HYDROLOGY E17/D14 ONE PLAN

E 17/D 15

1 PLAN

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

September 21,1981

Mr. Millan McCrery
Electro-jet, Inc.
6801 Gruber N.E.
Albuquerque, New Mexico 87109

Re: Drainage Easement Along 6801 Gruber N.E.

Dear Mr. McCreary:

I have further investigated the availability of funds for the paving of the rundown which follows the south boundary line of your property. Regrettably, I have found that no funding sources are available either on an emergency basis or for the provision in the future of an ultimate facility. While the City will not object to the construction of a temporary facility, that meets the approval of P.N.M. and is built following plans acceptable to the City Engineer's Office, you will also be requested to supply a maintenance covenant, (a typical form is enclosed for your review) that will absolve the City from any maintenance and repair obligations. If you have any questions on the above please advise.

Very truly yours,

C. M. Easterling
Principal Asst. City Engineer/Hydrology

CME/fs

cc: R. S. Heller, City Engineer
Mr. deVesty, Legal Dept.

Enclosure

EARTH ENVIRONMENTAL CONSULTANTS, INCORPORATED

9426 Indian School Road, N.E. • Albuquerque, New Mexico 87112 • Telephone (505) 292-3552

August 24, 1978

Mr. Bill Buckley, Architect
1509 San Pedro N.E.
Albuquerque, New Mexico 87110

Dear Mr. Buckley:

Reference is made to our letter to you, dated August 22, 1978, concerning the Gruber Machine Company building. In answer to your questions concerning the effects of increases in soil moisture content on the anticipated settlement associated with the recommended 9x9 footings, we have the following additional comments and recommendations. We feel that our footing proportioning analysis is conservative enough to allow for some increase in the moisture content of the soil without causing excessive settlement. We do, however, feel that excessive settlement could be expected should the soil beneath the footing become saturated. As a result, every effort should be made to minimize infiltration of water near the building. Based upon the conclusions of the Sergent, Hauskins & Beckwith report No. 377-1172, we do not feel that the drainage channel to the west of the proposed building will cause a significant enough increase in the soil moisture content to cause the foundation to fail.

Sincerely,

EARTH ENVIRONMENTAL CONSULTANTS, INC.

Gary L. Richardson

Gary L. Richardon, P.E.

GLR/cw

EARTH ENVIRONMENTAL CONSULTANTS, INCORPORATED

9426 Indian School Road, N.E. • Albuquerque, New Mexico 87112 • Telephone (505) 292-5552

August 22, 1978

Mr. Bill Buckley, Architect
1509 San Pedro, N. E.
Albuquerque, New Mexico 87110

Dear Mr. Buckley:

At your request we have reviewed the "Soil Investigation Report" No. E77-1172 prepared by Sergent, Hauskins & Beckwith, and the "Engineering and Project Data" for the Gruber Machine Company Star Manufacturing Company, Job No. 1-78-2195. The purpose was to proportion footings to support the proposed building. The SHB report indicates that blow counts as low as two blows per foot exist within 12.5 feet of the ground surface in 5 of the 7 bore holes. These blow counts were adjusted for depth yielding a design value of four blows per foot. The column loads associated with the Gruber building are 17.31 k per column.

Footings four feet square were tried, which failed to meet both bearing capacity and settlement requirements. Footings five feet square meet the allowable bearing capacity requirements but fail to meet the settlement requirements. Footings nine feet square meet both the bearing and settlement requirements. Footings with these dimensions should yield settlement values of approximately one inch. We recommend the use of a nine foot square footing under each column. These footings should be placed with their bottom surface three to four feet below the ground surface. It is also important to structurally isolate the footings and columns from the floor slab of the building.

Sincerely,

EARTH ENVIRONMENTAL CONSULTANTS, INC.

Gary L. Richardson

Gary L. Richardson, P.E.

GLR/gad

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
DAVID RUSK

CITY ATTORNEY
GEORGE R. "PAT" BRYAN, III

ASSISTANT CITY ATTORNEYS

Barbara Albin
Theodore C. Baca
Bruce Burwell
William R. Conner
Malcolm W. deVesty
C.J. Finnen
Patrick H. Kennedy
William L. Kraemer
Patrick L. McDonald
John A. Myers
Robert K. Patten
Albert Thiel
William J. Tryon

August 15, 1978

R. W. Gruber, Sr., President
Gruber Manufacturing Co.
6801 Gruber Avenue, N.E.
Albuquerque, New Mexico 87109

Re: Warehouse Building at 6801 Gruber Avenue, N.E.

Dear Mr. Gruber:

Your letter of August 14, 1978 in response to Mr. Conegliano's letter of August 8, 1978 to Mr. Buckley has been forwarded to me for response. As I understand the situation, the previous soil tests of this property have indicated that the foundation material may be unsuitable and Mr. Conegliano requested that soil tests be made pursuant to the Uniform Building Code. You have requested in lieu thereof some type of a release to indemnify the City of Albuquerque. Since this matter could involve third parties and subsequent owners, it is my advice and recommendation to the City that such an indemnification would not be adequate. Therefore, you are advised that the soil on this building site shall be tested by a qualified engineer or architect licensed by the State of New Mexico as required by Section 2905 of Chapter 29 of the Uniform Building Code. The report and recommendations shall be submitted to the City Engineer and the Building Inspection Division.

Sincerely,

Malcolm W. deVesty

Malcolm W. deVesty
Assistant City Attorney

cc: Mr. Bill Buckley
Bruno Conegliano, Assistant City Engineer
Rip Orr, Public Works
Tony Reynolds, Plan Check Section
James Jaramillo, Chief Administrative Officer

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

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6801 Gruber Avenue, N.E.
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Sincerely,

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Assistant City Attorney

cc: Mr. Bill Buckley
Bruno Conegliano, Assistant City Engineer
Rip Orr, Public Works
Tony Reynolds, Plan Check Section
James Jaramillo, Chief Administrative Officer

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 8, 1978

Bill Buckley
3305 Campus Blvd.,NE
Albuquerque, New Mexico

Dear Mr. Buckley:

Soil reports for this tract indicate that fill material had been placed and was not properly compacted.

It is requested that soil tests be supplied to this office verifying the adequacy of the compaction of the subsoil, before foundation permits are granted. The soil engineer's report will have to confirm the capability of the soils to receive the in filtration water from the ponding area and from the Beta channel to the west, without subjecting the foundation of the proposed warehouse to settlement and structural damage.

According to the City of Albuquerque Drainage Policy Resolution 59-1976 the owner of this tract is also responsible for bank protection and stabilization of the east half of the arroyo to the west.

It is the option of the owner to construct the improvements now or to wait for the construction of the necessary ultimate improvements At that time this parcel will be charged with the pro-rata share of the improvements costs. If the first option is selected I will be available to discuss with his engineer the requirements for the channel stabilization.

Very truly yours,

Bruno Conegliano
Asst. City Engineer-Hydrology

cc; Rip Orr
Dwayne Sheppard
Richard Leonard

NOV 29 1973

GRUBER MFG. CO.

6801 Gruber Ave., N.E. Albuquerque, New Mexico 87109 Phone (505) 344-1611

November 28, 1973

City of Albuquerque
Public Works Dept.
400 Marquette Ave., N. W.
Albuquerque, New Mexico
Attn: Mr. Rip Orr

Dear Mr. Orr:

I wrote to you last July 30th requesting that some action be taken with regard to the drainage ditch situation on the southeast side of our property. I am wondering what has been done to correct this problem. Noticeable cracks are again appearing in our parking lot due to washout from the ditch. Should it become necessary to make additional repairs, the bill will be forwarded to the City of Albuquerque for payment. I would appreciate hearing from you as soon as possible.

Yours very truly,

R. W. Gruber, Sr.
President

RWG/sk

Bob K - copy for you per our discussion this morning.
Rip 11-29-73

P-174-73

AUG 2 1973

GRUBER MFG. CO.

6801 Gruber Ave., N.E. Albuquerque, New Mexico 87109 Phone (505) 344-1611

July 30, 1973

City of Albuquerque
Public Works Dept.
400 Marquette Ave., N. W.
Albuquerque, New Mexico
Attn: Mr. Rip Orr

Remainder 11-12-73 file

Dear Mr. Orr:

I am writing with regard to the drainage ditch at the intersection of Gruber Ave., N. E. and Pan American Fwy. Pl. which accepts water from both of these streets and runs through an easement along the Gruber Mfg. Co. parking lot to an arroyo in the rear. As I suggested in our previous conversations, the City should install water pipes in the drainage ditch for this area. I am continuously having washout causing the blacktop to separate, causing large cracks and resulting in the parking lot slipping towards the ditch. The problem is getting progressively worse and I have had Universal Constructors in to make repairs at a cost of $1000.00.

If this problem should continue and should I lose the end of my parking lot from washout, I will expect the City to make the repairs at their expense. I would appreciate your prompt action in getting a pipeline to accept the drainage from both of these streets.

Yours very truly,

R. W. Gruber, Sr.
President

RWG/sk

8-2-73
B. Kielick - Please make a rough est. to pave the surface drainage Ditch along Gruber's South line "For information only" - I don't intend to spend any City money on it but need to know ballpark price. G. Paul knows about this. Jack Clifford (Representing owners along South side may be willing to share in cost - Estimate is for discussion purposes. Thanks
Rip

SOIL INVESTIGATION REPORT

Gruber Manufacturing Company Building

6801 Gruber Avenue, N.E.

Albuquerque, New Mexico

SHB Job No. E77-1172

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • ALBUQUERQUE • EL PASO • TUCSON

SERGENT, HAUSKINS & BECKWITH CONSULTING SOIL AND FOUNDATION ENGINEERS

APPLIED SOIL MECHANICS • ENGINEERING GEOLOGY • MATERIALS ENGINEERING

B. DWAINE SERGENT, P.E.
DALE V. BEDENKOP, P.E.
JOHN B. HAUSKINS, P.E.
ROBERT D. BOOTH, P.E.
DONALD G. METZGER, GEOL.
GEORGE H. BECKWITH, P.E.
BENNY E. McMILLAN, P.E.
BUD WOODWARD

January 6, 1977

City of Albuquerque
City Attorney's Office
Albuquerque, New Mexico

SHB Job No. E77-1172

Attention: Pat Kennedy

Re: Gruber Manufacturing Co. Building
6801 Gruber Avenue, N. E.
Albuquerque, New Mexico

Gentlemen:

Our Soil Investigation Report on the referenced project is herewith submitted. The report includes the results of test drilling and laboratory analyses along with our discussion and conclusions.

Should any questions arise concerning this report, we would be pleased to discuss them with you.

Respectfully submitted,
Sergent, Hauskins & Beckwith, Inc.

By Robert D. Booth
Robert D. Booth, P. E. 5711

ROBERT D. BOOTH NEW MEXICO 5711 REGISTERED PROFESSIONAL ENGINEER

Copies: Addressee (6)

REPLY TO: 2821 GIRARD BLVD., N.E., ALBUQUERQUE, NEW MEXICO 87107

PHOENIX (602) 272-6848 | ALBUQUERQUE (505) 345-8606 | EL PASO (915) 591-8185 | TUCSON (602) 884-0333

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SHB Job No. E77-1172

Gruber Manufacturing Company Building
6801 Gruber Avenue, N.E.
Albuquerque, New Mexico
SHB Job No. E77-1172

1. INTRODUCTION

This report is submitted pursuant to a soil investigation made by this firm of the site of the Gruber Manufacturing Building located at 6801 Gruber Avenue, N.E., in Albuquerque, New Mexico. The object of the investigation was to evaluate the physical properties of the subsoils underlying the site to determine the cause of distress to the building and to locate the probable source of moisture increase.

2. INVESTIGATION

2.1 Subsurface Exploration

Seven exploratory borings were drilled to depths of between 21 and 26 feet below existing grade. Standard penetration testing and open-end drive sampling were performed at selected intervals in the borings. During test drilling, the soils encountered were continuously examined, visually classified and logged. Results of the field investigation are presented in Appendix A which includes a brief description of test drilling equipment and procedures, a site plan showing boring locations and logs of the test borings. The field investigation was directed by Robert D. Booth, P.E., of this firm.

2.2 Laboratory Analysis

Moisture content determinations were made on all tube

samples recovered while dry densities were determined for the 2.42 inch diameter open-end drive samples. Results of these tests are presented on the boring logs.

Grain-size analysis and Atterberg Limits tests were performed on selected samples to aid in classification. The results of these tests are presented in Appendix A.

3. SITE CONDITIONS & SOIL PROFILE

3.1 Site Conditions

The site is located on alluvial fan deposits sedimented from the Sandia Mountains to the east. Prior to development, the natural ground surface sloped downward to the southwest. Development of the site for the existing construction involved leveling the site resulting in some cut on the northeast portion of the property and fill being placed towards the southwest portion. Bituminous surfacing is present adjacent to the structure on the east, west and south sides while undeveloped, cleared and leveled ground is present on the north side. A small drainage ditch, which drains downwards towards the west, is present approximately 64 feet south of the structure. A much larger drainage ditch, which drains towards the north (see Site Plan, Appendix A), is located about 49 feet west of the structure.

3.2 Soil Profile

As indicated by the exploratory borings, the subsoils

underlying the site consist predominantly of highly stratified and interbedded deposits of silty sand, relatively clean sands and sandy silts. As indicated by the penetration test data, these soils are generally soft or loose with some very soft or loose zones.

3.3 Soil Moisture & Ground Water Conditions

No free ground water was encountered in the test borings. Soil moisture contents were relatively low to medium. Although background information relative to natural soil moisture content prior to site development was not available, based upon our experience in the general area of the site, soil moisture contents are generally elevated somewhat above natural soil moisture contents.

3.4 Affect of Moisture Changes on Subsoils

The subsoils underlying the site possess a moderate to severe "collapse" potential. These "collapsing" soil deposits are formed by flash floods. The soils quickly dry out after each phase of deposition and often become weakly cemented. During this process the underlying layers are not wetted to a significant depth. Thus, the deposits are built up to great depths at low densities in a dry state. When saturated, these deposits will often experience large settlements under their

own weight or very low superimposed stresses. Extensive consolidation testing performed on soils within the general area indicate that extensive zones of severely "collapsing" soils are present.

4. DISCUSSION & CONCLUSIONS

4.1 Analysis of Results

It is concluded that the present distress to the structure is due to moisture increase in the underlying supporting soils and subsequent "collapse" resulting in excessive differential foundation settlements. It is also concluded that further moisture increase has the potential to create large additional settlements. Thus, it is critical to stop the source of moisture to prevent future damage to the structure.

4.2 Probable Moisture Sources

The moisture content determinations performed on the samples generally indicate that soil moisture contents are highest near the building and have a tendency towards decreasing upon increasing distance away from the building. Moisture contents of the soils directly underlying the drainage ditch to the south were found to be considerably lower than soil moisture contents within the borings drilled adjacent to the structure. In addition, soil moisture contents determined for the boring located on the extreme north side of the building

were generally lower than those located immediately adjacent to the structure. Thus, it is concluded that the most probable source, or sources, of moisture is as follows:

1. The majority of the area surrounding the structure is paved such that very little infiltration of surface waters and roof runoff would be expected. However, the area located along the north side of the structure is unpaved and is graded relatively flat. In addition, the permeability of many of the near surface soils is such that relatively rapid infiltration of water would occur. Thus, infiltration of surface waters and roof runoff along the north side of the structure is at least one probable source of moisture.

2. Underground plumbing leaks, either in water or sewer lines, is considered another probable source of moisture.

3. At the time of our investigation, two small infiltration ditches which were draining small quantities of water from inside the building, were present on the north side of the structure. The purpose of these small ditches and the length of time thay have been in operation is not known. However, drainage of water into infiltration ditches located near the structure, even in very small quantities, would have the potential of over a period of time to create large soil moisture increases.

It does not appear that the drainage ditches can be considered a probable source since soil moisture contents directly underlying the ditch are lower than those nearest the building. Soil moisture contents of the borings drilled adjacent to the structure were as high as 20 and 26 percent in two of the borings while soil moisture contents directly underlying the drainage ditch only ranged to a high of 15 percent.

APPENDIX A

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • ALBUQUERQUE • EL PASO • TUCSON

TEST DRILLING EQUIPMENT & PROCEDURES

Drilling Equipment Truck mounted CME-55 drill rigs powered with 4 or 6 cylinder Ford Industrial Engines are used in advancing test borings. The 4 cylinder and 6 cylinder engines are capable of delivering about 4350 and 6500 ft. lbs. torque with twin hydraulic rams capable of exerting 12,000 pounds downward force. Drilling through soil or softer rock is performed with 6½" O.D. 3¼" I.D. hollow stem auger or 4½" continuous flight auger. Carbide insert teeth are normally used on the auger bits so they can often penetrate rock or very strongly cemented soils which require blasting or very heavy equipment for excavation. Where refusal is experienced in auger drilling, the holes are sometimes advanced with tricone gear bits and NW rods using water or air as a drilling fluid.

Sampling Procedures Dynamically driven tube samples are usually obtained at selected intervals in the borings by the ASTM D1586 procedure. Two inch O.D. 1-3/8" I.D. samples are used in many cases to obtain the standard penetration resistance. "Undisturbed" samples of firmer soils are often obtained with 3" O.D. samplers lined with 2.42" I.D. brass rings. Driving energy is generally recorded as the number of blows of a 140 pound 30 inch free fall drop hammer required to advance the samplers in 6 inch increments. However, in stratified soils driving resistance sometimes is recorded in 2 or 3 inch increments so that soil changes and the presence of scattered gravel or cemented layers can be readily detected and realistic penetration values obtained for consideration in design. These values are expressed in blows per foot on the logs. "Undistrubed" sampling of softer soils is sometimes performed with thin walled Shelby tubes (ASTM D1587). Where samples of rock are required, they are obtained by NX Diamond Core Drilling (ASTM D2113). The tube samples are labeled and placed in watertight containers to maintain field moisture contents for testing. When necessary for testing, larger bulk samples are taken from auger cuttings.

Continuous Penetration Tests Continuous penetration tests are performed by driving a 2" O.D. blunt nosed penetrometer adjacent to or in the bottom of borings. The penetrometer is attached to 1-5/8" O.D. drill rods to provide clearance and minimize side friction so that penetration values are as nearly as possible a measure of end resistance. Penetration values are recorded as the number of blows of a 140 pound 30 inch free fall drop hammer required to advance the penetrometer in one foot increments or less.

Boring Records Drilling operations are directed by our field engineer or geologist who examines soil recovery and prepares boring logs. Soils are visually classified in accordance with the Unified Soil Classification System (ASTM D2487) with appropriate group symbols being shown on the logs.

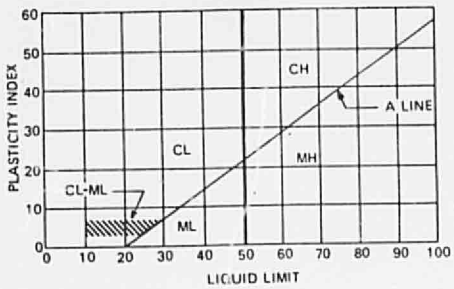
UNIFIED SOIL CLASSIFICATION SYSTEM

Soils are visually classified by the Unified Soil Classification system on the boring logs presented in this report. Grain-size analysis and Atterberg Limits Tests are often performed on selected samples to aid in classification. The classification system is briefly outlined on this chart. For a more detailed description of the system, see "The Unified Soil Classification System" Corp of Engineers, US Army Technical Memorandum No. 3-357 (Revised April 1960) or ASTM Designation: D2487-66T.

MAJOR DIVISIONS				GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (50% or less of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No. 200 sieve)			GW	Well graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
					GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		GM	Silty gravels, gravel-sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 seive)			SW	Well graded sands, gravelly sands.
					SP	Poorly graded sands, gravelly sands.
		SANDS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		SM	Silty sands, sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		SC	Clayey sands, sand-clay mixtures.
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS (LIMITS PLOT BELOW "A" LINE & HATCHED ZONE ON PLASTICITY CHART)	SILTS OF LOW PLASTICITY (Liquid Limit Less Than 50)			ML	Inorganic silts, clayey silts with slight plasticity.
		SILTS OF HIGH PLASTICITY (Liquid Limit More Than 50)			MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	CLAYS (LIMITS PLOT ABOVE "A" LINE & HATCHED ZONE ON PLASTICITY CHART)	CLAYS OF LOW PLASTICITY (Liquid Limit Less Than 50)			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		CLAYS OF HIGH PLASTICITY (Liquid Limit More Than 50)			CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

NOTE: Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone on the plasticity chart to have double symbol.

PLASTICITY CHART



DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to ¾ in.
Fine gravel	¾ in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve

TERMINOLOGY USED TO DESCRIBE THE RELATIVE DENSITY, CONSISTENCY OR FIRMNESS OF SOILS

The terminology used on the boring logs to describe the relative density, consistency or firmness of soils relative to the standard penetration resistance is presented below. The standard penetration resistance (N) in blows per foot is obtained by the ASTM D1586-67 procedure using 2" O.D. - 1 3/8" I.D. samplers.

1. Relative Density. Terms for description of relative density of cohesionless, uncemented sands & sand-gravel mixtures.

N	Relative Density
0-4	Very loose
5-10	Loose
11-30	Medium dense
31-50	Dense
50+	Very Dense

2. Relative Consistency. Terms for description of clays which are saturated or near saturation.

N	Relative Consistency	Remarks
0-2	Very soft	Easily penetrated several inches with fist.
3-4	Soft	Easily penetrated several inches with thumb.
5-8	Medium stiff	Can be penetrated several inches with thumb with moderate effort.
9-15	Stiff	Readily indented with thumb, but penetrated only with great effort.
16-30	Very stiff	Readily indented with thumbnail.
30+	Hard	Indented only with difficulty by thumbnail.

3. Relative Firmness. Terms for description of partially saturated and/or cemented soils which commonly occur in the Southwest including clays, cemented granular materials, silts and silty and clayey granular soils.

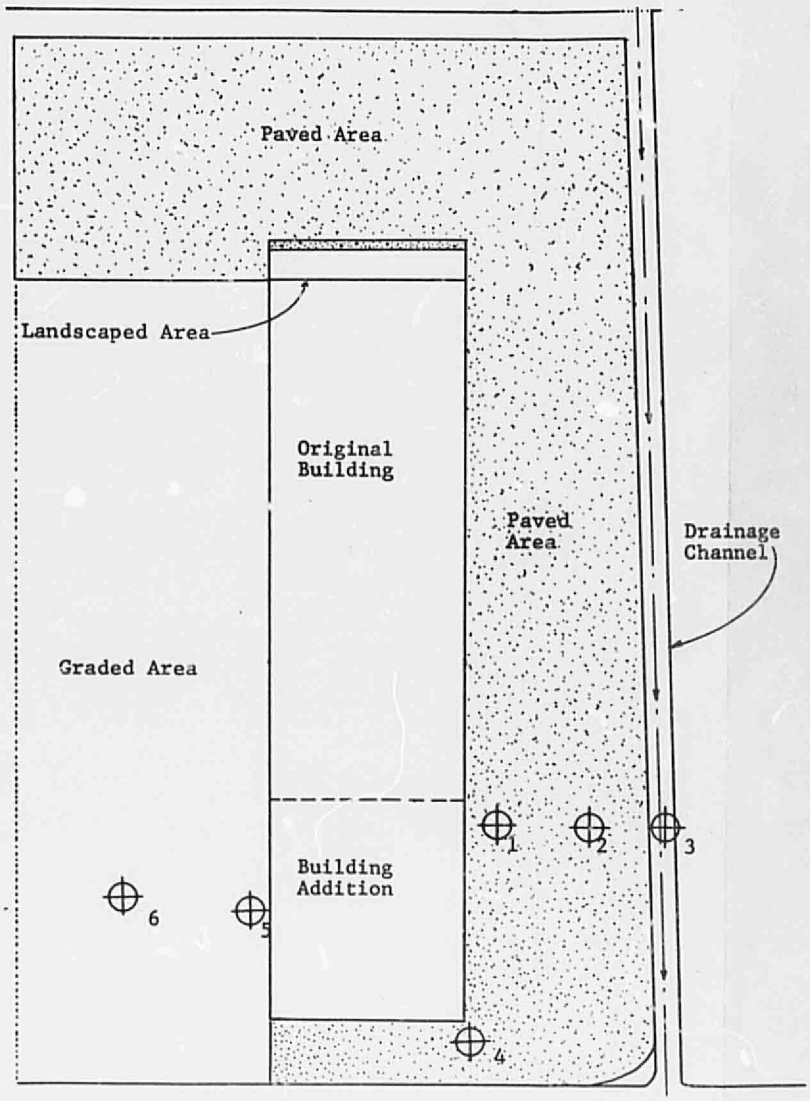
N	Relative Firmness
0-4	Very soft
5-8	Soft
9-15	Moderately firm
16-30	Firm
31-50	Very firm
50+	Hard

SITE PLAN

SHOWING LOCATIONS OF TEST BORINGS

Scale
1" = 40'

Gruber Manufacturing Company
Building
5801 Gruber Avenue, N.E.
Albuquerque, New Mexico
SHB Job No. E77-1172



SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • ALBUQUERQUE • EL PASO • TUCSON

PROJECT Gruber Manufacturing Company Building **LOG OF TEST BORING NO. 1**

JOB NO. E77-1172 DATE 12-28-77

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 99.59

DATUM Assumed

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			☒	S	14		6	SM	moderately firm	SILTY SAND, trace of clay, generally well-graded, nonplastic, brown
			☒	U	14	118	7			
5			☒	S	5		7	SM	soft to very soft	SILTY SAND, trace of clay, predominantly fine to medium, low plasticity to nonplastic, brown
			☒	U	6	104	11			
10			☒	S	6		3	SW	soft	SAND, some silt, generally well-graded, small amount of gravel, nonplastic, light brown
			☒	S	9		3			
15			☒	S	6		2		very soft to soft	SANDY SILT, nonplastic, light brown
			☒	S	2		14	ML		note: thin layer (2"+) of well-graded sand at 20'6"
20			☒	S	4		20			
			☒	S	7		14			
25			☒	S	7		13			
										Stopped auger at 24'6" Stopped sampler at 26'
30										

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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CONSULTING SOIL AND FOUNDATION ENGINEERS
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PROJECT Gruber Manufacturing Company Building **LOG OF TEST BORING NO.** 2

JOB NO. E77-1172 DATE 12-28-77

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 97.85

DATUM Assumed

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			☒	U	15	116	7		moderately firm to soft	SILTY SAND, predominantly fine to medium, trace of clay, nonplastic, brown
			☒	S	5		6	SM		
5			☒	S	6		5			
								SP-SM	loose	SAND, some silt, predominantly fine to medium, nonplastic, brown
			☒	U	4	109	6	SM		
10			☒	S	4		5		very soft	SILTY SAND, predominantly fine to medium, nonplastic, brown
								SM		
			☒	S	2		16		soft	SILTY SAND, predominantly fine, nonplastic, light brown
15			☒	U	3	80	20			
								ML	very soft	SANDY SILT, trace of clay, low plasticity to nonplastic, light brown note: occasional thin layers of silty sand, very fine, nonplastic, light brown before 17'6"
			☒	S	4		9			
20			☒	S	3		24			
25										Stopped auger at 19'6" Stopped sampler at 21'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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PROJECT Gruber Manufacturing Company Building **LOG OF TEST BORING NO.** 3

JOB NO. E77-1172 DATE 12-28-77

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 94.61

DATUM Assumed

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			☒	S	18		8	SM	moderately firm to very soft	SILTY SAND, predominantly fine to medium, low plasticity to nonplastic, brown
			☒	S	4		6			
5			☒	S	2		8	SM	very soft	SILTY SAND, very fine, nonplastic, brown
			☒	S	4		10	SP-ML	very soft	Alternating thin layers (2"-6") SAND, predominantly fine to medium & CLAYEY SILT, generally low plasticity to nonplastic, brown
10			☒	S	3		15			
			☒	S	3		15		very soft to soft	SANDY SILT, trace of clay, low plasticity to nonplastic, light brown
15			☒	S	6		9	ML		
			☒	S	3		12			note: thin layer of silty sand, fine, nonplastic, light brown at 15'
20			☒	S	8		11			
25										Stopped auger at 19'6" Stopped sampler at 21'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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PROJECT Gruber Manufacturing Company Building **LOG OF TEST BORING NO.** 4

JOB NO. E77-1172 DATE 12-28-77

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 99.98

DATUM Assumed

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			☒	S	9		7		moderately firm	SILTY SAND, predominantly fine to medium, nonplastic, brown
			☒	U	11	116	6	SM		
5			☒	U	16	116	7			
			☒	S	5		6	SP-SM	loose	SAND, some silt, predominantly fine to medium, nonplastic, light brown
10			☒	S	2		7			
			☒	S	1		13	SM & ML	very soft	Alternating layers of SILTY SAND & SANDY SILT, trace of clay, low plasticity to nonplastic, light brown
15			☒	S	10		3			
			☒	S	18		2	SP	medium dense	SAND, predominantly fine to medium, trace of silt, nonplastic, light brown
20			☒	S	8		3			
								ML		
								SM		note: generally coarser with depth with gravel
25			☒	S	16		5			
									soft	CLAYEY SILT, some sand, low plasticity, light brown
30									moderately firm	SILTY SAND, very fine, nonplastic, light brown
										Stopped auger at 24'6" Stopped sampler at 26'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A - Auger cuttings. B - Block sample
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.

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PROJECT Gruber Manufacturing Company Building **LOG OF TEST BORING NO.** 5

JOB NO. E77-1172 DATE 12-28-77

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 100.06

DATUM Assumed

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	9		8	SM	moderately firm	SILTY SAND, predominantly fine to medium, nonplastic, brown
			X	U	14	123	10			
5			X	S	10		4	SP-SM	moderately firm	SAND, predominantly fine, some silt, nonplastic, tan
			X	U	10		10			
10			X	S	2		14	SM	soft	SILTY SAND, trace of clay, nonplastic, light brown
			X	S	17		3		medium dense	SAND, predominantly fine to medium, trace of silt, nonplastic, light brown
15			X	S	18		4	SP-SM		
			X	S	5		26			
20			X	S	23		2	ML SP	soft	CLAYEY SILT, trace of sand, low plasticity, brown
25									medium dense	SAND, predominantly fine to medium, trace of silt, nonplastic, light brown
										Stopped auger at 19'6" Stopped sampler at 21'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A - Auger cuttings. B - Block sample
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.

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PROJECT Gruber Manufacturing Company Building **LOG OF TEST BORING NO.** 6

JOB NO. E-7-1172 DATE 12-28-77

RIG TYPE CME-55

BORING TYPE 6½" Hollow Stem Auger

SURFACE ELEV. 98.73

DATUM Assumed

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			☒	S	10		10		moderately firm to very soft	SILTY SAND, predominantly fine to medium, some clay, low plasticity, nonplastic, brown
			☒	S	3		9			
5			☒	S	5		NR	SM		
			☒	S	3		8			
10			☒	S	7		11			
			☒	S	2		2	SW-SM	very loose to medium dense	SAND, predominantly fine to medium, trace of silt, nonplastic, light brown
15			☒	S	14		3			
			☒	S	2		10	ML	very soft	SANDY SILT, nonplastic, light brown
20			☒	S	11		3	SM	moderately firm	SILTY SAND, predominantly fine to medium, low plasticity to nonplastic, light brown
25										Stopped auger at 19'6" Stopped sampler at 21'

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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PROJECT Gruber Manufacturing Company Building **LOG OF TEST BORING NO.** 7

JOB NO. E77-1172 DATE 12-28-77

RIG TYPE CME-55
BORING TYPE 6½" Hollow Stem Auger
SURFACE ELEV. 100.89
DATUM Assumed

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Percent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			☒	S	18		3	SM	moderately firm	SILTY SAND, predominantly fine, nonplastic, brown
			☒	U	24		2			
5			☒	S	13		NR	SW-SM	medium dense to loose	SAND, trace of silt, nonplastic, brown
			☒	S	7		2			
10			☒	S	20		2	ML	soft	SANDY SILT, very fine, nonplastic, brown
			☒	S	5		2	SM	soft	SILTY SAND, predominantly medium, nonplastic, brown
15			☒	S	4		25	CL		note: thin silt lenses
			☒	S	8		3		soft	SANDY CLAY, low plasticity, considerable silt, dark brown
20			☒	S	5		4	SM	soft to firm	SILTY SAND, predominantly fine, nonplastic, brown
25			☒	S	27		5			
										Stopped auger at 24'6" Stopped sampler at 26'
30										

GROUND WATER

DEPTH	HOUR	DATE
	none	

SAMPLE TYPE

A – Auger cuttings. B – Block sample
S – 2" O.D. 1.38" I.D. tube sample.
U – 3" O.D. 2.42" I.D. tube sample.
T – 3" O.D. thin-walled Shelby tube.

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APPENDIX B

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TABULATION OF TEST RESULTS

Job No. E77-1172

Project Gruber Manufacturing Company Building

Material

Source

HOLE NO.	LOCATION	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS – ACCUM. % PASSING												LAB. NO.
						200	100	40	16	10	4	¼	⅜	¾	1	1½	2	
1	See Site Plan	4½'	SM	-	NP	29	40	50		82	93		99	100				72-2
1	See Site Plan	12½'	SW	-	NP	4	8	21		70	94		100					72-4
1	See Site Plan	17½'	ML	-	NP	76	88	29		97	99		100					72-5
2	See Site Plan	2½'	SM	-	NP	22	39	49		74	92		97	100				72-7
2	See Site Plan	14½'	ML	-	NP	88	96	99		100	100							72-9
3	See Site Plan	9½'	ML	-	NP	79	97	97		99	99		100					72-10
3	See Site Plan	17½'	ML	-	NP	51	75	85		93	97		100					72-11
4	See Site Plan	4½'	SM	-	NP	26	36	45		70	92		98	100				72-13
4	See Site Plan	12½'	SM	-	NP	44	61	71		84	92		97	100				72-14
5	See Site Plan	2½'	SM	-	NP	30	41	50		74	89		98	100				72-15
5	See Site Plan	9½'	SM	-	NP	49	64	73		88	95		99	100				72-16
5	See Site Plan	14½'	SM-SP	-	NP	6	9	17		71	96		100					72-17
6	See Site Plan	12½'	SW-SM	-	NP	6	8	15		67	97		100					72-18
7	See Site Plan	7½'	SW-SM	-	NP	7	10	16		56	94		99	100				72-19
7	See Site Plan	14½'	CL	31	8	74	83	94		99	100		100					72-20

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