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File 1992-0023 Name: Heritage Elder Care Facility - ODP/Final Plan - 2835 Patterson Rd.

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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.
X	X	**Table of Contents**
		***Review Sheet Summary**
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X	X	Reduction of assessor's map.
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X	X	***Mailing list to adjacent property owners**
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		Record of certified mail
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		Reduction of any maps – final copy
		***Final reports for drainage and soils (geotechnical reports)**
		Other bound or non-bound reports
		Traffic studies
X	X	***Review Comments**
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DOCUMENT DESCRIPTION:

X	X	Action Sheet - Approved - 7/15/92	X	X	City Council Agenda, Minutes - 7/15/92-**
X	X	Correspondence	X		Public Notice Posting - 7/13/92
X	X	Traffic Access and Impact Study - 4/24/92	X	X	Development Improvements Agreement - **
X		Certification of Plat	X		Agreement for detention/retention facilities - not signed by City
X	X	Subdivision Summary Form	X		Warranty Deed not conveyed to City
X		E-mails	X	X	Planning Clearance - **
X		Submittal Sheet	X X		Heritage Homes Final Plan Plat & ODP Design Density Shift
X		Development Schedule	X	X	Elevation Map
X		Flood Plain Analysis	X	X	Final Plat
X		Treasurer's Receipt of Taxes Due - 4/27/92	X	X	Site Plan
X		Gamma Radiation Survey Form - 5/92 - Tailings removed	X	X	Composite Plan
X	X	Planning Commission Minutes - 6/2/92, 7/7/92 - **	X	X	1992 ODP Revision 1992
X	X	Utility Coordinating Committee Approval - 6/10/92	X	X	Landscape Plan

SPECIAL & CONDITIONAL USE SUBMITTAL

Heritage Homes	1	4/15/92
Project Name	Submittal No.	Submittal Date

ENGINEERING CHECKLIST

The following checklist is an abbreviated form based primarily on Section 4-7 of the Development Code, which should be referred to for additional information. Items marked "Not Req'd" are not necessary for the initial submittal, but may be required as a result of agency review.

CODE ITEM	DESCRIPTION	Received		Not Rec'd	Not Req'd
		Complete	Incomp		
4-7-1 &	Existing Features	✓			
5-6-13	Proposed Improvements	✓			
4-7-2 A	Elevation or Perspective Drawings	✓			
B	Developement Schedule and Phasing	✓			
C	Agreements, Provisions, and Covenants				GRW
E-i	Grading and Drainage Plan & Report	✓	✓		
E-ii	Utility Composite: Sewer, Water, Gas, Electric TV, Telephone, Storm Drain, Irrigation, Ditches	✓			
E-iii	Landscape Plan	✓			
E-iv	Irrigation Plan			✓	
E-v	Level I Environmental Site Assessment	✓			✓
E-vi	Level II Environmental Site Assessment (if recommended by Level I ESA)				GRW
E-vii	CDOT Access Permit				GRW
E-viii	Section 404 Permit				GRW
E-ix	Restoration or Reclamation Plans				GRW
E-x	Traffic Impact Study	✓			
E-xi	Best Management Practices Plan				GRW
E-xii	Water Supply, Water Usage, and Sewage Generation Estimates	✓			
E-xiii	Improvements Agreement and Guarantee			✓	GRW
E-xiv	Power of Attorney for Annexation and I.D.				GRW
E-xv					
E-xvi					

EVALUATION OF SUBMITTAL

Submittal is: ☐ accepted ☒ conditionally accepted ☐ rejected as incomplete

C - Need agreement to maintain detention facilities

E-i - D.R. is incomplete & inadequate

See other comments

Gerald Williams
244-1577

A

DEVELOPMENT APPLICATION

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

A Receipt _____
Date _____
Rec'd By _____

File No. 23-92

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

PETITION	PHASE	SIZE	LOCATION	ZONE	LAND USE
[ ] Subdivision Plat/Plan	[ ] Minor [ ] Major [ ] Resub				
[ ] Rezone				From: To:	
[X] Planned Development	[X] ODP [ ] Prelim [X] Final	~2 acres	S. of F Rd E of 28 1/4 Rd 2836 Patterson Rd	PR	Elderly Housing
[ ] Conditional Use					
[ ] Zone of Annex					
[ ] Text Amendment					
[ ] Special Use					
[ ] Vacation					[ ] Right-of-Way [ ] Easement

[X] PROPERTY OWNER [X] DEVELOPER [X] REPRESENTATIVE

HERITAGE ELDER CARE, A COLORADO GENERAL PARTNERSHIP		
Name	Name	Name
2955 F ROAD		
Address	Address	Address
GRAND JUNCTION, COLORADO 81504		
City/State/Zip	City/State/Zip	City/State/Zip
303 243 7224		
Business Phone No.	Business Phone No.	Business Phone No.

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

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

X HARLEY T JACKSON Harley T Jackson 4/15/92

Signature of Person Completing Application Date

X Harley T. Jackson

Signature of Property Owner(s) - Attach Additional Sheets if Necessary

Original
Do NOT Remove
From Office

B.

HERITAGE ELDER CARE PROPOSAL
FOR 2835 PATTERSON ROAD

Heritage Elder Care proposes to develop the above site that is located on the south side of Patterson Road adjacent and east of the new Fire Station located on the SE corner of 28 1/4 Road and Patterson Road. HEC proposes to construct two buildings, site utilities, fire hydrants, parking, road ways, and landscaping on the 2+/- acre site.

One building will be a 15 bedroom suite Personal Care Home for the Elderly similar to those built, owned and operated by HEC presently. HEC Homes are full brick veneer, complete with parking, patios, walks, grass and landscaping. The 15 bedroom suites all have private bathrooms and spacious closets. The Homes have residential type kitchens, family dinning rooms, family style living rooms, laundry room and residents service area room.

The services provided by Heritage Personal Care Homes are as follows; Three meals a day plus morning, afternoon and evening snacks, weekly housekeeping, personal and linen laundry, reminding and monitoring medications, numerous activities, including cable TV, transportation to and from doctors appointments and other errands. All of the above is included in one monthly fee. All of our Residents are private pay therefore we receive no Federal or State funding.

The second building will contain 27 congregate units, one and two bedrooms living room, dining area, kitchenettes. The building will have a central kitchen, dinning room, activity room, and an office. All units will be handicap available by way of ramps and 6 foot hallways. The exterior of the building will be stucco, that will be compatible with the existing buildings in the area. Both buildings will have use of the parking lots. The parking lots have extra wide aisles.

The landscaping along Patterson will consist of a 4 ft. high berm planted with heavy cover on both sides and top to reduce the street noise as much as possible. The east and west property lines will be landscaped with plant material that will help cut down on the street noise. The south yard will be xeriscaped so as to reduce water use. The open areas will be landscaped with trees, shrubs and grass. A subdivision sign approximately 3 ft tall and 12 ft long will be installed facing Patterson and parallel with the berm.

The phasing of the development of the property will depend upon the availability of commercial real estate financing. Phase one will be the building of the congregate units, roadway, parking lot, landscaping, berm and sign. Phase 2 will be the building of the Personal Care Home.

We feel that this project provides a good transition from the Fire Station and high traffic on Patterson to the high density to the south. The use we propose is less dense than the previously approved, but abandoned project. This project calls for very minimal services and impact. We pride ourselves as being good neighbors.

#23 92

DEVELOPMENT SCHEDULE

The plans are to start construction in the Summer of 1992, depending on the commercial real estate mortgage market, with completion of the total project within three years.

R. ADJACENT LAND USE AND ZONING; SEE SITE PLAN.

S. DRAINAGE/GRADING PLAN; SEE SITE PLAN.

T. UTILITIES COMPOSITE; SEE UTILITIES PLAN.

U. LANDSCAPING/SCREENING/BUFFERING;

A. TYPES OF OPEN SPACE; SEE SITE PLAN.

B. PERCENT OF OPEN SPACE; SEE EXIBIT "E".

C. MAINTENANCE, IRRIGATION RIGHTS;

OPEN SPACE WILL BE MAINTAINED BY OWERS/OPERATORS.

THERE ARE NO IRRIGATION RIGHTS WITH THIS PARCEL.

V. PARKING; SEE SITE PLAN.

X. TRAFFIC CIRCULATION PATTERNS; SEE SITE PLAN.

#23 92

I

FLOOD PLAIN ANALYSIS

THE PARCEL OF LAND THAT IS BEING CONSIDERED IS ONE OF THE HIGHEST POINTS IN THE VALLEY AND IS NOT SUBJECT TO ANY FLOODING.

H

2943-063-00-041
Kenneth M Matchett
Thelma H Matchett
2844 F Road
Grand Jct.,Co.81506

2943-072-17-036
JOHN A SIEGFRIED
BOX 60214
GRAND JCT, CO.,81506

2943-072-00-944
CITY OF GRAND JUNCTION
WATER TANK

GRAND JUNCTION,CO.,81501

2943-072-00-035
LAWRENCE B DOWD
2660 PARADISE WAY
GRD JCT CO 81506

MESA FEDERAL S&L ASSOC
RTC-RESEIVER: K TAYLOR
1515 ACADEMY BLVD
COLORADO SPRINGS, CO 80909

02943-072-00-018
G NEIL KARNES
DAWN D KARNES
591½ CATSKILL CT
GRD JCT, CO.,81503

[illegible]

2943-072-17-011
PTARMIGAN INVESTMENT
PROFIT SHARING PLAN
1119 N 1ST ST
GRD JCT, CO., 81501

2943-072-17-012
PTARMIGAN INVESTMENT
PROFIT SHARING PLAN
1119 N 1ST ST
GRD JCT, CO.,81501

2943-072-17-013
PTARMIGAN INVESTMENT
PROFIT SHARING PLAN
1119 N 1ST ST
GRD JCT, CO.,81501

2843-072-17-014
PTARMIGAN INVESTMENT
PROFIT SHARING PLAN
1119 N 1ST ST
GRD JCT, CO.,81501

2943-072-17-015
PTARMIGAN INVESTMENT
PROFIT SHARING PLAN
1119 N 1ST ST
GRD JCT, CO.,81501

2943-072-17-016
MARY SUSAN ROWLAND
AARON LANE
2837 GRAND FALLS CIRCLE#2
GRAND JUNCTION, CO.,81501

2943-063-00-041
KENNETH M MATCHETT
THELMA H MATCHETT
2844 F ROAD
GRD JCT, CO.,81506

#23 92

GEOLOGIC HAZARDS/SOILS REPORT
AND
GAMMA RADIATION SURVEY
FOR
HERITAGE HOMES - THE FALLS

CITY OF GRAND JUNCTION, COLORADO

APRIL, 1992

Prepared by:

Barnes Geologic Consulting, Inc.
2325 Elderberry Court
Grand Junction, CO 81506
(303) 242-8655

Client:

Heritage Elder Care
2955 F Road
Grand Junction, CO 81504
(303) 243-7224

GEOLOGIC HAZARDS/SOILS REPORT
AND
GAMMA RADIATION SURVEY
FOR
HERITAGE HOMES - THE FALLS

CITY OF GRAND JUNCTION, COLORADO
APRIL, 1992

INTRODUCTION

Heritage Homes - The Falls is located in part of the NE ¼ of the NW ¼ of Section 7, Township 1 South, Range 1 East, Ute Principal Meridian. The property is in the northeast portion of the City of Grand Junction and is just east of the intersection of 28¼ Road and Patterson Road (F Road). The north boundary is formed by Patterson Road. Grand Junction Fire Station No. 2 is under construction immediately to the west of this property.

An elder care facility consisting of two buildings is planned for this tract of approximately two acres. The property is undeveloped shale hills located just north of a highly developed group of townhomes and multi-family units. An area of irrigated croplands is located north of Patterson Road.

The purpose of this report is to identify geologic hazards, particularly hazards that might have an adverse effect on construction of large buildings, and is based on a surface reconnaissance of the property and adjacent terrain. References used to supplement surface observations included USGS Professional Paper 451, USGS Map I-736, and soils mapping by the Soil Conservation Service (SCS). A soils map based on SCS classifications has been prepared and is attached to this report.

In addition, information was obtained by verbal communication with Lambert and Associates, Montrose, Colorado, on the subsurface. This firm had drilled 7 holes on the property in April, 1992, to gather design data.

REGIONAL GEOLOGY

The property is located on the northeast flank of the Uncompahgre Uplift where the underlying sedimentary beds dip about 3° to the northeast into the Piceance Basin. The site is within the extensive Grand Valley which has been eroded into Mancos Shale of Cretaceous age by the Colorado River. The sedimentary layers beneath the Mancos range in age from Triassic to Cretaceous, and igneous and metamorphic rocks of Precambrian age lie beneath the sedimentaries.

Mancos Shale is a marine deposit and consequently contains soluble salts. The formation was originally about 4,000 feet in thickness, but the Mancos under the subject parcel is now

about 1,200 feet thick due to erosion of the valley. The shale is dark gray, thin bedded, and composed mainly of clay and silt particles.

The Grand Valley has a history of minor seismic activity and the seismic risk is low. Recent and nearby earthquakes occurred on November 12, 1971, and January 30, 1975. The 1971 earthquake had a Richter magnitude of 4.0 and was located 13 miles southwest of Grand Junction. The 1975 earthquake had a magnitude of 4.4 and was located 14 miles northwest of Grand Junction. A mild quake of 2.5 magnitude occurred near Palisade on October 20, 1990. No damage was reported from any of these events.

SITE GEOLOGY

Heritage Homes - The Falls was a series of shale ridges and hills which have been leveled by excavating the topographic highs and filling into low areas in order to create building sites. The ground elevation is about 4,740 feet and the climate is semiarid.

Geologic Formations and Soils

The site is essentially composed of weathered Mancos Shale overlain by varying depths of man-made fill which consist of shale fragments and clay soils derived from excavating the ridges and tops of the hills to create a level area. The existing near-level land forms the northern three-fourths portion of the parcel. The remaining land has been shaped into two berms; the northern berm is about 30 feet wide and has a vertical bank 4 feet high. The second berm is about 20 feet wide and the vertical bank is 7 feet high.

The shale bedrock, which is either exposed at the surface or is overlain by the fill material, is the lower portion of the Mancos Formation of Cretaceous age. The Mancos is a thick sequence of dark gray, thin bedded, marine shale.

The soils at this site have been mapped by the SCS as Persayo-Chipeta silty clay loam and as "rough broken land". However, the land surface has been much disturbed by cut-and-fill since the mapping.

Geologic Structure

The dip of the underlying bedrock is about 3° to the northeast away from the nearby Uncompahgre Uplift. The Redlands fault, a dominant structural feature, is located about 7 miles to the southwest.

Foundation Materials

This site has variable depths of silty clay and shale fragments over Mancos bedrock due principally to the cut-and-fill technique

used to level the property. The thickness of loose shale pieces and soil could be quite variable; that is, the depth may be shallow where a shale hill was excavated off and deeper where the excavated debris was used to fill topographic lows.

The leveling of the site has made surface observation of the geology rather difficult; however, the two east-west trending, vertical berm cuts of 4 feet and 7 feet near the south portion of the property provide good exposures. Both cuts show in-place shale near their easterly portions and man-made fill of soil and shale fragments for the full berm heights along the middle and west reaches of the cuts. Both the soil and disturbed shale materials contain occasional pieces of glass and plastic which confirm that these deposits are not natural but rather have been made-made in the recent past.

Seven exploratory holes by the firm of Lambert and Associates of Montrose, Colorado, were completed at this site in April, 1992, as a first step in analyzing the foundation materials. The holes reportedly (verbal communication, April 14, 1992) encountered 1 to 3 feet of silty clay over Mancos Shale. The final hole depths were about 20 feet.

The fill will be very susceptible to differential settlement upon loading and/or saturation. For building foundations, the fill should either be penetrated by piers or stem walls, or be removed and replaced with compacted fill.

The undisturbed shale bedrock is expected to have good bearing strengths but could contain bentonitic clays that would swell upon wetting and shrink during drying. It will be imperative to provide both surface and subsurface drainage to minimize changes in moisture in the foundation materials.

The man-made fill may be permeable to runoff from natural precipitation or irrigation of landscape plants. Good drainage must be constructed to avoid ground water accumulation which could result in slope stability or swelling clay problems. The surface must be sloped away from buildings to convey roof and flatwork runoff, as well as any landscape irrigation water, away from the structure foundations.

Due to the complex array of both in-place shale and man-made fill of shale fragments and soil underneath the proposed structures, the foundation characteristics must be thoroughly investigated by subsurface exploration prior to final design of any structure. Samples of the materials (both fill and bedrock) must be obtained and laboratory testing conducted to determine their engineering properties such as swelling and consolidation potential. This data can then be used to design appropriate building foundations for each structure, including a drainage plan.

The fill materials and bedrock at this site contain soluble salts that could cause deterioration of concrete. Sulfate resistant cement should be used to avoid this possibility.

Water Table

No evidence exists of a high water table at this site although the area north of Patterson Road is irrigated croplands. The drilling of 7 holes up to 20 feet deep on this property by Lambert and Associates in April, 1992, (verbal communication, April 14, 1992) did not reach the water table. Some moisture was reported from a hole near the southwest corner of the parcel.

The depth to ground water during the various seasons of the year must be known as a water table elevation near the building foundations could not only result in settlement of the man-made fill and swelling of any expansive clays, but also slope instability on the berms at the south portion of the site. Sewage will be conveyed from the area by municipal collector lines.

Slope Stability

This property is composed of a gently sloping area on the northern portion (1 to 2 percent slopes) formed by cut-and-fill and two berms on the southern portion. The areas of man-made fill could settle upon saturation and/or loading and have been discussed above.

Two berms forming the south portion of this parcel are about 4 feet high and 30 feet wide, and 7 feet high and 20 feet wide. Instability by slumping or landsliding of these berms is possible, especially if saturated by improper surface drainage or ground water seepage from the north. The strength of the man-made fill materials and the Mancos Shale forming the berms would be greatly reduced upon saturation. These factors must be considered during building design and construction.

FLOOD POTENTIAL

Due to the topography, no flood hazard exists at this subdivision. The site is on a minor drainage divide and no drainageways traverse the property.

RADIATION HAZARD

Uranium mill tailings were used extensively in the Grand Junction area between 1952 and 1965 for landfill and construction. A gamma radiation survey was conducted on the property on April 18 and 19, 1992. Two small areas of readings higher than background were found (see the attached Figures 1 and 2).

The radiation falls below the Department of Energy (DOE) criteria for clean-up assistance by the federal government due to the small area of high gamma readings. (The DOE requirement for

remedial action is 25 microroentgens per hour above background when averaged over 100 square meters). The Colorado Department of Health has been contacted and will provide technical assistance during a clean-up operation to be conducted by the property owners.

CONCLUSIONS

A surface reconnaissance was conducted on April 18 and 19, 1992, at Heritage Homes - The Falls to identify geologic hazards to building construction. The hazards and recommendations are summarized as follows:

1. The man-made fill of shale fragments and silty clays resulting from leveling of this parcel would be very susceptible to settlement upon saturation and/or loading. The character and thickness of this fill must be thoroughly investigated at each building site prior to foundation design.

2. The Mancos Shale bedrock often contains swelling clays and must also be evaluated prior to design and construction.

3. The fill materials and shale at this site contain heavy concentrations of sulfate salts and sulfate resistant cement should be used in concrete.

4. The site is a topographic high and there is no evidence of ground water near the surface. Due to the presence of unconsolidated fill and potential swelling clays, the elevation of the water table in relation to the building foundations during all seasons of the year must be understood.

5. The two berms near the south portion of this property present a minor slope stability hazard, especially if the materials became saturated. This potential hazard must be considered during drainage planning and design of buildings.

6. Due to the topography, no flood hazard exists at this site.

7. A surface gamma radiation survey of this property has revealed two small areas of anomalous readings. The materials within these areas will be removed by the property owners with technical assistance from the Colorado Department of Health.

8. Commercial mineral resources of metallic or non-metallic nature are not found in the immediate area. A small possibility for production of oil and/or natural gas from underlying formations exists.

9. The area has a low probability of destructive seismic events.

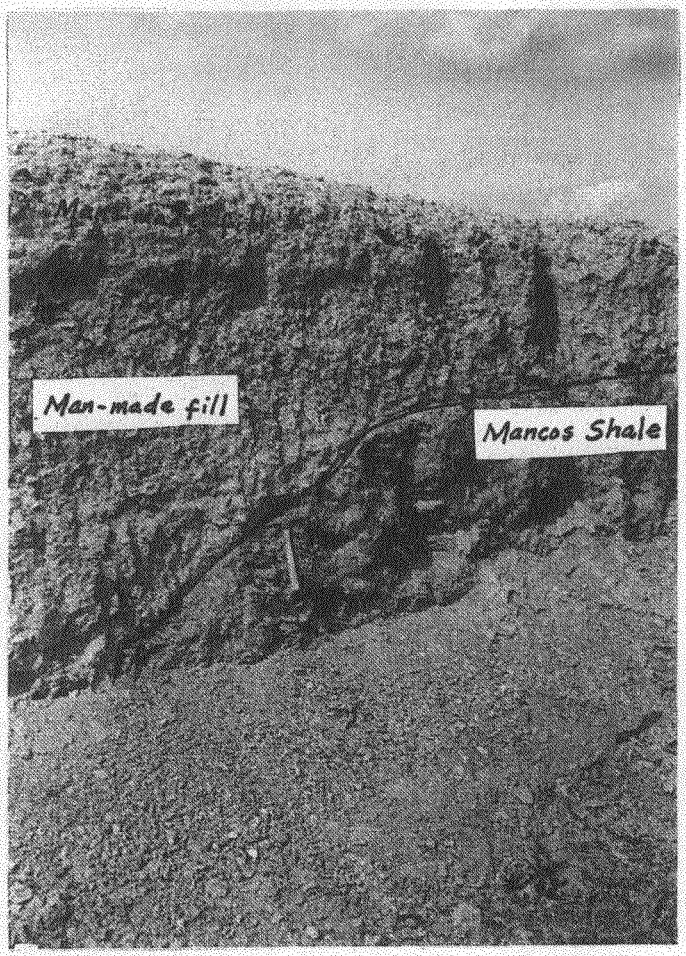
A number of geologic hazards have been identified at this property but each can be mitigated by proper engineering design prior to construction. The geotechnical data necessary to allow adequate design can be obtained by appropriate techniques such as drilling, sampling, and laboratory testing of the various foundation materials.

Prepared by:

BARNES GEOLOGIC CONSULTING, INC.

Joe G. Barnes

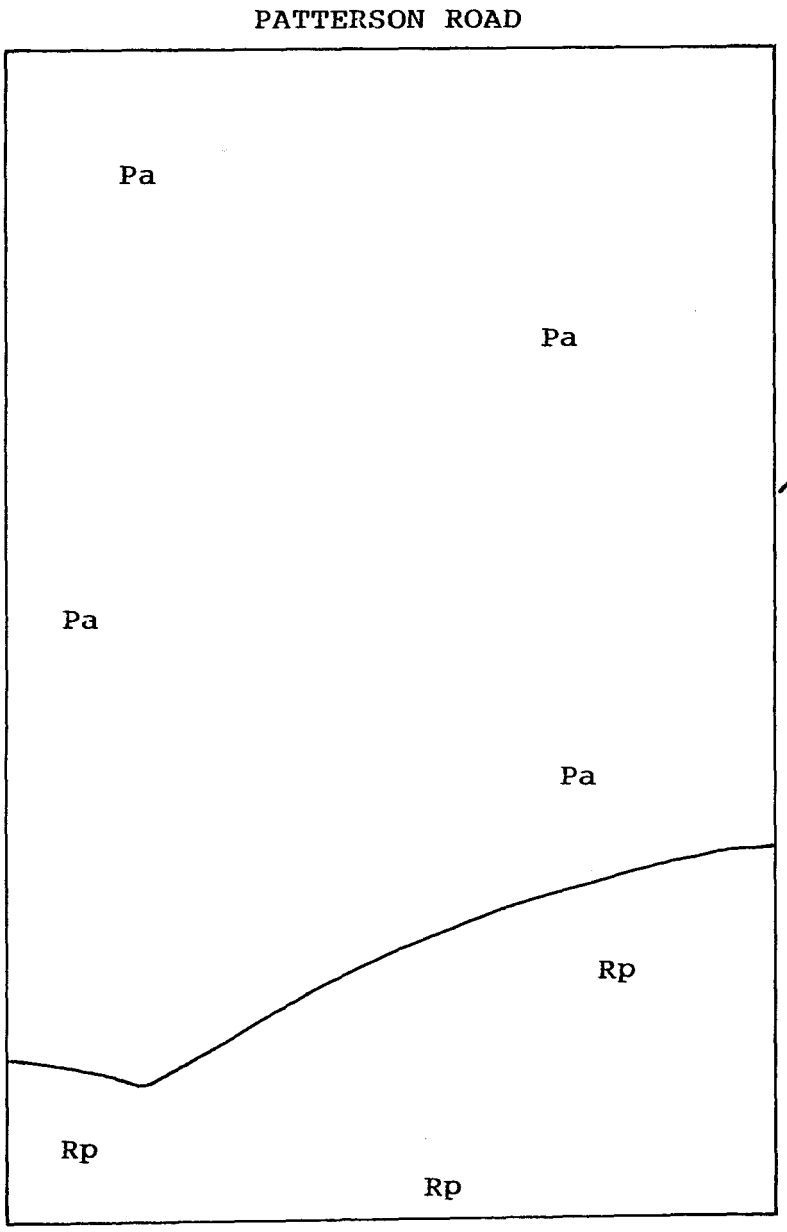
Joe G. Barnes, President
Engineering Geologist



Close-up of an exposure on the southernmost berm cut showing a contact (marked with the hammer) between in-place Mancos Shale and the overlying man-made fill. This photo is about 60 feet north and 90 feet west of the southeast corner of the property.

Looking northeast at the two berms on the southern portion of the site. The berms are partly in-place shale and partly man-made fill.

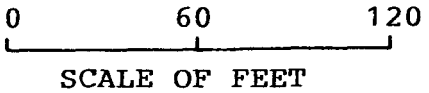
HERITAGE HOMES-THE FALLS--PHOTOS BY JOE G. BARNES, APRIL 19,1992.



EXPLANATION

Pa	Persayo-Chipeta silty clay loam.
Rp	Rough broken land; weathered Mancos Shale, silty clay, and shale fragments at surface.

Adapted from "Soil Map, Grand Junction, Colo. Area", SCS, surveyed 1939-40. This property has been leveled since the SCS mapping by cut-and-fill and berm construction with heavy excavation equipment.



SOILS MAP
HERITAGE HOMES-THE FALLS

April, 1992
Barnes Geologic Consulting, Inc.
Drawn by JGB

SOIL CONSERVATION SERVICE
SOIL DATA SHEET

PERSAYO-CHIPETA SILTY CLAY LOAMS, 0 to 2 percent slopes, Class IVs (Pa)

At least 80 percent of this complex consists of Persayo silty clay loam, 0 to 2 percent slopes. The other member of the complex, Chipeta silty clay loam, 0 to 2 percent slopes, occurs as small irregular bodies of light-gray to gray silty clay loam too small to separate on the map. These soils are similar in most respects, but they differ slightly in a few. Aside from their color difference - the Persayo soil is a pale yellow whereas the Chipeta is gray - the Persayo has a somewhat higher silt content, a slightly deeper surface soil, and a somewhat less compact subsoil.

The 8- to 10-inch surface soil of Persayo silty clay, 0 to 2 percent slopes, is a pale-yellow silty clay loam that contains a few scattered, pale yellow, easily crumbled, shale fragments. Below this depth the shale fragments generally are increasingly more abundant, but in places there are not many to depths of 15 to 18 inches. This material is hard and compact when it is dry. When wet, however, it is less plastic than in the Chipeta soil and therefore is slightly more permeable to plant roots. The soil is calcareous from the surface downward, although the lime is not visible. A small percentage of salts is common, but the cultivated acreage adversely affected is small. A slight scattering of pebblelike aggregates of gypsum over the surface is common. Seams of gypsum occur in the underlying shale strata. Both soils have developed in place from materials weathered from Mancos shale.

The organic-matter content in both soils is very low. Internal drainage and permeability to plant roots are slow.

Soil limitations are classified as severe for sanitary land fill (depth to rock, slope), septic tank absorption fields (depth to rock, slope), and sewage lagoons (depth to rock, slope). Limitations are moderate to severe for local roads and streets (shrink-swell, depth to rock and slope), shallow excavations (depth to rock, slope), dwellings with basements (shrink-swell, depth to rock, slope), dwellings without basements (shrink-swell, depth to rock, slope.)

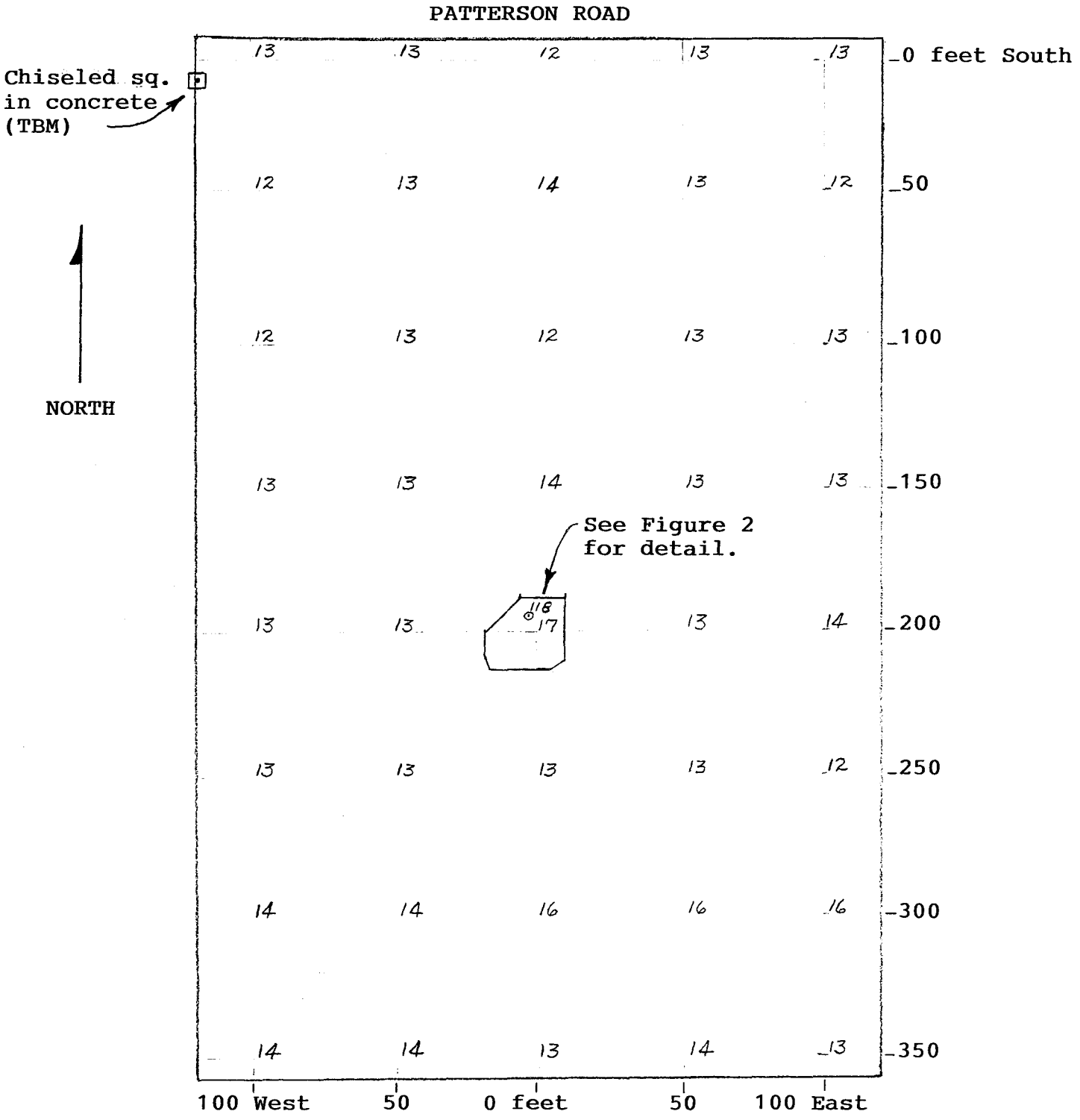
SOIL CONSERVATION SERVICE
SOIL DATA SHEET

ROUGH BROKEN LAND, CHIPETA AND PERSAYO SOIL MATERIALS, Class VIIIs (Rp)

This land type consists mainly of bare Mancos shale. The rather steep areas northeast of Grand Junction consist mainly of bare Chipeta soil-forming material, whereas those north of Mack have a thin to moderately thick mantle of gravelly clay loam, Fruita soil material, overlying the Mancos shale.

Some areas of this land type that have a mantle of soil material could be used for irrigated pasture. Most of the acreage, however, is steep and consists of raw shale. This land type is periodically grazed by sheep, normally late in the fall. The sparse cover consisting of saltsage, saltbush, some shadscale and ryegrass, and other plants provides browse of low value.

Soil limitations are classified as severe for local roads and streets (slopes), shallow excavations (slopes, depth to shale), dwellings (slopes, depth to shale), and sewage lagoons (slopes over 15%). the property is highly variable regarding its limitations for septic tank filter fields and requires on-site investigation.



NOTES : Gamma radiation survey conducted at 50-foot grid intervals. Used Ludlum Measurements Scintillometer,Model 19,Micro R Meter. Units shown on drawing are microroentgens per hour. See Figure 2 for detail of anomalous readings.

0 50 100

SCALE OF FEET

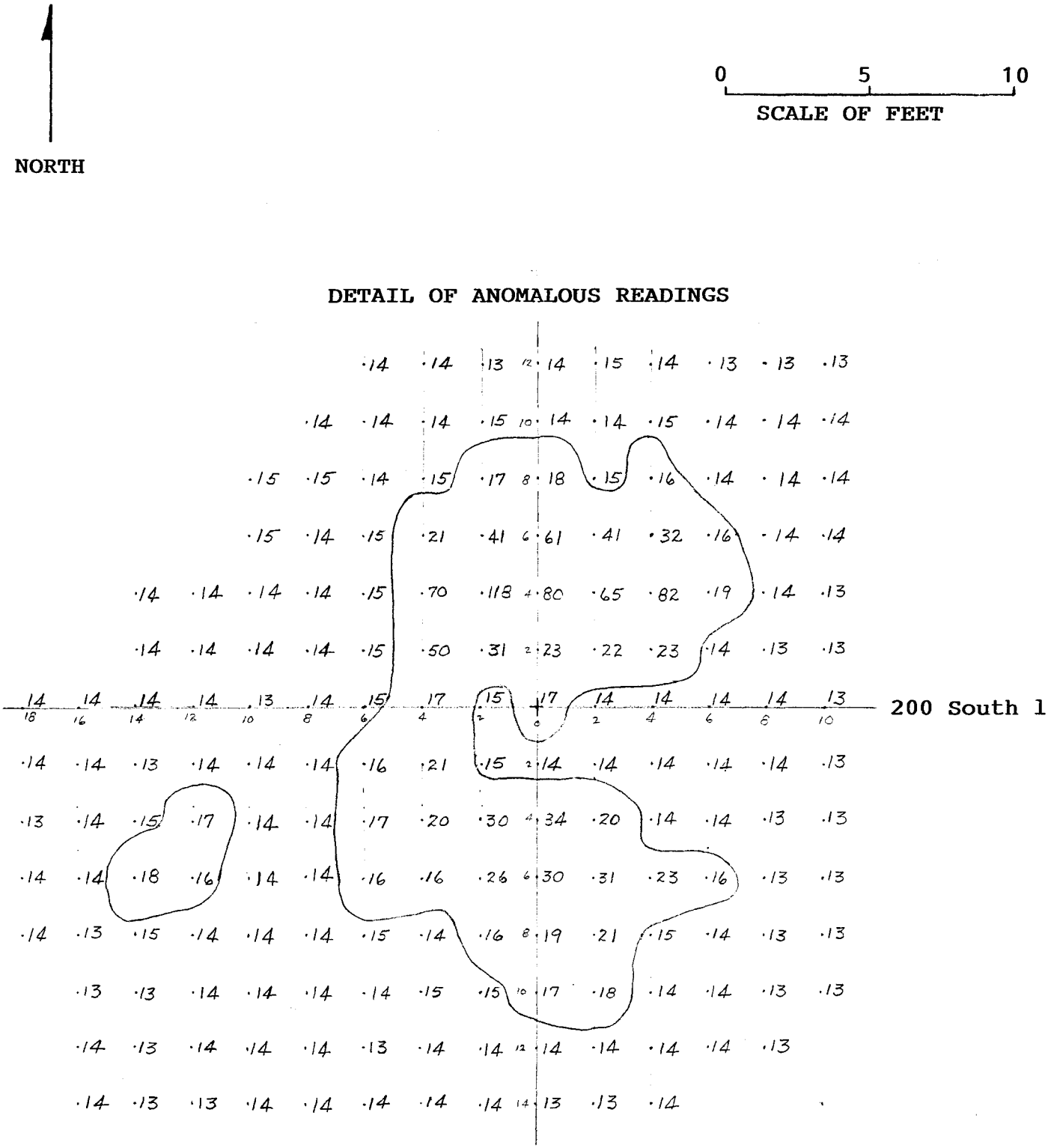
FIGURE 1

GAMMA RADIATION REPORT

HERITAGE HOMES - THE FALLS

APRIL 20, 1992

Barnes Geologic Consulting, Inc.
Prepared by Joe G. Barnes



EXPLANATION

Area higher than 15 micro R/hr.

FIGURE 2

GAMMA RADIATION REPORT

HERITAGE HOMES - THE FALLS

APRIL 20, 1992

Barnes Geologic Consulting, Inc.
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April 24, 1992

TRAFFIC ACCESS AND IMPACT STUDY

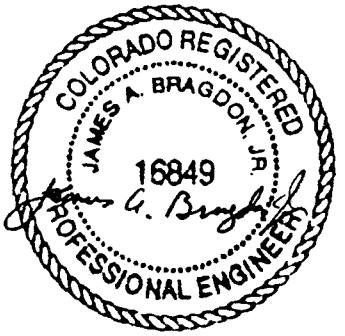
* HERITAGE HOMES - THE FALLS *
Grand Junction, Colorado

Prepared For:

HERITAGE HOMES

Prepared By:

James A. Bragdon, Jr., P.E.



PURPOSE

The purpose of this study is to assess the effects that HERITAGE HOMES - THE FALLS will have on the surrounding roadway network, and to determine what provisions are needed for safe and efficient site access and traffic flow.

SITE DESCRIPTION

HERITAGE HOMES - THE FALLS is located at 2835 Patterson Road, in Grand Junction, Colorado. It will be an elderly care facility, consisting of a 15 bedroom congregate care facility and a 27 unit elderly housing facility. The site is east of, and adjacent to, the new Grand Junction fire station, which is currently under construction. The only traffic access point available to the site is onto Patterson Road.

EXISTING ROADWAYS

Patterson Road is a five lane roadway, with a two-way left turn center lane. There is a raised median on Patterson Road that begins approximately 50 feet west of the east property line of the site and continues west to 28¼ Road.

Traffic counts, provided by the City of Grand Junction and taken in March, 1991, indicate an ADT of 19,230. The A.M. peak hour volume (7 A.M. - 8 A.M.) was 1,433 vehicles. The P.M. peak hour volume (5 P.M. - 6 P.M.) was 1,696 vehicles.

TRIP GENERATION

The ITE TRIP GENERATION (5th. Edition) was used to project the trip ends that will be generated by HERITAGE HOMES - THE FALLS at total build out. A total of three trip ends will be generated during the A.M. peak hour, and a total of six trip ends will be generated during the P.M. peak hour. The trip generation analysis can be found on Page 2.

*** TRIP GENERATION ***

REFERENCE: ITE TRIP GENERATION (5th. Edition)

GENERATOR:

Congregate Care Facility -- 15 Bedrooms

Elderly housing Facility (Attached) -- 27 Units

TRIP GENERATION RATES (Based on peak hour of adj. st. traffic):

Congregate Care (ITE Land Use Code 252)

A.M. -- 0.06 Trip Ends/Dwelling Unit
P.M. -- 0.17 " " " "

Elderly Housing (Attached) (ITE Land Use Code 253)

A.M. -- 0.05 Trip Ends/Dwelling Unit
P.M. -- 0.08 " " " "

TRIP GENERATION:

A.M. Peak Hour of adjacent street traffic

Congregate Care: (15)(0.06)= 0.90 or 1.0 Trip Ends

Elderly Housing: (27)(0.05)= 1.35 or 2.0 Trip Ends

TOTAL: 3.0 Trip Ends

P.M. Peak Hour of adjacent street traffic

Congregate Care: (15)(0.17)= 2.55 or 3.0 Trip Ends

Elderly Housing; (27)(0.08)= 2.16 or 3.0 Trip Ends

TOTAL: 6.0 Trip Ends

ANALYSIS

HERITAGE HOMES - THE FALLS should generate only about three trip ends during the A.M. peak hour and only about six trip ends during the P.M. peak hour. There will only be approximately six employees. These will be mostly kitchen personnel, and their trips will probably not coincide with with either peak hour of Patterson Road. Therefore, this development should have negligible impact on the capacity or safety of Patterson Road.

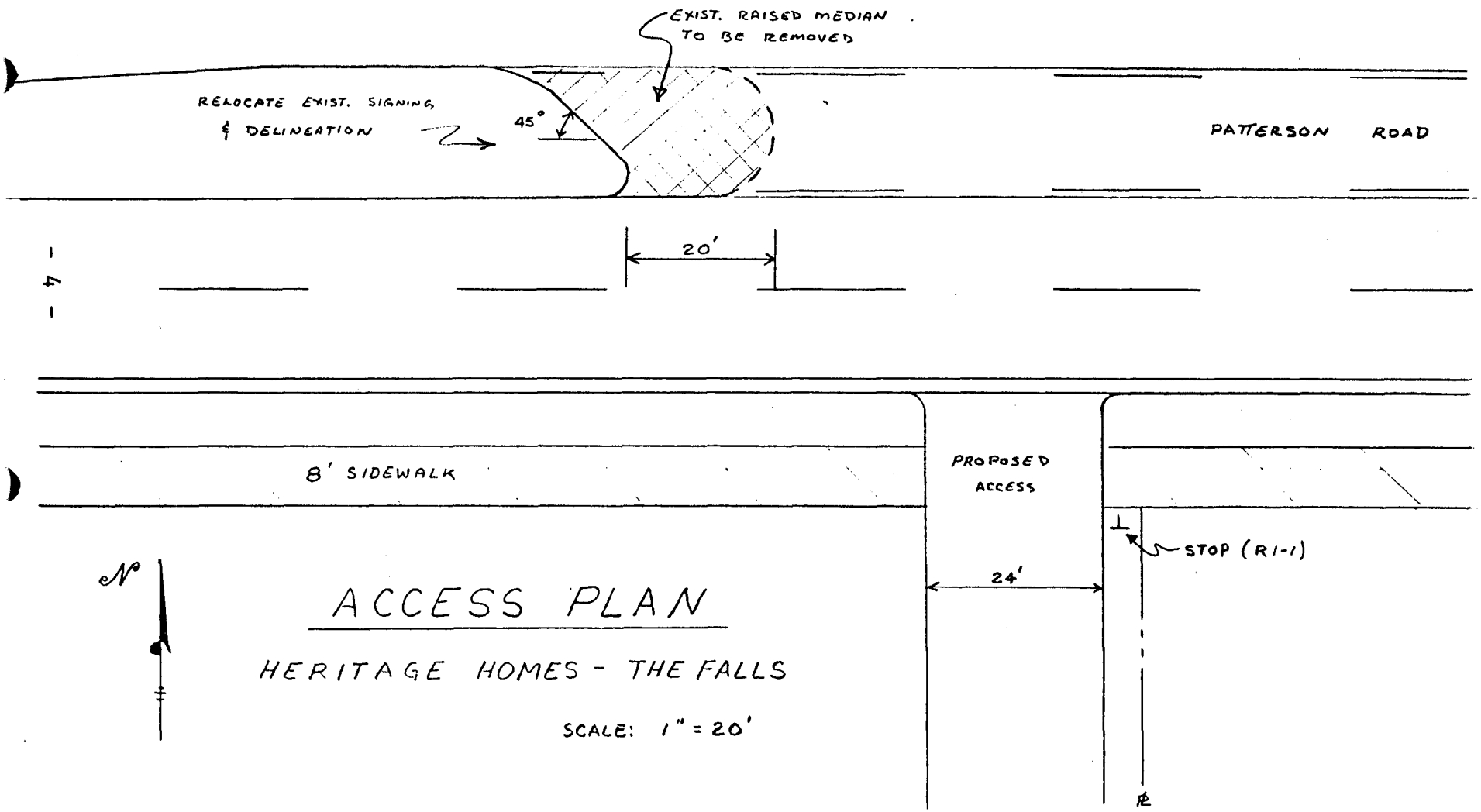
With regard to the turning movements into and out of the access point on Patterson Road, there should be no problems with the right turn in, the right turn out, and the left turn in. The only movement of concern is the left turn out to go west on Patterson Road. This is because of the existing raised median on Patterson Road.

The situation with the raised median can be mitigated by locating the site access point as close as possible to the east property line, and removing approximately twenty feet of the raised median. This will provide about fifty feet of storage in the two-way left turn painted median for vehicles exiting the site to go west on Patterson Road. This is not an acceleration lane, but is intended to provide storage for exiting vehicles. The existing delineation and signing on the raised median should be relocated.

A sketch of the recommended access arrangement is shown on Page 4.

SUMMARY

HERITAGE HOMES - THE FALLS, by virtue of the type of land use characteristics involved, will have minimal impact on the capacity or safety of Patterson Road. With modifications to the access point and the raised median on Patterson Road as outlined above, a full movement access can be safely accomodated.



ACCESS PLAN

HERITAGE HOMES - THE FALLS

SCALE: 1" = 20'

Lambert and Associates

CONSULTING GEOTECHNICAL ENGINEERS AND MATERIAL TESTING

April 27, 1992

Heritage Construction
2955 F Road
Grand Junction, CO 81504

PN: M92059GE

Attention: Mr. Bill Ihrig

Subject: Geotechnical Engineering Study for the Proposed Falls Elderly Housing Project near 28 1/4 Road and Patterson Road Grand Junction, Colorado

Mr. Ihrig:

Lambert and Associates is pleased to present our geotechnical engineering study for the subject project. The field study was completed on April 10, 1992. The laboratory study was completed on April 27, 1992. The analysis was performed and the report prepared from April 21, 1992 through April 27, 1992. Our geotechnical engineering report is attached.

Section 2.0 provides a technical guide for design team members for rapid information retrieval from our report. We are available to review the geotechnical engineering aspects of your plans and specifications for the project including the earthwork specifications as discussed in this report.

We are available to provide soil density and concrete testing services and provide foundation excavation and drilled pier observations during construction. We recommend that Lambert and Associates, the geotechnical engineer for the project, provide material testing services to maintain continuity between design and construction phases.

If you have any questions concerning the geotechnical engineering aspects of your project please contact us. Thank you for the opportunity to perform this study for you.

Respectfully submitted,

LAMBERT AND ASSOCIATES

Norman W. Johnston

Norman W. Johnston, P.E.

NWJ/nr

#23 92

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Lambert and Associates

CONSULTING GEOTECHNICAL ENGINEERS AND MATERIAL TESTING

GEOTECHNICAL ENGINEERING STUDY

FALLS ELDERLY HOUSING PROJECT

28 1/4 ROAD AND PATTERSON ROAD

GRAND JUNCTION, COLORADO

Prepared for:

HERITAGE CONSTRUCTION

PROJECT NUMBER: M92059GE

April 27, 1992

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M92059GE

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1.0 INTRODUCTION

This report presents the results of the geotechnical engineering study we conducted for the proposed Falls Elderly Housing project. The study was conducted at the request of Mr. Bill Ihrig.

The conclusions, suggestions and recommendations presented in this report are based on the data gathered during our site and laboratory study and on our experience with similar soil conditions. Factual data gathered during the field and laboratory work are summarized in Appendices A and B.

1.1 Proposed Construction

The proposed construction will consist of two (2) structures. One (1) structure will be a single story wood frame superstructure. It is our understanding that the preferred foundation for this structure is a monolithic concrete slab-on-grade. The second structure will be a one (1) and two (2) story structure which will step down the hillside to the south. The structure will be supported on reinforced concrete foundations with a suspended wood floor over a crawl space area.

1.2 Scope of Services

Our services included geotechnical engineering field and laboratory studies, analysis and report preparation for the proposed site. The scope of our services is outlined below.

- The field study consisted of describing and sampling the soils encountered in seven (7) auger advanced test borings at the proposed building location.

- The soils encountered in the test borings were described and samples retrieved for the subsequent laboratory study.

- The laboratory study included tests of select soil samples obtained during the field study to help assess the strength and swell/consolidation potential of the soils tested. A soil sample was tested for sulfate chemicals which may be potentially corrosive to concrete.

- This report presents our geotechnical engineering suggestions and recommendations for planning and design of site development including:

  . Viable foundation types for the conditions encountered,
  . Allowable bearing pressures for the foundation types,
  . Lateral earth pressure recommendations for design of laterally loaded walls, and
  . Geotechnical considerations and recommendations for concrete slab-on-grade floors.

- Our recommendations and suggestions are based on the subsurface soil and ground water conditions encountered during our site and laboratory studies.

2.0 TECHNICAL GUIDE FOR DESIGN TEAM

This report contains geotechnical engineering suggestions and recommendations with background and support information. Design specific values may be difficult to locate quickly within the sections that present each design criteria. Therefore, some of the design values are discussed briefly in this section. The values presented here are a brief synopsis of the design values presented in the appropriate sections of this report and therefore do not present all of the pertinent information for that section.

The design bearing capacity for spread footings will depend on the minimum depth of embedment of the bottom of the footing below the lowest adjacent grade and is 5000 pounds per square foot, with a minimum dead load of 2000 pounds per square foot and a minimum depth of embedment of at least one (1) foot when placed on the natural undisturbed formational material. The bearing capacity may be increased by about 20 percent for transient loads such as wind and seismic loads. Foundation design considerations are presented in section 5.0.

Drilled pier foundations may be used. They should be drilled a minimum of ten (10) feet into the hard unweathered formational material and designed for end bearing only using an end bearing capacity of 20,000 pounds per square foot and a minimum dead load of 5000 pounds per square foot. Drilled pier foundations are discussed in section 6.3.

Concrete slab-on-grade floors should be separated from all bearing members and placed on a blanket of compacted structural fill which is at least one (1) foot thick. We suggest the floor slab be reinforced with a 6 x 6 - W2.9 x W2.9 (6 x 6 - 6 x 6) welded wire mesh as a minimum reinforcement. Concrete floor slabs should be jointed with jointed areas about 200 square feet and approximately square. Concrete floor slabs are discussed in section 7.0.

Lateral earth pressures for the design of basement walls are; active lateral earth pressure of 35 pounds per cubic foot per foot of depth, at rest lateral earth pressure of 50 pounds per cubic foot per foot of depth, passive lateral earth pressure of 400 pounds per cubic foot per foot of embedment and a coefficient of friction between the concrete and soil of 0.3 for the natural on-site soils. Lateral earth pressures are discussed in section 9.0.

We recommend that we be contacted to observe foundation excavations during construction.

3.0 SITE CHARACTERISTICS

Site characteristics include observed existing and pre-existing site conditions that may influence the geotechnical engineering aspects of the proposed site development.

3.1 Site Location

The proposed building site is located southeast of the intersection of Patterson Road and 28 1/4 Road, Grand Junction, Colorado. A project vicinity map is presented on Figure 1.

3.2 Site Conditions

The proposed building site is located near the crest of a small ridge. The crest slopes down to the north with only minor topographic relief across the proposed single-story wood structure site. The south portion of the site slopes down to the south with inclinations varying from near vertical to near horizontal. The

south portion of the site has been somewhat terraced and graded in the recent past. The terracing consists of two (2) terraces which step down. Each terrace is about thirty (30) feet wide and steps down with about a six (6) to eight (8) foot vertical. The excavation at the back of both terraces indicate exposed formational material at the bottom of each excavation. The southwest portion of the lower excavation indicates that there is some man-placed fill varying in thickness from about zero (0) feet to a depth of about five (5) to six (6) feet.

3.3 Subsurface Conditions

The subsurface exploration consisted of observing, describing and sampling the soils encountered in seven (7) test borings. The approximate locations of the test borings are shown on Figure 2. The logs describing the soils encountered in the test borings are presented in Appendix A.

The soils encountered in the test borings consisted of silty clay to a depth of about one (1) to three (3) feet. The silty clay soil was underlain by formational material. The formational material was a silty clay shale of the Mancos formation. The Mancos formational shales typically have low swell potential when in their hard unweathered state. However these materials may have moderate to high swell potential when only slightly weathered.

No free subsurface water was encountered in the test borings at the time of our field study. However, test boring 7 contained very moist conditions to a depth of about twelve (12) feet.

4.0 ON-SITE DEVELOPMENT CONSIDERATIONS

We anticipate that the subsurface water elevation may fluctuate with seasonal and other varying conditions. Our experience in the area indicates that fractured layers may exist in the formational material and that the fractured layers may carry or store water. If water is encountered it may be necessary to dewater construction excavations to provide more suitable working conditions. Excavations should be well braced or sloped to prevent wall collapse. Federal, state and local safety codes should be observed.

The formational material encountered in the test borings was very hard. We anticipate that it may be possible to excavate this material, however additional effort may be necessary. We do not recommend blasting to aid in excavation of the material. Blasting may fracture the formational material which will reduce the integrity of the support characteristics of the formational material.

It has been our experience that sites in developed areas may contain existing subterranean structures or poor quality man-placed fill. If subterranean structures or poor quality man-placed fill

are suspected or encountered, they should be removed and replaced with compacted structural fill as discussed under COMPACTED STRUCTURAL FILL below.

5.0 FOUNDATION DISCUSSION

Two criteria for any foundation which must be satisfied for satisfactory foundation performance are:

1) contact stresses must be low enough to preclude shear failure of the foundation soils which would result in lateral movement of the soils from beneath the foundation, and

2) settlement or heave of the foundation must be within amounts tolerable to the superstructure.

The soils encountered in the test borings have varying engineering characteristics that may influence the design and construction considerations of the foundations. The characteristics include swell potential, settlement potential, bearing capacity and the bearing conditions of the soils supporting the foundations. These are discussed in general below to increase your familiarity with the characteristics that can be of influence to any structure.

5.1 Swell Potential

Some of the materials encountered in the test borings at the anticipated foundation depth may have swell potential. Swell potential is the tendency of the soil to increase in volume when it becomes wetted. The volume change occurs as moisture is absorbed

into the soil and water molecules become attached to or adsorbed by the individual clay platlets. Associated with the process of volume change is swell pressure. The swell pressure is the force the soil applies on its surroundings when moisture is absorbed into the soil. Foundation design considerations concerning swelling soils include structure tolerance to movement and dead load pressures to help restrict uplift. The structure's tolerance to movement should be addressed by the structural engineer and is dependent upon many facets of the design including the overall structural concept and the building material. The uplift forces or pressure due to wetted clay soils can be addressed by designing the foundations with a minimum dead load. Suggestions and recommendations for design dead load are presented below.

5.2 Settlement Potential

Settlement potential of a soil is the tendency for a soil to experience volume change when subjected to a load. Settlement is characterized by downward movement of all or a portion of the supported structure as the soil particles move closer together resulting in decreased soil volume. Settlement potential is a function of foundation loads, depth of footing embedment, the width of the footing and the settlement potential or compressibility of the influenced soil. The anticipated post construction settlement potential is based on site specific soil conditions and is presented below.

5.3 Soil Support Characteristics

The soil bearing capacity is a function of the engineering properties of the soils supporting the foundations, the foundation width, the depth of embedment of the bottom of the foundation below the lowest adjacent grade, the influence of the ground water and the amount of settlement tolerable to the structure. Soil bearing capacity and associated minimum depth of embedment are presented below.

The foundation for the structure should be placed on relatively uniform bearing conditions. Varying support characteristics of the soils supporting the foundation may result in nonuniform or differential performance of the foundation. Formational material was encountered in some of the test borings at shallow and varying depths. We anticipate that the surface of the formational material may undulate throughout the building site. If this is the case it may result in a portion of the foundation for the structure being placed on the formational material and a portion of the foundation being placed on the overlying soils. Varying support material will result in nonuniform bearing conditions. The influence of nonuniform bearing conditions may be reduced by placing the foundation members entirely on the formational material.

6.0 FOUNDATION RECOMMENDATIONS

We have analyzed spread footings and drilled piers as potential foundation systems for the proposed structures. These are discussed below. We have provided design parameters for several foundation types. Of these, because of the expansion potential of the site soils, we feel that the drilled piers will provide the foundation with the least likelihood of significant post construction movement. All of the design parameters are based on extraordinary craftsmanship, care during construction and post construction cognizance of the potential swelling soil hazard, with appropriate post construction maintenance.

6.1 Spread Footings

The structures may be founded on spread footings which are placed entirely on the natural undisturbed formational material. The bearing capacity will depend on the minimum depth of embedment of the bottom of the footing below the lowest adjacent grade. The embedment concept is shown on Figure 3. The footings may be designed using a bearing capacity of 5000 pounds per square foot with a minimum dead load of 2000 pounds per square foot and a minimum depth of embedment of at least one (1) foot when placed entirely on the natural undisturbed formational material.

If the foundations are designed and constructed as discussed above we anticipate that the post construction total settlement may be in the range of one half (1/2) inch.

We recommend that we be contacted to observe the foundation excavations during construction to verify the soil support conditions and our recommendations. We will then revise our recommendations based on our observations if necessary.

6.2 General Spread Footing Considerations

In our analysis it was necessary to assume that the material encountered in the test borings extended throughout the building site and to a depth below the maximum depth of the influence of the footings. We should be contacted to observe the soils exposed in the foundation excavations prior to placement of foundations to verify the assumptions made during our analysis.

We anticipate that the surface of the formational material may undulate which may result in a portion of the footings supported on the overlying soils. If this happens the foundations will perform differently between the areas supported on formational material and the areas supported on the non-formational material. For this reason we suggest that if formational material is encountered only in portions of the foundation excavations at footing depth the foundation in all areas should be extended to support all footings on the formational material.

The bottom of any footings exposed to freezing temperatures should be placed below the maximum depth of frost penetration for the area. Refer to the local building code for details.

The bottom of the foundation excavations should be observed to assure that the footings are supported on undisturbed formational material. The bottom of the footing excavations should be thoroughly cleaned to remove all disturbed formational material.

All footings should be proportioned as much as practicable to reduce the post construction differential settlement. Footings for large localized loads should be designed for bearing pressures and footing dimensions in the range of adjacent footings to reduce the potential for differential settlement. We are available to discuss this with you.

Foundation walls may be reinforced, for geotechnical purposes. We suggest at least two (2) number 5 bars, continuous at the top and the bottom (4 bars total), at maximum vertical spacing. This will help provide the walls with additional beam strength and help reduce the effects of slight differential settlement. The walls may need additional reinforcing steel for structural purposes. The structural engineer should be consulted for foundation design. The structural engineering reinforcing design tailored for this project will be more appropriate than the suggestions presented above.

6.3 Drilled Piers

Drilled piers or caissons that are drilled into the unweathered formational material may be used to support the proposed structures. The piers should be drilled into the

formational material a distance equal to at least two (2) pier diameters, or ten (10) feet, whichever is deeper. The piers should be designed as end bearing piers using a formational material bearing capacity of 20,000 pounds per square foot and a side friction of 2,000 pounds per square foot for the portion of the pier in the unweathered formational material. The piers should be designed with a minimum dead load of 5000 pounds per square foot.

We suggest that piers be designed using end bearing capacity only. The side shear may be used for the design to resist uplift forces. When using skin friction for resisting uplift we suggest that you discount the upper portion of the pier embedment in the formational material to a depth of at least one and one half (1 1/2) pier diameters into the formational material. The bottom of the pier holes should be cleaned to insure that all loose and disturbed materials are removed prior to placing pier concrete. Because of the rebounding potential in the formational materials when unloaded by excavation and the possibility of desiccation of the newly exposed material we suggest that concrete be placed in the pier holes immediately after excavation and cleaning.

If the piers are designed and constructed as discussed above we anticipate that the post construction settlement potential of each pier may be less than about one quarter (1/4) inch.

The portion of the pier above the formational surface and in the weathered formational material should be cased with a sono tube or similar casing to help prevent flaring on the top of the pier holes and help provide a positive separation of the pier concrete and the adjacent soils. Construction of the piers should include extreme care to prevent flaring of the top of the piers. This is to help reduce the potential of swelling soils to impose uplift forces which will put the pier in tension. The drilled piers should be vertically reinforced to provide tensile strength in the piers should swelling on-site soils apply tensile forces on the piers. The structural engineer should be consulted to provide structural design recommendations.

Grade beams between piers should be provided with void spaces between the soil and the grade beam. The grade beam should not come in contact with the soils. Separation is to help reduce the potential for heave of the foundations should the soils swell.

We anticipate that ground water will not be encountered in the pier holes. However, if ground water is encountered, the pier holes should be dewatered prior to placing pier concrete and no pier concrete should be placed when more than six (6) inches of water exists in the bottom of the pier holes. The piers should be filled with a tremie placed concrete immediately after the drilling and cleaning operation is complete. It may be necessary to case

the pier holes with temporary casing to prevent caving during pier construction.

Very difficult drilling conditions were encountered in the formational material during our field study. We anticipate that the formational material may be very difficult to drill with pier drilling equipment readily available in western Colorado. It may be necessary to obtain specialty pier drilling equipment to drill piers into the formational material encountered in our test borings.

The structural engineer should be consulted to provide structural design recommendations for the drilled piers and grade beam foundation system.

7.0 INTERIOR FLOOR SLAB DISCUSSION

It is our understanding that, as currently planned, the floor for the north structure may be a concrete slab-on-grade floor. The natural soils that will support interior floor slabs are stable at their natural moisture content. However, the owner should realize that when wetted, the site soils may experience volume changes.

Engineering design dealing with swelling soils is an art which is still in its infancy. The owner is cautioned that the soils on this site may have swelling potential and concrete slab-on-grade floors and other lightly loaded members may experience movement

when the supporting soils become wetted. We suggest you consider floors suspended from the foundation systems as structural floors or a similar design that will not be influenced by subgrade volume changes. If the owner is willing to accept the risk of possible damage from swelling soils supporting concrete slab-on-grade floors, the following recommendations to help reduce the damage from swelling soils should be followed. These recommendations are based on generally accepted design and construction procedures for construction on soils that tend to experience volume changes when wetted and are intended to help reduce the damage caused by swelling soils. Lambert and Associates does not intend that the owner, or the owner's consultants should interpret these recommendations as a solution to the problems of swelling soils, but as measures to reduce the influence of swelling soils.

Concrete flatwork, such as concrete slab-on-grade floors, should be underlain by compacted structural fill. The layer of compacted fill should be at least one (1) foot thick and constructed as discussed under COMPACTED STRUCTURAL FILL below.

The natural soils exposed in the areas supporting concrete slab-on-grade floors should be kept very moist during construction prior to placement of concrete slab-on-grade floors. This is to help increase the moisture regime of the potentially expansive soils supporting floor slabs and help reduce the expansion

potential of the soils. We are available to discuss this concept with you.

Concrete slab-on-grade floors should be provided with a positive separation, such as a slip joint, from all bearing members and utility lines to allow their independent movements and to help reduce possible damage that could be caused by movement of soils supporting interior slabs. The floor slab should be constructed as a floating slab. All water and sewer pipe lines should be isolated from the slab. Any appliances, such as a water heater or furnace, placed on the floating floor slab should be constructed with flexible joints to accommodate future movement of the floor slab with respect to the structure. We suggest partitions constructed on the concrete slab-on-grade floors be provided with a void space above or below the partitions to relieve stresses induced by elevation changes in the floor slab.

The concrete slabs should be scored or jointed to help define the locations of any cracking. The areas defined by scoring and jointing should be about square and enclose about 200 square feet. Joints should be scored in the floors a distance of about three (3) feet from, and parallel to, the walls.

If moisture rise through the concrete slab-on-grade floors will adversely influence the performance of the floor or floor coverings a moisture barrier may be installed beneath the floor slab to help discourage capillary and vapor moisture rise through

the floor slab. The moisture barrier may consist of a heavy plastic membrane, six (6) mil or greater, protected on the top and bottom by at least two (2) inches of clean sand. The plastic membrane should be lapped and taped or glued and protected from punctures during construction.

The Portland Cement Association suggests that welded wire reinforcing mesh is not necessary in concrete slab-on-grade floors when properly jointed. It is our opinion that welded wire mesh may help improve the integrity of the slab-on-grade floors. We suggest that concrete slab-on-grade floors should be reinforced, for geotechnical purposes, with at least 6 x 6 - W2.9 x W2.9 (6 x 6 - 6 x 6) welded wire mesh positioned midway in the slab. The structural engineer should be contacted for structural design of floor slabs.

8.0 COMPACTED STRUCTURAL FILL

Compacted structural fill is typically a material which is constructed for direct support of structures or structural components.

There are several material characteristics which should be examined before choosing a material for potential use as compacted structural fill. These characteristics include; the size of the larger particles, the engineering characteristics of the fine grained portion of material matrix, the moisture content that the

material will need to be for compaction with respect to the existing initial moisture content, the organic content of the material, and the items that influence the cost to use the material.

Compacted fill should be a non-expansive material with the maximum aggregate size less than about two (2) inches and less than about twenty five (25) percent coarser than three quarter (3/4) inch size.

The reason for the maximum size is that larger sizes may have too great an influence on the compaction characteristics of the material and may also impose point loads on the footings or floor slabs that are in contact with the material. Frequently pit-run material or crushed aggregate material is used for structural fill material. Pit-run material may be satisfactory, however crushed aggregate material with angular grains is preferable. Angular particles tend to interlock with each other better than rounded particles.

The fine grained portion of the fill material will have a significant influence on the performance of the fill. Material which has a fine grained matrix composed of silt and/or clay which exhibits expansive characteristics should be avoided for use as structural fill. The moisture content of the material should be monitored during construction and maintained near optimum moisture content for compaction of the material.

Soil with an appreciable organic content may not perform adequately for use as structural fill material due to the compressibility of the material and ultimately due to the decay of the organic portion of the material.

The natural on-site soils are not suitable for use as compacted structural fill material supporting building or structure members because of their clay content and swell potential. The natural on-site soils may be used as compacted fill in areas that will not influence the structure such as to establish general site grade. We are available to discuss this with you.

All areas to receive compacted structural fill should be properly prepared prior to fill placement. The preparation should include removal of all organic or deleterious material and the areas to receive fill should be proof rolled after the organic deleterious material has been removed. Any areas of soft, yielding, or low density soil, evidenced during the proof rolling operation should be removed. Fill should be moisture conditioned, placed in thin lifts not exceeding six (6) inches in compacted thickness and compacted to at least 90 percent of maximum dry density as defined by ASTM D1557, modified Proctor.

We recommend that the geotechnical engineer or his representative be present during the proof rolling and fill placement operations to observe and test the material.

9.0 LATERAL EARTH PRESSURES

It is our understanding that as currently planned the proposed construction will not include basement or other retaining walls. We anticipate that due to the nature of the site terracing and the proposed type of construction for the south site that some wall may exist with sufficient backfill to act as retaining walls.

Laterally loaded walls supporting soil will act as retaining walls and should be designed as such.

Walls that are designed to deflect and mobilize the internal soil strength should be designed for active earth pressures. Walls that are restrained so that they are not able to deflect to mobilize internal soil strength should be designed for at-rest earth pressures. The values for the lateral earth pressures will depend on the type of soil retained by the wall, backfill configuration and construction technique. We suggest that for design of laterally loaded walls you consider an active lateral earth pressure of 35 pounds per cubic foot per foot of depth and an at-rest lateral earth pressure of 50 pounds per cubic foot per foot of depth for the on-site soils retained.

The soils tested have measured swell pressure of about 1600 pounds per square foot. Our experience has shown that the actual swell pressure may be much higher. If the retained soils should be come moistened after construction the soil may swell against

retaining or basement walls. The walls should be designed to resist the swell pressure of the soils.

The above lateral earth pressures may be reduced by overexcavating the wall backfill area beyond the zone of influence and backfilling with crushed rock type material. The zone of influence concept is presented on Figure 4. We suggest that you consider, if the backfill areas are overexcavated beyond the zone of influence and backfilled with crushed rock type material, an active lateral earth pressure of 35 pounds per cubic foot of depth and an at-rest lateral earth pressure of 50 pounds per cubic foot per foot of depth for the design of laterally loaded walls.

Resistant forces used in the design of the walls will depend on the type of soil that tends to resist movement. We suggest that you consider a passive earth pressure of 400 pounds per cubic foot per foot of embedment and a coefficient of friction of 0.3 for the on-site soil.

The lateral earth pressure values provided above, for design purposes, should be treated as equivalent fluid pressures. The lateral earth pressures provided above are for level well drained backfill and do not include surcharge loads or additional loading as a result of compaction of the backfill. Unlevel or non-horizontal backfill either in front of or behind walls retaining soils will significantly influence the lateral earth pressure values. Care should be taken during construction to prevent

construction and backfill techniques from overstressing the walls retaining soils. Backfill should be placed in thin lifts and compacted, as discussed in this report to realize the lateral earth pressure values.

Walls retaining soil should be designed and constructed so that hydrostatic pressure will not accumulate or will not affect the integrity of the walls. Drainage plans should include a subdrain behind the wall at the bottom of the backfill to provide positive drainage. Exterior retaining walls should be provided with perimeter drain or weep holes to help provide an outlet for collected water behind the wall.

The ground surface adjacent to the wall should be sloped to permit rapid drainage of rain, snow melt and irrigation water away from the wall backfill. Sprinkler systems should not be installed directly adjacent to retaining or basement walls.

10.0 DRAIN SYSTEM

Free subsurface water was not encountered in the test borings at the time of our field study. However, a drain system should be provided around building spaces below the finished grade and behind any walls retaining soil. The drain systems are to help reduce the potential for hydrostatic pressure to develop behind retaining walls. A sketch of the drain system is shown on Figure 5.

Subdrains should consist of a three (3) or four (4) inch diameter perforated rigid pipe surrounded by a filter. The filter should consist of a filter fabric or a graded material such as washed concrete sand or pea gravel. If sand or gravel is chosen the pipe should be placed in the middle of about four (4) cubic feet of aggregate per linear foot of pipe. The drain system should be sloped to positive gravity outlets. If the drains are daylighted the drains should be provided with all weather outlets and the outlets should be maintained to prevent them from being plugged or frozen. We should be called to observe the soil exposed in the excavations and to verify the details of the drain system.

11.0 BACKFILL

Backfill areas and utility trench backfill should be constructed such that the backfill will not settle after completion of construction, and that the backfill is relatively impervious for the upper few feet. The backfill material should be free of trash and other deleterious material. It should be moisture conditioned and compacted to at least 90 percent relative compaction using a modified Proctor density (ASTM D1557). Only enough water should be added to the backfill material to allow proper compaction. Do not pond, puddle, float or jet backfill soils.

Improperly placed backfill material will allow water migration more easily than properly recompacted fill. Improperly compacted

fill is likely to settle creating a low surface area which further enhances water accumulation and subsequent migration to the foundation soils.

Backfill placement techniques should not jeopardize the integrity of existing structural members. We recommend recently constructed concrete structural members be appropriately cured prior to adjacent backfilling.

12.0 SURFACE DRAINAGE

The foundation soils should be prevented from becoming wetted after construction. This can be aided by providing positive and rapid drainage of surface water away from the building.

The final grade of the ground surface adjacent to the building should have a definite slope away from the foundation walls on all sides. We suggest a minimum fall of about one (1) foot in the first ten (10) feet away from the foundation. Downspouts and faucets should discharge onto splash blocks that extend beyond the limits of the backfill areas. Splash blocks should be sloped away from the foundation walls. Snow storage areas should not be located next to the structure. Proper surface drainage should be maintained from the onset of construction through the proposed project life.

13.0 LANDSCAPE IRRIGATION

An irrigation system should not be installed next to foundation walls, concrete flatwork or asphalt paved areas. If an irrigation system is installed, the system should be placed so that the irrigation water does not fall or flow near foundation walls, flatwork or pavements. The amount of irrigation water should be controlled.

We recommend that wherever possible xeriscaping concepts be used. Generally the xeriscape includes planning and design concepts which will reduce irrigation water. The reason we suggest xeriscape concepts for landscaping is because the reduced landscape water will decrease the potential for water to influence the long term performance of the structure foundations and flatwork. Many publications are available which discuss xeriscape. Colorado State University Cooperative Extension has several useful publications and most landscape architects are familiar with the subject.

Due to the expansive nature of the soils tested we suggest that the owner consider landscaping with only native vegetation which requires only natural precipitation to survive. Additional irrigation water will greatly increase the likelihood of damage to the structure as a result of volume changes of the material supporting the structure.

14.0 SOIL CORROSIVITY TO CONCRETE

Chemical tests were performed on a sample of soil obtained during the field study. The soil sample was tested for pH, water soluble sulfates, and total dissolved salts. The results are presented in Appendix B. The test results indicate a water soluble sulfate content of 0.732 to 0.825 percent. Based on the American Concrete Institute (ACI) information a water soluble sulfate content of 0.732 to 0.825 percent indicates severe exposure to sulfate attack on concrete. We suggest sulfate resistant cement be used in concrete which will be in contact with the on-site soils. American Concrete Institute recommendations for sulfate resistant cement based on the water soluble sulfate content should be used. The American Concrete Institute recommends a maximum water/cement ratio of 0.45 for concrete where severe exposure to sulfate attack will occur.

15.0 CONCRETE QUALITY

It is our understanding current plans include reinforced structural concrete for building foundations and walls, and may include concrete slabs-on-grade and pavement. To insure concrete members perform as intended the structural engineer should be consulted and should address factors such as design loadings, anticipated movement and deformations.

The quality of concrete is influenced by proportioning of the concrete mix, placement, consolidation and curing. Desirable qualities of concrete include compressive strengths, water tightness and resistance to weathering. Engineering observations and testing of concrete during construction is essential as an aid to safeguard the quality of the completed concrete. Testing of the concrete is normally performed to determine compressive strength, entrained air content, slump and temperature. We recommend that your budget include provisions for testing of concrete during construction and that the testing consultant be retained by the owner or the owner's engineer or architect, not the contractor, to maintain third party credibility.

16.0 POST DESIGN CONSIDERATIONS

This subsoil and foundation study is based on limited sampling, therefore it is necessary to assume that the subsurface conditions do not vary greatly from those encountered in the test borings. Our experience has shown that significant variations are likely to exist and can become apparent only during additional on-site excavation. For this reason, and because of our familiarity with the project, Lambert and Associates should be retained to observe foundation excavations prior to foundation construction, to observe the geotechnical aspects of the construction, and to be available in the event any unusual or unexpected conditions are

encountered. The cost of the geotechnical engineering observations and material testing during construction or additional engineering consultation is not included in the fee for this report. We recommend that your construction budget include site visits early during construction for the project geotechnical engineer to observe foundation excavations and for additional site visits to test compacted soil. We recommend that the observation and material testing services during construction be retained by the owner or the owner's engineer or architect, not the contractor, to maintain third party credibility. We are experienced and available to provide material testing services. We have included a copy of a report prepared by Van Gilder Insurance which discusses testing services during construction. It is our opinion that the owner, architect and engineer be familiar with the information. If you have any questions regarding this concept please contact us.

It is difficult to predict if unexpected subsurface conditions will be encountered during construction. Since such conditions may be found we suggest that the owner and the contractor make provisions in their budget and construction schedule to accommodate unexpected subsurface conditions.

This report does not provide earthwork specifications. We can provide guidelines for your use in preparing project specific earthwork specifications. Please contact us if you need these for your project.

17.0 LIMITATIONS

It is the owner's and the owner's representatives responsibility to read this report and become familiar with the recommendations and suggestions presented. We should be contacted if any questions arise concerning the geotechnical engineering aspects of this project as a result of the information presented in this report.

The recommendations outlined above are based on our understanding of the currently proposed construction. We are available to discuss the details of our recommendations with you, and revise them where necessary. This geotechnical engineering report is based on the proposed site development and scope of services as provided to us by Mr. Bill Ihrig, on the type of construction planned, existing site conditions at the time of the field study, and on our findings. Should the planned, proposed use of the site be altered, Lambert and Associates must be contacted, since any such changes may make our suggestions and recommendations given inappropriate. This report should be used ONLY for the planned development for which this report was tailored and prepared, and ONLY to meet information needs of the owner and the owner's representatives. In the event that any changes in the future design or location of the building are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions

of this report are modified or verified in writing. It is recommended that the geotechnical engineer be provided the opportunity for a general review of the final project design and specifications in order that the earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications.

This report presents both suggestions and recommendations. The suggestions are presented so that the owner and the owner's representatives may compare the cost to the potential risk or benefit for the suggested procedures.

We represent that our services were performed within the limits prescribed by you and with the usual thoroughness and competence of the current accepted practice of the geotechnical engineering profession in the area. No warranty or representation either expressed or implied is included or intended in this report or our contract. We are available to discuss our findings with you. If you have any questions please contact us. The supporting data for this report is included in the accompanying figures and appendices.

This report is a product of Lambert and Associates. Excerpts from this report used in other documents may not convey the intent or proper concepts when taken out of context or they may be misinterpreted or used incorrectly. Reproduction, in part or

whole, of this document without prior written consent of Lambert and Associates is prohibited.

This report and information presented can be used only for this site, for this proposed development and only for the client for which our work was performed. Any other circumstances are not appropriate applications of this information. Other development plans will require project specific review by us of the project.

We have enclosed a copy of a brief discussion about geotechnical reports published by Association of Soil and Foundation Engineers for your reference.

Please call when further consultation or observations and tests are required.

If you have any questions concerning this report or if we may be of further assistance, please contact us.

Respectfully submitted;

LAMBERT AND ASSOCIATES Reviewed by:

Norman W. Johnston, P. E. Dennis D. Lambert, P. E.
Manager Geotechnical Engineer Principal Geotechnical Engineer

NWJ/nr

owners view testing and inspection as an undertaking which simply duplicates something they are entitled to in any event. They are confident they will be protected by contract documents which cover every detail and contingency. They look to local building inspectors to assure compliance with codes. And they fully expect the design team to fulfill its obligation to safeguard the quality of the work.

A Fox in the Henhouse

If testing is perceived as little more than an unnecessary, but unavoidable expense, why not make the general contractor responsible for controlling the cost? It may produce a savings, and it certainly eliminates an adminstrative headache. If contractual obligations dealing with the project schedule and budget can be enforced, surely those governing quality can be enforced, as well. Possibly so, but who is going to do it?

Some testing consultants will not accept CQC work. The reasons they give come from firsthand experience. They include: 1) inadequate to barely adequate scope, 2) selection based on the lowest bid; 3) non-negotiable contract terms inappropriate to the delivery of a professional service; 4) intimidation of inspectors by field supervisors; and 5) suppression of low or failing test results. This ought to be fair warning to any owner.

Keeping Both Hands on the Wheel

The largest part of the problem, from your point of view, is one of artful persuasion. If you cannot convince your client of the value of independent testing and inspection, no one can. Yet, if you do not, you are likely to find yourself responsible for an assurance of quality you are in no position to deliver. How can you keep quality control where it belongs and, in the process, prevent the owner from compromising his or her interests in the project as well as yours? Consider these suggestions:

1. Put the issue on an early agenda. It needs your attention. Anticipate the owner's inclination to avoid dealing with testing and inspection, and explain its importance to the success of the project. Persist, if you can, until your client agrees to hire the testing laboratory independently and to establish an adequate budget to meet the anticipated costs. A testing consultant hired by the owner cannot be fired by the general contractor for producing less than favorable results.

2. Tailor the testing requirements carefully. Scissors and paste can be your very worst enemies. Specify what the job requires, retain control of selection and hiring, make certain the contractor's responsibilities for notification for scheduling purposes are clear, and require that copies of all reports be distributed by the laboratory directly to you.

3. Insist on a preconstruction testing conference. It can be an essential element of effective coordination. Include the owner, the general contractor, major subcontractors, the testing consultant, and the design team. Review your requirements, the procedures to be followed, and the responsibilities of each of the parties. Have the testing consultant prepare a conference memorandum for distribution to all participants.

4. Monitor tests and inspections closely. Make certain your field representative is present during tests and inspections, so that deficiencies in procedures or results can be reported and acted upon quickly. Scale back testing if it becomes clear it is appropiate to do so under the circumstances; do not hesitate to order additional tests if they are required.

5. Finally, keep your client informed. Without your help, he or she is not likely to understand what the test results mean, nor will your actions in response to them make much sense. If additional testing is called for, explain why. Remember, it is an unexpected and, possibly, unbudgeted additional cost for which you will need to pave the way. In this sense, independent testing and inspection can serve an important, secondary purpose. You might view it as a communications resource. Use it in this way, and it just may yield unexpected dividends.

IMPORTANT INFORMATION
ABOUT YOUR
GEOTECHNICAL ENGINEERING REPORT

More construction problems are caused by site subsurface conditions than any other factor. As troublesome as subsurface problems can be, their frequency and extent have been lessened considerably in recent years, due in large measure to programs and publications of ASFE/ The Association of Engineering Firms Practicing in the Geosciences.

The following suggestions and observations are offered to help you reduce the geotechnical-related delays, cost-overruns and other costly headaches that can occur during a construction project.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

A geotechnical engineering report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and configuration; the location of the structure on the site and its orientation; physical concomitants such as access roads, parking lots, and underground utilities, and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, consult the geotechnical engineer to determine how any factors which change subsequent to the date of the report may affect its recommendations.

Unless your consulting geotechnical engineer indicates otherwise, *your geotechnical engineering report should not be used*:

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership, or
- for application to an adjacent site.

Geotechnical engineers cannot accept responsibility for problems which may develop if they are not consulted after factors considered in their report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by geotechnical engineers who then render an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances actual conditions may differ from those inferred to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. *Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact.* For this reason, *most experienced owners retain their geotechnical consultants through the construction stage,* to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which existed at the time of subsurface exploration, *construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time.* Speak with the geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

Geotechnical engineers' reports are prepared to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. Unless indicated otherwise, this report was prepared expressly for the client involved and expressly for purposes indicated by the client. Use by any other persons for any purpose, or by the client for a different purpose, may result in problems. *No individual other than the client should apply this report for its intended purpose without first conferring with the geotechnical engineer. No person should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, the geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review the adequacy of their plans and specifications relative to geotechnical issues.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final boring logs are developed by geotechnical engineers based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final boring logs customarily are included in geotechnical engineering reports. *These logs should not under any circumstances be redrawn* for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To minimize the likelihood of boring log misinterpretation, *give contractors ready access to the complete geotechnical engineering report* prepared or authorized for their use. Those who do not provide such access may proceed under the *mistaken* impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because geotechnical engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical consultants. To help prevent this problem, geotechnical engineers have developed model clauses for use in written transmittals. These are *not* exculpatory clauses designed to foist geotechnical engineers' liabilities onto someone else. Rather, they are definitive clauses which identify where geotechnical engineers' responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report, and you are encouraged to read them closely. Your geotechnical engineer will be pleased to give full and frank answers to your questions.

OTHER STEPS YOU CAN TAKE TO REDUCE RISK

Your consulting geotechnical engineer will be pleased to discuss other techniques which can be employed to mitigate risk. In addition, ASFE has developed a variety of materials which may be beneficial. Contact ASFE for a complimentary copy of its publications directory.

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ASSOCIATION OF SOIL AND FOUNDATION ENGINEERS

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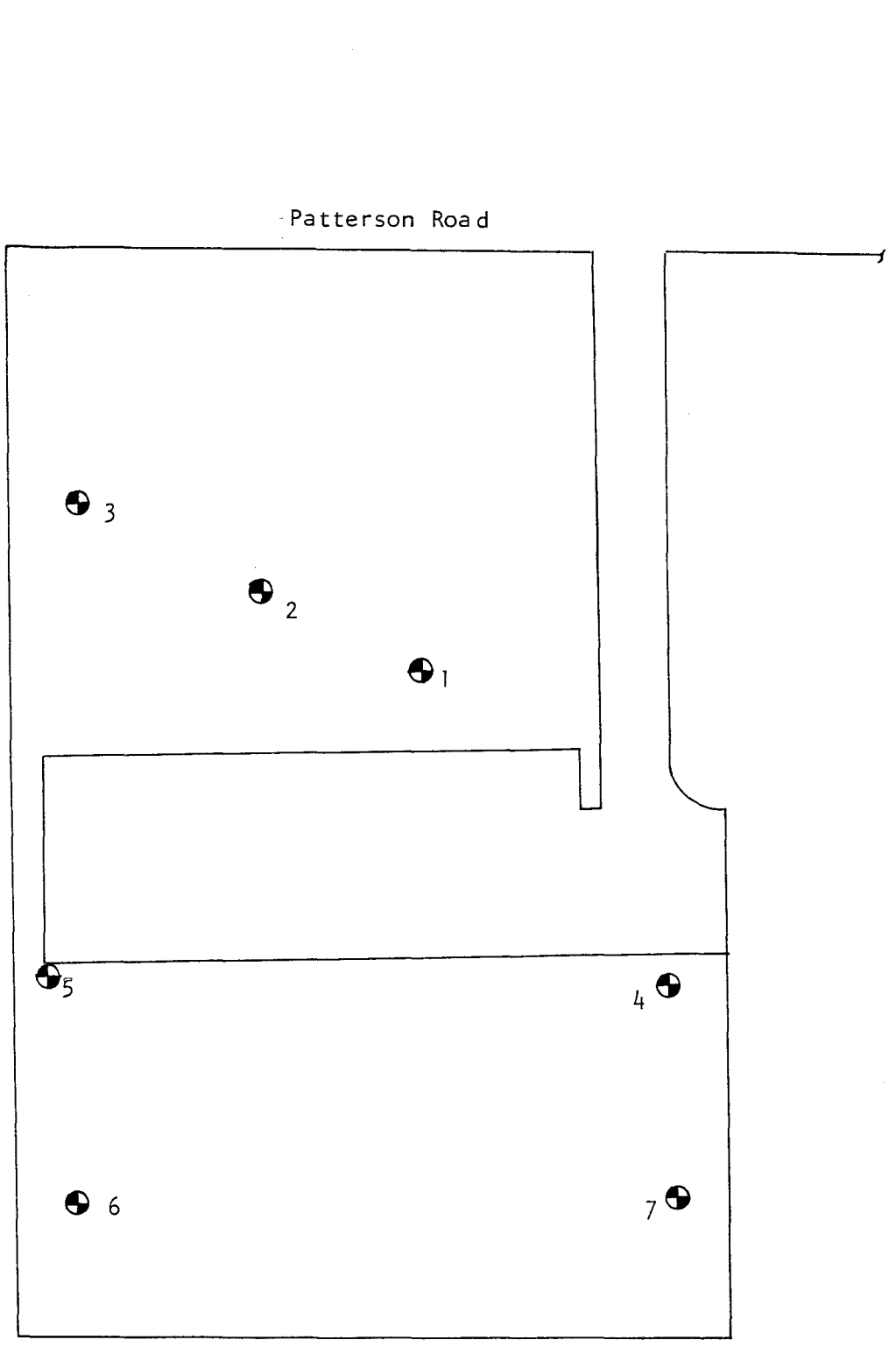


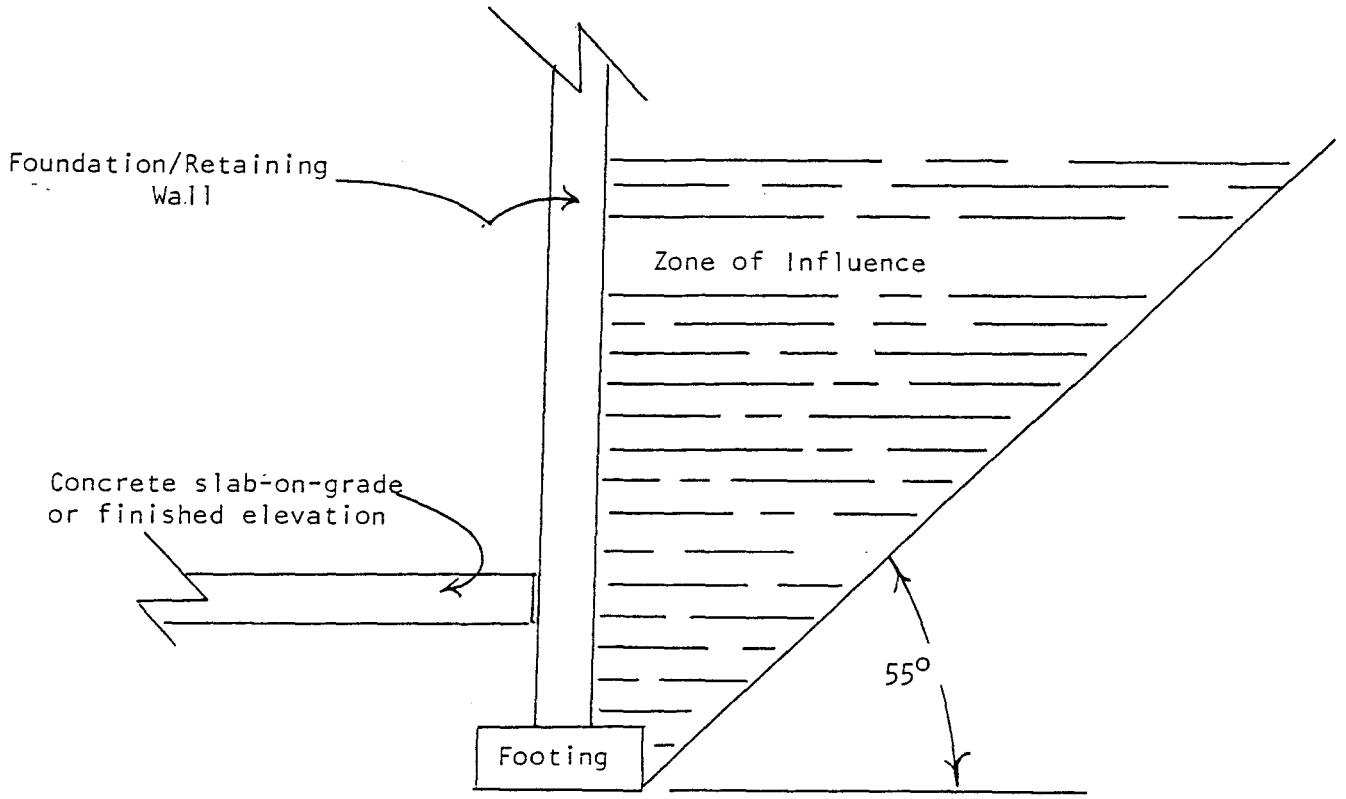
7 Indicates approximate test boring locations

This sketch was reproduced from a sketch provided by Heritage Homes and is intended to present geotechnical data only

TEST BORING LOCATION SKETCH

Lambert and Associates

Project No.:	M92059GE
Date:	4/27/92
Figure:	2



BACKFILL ZONE OF INFLUENCE CONCEPT

Lambert and Associates

Project No.:	M92059GE
Date:	4/27/92
Figure:	4

APPENDIX A

The field study was performed on April 10, 1992. The field study consisted of logging and sampling the soils encountered in seven (7) test borings. The approximate locations of the test borings are shown on Figure 2. The log of the soils encountered in the test borings are presented on Figures A2 through A8.

The test borings were logged by Lambert and Associates and samples of significant soil types were obtained. The samples were obtained from the test boring using a Modified California Barrel sampler and bulk disturbed samples were obtained. Penetration blow counts were determined using a 140 pound hammer free falling 30 inches. The blow counts are presented on the logs of the test borings such as 50/5 where 50 blows with the hammer were required to drive the sampler 5 inches.

The engineering field description and major soil classification are based on our interpretation of the materials encountered and are prepared according to the Unified Soil Classification System, ASTM D2488. Since the description and classification which appear on the test boring log is intended to be that which most accurately describes a given interval of the test borings (frequently an interval of several feet) discrepancies do occur in the Unified Soil Classification System nomenclature between that interval and a particular sample in the interval. For

example, an interval on the test boring log may be identified as a silty sand (SM) while one sample taken within the interval may have individually been identified as a sandy silt (ML). This discrepancy is frequently allowed to remain to emphasize the occurrence of local textural variations in the interval.

The stratification lines presented on the logs are intended to present our interpretation of the subsurface conditions encountered in the test borings. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF TEST BORING

Date Drilled 4/10/92 **Field Engineer** Johnston **Boring Number** 1

Location See test boring location sketch **Elevation** _____

Diameter 4 inches **Total Depth** 15 feet **Water Table** None encountered

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Clay,silty,stiff,slightly moist,brown (CL)	
		Bulk		Formational material,silty,clay shale hard,gray to black,Mancos formation	
		C	50/6		Swell Consolidation Test: MC: 11.8% DD: 118.0 pcf
	5		50/6		Direct Shear Strength Test: MC: 13.0% DD: 114.0 pcf
	10				
	15			Bottom of test boring 1 at 15 feet	
	20				
	25				

Project Name The Falls Elderly Housing **Project Number** M92059GE **Figure** A2

Lambert and Associates

CONSULTING GEOTECHNICAL ENGINEERS AND MATERIAL TESTING

LOG OF TEST BORING

Date Drilled 4/10/92 **Field Engineer** Johnston **Boring Number** 3

Location See test boring location sketch **Elevation** _____

Diameter 4 feet **Total Depth** 15 feet **Water Table** None encountered

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Clay,silty,stiff,slightly moist, brown (CL)	
	5	C	40/6	Formational material,silty,clay shale, hard,gray to black,Mancos formation	
	10				
	15			Bottom of test boring 3 at 15 feet	
	20				
	25				

Project Name The Falls Elderly Housing **Project Number** M92059GE **Figure** A4

Lambert and Associates

CONSULTING GEOTECHNICAL ENGINEERS AND MATERIAL TESTING

LOG OF TEST BORING

Date Drilled 4/10/92 **Field Engineer** Johnston **Boring Number** 5

Location See test boring location sketch **Elevation** _____

Diameter 4 inches **Total Depth** 15 feet **Water Table** None encountered

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Clay,silty,stiff,slightly moist,brown (CL)	
		C	50/6	Formational material,silty,clay shale, hard,gray to black,Mancos formation	
	5				
	10				
	15			Bottom of test boring 5 at 15 feet	
	20				
	25				

Project Name The Falls Elderly Housing **Project Number** M92059GE **Figure** A6

Lambert and Associates

CONSULTING GEOTECHNICAL ENGINEERS AND MATERIAL TESTING

LOG OF TEST BORING

Date Drilled 4/10/92 **Field Engineer** Johnston **Boring Number** 6

Location See test boring location sketch **Elevation** _____

Diameter 4 inches **Total Depth** 10 feet **Water Table** None encountered

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Clay,silty,medium stiff,slightly moist,brown (CL) possible man-placed fill	
	5	Bulk C	50/5	Formational material,silty,clay shale hard,gray,Mancos formation	Swell Consolidation Test: MC: 6.6% DD: 108.0 pcf
	10			Bottom of test boring 6 at 10 feet	
	15				
	20				
	25				

Project Name The Falls Elderly Housing **Project Number** M92059GE **Figure** A7

Lambert and Associates

CONSULTING GEOTECHNICAL ENGINEERS AND MATERIAL TESTING

LOG OF TEST BORING

Date Drilled 4/10/92 **Field Engineer** Johnston **Boring Number** 7

Location See test boring location sketch **Elevation** _____

Diameter 4 inches **Total Depth** 15 feet **Water Table** None encountered

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Clay,silty,medium stiff,slightly moist,brown (CL)	
				Formational material,silty,clay shale, weathered to firm	
	5				
	10			Hard at 12 feet	
	15			Bottom of test boring 7 at 15 feet	
	20				
	25				

Project Name The Falls Elderly Housing **Project Number** M92059GE **Figure** A8

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CONSULTING GEOTECHNICAL ENGINEERS AND MATERIAL TESTING

APPENDIX B

The laboratory study consisted of performing:

. Moisture content and dry density tests,
. Swell-consolidation tests,
. Direct Shear Strength tests, and
. Chemical tests.

It should be noted that samples obtained using a drive type sleeve sampler may experience some disturbance during the sampling operations. The test results obtained using these samples are used only as indicators of the in situ soil characteristics.

TESTING

Moisture Content and Dry Density

Moisture content and dry density were determined for each sample tested of the samples obtained. The moisture content was determined according to ASTM Test Method D2216 by obtaining the moisture sample from the drive sleeve. The dry density of the sample was determined by using the wet weight of the entire sample tested. The results of the moisture and dry density determinations are presented on the log of test borings, Figures A2 through A8.

Swell Tests

Loaded swell tests were performed on drive samples obtained during the field study. These tests are performed in general accordance with ASTM Test Method D2435 to the extent that the same equipment and sample dimensions used for consolidation testing are used for the determination of expansion. A sample is subjected to static surcharge, water is introduced to produce saturation, and

volume change is measured as in ASTM Test Method D2435. Results are reported as percent change in sample height.

Consolidation Tests

One dimensional consolidation properties of drive samples were evaluated according to the provisions of ASTM Test Method D2435. Water was added in all cases during the test. Exclusive of special readings during consolidation rate tests, readings during an increment of load were taken regularly until the change in sample height was less than 0.001 inch over a two hour period. The results of the swell-consolidation load test are summarized on Figures B1 and B2, swell-consolidation tests.

It should be noted that the graphic presentation of consolidation data is a presentation of volume change with change in axial load. As a result, both expansion and consolidation can be illustrated.

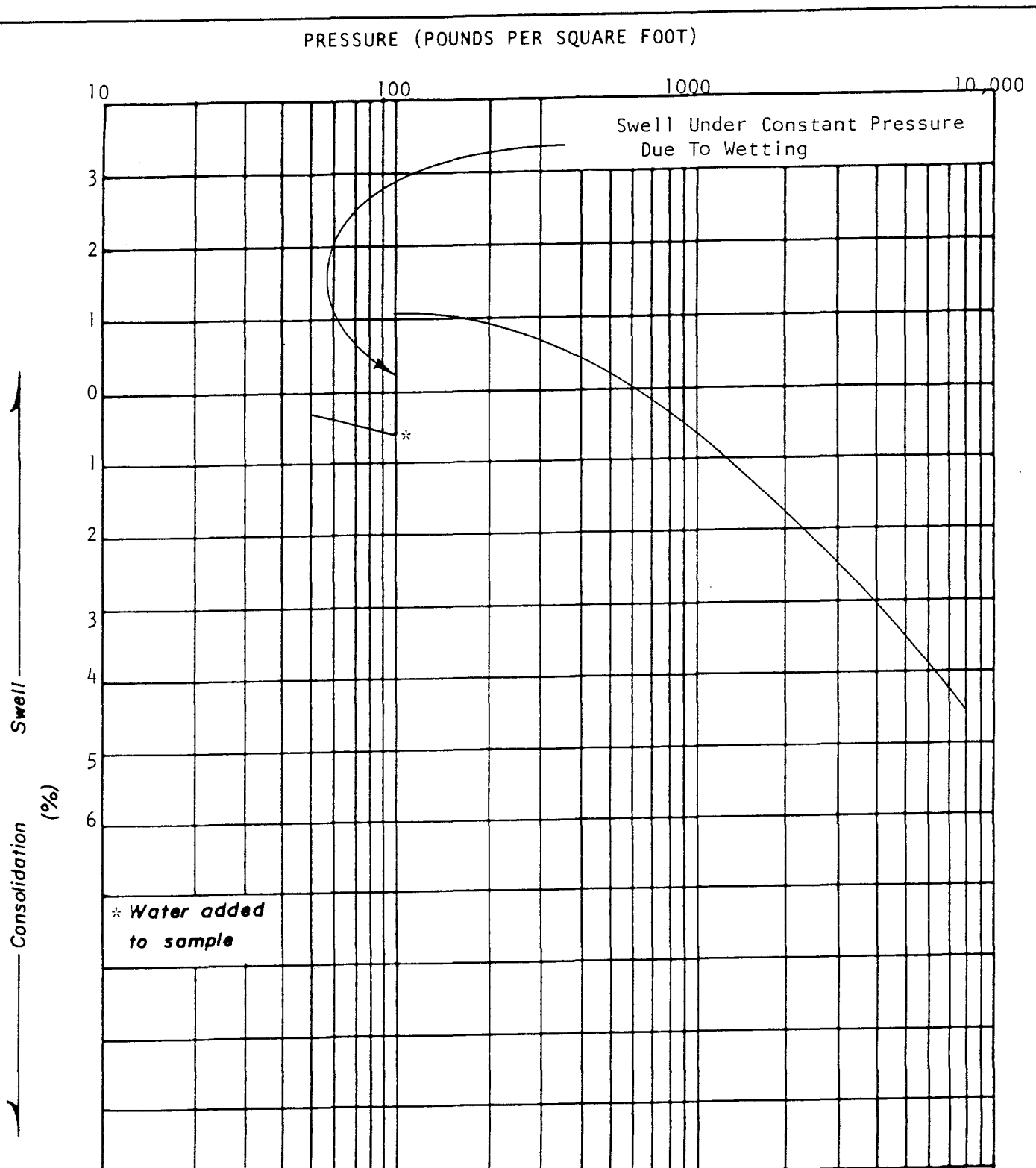
Direct Shear Strength Tests

Direct shear strength properties of sleeve samples were evaluated in general accordance with testing procedures defined by ASTM Test Method D3080. The direct shear strength test was performed on a sample obtained from the test borings. Based on the results of the direct shear strength tests an internal angle of friction of 25 degrees and a cohesion of 750 pounds per square foot were used for the soils in our analysis.

Chemical Tests

Chemical tests for water soluble sulfates, pH, and total dissolved salts were performed by Grand Junction Laboratories on select samples obtained during the field study. The results of the chemical tests are tabulated below.

Test Boring	1	6
Depth	1 to 4 feet	4 feet
pH	8.2	7.9
Total Dissolved Salts	0.944%	0.983%
Water soluble sulfates	0.732%	0.825%



Boring No. 6	SUMMARY OF TEST RESULTS				
Depth 4 feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	6.6	108.0	1.0	1.94	1600 ±
Final					
Soil Description	Formational material, shale, dark brown-black				

SWELL - CONSOLIDATION TEST

Lambert and Associates

Project No.: M92059GE

Date: 4/27/92

Figure: B2

REVIEW COMMENTS

(Page 1 of 9)

FILE NO. #23-92 **TITLE HEADING:** Heritage Home at the Falls

ACTIVITY: Heritage Elder Care Home at the Falls
ODP & Final Plat & Plan. ODP to transfer density for the undeveloped Falls Subdivision. Final Plat for 1 lot subdivision and Final Plan for Senior Housing and Elderly Care Facility

LOCATION: 2835 Patterson Road

PHASE: ODP & Final **ACRES:** Appx 2

PETITIONER: Heritage Elder Care, A General Partnership

PETITIONER'S ADDRESS/TELEPHONE: 2955 F Road
243-7224

PROJECT ENGINEER/REPRESENTATIVE: Wm A Thrig and/or Harley T Jackson

STAFF REPRESENTATIVE: Dave Thornton

NOTE: WRITTEN RESPONSE BY THE PETITIONER TO THE REVIEW COMMENTS IS REQUIRED ON OR BEFORE 5:00 P.M., May 29, 1992.

CITY FIRE DEPARTMENT 05/08/92
George Bennett 244-1400

North Unit: The fire hydrant placement is acceptable. Access to the south side of the 27 unit building is not acceptable. The fire hydrant to the S/W corner of the 27 unit building has no access provided; therefore, a sprinkler system is required. A review of the sprinkler system calc's and plans and a review of the fire alarm system plans is required. Please contact our office with any problems or concerns.

Access to the fire hydrant located at the S/W corner at the property appears to be a problem. Please contact our office to discuss this.

COUNTY ENGINEER 05/13/92
Joseph J. Bielman 244-1689

No comments or objections.

US WEST 05/08/92
Leon Peach 244-4964

No comments at this time.

CITY PARKS/RECREATION DEPARTMENT 5/8/92
Don Hobbs 244-1542

I need a clarification as to how this project is classified as outlined in 5-4-6-B3. If fees are required, an appraisal will be needed.

CITY PROPERTY AGENT 05/12/92
Tim Woodmansee 244-1565

The distance of 329.84 along the westerly boundary line appears to be in error by 70 feet.

CITY POLICE DEPARTMENT 05/14/92
Marty Currie 244-3563

No police problems noted.

As a general question: Is it appropriate to have an "elderly care home" next to a fire station? Won't the noise from the fire trucks disrupt the care center tenants? It seems like we might be entering into a noise conflict.

PUBLIC SERVICE CO 05/13/92
Dale Clawson 244-2695

If junipers are planted in utility easement, they will be destroyed if utilities need to work in easement.

CITY UTILITIES ENGINEER 05/15/92
Bill Cheney 244-1590

Easements

1. A 25' utility easement is required across the south portion of the property adjacent to the south property line. The easement is for the purpose of extending the water line at a later date.

2. A 15' utility easement is required across the center of the property to accommodate the water line and hydrant.

2. Do not use an incremented time between zero and T_c. Doing so with an associated "I" value from the curve is contrary to rational method procedures, and will result in excessive required detention volume.

3. The time is seconds volume is the product of 60 and the time difference in minutes from the line above and below, ie. the numbers are incremental not accumulative.

4. A T_c value less than 5 minutes was used for Basins "B" and "C". Use 5 minutes as a minimum extrapolation of data curves will increase error - towards higher runoff rates!

5. Detention calculations are not provided for Basin "B", and are not possible for the current design of Basin "C". Reference is made to comment 1-c.

6. Drainage reports must be sealed and signed.

Site (& Grading) Plan

1. Label the 10' utility easement.

2. Provide a maintenance agreement for the detention facility.

3. Provide an improvements agreement for the surface improvements within the R.O.W.

4. Provide documentation of the off-site easement to be used for drainage at the southwest corner of the site.

5. Label and identify the riprap size, depth, etc.

6. Slope in grass swales must be at least 1.0%. From the south parking lot, the contours shown do not provide 1% minimum, and the outlet pipe invert should be no higher than elevation 36.4.

7. The minimum slope on the detention basins should be 1.0% slope, which would require some adjustment to contours in Detention Basin "A".

8. The bleedoff culvert is noted as having an orifice? (of unknown size - calculated by the contractor?) to restrict flow to 1.5 cfs. Per the drainage calculations, 1.47 cfs maximum is allowed in the 10 year storm event to be released from the entire site, not just Basin A (see comments on the Drainage Report). What is the ponding depth in the 10-year event in the basin, which determines the orifice outflow? This must be designed.

9. Per current design, the 8" bleedoff pipe outflows into the air 1.0 foot above the sidewalk. Application of calculations in the design effort at all critical points would help prevent this kind of error. Also, outletting an 8" pipe immediately into or 5" high drain trough under the sidewalk is not acceptable. The pipe should outlet several feet in back of the sidewalk with a concrete transitional trough, or designed in some other way to prevent overflow onto the sidewalk. The outlet invert should be provided on the pipe.

10. A profile is required showing the curb flowline to pipe invert, with invert elevation grades provided at the beginning and ending of each segment type of facility (ie. scupper, drain trough, transitional trough, and pipe).

11. The scupper width and height is not identified.

12. The under sidewalk drain trough has a plate, not a grate cover.

13. As previously commented on, existing and proposed facilities are all shown in solid light-weight lines, with no call-outs. The distribution must be made.

14. The existing curb, gutter, and sidewalk is not shown where the proposed drive entrance is. This should either be shown and noted for removal, or a note should identify that it exists, must be removed, and is not shown for clarity.

15. Flowline elevations are required on the drive entrance at both the front and back of walk locations on both sides of the drive.

16. The curb return radius to flowline must be called out.

17. The driveway must be tied to the property line. Provide dimensions on data.

18. The handicap ramps should be called out or placed in the legend.

19. The hydrology information provided on the plan does not match the drainage calculations.

20. The note about 4:1 side slope is only on one side of the swale. What about the other side? Also, the swale thalweg denoted by the 1% arrow does not correspond to the contours.

21. The buildings and/or parking lots are not adequately tied to property lines.

22. Submitted plans must be sealed and signed by a registered engineer. Future submittals without such will not be reviewed, but will be rejected.

UTE WATER **05/18/92**
Gary Mathews **242-7491**

This project was originally reviewed and approved as "Cascade Condominiums and Health Club - City File No. 71-81" with the Ute District as the water purveyor.

Services will be provided by Ute in much the same way as described in review comments dated 7-10-81, subject to appropriate regulations adopted subsequently.

Policies and fees in effect at the time of application will apply.

COMMUNITY DEVELOPMENT DEPARTMENT **05/19&20/92**
David Thornton

1. Open Space fees will be calculated by charging $225.00 per unit for 27 congregate units plus 2.5% of the fair market value of the unimproved land associated with the 15 bedroom personal care facility. An appraisal is required for the unimproved land associated with the 15 bedroom care facility. All open space fees must be paid prior to recording the Final Plat and issuance of the building permit.

2. The landscaping plan must be more detailed. The plan needs to show proposed and existing landscaping features and they are to be identified as to location, common name, botanical name, existing size or proposed size at planting. We would recommend that the plan incorporate similar landscaping features the Fire Station to the west of this site is currently doing. The xeriscape planting area needs to be detailed as to what plant materials. Also, the west side of the 27 congregate units should have landscaped screening or screening of some type.

3. Through the Outline Development Plan (ODP) of the Falls Planned Development a "Designed Density" shift is required to accommodate this proposal. In determining the total density of Heritage Homes, the 15 Bedroom care Facility's density is determined by assigning 2.5 bedrooms to be equivalent to 1 residential unit. Therefore the 15 bedroom facility has a density of 6 units. The 27 congregate units have a density of 27 units. Therefore, total density for the project is 33 units on 1.93 acres. This computes to 17.1 units per acre.

The density currently assigned to this parcel is 9.5 units per acre. This computes to a total of 18.3 units for the parcel. (33 - 18.3 = 14.7). Through the ODP "design density" shift, 14.7 total units are required to be shifted from the remainder of the Falls Development to the proposed Heritage Homes project. This increases the density by 7.6 units per acre to a total of 17.1 units per acre for the Heritage Homes project. The remainder of the Falls Planned Development will be decreased by 14.7 units total.

Please submit a new copy of the ODP showing the above calculations transferring the density.

MEMORANDUM

To: Randy Booth, Comptroller
From: Dave Thornton, Planner
Subject: Release of Improvements Guarantee for Heritage Homes
Date: May 14, 1993

Heritage Elder Care is requesting that the City release $21,850.00 from their Improvements Guarantee cash escrow account with the City for their development located at 2835 Patterson Road. Gerald Williams, Development Engineer and I have inspected the site and found it acceptable to release the above amount. The remaining money will stay in their account to cover the future cost of improvements associated with phase II of this development. They anticipate construction of phase II within the next 12 months.

Please make the check out to Harley T. Jackson and someone from Heritage Elder Care will be by to pick it up next Friday.

Late Comments

WestWater Engineering

Consulting Engineers

502 WEST EIGHTH ST. P.O. BOX 1470 · PALISADE, COLORADO 81526 (303) 464-5134

May 21, 19912

Bill Irigh
Heritage Elder Care
2955 F Road
Grand Junction, CO 81504

RE: Review Comments for the Central Grand Valley Sanitation District on the Heritage Homes - The Falls

Dear Mr. Irigh,

The Central Grand Valley Sanitation District has reviewed the proposed sewer service to the Heritage Homes at The Falls and has the following comments:

1. Separate service lines will be required for each building structure. As proposed, the 6 inch service line would provide service to both the 27 units in phase 1 and the 15 units in phase 2. The sewer service presently proposed for phase 2 would also be located underneath the phase 1 structure. Providing service to phase 2 in this manner does not meet the Uniform Plumbing Code. A second service from the Fire Station sewer main will need to be extended along the easterly or westerly edge of the property outside the limits of the phase 1 structure.

2. All of the service lines shall meet the sizing and construction requirements of the Uniform Plumbing Code.

3. The District maintenance responsibilities end at the sewer main. It will be the responsibility of the owner to maintain the sewer service laterals to each building structure.

4. All taps on the sewer main will be accomplished by District personnel.

5. Because of the realignment of the Fire Station sewer main, an additional easement is to be provided along the south property line to provide a total easement width of 10 feet from the new sewer main centerline.

6. Tap fees will be based upon the present City of Grand Junction EQU rate structure.

7. The following minimum drafting standards apply for all District submittals:

   a. All existing sewer lines should be shown with a dashed line and existing manholes with an open circle.

   b. The actual alignment for the new Fire Station sewer main and manholes should be shown on the utility plan.

   c. All District submittals shall be on 24x36 inch sheets.

Please revise the utility plan and plat to address the aforementioned comments and resubmit to us for the Board's approval at their June 9th regular meeting.

Respectfully,

Stephen T. LaBonde
District Engineer

STL/sc

cc: Community Development Dept., City of Grand Junction
Bill Cheney, City of Grand Junction
Gerald Williams, City of Grand Junction
Edith Kinder, Central Grand Valley Sanit. Dist.
Fred Bishop, Bishop Construction Co.

File
#23-92

City of Grand Junction
Community Development Department

Subject: Response to the Review Comments on Heritage Homes at The Falls.

Fire Department: As per discussions with the Fire Department, the fire hydrant on the southwest corner will not be installed. A dry standpipe system and sprinkler system will be installed in the 27 units with the approval of the Fire Department.

City Parks and Recreation Department: The appraisal is presently being done by a certified Appraiser.

Police Department: The noise factor created by the Fire Department should be no greater than the fire trucks and ambulances noise along Patterson Road.

City Property Agent: The distance of 329.84 feet is the distance along HEC and the Fire Departments common boundary.
HEC property line extends 20 feet to the south. Patterson Road takes an additional 50 feet to the north to the center of the street.

City Utilities Engineer:
1. The easement has been changed on the final plat and utility plan.
2. The same as above.
3. The same as above.

Water:
1. Agreed.
2. Shown on revised utility plan.
3. Taken care of in Fire Departments response.
4. Shown on revised utility plan.
5. Shown on revised utility plan.
6. Complied with in revised utility plan.

City Development Engineer: See attachment.
Comments are by our Registered Professional Engineer with the exception of Site and Grading Plan comments are by the owners.

Transportation Engineer:
1. Shown on the revised site plan.
2. Will be complied with.
3. Will comply with the wishes of the consenses of Departments of authority.
4. Agreed.
5. Will be provided when final removal area is determined.
6. Shown on final site plan.

Review Sheet Comments Responses

City Development Engineer - Gerald Williams

Drainage Report

1. a. See revised Drainage Calculations - attached
   b. Same
   c. Being revised
2. Substituted SCS hydrograph
3. Stupid error
4. Accepted
5. See revised Drainage Calculations (attached)
6. Noted

Site (& Grading) Plan We may use on site detention

1. Accomplished on Utility Plan
2. Owner will be completed if nessary
3. Owner may not be nessary
4. Owner may not be nessary
5. Done
6. Held in abeyance - subject to additional percolation tests
7. Same as 6. above
8. Same as 6. above
9. Same as 6.
10. Same as 6.
11. Same as 6.
12. Noted

HERITAGE HOMES

5-26-92

REVISED DRAINAGE CALCULATIONS & RESPONSE TO REVIEW SHEET COMMENTS

FROM ORIGINAL DRAINAGE REPORT

Q_{10} HISTORIC = 1.97 cfs (USE 1.9)

Q_{10} DEVELOPED = 3.2 cfs

Q_{100} DEVELOPED = 4.7 cfs

FROM DRIVEWAY BASIN (NO DETENTION AVAILABLE)

Q_{10} DEVELOPED = 0.50 cfs

Q_{10} BASIN A = 1.9 cfs

Q_{10} BASIN C = 1.3 cfs

(PRORATED VIA RELATIVE % OF PERVIOUS & IMPERVIOUS AREAS)

ROBERT S. COBURN REGISTERED PROFESSIONAL ENGINEER STATE OF COLORADO

10YR

DETENTION REQ'D FOR 1.7 cfs

DETENTION VOL. CALCULATED VIA SCS HYDROGRAPH

VOL. DETENTION REQ'D = 1400 ft³ (APPENDIX)

DETENTION POND A = 1200 ft³ (APPENDIX)

DETENTION POND C = 222 ft³

ADDITIONAL SUBSURFACE DRAIN (PERCOLATION) TESTS ARE BEING CONDUCTED TO DETERMINE BLEED-OFF REQUIREMENTS & BLEED OFF SYSTEMS WILL BE REDESIGNED WHEN TEST RESULTS ARE AVAILABLE.

APPENDIX (cont.)

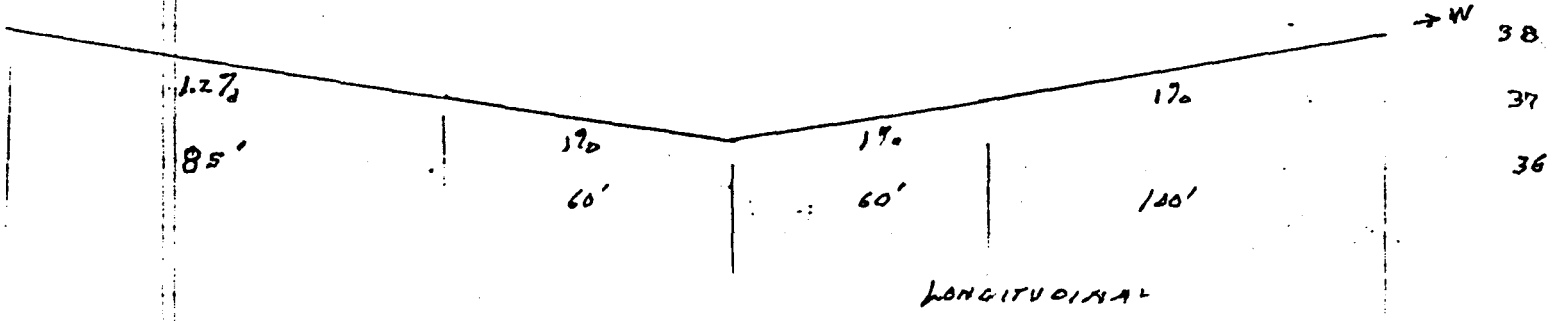
$(8 \times 80) + (10 \times 160) = 640 + 1600$

$= 2240 / 240 = 9.3$

70'

VOLUME CALCULATIONS

BASIN A DETENTION



AVERAGE DEPTH = 0.8'

AVERAGE WIDTH = 8' FOR 80'
10' FOR 160'
} 9.3'

AVERAGE LENGTH = $(180 + 145)/2 = 160'$

VOL = $0.8 \times 9.3 \times 160 = 1190$ FT^3 DETENTION A

DETENTION BASIN B

AVERAGE LENGTH = $178'/2 = 89'$

AVERAGE WIDTH = $10/2 = 5'$

AVERAGE DEPTH = $1/2 = 0.5'$

VOL. = $0.5 \times 5 \times 89 = 222$ FT^3 DETENTION B

DETENTION AVAILABLE = $1190 + 222 = 1400$ FT^3

DETENTION REQD = 1400 FT^3

REVIEW COMMENTS ON THE
RESPONSE TO CITY REVIEW COMMENTS
FOR
HERITAGE HOMES - THE FALLS

June 2, 1992

Drainage Report

1. Runoff rates are provided without supporting calculations.

2. Calculated detention volume for Basin "A" assumes, as before, that the bleed-off rate is 1.5 cfs. We pointed out before that this was inappropriate, even if possible and still be able to meet other criteria. However, the value is still used, with no calculations to support it, nor indication as to how one sub-basin may be justified in releasing runoff at the full site historic rate.

3. The report and review comments allude to the possibility of using retention and soil percolation in lieu of the bleed-off pipe as per the plans and detention calculations. There should not be a discrepancy, and the method of discharge should be resolved prior to final plan submittal.

4. Basin "B" is rectangular and flat enough that average width times average length times average depth will result in an adequately close approximation of volume available, but the values used were inappropriate, which resulted in less retention volume calculated than is actually available. Even so, volume in excess of the contributing runoff is of minimal value, and may not be used in addition to detention volume provided elsewhere to meet the overall site detention requirements. Runoff from each sub-basin must be determined and applied to the applicable detention/retention facility individually. In other words, each sub-basin stands alone except for the fact that the composite bleed-off and direct runoff from the site may not exceed historic total site runoff. This has been explained before.

5. Basin "A" detention calculations are also incorrect. An easier and more correct way to analyze detention volume is by use of the conic method equation, or

$$V = h/3\ [A_1 + A_2 + (A_1A_2)^{.5}]$$

where: V = volume, ft^3;

h = height between area A_1 and area A_2, ft;

A_1 = Area of the bottom, such as the small area around the outlet (or contour 28 in Basin "B", as an example), in ft^2; and

4. Documentation of the off-site easement to be used for drainage was requested. The response was that this may not be necessary. Per the current plans submitted for final review, it is necessary, as was indicated by our previous comment.

5. Okay.

6-11. The response comments indicate that issues raised in our comments 6, 7, 8, 9, 10, and 11 are all "held in abeyance - subject to additional percolation tests." These are significant issues relating to how the development will be able to meet drainage criteria. If the plan for addressing these basic concerns are held in abeyance, then this final submittal as well should be held in abeyance until a course of action is resolved upon.

12. The scupper from the sidewalk to street still does not have dimensions provided.

13. The existing sidewalk, curb, and gutter remain shown by solid lines as are proposed facilities, and are not denoted as existing. (The only exception is in the new driveway, which is in response to comment 14.) The response comment indicates that the correction will be accomplished, but it is not.

14. Okay.

15. Okay.

16. Okay.

17. Okay.

18. Okay.

19. Okay.

20. Channel side slopes are still only shown on one side. Channel conveyance capacity has still not been addressed in the drainage report.

21. Okay.

22. Okay

STATE OF COLORADO

ROY R. ROMER
GOVERNOR

JOHN W. ROLD
DIRECTOR

COLORADO GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES
715 STATE CENTENNIAL BUILDING — 1313 SHERMAN STREET
DENVER, COLORADO 80203 PHONE (303) 866-2611

June 5, 1992 MA-92-0026

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

Re: Proposed Heritage Home at "The Falls",
2835 Patterson Avenue, Grand Junction

Gentlemen:

At your request, we have reviewed the materials submitted for and made a field inspection on May 26, 1992, of the site of the proposed elder-care home referenced above. The following comments summmarize our findings.

Our most serious geology-related concern about construction of this facility is that the shale bedrock and its derived materials on this site are highly expansive. Consequently, we recommend that the proponent have his architect collaborate with a qualified soils and foundation engineer to ensure that the foundation for the facility is adequately engineered. The foundation should be designed after a detailed soils and foundation investigation is completed. The soils and foundation engineer should design the foundation and supervise its construction. Special care should be tasken to ensure that drainage in the immediate vicinity of the building(s) is adequately controlled to minimize the possibility of foundation damage and/or excessive maintenance for the building(s) and appurtenances.

The proposed parking area at the rear of the parcel should be graded in such a manner that runoff from it is not directed to the street, the existing townhouses, and proposed or existing single-family houses south of the subject parcel.

If these recommendations and those made in the submitted Barnes report are followed and made a condition of approval of this proposal, then we have no geology-related objection to it.

Sincerely,

James M. Soule

James M. Soule
Engineering Geologist

CITY OF GRAND JUNCTION DEVELOPMENT FILE 23-92, HERITAGE HOMES ELDER CARE FACILITY, LOCATED AT 2835 PATTERSON ROAD IN THE CITY OF GRAND JUNCTION HAS BEEN REVIEWED AND APPROVED BY THE UTILITY COORDINATING COMMITTEE.

John L Ballagh
CHAIRMAN

June 10, 1992
DATE

COMMUNITY DEVELOPMENT DEPARTMENT STAFF REPORT

File # 23-92

PROPOSAL

Heritage Homes Final Plan & Plat & ODP "Design Density" Shift

Request is for two facilities on 1.93 acres: one 27 unit congregate Elderly care facility and one 15 bedroom Elderly care facility.

Location: 2835 Patterson Road

Formerly this site was approved in 1981 for Cascade Condominiums & Health Club, but was reverted in 1984. Currently this site is zoned Planned Residential (9.5 units per acre) but has no plan.

1. **Total Open Space Fees required is $6,405.75.** These fees are calculated by charging $225.00 per unit for 27 congregate units plus 2.5% of the fair market value of the unimproved land associated with the 15 bedroom personal care facility. The appraisal reports the Raw land value at $13,230. 2,5% of 13,230 = $330.75. **All open space fees must be paid prior to recording the Final Plat and issuance of the building permit.**

2. The landscaping plan dated May 26, 1992 meets staff approval and conforms to the intent of the code.

3. Through the Outline Development Plan (ODP) of the Falls Planned Development a "Designed Density" shift is required to accommodate this proposal. In determining the total density of Heritage Homes, the 15 Bedroom care Facility's density is determined by assigning 2.5 bedrooms to be equivalent to 1 residential unit. Therefore the 15 bedroom facility has a density of 6 units. The 27 congregate units have a density of 27 units. Therefore, total density for the project is 33 units on 1.93 acres. This computes to 17.1 units per acre.

The density currently assigned to this parcel is 9.5 units per acre. This computes to a total of 18.3 units for the parcel. (33 - 18.3 = 14.7). Through the ODP "design density" shift, 14.7 total units are required to be shifted from the remainder of the Falls Development to the proposed Heritage Homes project. This increases the density by 7.6 units per acre to a total of 17.1 units per acre for the Heritage Homes project. The remainder of the Falls Planned Development will be decreased by 14.7 units total.

4. The number of Parking Spaces is adequate. 41 spaces are proposed and a total of 17 (1/2 space per unit) plus employee parking is required.

5. All Review Agencies have been Address except the Development Engineers concern on GRADING & DRAINAGE

SURROUNDING LAND USE AND ZONING

The surrounding landuses are the Firestation to the West (zoned PZ), to the East and South is the "Falls" residential development (zoned PR-8)

CORRIDOR GUIDELINES - PATTERSON ROAD

The Patterson Road Corridor Guidelines encourage residential development along the stretch of the corridor from 15th Street to 30 Road. The guidelines recommend that development should be done in a planned development context to help ensure good site planning. The corridor guidelines also recommend that adequate walkways be provided along Patterson Road and that curb cuts and access points on Patterson Road should be limited and consolidated for shared access between developments.

CRITERIA - (rezone, special use, conditional use, vacation, etc.)

A rezone is not required, although a density shift must occur from the "Falls" outline development plan (ODP) to allow this proposal.

RECOMMENDATIONS

Book 1918
Page 632

CITY OF GRAND JUNCTION
COMMUNITY DEVELOPMENT DEPARTMENT

SUBJECT: DENSITY TRANSFER - THE FALLS

I, JOHN A. SIEGFRIED, (transferor), represent and warrant that I am the sole and complete owner and developer of certain parcels and lots of THE FALLS. I hereby agree to transfer, for consideration received, the following densities to LOT ONE (1.93 acres), a part of THE FALLS, now owned by HERITAGE ELDER CARE. LOT ONE is now known as HERITAGE HOMES at THE FALLS.

The densities which are being transferred to HERITAGE HOMES at THE FALLS are:

Six units, as that term is defined herein and in accordance with the Zoning and Development Code for the City of Grand Junction, from LOTS 12 and 14, THE FALLS - FILING NO. THREE, as recorded in Plat Book 13 at Page 122 of the Mesa County Clerk and Recorders Office.

Nine units, as that term is defined herein and in accordance with the Zoning and Development Code for the City of Grand Junction, from PARCEL III, which is described as:

A tract of land in the NE 1/4 NW 1/4, Section 7, Township 1 South, Range 1 East, Ute Meridian, more particularly described as:

Commencing at the Southwest Corner of Lot 15, Block 2, THE FALLS - FILING NO. THREE, thence South 02°07'42" East along the Easterly right of way of 28 1/4 Road 56.98 feet to the True Point of Beginning, thence along the Southerly boundary of Grand Falls Drive the following 5 courses and distances:

(1) North 72°44'46" East 56.89 feet,
(2) along the arc of a curve to the right having a radius of 350.29 feet and a central angle of 17°05'14" a distance of 104.47 feet,
(3) North 89°50'00" East 195.00 feet,
(4) along the arc of a curve to the left having a radius of 127.50 feet and a central angle of 37°25'00" a distance of 83.26 feet,
(5) North 52°25'00" East 146.05 feet to the Northwest Corner of TRACT K, THE FALLS - FILING NO. TWO,

thence South 23°49'36" East 150.90 feet, thence North 89°50'00" East 22.60 Feet, thence South 19°53'20" East 362.72 feet to the South line of the NE 1/4 NW 1/4 of Section 7, thence South 89°57'00" West along the South line of the NE 1/4 NW 1/4 of Section 7 a distance of 721.52 feet to a point on the Easterly right of way of 28 1/4 Road the

following 2 courses and distances:

(1) North 01°15'14" West 28.62 feet,

(2) along the arc of a curve to the left whose radius is 1184.50 feet and whose long chord bears North 06°49'56" West a distance of 230.33 feet to a point on the West line of the NE 1/4 NW 1/4 of Section 7,

thence along the West line of the NE 1/4 NW 1/4 of Section 7, North 02°07'42" West 73.75 feet more or less to the True Point of Beginning,

A unit means, and is understood by me to mean, a dwelling unit which is defined as "any structure or part thereof designed to be occupied as the living quarters of a single housekeeping unit" and as further defined in the Grand Junction Zoning and Development Code.

I, JOHN A. SIEGFRIED, shall indemnify and save and hold harmless the City of Grand Junction, its employees and its officers, from and against all claims, liabilities, causes of action or other legal proceedings by Heritage Elder Care, its successors in interest, or by third parties, for damages in any way arising out of, connected with, or resulting from the transfer and/or exercise of development density hereunder. Indemnity shall include transferor's obligation to defend any and all actions, claims or other legal proceedings and pay for all expenses including attorney fees incurred in connection therewith.

Signed:

JOHN A. SIEGFRIED

Date July 15 92

Subscribed and sworn to me this 15 day of July, 1992, by John A. Siegfried. Witness my hand and official seal.

Theresa L Martinez

Notary

My commission expires: June 13 1995

FF

ACTION SHEET

ACRES 1.93

UNITS

DENSITY

ODP & FINAL Plat & Plan

FILE NUMBER 23-92

ZONE PR

TAX SCHEDULE # 2943-072-00-027

ACTIVITY ODP to transfer density from the undeveloped Falls Sub.

PHASE Final Plat for 1 lot Sub. & Final Plan for Senior Housing & Elderly Care Facility

COMMON LOCATION S. of F Rd, E. of 28¼ Rd 2835 Patterson Rd

DATE SUBMITTED DATE MAILED OUT DATE POSTED

DAY REVIEW PERIOD RETURN BY

OPEN SPACE DEDICATION (acreage) OPEN SPACE FEE REQUIRED $ PAID RECEIPT # 5002

RECORDING FEE REQUIRED $ PAID (Date) DATE RECORDED

REVIEW AGENCIES

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 } G.V. Water Users
- ● 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) - do not need a cover sheet
- ○ CIC (11 packets)
- ○ Other
- ○
- ○
- ○

25 copies + one office copies

TOTALS

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

September 1, 1992

Mr. William Ihrig
Heritage Elder Care
2955 F Road
Grand Junction, CO 81504

Re: Heritage Home at the Falls

Dear Bill:

The plans for Heritage Home at the Falls have been approved for construction. We now request that the following information be submitted for site work (not buildings) as soon as possible:

(i) Construction schedule;
(ii) List of contractors to be used;
(iii) Testing laboratory that will provide materials and other testing; and
(iv) Name of 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 the above, please call.

Sincerely,

Gerald R Williams

Gerald R. Williams, P.E.
Development Engineer

Attachment

xc: Don Newton, City Engineer
Dave Thornton, Planner
File

Heritage Elder Care

A. Water

(1) Due to the location of the water line at the northwest corner of the property, it will be necessary to provide a 15' utility easement across the north portion of the property for future line extensions. Ten feet does not allow adequate room to construct line to the east.

(2) The water meter location shown at the southwest corner of the property will have to be moved north adjacent to the southwest corner of the parking lot to provide access for the meter readers.

(3) The water line will be buried a minimum depth of 57", not 48" as shown.

(4) No valve shown in north/south line as requested.

B. Sewer - No comment

6-4-92

Bill Cheney, Utility Engineer

Heritage Homes Final Plan & Plat & ODP "Design Density" Shift

File #23-92

Community Development Department Comments:
Dave Thornton, Planner (244-1447)

1. Open Space fees will be calculated by charging $225.00 per unit for 27 congregate units plus 2.5% of the fair market value of the unimproved land associated with the 15 bedroom personal care facility. An appraisal is required for the unimproved land associated with the 15 bedroom care facility. All open space fees must be paid prior to recording the Final Plat and issuance of the building permit.

2. The landscaping plan must be more detailed. The plan needs to show proposed and existing landscaping features and they are to be identified as to location, common name, botanical name, existing size or proposed size at planting. We would recommend that the plan incorporate similar landscaping features the Fire Station to the west of this site is currently doing. The xeriscape planting area needs to be detailed as to what plant materials. Also, the west side of the 27 congregate units should have landscaped screening or screening of some type.

3. Through the Outline Development Plan (ODP) of the Falls Planned Development a "Designed Density" shift is required to accommodate this proposal. In determining the total density of Heritage Homes, the 15 Bedroom care Facility's density is determined by assigning 2.5 bedrooms to be equivalent to 1 residential unit. Therefore the 15 bedroom facility has a density of 6 units. The 27 congregate units have a density of 27 units. Therefore, total density for the project is 33 units on 1.93 acres. This computes to 17.1 units per acre.

The density currently assigned to this parcel is 9.5 units per acre. This computes to a total of 18.3 units for the parcel. (33 - 18.3 = 14.7). Through the ODP "design density" shift, 14.7 total units are required to be shifted from the remainder of the Falls Development to the proposed Heritage Homes project. This increases the density by 7.6 units per acre to a total of 17.1 units per acre for the Heritage Homes project. The remainder of the Falls Planned Development will be decreased by 14.7 units total.

Please submit a new copy of the ODP showing the above calculations transferring the density.

4. The number of Parking Spaces is adequate. 41 spaces are proposed and a total of 17 (1/2 space per unit) plus employee parking is required.

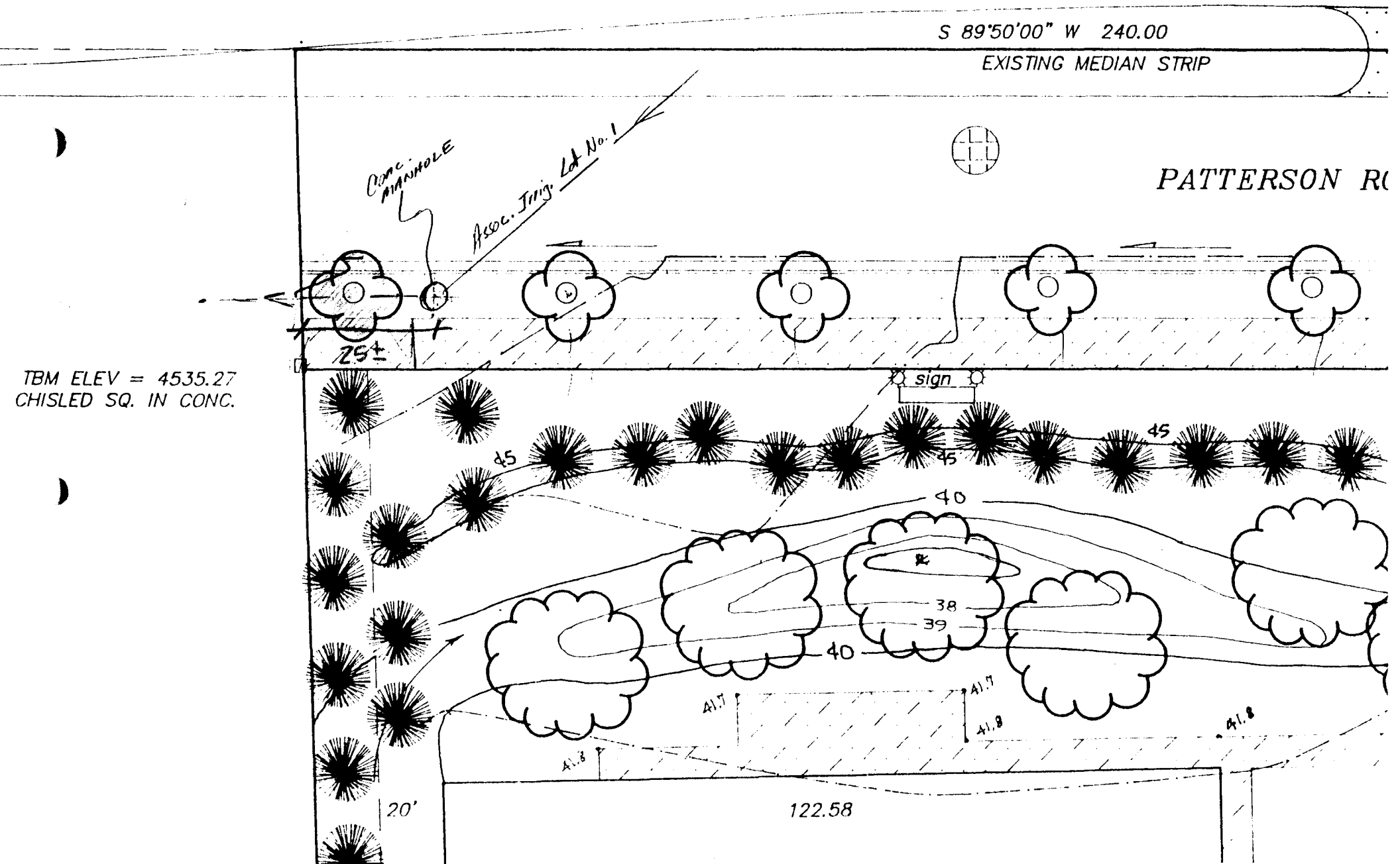
5. On the Final Plat, surveyor needs to show the location of the elevation benchmark. Also, in the dedication there is mention of this subdivision being called "THE FALLS POINTE". Which is it? HERITAGE HOMES - THE FALLS? or THE FALLS POINTE?

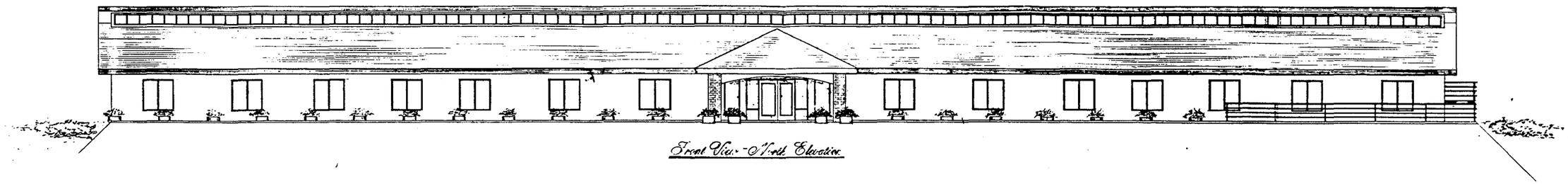
THE FALLS ODP

AREA	FILING NO.	BLOCK	LOT	ACRES	ALLOWED BY ZONING PRB	DENSITIES AT 1-1-92	ODP REVISIONS: REPLAT LOTS 12+14 FILING 3. ROW VACATION 3-3-92 #2-92	ODP REVISIONS: REPLAT PORTION FILING 2 FALLS POINTE 4-7-92 #11-92	ODP REVISIONS: HERITAGE HOMES #23-92	NC = NO CHANGE: DENSITIES AT 7-92 INCLUDING HERITAGE HOMES - THE FALLS
A	2	2	9	1.02	8	12	NC	NC	NC	12 SFA
B	2	4&6	—	5.28	42	19	-5 = 14	-2 = 12	NC	12 SFD
C	—	—	—	6.2	50	87	-62 = 25	NC	-9 = 16	16 SFD/A
D	3	—	13	1±	8	20	NC	NC	NC	20 SFA
E	3	—	11	0.758	6	8	NC	NC	NC	8 SFA
F	3	—	12&14	1.257	10	7	+9 = 16	NC	-6 = 10	10 SFA
G	3	—	15	0.696	6	4	NC	NC	NC	4 SFA
H	HERITAGE HOMES THE FALLS	—	—	1.93	18 (PR 9.5)	18	NC	NC	+15 = 33	33 ELDERLY CARE
I	3	7	1	±1	8	12 BUILT	NC	NC	NC	12 SFA
J	2	—	—	0.692	6	8 BUILT	NC	NC	NC	8 SFA
K	1 AMENDED	1-5	—	15.477	124	55	NC	NC	NC	55 SFA/D
ODP TOTALS				35.31±	286	250	192	190	190	190

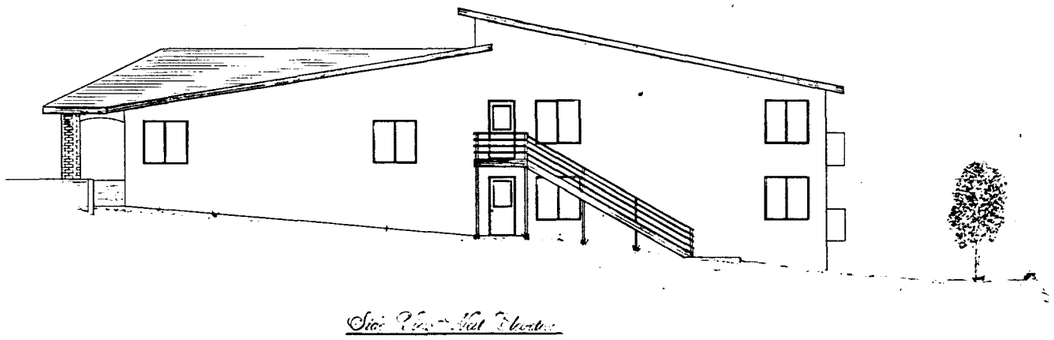
LEWIS HOFFMAN 6-30-92

Grand Valley Water Users

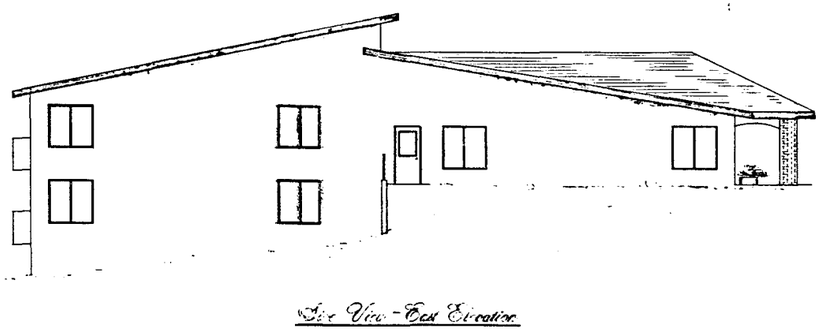




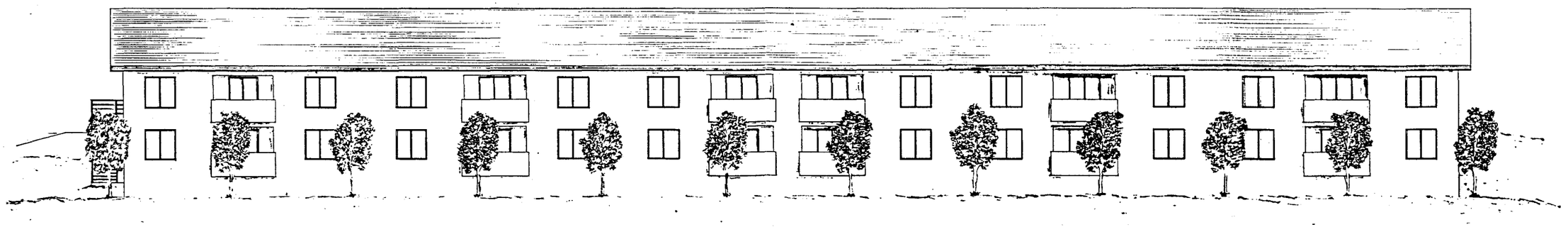
Front View - North Elevation



Side View - West Elevation



Side View - East Elevation

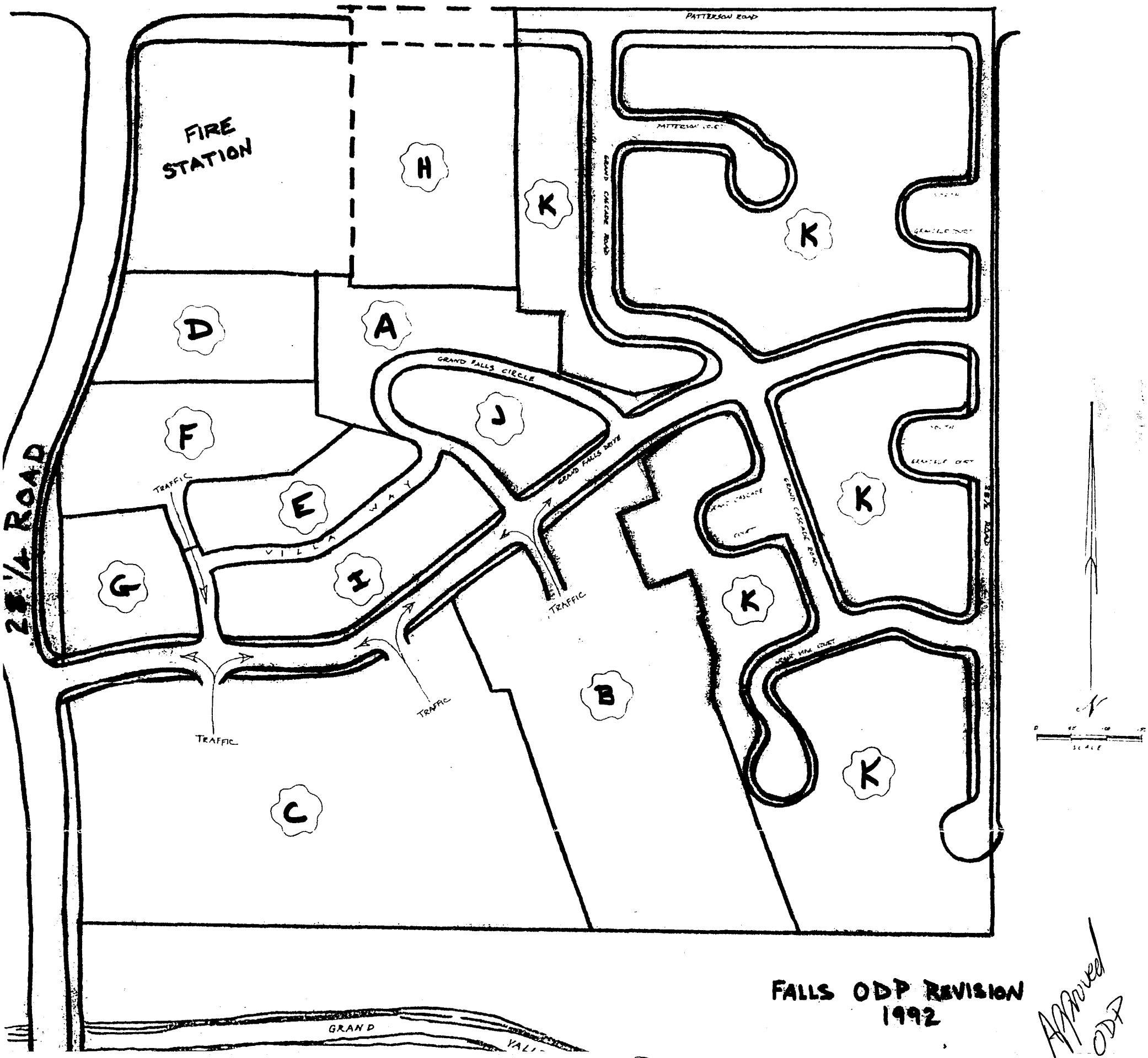


Rear View - South Elevation

All Scales 1/8"=1'-0"

#23'92

Original
Do NOT Remove
From Office



FALLS ODP REVISION
1992

Approved ODP

THE FALLS ODP

AREA	FILING NO.	BLOCK	LOT	ACRES	ALLOWED BY ZONING PRB	DENSITIES AT 1-1-92	ODP REVISIONS: REPLAT LOTS 12+14 FILING 3, ROW VACATION 3-3-92 #2-92	ODP REVISIONS: REPLAT PORTION FILING 2 FALLS POWTE 4-7-92 #11-92	ODP REVISIONS: HERITAGE HOMES #23-92	NC = NO CHANGE: DENSITIES AT 7-92 INCLUDING HERITAGE HOMES - THE FALLS
A	2	2	9	1.02	8	12	NC	NC	NC	12 SFA
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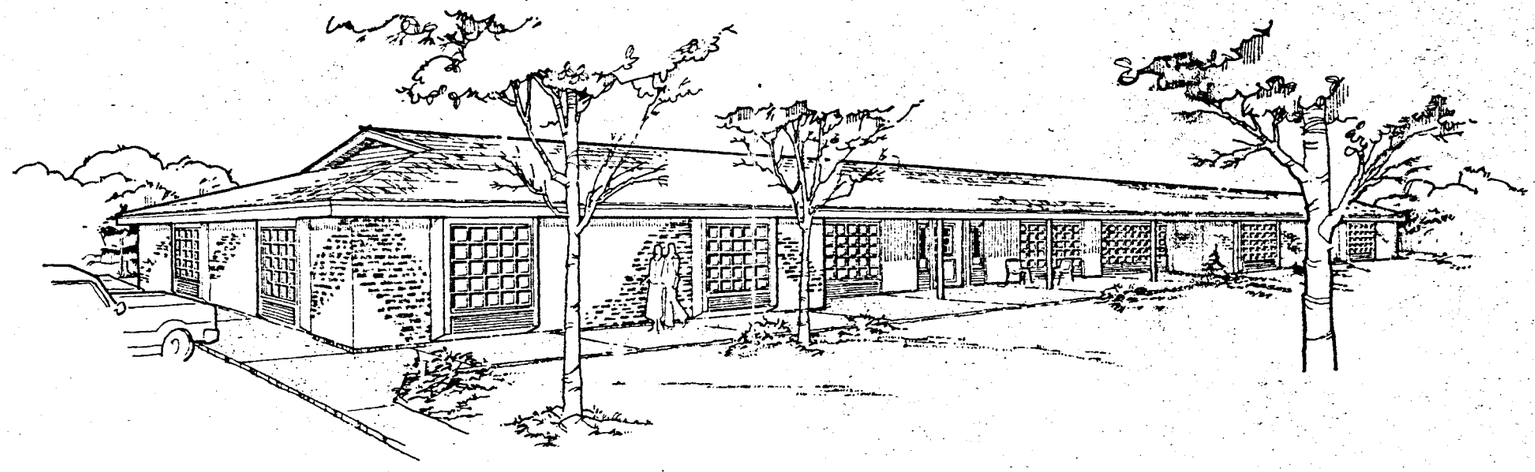
K	1 AMENDED	1-5	—	15.477	124	55	NC	NC	NC	55 SFA/D
ODP TOTALS				35.31±	286	250	192	190	190	190

(LEWIS HOFFMAN 6-30-92)



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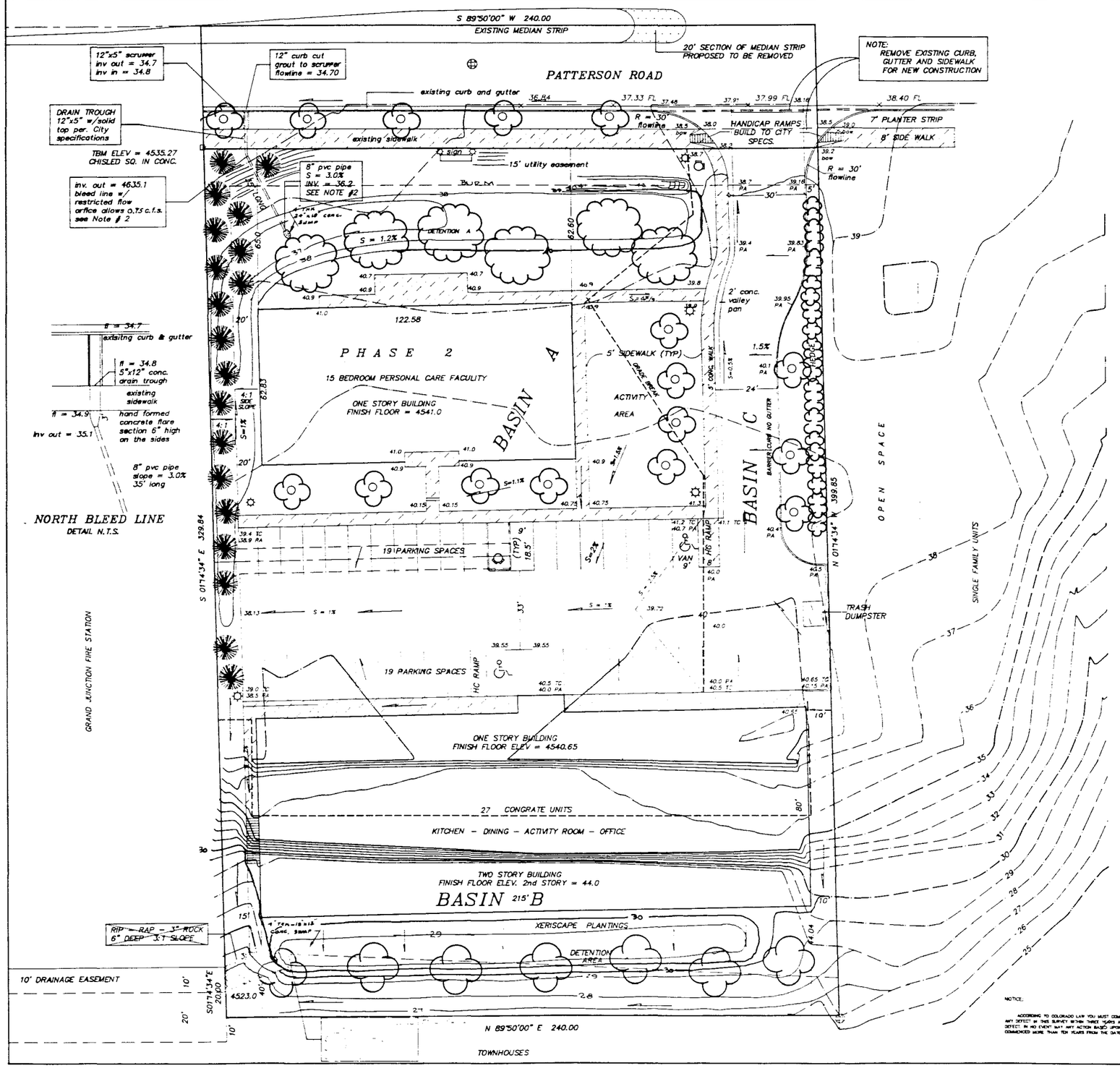
SCALE:	APPROVED BY	DRAWN BY
DATE: 6/24/69		
		DRAWING NUMBER



LEGEND & NOTES

1. NOTE: BUILD CURB, GUTTER, RAMP, ECT. TO CITY OF GRAND JUNCTION SPECIFICATIONS
2. Restricted flow orfice - use 8" pvc slip cap (Do NOT solvent weld) cut orfice opening 5"Dia at pipe flowline
3. ~~Restricted flow orfice in 4" pvc slip cap w/ circular orfice 3/4" Dia. at pipe flowline~~
4. Under sidewalk Drain Trough - see City of Grand Junction "Standard Drainage Details" sheet 2 Exhibit F

DRAINAGE BASIN BOUNDARY

HONEY LOCUST

MOUNTAIN ASH

RUSSIAN OLIVE

JUNIPER

DIRECTION OF DRAINAGE

FIRE HYDRANT

STREET LITE

HANDICAP PARKING

CONTOUR INTERVAL = 1.0 FT.

ELEVATIONS BASED ON 4535.27 ON BENCH MARK AS SHOWN

SETBACKS

REAR = 20'FEET
SIDE = 10' FEET
FRONT = 20'FEET

LAWNS & OPEN SPACE = 36,000 SQ. FT.

GROUND COVER WILL BE A COMBINATION OF GRASS-NATIVE GROUND COVER AND ROCK

CERTIFICATION

I, MAX E. MORRIS , CERTIFY THAT THIS PLAT IS PREPARED FROM FIELD NOTES OF A SURVEY MADE BY ME IN MARCH 1992.

COLO. REG. PROF. LAND SURVEYOR L.S. 16413

revised 6/12/92
REVISED 5/14/92
REVISED 4/22/92

NOTICE:

ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

HERITAGE HOMES - THE FALLS

SITE PLAN

FOR: HERITAGE

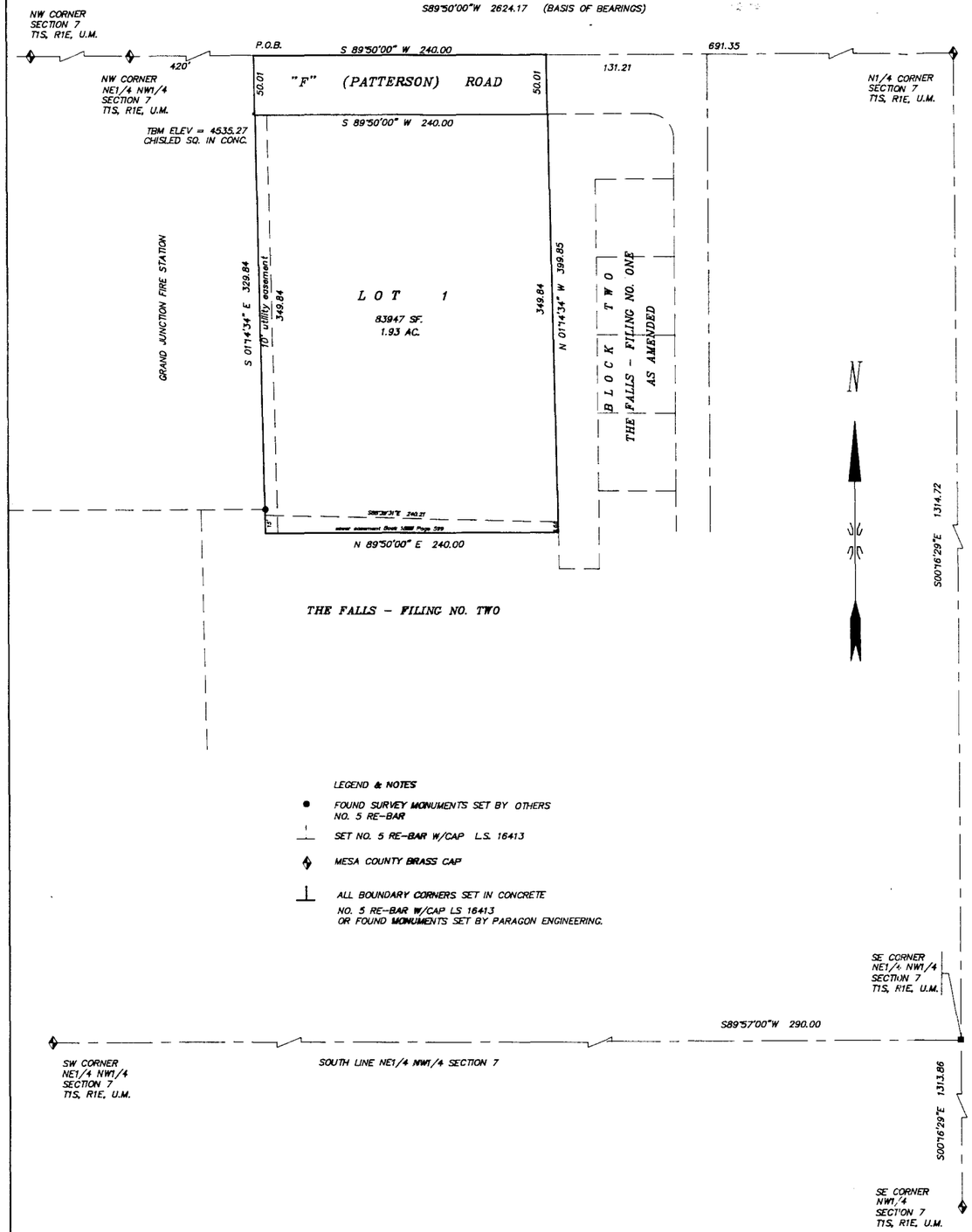
SCALE: 1"IN = 20'FT

DATE: 4/9/92

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
ACAD ID: HER-FALL
SHEET NO.
FILE: 92087

EE



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HERITAGE HOMES - THE FALLS

DEDICATION

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned, Heritage Elder Care, a Colorado Partnership, 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 1893 at Page 904 of the Mesa County Clerk and Recorders Office, and being situated in the NE1/4 NW1/4 Section 7, Township 1 South, Range 1 East of the Ute Meridian, Mesa County, Colorado as shown on the accompanying plat, said property being described as follows:

Commencing at a point 420 feet East of the Northwest Corner of the NE1/4 NW1/4, Section 7, Township 1 South, Range 1 East of the Ute Meridian, thence East 240 feet; thence South 400 feet; thence West 240 feet; thence North 400 feet to the point of beginning.
EXCEPTING THEREFROM any portion thereof lying within the lines of F Road, as described in Road Book 1, Page 182, EXCEPTING THEREFROM the North 50 feet for street and utility purposes as conveyed to the City of Grand Junction by instrument recorded September 18, 1980 in Book 1275 at Page 925, and re-recorded November 17, 1980 in Book 1285 at Page 123, Mesa County, Colorado.

That said owner has caused the said real property to be laid out and surveyed as HERITAGE HOMES-THE FALLS, 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 THE FALLS POINTE, 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, Colorado.

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

_____ _____

Heritage Elder Care, A Colorado Partnership
WILLIAM A. IHRIG general partner

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

The foregoing instrument was acknowledged before me this _____ day of _____ A.D., 199__, by William A. Ihrig, general partner of Heritage Elder Care, a Colorado Partnership.

_____ _____

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 HERITAGE HOMES-THE FALLS, 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 HERITAGE HOMES-THE FALLS, 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

Date

HERITAGE HOMES - THE FALLS

FINAL PLAT

SITUATED IN SECTION 7, TOWNSHIP 1 SOUTH, RANGE 1 EAST, UTE MERIDIAN

FOR: HERITAGE ELDER CARE	Q.E.D. SURVEYING SYSTEMS Inc. 1018 COLO. AVE. GRAND JUNCTION COLORADO 81501 (303) 241-2370 464-7568	SURVEYED BY: DMM MF
SCALE: FEET 0 10 20 30 40 50 / 0 3 6 9 12 15 / METERS 1"IN = 50'FT		DRAWN BY: MEM
DATE: 4/27/92		ACAD ID: HERFALLF
		SHEET NO.
		FILE: 92087

#23 92