PLANS/PLATS ON FILE

FILE DESC: F-22/D014

PLANS/PLATS 0

R. WARD HONNICUTT, CHAIRMAN
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RONALD D. BROWN, DIRECTOR

LARRY A. BLAIR
EXECUTIVE ENGINEER

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 PROSPECT N.E. ALBUQUERQUE, N.M. 87107
TELEPHONE (505) 884-2111

RECEIVED
MAR 17 1989
HYDROLOGY SECTION

March 10, 1989

Parks & Recreation Department
Attn: Mr. Rex Funk
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

RE: John Robert Dam and the Redivision of Lot 28-A, Block 2, Vista Del Sandia

Dear Mr. Funk:

Following the appearance of members of the John B. Robert Neighborhood Association at the February 23, 1989 AMAFCA Board Meeting, the Board directed me to write a letter amplifying AMAFCA's position with regard to proposed development.

AMAFCA has previously provided Bohannan-Huston, Inc. with technical comments in our letter of December 19, 1988 (copy attached).

Reference is also made to the Neighborhood Association's letter of February 21, 1989 (copy attached).

AMAFCA's portion is as follows:

- Fill imported from outside the reservoir area is not objectionable, provided it does not diminish reservoir capacity in a manner which would compromise the design capacity of the John B. Robert Dam. From the construction drawings we have determined that the 100-year storm maximum flood pool elevation is 5770.5 and the elevation of the emergency spillway crest is 5770.9. Between this elevation difference (0.4 feet) a volume of 8.3 acre feet is available.

- We do not require that fill be taken from the reservoir area. We have investigated the placement of a retaining wall on the northerly side of Lot 28-A and determined that the additional fill below elevation elevation 5772.0 would not cause any compromise of the dam design criteria.

We have also investigated the potential of using a maximum 6 foot high retaining wall at the northerly property line with the remaining transition to the existing grade being accomplished by the placement of fill on the lands to the north of Tract 28-A. This method would place approximately 1.4 acre feet of fill below elevation 5772.0 and reduce the volume of the dam by 1.4 acre feet. We would normally require that the

placement of fill be accompanied by an equivalent amount of borrow from the dam pool area. Considering the objections from the John B. Robert Neighborhood Association to the removal of such material, and the fact that 8.3 acre feet is available in the 100-year design freeboard, AMAFCA would not object to 1.4 acre feet of fill using borrow sources outside of the Dam area.

- We do not object to borrow material being removed from the reservoir area; however, a decision to allow for such borrow must be made by your office. If such is permitted, we strongly recommend that erosion be controlled by limiting slopes to about 4 or 5 Horizontal to 1 Vertical. If steeper, the slopes should be limited to 10 feet slope length. We strongly recommend the construction of erosion control measures, such as rock mulch or revegetation, depending on the location of the borrow site.

- We will require that inspection of the proposed engineered fill be done by a Registered Engineer, who must certify that such construction was done in accordance with approved plans and specifications.

- Any private use of AMAFCA's easement on the lands north of Lot 28-A, for the permanent placement of fill material, will require approval of an agreement by AMAFCA's Board of Directors. State Engineer approval of the construction drawings will also be required.

The City of Albuquerque holds the fee title to the lands north of Lot 28-A and AMAFCA holds an easement for the operation and maintenance of John B. Robert Dam. It is therefore appropriate that the City take the lead in deciding how its land can be utilized. AMAFCA is prepared to provide further advice to the City to assure the safe operation of the Dam.

Sincerely,

Larry A. Blair

Larry A. Blair, PE
Executive Engineer

cc: Robert Wolfe, 209 Creek Drive NE, Albuquerque
Kerry L. Davis, Bohannan-Huston, Inc.
Bernie Sujka, John B. Robert Neighborhood Association
Fred Aguirre, City of Albuquerque, Hydrology, PWD
Dan Hogan, City of Albuquerque, Chief Drainage Engineer, PWD
George Selvia, City of Albuquerque, PWD
Walt Nickerson, City of Albuquerque, City Engineer
Don Lopez, State Engineer's Office

Albuquerque
Metropolitan
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R. H. SWINBURNE, CHAIRMAN
WILLIAM V. HERFORD, VICE-CHAIRMAN
REX FUHR, SECRETARY-TREASURER
H. WARD HUNNICUTT, DIRECTOR
SHEILA GARCIA, DIRECTOR

LARRY A. BLAIR
EXECUTIVE ENGINEER

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

2600 PROSPECT N.E. ALBUQUERQUE, N.M. 87107
TELEPHONE (505) 884-2215

December 19, 1988

Kerry L. Davis, P.E.
Bohannan-Huston, Inc.
7500 Jefferson NE, Courtyard I
Albuquerque, New Mexico 87109

RE: Redivision of Lot 28-A, Block 2, Vista Del Sandia

Dear Mr. Davis:

On November 28, 1988, we received a copy of a Conceptual Grading and Drainage Plan and a letter to Roger Green of the City of Albuquerque concerning Vista Del Sandia Subidivision. The plan shows elevations and grading for four single family lots. The plan also includes grading on land lying north of Vista Del Sandia. AMAFCA holds an easement on the land to the north for the existing flood pool of John Robert Dam.

On December 5, 1988, we received a letter from you which included an update to the Conceptual Grading and Drainage Plan and a new geotechnical report prepared by Vinyard and Associates, Inc.

The following are AMAFCA's comments concerning the plan and letters and plans submitted:

1. AMAFCA has no objection to the placement of buildings, parking areas, driveways and sidewalks on Lot 28-A, Block 2 of Vista Del Sandia provided that the finish floors, basement floors, and finish grades are constructed above elevation 5772. It appears that the project proposed will be in compliance with this requirement. AMAFCA's easement at this site should not be vacated since the restrictions imposed by the easement must remain in place for any future construction.

2. We note that the lots will drain to Paseo del Oso, and to the concrete rundown at the westerly boundary. AMAFCA has no objection to this drainage concept. The City of Albuquerque must approve the storm water discharge into its street and drainage rundown.

3. The plan proposes to place earth fill on the John Robert Dam easement to a finish grade of 3:1 to 2.5:1. This fill is to be placed on existing grades having slopes as steep as 3:1. Fill heights up to 18 feet are proposed. The safety, integrity, and safe functioning of John Robert Dam is AMAFCA's primary concern.

More specifically, our concern is that the proposed fill (and buildings) will be stable under all types of reservoir operating conditions, so that a slide will not occur which might block the principal spillway, or otherwise affect the operation of the dam. The safety of the structures in Lot 28-A will depend on the long term stability of the fill slopes. Because AMAFCA will have no direct control over the quality of construction, we will not assume responsibility for any damages to buildings and adjacent facilities on Lot 28-A, should they occur. The report prepared by Vinyard and Associates appears to address the issues of slope stability and construction methods which most concern us regarding the dam. This report and the specifications in the report should be included in the construction plans for the fill areas.

4. Section III of the Manual of Rules and Regulations Governing the Appropriation and Use of the Surface Waters of the State of New Mexico, by the State Engineer contains specific requirements for changes and amendments for projects. We believe that the magnitude of changes to the John Robert Dam flood pool, as proposed by the grading plans submitted, clearly require State Engineer approval. We will be submitting the plans you are preparing to the State Engineer.

5. The material for construction of the fill areas is proposed to come from the Flood Pool areas of John Robert Dam. We will need a plan detailing the location, construction criteria, and soil disturbance restoration provisions for the cut areas. If proposed cut slopes are to be substantially steeper than the existing basin slopes, a geotechnical investigation will be required in the cut areas. The location of excavation and fill areas should also be coordinated with the City Parks and Recreation Department since they may have recreation and trail uses existing or proposed within the basin.

6. We note that in the Spring, 1988 the City of Albuquerque placed a subsurface drain in Paseo del Oso and on Lot 28-A to relieve groundwater problems in a lot across from this subdivision. This pipe should be shown on the Plans along with any notes on the relocation by project construction.

7. We note that two retaining walls are proposed along the northerly boundary. Will the foundations for this wall require an encroachment agreement from the City?

8. The private access easement as shown on the Grading and Drainage Plan is 22 feet wide. Should the easement on the proposed final plat match this width? It is currently shown at 18 feet wide.

9. Comments numbered 3, 4 and 5 herein are based on the assumption that the City of Albuquerque will permit the excavation and grading of its fee title property. The district court judgment (No. 3-76-01371) affecting this property stated that "the earth and other material used for the fill may be provided by petitioner at no cost to the landowner from lands of the petitioner adjacent to said tract and east of the Juan Tabo Dam, as the petitioner may direct." The petitioner at that time was AMAFCA; subsequent to this decision the lands were conveyed to the City of Albuquerque with AMAFCA retaining a drainage easement.

The judgment did not contain any rights to fill the lands of the petitioner. The City of Albuquerque, through its Parks and Recreation Department, may determine that it is not in its best interest to allow for excavation or fill on its property. If this is their decision, development of Lot 28-A, would likely require the use of retaining walls and fill from sources other than the John Robert (Juan Tabo) Dam flood pool. Based on the contour map submitted, we have determined that 0.166 acre feet of storage would be deleted from the 100-year flood pool (to elevation 4772) if a retaining wall was constructed across the northerly boundary of Lot 28-A. There is sufficient height in the elevation of the emergency spillway to accommodate this quantity in the 100-year flood pool. AMAFCA therefore will consent to the placement of fill from outside sources on Lot 28-A should the City not allow excavation from the dam area. A decision on whether or not to allow for fill and cut must come from the City of Albuquerque, subject to review by AMAFCA. Subject to appropriate design and construction, AMAFCA can accommodate either option.

10. Mitigation of soil erosion during construction should be included in the drainage plan. Your certification concerning personal inspection of the land and accuracy of the existing contour map should be added to the plans.

Please note that the City of Albuquerque may have additional comments concerning this plan since they hold the fee title to the lands proposed for grading and drainage.

Sincerely,
AMAFCA

Clifford E. Anderson
Drainage Engineer

cc: Roger Green, Public Works Hydrology, City of Albuquerque
C. Robert Wolfe, 209 Creek Drive, NE Albuquerque
Fred Sanchez, Albuquerque Surveying Company
Roberto Albertorio, Zoning Hearing Examiner, City of Albuquerque

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

February 21,1989

Albuquerque Metropolitan Arroyo Flood Control Authority
2600 Prospect Ave. NE
Albuquerque, New Mexico 87107

Dear Boardmembers,

This letter is intended to bring to your attention concerns of the John B. Robert Neighborhood Association regarding the proposed removal of additional soil from the ponding area of the John B. Robert Dam.

Previous excavation permitted by the City has been costly to the taxpayer. Removal of soil for use as fill by a Townhome developer resulted in excessive erosion. These concerns were expressed by the Bear Canyon Arroyo and Bear Tributary Corridor Planning Committee in their report dated October 14, 1987. Issues were Item 2: "Broke Off Channel (east of Juan Tabo) is eroding" and Item 6: "Topsoil removed from the John B. Robert Dam area has displaced wildlife and caused increased bank erosion." The City was required to spend in excess of $170,000.00, to correct the damage, protect private property, and to ensure the safety of children playing in the area.

We also want to call to your attention the fact that while a District Court Judgement, No. 3-76-01371, dated February 23, 1977 permits the AMAFCA to give soil from the ponding area to adjacent landowners it does <u>not</u> require the City to do so. It also requires that landowners obtain consent from the City prior to using fill from any other source.

If additional soil removal from the dam ponding area is allowed, erosion on adjacent properties is certain to increase. Should the City determine that it is in their best interest to permit developers to remove additional soil for use as fill, we feel that the developer should be required to submit a bond in an amount sufficient to cover the costs of repairing and preventing any damage therefrom.

We would appreciate the opportunity to meet with the entire Board, or with selected members, at a time convenient to you.

Respectfully yours,

Bernie Sujka

Bernie Sujka
Vice President
John B. Robert Neighborhood Association

RECEIVED
FEB 22 1989
AMAFCA

Copy to:

ANAFCA
Larry Blair
Clifford Anderson
Jeff Baker

Richard J. Chapman, City Council District 8
Mary Lou Haywood-spell, Office of Neighborhood Services

Dan Hogan, PWD Design Engineering
Janet Sayers, Parks and Recreation
Paula Donahue, Planning Department

HYDROLOGY F22/D14 3 PLANS

F 22/D14

3 PLANS

TABLE 1

STREET	FROM	TO	Area symbol	A acres	C	AC	ΣAC	T min.	189/(25+T) I in./hr.	Q c.f.s.	Slope %	Length ft.	Avg Vel. ft/sec	ΔT min.	Allow. Q	NOTES
Off site																
Manitoba	Tramway	E/o Key West	1	6.6	.45	3.0		18	4.4	13	4.0	830	3.5	4		
Manitoba	Key West	Montego	2	5.0	.6	3.0	6.0	22	4.0	24	3.7	1200	5.0	4		
Manitoba	Montego	Basin	3	14.0	.6	8.4	14.4	26	3.7	53	5.7	280	6.0	1		
Manitoba	Basin	Danube	4	3.3	.6	2.0	16.4	27	3.6	59	3.7	1200	6.0	3		
Manitoba	Danube	Cairo	5	13.0	.6	7.8	24.2	30	3.4	82	3.7	530	7.0	1		
Manitoba	Cairo	Sarasota	6	4.0	.6	2.4	26.6	31	3.4	90						
Key West	Manitoba	Cul-de-sac	7	9.9	.6	5.9		18	4.4	26						Velocity at intersection abt 6 ft/sec vel. head .6 depth about .4' all flows should turn & enter Bear Canyon Arroyo via easement.
Key West	Culdesac	Danube	8	5.9	.6	3.5		12	5.1	18						
			9	0.8	.4	.3		10	5.4	2						
			8&9				3.8	12	5.1	19.4	3.5	1300	5	4		
Key West	Danube	Cairo	10	7.9	.6	4.7	8.5	16	4.6	39	4.3	420	5.6	1		
Key West	Cairo	Easement	11	2.8	.6	1.7	10.2	17	4.5	46						D=.47 V=6.5 $V^2/2g$=.7 Flow splits proportional to width of channel. If we assume all flow is on N.W. side of street split will be 50-50.
Key West	Flow in street					[redacted]	5.1	17	4.5	23						
Junction Key West & Manitoba							31.7	31	3.4	108	2.8	700	8	1		V=9 ft/sec D=.72 within capacity of st.
Manitoba	Key West	Juan Tabo	12	4.2	.6	2.5	34.2	32	3.3	113						
ON SITE																
			E1	.8	.4	.3		10	5.4	1.6						Area 9 above.
			E2	3.7	.4	1.5		10	5.4	8.1						Drains directly to Bear Canyon Arroyo
			E3	2.6	.4	1.0		10	5.4	5.4						Drains directly to Bear Canyon Arroyo
			E4	3.4	.4	1.4		10	5.4	7.6						Drains directly to Bear Canyon Arroyo
			E5	8.1	.33	2.7		10	5.4	14.6						Drains directly to Juan Tabo Dam
			E6	1.3	.4	0.5		10	5.4	2.7						Drains offsite and goes directly to Dam
			E7	1.1	.3	0.3		10	5.4	1.6						Flows to Manitoba & Juan Tabo

TABLE 1

Presley Company of New Mexico
STORM DRAINAGE COMPUTATIONS

Existing Conditions
Vista del Sandia
Dominant

BASED ON RATIONAL METHOD Q = CIA

Q = Design peak runoff rate in c.f.s.
C = Runoff coefficient
A = Watershed area in acres

I = Rainfall intensity in in./hr. for 100 year storm. Intensity-duration relationship

TABLE 2

STREET	FROM	TO	Area symbol	A acres	C	AC	ΣAC	T min.	159/(25+T) I in/hr.	Q c.f.s.	Slope %	Length ft	Avg Vel. ft/sec	ΔT min.	Allow. Q	NOTES
Manitoba	Tramway	E/O Key West	1	6.6	.45	3.0		18	4.4	13	4.0	830	3.5	4		
Manitoba	Key West	Montego	2	5.0	.6	3.0	6.0	22	4.0	24	3.7	1200	5.0	4		
Manitoba	Montego	Basin	3	14.0	.6	8.4	14.4	26	3.7	53	5.7	280	6.0	1		
Manitoba	Basin	Danube	4	3.3	.6	2.0	16.4	27	3.6	59	3.7	1200	6.0	3		
Manitoba	Danube	Cairo	5	13.0	.6	7.8	24.2	30	3.4	82	3.7	530	7.0	1		
Manitoba	Cairo	Sarasota	6	4.0	.6	2.4	26.6	31	3.4	90						
Key West	Cul de sac	Danube	8	5.9	.6	3.5		12	5.1	18						
			D1	1.7	.6	0.7	4.2	12	5.1	21.4	3.5	1300	5	4		
Key West	Danube	Cairo	10	7.9	.6	4.7	8.9	16	4.6	41	4.3	420	5.6	1		
Key West	Cairo	Easement	11	2.8	.6	1.7	10.6	17	4.5	48						Assume Flow split 50-50
Flow	Remains in	Key West					5.3		4.5	24						
Junction	Key West &	Manitoba					31.9	31	3.4	108	2.8	700	8	1		
Manitoba	Key West	Juan Tabo	12	4.2	.6	2.5	34.4	32	3.3	114						
ONSITE			D1	1.2	.6	.7		10	5.4	3.8						Increase of 2cfs to Danube
			D2	9.2	.65	6.0		15	4.7	28.4						With offsite 52.4 cfs in rundown to dam
			D3	1.1	.9	.9		10	5.4	4.9						Increase of 3cfs to Manitoba
			D4	0.9	.45	.4		10	5.4	2.2						Ponded if not with increase rundown 54.6
			D5	8.6	.4	3.4		10	5.4	18.4						Drains directly to Bear Canyon Arroyo

Presley Company of New Mexico
STORM DRAINAGE COMPUTATIONS Vista del Sandia
Developed Conditions
Designed

BASED ON RATIONAL METHOD Q = CIA

Q = Design peak runoff rate in c.f.s.
C = Runoff coefficient
A = Watershed area in acres

I = Rainfall intensity in in./hr. for 100 year storm. Intensity-duration relationship

TABLE 2

CITY OF ALBUQUERQUE
DRAINAGE COMPLAINT REPORT

Location ..... Sheet ..... of .....

Reported by: GEORGE BASTIAN Phone 299-3093

Address: 11300 PASEO DEL OSO NE Ext.

Complainant ..... Phone .....

Address ..... Ext. .....

Taken by: FRED Date 6-10-87

COMPLAINT WATER SEEPING UP IN THIS FRONT YARD NEXT TO DRAINAGE EASEMENT

Referred to: [illegible]

INVESTIGATION – CAUSE WATER APPEARS TO BE SEEPING UP IN LOW SPOT

Recommendation: .....

Investigated by: [illegible] Date .....

Action taken: ADVISED OF PRIVATE PROBLEM BY PHONE

Taken by: ..... Date .....

Follow Up: .....

Taken by: ..... Date .....

Zone Atlas F22

Drainage Map .....

Complaint Report No. F22-C5

Date .....

Plan No. .....

Date .....

Project No. .....

Approved .....

JAMES D. SMITH
EXECUTIVE ENGINEER

B. H. SWINBURNE, CHAIRMAN
WILLIAM V. HEREFORD, VICE-CHAIRMAN
FRANCES McCOY, SECRETARY-TREASURER
VERNON DOAK, DIRECTOR
RICHARD H. CLOUGH, DIRECTOR

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority
2600 PROSPECT AVE. N.E.
P. O. BOX 25851 - ALBUQUERQUE, N. M. 87125
TELEPHONE 344-3516

March 30, 1978

RECEIVED
MAR 30 1978
CITY ENGINEERS

Mr. Bruno Conegliano, Ass't City Engineer
City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico

Re: Drainage Report for Vista del Sandia
dated February 1978

Dear Bruno:

As a result of a meeting with Kleston Laws, (Presley Development) at our office on March 24, 1978, the above captioned drainage report is approved subject to the following conditions:

(1) Dedication of drainage way (shown as Lot 29 on Replat) as required by City of Albuquerque.

(2) Completion and stabilization of drainage rundown from west end of Key West Drive to base of Juan Tabo Dam. Concrete rundown design as proposed in drainage report must be submitted for joint approval by AMAFCA and City.

If you have any questions, please contact me.

Sincerely yours,

Wiley R. Smith, P.E.
Engineers

cc: Mr. Cleston H. Laws, P.E.
Presley Development
1909 Carlisle Blvd., N.E.
Albuquerque, New Mexico 87110

Presley Company Of New Mexico

February 17, 1978

Mr. V. M. Kimmick, City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

RECEIVED
FEB 17 1978
CITY ENGINEERS

RE: Vista del Sandia

Dear Mr. Kimmick:

Please review the attached drainage report for the subject subdivision. We have enclosed three copies of the drainage report for City and AMAFCA files.

We expect preliminary plat approval on February 22, 1978. The plat was considered by the Administrative Review Board on November 22, 1977, and deferred for 90 days for lack of a Sector Development Plan. The Planning Department's report is attached.

Also included is one copy of the soils report to assist your review. The grading plan will be submitted with the final plat, street and utility plans.

If there are any questions, please call.

Very truly yours,

THE PRESLEY COMPANY
OF NEW MEXICO

Kleston H. Laws

Kleston H. Laws
Vice President

KHL/rh

encl.

1909 Carlisle Blvd., N.E. • Albuquerque, New Mexico 87110 • (505) 265-5811

DRAINAGE REPORT

FOR

VISTA DEL SANDIA

February 1978

PRESLEY COMPANY OF NEW MEXICO
1909 Carlisle Blvd. NE
Albuquerque New Mexico 87106

Kleston H Laws

Kleston H. Laws, N.M. P.E.&L.S. 5628

DRAINAGE REPORT

FOR

VISTA DEL SANDIA

PURPOSE

This report will present to governing agencies the safe and adequate method of handling the 100 year storm for the proposed Vista del Sandia Subdivision. It is prepared in accordance with the City of Albuquerque Subdivision Ordinanace, Section 21.B, and the AMAFCA Drainage Resolution 1972-2. It will demonstrate the proposed subdivision can be properly developed for residential use.

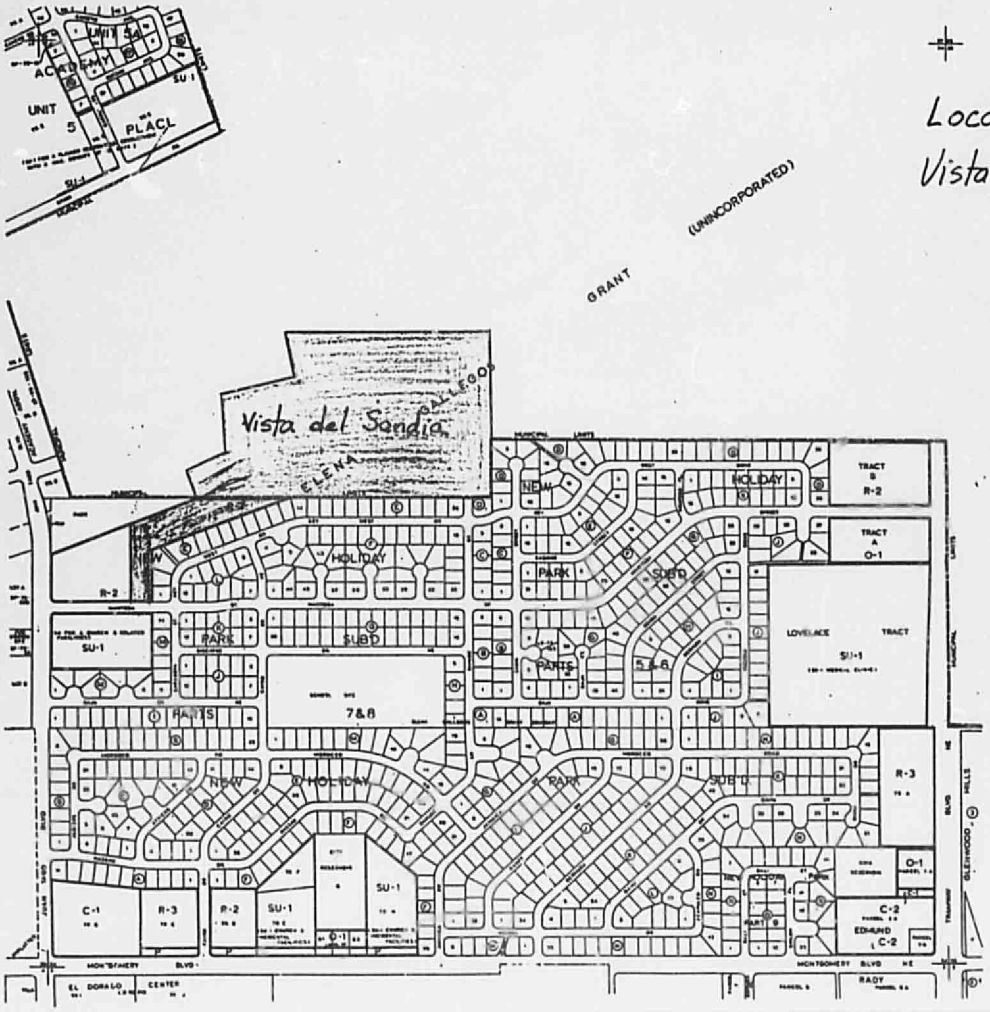
LOCATION AND TERRAIN

The tract is located between New Holiday Park and Bear Canyon Arroyo east of Juan Tabo Blvd. and is shown on the Location Map on the next page.

The tract is quite steep and parallels the Bear Canyon Arroyo. Several arroyos, which originally drained the mesa, cut deeply through this tract. About half of the tract is in the Flood Hazard Area identified by the City of Albuquerque Flood Hazard Zoning Ordinance.

Vegetation is sparse composed of native grasses, bushes, and common weeds. Much of the flatter areas have been disturbed and have very little vegetation. Trash, filling and dumping has greatly altered the original contours and vegetation.

Location Map
Vista del Sandia



F-22-Z

A review of the ortho photo taken by Bohannan, Westman, Huston and Associates in December 1972 for AMAFCA confirms the modification of contours, vegetation and arroyos by the development of New Holiday Park Subdivision.

OFFSITE FLOWS

Offsite flows enter the proposed subdivision through a 15 foot wide drainage easement. Map 1 shows the boundary of the offsite watersheds. Specifically, flows come down Key West Drive to enter the drainage easement. Flows in Manitoba Street also abut the south edge of Vista del Sandia, but do not effect the proposed subdivision. The offsite watershed has been divided into smaller sub basins and the flows are calculated in Table 1.

Tables 1 & 2 use the rational formula to calculate runoff. The time of concentration was taken from a table given in Seelye Design and checked with a graph published by FAA. The rainfall intensity was taken from the Albuquerque Master Plan of Drainage prepared by Herkenoff. Coefficient of runoff for developed property of 0.6 was used in the existing residential area. From the contours it appears some of these lots must have back yard ponding, although ponding was not considered in these calculations. The "C" value of 0.6 is higher than recommended in the technical literature for residential areas. A "C" value of 0.45 used for the undeveloped areas is higher than recommended in most literature. These conservative values were used and should over estimate the flows to be expected in the 100 year flood.

Determining the amount of offsite flow which will enter the easement is most difficult. The flow in Key West Drive would be about 6 inches deep and flowing about 7 feet per second, however, the easement is on a curve the flow momentum will tend to carry the flow to the outside of the curve so these figures may not be accurate. To determine the flow split, it was assumed the flow would be on half of Key West Drive and flow depth and velocity momendum would be acting on the street and easement is equally. Since the width of channel for both the half street and easement is equal the flow would split equally. However, the street is wider and all the flow will not be on half the street which should cause the flow in the easement to be less than half the total flow in the street.

This report will assume half the flow in Key West Drive will flow in the easement and become the offsite flow to the Subdivision. All other offsite flows are in the Bear Canyon Arroyo or blocked by streets and block walls.

BEAR CANYON ARROYO

The flood plain information was taken from the Northeast Heights Drainage Management Plan. It is anticipated the flood plain will be reserved as open space and is certainly controlled by the Flood Hazard Area Zoning Ordinance of the City of Albuquerque.

PROPOSED DEVELOPMENT

The subdivision will be developed as R-1 single family residences. The lots will be 75 to 80 feet wide and 110 to 120 feet deep and range from 8,250 to 9,600 square feet. The buildings will vary from about 2,000 to 2,600 square feet of heated area.

The small gullies which cut into the bank of Bear Canyon Arroyo will be filled. Also some areas along the bank of Bear Canyon Arroyo will be filled and benched to create a pad adequate for the building. All earth work shall be performed in accordance with FHA requirements and the report and specifications in [illegible] F.M. Fox Soil Investigation for Vista del Sandia. A registered professional engineer, competent in soils, will be retained to inspect and certify the earth work.

The 100 year flood plain will not be developed or altered by cutting or filling except in the area of the backwater of the Juan Tabo Dam, which if filled, must have an equal amount of material removed from the detention area of the dam. This arrangement is in accordance with the agreement made with AMAFCA when the property was acquired. The large boulders will be rolled randomly to the toe of the Bear Canyon Arroyo bank to act as revetments and help developed velocity changes in the arroyo flow which should cause material to settle thus encouraging the arroyo to stay more nearly in the center of the wide 100 year flood plain.

The runoff from the lots directly enters Bear Canyon Arroyo or is conveyed into the Juan Tabo Dam. Only lots which cannot be graded to drain to a street will be ponded. Most of the subdivision will drain directly to the arroyo or the detention Dam.

Offsite flows enter the subdivision at one location where both onsite and offsite flows will be conveyed to the dam area by a rundown constructed

of concrete.

Map 2 and Table 2 shows the drainage basins and flow calcuations for the subdivision. Note the maximum water depth in the street will be about 7 inches.

PROPOSED DRAINAGE IMPROVEMENTS

Paseo del Oso will convey onsite flows to the low spot where the existing easement presently delivers the offsite flows. A concrete valley gutter will be placed across the street and a rundown constructed to the toe of the bank to prevent erosion. West of the existing homes in New Holiday Park, Paseo del Oso will convey flows to Manitoba. Thence in Manitoba, to Juan Tabo Blvd. where the storm drain and street will convey the flows to Bear Canyon Arroyo. Table 2 shows there is no increase in street flow in Manitoba when Vista del Sandia is developed.

CONCLUSIONS

Flows can adequately be handled in existing and proposed streets.

Flows are conveyed to a major drainage facility without exceeding the capacity of any facility as required by the AMAFCA Drainage Resolution.

The drainage easement will be concrete lined to carry the flows from Paseo del Oso to the dam and prevent erosion.

Appendix

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SOIL INVESTIGATION
VISTA DEL SANDIA SUBDIVISION
ALBUQUERQUE, NEW MEXICO

Prepared For
The Presley Company of New Mexico

Job No. 31102021500
November 2, 1977

ALBUQUERQUE CHEYENNE DENVER PORTLAND SPOKANE TEHRAN

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SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

1. Subsoil conditions across the site are fairly erratic and vary with depth. Soils consist primarily of coarse to fine grained, clean to very silty, loose to dense sand, with intervals of medium dense to dense sand and gravel.

2. The residences in the subdivision should be supported on conventional spread footings founded on compacted natural soils or structurally controlled fill, and designed for a maximum soil bearing pressure of 1500 pounds per square foot.

3. Neither ground water nor bedrock were encountered in the test holes.

4. Other design and construction considerations are presented in this report.

GENERAL

This report presents the results of a subsoil investigation conducted at the site of the proposed Vista Del Sandia Subdivision, to be located immediately north of the New Holiday Park Subdivision, Parts 7 and 8, between Juan Tabo Boulevard, N.E. and Danube Street, N.E., Albuquerque, New Mexico.

The purpose of this investigation is to determine the safest and most economical types and depths of foundations, allowable soil bearing pressures, ground water conditions, and any special precautions which should be taken for the design and construction

of the residences due to soil and ground water conditions.

The conclusions and recommendations presented in this report are based on data compiled during the site investigation, on the results of laboratory testing, and on our experience with similar soil conditions. Factual data gathered during the field and laboratory investigations are presented in Figures 1 through 8 and Table 1.

PROPOSED CONSTRUCTION AND SITE CONDITIONS

It is our understanding, from information supplied to this office by The Presley Company of New Mexico, that the lots will be developed with single and two-story dwelling units. It is assumed that the residences will be of woodframe and brick veneer, or stucco-type construction. To our knowledge, no basements are planned, and the floors will be concrete slabs-on-grade. Wall loads for the structures are anticipated to be on the order of 1500 to 2000 pounds per linear foot.

The subject site is bounded on the north by the Bear Canyon Arroyo and the Albuquerque Metropolitan Arroyo Flood Control Authority's Juan Tabo Dam. The site is bounded on the west by Juan Tabo Boulevard, N.E., and on the east by Holiday Park, Parts 5 and 6. On the south, the site is bounded by Manitoba Street, N.E., and New Holiday Park, Parts 7 and 8.

Portions of the site are very steep with slopes ranging from approximately 0% on the southern portion of the site to approximately 30% on the northern portion of the site near Bear Canyon

Arroyo. As shown on the Test Hole Location Plan, Figure 1, three small arroyos cross the site; two in the central portion; and one in the northeastern portion. The estimated maximum relief across the area is on the order of 100 feet. The site is covered by natural vegetation consisting of brush, cacti, weeds, and substantial areas are covered with surface debris and probable man-made fill. There are large boulders located within all three of the arroyos and surrounding areas across the site. These boulders have an estimated maximum size of approximately 8 feet in diameter. It is estimated that substantial amounts of cut and fill will be required to develop the site.

SUBSOIL CONDITIONS

As shown on the Logs of Test Holes, Figures, 2, 3, 4 and 5, subsoil conditions across the site are fairly erratic and vary with depth. The soils generally consist of coarse to fine-grained, clean to very silty, loose to dense sand. Small intervals of sand and gravel were encountered in Test Holes #2, #3 and #14. In Test Holes #11 and #12, man-made fill was encountered from the surface to a depth of 4.0 feet.

Neither ground water nor bedrock were encountered in any of the test holes to depth 20 feet, the maximum depth of exploration.

Areas of man-made fill and debris of an undefined depth were encountered across the site, refer to Test Hole Location Plan, Figure 1. The extent of the surface fill can best be determined by continuous inspection during earthwork operations.

The soils encountered in the test holes are non-swelling. The slightly silty to very silty sands encountered across the site will consolidate under light to moderate building loads when wetted. Some of these silty sands possess high dry strengths, but are susceptible to changes in moisture content. Without protection from an increase in natural moisture content, excessive settlements can be expected, refer to Swell-Consolidation Tests, Figures 5 through 8. The amount of possible settlement can be minimized by means of densification of the soil, as well as other positive methods designed to control the moisture content.

FOUNDATIONS - CONVENTIONAL SPREAD FOOTINGS

Settlement is the governing criteria for the foundation design of the residences due to the erratic nature of the slightly silty to silty sands encountered across the site. The residences should be supported on conventional spread footings, founded on compacted natural soils, or structurally controlled fill, and designed for a maximum soil bearing pressure of 1500 pounds per square foot.

Prior to the placement of structurally controlled fill, and subsequent to final grading in cut sections, the natural soils should be moistened to optimum moisture content (± 2%), for a minimum of 5 feet, or for as deep as practicable, and compacted to 95% of maximum density as determined by ASTM D-1557, with a minimum of 8 passes using a heavy vibratory roller. Any structurally controlled fill placed for the foundation support should be placed as detailed in the attached Appendix, "Earthwork Specifications". Should the use of a vibratory roller pose a

threat to the structural integrity of the surrounding buildings, a heavy pneumatic roller may be used in its place. No foundation should bear in a zone of existing man-made fill. Existing fill should be removed and replaced with structurally controlled fill.

Special care should be taken to insure that prior to the footing placement, all materials disturbed or loosened in the excavation process are recompacted to 95% of maximum density as determined by ASTM D-1557. The footings should be proportioned as much as practicable in order to minimize differential settlement. A minimum strip footing width of 16 inches is recommended. Exterior footings should be placed a minimum of 18 inches below final grade for frost protection.

INTERIOR FLOOR SLAB CONSTRUCTION

Interior floor slabs should be supported on compacted natural soils, or structurally controlled fill. Subsequent to the placement of utilities and prior to slab placement, disturbed soils should be compacted to 90% of maximum density as determined by ASTM D-1557. Fill placed for slab support should be compacted in accordance with the specifications as outlined in the attached Appendix.

It is good practice to separate slabs from all bearing members and utilities to allow their independent movement. However, if desired, slabs may be tied into the foundation walls. Where concentrated loads are anticipated, a gravel layer should be placed beneath the slab to help distribute these loads. Frequent joints should be scored in the slab to control the location of any cracking.

REINFORCING

It is recommended that the foundation walls be well reinforced to minimize the effects of differential settlements, refer to foundation design for details.

BACKFILL AND SURFACE DRAINAGE

The foundation soils should be prevented from being wetted after construction. Backfill around the foundation should be moistened and compacted. Only enough water should be added to the backfill material to allow proper compaction. Do not puddle or jet backfill.

The final grade should have a good slope away from the foundation walls on all sides. A minimum of 1 foot of fall in the first 10 feet is recommended. Drainage from roofs, with our without gutters and downspouts, should not be allowed to pond in the backfill adjacent to the foundation walls. Backfill should be protected from erosion and subsequent ponding of water by suitable means.

Any ponding areas required to control surface runoff should be located as far from the foundation walls as possible, a minimum of 15 feet.

REMOVAL OF ON-SITE BOULDERS

Boulders encountered across the proposed subdivision are not suitable for use as fill or foundation support, and should be removed from the site.

SUITABILITY OF ON-SITE MATERIALS AS PAVEMENT SUBGRADE

The materials encountered across the site satisfy the requirements for a CBR value of 20 by satisfying the schedule of requirements for Gradation and Atterberg Limits as stated in Section 104.2 of the City of Albuquerque's Contract Documents for City-Wide Utilities and Paving.

CONSTRUCTION INSPECTION

The recommendations outlined above are based on the current plans for the proposed development. If the plans are modified in the future, we should be contacted to review our recommendations. In any soil investigation, it is necessary to assume that the subsoil conditions do not vary greatly from the conditions encountered in the test holes. Should varying conditions be encountered, we should be contacted.

It is highly recommended that a continuous program of field inspection be implemented to insure that the above recommendations are satisfied. It is advisable that we be called to supervise and inspect the fill placement.

We will be glad to discuss the details of this report with you. Thank you for the opportunity of working with you on this project.

F. M. FOX & ASSOCIATES OF THE SOUTHWEST, INC.

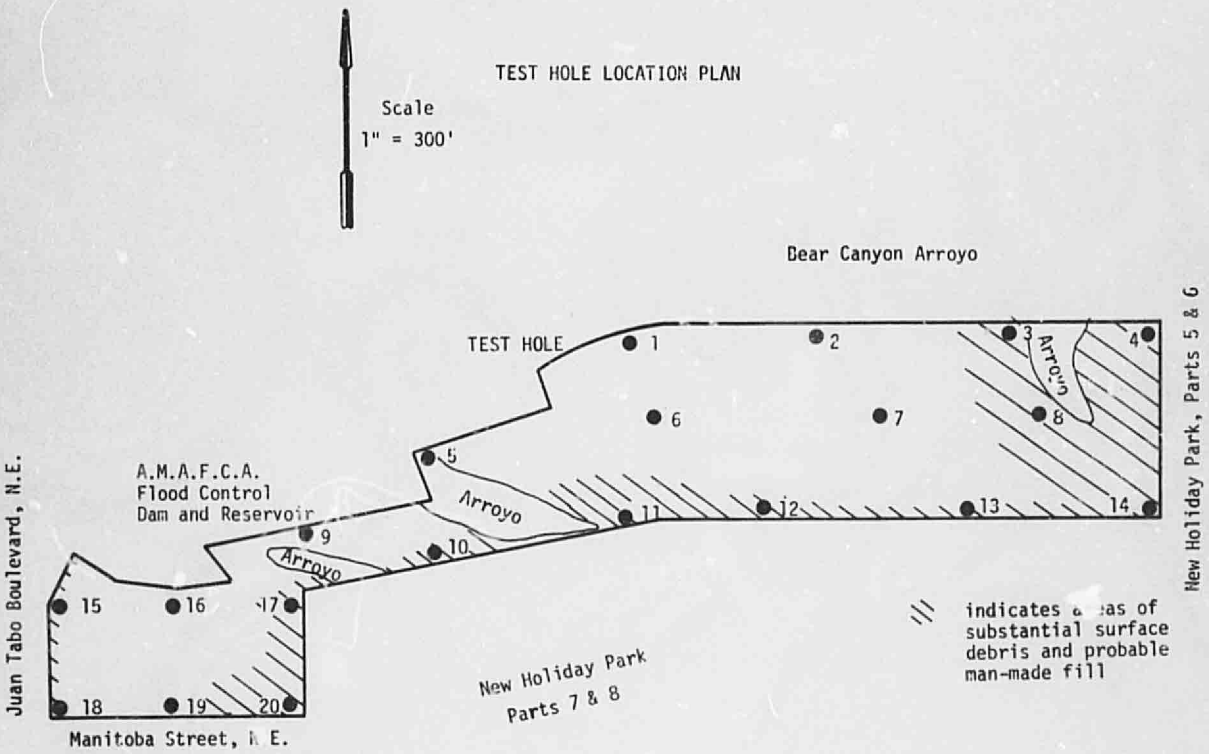
Joseph L. Sullivan
Staff Engineer

CHARLES M. MILLER
STATE OF NEW MEXICO
No. 6018
REGISTERED PROFESSIONAL ENGINEER

Reviewed by:

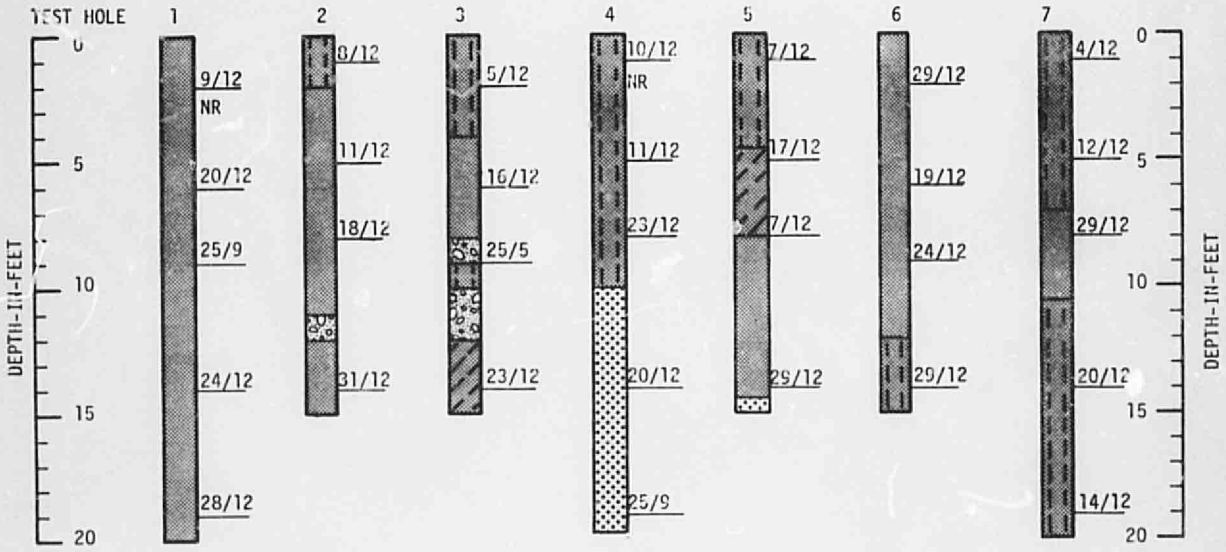
Charles M. Miller
Professional Engineer

Copies: Addressee (15)



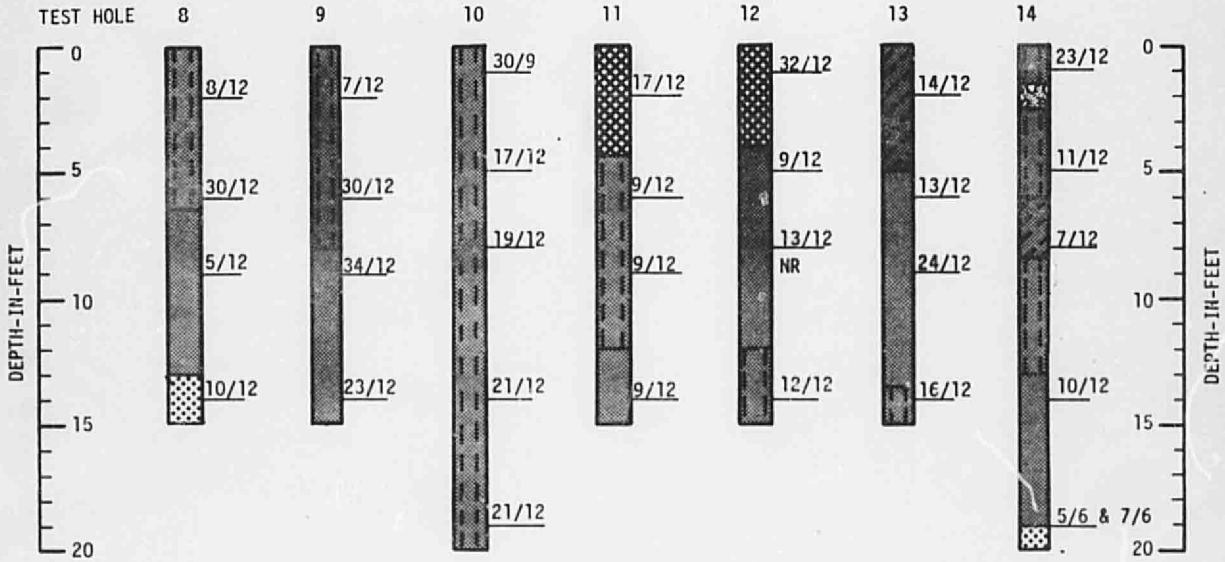
Note: Property boundaries supplied by the office of the Presley Company of New Mexico

Figure 1



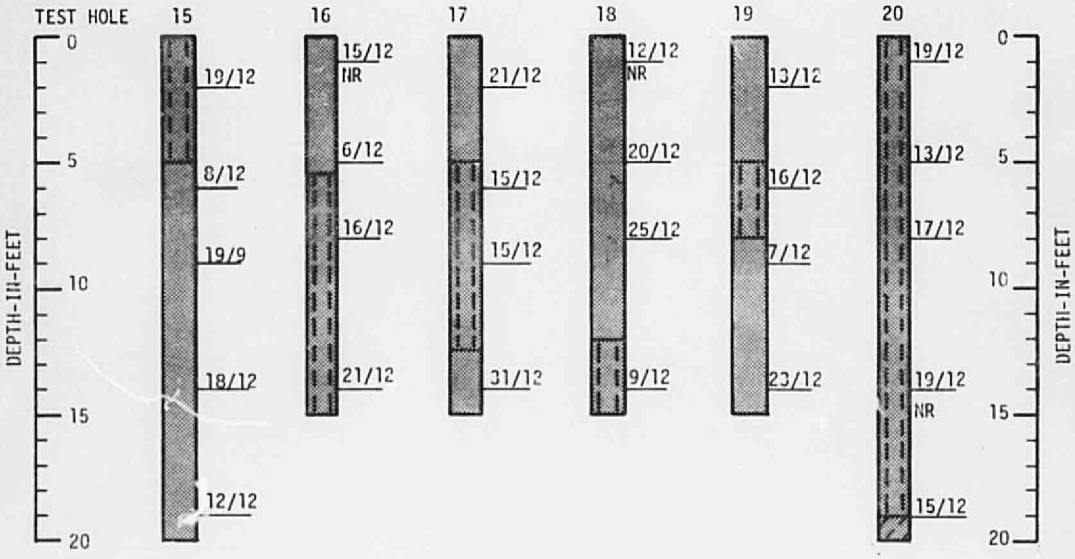
LOGS OF TEST HOLES

Figure 2



LOGS OF TEST HOLES

Figure 3



LOGS OF TEST HOLES

Figure 4

LOGS OF TEST HOLES

LEGEND

SAND, coarse to fine grained, slightly silty, loose to dense, slightly moist to medium moist, slightly calcareous, brown (SP-SM)

SAND, coarse to fine grained, silty, loose to medium dense, slightly moist to medium moist, slightly calcareous, light brown to brown (SM)

SAND & GRAVEL, some cobbles and small boulders, clean to slightly silty, slightly moist to medium moist, medium dense to dense (SW-GW, SP-GP)

SAND, medium to fine grained, some coarse grained, silty to very silty, medium dense, medium moist, very calcareous, light brown (SM)

SAND, coarse to fine grained, clean to slightly silty, medium dense to dense, slightly moist to medium moist, brown (SP, SW)

MAN-MADE FILL

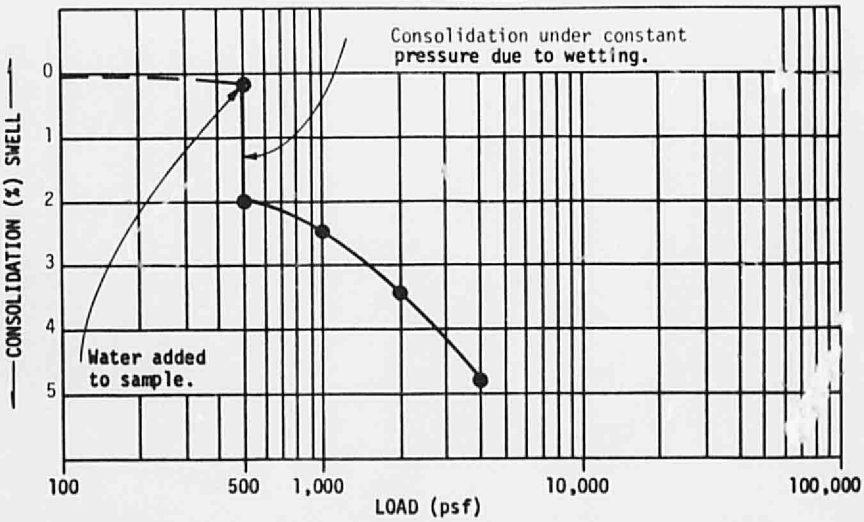
NR indicates no sample recovery

NOTES

1. Test holes were drilled on October 15, 16 and 17, 1977, with a 4 inch diameter continuous flight power auger.
2. (9/12) location of Standard Penetration Test; indicates that 9 blows with a 140 pound hammer, falling 30 inches, were required to drive a 2 inch diameter sampler 12 inches.
3. No free-water found in test holes at time of drilling.

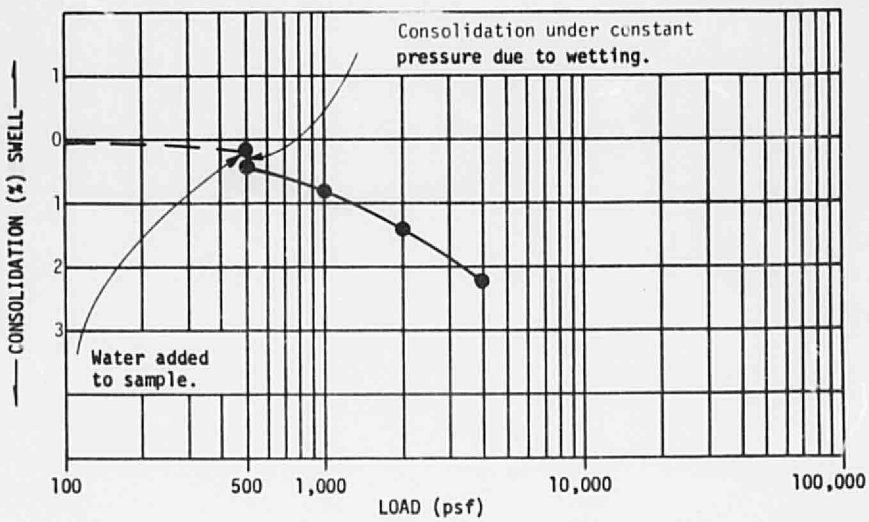
Figure 5

SWELL-CONSOLIDATION TESTS



Sample of silty SAND from test hole 5 from depth 5 feet.

Natural Moisture Content 2.7% Natural Dry Density 116 pcf



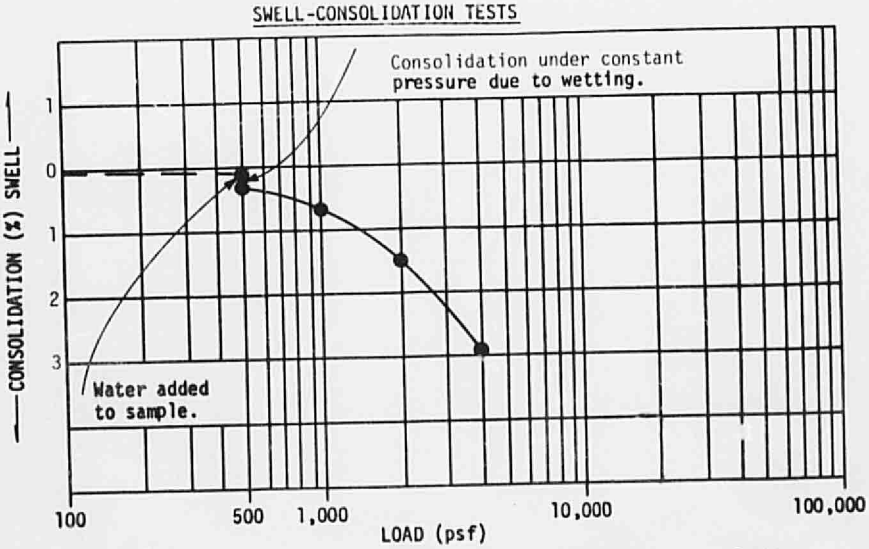
Sample of silty SAND from test hole 10 from depth 5 feet.

Natural Moisture Content 2.3% Natural Dry Density 113 pcf

Form 1-109

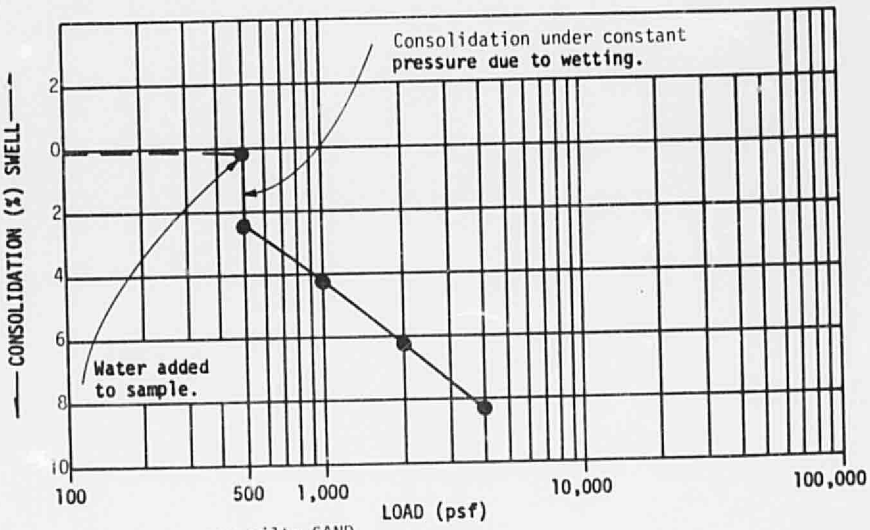
FIGURE 6

SWELL-CONSOLIDATION TESTS



Sample of silty SAND from test hole 11 from depth 9 feet.

Natural Moisture Content 4.3% Natural Dry Density 113 pcf



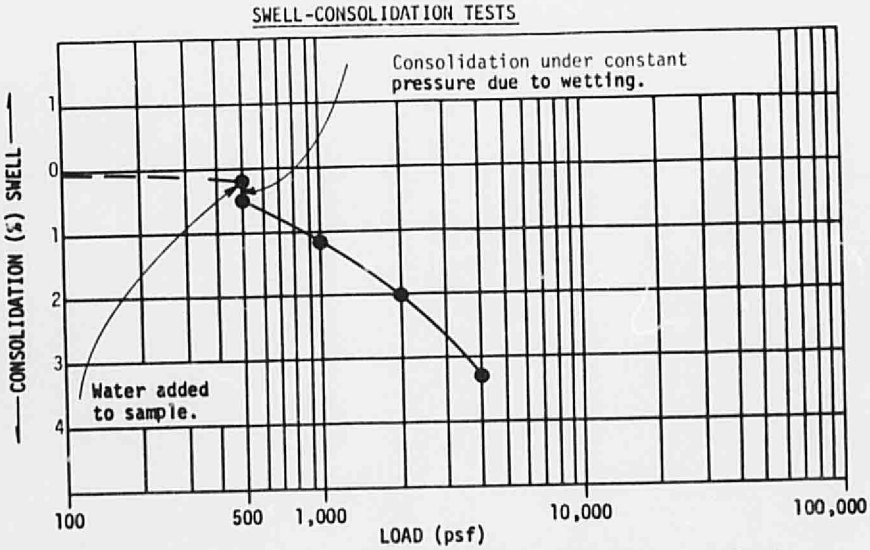
Sample of very silty SAND possible MAN-MADE FILL from test hole 13 from depth 2 feet.

Natural Moisture Content 3.2% Natural Dry Density 106 pcf

Form 1-109

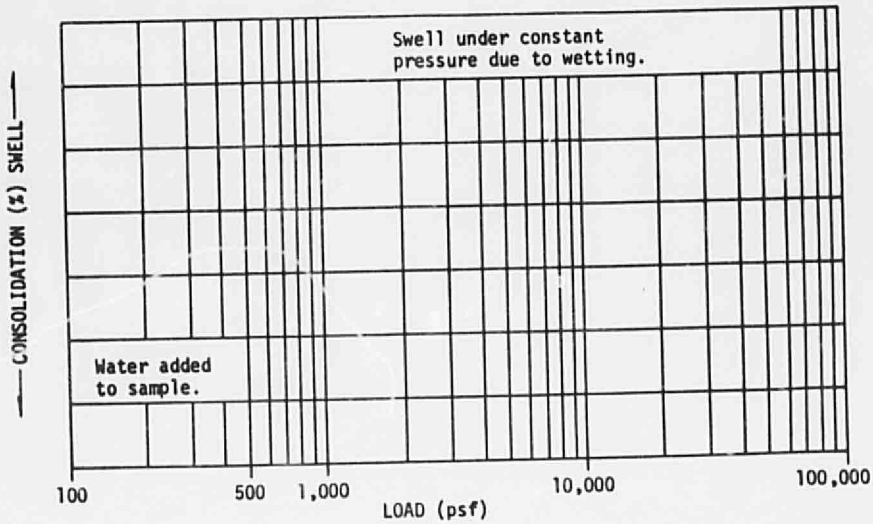
FIGURE 7

SWELL-CONSOLIDATION TESTS



Sample of very silty SAND from test hole 14 from depth 5 feet.

Natural Moisture Content 6.4% Natural Dry Density 112 pcf



Sample of _____ from test hole ____ from depth ____ feet.

Natural Moisture Content _____ Natural Dry Density _____

Form 1-109

FIGURE 8

SUMMARY OF LABORATORY TEST DATA

Hole No.	Depth of Sample (ft)	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits LL	Atterberg Limits PI	Sieve Analysis % Passing No. 4	No. 10	No. 40	No. 200	Soil Description	Remarks
1	6	134	1.3	NV	NP	77	54	26	8	slightly silty SAND	
3	6	126	1.6	NV	NP	83	57	23	7	slightly silty SAND	
4	5	121	1.7	22	NP	86	56	23	16	silty SAND	
5	5	116	2.7	22	NP	92	78	55	31	silty SAND	Figure 6
8	6	131	1.4	NV	NP	83	60	29	11	slightly silty SAND	
10	5	113	2.3	NV	NP	94	81	53	27	silty SAND	Figure 6

Table 1

SUMMARY OF LABORATORY TEST DATA

Hole No.	Depth of Sample (ft)	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits LL	Atterberg Limits PI	Sieve Analysis % Passing No. 4	Sieve Analysis % Passing No. 10	Sieve Analysis % Passing No. 40	Sieve Analysis % Passing No. 200	Soil Description	Remarks
11	9	113	4.3	NV	NP	88	74	53	22	silty SAND	Figure 7
12	1	116	4.6	22	NP	94	75	49	28	MAN-MADE FILL	
13	2	106	3.2	24	4	98	84	56	35	very silty SAND possible MAN-MADE FILL	Figure 7
14	5	112	6.4	NV	NP	96	89	63	42	very silty SAND	Figure 8
16	8	119	3.0	20	NP	94	74	44	22	silty SAND	

Notes:

NV indicates No Value
NP indicates Non-Plastic

Table 1 con't.

APPENDIX

EARTHWORK SPECIFICATIONS

1. GENERAL

The Soils Engineer shall be the Owner's representative to control the earthwork placement, moisture content, and compaction. The Soils Engineer shall approve the materials, the method of placing and compaction, and shall give written approval of the completed fill.

The structurally controlled fill shall be placed and compacted as follows:

2. CLEARING AREA TO BE FILLED

All timber, logs, trees, brush, stumps, trash, sod, matted roots and roots larger than 2 inches in diamater shall be removed, piled, or otherwise disposed of. All rocks, cobbles and boulders larger than 6 inches in diameter shall be removed or otherwise disposed of at the direction of the Soils Engineer.

3. SCARIFYING AREA TO BE FILLED

a. The surface shall be plowed or scarified to a depth of at least 6 inches, and smoothed until the surface is free from ruts, hummocks, and other uneven features, which would tend to prevent uniform compaction from the equipment to be used.

b. Where fill is to be placed on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be plowed, or scarified deeply. Where the slope ratio of the ground is steeper than 3 horizontal to 1 vertical, the bank shall be stepped or benched.

c. Strippings may be placed along rear lot lines and in rear areas where no foundation or slabs will be constructed. All strippings shall be free of logs, trees, timber, trash and rocks greater than 6 inches. Stripping will be placed subsequent to the placement of all structurally controlled fill, and to a depth not greater than 6 inches.

4. PREPARATION OF EARTHWORK AREAS TO BE FILLED

After the foundation for the fill has been cleared, any frozen

material removed, and it has been plowed or scarified, it shall be disced or bladed until it is uniform and free from large clods, brought to optimum moisture content (± 2%), for a minimum of 5 feet, or for as deep as practicable, and compacted with a minimum of 8 passes using a heavy vibratory compactor to a minimum of 95% of maximum density as determined by ASTM D 1557.

5. TREATMENT OF CUT SECTIONS

Subsequent to the final grading in cut sections, the ground surface shall be plowed or scarified, and brought to optimum moisture content (± 2%), for a minimum of 5 feet, or for as deep as practicable. The ground surface shall then be compacted with a minimum of 8 passes using a heavy vibratory compactor to 95% of maximum density as determined by ASTM D 1557.

6. FILL MATERIAL

Mateials for the fill shall consist of materials selected, or approved by the Soils Engineer. The materials used shall be free of all plant growth, frozen materials, and other deleterious substance, and shall not contain rocks or lumps which have a diameter of more than 6 inches, and shall have a plasticity index not greater than 12, and a liquid limit not greater than 40. It is anticipated that borrow from the site will be satisfactory.

7. DEPTH AND MIXING OF FILL LAYERS

Selected fill materials shall be placed in layers, which, when compacted, shall not exceed 6 inches. Each layer shall be spread evenly, and shall be thoroughly mixed during the spreading to insure uniformity of material in each layer.

8. ROCK

When the fill material includes rock, no large rock (6 inches maximum) shall be allowed to nest, and all voids must be carefully filled with small stones, or earth properly compacted. No large clods (maximum size 6 inches) will be permitted closer than 12 inches below the finished grade.

9. MOISTURE CONTENT

The fill material shall be compacted at the optimum moisture content (± 2%) specified for the soil. Sufficient laboratory Moisture-Density Relationship Tests should be made to determine the optimum moisture content for the various soils encountered in the

borrow area. The Contractor may be required to add the necessary moisture to the fill material in the borrow area, if, in the opinion of the Soils Engineer, it is not possible to obtain uniform moisture content by adding water to the fill surface.

10. AMOUNT OF COMPACTION

After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted to not less than 90% of maximum density as determined by ASTM D-1557, except that fill greater than 2 feet in depth placed for slab or foundation support, or for the top 6 inches of the street subgrade, prior to paving operations, shall be compacted to 95% of maximum density.

11. COMPACTION OF FILL LAYERS

Compaction shall be by vibratory rollers, sheepsfoot rollers, segmented steel wheeled rollers, multiple wheeled pneumatic tired rollers, or other types of suitable compaction equipment. Compaction shall be of such design that it will be able to compact the fill to specified density. Compaction shall be accomplished while the fill material is at the specified moisture content. Compaction of each layer shall be continuous over its entire area, and the compaction equipment shall make sufficient trips to insure that the required density has been obtained.

12. COMPACTION OF SLOPES

Fill slopes shall be compacted by means of sheepsfoot or vibratory rollers, or other suitable equipment. Compacting operations shall be continued until the slopes are stable, but not too dense for planting, and until there is no appreciable amount of loose soil on the slopes. Compacting of the slopes may be done progressively in increments of three to five feet (3' to 5') in fill height, or after the fill is brought to its total height as approved by the Soils Engineer.

13. DENSITY TESTS

Field density tests shall be made by the Soils Engineer on each layer of fill. Sufficient tests shall be made to determine the adequacy of the fill. The frequency of testing shall be determined by the Soils Engineer in the field depending on conditions encountered. Density tests shall be performed by ASTM, Method D-1556 with a 4 or 6 inch sand cone, ASTM, Method D-2167 (water balloon), or approved nuclear density devices and methods.

14. FINISHED SLOPES AND BUILDING PADS

Fill operations shall be continued in 6-inch compacted layers as specified above until the fill has been brought to the finished slopes and elevations shown on the accepted plans. Slopes steeper than 3 horizontal to 1 vertical should be protected from erosion.

15. SUPERVISION

Supervision by the Soils Engineer shall be continuous during the fill and compacting operations, so that he can certify that the fill was placed in accordance with the accepted specifications.

16. SEASONAL LIMITS

No fill shall be placed upon frozen ground, nor placed, spread, or rolled while it is frozen or thawing during unfavorable weather conditions. When the work is interrupted by heavy rains, snow, or frost penetration, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of the previously placed fill are as specified.

17. NOTIFICATION REGARDING START OF GRADING

Notification shall be submitted to The Presley Company of New Mexico advising of the start of grading operations at least 3 days in advance of the starting date, and of any resumption dates when the grading operations have been stopped for any reason other than adverse weather conditions.

18. REPORT OF FIELD DENSITY TESTS

Density tests made by the Soils Engineer as specified in the density tests above shall be submitted to the Owner.

19. CERTIFICATION REGARDING COMPLETED FILL

The Soils Engineer shall certify that the site was filled with accepted material in accordance with the accepted specifications, and give a professional opinion regarding shrinkage, or settlement of the fill, and a safe load bearing capacity of the fill.

20. CERTIFICATION REGARDING COMPLETED GRADE ELEVATIONS

A Registered Civil Engineer, or Land Surveyor, shall certify

that the general grading has been completed, and the resulting grade elevations are in substantial conformity (grade variations not exceeding 0.5 foot) with the previously accepted detailed development plan.

21. STREET FINE GRADING AND COMPACTION PRIOR TO PAVING

Prior to the paving operation of the indicated project, and after all underground utilities within the street right-of-way have been installed, the earthwork Contractor, or pavement Contractor, shall scarify, regrade, and recompact the street subgrade to its final fine-grading elevations and specified density.

Note 1. Strippings may be placed along back lot lines, or disposed of, as directed by the Owner.

Note 2. Summary of Compaction Requirements.

	Minimum Compaction Requirements
1. Fill greater than 2 feet in total depth placed for slab support, and the top 6 inches of street subgrade	95%
2. Fill less than 2 feet in total depth placed for slab support and all other common fill .	90%