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File 1991-0047 Name: Ptarmigan Ridge - Filing 2 - Final Plat

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		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.
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		***General project report**
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X		Reduction of assessor's map.
		Evidence of title, deeds, easements
X	X	***Mailing list to adjacent property owners**
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		Reduction of any maps – final copy
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		Other bound or non-bound reports
		Traffic studies
X	X	***Petitioner's response to comments**
		***Staff Reports**
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		***Summary sheet of final conditions**

DOCUMENT DESCRIPTION:

X	X	Action Sheet - 8/6/91	X	X	Interim Drainage Study - 7/28/91
X	X	Impact Statement and Project Narrative	X	X	Subsurface Soils Exploration - 9/5/90
X	X	Planning Commission Minutes - ** - 8/6/91	X		Avigation Easement - ** - sent to City Clerk's Office for Airport file - 5/6/92
X		Legal Ad - 7/30/91	X	X	Final Plat - Filing 2
X		Notice of Public Hearing - 8/6/91	X	X	Site Plan
X		Subdivision Summary Form	X		Public Notice Posting - 8/7/91
X	X	Warranty Deed not to City - rec. 2/20/91	X	X	Drainage/Grading Plan-All maps in GIS historical files
X	X	Radiation Examination - 4/16/90	X		Road Plans and Profiles
X	X	Covenants	X		Sewer Line A, B, & C Plan & Profile
X		Treasurer's Certificate of Taxes Due - 6/27/91	X		Utility Plans
X	X	DIA - 4/28/92 - **ORIGINAL IN FILE**	X		Standard Drainage Details
X	X	Irrevocable Letter of Credit - 5/1/92 - **ORIGINAL IN FILE**	X		Standard Sanitary Sewer Details (SS-1)
X	X	Drainage Report - 5/11/92	X		Handicap Ramp Details
X	X	Correspondence	X		Standard Water Line Details/ Stand. Pavement Details
X	X	Newspaper Articles	X		Storm Drain Inlet Details (ST-3)
X		Notice of Public Hearing	X		

A

Receipt # #47 91

Date Rec. _____

Received By _____

DEVELOPMENT APPLICATION

We, the undersigned, Being the owners of property situated in Mesa County, State of Colorado, as described on the attached legal description form do hereby petition this:

Type of Petition	Sq.Ft	Phase	Common Location	Zone	Type of Usage
(●) Subdivision Plat/Plan	5.5 AC	( ) Minor (●) Major	North of 15th ST & West of 27½ Rd	RSF-4	
( ) Rezone				Frm ▷ To	
( ) Planned Development		( ) ODP ( ) Prelim ( ) Final	Do NOT Remove from Office		
( ) Conditional Use					
( ) Hwy-Oriented Development				H.O.	
( ) Text Amendment					
( ) Special Use					
( ) Vacation					( ) Right-of-way ( ) Easement

PROPERTY OWNER (●)	DEVELOPER (●)	REPRESENTATIVE (●)
PTARMIGAN INVESTMENTS INC.	JOHN SIEGFRIED	JOHN SIEGFRIED
Name	Name	Name
BOX9088	BOX 9088	BOX 9088
Address	Address	Address
GRAND JUNCTION CO 81501	GRAND JUNCTION CO 81501	GRAND JUNCTION CO 81501
City/State	City/State	City/State
(303)241-7025	(303) 241-7025	(303)241-7025
Business Phone #	Business Phone #	Business Phone #

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 & COMPLETE TO THE BEST OF OUR KNOWLEDGE, AND THAT WE ASSUME THE RESPONSIBILITY TO MONITOR THE STATUS OF THE APPLICATION AND THE REVIEW SHEET COMMENTS. WE RECOGNIZE THAT WE OURSELVES, OR OUR REPRESENTATIVE(s) MUST BE PRESENT AT ALL 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 RE-SCHEDULING EXPENSES BEFORE IT CAN AGAIN BE PLACED ON THE AGENDA.

X _____ June 27 91

Signature of person completing application — Date

X _____ " "

X _____ " "

Signature of property owner(s) - attach additional sheets if necessary

#47 91

B

IMPACT STATEMENT AND PROJECT NARRATIVE

PTARMIGAN RIDGE FILING 2

Ptarmigan Ridge is located on 26 acres bounded on the south by North 15th Street and Ridge Drive. It also touches 27 1/2 Road to the east. Both of these boundaries provide access to collector streets while other traffic flows will be internal.

From a design standpoint, the development consists of two separate types of development--Bell Ridge Subdivision blocks 4 and 5, are an extension and completion of an existing neighborhood, Bell Ridge Subdivision. Ptarmigan Ridge is a separate and planned neighborhood which reflects a more rural setting. Filing 2 is a continuation of that neighborhood.

Ptarmigan Ridge is scheduled for development over a three year period that commenced in the fall 1990. It is anticipated that phases consisting of 25 to 30 lots per phase will be developed on an annual basis. First phases logically will be those areas closest to 27 1/2 Road and North 15th where it ends. Filing 2 will consist of 16 lots with development to commence in the fall of 1991. Street and sidewalk design has been reconfigured to conform to proposed City standards. The phases will use Ute water and City of Grand Junction services, as well as Grand Valley Water User's irrigation.

Ptarmigan Ridge Filing 2 is a development planned for a density of approximately 2.8 homes per acre, within an area zoned to permit four units per acre.

Ptarmigan can presently be served by Ute water from the northeast and southwest road frontage and city sewer is available at 15th Street. Irrigation water is available from Grand Valley Water User's Association, and should be adequate.

Part of Ptarmigan lies within the critical zone of Walker Field and an aviation easement will provided.

An approximately one acre parcel which is quite linear lies next to Ptarmigan's southeast boundary and it is proposed that upon final plat a piece of land will be deeded to this neighbor in order to provide an additional access for two lots should the neighbor wish to subdivide this lot in the future. This is addressed in the current Filing 2 final plat and provides maximum future use of the neighbor's property.

O DEVELOPMENT SCHEDULE

Construction will commence in the fall of 1991 and be completed in the fall of 1991 or by spring of 1992.

Q SITE PLAN

Standard Grand Junction setbacks will apply to these lots. The only antcipated landscaping is along the drainage on the southeast corner of the subdivision for screening. Native plants with minimum water requirements will be used, and this will encouraged.

R

Adjacent land use and zoning is indicated on the site plan.

U LANDSCAPING

Individual landscaping of lots will be done by the lot-owners. There will be no common area landscaping in Filing 2.

#47 91

X,Y TRAFFIC ANALYSIS

Ten car trips per day per household, or 160 trips per day will be generated by Filing 2, rather than the maximum of 220 trips per day which present zoning allows.

All cul-de-sacs entering into Ptarmigan Ridge Road shall have stop signs. There will also be a stop sign installed on South Ptarmigan Ridge Road where it becomes North 15th Street.

Street signage and lighting will be installed to present city standards.

A temporary cul-de-sac will not be necessary because the cul-de-sac on Ptarmigan Court will serve this purpose.

On Ptarmigan Lane, the driveway to lots 2 and 3 will serve as potential turnarounds until a cul-de-sac is developed to serve the adjacent property.

C

SUBDIVISION SUMMARY FORM

#47 91

City of Grand Junction

TYPE OF SUBMISSION

Preliminary Plan _____
Final Plat/Plan _____

Subdivision Name: Ptarmigan Ridge Filing #2

Location of Subdivision: TOWNSHIP 1 S. RANGE 1 W. SECTION 1 1/4 N.W.

Type of Subdivision	Number of Dwelling Units	Area (Acres)	% of Total Area
(X) SINGLE FAMILY	16	4.4	79%
( ) APARTMENTS			
( ) CONDOMINIUMS			
( ) MOBILE HOME			
( ) COMMERCIAL	N.A.		
( ) INDUSTRIAL	N.A.		
Street		1.156	21%
Walkways			
Dedicated School Sites			
Reserved School Sites			
Dedicated Park Sites			
Reserved Park Sites			
Private Open Areas			
Easements			
Other (specify)			
		.69	12%

Estimated Water Requirements 5,440 (16 x 340) gallons/day.

Proposed Water Source Ute water or City of Grd. Jct.

Estimated Sewage Disposal Requirement 4,400 (16 x 275) gallons/day.

Proposed Means of Sewage Disposal City of Grd. Jct.

Onion Hill Ltd.
Box 2188
Grand Junction, CO 81502

Nelia G. Henderson
671 Eastcliff Dr.
Grand Junction, CO 81506

Beverly A. Whitney
660 Eastcliff Dr.
Grand Junction, CO 81506

First United Presbyterian Church
622 White
Grand Junction, CO 81502

Elmer L. Moore
658 Eastcliff Dr.
Grand Junction, CO 81506

Victor J. Trenn
2715 Midway Ave.
Grand Junction, CO 81506

Emanuel Epstein
1900 Quentin Road
Brooklyn, NY 11229

Conrad G. Pyle
674 Eastcliff Dr.
Grand Junction, CO 81506

David H. Schoening
653 Eastcliff Dr.
Grand Junction, CO 81506

Jimmie L. Etter
697 27½ Road
Grand Junction, CO 81501

Edgar W. Foy
664 Eastcliff Dr.
Grand Junction, CO 81506

Vera M. Hutchinson
2714 F½ Rd.
Grand Junction, CO 81506

Frank L. Webber
669 E. Cliff Dr.
Grand Junction, CO 81506

J.D. Walters
666 Eastcliff Dr.
Grand Junction, CO 81506

Andrew F. Wilhelm
652 Eastcliff Dr.
Grand Junction, CO 81506

John T. Daniels
665 Eastcliff Dr.
Grand Junction, CO 81506

Rodney H. Wright
668 Eastcliff Dr.
Grand Junction, Co 81506

James D. Cihlar
654 Eastcliff Dr.
Grand Junction, CO 81506

Kevin E. Tiedeman
663 Eastcliff Dr.
Grand Junction, CO 81506

Michael D. Peterson
670 Eastcliff Dr.
Grand Junction, CO 81506

Louise C. Scalzo
656 Eastcliff Dr.
Grand Junction, CO 81506

Dennis A. Cotthaus
661 Eastcliff Dr.
Grand Junction, CO 81506

Marguerite McGinn
672 Eastcliff Dr.
Grand Junction, CO 81506

Alton B. Crisman
1819 Ridge Dr.
Grand Junction, CO 81506

Michael D. McCoin
2716 Midway Ave.
Grand Junction, CO 81506

J.D. Walters
662 Eastcliff Dr.
Grand Junction, Co 81506

George E. Mead
1805 Ridge Dr.
Grand Junction, CO 81506

Thomas N. Kriegshauser
673 Eastcliff Dr.
Grand Junction, CO 81506

Ronald W. Rozga
1741 Ridge Dr.
Grand Junction, CO 81506

Louis G. Morton,Jr.
1753 Ridge Dr.
Grand Junction, CO 81506

H

#47 91

Steven P. Lopez 1716 Bellridge Ct. Grand Junction, CO 81506	Marjory E. Spomer 1720 Ridge Dr. Grand Junction, CO 81506	Louis A. Frassetti 3621 Bell Ct. Grand Junction, CO 81506
Walter Bergman 1754 Bellridge Ct. Grand Junction, CO 81506	Volney C. Coleman 1820 Ridge Dr. Grand Junction, CO 81506	Maurice G. Becker 1806 Ridge Ct. Grand Junction, CO 81506
John O. Lancaster P. O. Box 2869 Page, AZ 86040	Mabel Brownson 3620 Bell Ct. Grand Junction, CO 81506	Thomas R. Jeys, Jr. 646 27¼ Rd. Grand Junction, CO 81506
Kenneth E. Gregory 1820 Bellridge Ct. Grand Junction, CO 81506	Ione O'Brien 3636 Bell Ct. Grand Junction, CO 81506	C. Peterson - L.R. Trust 647 27 ¼ Rd. Grand Junction, CO 81506
Laureece M. Turner 1739 Bellridge Ct. Grand Junction, CO 81506	Daniel Sullivan 3644 Bell Ct. Grand Junction, CO 81506	Spomer Construction Company 1720 Ridge Dr. Grand Junction, CO 81506
Douglas A. Alexander 1729 Bellridge Ct. Grand Junction, CO 81506	Howard A. Rudolph 3648 Bell Court Grand Junction, CO 81506	Margaret D. Eachus 652 27¼ Rd. Grand Junction, CO 81506
Mary B. Graham P. O. Box 1273 Grand Junction, CO 81506	Spomer Construction Company 1720 Ridge Dr. Grand Junction, CO 81506	Earl H. Davis P. O. Box 2783 Grand Junction, CO 81502
Wilbur Warden Lydia Family Trust 1730 Ridge Dr. Grand Junction, CO 81506	Gregory A. Guth 3150 Lakeside Dr. #309 Grand Junction, CO 81506	Andrew Christensen Family Ltd. Partnership 2669 Paradise Dr. Grand Junction, CO 81506
Kenneth Fallert 667 East Cliff Dr. Grand Junction, CO 81506	Ralph and Donna Ham 8513 W. Center Ave. Lakewood, CO 80226	Kenneth J. Kleinwachter 500 Pinyon Ave. Grand Junction, CO 81501

H

Dwain McClellan
3321 C Road
Grand Junction, CO 81520

Marvin and Leta Higginson
534 E. Valley Dr.
Grand Junction, CO 81504

Donna A. Hefner
409 W. Kennedy Apt. 1
Grand Junction, CO 81505

Rufus and Florence Joney
646½ Oxbow Road
Grand Junction, CO 81504

Danny Scott Edwards and
Cynthia Lee
487 Fruitwood Dr.
Grand Junction, CO 81504

Thomas and Son
321 Quail Dr.
Grand Junction, CO 81503

James D. West
743 Horizon Court
Grand Junction, CO 81506

#47 91

K

RADIATION EXAMINATION

PTARMIGAN SUBDIVISION

Mesa County, Colorado
April 16, 1990

The proposed Ptarmigan Subdivision, being developed by Ptarmigan Investments Inc., P.O. Box 9088, Grand Junction, CO 81501, was examined for potential radiation hazard. The property is located in a portion of Section 1, T 1 S, R 1 W, Ute P.M. in Mesa County, Colorado. Conditions at the site at the time of this investigation indicate the site is free of radiation hazard.

The examination of the site was carried out according to the requirements of Colorado SB 35, and of local regulations which require radiation examinations for proposed subdivisions. The field examination was carried out in conjunction with the foregoing geologic field investigation, using a Urinco Scintillation Counter Model #720N. The surface was thoroughly traversed on foot and the man-made structures and accumulations of debris were checked. Background radiation was 50 counts per second, +/- 10cps. No where on the property was found a reading higher than background.

As all readings were well below Colorado Health Department standards of 250 counts per second, there is no apparent reason for more detailed radiation survey work.

John H. Wright
Certified Professional Geologist

#47 91

REVIEW SHEET SUMMARY

FILE NO. 47-91 **TITLE HEADING: FINAL PLAT**

ACTIVITY: Request for a Final Plat of Ptarmigan Ridge Filing 2

PETITIONER: Ptarmigan Investments Inc.

LOCATION: W 27-1/2 Rd/S of Horizon Dr and N of 15th St

ENGINEER: John Siegfried

STAFF REPRESENTATIVE: Kathy Portner 303-244-1446

NOTE: WRITTEN RESPONSE BY THE PETITIONER TO THE REVIEW COMMENTS IS REQUIRED.

Community Development 7/24/91
Kathy Portner 244-1446

See attached comments.

Grand Valley Rural Electric 7/12/91
C. Mitish

Not in Grand Valley Power area & no GVP lines distribution or transmission involved.

Police Department 7/10/91
Capt H.L. Gorby

The calls for service load of the Police Department has reached the point any annexation will require additional patrol personnel. (This will be addressed in 1992 budget)

City Parks and Recreation 7/5/91
Don Hobbs

Open space fee based on 16 units at $225.00 per unit = $3,600.00 due.

County Engineering 7/9/91
Jaci Gould

No objections.

City Fire Department 7/19/91
George Bennett 244-1400

We have no problem with this submittal at this time. Please contact our office with information our about your plans to continue and loop the water line.

City Utility Engineer 7/8/91
Bill Cheney 244-1590

1. Change "sewer note 3" to reflect city specifications for encasements.
2. Sewer service for Lot 6 at Sta. 5+06 needs to be relocated south of manhole #2.
3. Stub sewer line from manhole #2 out from beneath asphalt for future construction. Approximately 42' required from center of manhole.
4. Change MH #4 to MH #3 on Line "B" profile.
5. Water line in Ptarmigan Lane shall be 6" or greater in diameter if a fire hydrant will be installed on the extension of this line at a later date.
6. Reference water and sewer lines with bearings and distance or offsets to established property lines so contractor knows where to construct utilities.
7. Show location of bench mark as it relates to proposed sewer lines. Bench mark as indicated is 1/4 mile away from the project. For purposes of construction a closer reference point is needed.
8. All property pins and radius points must be set and the street cut to subgrade before water and sewer can be installed.

Improvements Agreement
1. Justification for unit costs on utilities by developer will be required before costs as provided can be accepted or approved.

Ute Water 7/9/91
Gary R. Matthews

1. The 8" water main on Ptarmigan Ridge Road must be 2 to 3 feet from the curb and gutter.

Public Service Co. 7/11/91
Carl Barnkow

Gas: No objections Filing 2.
Electric: Additional utility easements requested as indicated in red.

U.S. West 7/15/91
Leon Peach

New or additional telephone facilities necessitated by this project may result in a "contract" and up-front monies required from developer, prior to ordering or placing of said facilities.

City Property Agent 7/19/91
Tim Woodmansee

This plat constitutes a portion of lot 1 of Spomer subdivision. Can a split of a previously subdivided tract be made without renaming or resubdividing the balance?

The utility plan shows an easement along the northern boundary of Lot 1, Block 2 which is not shown on the plat.

There are bearing and distance discrepancies on the plat. Please recheck all dimensions.

City Engineer 7/17/91
J. Don Newton

Drainage and Grading Plan is incomplete. No drainage report was submitted. Proposed grading plan shows drainage across lot lines. Drainage from each lot should be directed to a street or drainage easement. Is the proposed "pond" to be used for detention of storm drainage? No details are shown for inlet and outlet controls. On-site detention volume shall be calculated based on the Modified Rational Method (APWA Special Report No. 49) or other approved method.

Road plans are incomplete due to missing information and inadequate details.

A street light will be required at each intersection (3 total required). No drainage improvements are shown on the Improvements Agreement.

Half street improvements will be required for Ridge Drive adjacent to Lot 1. This street will eventually be extended to 12th Street.

Submit details for proposed turnaround on Ptarmigan Lane. This turnaround should accommodate a fire truck within the public right-of-way.

A speed limit sign (20 mph) will be required on Ptarmigan Ridge Road.

A barricade may be required at the end of Ptarmigan Lane if a cul-de-sac is not required.

Walker Field 7/18/91
M. Sutherland

No opposition to this development. It is located within the Airport Area of Influence and will require that an Avigation Easement be recorded with the Clerk and Recorder of Mesa County at the time of plat recording.

The developer acknowledged this requirement in the project narrative. Please ensure that the document is recorded and a (recorded) copy is sent to Walker Field in a timely manner.

Grand Valley Water Users 7/19/91
G.W. Klapwyk

See attached comments.

No Comments received from the following review agencies:

City Attorney
U.S. Postal Service
Transportation Engineer

Community Development 7/24/91
Kathy Portner

The proposal is for a final plat of Ptarmigan Ridge Filing 2 located north of Ridge Drive and west of 27 1/2 Road. The current zoning of the property is RSF-4. Filing 2 consists of 16 single family lots on 4.4 acres for an overall density of 3.6 units per acre.

The proposed development is compatible with the surrounding neighborhood.

The property is within Walker Field Airport's Area of Influence Zone. Low density development (less than 4 units/acre) is listed as a compatible use in that zone (section 5-11-3.A.4 in the Zoning and Development Code). An Avigation Easement will be required to be recorded with the plat.

The soils report notes a potential for perched water table conditions created by irrigation and roof runoff. The design and construction of all improvements should take that into account. Because of the possibility of varying soil conditions, open excavation observation should be performed by a soils engineer prior to placing forms or pouring concrete. The site drainage recommendations and foundation recommendations made in the Lincoln-DeVore, Inc. soils report (dated Sept. 5, 1990) should be followed for site specific construction.

An acceptable drainage plan and report must be completed for Filing 2, addressing overall drainage as well as drainage and grading of each lot. The report should specifically address the affects of the proposed subdivision drainage on the adjoining properties. All lot drainage must be directed to the street or drainage easement.

A temporary cul-de-sac or other acceptable turn-around must be provided at the end of Ptarmigan Lane.

The areas of all irregularly-shaped lots must be shown (section 6-8-2.A.1.l).

The easements along the east and south boundaries of Block One must be labelled.

All streets must be named in accordance with section 5-3-4 of the Zoning and Development Code. Therefore, the proposed Ptarmigan Ridge Road must be 15th Street since it is an extension of 15th Street. Ptarmigan Lane must be designated as a Court since it is doubtful it will ever go through. It could be called South Ptarmigan Court. The cul-de-sac to the north could then be called North Ptarmigan Court.

The grading and drainage plan as required by Community Development and the City Engineer and the road plans, including a turn-around at the end of Ptarmigan Lane, must be submitted for City review by July 30, 1991. All other review agency comments must be addressed in writing by August 2, 1991.

G.V. Water Users

Ptarmigan Ridge Filing 2

(A) As stated by the narrative, irrigation water is available from Grand Valley Water Users' Association, however its "adequacy" is dependent upon the irrigation distribution system installed within the subdivision and the management of that system and the water available to it. The Association will deliver the subdivision's allotted water to the established point of delivery on a continuous flow basis, from which point it will be distributed by others. Assessment for such water will go to a single entity, either the developer, the homeowners association, etc. (See comments submitted to City Planning Department in June and July 1990 on Ptarmigan-File No. 25-90.)

(B) There are a number of questions unaddressed regarding the drainage channel flowing through or along Blocks # 2 and 3 of this filing #2, continuing northeasterly thru Ptarmigan to the channels origination in the adjacent Christenson property. A comprehensive plan regarding perpetual maintenance of the drainage channel should be provided. Diligent and adequate future maintenance of the channel is critical, in as much as its function or lack thereof, has the potential to benefit or harm the entire area. Return-flow and storm run-off water in the amount of several cubic feet per second can enter the channel at its upper end near the intersection of Courtland and 27 1/2 Road. In addition, seepage and run-off water can and does enter it from the Christenson property and from Ptarmigan all the way to 15th Street and Ridge Drive. Channels such as this do not remain functional unless given the attention needed to move sizeable flows of water when required and to keep the water table from rising in its vicinity. Indications are that the water table is quite high near the channel in Blocks 2 and 3 at this time, without further deterioration of channel flow conditions. Also, less than optimum flow conditions create many complaints in suburban areas due to safety concerns for pets and small children and insect and mosquito infestation that can stem therefrom.

This channel has the potential to affect too many people to allow its welfare to rest only in the hands of the owners of the lots through which it passes. To be effective, it must be adequately and uniformly maintained throughout Ptarmigan and this by no means is assured when left to individual lot owners. Typically, a 15' drainage easement as proposed, is not adequate for upkeep of a channel such as this one and unless a

comprehensive, workman-like channel maintenance plan is developed that can function within the proposed 15' drainage easement, such easement width must be considered too restricting.

An alternative to the open drain, is a properly designed and covered piped drain, which could eliminate many of the problems associated with the open channel, but would still require an easement and someone to be responsible for any future problems that might occur with it.

Based on numerous similar instances, if this drainage channel matter is not resolved at the suburban development stage, it will, in the future, almost assuredly be a problem for residents of the area and local government.

G. W. Klapwyk - 7/9/91

G. W. Klapwyk - Manager
Grand Valley Water Users' Association

FF — ACTION SHEET

CITY OF GRAND JUNCTION COLORADO

FINAL

Original Do NOT Remove From Office

ACRES 5.558 AC

UNITS 16

DENSITY 2.8

FILE NUMBER 47-91

ZONE RSF-4

TAX SCHEDULE # 2945-012-00-001 ~~-053~~ ~~-044~~ 096

ACTIVITY Final Plat on Filing 2

PHASE Final

COMMON LOCATION W. of 27 1/2 Rd / South of Horizon Dr. / North of 15th St.

DATE SUBMITTED ______ DATE MAILED OUT ______ DATE POSTED ______

______ DAY REVIEW PERIOD RETURN BY ______

OPEN SPACE DEDICATION (acreage) ______ OPEN SPACE FEE REQUIRED $ ______ PAID RECEIPT # ______

RECORDING FEE REQUIRED $ ______ PAID (Date) ______ DATE RECORDED ______

REVIEW AGENCIES

Columns: A Applic. · B Narr. · C Summary Form · D (crossed out) · E Legal Evid. Title · F (struck) · G Legal · H Adjacent Prop. · I (crossed out) · J (crossed out) · K Gamma · L Subsurf. Soils · M Imp. Agree. · N Imp. Guarantee · O Dev. Sched. · P Plat · Q Site Plan · R Adj. Land Use · S Drainage/Grad. · T Util. Ties · U Landscaping · V (crossed out) · W Roadway Plan · X Traffic Circ. · Y Traffic Analysis · Z (crossed out) · AA (crossed out) · BB Assr Map · CC Reduct. Assr Map · DD Reduct. of Plan · EE Reduct. of Plat · FF Action Sheet · GG Co. Treas. Tax Cert.

Agency	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	GG
Planning Department	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
City Engineer	●	●	●						●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●				
Transportation Engineer	●	●	●										●	●	●	●	●	●	●	●	●	●	●	●	●	●			●				
City Parks/Recreation	●	●	●	●									●	●	●	●	●	●	●		●	●				●			●				
City Fire Department	●	●	●										●	●	●	●	●	●	●	●	●	●	●	●	●	●			●				
City Police Department	●	●	●												●	●	●	●			●	●				●			●				
County Planning	●	●	●										●	●	●	●	●	●	●	●	●	●				●			●				
County Engineer	●	●	●										●	●	●	●	●	●	●	●	●	●	●	●	●	●			●				
County Health	●	●	●							●	●		●	●	●	●	●	●	●		●	●				●			●				
Floodplain Administration	●	●	●						●				●	●	●	●	●	●	●		●	●				●			●				
G.J. Dept. of Energy	●	●	●										●	●	●	●	●	●	●		●	●				●			●				
Walker Field	●	●	●										●	●	●	●	●	●	●		●	●				●			●				
School District	●	●	●										●	●	●	●	●	●	●		●	●				●			●				
Irrigation } G.V. Water Users	●	●	●										●	●	●	●	●	●	●	●	●	●				●			●				
Drainage }	●	●	●										●	●	●	●	●	●	●	●	●	●				●			●				
Water (Ute, Clifton)	●	●	●										●	●	●	●	●	●	●	●	●	●				●			●				
Sewer Dist. (FV, CGV, OM)	●	●	●										●	●	●	●	●	●	●	●	●	●				●			●				
U.S. West	●	●	●										●	●	●	●	●	●	●	●	●	●				●			●				
Public Service (2 sets)	●	●	●										●	●	●	●	●	●	●	●	●	●				●			●				
State Highway Department	●	●	●										●	●	●	●	●	●	●		●	●				●			●				
State Geological	●	●	●							●	●		●	●	●	●	●	●	●		●	●				●			●				
State Health Department	●	●	●										●	●	●	●	●	●	●		●	●				●			●				
City Property Agent	●	●	●										●	●	●	●	●	●	●	●		●	●			●			●				
City Utilities Engineer	●	●	●										●	●	●	●	●	●	●	●		●	●			●			●				
City Attorney	●	●	●		●	●							●	●	●	●	●	●								●			●				
Building Department	●	●	●									●			●		●	●				●				●			●	●	●		
DDA	●	●	●												●														●	●	●		
GJPC (7 packets)	●	●	●												●			●			●	●			●	●			●				
CIC (11 packets)	●	●	●												●			●			●	●				●			●	●	●		
Other G.V. Rural Electric	●	●	●												●	●	●	●								●			●	●	●		
POST OFFICE	•	•	•												•	•	•	•								•			•	•	•		
TOTALS																																	

BOARDS	DATE	
PC	8/6/91	Approve subject to staff review & recommendations dated Aug. 5, 1991 (7-0)

STAFF

APPLICATION FEE REQUIREMENTS

$225.00 + 5.00 per lot — 16 lots = $80 — Total $305.00

GRAND JUNCTION planning

DEVELOPMENT FILE 47-91, PTARMIGAN RIDGE FILING 2, LOCATED NORTH OF 15TH STREET AND WEST OF 27-1/2 ROAD IN THE CITY OF GRAND JUNCTION HAS BEEN REVIEWED AND APPROVED BY THE UTILITY COORDINATING COMMITTEE.

CHAIRMAN John L. Ballagh DATE August 14, 1991

City of Grand Junction, Colorado
81501-2668
250 North Fifth Street

REVIEW COMMENTS

May 11, 1992

Robert Coburn
Q.E.D. Surveying
1018 Colorado Avenue
Grand Junction, CO 81501

Re: Ptarmigan Ridge Filing #2

Dear Mr. Coburn:

The following is our review comments for the most recent submittal for Ptarmigan Ridge.

Drainage Report

1. Time of concentrations are provided with no documentation as to method, procedures, or parameters used to obtain the values. These must be provided in the report.

2. The method used to determine required detention volume is not:

   a) Identified as to source;
   b) Discussed as to the applicability in meeting City required detention, which is to prevent an increase in the ten-year runoff due to development;
   c) The method as presented does not prevent an increase in runoff due to development in the ten-year storm as required;
   d) The report acknowledges that the pond fills in 8 minutes and although no calculations are provided to support that. The 8 minutes does coincide with other hydrologic data provided in the report. However, the report also indicates that the time of concentration for the storm is 9 minutes, which

indirectly indicates that the pond is not meeting the requirement to reduce peak runoff;

e) Computer or hand methods may be used to size detention facilities, however the developed ten-year storm peak runoff shall not exceed the historic ten-year runoff rate; and

f) Attached is a copy of a simple method which may be used in sizing retention or detention facilities.

3. Basin A, having an undocumented time of concentration of 12 minutes, has a peak ten-year runoff of 7.9 CFS. Flow from ten-year events may not top the curb; therefore, outfalls, catch basin inlets and piping, or higher curbing may be required to maintain flow depths below the curb levels. Use modified Manning equation calculations to show adequacy of the design. All calculations and documentation are to be provided in the report. All runoff in the ten-year storm event from Basin A that does not overtop the road crown to the east side must be conveyed in the concrete valley pan to the detention pond. The 100-year depth of flow in the gutter shall not exceed 1.0 feet due to runoff from Basin A or backwater from other areas. Facility designs must accommodate this criteria in calculations, and documentation must be provided.

4. In Section 3 of the drainage report under "Basin A", the narrative indicates that 7.0 CFS will flow into the pond. This should be revised to read 6.9 CFS per previous calculations and narrative.

5. The inlet provided to intercept Basin C runoff should be capable of intercepting at least 2.3 CFS; however, the report indicates that the inlet should be capable of intercepting 4.1 CFS, allowing the 1.8 CFS detention requirement being taken from Basin A runoff. Please provide inlet interception calculations in the report to show the inlet interception rate in conformance with the overall detention conveyance requirements.

6. Frequently, there is an absence of definition in the report regarding the storm intensity of calculations presented. For example, the calculations in Section 2 should identify that they are for a ten-year storm event. In Section 3 under Basin C, the 4.1 CFS should be identified as a peak runoff from a ten-year event. Be careful to always identify the storm event at these and other places in the report.

7. The 18 inch culvert crossing from the inlet is shown as a 15" on the road plan and profiles drawing.

8. Culvert hydraulics are generally governed by inlet or outlet control, not pipe hydraulics; therefore, use of the Manning equation is inappropriate. The Federal Highway Administration procedures as provided in HDS-5 shall be used in culvert design. Both inlet and outlet control shall be checked for each culvert and

calculations and design sheets provided with the report.

9. Use of procedures discussed in 8 above will indicate that the north and south culverts are undersized. More culverts, lower weirs, or revised floodplain delineations are required. Various options were discussed in our meeting held May 6, 1992, but solution selection is up to the developer's engineer. However, full support of calculations of culvert, weir, and ponding information must be provided in the report.

10. The future overflow point elevation on Ridge Drive is 4705.7, which is the crown elevation of a full street cross-section and the low point of Ridge Drive. Weir overflow calculations must be based upon the future criteria, not on the temporary situation with only a partially constructed street.

12. Hydrologic and hydraulic calculations must be presented in the report. They need not be typed and may be included in the Appendix, but they must be complete and organized. Anything less than this which is presented for review in the future will be rejected as unacceptable and will be returned without review.

Drainage and Grading Plan

1. Detention pond capacity is inadequate as previously mentioned.

2. The bottom of the detention pond shall have the minimum of 1% grade to the outlet.

3. The one to one side slopes are very steep. They are not conducive to maintenance. Although the pond is private and must be maintained by the property owners' association, the ability to maintain and upkeep the pond must be considered. Also, a maintenance agreement must be provided to the City.

4. The pond must be on a common open space area or detention pond or drainage easement or tract. As currently proposed, it is located on lot 1 outside of an easement.

5. The design invert grade of the 18 inch RCP at the catch basin inlet is 4703.4. The crown would be at 4704.9 and the top of pipe (not at bells) at 4705.2. The design gutter flowline is at 4705.4. How is the design going to accommodate:

   a) Pipe strength loading. Use the .01 inch crack method commonly used with concrete pipe, HS-20 loading. Although, usually a safety factor of 1.0 is used, due to the extreme shallow cover and considering construction stresses and long-term impact factors, use a safety factor of 1.8 for cover less than 0.5 feet and 1.6 for cover between 0.5 and 1.0 feet is required. Identify existing pipe and bedding class, backfill material weight, K-ratio, and coefficient of sliding friction. Also provide the "D" loading;

b) Gutter and catch basin reinforcement over the pipe to prevent cracking;

c) Differential settling of pavement over the pipe and adjacent to it; and
d) As-built grades of the pipe if it is not lowered.

6. Plans show the maximum depth of water ponding in roadway as 0.7 feet. Provide calculations in the drainage report to support ponding depths and indicate storm intensity. It appears upon review that depths more closely approach 0.95 feet. Please be aware that we will not accept more than 1.0 feet of ponded water in the streets for storm intensities of 100-year or less.

7. The 100-year floodplain delineation is not correct per current design. Revise as necessary pending new culvert design.

8. The procedure of showing floodplain delineation on the covenants, codes, and restrictions as opposed to on the final plat is acceptable.

9. An adjacent contiguous retention, detention, irrigation, and utility easement is shown. Please provide a copy of the document providing such easement as required by the City Development Code.

10. Show how drainage from Ptarmigan Court South will be conveyed to the drainage channel and what is provided for erosion control. Provide conveyance capacity calculations as necessary.

11. The plans specified a red valve to prevent reverse flow. Red Valve is a company that provides many types of valves. The Red Valve flexible flap gate that would be appropriate is a Tide Flex. Also specify that it shall be installed on the channel end of the pipe.

12. The Drainage and Grading plan needs to be signed and sealed by a registered engineer.

Plat and C.C.&R.'s

1. In conjunction with the information provided above, it may be necessary to revise the C.C.&R.'sto provide for changed 100-year floodplain limits pending the new culvert design.

2. Given the information provided above, it will likely be necessary to amend the plat to provide for an easement or tract or open space area for the detention pond. The same information was provided to the developer's engineer several weeks ago during a meeting held at City Hall.

PR2ROAD DRAWING

1. The driveover curb, gutter, and sidewalk detail shown should be labeled not as typical, but applicable to all roads except Ridge Drive.

2. The driveover curb, gutter, and sidewalk detail shown provides limited conveyance capacity of stormwater runoff as previously discussed. We recommend consideration of the new City standard which provides greater capacity.

3. At the intersection of Ptarmigan Court South and North 15th Street, currently the center line profile of Ptarmigan Court South intersects with the centerline elevation of North 15th Street causing a decrease in North 15th Street cross slope throughout the entire half street width. Although not required for this particular job, it would be recommended to continue the 1.5 percent cross street slope from North 15th Street centerline to the east for one lane width, or 12 feet, before changing the grade to match the centerline grade of Ptarmigan Court South.

4. The profile of North 15th Street must be labeled.

5. In the profile of North 15th Street, there is a typo at 5+01.77. "CPURT" should read Court.

6. The pipe from the inlet is labeled on the plan and profile as a 15". This does not correspond to all other places where the pipe is labeled as an 18" pipe.

7. Within the Ridge Drive right-of-way and west of North 15th Street is a fence and also a row of trees. These should be shown on the plans.

8. Provide flowline grades between the fillets and the valley pans at Ptarmigan Court North and North 15th Street intersection.

9. Station equations at intersections should indicate stations north and stations east.

10. Drainage conveyance from Ptarmigan Court South to the drainage channel should be shown (also see comments in drainage section regarding this).

The following comments relate to previous City review comments dated March 24, 1992.

11. For item #1 of the previous review comments, the back of walk elevations should be shown at all curb returns, PC's, PT's, and other reverse curvature points. Some of these are provided on the plan, but many are not. They must be shown.

12. Item #6 of the previous review comments requested flowline or back of walk

elevations to be provided at the end of such improvements on Ptarmigan Court South. These are still not shown.

13. Note 8 of the previous review comments indicates that the pavement improvement section for the temporary cul-de-sac at the end of Ptarmigan Court South should be the same as for streets and they should be shown on the plans. The plans currently have a note calling out temporary pavement with asphalt and aggregate base thickness; however, there are two notes in the plan and profile which still exist which call for the end of construction prior to the cul-de-sac. These notes must be removed or revised to accommodate the paving of the temporary cul-de-sac. Also, the radius of the pavement is not provided. No design for drainage swales is provided, and grades must be provided around the perimeter of the cul-de-sac to allow review.

14. Per previous review comment #9, a legend must be provided for the symbols used on the plan.

15. Per previous review comment #10, minimum compaction requirements for subgrade, road base, and asphalt pavement must be provided on the typical road sections.

PR2RIDGE DRAWING

1. The monolithic curb, gutter, and sidewalk, cannot be labeled typical. Rather, it should be labeled as applicable to Ridge Drive.

2. The Ridge Drive cross section dimensions the back of walk and edge of gutter, which provides for a 6' curb, gutter, and sidewalk section. This should be 7' per the detail.

3. The Ridge Drive profile centerline grade should be labeled as at the centerline of the roadway. Also shown should be the profile of the edge of pavement 8' north of the centerline for that portion of Ridge Drive which is located west of North 15th Street.

4. The following is taken from previous City review comments dated March 24, 1992:

Item #5

Provide cross sections showing how curb and gutter matches existing pavement on Ridge Drive, also for the portion of Ridge Drive in Filing #1. (This could be accomplished by providing cross sections of the proposed and existing street cross section at station 2+50, 3+00, 3+50, and at the station where the new curb and gutter and pavement begins, which station is not but must be shown on the plans.)

PR2ENTRY DRAWING

1. The intersection of North 15th Street and Ridge Drive is not a normal intersection, inasmuch as the segment of Ridge Drive going west will be about a third of a normal street pavement section. The current traffic pattern in road design is for a 90 degree bend. In order to be able to review and construct the intersection properly, we request that spot elevations be provided as follows:

   a) Along the edge of pavement line along the west side of North 15th Street and the south side of Ridge Drive extending west from North 15th Street, spot elevations shall be provided at the point where the existing pavement curves towards the east, and at the point of curvature of the proposed edge of pavement going west, and where the proposed edge of pavement crosses the Ridge Drive street centerline, and at the point of tangency with the edge of pavement going west on Ridge Drive;
   b) Roadway pavement grades at the centerline of both street intersections and also at locations opposite of all point of curvatures of curb returns; and
   c) Edge of gutter elevations at all point of curvature of curb returns.

General Comment

In the future, profiles will be required not only for the centerline of pavement but also for the left and right side. If all three profiles are not provided, the plans will not be reviewed.

Sincerely,

Gerald Williams

Gerald Williams, P.E.
Development Engineer
City of Grand Junction

xc: Don Newton, City Engineer
David Thornton, Community Development
John Siegfried, Developer

file\ptarm2.rev

skw

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

June 29, 1992

John Sigfried
QED Surveying Systems
1018 Colorado Avenue
Grand Junction, CO 81501

Re: Ptarmigan Ridge, Filing Two

Dear John:

It has come to my attention that construction of the streets in the Ptarmigan Ridge Filing Two is continuing without approved plans. This construction was not to proceed beyond the placement of aggregate base course until the street grades and drainage issues are resolved and the plans are approved by this office.

Please be aware that any concrete curb, gutter, sidewalk, drainage facilities or paving that is installed prior to approval of the construction plans may not be accepted by the City.

I recommend that construction of the streets be discontinued until the plans have been revised, resubmitted, and approved.

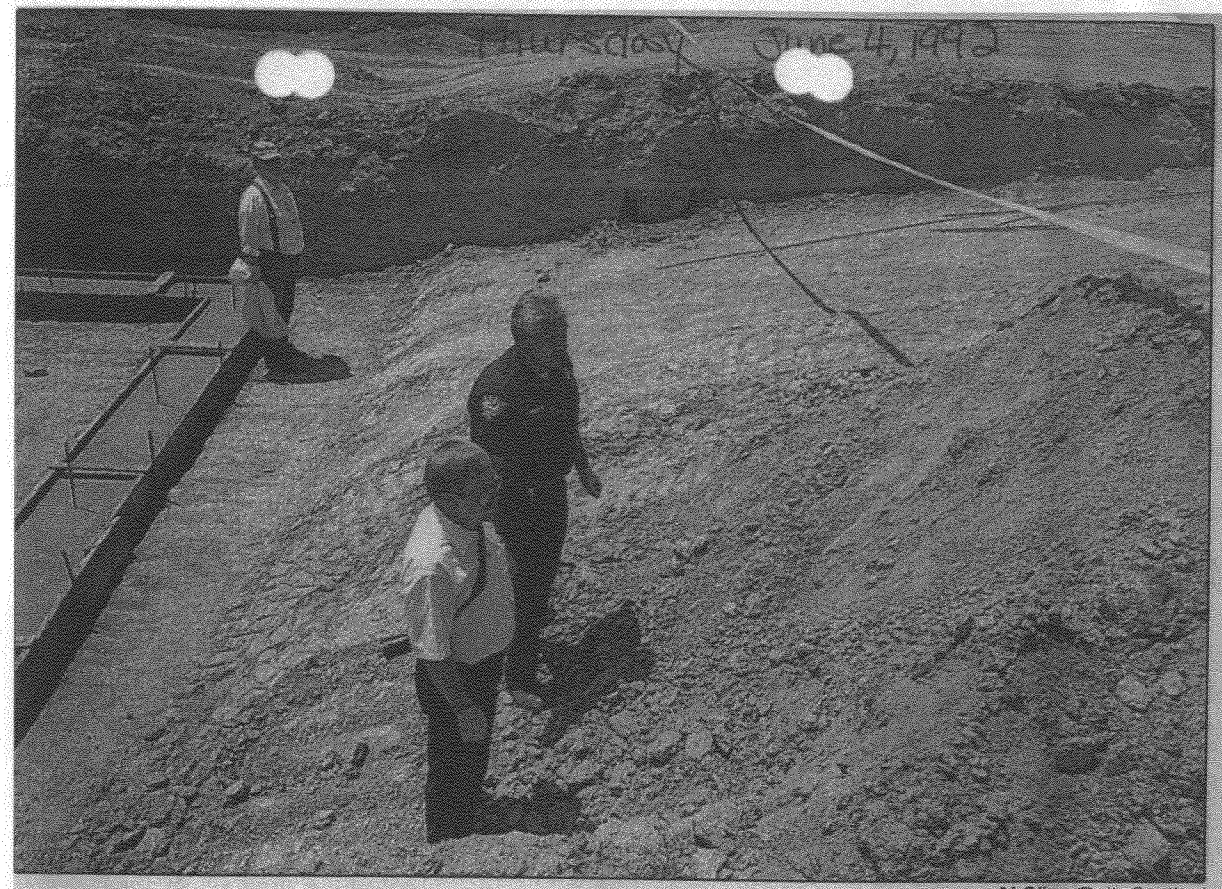
Sincerely,

J. Don Newton, P.E.
City Engineer

mg

xc: Gerald Williams
Mark Relph
Dave Thornton
Dan Wilson

Thursday June 4, 1992



Al Gibes/Daily Sentinel

Deputy Coroner Gardner Clymer, left, Grand Junction Police Investigator Jerry Hill and Officer Ron Maes investigate a Ptarmigan Ridge construction site where a grave was unearthed Wednesday.

Old grave found at construction site

Greg Grant
Daily Sentinel

Tekla Fash says she has a good idea of how a grave happened to be discovered Wednesday while construction workers were building a house in the Ptarmigan Ridge subdivision off 15th Street.

The workers discovered the bones in a pile of dirt dug up by a front-end loader working on a house site on what is now a dirt road extending beyond the end of the paved 15th Street and its intersection with Ridge Drive now under construction. Authorities were immediately called to investigate.

Fash, 88, still has fond memories of her childhood in that area, growing up on her father's land far north of Grand Junction.

She said their home was built where the old Grand Junction Cemetery used to be in the late 1800s.

Fash said most of the bodies had been removed and her father grew an orchard in the area. But Fash said she wouldn't be surprised if a body or two was left behind.

"I remember there were two graves that my dad had built a fence around," Fash said. "He used to tell us not to bother it. He said there was a law back then that said you couldn't move a body for seven years after it had been buried."

But Fash said she can't recall whatever became of those two graves.

Historian Dave Fishell said the remains discovered Wednesday might have been buried in what was known as Hope Cemetery, which ceased to be used in the 1800s.

A study was done in the early 1980s to determine what became of the remains buried in cemeteries in Mesa County. But there was no mention of Hope Cemetery in that study, Fishell said.

Construction remained halted this morning at the site where the bones were discovered.

Cemetery identified by historian

C. Patrick Cleary
Daily Sentinel

The old graveyard in Ptarmigan Ridge where human bones were found Wednesday is Fairview Cemetery No. 1, and not Hope Cemetery, according to local historian Dave Fishell.

Fishell said he received calls from local residents who have lived for more than 70 years near where the bones were found and who said it wasn't Hope Cemetery.

Construction workers Wednesday discovered the bones in dirt dug up by a front-end loader on a housing site. It is located on what is now a dirt road extending beyond the end of the paved 15th Street and its intersection with Ridge Drive.

Fishell also said that the remains found were not Indian.

"They found pieces of casket," he said.

Fishell on Thursday used the 1985 Colorado Cemetery Directory to determine which of 27 cemeteries in Mesa County the workers found. The directory is produced by the Colorado Council of Genealogical Societies.

The description of Fairview Cemetery only indicates the cemetery is three-quarters of a mile north of Main Street.

Fishell then pulled up an 1896 plat of Mesa County. That plat clearly marked the area where the bones were found as Fairview Cemetery.

The Daily Sentinel
Friday June 5, 1992

PTARMIGAN RIDGE - FILING TWO
INTERIM DRAINAGE STUDY

July 28, 1991

General

A drainage report has been submitted with the Preliminary Plan for Ptarmigan Ridge Subdivision. This interim study is to address the storm drainage control that will be required for the development of Filing Two only and prior to further development.

Summary

Basic Premises

1. Some historic storm drainage from areas outside of Filing 2 will impact Filing 2.

2. The historic flow in the main NE to SW natural drain wash will not be increased or impacted.

3. The detention pond will be off-stream (from the natural drain wash) and will serve only the developed area of Filing 2.

Offsite Historic Flow Impacting Filing Two

(Please refer to the Drainage & Grading Plan)

In the event of a 10 year storm approximately 1.6 cfs historic flow will be generated off-site and impact Filing 2. This storm water will be intercepted by Ptarmigan Ridge Road and will be conducted down the east side of the street to Ptarmigan Lane, then down Ptarmigan Lane and to the natural drain wash.

Ptarmigan Ridge Filing Two

Storm water calculations for Filing 2 are shown as follows:

Area = 5.9 ac Tc = 8′ c historic = 0.30, c developed = 0.52

I = 2.6 (10 yr. storm)

Historic Q = 0.30 x 2.6 x 5.9 = 4.6 cfs

100 yr = 7.1 cfs

Developed Q = 0.52 x 2.6 x 5.9 = 8.0 cfs

100 yr = 12.3

The development of Filing 2 will increase storm water drainage by 3.6 cfs for a 10 year storm. This increase will be detained in a detention pond such that the natural drain wash flows will not be impacted greater than historic.

Filing Two - Storm Water Flow

Because of the topography and final grading plan of Filing 2 as developed, it is proposed:

1. All storm water (both historic & developed) from Blocks 2 & 3 will be conducted directly to the natural drain wash either via the city streets or lot grading (Lots 2,4, & 5, Block 3, and Lots 1,2, & 3, Block 2_).

2. As a trade-off for 1. above, all the storm water (both historic & developed) from Block 1 will be conducted directly to the detention pond.

   Please note that this is a direct trade-off where Filing 2 development generates an increase of 3.6 cfs and the total drainage off of Block 1 is 3.6 cfs. Consequently there will be no increase in the natural drain wash.

Drain Wash Considerations

Filing Two development requires that 1 culvert be installed to carry storm waters in the major natural drain wash across Ptarmigan Ridge Road.

It is proposed that this be sized to carry the total developed storm drainage for all present and future proposed filings of the Ptarmigan Ridge Development plus existing flows both historic and developed for areas under separate ownership.

The 10 year storm drainage is calculated as follows:

Tc = 8′ I = 2.6 A = 18 ac. c = 0.60 (estimated)

Q = 0.60 x 2.6 x 18 = 28 cfs

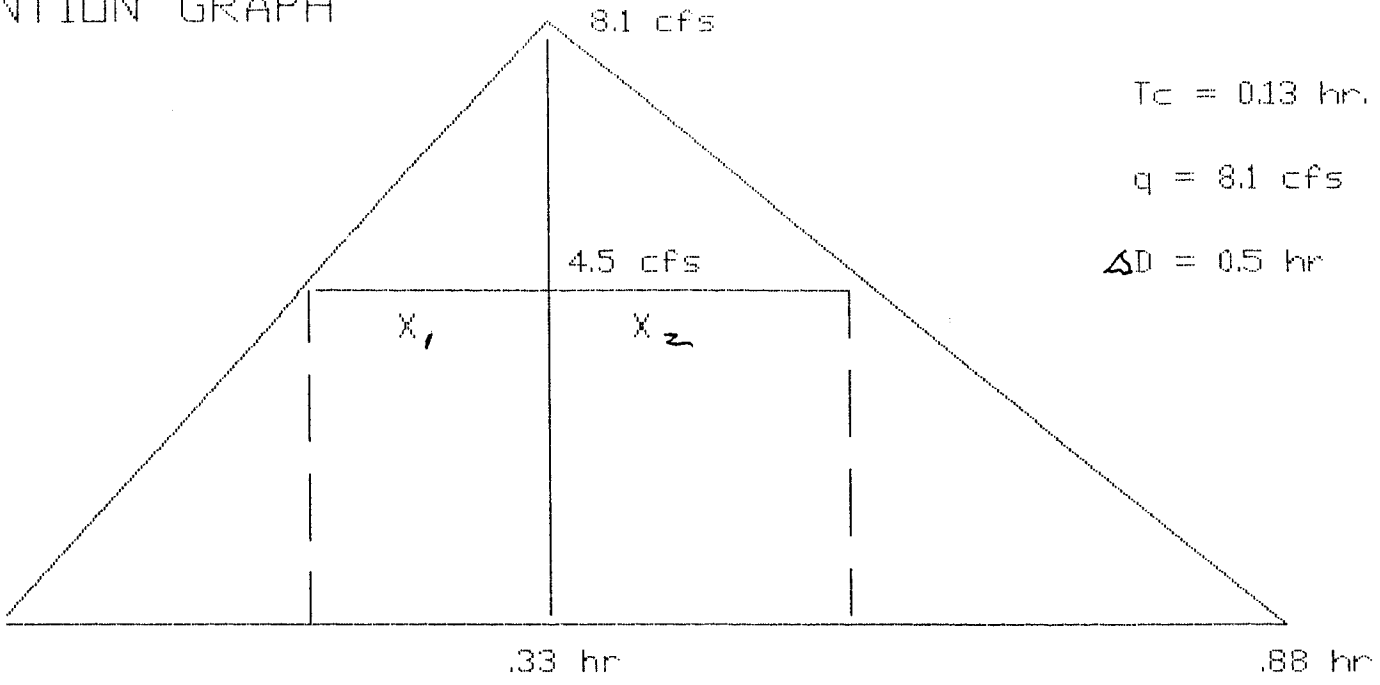
100 yr = 43 cfs

It is proposed that the 24" conc. culvert be installed at a slope of 1%_.

100 Year Storm

Storm drainage waters for a 100 year storm will overflow the culvert in Ptarmigan Ridge Road but will be intercepted by Ridge Drive and flow into the Natural Drain Wash.

DETENTION GRAPH



Tc = 0.13 hr.

q = 8.1 cfs

ΔD = 0.5 hr

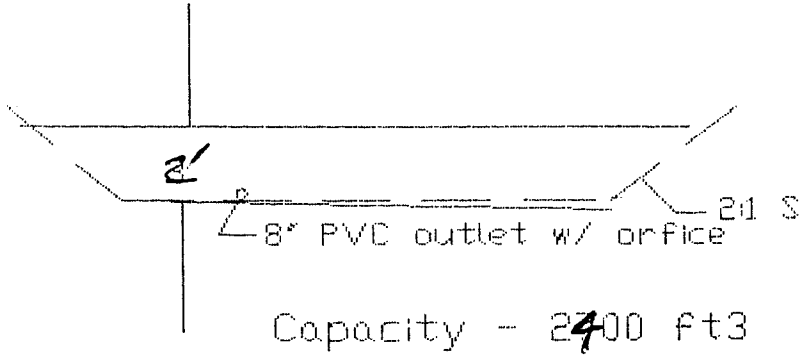
Tp = ΔD/2 + 0.6 Tc = 0.33

Tb = 2.67 x 0.33 = 0.88

V = 0.38 x 3.6 x 3600 x 0.5 = 2400 ft3

POND GEOMETRY

plan irregular 30' x 45'



Capacity - 2400 ft3

FILE NO. 47-91

Ptarmigan Ridge Filing 2
WRITTEN RESPONSES 8-1-91

City Utility Engineer:

Plans revised per comments.

Re: Improvements agreement costs justification: while I have visited with City Engineer regarding costs in the past, I will, again bring in bids and cooperate in our cost data gathering, which should be mutually educational.

Ute Water:

Plans revised per comment.

Public Service Co.:

Plat revised per comment.

City Engineer:

I am involved in research and dialogue with the City Attorney regarding 1\2 street improvements and do not accept the city's contention as to my impact on this street.

Ptarmigan Lane temporary turn-around details are under separate cover for consideration after conversations with City Planning.

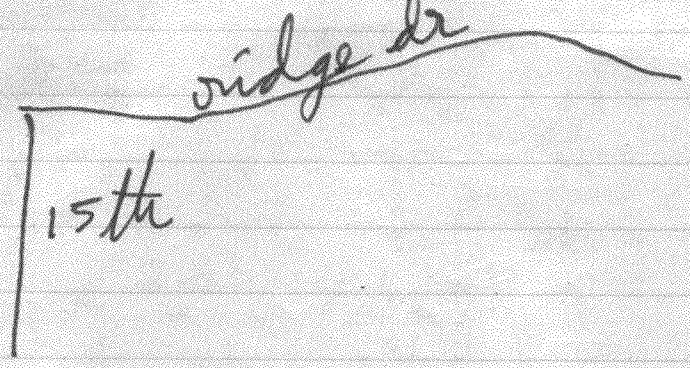
Why a 20 MPH sign on Ptarmigan Ridge Road ?

Community Development:

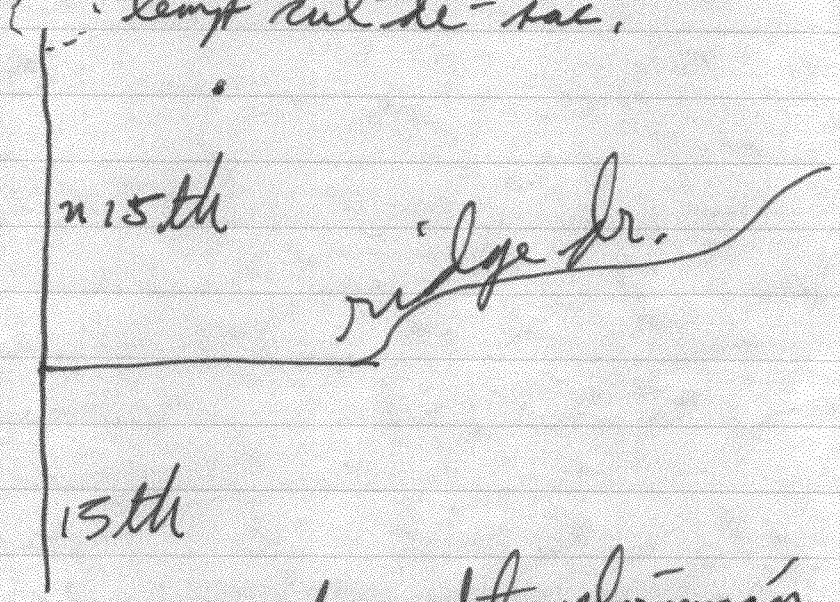
Expanded soils data is submitted under separate cover. Engineered foundations are required by the covenants. It is also the case that the existing neighboring subdivision can't adversely affect and/or saturate Ptarmigan Ridge Filing 2, and while liability is a two-way street, the potential for cooperation in restriction of watering to reasonable quantities to mitigate is great.

The name Ptarmigan Ridge Road is very much a part of defining a neighborhood with the attendant sense of pride and cohesiveness, which to me, seems sorely lacking in the suggested generic naming of 15th Street. 15th Street will have to turn east eventually and lose its name (it already does now at Ridge Drive). Why not change the name now and allow the Ptarmigan neighborhood to have this singular street identity. See my attached drawing!

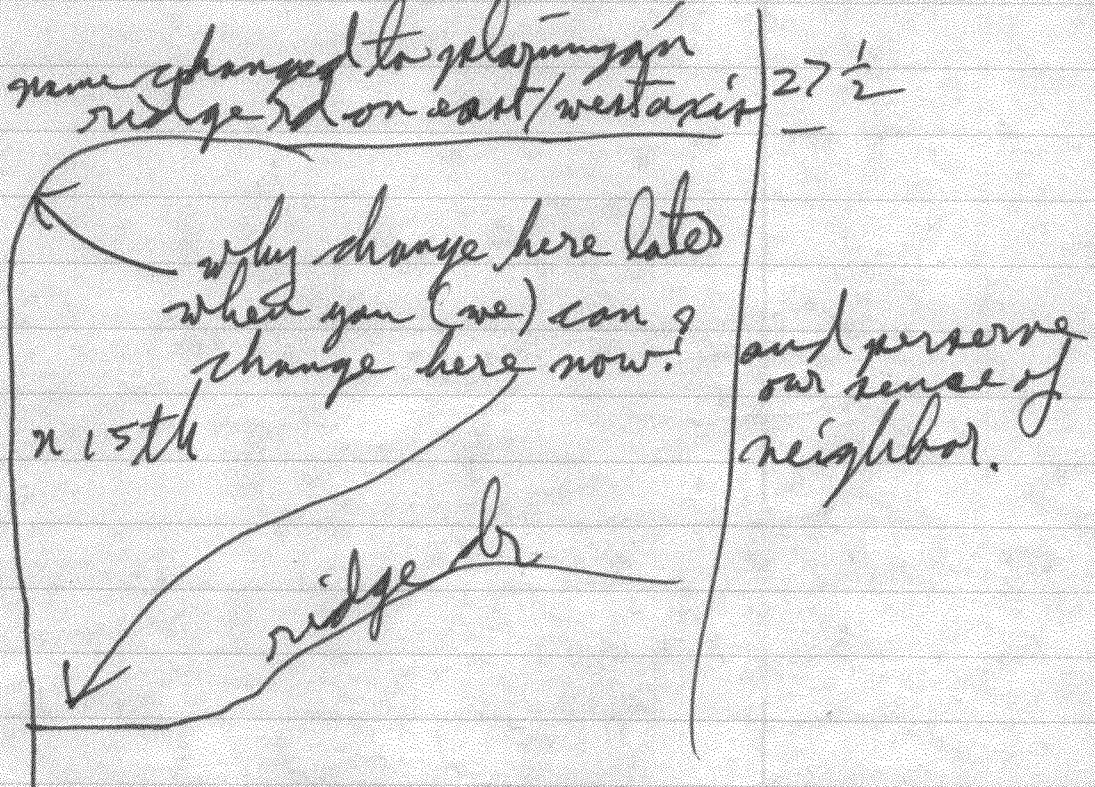
present



short term



long term



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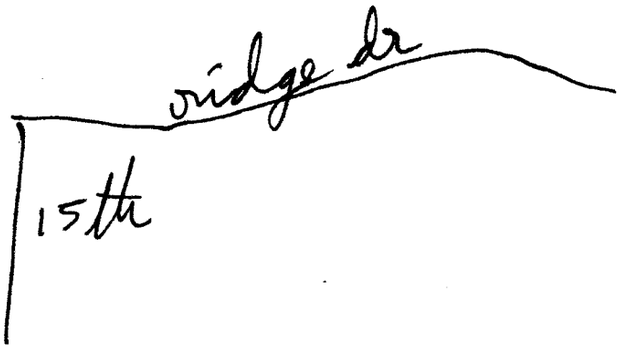

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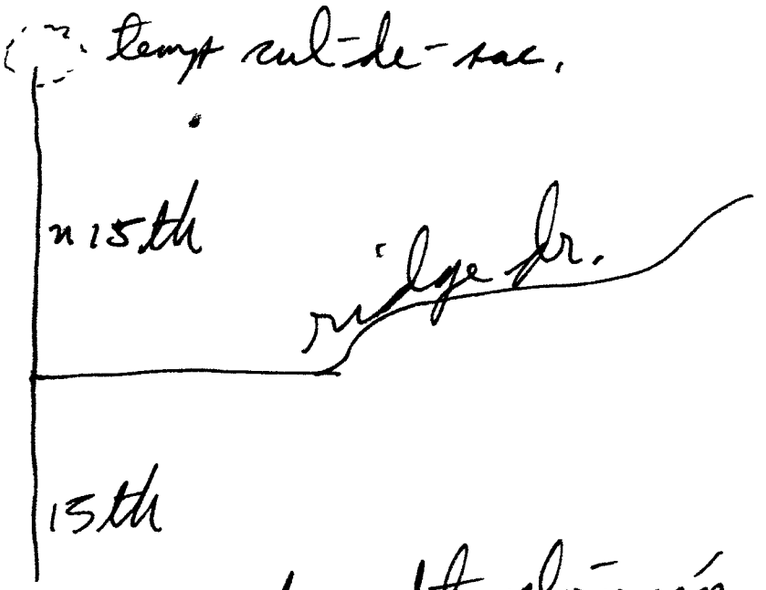

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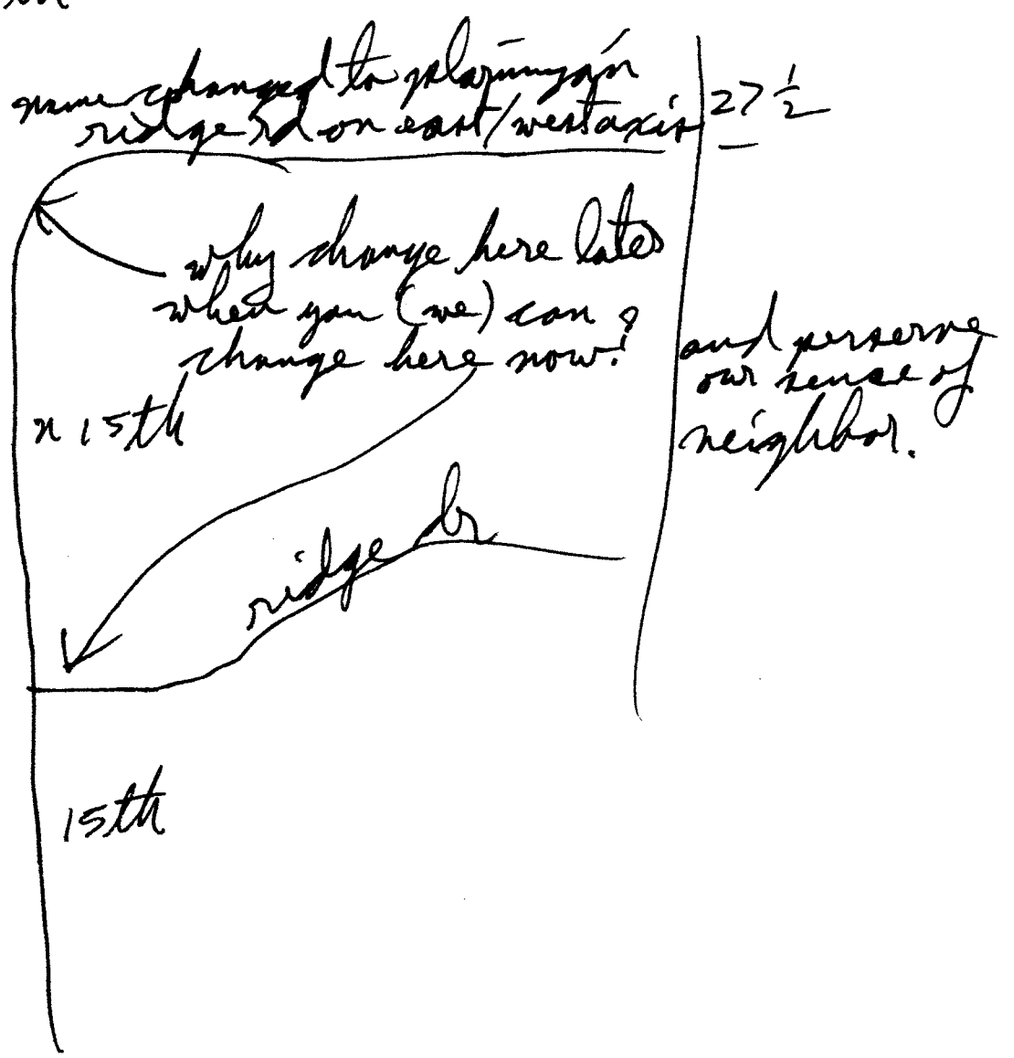

SUBSURFACE SOILS EXPLORATION

BELL RIDGE SUBDIVISION AKA PTARMIGAN RIDGE

GRAND JUNCTION, COLORADO

Prepared For:

Mr. John Siegfried
P.O. Box 9088
Grand Junction, CO 81502

Prepared By:

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

September 5, 1990

#47 91

Lincoln DeVore, Inc.
Geotechnical Consultants
1441 Motor St.
Grand Junction, CO 81505
(303) 242-8968

September 5, 1990

Mr. John Siegfried
P.O. Box 9088
Grand Junction, CO 81502

Re: SUBSURFACE SOILS EXPLORATION

BELL RIDGE SUBDIVISION

GRAND JUNCTION, COLORADO

Dear Mr. Siegfried:

Transmitted herein are the results of a Subsurface Soils Exploration for the proposed

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
Western Slope Branch Manager
Grand Junction Office

Reviewed by: _____ 9/7/90
George D. Morris, P.E.
Colorado Springs Office

GEORGE D. MORRIS REGISTERED 2851 PROFESSIONAL ENGINEER STATE OF COLORADO

EMM/rl

LDTL Job No. 72865-J

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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. We understand that the proposed structures will consist of one and two-story wood-framed buildings with the possibility of full basements with concrete floor slabs on grade or no basements and concrete slabs on grade or crawlspace-type structures. A vicinity map is included in the Appendix of this report.

The characteristics of the subsurface materials encountered were evaluated with regard to the type of construction described above. Recommendations are included herein to match the described construction to the soil characteristics found. The information contained herein may or may not be valid for other purposes. If the proposed site use is changed or types of construction proposed, other than noted herein, Lincoln DeVore should be contacted to determine if the information in this report can be used for the new construction without further field evaluations.

PROJECT SCOPE

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

program, and on our experience with similiar soil and geologic conditions in the area.

The scope of our geotechnical exploration consisted of a surface reconnaissance, a geophoto study, 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 construcion 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 August 18, 19, and 28 1990, and consisted of a site reconnaissance by our geotechnical personnel and the drilling of twelve exploration borings. These shallow exploration borings were drilled within the proposed building lots near the locations indicated on the Boring Location Plan. The twelve shallow exploration borings were located to obtain a reasonably good

profile of the subsurface soil conditions. Six borings were utilized for the installation of piezometers. These piezometers were placed to monitor the water levels along the irrigation ditch, along the west property line. All exploration borings were drilled using a CME 45, truck mounted drill rig with continuous flight auger to depths of approximately 9 to 24 feet. Samples were taken with a standard split spoon sampler, a California spoon sampler with liners, thin-walled Shelby Tubes, and by bulk methods. Logs describing the subsurface conditions are presented in the attached figures.

Laboratory tests were performed on representative soil samples to determine their relative engineering properties. 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 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 South East Quarter of Section I, Township I South, Range I West of the Ute Principal Meridan, Mesa County, Colorado. More specifically the site is located north of Ridge Drive and is between 27 1/2 Road and the extension of North 15th Street. The tract contains 60 single-family lots.

The topography of the site is relatively flat with a slight overall gradient to the South. 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 along the proposed Ptarmigan Ridge Road and into the Ridge Drive drainage features, eventually entering a series of improved, naturally-occuring drainage ditches which discharge in the Colorado River. Surface and subsurface drainage on this site would be described as fair.

GENERAL GEOLOGY AND SUBSURFACE DESCRIPTION

The geologic materials encountered under the site consist of a series of silty clay and sandy clay soils which are underlain by the Mancos Shale Formation. Man-made fill, consisting of uncompacted soil, trash and construction debris is present in the north portion of the tract within Blocks 3 and 5. The geologic and engineering properties of the materials found in our twelve shallow exploration borings will be discussed in the following sections.

The 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 orioininate 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 within 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.

The geologic and engineering properties of the materials encountered, as indicated by the enclosed subsurface logs, will be discussed in the following paragraphs.

Soil Type No. I comprises the surface, alluvial soils which were encountered during this exploration.

This soil type was classified as a low plastic, silty clay (CL) under the Unified Classification System. The Standard Penetration Tests ranged from 9 blows per foot to 40 blows per foot. Penetration tests of this magnitude indicate that the soil is apparently stiff and of apparent medium to high density. Due to the moisture content of these soils the apparent stiffness and density appears to be higher than it is actually realized. The sample obtained from Exploration Boring No. 3 indicates that these have a dry density of only 92.6 pcf which indicates a low density soil. The moisture content varied from 4.3% to 14.3%, indicating a relatively dry soil. This soil is plastic and is sensitive to changes in moisture content. With decreased moisture, it will tend to shrink, with some cracking upon dessication. Upon increasing moisture, it will tend to expand. Expansion tests were performed on typical samples of the soil and expansive pressures on the order of 400 to 920 psf were found to be typical. This material will also consolidate upon saturation or excessive loading. If recommended bearing values

are not exceeded, such settlement will remain within tolerable limits. The allowable maximum bearing value was found to be on the order of 1200 psf. A minimum dead load of 300 psf will be required over the majority of the site.

At depths ranging from seven to twenty-two feet below the exisitng ground surface, the Mancos Shale was encountered. The Mancos Shale was found to be quite weathered and is designated as Soil Type No. IV. A minimum dead load of 300 psf will be required over a majority of the site.

Soil Type No.s II and III are very similar in engineering characteristics but have different appearances in the field. Soil Type No. II is a generally fine-grained sand which is alluvial in origin and is a product of the debris flow action from the Bookcliffs. Soil Type No. III is also alluvial and a product of the debris flow activity but contains large amounts of gravel and occasionally cobble-sized fragments of sandstone, siltstone, and claystone of the lower Mesa Verde Formation. These fragments are the deposits within the high-velocity areas of the original debris flow features. The fine-grained Soil Type II is derived from the sandstones, siltstones, and claystones of the Mesa Verde Formation and represent a more severely weathered and eroded version of Soil Type No. III. For the discussion of this report Soil Types II and III will be described together in the following paragraph.

This Soil Type was classified as a silty sand (SM) under the Unified Classification System. This material is of low plasticity, of low to moderate permeability, and was encountered in a moist to wet condition. It undergoes 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 1200 psf, with 200 minimum dead load pressure required. The finer grained portion of Soil Type No. II and III contains sulfates in detrimental quantities.

The Mancos Shale is described as a thin-bedded, drab, light to dark gray marine shale, with thinly interbedded fine grain sandstone and limestone layers. Some portions of the Mancos Shale are bentonitic, and therefore, are highly expansive. The majority of the shale, however, has only a moderate expansion potential.

This soil type was classified as a silty clay (CL) under the Unified Classification System. The Standard Penetration Tests ranged from 39 blows per foot to over 80 blows per foot. Penetration tests of this magnitude indicate that the soil is variable and of medium to high density. The moisture content varied from 9.3% to 20.6%, indicating a relatively moist soil. This soil is plastic and is sensitive to changes in moisture content. With decreased moisture, it will tend to shrink, with some cracking upon dessication. Upon increasing moisture, it will tend to expand. Expansion tests were performed on typical samples of the soil and expansive pressures on the order of 900 psf were found to be typical. The allowable maximum bearing value was found to be on the order of 3500 psf for the top two feet of the weathered Mancos Shale and increased to 7000 psf below the top two feet of the Mancos Shale. A

minimum dead load of 1000 psf will be required for the top two feet of the Mancos Shale and 1800 psf will be required below the top two feet of the Mancos Shale.

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

GROUND WATER:

A free water table came to equilibrium during drilling and monitor wells were installed as indicated on the Exploration Boring Location Diagram. Measured depths to the water surface are indicated. This is probably very close to the true phreatic surface rather than a perched water table. 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 on this site depending upon external environmental effects.

Due to the proximity of the Mancos Shale formation, there exists a possibility of a perched water table developing in the alluvial soils which overlie the soil. This perched water would probably be the result of increased irrigation due to the presence of lawns and landscaping and roof runoff. The exploration holes indicate that the top of the Mancos Shale is relatively flat over much of the site and that subsurface drainage would probably be quite slow. While it is believed that under the existing conditions at the time of this exploration the construction process would not be effected by any

free-flow waters, it is very possible that several years after development is initiated, a troublesome perched water condition may develop which will provided construction difficulties. In addition, this potential perched water could create some problems for existing or future foundations on this tract. Therefore it is recommended that the future presence of a perched water table be considered in all deisgn and construction of both the proposed residential structures and any subdivision improvements.

Due to the existing water table in some portions of this tract and the possibility of free water in other portions of this tract, it is recommended that basement or half basement foundations be constructed with a subsurface peripheral drain system for each structure. All floor slabs should be constructed over a capillary break and vapor barrier.

Because of capillary rise, the soil zone within a few feet above any future free water level associated with perched water tables may 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.

Careful analysis of the top elevations of the Mancos Shale Formation and the existing pattern of groundwater indicates that the majority of free water encountered in the exploration borings is associated with the irrigation ditch along the west property line and the normal lawn irrigation and water drainage characteristics of the residential Onan Subdivision, along East Cliff Drive. The surface drainage plan for Ptarmigan Ridge Subdivision should be designed in a manner which would improve the surface runoff characteristics in the west portion of this subdivision and encourage the rapid removal of surface waters into an established drainage system. Consideration should be given to properly lining or piping the existing irrigation ditch along the west property line, which is probably the major contributor to the ground water rise in this area.

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 potential for perched water tables and the expansive clays of the Mancos Shale.

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 similiar 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.

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. Planters, if any, should be so constructed that moisture is not allowed to seep into foundation areas or beneath slabs or pavements.

We recommend that a perimeter drain be placed around the exterior walls of the structure at foundation level or below. A drain of this type includes a perforated pipe and an adequate gravel collector, the whole being wrapped in a geotextile filter fabric. We recommend that the discharge pipe for this drain be given a free gravity outlet to exit at ground surface. If "daylight" cannot be obtained, we recommend that a sealed sump and pump be used to discharge the seepage. Under no circumstances shall a "dry well" be used on this site.

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

To give the building extra lateral stability and to aid in the rapidity of runoff, it is recommended that all backfill around the building and in utility trenches in the vicinity of the building be compacted to a minimum of 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 a minimum of 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.

FOUNDATIONS

SHALLOW

We recommend the use of a conventional shallow foundation system consisting of continuous spread footings beneath all bearing walls and isolated spread footings beneath all columns and other points of concentrated load. Such a shallow foundation system, resting on the alluvial silty clays of Soil Type No. I, may be designed on the basis of an allowable bearing capacity of 1200 psf maximum. A minimum dead load of 300 psf must be maintained. Contact stresses beneath all continuous walls should be balanced to within + or - 150. psf at all points. Isolated interior column footings should be designed for contact stresses of about 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.

It should be noted that the term "footings" as used above includes the wall on grade or "no footing" type of foundation system. On this particular site, the use of a more conventional footing, the use of a "no footing", or

the use of voids will depend entirely upon the foundation loads exerted by the structure. We would anticipate the use of conventional footings on this site.

If full basement type construction is anticipated for a given structure or if the loading conditions of a crawlspace or a half basement-type structure would require more bearing than the capacity than the silty clays of Soil Type No. I can offer then the clays of the Mancos Shale Formation may be utilized for foundation bearing. At this time Lincoln-DeVore has not been informed of the individual foundation/building plans and is therefore not informed as to the precise wall or column loading plan within any of the proposed buildings. Therefore, three foundation types which could be utilized for single-family residences are recommended based on our experience in this area. The choice between these foundation types depends on the internal loading of the foundation members and the amount of excavation planned to achieve the finished lower elevations.

The three foundation types preliminarily recommended are as follows:

1. The voided wall on grade foundation system with a stemwall resting directly on the shale formation.

2. The isolated pad and grade beam foundation system in which the grade beam is voided and loads are transfered to the isolated pads.

3. The drilled pier and fully voided grade beam system with the loads transfered to the piers.

Recommendations given in this report are given for the Shallow Foundation Types No. 1 and 2 and the Deep Foundation Type No. 3.

A conventional shallow foundation system consisting of either a voided wall on grade or an isolated pad and grade beam system, resting on the relatively unweathered expansive clays of the Mancos Shale Formation, may be designed on the basis of an allowable bearing capacity of 7000 psf maximum, and a minimum dead load of 1800 psf must be maintained. Contact stresses beneath all continuous walls should be balanced to within + or - 200 psf at all points. Isolated interior column footings should be designed for contact stresses of about 200 psf more than the average used to average used to balance continuous walls. The criteria use for balancing will depend somewhat upon the nature of the structure. Single-story, slab on grade structures and single-story crawlspace structures may be balance on the basis of dead load only. Multi-story structures may be balanced on the basis of dead load plus one half live load, for up to three stories.

Stem walls for a shallow foundation system should be designed as grade beams capable of spanning at least 13 feet. These "grade beams" should be horizontally reinforced both near the top and near the bottom. The horizontal reinforcement required should be placed continuously around the structure with no gaps or breaks. A foundation system designed in this manner should provide a rather rigid system and, therefore, be better able to tolerate differential movements associated with the expansive clays.

DEEP FOUNDATIONS:

If the building loads or final building elevations require a deep foundation system, consisting of either drilled piers or driven piles, the following recommendations should be followed. Deep foundations must extend through the low density, upper lean clay materials and into the underlying clays of the Mancos Shale. Both types of foundation have advantages and disadvantages with respect to this site. Therefore, the decision as to which system is used is largely economic and will be left to the owner or his representative. Drilled pier and driven pile foundation systems will be discussed in turn.

DRILLED PIERS:

We recommend that drilled piers have a minimum shaft length of 15 feet and be embedded at least 10 feet into the relatively unweathered bedrock. At this level, these piers may be designed for a maximum end bearing capacity of 25000 psf, plus 1800 psf side support considering only the side wall area embedded in the bedrock. Due to the expansive potential of the bedrock, a minimum dead load uplift is required, consisting of a point uplift of 1800 psf and 300 psf side uplift, based on the side wall embedded in the bedrock. The overburden is soft and no supporting or uplift values are assigned to this material. The weight of the concrete in the pier may be incorporated into the required dead load.

It is recommended that the bottoms of all piers be thoroughly cleaned prior to the placement of concrete. The amount of reinforcing in each pier will depend on the

magnitude and nature of loads involved. As a rule of thumb, reinforcing equal to approximately 1/2 of 1% of the gross cross-sectional concrete area should be used. Additional reinforcing should be used if structural conditions warrant. We recommend that reinforcing extend through the full length of pier.

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

DRILLED PIER OBSERVATION:

The foundation installation for drilled piers should be continuously observed by a representative of Lincoln DeVore to determine that the recommended bearing material has been adequately penetrated and that soil conditions are as anticipated by the exploration. This observation will aid in attaining an adequate foundation system. In addition, abnormalities in the subsurface conditions encountered during foundation installation can be identified and corrective measures taken as

required. Lincoln DeVore requires a minimum of one working day's notice, and a copy of the foundation plan, to schedule any field observation.

GRADE BEAMS:

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

DRIVEN PILES:

We recommend that driven piles bear in the competent materials of the underlying formation. We anticipate that pile driving refusal will be encountered within a few feet of penetration into the shale. Based on a static analysis, piles driven to refusal may be designed for an allowable tip bearing capacity of 70 to 100 tons psf. To determine the bearing area of the pile, the area including the space between the flanges may be included. For example, an HB-12 pile may be assumed to have an end area of approximately 1 square foot. A round, closed-end pipe pile bearing area would be the area of the pile end plate. Pile driving refusal should be determined by our representative in the field. Generally, pile driving refusal is taken as a maximum of 15 blows per inch. If pile groups are used, the overall capacity of the pile group should be reduced in

accordance with the appropriate efficiency formula (such as the Converse-Labarre method). If bearing capacities greater than those recommended above are necessary, we recommend that the pile bearing capacity be determined on the basis of static load tests.

It is anticipated that steel piling (either 'H' sections or concrete filled pipe) will be utilized in this construction. The following recommendations will assume the use of these materials. If wood or concrete piling are anticipated, recommendations can be readily provided.

Driving hammers should be of such size and type to consistently deliver effective dynamic energy suitable to the piles and materials into which they are to be driven. Hammers should operate at manufacturer's recommended speeds and pressures. We recommend that a pile driving hammer be used which is rated at at least 19,000 feet pounds. However, driving energy should not be so large that pile damage occurs.

Piles must be used in groups to provide for eccentricities in loading. The group capacity will be less than the summation of the individual pile capacities, depending upon the relative spacing of the piles. A conservative estimate of group capacity is two-thirds of the summation of the individual pile capacities.

We recommend that minimum spacing of the piles be twice the average pile diameter or 1.75 times the diagonal dimension of the pile cross-section, but no less than 24 inches. It is recommended that the tops of the piles extend a minimum of 4 inches into the pile cap. Based on the exploration borings no pile shorter than feet is recommended unless proper

pile capacity is verified by field inspection by the Geotechnical Engineer. Vertical piles should not vary more than 2% from the plumb position. We further recommend that eccentricity of reaction on a pile group with respect to the load resultant not exceed a dimension that would produce overloads of more than 10% in any one pile.

Since the underlying bedrock is moderately expansive, we recommend a minimum of permanent pressure be maintained on each pier. The minimum pressure should be designed based on a tip uplift pressure of 2500 psf. The area used to consider the uplift pressure should be width times the depth of the pile section used when considering H piles. Round pipe piles will require an end uplift pressure of 1800 psf and a side uplift of 300 psf for the portion of the side wall in contact with the expansive formation.

Based on our analyses, a standard 10-3/4 inch diameter, 1/4 inch wall, pipe pile driven to refusal may be designed for an allowable capacity of 70 to 100 tons. On this site the capacity of the pile will govern allowable load. Pile driving refusal required to obtain the recommended capacity was taken as 7 blows per inch with a 20 foot kip hammer. Driving hammers should be of such size and type to consistently deliver effective energy suitable to the piles and materials into which they are driven. Final pile driving refusal should be determined by representatives of Lincoln DeVore in the field.

DRIVEN PILE OBSERVATION:

Continuous observation of the pile driving operations and a pile load test, if required, should be

performed by Lincoln DeVore as a representative of the owner. A continuous log should be maintained on the number of blows per foot required to drive each pile. Driving should be completed without interruption (except for splicing) and without jetting or pre-drilling unless the gestechnical engineer has been contacted for further recommendations.

GRADE BEAMS:

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

CONCRETE SLABS ON GRADE

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

Any partitions which will be located on slabs on grade should be constructed with a minimum space of 2 inches at the bottom of the wall. This space should allow for any future potential upward movement of the floor slabs and minimize damage to the walls and roof sections above the slabs.

It is recommended that slabs on grade be

constructed over a capillary break of approximately 6 inches in thickness. We recommend that the material used to form the capillary break be free draining, granular material and not contain significant fines. A free draining outlet is also recommended for this break so that it will not trap water beneath the slab. A vapor barrier is recommended beneath the floor slab and above the capillary break. To prevent difficulty in finishing concrete, a 2 inch sand layer should be placed above the break.

The magnitude of expansion measured of the soils on this site is such that floor slab movement should be expected if slab on grade consstruction is used. In general, the closer the slab is to the Mancos Shale Formation, the more movement which should be expected. Where floor slabs are cast on expansive soils, no known method of construction will prevent all future slab movement. If the builder and future owner are willing to risk the possibility of some damage due to concrete floor slab movement, the recommendations contained herein should be carefully followed and can help minimize such damage. Any subsequent owner should be advised of the soil conditions and advised to maintain the surface and subsurface drainage, framing of partition above floor slabs, dry wall and finish work above floor slabs, etc.

The first alternative is to dispense with slab-on-grade construction and use a structural floor system. A structural floor system may be either a structural reinforced concrete slab or a structural wood floor system suspended with floor joists. Each system would utilize a crawl space. This alternative would substantially reduce a potential

for post construction slab difficulties due to the expansive properties of the Mnacos Shale Formation.

The second alternative is to install a three foot "buffer zone" of non-expansive, granular soil beneath the slab. This would mitigate the potential for slab movement; however, some potential for movment still exists. Should this alternative be selected, we would recommend that the following be performed:

1. Non-expansive granular soils should be selected for the "buffer zone". The granular soils should contain less than 20% of the material, by dry weight, passing the U.S. No. 200 Sieve. We recommend that the geotechnical engineer be contacted to examine the soils when they are selected, to substantiate that they comply with the recommendations.

2. The perimeter drain for the structures should be located at the elevation equal to or deeper than the "buffer zone". This is to reduce the potential for a "bathtub" effect" which may cause the slab to heave. The "bathtub effect" is created when water is allowed to seep into the "buffer zone" and then becomes trapped since the underlying clay soils have a much lower permeability rate than the "buffer zone" material. Therefore, water may accumulate in the "buffer zone" and subsequently wet the clay soils and cause them to expand.

3. All the non-bearing partitions which will be located on the slabs should be constructed with a minimum 2 inches of void space at the bottom of the wall. This space would allow for the future upward movement of the floor slabs and minimize damage to walls and roof sections above the slabs. The space may require rebuilding after a period of time, since heaving produced by the soils may exceed 2 inches.

4. We recommend that all slabs being placed on the "buffer zone" be constructed to act independently of the other structurall portions of the building. One method of allowing the slabs to float freely is to use expansion material at the slab-structure interface. Control joints should be placed 20 feet on center in each direction. These control joints should control the cracking of the slab should the under-lying soils come in contact with water.

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

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

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

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

4. Any partitions which will rest on the slabs on grade should be constructed with a minimum void space of 2 inches at the bottom of the wall (see figure in the Appendix). This base should allow for future upward movement of the floor slabs and minimize movement and damage in walls and floors above the slabs. This void may require rebuilding after a period of time, should heave exceed 2 inches.

EARTH RETAINING STRUCTURES

The active soil pressure for the design of earth retaining structures may be based on an equivalent fluid pressure of 54 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 77 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 240 pcf per foot of depth. The coefficient of friction for concrete to soil may be assumed to be 0.24 for resistanse to lateral movement. When combining frictional and passive resistance, the latter must be reduced by approximately 1/3.

We recommend that the backfill behind any retaining wall be compacted to a minimum of 85% of its maximum modified Proctor dry density, ASTM D-1557. The backfill material should be approved by the Soils Engineer prior to placing and a sufficient amount of field observation and density tests should be performed during placement. Placing backfill behind retaining walls before the wall has gained sufficient strength to resist the applied lateral earth pressures is not recommended.

Drainage behind retaining walls is considered critical. If the backfill behind the wall is not well drained, hydrostatic pressures are allowed to build up and lateral earth pressures will be considerably increased. Therefore, we recommend a vertical drain be installed behind any impermeable retaining walls. Because of the difficulty in placement of a gravel drain, we recommend the use of a composite

drainage mat similar to Enkadrain or Miradrain. An outfall must be provided for this drain.

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. Calcuim 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 at this property that may be required to support pavements have been evaluated using the Hveem-Carmany method to determine their support characteristics. The results of the laboratory testing are as follows:

R = 15 by expansion
Expansion @ 300 psi = 3.1
Displacement @ 300 psi = 3.68

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.

The developer of the structure should be aware that the traffic volume and the loads on pavement will be considerably higher during the construction phase than during the design life of the pavement structure. Therefore, some repair may be required after construction of the pavement is complete.

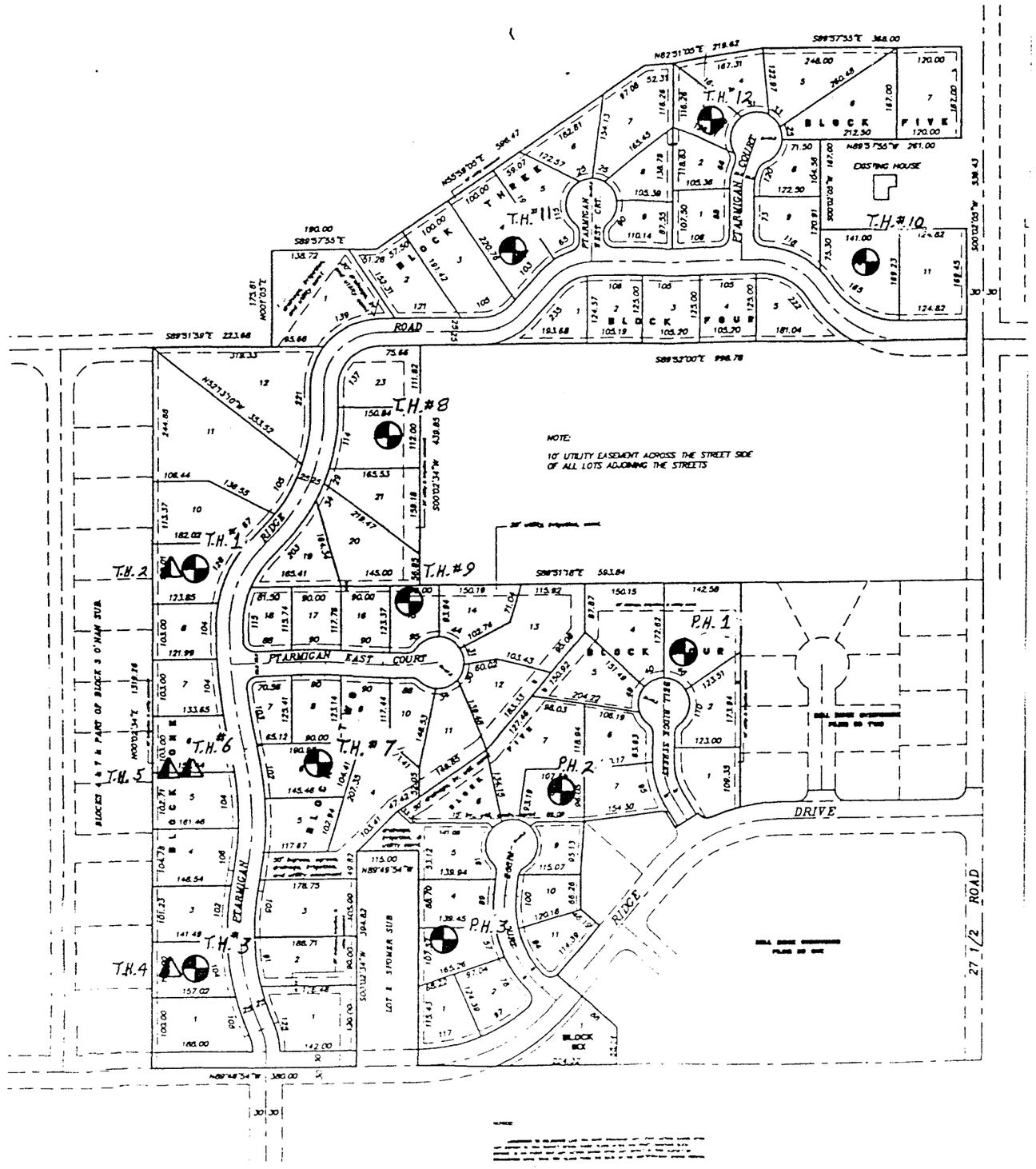
An alternative would be to design a heavier pavement section at this time, utilizing the expected construction volume. It has been our experience that pavement failures during construction are minimal, and that it is more economical to repair localized failures due to contruction traffic rather than construct a heavier pavement section.

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 architect and engineer for the project, and are incorporated into the plans. In addition, it is his responsibility that the necessary steps are taken to see that the contractor and his subcontractors carry out these 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



HOLE NUMBER	DATE DRILLED	DEPTH TO SHALE	WATER @ DRILLING	WATER @ 8-28-90	WATER @ 9-4-90	WATER @ 12-7-90	WATER @ 3-13-91	WATER @ 6-26-91
T.H. 1	8/17/90	22'	10'-6"	10'	10'	10'-1"	11'-6"	8'-2"
T.H. 2	8/17/90	22'	10'-0"	9'-2"	9'-7"	9'-7"	10'-4"	8'-2"
T.H. 3	8/20/90	17'	12'	11'-6"	11'-4"	12'-10"	15'-0"	10'-5"
T.H. 4	8/20/90	17'	12'-6"	12'	10'-10"	13'-7"	15'-7"	10'-11"
T.H. 5	8/20/90	19'	10'	9'-8"	9'-0"	11'-1"	13'-4"	8'-0"
T.H. 6	8/20/90	19'	10'	10'	9'-7"	11'-4"	12'-0"	8'-5"
T.H. 7	8/20/90	12'	—	—				
T.H. 8	8/20/90	16'	—	—				
T.H. 9	8/24/90	17'	—	—				
T.H. 10	8/24/90	15'	9'					
T.H. 11	8/28/90	12'	—	—				
T.H. 12	8/28/90	7'	—	—				
P.H. 1	6/28/90	7'	—					
P.H. 2	6/28/90	6'	—					
P.H. 3	6/28/90	6'	—					

EXPLORATION BORING

PIEZOMETER

EXPLORATION BORING LOCATION

PTARMIGAN RIDGE SUB. GRAND JUNCTION, COLO.

LINCOLN DeVORE ENGINEERS · GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO,

LO # 72865-J

DRAWN BY: EMM	SCALE:	DATE: 8-28-90
CHECKED BY:	CONT. INTERVAL:	REV.

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

SYMBOLS & NOTES:

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

Standard Penetration Drives are made by driving a standard 1.4" split spoon sampler into the ground by dropping a 140 lb. weight 30". ASTM test des. D-1586.

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

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

LINCOLN DeVORE TESTING LABORATORY

COLORADO: Colorado Springs, Pueblo, Glenwood Springs, Montrose, Gunnison, Grand Junction. – WYO. – Rock Springs

EXPLANATION OF BOREHOLE LOGS AND LOCATION DIAGRAMS

BORING NO. 1

ELEVATION:

DEPTH (FT)	SYMBOL	SAMPLE	DESCRIPTION	PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)
		I				5.4%
5			GRAVELS – SANDSTONE FRAG.			
		III		5/6		
				15/12		10.2%
			Free Water @ 10'	25/18		
10			SANDSTONE FRAGMENTS – LARGE			
		III		23/6		
				28/12		18.4%
15				35/18		
		IV				
20			MANCOS SHALE			
						11.9%
23						

FREE WATER AT 10'
24 HOURS AFTER DRILLING
8-17-90

LOG OF SUBSURFACE EXPLORATION

Lincoln DeVore, Inc.
Geotechnical Consultants

PTARMIGAN RIDGE

DATE 8-17-90

JOB NO. 72865-J

DRAWN EHM

BORING NO. 3

ELEVATION:

DEPTH (FT)	SYMBOL	SAMPLE	DESCRIPTION	PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)
5		I			92.6	4.3%
		I		6/6		14.2%
10				15/12		
			11'-6" FREE WATER	25/18		
		III		3/6		19.7%
15			OCC. SANDSTONE FRAGMENTS	7/12		
				12/18		
			MANCOS SHALE			
		IV		30/6		14.9%
20				76/12		

FREE WATER 11'-6"
24 HOURS AFTER DRILLING
8-20-90

LOG OF SUBSURFACE EXPLORATION

Lincoln DeVore, Inc.
Geotechnical Consultants

PTARMIGAN RIDGE

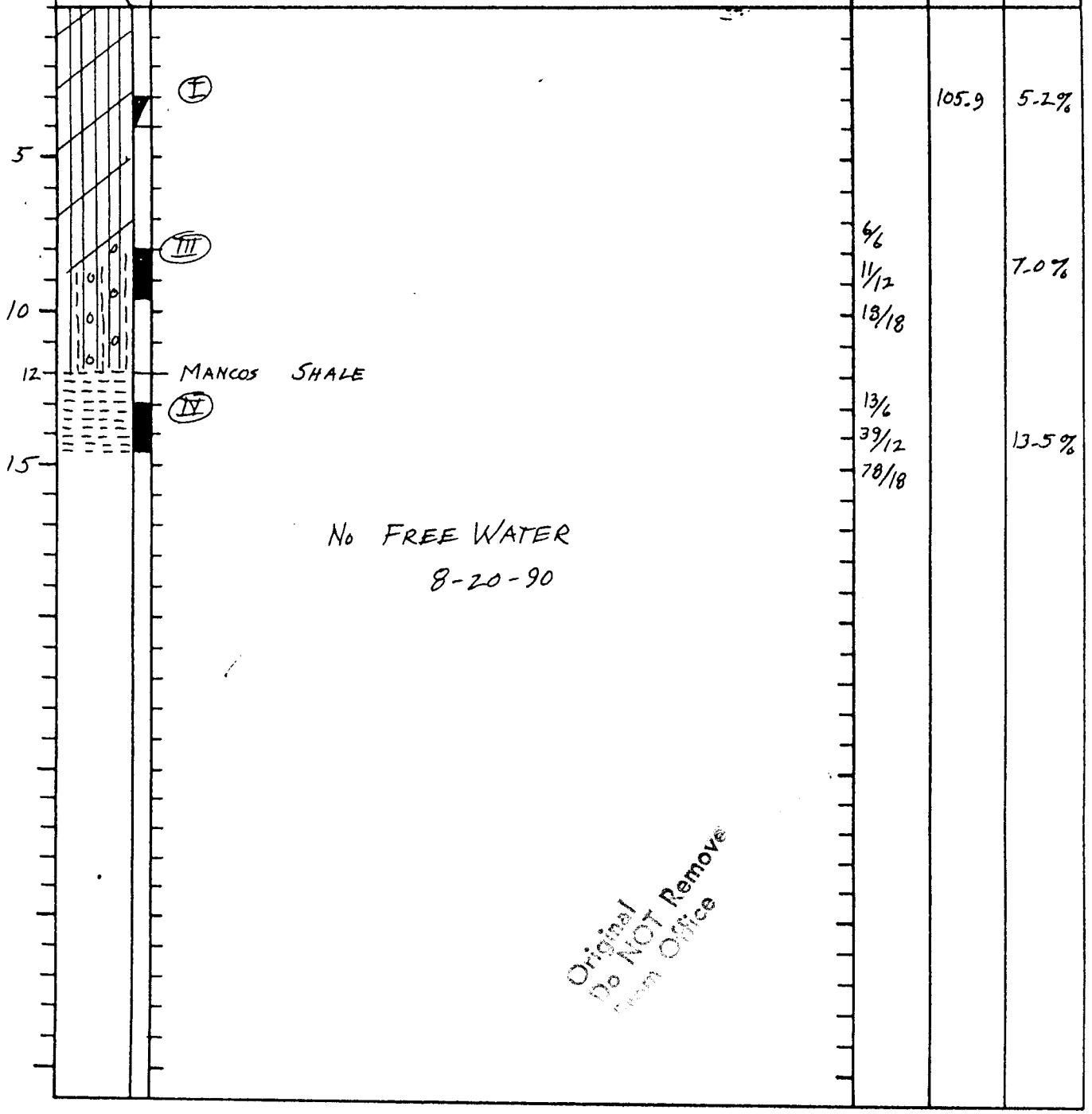
DATE 8-20-90

JOB NO. 72865-J

DRAWN EHM

BORING NO. 7

ELEVATION:



LOG OF SUBSURFACE EXPLORATION

Lincoln DeVore, Inc.
Geotechnical Consultants

PTARMIGAN RIDGE

DATE 8-20-90

JOB NO. 72865-J

DRAWN EMM

BORING NO. 8

ELEVATION:

DEPTH (FT)	SYMBOL	SAMPLE	DESCRIPTION	PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)
5		II		6/6 18/12 33/18		5.5%
10		III		5/6 12/12 18/18		13.7%
15		I		5/6 13/12 26/18		14.3%
16			KM MANCOS SHALE			
		IV		53/6 90/10		15.1%
20						

No FREE WATER
DURING DRILLING
8-24-90

LOG OF SUBSURFACE EXPLORATION

Lincoln DeVore, Inc.
Geotechnical Consultants

PTARMIGAN RIDGE

DATE 8-24-90

JOB NO. 72865-J

DRAWN EMM

BORING NO. 9

ELEVATION:

DEPTH (FT)	SYMBOL	SAMPLE	DESCRIPTION	PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)
5		I		15/6 40/12 70/18		4.9%
10		II				8.9%
15		III		3/6 7/12 12/18		12.6%
17			MANCOS SHALE			
20		IV		30/6 80/12		14.0%

NO FREE WATER
DURING DRILLING
8-24-90

LOG OF SUBSURFACE EXPLORATION

Lincoln DeVore, Inc.
Geotechnical Consultants

PTARMIGAN RIDGE

DATE 8-24-90

JOB NO. 72865-J

DRAWN EMM

BORING NO. 10

ELEVATION:

DEPTH (FT)	SYMBOL	SAMPLE	DESCRIPTION	PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)
5			FILL			
9		III	9' H_2O	7/6 15/12 24/18		14-9%
10		III	GRAVEL SIZED SANDSTONE FRAGMENTS	17/6		14-3%
15			MANCOS SHALE	32/12 46/18		
		IV		4/6 54/8		17-5%
20			FREE WATER @ 9' DURING DRILLING 8-24-90			

LOG OF SUBSURFACE EXPLORATION

Lincoln DeVore, Inc.
Geotechnical Consultants

PTARMIGAN RIDGE

DATE 8-24-90

JOB NO. 72865-J

DRAWN EMM

BORING NO. 11

ELEVATION:

DEPTH (FT)	SYMBOL	SAMPLE	DESCRIPTION	PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)
			FILL	4/6		
				9/12		
5				16/18		
			(II)	4/6		
				11/12		6-3%
10				4/18		
12½			(IV) MANCOS SHALE	18/6		20.6%
				42/12		
15				74/18		

NO FREE WATER
8-28-90

LOG OF SUBSURFACE EXPLORATION

Lincoln DeVore, Inc.
Geotechnical Consultants

PTARMIGAN RIDGE		DATE 8-28-90
JOB NO. 72865-J	DRAWN EHM	

BORING NO. 12

ELEVATION:

DEPTH (FT)	SYMBOL	SAMPLE	DESCRIPTION	PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)
		II				
7			MANCOS SHALE			
		IV		15/6 46/12		9.3%

NO FREE WATER

8-28-90

LOG OF SUBSURFACE EXPLORATION

Lincoln DeVore, Inc.
Geotechnical Consultants

PTARMIGAN RIDGE

DATE 8-28-90

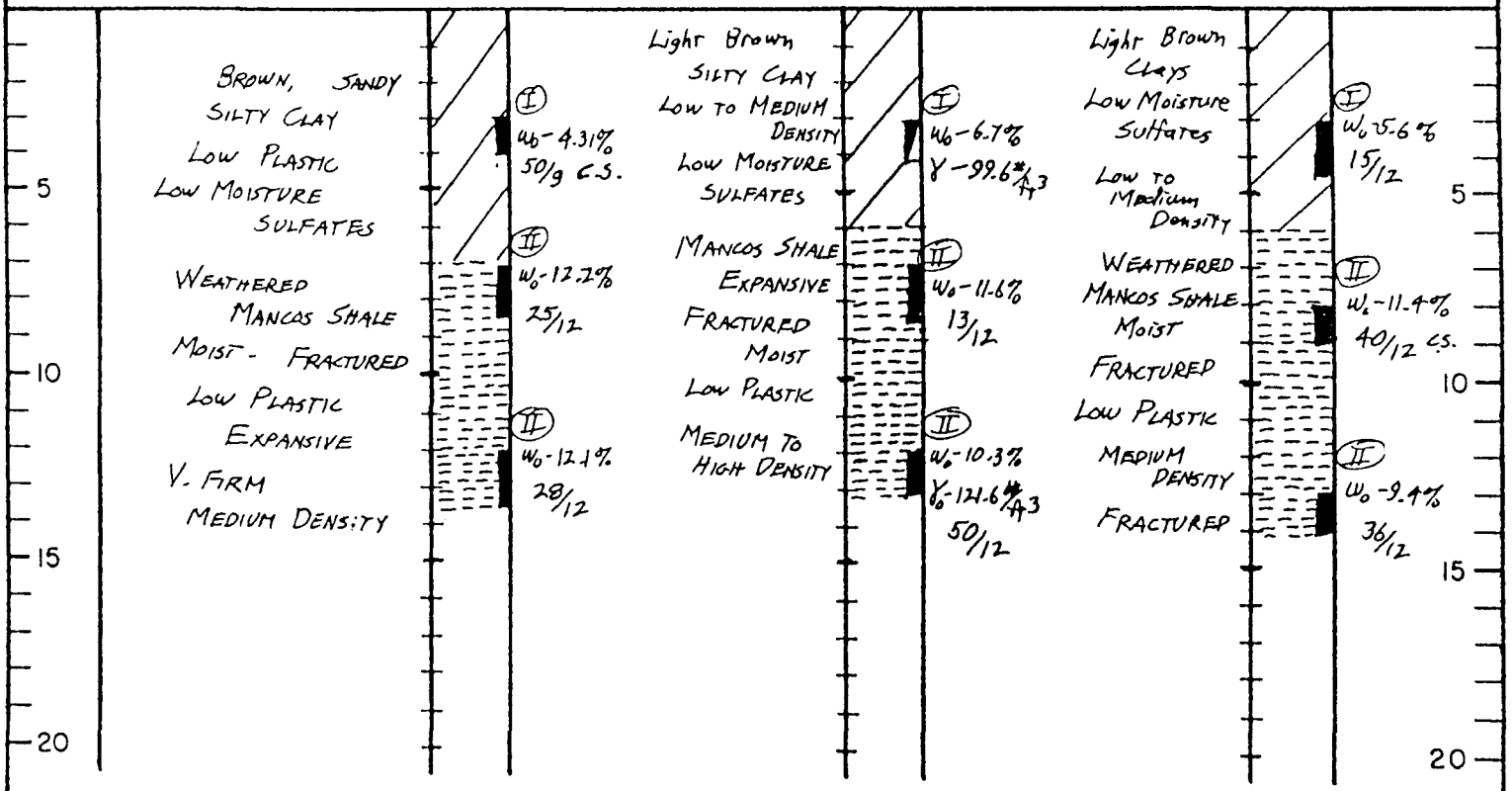
JOB NO. 72865-J

DRAWN EMM

Job No. LD 72823-J

TEST HOLE NO. P-H-#1 P-H-#2 P-H-#3

ELEVATION



No Free Water In The Exploration Borings At Time of Drilling 6-28-90

DRILLING LOGS

LINCOLN DeVORE ENGINEERS • GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO,

SUMMARY SHEET

Soil Sample CLAY - SILT (CL-ML)

Test No. 72865-J

Location PTARMIGAN RIDGE - GRAND JUNCTION

Date 8-28-90

Boring No. 9 Depth 3

Sample No. (I)

Test by RM

Natural Water Content (w) 4.9 %

Specific Gravity (Gs) _____

In Place Density (γ_o) _____ pcf

SIEVE ANALYSIS:

Sieve No.	% Passing
1 1/2"	
1"	
3/4"	
1/2"	
4	
10	100.0
20	95.5
40	87.8
100	76.6
200	68.2

HYDROMETER ANALYSIS:

Grain size (mm)	%
.02	46.7
.005	44.4

Plastic Limit P.L. 15.1 %

Liquid Limit L. L. 20.6 %

Plasticity Index P.I. 5.5 %

Shrinkage Limit _____ %

Flow Index _____

Shrinkage Ratio _____ %

Volumetric Change _____ %

Lineal Shrinkage _____ %

MOISTURE DENSITY: ASTM METHOD

Optimum Moisture Content - w_o _____ %

Maximum Dry Density - γ_d _____ pcf

California Bearing Ratio (av) _____ %

Swell: _____ Days _____ %

Swell against _____ psf Wo gain _____ %

BEARING:

Housel Penetrometer (av) _____ psf

Unconfined Compression (qu) _____ psf

Plate Bearing: _____ psf

Inches Settlement _____

Consolidation % under psf

PERMEABILITY:

K (at 20°C) _____

Void Ratio _____

Sulfates 1000 ppm.

SOIL ANALYSIS

LINCOLN-DeVORE TESTING LABORATORY
COLORADO SPRINGS, COLORADO

Soil Sample Silty Sand (SM)

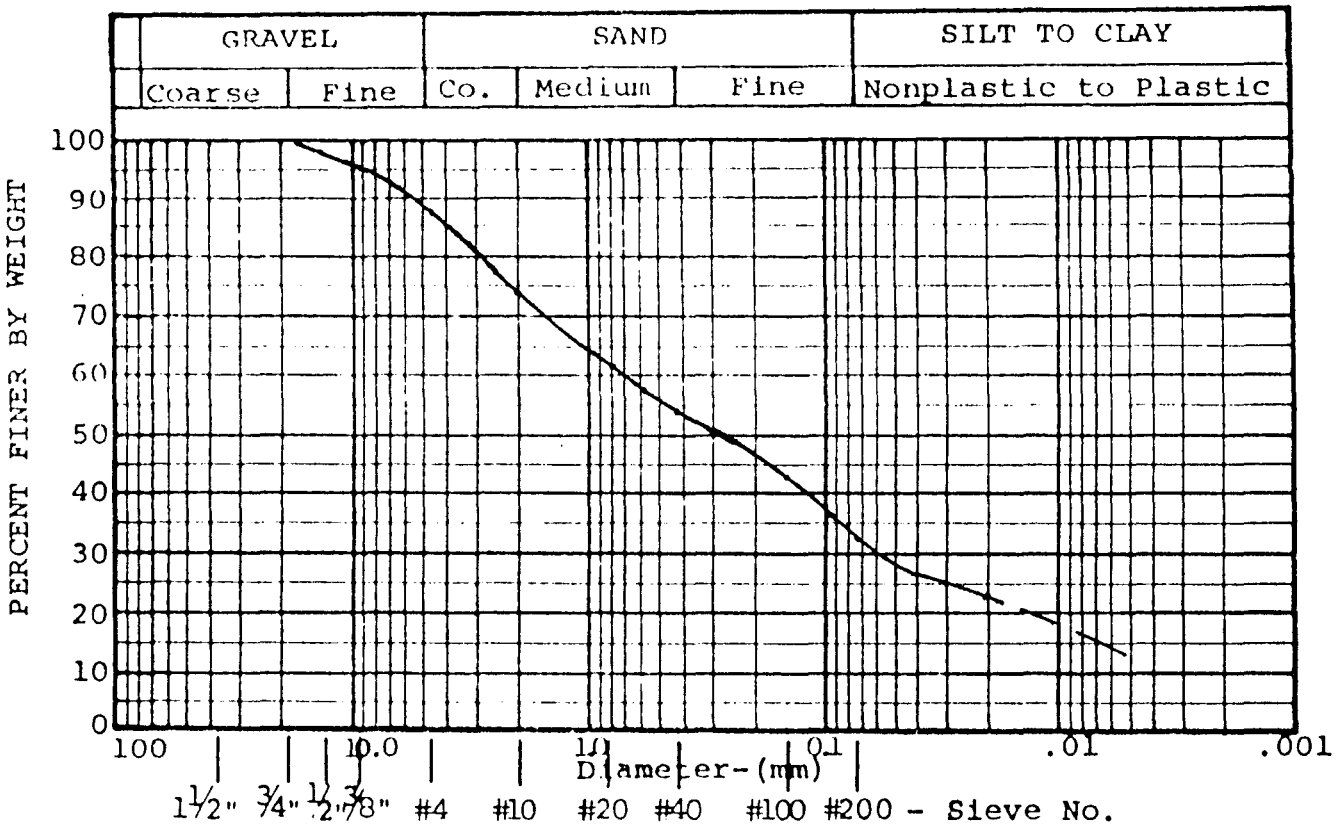
Project Ptarmigan Ridge

Sample Location 11@8

Test No. 72865-J

Date 8-31-90

Test by RM



Sample No. II

Specific Gravity

Moisture Content 13.7

Effective Size

Cu

Cc

Fineness Modulus

L.L. 18.6 % P.I. N.P. %

BEARING psf

Sieve Size	% Passing
1 1/2"	
1"	
3/4"	100.0
1/2"	98.2
3/8"	95.5
4	87.1
10	73.6
20	61.4
40	54.3
100	42.4
200	32.4
0200	23.2

Sulfates 2000 ppm

GRAIN SIZE ANALYSIS

LINCOLN DeVORE ENGINEERS GEOLOGISTS

COLORADO: COLORADO SPRINGS
GRAND JUNCTION, PUEBLO,
GLENWOOD SPRINGS

Soil Sample SILTY SAND (SM)

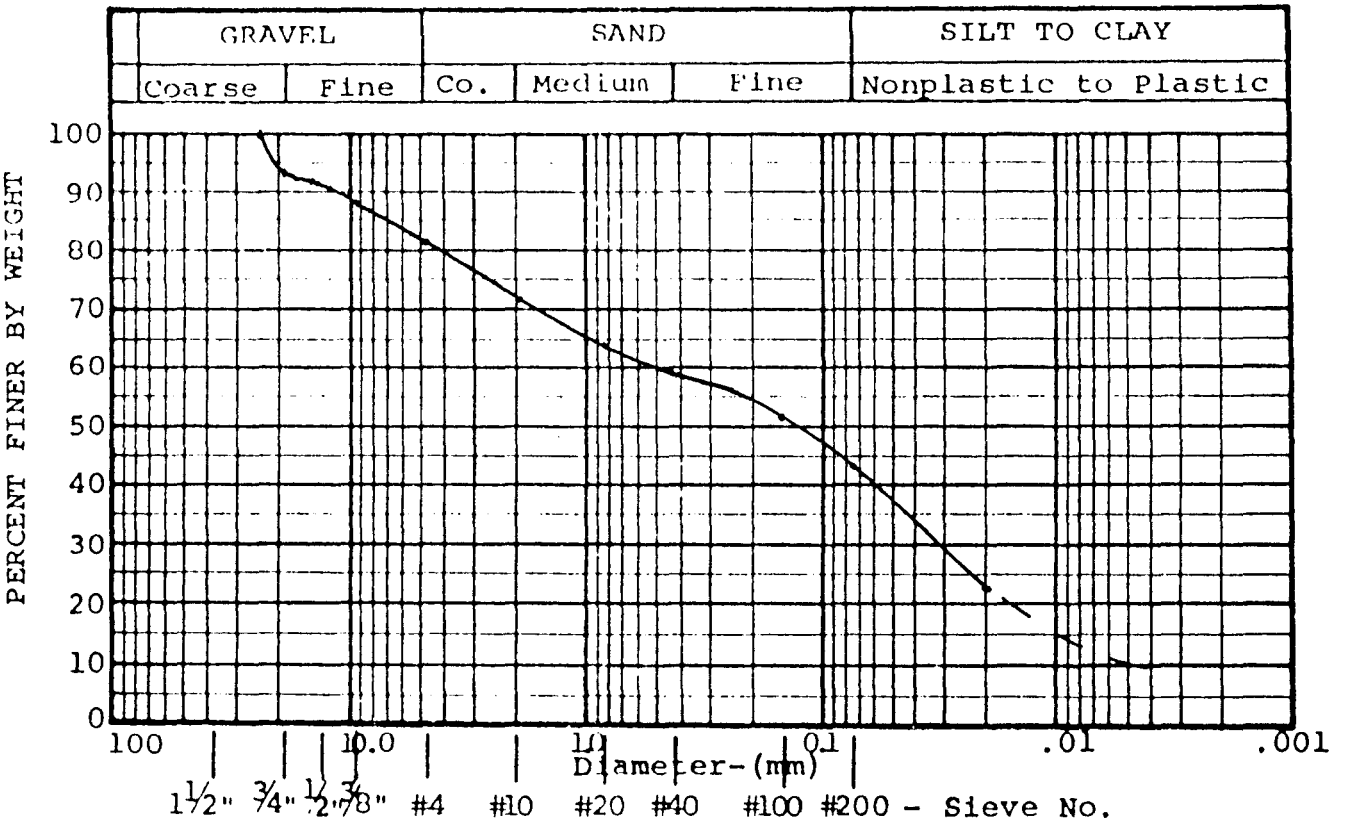
Test No. 72865-J

Project PTARMIGAN RIDGE

Date 8-31-90

Sample Location 3C13

Test by RM



Sample No. III

Specific Gravity

Moisture Content 19.7%

Effective Size

Cu

Cc

Fineness Modulus

L.L. 16.4 % P.I. N-P %

BEARING psf

Sieve Size	% Passing
1 1/2"	
1"	100.0
3/4"	92.9
1/2"	90.7
3/8"	87.8
4	81.3
10	71.2
20	63.7
40	59.4
100	50.7
200	43.0
0200	22.6

Sulfates 2000 ppm

GRAIN SIZE ANALYSIS

LINCOLN DeVORE ENGINEERS GEOLOGISTS

COLORADO: COLORADO SPRINGS
GRAND JUNCTION, PUEBLO,
GLENWOOD SPRINGS

SUMMARY SHEET

Soil Sample MANCOS SHALE (CL)

Test No. T2865-J

Location PTARMIGAN RIDGE

Date 8-28-90

Boring No. 7 Depth 13

Sample No. IV

Test by RM

Natural Water Content (w) 13.5 %

Specific Gravity (Gs) _____

In Place Density (γ_o) _____ pcf

SIEVE ANALYSIS:

Sieve No.	% Passing
1 1/2"	
1"	
3/4"	
1/2"	
4	
10	100.0
20	93.7
40	89.1
100	83.3
200	79.2

HYDROMETER ANALYSIS:

Grain size (mm)	%
.02	49.1
.005	41.8

Plastic Limit P.L. 17.2 %

Liquid Limit L. L. 27.1 %

Plasticity Index P.I. 9.9 %

Shrinkage Limit _____ %

Flow Index _____

Shrinkage Ratio _____ %

Volumetric Change _____ %

Lineal Shrinkage _____ %

MOISTURE DENSITY: ASTM METHOD

Optimum Moisture Content - w_o _____ %

Maximum Dry Density - γ_d _____ pcf

California Bearing Ratio (av) _____ %

Swell: _____ Days _____ %

Swell against _____ psf Wo gain _____ %

BEARING:

Housel Penetrometer (av) _____ psf

Unconfined Compression (qu) _____ psf

Plate Bearing: _____ psf

Inches Settlement _____

Consolidation % under psf

PERMEABILITY:

K (at 20°C) _____

Void Ratio _____

Sulfates 2000 ppm.

SOIL ANALYSIS

LINCOLN-DeVORE TESTING LABORATORY
COLORADO SPRINGS, COLORADO

TEST HOLE NO.	SAMPLE DEPTH (FT.)	NAT. MOIST. Wo = %	NAT. DRY DENSITY (PCF)	PERCENT PASSING NO. 200 SEIVE	ATTERBERG LIMITS			UNCONFINED COMPRESSIVE STRENGTH (PSF)	SWELL TEST (PSF)	WATER SOLU. SULF. (PPM)	ASTM D-2487 SOIL CLASS.	SOIL TYPE NO.	DESCRIPTION AND NOTES
					LIQUID LIMIT LL-%	PLASTIC LIMIT PL-%	PLAST. INDEX PI-%						
9	3	4.9								2000		I	
	8	8.9							468 Remold			I	
	13	12.6								2000		III	
	18	14.0								2000		IV	
10	3									2000		FILL	
	8	14.9								2000		III	
	13	14.3								2000		III	
	18	17.5										IV	
11	3											FILL	
	8	6.3										II	
	13	20.6								2000		IV	
12	3											II	
	8	9.3								2000		IV	

LABORATORY TEST RESULTS
SUMMARY OF SAMPLES

LINCOLN DeVORE ENGINEERS · GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS
WYOMING: EVANSTON

Job No. LD

Rpt. Date

TEST HOLE NO.	SAMPLE DEPTH (FT.)	NAT. MOIST. Wo = %	NAT. DRY DENSITY (PCF)	PERCENT PASSING NO. 200 SEIVE	ATTERBERG LIMITS			UNCONFINED COMPRESSIVE STRENGTH (PSF)	SWELL TEST (PSF)	WATER SOLU. SULF. (PPM)	ASTM D-2487 SOIL CLASS.	SOIL TYPE NO.	DESCRIPTION AND NOTES
					LIQUID LIMIT LL-%	PLASTIC LIMIT PL-%	PLAST. INDEX PI-%						
1	3	5.4										I	
	8	10.2								2000		III	
	13	18.4										III	
	22	11.9								2000		IV	
3	3	4.3							204 remold			I	
	8	14.2								2000		I	
	13	19.7										III	
	18	14.9								2000		IV	
7	3	5.2	105.9						921			I	
	8	7.0										III	
	13	13.5								2000		IV	
8	3	5.5										II	
	8	13.7										III	
	13	14.3								2000		I	
	18	15.1								2000		IV	

Form Office Approved

LABORATORY TEST RESULTS
SUMMARY OF SAMPLES

LINCOLN DeVORE ENGINEERS · GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS
WYOMING: EVANSTON

Job No. LD
Rpt. Date

4-27-92

DON

WE ARE IN PROCESS OF OBTAINING THE IMPROVEMENTS GUARANTEE. NEED YOU TO REVIEW AND APPROVE THE AMOUNT OF $69,395. WE PLAN TO RECORD PLAT MIDDLE OF THIS WEEK.

THANKS
LEWIS HOFFMAN
241-7025

Imp. Agree to include stretch of sidewalk in Filing ONE

No Bldge Permits until PLAN Drainage Road Plans Approved

Bldge Dr. 15th ST. culdesacs see Don re culdesac

47-91

BOOK 1898 PAGE 278

1601506 10:56 AM 05/06/92
MESA CO.CLK & REC MESA COUNTY CO

F

Ptarmigan Ridge Filing 2

Mesa County, Colorado

These covenants are meant to help establish and continue a strong sense of neighborhood and quality within Ptarmigan Ridges.

1. All lots shall be used for one single family dwelling per lot and shall not be further subdivided.

2. No animals other than housepets shall be allowed and these will be confined by the owners to their lot. No animals shall be kept, bred, or maintained for commercial purposes. No horses, cattle, sheep, goats, or donkeys will be allowed to be kept on Ptarmigan Ridge lots.

3. Each single family dwelling shall be constructed so that the dwelling space on the first floor, excluding decks, patios, porches, carports,and garages, shall be not less than the following minimum square footages for both single story and two (2) story structures. If the structure is a tri-level, of the main living area is spread over two continuous and adjacent levels, the combination of such levels shall be construed to be the first floor. Lots will be designated as to type on final plat.

1 story: 1500 min.
2 story: 750 min. first floor

Except Lot 2, Block 3 which shall have a 1200 min. or 600 first floor for a 2 story min.

4. All building set back requirements are to be to city standards.

5. All foundation plans shall be engineered by a licensed Colorado engineer and bear the stamp of same.

6. Invalidation of any one of these covenants by judgement, statute, or court order shall in no way effect any other covenant. These covenants are binding upon all purchasers of a lot or lots in Ptarmigan now and in the future.

7. No trailer, basement, tent, barn, or other outbuilding or temporary structure shall be used as a residence, temporary or permanent.

8. Only persons holding title to land in Ptarmigan Ridge shall have the right to seek remedy at law or in equity against any person or persons violating or attempting to violate any of these covenants.

9. There is hereby established Ptarmigan Ridge Homeowners Association, an association of which every lot owner will be a member. Membership passes automatically with the sale of the lot. The association shall have the duty to administer the water rights and irrigation practices for Ptarmigan Ridge. It shall have the right to assess members on any reasonable basis for their fair share of the costs of irrigation water, and such charges shall be a lien against each owner's lot. In the event that any such charges become more than thirty (30) days overdue, the association may assess a reasonable penalty, and may add to the assessment all costs of collection. The lien, if foreclosed, shall be foreclosed in the manner of a mechanic's lien under Colorado law. The members of the association, by majority vote, may elect officers. They may, but are not required to, adopt bylaws governing their organization. There shall be one vote per lot in any filed portion of the total Ptarmigan Ridge subdivision.

10. The above covenants may be modified and/or amended by a vote of members of the Homeowners Association with approval by no less than 80% of the members.

11. These covenants shall run with the land for the benefit of all future owners.

12. No vehicles shall be allowed on any lot, that can't be driven under their own power within twenty-four hours.

13. A three person architectural control committee shall be established to review and approve house plans and landscape plans in order to maintain the integrity of Ptarmigan Ridge.

14. Two large trees shall be planted at curb side in order to create a tree-lined street consistent with traditional Grand Junction street treatment.

16. If a lot is purchased and not built on within 18 months from date of purchase, the owner will submit an interim landscape plan which will maintain the integrity in accordance with other built-on lots.

17. Recommended finish floor elevations for selected lots are as follows:

Block 1		
	Lot 1	4706~~.7~~ 7.2
Block 2		
	Lot 1	4706~~.7~~ 7.2
	Lot 2	4707~~.0~~ 7.5
	Lot 3	4707~~.0~~ 7.5
Block 3		
	Lot 2	4708~~.0~~ 8.5

LEH 5-6-92

Reference manhole rim elevation of 4705.55 in intersection of No. 15th St. and Ridge Drive.
See attached Exhibit A for limits of 100 year storm. LEH 5-6-92

Dated: APRIL 27, 1992

Ptarmigan Investments Inc.

By: John A. Stuff

FILE: PRF2F

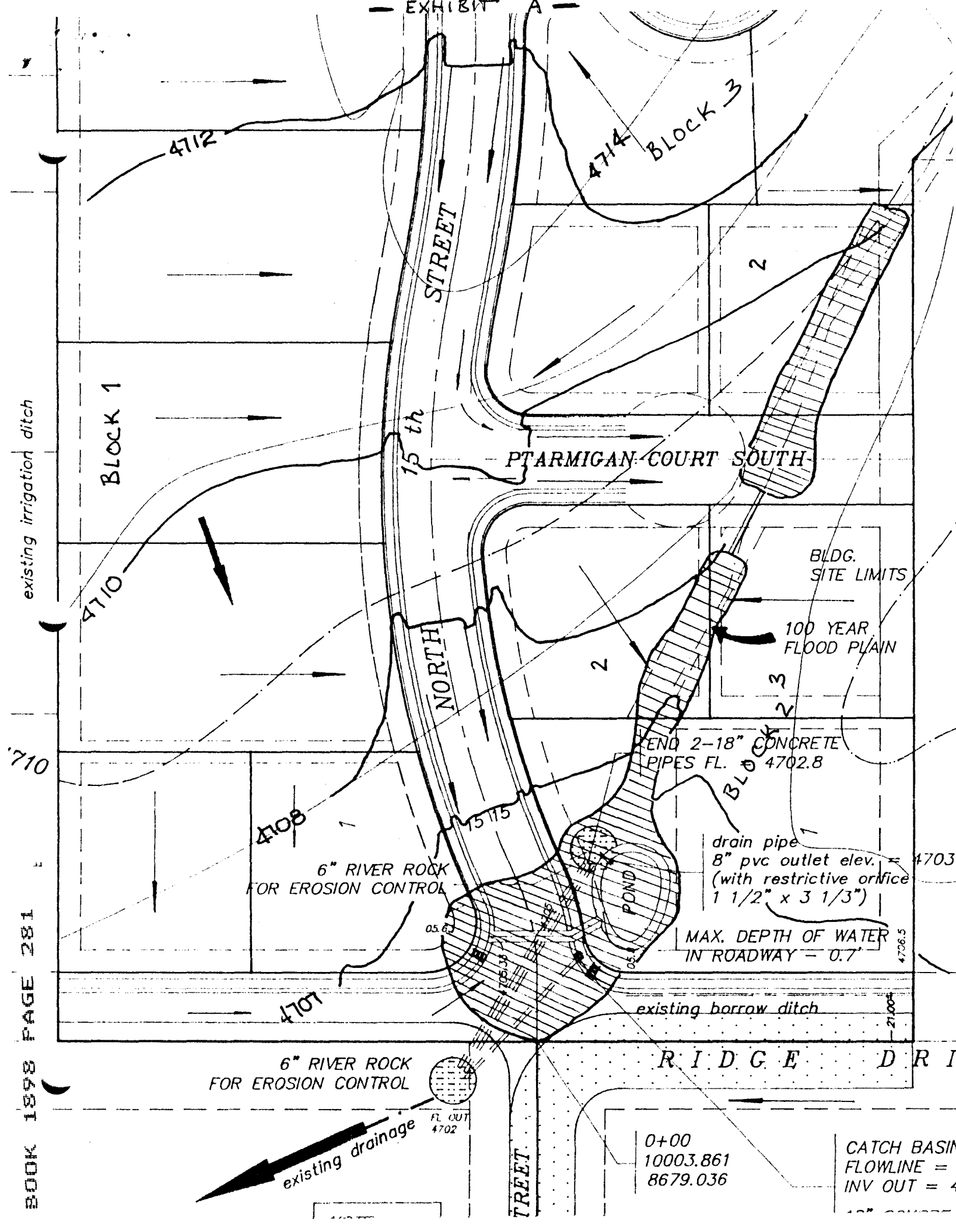


EXHIBIT A
4712
4714
BLOCK 3
STREET
15 th
PTARMIGAN COURT SOUTH
BLOCK 1
existing irrigation ditch
4710
BLDG.
SITE LIMITS
100 YEAR
FLOOD PLAIN
NORTH
2
3
END 2-18" CONCRETE
PIPES FL. 4702.8
4708
6" RIVER ROCK
FOR EROSION CONTROL
drain pipe
8" pvc outlet elev. = 4703
(with restrictive orifice
1 1/2" x 3 1/3")
POND
MAX. DEPTH OF WATER
IN ROADWAY = 0.7'
4706.5
4707
existing borrow ditch
R I D G E D R I
6" RIVER ROCK
FOR EROSION CONTROL
FL OUT
4702
existing drainage
0+00
10003.861
8679.036
CATCH BASIN
FLOWLINE =
INV OUT =
BOOK 1898 PAGE 281

PTARMIGN RIDGE FILING 2
PLAT recorded
ON MAY 6, 1992
10:56 AM
BOOK 14
PAGE 48
05/06/92
RECEPTION # 1601504
DRAWER # Z40

#47-91

PLAT recorded

ON MAY 6, 1992 10:56 AM

Book 14

Page 48 05/06/92

Reception # 1601504

DRAWER # Z40

(Z AS IN ZEBRA)

AVIGATION EASEMENT

Book 1898

Page 275 thru 277

Restrictive Covenants

Book 1898

Page 278 thru 281

Improvements Agreement — Book 1898
Page 282

Improvements Guarantee (Letter of Credit)

Book 1898
PAGE 283

#47-91

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

August 18, 1992

William Heley, P.E.
WH Engineering
2257 Fawn Court
Grand Junction, CO 81503

Re: Ptarmigan Ridge Filing 2

Dear Bill:

We have received and reviewed the plans sealed August 13, 1992, for Ptarmigan Ridge Filing 2, sheets 1 through 10, and approve the plans for construction. The remaining outstanding issue is a sketch detail of the future outlet manhole at the southwest corner of Ridge Drive and North 15th Street.

A detention/retention facility maintenance agreement will not be required. Although the agreement addresses developer/owner responsibility, particularly items 1 through 4 therein, it was determined that the existing development code and obligations implied therein adequately covers these issues, and that additional paperwork is unmerited.

If you have any questions concerning the above, please call.

Sincerely,

Gerald R Williams

Gerald R. Williams, P.E.
Development Engineer

mg

xc: Don Newton, City Engineer
Dave Thornton, City Planner
John Seigfried, Developer

filegw\\ptarm_#2

MEMORANDUM

DATE: April 28, 1993

TO: David Thornton

FROM: Gerald Williams

SUBJECT: Ptarmigan Ridge Filing #2

We have reviewed information submitted regarding Ptarmigan Ridge Filing #2 Subdivision, and have inspected facilities in the field. It appears that facilities have been adequately constructed per the plans. We therefore initially accept the constructed facilities as of the date of this memorandum, and request release of the full improvements guarantee.

cc: Don Newton, City Engineer

Item 7.

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

August 20, 1992

John Siegfried
1018 Colorado Avenue
Grand Junction, CO 81501

Re: Ptarmigan Ridge Filing 2

Dear John:

The plans for Ptarmigan Ridge Filing 2 have been approved for construction. We now request that the following information be submitted as soon as possible:

(i) Construction schedule;
(ii) List of contractors to be used on the project;
(iii) Testing laboratory that will provide materials and other testing; and
(iv) Name of the developer's designated inspector.

In addition to the above, Walt Hoyt at 244-1577 or 244-6232 (mobile) should be called for inspection for the various stages of construction as outlined on the attached form which will be used to keep track of construction inspection and approvals.

If you have any questions regarding above, please call.

Sincerely,

Gerald R Williams

Gerald R. Williams, P.E.
Development Engineer

Attachment

xc: Don Newton, City Engineer
Dave Thornton, Planner

CONSTRUCTION PHASE

INSPECTION TYPE		1st Inspection	2nd Inspection	3rd Inspection	PASS
OVERLOT GRADING					
BEST MANAGEMENT PRACTICES					
SEWER:	Bedding				
	Pipeline				
	Services				
	Backfill				
	Deflection				
	Pressure				
	Infiltration				
	Lamping				
	Manholes				
WATER:	Bedding				
	Pipeline & Appurt.				
	Services				
	Backfill				
	Pressure Test				
	Disinfection				
DRAINAGE:	Bedding				
	Pipeline				
	Culverts				
	Backfill				
	Detention				
STREETS:	Subgrade				
	Geosynthetics				
	Basecourse				
	Asphalt				
	Concrete				

Completed

AS-BUILTS

SUBMITTAL TYPE	1st Submittal		2nd Submittal		APPROVED	
	Rec'd	Ret'd	Rec'd	Ret'd	Rec'd	Ret'd
Grading & Drainage						
Best Management Practices						
Detention Basin						
Storm Drainage						
Water						
Sewer						
Streets						
Irrigation						
Other						

COMMENTS

MEMORANDUM

DATE: November 9, 1992

TO: Dave Thornton

FROM: Gerald Williams

SUBJ: Ptarmigan Ridge Filings 2, 3, and 4

I thought it may be beneficial to summarize some of the outstanding issues relating to the Ptarmigan Ridge Filings 2, 3, and 4 which are under construction and review.

Filing 2 Retention Basin. The drainage design requires that a retention basin be constructed at 27 1/2 Road across from Cortland Avenue. Retention basins are permitted runoff reduction facilities, but conditions do apply. Thus far, the following concerns and non-conforming conditions exist.

1. We have not had runoff producing rainfall since November 2nd or 3rd, and yet when I visited the site on November 5th, several feet of water remained in the basin. We realize that some of that was probably bleed-off water from the church site detention pond, and therefore direct conclusions regarding percolation rates are difficult to obtain. I noted however, that there was no inflow into the pond occurring at the time of my visit.

   I visited the site again today, 4 days later, and although the water level had receded, ponded water remained over most of the basin bottom, with depths exceeding 0.5 feet. The volume of water in the pond on November 5 was significantly less than 100-year storm required retention volume, and yet the water was unable to percolate out within the required 48 hours.

2. Side slopes of basins are not allowed steeper than 3H:1V. Site observations and the submitted volume certification drawing indicate that side slopes approximate 1.4 or 1.5 to 1. This represents a safety hazard, cannot be readily maintained, and is not acceptable. The side slopes must conform to criteria.

3. When Lewis Hoffman spoke with us at the Community Development counter the morning of November 4, he indicated that the pond was full of water, and therefore would preclude the possibility of a survey in the immediate future for volume certification. Notwithstanding, the very next day (the day I observed several feet of water still in the pond), I received a volume certification for the basin. The top of the basin could have been surveyed, and the general slope as well, but unless as-built bottom elevations were known prior to storm runoff, it is doubtful that the information presented is reliable.

4. In addition to the above issues, we also intend to inspect the diversion struction that receives runoff from 3 pipes and outlets into the 24 inch CMP. This will be done at the time that basin is re-inspected after corrections are made.

All four above concerns must be addressed prior to our acceptance of the detention basin, which will also be prerequisite to approving Filing 3 and 4 plans and plats.

Traffic Regulations A recent site visit revealed that required traffic signage has yet to be installed by the developer. A stop sign facing north at the northeast corner of the intersection is required. At the same corner, only facing east, a double sign is required having a **No Outlet** sign (W14-2) and small rectangular sign underneath which reads "Private Drive". These signs govern traffic at the Ridge Drive and N. 15th Street intersection, which is the access to Filings 3 and 4. Consequently, we will require that these signs be installed prior to our approval of Filings 3 and 4 plans and plats.

Drainage Report Previous requirements for the Filings 3 and 4 drainage report have not been completely addressed, even on the latest addendum dated November 3, 1992. Lewis Hoffman was informed of this on November 4, and indicated that he would have the engineer give me a call to discuss what is still lacking and also our concerns with what was submitted. So far we have not received a phone call or any additional information. This issue must be resolved prior to approving Filings 3 and 4 plans and plats.

Inlet An inlet is required at the southwest corner of Ridge Drive and N. 15th Street. Filings 3 and 4 are not dependent in any way upon the inlet, and therefore the inlet will not be a condition of Filings 3 and 4 approval. However, it must be done as part of Filing 2 and prior to acceptance of Filing 2 work.

I presume that you will be immediately forwarding a copy of this to the developer. I invite questions or comments from you or them.

file:GW:REVPTARM.GW

skw

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

March 4, 1993

John Siegfried
QED Surveying Systems
1018 Colorado Avenue
Grand Junction, CO 81501

Re: Ptarmigan Ridge, Filing Two

Dear John:

It has come to my attention that construction of the streets in Ptarmigan Ridge Filings 3, 4, and 5 is commencing without the required inspection and test results or acceptance of the utilities, subgrade preparation and aggregate base course.

Please be aware that any concrete curb, gutter, sidewalk, drainage facilities or paving that is installed prior to City approval of the underlying utilities and road base may have to be removed.

I recommend that construction of the streets be discontinued until the required inspection and test reports have been performed, submitted, and approved. I also need to know who will be responsible for daily inspection and construction management for these Filings.

Please call if you have any questions regarding these requirements.

Sincerely,

J. Don Newton

J. Don Newton, P.E.
City Engineer

mg

xc: Gerald Williams
Mark Relph
Dave Thornton
Dan Wilson

FILING 3 UNITED HAS BEEN GIVEN THE GO AHEAD TO PAVE STREETS WHENEVER THEY ARE READY.

FILINGS 4 & 5 UNITED IS SCHEDULED TO PLACE BASE 3/5/93 UNDER PROPOSED CONCRETE. MMS IS SCHEDULED TO TO FOLLOW WITH CONCRETE, UNITED WITH ROAD BASE AND ASPHALT. THESE ARE TO TAKE PLACE NEXT WEEK WHEN LEWIS WILL BE GONE.

OUR CONCERN IS THAT ADEQUATE TESTING HAS NOT BEEN PERFORMED, NOR IS THE ADEQUATE PROVISION FOR INSPECTION. PROBLEMS ARE SUMMARIZED BELOW.

DESCRIPTION OF TEST OR INFO	FILING 3	FILING 4	FILING 5
PASSING S/L COMPACTION TESTS	OK	2/34	0/12
PASSING W/L COMPACTION TESTS	OK	21/30	0/10
PASSING W/L PRESSURE TEST	NONE	NONE	NONE
PASSING S/L PRESSURE TEST	NONE	YES	NONE
PASSING S/L LAMPING TEST	YES	YES	YES
PASSING S/L DEFLECTION TEST	N/R	N/R	N/R
DEVELOPER'S INSPECTOR'S REPORTS	NONE	NONE	NONE
SUBGRADE BELOW CONCRETE COMP. TESTS	—	NONE	NONE
SUBGRADE BELOW ASPHALT COMP. TESTS	NONE	—	—
BASE COURSE BELOW ASPHALT COMP. TESTS	NONE	—	—
DEVELOPER'S INSPECTOR FOR NEXT WEEK	NONE ↓ WANT TO PAVE!	NONE ↓ WANT TO PROCEED WITH CONCRETE AND ASPHALT BASE WORK	NONE ↓

EVALUATION OF SYSTEM BY A THIRD PARTY ENGINEER SELECTED BY KATHY DEPPE & PAID FOR BY PTARMIGAN

- INVOICE -
5/12/93

TO: Ms. Kathy Deppe
1401 N. 1st Street
Grand Junction, CO 81501

FOR: Consulting Engineering - Irrigation System Review/Analysis (Ptarmigan Ridge Subdivision)

11 Hours. @ $50.00/hr. = $ 550.00

Clerical - Lump Sum = $ 25.00

TOTAL DUE = $ 575.00

PAYABLE TO: Patrick M. O'Connor
141 W. Ottley Avenue
Fruita, CO 81521

May 12, 1993

Ms. Kathy Deppe
Remax Grand Junction
1401 N. 1st Street
Grand Junction, CO 81501

RE: PTARMIGAN RIDGE SUBDIVISION (FILINGS ONE THROUGH FIVE) - IRRIGATION

Dear Ms. Deppe:

This letter is in response to your request for general analysis of the adequacy of the above referenced irrigation system. It is based on information provided to me by Mr. Lewis Hoffman (Parmigan Investments, Inc.) and Mr. Ed Oest (Irrigation Systems Company of Western Colorado). The information was provided through discussions and reviews of existing design drawings. My response is not based on field verification of the system construction other than a brief site visit to the pumphouse on May 10 with Mr. Hoffman.

SUMMARY:

The system is adequate to deliver a reasonable amount of water (at least 2 inches per week) to 64 lots with an estimated average irrigable area of 5,000-square-feet each, but only with the cooperation of the 64 individual lot owners. Homeowners must follow a watering schedule designed to attenuate the demand on the pumping system. If cooperation is not obtained, the present system will likely fail in attempts to provide pressure and flowrate during peak demand periods.

GENERAL:

Homeowners in multi-lot subdivisions are often faced with similar situations and problems when dealing with irrigation. In general, they have two choices when electing to provide irrigation:

1) provide a modest system and depend upon cooperation, or

2) allow unrestricted use and spend a high unit cost per lot to provide storage (ponds) and a variable demand pumping system.

Costs for the latter option can typically run from $10,000 to $20,000 (or more) for pond construction, plus $15,000 to $25,000 for variable-stage pumping systems with pressure tanks. Most developers opt for the less costly arrangement and rely on continued cooperation among the users.

The information used to estimate demand and available supply is as follows:

DEMAND:

Typical Lot Size - 9,000 S.F.
Typical Irrigable Area Per Lot - 5,000 S.F.
Total Number of Lots (Filings 1-5) - 64 lots
64 lots (5,000 S.F. Irrig.) @ 2"/week = 40 g.p.m. (continuous)

INDIVIDUAL DEMAND:

Assume: 5 sprinklers @ 5 g.p.m. each = 25 g.p.m./user

SUPPLY:

Water Right = 168 G.P.M. (Lewis Hoffman 5/10/93)
Pump Feed Line: 6"PVC @ S = 0.91%, Q = 320 g.p.m. (available)
Pump Capacities: From Curves (Ed Oest 5/8/93) - 15 H.P.
100 g.p.m. @ 174' T.D.H. (74 p.s.i.)
400 g.p.m. @ 110' T.D.H. (47 p.s.i.)

CONCLUSION:

More than enough continuous flow water-right exists to provide irrigation to the 64-lot development. The pump feed line is capable of supplying approximately twice the allowable right and the pump is capable of moving this much, and more, dependent on operating pressure. Therefore, the system is adequate as long as peak demands don't exceed available water quantities or pump capabilities. This must be controlled by scheduling watering times. Otherwise, more than six (estimated) simultaneous users will exceed allowable water-rights and more than 12-to-15 (estimated) simultaneous users will exceed available supply to the pump.

POSSIBLE FUTURE PROBLEMS:

1) Too many simultaneous users. Solution: Set up watering schedule that users will abide by.

2) Exceeding allowable water right. Solution: Additional water may be used when it is available and not restricted, but watering schedule should be based on allowable maximum only.

3) Pump capacities exceeding suction feed. Solution: Throttle back the gate valve on the discharge side of the pump to keep it operating at (or behind) 300 g.p.m. (approximately) on the curve.

4) High pump temperatures during non-use (with pump timer on). Solution: Mr. Oest has designed a bypass system to circulate water through the pump during no-use periods. This is, in my opinion, a good system but may need to waste (to drain) a small stream of water to allow introduction of cool feed water to prevent overheating. This could easily be accomplished in the future, if necessary. The system should be tested for such conditions prior to overall use.

5) Increased operating pressures and flowrate problems associated with recent increase in pump size. Solution: Carefully, and slowly, open and close all control valves during operation. Test and monitor the distribution system prior to overall use.

Please feel free to call me with any questions you have associated with this report. I would be happy to assist you, or your users, in establishing a workable watering schedule to match the capabilities of your system.

Sincerely,

Patrick M. O'Connor, P.E.

xc: Mr. Lewis Hoffman
Mr. Ed Oest

IRRIGATION SYSTEMS COMPANY

OF WESTERN COLORADO
2098 HWY. 6 & 50 FRUITA, COLORADO 81521
(303) 242-2900 FAX (303) 242-8205

May 28, 1993

Lewis Hoffman
Ptarmegan Ridge Filing One
Box 9088
Grand Junction, CO 81501

RE: BOOSTER PUMP STATION MODIFICATION

Dear Mr. Hoffman

This Booster Station is intended to be a single pump pressure booster only as originally designed May 4, 1992 memo to you. It is hereby modified from the original 7.5 H.P. to a 15 H.P. Pump and from one outlet to two outlets.

This station is now operated by a Cornell 2.5 W 6.2" impeller 15-2 pump with + or - 2.0 feet positive head. There is no Jockie Pump and no pressure tank and there is but one 15 H.P. 3 Phase Pump operated by a 3 Phase Rotary RTG256 Phase converter through a KG15 panel. The pressure and/or volume can fluctuate depending on the use.

There is a time clock which can be set to shut the pump off or turn it on when desired. There is a variable time delay allowing overide of the low pressure cut off switch. There is a K-10 back pressure valve initially set at 62 psi which is below the 68 psi shut off head of the pump. At 62 psi the pump will begin to cycle water back into the intake to keep the pump cool when no other water is flowing. This also serves as over pressure protection in addition to pump cooling, and will hold the system at 62 psi.

This is the simplest and most inexpensive booster station design I know of. With free flow conditions through the Yak Screen at the Inlet and without cavitation or vortex losses, the 6" feeder line should provide about 300 gpm at 1 psi (2.31 feet) to the station.

The 15 H.P. Pump and 3 Phase 220 volt and motor has the ability to discharge approximately 300 gpm @ 54 psi, 360 gpm @ 44 psi, 100 gpm @ 67 psi. See curve enclosed.

A low pressure switch provides protection in case of a line break and also can serve to start the pump manually. It will shut the pump down if the discharge pressure drops below about 6 psi. When this happens, the cause for the low pressure, such as a broken line, must be repaired then restart the pump manually.

The pump must be started initially, at the beginning of each Irrigation season or after the system has been drained, with the gate valve closed. Then open the gate valve very gradually so as not to drop below the low pressure switch shut off pressure below 6 psi.

It is possible that the pump may not start by the time clock if the back pressure has been reduced to less than 6 psi and the time delay has run out. In that case the gate valve must be manually shut start the pump then gradually opened. The pump can therefore run continually even though no water is being used, only bypassed.

There is a one year warranty on all new parts. The used pump is sold As-Is. The electrical wiring was done by Eberhart Electric Co in Grand Junction, 434-0328.

IRRIGATION SYSTEMS COMPANY OF WESTERN COLORADO

ED OEST PH.D PRESIDENT

Enclosure - Cornell 2.5 W Pump Curve

lo

C: Kathy P.

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

28 JULY 1994

MR. JOHN SIEGFRIED
P.O. BOX 9088
GRAND JUNCTION, COLORADO 81502

Dear Mr. Siegfried:

Ptarmigan Court South in Ptarmigan Ridge subdivision, filing #2, was originally constructed as a temporary cul-de-sac with the stated intention that the street would be extended to the east to serve future filings. The property to the east of filing 2 was subsequently developed by you and Ptarmigan Court South was not extended. The unimproved right of way between filings was vacated and the temporary cul-de-sac was never constructed in accordance with adopted street standards. Review of the development file shows that the temporary cul-de-sac was not designed, graded or constructed to an approved standard. Construction of the cul-de-sac is required by the Zoning and Development Code and must be done to an approved standard.

In order for the temporary cul-de-sac to be constructed to standard the following improvements must be made:
1. Curb, gutter and sidewalk must be installed;
2. A drainage pan from the cul-de-sac to the existing inlet in the drainage easement is required;
3. A drainage pan and a storm drain inlet into the existing culvert is required on the south side of the street;
4. The portion of the cul-de-sac constructed in the easement must be relocated or be dedicated as right of way;
5. A drainage pan must be constructed at the intersection of Ptarmigan Court South at 15th Street. Currently all of the runoff north of this cul-de-sac is into it and such is not acceptable and may not continue.

If the Zoning Code requirement is not sufficiently compelling reason to construct the required improvements, please be advised that the Community Development Department will refer the matter to the City Attorney to initiate legal action in accordance with the warranty provided under the improvements agreement and guarantee.

Please submit engineered plans and a construction schedule for the above required improvements to the Community Development Department by no later than August 31, 1994.

Sincerely,

Larry Timm
Director of Community Development

pc: Jody Kliska
Mark Relph
John Shaver
Dan Wilson

E.B. HAMILTON, JR.
Attorney At Law
Post Office Box 292
Durango, Colorado 81302
(303) 247-0916

~~Ptarmigan~~ file in Ptarmigan Ridge filing #2

October 6, 1994

Mr. Larry Timm
Director of Community Development
City of Grand Junction
250 North Fifth Street
Grand Junction, CO 81501

Re: Cul de sac

Dear Mr. Timm:

I was in Grand Junction early this week, and looked, again, at the alleged drainage problem. We met with two of the three owners of homes on the cul de sac.

A solution that would seem to be reasonable and cost effective and satisfactory to everyone is to make minor alterations to the pavement to stop the ponding on the south side of the cul de sac. We need to measure some elevations to make sure this will work, but it sure looks like it.

The temporary cul de sac is no longer temporary, since we have completed arrangements with the City to abandon the easement that initially was supposed to run to Mrs. Eachus' property.

Homes have been built on the cul de sac, and people seem satisfied with it as it is. To do sidewalks, etc., we would have to dig up people's lawns and fences.

The drainage pan at the intersection of Ptarmigan Court South at 15th Street would be totally contrary to the drainage plan for the area and would result in adding increased flow where it never went historically. We would be liable in damages if we did it. If you want to, however, we have no objection.

You may have received complaints about drainage, but the system was built as required and is working as required, except for the puddling in the cul de sac, and we, our contractor, and the owners will take care of that. We did meet with Milo Johnson, and it appears that what he did has not caused the problem, and that the drainage system he constructed should work and be consistent with that which was required of us by The City of Grand Junction and its engineers.

Very truly yours,

E. B. Hamilton, Jr.
(303) 259-3615

EBH;JR/bdh

fill in Ptarmigan #2 file

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

February 17, 1995

Mr. John Siegfried
P.O. Box 9088
Grand Junction, CO 81502

Re: Ptarmigan Court South

Dear John:

On Monday, February 6, 1995, Lewis Hoffman and I met with Hugh Pape and Ron Cline, home owners on Ptarmigan Court South, to discuss their concerns regarding the incomplete cul-de-sac on Ptarmigan Court South. The home owners have insisted that the cul-de-sac be completed with curb, gutter, and sidewalk to conform with minimum City Street standards and with the other streets in the subdivision.

In order to solve this problem, I proposed to Mr. Hoffman that the City would provide surveying and engineering services necessary to design the extension of curb, gutter, and sidewalk around the cul-de-sac. The Engineering Services would include designing a drainage inlet and pipe to convey storm water from the east side of the cul-de-sac to the existing 18" drainage pipes.

I also proposed that the City share the cost of constructing these improvements with the subdivision developers at a 50/50 cost not to exceed a $2000 contribution by the City. Construction of these improvements would be the sole responsibility of the developer. The City would require review and approval of any contract and invoices on the project prior to payment of any costs.

The above proposal is available until the close of business on February 28, 1995. After that date, the City will not participate in the design or construction of the improvements and will pursue all available legal remedies to require your completion of the cul-de-sac improvements..

Please let me know, in writing, on or before February 28, 1995 if you agree to sharing the cost of the cul-de-sac improvements as outlined in this letter.

Thank you for your consideration of this proposal.

Sincerely,

J. Don Newton
City Engineer

xc: Mark Relph, Public Works Manager
John Shaver
Larry Timm
File

File:H:donn\siegfrie.215

KP X
MD X
TD X
FYI + file

RECEIVED
FEB 28 1995

February 28, 1995

J. Don Newton, P.E.
City Engineer
City of Grand Junction
250 North Fifth Street
Grand Junction, CO 81501-2668

Re: Ptarmigan Court South

Dear Don:

This letter is in response to your letter of February 17, 1995 proposing a solution to the perceived problems at the above captioned cul-de-sac.

We can accept the proposal with a few alterations and additions. First, we would like to have the opportunity to review the design prior to its finalization due to the cost implications. Since this is not a true 50/50 split of construction costs, in that you have proposed a $2000 limit on City participation, we would like to be sure the design is cost efficient and not over designed. The example would be the drainage. When drainage is put underground rather than dealt with on the surface, costs can go up 200-400% (especially when we have no idea what the homebuilder involved constructed in what was designed and approved by the City as an open drainage ditch.)

If the total construction costs significantly exceed $4000, we would request the opportunity to renegotiate the City's share in good faith. We had a $1935 solution that would have worked, but due to homeowner pressure on the City that solution has been dropped.

We believe our requests are reasonable and we are anxious to put this matter behind us.

Thank you,

47-91

Ptarmigan
File #2

John Siegfried
Ptarmigan Investments, Inc.
P.O. Box 9088
Grand Junction, CO 81501

file in Ptarmigan Ridge - Ptarmigan Court South

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

March 2, 1995

Mr. John Siegfried
Ptarmigan Investments, Inc.
P.O. Box 9088
Grand Junction, CO 81502

Re: Ptarmigan Court South

Dear John:

Based on your acceptance of the proposal for completing the curb, gutter, sidewalk and drainage improvements on the cul-de-sac, I will proceed with surveying and design of the improvements.

When we complete the design, I will send you a copy of the construction drawings for your review and comment.

After final revisions have been made to the drawings, the City will obtain at least three price proposals for the street improvements from local contractors. No construction work will be authorized until both the City and Ptarmigan Investments, Inc. have agreed on the total cost, division of costs, and the method of payment.

Thank you for your assistance and cooperation in resolving this issue.

Sincerely,

Don Newton

J. Don Newton

xc: John Shaver
Mark Relph
Larry Timm
Jim Shanks
File

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

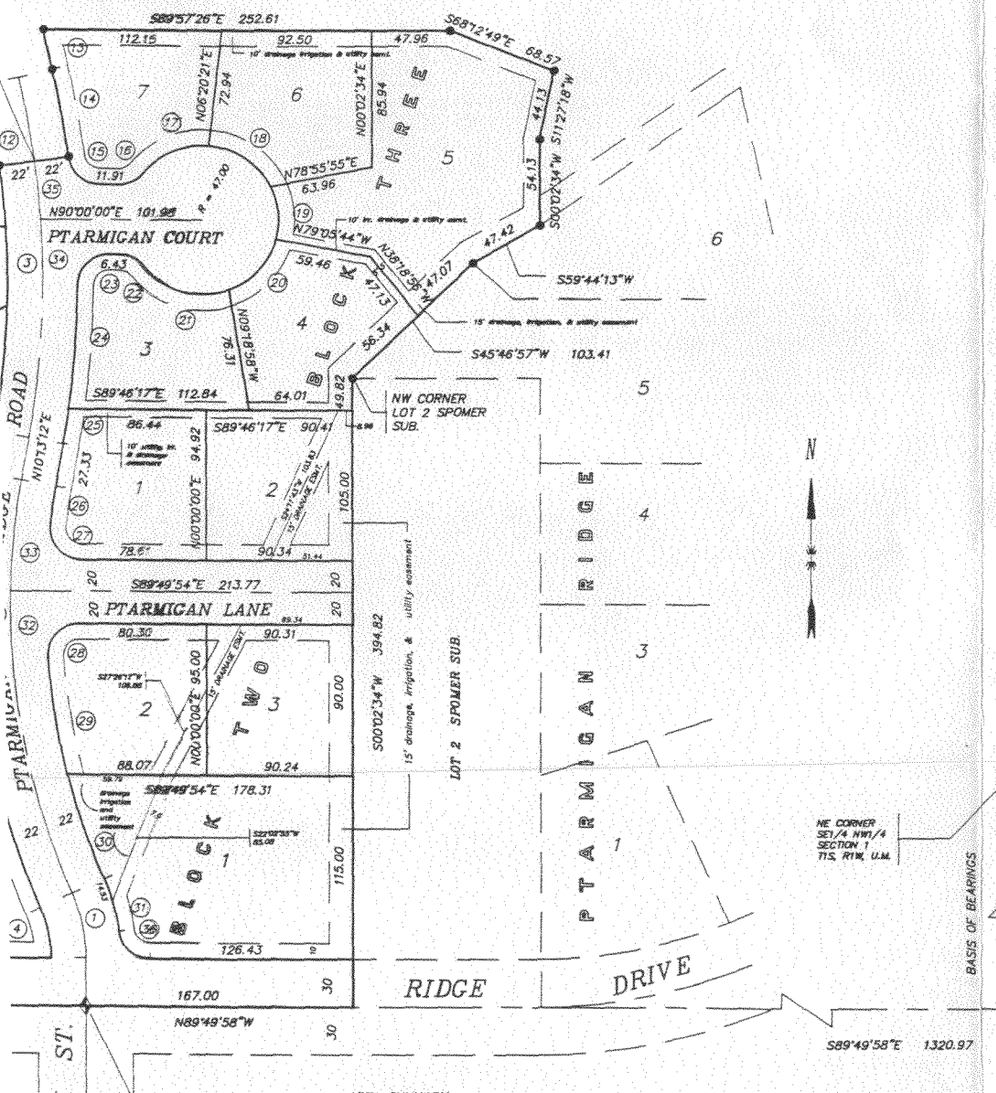
****

#47 91

A parcel of land situated in the NW1/4 Section 1, Township 1 South, Range 1 West of the Ute Meridian, Grand Junction, Colorado being described as follows:

Considering the East line of the NW1/4 Section 1, T1S, R1W, U.M. to bear S00°02'05"W and all bearings contained herein to be relative thereto: Beginning at the SW corner of the SE1/4 NW1/4 Section 1, Township 1 South, Range 1 West, Ute Meridian; thence N89°49'54"W 213.00 feet; thence N00°02'34"E 596.01 feet; thence S73°15'12"E 163.06 feet; thence 22.61 feet along the arc of a curve to the right with a radius of 532.30 feet and whose chord bears S09°00'02"E 22.60 feet; thence N82°12'58"E 44.00 feet; thence 55.77 feet along the arc of a curve the left with a radius of 576.30 feet and whose chord bears N10°33'22"W 55.75 feet; thence 25.91 feet along the arc of a curve to the right with a radius of 975.78 feet and whose chord bears N12°33'12"W 25.91 feet; thence S89°57'26"E 252.61 feet; thence S68°12'49"E 68.57 feet; thence S11°27'18"W 44.13 feet; thence S00°02'34"W 44.13 feet; thence S59°44'13"W 47.42 feet; thence S45°46'57"W 103.41 feet to the NW corner of Lot 2 Spomer Subdivision; thence S00°02'34"W 394.82 feet; thence N89°49'54"W 167.00 to the point of beginning, containing 5.558 Acres as described.

3	15°00'14"	354.30	174.18	173.46	N01°13'05"E
4	23°59'36"	78.00	32.66	32.43	N11°53'20"W
5	08°53'54"	467.23	72.56	72.49	N19°26'11"W
6	11°34'42"	467.23	94.42	94.26	N09°11'53"W
7	11°03'36"	467.23	90.19	90.05	N02°07'16"E
8	02°34'08"	467.23	20.95	20.95	N08°56'08"E
9	08°29'19"	532.30	78.86	78.79	N05°58'33"E
10	05°23'08"	532.30	50.03	50.02	N00°57'49"W
11	06°33'48"	532.30	60.98	60.94	N06°56'08"W
12	02°26'00"	532.30	22.61	22.60	S09°00'02"E
13	01°33'00"	957.78	25.91	25.91	S12°33'12"E
14	05°32'40"	576.30	55.77	55.75	S10°33'22"E
15	82°12'58"	28.00	28.70	26.30	S48°33'31"E
16	51°10'51"	20.00	17.87	17.28	N64°24'35"E
17	56°27'52"	47.00	46.32	44.47	N67°03'05"E
18	38°10'00"	47.00	47.71	45.69	S55°37'59"E
19	41°31'47"	47.00	34.07	33.33	S05°47'05"E
20	54°46'47"	47.00	44.94	43.24	S42°22'11"E
21	71°25'16"	47.00	58.59	54.87	N74°31'47"E
22	51°10'51"	20.00	17.87	17.28	N64°24'35"W
23	89°41'19"	28.00	31.31	28.21	S45°09'20"W
24	07°41'14"	576.30	77.32	77.26	S04°09'18"W
25	02°13'17"	576.30	22.34	22.34	S09°06'33"W
26	03°14'13"	423.23	23.91	23.91	S08°36'05"W
27	96°48'53"	20.00	33.79	29.92	S41°25'28"E
28	94°34'25"	20.00	33.01	29.39	S42°52'54"W
29	10°05'31"	423.23	74.55	74.45	S09°27'04"E
30	09°22'18"	423.23	69.25	69.17	S19°11'29"E
31	15°55'25"	122.00	33.91	33.80	S15°55'25"E
32	25°03'49"	445.23	194.76	193.22	N11°21'13"W
33	09°02'31"	445.23	70.26	70.19	N05°41'56"E
34	14°13'47"	354.30	137.66	137.31	N03°06'10"E
35	03°46'27"	354.30	36.51	36.50	N05°53'48"W
36	81°52'11"	20.00	28.58	26.21	S48°53'48"E



LEGEND & NOTES

- ● *SET NO 5 RE--BAR WITH CAP L.S. 16413 IN CONCRETE*
- ⊥ *SET NO. 5 RE--BAR W/CAP L.S. 16413 AT ALL LOT CORNERS*
- ◈ *MESA COUNTY BRASS CAP*

NOTE:

10' UTILITY EASEMENT ACROSS THE STREET SIDE OF ALL LOTS ADJOINING THE STREETS

That the undersigned, Ptarmigan Investments, a Colorado Corporation, is the owner of that real property situated in the City of Grand Junction, County of Mesa, State of Colorado, and is described in Book at Page of the Mesa County Clerk and Recorders Office, and being situated in the NW1/4 Section 1, Township 1 South, Range 1 West of the Ute Meridian, Mesa County, Colorado as shown on the accompanying plat, said property being additionally described as follows:

A parcel of land situated in the NW1/4 Section 1, Township 1 South, Range 1 West of the Ute Meridian, Grand Junction, Colorado being described as follows:

Considering the East line of the NW1/4 Section 1, T1S, R1W, U.M. to bear S00°02'05"W and all bearings contained herein to be relative thereto: Beginning at the SW corner of the SE1/4 NW1/4 Section 1, Township 1 South, Range 1 West, Ute Meridian; thence N89°49'54"W 213.00 feet; thence N00°02'34"E 596.01 feet; thence S73°15'12"E 163.06 feet; thence 22.61 feet along the arc of a curve to the right with a radius of 532.30 feet and whose chord bears S09°00'02"E 22.60 feet; thence N82°12'58"E 44.00 feet; thence 55.77 feet along the arc of a curve the left with a radius of 576.30 feet and whose chord bears N10°33'22"W 55.75 feet; thence 25.91 feet along the arc of a curve to the right with a radius of 975.78 feet and whose chord bears N12°33'12"W 25.91 feet; thence S89°57'26"E 252.61 feet; thence S68°12'49"E 68.57 feet; thence S11°27'18"W 54.13 feet; thence S00°02'34"W 54.13 feet; thence S59°44'13"W 47.42 feet; thence S45°46'57"W 103.41 feet to the NW corner of Lot 2 Spomer Subdivision; thence S00°02'34"W 394.82 feet; thence N89°49'58"W 167.00 to the point of beginning, containing 5.558 Acres as described.

That said owner has caused the said real property to be laid out and surveyed as PTARMIGAN RIDGE, FILING NO. TWO, a subdivision of a part of City of Grand Junction, County of Mesa, State of Colorado.

That said owner does hereby dedicate and set apart all of the streets and rights--of--way as shown on the accompanying plat to the City of Grand Junction, for the use of the public forever and dedicate to the CITY OF GRAND JUNCTION, for the use of the public those portions of said real property which are labeled as utility easements on the accompanying plat as perpetual easements for the installation and maintenance of utilities, irrigation, and drainage facilities, including but not limited to electric lines, gas lines, sewer lines, telephone lines, and appurtenances; together with the right to trim interfering trees and brush; with perpetual right of ingress and egress for installation and maintenance of such lines, and said owners hereby dedicate all common areas to the use and benefit of the owners of the lots hereby platted. Such easements and rights shall be utilized in a reasonable and prudent manner. The areas shown as ingress and egress and utility easements are dedicated to the owners of the property within said PTARMIGAN RIDGE, FILING NO. TWO, for perpetual ingress and egress for themselves and the general public, including the postal service, trash, fire, police, emergency vehicles, and the City of Grand Junction.

That all expenses for street paving or improvements shall be furnished by the seller or purchaser, not the County of Mesa.

IN WITNESS WHEREOF said owner has caused his name to be hereunto subscribed this _____ day of _____ A.D., 199__.

Ptarmigan Investments, a Colorado Corp.
John A. Siegfried, President

STATE OF COLORADO)
) S.S.
COUNTY OF MESA)

The foregoing instrument was acknowledged before me this _____ day of _____ A.D., 199__ by John A. Siegfried as president of Ptarmigan Investments, a Colorado Corporation.

My commission expires:

Notary Public

Address

CLERK AND RECORDERS CERTIFICATE

STATE OF COLORADO)
) S.S.
COUNTY OF MESA)

I hereby certify that this instrument was filed in my office at _____ o'clock ____M. this _____ day of _____ A.D., 199__, and is duly recorded in Plat Book No. _____, Page _____

CITY APPROVAL

This plat of PTARMIGAN RIDGE, FILING NO. TWO, a subdivision of the City of Grand Junction, County of Mesa, and State of Colorado was approved and accepted this _____ day of _____ A.D. 199 __.

City Manager — *President of Council*

Director of Development — *Chairman, Grand Junction Planning Commission*

Grand Junction City Engineer

SURVEYOR'S CERTIFICATE

I, Max E. Morris, certify that the accompanying plat of PTARMIGAN RIDGE SUBDIVISION, FILING NO. TWO, a subdivision of a part of the City of Grand Junction, Count of Mesa, State of Colorado has been prepared under my direct supervision and accurately represents a field survey of same. I further certify that this plat conforms to all applicable requirements of the Zoning and Development Code of the City of Grand Junction and all applicable state laws and regulations.

Max E. Morris, Q.E.D. Surveying Systems Inc.
Colorado Registered Professional Land Surveyor L.S. 16413

Date

PTARMIGAN RIDGE FILING TWO

FINAL PLAT

SITUATED IN THE NW1/4 SECTION 1, TOWNSHIP 1 SOUTH, RANGE 1 WEST, UTE MERIDIAN

FOR:	Q.E.D.	SURVEYED BY: MEM DKB

No Bldg Permits are to be issued until Dev. has signed off

DRAINAGE, GRADING & CONSTRUCTION PLANS, ETC

3500

PTARMIGAN RIDGE FILING TWO

DEDICATION

KNOW ALL MEN BY THESE PRESENTS:
That the undersigned, Ptarmigan Investments, a Colorado Corporation, is the owner of that real property situated in the City of Grand Junction, County of Mesa, State of Colorado, and is described in Book 1894 at Page 476 of the Mesa County Clerk and Recorders Office, and being situated in the NW1/4 Section 1, Township 1 South, Range 1 West of the Ute Meridian, Mesa County, Colorado as shown on the accompanying plat, said property being additionally described as follows:

A parcel of land situated in the NW1/4 Section 1, Township 1 South, Range 1 West of the Ute Meridian, Grand Junction, Colorado being described as follows:
Considering the East line of the NW1/4 Section 1, T1S, R1W, U.M. to bear S00°02'05"W and all bearings contained herein to be relative thereto: Beginning at the SW corner of the SE1/4 NW1/4 Section 1, Township 1 South, Range 1 West, Ute Meridian; thence N89°49'54"W 213.00 feet; thence N00°02'34"E 596.01 feet; thence N89°49'54"W 19.17 feet along the arc of a curve to the right with a radius of 1001.78 feet and whose chord bears S12°46'48"E 19.17 feet; thence 51.51' feet along the arc of a curve to the right with a radius of 532.30 feet and whose chord bears S10°33'22"E 51.49 feet; thence N82°12'58"E 44.00 feet; thence 55.77 feet along the arc of a curve the left with a radius of 576.30 feet and whose chord bears N10°33'22"W 55.75 feet; thence 41.21 feet along the arc of a curve to the right with a radius of 957.78 feet and whose chord bears N12°05'44"W 41.21 feet; thence S89°57'26"E 116.82 feet; thence S83°47'22"E 139.61 feet; thence S68°12'49"E 68.57 feet; thence S11°27'18"W 44.13 feet; thence S00°02'34"W 54.13 feet; thence S59°44'13"W 47.42 feet; thence S45°46'57"W 103.41 feet to the NW corner of Lot 2 Spomer Subdivision; thence S00°02'34"W 394.82 feet; thence N89°49'58"W 167.00 feet to the point of beginning, containing 5.701 Acres as described.

That said owner has caused the said real property to be laid out and surveyed as PTARMIGAN RIDGE, FILING NO. TWO, a subdivision of a part of City of Grand Junction, County of Mesa, State of Colorado.

That said owner does hereby dedicate and set apart all of the streets and rights-of-way as shown on the accompanying plat to the City of Grand Junction, for the use of the public forever and dedicate to the CITY OF GRAND JUNCTION, for the use of the public those portions of said real property which are labeled as utility easements on the accompanying plat as perpetual easements for the installation and maintenance of utilities, irrigation, and drainage facilities, including but not limited to electric lines, gas lines, sewer lines, telephone lines, and appurtenances; together with the right to trim interfering trees and brush; with perpetual right of ingress and egress for installation and maintenance of such lines, and said owners hereby dedicate all common areas to the use and benefit of the owners of the lots hereby platted. Such easements and rights shall be utilized in a reasonable and prudent manner. The areas shown as ingress and egress and utility easements are dedicated to the owners of the property within said PTARMIGAN RIDGE, FILING NO. TWO, for perpetual ingress and egress for themselves and the general public, including the postal service, trash, fire, police, emergency vehicles, and the City of Grand Junction.

That all expenses for street paving or improvements shall be furnished by the seller or purchaser, not the City of Grand Junction.

IN WITNESS WHEREOF said owner has caused his name to be hereunto subscribed this 23 rd day of April A.D., 1992.

John A. Siegfried

Ptarmigan Investments, a Colorado Corp.
John A. Siegfried, President

STATE OF COLORADO)
COUNTY OF MESA) S.S.

The foregoing instrument was acknowledged before me this 23rd day of April A.D., 1992 by John A. Siegfried as president of Ptarmigan Investments, a Colorado Corporation.

My commission expires: 11/1/95

Notary Public

Address

CLERK AND RECORDERS CERTIFICATE

STATE OF COLORADO)
COUNTY OF MESA) S.S.

I hereby certify that this instrument was filed in my office at 10:50 o'clock A M. this 6th day of MAY A.D., 1992 and is duly recorded in Plat Book No. 14, Page 48

Reception No.:

CITY APPROVAL

This plat of PTARMIGAN RIDGE, FILING NO. TWO, a subdivision of the City of Grand Junction, County of Mesa, and State of Colorado, was approved and accepted this 29th day of APRIL A.D. 1992.

City Manager

President of Council

Director of Development

(RON HALSEY)
Chairman, Grand Junction Planning Commission

Grand Junction City Engineer

SURVEYOR'S CERTIFICATE

I, Max E. Morris, certify that the accompanying plat of PTARMIGAN RIDGE SUBDIVISION, FILING NO. TWO, a subdivision of a part of the City of Grand Junction, County of Mesa, State of Colorado has been prepared under my direct supervision and accurately represents a field survey of same. I further certify that this plat conforms to all applicable requirements of the Zoning and Development Code of the City of Grand Junction and all applicable state laws and regulations.

Max E. Morris, Q.E.D. Surveying Systems Inc.
Colorado Registered Professional Land Surveyor L.S. 16413

16413

Date

revised 4/15/92
revised 10/31/91
revised 7/30/91

PTARMIGAN RIDGE FILING TWO

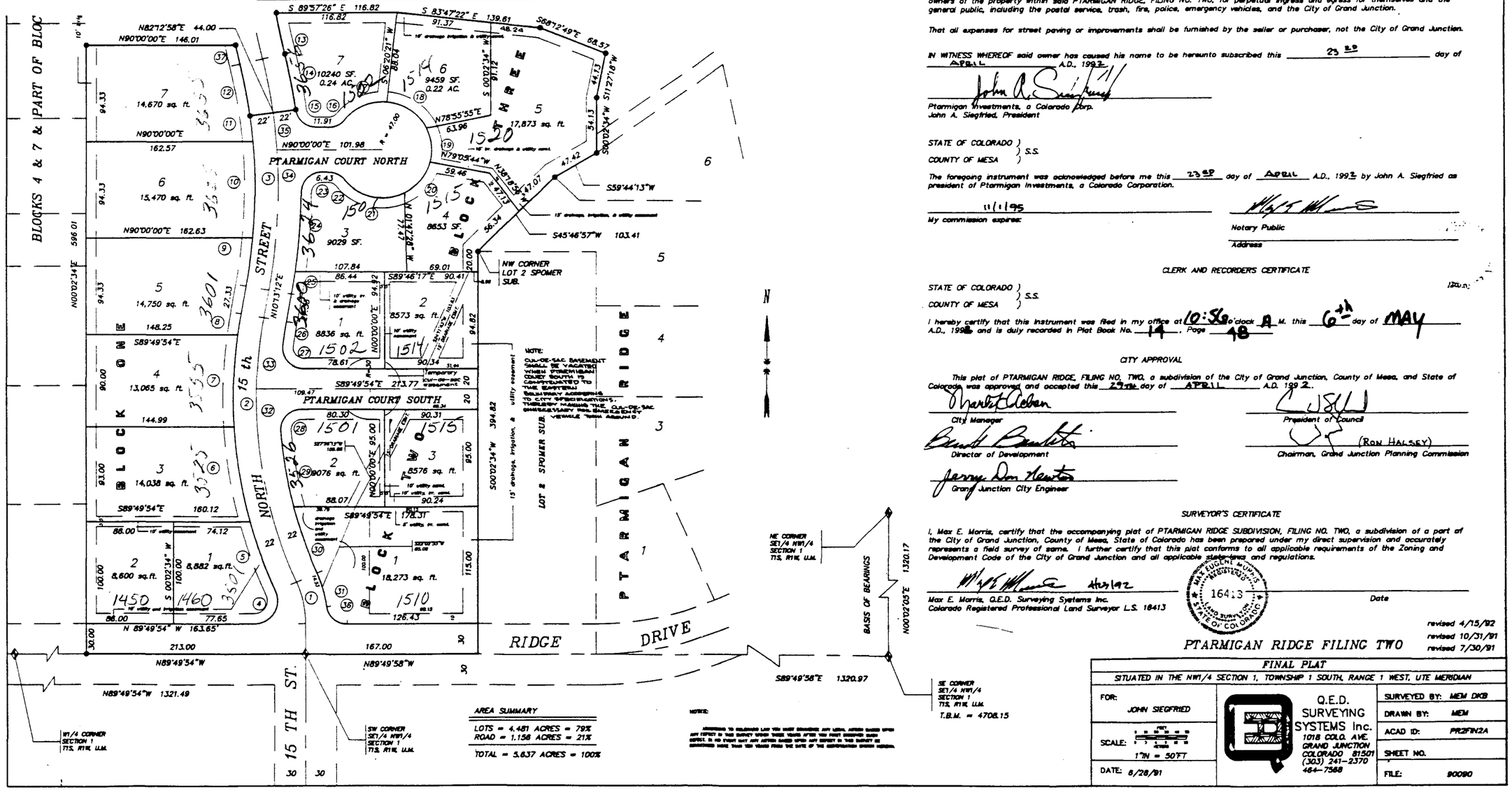
CURVE TABLE				
NO.	DELTA	RADIUS	ARC	CHORD
1	23°33'49"	100.00	41.76	41.46 N11°55'17"W
2	34°06'28"	445.23	264.83	261.13 N06°49'38"W
3	18°08'14"	554.30	174.18	173.46 N01°13'05"E
4	114°03'13"	28.53	44.85	37.80 N33°08'38"W
5	08°53'54"	467.23	72.56	72.49 N19°26'11"W
6	11°34'48"	467.23	94.48	94.26 N09°11'53"W
7	11°03'36"	467.23	90.19	90.05 N00°07'16"E
8	02°34'08"	467.23	20.95	20.95 N08°56'08"E
9	05°07'37"	532.30	47.63	47.61 N07°39'23"E
10	10°10'01"	532.30	94.45	94.33 N01°51'25"E
11	02°42'36"	532.30	25.18	25.17 N06°25'44"W
12	05°32'40"	532.30	51.51	51.49 S10°33'22"E
13	02°27'59"	957.78	41.21	41.21 S12°46'48"E
14	05°32'40"	576.30	55.77	55.75 S10°33'22"E
15	82°12'58"	20.00	28.70	26.30 S48°53'31"E
16	51°19'51"	20.00	17.87	17.28 N64°24'35"E
17	56°27'52"	47.00	46.32	44.47 N67°03'05"E
18	58°10'00"	47.00	47.71	45.69 S35°37'59"E
19	41°31'47"	47.00	34.07	33.33 S05°47'05"E
20	48°13'07"	47.00	39.55	38.40 S39°05'21"W
21	77°58'56"	47.00	63.97	59.14 N77°48'37"W
22	51°19'51"	20.00	17.87	17.28 N64°24'35"W
23	89°41'19"	20.00	31.31	28.21 S45°09'26"W
24	07°41'14"	576.30	77.26	77.20 N39°09'18"W
25	02°13'17"	576.30	22.34	22.34 N39°06'33"W
26	03°14'13"	423.23	23.91	23.91 S38°36'05"W
27	94°48'53"	20.00	33.79	29.98 S41°25'29"E
28	94°34'25"	20.00	33.01	29.39 S42°52'54"W
29	10°05'31"	423.23	74.55	74.45 S39°27'04"E
30	09°23'18"	423.23	69.35	69.27 S19°11'29"E
31	15°55'25"	122.00	33.91	33.80 S15°55'25"E
32	25°03'49"	445.23	194.76	193.22 N11°21'13"W
33	09°02'31"	445.23	70.26	70.19 N03°04'54"E
34	14°13'47"	554.30	137.66	137.31 N03°06'18"E
35	03°46'27"	554.30	36.51	36.50 N05°53'48"W
36	01°52'11"	20.00	28.58	26.21 S48°53'48"E
37	01°05'47"	1001.78	19.17	19.17 S12°46'48"E

LEGEND & NOTES

- ● SET NO 5 RE-BAR WITH CAP L.S. 16413 IN CONCRETE
- ⊥ SET NO. 5 RE-BAR W/CAP L.S. 16413 AT ALL LOT CORNERS
- ◈ MESA COUNTY BRASS CAP

NOTE:

10' UTILITY EASEMENT ACROSS THE STREET SIDE OF ALL LOTS ADJOINING THE STREETS



AREA SUMMARY

LOTS = 4.481 ACRES = 79%
ROAD = 1.156 ACRES = 21%
TOTAL = 5.637 ACRES = 100%

NOTICE:

ACCEPTANCE OF COLORADO LAND SURVEY STANDARDS ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY SHALL BE COMMENCED WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT SHALL ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

FINAL PLAT

SITUATED IN THE NW1/4 SECTION 1, TOWNSHIP 1 SOUTH, RANGE 1 WEST, UTE MERIDIAN

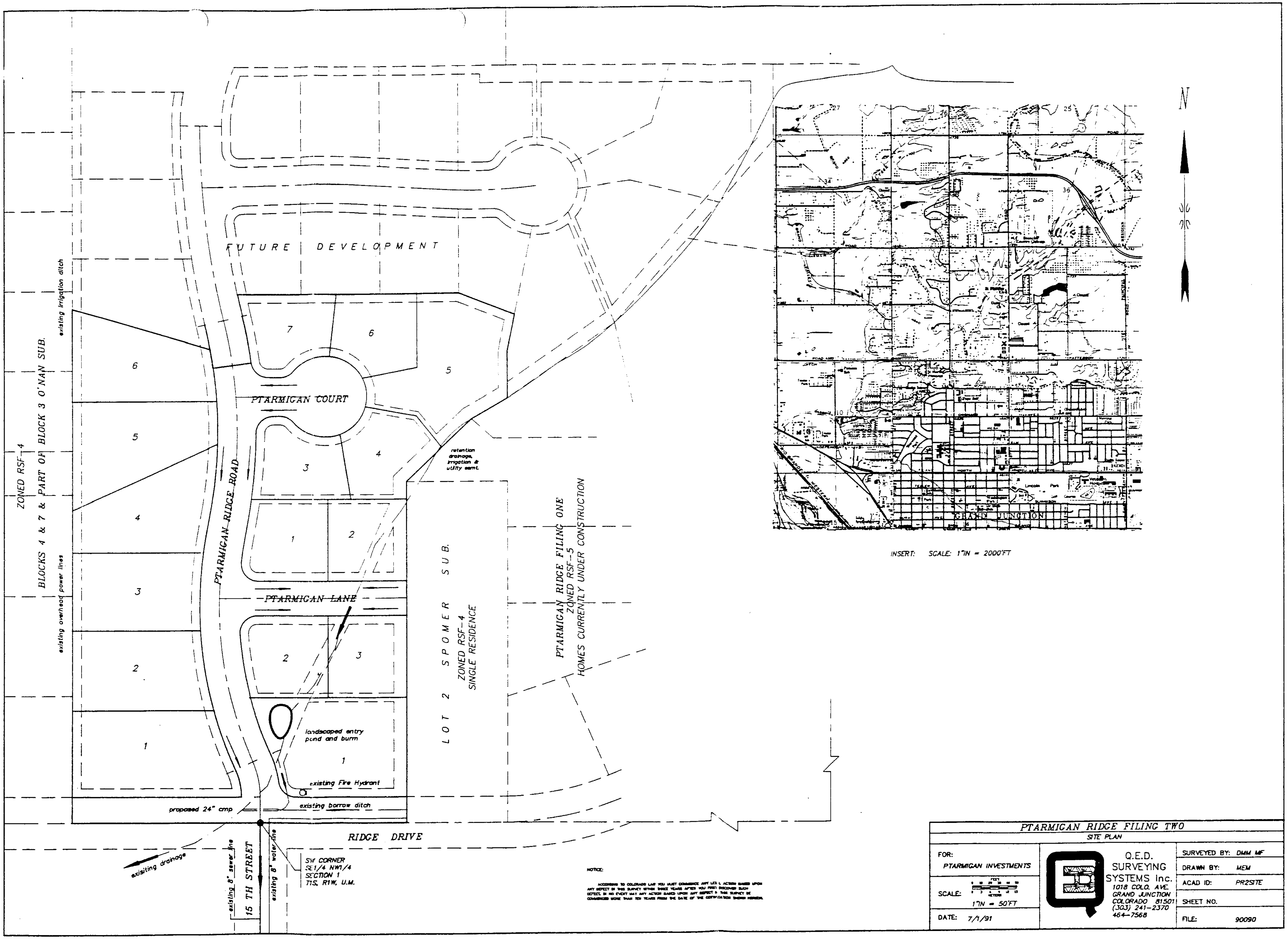
FOR: JOHN SIEGFRIED

SCALE: 1"IN = 50'FT

DATE: 8/28/91

Q.E.D. SURVEYING SYSTEMS Inc.
1018 COLO. AVE.
GRAND JUNCTION
COLORADO 81501
(303) 241-2370
464-7568

SURVEYED BY:	MEM DKB
DRAWN BY:	MEM
ACAD ID:	PR2FIN2A
SHEET NO.	
FILE:	90090


ZONED RSF-4
BLOCKS 4 & 7 & PART OF BLOCK 3 O'NAN SUB.
existing irrigation ditch
existing overhead power lines
FUTURE DEVELOPMENT
PTARMIGAN COURT
PTARMIGAN RIDGE ROAD
PTARMIGAN LANE
1
2
3
4
5
6
7
retention drainage, irrigation & utility esmt.
landscaped entry pond and burm
existing Fire Hydrant
existing borrow ditch
proposed 24" cmp
LOT 2 SPOMER SUB.
ZONED RSF-4
SINGLE RESIDENCE
PTARMIGAN RIDGE FILING ONE
ZONED RSF-5
HOMES CURRENTLY UNDER CONSTRUCTION
RIDGE DRIVE
15 TH STREET
existing 8" sewer line
existing 8" water line
existing drainage
SW CORNER
SE1/4 NW1/4
SECTION 1
T1S, R1W, U.M.
N
INSERT: SCALE: 1"IN = 2000'FT
GRAND JUNCTION
NOTICE:

PTARMIGAN RIDGE FILING TWO		
SITE PLAN		
FOR: PTARMIGAN INVESTMENTS	Q.E.D. SURVEYING SYSTEMS Inc. 1018 COLO. AVE. GRAND JUNCTION COLORADO 81501 (303) 241-2370 464-7568	SURVEYED BY: DMM MF
		DRAWN BY: MEM
SCALE: 1"IN = 50'FT		ACAD ID: PR2SITE
		SHEET NO.
DATE: 7/1/91		FILE: 90090

Original
Do NOT Remove
From Office

47 91

CITY OF GRAND JUNCTION IMPROVEMENTS AGREEMENT

RE: PTARMIGAN RIDGE Filing #2 N 15th St.
Name of Subdivision or Other Improvement — Location

Intending to be legally bound, the undersigned subdivider hereby agrees to provide throughout this subdivision and as shown on the subdivision plat of PTARMIGAN RIDGE (Name of Subdivision) date JUNE 30, 1991, the following improvements to City of Grand Junction standards and to furnish an Improvements Guarantee in the form acceptable to the City for these improvements.

#47 91

Improvements	Quantity and Unit Costs	Estimated Cost	Estimated Completion Date
Street Grading	2100 c.y. @ 1.75	3675	Nov 1, 91
Street Base	1350 @ $11 ton	14,850	"
Street Paving	2500 @ $5.75	14,375	"
Curbs and Gutters	1645' @ $7.00	11,587	
Sidewalks	1645' @ $8.00	13,088	
Storm Sewer Facilities	N.A.		"
Sanitary Sewers	N.A.		
Mains	700 @ $9.00	6,300	
Laterals/House Connections	16 @ $200	3,200	"
On-site Sewage ~~Treatment~~ MANHOLES	4 @ $770	3,080	
Water Mains	700' @ $9.00	6,300	
Fire Hydrants	1 @ $750	750	"
On-site ~~Water Supply~~ Service	16 @ $160	2560	
Survey Monuments irrigation	1200 @ $3 + Ser	4800	
Street Lights	1 @ 500	500	
Street Name Signs	3 @ 50	150	"
Construction Administration	5%	5000.00	
Utility Relocation Costs			
Design Costs	Prepaid		
SUB TOTAL		$90,215	

Supervision of all installations (should not normally exceed 4% of subtotal) $3,500.

TOTAL ESTIMATED COST OF IMPROVEMENTS AND SUPERVISION: $ $93,721.00

The above improvements will be constructed in accordance with the specifications and requirements of the City or appropriate utility agency and in accordance with detailed construction plans, based on the City Council approved plan, and submitted ot the City Engineer for review and approval prior to start of construction. The improvements will be constructed in reasonable conformance with the time schedule shown above. An Improvements Guarantee will be furnished to the City prior to recording the subdivision plat.

Signature of Subdivider

(If corporation, to be signed by President and attested to by Secretary, together with the corporate seal.)

DATE: June 30 1991

I have reviewed the estimated costs and time schedule shown above and, based on the plan layouts submitted to date and the current costs of construction, I take no exception to the above.

City Engineer

CITY OF GRAND JUNCTION IMPROVEMENTS AGREEMENT

RE: PTARMIGAN RIDGE Filing #2 N 15th St.
Name of Subdivision or Other Improvement — Location

Intending to be legally bound, the undersigned subdivider hereby agrees to provide throughout this subdivision and as shown on the subdivision plat of PTARMIGAN RIDGE (Name of Subdivision) date JUNE 30, 1991, the following improvements to City of Grand Junction standards and to furnish an Improvements Guarantee in the form acceptable to the City for these improvements.

#47 91

Improvements	Quantity and Unit Costs	Estimated Cost	Estimated Completion Date
Street Grading	2100 c.y. @ 1.75	3675	Nov 1, 91
Street Base	1350 @ $11 ton	14,850	"
Street Paving	2500 @ 5.75	14,375	"
Curbs and Gutters	1645' @ 7.00	11,587	
Sidewalks	1645' @ 8.00	13,088	
Storm Sewer Facilities	N.A.		"
Sanitary Sewers	N.A.		
Mains	700 @ 9.00	6,300	
Laterals/House Connections	16 @ $200	3,200	"
On-site Sewage ~~Treatment~~ MANHOLES	4 @ 770	3,080	
Water Mains	700' @ 9.00	6,300	
Fire Hydrants	1 @ 750	750	"
On-site ~~Water Supply~~ Service	16 @ $160	2560	
Survey Monuments irrigation	1200 @ $3 + Ser	4800	
Street Lights	1 @ 500	500	
Street Name Signs	3 @ 50	150	"
Construction Administration	5%	5000.00	
Utility Relocation Costs			
Design Costs	Prepaid		
SUB TOTAL		$90,215	

Supervision of all installations (should not normally exceed 4% of subtotal) $3,500

TOTAL ESTIMATED COST OF IMPROVEMENTS AND SUPERVISION: $ $93,721.00

The above improvements will be constructed in accordance with the specifications and requirements of the City or appropriate utility agency and in accordance with detailed construction plans, based on the City Council approved plan, and submitted ot the City Engineer for review and approval prior to start of construction. The improvements will be constructed in reasonable conformance with the time schedule shown above. An Improvements Guarantee will be furnished to the City prior to recording the subdivision plat.

Original Do NOT Remove From Office

Signature of Subdivider

(If corporation, to be signed by President and attested to by Secretary, together with the corporate seal.)

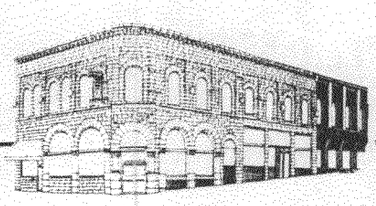
DATE: June 30 1991

I have reviewed the estimated costs and time schedule shown above and, based on the plan layouts submitted to date and the current costs of construction, I take no exception to the above.

City Engineer

BURNS NATIONAL BANK

900 Main Avenue • Post Office Drawer N • Durango, CO 81302-9984
(303) 247-5151 • FAX (303) 247-3795



May 1, 1992

IRREVOCABLE LETTER OF CREDIT

All drafts must by marked:
Drawn under Credit No. 3247-5

City of Grand Junction

We hereby establish our Irrevocable Letter of Credit in you favor for the account of: JOHNNIE A. SIEGFRIED and E. B. HAMILTON, JR.

up to the aggregate amount of SIXTY NINE THOUSAND THREE HUNDRED NINETY FIVE ($69,395.00), available by your draft drawn at sight on The Burns National Bank, Durango, Colorado.

This Letter of Credit is effective immediately for an amount not to exceed the sum shown hereon.

The amount and date of negotiation must be endorsed on the back thereof by the negotiator.

The draft drawn under this Letter of Credit must by accompanied by the following:

> A demand request by the City Engineer at any time prior to midnight on April 30, 1993.

We hereby agree with the drawers, endorsers and bona fide holder of drafts drawn under and in compliance with the terms of this credit that such credit will be duly honored upon presentation of the drawee.

Except as otherwise expressly stated therein, this credit is subject to Article V of the Colorao Uniform Commercial Code.

Sincerely,

Bonnie M. Kinney

THIS CREDIT EXPIRES: 4/30/93

Bonnie M. Kinney
Assistant Vice President

CITY OF GRAND JUNCTION IMPROVEMENTS AGREEMENT

RE: Ptarmigan Ridge Filing #2 N. 15th and Ridge Drive
Name of Subdivision or Other Improvement Location

Intending to be legally bound, the undersigned subdivider hereby agrees to provide throughout this subdivision and as shown on the subdivision plat of Ptarmigan Ridge Filing #2 date April 22 19 92, the following improvements to City of Grand Junction standards and to furnish an Improvements Guarantee in the form acceptable to the City for these improvements.
Name of Subdivision

BOOK 1898 PAGE 283

Improvements	Quantity and Unit Costs	Estimated Cost	Estimated Completion Date
Street Grading	2100c.y. at 1.75	3675	July 1,1992
Street Base	1350t at 11/ton	14850	"
Street Paving	2500 at 5.75	14375	"
Curbs and Gutters	16451f at 7.00/ft	~~11587~~ 11,515	"
Sidewalks	16451f at 8.00/ft	~~13088~~ 13,160	"
Storm Sewer Facilities	N/A		
Sanitary Sewers	N/A		
Mains	N/A		
Laterals/House Connections	N/A		
On-site Sewage Treatment	N/A		
Water Mains	N/A		
Fire Hydrants	N/A		
On-site Water Supply	N/A		
~~Survey Monuments~~ Irrigation	1200ft. at 3.00 +	ser. 4800	"
Street Lights	2 at 500ea.	1000	
Street Name Signs	3 at 40ea.	120	
Construction Administration	Lump Sum	3200	
Utility Relocation Costs			
Design Costs			
SUB TOTAL		66695	

Supervision of all installations (should not normally exceed 4% of subtotal) 2700

TOTAL ESTIMATED COST OF IMPROVEMENTS AND SUPERVISION: $ $69395

The above improvements will be constructed in accordance with the specifications and requirements of the City or appropriate utility agency and in accordance with detailed construction plans, based on the City Council approved plan, and submitted ot the City Engineer for review and approval prior to start of construction. The improvements will be constructed in reasonable conformance with the time schedule shown above. An Improvements Guarantee will be furnished to the City prior to recording the subdivision plat.

Signature of Subdivider

(If corporation, to be signed by President and attested to by Secretary, together with the corporate seal.)

DATE: [illegible] 19 92

I have reviewed the estimated costs and time schedule shown above and, based on the plan layouts submitted to date and the current costs of construction, I take no exception to the above.

City Engineer

BOOK 2074 PAGE 35

1683375 09:58 AM 05/25/94
MONIKA TODD CLK&REC MESA COUNTY CO

RELEASE FROM IMPROVEMENTS AGREEMENT/GUARANTEE

Development Name Ptarmigan Ridge Filing No. 2 File # AT-91

Location North of Ridge Drive at North 15th Street

THE FOLLOWING SIGNATURES INDICATE ACCEPTANCE OF IMPROVEMENTS REQUIRED FOR THIS DEVELOPMENT. ONLY AN AUTHORIZED REPRESENTATIVE OF THE ENTITIES LISTED BELOW MAY SIGN THIS DOCUMENT.

CITY ENGINEER

J Don Newton 12-27-93
Signature & Date

J. Don Newton, City Engineer
Print Name & Title

WATER (NON-CITY)

Ralph W Olson 2/8/94
Signature & Date

Superintendent, Distribution
Print Name & Title

~~CITY UTILITIES MANAGER~~

Greg Trainor 12/27/93
Signature & Date

GREG TRAINOR, UTIL. MNGR.
Print Name & Title

FIRE DEPARTMENT

George Bennett 12-28-93
Signature & Date

George Bennett Fire Prevention Officer
Print Name & Title

DRAINAGE

J Don Newton 12-27-93
Signature & Date

J. Don Newton, City Engineer
Print Name & Title

IRRIGATION

Irrigation systems must be signed off by a professional engineer.

I have personally inspected the completed system. It has been properly designed and installed and is fully operational.

Robert S Coburn 12-23-93
Signature & Date

ROBERT S. COBURN #7444
Print Name & P.E. Number

P.E. Stamp

* *

I hereby certify that the improvements required by the Improvements Agreement recorded in the records of the County Clerk and Recorder of the County of Mesa, Colorado, in Book 1898, at pages 282 and supported by the Improvements Guarantee recorded in Book 1898, at pages 283 have been completed and accepted by the above signatures.

In accordance with the provisions of the Grand Junction Zoning and Development Code, the above referenced agreement and guarantee are hereby released.

Larry Timm 5/18/94
Signature & Date
Director of Planning

AVIGATION EASEMENT

1601505 10:56 AM 05/06/92
MESA CO.CLK & REC Mesa County Co
DOC EXEMPT

THIS EASEMENT is made and entered into by and between the WALKER FIELD, COLORADO, PUBLIC AIRPORT AUTHORITY, a body corporate and politic and constituting a political subdivision of the State of Colorado, hereinafter called GRANTEE, and PTARMIGAN INVESTMENTS INC. hereinafter, GRANTOR;

WHEREAS, Grantee is the owner and operator of Walker Field Airport situated in the County of Mesa, State of Colorado, and in close proximity to the land of Grantor, and Grantee desires to obtain and preserve for the use and benefit of the public a right of free and unobstructed flight for aircraft landing upon, taking off from, or maneuvering about said airport; and

WHEREAS, Grantor is the owner in fee simple of that certain parcel of land situated in the County of Mesa, State of Colorado, to wit:

SEE ATTACHED DESCRIPTION : Exhibit A

NOW, THEREFORE, in consideration of the sum of One Dollar ($1.00) and other good and valuable consideration, the receipt of which is hereby acknowledged, the Grantor, for himself, his heirs, administrators, executors, successors and assigns, does hereby grant, bargain, sell and convey unto the Grantee, its successors and assigns, for the use and benefit of the public, an easement and right of way appurtenant to Walker Field Airport, for the passage of all aircraft ("aircraft" being defined for the purposes of this instrument as any device known or hereafter invented, used or designed for navigation or flight in the air) by whomsoever owned and operated, in the navigable airspace above the surface of Grantor's Property to an infinite height above said Grantor's property, together with the right to cause in said airspace such noise and vibrations, smoke, fumes, glare, dust, fuel particles and all other effects that may be caused by the normal operation of aircraft landing at or taking off from or operating at or on said Walker Field Airport, and Grantor hereby waives, remises and releases any right or cause of action which Grantor now has or which Grantor may have in the future against Grantee, its successors and assigns, due to such noise, vibrations, smoke, fumes, glare, dust, fuel particles and all other effects caused by the normal operation of such aircraft.

FURTHER, Grantor hereby covenants, for and during the life of this easement, that Grantor:

(a) shall not hereafter construct, permit or suffer to maintain upon said land any obstruction that extends into navigable airspace required for use of said airport runway surfaces; (Navigable airspace is defined for the purpose of this instrument

as airspace at and above the minimum flight altitudes, including take off and landing, as prescribed in Federal Aviation Administration Federal Air Regulations Part 91, and as such regulations are amended.)

(b) shall not hereafter use or permit or suffer use of said land in such a manner as to create electrical or electronic interference with radio communication or radar operation between the installation upon Walker Field Airport and aircraft, or to make it difficult for flyers to distinguish between airport lights and others or to result in glare in the eyes of flyers using the said airport, or to impair visibility in the vicinity of the airport, or otherwise to endanger the landing, taking off or maneuvering of aircraft.

Grantor agrees the aforesaid covenants and agreements shall run with the land for the benefit of Grantee, its successors and assigns, until said airport shall be abandoned and shall cease to be used for public airport purposes.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal on this 17 day of Sept, A.D. 1991.

John A. Siegfried

Pres.

(Title)

STATE OF COLORADO)
) ss.
COUNTY OF MESA)

The foregoing instrument was acknowledged before me this 17TH day of SEPT, A.D. 1991, by JOHN A. SIEGFRIED.

My Commission expires: Nov 1, 1995

Notary Public

NOTARY PUBLIC STATE OF COLORADO

EXHIBIT A
Avigation Easement for Ptarmigan Ridge Filing 2

A parcel of land situated in the NW1/4 Section 1, Township 1 South, Range 1 West of the Ute Meridian, Grand Junction, Colorado being described as follows:

Considering the East line of the NW1/4 Section 1, T1S, R1W, U.M. to bear S00°02'05"W and all bearings contained herein to be relative thereto: Beginning at the SW corner of the SE1/4 NW1/4 Section 1, Township 1 South, Range 1 West, Ute Meridian; thence N89°49'54"W 213.00 feet; thence N00°02'34"E 596.01 feet; thence N90°00'00"E 146.01 feet; thence 19.17 feet along the arc of a curve to the right with a radius of 1001.78 feet and whose chord bears S12°46'48"E 19.17 feet; thence 51.51' feet along the arc of a curve to the right with a radius of 532.30 feet and whose chord bears S10°33'22"E 51.49 feet; thence N82°12'58"E 44.00 feet; thence 55.77 feet along the arc of a curve the left with a radius of 576.30 feet and whose chord bears N10°33'22"W 55.75 feet; thence ~~25.91~~ 41.21 feet along the arc of a curve to the right with a radius of 957.78 feet and whose chord bears N12°05'44"W 41.21 feet; thence S89°57'26"E 116.82 feet; thence S83°47'22"E 139.61 feet; thence S68°12'49"E 68.57 feet; thence S11°27'18"W 44.13 feet; thence S00°02'34"W 54.13 feet; thence S59°44'13"W 47.42 feet; thence S45°46'57"W 103.41 feet to the NW corner of Lot 2 Spomer Subdivision; thence S00°02'34"W 394.82 feet; thence N89°49'58"W 167.00 feet to the point of beginning, containing 5.701 Acres as described.