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File 1993-0038

Name: Pepper Tree - Filing 4 - F & 29 Roads

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X		Gamma Radiation Survey - 10/11/79			
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X	X	Exterior Elevations Maps			

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**GEOLOGIC HAZARDS REPORT
FOR
PEPPER TREE FILING NO. 4
CITY OF GRAND JUNCTION, COLORADO
MARCH, 1993**

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**GEOLOGIC HAZARDS REPORT
FOR
PEPPER TREE FILING NO. 4**

CITY OF GRAND JUNCTION, COLORADO

MARCH, 1993

INTRODUCTION

Pepper Tree Filing No. 4 is located in part of the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$ 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 south of Patterson Road (F Road) and between 28 $\frac{3}{4}$ and 29 Roads. The site is at the south end of West Indian Creek Road.

The proposed development is a southward extension of the existing Pepper Tree Subdivision and would consist of several condominiums/townhouses on approximately 4.2 acres. The property is gently sloping and is presently undeveloped. The vegetation is weeds, grass, willows, and a few cottonwood trees which is mostly the result of leakage from small canals which border the property. The general nearby area consists of residences, small irrigated fields, and undeveloped land.

The purpose of this report is to identify geologic hazards, particularly hazards that might have an adverse effect on construction of large multi-family buildings. 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, site-specific information was obtained from a report titled "Subsurface Soils Exploration - Pepper Tree Filing No. 4" dated March 24, 1993, by Lincoln-DeVore, Inc. of Grand Junction, Colorado. This firm drilled 4 holes on the property on March 15, 1993, to gather preliminary foundation data. Laboratory tests were performed on representative soil samples to determine engineering properties. Drill logs and a location map prepared by Lincoln-DeVore are attached to this report.

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

The Pepper Tree Filing No. 4 property is in the broad Grand Valley which has been eroded from Mancos Shale. The ground elevation on the site is about 4,670 feet and the slopes are very gentle. The general area is semiarid and receives a long term, average annual precipitation of about 8.6 inches. The croplands are irrigated by diversions from the Colorado River.

Geologic Formations and Soils

The site is in a transitional area between low Mancos Shale hills to the west and gentle alluvial slopes along Indian Wash to the east. The land to the west can be characterized as a "badlands" area with sparse vegetation, patches of alkali, and weathered Mancos Shale essentially forming the ground surface.

The soils encountered by Lincoln-DeVore in the 4 exploratory holes were silty clays and sandy silts which ranged in thickness from 7.5 to 12 feet. Weathered Mancos Shale underlies these alluvial soils and was reported to be fractured and to contain soluble salts. Deeper alluvium, up to 20 feet or more, is known to occur in many locations along Indian Wash and deep soils could be present near the southeast corner of the property. The present channel of Indian Wash is about 80 feet east of the southeast property corner.

The near-surface soils have been mapped for agricultural purposes by the Soil Conservation Service as Billings silty clay loam, Persayo-Chipeta silty clay loam, and Ravola clay loam.

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

The silty clays and sandy silts found in the 4 test holes are described in the March 24, 1993, Lincoln-DeVore report as being of "low plasticity, of low to moderate permeability, and encountered in a low density, wet condition. If this soil is found in a relatively dry condition, it may undergo mild expansion with the entry of small amounts of moisture, but will undergo long-term consolidation upon the addition of larger amounts of moisture. This soil will settle after being loaded."

The weathered Mancos Shale, which was also found in all 4 exploratory holes, was described as "somewhat weathered near the upper surface, but became quite stiff with increasing depth. This soil type was classified as a low plastic clay under the Unified Soil Classification System. The Standard Penetration Tests ranged from 39 blows per foot to over 100 blows per foot. Penetration tests of this magnitude indicate that the soil is very stiff and of medium to high density. The moisture content varied from 10.5 to 15.4%, indicating a relatively moist soil. This soil is plastic and is sensitive to changes in moisture content."

Additional details on the foundation materials as well as recommendations for design are presented in the Lincoln-DeVore report.

Spoil piles of waste materials about 3 to 12 feet deep are present on the middle and southeastern portions of the property; the approximate locations are marked on the attached Soils Map. This material consists of soil, broken concrete, tree limbs, waste lumber, and possibly other unknown trash. The debris would obviously be unsuitable as foundation material and should be removed from any building site or otherwise accommodated in the project plan.

The soils 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

A perched ground water table may exist at this site due to the presence of irrigation ditches and landscape irrigation in the subdivision to the north. A small unlined canal parallels the

west and south property lines and a small concrete ditch follows the east boundary. Indian Wash, a rather large drainage heading in the Bookcliffs, is about 80 feet from the southeast property corner. The large Grand Valley Canal is about 350 feet to the south.

Ground water was not found in any of the 4 test holes by Lincoln-DeVore at the time of the drilling (March 15, 1993). However, very wet conditions were reported from each of the holes. The Lincoln-DeVore report recommends that basement or half basement foundations not be used at this site.

The depth to ground water during the various seasons of the year must be determined prior to any foundation design. The water table in the general area is usually the highest in the month of October, at the end of the irrigation season. Sewage will be conveyed from the area by municipal collector lines.

Slope Stability

No landslide or other slope stability hazards exist due to the very gentle slopes. The ground surface slopes southeast towards Indian Wash at 1 to 4 percent.

FLOOD POTENTIAL

Indian Wash, an intermittent drainage which extends northeastward towards the Bookcliffs, is located about 80 feet east and 8 feet lower in elevation from the southeast corner of this property. A floodwater-retarding structure has been constructed by the Soil Conservation Service across Indian Wash about 3 miles north of this subdivision to provide protection against 100-year floodflows (Flood Insurance Study--Mesa County, Colorado, FEMA, July 15, 1992, page 16).

RADIATION HAZARD

Uranium mill tailings were used extensively in the Grand Junction area between 1952 and 1965 for landfill and construction. No tailings were found on the subject property by a gamma radiation survey conducted by ARIX Corporation on October 11, 1979.

CONCLUSIONS

A surface reconnaissance was conducted by Barnes Geologic Consulting, Inc. on March 13, 1993, at the proposed Pepper Tree Filing No. 4 to identify geologic hazards to building construction. Additionally, 4 shallow exploration holes were drilled by Lincoln-DeVore, Inc. on March 15, 1993, to identify general subsurface conditions. The hazards and recommendations

are summarized as follows:

1. The foundation materials at this property are variable depths of silty clay and sandy silt overlying weathered Mancos Shale. The soil depths revealed by the 4 exploration holes varied from 7.5 to 12 feet. The engineering properties of the soils were described in the Lincoln-DeVore report dated March 24, 1993, as being low plasticity, low density, and low to moderate permeability. The soils were found to be wet, but a water table was not encountered at the time of the drilling (March 15, 1993). The site-specific engineering properties of each soil layer must be determined and utilized in the final design of each structure foundation.
2. The weathered Mancos Shale bedrock encountered in each of the exploration holes contained swelling clays. This potential for shrink-swell must also be evaluated prior to design and construction at locations where the shale would be a part of the foundation.
3. The soils and shale and at this site contain varying amounts of sulfate salts and sulfate resistant cement should be used in concrete.
4. Ground water was not found in any of the four exploration holes during the March 15, 1993 drilling, but wet soil was reported from each hole. The ground water table may be fairly high in the summer and fall months due to the irrigated landscaping and croplands and the numerous irrigation canals. The depth to ground water during each season of the year must be determined prior to foundation design.
5. The gentle slopes (1 to 4 percent) of this property do not present any slope stability hazard.
6. The property is near Indian Wash but an existing floodwater-retarding structure about 3 miles to the north across the wash provides protection against 100-year floodflows.
7. No gamma radiation above background was found on this site by a survey performed by ARIX Corporation on October 11, 1979.
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.

Several potential geologic hazards have been identified at this property, mainly the potential of swelling clays in the weathered shale and the possibility of a high ground water table during the irrigation season, but the conditions can be mitigated by proper engineering design of the foundations 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





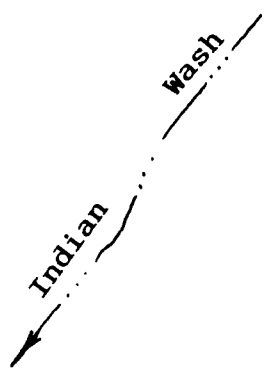
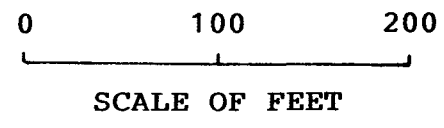
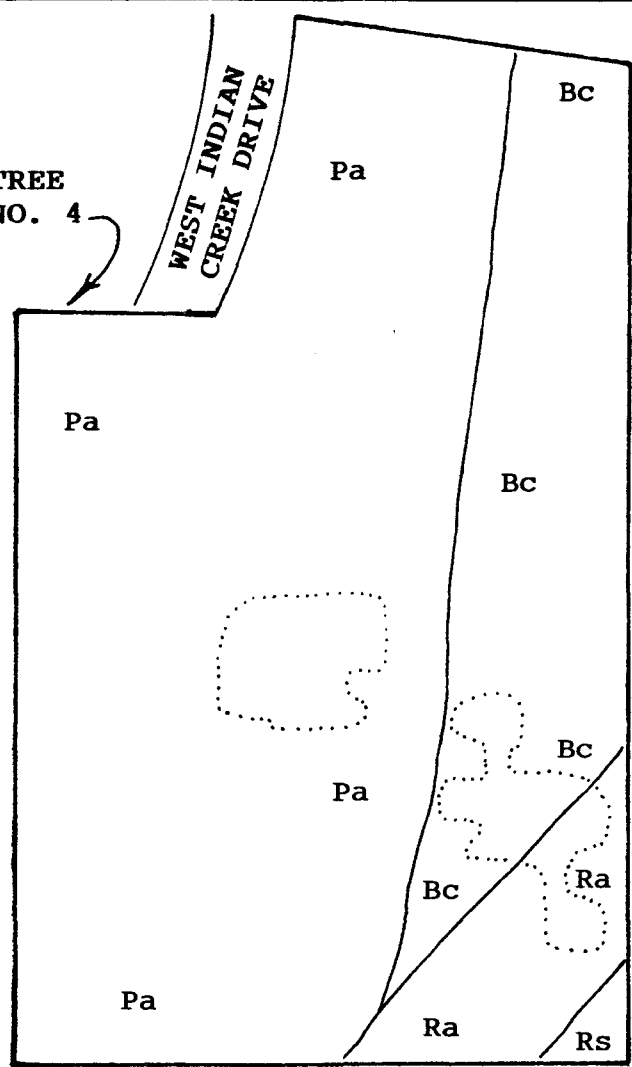
PEPPER TREE FILING NO. 4 -- Panoramic view looking north at a portion of the proposed subdivision. Spoil piles of soil, broken concrete, and other debris can be seen in the right middle of the photos. The Bookcliffs are in the background.

PHOTOS BY JOE G. BARNES

MARCH 18, 1993

PEPPER TREE
FILING NO. 4

WEST INDIAN
CREEK DRIVE



EXPLANATION

- Bc Billings silty clay loam.
- Pa Persayo-Chipeta silty clay loam.
- Ra Ravola clay loam.
- Rs Rough gullied land.

Adapted from "Soil Map, Grand Junction Area, Colorado", SCS, surveyed 1939-40.

Spoil piles of soil, broken concrete, limbs, and waste lumber (sketched 3-13-93).

SOILS MAP

PEPPER TREE FILING NO. 4

MARCH, 1993

Barnes Geologic Consulting, Inc.

Drawn by JGB

SOIL CONSERVATION SERVICE
SOIL DATA SHEET

BILLINGS SILTY CLAY LOAM, 0 to 2 percent slopes, Class IIs Land (Bc)

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

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

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

Soil limitations are classified as severe for local roads and streets (poor traffic-supporting capacity, moderate to high water tables common), shallow excavations (high water tables common), and septic tank filter fields (slow permeability, poor internal drainage, seasonal high water table).

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

RAVOLA CLAY LOAM, 0 to 2 percent slopes, Class IIs Land (Ra)

This soil has developed in material that consists largely of reworked Mancos shale but includes an appreciable amount of sandy alluvium from the higher Mesaverde formation. The surface of these deposits is relatively level, but the depth of the deposits ranges from 5 to 30 feet. The soil is associated with the Billings silty clay loams and the Ravola fine sandy loams.

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

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

No severe limitations exist for this soil type.

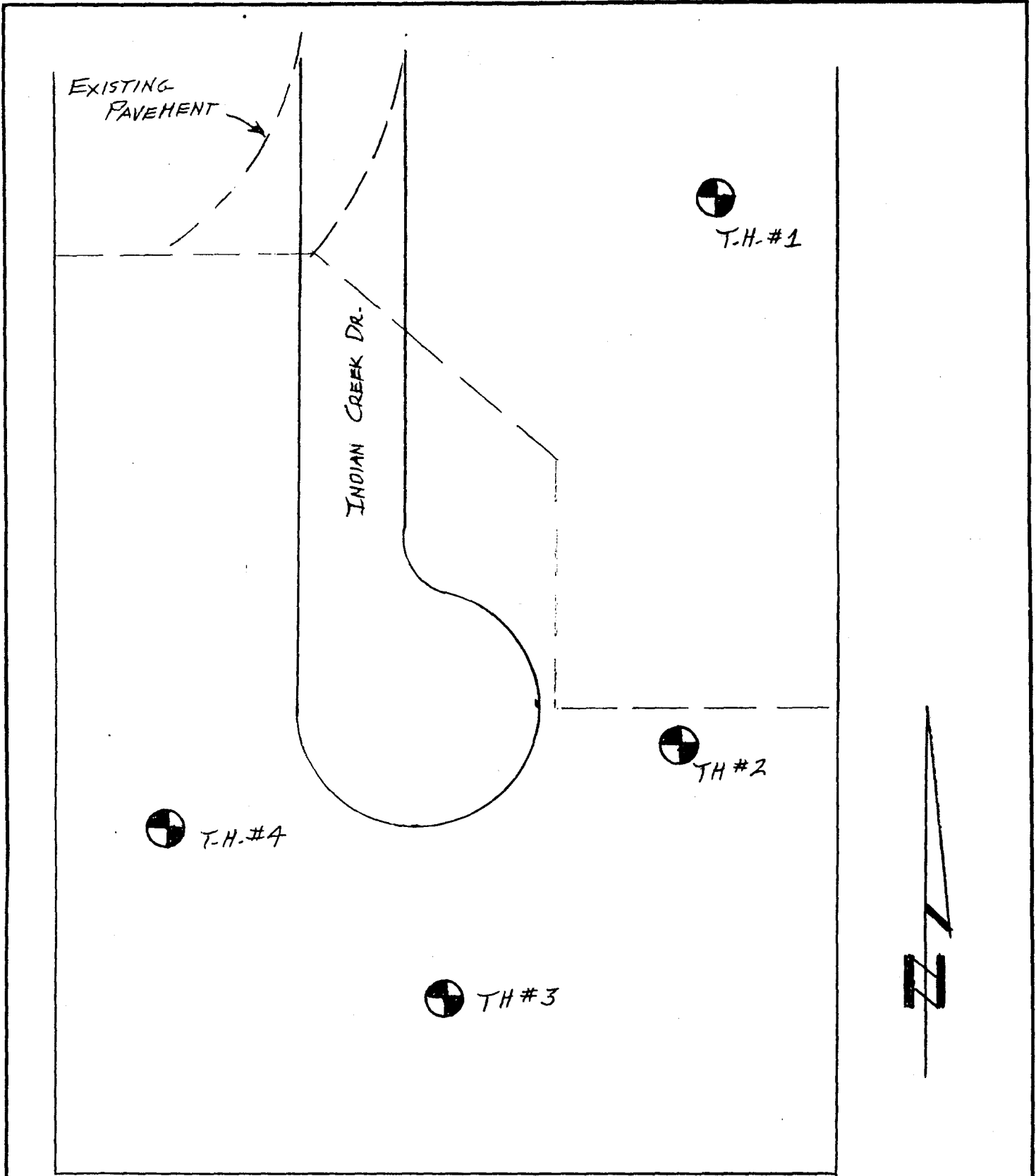
SOIL CONSERVATION SERVICE
SOIL DATA SHEET

ROUGH GULLIED LAND, Class VIIIe (Rs)

This land type is the product of erosion, gullying, and gully-bank caving of Billings soil material.

Erosion, facilitated by occasional mountain freshets and surface flow of irrigation waste water, continues until a gully has been cut down to the sandy substratum. The small continuous flow of irrigation waste water down the gully keeps the sandy substratum wet during the irrigation season. Some irrigation water applied on the fields adjoining the gully follows animal burrows or seeps down through the soil material until it reaches the sandy substratum. It then trickles out into the gully in small springlike veins and carries the saturated sandy material with it. Eventually, the high bank is undermined and topples down into the gully. The underground erosion and caving continually widen the gully. Some of the gully banks are already 50 to 400 yards apart. Unless waste water from irrigated land is disposed of through corrugated iron outlets, the cropland bordering the gullies gradually caves away.

Soil limitations are classified as severe for local roads and streets (slopes, flood hazard), shallow excavations (slopes, flood hazard), dwellings with basements (steep slopes, erosive soil materials), dwellings without basements (steep slopes, erosive soil materials), sanitary land fill (clayey textures, flooding, steep slopes), septic tank absorption fields (slopes), and sewage lagoons (slopes, flood hazard.)



Lincoln DeVore, Inc.
Geotechnical Consultants

PEPPERTREE SUB. FILE III G-J-

IBX, INC-

DATE
3-27-93

JOB NO.
77975-J

DRAWN
EHM

NO SCALE

		BORING NO. 1		PENETRATION RESISTANCE	IN-SITU DENSITY [PCF]	MOISTURE CONTENT [%]
DEPTH [FT]	SAMPLE	ELEVATION:	DESCRIPTION			
5	(I)		ALLOVIAL LOW PLASTIC CLAY & SILTY CLAY LOW DENSITY - MOIST STRATA OF SULFATES INCREASING MOISTURE - VERY SILTY SHALE FRAGMENTS - SILTY STRATA VERY MOIST - LOW TO MEDIUM DENSITY	S.T.		13.6%
10	(II)		WEATHERED MANCOS SHALE @ 8' STRATA OF SULFATES MEDIUM DENSITY STRATA OF SILTSTONE EXPANSIVE INCREASING DENSITY - MOIST	SPT 14/6 39/12 85/18		12.4%
15	(II)			SPT 28/6 76/12		11.5%
NO FREE WATER DURING DRILLING						
3-15-93						

LOG OF SUBSURFACE EXPLORATION



Lincoln DeVore, Inc.
Geotechnical Consultants

PEPPER TREE SUB. FIL III G.J.

IBX, INC.

DATE
3-27-93

JOB NO.
77975-J

DRAWN
EMM

		BORING NO. 2		PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)
DEPTH (FT)	SAMPLE	ELEVATION:	DESCRIPTION			
5			SILTY CLAY SANDY ALLUVIAL (I) LOW PLASTIC CLAY - V. MOIST LOW DENSITY STRATA VERY SILTY - ALLUVIAL VERY MOIST TO WET - STRATIFIED LOW TO MEDIUM DENSITY COMPRESSIBLE	SPT 5/8 9/12 13/18		13.6%
10			(I) VERY WEATHERED MANCOS SHALE STRATA OF SULFATES - SOFT VERY STRATIFIED INCREASING DENSITY	ST	108.9	16.5%
15			(II) T.D. @ 15' WET, BUT NO FREE WATER DURING DRILLING MARCH 15, 1993	SPT		15.4%

LOG OF SUBSURFACE EXPLORATION



Lincoln DeVore, Inc.
Geotechnical Consultants

PEPPER TREE SUB. FIL. III G-J.

IBX, INC.

DATE
3-27-93

JOB NO.
77975-J

DRAWN
EMH

DEPTH (FT)	SYMBOL	SAMPLE	BORING NO. 3		PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)	
			ELEVATION:	DESCRIPTION				
5		I	SILTY, SANDY CLAY ALLUVIAL, LOW PLASTIC - SULFATE MEDIUM DENSITY - SOME HIGHER DENSITY STRATA VERY WEATHERED SHALE? - VERY HIGH SULFATES	VERY MOIST	S.T.	114-3	15.1%	
10		II	MANCOS SHALE @ 7 1/2' EXPANSIVE T.D. @ 7 1/2'	DENSE MOIST VERY SILTY STRATA VERY DENSE, NEAR DRILL REFUSAL	S.P.T.	45 6 93 143 / 12 15	10-8%	
15			NO FREE WATER DURING DRILLING 3-15-93					

LOG OF SUBSURFACE EXPLORATION



Lincoln DeVore, Inc.
Geotechnical Consultants

PEPPERTREE SUB. FIL III, G.J.

IBX, INC.

DATE
3-27-93

JOB NO.
77975-J

DRAWN
EHM

DEPTH (FT)	SYMBOL	SAMPLE	BORING NO. 4		PENETRATION RESISTANCE	IN-SITU DENSITY (PCF)	MOISTURE CONTENT (%)
			ELEVATION:	DESCRIPTION			
5		I	ALUVIAL-STRATIFIED SILTY CLAY and LOW PLASTIC SILT		SPT 14/6 29/12 54/18		12.6%
			LOW PLASTIC SILT - VERY MOIST MEDIUM DENSITY VERY STRATIFIED SULFATES				
10		II	VERY HIGH SULFATES ABOVE SHALE MANCOS SHALE		SPT 20/6 45/12 80/18		10.5%
			VERY DENSE-STRATIFIED SULFATES, EXPANSIVE SILTSTONE STRATA				
NO FREE WATER DURING DRILLING 3-15-93							

LOG OF SUBSURFACE EXPLORATION



Lincoln DeVore, Inc.
Geotechnical Consultants

PEPPER TREE SUB. FILL III G-J.

IBX, INC

DATE

3-27-93

JOB NO.

77975-J

DRAWN

EMM

SOILS DESCRIPTIONS:		ROCK DESCRIPTIONS:		SYMBOLS & NOTES:	
SYMBOL	USCS DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Topsoil		SEDIMENTARY ROCKS CONGLOMERATE		9/12 Standard penetration drive Numbers indicate 9 blows to drive the spoon 12" into ground.
	Man-made Fill		SANDSTONE		ST 2-1/2" Shelby thin wall sample
	GW Well-graded Gravel		SILTSTONE		W ₀ Natural Moisture Content
	GP Poorly-graded Gravel		SHALE		W _x Weathered Material
	GM Silty Gravel		CLAYSTONE		Free water table
	GC Clayey Gravel		COAL		γ ₀ Natural dry density
	SW Well-graded Sand		LIMESTONE		T.B. - Disturbed Bulk Sample
	SP Poorly-graded Sand		DOLOMITE		② Soil type related to samples in report
	SM Silty Sand		MARLSTONE		15' W _x Form. Top of formation
	SC Clayey Sand		GYPSUM		⊕ Test Boring Location
	ML Low-plasticity Silt		Other Sedimentary Rocks		⊠ Test Pit Location
	CL Low-plasticity Clay		IGNEOUS ROCKS GRANITIC ROCKS		↔ Seismic or Resistivity Station. Lineation indicates approx. length & orientation of spread (S = Seismic, R = Resistivity)
	OL Low-plasticity Organic Silt and Clay		DIORITIC ROCKS		
	MH High-plasticity Silt		GABBRO		
	CH High-plasticity Clay		RHYOLITE		
	OH High-plasticity Organic Clay		ANDESITE		
	Pt Peat		BASALT		
	GW/GM Well-graded Gravel, Silty		TUFF & ASH FLOWS		
	GW/GC Well-graded Gravel, Clayey		BRECCIA & Other Volcanics		
	GP/GM Poorly-graded Gravel, Silty		Other Igneous Rocks		
	GP/GC Poorly-graded Gravel, Clayey		METAMORPHIC ROCKS GNEISS		
	GM/GC Silty Gravel, Clayey		SCHIST		
	GC/GM Clayey Gravel, Silty		PHYLLITE		
	SW/SM Well-graded Sand, Silty		SLATE		
	SW/SC Well-graded Sand, Clayey		METAQUARTZITE		
	SP/SM Poorly-graded Sand, Silty		MARBLE		
	SP/SC Poorly-graded Sand, Clayey		HORNFELS		
	SM/SC Silty Sand, Clayey		SERPENTINE		
	SC/SM Clayey Sand, Silty		Other Metamorphic Rocks		
	CL/ML Silty Clay				

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

REVIEW COMMENTS

Page 1 of 8

FILE NO. #38-93

TITLE HEADING: Preliminary Plan - Pepper Tree,
Filing #4

LOCATION: F Road and 29 Road

PETITIONER: IBX, Inc.

PETITIONER'S ADDRESS/TELEPHONE: 640 South 12th Street
Grand Junction, CO
241-0604

PETITIONER'S REPRESENTATIVE: Rolland Engineering

STAFF REPRESENTATIVE: David Thornton

**NOTE: WRITTEN RESPONSE BY THE PETITIONER TO THE REVIEW COMMENTS IS
REQUIRED ON OR BEFORE 5:00 P.M., APRIL 27, 1993.**

UTE WATER DISTRICT
Gary R. Mathews

4/8/93
242-7491

Ute Water will supply this project. The 8" water main will be installed in the road approximately 2-3' from curb and gutter. The developer needs to contact Ute Water to discuss what method of metering is available for domestic water service. The existing 8" water main is adequate for Filing #4.

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

U.S. WEST
Leon Peach

244-4964
244-4964

New or additional telephone facilities necessitated by this project may result in a "contract" and up-front monies required from developer, prior to ordering or placing of said facilities. For more information call Leon Peach, 244-4964.

CITY DEVELOPMENT ENGINEER
Gerald Williams

4/14/93
244-1591

See attached comments.

CITY PARKS & RECREATION DEPARTMENT
Don Hobbs

4-8-93
244-1542

Based upon the approximate unit number of 37 @ \$225.00 per unit - open space fee due is \$8,325.00.

GRAND JUNCTION FIRE DEPARTMENT
George Bennett

4/12/93
244-1400

The fire hydrant placement looks fine.

A fire flow survey needs to be conducted prior to a building clearance for is issued to determine the required flows. Please submit a completed stamped set of building plans for our review.

4/19/93 - The Fire Department is unable to approve the plans as submitted since the proposed line length feeding the end hydrant is in excess of 1,000 feet. The Department would consider a decrease in the proposed number of units per building to meet the requirements of the ordinance dealing with line lengths and hydrant spacing.

GRAND JUNCTION POLICE DEPARTMENT
Mark Angelo

4/14/93
244-3587

Because existing roadway narrow, recommend either (preferred) no on-street parking, or one side of street only. If this is the case, there is inadequate parking for owners and/or tenants and at least one guest in front of some of the townhomes. Radius for circular offset should be the same as what is required for a cul-de-sac turn around, minimum dimensions residential court.

What is the proposed lighting for the parking lots and on the buildings?

What is the proposed landscaping?

CITY UTILITIES ENGINEER
Bill Cheney

4/15/93
244-1590

Incomplete information on "Utility Plan". Nothing is stated on the drawing referencing the removal of existing utilities, vacating existing easements or providing new easements for the new alignment. All of these items will have to be addressed on the Final submittal if the Preliminary Plan is approved.

CENTRAL GRAND VALLEY SANITATION DISTRICT
S.T. Labonde, P.E.

4/15/93
464-5134

See attached letter.

MESA COUNTY PLANNING
Matt Osborn

4/16/93
244-1724

There is a need for this type and density of housing in the valley which we support. We do have some concerns regarding the single access onto F Road and the number of left hand turns required. It appears that the townhomes are oriented around the parking lots. The Final Plan should include a landscaping plan that will break-up the expanse of pavement. Will there be any common areas proposed?

PUBLIC SERVICE COMPANY
Dale Clawson

4/12/93
244-2695

ELECTRIC & GAS: Require 14 foot utility easement along east, west and south perimeters of property, and that common open space be also dedicated as utility easement.

STAFF ANALYSIS:

The proposal is for a continuation of the existing Pepper Tree Subdivision which currently contains 43 townhomes on 4 acres (Filings 1, 2, and 3) developed in 1982. At that time a preliminary development plan was approved for the entire 8.3 acres for 89 attached dwelling units. The current proposal for filing 4 is a modification of that original approval in the road alignment, an increase in the size of units and a decrease in the number of units. The number of units proposed was 37 units which has been modified to 33 units to comply with the water line ordinance (Ordinance #2627). If Ordinance #2627 is modified prior to the petitioners submitting a final plan/plat on the south end of the development, they may propose adding the 4 additional units at that time, provided it's allowed by the ordinance. The proposed development continues the character established in filings 1, 2 and 3.

Issues and Comments

An easement should be provided south from the cul-de-sac to the newly dedicated ROW for future water line extension and looping. The petitioner has agreed to provide an easement.

The proposed roadway does not meet current standard for width, however, it is consistent with the roadway width through the existing filings of Pepper Tree. The City Engineer may require that the ROW be signed for "no parking".

Required parking, as per the Zoning and Development Code, is 2 spaces per unit for all one family dwellings up to and including four family dwelling units. For all multi-family dwelling units, five and greater per structure, 1 1/2 space per dwelling unit is required, plus one additional space per every five spaces for recreational vehicles and/or visitor parking. The petitioner has indicated that the proposed parking does meet the requirements.

The final plat/plan will require the vacation of the existing ROW that is to be realigned. A ROW vacation requires a recommendation by Planning Commission and an ordinance by City Council.

Development and maintenance of the common open space must be addressed with the final plat/plan submittal.

The Final Plan submittal must also address the following: 1) provide stormwater conveyance swales at the west, east, and south sides of the subdivision; 2) provide scales on drawings; and 3) the triplex appears to be beyond the 150-foot radius fire protection limit.

Parks and Open Space fees will be due prior to recording any of the plats for the number of units included in that filing.

The revised site plan submitted in response to review comments shows a 5' setback along the east and west property lines. The original proposal was for a 10' setback. The 10' setback should be required.

The petitioner is proposing to use the existing irrigation system for the proposed development. The existing facilities should be adequate to service the new area. Details on that system will be provided with the final submittals.

All other review agency comments have been addressed or will be addressed at final plan/plat stage.

STAFF RECOMMENDATION:

Staff recommends approval of the Preliminary Plan subject to any outstanding agency comments being addressed with the final submittals and with the condition that the setbacks along the east and west property lines be 10' instead of 5' as proposed.



WestWater Engineering

Consulting Engineers

502 WEST EIGHTH ST.
April 15, 1993

P.O. BOX 1470-PALISADE, COLORADO 81526

(303) 464-5134

City of Grand Junction
Community Development Dept.
Attn: Kathy Portner
250 North 5th Street
Grand Junction, CO 81501

RE: Central Grand Valley Sanitation District Review Comments
on Preliminary Sewer Layout for the Pepper Tree Filing #4
Subdivision

Dear Ms. Portner,

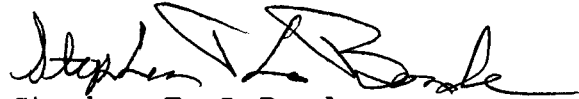
The following are Central Grand Valley Sanitation District's review comments on the preliminary sewer collection system layout for the Pepper Tree Filing #4 Subdivision:

1. Existing sewer lines should be designated with a dashed line and existing manholes with an open circle. New sewer lines should be designated with a solid line, and new manholes designated by solid circles. We ask that these drafting standards be met to clearly differentiate between existing sewers and proposed new sewerline extensions.
2. The proposed new sewer lines, in combination with the existing sewer lines, appear to provide a looped sewer system. We assume some of the existing sewer lines are to be abandoned, since they would be located under the new building structures. If so, the sewer lines to be abandoned should be designated as such, with a clear designation showing disconnection from the proposed sewer system.
3. Proposed sewer service lines to the individual town-homes should be shown on the preliminary layout.
4. The existing sewer lines at the discharge point to the District's system should be shown to indicate the location of the outfall from the subdivision.
5. The proposed method of service for the first phase of the development is acceptable. All taps to the existing sewer main will be accomplished by the District upon notification from the petitioner and payment of the appropriate tap fees.

6. The proposed new sewer line in the southwest corner of the property is shown to be approximately 3 feet from the proposed building footprint. The District will require a minimum 10 foot separation between the new sewer line and any building structure.
7. Upon acceptance of the preliminary sewer plan, it will be necessary for the petitioner to submit final Plans on the proposed new sewer line extensions, to include the utilities composite, and detailed plan and profile sheets. Easements will be required where the sewer line is not located within the street right-of-way, even though located within the common area of the subdivision.
8. The petitioner will also be required to execute the District's Sewer Line Extension Application and Agreement upon submittal of the final design plans.

Please have the petitioner revise the preliminary sewer plan and resubmit to the District for their final review and approval.

Respectfully,



Stephen T. LaBonde
District Engineer

STL/sc

cc: Edith Kinder, Central Grand Valley Sanit. Dist.
Bill Cheney, City of Grand Junction
Tom Rolland, Rolland Engineering
Pat Tucker, IBX Inc.

Preliminary Plan PEPPER TREE - Filing No. 4

April 26, 1993

Response to Review Comments

Location: F Road and 29 Road

Petitioner: IBX, Inc.

Petitioner Representative: ROLLAND ENGINEERING

Response Prepared by: Trevor Brown

RECEIVED GRAND JUNCTION
PLANNING DEPARTMENT

APR 27 1993

Ute Water District (Gary R. Mathews)

We have contacted Ute Water District to discuss metering for domestic water service. At this time we are planning to service each set of units with a single meter.

U.S. West (Leon Peach)

T. Brown contacted Leon Peach 4-23-93. U.S. West will create a contract with IBX, Inc. when final plans are received/approved. Phone service will follow utilities (electric and gas).

City Development Engineer (Gerald Williams)

All items addressed on drawings.

City Parks and Recreation Department (Don Hobbs)

Open Space Fees are acceptable. We are planning on completing Pepper Tree in Phases and therefore we would prefer that fees be paid on a pro-rate basis based upon the number of units that are being completed during a particular Phase. (i.e. Phase I will have 5 units; 5 units * \$225.00/unit = \$1,125.00 due at final acceptance of Phase I).

Grand Junction Fire Department (George Bennett)

We have adjusted the fire hydrant location so it does not exceed the 1000 foot limit. We have also adjusted the number of units per building to comply with the fire code (i.e. 2 or less units 250 feet from hydrant; more than two units 150 feet from hydrant). This affects the most southern building only. These buildings will be completed in a later phase of construction and should revisions be made to the 1000 foot limit we will request reconfiguration back to our original concept at that time.

Grand Junction Police Department (Mark Angelo)

1) We accept the recommendation of no on-street parking. Parking areas will be sized per City of Grand Junction Planning Specifications. Any circular offsets will meet radius requirements.

2) Proposed lighting for parking lots and buildings will be the same style and quantity as presently installed at Pepper Tree.

3) The Present Pepper Tree landscaping will be continued into the new development.

City Utilities Engineer (Bill Cheney)

We have indicated on the drawing the existing utilities we will be removing. We are uncertain at this time if recorded easements exist for these proposed removals. New easements will be provided for all utilities.

Central Grand Valley Sanitation District (S. T. Labonde, P.E.)

- 1) Drafting standards delineating existing and proposed sewer lines will be met.
- 2) Some of the existing sewer line will be abandoned and will be clearly designated on the plan.
- 3) Typical proposed service to individual townhomes is shown.
- 4) See plan drawing.
- 5) Petitioner will notify the District and pay appropriate tap fees for first phase of development when the final for Phase I is accepted.
- 6) Ten foot separation between new sewer lines and buildings will be maintained.
- 7) Final plans will be submitted upon acceptance of the preliminary sewer plan. Detailed plan and profile sheets along with a utilities composite will be included.
- 8) The petitioner will execute the District's Sewer Line Extension Application upon submittal of the final design plans.

Mesa County Planning (Matt Osborn)

Left hand turns onto F Road are a concern because of the single access nature of Pepper Tree. A left hand turn into Pepper Tree should not pose a problem because of the center turning median on F Road. We believe that the characteristics of prospective buyers/homeowners at Pepper Tree are such that their traffic flow patterns will not contribute to existing peak flow traffic patterns

Townhomes are oriented around the parking lots. Landscaping will be similar to existing Pepper Tree landscaping. The final plan will include landscaping. All areas except for the townhome footprints are considered common areas.

Public Service (Dale Clawson)

The utility easement will be 14 feet. Easements will be provided for service to townhomes.

Community Development (Kathy Portner)

- * The original tailings report by Arix identified tailings deposits only at a small area in the original development of Pepper Tree. We assume that these tailings deposits were taken care of during the original construction. No tailings were found in the area of the present Pepper Tree, Filing No. 4.
- * Utility easements will be provided.
- * The roadway will be a no parking area.
- * We will meet requirements for number of parking spaces.
- * Sanitary sewer concerns regarding abandonment and relocation are shown on drawing.
- * Final plat/plan will vacate existing ROW that is being realigned. We will ask for a recommendation from Planning Commission and an ordinance by City Council at that time.
- * Development and maintenance of the common open space will be addressed with the final plat/plan submittal.

STAFF REVIEW

FILE: #38-93
DATE: April 28, 1993
STAFF: Kathy Portner
REQUEST: Preliminary Plan--Pepper Tree, Filing #4
LOCATION: South-West of F Road and 29 Road
APPLICANT: IBX Inc.

EXISTING LAND USE: Undeveloped

PROPOSED LAND USE: Residential

SURROUNDING LAND USE:

NORTH: Residential
SOUTH: Undeveloped
EAST: Agricultural
WEST: Undeveloped

EXISTING ZONING: PR-20 (Planned Residential, 20 units per acre)

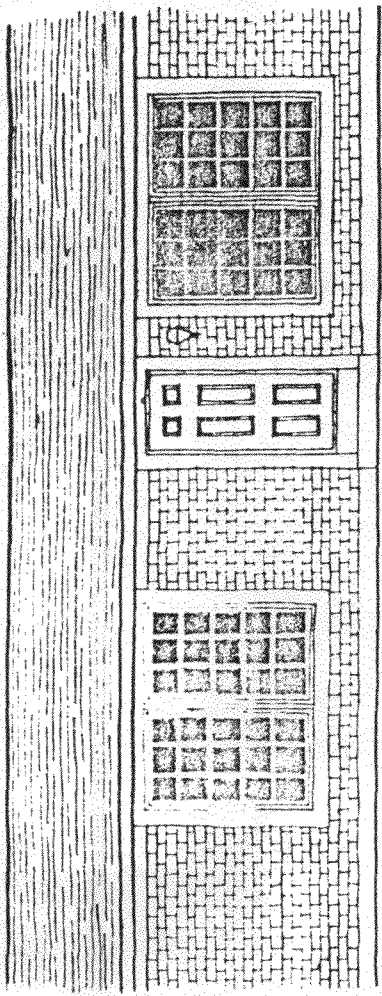
PROPOSED ZONING: PR-20

SURROUNDING ZONING:

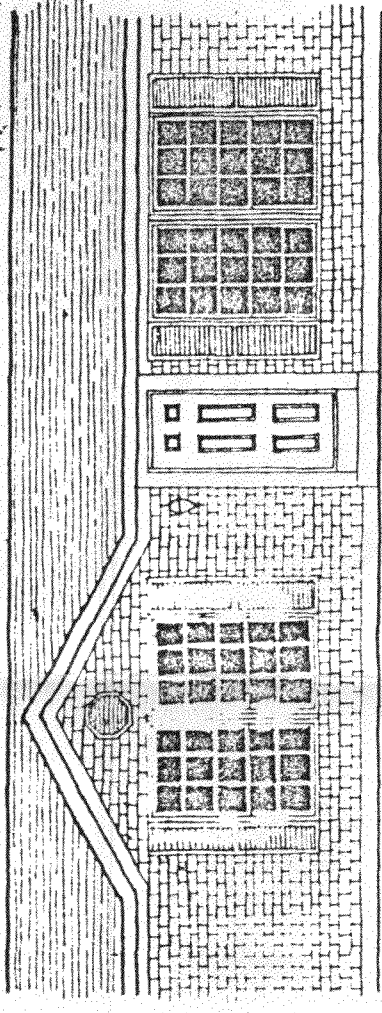
NORTH: PR-20
SOUTH: RSF-5
EAST: County zoning R-2
WEST: County zoning R-2

RELATIONSHIP TO COMPREHENSIVE PLAN:

There is no Comprehensive Plan for this area. The Patterson Road Corridor Guidelines suggest that in this area, new residential development with 10 units per acre is the most compatible and appropriate density. This proposal meets that guideline with a designed density of 9.25 units per acre.

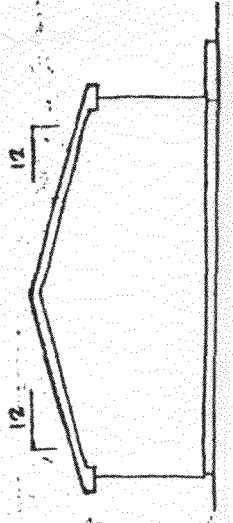


32'-0"
ELEVATION 1

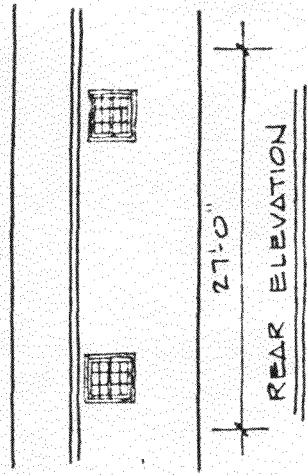


32'-0"
ELEVATION 2

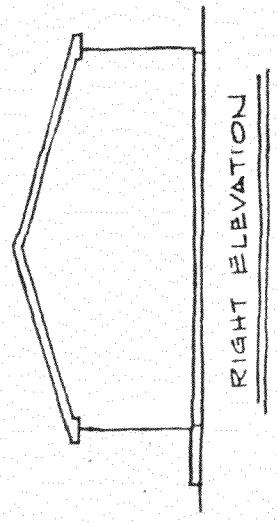
FRONT ELEVATIONS



LEFT ELEVATION



REAR ELEVATION



RIGHT ELEVATION

- RIDGE VENT
- 240" ASPHALT SHINGLES
- PRE-FINISHED FASCIA
- VINYL SHUTTERS
- 7-1/2" CEILING HGT
- * FUNCTIONAL VENTED SOFFIT
- BRICK VENEER (BY BUILDER FIELD INST.)
- * SEE CROSS SECTIONS

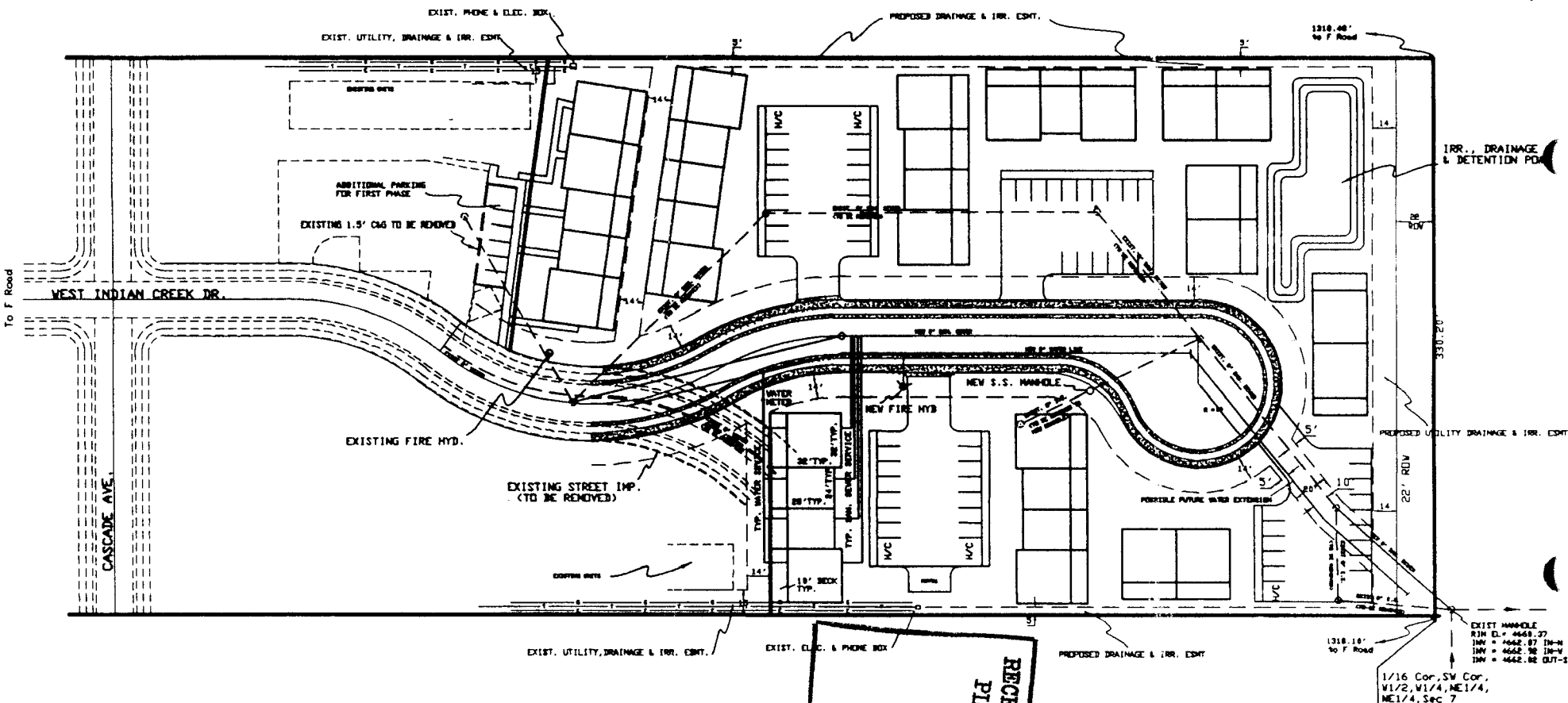


DRAWING NUMBER	01701	PROJECT	Baybourn Woods	DRAWING NUMBER	NORMANDY II
DATE	1/10	DRAWN BY	S	CHECKED BY	
SCALE	1/4" = 1'-0"	HOUSE NUMBER		DATE	1/25/01
NOTICE		CHANGE		SHEET	1 OF 9
OPTIONAL		DATE			
OPTIONAL		DATE			

PEPPER TREE FILING NO. 4

INDIAN WASH

BENCH MARK
MCSM CORNER 29TH & F ROAD
ELEVATION = 4683.11



COMMON OPEN SPACE WILL EITHER BE DESIGNATED AS AVAILABLE FOR UTILITY INSTALLATION, OR EASEMENT CORRIDORS WILL BE PROVIDED ON FINAL PLAN. PROPOSED BUILDINGS WILL BE TOWNHOMES AND LOT BOUNDARIES WILL COINCIDE WITH BUILDING AND DECK FOOTPRINTS.

1/16 Cor. SW Cor. V1/2, V1/4, NE1/4, NE1/4, Sec 7
EXIST. MANHOLE
RIM EL. = 4649.37
10W = 4642.87 IN-W
10N = 4642.78 IN-W
10E = 4642.86 OUT-1

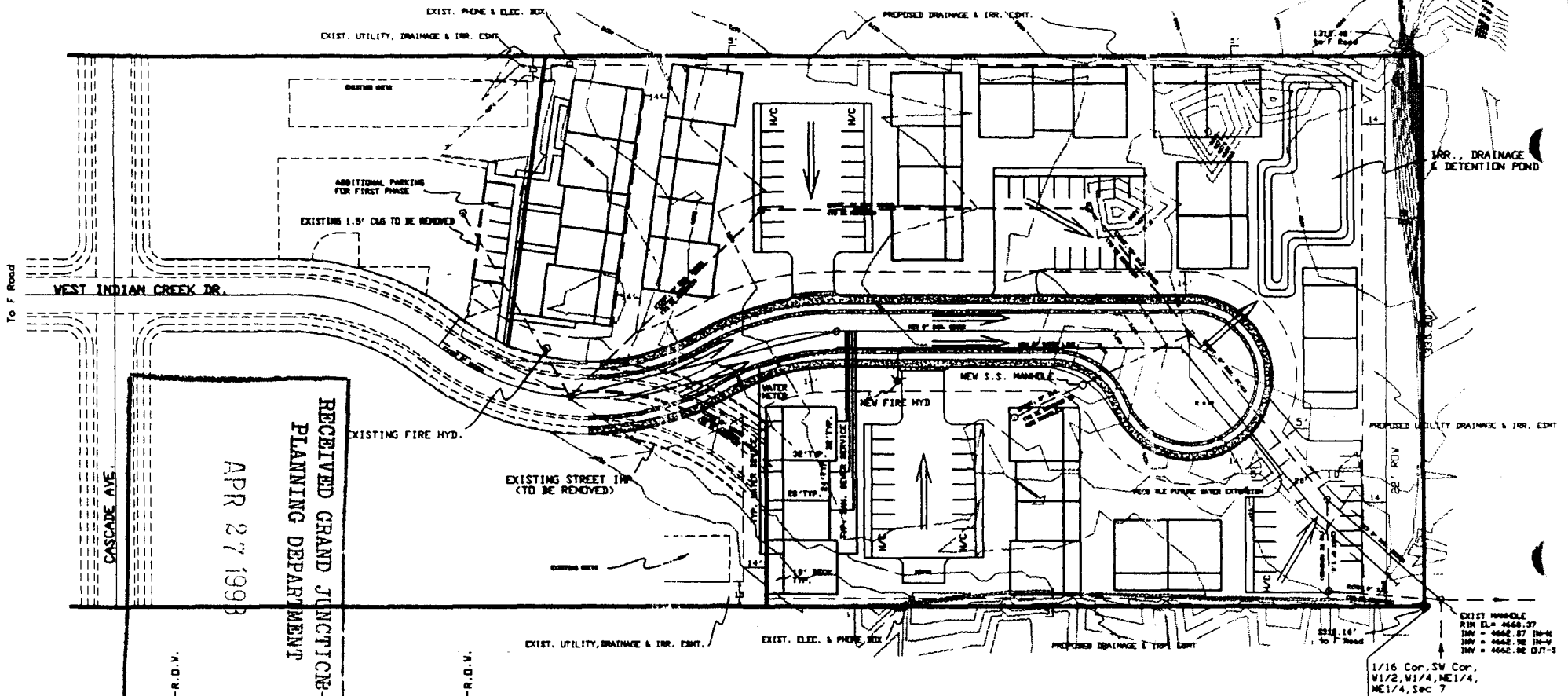
RECEIVED GRAND JUNCTION
 PLANNING DEPARTMENT
 APR 27 1993

	PEPPER TREE FILING NO. 4 PRELIMINARY UTILITY PLAN
	ROLLAND ENGINEERING 405 RIDGES BLVD. GRAND JUNCTION, CO. 81502 (303) 242-8188

PEPPER TREE FILING NO. 4

INDIAN WASH

BENCH MARK
NCSM CORNER 25TH & F ROAD
ELEVATION = 4689.11



DRAINAGE NOTES

THE SITE PRESENTLY DRAINS TO THE SOUTH AND EAST INTO A DRAIN DITCH THEN INTO INDIAN WASH WHICH RUN ABOUT 60 FEET FROM THE SOUTH EAST CORNER.

SHEET FLOW FROM PROPERTY TO THE WEST OF THE SITE IS INTERCEPTED ALONG THE WEST PROPERTY LINE IN A DITCH AND CONVEYED TO INDIAN WASH.

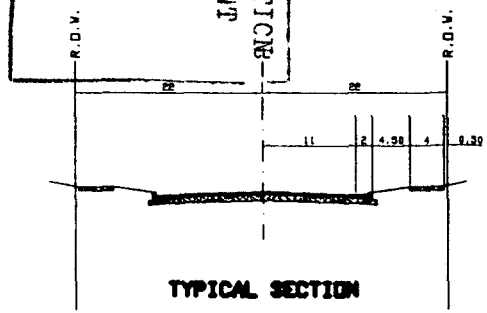
THERE WILL BE NO IMPACT TO ADJACENT PROPERTIES BECAUSE HISTORIC DRAINAGE PATTERNS AND FLOWS WILL NOT BE CHANGED

→ DIRECTION OF STORM WATER FLOW. PARKING AREAS MAY ALSO BE UTILIZED FOR STORM WATER DETENTION.

IT IS ANTICIPATED AT THIS TIME THAT ALL STORM WATER CONVEYANCE (OTHER THAN RELEASE FROM THE POND) CAN BE ACCOMMODATED WITH SURFACE FLOW.

COMMON OPEN SPACE WILL EITHER BE DESIGNATED AS AVAILABLE FOR UTILITY INSTALLATION, OR EASEMENT CORRIDORS WILL BE PROVIDED ON FINAL PLAN. PROPOSED BUILDINGS WILL BE TOWNHOMES AND LOT BOUNDARIES WILL COINCIDE WITH BUILDING AND DECK FOOTPRINTS.

TYPICAL SECTION
V. INDIAN CREEK DR.



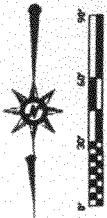
ROLLAND ENGINEERING
405 RIDGES BLVD.
GRAND JUNCTION, CO. 81502
(303) 242-8200

PEPPER TREE FILING NO. 4
PRELIMINARY
SITE PLAN

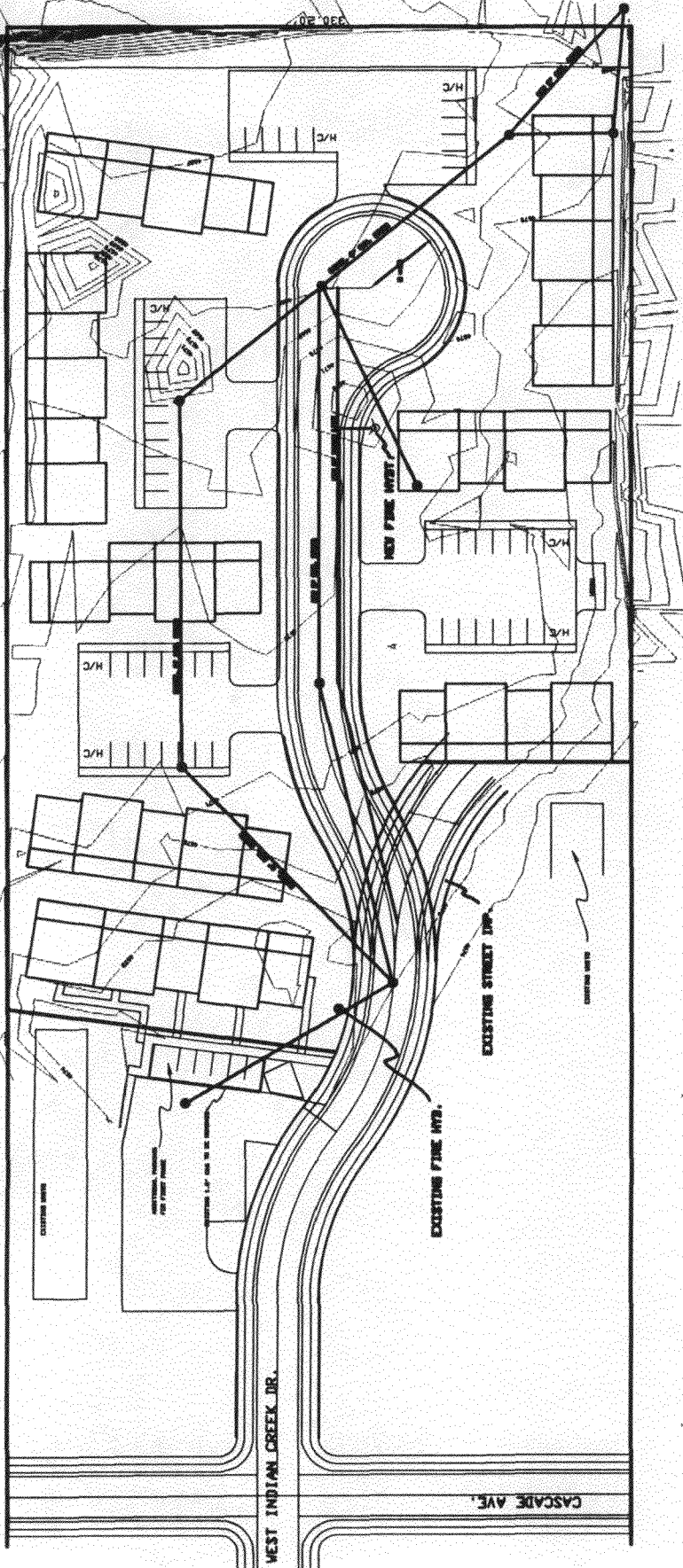
4/27/93

PEPPER TREE FILING NO. 4

BENCH MARK
NCHN CORNER 25TH & F ROAD
ELEVATION = 4689.11



INDIAN WASH

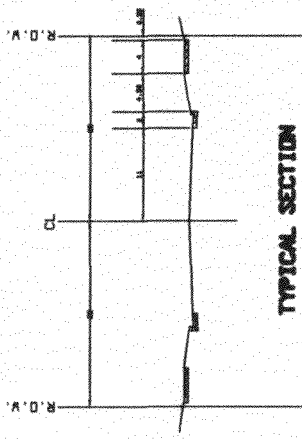


Original
Do NOT Remove
From Office #38 93

	PEPPER TREE FILING NO. 4 PRELIMINARY SITE PLAN
	<small>ROLLAND ENGINEERING 145 RIVERS BLVD. 2908 JUNCTION, CO. 81502 (303) 555-5991</small>

DRAINAGE NOTES

THE SITE PRESENTLY DRAINS TO THE SOUTH AND EAST INTO A DRAIN DITCH THEN INTO INDIAN WASH WHICH RUN ABOUT 60 FEET FROM THE SOUTH EAST CORNER. SHEET FLOW FROM PROPERTY TO THE WEST OF THE SITE IS INTERCEPTED ALONG THE WEST PROPERTY LINE IN A DITCH AND CONVEYED TO INDIAN WASH. THERE WILL BE NO IMPACT TO ADJACENT PROPERTIES BECAUSE HISTORIC DRAINAGE PATTERNS AND FLOWS WILL NOT BE CHANGED



TYPICAL SECTION
V. INDIAN CREEK DR.