HYDROLOGY J14/D12 1 PLAN

J14/D12

1 Plan

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

J14-D12

October 20, 1981

Mr. John Esquibel
A&E Engineering
1330 San Pedro N.E., Suite 114
Albuquerque, New Mexico 87110

Re: SOUTHWEST FILM DRAINAGE REPORT

Dear John:

The referenced drainage report is hereby approved. Please see that copies of the revised plans (dated 10/19/81) are placed in the construction sets. Mr. Fred Aguirre will sign off for Hydrology when this is done.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/fs

cc: Mr. John Vanderpool

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

October 12, 1981

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3. DR #15B1 - The site is located in the Valley. Therefore, Interim Drainage Guidelines call for the 50 year developed volume to be ponded.

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City of Albuquerque

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DRAINAGE REPORT INFORMATION SHEET

PROJECT TITLE Southwest Film

ZONE ATLAS PAGE NO. J-14Z CITY ADDRESS 510 KINLEY ST.

LEGAL ADDRESS 510 KINLEY

ENGINEERING FIRM A & E. ENGINEERING INC. CONTACT J. F Esquibel or Ted Contarody

ADDRESS 1330 SAN PEDRO NE PHONE 266-8791

OWNER Mr. Sid Johnson JR. CONTACT owner

ADDRESS 1703 Guadalupe Trail NW PHONE 344-5905

ARCHITECT/~~SURVEYOR~~ John Vanderpol AIA CONTACT John Vanderpol

ADDRESS 10832 Prospect Ave NE PHONE 298-7873

DATE ~~SUBMITTED~~ Resubmitted 10/14/81

BY John F Esquibel president (A&E Engr Inc

MUNICIPAL DEVELOPMENT DEPARTMENT

Richard S. Heller, P.E., City Engineer ENGINEERING DIVISION Telephone (505) 766-7467

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

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A&E ENGINEERING INC.

CIVIL ENGINEERING, LAND PLANNING, AND SURVEYING

S14-D12

October 14, 1981

Mr. Brian G. Burnett
City Engineer
Hydrology Section
P.O. Box 1293
Albuquerque, New Mexico 87103

RECEIVED

OCT 15 1981

ENGINEERING

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1. Computed ponds for a 50-year storm.

2. Submitted calculations for emergency spillway drainage.

3. Increased size of ponds to comply with 50-year storm.

Please be aware that the owner and the contractor need this final approval so that they may commence construction immediately.

We will be available to respond immediately to any request or additional requirements that may occur.

Very truly yours,

A & E ENGINEERING, INC.

John F. Esquibel, President

JFE:mhe

1330 SAN PEDRO N.E.
SUITE 114 (505-266-8791)
ALBUQUERQUE, NEW MEXICO 87110

J14-D12

A&E ENGINEERING INC.

CIVIL ENGINEERING, LAND PLANNING, AND SURVEYING

October 14, 1981

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ADDRESS 10832 Prospect Ave NE. PHONE 298-7823

DATE ~~SUBMITTED~~ Resubmitted 10/14/81

BY John F Esquibel president (A&E Engr Inc

MUNICIPAL DEVELOPMENT DEPARTMENT

Richard S. Heller, P.E., City Engineer ENGINEERING DIVISION Telephone (505) 766-7467

Revised 10/14/81

Volume undeveloped = 3519.6 cu. ft.

AREA "A"

TOTAL DEVELOPED AREA = 15,492 sq. ft.

Volume

$0.9 \times \frac{2.4}{12} \times 15{,}492$ sq. ft. = 2788.6 cu. ft.

Volume undeveloped area where proposed development will occur

$0.4 \times (2.4) \times 15{,}492 = 1239.4$ cu. ft.

Runoff after developed = 2788.6
Runoff before developed = 1239.4
1549.2 cu. ft. for 100-year storm

AREA "B"

Will remain in its natural state and will not affect this development.

The portion of the parking lot that will be used for ponding will flood to elevation 60.1 under maximum design conditions.

The combined ponding conditions this being the pond 1109 cu.ft. and the parking lot having a ponding capacity of 728 cu. ft. for a combined total ponding capacity for a 100-year storm of 1576.0 cu. ft. This is (1837 - 1549) = 288cu. ft. in excess of the required amount.

CALCULATIONS

Area of parking lot to be used as ponding 5600 sq. ft. x 0.13 ft. = 728 cu. ft.

SUMMARY

It is recommended that this development be approved since the computations show that the proposed design is adequate to satisfactorily handle a 100-year storm.

50 year Storm pond Calculations

Revised 10/14/81

From: Noaa Atlas 2 Vol IV
New Mexico

50 year storm
10 minute duration
i = intensity 4.85
$Q = CiA$

$C = 0.9$ for developed area
$C = 0.4$ for undeveloped area

$a_{undeveloped}$ = Area (acres) = $2802\ SF / 43560$ = 0.064 Acres

$a_{developed}$ = Area (acres) = $15682 / 43560$ = 0.36 Acres

$Q_{50\ developed} = 0.9\,(4.85)\,(0.36) = 1.57$ cfs

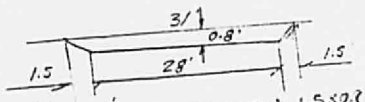
$Q_{50\ undeveloped} = 0.4\,(4.85)\,(0.064) = 0.12$ cfs

$\text{Volume}_{50\text{-developed}} = 1.57\ ft^3/sec \times 10\ min \times 60\ sec/min = 942.\ ft^3$

$\text{Volume}_{50\ undeveloped} = 0.12\ ft^3/sec \times 10\ min \times 60\ sec/min = 72\ ft^3$

Total 50 year runoff flowing into pond
= **1014.0 ft^3 required**

Pond Size or Capacity



W = 31'
L = 47'

Volume/LF = $28 \times 0.8 + 1.5 \times 0.8 = 23.6\ ft^3/LF$

Total Capacity of Pond = $23.6/LF \times 47\ LF$ = **1109 ft^3**

Revision 10/13/01

Emergency spillway calculations

The pond has been designed as a changing rate orfice retention basin for a 100 year frequency storm. The storm water will drain from the pond of a maximum rate equivalent to a - 5-year Q_5 storm calculated for developed condition.

$Q = CIA$

Total area (A in acres) = 15,492 SF or 0.36 acres

$C = 0.9$

$I = 3.43$

$Q_5 = 0.9\,(3.43)\,(0.36) = 1.11$ cfs

Therefore the flow of $Q_5 = 1.11$ cfs will be used to design the emergency outlet (spillway)

By using the weir approach

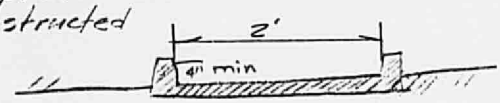
$$Q = 3.33\, L\, H^{3/2}$$

where $H = 0.5'$ maximum.

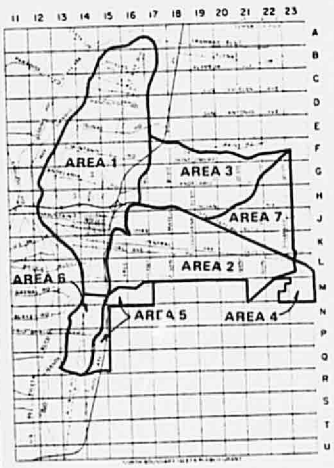
$$L = Q / 3.33\, H^{3/2}$$

$$L = \frac{1.11}{3.33\,(0.5)^{3/2}} = \frac{1.11}{1.18} = 0.94 \text{ feet}$$

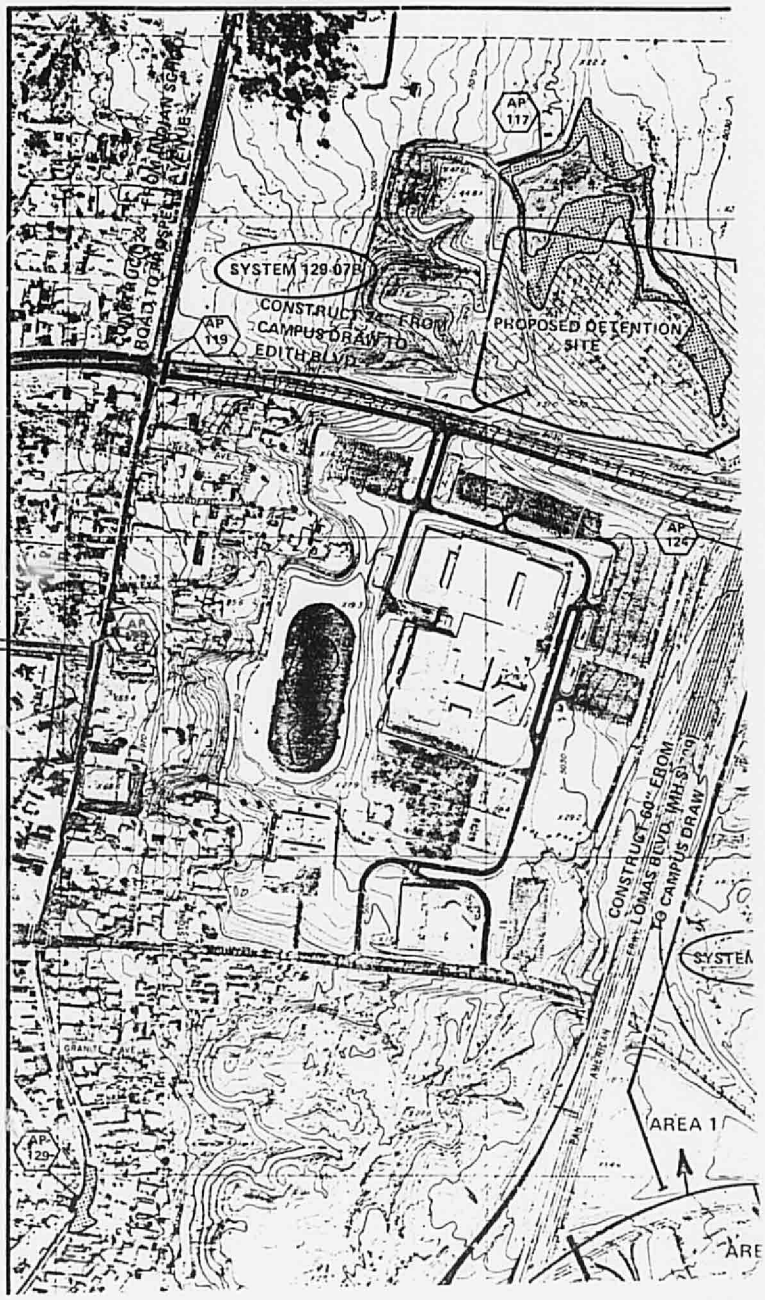
Therefore we recommend a spillway of asphalt 2.0' wide and 4" in height to be constructed



FLOOD HAZARD BOUNDARY MAP



ALBUQUERQUE - ORTHO - TOPO MAP.



Note: Edith, Eliminate Kirtley St. and have curb and gutters into connection the project-off-site.

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Revised 10/14/81

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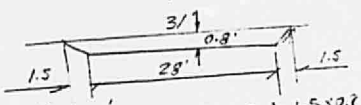

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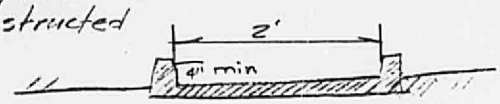

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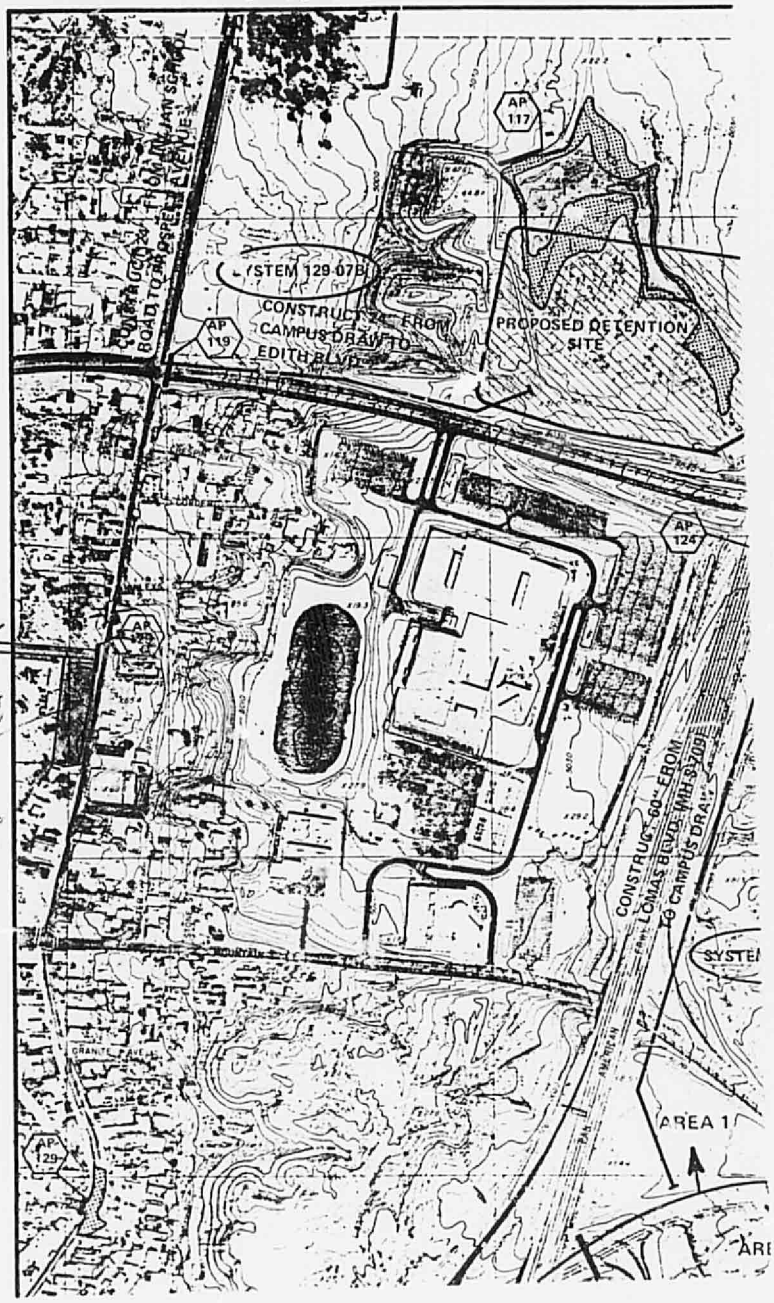

Note: Edith Elm. and Kinley Schools have curbing, gutters, and connections to project site.

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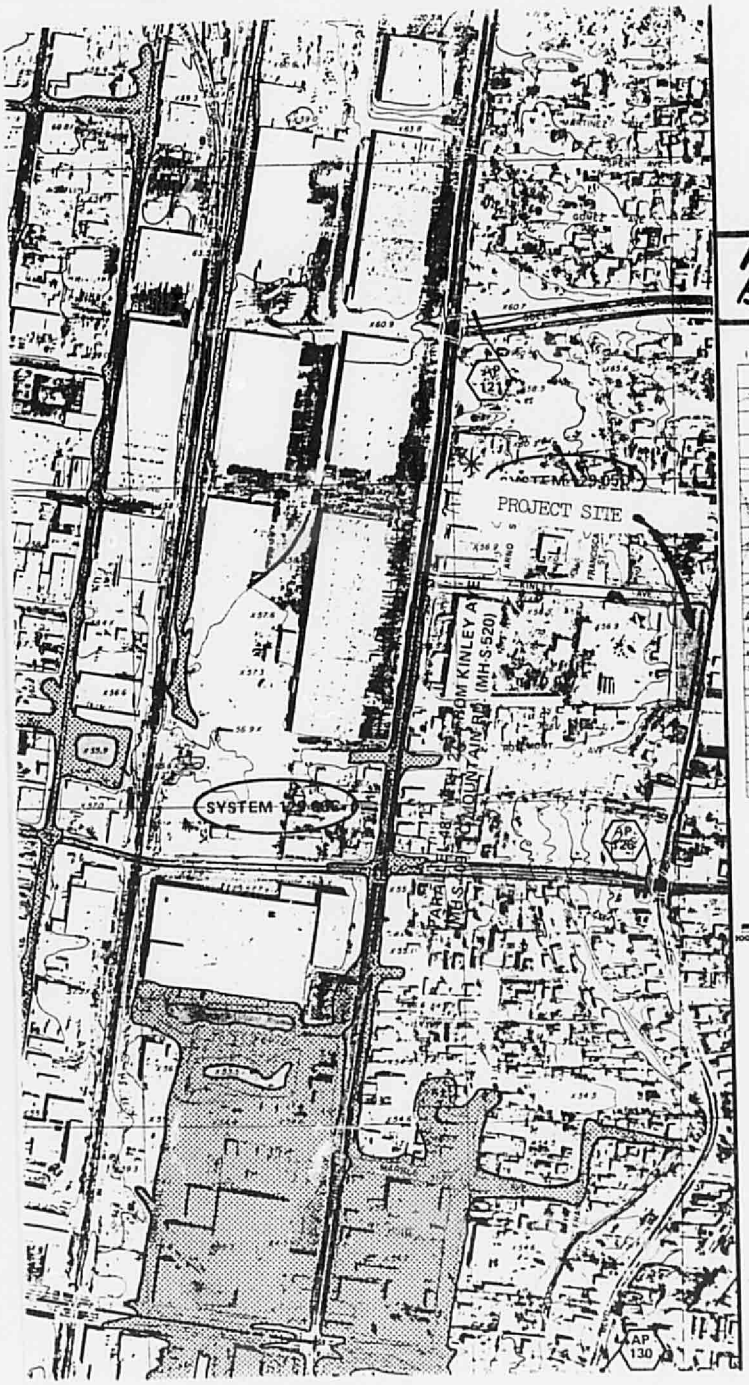

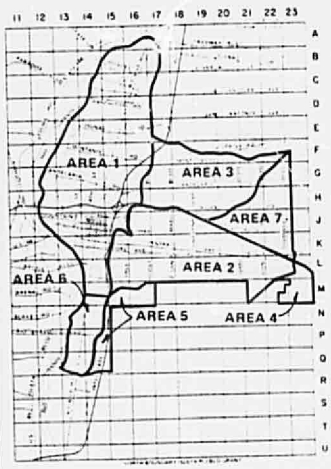

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SUMMARY

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FOX Consulting Engineers and Geologists

F. M. FOX & ASSOCIATES, INC.
3412 BRYN MAWR DRIVE, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0900

SUBSOIL INVESTIGATION

WAREHOUSE AND OFFICE BUILDING

KINLEY AVENUE, N.E. AND EDITH BOULEVARD, N.E.

ALBUQUERQUE, NEW MEXICO

Prepared for:

John VanderPol, Architect

September 14, 1981

Job No. 0108120

ALBUQUERQUE • DENVER • PHOENIX

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GUIDE SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL		

GENERAL

This report presents the results of a subsoil investigation conducted at the site of a proposed warehouse and office building to be located southwest of the intersection of Kinley Avenue, N.E. and Edith Boulevard, 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, groundwater conditions, and any special precautions which should be taken for the design and construction of the warehouse and office building due to soil conditions.

Conclusions and recommendations presented in this report are based on data gathered during the site investigation, on the results of laboratory testing, and on our experience with similar soil conditions. Data gathered during the field and laboratory investigations are presented in Figures 1 through 3, and Table 1.

PROPOSED CONSTRUCTION AND SITE CONDITIONS

From information supplied by John VanderPol, Architect, the proposed site will be developed with a one-story office and warehouse. The structure will be constructed using a rigid steel frame with metal siding for the exterior. The floors will be concrete slabs-on-grade, and to our knowledge no basements or sublevels are planned. It is our understanding that the proposed finish floor elevation will be one foot above existing grade. Maximum column loads are anticipated to be on the order of 10 kips with non-load bearing walls.

The subject site is bounded on the north by Kinley Avenue, to the east by Edith Boulevard, to the south by undeveloped property, and to the west by an existing garage and office building. The site has been graded and has 1.5 to 2 feet of man-made fill located throughout the building area. Overhead power poles were located on the east and north boundaries of the site with underground utilities running parallel with Edith and Kinley Avenue. A cyclone fence delineates the north, east and south boundaries of the site. Vegetation consists of a moderate growth of weeds, with some trash and debris. The site is generally flat, and slight amounts of grading will be required for development.

SUBSOIL CONDITIONS

As shown on the Logs of Test Holes, Figure 2, subsoil conditions are fairly uniform but vary with depth. The test holes generally encountered silty to slightly silty, medium dense to dense sands with intervals of silt located in both test holes. The surface material encountered in the test holes was 1.5 to 2 feet of man-made fill. This material should be removed from the building area prior to construction, and can be used as structurally controlled fill if the trash and debris are removed from this material.

Neither groundwater nor bedrock were encountered in the test holes to depth 20 feet (elevation 78.5 feet), the maximum depth of exploration.

The slightly clayey, sandy silt encountered in the test holes is non-swelling. However, these materials will consolidate under the proposed building loads. Refer to Swell-Consolidation Tests, Figure 3. The amount of settlement can be minimized by proper densification

of the natural soils, as well as other positive methods designed to control the moisture content of the foundation soils.

FOUNDATIONS - CONVENTIONAL SPREAD FOOTINGS

The proposed warehouse and office building should be supported on conventional spread footings placed on structurally controlled fill which will be placed after removal of the man-made fill. The foundations should be designed for a maximum soil bearing pressure of 1500 pounds per square foot. All man-made fill located on the site should be removed prior to construction.

Prior to foundation placement and placement of structurally controlled fill, the proposed bearing surfaces should be scarified, brought to optimum moisture content (± 2%) for as deep as practicable, and compacted to a minimum of 95% of maximum density as determined by ASTM D-1557, using a heavy vibratory roller. Structural fill for foundation support should be placed and compacted as detailed in the attached Appendix. If vibratory compaction techniques pose a threat to the structural integrity of nearby structures, static compaction should be used.

Footings should be proportioned as much as practicable in order to minimize differential settlement. A minimum strip footing width of 16 inches and a minimum column footing dimension of 24 inches should be maintained. All exterior footings for the structure should be a minimum of 18 inches below final exterior grade for frost protection. Special care should be taken to insure that prior to footing placement all materials disturbed or loosened in the excavation process are removed or recompacted to a minimum of 95% of the specified density.

The warehouse and office building will be of rigid frame construction. Therefore, a passive earth pressure is needed for the design of footings. This may be approximated by the following equivalent fluid pressure.

Passive Earth Pressure = Equivalent Fluid Pressure for a fluid whose density is 390 pcf.

This force should be assumed to act at the lower third of the stress triangle. In addition, it is recommended that a safety factor of 2 be used in design. This value is based on Rankine theory. A value of 0.4 should be used for the coefficient of sliding friction between the soil and the footing.

INTERIOR FLOOR SLAB CONSTRUCTION

Interior floor slabs for the office and warehouse building should be supported on compacted natural soil or structural fill. All existing fill on the site should be removed prior to the placement of floor slabs. Subsequent to the placement of utilities, and prior to slab placement, the natural soils should be moistened to optimum moisture content (± 2%) and be compacted to 90% of maximum density. Any fill placed for slab support should be placed in accordance with the specifications outlined in the attached Appendix.

It is good practice to separate slabs from all bearing members and utility lines to allow their independent movement. However, if desired, slabs may be tied into foundation walls. Where concentrated loads are anticipated, or for the ease of construction, a gravel layer may 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

Foundations and slabs should be well reinforced to minimize the effects of differential settlement. Refer to the foundation design for details.

BACKFILL AND SURFACE DRAINAGE

The foundation soils should be prevented from being wetted after construction. Backfill around the foundations should be free of trash and construction debris, and should be moistened and compacted to a minimum of 90% of maximum density as determined by ASTM D-1557. 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 foundation walls on all sides. A minimum slope of 1 foot of fall in the first 10 feet from all foundation walls is recommended. Drainage from roofs, and all other surface water, should not be allowed to pond in the backfill areas. Backfill adjacent to foundation walls should be protected from erosion and subsequent ponding of water by suitable means.

Ponding areas should be eliminated if possible. However, if they are required for the control of surface runoff they should be located as far from foundation walls as possible, a minimum of 15 feet.

IRRIGATION OF LANDSCAPED AREAS

Do not install sprinkler system lines next to foundation walls. If a sprinkler system is installed, the sprinklers should be placed so that the spray from the heads under full pressure does not fall within 5 feet of foundation walls. Irrigation should be minimized and controlled. Any planters adjacent to the structure should be watertight, and we recommend employing plants native to the area which require minimal irrigation.

CONSTRUCTION INSPECTION

The recommendations outlined above are based on the current plans for the proposed office and warehouse building. If the plans become significantly modified in the future we should be contacted for supplemental recommendations.

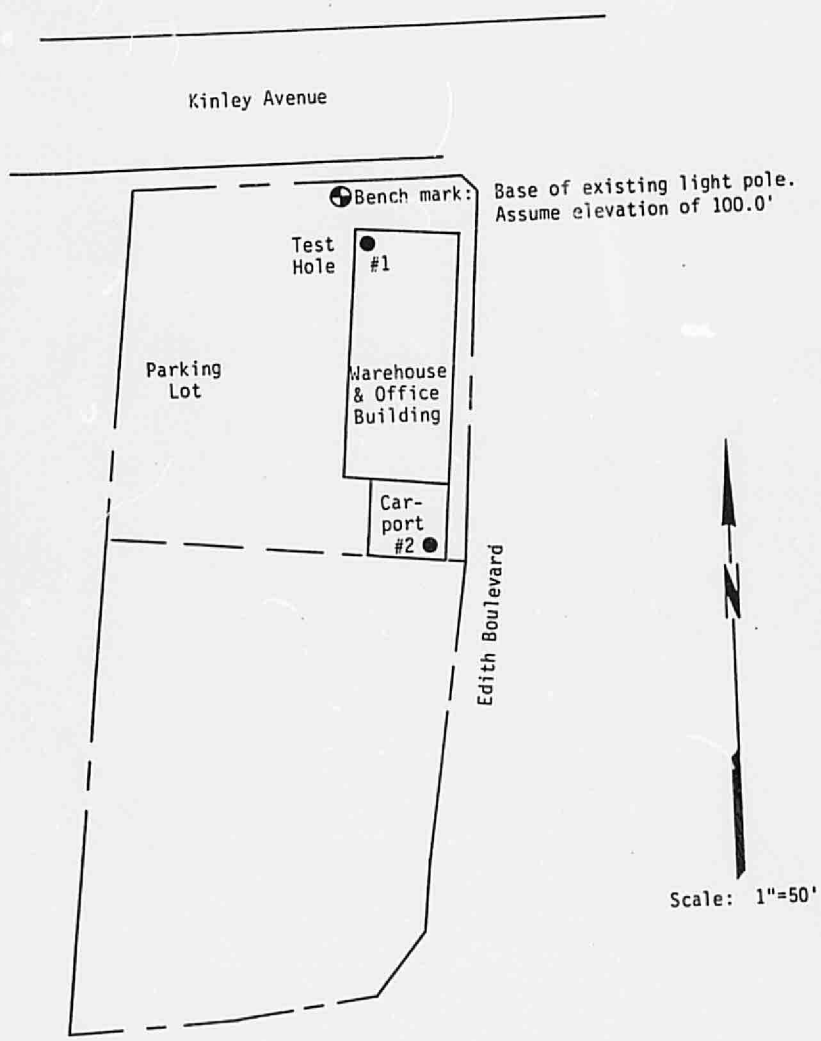
In any foundation investigation it is necessary to assume that the subsoil conditions do not vary greatly from the conditions encountered in the test holes. Our experience has shown that variations do exist, and that they are generally apparent in the foundation excavations. For this reason we strongly recommend that we be called to inspect the soils exposed in the foundation excavations prior to construction, and to supervise any fill placement.

F.M. Fox & Associates, Inc.

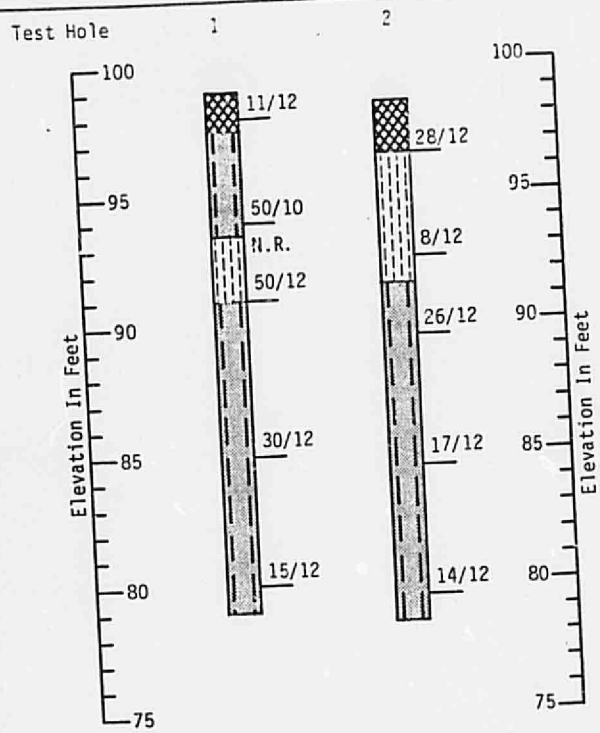
Timothy F. Turkowski
Staff Geotechnical Engineer

Reviewed by:

Charles M. Miller, P.E.
Geotechnical Division Manager



TEST HOLE LOCATION PLAN	Job No: 0108120
FOX Consulting Engineers and Geologists	Date: Sept. 14, 1981
	Figure 1



Legend

MAN-MADE FILL, sand, silty, clayey, medium to fine-grained, some trash and debris, medium dense, slightly moist to dry, calcareous, light brown to brown

SAND, medium to fine-grained, silty to slightly silty, medium dense to dense, dry to slightly moist, trace gravel, calcareous, brown (SM)

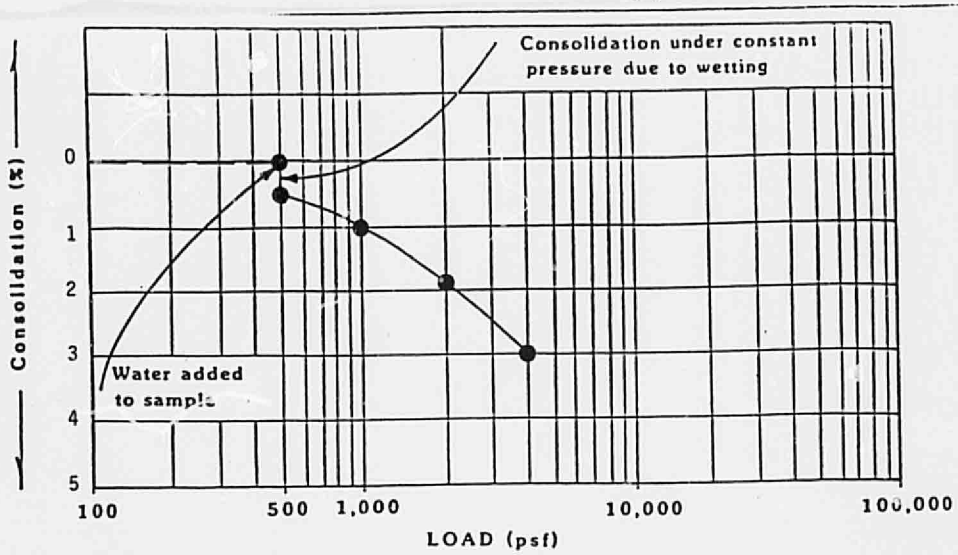
SILT, sandy to slightly sandy, fine-grained, very stiff to stiff, slightly moist to medium moist, some moderate plasticity lenses, slightly calcareous, brown to light brown (ML)

N.R. indicates no sample recovery.

Notes

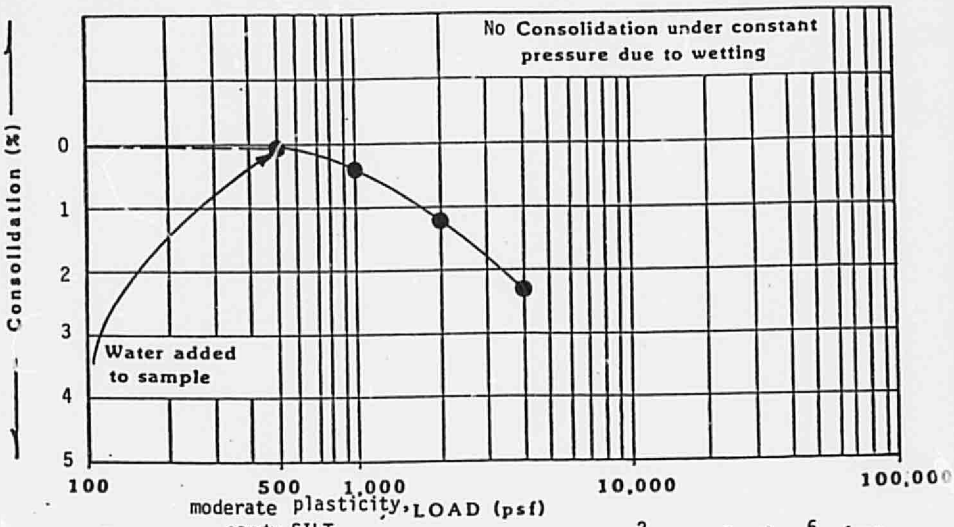
1. Test holes were drilled on September 2, 1981 with a 6-inch diameter hollowstem continuous flight power auger.
2. (11/12) location of Standard Penetration Test; indicates that 11 blows with a 140-pound hammer, falling 30 inches, were required to drive a 2-inch diameter sampler 12 inches.
3. Elevations taken with a hand level and are approximate.
4. Groundwater was not encountered in the test holes.

LOGS OF TEST HOLES	Job No: 0108120
FOX Consulting Engineers and Geologists	Date: Sept. 14, 1981
	Figure 2



Sample of sandy SILT from test hole 2 at depth 2 feet.

Natural Moisture Content 6.8 % Natural Dry Density 107 pcf.



Sample of sandy SILT from test hole 2 at depth 6 feet.

Natural Moisture Content 14 % Natural Dry Density 78 pcf.

SWELL - CONSOLIDATION TESTS	Job No: 0108120
FOX Consulting Engineers and Geologists	Date: Sept. 14, 1981
	Figure 3

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. 80	No. 200	Soil Description	Remarks
2	2	107	6.8	19	NP	100	98	95	85	61	sandy SILT	Fig. 3
2	6	78	14	45	16	98	96	83	77	58	moderate plasticity, sandy SILT	Fig. 3

NP indicates Non-Plastic

Table 1

APPENDIX

GUIDE SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL

GENERAL

The Soils Engineer shall be the owner's representative to control the fill operations. The Soils Engineer shall approve the material, the method of placing and compacting, and shall give written approval of the completed fill after having taken sufficient tests to assure compliance with the specifications.

Non-Expansive Fill Material

Non-expansive fill material shall be sands or gravels which have a plasticity index not greater than 20. The following criteria should be used for determination of acceptable amounts of fines in the non-swelling fill materials.

Liquid Limit (%)	% Passing the #200 Sieve
Greater than 50%	0 to 10%
From 30% to 50%	0 to 20%
Less than 30%	0 to 30%
Non-Plastic	0 to 50%

Material larger than 6 inches shall not be placed in the fill, and material larger than 4 inches shall not be placed within 1 foot of bearing surfaces of slabs, foundations or pavements. Material shall be approved by the Soils Engineer.

Preparation of Excavated Surfaces

The excavated surface under the areas to be filled shall be scarified, brought to optimum moisture content (± 2%) for as deep as practicable, and compacted using a heavy vibratory roller to a minimum of 95% of maximum density as determined by ASTM D-1557.

Preparation of Natural Ground - Site Fill and Treatment of Cut Sections

Prior to the placement of site fill, and subsequent to final grading in cut sections, the natural ground should be scarified, brought to optimum moisture content (± 2%) for as deep as practicable, and compacted using a heavy vibratory roller to a minimum of 95% of maximum density as determined by ASTM D-1557. All vegetation and topsoil should be removed before beginning preparation of natural ground.

PLACING FILL

No brush, sod, frozen material, or other perishable or unsuitable material shall be placed in the fill. Distribution of material shall be such as to avoid lenses differing substantially from the surrounding material. The materials shall be delivered to the fill in such a manner as to result in a well and uniformly compacted fill.

Before compacting, the fill material shall be spread in approximately horizontal layers not greater than 8 inches thick.

MOISTURE CONTROL

The material, while being compacted, shall contain the optimum moisture content for compaction distributed uniformly throughout the layers. The contractor shall be required to add moisture to the material in the excavation if, in the opinion of the Soils Engineer, it is not possible to obtain proper and uniform moisture by adding water on the fill surface.

COMPACTION

When the moisture and condition of each individual layer is satisfactory, it shall be compacted by method approved by the Soils Engineer. A Proctor Test should be performed on each typical fill material and frequent density tests of the fill shall be taken.

When compacting cohesionless free-draining materials such as sands and gravels, the material shall be deposited in layers and compacted by treads of a crawler-type tractor, surface of internal vibrators, smooth or pneumatic rollers, hand or power tampers, or by any other means approved by the Soils Engineer. The thickness of the horizontal layers after compaction shall not exceed 6 inches compacted thickness if compaction is performed by tractor treads, surface vibrators or similar equipment, or not more than the penetrating length of the vibrator head if compaction is performed by internal vibrators. The material may be ponded or flooded to aid in the compaction only if free-draining material underlies the new fill.

If the use of vibratory compaction techniques poses a threat to the structural integrity of nearby structures, static compaction should be used.

DENSITY REQUIREMENTS

Fill placed for foundation support shall be compacted to a minimum of 95% of maximum density as determined by ASTM D-1557.

Fill placed for slab support shall be compacted to a minimum of 90% of maximum density as determined by ASTM D-1557.

DRAINAGE REPORT

FOR

SOUTHWEST FILM
510 Kinley Avenue

ALBUQUERQUE, NEW MEXICO

RECEIVED

OCT 01 1981

ENGINEERING

PREPARED FOR:

SOUTHWEST FILM
c/o JOHN VANDERPOL
10832 PROSPECT AVENUE
ALBUQUERQUE, NEW MEXICO

PREPARED BY:

A & E ENGINEERING, INC.
1330 SAN PEDRO NE
ALBUQUERQUE, NEW MEXICO

JUNE 15, 1981
REVISED SEPTEMBER 25, 1981

THEODORE M. CONRARDY
REGISTERED PROFESSIONAL
ENGINEER NO. 2933

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A&E ENGINEERING INC.
CIVIL ENGINEERING, LAND PLANNING, AND SURVEYING

June 15, 1981

Mr. John Vanderpol
10832 Prospect Avenue NE
Albuquerque, New Mexico 87112

RE: SOUTHWEST FILM

Dear Sir:

We are transmitting this drainage report for Lot 6, of Block 6 of the Springer Transfer No. 1 Addition in Albuquerque, New Mexico. The control of the runoff shall comply with the requirements of the Albuquerque Metropolitan Arroyo Flood Control Authority and with the present City of Albuquerque drainage policies.

We do appreciate this opportunity to serve you and if any questions develop, we will be available to assist you in any response regarding this report.

Very truly yours,

A & E ENGINEERING, INC.

John F. Esquibel, President

JFE:mhe

1330 SAN PEDRO N.E.
SUITE 114 (505-266-8791)
ALBUQUERQUE, NEW MEXICO 87110

GENERAL:

This drainage report consists of a hydrologic study of a probable 100-year storm affecting the proposed development on Lot 6, of Block 6 of the Springer Transfer No. 1 Addition.

LOCATION AND DESCRIPTION:

The property under study is a parcel of land zoned M-1 and contains approximately 1.01 acres. It is located on the southwest corner of the the intersection of Kinley Avenue and Edith Boulevard. This property is more particularly described as Lot 6, of Block 6 of the Springer Transfer No. 1 Addition. The address of this lot is 500 Kinley Avenue.

The existing terrain for the parcel slopes to the west at about 1.80 grade.

PROPOSED DEVELOPMENT:

This parcel of land is to be developed into an office and warehouse to house the Southwest Film. It will be graded, paved and landscaped to shed storm water off the property, so that the runoff drains into proposed ponds and shall be controlled in a similar manner as existing conditions.

PROPOSED DRAINAGE PLAN

In order to control onsite runoff of this development, the area has been designed with grades, landscaped area and ponds to collect the runoff.

The drainage has been divided into two (2) drainage areas to prevent concentration of runoff at only one point. (See Plate 1 drainage plan).

Drainage area "A" is the onsite drainage area being the undeveloped portion directly south and east of the developed area. The drainage flows across the existing undeveloped lot in similar manner to the existing conditions. Drainage area "B" the developed portions of this project is the paved area west of the building and the building roofs drains into the pond located along the northwest corner of the parking lot.

There is no offsite runoff affecting this lot.

DISCUSSION OF METHOD

The development of this area will be controlled by the guidelines set forth in the recent resolution of the Albuquerque Metropolitan Arroyo Flood Control Authority and the City of Albuquerque.

The amount of storm water is computed by using a 100-year storm, this being a storm consisting of 100-year 6 hours precipitation as shown by the rainfall frequency maps for New Mexico, June 1967, published by the Special Studies Branch, Office of Hydrology, United States Weather Bureau.

The pond area was calculated so that the volume of water ponded would equal the volume of runoff produced by the development. The pond is sized to hold a 10-year sotrm and the pond and a portion of the parking lot for the 100-year storm.

ONSITE DRAINAGE CALCULATIONS

TOTAL UNDEVELOPED AREA

Area = 1.01 acres

Volume of runoff
Runoff factor = 0.4
Rainfall = 2.4 in.

Volume = $0.4 \times \frac{2.4}{12} \times 1.01$ acre x 43,560 sq. ft. = 3519.6 cfs.

Volume undeveloped = 3519.6 cu. ft.

AREA "A"

TOTAL DEVELOPED AREA = 15,492 sq. ft.

Volume

$0.9 \times \frac{2.4}{12} \times 15{,}492$ sq. ft. = 2788.6 cu. ft.

Volume undeveloped area where proposed development will occur

$0.4 \times (2.4) \times 15{,}492 = 1239.4$ cu. ft.

Runoff after developed = 2788.6
Runoff before developed = 1239.4
1549.2 cu. ft. for 100-year storm

AREA "B"

Will remain in its natural state and will not affect this development.

The portion of the parking lot that will be used for ponding will flood to elevation 60.1 under maximum design conditions.

The combined ponding conditions this being the pond 848 cu. ft. and the parking lot having a ponding capacity of 728 cu. ft. for a combined total ponding capacity for a 100-year storm of 1576.0 cu. ft. This is (1576.0 - 1549) = 27 cu. ft. in excess of the required amount.

CALCULATIONS

Area of parking lot to be used as ponding 5600 sq. ft. x 0.13 ft. = 728 cu. ft.

SUMMARY

It is recommended that this development be approved since the computations show that the proposed design is adequate to satisfactorily handle a 100-year storm.

10 year storm Pond Calculations

From: Noaa. Atlas 2, Vol. IV New Mexico

10 year storm
10 minute duration
i - intensity = 3.94

$Q = c\,i\,a$

$c = 0.9$ for developed area
$c = 0.4$ for undeveloped area

$a_{undeveloped}$ = area (in acres) = $2802\,SF / 43560\,AC.$ = 0.064 acres

$a_{developed}$ = $16000 / 43560$ = 0.36 acres

$Q_{10\,developed} = 0.9\,(3.94)\,(0.36) = 1.27$ cfs

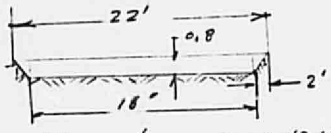
$Q_{10\,undeveloped} = 0.4\,(3.94)\,(0.064) = 0.10$ cfs

$Volume_{10\text{-}developed} = 1.27\,ft^3/sec. \times 10\,min \times 60\,sec/min = 762.0\,ft^3$

$Volume_{10\text{-}undeveloped} = 0.10\,ft^3/sec \times 10\,min \times 60\,sec/min = 60.0\,ft^3$

Total 10-year runoff flowing into pond = $822.0\,ft^3$

Pond Size or capacity:



$L = 52'$

Volume/Ft = $18 \times 0.8 + (2 \times 0.8) = 13.6$ cu ft/Ft. = 16.0 cu ft/Ft

$16.0\,ft^3/ft \; 52.0\,ft = \underline{848.0\,cu\,ft.}$

Pond (Drain Pipe)

Calculations

$L = 20.0$

$H = (59.20 - 59.10 = 0.10$

Orfice opening 1/2 diameter hole

$d = 2\frac{1}{2}''$ or $\frac{2.5}{12} = 0.208$ ft.

Volume generated into pond is equal to 1,549.2 ft^3 by a 100 year storm.

Orfice Design

$Q = Ca\sqrt{2gh}$ $\qquad a = \frac{\pi\left(\frac{0.5}{12}\right)^2}{4} = 0.0014\ ft^2$

$C = 0.64$

$Q = 0.64(0.0014)\sqrt{64.4\ (0.10)}$

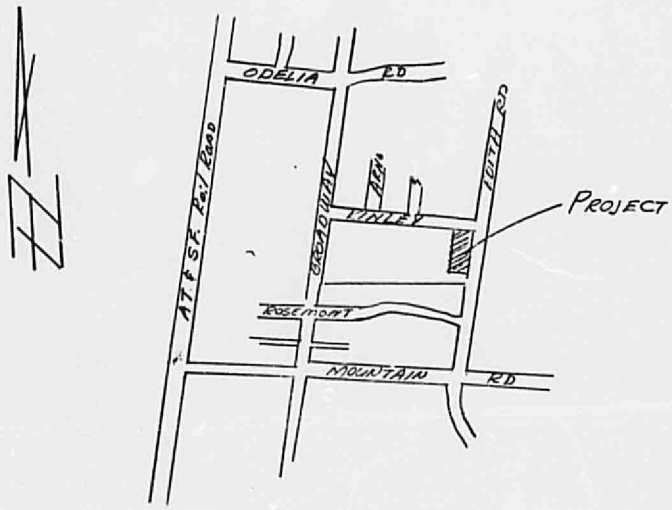
$Q = 0.0023$ cfs

Volume per day = 0.0023 cfs x 86,400 sec/day = 198.7 ct/day/orfice

Therefore based on this calculations the will drain out into the street curb and gutter by using 8-1/2" diameter holes in a day.

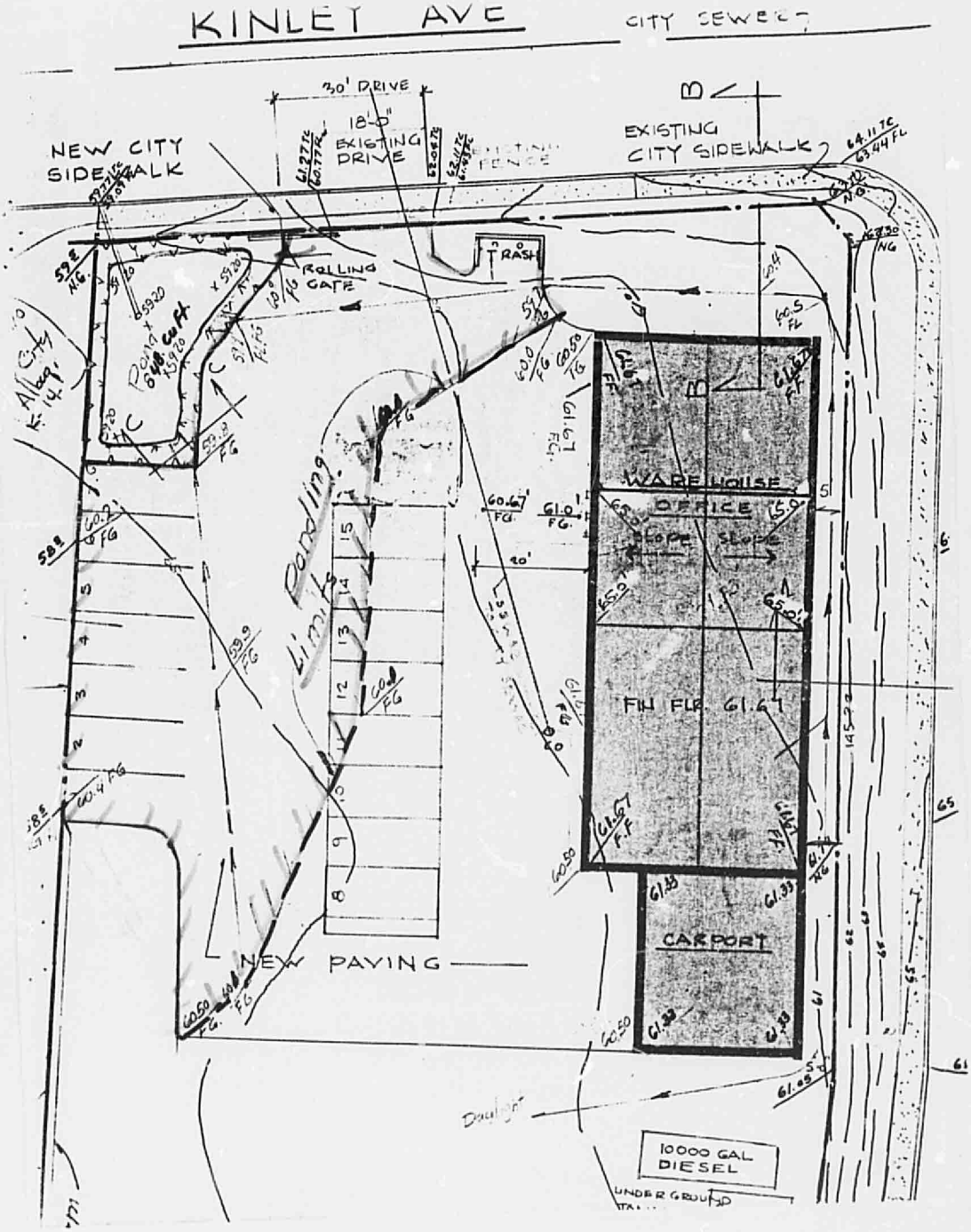
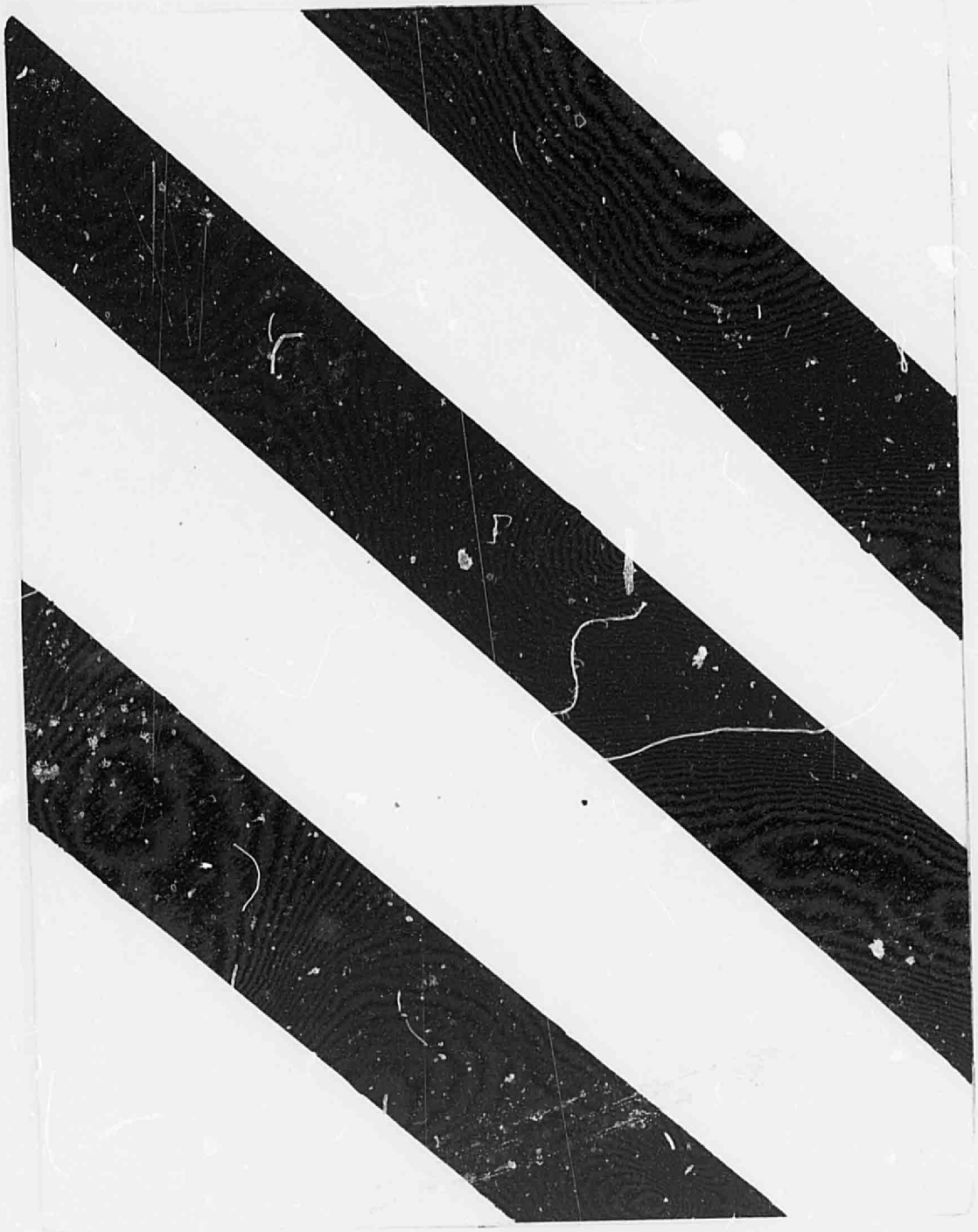
8 x 198.7 = 1582.4 cubic feet

The pond will be drained in one day.



VICINITY OR LOCATION MAP

Zone Atlas No J-14-Z


KINLET AVE
CITY SEWER
30' DRIVE
18'-0" EXISTING DRIVE
NEW CITY SIDEWALK
EXISTING CITY SIDEWALK
EXISTING FENCE
TRASH
ROLLING GATE
Pond 6400 cu ft
Alley
Rolling Limits
WAREHOUSE
OFFICE
SLOPE
FIN FLR 61.67
CARPORT
NEW PAVING
10000 GAL DIESEL
UNDER GROUND TANK