36 .35 - .43	.36 - .44 .40 - .48	.24 - .32 .30 - .38	.30 - .38 .40 - .48	.40 - .48 .50 - .58
Cultivated/Agricultural	.08 - .18 .14 - .24	.13 - .23 .18 - .28	.16 - .26 .22 - .32	.11 - .19 .16 - .24	.15 - .23 .21 - .29	.21 - .29 .28 - .36	.14 - .22 .20 - .28	.19 - .27 .25 - .33	.26 - .34 .34 - .42	.18 - .26 .24 - .32	.23 - .31 .29 - .37	.31 - .39 .41 - .49
Pasture	.12 - .22 .15 - .25	.20 - .30 .25 - .35	.30 - .40 .37 - .47	.18 - .26 .23 - .31	.28 - .36 .34 - .42	.37 - .45 .45 - .53	.24 - .32 .30 - .38	.34 - .42 .42 - .50	.44 - .52 .52 - .60	.30 - .38 .37 - .45	.40 - .48 .50 - .58	.50 - .58 .62 - .70
Meadow	.10 - .20 .14 - .24	.16 - .26 .22 - .32	.25 - .35 .30 - .40	.14 - .22 .20 - .28	.22 - .30 .28 - .36	.30 - .38 .37 - .45	.20 - .28 .26 - .34	.28 - .36 .35 - .43	.36 - .44 .44 - .52	.24 - .32 .30 - .38	.30 - .38 .40 - .48	.40 - .48 .50 - .58
Forest	.05 - .15 .08 - .18	.08 - .18 .11 - .21	.11 - .21 .14 - .24	.08 - .16 .10 - .18	.11 - .19 .14 - .22	.14 - .22 .18 - .26	.10 - .18 .12 - .20	.13 - .21 .16 - .24	.16 - .24 .20 - .28	.12 - .20 .15 - .23	.16 - .24 .20 - .28	.20 - .28 .25 - .33
RESIDENTIAL AREAS 1/8 acre per unit	.40 - .50 .48 - .58	.43 - .53 .52 - .62	.46 - .56 .55 - .65	.42 - .50 .50 - .58	.45 - .53 .54 - .62	.50 - .58 .59 - .67	.45 - .53 .53 - .61	.48 - .56 .57 - .65	.53 - .61 .64 - .72	.48 - .56 .56 - .64	.51 - .59 .60 - .68	.57 - .65 .69 - .77
1/4 acre per unit	.27 - .37 .35 - .45	.31 - .41 .39 - .49	.34 - .44 .42 - .52	.29 - .37 .38 - .46	.34 - .42 .42 - .50	.38 - .46 .47 - .55	.32 - .40 .41 - .49	.36 - .44 .45 - .53	.41 - .49 .52 - .60	.35 - .43 .43 - .51	.39 - .47 .47 - .55	.45 - .53 .57 - .65
1/3 acre per unit	.22 - .32 .31 - .41	.26 - .36 .35 - .45	.29 - .39 .38 - .48	.25 - .33 .33 - .41	.29 - .37 .38 - .46	.33 - .41 .42 - .50	.28 - .36 .36 - .44	.32 - .40 .41 - .49	.37 - .45 .48 - .56	.31 - .39 .39 - .47	.35 - .43 .43 - .51	.42 - .50 .53 - .61
1/2 acre per unit	.16 - .26 .25 - .35	.20 - .30 .29 - .39	.24 - .34 .32 - .42	.19 - .27 .28 - .36	.23 - .31 .32 - .40	.28 - .36 .36 - .44	.22 - .30 .31 - .39	.27 - .35 .35 - .43	.32 - .40 .42 - .50	.26 - .34 .34 - .42	.30 - .38 .38 - .46	.37 - .45 .48 - .56
1 acre per unit	.14 - .24 .22 - .32	.19 - .29 .26 - .36	.22 - .32 .29 - .39	.17 - .25 .24 - .32	.21 - .29 .28 - .36	.26 - .34 .34 - .42	.20 - .28 .28 - .36	.25 - .33 .32 - .40	.31 - .39 .40 - .48	.24 - .32 .31 - .39	.29 - .37 .35 - .43	.35 - .43 .46 - .54
MISC. SURFACES Pavement and roofs	.93 .95	.94 .96	.95 .97	.93 .95	.94 .96	.95 .97	.93 .95	.94 .96	.95 .97	.93 .95	.94 .96	.95 .97
Traffic areas (soil and gravel)	.55 - .65 .65 - .70	.60 - .70 .70 - .75	.64 - .74 .74 - .79	.60 - .68 .68 - .76	.64 - .72 .72 - .80	.67 - .75 .75 - .83	.64 - .72 .72 - .80	.67 - .75 .75 - .83	.69 - .77 .77 - .85	.72 - .80 .79 - .87	.75 - .83 .82 - .90	.77 - .85 .84 - .92
Green landscaping (lawns, parks)	.10 - .20 .14 - .24	.16 - .26 .22 - .32	.25 - .35 .30 - .40	.14 - .22 .20 - .28	.22 - .30 .28 - .36	.30 - .38 .37 - .45	.20 - .28 .26 - .34	.28 - .36 .35 - .43	.36 - .44 .42 - .52	.24 - .32 .30 - .38	.30 - .38 .40 - .48	.40 - .48 .50 - .58
Non-green and gravel landscaping	.30 - .40 .34 - .44	.36 - .46 .42 - .52	.45 - .55 .50 - .60	.45 - .55 .50 - .60	.42 - .50 .48 - .56	.50 - .58 .57 - .65	.40 - .48 .46 - .54	.48 - .56 .55 - .63	.56 - .64 .64 - .72	.44 - .52 .50 - .58	.50 - .58 .60 - .68	.60 - .68 .70 - .78
Cemeteries, playgrounds	.20 - .30 .24 - .34	.26 - .36 .32 - .42	.35 - .45 .40 - .50	.35 - .45 .40 - .50	.32 - .40 .38 - .46	.40 - .48 .47 - .55	.30 - .38 .36 - .44	.38 - .44 .45 - .53	.46 - .54 .54 - .62	.34 - .42 .40 - .48	.40 - .48 .50 - .58	.50 - .58 .60 - .68

NOTES:
1. Values above and below pertain to the 2-year and 100-year storms, respectively.
2. The range of values provided allows for engineering judgement of site conditions such as basic shape, homogeneity of surface type, surface depression storage, and storm duration. In general, during shorter duration storms (Tc ≤ 10 minutes), infiltration capacity is higher, allowing use of a "C" value in the low range. Conversely, for longer duration storms (Tc) 30 minutes), use a ""C value in the higher range.
3. For residential development at less than 1/8 acre per unit or greater than 1 acre per unit, and also for commercial and industrial areas, use values under MISC SURFACES to estimate "C" value ranges for use.

RATIONAL METHOD RUNOFF COEFFICIENTS
(Modified from Table 4, UC-Davis, which appears to be a modification of work done by Rawls)

TABLE "B-1"

REPRODUCED FROM FIGURE 15.2, SCS 1972



DETERMINATION OF "Ts" | FIGURE "E-3"

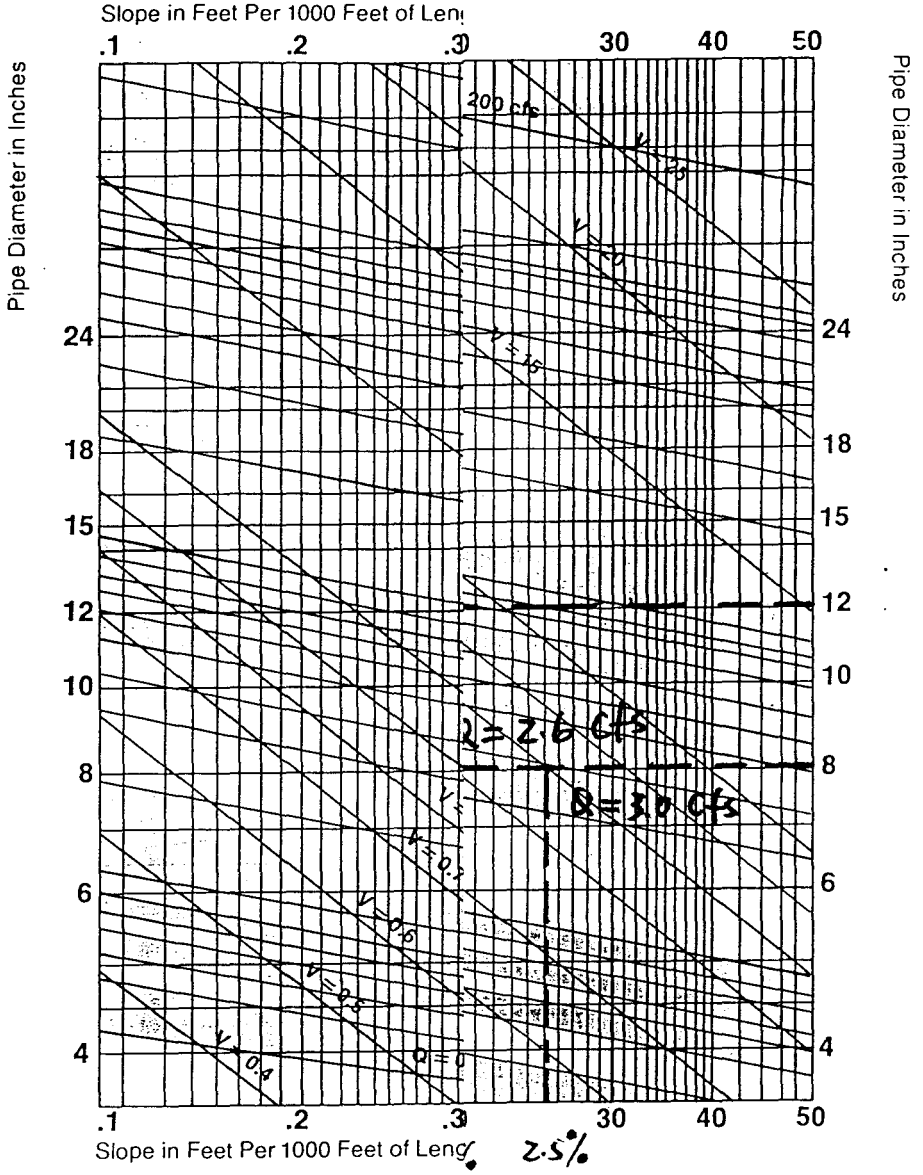
ROAD TYPE	COMBINATION INLET CAPACITY (CFS)					
	SINGLE		DOUBLE		TRIPLE	
	2-YR	100-YR	2-YR	100-YR	2-YR	100-YR
Urban Residential (local)	6.4	13	9.5	22	12.7	31
Residential Collector, Commercial and Industrial Streets	3.2	13	4.9	22	6.5	31
Collector Streets (3000 - 8000 ADT)	2.7	13	4.0	22	5.3	31
Principal and Minor Arterials	6.0	13	9.0	22	12.0	31

Inlet capacities shown above are based upon: 1) use of non-curved vane grates (similar to HEC-12 P-1 7/8-4 grates; 2) HEC-12 procedures; 3) clogging factors per Section VI; and 4) City/County standard inlets with 2-inch radius on curb face and type C grates. Capacities shown for 2-year storms are based upon depths allowed by maximum street inundation per Figure "G-3". The 100-year capacities are based upon a ponded depth of 1.0 foot. Note that only combination inlets are allowed in sag or sump conditions.

MAXIMUM INLET CAPACITIES: SUMP OR SAG CONDITION — **TABLE "G-1"**

Flow Chart for Pipe Flowing Full

Coefficient of Fl grades or in the
n 0.009 neter pipe.



Conversion Chart
Table 1
Slope Values

Slope values derived from this chart are for coefficient of flow n = 0.009. They may be converted to slopes for other coefficients of flow by means of the following multiplying factors:

0.79	for n = 0.008	1.77	for n = 0.012
1.00	for n = 0.009	2.086	for n = 0.013
1.23	for n = 0.010	2.42	for n = 0.014
1.494	for n = 0.011	2.778	for n = 0.015

Conversion Chart
Table 2
Diameters

Diameters derived fron0.013
coefficient of flow n = (ft.
be converted to diame./sec.
coefficients of flow by r
following multiplying fa
0.956 for n = 0.008
1.000 for n = 0.009
1.040 for n = 0.010
1.078 for n = 0.011

r flow coefficient
/ert result as follows:
7 slope and also at
ec. At intersection
er 8". Converting
Conversion Factors ps 1.147 (See Table
CES, MGD. GPM r 1.147 for corrected
To convert cubic feet by 0.646. To convert cu". (Must use next
million gallons per day (cfs) to gallons per min
by 448.83.

One cubic foot of wate

Example 4

Assume:

An 8-inch diameter pipe with n = 0.009 installed at a slope of 1.6 ft/1000 ft. will give a minimum full flow velocity of 2 fps and flow rate of 0.698 cfs.

Required:

What will be the flow rate and velocity if the pipe is flowing 3/10ths full?

At Y/D = 0.3 Vp/Vf = 0.77 and Qp/Qf = .19 from the hydraulic elements chart on cover. Therefore Vp = .77 Vf or 1.54 fps and Qp = 19 Qf or 0.132 cfs.

ENTRADA TOWNHOUSES SUBDIVISION DRAINAGE

HISTORIC CONDITION

1. Drainage Area A = 3.60 Acre

(1) 2-Year Storm:

Hydrological soil group: C

Runoff Coefficient C_{2h} = 0.40 (pasture/2-6%)

Overland Flow Length L_o = 160 ft

Overland flow slope S_o =7.5%

Overland flow Time To = $1.8(1.1-C)(L)^{0.5}/(S)^{0.33}$

$=1.8(1.1-0.40)(160)^{0.5}/(7.5)^{0.33} \approx 8.2$ min

Concentrated Flow L= 749 ft

Slope S=5%

Velocity V=4.9 ft/s (Gullies, from Figure E-3 of the Manual)

Flow time Ts = 749/4.9/60 = 2.8 min

Tc= To + Ts =8.2+2.8 =11 min

Intensity I_{2h} = 1.46 in/hr (From Table A-1 of the Manual)

Runoff Q_{2h} =CIA=0.40*1.46*3.6 =**2.10 cfs**

(2) 100-Year Storm:

Hydrological soil group: C

Runoff Coefficient C_{100h} = 0.50 (pasture/2-6%)

Overland Flow Length L_o = 160 ft

Overland flow slope S_o =7.5%

Oberland Time To = $1.8(1.1-C)(L)^{0.5}/(S)^{0.33}$

$=1.8(1.1-0.50)(160)^{0.5}/(7.5)^{0.33} \approx 7$ min

Concentrated Flow L= 749 ft

Slope S=5%

Velocity V=4.9 ft/s (Gullies, from Figure E-3 of the Manual)

Flow time Ts = 749/4.9/60 = 2.8 min

Tc= To + Ts =7+2.8 =9.8 min≈ 10 min

Intensity I_{100h} = 3.80 in/hr

(From Table A-1 of the Manual)

Runoff Q_{100h} =CIA=0.50*3.8*3.6 =**6.84 cfs**

DEVELOPED CONDITION

1. Drainage Area A = 3.60 Acres

ENTRADA TOWNHOUSES SUBDIVISION DRAINAGE

DEVELOPED CONDITION

(1)2-Year Storm:
Hydrological soil group: C
Runoff Coefficient C_{2d} = 0.5 (Residential area, 3.6/23=0.16 acre per unit)

Overland Flow Time
Overland Flow Length L_o = 182 ft
Overland flow slope S_o = 6%
To = $1.8(1.1-C)(L)^{0.5}/(S)^{0.33}$=$1.8(1.1-0.50)(182)^{0.5}/(6)^{0.33}$ ≈8 min

Concentrated flow Length Lc =778 ft
Slope S=5.4 %
Flow Velocity =4.7 ft/s (Gullies, from Figure E-3 of Manual)
Flow time Ts=778/4.7/60 =2.8 min

Time of Concentration Tc =To+Ts=8+2.8= 10.8min ≈11 min
Intensity I_{2d} = 1.46 in/hr(From Table A-1 of the Manual)
Runoff Q_{2d} =CIA=0.50*1.46*3.6=**2.63 cfs**

(1)100-Year Storm:
Hydrological soil group: C
Runoff Coefficient C_{100d} = 0.60 (Residential area, 3.6/23=0.16 acre per unit)

Overland Flow Time
Overland Flow Length L_o = 182 ft
Overland flow slope S_o = 6%
To = $1.8(1.1-C)(L)^{0.5}/(S)^{0.33}$=$1.8(1.1-0.60)(182)^{0.5}/(1)^{0.33}$ ≈6.7 min

Concentrated flow Length Lc =778 ft
Slope S=5.4 %
Flow Velocity =4.7 ft/s (Gullies, from Figure E-3 of Manual)
Flow Time Ts=778/4.7/60 =2.8 min

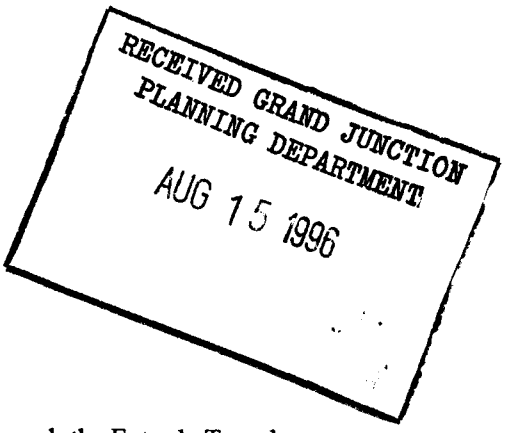
Time of Concentration Tc =To+Ts =6.7+2.8≈ 10 min
Intensity I_{100d} = 3.8 in/hr(From Table A-1 of the Manual)

Runoff Q_{100d} =CIA=0.60*3.8*3.6=**8.21 cfs**

July 16, 1996

To: The Ridges Neighborhood
Grand Junction, Colorado

From: Mr. Cris Caruso
c/o ROLLAND Engineering
405 Ridges Blvd., Suite A
Grand Junction, CO 81503



Subject: ***Proposed Relocation of School Bus Shelter***

Dear Neighbor,

As part of our design effort for safe pedestrian circulation around and through the Entrada Townhouses Project, the City of Grand Junction and the School District have asked us to contact you regarding a proposed relocation of the school bus shelter located at the intersection of Ridges Blvd. and Ridge Circle Drive.

In an effort to redirect the children away from the dangerous traffic patterns of Ridge Circle Drive, we are proposing to have the school bus shelter moved approximately 300 feet to the north along Ridges Blvd. Reasons for the proposed relocation are as follows:

1) The existing location is at the very busy intersection of Ridges Blvd. and Ridge Circle Drive. The divided highway intersection at the existing location can be unsafe with the number of traffic movements that occur even when a bus is stopped.

2) The traffic pattern at the new location is safer because traffic only moves in one direction and must stop behind the school bus.

3) The bus shelter is currently located adjacent to a private commercial lot with parking on the private lot and will likely have to be moved when the lot is developed. The City will allow and make provisions for limited parking at the new bus shelter location.

4) Positioning the bus shelter at the connection of an existing pedestrian pathway will enhance the safe transit of children from their homes to the bus stop by getting them off of the high traffic streets and on to the pathways.

5) The short distance involved in the bus shelter relocation will enhance the safety of the neighborhood without creating an inconvenience.

If you have any comments about the bus shelter relocation please direct them in writing to Mr. Cris Caruso to the above address. If we do not receive your comments by July 25, 1996, we will assume you are not opposed to the relocation. The relocation of the shelter is proposed to occur during Christmas Break, 1996 or in the Summer of 1997.

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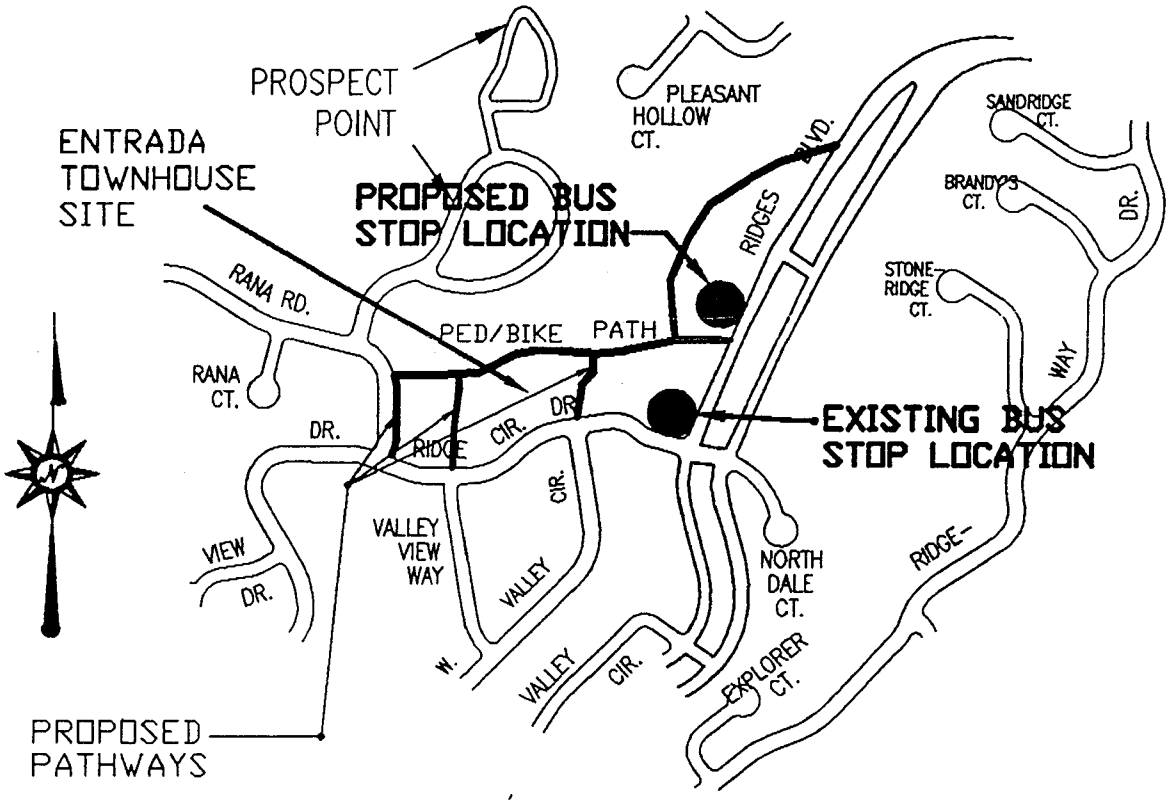
BUS STOP RELOCATION

The Ridges-Entrada Townhouses



NOTE:
APPROXIMATE DISTANCE OF PROPOSED BUS STOP MOVE IS 300 FEET TO THE NORTH FROM ITS PRESENT LOCATION.

COMMENT

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The Fleisher Company
Commercial Real Estate in Aspen

ENTRADA TOWNHOUSES II
General Project Report
July 25, 1996

Entrada Townhouses II is located on a property consisting of approximately 3.6 acres located at the corner of Ridge Circle Drive and Rana Road with a legal description of Lot 1 in Block 9 of the Ridges Filing Number Two.

The Ridges, being a planned community with a combination of multi-family and single-family dwellings, is commonly known for its natural landscapes in the foothills of the Colorado National Monument. Convenient from town, the location has been ideal for those who seek a rural setting but require quick access to the many amenities offered in Grand Junction.

Proposed for the site are twenty-three townhomes in single family, two, and three unit configurations which is consistent with surrounding neighborhoods. Current zoning regulations allow for thirty units, however we feel this density compromises the neighborhood's quality. Fourteen of the units are designed as one story homes and nine have two stories.

The layout is community oriented and pedestrian friendly with maximum open space. Walking paths are proposed to connect the neighborhood to adjacent paths. Strict Covenants, Conditions, and Restrictions will be applied to the neighborhood in line with those in other Ridges developments.

Private driving surfaces will be used to access the homes from two locations off of Ridge Circle Drive. The typical city street section is not proposed to be used in the new neighborhood as it would greatly diminish the amount of open space without added benefit for vehicles. Irrigation, water, and sewer facilities are available for access from adjacent streets. The irrigation system is designed to supply all common areas.

There will be no unusual demands placed upon public facilities by this project, nor are there any apparent geological hazards along the moderately sloping property. Please refer to the drawings and report by Rolland Engineering for details of the existing and proposed site conditions.

We look forward to commencing this project in the fall of 1996.

Sincerely,

Cristopher Caruso
Project Manager

200 East Main Street • Aspen, Colorado 81611 • 970/925-2122 • Fax 920-1628

SUBSURFACE SOILS EXPLORATION

THE ENTRADA TOWNHOMES

GRAND JUNCTION, CO

Prepared For:

THE FLEISHER COMPANY
200 East Main Street
Aspen, CO 81611

Prepared By:

LINCOLN-DeVORE, INC.
1441 Motor Street
Grand Junction, CO 81505

August 1, 1996

Lincoln DeVore, Inc.
Geotechnical Consultants
1441 Motor St.
Grand Junction, CO 81505
TEL: (970) 242-8968
FAX: (970) 242-1561

August 1, 1996

The Fleisher Company
200 East Main Street
Aspen, Colorado 81611

Re: SUBSURFACE SOILS EXPLORATION

THE ENTRADA TOWNHOMES

Grand Junction, Colorado

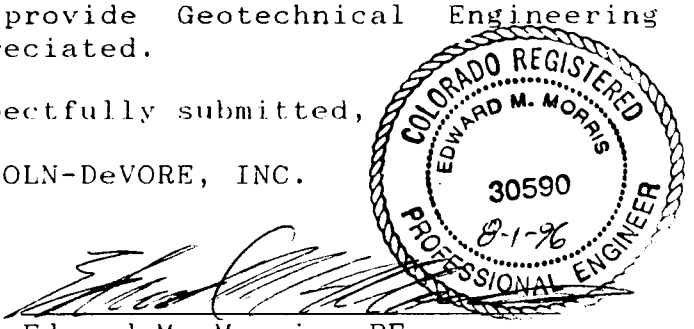
Dear Sir:

Transmitted herein are the results of an updated Subsurface Soils Exploration for the proposed Entrada Townhomes, The Ridges Subdivision, Grand Junction, Colorado.

If you have any questions after reviewing this report, please feel free to contact this office at any time. This opportunity to provide Geotechnical Engineering services is sincerely appreciated.

Respectfully submitted,

LINCOLN-DeVORE, INC.



By:
Edward M. Morris, PE
Western Slope Branch Manager
Grand Junction, Office

LDTL Job No. 85579-J

EMM/bh

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INTRODUCTION

PROJECT DESCRIPTION

This report presents the results of our geotechnical evaluation performed to determine the general subsurface conditions of the site applicable to construction of approximately 23 single family residential units, to be known as The Entrada Townhouse Subdivision. A vicinity map is included in the Appendix of this report.

To assist in our exploration, we were provided with a plot plan prepared by Rolland Engineering of Grand Junction, Colorado. The Boring Location Plan attached to this report is based on that plan provided to us.

We understand that the proposed structures will consist of attached and detached, single and possibly two-story, wood framed buildings with either crawlspace or concrete floor slabs on grade. It is possible that some basements may be constructed on this site. Lincoln DeVore has not seen any building plans, but structures of this type typically develop wall loads on the order of 600-200 plf and column loads on the order of 5-15 kips.

The characteristics of the subsurface materials encountered were evaluated with regard to the type of construction described above. Recommendations are included herein to match the described construction to the soil characteristics found. The information contained herein may or may not be valid for other purposes. If the proposed site use is changed or

types of construction proposed, other than noted herein, Lincoln DeVore should be contacted to determine if the information in this report can be used for the new construction without further field evaluations.

PROJECT SCOPE

The purpose of our exploration was to evaluate the surface and subsurface soil and geologic conditions of the site and, based on the conditions encountered, to provide recommendations pertaining to the geotechnical aspects of the site development as previously described. The conclusions and recommendations included herein are based on an analysis of the data obtained from our field explorations, laboratory testing program, and on our experience with similar soil and geologic conditions in the area.

This site was previously the subject of a report of Subsurface Soils Investigation performed by Lincoln DeVore, dated September 19, 1978, Lincoln DeVore Job #23411-J.

The scope of our geotechnical exploration consisted of a surface reconnaissance, subsurface exploration, obtaining representative samples, laboratory testing, analysis of field and laboratory data, and a review of geologic literature.

Specifically, the intent of this study is to:

1. Explore the subsurface conditions to the depth expected to be influenced by the proposed construction.

2. Evaluate by laboratory and field tests the general engineering properties of the various strata which could influence the development.

3. Define the general geology of the site including likely geologic hazards which could have an effect on site development.

4. Develop geotechnical criteria for site grading and earthwork.

5. Identify potential construction difficulties and provide recommendations concerning these problems.

6. Recommend an appropriate foundation system for the anticipated structure and develop criteria for foundation design.

FIELD EXPLORATION AND LABORATORY TESTING

A field evaluation was performed on 7-15-96 & 7-25-96, and consisted of a site reconnaissance by our geotechnical personnel and the drilling of 4 shallow exploration borings. These 4 shallow exploration borings were drilled within the proposed building envelopes near the locations indicated on the Boring Location Plan. The exploration borings were located to obtain a reasonably good profile of the subsurface soil conditions. All exploration borings were drilled using a CME 45-B, truck mounted drill rig with continuous flight auger to depths of approximately 10-15 feet. Samples were taken with a standard split spoon sampler, thin walled Shelby tubes, and by bulk methods. Logs describing the subsurface conditions are presented in the attached figures.

The following laboratory tests were performed on representative soil samples to determine their relative engineering properties.

ASTM D-2487	Soil Classification
ASTM D-2435	One Dimensional Consolidation
ASTM D-2166	Unconfined Compression
ASTM D-3080	Direct Shear Strength, Cd
ASTM D-2937	In-Place Soil Density
ASTM D-2216	Moisture Content of Soil
ASTM D-2844	R-Value of Soils (Hveem-Carmany)

Tests were performed in accordance with test methods of the American Society for Testing and Materials or other accepted standards. The results of our laboratory tests are included in this report. The in-place soil density, moisture content and the standard penetration test values are presented on the attached drilling logs.

FINDINGS

SITE DESCRIPTION

The project site is located in the Southeast Quarter of Section 17, in the Northeast Quarter of Section 20 Township 1 South, Range 1 West of the Ute Principal Meridian, Mesa County, Colorado. More specifically the site is located within The Ridges Subdivision, in the City of Grand Junction. The site is bordered by Ridge Circle Drive to the South, Rana Road to the West and contains approximately 3.6 acres.

The topography of the site is somewhat broken with a drainage way/gully on the North side and two small hills on the South and Southwest side of the property. The topography of the site generally slopes to the North-Northwest. The maximum elevation is near the Southwest corner, at approximately 4722' above mean sea level and the minimum elevation is at the Northeast corner, with a elevation of approximately 4677' above mean sea level.

The exact direction of surface drainage on any individual lot is somewhat variable and will be determined by the final construction. In general, drainage is expected to travel toward the North and Northeast, entering the drainage easement which in turn drains to the main drainage feature in Ridges Blvd. which in turn continues North to the Colorado River. Surface drainage on this site would be described as good and subsurface drainage would be described as fair to poor.

On-site erosion can be a significant problem if drainage and vegetation are not carefully controlled. Vegetation will probably be maintained in the immediate area around the building site, but special care should be taken to maintain vegetation on the steeper slopes. We recommend that runoff from these slopes be carefully controlled to prevent erosion caused by irrigation practices, sheetwash or seepage. It may be necessary to provide culverts or drainage ways to prevent excessive erosion along steeper slopes.

GENERAL GEOLOGY AND SUBSURFACE DESCRIPTION

The geologic materials encountered under the site consist of a very thick sequence of sedimentary rocks, with thin, isolated deposits of alluvial soils. The bedrock beneath this site is the Burro Canyon Formation and the basal chert conglomerate sandstone of the Dakota Formation in the Southwest portion of the tract. This tract was the object of a Subsurface Soils Investigation, performed by Lincoln DeVore, in 1978. In addition, several subsequent letters were written in 1978, involving alternate foundation systems for this site. This present report is intended to be an update of the original geotechnical report in 1978 and to include information recently obtained from this site. The geologic and engineering properties of the materials found in our 4 shallow exploration borings will be discussed in the following sections.

The soils encountered beneath this site have been divided into two soil groups. The relatively thin, alluvial soils on this site have properties very similar to the

weathered sandstone of the Dakota Formation. The Dakota Formation is relatively thin on this site and, may be penetrated by some construction and foundation systems in this area. The Dakota Formation and the alluvial soils appear to be limited to the Southwest portion of the site. The surface alluvial soils and the very weathered Dakota sandstone has been designated Soil Type I for this report.

This Soil Type is classified as a silty sand (SM) of fine to coarse grain size under the Unified Classification System. This soil type is of very low plasticity and of medium density. This soil will have virtually no tendency to expand upon the addition of moisture. Settlement will be minimal under the recommended foundation loads. This soil will undergo elastic settlement upon application of static foundation pressures. Such settlement is characteristically rapid and should be virtually complete by the end of construction. If the recommended allowable bearing values are not exceeded, and if all other recommendations are followed, differential movement will be within tolerable limits. At shallow foundation depths this soil was found to have an average allowable bearing capacity of 1800 psf.

The sandstones of the Dakota Formation, if broken down, would have engineering characteristics very similar to Soil Type I. If the sandstones are encountered in a cemented, relatively dense condition a maximum allowable bearing on the order of 6000 psf would be appropriate. It must be noted the Dakota Formation is relatively thin in this area and the near

vicinity of the underlying expansive clays of the Burro Canyon Formation must be taken into account for all shallow foundations on this site.

The Burro Canyon Formation is the bedrock beneath this entire tract. The Burro Canyon Formation can be described as a stratified and lenticular sequence of greenish gray and gray claystone, silty shale, mudstone, clayey siltstone and occasional sandstone. The Burro Canyon Formation is exposed on or near the ground surface on the North and East portion of the tract. This soil has been designated Soil Type II for this report.

This soil type was classified as a clayey sand (SC) under the Unified Classification System. This soils type does contain strata of sandy clays and silty clays. The Standard Penetration Tests ranged from approximately 50 blows per foot to in excess of 150 blows per foot. Penetration tests of this magnitude indicate that the soil is relatively hard and of medium to high density. The moisture content varied from 9.1% to 14.3%, indicating a relatively dry soil. This soil is plastic and is sensitive to changes in moisture content. With decreased moisture, it will tend to shrink, with some cracking upon desiccation. Upon increasing moisture, it will tend to expand. Expansion tests were performed on typical samples of the soil and expansive pressures on the order of 800-1100 psf were found to be typical. The allowable maximum bearing value for shallow foundations was found to be on the order of 6000 psf. A minimum dead load of 2000 psf will be required. This soil was found to contain sulfates in detrimental quantities.

The boring logs and related information show subsurface conditions at the date and location of this exploration. Soil conditions may differ at locations other than those of the exploratory borings. If the structure is moved any appreciable distance from the locations of the borings, the soil conditions may not be the same as those reported here. The passage of time may also result in a change in the soil conditions at the boring locations.

The lines defining the change between soil types or rock materials on the attached boring logs and soil profiles are determined by interpolation and therefore are approximations. The transition between soil types may be abrupt or may be gradual.

GROUND WATER:

No free water surface was encountered in exploration borings #1,3 & 4 during drilling on this site. Free water level developed in exploration boring #2 several days after drilling. This free water level appears to be related to irrigation watering on sites South and West of this tract. Based upon the geology of the area, the sedimentary beds of the Burro Canyon Formation are dipping to the North-Northwest. It is believed that areas of perched water should be anticipated in some more permeable rock strata. It is further anticipated this water will be relatively close to the surface in the drainage ditch along the North property line and possible in some strata near the East property line, possibly near Lots 5 through 10 of lot 1. This

perched water is apparently the result of irrigation practices to the South and West of this tract, particularly along Ridge Circle Drive, Hillview and Ridgeview Drive. The true phreatic surface in this area is the deep artesian water table in the Redlands and Orchard Mesa areas. It is believed this artesian water surface is several hundred feet below the present ground surface and should not affect construction on this site.

Due to the proximity of the Burro Canyon Formation across this entire tract, there exists a probability of individual perched water tables developing in the backfill soils of utility construction and individual house excavation sites. These perched waters would probably be the result of increased irrigation due to the presence of lawns, landscaping and roof runoff. While it is believed that under the existing conditions, the construction process would not be affected by any free flowing waters, it is very possible that several years after developement is initiated a troublesome perched water condition may develop which will provide construction difficulties. In addition this potential perched water at the individual lot sites could create some problems for any foundations on this tract. Therefore it is recommended that the future presence of a perched water table be considered in all design and construction for both the proposed residential structures and any subdivision improvements.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL DISCUSSION

No geologic conditions were apparent during our reconnaissance which would preclude the site development as planned, provided the recommendations contained herein are fully complied with. Based on our investigation to date and the knowledge of the proposed construction, the site condition which would have the greatest effect on the planned development is the expansive clays of the Burro Canyon Formation.

Since the exact magnitude and nature of the foundation loads are not precisely known at the present time, the following recommendations must be somewhat general in nature. Any special loads or unusual design conditions should be reported to Lincoln DeVore so that changes in these recommendations may be made, if necessary. However, based upon our analysis of the soil conditions and project characteristics previously outlined, the following recommendations are made.

OPEN FOUNDATION OBSERVATION

Since the recommendations in this report are based on information obtained through random borings, it is possible that the subsurface materials between the boring points could vary. Therefore, prior to placing forms or pouring concrete, an open excavation observation should be performed by representatives of Lincoln DeVore. The purpose of this observation is to determine if the subsurface soils directly below the proposed foundations are similar to those encountered in our

exploration borings. If the materials below the proposed foundations differ from those encountered, or in our opinion, are not capable of supporting the applied loads, additional recommendations could be provided at that time.

EXCAVATION:

Site preparation in any areas to receive structural fill should begin with the removal of all topsoil, vegetation, and other deleterious materials. Prior to placing any fill, the subgrade should be observed by representatives of Lincoln DeVore to determine if the existing vegetation has been adequately removed and that the subgrade is capable of supporting the proposed fills. The subgrade should then be scarified to a depth of 10 inches, brought to near optimum moisture conditions and compacted to at least 90% of its maximum modified Proctor dry density [ASTM D-1557]. The moisture content of this material should be within + or - 2% of optimum moisture, as determined by ASTM D-1557.

In general, we recommend all structural fill in the area beneath any proposed structure or roadway be compacted to a minimum of 90% of its maximum modified Proctor dry density (ASTM D1557). This structural fill should be placed in lifts not to exceed six (6) inches after compaction. We recommend that fill be placed and compacted at approximately its optimum moisture content (+/-2%) as determined by ASTM D 1557. Structural fill should be a granular, non-expansive soil.

Allowable slope angle for cuts in the

native soils is dependent on soil conditions, slope geometry, the moisture content and other factors. Should deep cuts be planned for this site, we recommend that a slope stability analysis be performed when the location and depth of the cut is known.

No major difficulties are anticipated in the course of excavating into the surficial soils on the site. It is probable that safety provisions such as sloping or bracing the sides of excavations over 4 feet deep will be necessary. Any such safety provisions shall conform to reasonable industry safety practices and to applicable OSHA regulations. The OSHA Classification for excavation purposes on this site is Soil Class B, assuming free water or very moist soil conditions are not encountered. If free water or very moist soil conditions are encountered, the Soil Classification for excavation purposes would be reduced to Soil Class C.

DRAINAGE AND GRADIENT:

Adequate site drainage should be provided in the foundation area both during and after construction to prevent the ponding of water and the saturation of the subsurface soils. We recommend that the ground surface around the structure be graded so that surface water will be carried quickly away from the building. The minimum gradient within 10 feet of the building will depend on surface landscaping. We recommend that paved areas maintain a minimum gradient of 2%, and that landscaped areas maintain a minimum gradient of 8%. It is further recommended that roof drain downspouts be carried across all backfilled areas and discharged at least 10 feet away from the structure. Proper

discharge of roof drain downspouts may require the use of subsurface piping in some areas. Planters, if any, should be so constructed that moisture is not allowed to seep into foundation areas or beneath slabs or pavements.

If adequate surface drainage cannot be maintained, or if subsurface seepage is encountered during excavation for foundation construction, a full perimeter drain is recommended for these individual buildings. It is recommended that this drain consist of a perforated drain pipe and a gravel collector, the whole being fully wrapped in a geotextile filter fabric. We recommend that this drain be constructed with a gravity outlet. If sufficient grade does not exist on the site for a gravity outlet, then a sealed sump and pump is recommended. Under no circumstances should a dry well be used on this site.

The existing drainage on the site must either be maintained carefully or improved. We recommend that water be drained away from structures as rapidly as possible and not be allowed to stand or pond near the building. We recommend that water removed from one building not be directed onto the backfill areas of adjacent buildings. We recommend that a hydrologist or drainage engineer experienced in this area be retained to complete a drainage plan for this site.

To give the building extra lateral stability and to aid in the rapidity of runoff, it is recommended that all backfill around the building and in utility trenches in the vicinity of the building be compacted to a minimum of 90% of its maximum Proctor dry density, ASTM D 698. The native soils on

this site may be used for such backfill. We recommend that all backfill be compacted using mechanical methods. No water flooding techniques of any type may be used in placement of fill on this site.

Should an automatic lawn irrigation system be used on this site, we recommend that the sprinkler heads be installed no less than 5 feet from the building. In addition, these heads should be adjusted so that spray from the system does not fall onto the walls of the building and that such water does not excessively wet the backfill soils.

It is recommended that lawn and landscaping irrigation be reasonably limited, so as to prevent undesirable saturation of subsurface soils or backfilled areas. Several methods of irrigation water control are possible, to include, but not limited to:

* Metering the Irrigation water.
* Sizing the irrigation distribution service piping to limit on-site water usage.
* Encourage efficient landscaping practices.
* Enforcing reasonable limits on the size of high water usage landscaping for each lot and any park areas.

FOUNDATIONS

At this time, Lincoln DeVore has not been provided with a copy of the foundation/building plans and is, therefore, not informed as to the precise wall or column loading planned within the building. Therefore, three foundation types which could be utilized for a building of this type are recommended, based on our experience in this area. The choice between these foundation types depends on the internal loading of the foundation members and the amount of excavation planned to achieve the finished floor elevations.

The three foundation types preliminarily recommended are as follows:

1. The voided wall on grade foundation system with the stem wall resting directly on the Shale Formation.
2. The isolated pad and grade beam foundation system in which the grade beam is voided and loads are transferred to the isolated pads.
3. The drilled pier and fully voided grade beam system with the loads transferred to the piers.

Recommendations given in this letter report are given for the shallow and deep foundation types.

SHALLOW FOUNDATIONS:

A conventional shallow foundation system consisting of either a voided wall on grade or an isolated pad and grade beam system, resting on the relatively unweathered expansive clays of the Burro Canyon Formation, may be designed on the basis of an allowable bearing capacity of 6000 psf maximum, and a minimum dead load of 2000 psf must be maintained. Contact stresses beneath all continuous walls should be balanced to

within + or -150 psf at all points. Isolated interior column footings should be designed for contact stresses of about 300 psf more than the average used to balance continuous walls. The criteria use for balancing will depend somewhat upon the nature of the structure. Single-story, slab on grade structures and single-story crawlspace structures may be balance on the basis of dead load only. Multi-story structures may be balanced on the basis of Dead Load plus one half live load, for up to three stories.

Stem walls for a shallow foundation system should be designed as grade beams capable of spanning at least 14 feet. These "grade beams" should be horizontally reinforced both near the top and near the bottom. The horizontal reinforcement required should be placed continuously around the structure with no gaps or breaks. A foundation system designed in this manner should provide a rather rigid system and, therefore, be better able to tolerate differential movements associated with the expansive clays of the Burro Canyon Formation.

It is possible that some foundations on this site will be founded on the alluvial silty sands of Soil Type I. It is very important that such sites be confirmed that the expansive clays of the Burro Canyon Formation are not within close proximity of the proposed building foundations. It is recommended that a minimum distance of 4' be maintained between the building foundations and the expansive clays of the Burro Canyon Formation. If this 4' separation can be confirmed, the above recommendations for balancing a shallow foundation system

may be utilized and the maximum allowable bearing capacities of the silty sands of Soil Type I may be taken as 1800 psf and a minimum deadload of 500 psf should be maintained.

DRILLED PIERS:

Based upon our experience in this area and due to possibly poor surface and subsurface drainage conditions of the subdivision, a drilled pier foundation system may be the preferred system. It must be noted that a drilled pier and fully voided grade beam system is quite rigid and will be quite sensitive to relative differential movements of the individual piers. The presence of subsurface water and permeable strata in the Mancos Shale Formation indicates that a 'Stable Strata Below The Zone of Seasonal Moisture Change' may not be adequately defined at this period of time, due to changing environmental conditions caused by development.

We recommend that drilled piers have a minimum shaft length of 7 feet and be embedded at least 7 feet into the relatively unweathered claystones and mudstones of the Burro Canyon Formation. At this level,these piers may be designed for a maximum end bearing capacity of 25,000 psf, plus 2000 psf side support considering only the side wall area embedded in the bedrock. Due to the expansive potential of the bedrock, a minimum dead load uplift is required, consisting of a point uplift of 2000 psf and 350 psf side uplift, based on the side wall embedded in the bedrock. The overburden is soft and no supporting or uplift values are assigned to this material. The weight of the concrete in the pier may be incorporated into the required dead

load.

It is recommended that the bottoms of all piers be thoroughly cleaned prior to the placement of concrete. The amount of reinforcing in each pier will depend on the magnitude and nature of loads involved. As a rule of thumb, reinforcing equal to approximately 1/2 of 1% of the gross cross-sectional concrete area should be used. Additional reinforcing should be used if structural conditions warrant. We recommend that reinforcing extend through the full length of pier.

To minimize the possibility of voids developing in the drilled piers, concrete with a slump of 5 to 6 inches is recommended. We recommend that piers be dewatered and thoroughly cleaned of all loose material prior to placing the steel cage and concrete. The pier excavation should contain no more than 2 inches of free water unless the concrete is placed by means of a tremie extending to the bottom of the pier. A free fall in excess of 5 feet is not recommended when placing concrete in drilled piers. We recommend that casing be pulled as the concrete is being placed and that a 5 foot head of concrete be maintained while pulling the casing. It is recommended that drilled piers be plumb with 2% of their length and that the shaft maintain a constant diameter for the full length of the pier and not allowed to "mushroom" at the top.

DRILLED PIER OBSERVATION:

The foundation installation for drilled

piers should be continuously observed by a representative of Lincoln DeVore to determine that the recommended bearing material has been adequately penetrated and that soil conditions are as anticipated by the exploration. This observation will aid in attaining an adequate foundation system. In addition, abnormalities in the subsurface conditions encountered during foundation installation can be identified and corrective measures taken as required. Lincoln DeVore requires a minimum of one working day's notice, and a copy of the foundation plan, to schedule any field observation.

GRADE BEAMS:

A reinforced concrete grade beam is recommended to carry the exterior wall loads in conjunction with the deep foundation system. We recommend that this grade beam be designed to span from bearing point to bearing point and not be allowed to rest on the ground surface between these points. We recommend a void space be left between the bottom of the grade beam and the subgrade below due to the expansive nature of the subgrade soils.

CONCRETE SLABS ON GRADE

Slabs could be placed directly on the natural soils or on a structural fill. We recommend that all slabs on grade be constructed to act independently of the other structural portions of the building. One method of allowing the slabs to float freely is to use expansion material at the slab-structure interface.

If the slab is to be placed directly on the expansive soils or on a thin fill overlying these soils, the risk of slab movement is high and stringent mitigation techniques are recommended. No design method known at this time will prevent slab movement should moisture enter the expansive soils below. Therefore, to mitigate the effects of slab movement should they occur, we recommend the following:

1. Control joints should be placed in such a manner that no floor area exceeding 400 square feet remains without a joint. Additional joints should be placed at columns and at inside corners. These control joints should minimize cracking associated with expansive soils by controlling location and direction of cracks.

2. We recommend that all slabs on grade be isolated from all structural members of the building. This is generally accomplished by an expansion joint at the floor slab / foundation interface. In addition, positive separation should be maintained between the slab and all interior columns, pipes and mechanical systems extending through the slab.

3. The slab subgrade should be kept moist 3 to 4 days prior to placing the slab. This is done by periodically sprinkling the subgrade with water. However, under no circumstances should the subgrade be kept wet by the flooding or ponding water.

4. Any partitions which will rest on the slabs on grade should be constructed with a minimum void space of 2

inches at the bottom of the wall (see figure in the Appendix). This base should allow for future upward movement of the floor slabs and minimize movement and damage in walls and floors above the slabs. This void may require rebuilding after a period of time, should heave exceed 2 inches.

An alternative is to dispense with slab-on-grade construction and use a structural floor system. A structural floor system may be either a structural reinforced concrete slab or a structural wood floor system suspended with floor joists. Each system would utilize a crawl space. This alternative would substantially reduce a potential for post construction slab difficulties due to the expansive properties of the Burro Canyon Formation.

It is recommended that floor slabs on grade be constructed with control joints placed to divide the floor into sections not exceeding 360 to 400 square feet, maximum. Also, additional control joints are recommended at all inside corners and at all columns to control cracking in these areas.

Problems associated with slab 'curling' are usually minimized by proper curing of the placed concrete slab. This period of curing usually is most critical within the first 5 days after placement. Proper curing can be accomplished by continuous water application to the concrete surface or, in some instances by the placement of a 'heavy' curing compound, formulated to minimize water evaporation from the concrete. Curing by continuous water application must be carefully undertaken to prevent the wetting or saturation of the subgrade soils.

EARTH RETAINING STRUCTURES

The active soil pressure for the design of earth retaining structures may be based on an equivalent fluid pressure of 50 pounds per cubic foot. The active pressure should be used for retaining structures which are free to move at the top (unrestrained walls). For earth retaining structures which are fixed at the top, such as basement walls, an equivalent fluid pressure of 65 pounds per cubic foot may be used. It should be noted that the above values should be modified to take into account any surcharge loads, sloping backfill or other externally applied forces. The above equivalent fluid pressures should also be modified for the effect of free water, if any.

The passive pressure for resistance to lateral movement may be considered to be 210 pcf per foot of depth. The coefficient of friction for concrete to soil may be assumed to be 0.24 for resistance to lateral movement. When combining frictional and passive resistance, the latter must be reduced by approximately 1/3.

If relatively non-plastic gravelly sands, similar to Soil Type I are utilized for backfill, the above allowable effective soil fluid pressure may be reduced somewhat. The amount of reduction will depend on the actual soils utilized and should be determined at the time of construction.

REACTIVE SOILS

Since groundwater in the Grand Junction area in general and the Ridges area in particular typically contains sulfates in quantities detrimental to a Type I cement, a Type II or Type I-II or Type II-V cement is recommended for all concrete which is in contact with the subsurface soils and bedrock. Calcium chloride should not be added to a Type II, Type I-II or Type II-V cement under any circumstances.

PAVEMENTS

Samples of the surficial native soils that may be required to support pavements have been evaluated using the Hveem-Carmany method (ASTM D-2844) to determine their support characteristics. The results of the laboratory testing are as follows:

AASHTO Classification - A-1 Unified Classification - SM
Soil Type #I - Alluvial Sands & Wx Sandstones
R = 40
Expansion @ 300 psi = 26 psf
Displacement @ 300 psi = 3.63

AASHTO Classification - A-4(2) Unified Classification - SC
Soil Type #II - Mudstones, Burro Canyon Frm.
R = 8
Expansion @ 300 psi = 21.6 psf
Displacement @ 300 psi = 4.48

Displacement values higher than 4.00 generally indicate the soil is unstable and may require confinement for proper performance.

Traffic Counts or anticipated volumes have not been provided to Lincoln DeVore. Truck and passenger traffic volumes and mixture estimates by Lincoln DeVore indicate a daily EAL of 5 would probably be appropriate.

Two methods of design were utilized for this project. First, the 1986 AASHTO procedure, recognized by the Colorado Department of Transportation and second, The Asphalt

Institute (MS-1). A design life of 30 years was used, with an annual growth rate of 5%.

Based upon the existing topography, the anticipated final road grades and subsurface soils conditions encountered during the drilling program, a Drainage Factor of 0.7 (1986 AASHTO procedure) and a mean average annual air temperature (MAAT) of 60° Fahrenheit (Asphalt Institute Method) has been utilized for the section analysis.

Calculated Pavement Sections

18K EAL = 5 Soil Type I - "R" Value = 40

	1986 AASHTO Drainage Coefficient = 0.7	Asphalt Institute MAAT = 60° F	
AC	3"	3"	AC
ABC	4" use 6"	6"	ABC
Subbase	0"	0"	Subbase
FULL DEPTH AC	4"	4"	

18K EAL = 5 Soil Type II - "R" Value = 8

	1986 AASHTO Drainage Coefficient = 0.7	Asphalt Institute MAAT = 60° F	
AC	3" or 4"	4"	AC
ABC	10" or 6"	6"	ABC
Subbase	0" or 0"	0"	Subbase
FULL DEPTH AC	5"	5"	

SECTION CONSTRUCTION

We recommend that the asphaltic concrete pavement meet the State of Colorado DOT requirements for a Grade C or CX mix. If Laboratory Testing values are available, recycled asphalt may be factored and substituted for a portion of the new asphaltic concrete. In addition, the asphaltic concrete pavement should be compacted to 92% minimum and 96% maximum of its maximum theoretical (Rice) density.

The aggregate base course should meet the requirements of State of Colorado DOT Class 5 or Class 6 material, and have a minimum R value of 78. We recommend that the base course be compacted to a minimum of 95% of its maximum Modified Proctor dry density (ASTM D-1557), at a moisture content within + or -2% of optimum moisture. The native subgrade shall be scarified and recompacted to a minimum of 90% of their maximum Modified Proctor day density (ASTM D-1557) at a moisture content within + or -2% of optimum moisture.

All pavement should be protected from moisture migrating beneath the pavement structure. If surface drainage is allowed to pond behind curbs, islands or other areas of the site and allowed to seep beneath pavement, premature deterioration or possibly pavement failure could result.

LIMITATIONS

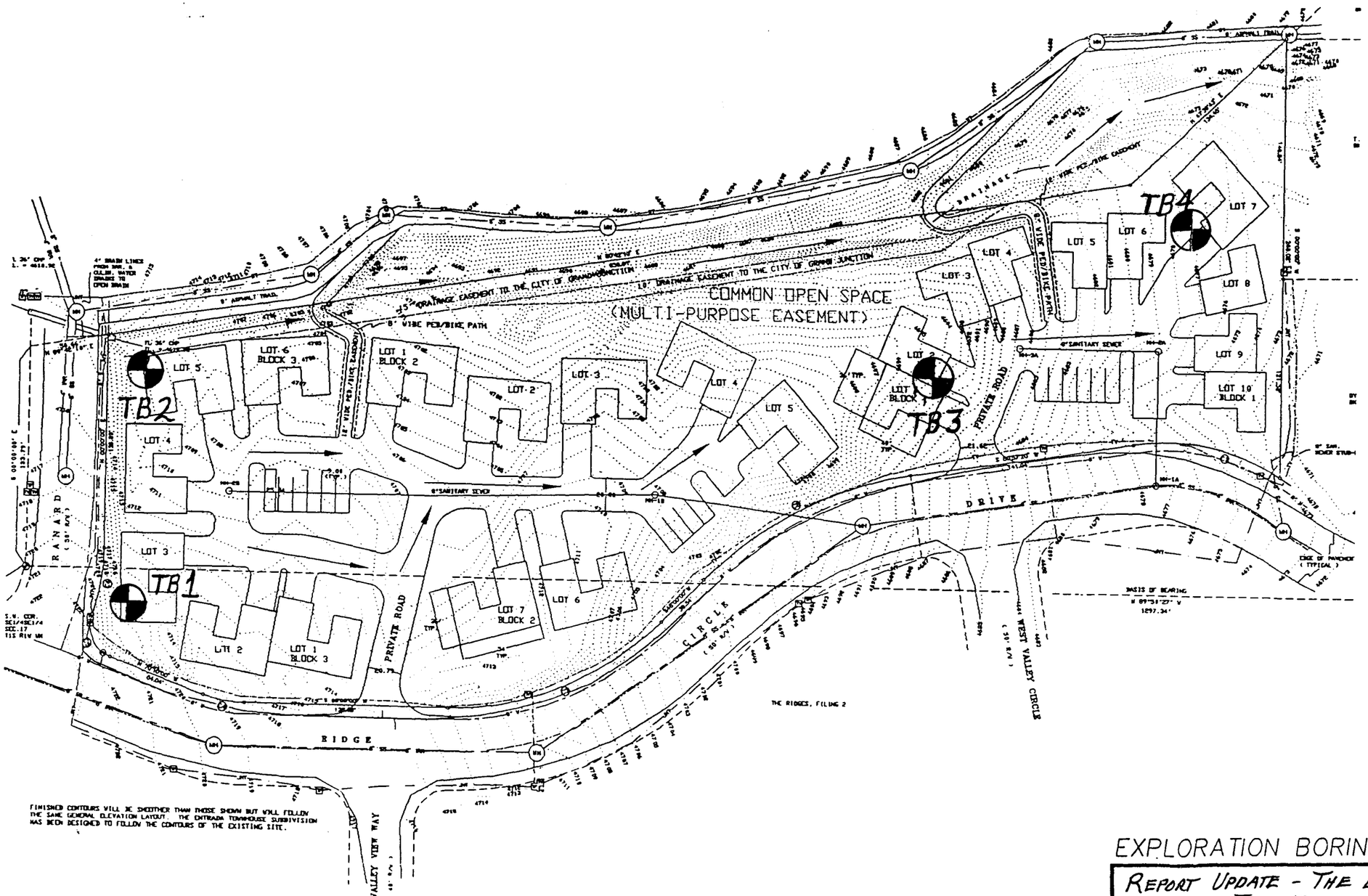
This report is issued with the understanding that it is the responsibility of the owner, or his representative to ensure that the information and recommendations contained herein are brought to the attention of the individual lot purchasers for the subdivision. In addition, it is the responsibility of the individual lot owners that the information and recommendations contained herein are brought to the attention of the architect and engineer for the individual projects and the necessary steps are taken to see that the contractor and his subcontractors carry out the appropriate recommendations during construction.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties. In addition, changes in acceptable or appropriate standards may occur or may result from legislation or the broadening of engineering knowledge. Accordingly, the findings of this report may be invalid, wholly or partially, by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of 3 years.

The recommendations of this report pertain only to the site investigated and are based on the assumption that the soil conditions do not deviate from those described in this report. If any variations or undesirable conditions are encountered during construction or the proposed

construction will differ from that planned on the day of this report, Lincoln DeVore should be notified so that supplemental recommendations can be provided, if appropriate.

Lincoln DeVore makes no warranty, either expressed or implied, as to the findings, recommendations, specifications or professional advice, except that they were prepared in accordance with generally accepted professional engineering practice in the field of geotechnical engineering.



EXPLORATION BORING

EXPLORATION BORING DIAGRAM

REPORT UPDATE - THE ENTRADA TWNHM.
THE FLEISHER COMPANY
THE RIDGES SUBDIVISION - GRAND JUNCTION

LINCOLN DeVORE
ENGINEERS · GEOLOGISTS

1441 MOTOR STREET
GRAND JCT. COLORADO
COLO. SPRINGS–PUEBLO

LD # 25579-J | SHEET | OF

DRAWN BY: E. M. MORRIS | SCALE: —— | DATE: 8-1-96

SOILS DESCRIPTIONS:

SYMBOL	USCS	DESCRIPTION
		Topsoil
		Man-made Fill
	GW	Well-graded Gravel
	GP	Poorly-graded Gravel
	GM	Silty Gravel
	GC	Clayey Gravel
	SW	Well-graded Sand
	SP	Poorly-graded Sand
	SM	Silty Sand
	SC	Clayey Sand
	ML	Low-plasticity Silt
	CL	Low-plasticity Clay
	OL	Low-plasticity Organic Silt and Clay
	MH	High-plasticity Silt
	CH	High-plasticity Clay
	OH	High-plasticity Organic Clay
	Pt	Peat
	GW/GM	Well-graded Gravel, Silty
	GW/GC	Well-graded Gravel, Clayey
	GP/GM	Poorly-graded Gravel, Silty
	GP/GC	Poorly-graded Gravel, Clayey
	GM/GC	Silty Gravel, Clayey
	GC/GM	Clayey Gravel, Silty
	SW/SM	Well-graded Sand, Silty
	SW/SC	Well-graded Sand, Clayey
	SP/SM	Poorly-graded Sand, Silty
	SP/SC	Poorly-graded Sand, Clayey
	SM/SC	Silty Sand, Clayey
	SC/SM	Clayey Sand, Silty
	CL/ML	Silty Clay

ROCK DESCRIPTIONS:

SYMBOL	DESCRIPTION
SEDIMENTARY ROCKS	
	CONGLOMERATE
	SANDSTONE
	SILTSTONE
	SHALE
x x x x x x	CLAYSTONE
	COAL
	LIMESTONE
	DOLOMITE
	MARLSTONE
	GYPSUM
	Other Sedimentary Rocks
IGNEOUS ROCKS	
	GRANITIC ROCKS
	DIORITIC ROCKS
	GABBRO
	RHYOLITE
	ANDESITE
	BASALT
	TUFF & ASH FLOWS
	BRECCIA & Other Volcanics
	Other Igneous Rocks
METAMORPHIC ROCKS	
	GNEISS
	SCHIST
	PHYLLITE
	SLATE
	METAQUARTZITE
	MARBLE
	HORNFELS
	SERPENTINE
	Other Metamorphic Rocks

SYMBOLS & NOTES:

SYMBOL	DESCRIPTION
	9/12 Standard penetration drive Numbers indicate 9 blows to drive the spoon 12" into ground.
	ST 2-1/2" Shelby thin wall sample
W_o	Natural Moisture Content
W_x	Weathered Material
Free water	Free water table
γ^o	Natural dry density
T.B.	Disturbed Bulk Sample
②	Soil type related to samples in report
15' W_x Form.	Top of formation
	Test Boring Location
	Test Pit Location
	Seismic or Resistivity Station. Lineation indicates approx. length & orientation of spread (S = Seismic, R = Resistivity)

Standard Penetration Drives are made by driving a standard 1 4" split spoon sampler into the ground by dropping a 140 lb. weight 30". ASTM test des. D-1586.

Samples may be bulk, standard split spoon (both disturbed) or 2-1/2" I.D. thin wall ("undisturbed") Shelby tube samples. See log for type.

The boring logs show subsurface conditions at the dates and locations shown, and it is not warranted that they are representative of subsurface conditions at other locations and times.

LINCOLN DeVORE INC

COLORADO SPRINGS
PUEBLO - GRAND JUNCTION

EXPLANATION OF BOREHOLE LOGS AND LOCATION DIAGRAMS

BORING NO. 1

LOT 3, BLOCK 3, SOUTHWEST CORNER OF PROJECT

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		DESSICATED				
		ALLUVIAL, DEBRIS FAN DEPOSIT PINK				
	SM	SILTY SAND Med-Fine GRAVEL DRY				
	I	COMPRESSIBLE PINK - WHITE	ST		111.3	2.1%
5			5	31/6		
	Kd	FINE GRAINED SANDSTONE DRY	SPT	122/12		2.2%
	Dakota Formation	STRATIFIED				
		Cross Bedded WHITE - V. Lt. GRAY				
		Occ. CHERT PEBBLES SI. MOIST	SPT	48/6		5.4%
10		PERMEABLE HARD TO DRILL	10	98/12		
	Kdb	MUDSTONE GRAY-GREEN SULFATES				
	Burro Canyon Frm	EXPANSIVE				
	SC	CLAYEY SAND SI. MOIST	SPT	27/6		12.8%
15	II	STRATIFIED	15	82/12		
		THIN SILTSTONE & SANDSTONE STRATA				
		TD @ 15'				
20			20			
25			25			
30			30			
		Blow Counts are cumulative for each 6 inches of sampler penetration.				
		NO Free Water During Drilling 7-15-96				

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.
Geotechnical Consultants
Grand Junction, Colorado

ENTRADA TOWNHOMES
The Ridges Sub. Grand Junction, Colo.
The Fleisher Company
Rolland Engineering
Date 7-27-96
Job No. 85579-J
Drawn EMM

BORING NO. 2

LOT 5, BLOCK 3, NORTHWEST CORNER OF PROJECT

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		SM SILTY SAND Med-Fine GRAVEL DESSICATED				
		I SL. COMPRESSIBLE WHITE - BUFF				
		Kd FINE GRAINED SANDSTONE				
		Dakota Formation HARD SANDSTONE DRY	SPT	72/6		3.6%
5		WHITE - V. Lt. GRAY Cross Bedded	5			
		SOME FRIABLE STRATA STRATIFIED				
		MANY CHERT PEBBLES Sl. MOIST				
		PERMEABLE FIRM - HARD TO DRILL				
			SPT	88/6		6.2%
10		Kdb MUDSTONE GRAY-GREEN SULFATES	10			
		Burro Canyon Frm VERY SANDY				
		SC CLAYEY SAND EXPANSIVE Sl. MOIST				
		II FIRM to HARD STRATIFIED				
		THIN SILTSTONE & SANDSTONE STRATA	SPT	51/6		14.3%
15		FREE WATER IN CASED BORING, 7-25-96	15	126/12		
		TD @ 15'				
20			20			
25			25			
30			30			
		Blow Counts are cumulative for each 6 inches of sampler penetration. NO Free Water During Drilling 7-15-96				

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.
Geotechnical Consultants
Grand Junction, Colorado

ENTRADA TOWNHOMES
The Ridges Sub. Grand Junction, Colo.

The Fleisher Company		Date
Rolland Engineering		7-27-96
Job No. **85579-J**	Drawn **EMM**	

BORING NO. 3

LOT 1, BLOCK 1, SOUTH-SOUTHEAST PORTION OF PROJECT

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
	SM	SILTY SAND Med-Fine GRAVEL DESSICATED				
		INCREASING CLAY SULFATES				
	Kdb	MUDSTONE VERY WEATHERED SI. MOIST				
	Burro Canyon Frm	EXPANSIVE	SPT	29/6		9.1%
5	SC	CLAYEY SAND GRAY-GREEN SI. MOIST	5	46/12		
	II	STRATIFIED		66/18		
		THIN SILTSTONE & SANDSTONE STRATA				
		FRACTURED				
	SC	CLAYEY SAND & SANDY CLAY	SPT	41/6		12.7%
10	II	EXPANSIVE	10	97/12		
		CLAYSTONE STRATA				
		VERY FIRM to HARD				
	SC	CLAYEY SAND SILTSTONE & MUDSTONE				
	II	FIRM to HARD	SPT	62/6		11.1%
15			15			
		TD @ 14'				
20			20			
25			25			
30			30			
		Blow Counts are cumulative for each 6 inches of sampler penetration.				
		NO Free Water During Drilling 7-25-96				

LOG OF SUBSURFACE EXPLORATION

ENTRADA TOWNHOMES

The Ridges Sub. Grand Junction, Colo.

The Fleisher Company

Rolland Engineering

Date 7-27-96

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

Job No. 85579-J

Drawn EMM

BORING NO. 4

LOT 7, BLOCK 1, NORTHEAST CORNER OF PROJECT

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		ALLUVIAL, DEBRIS FAN DEPOSIT PINK				
	SM	SILTY SAND Med-Fine GRAVEL DRY				
	I	METASTABLE STRATA PINK - WHITE	ST		108.4	8.5%
5		INCREASING GRAVELS Non-PLASTIC	5	06/06		
			SPT	26/12		7.5%
	Kdb	MUDSTONE GRAY-GREEN SULFATES		56/18		
	Burro Canyon Frm	EXPANSIVE				
	SC	CLAYEY SAND SI. MOIST	SPT	17/6		12.0%
10	II	STRATIFIED	10	74/12		
		THIN SILTSTONE & SANDSTONE STRATA				
		TD @ 10'				
15			15			
20			20			
25			25			
30			30			
		Blow Counts are cumulative for each 6 inches of sampler penetration. NO Free Water During Drilling 7-25-96				

LOG OF SUBSURFACE EXPLORATION

ENTRADA TOWNHOMES

The Ridges Sub. Grand Junction, Colo.

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

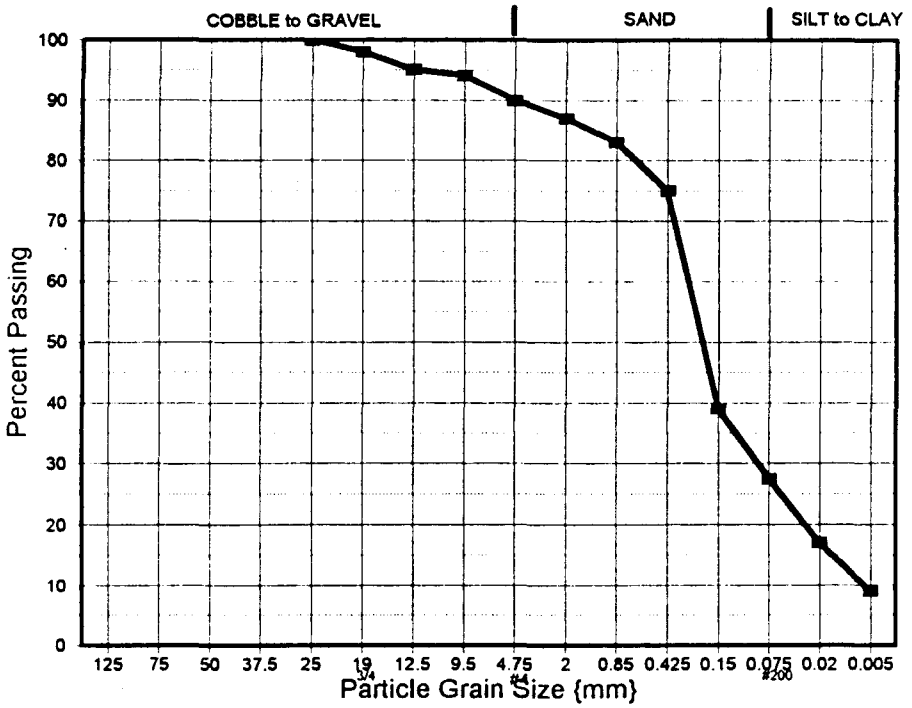
The Fleisher Company / Rolland Engineering	Date 7-27-96
Job No. 85579-J	Drawn EMM

Soil Sample: **SILTY SAND (SM), ALLUVIAL** Sample No.: **I** **(Typical)** 1

DEBRIS FAN & WEATHERED SANDSTONE Test by: **LRS**

Natural Water Content (w **2.1%** Boring No.: 1 Depth: 3'

Soil Specific Gravity (Gs): In-Place Density (pcf): 111.3



Effective size mm

Cu

Cc

Plastic Limit (PL) 15%

Liquid Limit (LL) 16%

Plasticity Index (PI) 1%

Shrinkage Limit (SL)

Shrinkage Ratio

DIRECT SHEAR:

Shear Angle: deg.

Tan Shear Angle:

Cohesion: psf

Sieve	(mm)	% Passing
5"	125	
3"	75	
2'	50	
1-1/2"	37.5	
1"	25	100
3/4"	19	98
1/2"	12.5	95
3/8"	9.5	94
# 4	4.75	90
#10	2	87
#20	0.85	83
#40	0.425	75
#100	0.15	39
#200	0.075	27.5
	0.02	17
	0.005	9

MOISTURE/DENSITY RELATIONSHIP:

ASTM Method:

Max. Dry Density : pcf

Optimum Moisture :

HVEEM-CARMANY: **FHA Soil Swell:**

'R' Value @ 300 psi: 40 % Swell

Displacement 300 psi: 3.63 psf

Expansion @ 300 psi: 26 psf

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 1800 psf

Unconfined Compression (qu): psf

CONSOLIDATION: @ psf

@ psf

SULFATE SALTS: 250 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

ENTRADA TOWNHOMES

The Ridges Sub. Grand Junction, Colo.

The Fleisher Company | Date

Rolland Engineering | 7-27-96

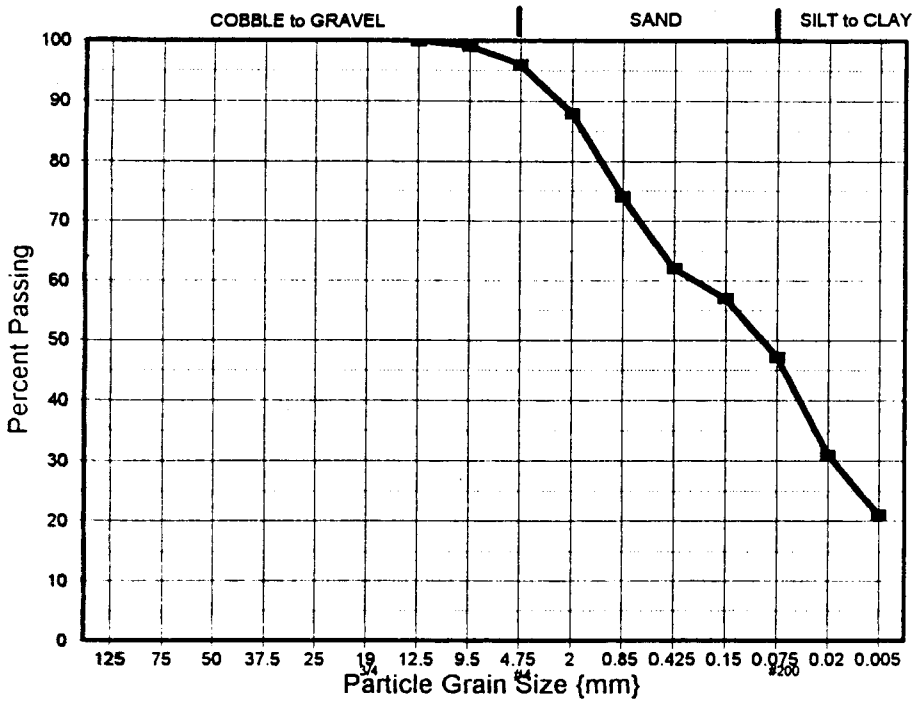
Job No. **85579-J** | Drawn **EMM**

Soil Sample: CLAYEY SAND (SC), MUDSTONE — Sample No. II (Typical)

Upper Member, BURRO CANYON FORMATION — Test by: LRS

Natural Water Content (w): — Boring No.: 3 Depth: 4'

Soil Specific Gravity (Gs): — In-Place Density (pcf):



Effective size mm

Cu

Cc

Plastic Limit (PL) 20%

Liquid Limit (LL) 29%

Plasticity Index (PI) 9%

Shrinkage Limit (SL)

Shrinkage Ratio

DIRECT SHEAR:

Shear Angle: deg.

Tan Shear Angle:

Cohesion: psf

Sieve	(mm)	% Passing
5"	125	
3"	75	
2'	50	
1-1/2"	37.5	
1"	25	
3/4"	19	
1/2"	12.5	100
3/8"	9.5	99
# 4	4.75	96
#10	2	88
#20	0.85	74
#40	0.425	62
#100	0.15	57
#200	0.075	47.2
	0.02	31
	0.005	21

MOISTURE/DENSITY RELATIONSHIP:

ASTM Method:

Max. Dry Density : pcf

Optimum Moisture :

HVEEM-CARMANY:

'R' Value @ 300 psi:

Displacement 300 psi:

Expansion @ 300 psi:

FHA Soil Swell:

4.4 % Swell

1082 psf

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 6000 psf Shallow

Unconfined Compression (qu): psf

CONSOLIDATION: @ psf

@ psf

SULFATE SALTS: 500 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

ENTRADA TOWNHOMES

The Ridges Sub. Grand Junction, Colo.

The Fleisher Company

Rolland Engineering

Date **7-27-96**

Job No. **85579-J**

Drawn **EMM**

REVIEW COMMENTS

FILE #FPP-96-174 **TITLE HEADING:** Entrada Townhomes II

LOCATION: NE corner of Rana Road & Ridge Circle Drive

PETITIONER: Christopher Caruso

PETITIONER'S ADDRESS/TELEPHONE: Entrada Townhouses Ltd.
200 E Main Street
Aspen, CO 81611
925-2122

PETITIONER'S REPRESENTATIVE: Rolland Engineering

STAFF REPRESENTATIVE: Kathy Portner

NOTE: THE PETITIONER IS REQUIRED TO SUBMIT FOUR (4) COPIES OF WRITTEN RESPONSE AND REVISED DRAWINGS ADDRESSING ALL REVIEW COMMENTS ON OR BEFORE 5:00 P.M., AUGUST 22, 1996.

CITY COMMUNITY DEVELOPMENT **8/15/96**
Kathy Portner **244-1446**

1. The Preliminary Plan approval show 6 parking spaces in the east pod. The final shows only 5. Show how 6 can be provided.
2. Please state the reason for a 6' wide path along Rana Road rather than a 8' wide path.
3. Please indicate if you have received comment from the Scenic School Principal on moving the bus stop.
4. The pedestrian/bike easements must be dedicated on the plat. They should be dedicated to the homeowners for the use of the general public.
5. All internal streets' dedication must include ingress/egress for the general public for access to the pathway system.
6. There's no dedication for the utility and pedestrian/equestrian easements. If they were previously dedicated it should be so noted.
7. Is any part of the drainage ditch on Entrada's property?
8. What maximum height of structures is being proposed?
9. Planning Commission approval included a requirement for stop signs to be placed at the end of each private drive.
10. Preliminary approval also required that a direct link between the housing clusters be provided via a trail.
11. Indicate how trash service will be handled.
12. The homeowner's association shall establish an annual maintenance fund for the private streets. The formula and financial mechanisms of this fund shall be submitted by the petitioner for review and approval by the Public Works Director prior to the release of the Development Improvements Agreement.

CITY DEVELOPMENT ENGINEER **8/9/96**
Jody Kliska **244-1591**

1. Please provide a plan and profile for the bike paths.
2. The proposed culverts in the drainage need to be analyzed. The placement of culverts in the channel create a blockage in a previously uninhibited channel. What I want to know is will the 100 year event overtop the bike paths? How high will the water back up behind the bike paths? Does this affect the proposed townhomes on the embankment?
3. The drainage fee is calculated at $2451.38 for undetained discharge.
4. TCP credit may be allowed for the Rana Road path.
5. Storm sewer line c shows two direction changes, necessitating manholes.
6. Please provide coordinates or distances and bearings for the storm sewer lines.
7. Section 140.2a of the City Standard Contract Documents reads "Approved end sections required at the exposed end of all PVC pipe."
8. Section 102.10 of same document indicates CMP is not an approved material.
9. End sections are required at both inlet and outlet of culverts.
10. Why are the storm sewer lines designed on a flat grade? It appears the outlets will be on a fill rather than to existing grade.

CITY UTILITY ENGINEER **8/9/96**
Trent Prall **244-1590**

WATER:

W1. Degree of bends not identified on water plans.

SEWER:

S1. Please include the following notes on the sewer plans:

- A. Contractor shall have one signed copy of plans and a copy of the City of Grand Junction's Standard Specifications at the job site at all times.
- B. All sewer mains shall be PVC SDR 35 (ASTM 3034) unless otherwise noted.
- C. All sewer mains shall be laid to grade utilizing a pipe laser.
- D. All service line connections to the new main shall be accomplished with full body wyes or tees. Tapping saddles will not be allowed.
- E. No 4" service lines shall be connected directly into manholes.
- F. The contractor shall notify the City inspection 48 hours prior to commencement of construction.
- G. The Contractor is responsible for all required sewer line testing to be completed in the presence of the City Inspector. Pressure testing will be performed after all compaction of street subgrade and prior to street paving. Final lamping will also be accomplished after paving is completed. These tests shall be the basis of acceptance of the sewer line extension.
- H. The Contractor shall obtain City of Grand Junction Street Cut Permit for all work within existing City right-of-way prior to construction.
- I. A clay cut-off wall shall be placed 10 feet upstream from all new manholes unless otherwise noted. The cut-off wall shall extend from 6 inches below to 6 inches above granular backfill material and shall be 2 feet wide. If native material is not suitable, the contractor shall import material approved by the engineer.
- J. Benchmark _____.

IRRIGATION:

I1. Is irrigation proposed for this development? If so, irrigation plans need to be submitted.

CITY PROPERTY AGENT **8/14/96**
Steve Pace **256-4003**

1. Need to address utility, irrigation, pedestrian/bike and pedestrian/equestrian easements in the dedication.
2. Need to use consistent nomenclature in the general notes and dedication when using the term Common Open Space - versus Common Tracts, Outlots, Common Areas.
3. Should the total acreage be 3.59 acres instead of 4.60 acres.
4. On sheet 3 of 4, what do the 2 dimensions on the south line of the SE1/4 SE1/4 (s89-50-27E, 161.47 & S89-50-27E, 105.54) represent?
5. Should Lot 1, Block 9, Ridges Filing #2 be referenced in the dedication?
6. Remove language pertaining to drainage and detention/retention easements from dedication.

CITY FIRE DEPARTMENT **8/14/96**
Hank Masterson **244-1414**

One additional fire hydrant will be required. Locate this hydrant near lot 13 along the private road.

Fire department access is adequate as shown.

CITY POLICE DEPARTMENT **8/12/96**
Dave Stassen **244-3587**

The design of this project follows current crime prevention techniques. The independent parking areas need to be lit more than the rest of the project.

MESA COUNTY PLANNING **8/12/96**
Richard Goecke **244-1744**

1. The proposed points of access to the 2-clusters of townhomes should be aligned at 90° or greater to Ridge Circle.
2. The main feature or theme of the cluster containing units 1-10 appears to be the parking lot. Elimination of at least 2-units of the smaller design would provide a more attractive and functional cluster for units 1-10. Lot 4 dimensions are similar to those of lots 11-23 and as a free-standing unit is does not match the "attached" design of the other units in cluster 1-10. Re-design of this cluster to include a greater setback from the parking lot and the adjacent property would create a more open feeling.
3. Lots 22 and 23 are somewhat "orphaned" from the rest of the cluster (11-23). These proposed units are bounded on 3-sides by roadways giving them the appearance and feel of not being integrated into the rest of the development. Reconfigured parking and realignment of the proposed private road would help to integrate these 2-units into the design more effectively.
4. Overall, the project would not meet county guidelines for:
   - traffic circulation
   - setbacks
   - parking
   - buffering

MESA COUNTY SCHOOL DISTRICT #51 **8/14/96**
Lou Grasso **242-8500**

SCHOOL / CURRENT ENROLLMENT - CAPACITY / IMPACT
Scenic Elementary / 298 - 325 / 6
Redlands Middle School / 552 - 650 / 3
Fruita Monument High School / 1337 - 1100 / 4

REDLANDS WATER & POWER **8/14/96**
Gregg Strong **243-2173**

This townhome subdivision has no impact to Redlands facilities.

U S WEST COMMUNICATIONS **8/9/96**
Max Ward **244-4721**

For timely telephone service, as soon as you have a plat and power drawing for your housing development, please....

MAIL COPY TO
U S West Communications
Developer Contact Group
P.O. Box 1720
Denver, CO 80201

AND

CALL THE TOLL-FREE NUMBER FOR
Developer Contact Group
1-800-526-3557

We need to hear from you at least 60 days prior to trenching.

PUBLIC SERVICE COMPANY **8/7/96**
Gary Lewis **244-2698**

Multi-purpose easements should be sufficient for installation of gas and electric facilities to these lots.

RIDGES ARCHITECTURAL CONTROL COMMITTEE **8/7/96**
Munkres/Carlsrud/Lewis **241-5028**

Ridges A.C.C.O. recommends landscaping the backs of lots 18 through 23. Landscaping should include large trees, i.e. quick growing poplars or cottonwoods, which would give immediate relief to the stark landscapes. This should be interspersed with firs or Austrian pines. Screening of backyards for those who already live adjacent to these townhomes we feel will cushion the impact of these lots.

U.S. POSTAL SERVICE **8/5/96**
Mary Barnett **244-3434**

This is rural delivery area. Central delivery is required. A single of several locations along the private drive is recommended.

TCI CABLEVISION **8/9/96**
Glen Vancil **245-8777**

1. We require the developers to provide, at no charge to TCI Cablevision, an open trench for cable service where underground service is needed and when a roadbore is required, that too must be provided by the developer. The trench and/or roadbore may be the same one used by other utilities so long as there is enough room to accommodate all necessary lines.

2. We require developers to provide, at no charge to TCI Cablevision, fill-in of the trench once cable has been installed in the trench.
3. We require developer to provide, at no charge to TCI Cablevision, a 4" PVC conduit at all utility road crossings where cable TV will be installed. This 4" conduit will be for the sole use of cable TV.
4. Should your subdivision contain cul-de-sac's the driveways and property lines (pins) must be clearly marked prior to the installation of underground cable. If this is not done, any need to relocate pedestals or lines will be billed directly back to your company.
5. TCI Cablevision will provide service to your subdivision so long as it is within the normal cable TV service area. Any subdivision that is out of existing cable TV area may require a construction assist charge, paid by the developer, to TCI Cablevision in order to extend the cable TV service to that subdivision.
6. TCI will normally not activate cable service in a new subdivision until it is approximately 30% developed. Should you wish cable TV service to be available for the first home in your subdivision it will, in most cases, be necessary to have you provide a construction assist payment to cover the necessary electronics for that subdivision.

TO DATE, NO COMMENTS RECEIVED FROM:
City Parks & Recreation
City Attorney
City Solid Waste Management
Colorado Geological Survey

POSTING OF PUBLIC NOTICE SIGNS

The posting of the Public Notice Sign is to make the public aware of development proposals. The requirement and procedure for public notice sign posting are required by the City of Grand Junction Zoning and Development Code.

To expedite the posting of public notice signs the following procedure list has been prepared to help the petitioner in posting the required signs on their properties.

1. All petitioners/representatives will receive a copy of the Development Review Schedule for the month advising them of the date by which the sign needs to be posted. **IF THE SIGN HAS NOT BEEN PICKED UP AND POSTED BY THE REQUIRED DATE, THE PROJECT WILL NOT BE SCHEDULED FOR THE PUBLIC HEARING.**
2. A deposit of $50.00 per sign is required at the time the sign is picked up.
3. You must call for utility locates before posting the sign. Mark the location where you wish to place the sign and call 1-800-922-1987. You must allow two (2) full working days after the call is placed for the locates to be performed.
4. Sign(s) shall be posted in a location, position and direction so that:
   a. It is accessible and readable, and
   b. It may be easily seen by passing motorists and pedestrians.
5. Sign(s) MUST be posted at least **10 days** before the Planning Commission hearing date and, if applicable, shall stay posted until after the City Council Hearing(s).
6. **After the Public Hearing(s) the sign(s) must be taken down and returned to the Community Development Department within FIVE (5) working days to receive a full refund of the sign deposit.** For each working day thereafter the petitioner will be charged a $5.00 late fee. After eight working days Community Development Department staff will retrieve the sign and the sign deposit will be forfeited in its' entirety.

The Community Development Department staff will field check the property to ensure proper posting of the sign. If the sign is not posted, or is not in an appropriate place, the item will be pulled from the public hearing agenda.

I ~~have read~~ the above information and agree to its terms and conditions.

L Mason — 8-21-96

SIGNATURE — DATE

FILE #/NAME FPP-96-174 Entrada TH's II — RECEIPT # 4470

PETITIONER/REPRESENTATIVE: Entrada Townhouse Ltd. — PHONE # 243-8300 Rolland Eng.

DATE OF HEARING: 9-3-96 — **POST SIGN(S) BY:** 8-23-96

DATE SIGN(S) PICKED-UP 8-21-96 — **RETURN SIGN(S) BY:**

DATE SIGN(S) RETURNED 9/5/96 — RECEIVED BY: SLC

VI#4000716?

Jody

RESPONSE TO COMMENTS

Date: August 22, 1996
Title: **Entrada Townhomes**
File# PP-96-174
Location: NE Corner Rana Road & Ridge Circle Drive.

TO: City of Grand Junction
Community Development
250 North 5th Street
Grand Junction, CO 81501

FROM: The Fleisher Company, Inc.
Mr. Cris Caruso
200 East Main Street
Aspen, CO 81611
Phone (970)925-2122

Note: Thomas Rolland, P.E. of ROLLAND Engineering is not available until Monday, August 26, 1996 to stamp and sign the plans.

The following responses are sequenced in the order that the review comments were provided:

CITY COMMUNITY DEVELOPMENT

1. The Preliminary Plan did show 6 parking spaces in the east pod. One parking space was removed from the design, the space farthest to the west, because the grade differentials from the roadway to the parking space were found to be unacceptable and could not be implemented correctly with the other five parking spaces. We believe that we still comply with the minimum parking spaces necessary for the east pod.
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3. I have written a letter to Mr. Doug Levinson, Scenic Elementary School Principal, But have not received any comment at this time.
4. The pedestrian/bike easements have been dedicated on the plat and they have been dedicated to the homeowners for the use of the general public.
5. The internal street dedications have been changed to include ingress/egress for the general

public for access to the pathway system.

6. Previous dedication of the pedestrian/equestrian easements has been noted on the plat.
7. Part of the drainage ditch is on the Entrada property. Necessary easements have been created to dedicate the parts of the drainage ditch on Entrada property to the City of Grand Junction. The existing pedestrian/equestrian easement along the northern border has been extinguished with this plat and has been replaced by the drainage easement.
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11. ROLLAND Engineering contacted Mr. Darren Starr, Superintendent of Solid Waste Management, and discussed the best method of trash collection for Entrada. Mr. Starr asked about the structural integrity of the road to be built. After being told that the road would be built to City structural standards, Mr. Starr stated that the best trash collection method would be for individual residence pickup by the City trash service.
12. The Homeowner's Association will establish an annual maintenance fund for the private streets. The formula and financial mechanisms will be submitted for review and approval by the Public Works Director prior to release of the Development Improvements Agreement.

CITY DEVELOPMENT ENGINEER

1. A plan and profile has been provided for the bike paths.
2. An analysis of the culverts in the drainage has been performed and is included with this submittal. The townhomes on the embankment will not be affected by high water in the drainage channel.
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10. Storm sewer lines have been redesigned with a slightly steeper grade.

CITY UTILITY ENGINEER

Water:

Degree of bends have been identified on the water plans.

Sewer:

Notes 'A' thru 'J' have been added to the plans.

Irrigation:

Irrigation will be a part of this development. The proposed landscape plan will be refined to meet with City staff approval. The irrigation system will be designed to the final landscape plan. The irrigation system will be designed to meet with City Utility Engineer's approval. The irrigation system will originate from the main irrigation line in Ridge Circle Drive. The irrigation system will be owned and maintained by the Homeowner's Association.

CITY PROPERTY AGENT

1. Utility, irrigation, pedestrian/bike and pedestrian/equestrian easements have been addressed in the dedication.
2. General notes and dedication have been changed to use consistent nomenclature. Common Open Space will be used.
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5. Lot 1, Block 9, Ridges Filing #2 has been referenced in the dedication.
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CITY FIRE DEPARTMENT

An additional fire hydrant has been located near Lot 13 as requested.

CITY POLICE DEPARTMENT

Comments noted. Lighting, street lights, has been added to the plans at the independent parking areas.

MESA COUNTY PLANNING

Comments 1 thru 4 have been noted.

MESA COUNTY SCHOOL DISTRICT #51

Enrollment comments noted.

REDLANDS WATER & POWER

Comment of "No impact" is noted.

U.S. WEST
Appropriate construction documents and coordination will be provided as requested.

PUBLIC SERVICE COMPANY
Comment noted regarding the sufficiency of the multi-purpose easements for providing gas and electric facilities to these lots.

RIDGES ACCO
Landscaping comments noted.

U.S. POSTAL SERVICE
Final location of central delivery mailboxes will be coordinated with Mary Barnett.

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Comments 1 thru 6 regarding TCI service have been noted and will be complied with.

CULVERT FLOW CAPACITY ANALYSIS FOR ENTRADA TOWNHOUSES SUB.

1. THE FLOW CAPACITY OF EXISTING 36" CMP CULVERT CROSSING "RANA ROAD"

(1) Culvert length L= 58 feet
Upstream invert = 4710.92; Downstream invert = 4708.54
Culvert slope S= (4710.92-4708.54)/58 = 4.1%
Manning n value for CMP: n=0.024
36" Dia cross section area A= 3.14 $(3)^2/4$ =7.07 sf
Hydraulic radius R = D/4 = 3/4 =0.75 ft (flowing full)
Flowing full capacity Q=1.49 *7.07*$(0.75)^{2/3}$*$(0.041)^{0.5}$ /0.024=***73.4 cfs***

(2) The edge of pavement of Rana Road is measured to be 1.5 feet higher than the top of the culvert at upstream, the water head at the upstream culvert from the center of the culvert is: H=3/2 +1.5 =3 ft, then the flow capacity of the culvert under pressure is:
Q= $CA(2gH)^{0.5}$ = 0.6*7.07 $(2*32.2*3)^{0.5}$ = ***59 cfs***

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Culvert length L = 36 ft
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Flowing full capacity Q=1.49 *7.07*$(0.75)^{2/3}$*$(0.0694)^{0.5}$ /0.012=***190 cfs***

3. THE FLOW CAPACITY OF NEW 36" RCP CULVERT FURTHER DOWN FROM RANA ROAD
Culvert length L = 38 ft
Upstream invert = 4676.0; Downstream invert = 4674.0
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4. The runoff contribution from Entrada Townhouses Subdivision is 8.21 cfs for 100-Year developed events, the maximum flow through the channel is: 73.4+8.21 = ***82 cfs***, new culvert flow capacity (166 cfs & 190 cfs) is far bigger than the maximum flow through the channel, therefore the flow will not overtop the proposed bike paths and the water in the channel will not back up behind the bike path. The proposed townhomes will not be affected.

STAFF REVIEW

FILE: FPP-96-174

DATE: August 27, 1996

STAFF: Kathy Portner

REQUEST: Final Plan--Entrada Townhomes

LOCATION: NE corner Rana Road and Ridge Circle Drive

APPLICANT: The Fleisher Company

EXECUTIVE SUMMARY:

EXISTING LAND USE: Undeveloped

PROPOSED LAND USE: 23 townhome units

SURROUNDING LAND USE:

NORTH:	Single Family Residential
SOUTH:	Single Family Residential
EAST:	Undeveloped
WEST:	Single Family Residential

EXISTING ZONING: PR-4

PROPOSED ZONING: No Change

SURROUNDING ZONING:

NORTH:	PR-4
SOUTH:	PR-4
EAST:	PR-4
WEST:	PR-4

RELATIONSHIP TO COMPREHENSIVE PLAN:

No Comprehensive Plan exists for this area. The proposal is consistent with the densities established in the Ridges Amended Final Plan and the draft Growth Plan.

STAFF ANALYSIS:

This property, located at the north-east corner of Rana Road and Ridge Circle Drive, is currently platted into 30 townhome lots. Access to the townhomes is platted as a 25' road through the property. The proposal is to replat the 3.6 acre site into 23 townhome units with a different configuration.

The units are proposed to be accessed from two private drive off Ridge Circle Drive, one aligned with Valley View Way and one aligned with West Valley Circle. The private drive is 20' wide with parking pods interspersed along the length. Each unit has a double car garage and space for two cars to park in the driveway. Ten additional parking spaces are provided for the 13 units on one private drive, and five additional parking spaces are provided for the 10 units on the other private drive.

Planning Commission approved the Preliminary Plan with the following conditions:

1. The final plan must incorporate a trail connection between the housing clusters.

2. The trail linkages provided to the existing trail shall not exceed a 8% grade.

3. A 6' wide, detached, hard surface path shall be provided along Ridge Circle Drive.

4. Stop signs shall be provided for the two private drives.

The City Council approved the Planning Commission recommendation with the modification that City Engineering offer input on whether the path along Ridge Circle Drive should be required.

The applicant has proposed with the final design that the path along Ridge Circle Drive not be required, and is, instead, proposing that the bus stop located at Ridges Blvd. and Ridge Circle Drive be relocated to the north where the existing path intersects Ridges Blvd. The City supports that proposal but recommends that, in lieu of a path along Ridge Circle Drive, that the applicant construct a 8' wide, detached path along Ridges Blvd. from the new bus stop to Ridge Circle Drive.

The applicant has agreed to provide a path along Rana Road connecting Ridge Circle Drive to the existing path north of the property. A 6' wide path is proposed because of topographic constraints, which is acceptable to the City.

The revised final plan does not show a path connection between the housing clusters, although the written response to comments indicates it will be shown.

The private drives must be dedicated as ingress/egress easements for general public use to provide access to the trail system. Signage and possibly pavement markings, approved by the

City, shall be provided along the private drives to direct pedestrian and bicycle traffic to the pathway.

The applicant has agreed that the Homeowner's Association will establish an annual fund for the private streets. The formula and financial mechanisms will be submitted for review and approval by the Public Works Director prior to release of the Development Improvements Agreement.

STAFF RECOMMENDATION:

Staff recommends approval of the final plat/plan with the following conditions:

1. An 8' wide, concrete, detached path shall be constructed along Ridges Blvd. from the relocated bus stop to Ridge Circle Drive.

2. A path connecting the housing clusters shall be provided.

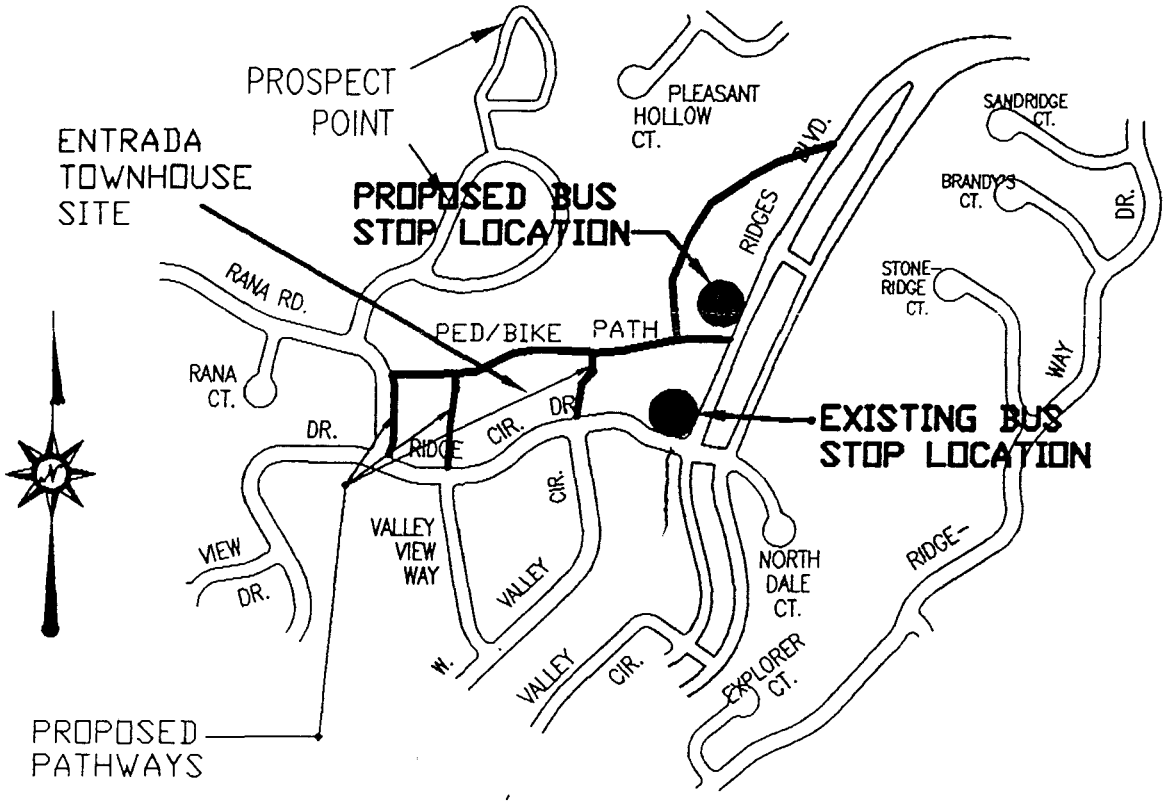
3. The private drives shall be dedicated as ingress/egress easements for general public use to provide access to the trail system. Signage and possible pavement markings, approved by the City, shall be provided along the private drives to direct pedestrian and bicycle traffic to the pathways.

RECOMMENDED PLANNING COMMISSION MOTION:

Mr. Chairman, on item #FPP-96-174, I move we approve the final plan/plat with staff conditions.

BUS STOP RELOCATION

The Ridges-Entrada Townhouses



NOTE:
APPROXIMATE DISTANCE OF PROPOSED BUS STOP MOVE IS 300 FEET TO THE NORTH FROM ITS PRESENT LOCATION.

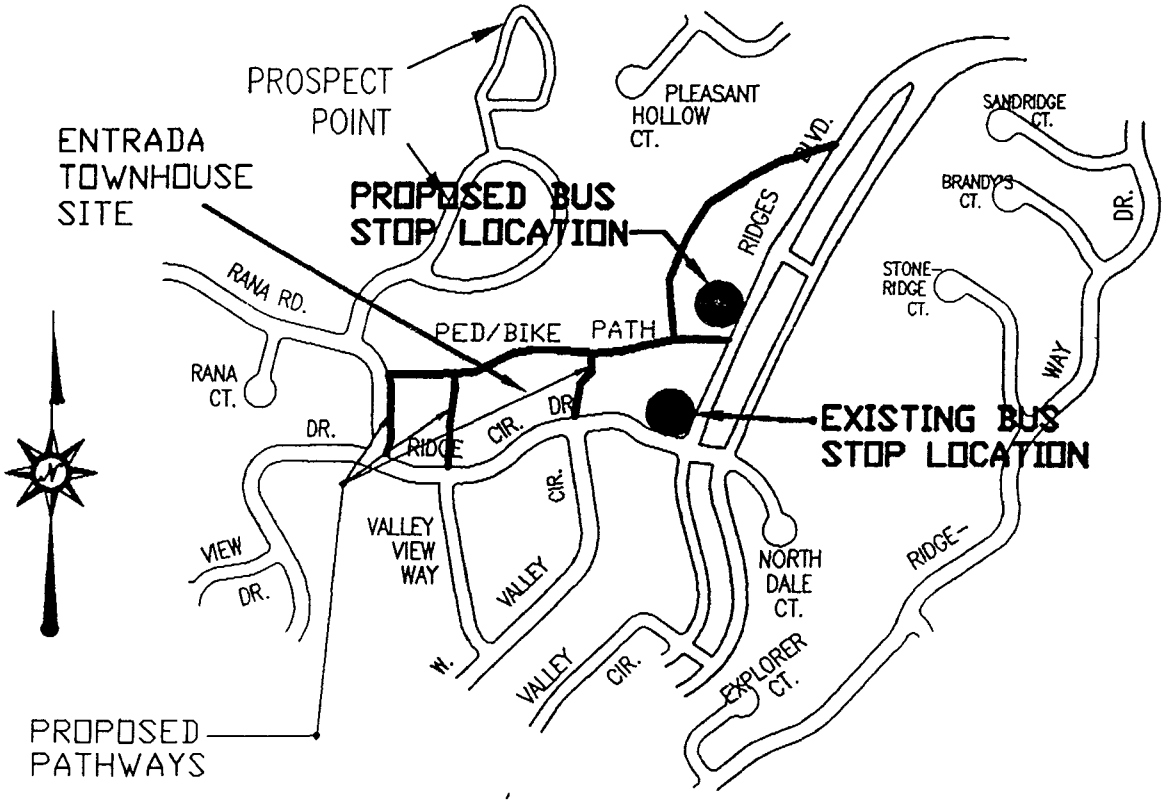
COMMENT

Regardless of where any bus stop is placed, motorists are required to stop behind a bus. Let's monitor the traffic flow during bus times instead of moving the stop. Most children who are serviced by the existing bus stop do not have to cross the street. Why do existing homes & families have to be inconvenienced by ENTRADA? moving the stop.

Mark Abbott

BUS STOP RELOCATION

The Ridges-Entrada Townhouses



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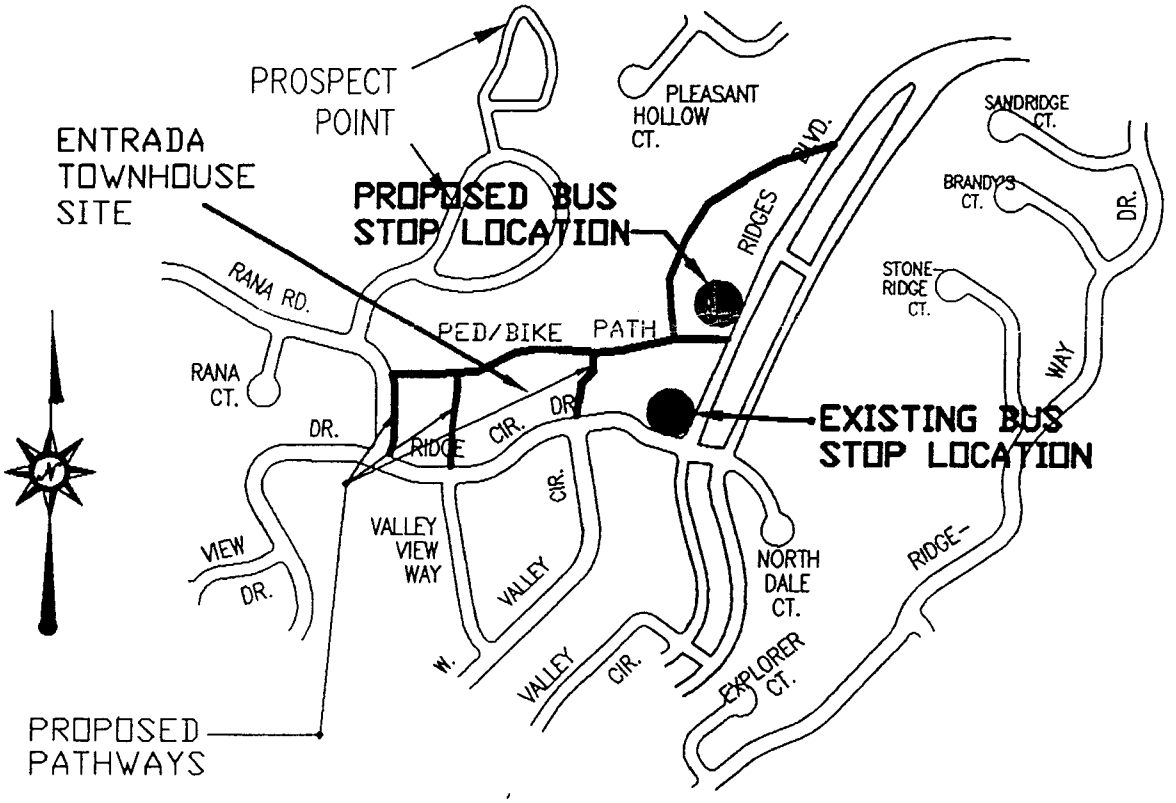
COMMENT

I don't have children, I trust the parents to know what is the best + safest interests of their children + I support their decision in this matter.

Lori Lei Standifer
377 W. Valley Cir. #G
Grand Jct, Co. 81503

BUS STOP RELOCATION

The Ridges-Entrada Townhouses



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COMMENT

OK with us. Thanks for trying to keep our kids safer.

The McCuistions

RESPONSE TO COMMENTS

Date: August 22, 1996
Title: **Entrada Townhomes**
File# PP-96-174
Location: NE Corner Rana Road & Ridge Circle Drive.

TO: City of Grand Junction
Community Development
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REVIEW COMMENTS

FILE #FPP-96-174 **TITLE HEADING:** Entrada Townhomes II

LOCATION: NE corner of Rana Road & Ridge Circle Drive

PETITIONER: Christopher Caruso

PETITIONER'S ADDRESS/TELEPHONE: Entrada Townhouses Ltd.
200 E Main Street
Aspen, CO 81611
925-2122

PETITIONER'S REPRESENTATIVE: Rolland Engineering

STAFF REPRESENTATIVE: Kathy Portner

NOTE: THE PETITIONER IS REQUIRED TO SUBMIT FOUR (4) COPIES OF WRITTEN RESPONSE AND REVISED DRAWINGS ADDRESSING ALL REVIEW COMMENTS ON OR BEFORE 5:00 P.M., AUGUST 22, 1996.

CITY COMMUNITY DEVELOPMENT **8/15/96**
Kathy Portner **244-1446**

1. The Preliminary Plan approval show 6 parking spaces in the east pod. The final shows only 5. Show how 6 can be provided.
2. Please state the reason for a 6' wide path along Rana Road rather than a 8' wide path.
3. Please indicate if you have received comment from the Scenic School Principal on moving the bus stop.
4. The pedestrian/bike easements must be dedicated on the plat. They should be dedicated to the homeowners for the use of the general public.
5. All internal streets' dedication must include ingress/egress for the general public for access to the pathway system.
6. There's no dedication for the utility and pedestrian/equestrian easements. If they were previously dedicated it should be so noted.
7. Is any part of the drainage ditch on Entrada's property?
8. What maximum height of structures is being proposed?
9. Planning Commission approval included a requirement for stop signs to be placed at the end of each private drive.
10. Preliminary approval also required that a direct link between the housing clusters be provided via a trail.
11. Indicate how trash service will be handled.
12. The homeowner's association shall establish an annual maintenance fund for the private streets. The formula and financial mechanisms of this fund shall be submitted by the petitioner for review and approval by the Public Works Director prior to the release of the Development Improvements Agreement.

CITY DEVELOPMENT ENGINEER **8/9/96**
Jody Kliska **244-1591**

1. Please provide a plan and profile for the bike paths.
2. The proposed culverts in the drainage need to be analyzed. The placement of culverts in the channel create a blockage in a previously uninhibited channel. What I want to know is will the 100 year event overtop the bike paths? How high will the water back up behind the bike paths? Does this affect the proposed townhomes on the embankment?
3. The drainage fee is calculated at $2451.38 for undetained discharge.
4. TCP credit may be allowed for the Rana Road path.
5. Storm sewer line c shows two direction changes, necessitating manholes.
6. Please provide coordinates or distances and bearings for the storm sewer lines.
7. Section 140.2a of the City Standard Contract Documents reads "Approved end sections required at the exposed end of all PVC pipe."
8. Section 102.10 of same document indicates CMP is not an approved material.
9. End sections are required at both inlet and outlet of culverts.
10. Why are the storm sewer lines designed on a flat grade? It appears the outlets will be on a fill rather than to existing grade.

CITY UTILITY ENGINEER **8/9/96**
Trent Prall **244-1590**

WATER:

W1. Degree of bends not identified on water plans.

SEWER:

S1. Please include the following notes on the sewer plans:

- A. Contractor shall have one signed copy of plans and a copy of the City of Grand Junction's Standard Specifications at the job site at all times.
- B. All sewer mains shall be PVC SDR 35 (ASTM 3034) unless otherwise noted.
- C. All sewer mains shall be laid to grade utilizing a pipe laser.
- D. All service line connections to the new main shall be accomplished with full body wyes or tees. Tapping saddles will not be allowed.
- E. No 4" service lines shall be connected directly into manholes.
- F. The contractor shall notify the City inspection 48 hours prior to commencement of construction.
- G. The Contractor is responsible for all required sewer line testing to be completed in the presence of the City Inspector. Pressure testing will be performed after all compaction of street subgrade and prior to street paving. Final lamping will also be accomplished after paving is completed. These tests shall be the basis of acceptance of the sewer line extension.
- H. The Contractor shall obtain City of Grand Junction Street Cut Permit for all work within existing City right-of-way prior to construction.
- I. A clay cut-off wall shall be placed 10 feet upstream from all new manholes unless otherwise noted. The cut-off wall shall extend from 6 inches below to 6 inches above granular backfill material and shall be 2 feet wide. If native material is not suitable, the contractor shall import material approved by the engineer.
- J. Benchmark _____.

IRRIGATION:

I1. Is irrigation proposed for this development? If so, irrigation plans need to be submitted.

CITY PROPERTY AGENT **8/14/96**
Steve Pace **256-4003**

1. Need to address utility, irrigation, pedestrian/bike and pedestrian/equestrian easements in the dedication.
2. Need to use consistent nomenclature in the general notes and dedication when using the term Common Open Space - versus Common Tracts, Outlots, Common Areas.
3. Should the total acreage be 3.59 acres instead of 4.60 acres.
4. On sheet 3 of 4, what do the 2 dimensions on the south line of the SE1/4 SE1/4 (s89-50-27E, 161.47 & S89-50-27E, 105.54) represent?
5. Should Lot 1, Block 9, Ridges Filing #2 be referenced in the dedication?
6. Remove language pertaining to drainage and detention/retention easements from dedication.

CITY FIRE DEPARTMENT **8/14/96**
Hank Masterson **244-1414**

One additional fire hydrant will be required. Locate this hydrant near lot 13 along the private road.

Fire department access is adequate as shown.

CITY POLICE DEPARTMENT **8/12/96**
Dave Stassen **244-3587**

The design of this project follows current crime prevention techniques. The independent parking areas need to be lit more than the rest of the project.

MESA COUNTY PLANNING **8/12/96**
Richard Goecke **244-1744**

1. The proposed points of access to the 2-clusters of townhomes should be aligned at 90° or greater to Ridge Circle.
2. The main feature or theme of the cluster containing units 1-10 appears to be the parking lot. Elimination of at least 2-units of the smaller design would provide a more attractive and functional cluster for units 1-10. Lot 4 dimensions are similar to those of lots 11-23 and as a free-standing unit is does not match the "attached" design of the other units in cluster 1-10. Re-design of this cluster to include a greater setback from the parking lot and the adjacent property would create a more open feeling.
3. Lots 22 and 23 are somewhat "orphaned" from the rest of the cluster (11-23). These proposed units are bounded on 3-sides by roadways giving them the appearance and feel of not being integrated into the rest of the development. Reconfigured parking and realignment of the proposed private road would help to integrate these 2-units into the design more effectively.
4. Overall, the project would not meet county guidelines for:
   - traffic circulation
   - setbacks
   - parking
   - buffering

MESA COUNTY SCHOOL DISTRICT #51 **8/14/96**
Lou Grasso **242-8500**

SCHOOL / CURRENT ENROLLMENT - CAPACITY / IMPACT
Scenic Elementary / 298 - 325 / 6
Redlands Middle School / 552 - 650 / 3
Fruita Monument High School / 1337 - 1100 / 4

REDLANDS WATER & POWER **8/14/96**
Gregg Strong **243-2173**

This townhome subdivision has no impact to Redlands facilities.

U S WEST COMMUNICATIONS **8/9/96**
Max Ward **244-4721**

For timely telephone service, as soon as you have a plat and power drawing for your housing development, please....

MAIL COPY TO
U S West Communications
Developer Contact Group
P.O. Box 1720
Denver, CO 80201

AND

CALL THE TOLL-FREE NUMBER FOR
Developer Contact Group
1-800-526-3557

We need to hear from you at least 60 days prior to trenching.

PUBLIC SERVICE COMPANY **8/7/96**
Gary Lewis **244-2698**

Multi-purpose easements should be sufficient for installation of gas and electric facilities to these lots.

RIDGES ARCHITECTURAL CONTROL COMMITTEE **8/7/96**
Munkres/Carlsrud/Lewis **241-5028**

Ridges A.C.C.O. recommends landscaping the backs of lots 18 through 23. Landscaping should include large trees, i.e. quick growing poplars or cottonwoods, which would give immediate relief to the stark landscapes. This should be interspersed with firs or Austrian pines. Screening of backyards for those who already live adjacent to these townhomes we feel will cushion the impact of these lots.

U.S. POSTAL SERVICE **8/5/96**
Mary Barnett **244-3434**

This is rural delivery area. Central delivery is required. A single of several locations along the private drive is recommended.

TCI CABLEVISION **8/9/96**
Glen Vancil **245-8777**

1. We require the developers to provide, at no charge to TCI Cablevision, an open trench for cable service where underground service is needed and when a roadbore is required, that too must be provided by the developer. The trench and/or roadbore may be the same one used by other utilities so long as there is enough room to accommodate all necessary lines.

2. We require developers to provide, at no charge to TCI Cablevision, fill-in of the trench once cable has been installed in the trench.
3. We require developer to provide, at no charge to TCI Cablevision, a 4" PVC conduit at all utility road crossings where cable TV will be installed. This 4" conduit will be for the sole use of cable TV.
4. Should your subdivision contain cul-de-sac's the driveways and property lines (pins) must be clearly marked prior to the installation of underground cable. If this is not done, any need to relocate pedestals or lines will be billed directly back to your company.
5. TCI Cablevision will provide service to your subdivision so long as it is within the normal cable TV service area. Any subdivision that is out of existing cable TV area may require a construction assist charge, paid by the developer, to TCI Cablevision in order to extend the cable TV service to that subdivision.
6. TCI will normally not activate cable service in a new subdivision until it is approximately 30% developed. Should you wish cable TV service to be available for the first home in your subdivision it will, in most cases, be necessary to have you provide a construction assist payment to cover the necessary electronics for that subdivision.

TO DATE, NO COMMENTS RECEIVED FROM:
City Parks & Recreation
City Attorney
City Solid Waste Management
Colorado Geological Survey

STATE OF COLORADO

COLORADO GEOLOGICAL SURVEY
Division of Minerals and Geology

Department of Natural Resources
1313 Sherman Street, Room 715
Denver, Colorado 80203
Phone (303) 866-2611
FAX (303) 866 2461

RECEIVED GRAND JUNCTION
PLANNING DEPARTMENT
SEP 10 1996

DEPARTMENT OF
NATURAL
RESOURCES

Roy Romer
Governor

James S. Lochhead
Executive Director

Michael B. Long
Division Director

Vicki Cowart
State Geologist
and Director

September 10, 1996 MA-97-0006

City of Grand Junction
Community Development Department
250 North 5th Street
Grand Junction, Colorado 81501

Re: Proposed Entrada Townhome Project -- Northeast of the Intersection of Rana Road and Ridge Circle Drive, Ridges Area, Grand Junction

Gentlemen:

At your request, we have reviewed the materials submitted for and made a field inspection of the site of the residential-development project indicated above. The following comments summarize our findings.

(1) The geologic conditions of this project area vary greatly across it as the bedrock is relatively close to the surface and it is covered with colluvium, slopewash, and artificial (man-placed) fill deposits partially derived from it. The bedrock consists primarily of variably thick sandstones and shale beds. As evidenced by data indicated in the submitted report by Lincoln DeVore, Inc., Grand Junction, shallow ground water was encountered in one drill hole. After buildout of this project, it is likely that shallow perched water table(s) will form on formational shales after which it might rise to normal foundation depths for buildings of the type planned to be constructed. Pavements and other impervious covers as well as landscaping irrigation could exacerbate the negative effects of this ground-water condition as well.

(2) Because of the indicated geologic conditions, it will be absolutely critical for the soils and foundation engineer to inspect all building foundation excavations prior to selection of foundation designs. It is possible that different designs may be the most appropriate depending on the specific building locations on the parcel and that, in many cases, remedial work, including fill placements and improvements in surface and subsurface drainage, will be advisable and/or necessary. This may include the installation of building-foundation drains and regrading parts of the parcel. It may be prudent, depending on the results of specific drainage and runoff calculations by the drainage engineer (drainage report not seen), to install new and improved drainage-control structures on the lower part of the parcel adjacent to (and beneath) Ridge Circle Drive. As you are aware, the Ridges area has experienced drainage problems in the past, and they could be worsened as development

continues if the overall effects of new projects such as this one are not considered in the overall drainage-control scheme for the entire Ridges development.

(3) The specific recommendations made in the Lincoln DeVore report are sound and should be expressly followed. If they and the recommendations made above are followed then we have no geology-related objection to your approval of this proposal.

Sincerely,

James M. Soule

James M. Soule
Engineering Geologist

Grand Junction Community Development Department
Planning • Zoning • Code Enforcement
250 North Fifth Street
Grand Junction, Colorado 81501-2668
(970) 244-1430 FAX (970) 244-1599

October 16, 1996

Cristopher Caruso
200 East Main Street
Aspen, CO 81611

RE: FPP-96-174, Entrada Townhomes II

Dear Mr. Caruso:

At their September 3, 1996 hearing the Planning Commission approved the final plan/plat for Entrada Townhomes in the Ridges with the following conditions:

1. An 8' wide, concrete, detached path shall be constructed along Ridges Blvd. from the relocated bus stop to Ridge Circle Drive.

2. The private drives shall be dedicated as ingress/egress easements for general public use to provide access to the trail system. Signage and possible pavement markings, approved by the City, shall be provided along the private drives to direct pedestrian and bicycle traffic to the pathways.

Following are the requirements for recording the plat and/or commencing construction:

1. Submittal of the final plat with any required changes for review. Once approved, the signed mylar can be submitted for City signatures. Once signed we need 2 full-sized mylar copies and 1 reduced 11" x 17" mylar copy.

2. Final copy of covenants to be recorded with the plat.

3. Final copy of Development Improvement Agreement and Guarantee for signatures to be recorded with the final plat.

4. Parks and Open Space fees of $225 per unit to be paid prior to recording of the plat.

5. Letter requesting credit to TCP for required off-site trail improvements.

6. Four sets of approved construction drawings.

7. TCP of $500 per unit, unless a credit is approved, and School Impact fee of $292 per unit to be paid at time of issuance of Planning Clearances for units.

Printed on recycled paper

8. Proof of formation of the Homeowner's Association.

9. The Homeowner's Association shall establish an annual maintenance fund for the private streets in accordance with the attached document titled "Maintenance Agreement". The agreement shall be recorded by the petitioner, with review and approval by the Public Works Department, prior to the recordation of the final plat.

10. Final approval for the bus stop relocation and approved plans for the physical relocation.

If you have any questions please call me at 244-1446.

Sincerely,

Katherine M. Portner

Katherine M. Portner
Acting Community Development Director

xc: Trevor Brown, Rolland Engineering

CITY OF GRAND JUNCTION FILE **#FPP-96-174 FINAL PLAT/PLAN - ENTRADA TOWNHOMES** LOCATED AT NE CORNER RANA ROAD & RIDGE CIRCLE DRIVE HAS BEEN REVIEWED AND APPROVED BY THE UTILITY COORDINATING COMMITTEE.

Phil Berlund
CHAIRMAN

12-11-96
DATE

City of Grand Junction, Colorado
250 North Fifth Street
81501-2668
FAX: (970)244-1599

January 3, 1997

Cristopher Caruso
200 East Main Street
Aspen, CO 81611

RE: FPP-96-174, Entrada Townhomes II

Dear Mr. Caruso:

The City of Grand Junction Public Works Department has been working with your consultant on the required relocation of the bus stop at the corner of Ridges Blvd. and Ridge Circle Drive. You will be responsible for moving and setting the structure. The structure shall not be moved until the new path along Ridges Blvd. to Ridge Circle Drive is completed by your contractor and the City gives you notice, in writing, to move the structure.

Questions regarding the bus stop relocation should be directed to Jody Kliska, 244-1591. Thank you for your cooperation through this process.

Sincerely,

Katherine M. Portner

Katherine M. Portner
Acting Community Development Director

xc: Trevor Brown, Rolland Engineering
Doug Cline, Street Superintendent

Printed on recycled paper

Grand Junction Community Development Department
Planning • Zoning • Code Enforcement
250 North Fifth Street
Grand Junction, Colorado 81501-2668
(303) 244-1430 FAX (303) 244-1599

July 14, 1997

Cris Caruso
200 East Main Street
Aspen, CO 81611

RE: Entrada Townhomes

Dear Mr. Caruso:

The following is required prior to recording the Entrada Townhome plat:

1. The maintenance agreement must be completed. Several of the "blanks" on the form that was submitted have not been filled in. Please read through the document to assure it is complete prior to submitting for City signatures.

2. The Development Improvements Agreement must be revised to include the "punch list" items identified in the final walk-through. The document to be recorded must be an original, not a Faxed copy. Please assure the Disbursement Agreement amount is equal to or greater than the revised DIA amount.

3. The proposed terms of the DIA of 3 years is acceptable for the landscaping, but not for the pathway connections. Please specify, through an attachment or on the DIA document, the phasing of the pathway construction and that the landscaping will be completed as each unit is completed and what the timing of the entryway landscaping will be.

4. The request for TCP credit must include a detailed listing of actual costs of the adjacent street improvements.

All of the above must be completed prior to plat recordation. In addition, the bus stop structure can now be relocated. Please proceed with the relocation, which must be complete well before the start of school at the end of August, 1997.

If you have further questions please call me at 244-1446.

Sincerely,

Katherine M. Portner
Acting Community Development Director

xc: Jody Kliska

The Fleisher Company

Commercial Real Estate in Aspen

July 15, 1997

Katherine Portner
Grand Junction Community Development Department
250 North Fifth Street
Grand Junction, Colorado 81501

RE: FPP-96-174, Entrada Townhomes II

Dear Katherine,

As you are aware, an agreement was made between the City of Grand Junction and Entrada Townhouses, Ltd. during the approval process for the above listed project regarding the Transportation Capacity Payment (TCP). I hereby request that a TCP credit of $500.00 per unit, totaling $11,500.00, be granted to Entrada Townhouses, Ltd. in exchange for the off-site trail improvements that we are in the process of constructing. The total cost of these improvements is $12,431.50.

Please contact me if you need any further information.

Sincerely,

Cristopher Caruso
Project Manager
Entrada Townhouses, Ltd.

ent tcp.ltr

200 East Main Street • Aspen, Colorado 81611 • 970/925-2122 • Fax 920-1628

Final Inspection Checklist

ENTRADA THS Subdivision

Date: 7-14-97

City of Grand Junction, Colorado
250 North Fifth Street
81501-2668
FAX: (303) 244-1599

Streets

__ Pavement

_____

_____

✓ Concrete
BACKFILL RANA RD. PATH ✓
COMPLETE CONCRETE PATHS ✓

_____

✓ Manholes
CONCRETE COLLAR REQUIRED - STORM SEWER MH INSTALL INVERTED RING & GROUT
MANHOLE LIDS NEED ADJUSTING TO MEET CITY SPEC.

✓ Signs
INSTALL BIKE ROUTE SIGNS AS PER APPROVED PLAN. ✓

__ Lighting

_____

__ Site Grading

_____

✓ Other
BACKFILL/CONTROL EROSION UNDER PAN AT RANA RD/TRAIL INTERSECTION ✓
DON'T SUBMIT AS-BUILTS COMPILATION OF TEST RESULTS

Utilites & Drainage

__ Water Lines

_____

__ Sewer Lines

_____

__ Inlet Structures

_____

__ Detention Facilities

_____

✓ Outlet Structures
PROVIDE EROSION CONTROL AT OUTLET OF RCP UNDER WESTERN SIDE

✓ COVER EXPOSED OUTLET OF STORM SEWER
✓ BROKEN CONCRETE PAN WEST PARKING AREA

Inspected by: _____
City Development Engineer

Developer or Representative: _____

Final Acceptance of the Streets and Drainage Facilities will be made when the above items have been corrected and inspected. Please call 244-1591 when ready for final acceptance.

The Fleisher Company
Commercial Real Estate in Aspen

January 28, 1997

Katherine Portner
Grand Junction Community Development Department
250 North Fifth Street
Grand Junction, Colorado 81501

RE: FPP-96-174, Entrada Townhomes II

Dear Katherine,

As you are aware, an agreement was made between the City of Grand Junction and Entrada Townhouses, Ltd. during the approval process for the above listed project regarding the Transportation Capacity Payment (TCP). I hereby request that a TCP credit of $500.00 per unit, totaling $11,500.00, be granted to Entrada Townhouses, Ltd. in exchange for the off-site trail improvements that we are in the process of constructing.

Please contact me if you need any further information.

Sincerely,

Cristopher Caruso
Project Manager
Entrada Townhouses, Ltd.

ent tcp.ltr

200 East Main Street • Aspen, Colorado 81611 • 970/925-2122 • Fax 920-1628

CITY OF GRAND JUNCTION
DEPARTMENT OF PUBLIC WORKS & UTILITIES
250 NORTH 5TH STREET
GRAND JUNCTION, CO 81501
(970) 244-4003

1806234 0923AM 07/18/97
MONIKA TODD CLK&REC MESA COUNTY CO

TO THE MESA COUNTY CLERK & RECORDER:

THIS IS TO CERTIFY that the herein named Subdivision Plat,

ENTRADA TOWNHOUSES II,

Situated in the SE1/4 & NE1/4 of Section 17, 20

Township 1 SOUTH, Range 1 WEST,

of the UTE Meridian in the City of Grand Junction, County of Mesa, State of Colorado, has been reviewed under my direction and, to the best of my knowledge, satisfies the requirements pursuant to C.R.S. 38-51-106 and the Zoning and Development Code of the City of Grand Junction for the recording of subdivision plats in the office of the Mesa County Clerk and Recorder.

This certification makes no warranties to any person for any purpose. It is prepared to establish for the County Clerk and Recorder that City review has been obtained. This certification does not warrant: 1) title or legal ownership to the land hereby platted nor the title or legal ownership of adjoiners; 2) errors and/or omissions, including, but not limited to, the omission(s) of rights-of-ways and/or easements, whether or not of record; 3) liens and encumbrances, whether or not of record; 4) the qualifications, licensing status and/or any statement(s) or representation(s) made by the surveyor who prepared the above-named subdivision plat.

Dated this 14 day of July, 1997.

City of Grand Junction,
Department of Public Works & Utilities

By: James L. Shanks
James L. Shanks, P.E., P.L.S.
Director of Public Works & Utilities

Recorded in Mesa County
Date: 7/18/97
Plat Book: 15 Page: 356-359
Drawer:
g:\special\platcert.doc

REF. | NAME OR PROJECT | DETAILS OF MEETINGS • AGREEMENTS • DECISIONS | TIME HRS. 1/10

Entrada

Covenants — BK 2342 Pg 741-746

Art. of Inc. — BK 2342 Pg 747-751

DIA — BK 2342 Pg 752-764

Maintenance Agreement — BK 2342 Pg 767-771

Hecla Cell-A-Gar Easement

BK 2342 Pg 738-740

TYPE LEGAL DESCRIPTION( )BELOW, USING ADDITIONAL SH( )TS AS NECESSARY. USE SINGLE SPACING WITH A ONE INCH MARGIN ON EACH SIDE.

****

LOT 1 in Block 9, THE RIDGES FILING NO. TWO