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File 1978-0131
Date 10/2/00

Project Name: The Falls -Preliminary

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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, not all entries designated to be scanned are present in the file. There are also documents specific to certain files, not found on the standard list. For this reason, a checklist has been included. **Remaining items, (not selected for scanning), will be marked present on the checklist. This index can serve as a quick guide for the contents of each file.** **Files denoted with (**) are to be located using the ISYS Query System. Planning Clearance will need to be typed in full, as well as other entries such as Ordinances, Resolutions, Board of Appeals, and etc.**
X	X	***Summary Sheet – Table of Contents**
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		***Submittal checklist**
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		Reduction of assessor's map
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		Public notice cards
		Record of certified mail
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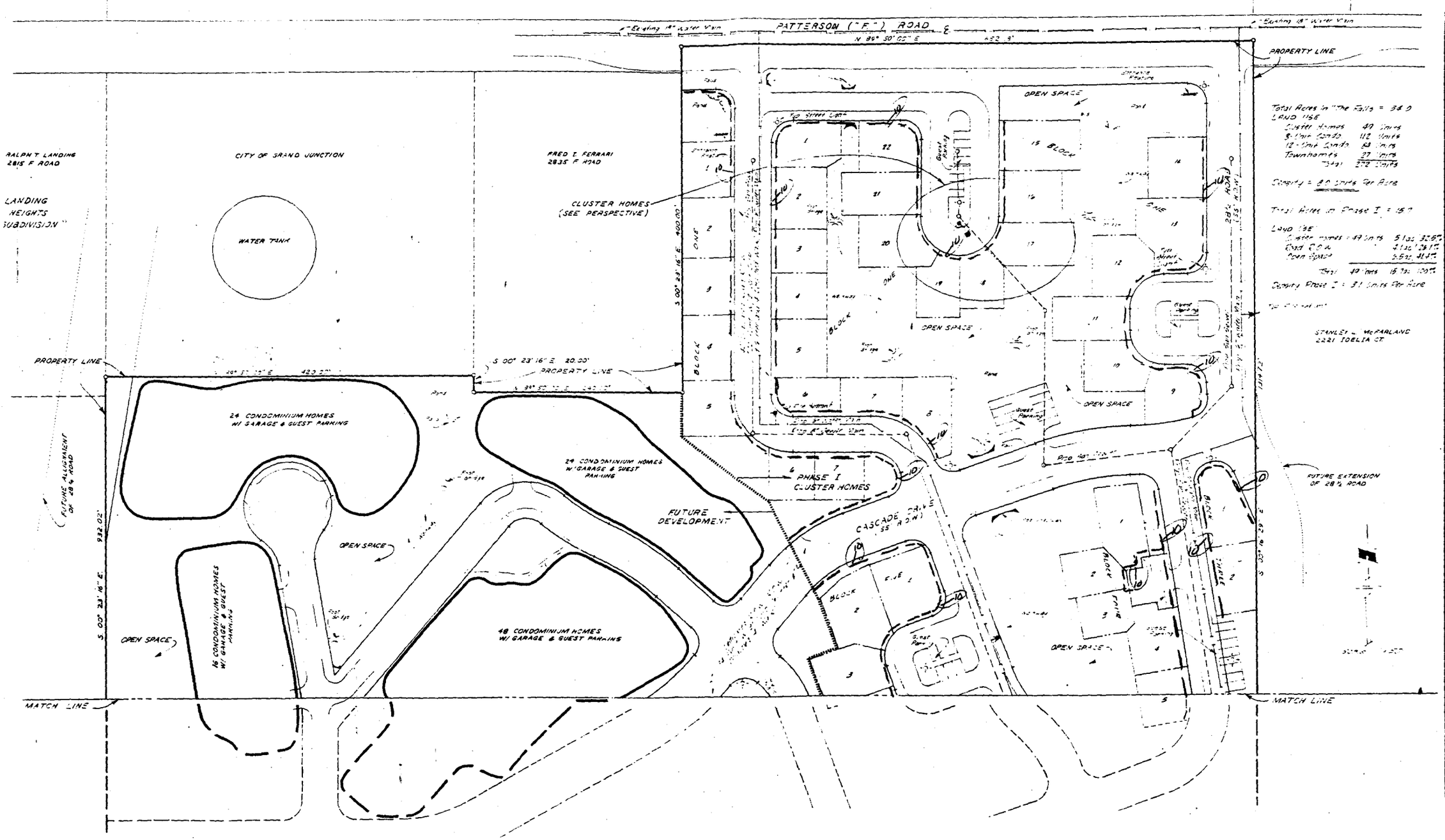
DOCUMENTS SPECIFIC TO THIS DEVELOPMENT FILE:

X	X	Follow-up Form			
X	X	Review Sheets			
X	X	Review Sheet Summary			
X		Preliminary Plan Application			
X		Development Summary Form			
X	X	Letter from Ronald Rish to Robert Gerlofs re: revised detailed construction plans – 3/24/80			
X	X	Report of Geologic Investigation -			
X		Memo from Gordon Bruchner to Mesa County Planning Commission re: gamma radiation survey -no tailings– 10/21/77			
X	X	Letter form Ron Rish to Paragon Engineering, Inc. – 3/11/81			
X		Grading & Drainage Plan			
X	X	Site Plan			

THE FALLS PHASE I

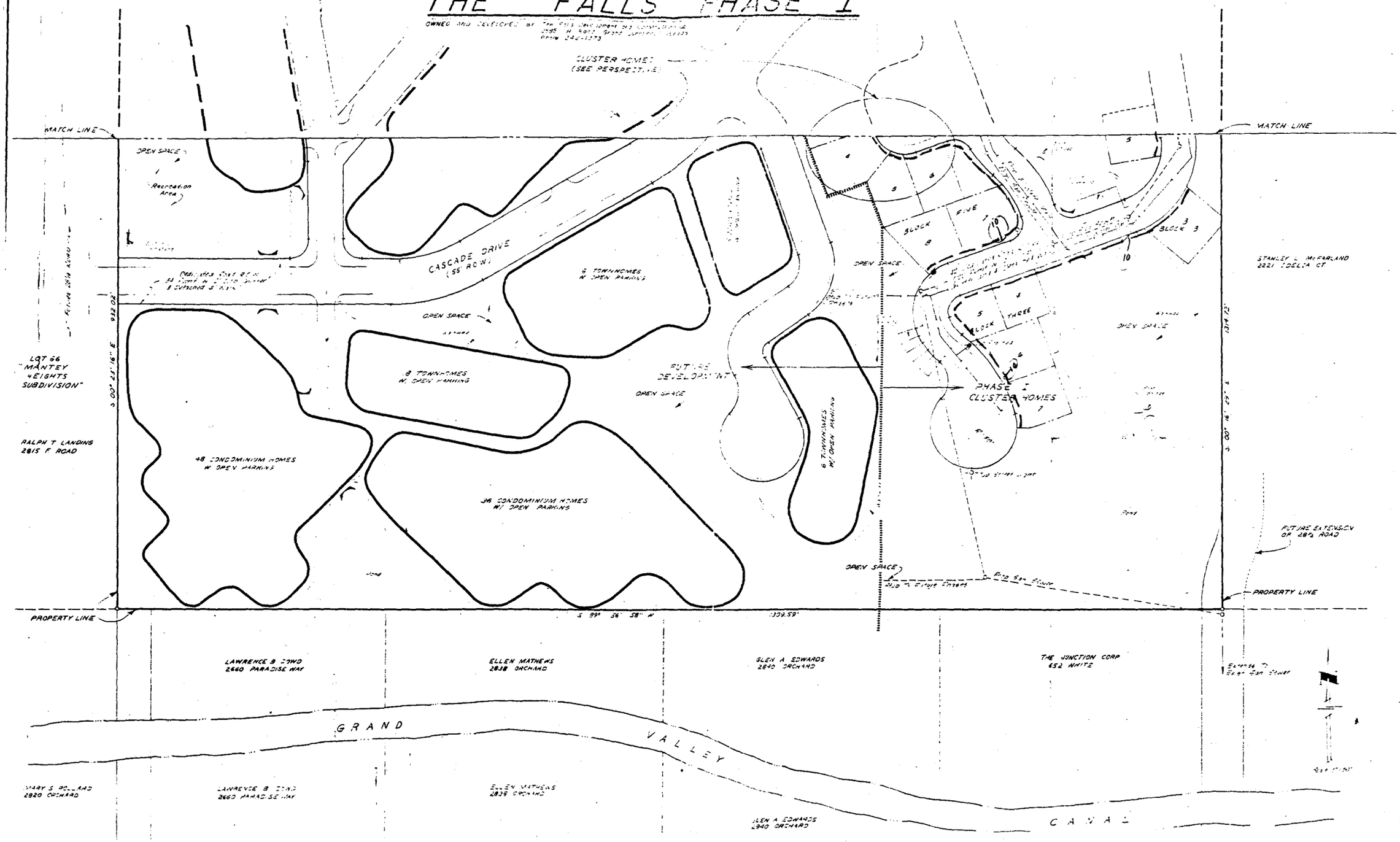
OWNED AND DEVELOPED BY The Falls Development Corporation
2595 H Road
Grand Junction, Colorado
Phone 243-[illegible]

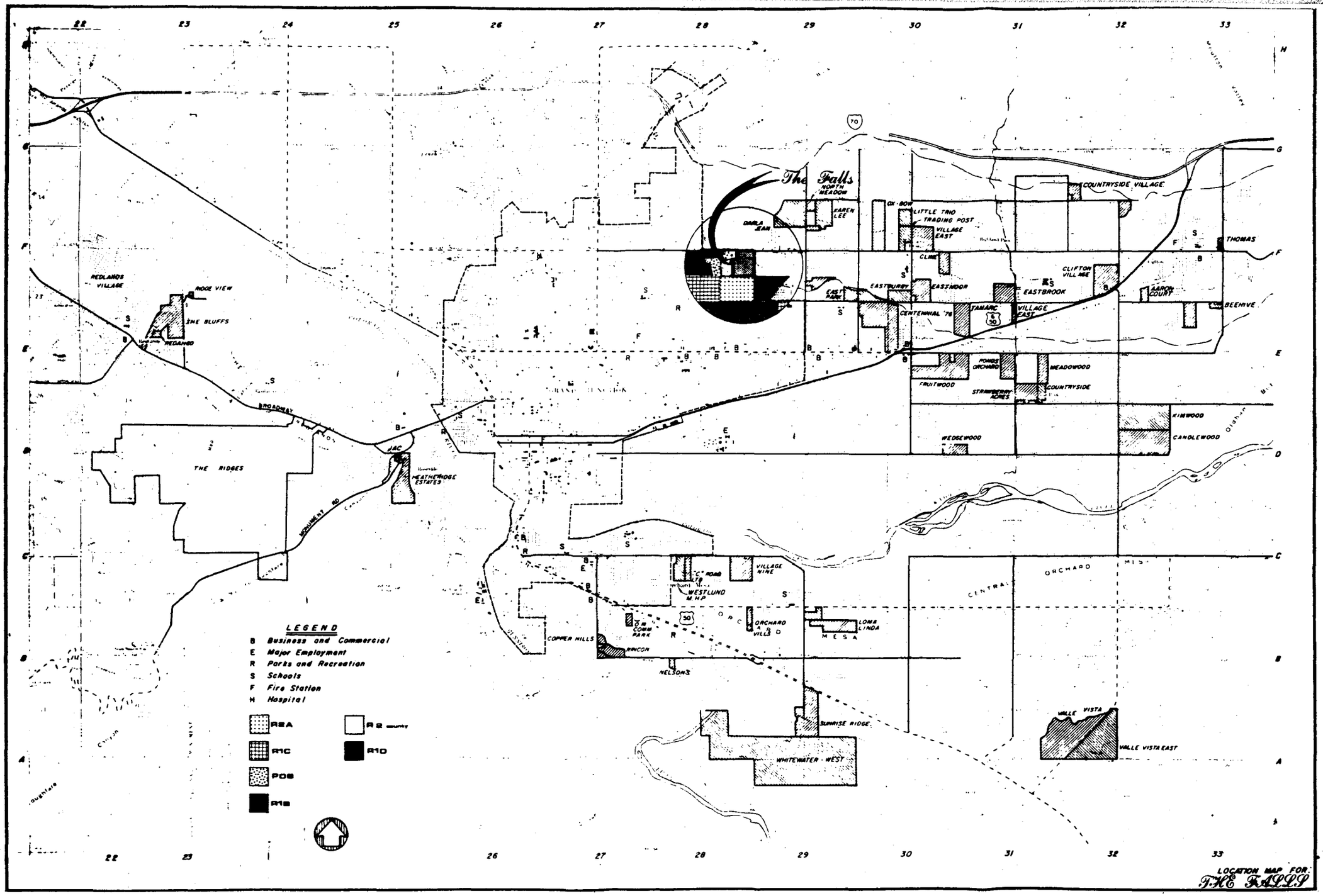


Preliminary Development Plan For:

THE FALLS PHASE I

OWNED AND DEVELOPED BY [illegible]




The Falls
NORTH MEADOW
KAREN LEE
DARLA ANN
OX-BOW
LITTLE TWO TRADING POST
VILLAGE EAST
COUNTRYSIDE VILLAGE
THOMAS
CLINE
CLIFTON VILLAGE
EASTBURY
EASTMOOR
EASTBROOK
EAST PARK
CENTENNIAL '76
TAMARC
VILLAGE EAST
AARON COURT
BEEHIVE
REDLANDS VILLAGE
RIDGE VIEW
THE BLUFFS
REDLANDS
BROADWAY
THE RIDGES
JAC
HEATHERIDGE ESTATES
MONUMENT RD
PONDS ORCHARD
MEADOWOOD
FRUITWOOD
STRAWBERRY ACRES
COUNTRYSIDE
KIMWOOD
CANDLEWOOD
WEDGEWOOD
VILLAGE NINE
"C" ROAD
WESTLUND M.H.P.
TOM COMB PARK
ORCHARD VILLAGE
LOMA LINDA
MESA
COPPER HILLS
RINCON
NELSON 3
CENTRAL ORCHARD MESA
SUNRISE RIDGE
WHITEWATER - WEST
VALLE VISTA
VALLE VISTA EAST
LEGEND
B Business and Commercial
E Major Employment
R Parks and Recreation
S Schools
F Fire Station
H Hospital
R2A
R2
R1C
R1D
PDS
R1B
LOCATION MAP FOR
THE FALLS

WALLACE G. BELL
CONSULTING GEOLOGIST
591 RAMBLING ROAD
GRAND JUNCTION, COLORADO 81501

303-242-7896

REPORT OF GEOLOGIC INVESTIGATION

THE FALLS SUBDIVISION

SUMMARY

The site of the proposed subdivision is a nearly square tract of 34 acres located just outside the northeast corner of the city of Grand Junction, Colorado.

Bedrock is Mancos Shale and is exposed at the surface throughout the tract. The topography is characterized by strong relief with relatively wide valleys separated by narrow, steep-sided ridges. The proposed plan of development involves reduction of the relief by removing material from the ridges and filling the valleys with it.

Development as planned is feasible from a geological standpoint but will require very careful engineering design and construction practices.

Development of the tract as a residential area will have no adverse effect upon the environment. In its present state, the tract has no productive capabilities or aesthetic value. Its conversion to a pleasant residential area should represent a decided improvement to the community.

LOCATION

The Falls is a proposed subdivision consisting of approximately 34 acres located in the NE¼ NW¼ Sec. 17, T. 1 S., R. 1 E., Ute Principal Meridian, immediately adjacent to the northeast corner of the city of Grand Junction in Mesa County, Colorado.

The tract is nearly square in shape and is bounded on the north by a small parcel bearing a large municipal water supply tank, a residential lot, and Patterson Avenue (F Road). It is bounded on the east by undeveloped ground, on the south by the Grand Valley Canal, and on the west by undeveloped, rough ground.

TOPOGRAPHY AND CULTURE

The tract consists entirely of rough undeveloped ground situated on the south side of a short, west-trending, asymmetric ridge. The ridge is approximately one mile in length and rises 80 feet above the north edge of the broad alluvial plain that characterizes the central part of the Grand Valley. The north side of the ridge is characterized by a smooth, gently sloping surface, but the south side is strongly dissected into a dendritic pattern of relatively wide floored valleys separated by high, narrow, very steep-sided ridges that project southward from the main ridge. The main ridge is an erosional remnant of a large terrace that was formed during the degradational phase of a previous cycle in the development of the Colorado River. The strong relief on the south side of the ridge was developed during that phase by tributary streams that eroded headward into the edge of the terrace.

The tract is situated on a drainage divide, so no upslope runoff water passes over the tract. Natural drainage is limited to precipitation falling directly on the surface of the tract.

The Grand Valley Canal flows westward along the south edge of the tract and cuts across the water courses that emerge from the valleys in the tract. The water courses are interrupted and drainage from them is diverted into the canal.

The overflow and drainage line from the municipal water tank at the northwest corner of the tract flows into the water course in the western part of the tract.

GEOLOGY

Bedrock in the tract consists of strata in the Mancos Shale which lie 1000 to 1200 feet above the base of the formation. The Mancos consists in this region of nearly 4000 feet of gray, marine shale with subordinate shaly siltstone and very fine-grained, thin-bedded sandstone.

Bedrock is exposed in the sides and crests of the ridges throughout the tract but is covered by a thin mantle of recent alluvium and soil on the floors of the valleys. Approximately 80 feet of strata are exposed in the tract, the lowest occurring in the canal bank along the south edge and the highest in the crests of the ridges in the northern part. The strata consist largely of the dense, gray, silty, impervious shale typical of the Mancos; however, in the uppermost part, they grade upward into a zone of shaly, sandy siltstone that weathers a conspicuous buff color. Strata in this zone occur in the crests of the ridges in the northern part of the tract.

The change from gray shale to buff-weathering, sandy siltstone is transitional, so it is difficult to establish a single bedding plane upon which to determine accurately the attitude of the strata. It appears, however, that the uppermost silty strata dip very gently northward.

A small amount of water is seeping to the surface in the valleys and moving down the water courses to drain into the canal. The valley floors along the water coarses are quite boggy and support a moderate growth of swamp grass and small brush.

The water that is emerging from the subsurface in the tract is moving through fractures in the impervious shale bedrock. It is seeping into the fractures from an unlined irrigation ditch that flows westward along Patterson Avenue near the crest of the main ridge and from precipitation and irrigation water spread on the fields north of the ditch. When water is plentiful on the surface of the ridge, the fractures in the bedrock are filled, and a hydrostatic head is produced within them above the level of the valley floors. As a result, the water in the fractures in the ridge moves toward the lowest points in the valleys where the pressure differential is greatest.

The water that is moving along the water course in the western part of the tract is issuing at a point where a thin bed of bentonitic shale or claystone crosses the stream channel near the head of the valley. The bentonitic bed supports a zone of vegetation about two feet wide for a short distance along the outcrop on both sides of the water course. A similar bed crops out near the base of a spur on the west side of the ridge in the southern part of the tract. The clay in these beds absorbs and holds water readily, especially near the surface where the confining pressure is minimal, and it has room to expand to accomodate the absorbed water. The clay is not, however, an aquifer which transmits ground water laterally through it. It is quite possible that the clay may swell to fill fractures that cut a stratum bearing it near the surface and thereby divert water laterally through the fracture above or below the stratum until it intersects the surface, but the water moves through the fractures and not through the strata.

PLAN OF DEVELOPMENT

The present plan of development calls for removing material from the crests of the ridges and filling the lower parts of the valleys to produce a regular surface sloping southward from the crest of the main ridge to the south edge of the tract. Construction will be confined to those areas where solid bedrock is at the surface, while the filled areas will be dedicated to open space.

The plan is quite feasible from a geological standpoint, but an efficient system for controlling surface and subsurface water will be required to prevent the development of a water table that might rise to affect the zone of construction.

Two sources of subsurface water must be accomodated in planning the development: (1) the water presently entering the tract through fractures from the high area north of the tract, and (2) a new source that will arise from seepage within the tract of precipitation and irrigation water into the fill and into fractures in the newly exposed bedrock areas.

While the amount of water presently moving into the tract through fractures from the north is quite small, it could constitute a significant contribution to an accumulation of water in the fill material if effective drainage is not provided. The most important source of subsurface water in the developed tract will be, however, direct seepage into the filled areas.

The initial porosity and permeability of the fill material will be quite high, and water will sink readily to the lower part of the fill. If an effective system for drainage is not provided, it will tend to accumulate and produce high water table conditions, especially in the lower part of the tract.

It is suggested that a subsurface drainage system be installed at the bottom of the valley fill areas approximately along the present water courses. This system would provide direct drainage through the tract for water seeping in from the main ridge. It would also provide a zone of low pressure to which seepage water would move downward through the fill material. This should keep the water table well below the surface throughout the tract. It might prove feasible to tie the surface drainage into the subsurface system.

It is recommended that the material removed from the sandy zone on the crests of the ridges be distributed along the bottoms of the valleys to provide a more permeable layer there and improve drainage at the base of the fill.

HAZARDS

After the surface of the tract has been prepared to grade, there should be no serious hazards of a geologic nature that might have an adverse effect upon life, health, or property.

There will be no slopes remaining sufficiently steep to present danger of landslide or soil flowage. Some subsidence in the fill areas should be expected as the material compacts; but, if structures are not resting on the fill, no serious effects should be manifested. Permanent development of the fill areas probably should be deferred several years to allow the major part of the subsidence to take place before significant investments are made in improvements.

Judging only from the presence of the strong relief, it may appear that the tract is undergoing strong erosion. The appearance is misleading, however, for the topography in the tract was inherited from an earlier period when rainfall was much greater, and the gradients of the tributaries were steeper than at present. There has been very little active erosion within the tract for a considerable length of time.

The lowest point on the tract is 60 feet above the present level of the river, so there is no danger that river flood waters could ever reach it. There is no danger from flash floods, for no upslope runoff crosses the tract.

Except for the presence of the municipal water tank on the crest of the main ridge above the western part of the tract, there are no artificial hazards. The likelihood that the water tank might rupture should be investigated by a qualified engineer. The discharge of the tank's overflow and drainage line into the tract could constitute a hazard if adequate drainage facilities are not provided.

CONSTRUCTION FACTORS

Assuming that construction on the filled areas will be avoided, the principal factor that will affect construction practices on the tract will be the nature of the bedrock. It undoubtedly will exhibit a tendency to swell when wet, and its properties should be determined accurately by a professional soils engineer before the specifications are established for footings and foundations.

A primary concern in design and construction should be to prevent water from reaching the bedrock under load bearing structures and around foundations. The water table must be prevented from rising into the zone of construction, and surface water must be prevented from seeping down around them. Drains should be installed around footings and foundations, and surface water should be controlled to minimize influent seepage. Each building lot should be carefully graded to specifications established in a master plan, and a clear, well graded system for gathering runoff from the lots and conducting it from the tract should be provided.

A tract-wide system should be designed for the construction of utility trenches so that the trenches serve as drains for subsurface water. The main trenches should drain down slope into the master drainage system, and lateral trenches should slope down grade to the main trenches. Each trench to a home-site should slope away from the house; trenches to houses on low side lots should not be constructed down grade where they can serve as sumps for water to collect near the surface beneath the houses. A layer of porous material or tile drain should be laid in the bottom of the trenches to improve their drainage characteristics.

ENVIRONMENTAL CONSIDERATIONS

Development of The Falls Subdivision should not have an adverse effect on the environment. The tract has no potential for agricultural use and, in its present state, has no beneficial effect upon the community.

Domestic water will be provided by the Ute Water Conservancy District and sewage disposal by the Fruitvale Sanitation District.

3 October 1977

Wallace G. Bell

Wallace G. Bell
Consulting Geologist

Lincoln DeVore
1000 West Fillmore St.
Colorado Springs, Colorado 80907
(303) 632-3593
Home Office

April 25, 1978

Bob Gerlofs
P O Box 2872
Grand Junction, CO

Re: Hveem-Carmany Testing
The Falls Subdivision

Gentlemen:

In accordance with your request, we have completed Hveem-Carmany testing on a sample of material from the above referenced location. The results are shown below.

R = 10
Average expansion pressure @ 300 psi = 10
Average displacement @ 300 psi = 4.03

We hope this has provided you with the information you required. If questions arise, please feel free to contact the Laboratory.

Respectfully submitted,

LINCOLN-DeVORE TESTING LAB.

George D. Morris, P. E.

GDM/heh
cc: LDTL - Grand Junction

Lincoln DeVore
1000 West Fillmore St.
Colorado Springs, Colorado 80907
(303) 632-3593
Home Office

March 27, 1978

Robert Gerlofs
P O Box 2872
Grand Junction, CO 81501

Re: SUBSURFACE SOILS INVESTIGATION

THE FALLS SUBDIVISION

GRAND JUNCTION, COLORADO

Sir;

Transmitted herewith is the report concerning a subsurface soils investigation for the proposed Falls Subdivision in Grand Junction, Colorado.

Respectfully submitted,

LINCOLN-DeVORE TESTING LAB.

Martin F. Essigmann Jr.
Geotechnical Engineer

Reviewed by George D. Morris, P. E.

MFE/sam
LDTL Job No. 20575, J-65

2700 Highway 50 West
Pueblo, Colo 81003
(303) 546-1150

P.O. Box 1427
Glenwood Springs, Colo 81601
(303) 945-6020

109 Rosemont Plaza
Montrose, Colo 81401
(303) 249-7838

P.O. Box 607
Gunnison, Colo 81230
(303) 641-2276

P.O. Box 1643
Rock Springs, Wyo 82901
(307) 382-2849

ABSTRACT:

The contents of this report are a subsurface soils investigation and foundation recommendations for Phase I of The Falls Subdivision in Grand Junction, Colorado. At the present time, the Laboratory has not seen a set of construction drawings for any of the proposed buildings on this site.

The foundation soils encountered during our exploration program were noted to consist almost entirely of high density, formational Mancos Shale. Although the formational shale does have a fairly high allowable bearing capacity, the clays are expansive and the expansive properties must be taken into consideration when proportioning the foundations. After consideration of the investigation and testing program described herein, it is our recommendation that a shallow foundation system be used to transfer the weight of the proposed structures on this site. Such a foundation system designed to penetrate through any low density fill which presently exists on the site may be designed on the basis of a maximum allowable bearing capacity of 9000 psf. A minimum design pressure of 1700 psf should be maintained at all times.

In an effort to limit possible differential movement, it is recommended that the foundation systems be well balanced and heavily reinforced. Contact stresses should be balanced to within about ±500 psf beneath all bearing walls throughout the units. Isolated interior column pads should be designed for pressures of approximately 200 psf more

than the avera[illegible] selected for the exterio[illegible]walls. For multi-story structures, or those with basements, the criteria for balancing should be on the basis of dead load plus approximately one-half the live load. All stem walls must be designed as grade beams capable of spanning at least 10 feet.

Adequate drainage must be maintained across the construction site. If proper surface drainage cannot be maintained, then a peripheral drain is recommended around the exterior of each unit.

All floor slabs on grade must be constructed to act independently of the other structural portions of the building.

More detailed recommendations can be found within the body of this report. All recommendations are subject to limitations set forth herein.

GENERAL:

The purpose of this investigation was to determine the general suitability of the site for construction of a series of light to medium weight, single family residential units. Characteristics of the individual soils found within the test borings were examined for use in designing foundations for these structures.

The first phase of The Falls Subdivision will be located on the southwest corner of the intersection of 28-1/2 Road and F Road (Patterson Road). This is in the northeastern metropolitan Grand Junction area and lies slightly above

the Grand Valley Canal.

Although the Laboratory has not seen a set of construction drawings for any of the proposed buildings on the site, it is our understanding that the buildings will be principally clustered single family residences, probably of two-story, conventional, wood frame design. Since no steep slopes presently exist in the area of Phase I, few slope stability problems are anticipated.

Topographically, the construction site occupies a highly dissected hillside draining principally in a southerly direction. A considerable amount of earth moving has been performed on the site prior to our investigation, with several large gullies being filled to the south of the Phase I area. For the most part, the building locations in Phase I appear to be in cut areas with approximately 2 feet of fill occurring near the center of the development and beneath the proposed roadways and parking areas. Deeper fills are anticipated to the south of the Phase I area.

Soils on the site consist almost entirely of high density, formational shales belonging to the Mancos Shale formation. A small amount of residually weathered material is located at the ground surface across the region, as indicated on the attached drilling logs. However, the soils are quite dense and can be considered as formation for the purposes of this report. The Mancos Shale is a thinly bedded, light to dark gray, marine shale with thin interbeds of fine

grained, calcareous sandstones and limestones. Some layers are known to be bentonitic and highly expansive, but most have only a moderate swell potential. As indicated on the drilling logs, formational shale was located at a relatively shallow depth in all five test borings drilled. While the soils are expansive, they do have a high allowable bearing capacity and will, therefore, make an excellent bearing strata for the proposed buildings.

BORINGS, LABORATORY TESTS & RESULTS:

Five test borings were drilled across the Phase I area of The Falls Subdivision as indicated on the attached Test Boring Location Diagram. These borings were placed in such a manner as to obtain a reasonably good profile of the subsurface soils. Although some slight variations were noted from point to point, the soil profile was judged sufficiently uniform that no further test borings were deemed necessary. All test borings were drilled with a power-driven, continuous auger drill. Samples were taken with the standard xsplit spoon sampler and by bulk methods.

As shown on the attached drilling logs, basically only a single soil material was encountered during our exploration program. The single soil type consists of the slightly weathered and formational Mancos Shale which was described previously. Precise engineering characteristics of this soil type can be found on the attached summary sheet. The following discussion will be general in nature.

Soil Type No. 1 classified as a lean clay (CL) of fine grain size. This soil was encountered as formational Mancos Shale only. It is generally plastic, of very low permeability and of high to very high density. These clays have a distinct tendency to expand upon the addition of moisture with expansion pressures on the order of 1700 psf being anticipated. This magnitude of expansion is generally judged sufficient to affect the structural portions of a building as well as floor slabs on grade and other flatwork. Foundations on this site must be designed with the expansive potential of Soil Type No. 1 in mind. Because of the initial high density of the formational shale, we would anticipate very little long term consolidation problems. Soil Type No. 1 was found to have an allowable bearing capacity on the order of 9000 psf. These clays were noted to contain sulfates in detrimental quantities.

No free water was encountered in any of the test borings to the depths drilled on this site. Free water should be fairly deep in this portion of Grand Junction and should not present any construction problems. However, because of the expansive nature of the shales, we would recommend that surface drainage be carefully designed and controlled. Further recommendations pertaining to drainage are included in the next section of this report.

Since the precise type and loads of the proposed structures are not known to the Laboratory at this time, the following conclusions and recommendations must be somewhat general in nature. Any special loads or unusual design conditions should be reported to the Laboratory so that changes in these recommendations may be made, if necessary. However, based upon our analysis of the soil conditions and project characteristics previously outlined, the following recommendations are made.

It is recommended that a shallow foundation system consisting of narrow continuous footings beneath all bearing walls and isolated spread footings beneath columns and other points of concentrated load be used to carry the weight of the proposed structures on this site. It should be noted that the term footing as used in the context of this report would include the wall on grade or "no footing" type of foundation configuration. The use of footings, the use of "no footings", or the use of a voided foundation system on this site will depend entirely upon the loads generated by the structures. We would anticipate the use of a "no footing" foundation system for this site with voids probably necessary to maintain the minimum design pressures, as well as to aid in balancing the structures.

Foundations designed to penetrate through the veneer of low density fill on the site may be proportioned on the basis of a maximum allowable bearing capacity

of 9000 psf. A minimum design pressure of 1700 psf should be maintained at all times.

As shown on the attached Test Boring Location Diagram, no structures are planned for the fill areas at this time. Therefore, it would appear that while the fill will not pose a problem to the actual structures on the site, problems associated with roadway stability may be encountered. We would recommend removing the low density fill beneath the roadway and parking areas of the site and compacting it to help insure roadway performance and stability.

Due to the expansive nature of the foundation soils encountered on this site, it must be recommended that the foundation system for the proposed structures be well balanced in order to lower the possibility of differential movement. The foundation system should be proportioned such that the total pressure on the soil is approximately the same throughout the structure. This can be accomplished by placing narrow footings beneath very light walls and wider footings beneath very heavily loaded walls. The judicious use of voids beneath very light walls will help meet the balancing criteria set forth herein as well as to maintain the minimum design pressures dictated by the expansive properties of the clays. If the building is to be multi-story or contain a basement, we would recommend balancing on the criterion of dead load plus about one-half the live load. If the structure is to be single-story without a basement, then balancing could be accomplished on the basis of dead load only. Using whichever criteria is applicable, the

foundation system should be proportioned such that pressures beneath all bearing walls are balanced to within about ±500 psf at all points. Isolated interior column pads should be designed for pressures of approximately 200 psf more than the average selected for the bearing walls.

In order to make the structure somewhat more rigid and to spread the loads more evenly around the building, it is recommended that all stem walls of the structure be designed as grade beams capable of spanning at least 10 feet. Horizontal reinforcing should be placed continuously around the structure with no gaps or breaks in the reinforcing steel unless they are specially designed. Beams should be reinforced at both top and bottom, with the majority of the reinforcement being placed near the top of the grade beam.

Where building floor slabs are to be used, they may be placed directly on grade or over a compacted gravel blanket of 4 to 6 inches in thickness. If this gravel bed is chosen, it must be provided with a free drainage outlet to the surface and must not be allowed to trap water beneath the floor slab.

All floor slabs on grade must be constructed to act independently of the interior columns and all bearing walls. In addition, concrete floor slabs on grade should be placed in sections no greater than 25 feet on a side. Deep construction or contraction joints could be placed at these lines to facilitate even breakage. This will help reduce any unsightly

cracking which would result from expansion of the foundation clays.

Any interior non-load bearing partitions which will be constructed to rest on the floor slab should be built with a space of at least 1-1/2 inches at either the top or bottom of the wall (preferably at the bottom of the wall). This space will allow for future expansion of the subgrade soils and will prevent damage to the wall and roof above which could be caused by this movement.

Adequate drainage must be provided in the foundation area both during and after construction to prevent the ponding of water. The ground surface around the building should be graded such that surface moisture is carried away from the building rapidly. The minimum gradient within 10 feet of the structure will depend upon the surface landscaping. Bare or paved areas should maintain a minimum gradient of 2%, while landscaped areas should have a minimum gradient of 5%. Roof drains must be carried across all backfilled areas and discharged well away from the structure. The overall drainage should be designed such that the runoff from one building does not move into the area immediately adjacent another structure.

To give the building extra lateral stability and to aid in the rapidity of runoff, all backfill around the buildings and in utility trenches leading to the structures should be compacted to at least 90% of its maximum Proctor dry density. Compaction should be carried out at approximately the Proctor optimum moisture content, plus or minus 2%.

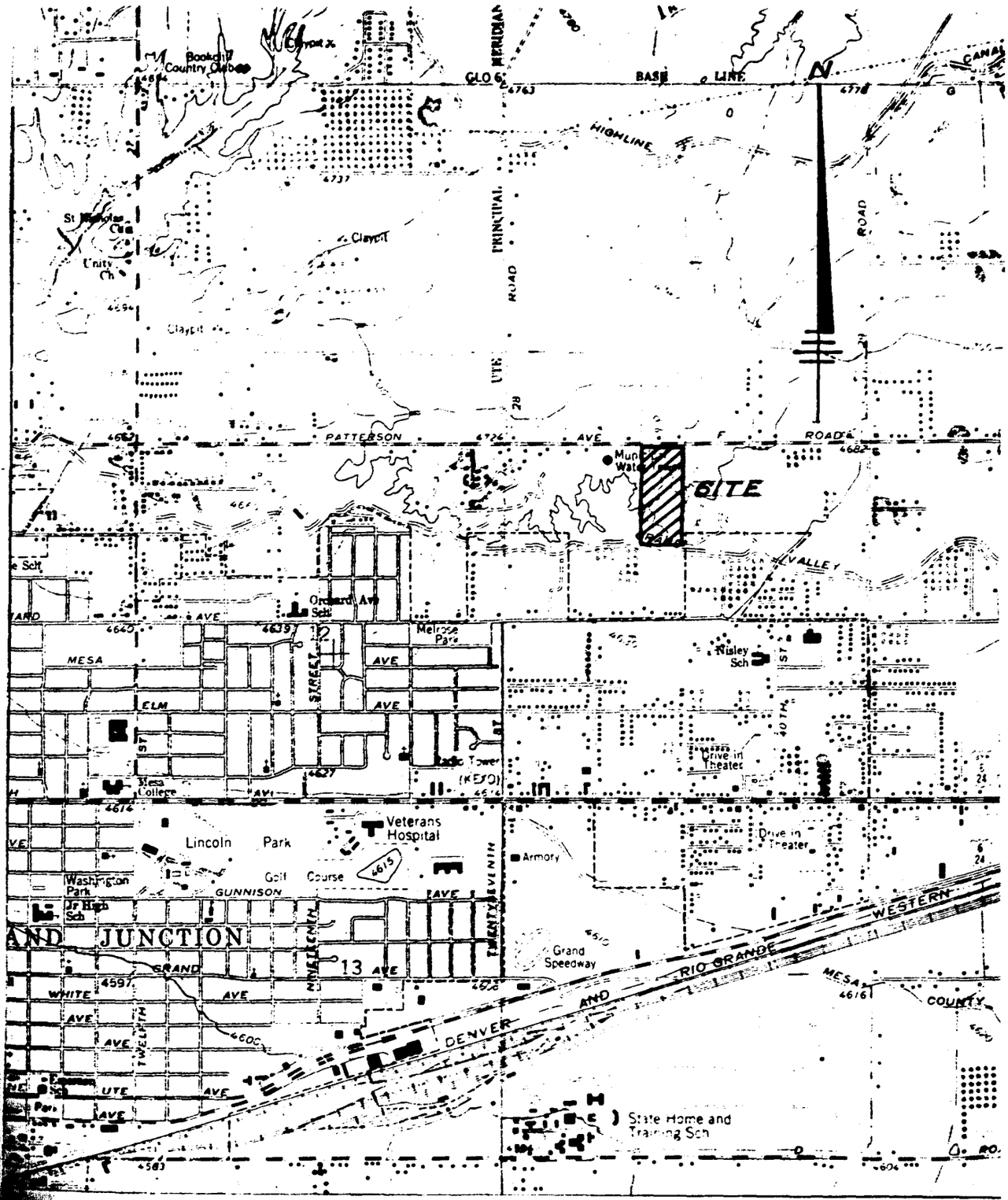
Backfill must be compacted to the required density by mechanical means. No water flooding techniques of any type should be used in the placement of fill on this site.

If proper surface drainage cannot be maintained, then we would recommend constructing a peripheral drain around the exterior of the units. Such a drain should consist of a discharge pipe, gravel collector and sand filter. Drywells should not be used anywhere across the subdivision. If a gravity discharge is not available, then we would recommend using a sealed sump and pump arrangement.

The open footing excavation must be inspected prior to the placing of forms and pouring of concrete to establish that proper design bearing material has been reached and that no debris, soft spots, or areas of unusually low density are located within the foundation region.

A Type II Cement is recommended for use in all concrete which will be in contact with the foundation soils. Under no circumstances should calcium chloride ever be added to a Type II Cement. In the event that a Type II Cement is difficult to obtain, a Type I Cement may be substituted but only if it is protected from the soil by an impermeable membrane.

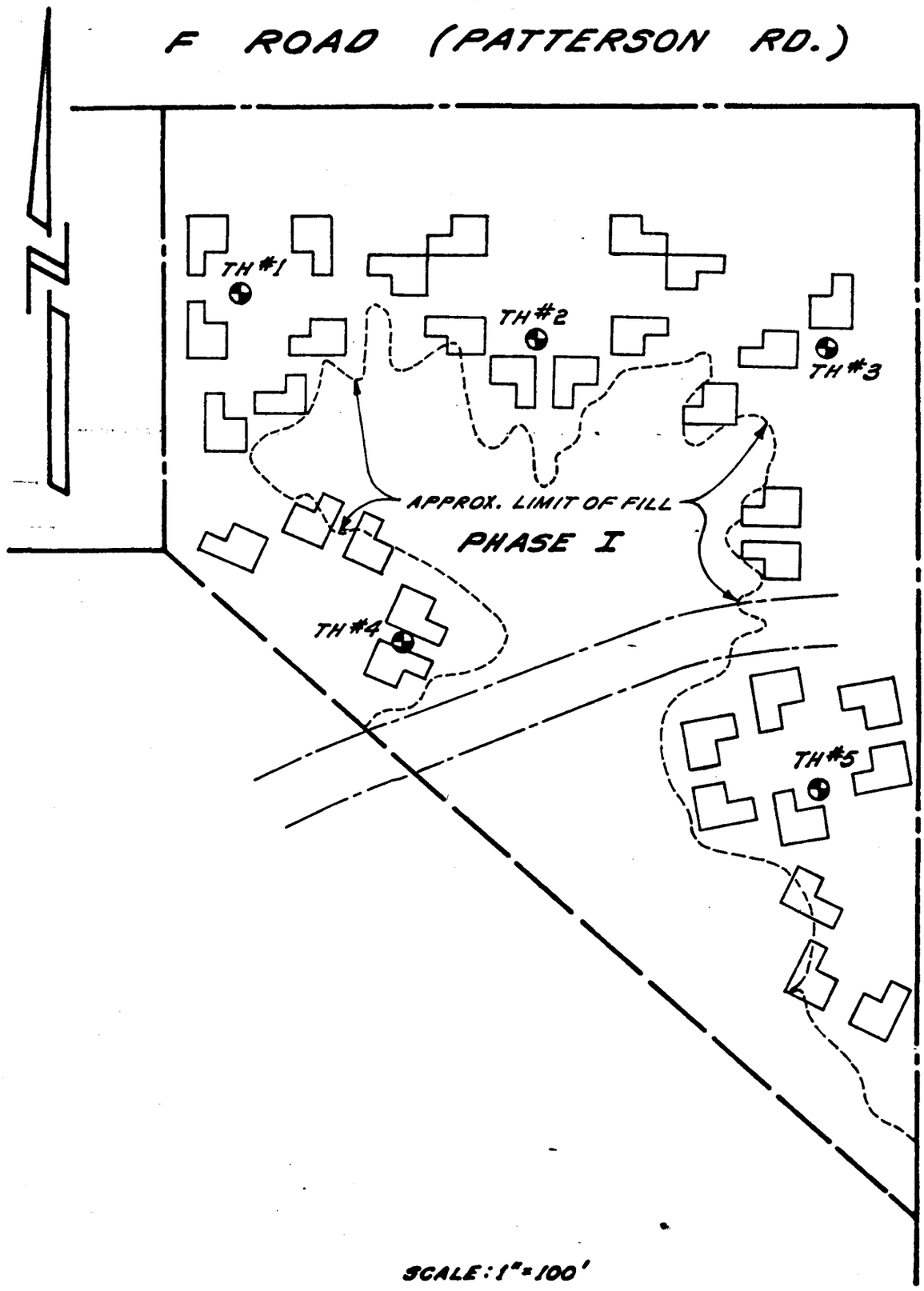
It is believed that all pertinent points concerning the subsurface soils on this site have been covered in this report. If questions arise or further information is required, please feel free to contact the Laboratory.



SCALE: 1" = 2000'

AL SITE LOCATION DIAGRAM
ALLS SUBDIVISION
JUNCTION, COLO.

THE LINCOLN-DeVORE TESTING LABORATORY
COLORADO: Colorado Springs, Pueblo, Glenwood Springs, Montrose, Gunnison. WYOMING: Rock Springs



TEST BORING LOCATION DIAGRAM
THE FALLS SUBDIVISION
GRAND JUNCTION, COLO.

THE LINCOLN-DeVORE TESTING LABORATORY
COLORADO: Colorado Springs, Pueblo, Glenwood Springs, Montrose, Gunnison. WYOMING: Rock Springs

SOILS DESCRIPTIONS:

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

ROCK DESCRIPTIONS:

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

SYMBOLS & NOTES:

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

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

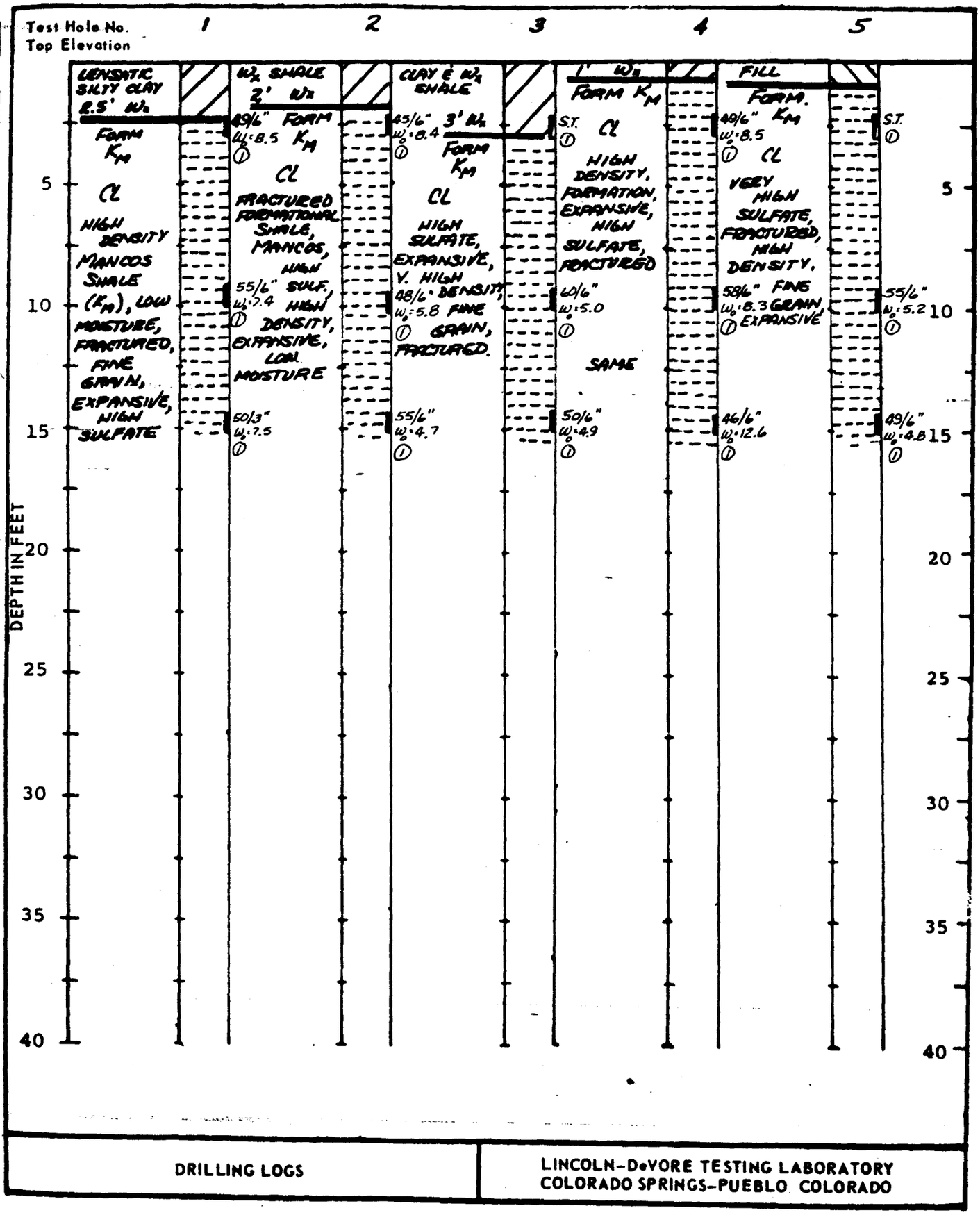
Samples may be bulk, standard split spoon (both disturbed) or 2-1/2" I.D. thin wall ("undisturbed") Shelby tube samples. See log for type.

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

LINCOLN DeVORE TESTING LABORATORY

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

EXPLANATION OF BOREHOLE LOGS AND LOCATION DIAGRAMS



DRILLING LOGS

LINCOLN-DeVORE TESTING LABORATORY
COLORADO SPRINGS-PUEBLO COLORADO

SUMMARY SHEET

Soil Sample CL (Farms Km)

Test No. J-65 20575

Location FALLS SUBDIVISION - PHASE I

Boring No. 1 Depth 3

Sample No. 1

Date 3-24-78

Test by SMS

Natural Water Content (w) 8.5 %

Specific Gravity (Gs) 2.63

In Place Density (γo) - pcf

SIEVE ANALYSIS:

Sieve No.	% Passing
1 1/2"	
1"	
3/4"	
1/2"	
4	
10	100.0
20	99.8
40	97.4
100	96.1
200	90.9

HYDROMETER ANALYSIS

Grain size (mm)	%
0.020	52.4
0.005	31.1

Plastic Limit P.L. 17.8 %

Liquid Limit L. L. 35.1 %

Plasticity Index P.I. 17.3 %

Shrinkage Limit 16.9 %

Flow Index

Shrinkage Ratio %

Volumetric Change %

Lineal Shrinkage %

MOISTURE DENSITY: ASTM METHOD

Optimum Moisture Content wo %

Maximum Dry Density -γd pcf

California Bearing Ratio (a) %

Swell 1 Day 6.9 %

Swell against 1700 psf Wo gain 12.8 %

BEARING

Housel Penetrometer (av) 9000 psf

Unconfined Compression (qu) psf

Plate Bearing: psf

Inches Settlement

Consolidation - % unde 4000 psf

PERMEABILITY:

K (at 20°C,

Void Ratio

- Sulfates 2000 + ppm.

SOIL ANALYSIS

LINCOLN-DeVORE TESTING LABORATORY
COLORADO SPRINGS, COLORADO

#131-78

City of Grand Junction, Colorado 81501
250 North Fifth St., 303 243-2633

RECEIVED MESA COUNTY DEVELOPMENT DEPARTMENT
MAR 12 1981

March 11, 1981

Katy F. McIntyre

Paragon Engineering, Inc.
2784 Crossroads Blvd.
Suite 104
Grand Junction, CO 81501

Dear Katy:

Re: The Falls - Filing No. 2

Following receipt of your letter of February 24, 1981, I researched the Development Department files and discussed the proposed change for North Grand Falls Way with Karl Metzner and Bob Bright. They did not seem to have knowledge of the cul-de-sac or its possible impact on the development plan for the two lots north of Grand Falls Drive. The file contained the two (2) enclosed review sheets of January 21 and 25, 1980, which are self-explanatory.

In light of comments No. 3 and 4 on the January 21, 1980, review sheet and the fact that a utility layout and sidewalks layout for the area in question have not been seen by me and have not been seen nor approved by the City Council, I am not in a position to respond to the proposed street plans or to sign the plat.

The questions I raised 13 months ago are ligitimate questions for a "Planned Development" and I feel you should meet with the Development Department staff at your earliest convenience to resolve these matters. As usual, I am available to meet with you and the Development staff as needed.

I also noticed that no easement is shown on the plat for the sanitary sewer proposed through Tract I (1-21-80 review comment number 6).

Very truly yours,

Ronald P. Rish

Ronald P. Rish, P.E.
City Engineer

RPR/hm

Enclosures

cc - Bob Bright
Karl Metzner
Jim Patterson w/encl.

File

City of Grand Junction, Colorado 81501
250 North Fifth St., 303 243-2633

March 24, 1980

Mr. Robert P. Gerlofs
Paragon Engineering, Inc.
P. O. Box 2874
Grand Junction, CO 81502

Dear Mr. Gerlofs:

Re: The Falls-Filing No. 1

The revised detailed construction plans for streets for the above as submitted on January 23, 1980, are in accordance with my review letter of April 9, 1979, and are therefore approved by this office for construction.

Submittal of those elements of the irrigation system which are essential elements of the storm drainage system (detention pond and outlet structures) must be reviewed and approved by this office prior to construction.

Our records indicate that a 50 ft. street right of way exists on 28½ Road south of The Falls. Routing of the storm system outlet in this right of way is reasonable and acceptable provided the facilities are constructed so as to not interfere with the possible future use of this right of way for street purposes. My review of the detailed plans is necessary before I have an opinion on whether this is the case. The details of outletting the storm system into the Grand Valley Canal may also require their approval.

I noticed the street plans call for construction of 7 ft. of mat on 28½ Road which is east of the edge of The Falls. It will be necessary for you to provide a deed for the required street right of way east of The Falls prior to construction of 28½ Road as shown on the plans.

I have also reviewed the cost estimate for your responsibility for street improvements on F Road as submitted on February 7, 1980. This estimate by Elam Construction dated February 2, 1980, although based on unit costs which are less than the City is experiencing in recent bids, is apparently a firm quote to you from a qualified contractor and therefore is acceptable as a basis for your deposit. Prior to concurring with the deposit total I need a letter from Elam stating how long they will honor the quoted prices since the City may choose to actually perform the work this year in conjunction with the 28¼ Road project. What the work will cost us this summer is the correct basis for the deposit. I also would appreciate a letter from you stating the pavement dimensions on which the estimate is based.

I also will mention here that in checking our files I can not find any record of the detailed construction plans for sanitary sewers in this project being reviewed and approved by the City Engineer. If you have a "sign-off" please send me a copy. In any case, a copy of the sewer plans would be appreciated. I know most of the pipes are in the ground but would like to keep the file in order so please submit the plans and I will respond with a letter if appropriate.

I apologize for taking so long to respond to your submittals and appreciate your cooperation in these matters.

Very truly yours,

Ronald P. Rish

Ronald P. Rish, P.E.
City Engineer

RPR/hm

cc - Karl Metzner✓
Jim Patterson
Jim Wysocki
File

REVIEW SHEET SUMMARY

FILE # 131-78

ITEM Preliminary PD-8 - THE FALLS

PC MEETING DATE _____

MCC/CC MEETING DATE _____

DATE REC.	COMMENTS	
12-8-78	FIRE DEPT.	Since a cluster home is not typical single family dwelling and your future development is multi-family, the minimum line size needed is 8" loop with hydrants spaced at approximately 300 ft. apart. Besides the hydrants shown on plot plan, two more hydrants needed: West side lot 1, block 1, and N.W. corner lot 2, blk 3.
12-9-78	CITY UTILITIES	Must have a drain way maintained to drain Mantey Heights Water tank to the canal each fall and during other times when it may need draining. No water lines are shown into the Guest Parking areas off F Road?; However, a hydrant is shown. Should move hydrant to north end of Island for better placement. Prefer all container trash service in this development.
12-13-78	CITY ENG.-RISH	(1) The proposed 42' ROW's should be 44' to fit new street stds. Since no on-street parking will be allowed on these, will adequate off-street spaces be available? (2) Council has budgeted for ROW acquisition and earthwork for 1979 for 28¼ Road from Orchard to Patterson. Because of topography, almost all of 28¼ will be off the Falls property but it will be immediately adjacent and is in my opinion a very significant access for The Falls. Will the developer assist us by obtaining 38.5' half ROW (east half) and granting power-of-attorney for full-street improvements on east-half? (3) Power of attorney should be granted for Patterson Road full street improvements. Other than accel-decel lanes, I recommend against any street construction on Patterson Road at this time. (4) Looks to me like some of the"on-street" sidewalks would be redundant with some paths. This should be studied and specific proposals made at final plat. (5) Looks like all streets planned conform to City Street stds (and they should) except for previously mentioned 44' ROW. If any sidewalks are deleted, ROW could be reduced by 4 ft. (6) Does not 2 on grading and Drainage plan mean the detention ponds will be overtopped and will flow across adjacent properties to the south to get to Grand Valley Canal? How often will this happen? (i.e. Est. storm frequency to cause overtopping and est. storm capacity of ponds?) Will any overtopping be controlled via providing overflow structures and positive improved outlet routes to the Canal? Will easements across properties to south be provided? Will Grand Valley Canal protest the flows being directed into their Canal? All these questions should be adequately addressed prior to final plat submittal since drainage outlet "system" may depend on the answers.
12-13-78	CITY ENG-MCKEE	Street geometrics look okay. No parking on 22' wide mats. Street light needed on street at curve in block one at lot 5 or 6.
PLANNING DEPARTMENT		Recommend approval based on staff/review comments.

PLANNING COMMISSION
Subject to staff comments and review comments and off street parking in area east of Ferrari Property.

CITY COUNCIL
Tabled further review of adequate street widths by city departments.

CITY COUNCIL - Approved subject to 55' st on "L" St. in upper left of development and adjust balance accordingly.

RECEIVED AFTER DECEMBER 19, 1978 MEETING

FILE # 131-78 ITEM PRELIMINARY PD-8 - THE FALLS

DATE REC.	REVIEW AGENCY	COMMENTS
12-29-78	MOUNTAIN BELL	Require utility easements as shown in red on plat.
12-29-78	PUBLIC SERVICE	Gas: requires 10 foot front lot line easements adjacent to all streets and cul-de-sacs. Will need to discuss other easements with developer as project progresses. Electric: possible front lot construction joint with gas. Will work with developer as to exact location of facilities prior to final plat.
12-27-78	UTE WATER	We have an 18" line in F Road that can serve this area. Water lines large enough to meet fire flow requirements must be installed. Tap fees and extension policies in effect will apply.

Subdivision Preliminary PD8 The Falls

Date 4 Dec 78 Item # 131-78

Petitioner Bob Gerlots

S.E. of City Water Tank on F Rd at 28¼ Rd line.

Review Agencies Comments	Review Agencies Comments

Action Taken	Action Taken
P.C. Approved 12/19/78	P.C.
C.C. Tabled 3 JAN 79	C.C. 1-17-79 Approved CIC
Comments	Comments
Subj. to Staff/Review Comments & Off St. pkg in area E. of Ferrari Property	

City Council - approved subj. to 55' St on "L" St in upper left of development & adjust balance accordingly.

ITEMS REQUIRED FROM DEVELOPER

___ Check	___ Utility Agreement	___ Title Investigation
___ Drainage	___ Landscaping	___ Covenants
___ Improvements Guarantee	___ Annexation	___ Other (Specify)