CITY OF ALBUQUERQUE

November 2, 2004

Shahab Biazar, P.E.
Advanced Engineering and Consulting, LLC
4416 Anaheim Ave. NE
Albuquerque, NM 87113

Re: Trucks West Parking Addition, Lot 4 Diversified Contractors Inc., Grading and Drainage Plan
Engineer's Stamp dated 10-10-04 (F17-D9)

Dear Mr. Biazar,

Based upon the information provided in your submittal received 10-18-04, the above referenced plan is approved for Paving Permit and Grading Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Upon completion of the project, please provide an Engineer Certification for our files.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. If you have any questions regarding this permit please feel free to call the DMD Storm Drainage Design section at 768-3654 (Charles Caruso).

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: Charles Caruso, DMD Storm Drainage Design
File

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

DRAINAGE INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: TRUCKS WEST PARKING ADDITION ZONE ATLAS/DRG. FILE #: F17/D009

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: LOT 4, DIVERSIFIED CONTRACTORS INC.

CITY ADDRESS: _____

ENGINEERING FIRM: *Advanced Engineering and Consulting, LLC* CONTACT: Shahab Biazar
ADDRESS: 10205 Snowflake Ct. NW PHONE: (505) 899-5570
CITY, STATE: Albuquerque, New Mexico ZIP CODE: 87114

OWNER: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

ARCHITECT: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- _____ DRAINAGE PLAN 1ST SUBMITTAL, REQUIRES TCL OR EQUAL
- _____ CONCEPTUAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- _____ EROSION CONTROL PLAN
- _____ ENGINEER'S CERTIFICATION (HYDROLOGY)
- _____ CLOMR / LOMR
- _____ TRAFFIC CIRCULATION LAYOUT (TCL)
- _____ ENGINEER'S CERTIFICATION (TCL)
- _____ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
- _____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- _____ SIA / FINANCIAL GUARANTEE RELEASE
- _____ PRELIMINARY PLAT APPROVAL
- _____ S. DEV. PLAN FOR SUB'D. APPROVAL
- _____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- _____ SECTOR PLAN APPROVAL
- _____ FINAL PLAT APPROVAL
- _____ FOUNDATION PERMIT APPROVAL
- N/A BUILDING PERMIT APPROVAL
- _____ CERTIFICATE OF OCCUPANCY (PERM.)
- _____ CERTIFICATE OF OCCUPANCY (TEMP.)
- X GRADING PERMIT APPROVAL
- X PAVING PERMIT APPROVAL
- _____ WORK ORDER APPROVAL
- _____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- _____ YES
- X NO
- _____ COPY PROVIDED

RECEIVED
OCT 18 2004
HYDROLOGY SECTION

DATE SUBMITTED: 10 / 18 / 2004 BY: Shahab Biazar, P.E.

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittals may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5)
2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5)
3. **Drainage Report:** Required for subdivisions containing more than ten (10) lots or containing five (5) acres or more

DRAINAGE REPORT
FOR

TRUCKS WEST PARKING ADDITION

LOT 4, DIVERSIFIED CONTRACTORS INC.

Prepared by:

ADVANCED ENGINEERING and CONSULTING, LLC

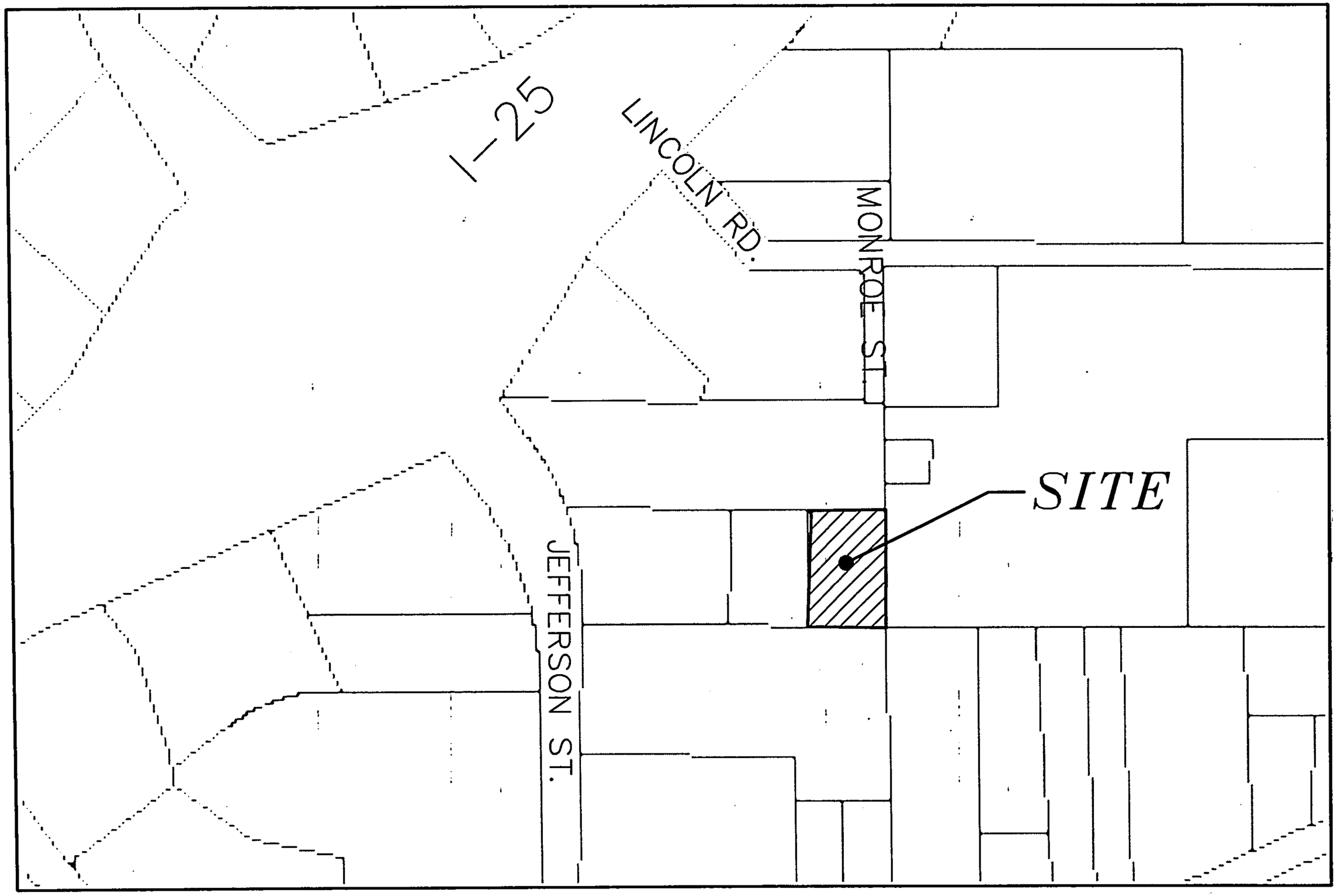
4416 Anaheim Ave., NE
Albuquerque, New Mexico 87113

October, 2004

SHAHAB BIAZAR NEW MEXICO 13479 REGISTERED PROFESSIONAL ENGINEER 10/18/04

Shahab Biazar
PE NO. 13479

RECEIVED
OCT 18 2004
HYDROLOGY SECTION



VICINITY MAP:

F-17-Z ****

Location

Trucks West Parking addition will be located on Lot 4 of Diversified Contractors Inc. Lot 4 is located three lots east of Jefferson. See attached Zone Atlas page number F-17 for exact location.

Purpose

The purpose of this drainage report is to present a grading and drainage solution for the proposed site. We are requesting rough grading approval and paving permit approval. The owners are proposing to pave the lot for parking spaces and build an access ramp from this Lot to their existing Lot to the North.

Existing Drainage Conditions

There is an existing building on site. The runoff from this site (at existing 100-year runoff rate of 3.17 cfs) drains west and south and then again south to existing inlets along the access road and Jefferson Street. Historically (based on A=100%) this site generated a runoff of 1.65 cfs. Based on the City Drainage number F17/D17 there is an offsite runoff of 84.50 cfs that enters this site from the east via surface and storm sewer pipe (42" RCP). The 42" RCP pipe daylights into a Concrete Box (± 5.0' high) and then drains south via a 3' wide by 1' high channel to the southeast corner of the lot and then drains west inside the same channel. From there the runoff will continue to drain west to some existing inlets on the access road and to the existing inlets on Jefferson Street. The 3' wide channel is under sized for the offsite runoff form the east. The channel has been design for smaller runoff than 100-year storm. Therefore, during a 100-year storm the runoff overflows the channel and drain via surface to the existing

inlets downstream. The site does not fall within a 100-year floodplain. The existing Trucks West site to the north has been submitted to City of Albuquerque under the City Drainage number F17/D81. A copy of the grading plan is located in the map pocket of this report. Copies of the drainage report and plans for the City Drainage number F17-D17 is also included with this report.

Proposed Conditions and On-Site Drainage Management Plan

The owners are proposing to pave the site for additional parking and build an access ramp to their exiting site to the north. The offsite runoff will continue to drain to this site. This site under the proposed conditions will generate a runoff rate of 4.72 cfs. The runoff will drain south and then west to the existing inlets along and to the existing inlets on Jefferson. The increase in the runoff based on the proposed construction is only 1.55 cfs, and it should not have an impact on the downstream storm drain facilities.

Calculations

City of Albuquerque, Development Process Manuel, Section 22.2, Hydrology Section was used for runoff calculations. See this report for Summary Table for runoff results and AHYMO input and summary output files for runoff calculations.

RUNOFF CALCULATIONS

(INPUT DATA FOR AHYMO CALCULATIONS)

The site is @ Zone 2

DEPTH (INCHES) @ 100-YEAR STORM

P_{60} = 2.01 inches

P_{360} = 2.35 inches

P_{1440} = 2.75 inches

DEPTH (INCHES) @ 10-YEAR STORM

P_{60} = 2.01 x 0.667
= 1.34 inches

P_{360} = 1.57

P_{1440} = 1.83

See the following sheets for Summary Table for runoff results and AHYMO input and summary output files for runoff calculations.

AHYMO INPUT FILE

```
* ZONE 2
**************************************************************
*      100-YEAR,  6-HR STORM (UNDER HISTORICAL CONDITIONS)       *
**************************************************************
START                 TIME=0.0
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                      RAIN DAY=2.75 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=101.0 AREA=0.001649 SQ MI
                      PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                      TP=0.1333 HR MASS RAINFALL=-1
**************************************************************
*        100-YEAR,  6-HR STORM (UNDER EXISITNG CONDITIONS)       *
**************************************************************
START                 TIME=0.0
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                      RAIN DAY=2.75 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=101.0 AREA=0.001649 SQ MI
                      PER A=0.00 PER B=40.00 PER C=47.00 PER D=13.00
                      TP=0.1333 HR MASS RAINFALL=-1
**************************************************************
*        100-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)       *
**************************************************************
START                 TIME=0.0
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=2.01 IN RAIN SIX=2.35 IN
                      RAIN DAY=2.75 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=102.0 AREA=0.001649 SQ MI
                      PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
                      TP=0.1333 HR MASS RAINFALL=-1
**************************************************************
*       10-YEAR,  6-HR STORM (UNDER HISTORICAL CONDITIONS)       *
**************************************************************
START                 TIME=0.0
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=1.34 IN RAIN SIX=1.57 IN
                      RAIN DAY=1.83 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=110.0 AREA=0.001649 SQ MI
                      PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
                      TP=0.1333 HR MASS RAINFALL=-1
**************************************************************
*        100-YEAR,  6-HR STORM (UNDER EXISITNG CONDITIONS)       *
**************************************************************
START                 TIME=0.0
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=1.34 IN RAIN SIX=1.57 IN
                      RAIN DAY=1.83 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=111.0 AREA=0.001649 SQ MI
                      PER A=0.00 PER B=40.00 PER C=47.00 PER D=13.00
                      TP=0.1333 HR MASS RAINFALL=-1
**************************************************************
*         10-YEAR,  6-HR STORM (UNDER PROPOSED CONDITIONS)       *
**************************************************************
START                 TIME=0.0
RAINFALL              TYPE=1 RAIN QUARTER=0.0 IN
                      RAIN ONE=1.34 IN RAIN SIX=1.57 IN
                      RAIN DAY=1.83 IN DT=0.03333 HR
COMPUTE NM HYD        ID=1 HYD NO=112.0 AREA=0.001649 SQ MI
                      PER A=0.00 PER B=10.00 PER C=0.00 PER D=90.00
                      TP=0.1333 HR MASS RAINFALL=-1
**************************************************************
*
FINISH
```

SUMMARY OUTPUT FILE

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02d RUN DATE (MON/DAY/YR) =10/15/2004
INPUT FILE = 200436 USER NO.= AHYMO-I-9702c01000R31-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.350
COMPUTE NM HYD	101.00	-	1	.00165	1.65	.047	.53121	1.533	1.563	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.350
COMPUTE NM HYD	101.00	-	1	.00165	3.17	.097	1.10213	1.500	2.999	PER IMP=	13.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	2.350
COMPUTE NM HYD	102.00	-	1	.00165	4.72	.174	1.98165	1.500	4.474	PER IMP=	90.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.570
COMPUTE NM HYD	110.00	-	1	.00165	.39	.011	.12517	1.533	.374	PER IMP=	.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.570
COMPUTE NM HYD	111.00	-	1	.00165	1.64	.045	.51364	1.500	1.551	PER IMP=	13.00
START										TIME=	.00
RAINFALL TYPE= 1										RAIN6=	1.570
COMPUTE NM HYD	112.00	-	1	.00165	3.06	.108	1.23172	1.500	2.895	PER IMP=	90.00
FINISH											

Rectangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: CHANEL-E

Comment: CHANNEL SECTION TO THE EAST

Solve For Discharge

Given Input Data:

Bottom Width.....	3.00 ft
Manning's n.....	0.012
Channel Slope....	0.0025 ft/ft
Depth.....	1.00 ft

Computed Results:

Discharge.....	13.21 cfs
Velocity.....	4.40 fps
Flow Area.....	3.00 sf
Flow Top Width...	3.00 ft
Wetted Perimeter.	5.00 ft
Critical Depth...	0.84 ft
Critical Slope...	0.0040 ft/ft
Froude Number....	0.78 (flow is Subcritical)

Rectangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: CHANEL-S

Comment: CHANNEL SECTION TO THE SOUTH

Solve For Discharge

Given Input Data:

Bottom Width.....	3.00 ft
Manning's n.....	0.012
Channel Slope....	0.0170 ft/ft
Depth.....	1.00 ft

Computed Results:

Discharge.....	34.46 cfs
Velocity.....	11.49 fps
Flow Area.....	3.00 sf
Flow Top Width...	3.00 ft
Wetted Perimeter.	5.00 ft
Critical Depth...	1.60 ft
Critical Slope...	0.0047 ft/ft
Froude Number....	2.02 (flow is Supercritical)

200436
GED

F 17-D 17

2 PLANS

K R U G E R L A K E A N D A S S O C I A T E S

Bob
Please forward

Mr. Verne Kimmick
Chief Engineer
City of Albuquerque
4th Floor, City Hall
POB 1293
Albuquerque, NM 87103

Subject: Navajo Freight Lines Terminal (7312)

Dear Sir:

We are enclosing herewith copy of the drainage study of the Navajo Freight Lines Terminal site at San Mateo Blvd., and Lincoln Road, NE. This study is for your review and approval.

Very truly yours

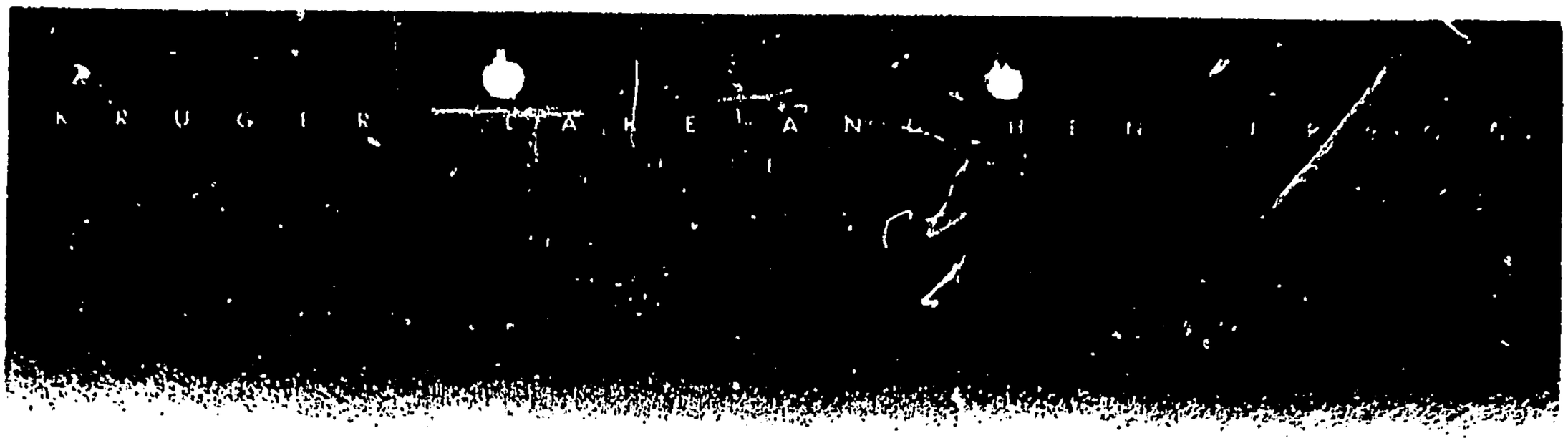
KRUGER, LAKE and ASSOCIATES
Architects and Engineers

N. J. Kruger, President

NJK:a

Enclosure

cc: Mr. L. F. Mattingley



January 30, 1974

Mr. John Robert
Albuquerque Metropolitan Arroyo
Flood Control Authority
2112 Girard Blvd. NE
Albuquerque, NM 87107

Subject: Navajo Freight Lines Terminal
Albuquerque, New Mexico (7312)

Dear Sir:

We are enclosing herewith a Drainage Study of the Navajo Freight Lines Terminal site revised in accordance with our recent conversation. We trust that with the changes made, and the grading, etc., the project now meets with your approval.

Very truly yours

KRUGER, LAKE and ASSOCIATES
Architects and Engineers

NJK:d

N. J. Kruger, President

Enclosure

cc: Mr. Q. R. Kellick, City Engineer &

22 OCTOBER 1976

ADDENDUM: 21st CENTURY SOUND BUILDING-ALBUQUERQUE NEW MEXICO

This addendum is issued to clarify the originally submitted plans and shall supersede the original plan in cases of discrepancy.

1. The lot shall drain into a drainage ditch (or canal) located just beyond the rear (west) property boundry. This ditch is owned and maintained by the Navajo Truck Company, and use of the ditch was given to 21st Century Sound when they purchased the lot from the Navajo Truck Company.

2. DRAINAGE CALCULATIONS:

PARAMETERS: t_c = 10 minutes (assumed)

I = 189/(t+25) = 5.4 inches/hour
C = 0.30 before building on land
= 0.95 for roof and asphalt areas
= 0.30 for gravel and landscaped areas

A = 0.53 acres total & 0.35 acres for roof & asphalt
0.18 acres for gravel & landscp.

THEN:

C = 0.73 as an average value for the entire piece of land after building on it (a weighted average)

** Q_o = CIA = (0.30)(5.4)(0.53) = 0.86 cfs which is the natural runoff and the quantity that may be used after construction.

** $T = -25 + \sqrt{7087.5CA/Q_o}$ (Albuquerque)
$= -25 + \sqrt{(7087.5)(0.73)(0.53)/(0.86)}$
= 32 minutes

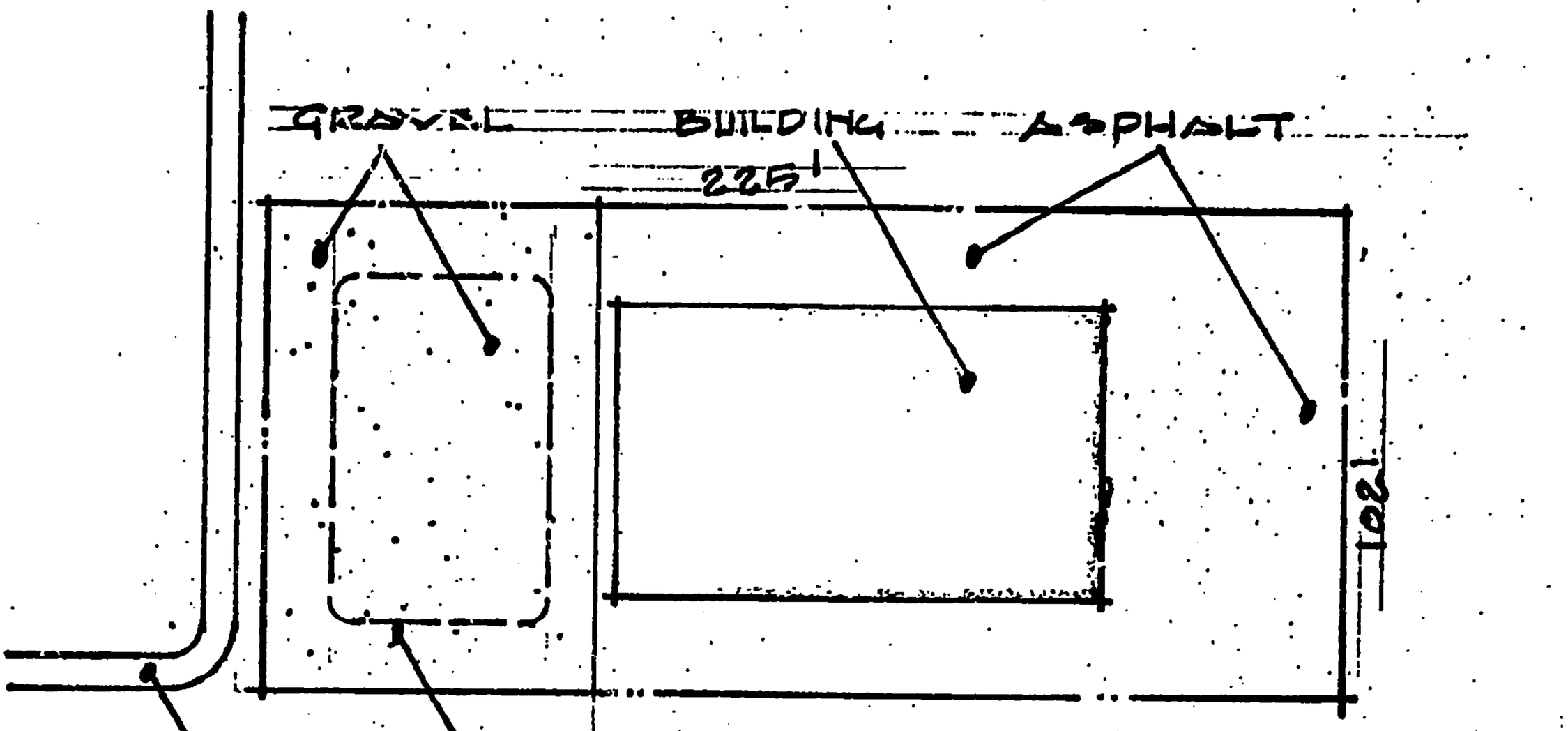
** $V_s = 60CA(189/(T+25))(T) - 40Q_oT$
$= 60(0.73)(0.53)(189/(32+25))(32) - 40(0.86)(32)$
= 1375 cf

A 40' x 70' x 6" pond will hold 1375 cf.

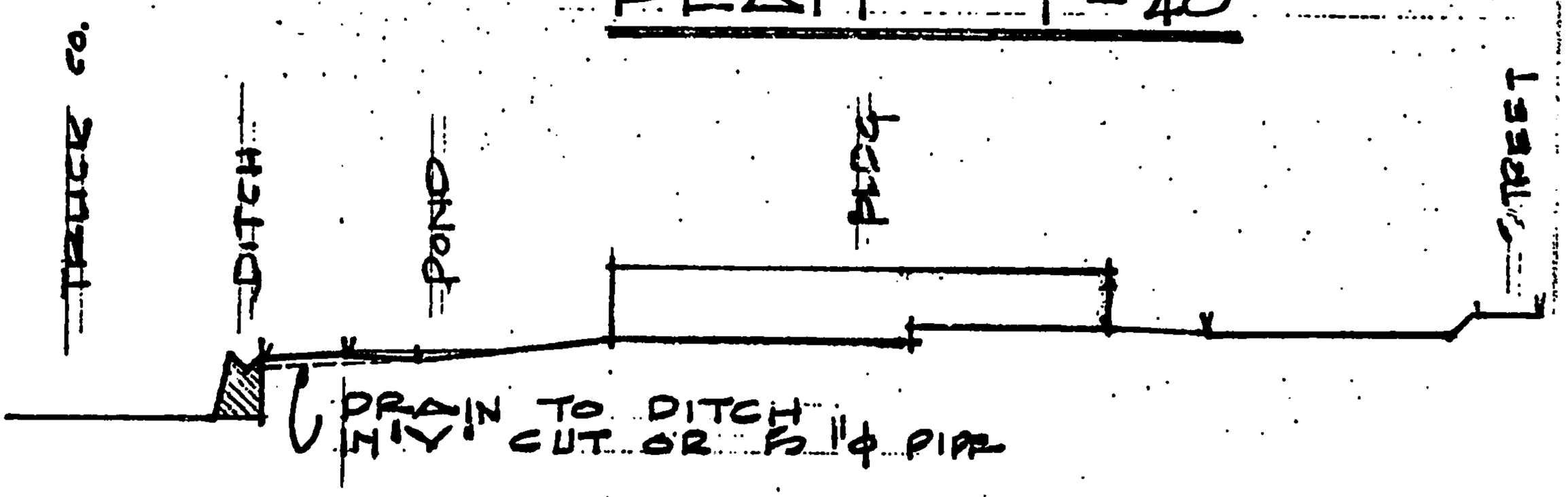
[A 5" ø pipe at about a 12" head will carry the required flow; a small 'V' cut should be an adequate alternative.]

2 - 6" deep "V" cut.

**NOTE: Basic equation derived from WATER & SEWAGE WORKS MAGAZINE Dec. 1973 issue



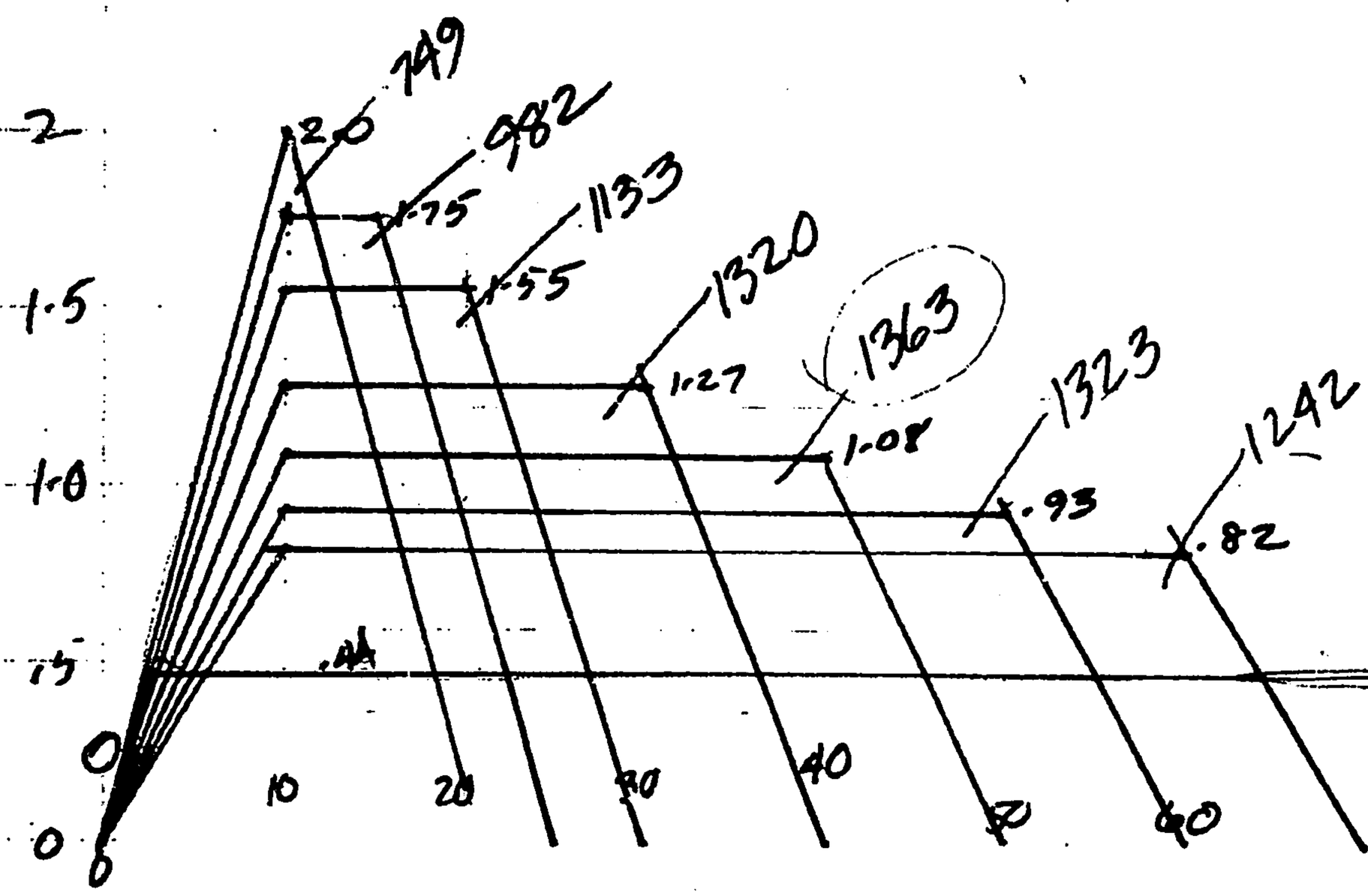
PLAN 1"-40'



SECTION

21 ST CENTURY SOUND — 10/22/70

T	Q
10	2
15	1.75
20	1.55
30	1.27
40	1.08
50	.93
60	.82



A DRAINAGE STUDY

OF

NAVAJO FREIGHT LINES' TERMINAL SITE

AT

SAN MATEO AND LINCOLN ROAD, N. E.
ALBUQUERQUE, NEW MEXICO

Kruger, Lake and Associates
Architects and Engineers
601 San Pedro Dr. NE.
Albuquerque, New Mexico 87108

Tel: 505 / 265-8452. -53

December 29, 1973
(Revised January 29, 1974)

I N D E X

Runoff Calculations:

A DRAINAGE STUDY

NAVAJO FREIGHT LINES TERMINAL SITE
San Mateo and Lincoln Road, N. E.
Albuquerque, New Mexico

A. GENERAL INFORMATION

1. Legal Description: See Legal description on Plot Plan, (Exhibit "A").

2. Location: The area concerned in this study is bordered on the east by San Mateo Blvd. NE. and on the north by Lincoln Rd. NE.

3. Contributing Drainage Areas: Approximately 43 acres between San Pedro Dr., NE. and San Mateo Blvd., NE., contribute to the run-off through the subject property as indicated on the attached topo map, (Exhibit "B").

4. Arroyos: A small arroyo flows through the site covered by this study.

5. San Mateo Diversion Storm Sewer: The City of Albuquerque has designed a storm sewer along the west right-of-way of San Mateo to divert the arroyo flowing through this land to Bear Canyon Arroyo. This sewer will be constructed under the Cities Block-to-Block Contract. Navajo Freight Lines, Inc., is participating in the cost of this storm sewer.

B. RUNOFF FORMULA

Runoff quantities are calculated by the rational formula - $Q = C \cdot I \cdot A$.

1. Coefficients (C):

a.	Roofs	.95
b.	Paved Areas	.90
c.	Developed Residential Areas	.65
d.	Nursery Areas	.60
e.	Drive-In Theater (Paved and Gravel)	.80
f.	Undeveloped Areas	.30

2. Intensity of Rainfall: (I = 5.4"/hr.)
Assume 10 minutes duration $I = \frac{189}{t + 25} = \frac{189}{10+25} = 5.4"/hour.$

C. RUNOFF CALCULATIONS - See Sheets 3 and 4.

D. RUNOFF CALCULATIONS AFTER CONSTRUCTION are based on Project Site Plans - See Exhibit "A".

E. RUNOFF CALCULATIONS PRIOR TO CONSTRUCTION are based on a preliminary area topographical map prepared by Bohannan, Westman, Huston (See Exhibit "B").

F. CONCLUSIONS

1. The quantity of runoff flow in the arroyo at Point "B", the low point at the west end of the property has been reduced from 196.2 c.f.s., prior to construction, to 84.5 c.f.s. after construction is completed.

2. The quantity of flow on to Lincoln Road has been increased by only a fraction (.70 c.f.s.). When curb and gutter has been installed on San Mateo and a water stop constructed at San Mateo and Lincoln, the total flow in Lincoln Road will be less than at present.

3. We feel that all requirements of the 1972-2 AMAFCA Drainage Resolution have been met by our design.

N. J. Kruger, President
KRUGER, LAKE and ASSOCIATES
Architects and Engineers

REGISTERED PROFESSIONAL ARCHITECTURAL ENGINEER
N. J. KRUGER
NO.
804
STATE OF NEW MEXICO

RUN OFF CALCULATIONS 12-15-78 MJK

AFTER IN ARROYO PRIOR TO CONSTRUCTION P-CLA

1. AT POINT A (OUTLET OF CULVERT)

WATER STORMS AT ALL INTERSECTIONS ON SAN PEDRO.

AREA OF WATERSHED BETWEEN SAN PEDRO & SAN MATEO (EXHIBIT 'B')

FROM PRELIMINARY TOPO MAP BY BOHANNAN-HUSTON

(A)	DWGS.	900 x 1000 = 900,000/43,560 =	20.6 A	C = .65
(B)	PARK-IN	700 x 950 =	15.25 A	C = .90
(C)	NON-IMPROVED	400 x 800	7.3 A	C = .80

$Q_{(A)}$ = 20.6 x .65 x 5.4 = 72.8 c.f.s.
$Q_{(B)}$ = 15.25 x .90 x 5.4 = 66.0 "
$Q_{(C)}$ = 7.3 x .80 x 5.4 = 12.0 "
TOTAL FLOW AT "A" = 150.0 C.F.S.

2. FLOW AT POINT "B" SEE EXHIBIT 'B'

(A)	NURSERY	700 x 400	6.43 A	C = .60
(D)	IMPROVED	940 x 370	2.98	
(E)	"	800 x 820	2.20	
(F)	"	700 x 650	2.98	12.34 C = .90
(G)	"	800 x 850	2.18	
(H)	"	750 x 800	2.10	
(I)	STREET	450 x 100	1.05 A	C = .90

FROM CULVERT PT "A" 1540 c.f.s.

Q_A = 20.6 x .40 x 5.4 = 210 "
$Q_{(F)}$ = 12.34 x .30 x 5.4 = 20.2 "
$Q_{(I)}$ = 1.05 x .90 x 5.4 = 5.0 "
TOTAL FLOW AT PT "B" = 146.2 C.F.S.
TOTAL FLOW IN ARROYO PRIOR TO CONSTRUCTION

B. ANTICIPATED FLOW IN ARROYO AFTER CONSTRUCTION

1. ALL FLOW AT POINT "A" IS TO BE DIVERTED TO BEAR CANYON VIA NEW STORM SEWER ALONG SAN MATEO BY CITY OF ALBUQUERQUE.

2. FLOW AT POINT "B". SE

(A)	NURSERY	700 x 400	=	6.43 A.	C = .60
(G)	PAVED AREA	125 x 373	46,600		
(H)	" "	250 x 175	50,000		
(I)	" "	145 x 236	34,300		
(J)	" "	140 x 225	32,100		
(K)	" "	150 x 600	90,000	10.62 A	C = .90
(L)	" "	80 x 50	4000		
(M)	" "	450 x 306	137,700		
		350 x 60	21,000		
		350 x 75	21,000		
		130 x 52	6,100		
(N)	" "	50 x 70	3,500		
		100 x 72	7,200		
(O)	NON-IMPROVED	500 x 380	110,000	2.85 A	C = .30
(P)	" "	100 x 100	10000		
(Q)	ROOF	80 x 350	28,000	1.54 A	C = .95
	"	90 x 460	41,400		

E 89.50 cfs

RUNOFF CALCULATIONS 12-15-93

A. [illegible]

Q = [illegible] 21.0 cfs.
Q = [illegible] 51.0 ✓
Q = [illegible] 4.6 ✓
Q = [illegible] 7.9 ✓
84.5

TOTAL ADDITIONAL FLOW PER B = 84.5 cfs < 196.2 cfs OK

C. FLOW ON TO LINCOLN PRIOR TO CONSTRUCTION

ⓒ	UNIMPROVED	5'mix 35' 220 x 240 50 x 40 200 x 100 60 x 410	21,000 53,900 3,500 10,500 20,500	C = .30
ⓓ				
ⓔ	PAVED AREA	300x155	55,800 = 1.55 A.	C = .90
ⓕ	ROOF	14 x 14	200 = .464 A.	C = .95

Qc = 3.85 x .30 x 5.4 = 6.2
Qd = 1.55 x .90 x 5.4 = 7.5
Qe = .464 x .95 x 5.4 = 2.4
TOTAL FLOW ON TO LINCOLN = 16.6 cfs.

D. FLOW TO LINCOLN AFTER CONSTRUCTION

Ⓐ	ROOF		.464 A.
Ⓑ	PAVED AREA		1.55 A.
Ⓒ	" &	50x310	
Ⓓ	" "	280x45	ROA.
	" "	30x110	
Ⓔ	ROOF	GOOD SE	.178 A.
Ⓕ	PAVED.	30 X 350	.16 A.
Ⓖ	LAWN	30x350	.242 A.

Qa = 2.4
Qb = 8.0
Qc = .90 x .40 x 5.4 = 4.8
Qd = .178 x .95 x 5.4 = .9
Qe = .16 x .90 x 5.4 = .8
Qf = .242 x .30 x 5.4 = .4

TOTAL FLOW INTO LINCOLN = 17.3 CFS > 16.6 by .70 CFS. OK

REVISED: 1-29-94.