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File FPP-1996-138 Name: Valley Meadows East - #1 and #2 – NE corner 25 ½ Road / Grand Valley Canal

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
		Reduction of assessor's map.
		Evidence of title, deeds, easements
		***Mailing list to adjacent property owners**
		Public notice cards
		Record of certified mail
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**
		***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	X	Final Drainage Plan – 5/31/96	X	X	Daily Construction Report – 10/31/96
X	X	Correspondence			City Council Minutes – 3/18/98
X	X	Stormwater Management Plan – 5/31/96			Resolution No. 25-98 - **
X		General Permit Application – 5/1/96			Grayscale
X		Treasurer's Certificate of Taxes Due – 5/1/96			Valley Meadows East – Filing No. Two – Vicinity Map -GIS Historical Maps - **
X	X	Valley Meadows East Subidvision – Off Site Run-Through Runoff Estimate Report			Valley Meadows East – Filing No. Two – Plat -GIS Historical Maps - **
X		Chicago Title Ins. Co. – Commitment for Title Ins.			Valley Meadows East – Filing No. Two – Utility Composite Plan -GIS Historical Maps - **
X		Certification of Incorporation – 3/30/94			Declaration of covenants, Conditions and Restrictions – Bk 2271/ Pg 367
X		E-mails			Discharge Agreement – Bk 2261 / Pg 394
X	X	Planning Commission Minutes – 7/2/96 - **			Indemnification Agreement – not recorded
X	X	Dedication			Protective Covenants

X	X	Notes to file	X		Warranty Deed – Reception No. 1175324-not conveyed to City
X		Articles of Incorporation – not recorded	X		Quit Claim Deed – Bk 2208 / Pg 90 – not conveyed to City
X	X	Subsurface Soils Exploration – 6/5/96	X	X	DIA – Bk 2271 / Pg 379- 398 - **
X	X	Grading and Stormwater Management Plan	X		Standard Sanitary Sewer Details Map
X		Streets and Sewer Plans and Profiles	X		General Notes and Typical Sections Map
X	X	Landscaping Plan for the Open Space	X		B.O.W. and Irrigation Pipe Plans and Profiles
X		Street and Sewer Plans and Profiles			Landscape Plan for Open Space

DEVELOPMENT APPLICATION

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

Receipt _____
Date _____
Rec'd By _____
File No. FPP-96-138

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	~15 acres	25½ & F½	~~RSF-4~~ PR 2.93	Residential
☐ 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
GWHC, Inc.	GWHC, Inc.	ROLLAND Engineering
Name	Name	
2467 Commerce Blvd.	2467 Commerce Blvd.	405 Ridges Blvd., Suite A
Address	Address	Address
Grand Junction, CO 81505	Grand Junction, CO 81505	Grand Junction, CO 81503
City/State/Zip	City/State/Zip	City/State/Zip
(970)242-1336	(970)242-1336	(970)243-8300
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 Trevor A. Brown — 4/29/96
Signature of Person Completing Application — Date

X [signature] — 4/29/96
Signature of Property Owner(s) - attach additional sheets if necessary — Date

SUBMITTAL CHECKLIST

MAJOR SUBDIVISION: FINAL

Location: 25½ & F½ Project Name: Valley Meadows East

Date Received 6-3-96

Receipt # 4111

File # FPP-96-138

ITEMS		DISTRIBUTION																												
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 GV	● Drainage District GS	● Water District WTP	O Sewer District	● U.S. West	● Public Service	O GVRP	O CDOT	O Corps of Engineers	O Colorado Geologic Survey	O U.S. Postal Service	~~● Persigo WWTF~~	● TCI Cable			TOTAL REQ'D.
● Application Fee # 275	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			
● 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			
● 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			
● 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																													
O 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														
● 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								
O 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.

PRE-APPLICATION CONFERENCE

Date: 4/18/96
Conference Attendance: Kathy L., Trent Brown
Proposal: Final Plat
Location: 25½ & F ½

Tax Parcel Number: 2945-031-00-155
Review Fee: $740 + Ac (@ $15/Ac)
(Fee is due at the time of submittal. Make check payable to the City of Grand Junction.)

Additional ROW required? 25½
Adjacent road improvements required? 25½
Area identified as a need in the Master Plan of Parks and Recreation? —
Parks and Open Space fees required? yes Estimated Amount: _____
Recording fees required? yes Estimated Amount: _____
Half street improvement fees/TCP required? yes Estimated Amount: _____
Revocable Permit required? —
State Highway Access Permit required? no
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.

X _____ X _____ 7/29/96
Signature(s) of Petitioner(s) Signature(s) of Representative(s)

STORMWATER MANAGEMENT PLAN
FOR
VALLEY MEADOWS EAST SUBDIVISION

MAY 31, 1996

ROLLAND ENGINEERING
405 RIDGES BLVD, SUITE A
GRAND JUNCTION, CO 81503
(970)-243-7905

STORMWATER MANAGEMENT PLAN
FOR
VALLEY MEADOWS EAST SUBDIVISION

A. SITE AND PROJECT DESCRIPTION

Valley Meadows East Subdivision has a total area of 14.93 acres, 0.73 acre of this project site will be dedicated to the city of Grand Junction, and also be used as the Grand Valley Canal Right-of-Way area, and approximate 0.1 acre of the this site will be dedicated as the Right-of-Way area for 25 1/2 road. Filing No. 1 of this subdivision is 4.26 acres. Filing No. 2 of this subdivision is 4.51 acres with the future Filing No. 3 containing the rest of the 14.93 acres. New streets, water, sanitary sewer, storm sewer, irrigation, gas, phone lines and cable TV lines will be provided for this subdivision. The site will be graded for drainage purpose. Estimated historic runoff coefficients for 2-Year is 2.33 cfs, and 7.70 cfs for 100-Year event. Estimated post-developed runoff coefficients for 2-Year is 4.93 cfs and 16.53 cfs for 100-Year event. The sequence of major construction activities on this project site will be: Street rough cut, sanitary sewer trench excavation, subgrade preparations, water trenches excavation, curb gutter and sidewalk construction, pavement and overlot grading. The soil erosion is minimum due to the relatively flat grade of the site. Soil contaminant is insignificant for this formerly farm land. The site is a formerly corn field and vegetation is very limited. Approximately 1% of the project site is covered with native grasses. There is no anticipated fueling, storage, chemicals, fertilizers, or other potential pollution sources for this site. Some irrigation tailwater runs through the site along the north property line in a concrete ditch , and runs through the west property line via a irrigation pipe to the Grand Valley Canal. Grand Valley Canal (approximate 25 feet wide and 5 feet deep) is immediately south of the project site. All runoffs from this site will be discharged to the Grand Valley Canal Via storm sewer system.

B. MANAGEMENT DURING CONSTRUCTION

There is no anticipated erosion, soil tracking, waste disposal, and contaminant pollution problems except dust associated with the construction of this site. Watering will be used to mitigate the effects of the construction activities on the site.

C. FINAL STABILIZATION AND LONG TERM MANAGEMENT

Since this is a residential area, landscaping and concrete pavement on the lots will achieve the final stabilization and pollutants control in the stormwater discharges. The Home Owner Association of this subdivision will ensure the landscaping on the site is appropriately maintained.

D. INSPECTION AND MAINTENANCE

The Home Owner Association of this subdivision will oversee that each lot and that common open spaces of this subdivision are appropriately landscaped and maintained in good condition.

VALLEY MEADOWS EAST SUBDIVISION

GENERAL PROJECT REPORT
Filings No. One and Two - Final

PREPARED FOR:

GWHC, Inc.
2467 Commerce Blvd.
Grand Junction, CO 81505

PREPARED BY:

ROLLAND ENGINEERING
405 Ridges Boulevard
Suite A
Grand Junction, CO 81503

June 3, 1996

file: vmenarr2.wpd

Valley Meadows East Subdivision (VME) is directly east, across 25 ½ Road, from the existing Valley Meadows Subdivision. The property, comprised of 15 acres, is located in the SW 1/4 NE 1/4, Section 3, Township One South, Range One West, of the Ute Meridian, Mesa County, Colorado. VME is located east of 25 ½ Road and north of the Grand Valley Canal.

The development site is currently a stubble corn field (last year's crop) on land that is considered "flat" in nature. The land slopes to the southwest at a grade of approximately 1 percent. Filing No. One is 4.26 acres of the total and contains 14 residential lots. An open-space lot has been added at the entrance of the subdivision for common use by the neighborhood. Filing No. Two is 4.51 acres of the total subdivision with 12 lots. Filing No. Two contains a centralized common open-space area that contains 1.15 acres and is to be available for use by the entire neighborhood.

The surrounding land use is almost all residential in nature. The land directly west of 25 ½ Road is already developed as Valley Meadows Subdivision, Filings #1 & 2. Moonridge Falls Subdivision is east of 25 ½ Road and North of Valley Meadows Subdivision. Kay Subdivision is located due south of VME, across the Grand Valley Canal. The area to the north and northeast of VME is residential in nature except for an approximate 10 acre tract and an approximate fifteen acre tract that are still zoned AFT County. The land to the east of VME is an older subdivision of large residential lots 3 to 5 acres in size. A major industrial park and employment center, Foresight Park, is located less than 1/4 mile to the south of the Valley Meadows East site.

Valley Meadows East Subdivision is a good infill project between Kay Subdivision and the Valley Meadows and Moonridge Falls Subdivisions. The housing at Kay Subdivision begins at approximately $105,000 and houses in Valley Meadows Subdivision are priced up to $180,000. Moonridge Falls Subdivision tends to have the highest cost of homes in the area with homes ranging from $150,000 to $200,000. The Valley Meadows East Subdivision offers a moderately priced home at a cost that is progressive as compared to the surrounding subdivisions. The houses are expected to cost in the range of $130,000. The original Valley Meadows Subdivision, Filing #1 and 2, sold very quickly. The vigorous sales of the lots at Valley Meadows Subdivision has prompted the developer to offer additional residential units in the immediate area.

The proposed land use for the entire Valley Meadows East Subdivision is the development of 44 single family residential units on 15 acres. The overall density of Valley Meadows East Subdivision will be 2.93 units per acre. The City of Grand Junction zoning for this site is currently PR-2.93. VME will be similar in housing style to Valley Meadows Subdivision.

Lot development standards will be per City of Grand Junction Standards. All development Improvements (Sewer, Water, Streets, Sidewalks, Etc.) will be per City of Grand Junction

REVIEW COMMENTS

FILE #FPP-96-138 **TITLE HEADING:** Valley Meadows East Subdivision

LOCATION: NE corner 25 ½ Road & Grand Valley Canal

PETITIONER: GWHC, Inc.

PETITIONER'S ADDRESS/TELEPHONE: 2467 Commerce Boulevard
Grand Junction, CO 81505
242-1336

PETITIONER'S REPRESENTATIVE: Rolland Engineering

STAFF REPRESENTATIVE: Kathy Portner / Dave Thornton

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., JUNE 21, 1996.

CITY COMMUNITY DEVELOPMENT **6/14/96**
Dave Thornton **244-1450**

PLAT COMMENTS:

1. All outlots as shown on submitted plat are to be labeled as tracts, starting with "Tract A" and sequentially lettered except future filings parcel which should be labeled as Outlot A.
2. Canal easement and trail easement along the east property line is to be dedicated to the City as an pedestrian/bicycle easement rather than a right-of-way.
3. A note is needed on the plat showing the location of F 3/4 Road.
4. Access (12 ft easement) from Chama Lane in filing #1 shall be provided to the 1.15 acre (Tract B) open space in filing 2.
5. The 10 access road from McCook Avenue in filing #2 to the 1.15 acre Open Space (Tract B) shall be a minimum of 12 feet wide. It can be either part of tract B or an easement.
6. Please revise dedication language on both plats as appropriate, i.e. dedication language for open space tracts, language for City pedestrian/bicycle easement and Grand Valley Irrigation R.O.W. with Ped/Bike easement to City, etc. City staff will work with you in preparing and recording the necessary Ped/Bike "trail" easement.

GENERAL COMMENTS:

7. A final design/site plan and landscaping plan for the open space areas is required for tract A in filing 1 and tract B in filing 2 (both are currently labeled as outlot A and Filing No. 2 Common Open Space respectively). This final plan is required to be submitted with the petitioners response to comments.
8. All open space platted in filing #1 shall be fully constructed as part of filing #1 including the easement (or access) to the future Tract B, a part of filing #2. All open space platted as part of filing #2 shall be constructed as part of filing #2.
9. Restrictions on height and type of fencing allowed for rear yards of all lots adjacent to the 1.15 acre Tract B Open Space area should be require to be no taller than 4 feet and all fences should be of the

same type (i.e split rail). These restrictions need to be incorporated into the covenants. Other design features to consider are: 1) How many gates will be allowed from each adjoining lot to the open space. 2) The 1.15 acre open space tract should be located with at least one frontage along a dedicated public street to create easier accessibility to all lot owners and encourage its' usage by all lot owners. If moving the open space location to a street location is not acceptable, then in an effort to create more open and inviting entrances to the 1.15 acre open space area, perhaps widening the entrances and/or limiting fencing along the access corridors will encourage the entire subdivision to use the area.

CITY DEVELOPMENT ENGINEER **6/14/96**
Jody Kliska **244-1591**

1. The same contractual agreements for drainage that were required with Valley Meadows filing 2 are required with this development.
2. New City Standard Contract Documents for Capital Improvements have been published and are available at Public Works for $10. All public improvements must be done in accordance with these standards.
3. Were any calculations performed to verify the size of the irrigation line behind the walk on 25 ½ Road?
4. A cleanout should probably be provided for the irrigation line. Whose responsibility for maintenance is this pipe?
5. Please indicate street lights and street name/stop signs on the street plans.
6. The city inspection fees on the DIA are likely to be closer to $1000.

CITY UTILITY ENGINEER **6/14/96**
Trent Prall **244-1590**

PLEASE NOTE: 1996 City of Grand Junction Standard Specifications shall apply for this proposed development. Copies are available for $10 in the Public Works and Utilities office.

WATER - UTE

1 Please provide a signoff block for Ute on all water related plans.
2 Identify angles for bends on waterline.

SEWER - CITY

1. Please reconfigure sewers so that MH1-B is on centerline of street.
2. Identify limits of Filing 1 sewer construction on McCook Avenue.
3. Sewer stub outs shall be capped and plugged east of property line. Stub out shall be identified with a steel fence post buried 1' below finished grade. As-built surveying of stub out required PRIOR to backfill.
4. Please use match lines for plan and profile sheets.
5. Need bearing and distance from Ex MH in 25 ½ to MH-A and MH 1-B to 2-B.
6. Run sewer through MH2-B on grade and eliminate the 0.2' fall across MH.
7. City of Grand Junction Standard Drawings were not submitted for review as part of the project set.
8. Please add the following notes to the sewer plan and profile.
   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" services 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 road 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. Sewer stub outs shall be capped and plugged east of property line. Stub out shall be identified with a steel fence post buried 1' below finished grade. As-built surveying of stub out required PRIOR to backfill.
K. Benchmark

CITY PROPERTY AGENT **6/17/96**
Steve Pace **256-4003**
See attached red-lined maps for comments.

CITY PARKS & RECREATION **6/13/96**
Shawn Cooper **244-3869**
1. Parks & Open Space fees - 26 lots (Filing 1 & 2) @ $225 = $5,850.
2. Common open space tracts to remain owned and maintained by HOA.
3. Hike and bike trail easement on canal bank.
4. 5' right-of-way or east property line for trail is extremely narrow for use, additional right-of-way will be necessary to make the right-of-way functional. Minimum trail width should be 8 feet with 2-3 feet of shoulder space on each side. Easement/right-of-way should allow for these widths.

CITY FIRE DEPARTMENT **6/13/96**
Hank Masterson **244-1414**
The Fire Department has no problems with this proposal.

CITY POLICE DEPARTMENT **6/14/96**
Dave Stassen **244-3587**
While place the open space in the center of the development may limit access, it is good crime prevention by having the surrounding houses keep an eye on the open space. This should limit potential criminal difficulties.

GRAND JUNCTION DRAINAGE DISTRICT **6/14/96**
John Ballagh **242-4343**
Drainage will apparently be handled by the City and Grand Valley Irrigation Company. No easements are shown to be dedicated to the Grand Junction Drainage District.

MESA COUNTY SCHOOL DISTRICT #51 **6/11/96**
Lou Grasso **242-8500**

SCHOOL - CURRENT ENROLLMENT / CAPACITY - IMPACT
Pomona Elementary - 301 / 325 - 12
West Middle School - 531 / 500 - 6
Grand Junction High School - 1674 - 1630 - 7

GRAND VALLEY IRRIGATION **6/10/96**
Phil Bertrand **242-2762**

Have concern about the Canal Easement or right-of-way being used a bicycle and pedestrian walk-way. This non-typical use or request of City. The 35 foot right-of-way has historically been used, maintained, occupied and cared for by GVIC. Some of the 35 feet cannot be used because it is in water. This bicycle and pedestrian right-of-way needs to be looked at closely for its reasonability, practicality and what real beneficial use does it truly serve?

UTE WATER **6/7/96**
Gary Mathews **242-7491**

1. A plat showing over-all view of this subdivision is required before approval.
2. Water mains shall be c-900, class 150. Installation of pipe fittings, valves and services including testing and disinfection shall be in accordance with Ute Water standard specifications and drawings.
3. Developer will install the meter pits and yokes. Ute Water will furnish pits and yokes.
4. Construction plans required 48 hours before development begins.
5. Policies and fees in effect at the time of application will apply.

U.S. WEST **6/5/96**
Max Ward **244-4721**

U.S. West will need 14' utility easements on both sides of streets - Chama Lane, Westwood Drive and McCook Avenue in Filing #1 and Filing #2, Westwood Drive.

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.

TCI CABLEVISION **6/12/96**
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 developers 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 the 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.

PUBLIC SERVICE COMPANY **6/12/96**
Jon Price **244-2693**

Public Service Company has no additional requirements at this time.

TO DATE, NO COMMENTS RECEIVED FROM:
City Attorney
Mesa County Planning

RESPONSE TO COMMENTS

Valley Meadows East Subdivision

Date: June 21, 1996
Location: NE Corner 25 ½ Road and Grand Valley Canal
Petitioner: GWHC, Inc.
2467 Commerce Blvd.
Grand Junction, CO 81505
Ph: 242-1336
City File # FPP-96-138
Petitioner's Representative: ROLLAND Engineering
405 Ridges Blvd., Suite A
Grand Junction, CO 81503
Ph: 243-8300

City Staff Representative: Kathy Portner/Dave Thornton

The following responses are in the same order of the original review comments:

CITY COMMUNITY DEVELOPMENT

1. With all due respect, all outlots as shown on the plat are designated by sequential labels (Outlot A, Outlot B, Etc.). We feel that this defines these areas, which are set aside for purposes other than residential buildings, according to accepted legal definitions. We have included a photocopied section of "Black's Law Dictionary" to support this opinion. The portion of the subdivision intended for future filings (originally shown as Outlot C) has been relabeled as Lot 1 of Block 4 per the suggestion from the City Property Agent review.
2. The City Council voted, at the May 1, 1996 Council Meeting, to accept the property along the Grand Valley Canal and along the eastern boundary as deeded right-of-way. The plat will continue to show these areas as right-of-way.
3. A note has been added to the plat indicating the location of F 3/4 Road.
4. Additional conversations between Mr. Richard Watson (GWHC, Inc.) and other City Personnel rendered a decision that the access from Chama Lane to the Open Space area was not required.
5. The access road from McCook Avenue, in filing #2, into the 1.15 acre Open Space has been increased to a width of 12 feet.
6. The dedication language will, and has been, revised as necessary. The dedication language for the City right-of-way areas has not been finalized with City Staff but will be in place by the time of plat recordation.
7. The Open Space areas, now labeled as Tract 'A' and Lot 1 of Block 4, will be landscaped. The landscape plan is for both areas to be irrigated, grassed, and to have trees. The entry lanes to the 1.15 acre Open Space will be graveled paths eight feet wide. The street

access points to the 1.15 acre Open Space will be signed at the entrances such that all neighborhood residents will be aware that the Open Space is for their use. The final landscape plan will be coordinated with City Staff.

8. All platted Open Space areas within filings #1 and #1 will be constructed during the construction phase of their respective plats.
9. Covenants will restrict the rear yard fencing to 4 foot in height for all lots adjacent to the 1.15 acre Open Space. The present location of the 1.15 acre Open Space is the desired location.

CITY DEVELOPMENT ENGINEER

1. Contractual agreements for drainage, the same agreements that were signed for Valley Meadows filing#2, will be signed between the Developer and the City.
2. All public improvements will be accomplished in accordance with the new City Standard Contract Documents for Capital Improvements.
3. Calculations were performed to size the irrigation line along 25 ½ Road. The Calculations are included in this response package.
4. A cleanout has been provided and is shown on the plans. The maintenance of the pipe will be the responsibility of the Homeowner's Association for Valley Meadows East. However, the easement that the pipe is in will be dedicated so that the City of Grand Junction has access to the pipe because the pipe also serves as a storm drain system.
5. Street lights and street name/stop signs have been added to the plans.
6. Improvements agreements have been revised to show the inspection fees of $1000.

CITY UTILITY ENGINEER

WATER

1. A sign-off block for Ute Water has been provided on all water related plans.
2. Angles for bends in waterlines have been identified on the plans.

SEWER

1. Sewer has been reconfigured so that MH1-B is located in the center of the street.
2. Limits of Filing #1 sewer construction have been identified on McCook Avenue.
3. Sewer stub outs will be capped and plugged at their terminus. Stub outs will be identified with a steel fence post buried 1 foot below finished grade. As-built surveying of stub out will be performed prior to backfill. A note to this effect has been added to the plans.
4. Sheet identification/location within the entire development project has been added to the plan and profile sheets.
5. Bearings and distances between Ex MH in 25 ½ Road and MH-A and between MH1-B to MH2-B have been added to plans.
6. Sewer line in MH2-B has been run through on grade and the 0.2' fall has been eliminated.
7. City of Grand Junction Standard Drawings are enclosed for review as part of this response.

8. The requested notes A thru K have been added to the "General Notes and Typical Section" sheet.

CITY PROPERTY AGENT

Red-lined maps have been reviewed and appropriate changes have been made. See revised plats for Filing #1 and Filing #2.

CITY PARKS & RECREATION

1. Parks and Open Space Fees noted. However, the Developer believes that Fees for this development are not appropriate since a large open space was created within the development at the request of the City.
2. Common open space, properties not dedicated to any other entities, will remain owned and maintained by the Homeowner's Association.
3. Hike and bike trail area along the canal will be a dedicated right-of-way.
4. The 5 foot right-of-way along the eastern boundary was accepted by the City Council as a right-of-way.

CITY FIRE DEPARTMENT

1. Comment of "no problems with this proposal" is noted.

CITY POLICE DEPARTMENT

1. Comments about surrounding houses keeping an eye on the Open Space are noted.

GRAND JUNCTION DRAINAGE DISTRICT

Comment noted about drainage being handled by the City of Grand Junction and the Grand Valley Irrigation Company.

MESA COUNTY SCHOOL DISTRICT #51

Enrollment numbers are noted.

GRAND VALLEY IRRIGATION

Concerns regarding the historical use of the 35 foot right-of-way/easement along the Canal bank are noted.

UTE WATER

1. We believe that the Utility Composite Plan shows the overall layout of the entire subdivision. We will provide Ute Water with any additional details as requested.
2. Water mains will be c-900, class 150. All pipe, and associated hardware, will be installed per Ute Water standard specifications and drawings.
3. Developer will install meter pits and yokes supplied by Ute Water.
4. Ute Water will have construction plans at least 48 hours prior to any development activity.

Community Development Department and included in the covenants for the subdivision.

3. The 12' and 15' access point into the open space area shall include a 6' wide concrete path with the remainder of the width being in gravel or similar ground cover. The two access points shall be clearly signed.

4. The final dedication language on the plats is subject to final approval by the Community Development Department.

5. The final landscaping and signage plan for the entry feature and common open space shall be reviewed and approved by the Community Development Department.

6. The bulk requirements for the zone shall be as follows:
Principal Structure
Front yard setback--20'
Rear yard setback--~~30'~~ 20'
Side yard setback--~~15'~~ 10'

Accessory Structure--on rear half of parcel
Rear yard setback--3'
Side yard setback--3'

Maximum Structure Height--32'

RECOMMENDED PLANNING COMMISSION MOTION:

Mr. Chairman, on item #FPP-96-138, I move we approve the final plat and plans for filings 1 and 2 with the staff conditions.

5. Comment about policies and fees noted.

U.S. WEST

* 14 foot multi-purpose easements have been added to the plat. 14 foot multi-purpose easements have been added in all of the requested locations.
* Developer Contact Group notification is noted.

TCI CABLEVISION

Items 1 thru 6 regarding TCI operating procedures are noted.

PUBLIC SERVICE COMPANY

Comment about Public Service Company having no additional requirements at this time is noted.

VALLEY MEADOWS EAST SUBDIVISION
OFF-SITE RUN-THROUGH RUNOFF ESTIMATE
AND
SIZING OF THE IRRIGATION LINE ALONG 25 1/2 ROAD

1. THE DRAINAGE AREA FOR THE PROPOSED IRRIGATION LINE BEHIND THE SIDEWALK ON 25 1/2 ROAD HAS BEEN ESTIMATED TO BE 30 ACRES.

2. DRAINAGE PATH LENGTH TO THE NORTH END OF THE IRRIGATION LINE IS 1850 FT.

3. AVERAGE SLOPE S=(4640-4610)/1850=1.6%

4. RUNOFF COEFFICIENT C_{100H}=0.2
(0-2% GROUP B SOIL/CULTIVATED/AGRICULTURAL)

5. OVERLAND FLOW TIME (FIRST 300 LF DRAINAGE PATH OF 1850 LF)
$To=1.8(1.1-0.2)(300)^{0.5}/(1.6)^{0.33}$ =24 MIN

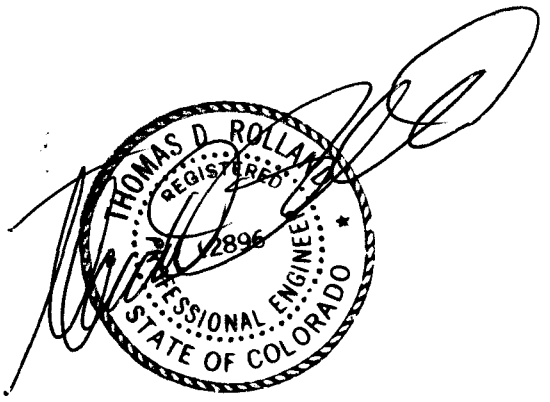
6. CONCENTRATED FLOW TIME Ts (1550 LF DRAINAGE PATH)
V = 1.3 FT/S (CULTIVATED STRAIGHT ROW, FROM FIGURE "E-3")
Ts=1550/1.3/60 ≈ 20 MIN

7. TIME OF CONCENTRATION Tc =To + Ts=24+20 =44 MIN

8. INTENSITY I_{100H} =1.82 IN/HR

9. 100-YEAR HISTORIC RUNOFF Q_{100H} =CIA=0.2*1.82*30 =**10.92 CFS**

10. THE FLOW CAPACITY FOR THE 15" PVC IRRIGATION LINE AT 1.42% IS **12.5 CFS>Q_{100H}=10.92 CFS**



FILE:C:\HAASE\RUNOFF.SAM, 6/21/96

Valley Meadows Estate

30 Acres

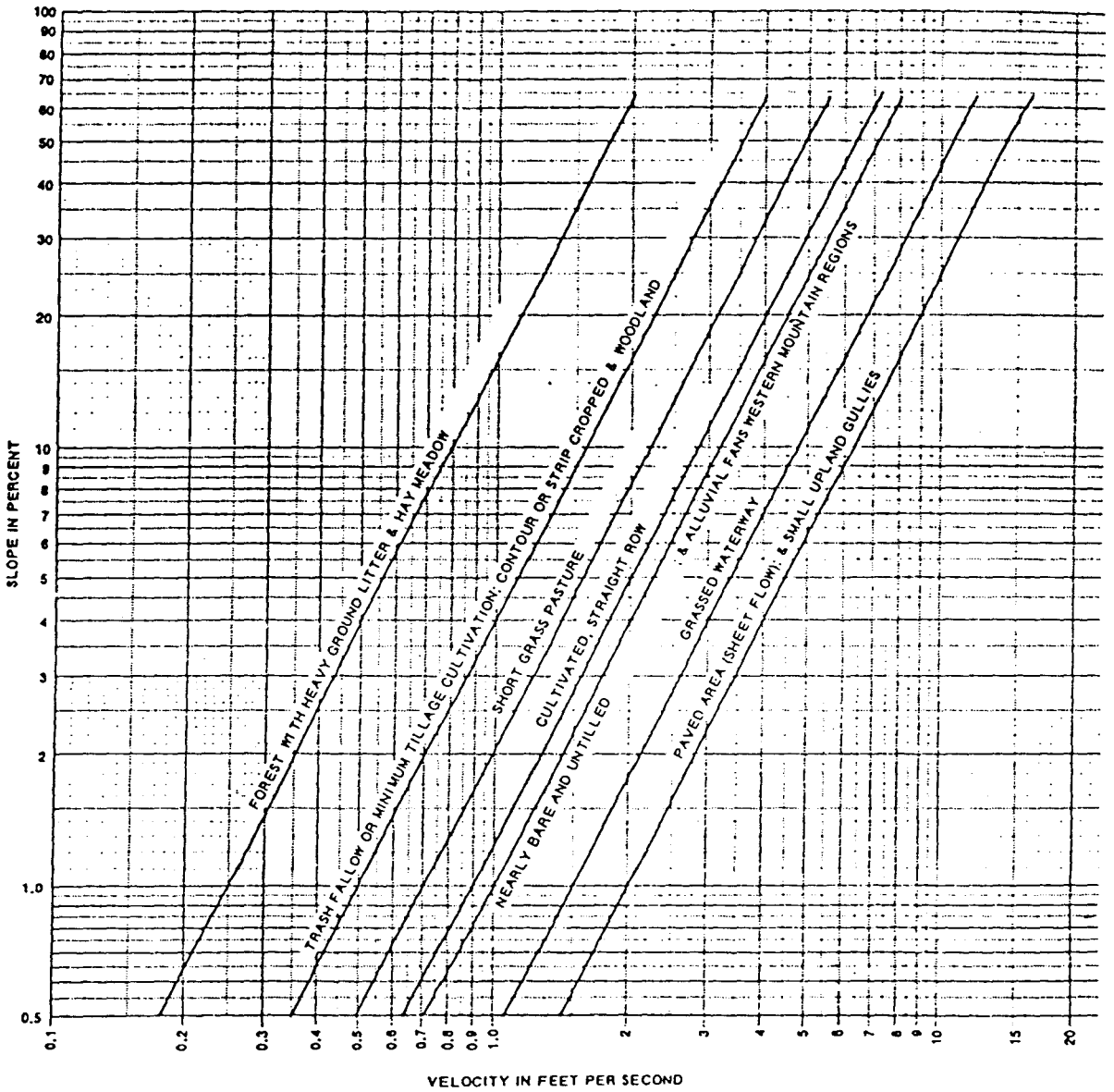
LAND USE OR SURFACE CHARACTERISTICS	SCS HYDROLOGIC SOIL GROUP (SEE APPENDIX "C" FOR DESCRIPTIONS)											
	A			B			C			D		
	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+	0-2%	2-6%	6%+
UNDEVELOPED AREAS Bare ground	.10 - .20 .14 - .24	.16 - .26 .22 - .32	.25 - .35 .30 - .40	.14 - .22 .20 - .28	.22 - .30 .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



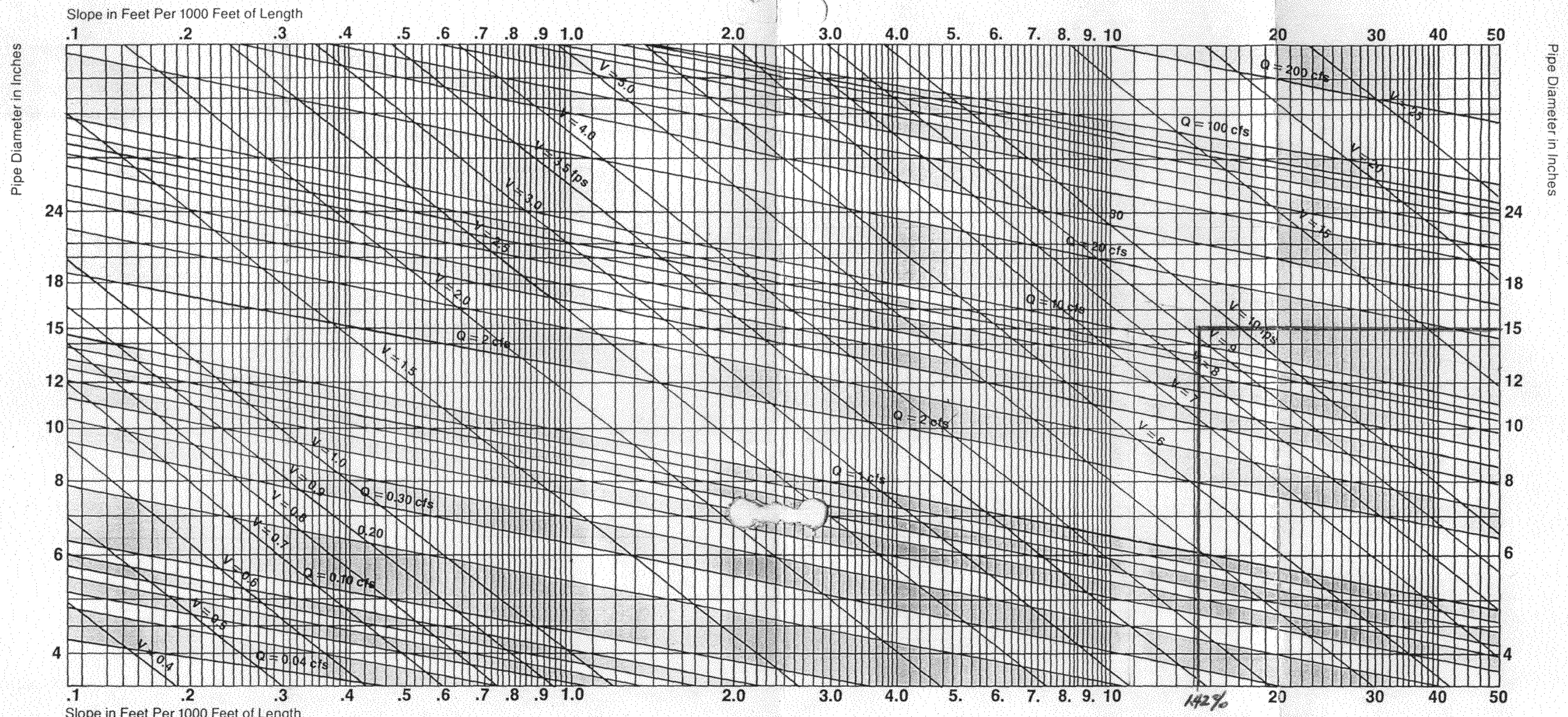
DETERMINATION OF "Ts"	FIGURE "E-3"

Flow Chart for Pipe Flowing Full

Coefficient of Flow
n = 0.009

Derived from the MANNING Formula
$v = \frac{1.486}{n} R^{2/3} S^{1/2}$

PVC Gravity Sewer Pipes have a coefficient of n = 0.009. Their high carrying capacities may often result in the use of flatter grades or in the use of smaller diameter 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 from this chart are for coefficient of flow n = 0.009. These may be converted to diameters for other coefficients of flow by means of the following multiplying factors:

0.956	for n = 0.008	1.114	for n = 0.012
1.000	for n = 0.009	1.147	for n = 0.013
1.040	for n = 0.010	1.180	for n = 0.014
1.078	for n = 0.011	1.211	for n = 0.015

Conversion Factors
CES, MGD, GPM

To convert cubic feet per second (cfs) to million gallons per day (MGD), multiply cfs by 0.646. To convert cubic feet per second (cfs) to gallons per minute, multiply cfs by 448.83.

One cubic foot of water = 7.48 gallons

Example 1

Assume:

Flow Coefficient n = 0.009
Length = 2800 ft.
Pipe Size = 8 inch
Elevations—Upstream = 215′-0″
Downstream = 213′-0″

Required:

1) Flow rate when flowing full
2) Velocity

Difference in elevation divided by length of pipe line equals slope in ft./ft. Multiplying by 1000 = slope 0.7 ft./1000 ft. Enter graph at 0.7 slope and also at 8 inch diameter pipe. At intersection, lines for velocity and flow rate also intersect. These give flow rate of 0.5 cu. ft. per second and velocity of 1.3 feet per second.

Example 2

Assume:

Flow Coefficient n = 0.013
Pipe Size = 8 inch
Flow rate = 0.5 cu. ft./sec.

Required:

Slope

First solve for slope based on flow coefficient n = 0.009, then multiply result by the correcting factor as follows: Enter graph at 8″ diameter and at flow rate 0.5 cu. ft./sec. At intersection find slope 0.71 ft./1000 ft. Correcting factor for n = 0.013 is 2.086 (See Table 1). Multiply 0.71 by factor 2.086 for corrected slope of 1.481 ft./1000 ft. for n = 0.013.

(Must use approximately twice the slope)

Example 3

Assume:

Flow Coefficient n = 0.013
Slope = 0.7 ft./1000 ft.
Flow rate = 0.5 cu. ft./sec.

Required:

Pipe Size

First find pipe size for flow coefficient n = 0.009, then convert result as follows: Enter flow chart at 0.7 slope and also at flow rate 0.5 cu. ft./sec. At intersection also find pipe diameter 8″. Converting factor for n = 0.013 is 1.147 (See Table 2). Multiply 8″ x factor 1.147 for corrected pipe diameter = 9.17″. (Must use next size larger.)

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.

STAFF REVIEW

FILE: FPP-96-138

DATE: June 26, 1996

STAFF: Kathy Portner

REQUEST: Final Plan/Plat--Valley Meadows East, Filings 1 & 2

LOCATION: E of 25 1/2 Road, N of Grand Valley Canal

APPLICANT: GWHC, Inc.

EXISTING LAND USE: Undeveloped

PROPOSED LAND USE: Single Family Residential, 2.93 units per acre

SURROUNDING LAND USE:

NORTH:	Undeveloped and proposed single family residential, 4 units per acre
SOUTH:	Single family residential, 3.8 units per acre
EAST:	Large-lot single family residential
WEST:	Single family residential,

EXISTING ZONING: PR-2.93

PROPOSED ZONING: PR-2.93 (Residential Single Family, 2.93 units per acre)

SURROUNDING ZONING:

NORTH:	RSF-4
SOUTH:	PR-3.8 (Planned Residential, 3.8 units per acre)
EAST:	AFT and R1B (Residential, 2 units per acre)
WEST:	PR-2.8 (Planned Residential, 2.8 units per acre)

RELATIONSHIP TO COMPREHENSIVE PLAN:

No Comprehensive Plan exists for this area. The Draft Growth Plan proposes this area as medium density residential, 4-7.9 units/acre.

STAFF ANALYSIS:

The Preliminary Plan for Valley Meadows East that Planning Commission reviewed and approved consisted of 52 single family lots on approximately 15 acres for a density of 3.5 units per acre. Planning Commission had also recommended approval of RSF-4 zoning. That was appealed by surrounding property owners to the City Council. City Council approved a zoning of PR-2.93 units per acre for 44 lots, with an average lot size of approximately 10,000 square feet, and approved the preliminary plan with the following changes:

1. Accept the offer of the five-foot trail easement on the east side of the property and two lots of open space as being the open space requirement;

2. The remainder of the lot reduction to 44 lots to be divided amongst the remaining lots as the developer chooses;

3. Acceptance of staff recommendations number 1 and 3 which deal with street naming and the location of F 3/4 Road;

4. Amend staff recommendation number 2 to accept their offer of canal right-of-way to be deeded to the City who would then grant an easement to Grand Valley Canal Company.

Staff believes the petitioner has addressed Council's conditions with the revised preliminary plan for 44 single family lots with 1.15 acres in open space and .16 acre entry feature. This proposal is for final plat/plan approval for filings 1 and 2. The overall internal street circulation of the subdivision is substantially the same as with the original submittal, with the elimination of one connection through the area that was redesigned as the common open space. Filing 1 consists of 14 lots on 4.26 acres and the entry feature. Filing 2 consists of 12 lots on 4.51 acres and the 1.15 acre centralized common open space area.

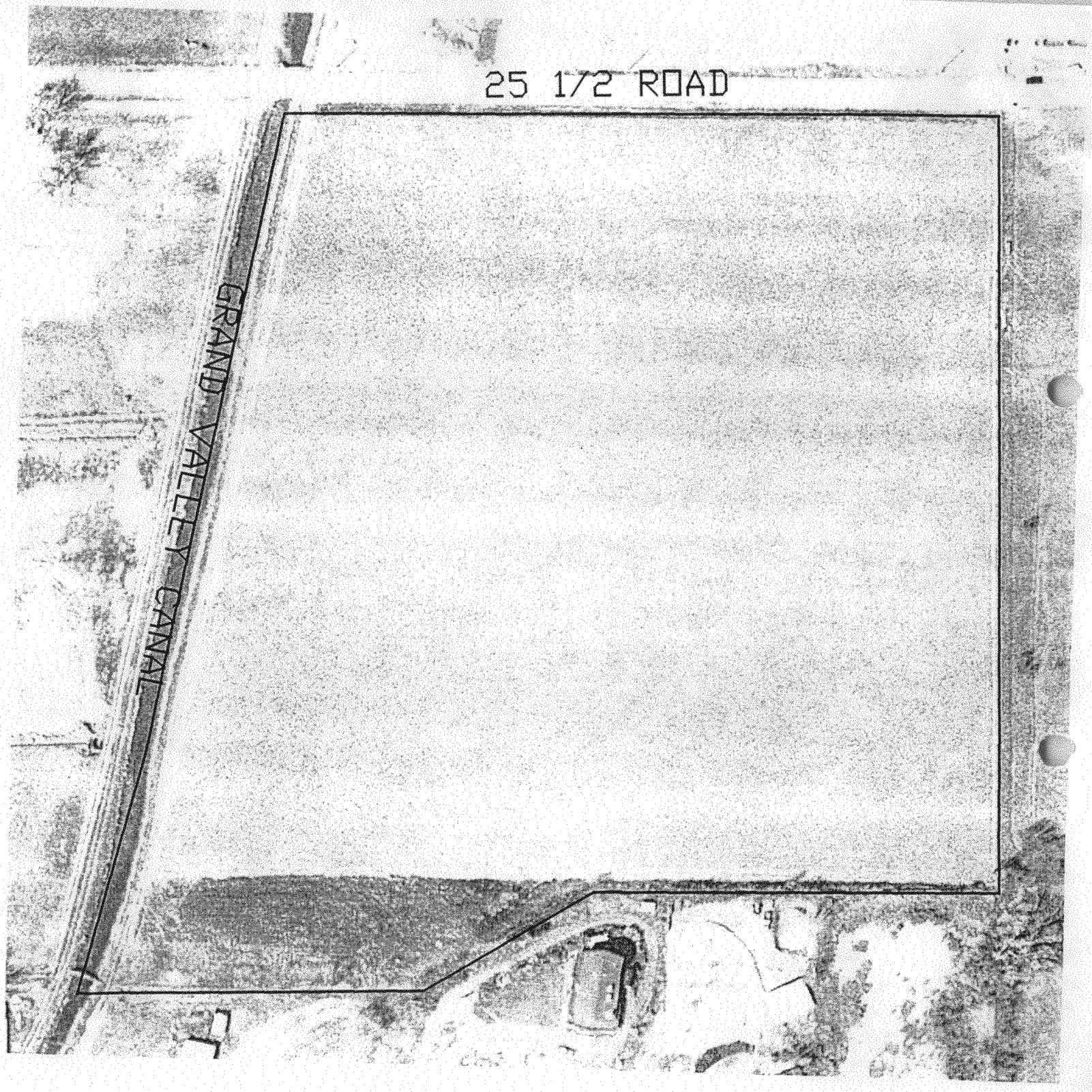
The common open space area needs to remain open and inviting to the subdivision residents. Staff recommends that privacy fencing not be allowed around the perimeter and along the access-ways and that the fencing that is allowed be uniform in design and materials.

STAFF RECOMMENDATION:

Staff recommends approval of Filings 1 and 2 with the following conditions:

1. A note shall be included on the plat showing the location of the proposed F 3/4 Road to the north.

2. Fencing along the entire perimeter of the common open space area shall be limited to a maximum of 4'in height and shall be "open-type" fencing, such as split rail or picket fencing. All fencing shall be uniform in type and design to be approved by the


25 1/2 ROAD
GRAND VALLEY CANAL

Other. Different or distinct from that already mentioned; additional, or further. Following an enumeration of particular classes "other" must be read as "other such like," and includes only others of like kind and character.

Other income. In taxation, income from sources other than in the operation of a business. An example of "other income" of a corporation includes, but is not limited to, interest and dividend income.

Otherwise. In a different manner; in another way, or in other ways.

Ought. This word, though generally directory only, will be taken as mandatory if the context requires it.

OUIL. Abbreviation for state statutes involving operation of motor vehicle while under influence of liquor or drugs. *See* Driving while intoxicated.

Oust. To put out; to eject; to remove or deprive; to deprive of the possession or enjoyment of an estate or franchise.

Ouster. A putting out; dispossession; amotion of possession. A species of injuries to things real, by which the wrong-doer gains actual occupation of the land, and compels the rightful owner to seek a legal remedy in order to gain possession. An ouster is a wrongful dispossession or exclusion of a party from real property and involves a question of intent. Notorious and unequivocal act by which one cotenant deprives another of right to common and equal possession and enjoyment of property. *See also* Ejectment.

Outbuilding. Something used in connection with a main building. A small building appurtenant to a main building, and generally separated from it, e.g. outhouse; storage shed. *See also* Outhouse.

Outcome test. In a diversity of citizenship action in a federal court, the result should be the same as if the action had been commenced in the state court.

Outer continental shelf. All lands lying submerged seaward and not including lands beneath navigable waters. The subsoil and sea bed of such lands are subject to the jurisdiction and control of the United States. 43 U.S.C.A. § 1331.

Outgo. Expenditures.

Outhouse. A building subservient to, yet distinct from, a principal dwelling, located either within or without the curtilage. A smaller or subordinate building connected with a dwelling, usually detached from it and standing at a little distance from it, not intended for persons to live in, but to answer some purpose of convenience or necessity; as an outside privy, a dairy, a toolhouse, and the like. Under statutes, such a building may be subservient to and adjoin a business building as well as a dwelling house. *See also* Outbuilding.

Outlaw. In English law, one who is put out of the protection or aid of the law. Popularly, a person violating the law; a fugitive.

Outlot. In early American land laws (particularly in Missouri), a lot or parcel of land lying outside the corporate limits of a town or village but subject to its municipal jurisdiction or control. Term now generally refers to an area of land on a plat which is to be used for a purpose other than a building site.

Out-of-court settlement. The phrase is used with reference to agreements and transactions in regard to a pending suit which are arranged or take place between parties or their counsel privately and without being referred to the judge or court for authorization or approval. Thus, a case which is compromised, settled, and withdrawn by private agreement of the parties, after its institution, is said to be settled "out of court." *See* Settlement *(Structured settlement).*

Out-of-pocket expenses. Said of an expenditure usually paid for with cash. An incremental cost.

Out-of-pocket loss. As measure of damages, is the difference between the value of what the purchaser parted with (*i.e.*, the purchase price paid by him) and the value of what he has received (*i.e.*, the actual market value of the goods). Also called "out-of-pocket loss rule."

Out of term. At a time when no term of the court is being held; in the vacation or interval which elapses between terms of the court.

Out of the state. In reference to rights, liabilities, or jurisdictions arising out of the common law, this phrase is equivalent to "beyond sea" *(q.v.)*. In other connections, it means physically beyond the territorial limits of the particular state in question, or constructively so, as in the case of a foreign corporation. But a foreign corporation maintaining an agent within the state is not deemed to be "out of the state," within various statutes dealing with jurisdiction over foreign corporations "doing business" within state.

Output contract. *See* Contract; Entire output contract.

Outrage. A grave injury; injurious violence. The tort of "outrage" (intentional infliction of serious mental distress) requires that defendant engage in outrageous and extreme conduct which results in intentionally or recklessly inflicted severe emotional distress.

Outright. Free from reserve or restraint; direct; positive; down-right; altogether; entirely; openly.

Outside. To the exterior of; without; outward from.

REVIEW COMMENTS

FILE #FPP-96-138 **TITLE HEADING:** Valley Meadows East Subdivision

LOCATION: NE corner 25 ½ Road & Grand Valley Canal

PETITIONER: GWHC, Inc.

PETITIONER'S ADDRESS/TELEPHONE: 2467 Commerce Boulevard
Grand Junction, CO 81505
242-1336

PETITIONER'S REPRESENTATIVE: Rolland Engineering

STAFF REPRESENTATIVE: Kathy Portner / Dave Thornton

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., JUNE 21, 1996.

CITY COMMUNITY DEVELOPMENT **6/14/96**
Dave Thornton **244-1450**

PLAT COMMENTS:

1. All outlots as shown on submitted plat are to be labeled as tracts, starting with "Tract A" and sequentially lettered except future filings parcel which should be labeled as Outlot A.
2. Canal easement and trail easement along the east property line is to be dedicated to the City as an pedestrian/bicycle easement rather than a right-of-way.
3. A note is needed on the plat showing the location of F 3/4 Road.
4. Access (12 ft easement) from Chama Lane in filing #1 shall be provided to the 1.15 acre (Tract B) open space in filing 2.
5. The 10 access road from McCook Avenue in filing #2 to the 1.15 acre Open Space (Tract B) shall be a minimum of 12 feet wide. It can be either part of tract B or an easement.
6. Please revise dedication language on both plats as appropriate, i.e. dedication language for open space tracts, language for City pedestrian/bicycle easement and Grand Valley Irrigation R.O.W. with Ped/Bike easement to City, etc. City staff will work with you in preparing and recording the necessary Ped/Bike "trail" easement.

GENERAL COMMENTS:

7. A final design/site plan and landscaping plan for the open space areas is required for tract A in filing 1 and tract B in filing 2 (both are currently labeled as outlot A and Filing No. 2 Common Open Space respectively). This final plan is required to be submitted with the petitioners response to comments.
8. All open space platted in filing #1 shall be fully constructed as part of filing #1 including the easement (or access) to the future Tract B, a part of filing #2. All open space platted as part of filing #2 shall be constructed as part of filing #2.
9. Restrictions on height and type of fencing allowed for rear yards of all lots adjacent to the 1.15 acre Tract B Open Space area should be require to be no taller than 4 feet and all fences should be of the

same type (i.e split rail). These restrictions need to be incorporated into the covenants. Other design features to consider are: 1) How many gates will be allowed from each adjoining lot to the open space. 2) The 1.15 acre open space tract should be located with at least one frontage along a dedicated public street to create easier accessibility to all lot owners and encourage its' usage by all lot owners. If moving the open space location to a street location is not acceptable, then in an effort to create more open and inviting entrances to the 1.15 acre open space area, perhaps widening the entrances and/or limiting fencing along the access corridors will encourage the entire subdivision to use the area.

CITY DEVELOPMENT ENGINEER **6/14/96**
Jody Kliska **244-1591**

1. The same contractual agreements for drainage that were required with Valley Meadows filing 2 are required with this development.
2. New City Standard Contract Documents for Capital Improvements have been published and are available at Public Works for $10. All public improvements must be done in accordance with these standards.
3. Were any calculations performed to verify the size of the irrigation line behind the walk on 25 ½ Road?
4. A cleanout should probably be provided for the irrigation line. Whose responsibility for maintenance is this pipe?
5. Please indicate street lights and street name/stop signs on the street plans.
6. The city inspection fees on the DIA are likely to be closer to $1000.

CITY UTILITY ENGINEER **6/14/96**
Trent Prall **244-1590**

PLEASE NOTE: 1996 City of Grand Junction Standard Specifications shall apply for this proposed development. Copies are available for $10 in the Public Works and Utilities office.

WATER - UTE

1 Please provide a signoff block for Ute on all water related plans.
2 Identify angles for bends on waterline.

SEWER - CITY

1. Please reconfigure sewers so that MH1-B is on centerline of street.
2. Identify limits of Filing 1 sewer construction on McCook Avenue.
3. Sewer stub outs shall be capped and plugged east of property line. Stub out shall be identified with a steel fence post buried 1' below finished grade. As-built surveying of stub out required PRIOR to backfill.
4. Please use match lines for plan and profile sheets.
5. Need bearing and distance from Ex MH in 25 ½ to MH-A and MH 1-B to 2-B.
6. Run sewer through MH2-B on grade and eliminate the 0.2' fall across MH.
7. City of Grand Junction Standard Drawings were not submitted for review as part of the project set.
8. Please add the following notes to the sewer plan and profile.
   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" services 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 road 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. Sewer stub outs shall be capped and plugged east of property line. Stub out shall be identified with a steel fence post buried 1' below finished grade. As-built surveying of stub out required PRIOR to backfill.
K. Benchmark

CITY PROPERTY AGENT **6/17/96**
Steve Pace **256-4003**
See attached red-lined maps for comments.

CITY PARKS & RECREATION **6/13/96**
Shawn Cooper **244-3869**
1. Parks & Open Space fees - 26 lots (Filing 1 & 2) @ $225 = $5,850.
2. Common open space tracts to remain owned and maintained by HOA.
3. Hike and bike trail easement on canal bank.
4. 5' right-of-way or east property line for trail is extremely narrow for use, additional right-of-way will be necessary to make the right-of-way functional. Minimum trail width should be 8 feet with 2-3 feet of shoulder space on each side. Easement/right-of-way should allow for these widths.

CITY FIRE DEPARTMENT **6/13/96**
Hank Masterson **244-1414**
The Fire Department has no problems with this proposal.

CITY POLICE DEPARTMENT **6/14/96**
Dave Stassen **244-3587**
While place the open space in the center of the development may limit access, it is good crime prevention by having the surrounding houses keep an eye on the open space. This should limit potential criminal difficulties.

GRAND JUNCTION DRAINAGE DISTRICT **6/14/96**
John Ballagh **242-4343**
Drainage will apparently be handled by the City and Grand Valley Irrigation Company. No easements are shown to be dedicated to the Grand Junction Drainage District.

MESA COUNTY SCHOOL DISTRICT #51 **6/11/96**
Lou Grasso **242-8500**

SCHOOL - CURRENT ENROLLMENT / CAPACITY - IMPACT
Pomona Elementary - 301 / 325 - 12
West Middle School - 531 / 500 - 6
Grand Junction High School - 1674 - 1630 - 7

GRAND VALLEY IRRIGATION **6/10/96**
Phil Bertrand **242-2762**

Have concern about the Canal Easement or right-of-way being used a bicycle and pedestrian walk-way. This non-typical use or request of City. The 35 foot right-of-way has historically been used, maintained, occupied and cared for by GVIC. Some of the 35 feet cannot be used because it is in water. This bicycle and pedestrian right-of-way needs to be looked at closely for its reasonability, practicality and what real beneficial use does it truly serve?

UTE WATER **6/7/96**
Gary Mathews **242-7491**

1. A plat showing over-all view of this subdivision is required before approval.
2. Water mains shall be c-900, class 150. Installation of pipe fittings, valves and services including testing and disinfection shall be in accordance with Ute Water standard specifications and drawings.
3. Developer will install the meter pits and yokes. Ute Water will furnish pits and yokes.
4. Construction plans required 48 hours before development begins.
5. Policies and fees in effect at the time of application will apply.

U.S. WEST **6/5/96**
Max Ward **244-4721**

U.S. West will need 14' utility easements on both sides of streets - Chama Lane, Westwood Drive and McCook Avenue in Filing #1 and Filing #2, Westwood Drive.

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.

TCI CABLEVISION **6/12/96**
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 developers 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 the 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.

PUBLIC SERVICE COMPANY **6/12/96**
Jon Price **244-2693**

Public Service Company has no additional requirements at this time.

TO DATE, NO COMMENTS RECEIVED FROM:
City Attorney
Mesa County Planning

8/6/96

VALLEY MEADOWS EAST

In dedication:

Grantor acknowledges the existing prescriptive dominant easement of Grand Valley Irrigation Company, and the rights incident thereto, within the area of the Grand Valley Irrigation Company easement shown on this plat. Grand Valley Irrigation Company by signing this plat acknowledges that the described easement is the extent of its prescriptive easement on the parcel shown on the plat. Grantor dedicates its title to the area within such easement to the City of Grand Junction, Colorado. The City of Grand Junction by acceptance of this plat acknowledges that Grand Valley Irrigation Company has the right to enforce such dominant easement against the City of Grand Junction or its successors and assigns, with respect to use by any licensee, invitee or permittee of the City of Grand Junction, including the public, of the property described herein to the City of Grand Junction.

KATHY,

PROPOSED PLAT DEDICATION THAT GVIC WOULD LIKE ON THE PLAT. Please Call.

Trevor

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

FAXED 8/9/96

DEPARTMENT OF NATURAL RESOURCES

August 9, 1996 MA-96-0048

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

Re: Proposed Valley Meadows East Subdivision -- Northeast of the Intersection of the Grand Valley Canal and 25 1/2 Road, Grand Junction

Gentlemen:

At your request, we have reviewed the matrerials submitted for and made a site inspection of the site of the proposed residential subdivision indicated above. The following comments summarize our findings.

(1) The geologic conditions of this site are typical of most of this part of the Grand Valley. There is a relatively thick sequence of clayey residual soils and alluvial deposits which were deposited as sheetwash which originated in the Mancos Shale outcrops of the Book Cliffs. These overlie the Mancos Shale bedrock. The thickness of these deposits is not known precisely, but they are well below the depth of the deepest utility excavations. There is a shallow water table in the area which results from irrigation in the vicinity and leakage from the Grand Valley Canal. Typically, these soils exhibit low blow counts and low bearing capacity as indicated by data presented in the submitted Lincoln-DeVore report.

(2) Because of the conditions indicated in (1), the most suitable type of structure in this subdivision will be a relatively light weight frame building (house) without a basement and founded on properly sized spread footings. This is consistent with the soils and foundation engineer's recommendations and this house type is typical of those in the neighboring subdivisions in particular and much of the Grand Valley in general. We do recommend that each foundation excavation be investigated by a soils and foundation engineer, however, as there probably will be some variation in soil bearing capacity from place to place in the subdivision.

(3) The conceptual drainage plan included with the submittal, if followed in construction, should be adequate to control storm drainage in the area.

If the recommendations made above and those in the submitted Lincoln-DeVore report are followed and made conditions of approval of this subdivision proposal, then we have no geology-related objection to it.

Sincerely,

James M. Soule

James M. Soule
Engineering Geologist

FINAL DRAINAGE REPORT
FOR
VALLEY MEADOWS EAST
SUBDIVISION

PREPARED FOR:
GWHC, INC.
2467 COMMERCE BLVD.
GRAND JUNCTION, CO 81505

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

May 31, 1996

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

RE: DRAINAGE REPORT FOR VALLEY MAEDOWS EAST SUBDIVISION

Dear Jody;

Enclosed you will find the Drainage Report for Valley Meadows East Subdivision Drainage calculations for 2 -Year and 100-Year design storms were performed for this report.

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

Respectfully submitted

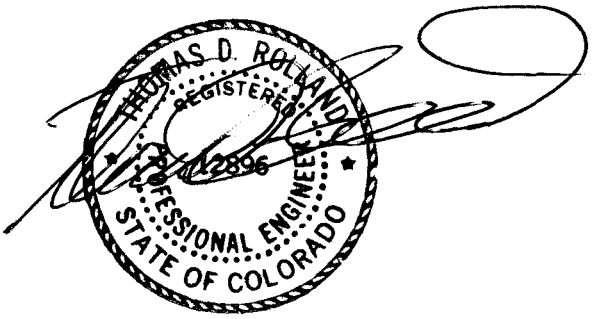
ROLLAND ENGINEERING

WEI LI, EIT

Enclosures

DRAINAGE REPORT
FOR
VALLEY MEADOWS EAST SUBDIVISION

PREPARED FOR:
GWHC INC.
2467 COMMERCE BLVD
GRAND JUNCTION, CO 81505
(970) 242-1336



PREPARED BY:

ROLLAND ENGINEERING
405 RIDGES BLVD., SUITE A
GRAND JUNCTION, CO 81503
MAY 31, 1996

TABLES OF CONTENTS

Valley Meadows East Subdivision Drainage

General Location and Description

Valley Meadows East Subdivision is an approximate 15 acres site located at SE 1/4, NW 1/4, SECTION 3, T1S, R1W, UTE MERIDIAN , MESA COUNTY, COLORADO. The Site lies immediately South of proposed Sunset Village Subdivision, East of 25 1/2 Road and North of Grand Valley Canal and Kay Subdivision is right across the Canal in the South. Access to this site can be gained through 25 1/2 Road. The site lies downstream of a major drainage basin which drains southwest to the Grand Valley Canal historically. There is a small swale along the East property line. There is also a tailwater ditch along the west property line and drains to the Canal. A concrete irrigation ditch along the North property line prevent the off-site run-off entering the project site. Two 12" CMP pipes on the south of the property drain overflow water to the Canal.

The soils on this site consist of a Billing Silty Caly Loam (Bc) and a Ravola Sandy Loam (Rf). The site is a cultivated corn land with spare grasses.

Existing Drainage Conditions

The proposed site has a slope of 1% toward south and drains to the Grand Valley Canal historically. There is some off-site runoff from the North running through the site by the tailwater ditch along the west property line but no off-site runoff contributions to the site. There is no previously determined 100-Year floodplain on this site.

Proposed Drainage Conditions

Based on the existing conditions on the site, runoff from this site will be collected with street gutter and inlets system and then discharged to the Grand Valley Canal via storm sewers. Due to the site restraints, no detention will be provided for this site. The tailwater ditch along the west property line will be relocated and replaced with a PVC underground pipe which still drains the Grand Valley Canal. Run-off from the east side of the improved 25 1/2 road will be collected with street gutter and discharged to the Canal via a temproray CMP pipe from the South end of the 25 1/2 road gutter.

Design Criteria and Approach

We are not aware of any master plans or any other limitations on this site. The Rational Method was used to perform the analysis for the 2-Year and 100-Year design storm events. The Hydrology and hydraulic computations conducted for this site utilized the **Stormwater Management Manual** (June, 1994) for the City of Grand Junction, Colorado.

Valley Meadows East Subdivision Drainage

SUMMMARY

Summarized below are the drainage calculations for this porject:

Project Area = 14.93acres
Filing No. 1 Area = 4.10 acres

Drainage Calculation Method: Rational Method

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

Pre-development Runoff Rates:

2-Year Historic Storm:
Q_{2h1} = 0.62 cfs
Q_{2h} = 2.33 cfs

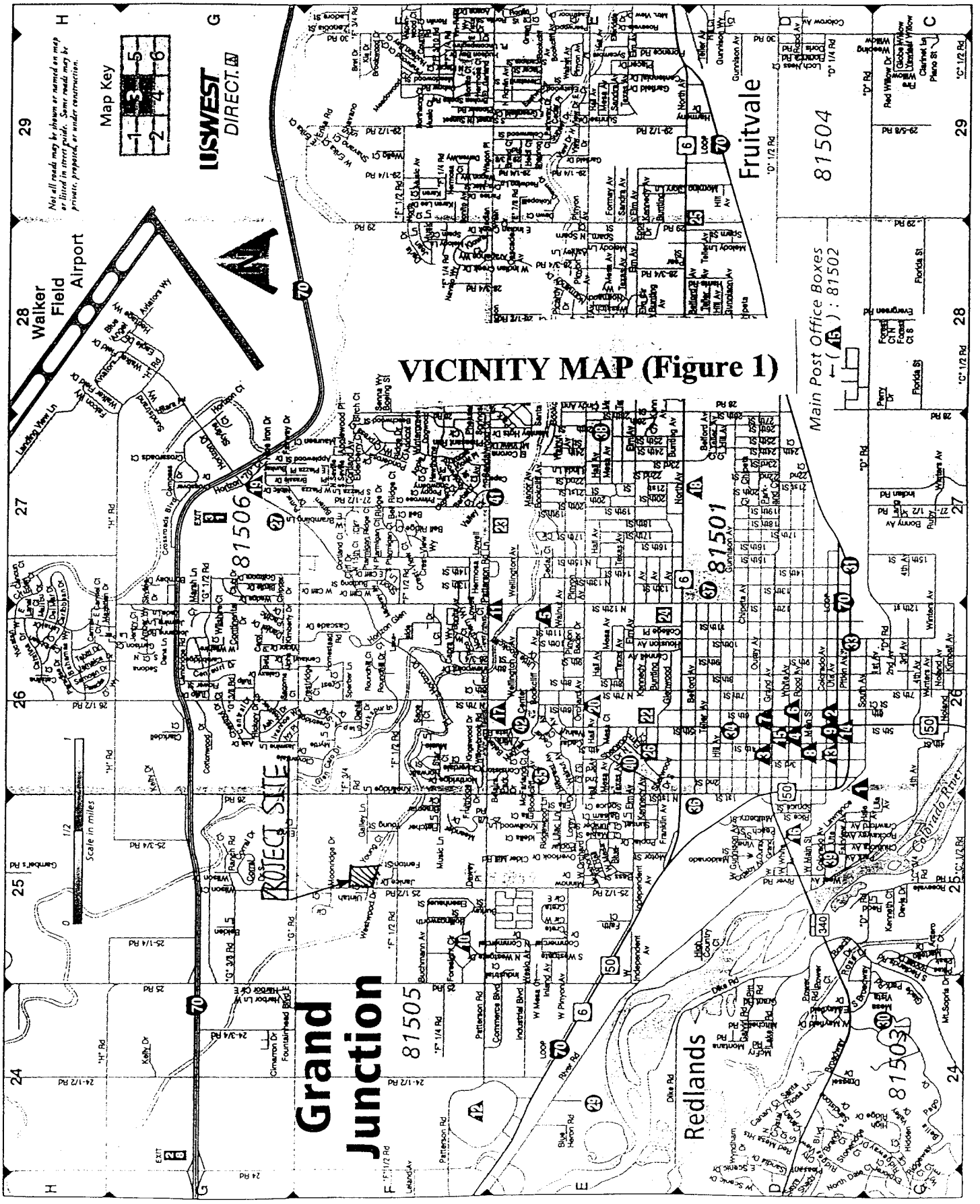
100-Year Historic Storm:
Q_{100h1} = 2.06cfs
Q_{100h} = 7.70 cfs

Post-development Runoff Rates:

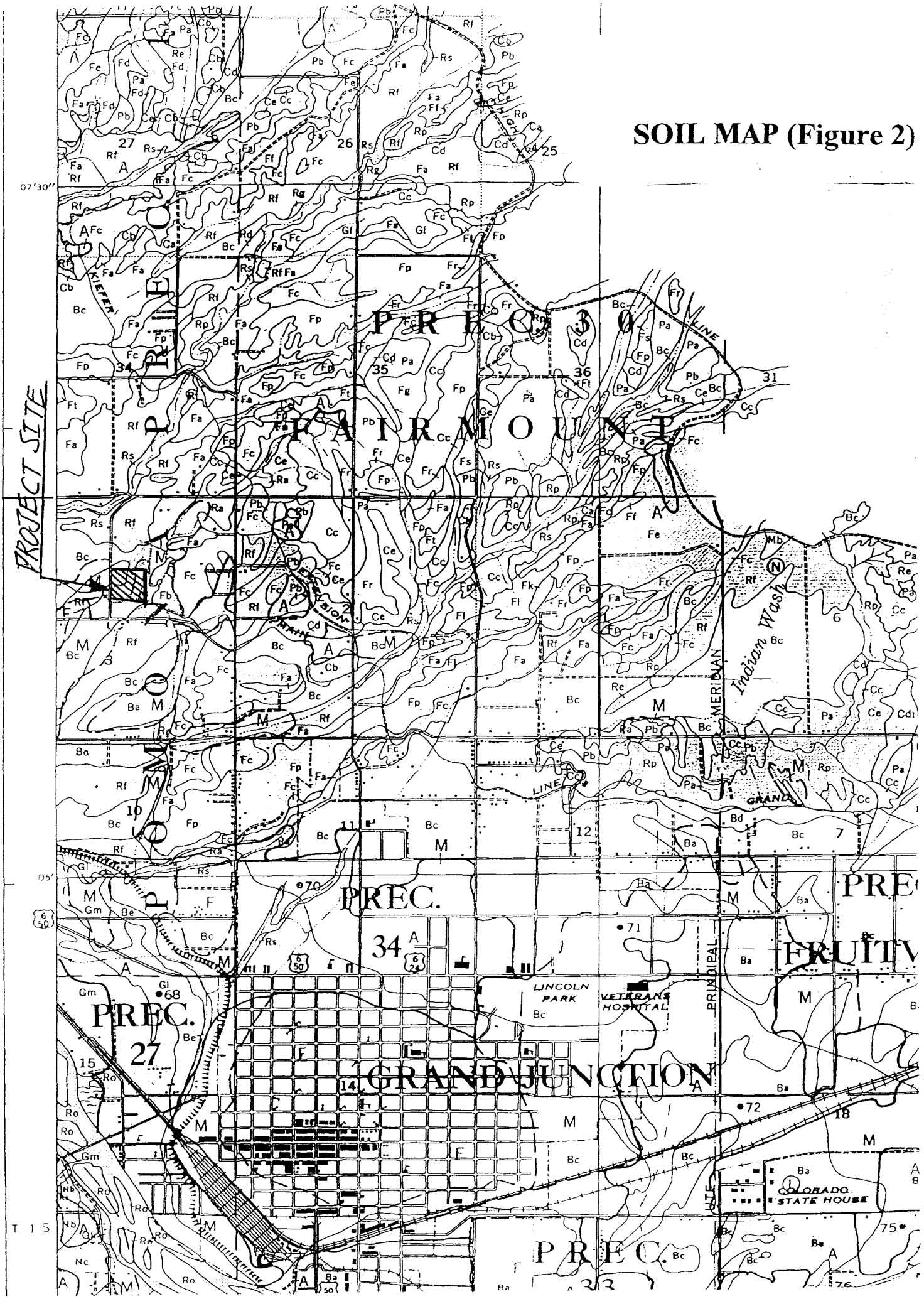
2-Year Developed Storm:
Q_{2d1} = 1.54 cfs
Q_{2d} = 4.93 cfs

100-Year Developed Storm:
Q_{100d1} = 5.03 cfs
Q_{100d} = 16.53 cfs

Grand Junction Area Street Map



SOIL MAP (Figure 2)



APPENDIX A

Valley Meadows East Subdivision Drainage Filing no. 1

HISTORIC CONDITION

1. Filing No. 1 Basin Area , A = 4.10 Acres

2-Year Storm:

SCS Hydrologica Soil Group : B C_{2h} = 0.19 (Cultivated/Agricultural; 0-2%)

(1) Overland Flow
Lo = 300 ft; S = 1%
To = $1.8(1.1-C_{2h})(Lo)^{0.5}/(S)^{0.33}$ = $1.8(1.1-0.19)(300)^{0.5}/(1)^{0.33}$ = 28.4 min

(2) Shallow Concentrated Flow
Ls = 443 ft; S =1%
V = 0.90 ft/s (cultivated straight row)
Ts = Ls/V = 443/0.9/60 = 8.2 min

(3) Tc = To+Ts = 28.4 + 8.2 = 36.6 min
I_{2h1} = 0.79 in/hr
Q_{2h1} = CIA = 0.19*0.79*4.10 = <u>0.62 cfs</u>

100-Year Storm:

SCS Hydrologica Soil Group : B C_{100h} = 0.24(Cultivated/Agricultural; 0-2%)

(1) Overland Flow
Lo = 300 ft; S = 1%
To = $1.8(1.1-C_{100h})(Lo)^{0.5}/(S)^{0.33}$ = $1.8(1.1-0.24)(300)^{0.5}/(1)^{0.33}$ = 26.8 min

(2) Shallow Concentrated Flow
Ls = 443 ft; S =1%
V = 0.90 ft/s (cultivated straight row)
Ts = Ls/V = 443/0.9/60 = 8.2 min

(3) Tc = To+Ts = 26.8 + 8.2= 35.0 min
I_{100h1} = 2.09 in/hr
Q_{100h1} = CIA = 0.24*2.09*4.10 = <u>2.06cfs</u>

DEVELOPED CONDITION

1. Filing No.1 Basin Area, A = 4.10 Acres

2-Year Storm:

Valley Meadows East Subdivision Drainage Filing No. 1

DEVELOPED CONDITION

SCS Hydrologica Soil Group : B C_{2d} = 0.33 (Residential area 0.33 acre/unit; 0-2%)

(1) Overland Flow
Lo = 150 ft; S = 3%
To = $1.8(1.1-0.33)(150)^{0.5}/(3)^{0.33}$ = 11.8 min

(2) Street Flow
Ls = 613 ft; S =0.7% (AVERAGE)
V = 1.7 ft/s (Paved Area)
Ts = Ls /V = 613/1.7/60 = 6.0 min

(3) Drainage Swale Flow
L_d =202 ft; S=0.6%
Hydraulic radius r= 0.25 ft; n=0.016
$V=1.49(r)^{0.67}(S)^{0.5}/n = 1.49(0.25)^{0.67}(0.006)^{0.5}/0.016$ =2.85 ft/s
Swale Flow Capacity Q=VA=2.85*(0.5*5*0.5)=3.56 cfs
T_d =202/2.85/60= 1.2 min

(4) Conduit Flow
From end of the swale to outlet of the 12" CMP at Grand Valley Canal, the flow time is insignificant.

(5) Tc = To+Ts +T_d= 11.8+6.0 +1.2 = 19 min
I_{2d1} = 1.14 in/hr
Q_{2d1} = CIA = 0.33*1.14*4.10 = <u>1.54cfs</u>

100-Year Storm:

SCS Hydrologica Soil Group : B C_{100d} = 0.41 (Residential area 0.33 acre/unit; 0-2%)
(1) Overland Flow
Lo = 150 ft; S = 3%
To = $1.8(1.1-0.41)(150)^{0.5}/(3)^{0.33}$ = 10.6 min

(2) Street Flow
Ls = 613 ft; S = 0.7% (average)
V = 1.7 ft (Paved Area)
Ts = Ls /V = 613/1.7/60 = 6.0 min

(3) Drainage Swale Flow
L_d =202 ft; S=0.6%
Hydraulic radius r= 0.25 ft; n=0.016
$V=1.49(r)^{0.67}(S)^{0.5}/n = 1.49(0.25)^{0.67}(0.006)^{0.5}/0.016$ =2.85 ft/s
Swale Flow Capacity Q=VA=2.85*(0.5*5*0.5)=3.56 cfs

Valley Meadows East Subdivision Drainage Filing No.1

DEVELOPED CONDITION

T_d =202/2.85/60= 1.2 min

(4) Conduit Flow

From end of the swale to outlet of the 12" CMP at Grand Valley Canal, the flow time is insignificant.

(5) Tc = To+Ts +T_d=10.6+6.0+1.2 = 17.8 min

I_{100d1} = 2.99 in/hr

Q_{100d1} = CIA = 0.41*2.99*4.10 = 5.03 cfs

Valley Meadows East Subdivision Drainage

HISTORIC CONDITION

1. Basin Area , A = 14.93 Acres

2-Year Storm:

SCS Hydrologica Soil Group : B C_{2h} = 0.19 (Cultivated/Agricultural; 0-2%)

(1) Overland Flow
Lo = 300 ft; S = 2%
$To = 1.8(1.1-C_{2h})(Lo)^{0.5}/(S)^{0.33} = 1.8(1.1-0.19)(300)^{0.5}/(2)^{0.33} = 22.5$ min

(2) Shallow Concentrated Flow
Ls = 610 ft; S =1%
V = 0.90 ft/s (cultivated straight row)
Ts = Ls/V = 610/0.9/60 = 11.3 min

(3) Tc = To+Ts = 22.5 + 11.3 = 33.8 min $\Rightarrow$ 34 min
I_{2h} = 0.82 in/hr
Q_{2h} = CIA = 0.19*0.82*14.93 = 2.33 cfs

100-Year Storm:

SCS Hydrologica Soil Group : B C_{100h} = 0.24(Cultivated/Agricultural; 0-2%)

(1) Overland Flow
Lo = 300 ft; S = 2%
$To = 1.8(1.1-C_{100h})(Lo)^{0.5}/(S)^{0.33} = 1.8(1.1-0.24)(300)^{0.5}/(2)^{0.33} = 21.3$ min

(2) Shallow Concentrated Flow
Ls = 610 ft; S =1%
V = 0.90 ft/s (cultivated straight row)
Ts = Ls/V = 610/0.9/60 = 11.3 min

(3) Tc = To+Ts = 21.3 + 11.3 = 32.6 min $\Rightarrow$ 33 min
I_{100h} = 2.15 in/hr
Q_{100h} = CIA = 0.24*2.15*14.93 = 7.70 cfs

DEVELOPED CONDITION

1. Basin Area, A = 14.93 Acres

2-Year Storm:

Valley Meadows East Subdivision Drainage

DEVELOPED CONDITION

SCS Hydrologica Soil Group : B C_{2d} = 0.33 (Residential area 0.33 acre/unit; 0-2%)

(1) Overland Flow
Lo = 100 ft; S = 1%
To = $1.8(1.1-0.33)(100)^{0.5}/(1)^{0.33}$ = 13.9 min

(2) Street Flow
Ls = 1134 ft; S =0.89% (AVERAGE)
V = 1.9 ft/s (Paved Area)
Ts = Ls /V = 1134/1.9/60 = 9.9 min

(3) Conduit Flow
From Inlet B to outlet at Grand Valley Canal, the flow time is insignificant.

(4) Tc = To+Ts = 13.9+9.9= 23.8 min ⇒24 min
I_{2d} = 1.0 in/hr
Q_{2d} = CIA = 0.33*1.0*14.94 = <u>4.93 cfs</u>

100-Year Storm:

SCS Hydrologica Soil Group : B C_{100d} = 0.41 (Residential area 0.33 acre/unit; 0-2%)
(1) Overland Flow
Lo = 100 ft; S = 1%
To = $1.8(1.1-0.41)(100)^{0.5}/(1)^{0.33}$ = 12.4 min

(2) Street Flow
Ls = 1134 ft; S = 0.89% (average)
V = 1.9 ft (Paved Area)
Ts = Ls /V = 1134/1.9/60 = 9.9 min

(3) Conduit Flow
From Inlet B to outlet at Grand Valley Canal, the flow time is insignificant.

(4) Tc = To+Ts =12.4+.9.9 = 22.32 min
I_{100d} = 2.70 in/hr
Q_{100d} = CIA = 0.41*2.70*14.93 = <u>16.53 cfs</u>

SUMMARY OF RUNOFF RATES

	2-Year Storm	100-Year Strom
Historic Condition	Q_{2h} = 2.33 cfs	Q_{100h} =7.70 cfs
	Q_{2h1} = 0.62 cfs (filing no. 1)	Q_{100h1} =2.06 cfs(filing no. 1)
Developed Condition	Q_{2d} = 4.93 cfs	Q_{100d} = 16.53 cfs

Valley Meadows East Subdivision Drainage

FLOW DEPTH IN THE STREET GUTTERS

2-Year and 100-Year storm events under developed conditions will be used to determine the flow depth in the street gutters. There will be two gutters on each street.

Formula: $Q = K\frac{Z}{n}\sqrt{S}\ (Y)^{8/3}$

Where: Q = the gutter flow (ft^3/s)
K = 0.56; a constant dependant upon unit (ft^3/s, ft)
Z = 5θ; the reciprocal of the transverse slope of the pavement.
n= 0.015; the roughness coefficient, typically 0.015 for concrete gutters.
S = 0.78% ; the average slope of the gutter.
Y = the depth of gutter flow.

Using the above typical values and 2-Year and 100-Year runoff rates, the depth of water (Y) in the street gutter can be determined for the worst case. The worst case for this subdivision will happened at the North side gutter of the Westwood Drive and nearby Inlet 1B. Runoff to Inlet 1B from the west side gutter of the Inlet can be estimated as follows:
The west side gutter of Inlet 1B has a drainage area about 1/3 of the Entire Drainage Are
Then runoffs used to determine the flow depth will be:

2-Year $Q_2 = 0.33\ Q_{2d} = 0.33*4.93 = 1.63$ cfs
100-Year $Q_{100} = 0.33 Q_{100d} = 0.33*16.53 = 5.45$ cfs

Therefore , $Y_2 = 0.18$ ft = 2.16 inch; $Y_{100} = 0.28$ ft = 3.36 inch

INLET CAPACITY ESTIMATE

Six single NEENAH R-3246C inlets will be placed on the Westwood Drive as shown on the drawings. The inlet capacity is as follows according to **Table "G-1" in the Stormwater Management Manual** (June, 1994) for the City of Grand Junction:

Inlet 1B has the largest drainage area of all inlets in this subdivision, the drainage area for Inlet 1B is about 40% of the entire drainage basin. Runoffs to Inlet 1B can be estimated as follows:

2-Year $Q_{21B} = 0.4\ Q_{2d} = 0.4*4.93 = 1.97$ cfs
100-Year $Q_{1001B} = 0.4 Q_{100d} = 0.4*16.53 = 6.61$ cfs

2-Year Inlet Capacity = 6.4 cfs > $Q_{21B} = 1.97$ cfs
100-Year Inlet Capacity = 13 cfs > $Q_{1001B} = 6.61$ cfs

STORM SEWER DESIGN

Storm Sewer from Inlet 1A to Inlet 2A: 12" PVC pipe;

L = 29 ft; S = 0.60%

Valley Meadows East Subdivision Drainage

STORM SEWER DESIGN

V = 5.2 ft/s Q = 3.0 cfs;

Storm Sewer from Inlet 2A to the intersection with the irrigation pipe: 12" PVC

L =122 ft; S = 1.44%
V = 7.8 ft/s Q=6.5 cfs

Storm Sewer from Inlet 1B to Inlet 2B: 12" PVC pipe;

L =29 ft; S = 0.7%
V = 5.6 ft/s Q=4.5 cfs

Storm Sewer from Inlet 2B to the Grand Valley Canal: 15" RCP pipe

L = 131 ft; n = 0.013
S = 1.2%; Hydraulic Radius r = 0.31 ft
$V = 1.49(r)^{0.67}(S)^{0.5}/n = 1.49(0.31)^{0.67}(0.012)^{0.5}/0.013 = 5.73$ ft/s
A=1.23 SF Q=1.23*5.73 =7.05 CFS

Storm Sewer from Inlet 1C to Inlet 2C: 12" PVC pipe;

L =76 ft; S = 0.5%
V = 4.6 ft/s Q=3.8 cfs

Storm Sewer from Inlet 2C to the Grand Valley Canal: 15" RCP pipe

L = 127.5 ft; n = 0.013
S = 1.0%; Hydraulic Radius r = 0.31 ft
$V = 1.49(r)^{0.67}(S)^{0.5}/n = 1.49(0.31)^{0.67}(0.01)^{0.5}/0.013 = 5.23$ ft/s
A=1.23 SF Q=1.23*5.23 =6.43CFS

Inlet 1A, 2A, 1C, and 2C are used to intercept runoffs toward Inlet 1B and 2B.

APPENDIX B

SUNSET VILLAGE
(MARC S. LAIRD)
(2945-031-00-124)

AFT
PATRICIA L. MORAN
2945-031-00-123

AFT
GEORGE R. JACHIM
2945-031-00-138

WALID BOU-MATAR
2945-032-00-174

12" PIPE

EX-EARTH DITCH

EX-CON IRR. DITCH

LOUIS J. MOTTS
2945-031-00-141
R1A

ROBERT G. HUNT
2945-031-00-142
R1A

BERNADINE R. WILSON
2945-031-00-140
R1A

Rf

Bc

IRRIGATION PIPE

25 1/2 ROAD

PR-2.8
VALLEY MEADOWS SUBDIVISION

FILING NO. 2

FILING NO. 3

FILING NO. 1

LINE TO SEPERATE SOIL TYPE

DESIGN DRIANGE FLOW PATH

773'

910'

FILING NO. 1 DESIGN FLOW PATH

WESTWOOD DR

EXISTING PROPERTY LINE

8" CMP

15" CMP

CANAL NORTH BANK

GRAND VALLEY CANAL

25' OFFSET FROM THE CANAL NORTH BANK

EXISTING PROPERTY LINE GRAND VALLEY IRRIGATION CANAL RIGHT-OF-WAY

GRAND VALLEY CANAL

EX-EARTH DITCH

12" CMP

ROBERT J. WILSON
2945-032-00-130
AFT

PR-3.8
KAY SUBDIVISION

BRENDA WAY

PR-3.6
CIMARRON NORTH SUBDIVISION

0' 50' 100' 150'

LEGEND

- MESA COUNTY SURVEY MONUMENT
- FILINGS BOUNDARY LINE

ON-SITE SOIL TYPES

Bc: BILLINGS SILTY CLAY LOAM
Rf: RAVOLA LOAM

(FROM "SOIL SURVEY, GRAND JUNCTION AREA (COLORADO, BY UNITED STATES DEPARTMENT) (OF AGRICULTURE, SCS 1955)

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

FILE: C:\HAASE\HIST.DWG

VALLEY MEADOWS EAST
SUBDIVISION

PRE-DEVELOPMENT DRAINAGE MAP

Designed	WL	Checked	TDR	HIST.PLT	Sheet
Drawn	WL	Date	2/26/96	4/24/97	OF

C:\HAASE\HIST Fri Apr 26 12:06:18 1996 ROLLAND ENGINEERING

APPROVED FOR CONSTRUCTION

CITY DEVELOPMENT ENGINEER

DATE

CITY UTILITY ENGINEER

DATE

ACCEPTED AS CONSTRUCTED

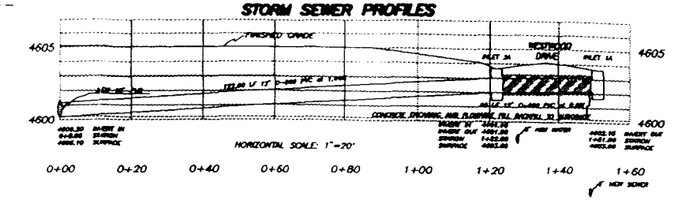
CITY DEVELOPMENT ENGINEER

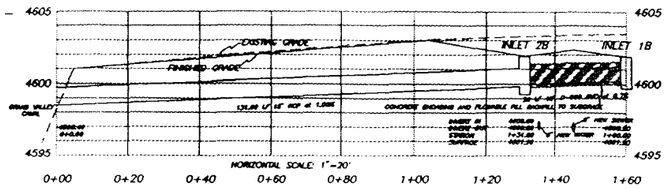
DATE

CITY UTILITY ENGINEER

DATE

STORM SEWER PROFILES





NOTES:
1. ALL STORM SEWER FOR FILING NO. 1 & 3 SHALL BE C-900 PVC PIPES UNLESS OTHERWISE SPECIFIED.
2. STORM SEWER PROFILES IN FILING NO. 3 WILL BE PROVIDED IN THE FUTURE FILING DESIGN.
3. ALL STORM INLETS SHALL BE NEENAH R-3246BC.
4. ALL STORM DRAIN INLETS SHALL BE INSTALLED PER CITY OF GRAND JUNCTION STANDARD DETAILS

DRAINAGE SUMMARY

FILING NO. 1 AREA =4.10 ACRES
PROJECT AREA = 14.93 ACRES

PRE-DEVELOPMENT RUNOFF RATES:
2-YEAR HISTORIC STORM Q_{2h1} = 0.62 CFS
2-YEAR HISTORIC STORM: Q_{2h} = 2.33 CFS

100-YEAR HISTORIC STORM: Q_{100h1} = 2.06 CFS
100-YEAR HISTORIC STORM: Q_{100h} = 7.70 CFS

POST-DEVELOPMENT RUNOFF RATES:
2-YEAR DEVELOPED STORM: Q_{2d1} = 1.54 CFS
2-YEAR DEVELOPED STORM: Q_{2d} = 4.93 CFS
100-YEAR DEVELOPED STORM: Q_{100d1} = 5.03 CFS
100-YEAR DEVELOPED STORM: Q_{100d} = 16.53 CFS

FOR DETAILS SEE THE DRAINAGE REPORT FOR "VALLEY MEADOWS EAST SUBDIVISION"

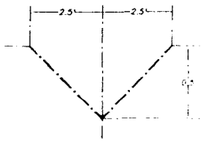
UTILITIES

WATER: UTE WATER
ELECTRICITY: PUBLIC SERVICE COMPANY
GAS: PUBLIC SERVICE COMPANY
CABLE TV: TCI
TELEPHONE: US WEST
IRRIGATION: GRAND VALLEY IRRIGATION COMPANY
SANITARY SEWER: CITY OF GRAND JUNCTION
FIRE: GRAND JUNCTION FIRE DEPARTMENT

ON-SITE SOIL TYPES

Bc: BILLINGS SILTY CLAY LOAM
Rl: RAVOLA LOAM

(FROM "SOIL SURVEY" GRAND JUNCTION AREA) (COLORADO, BY UNITED STATES DEPARTMENT) (OF AGRICULTURE, SCS 1955)



DRAINAGE SWALE
TYPICAL SECTION
NTS

LEGEND

- ⊗ - MESA COUNTY SURVEY MONUMENT
- →- - - DRAINAGE DIRECTION
- FF - MINIMUM FINISHED FLOOR ELEVATION

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

FILE: C:\HMASE\SDPLAN.DWG

VALLEY MEADOWS EAST SUBDIVISION

POST-DEVELOPMENT DRAINAGE MAP

Designed	Checked	SDPLAN.PLT	Sheet
Drawn MT	Date 2/28/96	3/11/96	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

Billings silty clay loam, 0 to 2 percent slopes—This soil, locally called adobe, is one of the most important and extensive in the Grand Valley. It covers nearly one-fifth of the Grand Junction Area. The areas occur on the broad flood plains and very gently sloping coalescing alluvial fans along streams. Many large areas are north of the Colorado River.

The soil is derived from deep alluvial deposits that came mainly from Mancos shale but in a few places from fine-grained sandstone materials. The deposits ordinarily range from 4 to 40 feet deep but in places exceed 40 feet. The deposits have been built up from thin sediments brought in by the streams that have formed the coalescing alluvial fans or have been dropped by the broad washes that have no drainage channel. The thickest deposit, near Grand Junction, was built up by Indian Wash.

The color and texture of the soil profile vary from place to place. The 8- to 10-inch surface soil normally consists of gray, light-gray, light olive-gray, or light brownish-gray silty clay loam. This layer grades into material of similar color and texture that extends to depths of 3 or 4 feet. Below this depth the successive depositional layers show more variation. Although the dominant texture is silty clay loam, the profile may have a loam, clay loam, fine sandy loam, or a very fine sandy loam texture.

Where there are fairly uniform beds of Mancos shale and where the soil is not influenced by materials deposited by adjoining drainage courses, the profile varies only slightly within the upper 3 or 4 feet. In areas bordering drainage courses, however, the soil varies more in texture and color from the surface downward.

One small area about 1½ miles southeast of Loma consists of light grayish-brown or pale-brown heavy silty clay loam that shows only slight variation in texture to depths of 4 to 6 feet. The underlying soil material is more variable. Below depths of 6 to 10 feet the layers generally are somewhat thicker and have a higher percentage of coarse soil material.

Also included with this soil are several small areas totaling about 3 square miles that are dominantly pale yellow. These are located 2½ to 3½ miles northeast of Fruita, 5 miles north of Fruita, 2½ miles northeast of Loma, 3 to 5 miles north of Loma, 1½ miles northwest of Loma, and 4 miles northwest of Mack. In these areas the 8- or 10-inch surface soil is pale-yellow silty clay loam, and the subsoil is a relatively uniform pale-yellow silty clay loam to depths of 4 to 8 feet. The accumulated alluvial layers are difficult to distinguish, but in a few places transitional to Fruita soils there are small areas having a pale-brown to light-yellowish brown color. These transitional areas are included with Billings silty clay loam because they have a finer textured subsoil than is characteristic of the Ravola soils.

Although moderately fine textured, this Billings soil permits successful growth of deep-rooted crops such as alfalfa and tree fruits. Its permeability is normally not so favorable as that of the Mesa, Fruita, and Ravola soils. Its tilth and workability are fair, but it puddles so quickly when wet and bakes so hard when dry that good tilth can be maintained only by proper irrigation and special cultural practices. Runoff is slow and internal drainage is very slow.

Like all other soils in the area, this one has a low organic-matter content. Under natural conditions it contains a moderate concentration of salts derived from the parent rock (Mancos shale). In places, however, it contains so much salt that good yields cannot be obtained. Some large areas are so strongly saline they cannot be used for crops. Generally, this soil is without visible lime, but it is calcareous. In many places small white flecks or indistinct light-colored streaks or seams indicate that lime, gypsum, or salts are present.

Use and management.—About 80 percent of this soil is cultivated. The chief irrigated crops are alfalfa, corn, dry beans, sugar beets, small grains, and tomatoes and other truck crops. Where the soil is located so as to avoid frost damage, tree fruits are grown.

Most of the field crops are grown in the central and western parts of the valley, or from Grand Junction westward. The entire acreage in tree fruits—approximately 3 square miles—lies between Grand Junction and Palisade. Because the climate is more favorable near Palisade, the acreage in orchard fruits is greater there. A few small orchards are located northeast of Grand Junction in the direction of Clifton. The main fruit acreage is between Clifton and Palisade. Peach orchards predominate, but a considerable acreage is in pears, especially near Clifton. Yields depend on the age of the trees and other factors, including management, but the estimated potential yield is somewhat less on this soil than on Mesa soils. This takes into account the slower internal drainage of this soil and its susceptibility to salinity if overirrigated. Yields of other crops vary according to the length of time the land has been irrigated, internal drainage or subdrainage, salt content of the soil, management practices, and local climate.

The uncultivated areas of this soil are mostly inaccessible places adjoining the larger washes, which occur mainly in the western part of the area, and those places that cannot be cropped profitably because they have inadequate drainage and a harmful concentration of salts. The uncultivated land supports a sparse growth of greasewood, saltbush, shadscale, rabbitbrush, ryegrass, peppergrass, and saltgrass. From 70 to 90 acres are required to pasture one animal during a season.

A number of places shown on the map by small marsh symbols are low and seepy. They could be ditched, but their acreage is likely too small to justify the expense. Left as they are, their salt content makes them worthless for any use except pasture.

Sizeable acreages of this soil apparently were overirrigated in the past. Irrigation water applied at higher levels to the north seeps upward in this soil where it occurs in low areas toward the river. Even now, new saline areas are appearing, and existing areas are getting larger. The total acreage affected by salts has remained more or less the same for the last two decades, but affected areas will continue to change in size and shape because of seepage.

Most fields are ditched where necessary. Some uncultivated areas require both leveling and ditching. In places subdrainage is inadequate because irregularities in the underlying shale tend to create pockets and prevent underground water from flowing into the drainage ditches. Also, in some areas where the alluvial mantle is 30 to 40 feet thick, the ditches are not always deep enough to drain the soil. Some areas are seepy because there are no ditches running in an east-west direction to intercept lateral flow of ground water from the over-

irrigated, permeable, medium-textured, stratified soils on the upper parts of the fan to the north. After being leveled, uncultivated areas would have to be cropped for 3 years before their salt content would be reduced enough to permit good yields.

Farmers can increase the organic-matter content of this soil by applying manure liberally and by growing alfalfa or clovers at least part of the time. A combination field crop and livestock type of farming favors improvement of this soil. Many of the small imperfectly drained areas may be kept in pasture. Strawberry clover and sweetclover are well suited, and mixtures of pasture grasses grow well.

Billings silty clay loam, 2 to 5 percent slopes (BD).—This soil covers a relatively small acreage in the Grand Valley. The areas are widely scattered. Except for its stronger slope, the soil is almost the same as Billings silty clay loam, 0 to 2 percent slopes. In a few places, notably north of Loma, there are areas having a pale-yellow color rather than the gray typical of the Billings soils.

Use and management.—Only about 15 percent of this soil is cultivated. Many of the areas lie along large drainageways or washes where they are difficult to reach. Even a larger number have such an uneven surface that considerable leveling would have to be done before they could be cropped. The cost of leveling, together with the expense of controlling erosion and gullying, discourages farmers from using them.

Many of the uncultivated areas have moderate concentrations of salts, but they are not particularly difficult to reclaim because they border natural ditches or washes which afford free disposal of irrigation water. Furthermore, for the most part, they have a porous substratum.

About the same crops are grown on this soil as on Billings silty clay loam, 0 to 2 percent slopes. The average yields are approximately the same.

Billings silty clay, 0 to 2 percent slopes (BA).—This soil, locally called heavy adobe, occurs well toward the Colorado River. It is on alluvial materials—4 to about 40 feet thick—that largely came from Mancos shale. Most of this soil lies east and southeast of Grand Junction and along the railroad between Grand Junction and Fruita.

The 8- or 10-inch surface soil consists of light brownish-gray, gray, or olive-gray silty clay. The layer is similar to the surface layer of Billings silty clay loam soils but it is harder and, in many places, darker. The subsoil consists of similarly colored layers of silty clay loam, silt loam, and silty clay. In places the soil is silty clay to depths exceeding 4 feet.

The entire profile is firm when moist and has a massive structure. The subsoil has many small irregularly shaped light-gray specks or indistinct mottles. Poorly defined light-colored streaks indicate the presence of lime, gypsum, or salts. The surface soil and subsoil are calcareous, the lime being well distributed. The fine texture of the soil greatly retards penetration of roots, moisture, and air.

Surface runoff is very slow to slow where the slope is less than 1 percent. Internal drainage is very slow because the subsoil is massive and very slowly permeable. Even with ample drainage ditches, the discharge of irrigation water is slow.

Tilth and workability are not good, because the soil has a fine texture and a low content of organic matter. Moreover, some fields contain areas 20 to 60 feet across that have excessive amounts of salts. Slick spots also occur. These salty areas and slick spots produce low or negligible yields of most crops and are extremely difficult to eliminate.

Use and management.—About 75 percent of this soil is cultivated. Most of the rest is affected by salts. Small grains, beans, sugar beets, and alfalfa are the chief crops. They yield less than on Billings silty clay loam, 0 to 2 percent slopes. Ordinarily, newly broken fields are cropped to oats or other small grains the first few seasons so that excess salts can be removed. Afterwards, if drainage is adequate, they may be planted to pinto beans, sugar beets, corn, or alfalfa. The very slow permeability of this soil makes it unsuitable for orchard crops. Also, it is located mainly in areas where the frost hazard is great. Probably the greater part of the irrigable acreage is used for sugar beets. Small grains, alfalfa, and pinto beans usually follow in the order named.

Billings silty clay, 2 to 5 percent slopes (BB).—This soil is similar to Billings silty clay, 0 to 2 percent slopes. It differs mainly in having greater slopes and a slightly finer textured and darker gray surface soil. In places, below depths of 3 or 4 feet, the silty clay or clay material is light olive gray.

The tilth and workability are poor. Surface runoff is medium, and internal drainage is very slow. The soil is better suited to irrigation than most of the larger nearly level areas of Billings silty clay, 0 to 2 percent slopes, many of which are affected by salts. Approximately 12 acres of this soil is in peach orchards. All the rest is normally used for cultivated crops, principally corn, pinto beans, and alfalfa. This soil is suited to about the same crops as Billings silty clay, 0 to 2 percent slopes, but it generally produces better yields.

Billings silty clay, moderately deep over Green River soil material, 0 to 2 percent slopes (BE).—This soil occurs on the outer margin of coalescing alluvial fans where 1 to 4½ feet of fine-textured deposits derived from shale overlies Green River soil materials.

Except for a few strips only a few rods wide that adjoin low-lying areas of Green River soils, this soil has not been altered by high overflows from the Colorado River. It is not likely that the main part of the soil will be covered by floodwaters from the Colorado River, as it lies well above the level of normal overflow.

Use and management.—About 85 percent of this soil is cultivated. The principal crops are alfalfa, corn, sugar beets, and pinto beans. A few peach orchards are on this soil near Clifton. Because the underlying strata are coarser, crops produce better on this soil than on most areas of the other Billings silty clay soils. Drainage and saline conditions have to be corrected before the soil will produce well.

Uncultivated acreages of this soil northwest of Grand Junction are saline, imperfectly drained, or both. Their tilth and workability are poor because they have a fine texture and a low content of organic matter.

335914—55——4

comparatively sharp rises or undulations having slopes of more than 9 percent that extend 4 to 6 feet above the prevailing level or in small irregularly shaped bodies on relatively smooth topography. Wherever the areas of Chipeta soil occur, they are too small and too intricately associated with the Persayo soil to be mapped separately.

Use and management.—About 25 percent of this complex is cultivated, but practically all of it could be. The Chipeta soil is not difficult to level, but the expense of leveling and the isolated location of the areas have not favored development for irrigation and cropping. The kinds of crops grown, the management practiced, and the yields produced are approximately the same as for Persayo-Chipeta silty clay loams, 0 to 2 percent slopes.

Ravola clay loam, 0 to 2 percent slopes (RA).—This soil, the second most extensive in the area, has developed in material that consists largely of reworked Mancos shale but includes an appreciable amount of sandy alluvium from the higher Mesaverde formation. The surface of these deposits is relatively level, but the depth of the deposits ranges from 5 to 30 feet. The soil is associated with the Billings silty clay loams and the Ravola fine sandy loams. The most important areas are east, northeast, and southeast of Fruita, north and northwest of Palisade, and north and northwest of Clifton.

The soil is much like the Billings silty clay loams but more porous because it contains more fine sand, especially in the subsoil. Ordinarily, the 10- or 12-inch surface layer consists of light brownish-gray to very pale-brown light clay loam. The underlying layers vary from place to place in thickness and texture and become more sandy below depths of 4 to 5 feet. The range in the subsoil is from fine sandy loam to clay loam.

Small fragments of shale and sandstone are common from the surface downward and are especially noticeable in areas nearest the source of the soil material. The entire profile is calcareous and friable, so internal drainage is medium and development of plant roots is not restricted. The surface is smooth. Most areas are at slightly higher levels than the associated areas of Billings silty clay loams and therefore have better drainage and a lower content of salts. The soil, however, is slightly saline under native cover, and in places it has strongly saline spots and a high water table.

Use and management.—About 95 percent of this soil is cultivated. The chief crops are alfalfa, corn, pinto beans, small grains, and, where climate is favorable, orchard fruits. Practically all the acreage used for tree fruits is near Clifton and Palisade. The acreage used for field crops varies from year to year, but by rough estimate about 30 percent is cropped to corn, 25 percent to alfalfa, 15 percent to pinto beans, 13 percent to orchard fruits, 10 percent to small grains, and the rest to sugar beets, tame hay, tomatoes, and various vegetable crops.

In general, the tilth and workability of this soil are favorable. The content of organic matter is generally less than 1 percent, but many farmers are improving the supply by growing more alfalfa and by using other improved management.

Ravola clay loam, 2 to 5 percent slopes (RB).—This soil differs from Ravola clay loam, 0 to 2 percent slopes, mainly in having greater slopes. Although the combined areas total only seven-tenths of a square mile, this soil is important because the largest single area—approximately 300 acres—is located southeast of Palisade in the Vinelands and is used for peach growing. The remaining areas, widely scattered over the valley, total about 150 acres and are of minor importance.

The large area occupies a position intermediate between the Green River soils and the higher Mesa soils. Its underlying gravel and stone strata consist not only of sandstone but also of granite, schist, basalt, and lava. Much of the lava was deposited by drainage from the southeast. This large area was included with the soil unit largely because its color was similar to that of the other soil areas. Not many years ago subdrainage became inadequate for existing tree fruits and it was not until a number of tile drains were laid, as deep as 7 to 8 feet in places, that subdrainage was corrected in parts of this particular area.

Use and management.—All of the large soil area is in peaches. On it peach yields average as high as in any section of the valley, primarily because the danger of frost damage is negligible. Some of the orchards are now more than 50 years old but have produced steadily and still yield more than 400 bushels an acre according to reports from local growers. About half of the small scattered areas are cultivated. They are used largely for field crops because climatic conditions are not so favorable for peach growing. In building up the organic matter content, the growing of legumes, application of manure in large amounts, and use of commercial fertilizer generally are practiced.

Ravola very fine sandy loam, 0 to 2 percent slopes (RF).—This extensive and important soil occurs either along washes or arroyas extending from the north or on broad coalescing alluvial fans. The alluvial material from which the soil has developed was derived from sandstone and shale and ranges from 4 to 20 feet deep. The principal areas of the soil are north and northwest of Grand Junction and north, northwest, and southwest of Fruita.

This soil is much like Ravola fine sandy loam, 0 to 2 percent slopes, but is generally more uniformly level. The texture is prevailingly very fine sandy loam, but the percentage of silt is noticeably higher in some places. A few small areas that have a loam texture are included.

The 10- or 12-inch surface layer consists of light brownish-gray to very pale-brown very fine sandy loam. In some places the underlying thin depositional layers vary only slightly in color or texture. In other places, especially near drainage courses, the layers are more variable and may grade to loam, silt loam, or fine sandy loam. Nevertheless, layers of very fine sandy loam are more numerous. Below depths of 4 to 5 feet, the texture is sandier, and at depths of 8 to 12 feet strata of loamy fine sand, gravel, and scattered sandstone rock are common.

Disseminated lime occurs from the surface downward. Owing to the friable consistence of the successive layers, the tilth, internal drainage, available supply of moisture for plants, permeability to plant roots, and other physical properties are favorable and assure a wide suitability range for crops. The organic-matter content, however, is low. The soil is slightly saline under native cover and has a few strongly saline spots. Occasionally the water table is high.

Use and management.—More than 99 percent of this soil is cultivated. The chief crops are alfalfa, corn, pinto beans, small grains,

and truck crops. Corn is planted on an estimated 35 percent of the area, alfalfa on 20 percent, beans on 20 percent, small grains on 10 percent, and potatoes, tomatoes, sugar beets, and irrigated pasture on the rest. The percentage of land planted to the various crops fluctuates considerably. Yields have been increased by using improved soil management, such as application of barnyard manure; the growing of clovers and alfalfa frequently after corn, potatoes, sugar beets, and other crops; and the more liberal use of treble superphosphate and mixed commercial fertilizer.

Ravola very fine sandy loam, 2 to 5 percent slopes (RG).—This soil, of minor importance because of its limited extent, occurs chiefly in the northwestern part of the county. Except for greater slope, it is very similar to Ravola very fine sandy loam, 0 to 2 percent slopes. Most of it is not cultivated. If it were leveled and cultivated, it would need about the same management as Ravola very fine sandy loam, 0 to 2 percent slopes, and should produce approximately the same yields.

Ravola fine sandy loam, 0 to 2 percent slopes (RC).—This soil, fairly important agriculturally, occurs mostly east, northeast, and north of Fruita. The soil-forming material is derived largely from sandstone but has some admixture of silt or finer sediments of shale origin.

The 10- or 12-inch surface layer consists of light brownish-gray, pale-brown, or very pale-brown fine sandy loam. The underlying depositional layers generally range from 1 to 3 inches thick; they may have a fine sandy loam, fine sandy clay, very fine sandy loam, or loam texture. The gradation in texture from one layer to another is almost imperceptible in some places, but fairly distinct in others. In most places the material below 4 feet is more sandy and slightly lighter grayish brown than that above.

The soil is calcareous from the surface downward, but the lime is not visible. Because the successive layers are friable, deep-rooted crops are well suited. Internal drainage is medium to rapid, and moisture relations are favorable. Though the organic-matter content is low, other physical properties are favorable and allow good tilth, good drainage, and moderate permeability for deep-rooted crops. The soil is slightly saline under native cover and strongly saline in a few spots. It is subject to an occasional high water table.

Use and management.—About 98 percent of this soil is cultivated. The most important field crops are potatoes, corn, alfalfa, and pinto beans. Comparatively smaller acreages are in sugar beets, small grains, and tomatoes, cucumbers, and other truck crops. An estimated 30 percent of the cultivated acreage is cropped to corn, 25 percent to alfalfa, 20 percent to potatoes, 15 percent to pinto beans, 5 percent to small grains, and the rest to truck crops, largely tomatoes.

The trend in recent years has been toward larger acreages of potatoes, tomatoes, and pinto beans. In earlier days, a considerable acreage was used for tree fruits, mainly pears. Severe blight, excessive cost of growing and marketing the fruit, and unsuitable climate have caused gradual conversion to field crops.

With proper management, this soil should remain productive indefinitely. Definite rotations normally are not followed. Frequently, alfalfa is grown 4 or 5 years, corn 1 or 2 years, then oats or wheat, and finally pinto beans. Manure, if available, generally is applied to the corn crop. The most common fertilizer is treble superphosphate, applied at the rate of 100 to 150 pounds an acre for field crops and truck crops. Some potato growers use commercial fertilizer at the rate of about 150 pounds an acre.

Ravola fine sandy loam, 2 to 5 percent slopes (RD).—Except for scattered areas totaling about 25 acres, most of this soil is in the Vinelands section east of Palisade. The soil-forming material is mostly local alluvium derived from shale and sandstone that has been brought down the drainage courses from the southeast. In areas east of Palisade a few scattered, rounded igneous gravel, cobbles, stones, and boulders in the lower subsoil indicate that there has been some admixture of sediments deposited in the past by the Colorado River.

The 10- or 12-inch surface layer is light brownish-gray or very pale-brown loam. The subsoil layers are similarly colored and dominantly of a fine sandy loam texture. Nevertheless, in places fine sandy loam, loam, and clay loam textures are represented in the subsoil. The soil is calcareous throughout. Although the organic-matter content is low, other physical properties insure good tilth, drainage, and permeability to deep-rooted crops. The soil is slightly saline under native cover and includes some strongly saline spots. Occasionally the water table is high.

Use and management.—Practically all of this soil is cultivated; deep-rooted crops are well suited. The two areas east of Palisade are in peach orchards and produce yields comparing favorably with those on Ravola clay loam soils in the same area. These two areas are small but valuable because they are located where the climate is ideal for tree fruits. The productivity of this soil, especially for orchard fruits, is practically the same as that of Mesa clay loam soils.

Ravola loam, 0 to 2 percent slopes (RE).—This soil is not extensive, but it is important agriculturally. It occupies relatively broad alluvial fans and flood plains along streams. It is at a slightly higher elevation than the bordering areas of Billings silty clay loam soils. It has developed in an alluvial deposit derived largely from Mancos shale and to lesser extent from the fine-grained sandstone of the Mesaverde formation. The soil is very similar to Ravola very fine sandy loam, 0 to 2 percent slopes, but it contains less very fine sand and a definitely larger amount of silt. In a number of small areas the texture approaches, or may be, a silt loam. From the Ravola clay loam soils, this soil differs in being coarser textured and not so gritty.

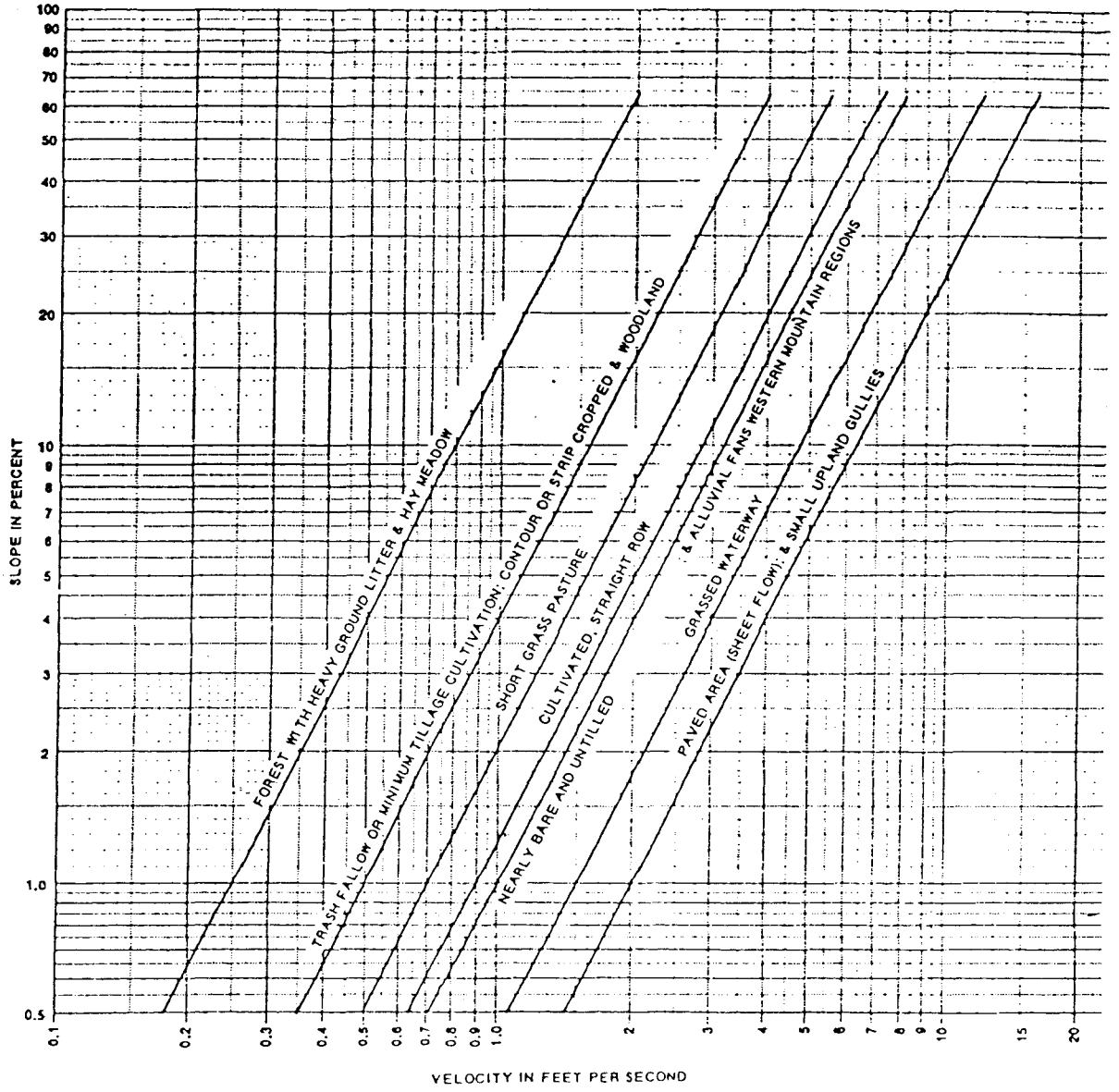
In the larger areas near Clifton, the 10- or 12-inch surface layer consists of light brownish-gray to pale-yellow, calcareous, heavy loam. The subsoil, similar to the surface soil in color, invariably contains a higher percentage of silt than the subsoil of the Ravola very fine sandy loams. Differences among the thin alluvial layers in the subsoil are almost imperceptible to depths of 3 to 4 feet. At depths greater than this, however, 1- to 3-inch layers of either silt or very fine sandy loam commonly occur among the more numerous layers of loam. The thin layers of silt or very fine sandy loam are most noticeable in the larger and broader areas west of Palisade.

Northeast of Fruita, northwest of Mack, and southeast and northeast of Loma, this soil consists of pale-yellow to light-gray surface

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					

REPRODUCED FROM FIGURE 15.2, SCS 1972



DETERMINATION OF "Ts"	FIGURE "E-3"

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"

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"**

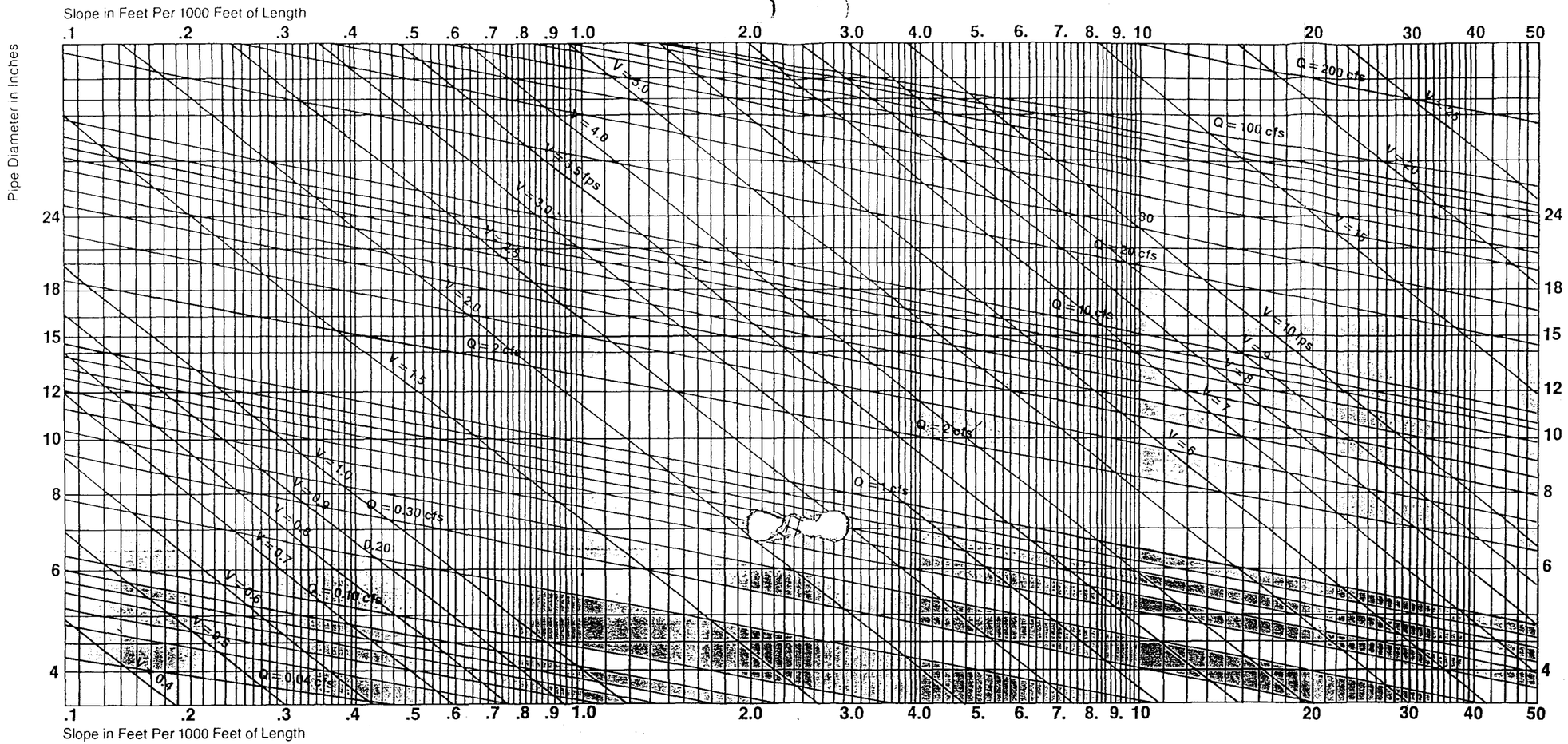
Flow Chart for Pipe Flowing Full

Coefficient of Flow
n = 0.009

Derived from the **MANNING** Formula

$$v = \frac{1.486}{n} R^{2/3} S^{1/2}$$

PVC Gravity Sewer Pipes have a coefficient of n = 0.009. Their high carrying capacities may often result in the use of flatter grades or in the use of smaller diameter 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 from this chart are for coefficient of flow n = 0.009. These may be converted to diameters for other coefficients of flow by means of the following multiplying factors:

0.956	for n = 0.008	1.114	for n = 0.012
1.000	for n = 0.009	1.147	for n = 0.013
1.040	for n = 0.010	1.180	for n = 0.014
1.078	for n = 0.011	1.211	for n = 0.015

Conversion Factors
CES, MGD, GPM

To convert cubic feet per second (cfs) to million gallons per day (MGD), multiply cfs by 0.646. To convert cubic feet per second (cfs) to gallons per minute, multiply cfs by 448.83.

One cubic foot of water = 7.48 gallons

Example 1

Assume:

Flow Coefficient n = 0.009
Length = 2800 ft.
Pipe Size = 8 inch
Elevations—Upstream = 215′-0″
Downstream = 213′-0″

Required:

1) Flow rate when flowing full
2) Velocity

Difference in elevation divided by length of pipe line equals slope in ft./ft. Multiplying by 1000 = slope 0.7 ft./1000 ft. Enter graph at 0.7 slope and also at 8 inch diameter pipe. At intersection, lines for velocity and flow rate also intersect. These give flow rate of 0.5 cu. ft. per second and velocity of 1.3 feet per second.

Example 2

Assume:

Flow Coefficient n = 0.013
Pipe Size = 8 inch
Flow rate = 0.5 cu. ft./sec.

Required:

Slope

First solve for slope based on flow coefficient n = 0.009, then multiply result by the correcting factor as follows: Enter graph at 8″ diameter and at flow rate 0.5 cu. ft./sec. At intersection find slope 0.71 ft./1000 ft. Correcting factor for n = 0.013 is 2.086 (See Table 1). Multiply 0.71 by factor 2.086 for corrected slope of 1.481 ft./1000 ft. for n = 0.013.

(Must use approximately twice the slope)

Example 3

Assume:

Flow Coefficient n = 0.013
Slope = 0.7 ft./1000 ft.
Flow rate = 0.5 cu. ft./sec.

Required:

Pipe Size

First find pipe size for flow coefficient n = 0.009, then convert result as follows: Enter flow chart at 0.7 slope and also at flow rate 0.5 cu. ft./sec. At intersection also find pipe diameter 8″. Converting factor for n = 0.013 is 1.147 (See Table 2). Multiply 8″ x factor 1.147 for corrected pipe diameter = 9.17″. (Must use next size larger.)

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.

NOTE: THIS IS A REPRODUCTION OF TABLE I, APPENDIX A, "DESIGN CHARTS FOR OPEN CHANNEL FLOW", (HDS #3)

	Manning's n range [8]
I. Closed conduits:	
A. Concrete pipe	0.011–0.013
B. Corrugated-metal pipe or pipe-arch:	
1. 2⅔ by ½-in. corrugation (riveted pipe): [9]	
a. Plain or fully coated	0.024
b. Paved invert (range values are for 25 and 50 percent of circumference paved):	
(1) Flow full depth	0.021–0.018
(2) Flow 0.8 depth	0.021–0.016
(3) Flow 0.6 depth	0.019–0.013
2. 6 by 2-in. corrugation (field bolted)	0.03
C. Vitrified clay pipe	0.012–0.014
D. Cast-iron pipe, uncoated	0.013
E. Steel pipe	0.009–0.011
F. Brick	0.014–0.017
G. Monolithic concrete:	
1. Wood forms, rough	0.015–0.017
2. Wood forms, smooth	0.012–0.014
3. Steel forms	0.013–0.013
H. Cemented rubble masonry walls:	
1. Concrete floor and top	0.017–0.022
2. Natural floor	0.019–0.025
I. Laminated treated wood	0.015–0.017
J. Vitrified clay liner plates	0.015
II. Open channels, lined [4] (straight alinement): [5]	
A. Concrete, with surfaces as indicated:	
1. Formed, no finish	0.013–0.017
2. Trowel finish	0.012–0.014
3. Float finish	0.013–0.015
4. Float finish, some gravel on bottom	0.015–0.017
5. Gunite, good section	0.016–0.019
6. Gunite, wavy section	0.018–0.022
B. Concrete, bottom float finished, sides as indicated:	
1. Dressed stone in mortar	0.015–0.017
2. Random stone in mortar	0.017–0.020
3. Cement rubble masonry	0.020–0.025
4. Cement rubble masonry, plastered	0.016–0.020
5. Dry rubble (riprap)	0.020–0.030
C. Gravel bottom, sides as indicated:	
1. Formed concrete	0.017–0.020
2. Random stone in mortar	0.020–0.023
3. Dry rubble (riprap)	0.023–0.033
D. Brick	0.014–0.017
E. Asphalt:	
1. Smooth	0.013
2. Rough	0.016
F. Wood, planed, clean	0.011–0.013
G. Concrete-lined excavated rock:	
1. Good section	0.017–0.020
2. Irregular section	0.022–0.027
III. Open channels, excavated [4] (straight alinement,[5] natural lining):	
A. Earth, uniform section:	
1. Clean, recently completed	0.016–0.018
2. Clean, after weathering	0.018–0.020
3. With short grass, few weeds	0.022–0.027
4. In gravelly soil, uniform section, clean	0.022–0.025
B. Earth, fairly uniform section:	
1. No vegetation	0.022–0.025
2. Grass, some weeds	0.025–0.030
3. Dense weeds or aquatic plants in deep channels	0.030–0.035
4. Sides clean, gravel bottom	0.025–0.030
5. Sides clean, cobble bottom	0.030–0.040
C. Dragline excavated or dredged:	
1. No vegetation	0.028–0.033
2. Light brush on banks	0.035–0.050
D. Rock:	
1. Based on design section	0.035
2. Based on actual mean section:	
a. Smooth and uniform	0.035–0.040
b. Jagged and irregular	0.040–0.045
E. Channels not maintained, weeds and brush uncut:	
1. Dense weeds, high as flow depth	0.08–0.12
2. Clean bottom, brush on sides	0.05–0.08
3. Clean bottom, brush on sides, highest stage of flow	0.07–0.11
4. Dense brush, high stage	0.10–0.14

	Manning's n range [8]
IV. Highway channels and swales with maintained vegetation [4] [7] (values shown are for velocities of 2 and 6 f.p.s.):	
A. Depth of flow up to 0.7 foot:	
1. Bermudagrass, Kentucky bluegrass, buffalograss:	
a. Mowed to 2 inches	0.07–0.045
b. Length 4–6 inches	0.09–0.05
2. Good stand, any grass:	
a. Length about 12 inches	0.18–0.09
b. Length about 24 inches	0.30–0.15
3. Fair stand, any grass:	
a. Length about 12 inches	0.14–0.08
b. Length about 24 inches	0.25–0.13
B. Depth of flow 0.7–1.5 feet:	
1. Bermudagrass, Kentucky bluegrass, buffalograss:	
a. Mowed to 2 inches	0.05–0.035
b. Length 4 to 6 inches	0.06–0.04
2. Good stand, any grass:	
a. Length about 12 inches	0.12–0.07
b. Length about 24 inches	0.20–0.10
3. Fair stand, any grass:	
a. Length about 12 inches	0.10–0.06
b. Length about 24 inches	0.17–0.09
V. Street and expressway gutters:	
A. Concrete gutter, troweled finish	0.012
B. Asphalt pavement:	
1. Smooth texture	0.013
2. Rough texture	0.016
C. Concrete gutter with asphalt pavement:	
1. Smooth	0.013
2. Rough	0.015
D. Concrete pavement:	
1. Float finish	0.014
2. Broom finish	0.016
E. For gutters with small slope, where sediment may accumulate, increase above values of n by	*0.002*
VI. Natural stream channels:[5]	
A. Minor streams [4] (surface width at flood stage less than 100 ft.):	
1. Fairly regular section:	
a. Some grass and weeds, little or no brush	0.030–0.035
b. Dense growth of weeds, depth of flow materially greater than weed height	0.035–0.05
c. Some weeds, light brush on banks	0.035–0.05
d. Some weeds, heavy brush on banks	0.05–0.07
e. Some weeds, dense willows on banks	0.06–0.08
f. For trees within channel, with branches submerged at high stage, increase all above values by	*0.01–0.02*
2. Irregular sections, with pools, slight channel meander; increase values given in 1a–e about	*0.01–0.02*
3. Mountain streams, no vegetation in channel, banks usually steep, trees and brush along banks submerged at high stage:	
a. Bottom of gravel, cobbles, and few boulders	0.04–0.05
b. Bottom of cobbles, with large boulders	0.05–0.07
B. Flood plains (adjacent to natural streams):	
1. Pasture, no brush:	
a. Short grass	0.030–0.035
b. High grass	0.035–0.05
2. Cultivated areas:	
a. No crop	0.03–0.04
b. Mature row crops	0.035–0.045
c. Mature field crops	0.04–0.05
3. Heavy weeds, scattered brush	0.05–0.07
4. Light brush and trees: [10]	
a. Winter	0.05–0.06
b. Summer	0.06–0.08
5. Medium to dense brush: [10]	
a. Winter	0.07–0.11
b. Summer	0.10–0.16
6. Dense willows, summer, not bent over by current	0.15–0.20
7. Cleared land with tree stumps, 100–150 per acre:	
a. No sprouts	0.04–0.05
b. With heavy growth of sprouts	0.06–0.08
8. Heavy stand of timber, a few down trees, little undergrowth:	
a. Flood depth below branches	0.10–0.12
b. Flood depth reaches branches	0.12–0.16
C. Major streams (surface width at flood stage more than 100 ft.): Roughness coefficient is usually less than for minor streams of similar description on account of less effective resistance offered by irregular banks or vegetation on banks. Values of n may be somewhat reduced. Follow recommendation in publication cited [4] if possible. The value of n for larger streams of most regular section, with no boulders or brush, may be in the range of	0.028–0.033

TYPICAL MANNING "n" VALUES | TABLE "F-1a"

SUBSURFACE SOILS EXPLORATION

VALLEY MEADOWS EAST SUBDIVISION

GRAND JUNCTION, COLORADO

Prepared For:

GWHC INCORPORATED
2467 Commerce St.
Grand Junction, CO

Prepared By:

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

June 5, 1996

Lincoln DeVore, Inc.
Geotechnical Consultants
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TEL: (970) 242-8968
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June 5, 1996

GWHC INC.
2467 Commerce Blvd
Grand Junction, Colorado

Re: SUBSURFACE SOILS EXPLORATION

VALLEY MEADOWS EAST SUBDIVISION

GRAND JUNCTION, COLORADO

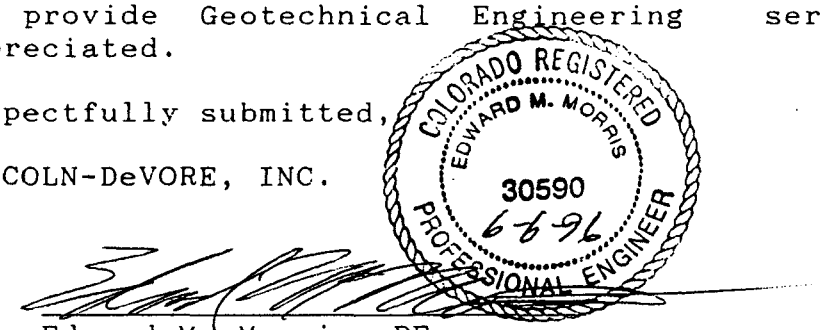
Dear Sir:

Transmitted herein are the results of a Subsurface Soils Exploration for the proposed construction of single family residential structures for the proposed Valley Meadows East Subdivision.

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. 85478-J

EMM/bl

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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 single family residential structures on the proposed Valley Meadows East Subdivision, Grand Junction, Colorado. A vicinity map is included in the Appendix of this report.

To assist in our exploration, we were provided with a preliminary plan of the Valley Meadows East Subdivision 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 be single family residential buildings and will consist of single and possibly two story, wood framed structures with either crawlspace or concrete floor slab on grade type construction. It is not anticipated that basement or half basement type construction will be utilized on this site. Lincoln DeVore has not seen a full set of building plans, but structures of this type typically develop wall loads on the order of 600-2000 plf and column loads on the order of 5-18 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 character-

istics 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.

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 5-15-96, and consisted of a site reconnaissance by our geotechnical personnel and the drilling of 5 shallow exploration borings. These 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 14-20 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 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 condi-

tions 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.

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-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 North half of the Southwest Quarter of the Northeast Quarter of Section 3, Township 1 South, Range 1 West of the Ute Principal Meridian, Mesa County, Colorado. More specifically the site is located approximately 2 miles North-Northeast of the main Downtown Business District of the City of Grand Junction and is bounded on the West by 25-1/2 Road, on the South by the main line of the Grand Valley Canal, approximately 1/8 of a mile North of F-1/2 Road. The tract is North of the Kay Subdivision and Cimarron Subdivision, East of the Valley Meadows Subdivision and South of Sunset Village Subdivision. Some land to the North is still utilized for agricultural purposes and is under irrigation. Very low density residential land use is East of this site. The site is within the Corporate Limits of the City of Grand Junction and contain approximately 14.9 acres.

The topography of the site is relatively flat, with a slight overall gradient to the South-Southwest. A small bluff is present to the East of the site, which is locally known as The Second Fruitridge. The exact direction of surface runoff on this site will be controlled by the proposed construction and therefore will be variable. In general, surface runoff is expected to travel away from new construction, along the proposed road system to any required storm detention areas and entering the established drainage ditches and other constructed features, eventually entering the independent Ranchman's Ditch to

the South and then to the Colorado River. Surface and subsurface drainage on this site would be described as poor to very poor.

GENERAL GEOLOGY AND SUBSURFACE DESCRIPTION

The geologic materials encountered under the site consist of in excess of 20' of unconsolidated alluvial and debris fan deposits which in turn overlie a very thick sequence of sedimentary rocks. The geologic and engineering properties of the materials found in our 5 shallow exploration borings will be discussed in the following sections.

The soils on this site consist of a coarse grained gravel and cobble alluvial deposit placed by the action of the Ancient Colorado River, covered with 20' thick alluvium/colluvium in excess of transported by mudflows from the hills to the North-Northeast. This stratification of upper soils results in a layered system of silts and clays with thin, interbedded sand lenses overlying a sand/gravel deposit. Generally, the silts and clays are soft, wet and of low density. Soil density decreases and the moisture content increases with increasing depth. The upper 2 to 6 feet of the soil profile are stiffer and relatively dry due to surface desiccation.

The primary soil type encountered under the site is a stratified sequence of alluvial silt with occasional silty sands and low plastic silty clays. The soils are typical of this area and have been designated Soil Type I for purposes of this report.

This Soil Type was classified as a sandy

silt (ML) under the Unified Classification System. This material is of non-plastic, of moderate to low permeability, and was encountered in a low to very low density, very moist to wet condition. This soil will settle after being loaded. The soils are susceptible to pumping under repeated, relatively loaded traffic, if the water table is within 5 to 8 feet of the traffic. These soils commonly exhibit some instability and may require special treatment due to the relatively high ground water table. The maximum allowable bearing capacity for this soil was found to be 950 psf, with 100 psf minimum dead load pressure required. Soil Type No. I contains sulfates in detrimental quantities.

The fine grained soils designated as Soil Type II generally contain small amounts of clay soils and are normally encountered as relatively thin strata on this site. In addition, these soils are commonly encountered as "top soil" and has been reworked by agricultural activities in the past.

This Soil Type was classified as a sandy silt with silty clays (ML, ML-CL) under the Unified Classification System. This material is of low to very low plasticity, of low permeability, and was encountered in a low density, desiccated to saturated condition. If this soil is found in a relatively dry condition, it may undergo mild expansion with the entry of small amounts of moisture, but will undergo long-term consolidation upon the addition of larger amounts of moisture. This soil will settle after being loaded. The maximum allowable bearing capacity for this soil was found to be 900 psf, with 150 minimum dead load pressure required. Soil Type No. II contains sulfates in detrimental quantities.

The surface soils on this site consist of a series of silty clay and sandy clay soils which are a product of mud flow/debris flow features which originate on the south-facing slopes of the Bookcliffs. These mud flow/debris flow features are a small part of a very extensive mud flow/debris flow complex along the base of the Bookcliffs and extending to the Colorado River. Utilizing recent events and standard evaluation techniques, this tract is not considered to be within with an active debris flow hazard area.

The surface soils are an erosional product of the upper Mancos Shale and the Mount Garfield Formations which are exposed on the slopes of the Bookcliffs. The soils contained within these mud flow/debris flow features normally exhibit a metastable condition which can range from very slight to severe. Metastable soil is subject to internal collapse and is very sensitive to changes in the soil moisture content. Based on the field and laboratory testing of the soils on this site, the severity of the metastable soils can be described as slight. However, these soils are very compressible, due to the natural low density conditions.

GROUND WATER:

A free water table came to equilibrium during drilling at approximately 4 to 8 feet below the present ground surface. The water table is somewhat closer to the ground surface, adjacent to the Grand Valley Canal. This is probably not a true phreatic surface but is an accumulation of subsurface

seepage moisture (perched water). In our opinion the subsurface water conditions shown are a permanent feature on this site. The depth to free water would be subject to fluctuation, depending upon external environmental effects.

Because of capillary rise, the soil zone within a few feet above the free water level identified in the borings will be quite wet. Pumping and rutting may occur during the excavation process, particularly if the bottom of the foundations are near the capillary fringe. Pumping is a temporary, quick condition caused by vibration of excavating equipment on the site. If pumping occurs, it can often be stopped by removal of the equipment and greater care exercised in the excavation process. In other cases, geotextile fabric layers can be designed or cobble sized material can be introduced into the bottom of the excavation and worked into the soft soils. Such a geotextile or cobble raft is designed to stabilize the bottom of the excavation and to provide a firm base for equipment.

Data presented in this report concerning ground water levels are representative of those levels at the time of our field exploration. Groundwater levels are subject to change seasonally or by changed environmental conditions. Quantitative information concerning rates of flow into excavations or pumping capacities necessary to dewater excavations is not included and is beyond the scope of this report. If this information is desired, permeability and field pumping tests will be required.

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 soft, compressible soils which may experience significant pumping upon the application of traffic loads.

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 all 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.

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 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 or an under slab drain may be required for 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.

If slab on grade construction is anticipated at or slightly below the ground surface, the relatively high ground water level found on this site should be controlled to prevent large upward fluctuations of this water surface. For this purpose, we recommend that this be accomplished by construction of an area drain beneath the building area.

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.

We recommend that water not be channeled along or across any newly filled areas, as this may result in accelerated erosion and damage to the fill. To fully minimize erosion, a vegetative cover should be established as soon after grading is complete as possible.

To give the buildings 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 85% 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

Assuming that some amount of differential movement can be tolerated, then a shallow foundation system designed on the basis of 900-950 psf maximum is recommended. In this case, recommendations pertaining to balancing, reinforcing, drainage and inspection are considered extremely important and must be followed.

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 150 psf less than the average used to balance the continuous walls. The criterion for balancing will depend somewhat upon the nature of the structure. Single-story, slab on grade structures may be balanced on the basis of dead load only. Multi-story structures may be balanced on the basis of dead load plus 1/2 live load, for up to 3 stories.

Stem walls for a shallow foundation system should be designed as grade beams capable of spanning at least 12 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 soft, very compressible foundation soils.

If the design of the upper structure is

such that loads can be balanced reasonably well, a floating structural slab type of foundation could be used on this site. Such a slab would require heavy reinforcing to resist differential bending along the rim wall. It is possible to design such a slab either as a thickened edge only, a solid or a ribbed slab. A rim wall must be used for confinement purposes. Any such slab must be specifically designed for the anticipated loading.

Such a foundation system may settle to some degree, however, the use of a structural fill beneath the slab and rim wall will help reduce settlement and hold differential movement to a minimum. Relatively large slabs will tend to experience minor cracking and heave of lightly loaded interior portions, unless the slabs are specifically designed with this movement in mind.

SOIL IMPROVEMENT/STRUCTURAL FILL

If greater soil bearing capacity is required for the proposed structure or if very soft areas or unstable areas are encountered during excavation then a soil excavation/replacement scheme may be utilized on this site. The existing low density, either unstable or very compressible soils should be removed to a depth of 1-1/2 to 2 feet below the proposed bottom footing or rimwall elevation. Once it is felt that adequate soil removal has been achieved, it is recommended that the excavation be closely examined by a representative of Lincoln DeVore to ensure that an adequate overexcavation depth has indeed

occurred and that the exposed soils are suitable to support the proposed structural man-made fill.

Once this examination has been completed, it is recommended that a coarse-grained, non-expansive, non-free draining man-made structural fill be imported to this site. The native soils may be utilized as structural fill, if specifically approved by the Geotechnical Engineer. This imported fill should be placed in the overexcavated portion of this site in lifts not to exceed 6 inches after compaction. A minimum of 90% of the soils maximum Modified Proctor dry density (ASTM D-1557) must be maintained during the soil placement. These soils should be placed at a moisture content conductive to the required compaction (usually Proctor optimum moisture content $\pm$ 2%). The granular material must be brought to the required density by mechanical means. No soaking, jetting, or puddling techniques of any type should be used in placement of fill on this site. To ensure adequate lateral support, we must recommend that the zone of overexcavation extend at least 2 feet around the perimeter of the proposed footing. To confirm the quality of the compacted fill product, it is recommended that surface density tests be taken at a maximum 2 foot vertical intervals.

The placement of a geotextile fabric for separation between the native soils and the structural fill may be recommended to aid the fill placement and to improve the stability of the completed fill.

When the structural fill is completed, an allowable bearing capacity of 1400 psf maximum may be assumed

for proportioning the footings or loadbearing portions of the slab.

SETTLEMENT:

We anticipate that total and/or differential settlements for the proposed structures may be considered to be within tolerable limits, provided the recommendations presented in this report are fully complied with. In general, we expect total settlements for the previously described structure types to be less than 1-1/2 inches.

FROST PROTECTION

We recommend that the bottom of all foundation components rest a minimum of 1-1/2 feet below finished grade or as required by the local building codes. Foundation components must not be placed on frozen soils.

Structural slab-on-grade (Monolithic) foundation systems typically have an effective soil cover of less than 12 inches. Under normal use, the building and foundation system radiates sufficient heat that frost heave from the underlying soils is not normally a problem. However, additional protection can be provided by applying an insulation board to the exterior of the foundation and extending this board to approximately 18 inches below the final ground surface grade. This board may be applied either prior to or after the concrete is cast and it is very important that all areas of soil backfill be compacted. Local building officials should be consulted for regulatory frost protection depths.

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 a vapor barrier is desired or required beneath slabs, due to the final building grades and the relatively high ground water elevations, we recommend that it be overlain by at least 2 inches of sand to decrease the likelihood of curing problems. An alternate method of reducing finishing problems would be to place the vapor barrier beneath approximately 6 inches of a minus 3/4 inch gravel fill. This method must be very carefully accomplished to minimize excessive puncturing and tearing of the vapor barrier.

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 64 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 230 pcf per foot of depth. The coefficient of friction for concrete to soil may be assumed to be 0.27 for resistance to lateral movement. When combining frictional and passive resistance, the latter must be reduced by approximately 1/3.

REACTIVE SOILS

Since groundwater in the Grand Junction area 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-4(8) Unified Classification - ML-CL
Soil Type # II

R	=	8
Expansion @ 300 psi	=	39 psf
Displacement @ 300 psi	=	4.02

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

Traffic Counts or volumes have not been provided to Lincoln DeVore. As the subdivision layout indicates the roads will probably be relatively low volume, it is assuming a standard mixture of trucks and passenger vehicles will be experienced. For purposes of this report, a daily EAL of 5 will be utilized.

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 2.2%.

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^{o} Fahrenheit (Asphalt Institute Method) has been utilized for the section analysis.

Calculated Pavement Sections

18K EAL = 5 Soil "R" Value = 9

	1986 AASHTO Drainage Coefficient = 0.7	Asphalt Institute MAAT = 60^{0} F	
AC	3"	4"	AC
ABC	9"	6"	ABC
Subbase	0"	0"	Subbase
FULL DEPTH AC	5"	4"	

Due to the high water ground water conditions and the very compressible subgrade soils, it is not recommended that a full depth asphalt section be used on this site unless, the ground water conditions significantly improve prior to construction and the proper compaction of the subgrade soils be accomplished.

PROPOSED PAVEMENT SECTIONS

SUBGRADE IMPROVEMENT, MECHANICALLY STABILIZED FILL

Based on the soil support characteristics outlined above and the anticipated pumping and unstable subgrade soils which will probably be encountered, we recommend the following Structural Fill Sections for areas of moderately unstable subgrade (pumping), due to permanent or seasonally soil moisture. Subgrade soils are assumed to be either fine grained sand (SM), Silt (ML), or Silty Clay (ML-CL). These sections assume the Subgrade Soils have an R Value >9.

Normal Residential, 18k EAL = 5:

	3"	asphaltic concrete
on	6"	of aggregate base course
on		Biaxial Geogrid or Geotextile for reinforcement
on	12"	of subbase/structural fill
on		Geotextile for separation and reinforcement

Due to the probability of very high soil moisture in the subgrade soils, the use of a Geotextile Fabric for separation and minor reinforcement (such as Mirafi 500-X), placed beneath the Structural Section, may be required in most areas along this road alignment. The upper layer of Biaxial Geogrid or Geotextile for reinforcement, placed beneath the Aggregate Base Course and the subbase/structural fill, may not be required, depending on actual field conditions.

The additional materials and effort expended in subgrade stabilization is to provide a construction platform, so the actual Road Section can be placed and compacted. The specific areas which will require placement of either the Biaxial Geogrid or the Geotextile Fabric will depend on the actual conditions encountered during construction. The subgrade and road section construction should be monitored by representatives of the Geotechnical Engineer.

Geotextile Fabric for separation and minor reinforcement should have a minimum Grab Strength of 180 lb., in the weakest direction (such as Mirafi 500-X). If free water is encountered in the excavation, a non-woven/needle punched Geotextile Fabric with a minimum Grab Strength of 110 lbs in the weakest direction (such as Mirafi 140-N) may be substituted. It should be noted the non-woven fabric is not as strong and will require careful construction techniques.

Biaxial Geogrid for reinforcement shall have a minimum Tensile strength @ 5% Strain of 550 lb/ft., in the weakest direction (such as Tensar BX 1100).

The Imported structural Fill (Hveem-Carmany R<70 , swell not critical) is to be Granular, Medium to

Coarse Grained, Very low plastic (PI<4), Non Freedraining, Compactable and within the following Gradation:

Maximum size, by screening	6"
Passing the #4 screen	20% - 85%
Passing the #40 screen	10% - 60%
Passing the #200 screen	3% - 15%

Imported Structural Fill and Aggregate Base Course (ABC) to be compacted to 90% of its maximum Modified Proctor dry density (ASTM-D-1557) at a moisture content within ± 2% of optimum moisture. The use of light weight tracked equipment will minimize subgrade degradation. Vibratory compaction equipment is not recommended.

During the placement of any structural fill, it is recommended that a sufficient amount of field tests and observation be performed under the direction of the Geotechnical Engineer. The Geotechnical Engineer should determine the amount of observation time and field density tests required to determine substantial conformance with these recommendations.

Any areas of Fill or Subgrade instability encountered during construction are to be immediately brought to the attention of the Geotechnical Engineer, so recommendations for stabilization can be given.

The Subgrade Stabilization is normally considered effective if the imported structural fill materials are confined, if specified imported fill and specified asphalt

densities are obtained and the final traffic surface is stable according to local practices. Some 'pumping and rolling' of the finish Base Course (ABC) surface is anticipated but, rutting should not occur.

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

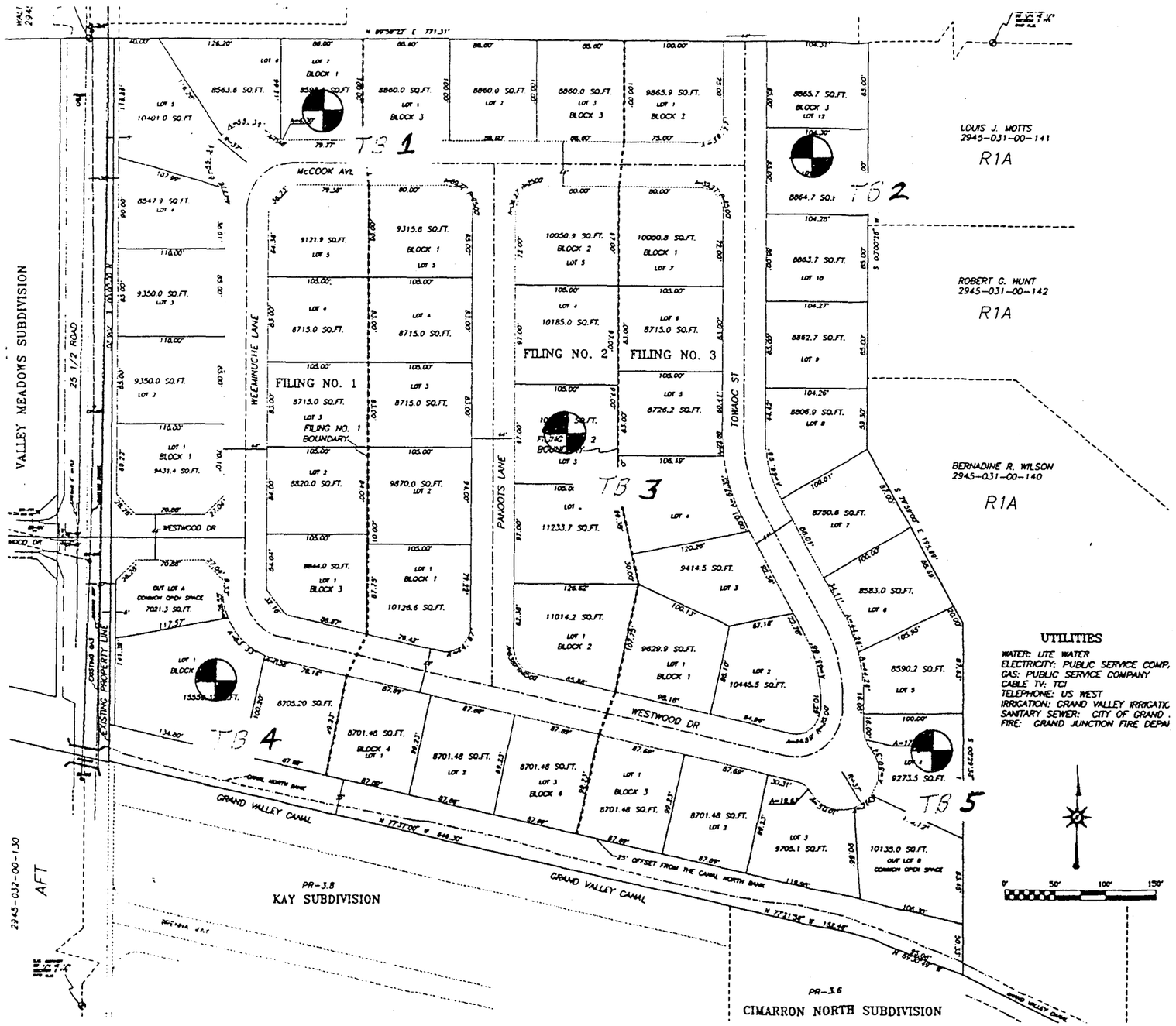
This report is issued with the understanding that it is the responsibility of the owner, or his representative to ensure that the information and recommendations contained herein are brought to the attention of the individual lot purchasers for the subdivision. In addition, it is the responsibility of 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

BORING LOCATION DIAGRAM

Valley Meadows East Subdivision

25½ & Westwood Dr. GRAND JUNCTION, Co.

LINCOLN DeVORE ENGINEERS · GEOLOGISTS

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

	LO # 85478-J	SHEET OF
DRAWN BY:	SCALE: None	DATE: 6-6-96
CHECKED BY: E.M. MORRIS	CONT. INT.	REV.

Map Adapted from Rolland Engineering
Preliminary Plat, 4-25-96

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 140lb. 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 1, BLOCK 7, Fil 1

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		ML-CL SURFACE SOILS REWORKED BY AGRICULTURE				
		II LOW PLASTIC SILT DESSICATED SOILS				
		COMPRESSIBLE ALLUVIAL SULFATES				
		ML SANDY SILT INCREASING MOISTURE w/DEPTH	ST		96.7	12.2%
5		I COMPRESSIBLE Non-PLASTIC	5			
		LOW DENSITY w/ SOME MEDIUM DENSITY STRATA				
		FREE WATER ▽				
		Occ. SILTY SAND STRATA FINE GRAINED				
		ML SANDY SILT VERY SOFT	SPT	01/06		24.8%
10		I VERY COMPRESSIBLE	10	02/12		
		ML LOW PLASTIC SILT		03/18		
		II w/ML-CL STRATA VERY SOFT TO DRILL				
		STRATIFIED w/ SILTY SAND & SANDY, SILTY CLAY	ST		97.5	25.4%
15			15			
		ML SANDY SILT STRATIFIED				
		I VERY SOFT VERY COMPRESSIBLE				
		ALLUVIAL w/ML-CL STRATA				
		ML SANDY SILT	SPT	01/12		28.0%
20		I HOLE SQUEEZING SHUT	20	02/18		
		TD @ 20'				
25		HOLE CAVED TO 6' - 5-16-96	25			
30			30			
		Blow Counts are cumulative for each 6 inches of sampler penetration.				
		Free Water @ 6'				
		During Drilling 5-15-96				

LOG OF SUBSURFACE EXPLORATION

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

VALLEY MEADOWS EAST SUBDIVISION
25-1/2 Road & WESTWOOD Drive

GWHC Inc.
Grand Junction, Colorado

Date 5-27-96

Job No. 85478-J

Drawn EMM

BORING NO. 2

LOT 11, BLOCK 3, FII 3

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		ML DESSICATED CRUST SI. MOIST				
		II LOW PLASTIC SILT VERY SOFT				
		Occ. LOW PLASTIC SILT STRATA SULFATES				
		ML SANDY SILT VERY COMPRESSIBLE WET	ST		95.4	19.6%
5		I VERY SOFT TO DRILL	5			
		DECREASING DENSITY				
		Occ. SANDY STRATA				
		FREE WATER ▽				
		ML w/ML-CL STRATA	SPT	01/18		31.4%
10		II VERY COMPRESSIBLE	10			
		Occ. LOW PLASTIC SILT STRATA				
		HOLE SQUEEZING SHUT				
		VERY SOFT TO DRILL				
		ML w/ML-CL STRATA	ST		92.2	24.3%
15		II VERY COMPRESSIBLE	15			
		Occ. LOW PLASTIC SILT STRATA				
		TD @ 14'				
20			20			
25			25			
30			30			
		Blow Counts are cumulative for each 6 inches of sampler penetration.				
		Free Water @ 8'				
		During Drilling 5-15-96				

LOG OF SUBSURFACE EXPLORATION

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

VALLEY MEADOWS EAST SUBDIVISION
25-1/2 Road & WESTWOOD Drive

GWHC Inc.
Grand Junction, Colorado

Date: 5-27-96

Job No.: 85478-J

Drawn: EMM

BORING NO. 3

LOT 2, BLOCK 3, Fil 2

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		ML SURFACE SOILS REWORKED BY AGRICULTURE				
		II ALLUVIAL SILT SL. DESSICATED CRUST				
		STRATIFIED WITH SILTY SAND VERY MOIST				
		ML LOW PLASTIC SILT SULFATES	ST		92.8	18.8%
5		II VERY COMPRESSIBLE	5			
		VERY SOFT TO DRILL WET				
		ML-I SANDY SILT				
		ML-CL, ORGANIC ▽ ORGANIC ODOR				
		FREE WATER = VERY COMPRESSIBLE	SPT	01/06		29.4%
10		III ORGANIC SANDY, SILTY CLAY	10	02/12		
		ML SANDY SILT		04/18		
		I				
		HOLE SQUEEZING SHUT				
		ML SILTY CLAY COMPRESSIBLE	ST		92.9	26.6%
15		III LOW PLASTIC	15			
20		TD @ 14'	20			
25			25			
30			30			
		Blow Counts are cumulative for each				
		6 inches of sampler penetration.				
		Free Water @ 8'				
		During Drilling 5-15-96				

LOG OF SUBSURFACE EXPLORATION

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

VALLEY MEADOWS EAST SUBDIVISION
25-1/2 Road & WESTWOOD Drive
GWHC Inc.
Grand Junction, Colorado

Date 5-27-96

Job No. 85478-J

Drawn EMM

BORING NO. 4

LOT 1, BLOCK 2, FII 1

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION				BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		ML	LOW PLASTIC SILT		DESSICATED CRUST			
		II			SULFATES			
		ML	SANDY SILT	Non-PLASTIC				
		I	COMPRESSIBLE	▽	WET	ST	93.9	20.6%
5		FREE WATER				5		
		ML-CL	SILTY CLAY	VERY SOFT TO DRILL		SPT	01/18	27.0%
		III	Occ. SILTY SAND STRATA					
		ML	SANDY SILT					
		I	THIN GRAVEL STRATA - SILTSTONE FRAGMENTS			ST	98.4	23.0%
10		ML-CL	SILTY CLAY			10		
		III	LOW PLASTIC					
				VERY SOFT TO DRILL				
			ALLUVIAL					
		ML-CL	SILTY CLAY	HOLE SQUEEZING		SPT	01/18	31.3%
15		III	LOW PLASTIC			15		
			TD @ 15'					
20						20		
25						25		
30						30		

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 45" 5-16-96

Drilled 5-15-96

LOG OF SUBSURFACE EXPLORATION

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

VALLEY MEADOWS EAST SUBDIVISION

25-1/2 Road & WESTWOOD Drive

GWHC Inc.

Grand Junction, Colorado

Date **5-27-96**

Job No. **85478-J**

Drawn **EMM**

BORING NO. 5

LOT 4, BLOCK 3, FII 3

BORING ELEVATION:

DEPTH (FT.)	SOIL LOG	DESCRIPTION		BLOW COUNT /inch	SOIL DENSITY pcf	WATER %
		ML LOW PLASTIC SILT REWORKED BY AGRICULTURE				
		II SOFT TO DRILL VERY MOIST				
		ML SANDY SILT COMPRESSIBLE SULFATES				
		I VERY LOW PLASTIC WET	ST		97.2	21.5%
5			5			
		FREE WATER				
		ALLUVIAL STRATIFIED w/ SILTY SAND				
		Occ. VERY SILTY CLAY STRATA				
		ML SANDY SILT	SPT	01/06		27.1%
10		I VERY SOFT TO DRILL	10	02/12		
		VERY COMPRESSIBLE		04/18		
		ML-CL SILTY CLAY ALLUVIAL				
		III LOW PLASTIC STRATIFIED	ST		92.7	26.0%
15			15			
		ML LOW PLASTIC SILT	SPT	1/6		26.7%
20		II	20	03/12		
				05/18		
25			25			
30			30			

Blow Counts are cumulative for each 6 inches of sampler penetration.

Free Water @ 5'

During Drilling 5-15-96

LOG OF SUBSURFACE EXPLORATION

VALLEY MEADOWS EAST SUBDIVISION

25-1/2 Road & WESTWOOD Drive

GWHC Inc.

Grand Junction, Colorado

Date: 5-27-96

Job No.: 85478-J

Drawn: EMM

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

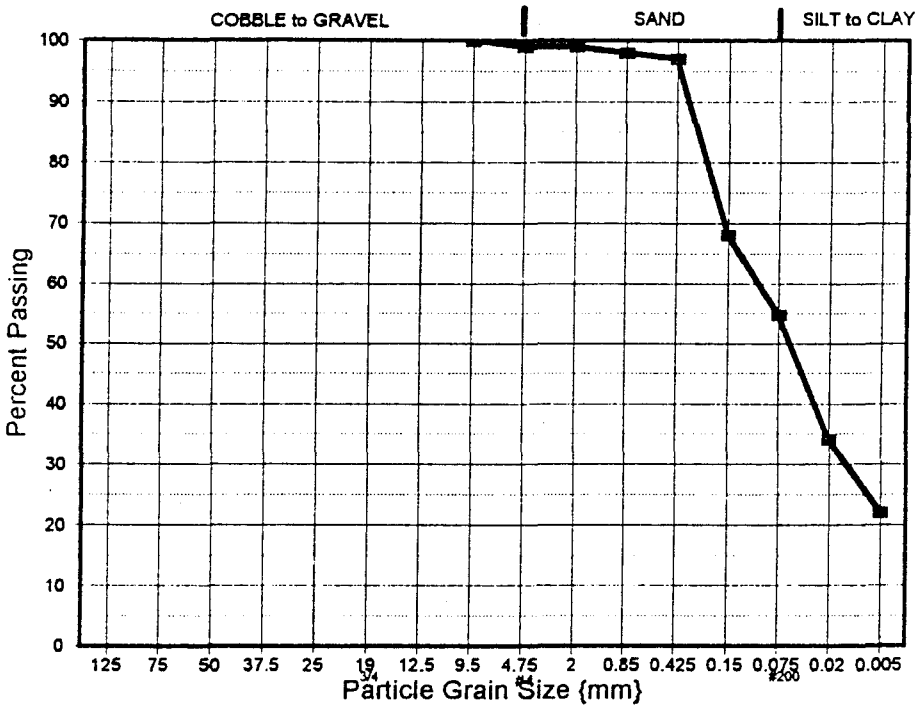
Grand Junction, Colorado

Soil Sample: **ALLUVIAL, SANDY SILT (ML)** Sample No. **I** **(Typical)**

Job Location: Test by: **LRS**

Natural Water Content **12.2%** Boring No.: 1 Depth: 3'

Soil Specific Gravity (G: **2.65** In-Place Density (pcf): 96.7



Effective size mm

Cu

Cc

Plastic Limit (PL) NP

Liquid Limit (LL)

Plasticity Index (PI) NP

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	
3/8"	9.5	100
# 4	4.75	99
#10	2	99
#20	0.85	98
#40	0.425	97
#100	0.15	68
#200	0.075	54.7
	0.02	34
	0.005	22

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:

0.04 % Swell

388 psf

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 950 psf

Unconfined Compression (qu): psf

CONSOLIDATION: 0.91% @ 936 psf

CRUST' 1.33% @ 2056 psf

SULFATE SALTS: 250 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

VALLEY MEADOWS EAST SUBDIVISION

25-1/2 Road & WESTWOOD Drive

GWHC Inc.

Grand Junction, Colorado

Date **5-27-96**

Job No. **85478-J**

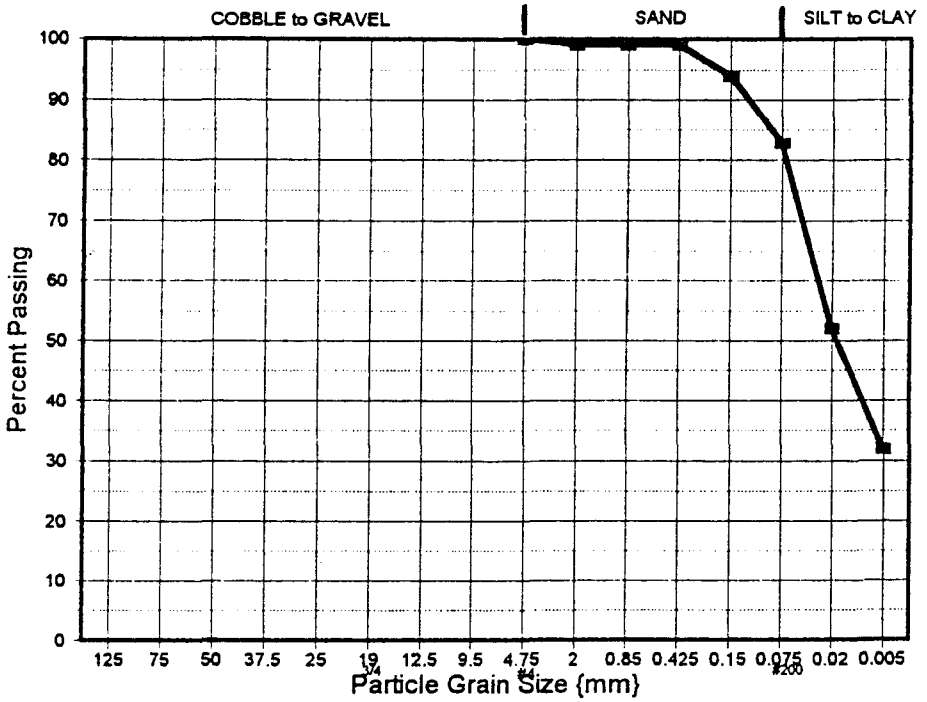
Drawn **EMM**

Soil Sample: SANDY SILT (ML) w/SILTY CLAY (ML-CL) Sample No. II (Typical)

Job Location: Test by: LRS

Natural Water Content 19.6% Boring No.: 2 Depth: 3'

Soil Specific Gravity (G: 2.66 In-Place Density (pcf): 95.4



Effective size mm

Cu

Cc

Plastic Limit (PL) 20%

Liquid Limit (LL) 23%

Plasticity Index (PI) 3%

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	
3/8"	9.5	
# 4	4.75	100
#10	2	99
#20	0.85	99
#40	0.425	99
#100	0.15	94
#200	0.075	82.8
	0.02	52
	0.005	32

MOISTURE/DENSITY RELATIONSHIP:

ASTM Method:

Max. Dry Density : pcf

Optimum Moisture :

HVEEM-CARMANY:

'R' Value @ 300 psi: 9 Expansion

Displacement 300 psi: 4.02

Expansion @ 300 psi: 39 psf

FHA Soil Swell:

% Swell

psf

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 900 psf

Unconfined Compression (qu): psf

CONSOLIDATION: 1.88% @ 904 psf

CRUST' 2.40% @ 2059 psf

SULFATE SALTS: 250 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

VALLEY MEADOWS EAST SUBDIVISION

25-1/2 Road & WESTWOOD Drive

GWHC Inc.

Grand Junction, Colorado

Date **5-27-96**

Job No. **85478-J**

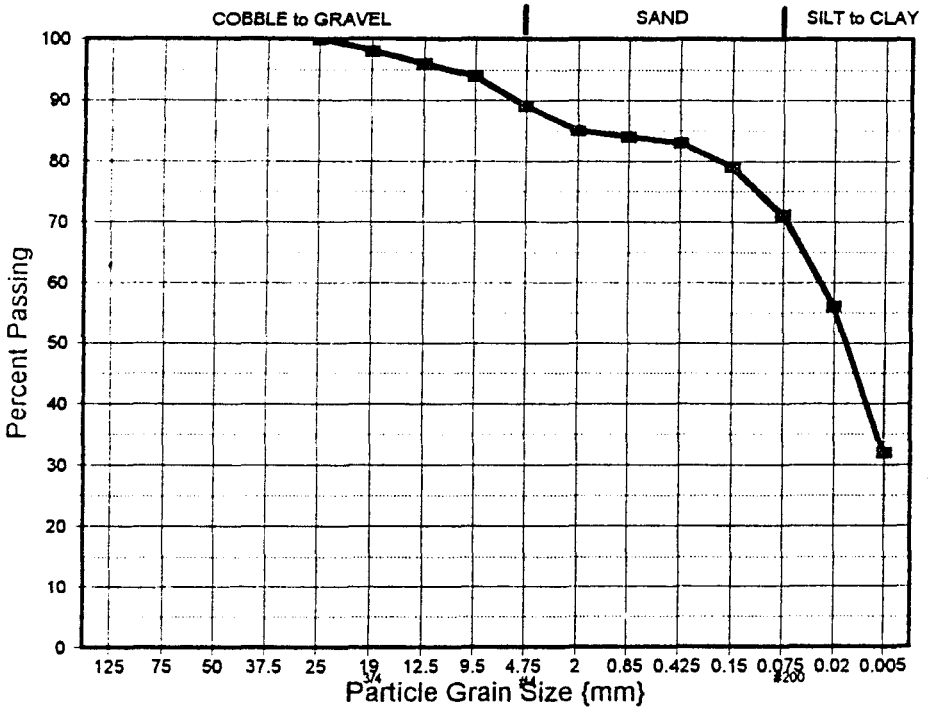
Drawn **EMM**

Soil Sample: SANDY, SILTY CLAY (ML-CL) Sample No. III (Typical)

Job Location: Test by: LRS

Natural Water Content 23.0% Boring No.: 4 Depth: 8'

Soil Specific Gravity (G: 2.66 In-Place Density (pcf): 98.4



Effective size mm

Cu

Cc

Plastic Limit (PL) 19%

Liquid Limit (LL) 24%

Plasticity Index (PI) 5%

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	96
3/8"	9.5	94
# 4	4.75	89
#10	2	85
#20	0.85	84
#40	0.425	83
#100	0.15	79
#200	0.075	71.2
	0.02	56
	0.005	32

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:

% Swell

psf

ALLOWABLE BEARING (net):

Standard Penetration (SPT): 800 psf

Unconfined Compression (qu): psf

CONSOLIDATION: 1.39% @ 921 psf

3.17% @ 2042 psf

SULFATE SALTS: 500 ppm

PERMEABILITY:

K (20 C): Void Ratio:

SOIL ANALYSIS and SUMMARY

LINCOLN - DeVORE, Inc.

Geotechnical Consultants

Grand Junction, Colorado

VALLEY MEADOWS EAST SUBDIVISION

25-1/2 Road & WESTWOOD Drive

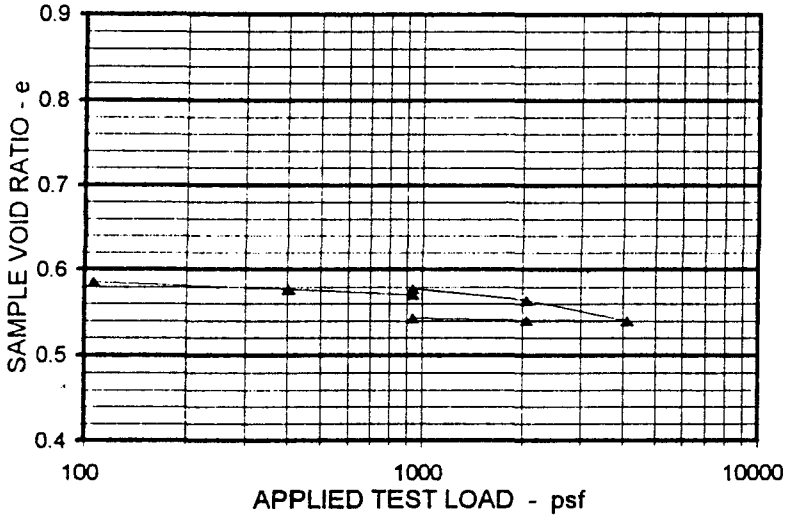
GWHC Inc.

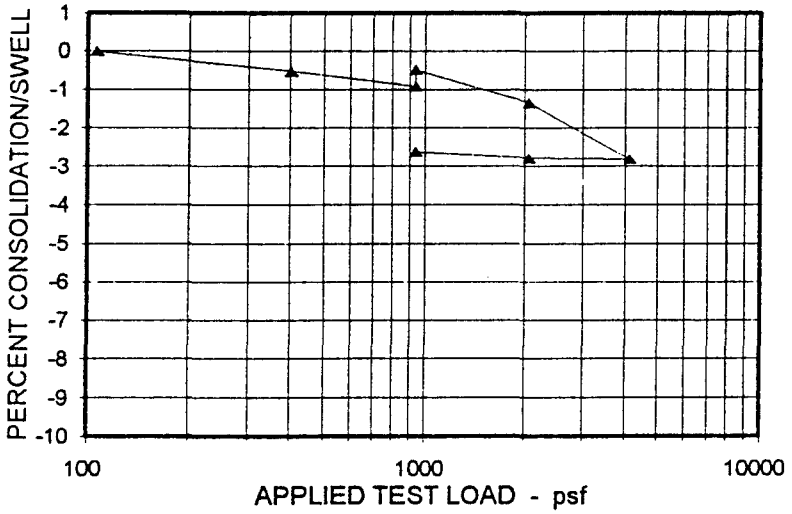
Grand Junction, Colorado

Date 5-27-96

Job No. 85478-J

Drawn EMM





The Consolidation Test (ASTM D-2435) Was Run By First Subjecting The Soil Specimen To A 'Seating' Load.

The 'Seating' Load Is To Remove Slack From The Apparatus And To Provide An Accurate Point of Beginning.

The Test Begins With The Specimen At Approximately Natural Moisture Content.

The Sample is Loaded to Approximately 900 psf And Then Saturated With Water.

Any Swell Or Collapse Of The Specimen Is Noted And The Loading Is Continued.

After The Maximum Test Load, The Soil Specimen Is Unload, To Measure Rebound And Swelling Potential, After Consolidation.

LOAD SUMMARY

106	*psf SEATING LOAD*
936	*psf SAMPLE SATURATED*
0	*% SOIL COLLAPSE*
0.04	*% SOIL EXPANSION/SWELL*
0.19	*% SAMPLE REBOUND @ UNLOAD*
2.81	*% MAXIMUM CONSOLIDATION*
4116	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	104.7	107.7	107.5
SOIL MOISTURE (%)	20.2%	20.3%	20.5%
CONSOLIDATION (%)	-0-	2.81%	2.62%
VOID RATIO (e)	0.585	0.541	0.544
SATURATION (%)	92%	100%	100%

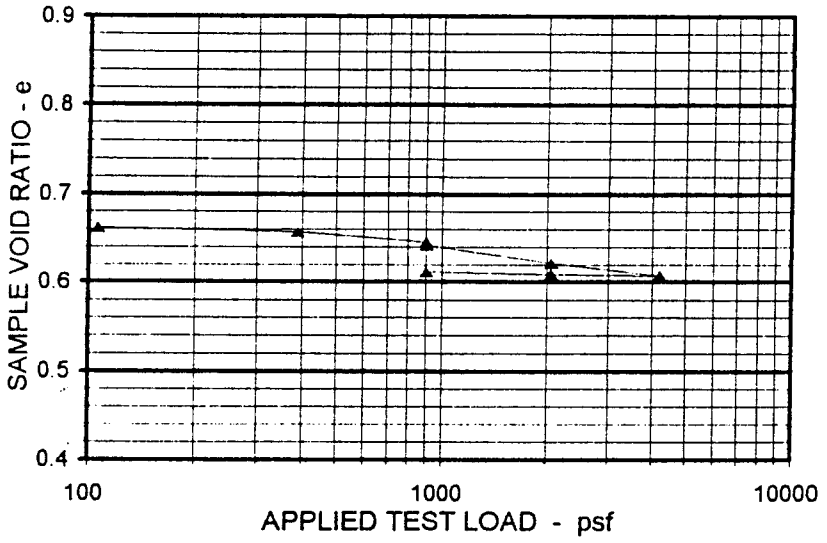
SOIL #:	I
SOIL TYPE:	ML
TEST HOLE #:	1 @ 3'
SAMPLE Gs:	2.66
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

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

VALLEY MEADOWS EAST SUBDIVISION
25-1/2 Road & WESTWOOD Drive

GWHC Inc. Grand Junction, Colorado		Date 5-27-96
Job No. 85478-J	Drawn EMM	



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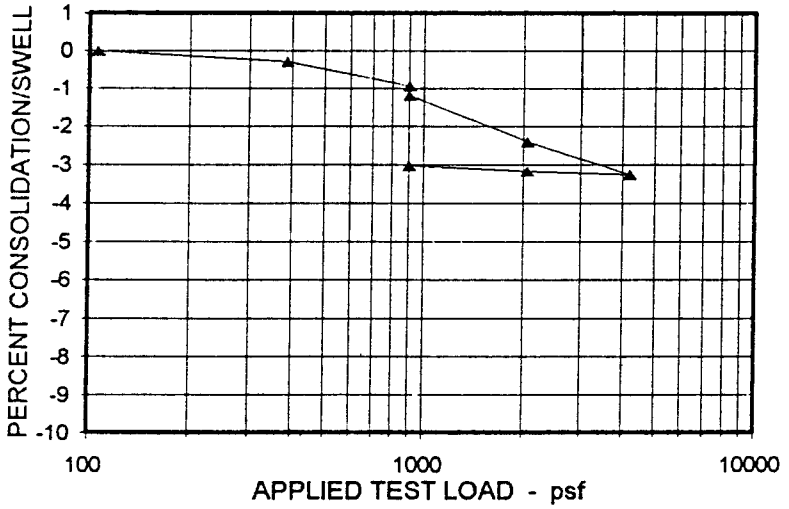
After The Maximum Test Load, The Soil Specimen Is Unload, To Measure Rebound And Swelling Potential, After Consolidation.



LOAD SUMMARY

106	*psf SEATING LOAD*
904	*psf SAMPLE SATURATED*
0.04	*% SOIL COLLAPSE*
0	*% SOIL EXPANSION/SWELL*
0.24	*% SAMPLE REBOUND @ UNLOAD*
3.25	*% MAXIMUM CONSOLIDATION*
4210	*psf MAXIMUM TEST LOAD*

	INITIAL	MAXIMUM LOAD	FINAL LOAD
SOIL DENSITY (pcf)	99.9	166.0	103.0
SOIL MOISTURE (%)	22.4%	0.0%	22.5%
CONSOLIDATION (%)	-0-	3.25%	3.01%
VOID RATIO (e)	0.662	0.000	0.612
SATURATION (%)	90%	100%	98%

SOIL #:	II
SOIL TYPE:	ML
TEST HOLE #:	2 @ 3'
SAMPLE Gs:	2.66
DIAMETER:	2.5"
AREA inchs:	.03409

SOIL CONSOLIDATION ASTM D-2435

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

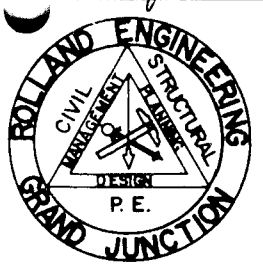
VALLEY MEADOWS EAST SUBDIVISION
25-1/2 Road & WESTWOOD Drive
GWHC Inc.
Grand Junction, Colorado
Date **5-27-96**
Job No. **85478-J**
Drawn **EMM**

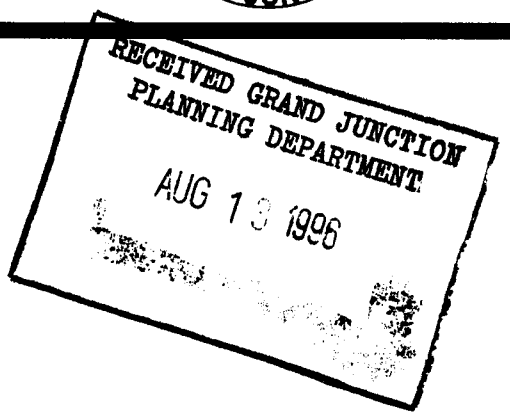
file in Valley Meadows East file

FPP-96-138

ROLLAND ENGINEERING

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





August 9, 1996

Community Development
Kathy Portner, Acting Director
250 N. 5th Street
Grand Junction, CO 81503

RE: Valley Meadows East Plat Dedication Language

Dear Kathy,

This letter is being written in an attempt to proceed beyond the present impasse between the City of Grand Junction and Grand Valley Irrigation Company (GVIC) regarding the 25 foot strip of land along the Grand Valley Canal that borders the southern boundary of the proposed Valley Meadows East Subdivision.

GVIC has authored plat dedication language that they will accept on the Valley Meadows East plat(s). GVIC , at this point in time, does not necessarily care about the underlying ownership of the 25 foot wide strip of land other than that their rights to a prescriptive easement are honored. The GVIC language is as follows (in quotes):

"In dedication:
Grantor acknowledges the existing prescriptive dominant easement of Grand Valley Irrigation Company, and the rights incident thereto, within the area of the Grand Valley Irrigation Company easement shown on this plat. Grand Valley Irrigation Company by signing this plat acknowledges that the described easement is the extent of its prescriptive easement on the parcel shown on the plat. Grantor dedicates its title to the area within such easement to the City of Grand Junction, Colorado. The City of Grand Junction by acceptance of this plat acknowledges that Grand Valley Irrigation Company has the right to enforce such dominant easement against the City of Grand Junction or its successors and assigns, with respect to use by any licensee, invitee or permittee of the City of Grand Junction, including the public, of the property described herein to the City of Grand Junction."

Please respond in writing to the above dedication language so that we may hopefully create a plat for Valley Meadows East that is acceptable to the City of Grand Junction as-well-as Grand Valley

Irrigation Company. If the above dedication language is not acceptable to the City of Grand Junction, please suggest alternative methods for dispute resolution that have not already been suggested.

Sincerely,
ROLLAND Engineering

Trevor A. Brown

cc: GWHC, Inc. - The Developers
Phil Bertrand - Grand Valley Irrigation Company

File: d:\user\letters\wp\vme-dedi.wpd

9/6/96

Recording checklist - Valley Meadows East

1. Discharge Agreement (Easement with City?) 5 pgs 3 pgs
2. Improvements Agreement/Guarantee 16 pgs — need signatures
3. Approved, signed plats
4. Approved construction drawings
5. Covenants 12 pgs
6. Parks & Open Space fees - $225/unit - prior to recording
7. UCC approval
8. TCP - $500.00/unit - Request for credit for adjacent improvements must be in writing prior to 1st permit being issued.
9. School Impact fee - $292/unit paid w/ bldg permits
10. Final landscaping and signage plan for entry feature and common open space — include in DIA
11. Proposed fencing design, height and location. — include in DIA
12. Note on plat restricting open space fencing to max. 4' in height & uniform design open-type fencing such as split rail or picket to be approved by City.
13. 2 full size mylar copies and 1 11"x17" reduced mylar copy of plat after signatures & final approval.
14. Recording fees
15. Articles of Incorporation — need original

- Will check on whether the fencing along 25½ Rd is requirement of developer

Jody Kliska
Development Engineer
City of Grand Junction
PO Box 1809
Grand Junction, CO 81502

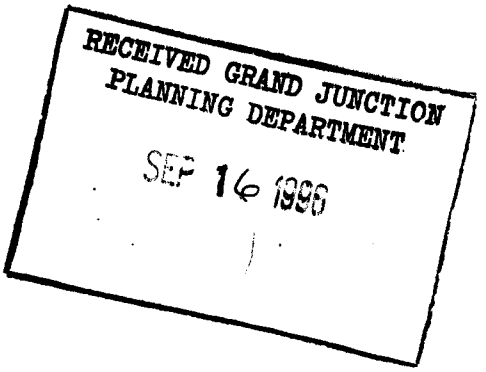
RE: Valley Meadows East Subdivision
Road Dedication Credit

Dear Ms. Kliska,

Please determine and credit to the TCP fee for the subject subdivision the amount for the dedication of 25.5 Road.

Sincerely,

John Davis



JD:rs
cc: Kathy Portner, Community Development

RE/MAX Above the Crowd!®

RECEIVED GRAND JUNCTION PLANNING DEPARTMENT
SEP 17 1996

Kathy Portner
City Community Development

attached are original plus one copy of:

1. Indemnification Agreement (signed by John)
2. Covenants (signed by John)
3. Discharge Agreement (signed by John + GVIC)

also attached is one copy of Develop. Improve. Agree. and Disburse. Agree. Jody already has copy and is reviewing today. Not signed pending her o.k.

Thanks — Ward

Before noon, Trevor was to have delivered a plat to you + one set of plans to Jody for final check.

What check amounts + to whom, please.

anything else??

RE/MAX 4000, Inc.
1401 N. 1st Street
Grand Junction, Colorado 81501
Office: (970) 241-4000
Toll Free: (800) 777-4573
Fax: (970) 241-4015

CITY OF GRAND JUNCTION FILE **#FPP-96-138 FINAL PLAT/PLAN - VALLEY MEADOWS EAST FILING #1** LOCATED AT THE NE CORNER 25 1/2 ROAD & GRAND VALLEY CANAL HAS BEEN REVIEWED AND APPROVED BY THE UTILITY COORDINATING COMMITTEE.

Dale Clawson
DALE CLAWSON - PUBLIC SERVICE

9/26/96
DATE

CITY OF GRAND JUNCTION FILE **#FPP-96-138 FINAL PLAT/PLAN - VALLEY MEADOWS EAST FILING #2** LOCATED AT THE NE CORNER 25 1/2 ROAD & GRAND VALLEY CANAL HAS BEEN REVIEWED AND APPROVED BY THE UTILITY COORDINATING COMMITTEE.

Dale Clawson
DALE CLAWSON - PUBLIC SERVICE

9/26/96
DATE

Wednesday, October 09, 1996

Jody Kliska
Development Engineer
City of Grand Junction
hand delivered

Dear Ms. Kliska:

For Valley Meadows East Subdivision, please apply the improvement cost for 25..5 Rd. of $34,265.00 (per the DEVELOPMENT IMPROVEMENTS AGREEMENT, Filing No. 1 (off-site)), against the Subdivision's TCP of $22,000.00.

Sincerely,

John Davis
Owner/Developer

cc: Kathy Portner

RECEIVED GRAND JUNCTION
PLANNING DEPARTMENT
OCT 10 1996

APPROVED
J. K Coda
10-10-96

FP-96-138

DAILY CONSTRUCTION REPORT

BANNER
BANNER ASSOCIATES, INC.
CONSULTING ENGINEERS & ARCHITECTS
2777 CROSSROADS BOULEVARD
GRAND JUNCTION, CO 81501 • (303) 243 8242

PROJECT: Valley Meadows East Subdiv.
CLIENT: John Davis
CONTRACTOR: Packerson Const.
FEATURE: Sewer main air pressure test. SHEET 1 OF

CONTRACT NO. JOB NO. 3324-61 DATE 10/28/96
WEATHER MIN. TEMP. MAX. TEMP. 55°F
WORK PERIOD 11:00 A.M. P.M. 1:00 A.M. P.M.

EQUIPMENT:

PERSONNEL: 1 crew 6 men working on foundations. 1 survey crew staking in roadways. 1 earthwork crew preparing roads, foundations.

NARRATIVE: Contractor conducted air pressure testing of sewer lines per GJT standards. See page UU-31 of GJT Standard Specs for Construction of Underground Utilities...
All lines held for times shown below. Temping was performed by GJT personnel.

8" Ø P.V.C. - USE 1.2 min/100 FT

Ext Ex MH to MH A - 46.05' - 34 sec
MH A to MH B - 118.24' - 1 min 26 sec
MH B to MH 1B - 90.80' - 1 min 6 sec
MH 1B to MH 2B - 204.54' - 2 min 28 sec
MH 2B to MH 3B - 361.61' - 4 min 21 sec
MH B to MH C - 346.17' - 4 min 24 sec
MH C to MH D - 354.06' - 4 min 15 sec

TEST RESULTS: All lines passed.

REVIEWED BY PREPARED BY

Refer to other reports:

BANNER

CONSULTING ENGINEERS & ARCHITECTS

BANNER ASSOCIATES, INC.
2777 Crossroads Boulevard
Grand Junction, Colorado 81506
(303) 243-2242
FAX (303)243-3810

605 East Main, Suite 6
Aspen, Colorado 81611
(303) 925-5857

December 23, 1997

Ms. Jody Kliska, P.E.
City Development Engineer
CITY OF GRAND JUNCTION
250 North 5th Street
Grand Junction, CO 81501

RE: Additional information relating to the grading of Open Space (park area) at Valley Meadows East Subdivision

Dear Jody,

As requested during our phone conversation yesterday, I am providing this letter to clarify a few issues that relate to the park area of Valley Meadows East Subdivision.

In my letter dated yesterday, I discussed the fact there will be water ponding during the period it will take to establish the grass. It should be understood that according to the original grading plan as prepared by **Rolland Engineering**, this ponding would occur in the backyards of those lots along the southern portion of the park. This is the reason for the slight modification in the grading of the open space, to avoid any ponding in these lots.

Also discussed during our conversation was the question of whether the park area was designed to be used as part of the drainage system, i.e. a detention or retention area. The response to this question would be no, it was not designed to be part of the drainage system. In addition to this fact, there is no off-site runoff being contributed to the park area such as streets draining into it. The only water introduced to the area is through direct precipitation or irrigation of the landscaping.

I hope that this letter clarifies these issues.

Sincerely,

BANNER ASSOCIATES, INC.

David E. Chase, P.E.
Project Manager

DEC/dc

cc: Ms. Jana Bingham, **Sonshine Construction**

BANNER

CONSULTING ENGINEERS & ARCHITECTS

BANNER ASSOCIATES, INC.
2777 Crossroads Boulevard
Grand Junction, Colorado 81506
(303) 243-2242
FAX (303)243-3810
605 East Main, Suite 6
Aspen, Colorado 81611
(303) 925-5857

December 22, 1997

Ms. Jody Kliska, P.E.
City Development Engineer
CITY OF GRAND JUNCTION
250 North 5th Street
Grand Junction, CO 81501

RE: As-constructed grading of Open Space (park area) at Valley Meadows East Subdivision

Dear Jody,

Following discussions with the City staff and Ms. Jana Bingham of **Sonshine Construction** last week, I am writing this letter to state my opinions regarding the grading that has been constructed for the park area of Valley Meadows East Subdivision during this last fall.

As you recall, plans for constructing the first two filings, which included the park area, were completed by **Rolland Engineering** for **GWHC, INC.** and then subsequently constructed by **Sonshine Construction**. The original design plans showed no method of conveying any collected runoff from the park area, only having the finish ground sloping from the north to the south at a grade of approximately 1%. During construction, however, it was discussed between **Sonshine** and **Banner** whether any drainage system should be implemented. It was decided that no additional drainage system would be installed at this time although **Banner** did look into the design of a system to mitigate any adverse impacts if it were necessary. In regard to the original grading plan of the park, we would not anticipate any long-term problems once it had an established grass surface. Until that point in time, we knew there would be a nuisance of storm water, as well as irrigation water, collecting on properties to the south of the park. Therefore, the grading was modified slightly to create a very shallow and subtle depression within the park to avoid this problem. Again, we would not anticipate any long-term problems with this revised plan once the grass has been established.

In summary, it is felt that during this process of having the grass reaching maturity, there will be a nuisance of ponding water in areas of the park. Where it will occur has been the issue that we have been trying to resolve. We have worked with **Sonshine Construction** to develop a plan that will minimize any impacts to the homeowners that surround the Open Space. During this growing process, these homeowners will have to show some patience and give this plan a chance to work. It is our opinion that given a chance to work, this alternative will perform adequately.

We understand that you and the Planning staff are interested in proper documentation regarding this issue, therefore, if I have not adequately addressed any of the issues regarding the grades constructed for the park area of Valley Meadows East Subdivision, please contact me at your convenience.

Sincerely,

BANNER ASSOCIATES, INC.

David E. Chase, P.E.
Project Manager

DEC/dc

cc: Ms. Jana Bingham, **Sonshine Construction**

Sundance Properties

P.O. Box 2867
Grand Junction, CO 81502
Rental Management 970-243-2308 Development 970-243-6763

February 27, 1998

Water Users on Head Gate No. HL055

Arline H. Burnell
2575 G Road
Grand Junction, CO
81505-9548

Michael & Caroline Dohm
2588 G Road
Grand Junction, CO 81505

Gary Duane Flynn
3415 G Road
Grand Junction, CO 81505

Robert & Lou Ellen Hunt
2572 Young Court
Grand Junction, CO 81505

Kay Subdivision
% Valerie Taylor
2556 Janece Drive
Grand Junction, CO 81505

Louis & Belle Motts
2574 Young Court
Grand Junction, CO 81505

John A. Nelson
2580 H Road
Grand Junction, CO

Daniel & Colleen Puckett
2563 F-1/2 Road
Grand Junction, CO 81505

John Davis
P.O. Box 2867
Grand Junction, CO 81502

Valley Meadows (West)
Homeowners Association
% Robt Wilson
673 Uintah Ct.
Grand Junction, CO 81505

Valley Meadow East
Homeowners Association
% Dru Mattson
2561 Westwood Drive
Grand Junction, CO 81505

cc: **Phil Bertrand - GVIC**
Max Schmidt
Jack Lofland
Barbara Forrest
Bernadine&Alan Sherman

Re: Lateral 55 - Users
Piping of Open Irrigation on the East Property Line of Valley Meadows East (VME)

Dear Users:

Concerning the above mentioned item, this letter shall serve as official notice that our firm has been requested to pipe the open ditch immediately adjacent to the East property line of Valley Meadows East (VME) Subdivision and on the west side and adjacent to properties owned by Louis & Belle Motts, Robert & Lou Ellen Hunt, and Bernadine & Allan Sherman. It is our intention to start and complete the work prior to the 1998 irrigation season, thus the work is scheduled for late March 1998. (As of 2/24/98 Grand Valley Irrigation Company estimates the earliest availability of water to Headgate #55 to be April 6, 1998.) Start of this work is contingent on written notice from VME Home Owners Association.

If you would like more specific information as to the design or if you have concerns and or questions, please call Jana Bingham at (970) 243-6763. Thank you for your time.

Sincerely

Jana L. Bingham

Jana L. Bingham
Development Manager
Sundance Properties

Sundance Properties

P.O. Box 2867
Grand Junction, CO 81502
Rental Management 970-243-2308 Development 970-243-6763

February 20, 1998

Ms. Barbara Forrest
2559 Westwood
Grand Junction, CO 81505

Re: Piping of Open Irrigation on the East Property Line of Valley Meadows East (VME)

Dear Barbara:

Concerning the above mentioned item, I would like to reconfirm our conversation yesterday which outlined the work we have been discussing at the east ditch over the past few weeks.

Sundance Properties is willing to pay ½ of the $8000 to $10,000 dollars estimated to cover the cost of piping the open ditch east of VME, as we discussed in early January. In order to complete this work prior to the 1998 Irrigation season, Sundance Properties must have an agreement with the Homeowners of VME that they will pay the remaining half of the cost to pipe the ditch no later then March 16, 1998.

As previously indicated, there are some important reasons this work should be completed prior to April 1, 1998, if the intention is to pipe it.

1) Irrigation water is typically let in the ditch April 1 or soon their after.
2) The VME Homeowners adjacent to the ditch have expressed their desire to have it piped this season.
3) Some VME Homeowners with rear yards adjacent to the ditch have proceeded to place privacy fencing in their rear yards, and are holding back at our request. Restricted access to the ditch after these fences go in place could greatly increase the cost of piping the ditch, thus the work should be completed prior to rear fences being place. (The quotes we have are contingent on the fencing not being placed.)
4) The adjacent VME Homeowners will most likely be wanting to landscape their rear yards, and although it is not expected that this work will require access into the yards, it would certainly be preferable to complete the work prior to landscaping.
5) Keeping the cost to a minimum has been a concern and material and labor costs will only rise as time passes. Bids are typically guaranteed a maximum of 90 days.

In addition, as I have previously explained, in order to work on this ditch we must notify the owners whose properties the ditch crosses. I have been working on this with current owners and have not yet received all of their approvals, however at this time do not have anyone at issue if the work is done prior to this irrigation season.

Barbara, as you know, since the time of the December 17, 1998 Homeowners Association meeting we have worked steadily to work out some of the issues and respond to the concerns expressed by the Homeowners about this ditch. This includes:

1) Having Sundance Properties engineers do design work and obtain initial subcontractor pricing in late December.
2) Contacting the US Conservation office to see if funds were available to defer the costs of this project.
3) Contacting and working with the US Conservation office to get a second design for this piping, at no cost of this design to the HOA. (This design is due to me by February 27, 1998).
4) Contacting other agencies to determine if low interest loans are available for this work.
5) Contacting adjacent subdivisions concerning sharing of costs, etc.

There is still a lot to accomplish in a short period of time in order to see this work done prior to irrigation water coming into the ditch. I will continue to do what I can to assure the cost to the HOA is no greater then ½ the amount mentioned above, and I appreciate you proceeding with communication to your HOA with out delay to receive their agreement to participate in this cost, if they wish to see the ditch piped.

I would like to reiterate, Sundance Properties, Inc.'s offer to participate in costs of this work will not be available after March 16, 1998 if written agreement for participation from the HOA is not received by that date. I would be glad to provide you additional information and meet with you or your HOA if necessary to further explain the proposed solutions.

Thank you for your time and efforts on these issues. I await your response.

Sincerely,

Jana L. Bingham

Jana L. Bingham
Development Manager
Sundance Properties

cc: Richard Livingston
Ernest Wollen
Dru Mattson

April 24, 1998

Katherine Portner
Planning Supervisor
City of Grand Junction
250 North 5th Street
Grand Junction, Colorado 81501

Re: Signs for Park

Dear Kathy,

Valley Meadows East Homeowner's Association has decided that we do not want signs in our development pointing to the park. The park is for the use of the residents, their guests and families. Everyone knows where it is. We want to release the developer - Sundance Properties from their obligation to put up these signs.

If you have any questions or concerns, please don't hesitate to call. Thank you for your cooperation in this matter.

Sincerely,

Barbara Forrest

Barbara Forrest
President
Valley Meadows East Homeowner's Association

cc: Sundance Properties

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

August 27, 1998

Mr. John Davis
Sundance Properties
P.O. Box 2867
Grand Junction, CO 81505

Re: Valley Meadows East Subdivision

Dear Mr. Davis:

We have inspected the improvements installed at Valley Meadows East Subdivision. The City Engineering Department is prepared to accept the public improvements; however, the private open space is not yet complete. On a site inspection on August 27, 1998, I observed standing water and swampy areas at the south end of the open space near the pathway. Those areas are not draining and have no established grass. As you know, the open space area was a requirement of the development and must be complete prior to us doing a final release on the Development Improvements Agreement for the property.

Please contact me by September 4, 1998 to discuss your plans to remedy the problem. Thank you for your cooperation.

Sincerely,

Katherine M. Portner
Planning Manager

xc: Ernest Wollen, Valley Meadows East Homeowners Association
Kerrie Ashbeck, City Development Engineer


25 1/2 ROAD
GRAND VALLEY CANAL

VALLEY MEADOWS EAST SUBDIVISION – FILING No. ONE

MSCM# 1122-1

MARC S. LAIRD

AFT
PATRICK L. MORAN

AFT
GEORGE R. JACHIM

MSCM# 1126

WALID BOU-MATAR

P.O.B.

OUTLOT B (980.0 SQ.FT.)
IRRIGATION FACILITIES AND MAINTENANCE.

10' IRRIG. & DRAINAGE EASEMENT

N 88°58'22" E 771.31'

508.11'

SEE DETAIL 'A'

DETAIL 'A'
N.T.S.

LOUIS J. MOTTS
R1A

ROBERT G. HUNT
R1A

BERNADINE R. WILSON
R1A

VALLEY MEADOWS SUBDIVISION
PLAT BK 14 PG 251

25 1/2 ROAD

BASIS OF BEARING N 00°00'00" E 706.20'

10' IRRIG. & DRAINAGE EASEMENT

MCCOOK AVE.

CHAMA LANE

WESTWOOD DR

OUT LOT A
COMMON OPEN SPACE
7081.29 SF.
0.16 AC.

LOT 1 BLOCK 1
9431.39 SF.
0.22 AC.

LOT 1 BLOCK 2
14957.31 SF.
0.33 AC.

LOT 1 BLOCK 3
9089.62 SF.
0.23 AC.

LOT 2
9669.06 SF.
0.22 AC.

LOT 3
9545.98 SF.
0.22 AC.

LOT 4
9545.98 SF.
0.22 AC.

LOT 5
10081.89 SF.
0.23 AC.

LOT 6
9738.62 SF.
0.28 AC.

LOT 7 BLOCK 1
8997.54 SF.
0.20 AC.

LOT 1 BLOCK 2
10108.14 SF.
0.23 AC.

LOT 2
9350.88 SF.
0.21 AC.

LOT 3
9350.88 SF.
0.21 AC.

LOT 4
8172.13 SF.
0.19 AC.

LOT 5
9738.97 SF.
0.21 AC.

909.96 SF.
0.02 AC.

0.19 AC.

OUTLOT C
FUTURE FILINGS TWO AND THREE.

DEDICATE EASEMENT TO THE GRAND VALLEY IRRIGATION COMPANY FOR THE OPERATION AND MAINTENANCE OF THE GRAND VALLEY CANAL.
EASEMENT IS THE SAME AREA AS THE CITY OF GRAND JUNCTION RIGHT-OF-WAY EXCEPT FOR THE 5 FOOT WIDE NORTH/SOUTH RIGHT-OF-WAY.

DEDICATE RIGHT-OF-WAY TO THE CITY OF GRAND JUNCTION FOR USE AS PEDESTRIAN/BICYCLE WALKWAY.

TEMPORARY DRAINAGE EASEMENT TO BE EXTINGUISHED AT FUTURE FILING.

10' IRRIG. & DRAINAGE EASEMENT

CANAL NORTH BANK

OUTLOT D

ROBERT J. WILSON

KAY SUBDIVISION
PLAT BK 14 PG 174

BRENNA WAY

(PENDING)
CIMARRON NORTH SUBDIVISION

MSCM# 559-2

NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.

LEGEND

- ⊕ – MESA COUNTY SURVEY MARKER
- ⊙ – SET 5/8" REBAR IN CONC-L.S. 18469
- ⊤ – SET REBAR & CAP AT LOT CORNERS-L.S. 18469
- • – FOUND REBAR AS NOTED

LAND USE SUMMARY

TOTAL LAND AREA:	14.93 ACRES	100.00%
FILING NO. ONE AREA:	4.26 ACRES	28.53%
TOTAL LOTS AREA:	3.05 ACRES	20.43%
TOTAL ROAD ROW AREA:	1.03 ACRES	6.90%
OPEN SPACE AREA: (OUTLOT 'A')	0.16 ACRES	1.07%
OUTLOT 'B' AREA: (IRRIGATION FACILITIES)	0.02 ACRES	0.13%
OUTLOT 'D': (CANAL ROW AREA)	0.73 ACRES	4.88%
PEDESTRIAN/BICYCLE ROW AREA:	0.10 ACRES	0.67%
OUTLOT 'C' AREA:	9.84 ACRES	65.91%

FILING NO. ONE LOTS NUMBER: 14

0' 50' 100' 150'

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

FILING\VME\FINAL\SEC-TRY\FILING-1.DWG

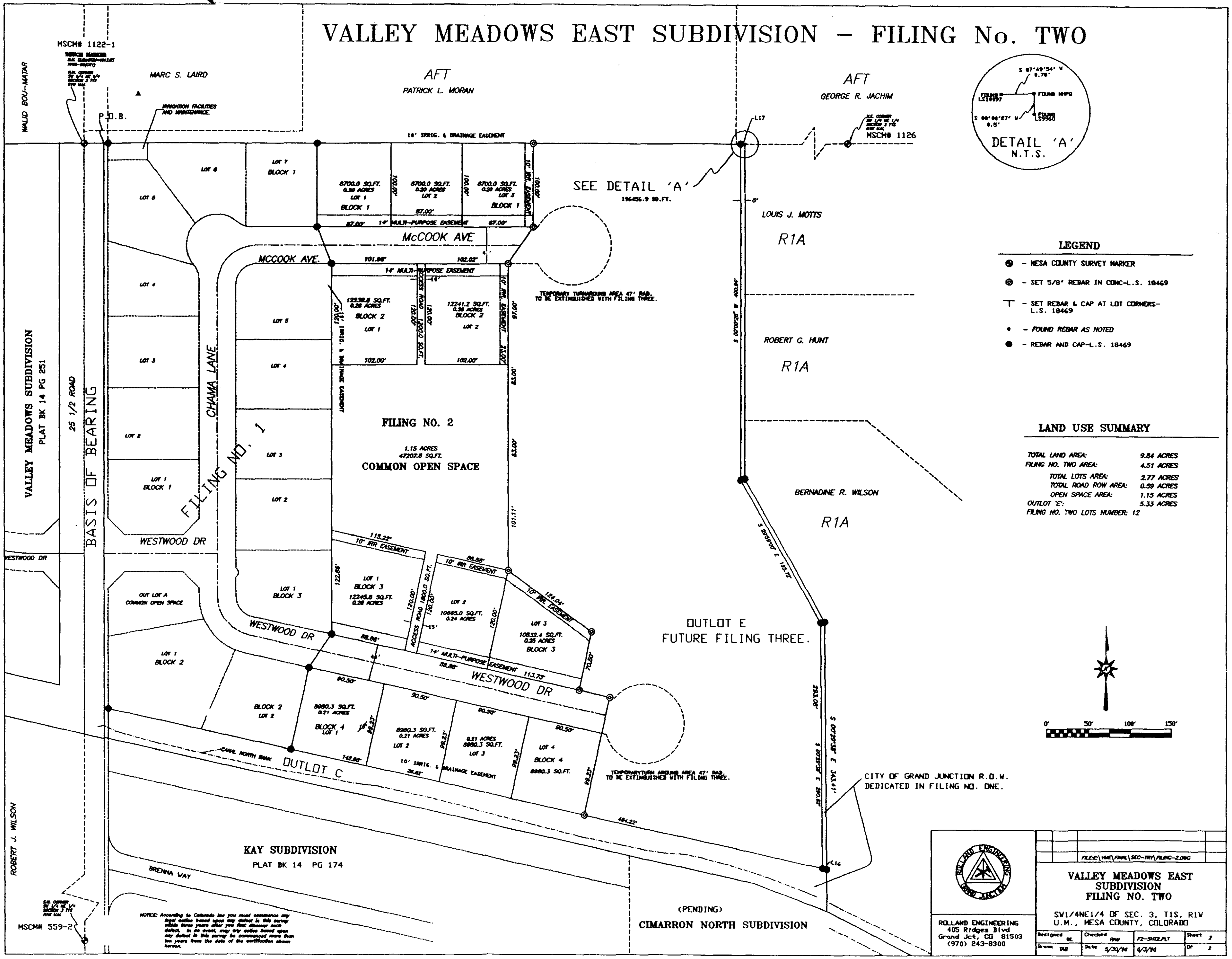
VALLEY MEADOWS EAST
SUBDIVISION
FILING NO. ONE

SW1/4NE1/4 OF SEC. 3, T1S, R1W
U.M., MESA COUNTY, COLORADO

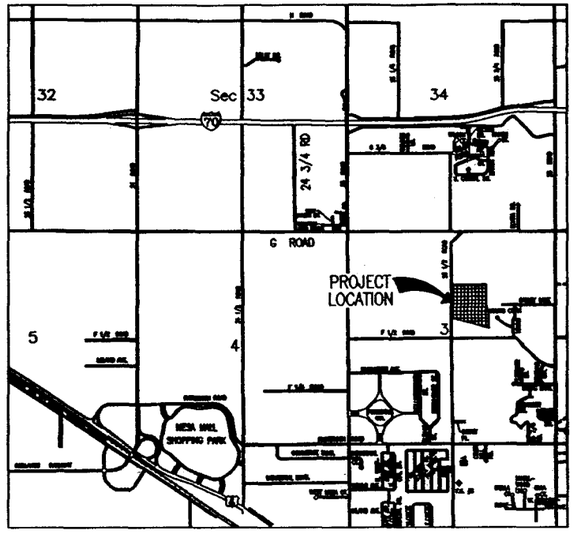
Designed	ML	Checked	RWR	F1-SHT2.PLT	Sheet 2
Drawn	TMB	Date	6/30/96	6/3/96	OF 2

E:\VME\FINAL\SEC-TRY\F1-11X17 Mon Jun 3 15:25:14 1996 ROLLAND ENGINEERING

C:\WORK\FILING-2 Mon Jun 3 17:22:55 1996 ROLLAND ENGINEERING



VALLEY MEADOWS EAST -FILING No. ONE



VICINITY MAP

LINE TABLE

L1	N 45°00'00" W	28.28'
L2	N 45°00'00" E	28.28'
L3	S 45°00'00" W	27.04'
L4	N 45°00'00" W	27.04'
L5	S 00°00'00" E	9.33'
L6	S 00°00'00" E	21.55'
L7	S 40°36'05" W	4.61'
L8	S 00°00'00" E	4.11'
L9	S 40°36'05" E	4.61'
L10	N 00°00'00" E	21.38'
L11	N 00°00'38" W	20.00'
L12	S 00°00'00" E	19.81'
L13	S 89°59'22" W	5.00'
L14	N 00°00'00" E	35.83'
L15	S 77°37'00" E	5.12'
L16	S 77°37'00" E	5.13'
L17	N 89°59'22" E	5.00'

CURVE TABLE

C1	69.00'	28.55'	28.35'	N 11°51'17" W	23°42'34"	14.48'
C2	69.00'	53.33'	52.02'	N 45°51'16" E	44°17'17"	28.08'
C3	69.00'	11.58'	11.57'	S 72°48'25" E	09°37'10"	5.81'
C4	47.00'	63.67'	58.91'	N 38°48'39" W	77°37'00"	37.80'
C5	25.00'	33.87'	31.34'	N 38°48'39" W	77°37'00"	20.11'
C6	25.00'	39.27'	35.35'	N 44°59'41" E	89°59'22"	25.00'
C7	47.00'	73.82'	66.46'	N 44°59'41" E	89°59'22"	46.99'
C8	25.00'	17.76'	17.39'	S 20°21'11" E	40°40'28"	9.27'
C9	37.00'	58.34'	52.33'	N 82°08'39" E	85°48'03"	34.32'
C10	37.00'	55.34'	50.33'	N 87°50'43" E	85°48'03"	34.32'
C11	25.00'	11.46'	11.36'	S 62°26'29" E	26°16'03"	5.83'

GENERAL NOTES

1. TITLE INFORMATION FROM MESA COUNTY RECORDS, AND WESTERN COLORADO TITLE Co., Order file No. 93-6-7K, effective date July 15, 1993.
2. BASIS OF BEARING BETWEEN MESA COUNTY SURVEY MARKERS FOR THE N.W. CORNER AND THE S.W. CORNER OF THE SW1/4 NW1/4 OF SEC. 3: BEARING EQUALS S00°00'00"W. (According to Valley Meadows Sub.).
3. ALL EASEMENTS ARE MULTI-PURPOSE EASEMENTS UNLESS OTHERWISE NOTED.
4. MAINTENANCE AND OPERATION OF PRIVATE OPEN SPACE IS THE RESPONSIBILITY OF THE HOMEOWNERS ASSOCIATION.
5. ELEVATION DATUM: N.W. CORNER SW1/4NE1/4 SEC.3,T1S,R1W,U.M. FROM NAVD-88 (City of Grand Junction).

DEDICATION

KNOW ALL MEN BY THESE PRESENTS:

GVHC, Inc. is the owner of a parcel of land being that tract of land described at Book 2288, Page 90 , Mesa County Records, and the perimeter being more particularly described, as a result of survey, by the following:

Commencing at a Mesa County Survey Marker for the N.W. Corner of the SW1/4NE1/4 of Section Three, Township 1 South, Range One West of the Ute Meridian, Mesa County, Colorado, from whence a Mesa County Survey Marker for the Southwest Corner of the SW1/4 NE1/4 of said Section Three bears S00°00'00"W 1320.48 feet; thence on the north line of the SW1/4NE1/4 of said Section Three N89°59'22"E 25.00 feet to the east line of 25 1/2 Road and the Point of Beginning; thence N89°59'22"E 771.31 feet; thence leaving said north line S00°00'38"W 399.38 feet; thence S29°59'00"E 195.69 feet; thence S00°29'38"E 343.41 feet to the north line of Cimarron North Subdivision; thence continuing on said subdivision line N69°30'49"W 95.06 feet; thence continuing on said subdivision line N77°21'58"W 152.46 feet to northeast corner of Kay Subdivision; thence on the north line of Kay Subdivision N77°37'00"W 649.30 feet to east line of 25 1/2 Road; thence N00°00'00"E 706.28 feet to the point of beginning.

That said owners have caused the said real property to be laid out and surveyed as VALLEY MEADOWS EAST SUBDIVISION, FILING NO. One, a Subdivision of a part of the County of Mesa.

That said owner does hereby dedicate and set apart real property as shown and labeled on the accompanying plat as follows:

All streets and Rights-of-Way to the City of Grand Junction for the use of the public forever;
All Multi-Purpose Easements to the City of Grand Junction for the use of the public utilities as perpetual easements for the installation, operation, maintenance and repair of utilities and appurtenances thereto including, but not limited to electric lines, cable TV lines, natural gas pipelines, sanitary sewer lines, water lines, telephone lines, and also for the installation and maintenance of traffic control facilities, street lighting, and grade structures;
All Irrigation Easements, including Outlot B, to the owners (Property/Homeowners Association) of the lots and tracts hereby platted as perpetual easements for the installation, operation, maintenance and repair of private irrigation systems;
All Drainage Easements to the owners (Property/Homeowners Association) of lots and tracts hereby platted as perpetual easements for the conveyance of runoff water which originates within the area hereby platted or from upstream areas, through natural or man-made facilities above or below ground.
Outlot 'A' to the owners (Homeowner's Association) for care and maintenance as common open space.
Outlot 'B' to the City of Grand Junction for pedestrian/bicycle walkway right-of-way subject to canal access benefitting the Grand Valley Irrigation Company.
Five foot wide pedestrian/bicycle right-of-way along eastern boundary to City of Grand Junction.

All easements include the right of ingress and egress on, along, over, under, and through and across by the beneficiaries, their successors, or assigns, together with the right to trim or remove interfering trees and brush, and in Drainage and Detention/Retention easements, the right to dredge; provided, however, that the beneficiaries of said easements shall utilize the same in a reasonable and prudent manner. Furthermore, the owners of lots or tracts hereby platted shall not burden nor overburden said easements by erecting or placing any improvements thereon which may prevent reasonable ingress and egress to and from the easement.

IN WITNESS WHEREOF, said owners have caused their names to be hereunto subscribed this _____ day of _____ A.D., 19___.

_____
GVHC, Inc. Officer

STATE OF (COLORADO)
) ss
COUNTY OF MESA)
The foregoing instrument was acknowledged before me this _____ day of _____ A.D., 19___.
by GVHC, INC.

My commission expires: _____

WITNESS MY HAND AND OFFICIAL SEAL.

_____
Notary Public

CLERK AND RECORDER'S CERTIFICATE
STATE OF COLORADO)
) ss
COUNTY OF MESA)
I hereby certify that this instrument was filed in my office at _____o'clock ___.M., this _____ day of _____ A.D., 19___, and is duly recorded as Reception Number _____ in Plat Book _____ , Page _____ through _____ inclusive.

_____ _____ _____
Clerk and Recorder Deputy Fees

Covenants, Conditions and Restrictions recorded in Book _____ , Page _____ ,

CITY OF GRAND JUNCTION CERTIFICATE OF APPROVAL
Approved this _____ day of _____ A.D. 1996.

_____ _____
Mayor City Manager

SURVEYOR'S CERTIFICATE
I, Richard A. Mason, do hereby certify that the accompanying plat of VALLEY MEADOWS EAST SUB., FILING No. ONE, a subdivision of a part of the City of Grand Junction, County of Mesa, has been prepared under my direct supervision and accurately represents a field survey of the same. Also said plat conforms to all applicable survey requirements of the Zoning and Development Code of the City of Grand Junction and all applicable state laws and regulations.

_____
Richard A. Mason
Registered Professional Land Surveyor
P.L.S. No. 18469

_____
Date

NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.

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

FILE#:\VME\FINAL\SEC-TRY\FILING-1.DWG

VALLEY MEADOWS EAST SUBDIVISION FILING NO. ONE

SW1/4NE1/4 OF SEC. 3, T1S, R1W U.M., MESA COUNTY, COLORADO

Designed	ML	Checked	RAM	F1-SHT1.PLT	Sheet 1
Drawn	DAB	Date	5/30/96	6/3/96	OF 2

E:\VME\FINAL\SEC-TRY\F1-11X17 Mon Jun 3 15:25:37 1996 ROLLAND ENGINEERING

VALLEY MEADOWS EAST SUBDIVISION – FILING No. TWO

MSCM# 1122-1

MARC S. LAIRD

AFT
PATRICK L. MORAN

AFT
GEORGE R. JACHIM

MSCM# 1126

WALID BOU-MATAR

P.O.B.

IRRIGATION FACILITIES AND MAINTENANCE

10' IRRIG. & DRAINAGE EASEMENT

SEE DETAIL 'A'
196456.9 SQ.FT.

DETAIL 'A'
N.T.S.

S 87°49'54" W 0.76'
FOUND #4PD
FOUND LS10097
FOUND LS9960
S 86°06'27" W 0.5'

LOUIS J. MOTTS
R1A

ROBERT G. HUNT
R1A

BERNADINE R. WILSON
R1A

VALLEY MEADOWS SUBDIVISION
PLAT BK 14 PG 251

25 1/2 ROAD

BASIS OF BEARING

CHAMA LANE

FILING NO. 1

McCOOK AVE.

14' MULTI-PURPOSE EASEMENT

TEMPORARY TURNAROUND AREA 47' DIA. TO BE EXTINGUISHED WITH FILING THREE.

FILING NO. 2

1.15 ACRES
47207.8 SQ.FT.
COMMON OPEN SPACE

WESTWOOD DR

OUT LOT A
COMMON OPEN SPACE

OUTLOT C

OUTLOT E
FUTURE FILING THREE.

CANAL NORTH BANK

ROBERT J. WILSON

KAY SUBDIVISION
PLAT BK 14 PG 174

BRENNA WAY

(PENDING)
CIMARRON NORTH SUBDIVISION

MSCM# 559-2

NOTICE: According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event, may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.

CITY OF GRAND JUNCTION R.O.W. DEDICATED IN FILING NO. ONE.

TEMPORARYTURN AROUND AREA 47' DIA. TO BE EXTINGUISHED WITH FILING THREE.

LEGEND

- ⊕ – MESA COUNTY SURVEY MARKER
- ⊙ – SET 5/8" REBAR IN CONC–L.S. 18469
- ⊤ – SET REBAR & CAP AT LOT CORNERS– L.S. 18469
- • – FOUND REBAR AS NOTED
- ● – REBAR AND CAP–L.S. 18469

LAND USE SUMMARY

TOTAL LAND AREA:	9.84 ACRES
FILING NO. TWO AREA:	4.51 ACRES
TOTAL LOTS AREA:	2.77 ACRES
TOTAL ROAD ROW AREA:	0.59 ACRES
OPEN SPACE AREA:	1.15 ACRES
OUTLOT 'E':	5.33 ACRES
FILING NO. TWO LOTS NUMBER:	12

0' 50' 100' 150'

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

FILES\VME\FINAL\SEC-TWP\FILING-2.DWG

VALLEY MEADOWS EAST SUBDIVISION FILING NO. TWO

SW1/4NE1/4 OF SEC. 3, T1S, R1W U.M., MESA COUNTY, COLORADO

Designed	MK	Checked	RMW	22-SHEET.PLT	Sheet	2
Drawn	MAB	Date	5/30/96	6/3/96	Of	2

C:\WORK\FILING-2 Mon Jun 3 17:22:55 1996 ROLLAND ENGINEERING

BENCH MARKER
B.M. ELEVATION=4613.03
N.E. CORNER
SW 1/4 NE 1/4
SECTION 3 11S
R1W U.M.
NAVD -88 (CITY)

SUNSET VILLAGE
(MARC S LAIRD)
(2945-031-00-124)

AFT
PATRICIA L MORAN
2945-031-00-123

AFT
GEORGE R. JACHIM
2945-031-00-138

WALID BOU-MATAR
2945-032-00-174

LOUIS J. MOTTS
2945-031-00-141
R1A

ROBERT G. HUNT
2945-031-00-142
R1A

BERNADINE R. WILSON
2945-031-00-140
R1A

ROBERT J. WILSON
2945-032-00-130
AFT

APPROVED FOR CONSTRUCTION

CITY DEVELOPMENT ENGINEER

DATE

CITY UTILITY ENGINEER

DATE

ACCEPTED AS CONSTRUCTED

CITY DEVELOPMENT ENGINEER

DATE

CITY UTILITY ENGINEER

DATE

PR-2.8
VALLEY MEADOWS SUBDIVISION

25 1/2 ROAD

McCOOK AVE

WESTWOOD DR

CHAMA LANE

KAPOTA ST

FILING NO. 1

FILING NO. 2
COMMON OPEN SPACE

FILING NO. 3

FILING NO. 1 LIMIT

FILING NO. 2 LIMIT

5' TRAIL

EXISTING PROPERTY LINE

RE-ALIGNMENT OF THIS EXISTING 15" CMP AS SHOWN ON THE PLAN

GRAND VALLEY IRRIGATION CANAL RIGHT-OF-WAY
CANAL NORTH BANK

GRAND VALLEY CANAL

PR-3.8
KAY SUBDIVISION

BRENNA WAY

PR-3.6
CIMARRON NORTH SUBDIVISION

GRAND VALLEY CANAL

LEGEND

- MESA COUNTY SURVEY MONUMENT
- FILINGS BOUNDARY LINE

UTILITIES

WATER: UTE WATER
ELECTRICITY: PUBLIC SERVICE COMPANY
GAS: PUBLIC SERVICE COMPANY
CABLE TV: TCI
TELEPHONE: US WEST
IRRIGATION: GRAND VALLEY IRRIGATION COMPANY
SANITARY SEWER: CITY OF GRAND JUNCTION
FIRE: GRAND JUNCTION FIRE DEPARTMENT

ON-SITE SOIL TYPES

Bc: BILLINGS SILTY CLAY LOAM
Rf: RAVOLA LOAM
(FROM "SOIL SURVEY", GRAND JUNCTION AREA)
(COLORADO, BY: UNITED STATES DEPARTMENT)
(OF AGRICULTURE, SCS 1956)

0' 50' 100' 150'

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

FILE: C:\HMASE\UCOMP.DWG

VALLEY MEADOWS EAST SUBDIVISION

FILING 1 & FILING 2

UTILITY COMPOSITE PLAN

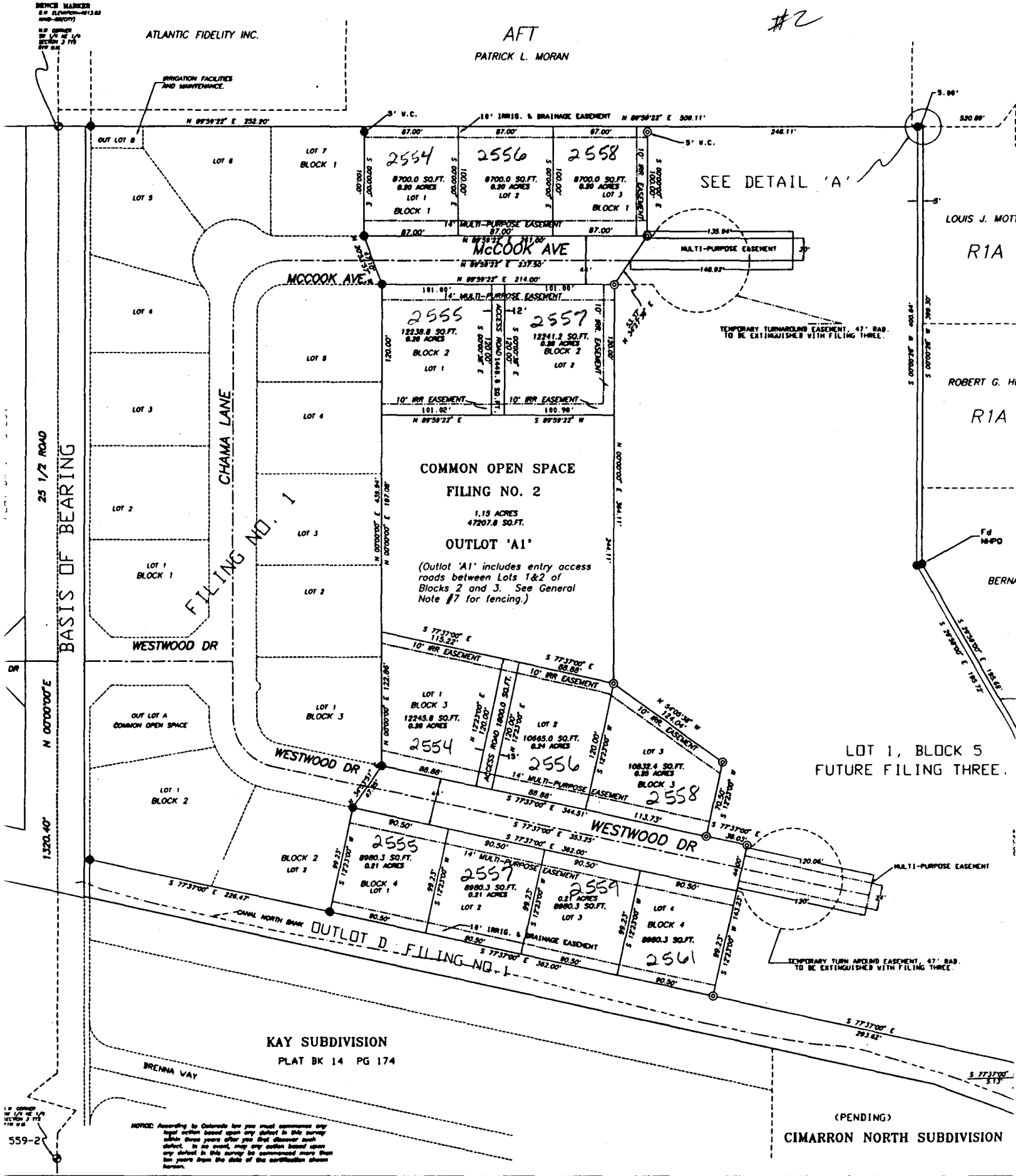
Designed	WL	Checked	TDR	UCOMP.PLT	Sheet
Drawn	WL	Date	2/28/96	3/31/96	OF

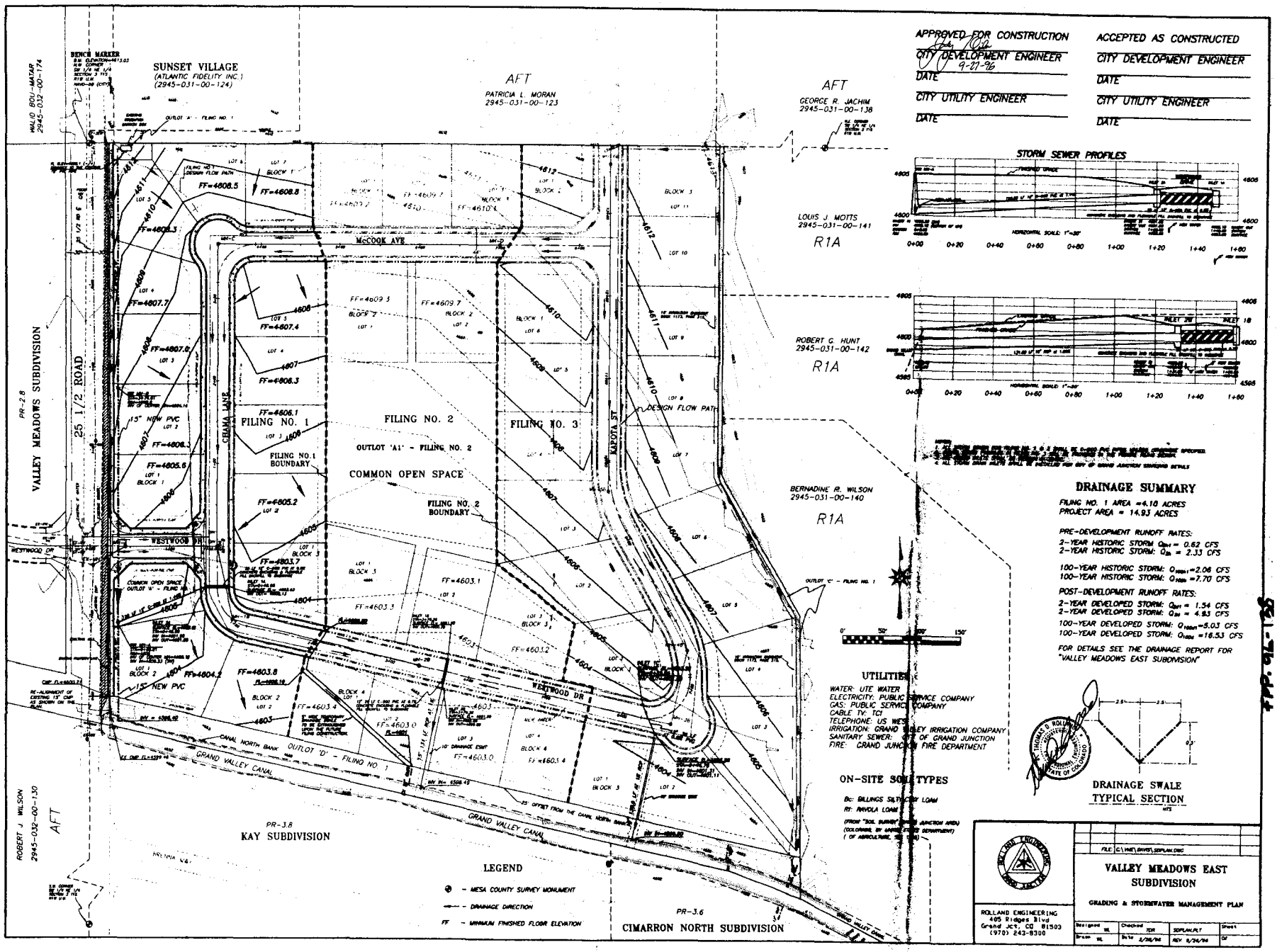
C:\HMASE\UCOMP Fri May 31 10:15:25 1996 ROLLAND ENGINEERING

FPP-1996-138

VALLEY MEADOWS EAST SUBDIVISION

#2





APPROVED FOR CONSTRUCTION
CITY DEVELOPMENT ENGINEER
9-27-96
DATE
CITY UTILITY ENGINEER
DATE

ACCEPTED AS CONSTRUCTED
CITY DEVELOPMENT ENGINEER
DATE
CITY UTILITY ENGINEER
DATE

STORM SEWER PROFILES

DRAINAGE SUMMARY

FILING NO. 1 AREA =4.18 ACRES
PROJECT AREA = 14.93 ACRES

PRE-DEVELOPMENT RUNOFF RATES:
2-YEAR HISTORIC STORM Q_{pre} = 0.62 CFS
2-YEAR HISTORIC STORM: Q_{2h} = 2.33 CFS

100-YEAR HISTORIC STORM: Q_{100h} =2.06 CFS
100-YEAR HISTORIC STORM: Q_{100h} =7.70 CFS

POST-DEVELOPMENT RUNOFF RATES:
2-YEAR DEVELOPED STORM: Q_{pre} = 1.54 CFS
2-YEAR DEVELOPED STORM: Q_{2d} = 4.83 CFS

100-YEAR DEVELOPED STORM: Q_{100d}=5.03 CFS
100-YEAR DEVELOPED STORM: Q_{100d} =18.53 CFS

FOR DETAILS SEE THE DRAINAGE REPORT FOR "VALLEY MEADOWS EAST SUBDIVISION"

UTILITIES

WATER: UTE WATER
ELECTRICITY: PUBLIC SERVICE COMPANY
GAS: PUBLIC SERVICE COMPANY
CABLE TV: TCI
TELEPHONE: US WEST
IRRIGATION: GRAND VALLEY IRRIGATION COMPANY
SANITARY SEWER: CITY OF GRAND JUNCTION
FIRE: GRAND JUNCTION FIRE DEPARTMENT

ON-SITE SOIL TYPES

Bc: BILLINGS SILTY CLAY LOAM
RY: RAVOLA LOAM
(FROM "SOIL SURVEY OF GRAND JUNCTION AREA (COLORADO), BY NATURAL RESOURCE CONSERVATION SERVICE DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE")

LEGEND

- MESA COUNTY SURVEY MONUMENT
- DRAINAGE DIRECTION
- FF = MINIMUM FINISHED FLOOR ELEVATION

DRAINAGE SWALE
TYPICAL SECTION
NTS

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

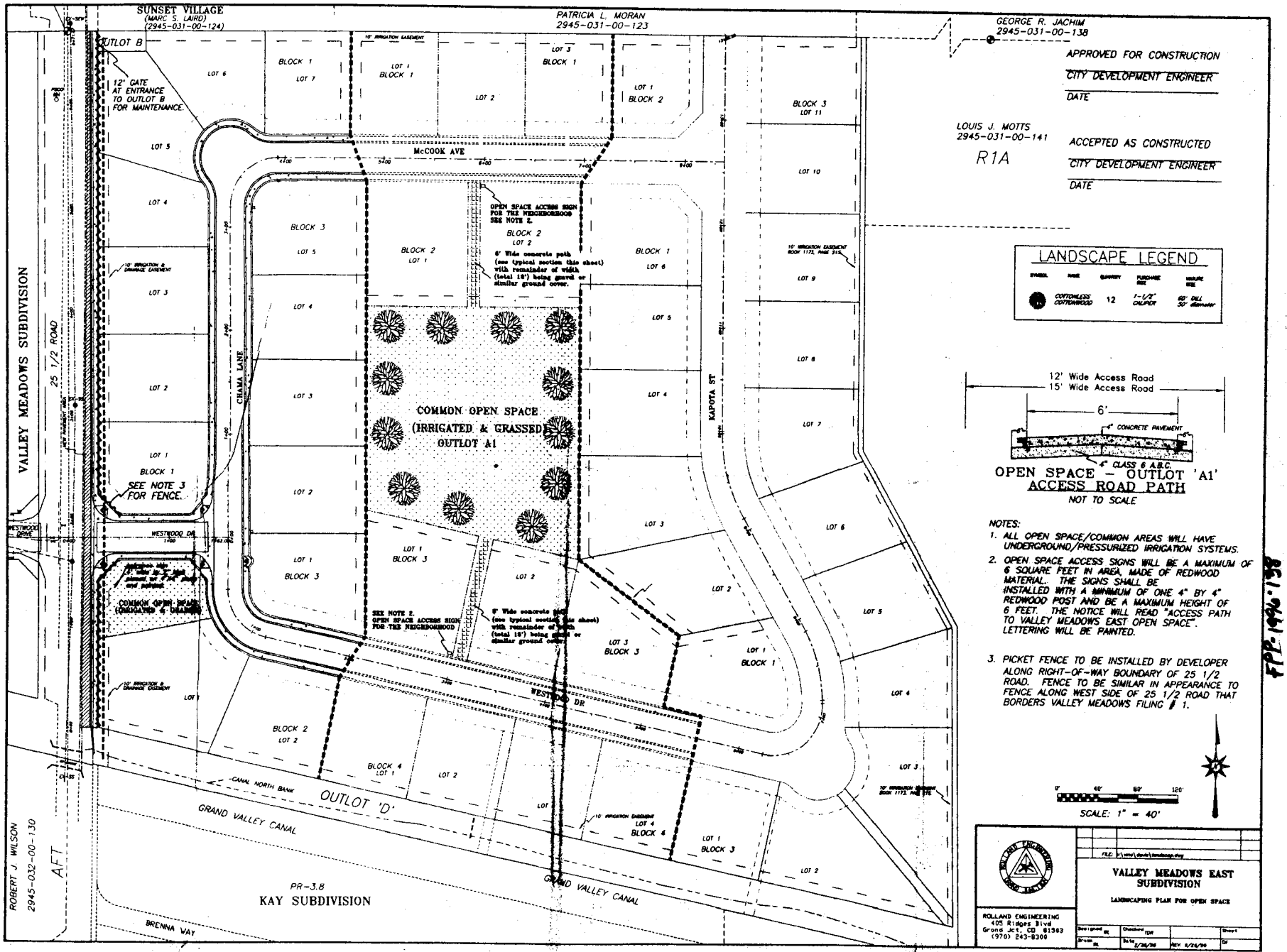
FILE: C:\VME\DWGS\SDPLAN.DWG

VALLEY MEADOWS EAST SUBDIVISION

GRADING & STORMWATER MANAGEMENT PLAN

Designed	WL	Checked	TDR	SDPLAN.PLT	Sheet
Drawn	WL	Date	8/28/96	REV 9/24/96	OF

FILE NO. FP-96-135


SUNSET VILLAGE
(MARC S. LAIRD)
(2945-031-00-124)
PATRICIA L. MORAN
2945-031-00-123
GEORGE R. JACHIM
2945-031-00-138
LOUIS J. MOTTS
2945-031-00-141
R1A
OUTLOT B
12' GATE AT ENTRANCE TO OUTLOT B FOR MAINTENANCE.
McCOOK AVE
VALLEY MEADOWS SUBDIVISION
25 1/2 ROAD
CHAMA LANE
KAPOTA ST
WESTWOOD DR
COMMON OPEN SPACE (IRRIGATED & GRASSED) OUTLOT A1
SEE NOTE 3 FOR FENCE.
OPEN SPACE ACCESS SIGN FOR THE NEIGHBORHOOD SEE NOTE 2.
6' Wide concrete path (see typical section this sheet) with remainder of width (total 15') being gravel or similar ground cover.
COMMON OPEN SPACE (IRRIGATED & GRASSED)
OUTLOT 'D'
CANAL NORTH BANK
GRAND VALLEY CANAL
ROBERT J. WILSON
2945-032-00-130
AFT
PR-3.8
KAY SUBDIVISION
BRENNA WAY
APPROVED FOR CONSTRUCTION
CITY DEVELOPMENT ENGINEER
DATE
ACCEPTED AS CONSTRUCTED
CITY DEVELOPMENT ENGINEER
DATE
LANDSCAPE LEGEND
SYMBOL
NAME
QUANTITY
PURCHASE SIZE
MATURE SIZE
COTTONLESS COTTONWOOD
12
1-1/2" CALIPER
60' TALL 30' diameter
12' Wide Access Road
15' Wide Access Road
6'
4" CONCRETE PAVEMENT
4" CLASS 6 A.B.C.
OPEN SPACE - OUTLOT 'A1'
ACCESS ROAD PATH
NOT TO SCALE
NOTES:
1. ALL OPEN SPACE/COMMON AREAS WILL HAVE UNDERGROUND/PRESSURIZED IRRIGATION SYSTEMS.
2. OPEN SPACE ACCESS SIGNS WILL BE A MAXIMUM OF 6 SQUARE FEET IN AREA, MADE OF REDWOOD MATERIAL. THE SIGNS SHALL BE INSTALLED WITH A MINIMUM OF ONE 4" BY 4" REDWOOD POST AND BE A MAXIMUM HEIGHT OF 6 FEET. THE NOTICE WILL READ "ACCESS PATH TO VALLEY MEADOWS EAST OPEN SPACE". LETTERING WILL BE PAINTED.
3. PICKET FENCE TO BE INSTALLED BY DEVELOPER ALONG RIGHT-OF-WAY BOUNDARY OF 25 1/2 ROAD. FENCE TO BE SIMILAR IN APPEARANCE TO FENCE ALONG WEST SIDE OF 25 1/2 ROAD THAT BORDERS VALLEY MEADOWS FILING # 1.
0' 40' 80' 120'
SCALE: 1" = 40'
ROLLAND ENGINEERING
405 Ridges Blvd
Grand Jct, CO 81503
(970) 243-8300
VALLEY MEADOWS EAST SUBDIVISION
LANDSCAPING PLAN FOR OPEN SPACE

FPP-1996-198