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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

February 27, 1986

Jeff Mortensen
Tom Mann & Associates, Inc.
811 Dallas, NE
Albuquerque, New Mexico 87110

RE: UPDATED DRAINAGE PLAN FOR NEWPORT EAST BUSINESS PARK
RECEIVED FEBRUARY 7, 1986 (M-16/D11)

Dear Mr. Mortensen:

I have reviewed the referenced plan and forward the following comments:

1. Is there a drainage easement for the runoff from Tract Z-1 that travels west.

2. Please explain how the runoff from Tract Z-7 is handled.

3. Please submit a copy of the plat for Tracts Z-1 thru Z-7.

If you have any questions regarding this project, call me at 766-7644.

Cordially,

Carlos A. Montoya, P.E.
City/County Floodplain Administrator

CAM/bsj

11104

DRAINAGE INFORMATION SHEET

PROJECT TITLE: NEWPORT EAST BUSINESS PARK ZONE ATLAS/DRNG. FILE #: M-16/D11

LEGAL DESCRIPTION: TRACTS X, Y, Z, A-1, C-1 & M, AIRPORT PARK

CITY ADDRESS: ALAMO SE

ENGINEERING FIRM: TOM MANN & ASSOC. CONTACT: J.G. MORTENSEN

ADDRESS: 811 DALLAS NE. PHONE: 265-5611

DEVELOPER: ~~OWNER:~~ CRADDOCK DEV. CO. CONTACT: DON MURPHY

ADDRESS: PHONE:

ARCHITECT: N/A CONTACT:

ADDRESS: PHONE:

SURVEYOR: TOM MANN & ASSOC. CONTACT: J.G. MORTENSEN

ADDRESS: 811 DALLAS NE PHONE: 265-5611

CONTRACTOR: N/A CONTACT:

ADDRESS: PHONE:

RECEIVED FEB 07 1986 HYDROLOGY SECTION

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. 86-71

EPC NO.

PROJ. NO.

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

✓ CONCEPTUAL GRADING & DRAINAGE PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

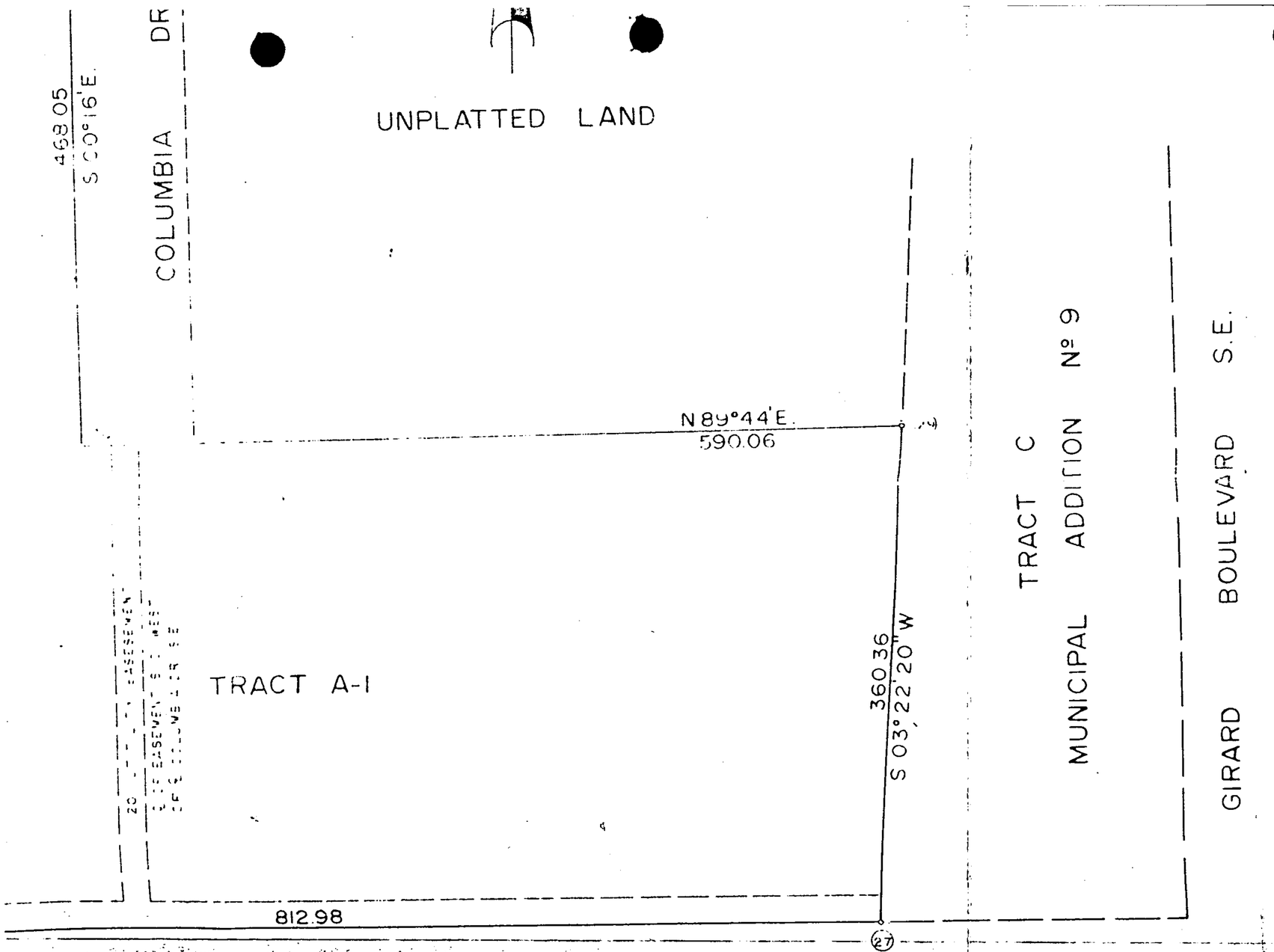
___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

✓ OTHER UPDATE AS (SPECIFY) REQUESTED BY FRED J. AGUIRRE @ DRB ON 02-04-86

DATE SUBMITTED: 02-06-86

BY: J.G. MORTENSEN



[illegible] Planning [illegible] Albuquerque, [illegible]

[illegible] half of 19[illegible] for the property ins[illegible] going plat.

[illegible] New Mexico Title Company

APPROVED:

[illegible] Water Engineer

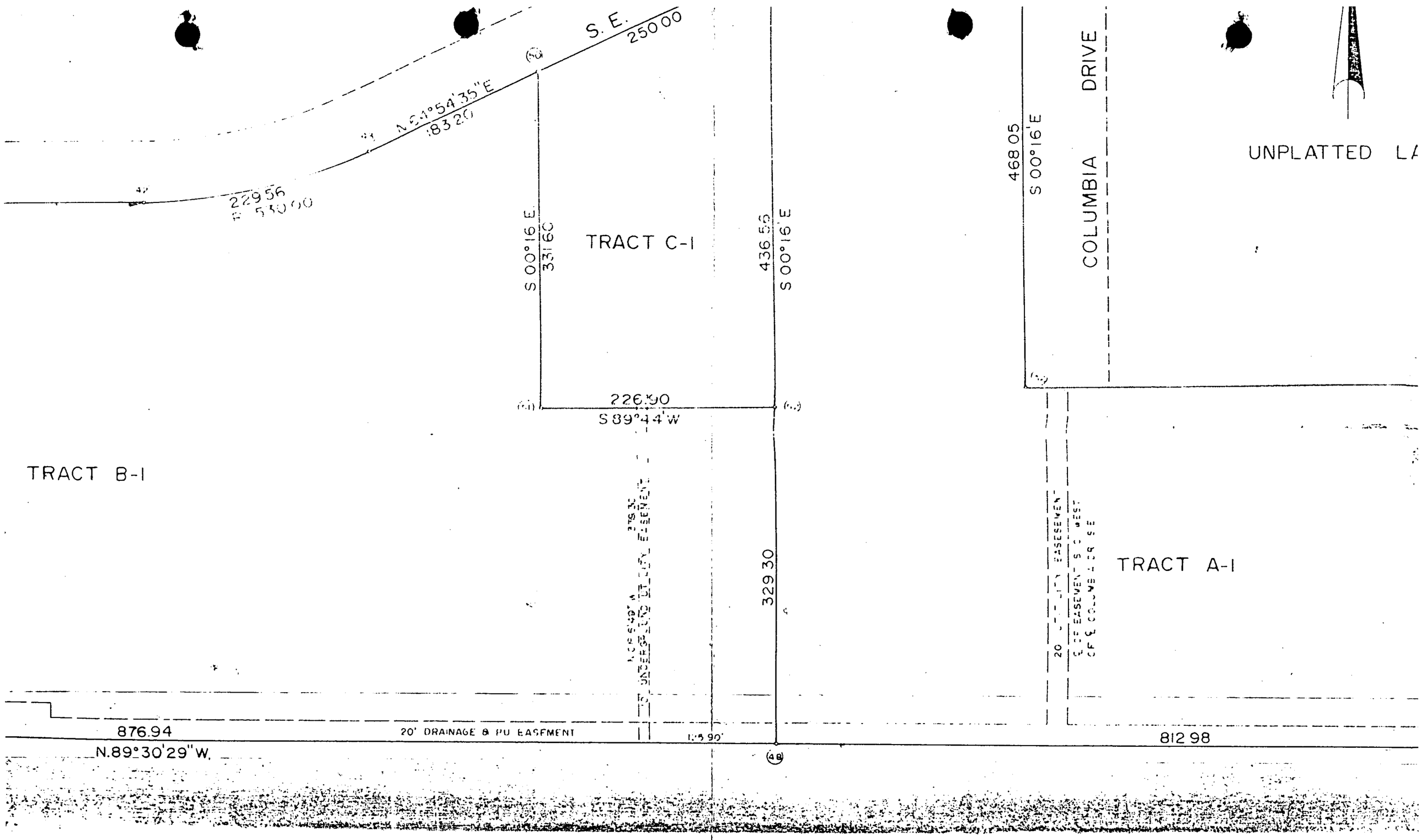
By: [illegible]

for City Engineer

By: Quentin R. Kilbich

[illegible]
Public Service Company of New Mexico

[illegible]
Mountain States Telephone


S. E.
250 00
N 54°54'35" E
183 20
229 56
S 00°16' E
331 60
TRACT C-1
436 55
S 00°16' E
226 90
S 89°44' W
TRACT B-1
329 30
468 05
S 00°16' E
COLUMBIA DRIVE
UNPLATTED LA
TRACT A-1
876.94
N.89°30'29" W.
20' DRAINAGE & PU EASEMENT
812 98

Community Sciences Corporation
P.O. Box 1328
CORRALES, NEW MEXICO 87048

(505) 897-0000

LETTER OF TRANSMITTAL

DATE 2/16/78	JOB NO.
ATTENTION	
RE:	

TO Bruno Caneglano
City Engineering

GENTLEMEN:

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☒ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Revised Drainage Plan Sheet III of Drainage Report for Newport Park

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please substitute this sheet for the one you now have. The changes which I understand were agreed upon with Craddock have been shown. Report text remains the same.

COPY TO Dave Werner - Craddock

SIGNED: Kent M. Whitman

If enclosures are not as noted, kindly notify us at once.

CITY OF ALBUQUERQUE

Albuquerque, New Mexico

From the office of....
Q.R. Kielich
Asst.City Engineer -Design

Good
MS

3 Mar. 75

Ken:

I am aware of this. Have worked up a project to connect the outlet end of 36" pipe to 60". Wanted to have Airport to pay their share and remaining from Storm Sewer Bond Fund. about 50-50. ~~the~~ Airport Director says ~~no~~ no-money now.

All runoff comes from airport parking lot and future development area south of airport lost road.

J.K.

JOHN B. ROBERT
EXECUTIVE ENGINEER

B. H. SWINBURNE, CHAIRMAN
FRED LUTHY, JR., VICE-CHAIRMAN
RICHARD H. CLOUGH, SEC.-TREAS.
WILLIAM V. HEREFORD, DIRECTOR
FRANCES McCOY, DIRECTOR

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

2112 GIRARD N.E.
P. O. BOX 25851 - ALBUQUERQUE, N. M. 87125
TELEPHONE 268-4519

Bob — Are you aware of this?

RECEIVED
FEB 28 1975
CITY ENGINEER

February 27, 1975

A & E Engineering, Inc.
4100 Silver S.E.
Albuquerque, New Mexico 87108

Attention: Mr. John Esquibel

Dear Mr. Esquibel:

I have reviewed the revised drainage report for the Newport Business Park which you transmitted with your letter of February 17, 1975 and find that it meets the requirements of AMAFCA Resolution #1972-2. In order to make the drainage system work in conformance with your plan, I am sure that you have cleared with the City of Albuquerque for the 36 inch storm sewer line connection between the existing outlet of the North Airport parking lot, to the 60 inch storm drain along the south boundary of the Newport Business Park tract.

In my opinion, this storm sewer and the connecting drains from the planned ponding areas should be installed prior to any extensive site development.

Sincerely yours,

John B. Robert

John B. Robert
Executive Engineer

cj

cc: Craddock Development Company
Mr. Vern Kimmick

Craddock
Development Company
2501 Yale Blvd., S.E., Albuquerque, New Mexico 87106 (505) 842-9136

March 30,1979

City of Albuquerque
Engineering Division
400 Marquette Ave.,N.W.
Albuquerque, N.M.

Attention: Drainage

Re: Techniflex I-2408 Alamo, S.E.

Dear Bruno:

This letter is to certify that necessary ponding for Newport Park will be completed to specifications upon completion of City Drainage piping to the south. At present time, preliminary grading has been completed. Landscaping and final grading are awaiting completion of a City of Albuquerque storm sewer on the south edge of the proposed pond.

Sincerely,

Claudio A. Vigil
Designer, Craddock Development Company

CAV:kd

Craddock
Development Company

2501 Yale Blvd., S.E.
Albuquerque, New Mexico 87106

City of Albuquerque
Engineering Division
400 Marquette Ave., N.W.
Albuquerque, N.M.

Community Sciences Corporation
P. O. Box 1328
CORRALES, NEW MEXICO 87048

(505) 897-0000

LETTER OF TRANSMITTAL

DATE 12/27/77 JOB NO.

ATTENTION

RE:

TO Mr. Varne Kennick

RECEIVED
JAN 03 1978
CITY ENGINEERS

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Revised Drainage Report for Newport Business Park

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

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☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO Jim Smith, Amafca
Dave Werner, Craddock

SIGNED: Kent M. Whitman

If enclosures are not as noted, kindly notify us at once.

community sciences corporation

November 8, 1976

RECEIVED
NOV 1 0 1976
CITY ENGINEERS

Mr. Kleston Laws
City Engineers Office
Albuquerque, NM

Re: Newport Business Park - Drainage

Dear Mr. Laws,

I have reviewed my calculations regarding net areas proposed to drain freely into the adjacent streets for Newport Business Park. The net area (excluding roof surfaces and landscaped areas) of those portions designated "A" & "C" is 5.8 acres. Therefore, rates of runoff can be compared as follows:

$$Q_{nat} = (0.4)(5.4)(19) = 41 cfs$$
$$Q_{dev} = (0.95)(5.4)(5.8) = 30 cfs$$

The net acreages of areas "A" & "C" had been established during the course of my calculations, but at the time I formated the final report, I did not feel they were necessary to its content, so unfortunately they were not included.

In addition, I am forwarding a copy of a letter which I sent to Craddock regarding required orifice sizes for the scupper controls for Multiplex 4 (bldg #9 of the report). As Craddock requests the same information for additional units, I will send you copies of my recommendations for your records.

I hope this information is what was needed so the report can be approved.

Sincerely yours,

Kent M. Whitman

Kent M. Whitman, P.E.

KMW/jt

Enclosure

4015 Carlisle Boulevard NE
Albuquerque, New Mexico 87107
(505) 881-2500

P.O. Box 1328
Corrales, New Mexico 87048
(505) 897-0000

SURVEYING
ENGINEERING
LAND PLANNING

2-7-78

Paul Werner
Dick Johnston } Crudworth.

1. If in future we need easement for line past east of pole they will grant easement. This will be determined by plans for City Hall.

2. We have easement for 48" to east.

3. They will provide a temp. catch basin near restaurant (future site.) and bleed water into alamo.

4. I have called Blumwood to get them to install drop inlet on south so we can determine where easement should be.

November 3, 1976

Craddock Development Company
2600 Yale Blvd. SE
Albuquerque, NM 87106

Attn: Mr. David Werner

Subject: Orifice Sizes for Scupper Controls - Multiplex 4.

Dear Dave,

As you requested I have run out some calculations to determine the required size and number of orifices needed to control outflow from the roof of Building # 4 (#9 on the drainage report). Based on a spacing of 40" o.c. for the scuppers and controls (adding to a total of 10 outlets), 5-5/16" diameter holes will be needed in each scupper control. These holes should be placed as close to the roof surface as practical. In addition I advise tight control on the dimensions of the metal retainers themselves since the structural adequacy of the scheme is based on the dimensions I have shown in the report.

Please let us know when we can be of further service.

Sincerely yours,

Kent M. Whitman, P.E.

KMW/jt

Nov 15 1976

Kent M Whitman
Community Sciences Corporation
P.O. Box 1328
Corrales, N.M. 87048

Re: Newport Business Park

Dear Mr. Whitman:

The addendum to drainage report for Newport Business Park is acceptable. Control flow drains for existing building ~~should~~ should be submitted for review and installed rapidly as possible. New buildings should have calculations submitted with the building permits.

Very truly yours

Kleston H Laws

cc John Robert

OCTOBER 1976

M 16-D1

A D D E N D U M

T O

D R A I N A G E R E P O R T

F O R

N E W P O R T B U S I N E S S P A R K

PREPARED FOR:

CRADDOCK DEVELOPMENT COMPANY

ALBUQUERQUE, NEW MEXICO

KENT M. WHITMAN
STATE OF NEW MEXICO
NO. 6170
REGISTERED PROFESSIONAL ENGINEER

Kent M. Whitman

Kent M. Whitman, P.E.

community sciences corporation

4015 Carlisle Boulevard NE
Albuquerque, New Mexico 87107
(505) 881-2500

P.O. Box 1328
Corrales, New Mexico 87048
(505) 897-0000

SURVEYING
ENGINEERING
LAND PLANNING

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ADDENDUM TO DRAINAGE REPORT

NEWPORT BUSINESS PARK

A. PURPOSE & SCOPE

Craddock Development Corporation is currently building Newport Business Park, a nineteen acre development in the southeastern quadrant of Albuquerque. (See Location Map, Plate I). A previously compiled drainage report, prepared by A & E Engineering, has proven unsatisfactory to Craddock due to the space requirements for on-site ponding. The function of this report shall be to serve as an addendum to the original A&E report for purposes of revising the on-site drainage scheme. The reader is referred to the original report as a prelude to this addendum.

B. OFF-SITE DRAINAGE

The original A&E report shows drainage approaching the subject property from both the south and the east. Said report states that the drainage originating east of the Craddock property must necessarily be routed through the development, while flows from the south will be intercepted by an existing (and future planned) pipe system. This report will not comment further on these off-site flows except to suggest a routing method for the flows from the east as shown on Plate III.

C. DESIGN CRITERIA

(1) Engineering Parameters

Coefficients of runoff equal to 0.4 for the natural state and 0.95 for the developed state were assumed for all calculations. In addition a 100 year-6 hour rainfall of 2.4 inches has been used as a basis for design per AMAFCA requirements.

(2) Flood Control Regulations

The drainage plan presented in this report has been designed to comply with the 1972 AMAFCA Resolution in regard to rate and volume of runoff leaving the

site. That Resolution has been interpreted to say that the rate and volume of runoff allowed to leave the site after development shall be no greater than the rate and volume running off prior to development.

D. PLAN FOR ON-SITE RUNOFF CONTROL

The basis for the runoff control plan presented in this report is the replacement of most of the surface ponds (as proposed in the original report) with retention on alternate surfaces, ie., roofs and landscaped areas. Plate III illustrates the scheme, and each building has been given a number for further reference. Drainage area designations A, B, and C refer to the net areas outlined after roof areas are subtracted.

It is proposed that outlet controls be placed at the scuppers of all roof drains as shown on Plate II. All water ponded up to the crest of the scupper control would be allowed to dissipate via small oriface outlets over a minimum 24 hour period thus contributing virtually no runoff during hours of peak storm intensity. In addition a minimum of 15% of the gross land area will be landscaped and constructed to retain all 100 year storm volumes falling on these areas for a minimum of 24 hours.

Area A will discharge freely into Yale Boulevard and Area C will discharge freely into Alamo Drive. Area B will drain to a 94' x 175' x 1.25' deep imponding basin covering a portion of a parking lot and some landscaped area. This imponding basin could be replaced by an underground dry well filled with washed gravel, occupying space below landscaped areas, and having a volume equal to 2.13 times the volume indicated for the surface basin. In either case, the basin will have a drain leading into the 60" storm pipe beneath Alamo Drive and sized to dissipate the basin volume over a 24 hour period.

E. VOLUMETRIC QUANTITIES

Referring to the calculations in Appendix A and subtractin the estimated natural runoff volume (66,200 cubic feet) from the estimated developed runoff volume (1,572,550 cubic feet) leaves a ponding requirement of 91,050 cubic feet. Table I below itemizes the volumes ponded by the various methods discussed. As shown at the bottom of the Table, 91,080 cubic feet can be retained for a 24 hour period by

the methods described. This will satisfy the requirement exactly. As an alternate to Area B pond, a subsurface, gravel-filled dry well having a volume of 43,790 cubic feet (or 1,620 cubic yards) may be substituted. For purposes of draining such a facility into the storm drain system, a maximum depth of 4 feet should be assumed. The resulting required surface area needed is then 10,950 square feet.

F. STRUCTURAL CONSIDERATIONS

The feasibility of ponding water on the roof systems has been determined based on the following structural criteria:

(1) All roofs are supported by prestressed double tee members designed to carry 20#/square feet live loadings. Double tees are 8 feet wide, have 2 inch thick flanges, have 5 3/4 inches wide tapering to 3 3/4 inches wide webs, and are 24 inches deep. Concrete has a compressive strength of 5,000 psi. Spans are 50 feet to 60 feet.

(2) Roofs on buildings 1-4 are flat.

(3) Roofs on buildings 5-12 are pitched 1 in 120.

(4) Maximum scupper spacings are 40 feet o.c.

G. SUMMARY OF RECOMMENDATIONS

In conclusion we make the following recommendations regarding control of runoff for the Newport Business Park:

(1) That scupper outlet controls per detail on Plate II be added to all roof drains to retain roof water for 24 hours.

(2) That a minimum of 15% of the gross land area (124,150 square feet) be dedicated to landscaping, and that these areas be constructed to hold all runoff occurring on them for a minimum of 24 hours. See detail, Plate III.

(3) That a 94' X 175' area adjacent to building 1 be dedicated as an intermittant ponding area to retain a portion of runoff from Area B for 24 hours.

(4) That Areas A & C be allowed to discharge freely since ponding requirements can be met by 1-3 above.

APPENDIX A - SAMPLE CALCULATIONS

(1) Runoff Volumes

$C_{DEV.} = 0.95$
$C_{NAT.} = 0.4$
Area = 19 Acres = 827,640 S.F.
Design Rainfall = 2.4" = o.2'

$V_{DEV.} = 0.95 \times 0.2 \times 827{,}640 = 157{,}259$ C.F.

$V_{NAT.} = 0.4 \times 0.2 \times 827{,}640 = 66{,}210$ C.F

(2) Roof Ponding Volumes - Buildings 5-10

Roof Pitch = 1:120 = .00833
Max. Span @ indicated Pitch = 60'
Scupper Control Height = 0.45'

Required Area/Ft. length = 60 x 0.2 = 12 S.F.

Distance back to 0 Water Surface Elevation = 0.45/.00833 = 54'

∴ Ponded Area/Ft. length = 0.5 x 0.45 x 54 = 12.15 > 12 O.K.

(3) Interior Street - Flow Capacity

Q = 52 c.f.s.
Slope = 1% min.
BW = 25'
Sideslopes = 0
n = 0.015

from Manning

$$Q = A \frac{(1.49)}{n} R^{2/3} s^{1/2}$$

solving for depth

D = 0.4' 0.5' O.K.

(4) Velocity Head @ Street Curve

V = 8 f.p.s.

$$V = \frac{V^2}{2g} = 1'$$

(5) <u>Ponding Depth @ Inflow to Street</u>

Q = 52 c.f.s.
Width = 25'

$\therefore$ q = 2.08 c.f.s.

$$y = \left(\frac{q^2}{g}\right)^{1/3} = 0.51'$$

V = 4.08 f.p.s.

$$\text{Velocity Head} = \frac{V^2}{2g} = 0.26'$$

Total Ponding Depth = 0.51' + 0.26'
= 0.77' < 1' O.K.

TABLE I

PONDING VOLUMES

AREA DESIGNATION	SURFACE AREA (Square feet)	AVERAGE PONDING DEPTH (feet)	VOLUME PONDED (Cubic feet)
Buildings 1-10	197,064	0.2	39,410
Buildings 11 & 12	62,784	0.1	6,280
Landscaped Areas	124,146	0.2	24,830
Area B Pond	16,450	1.25	20,560
TOTAL			91,080

PLATE I

LOCATION MAP

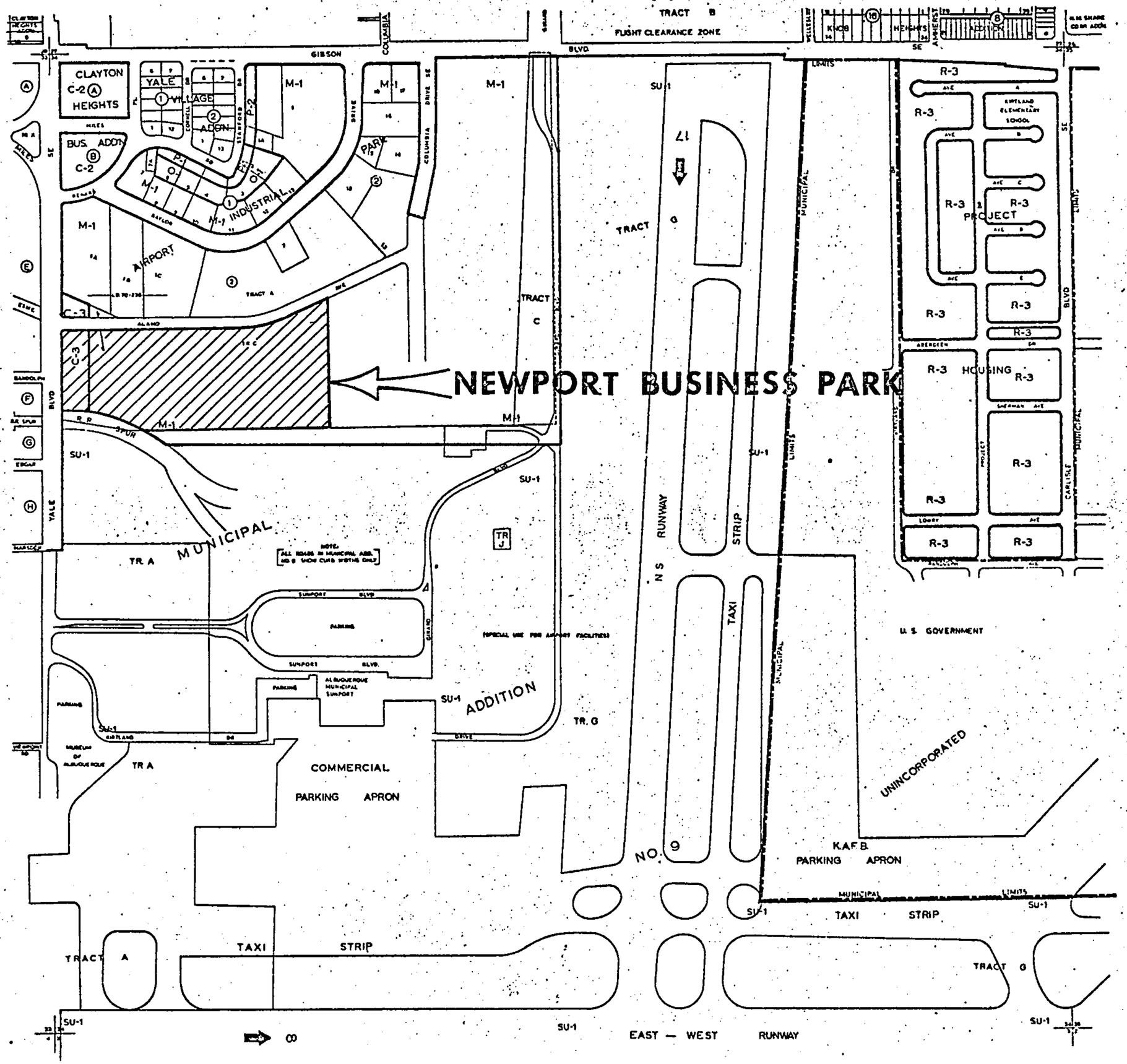
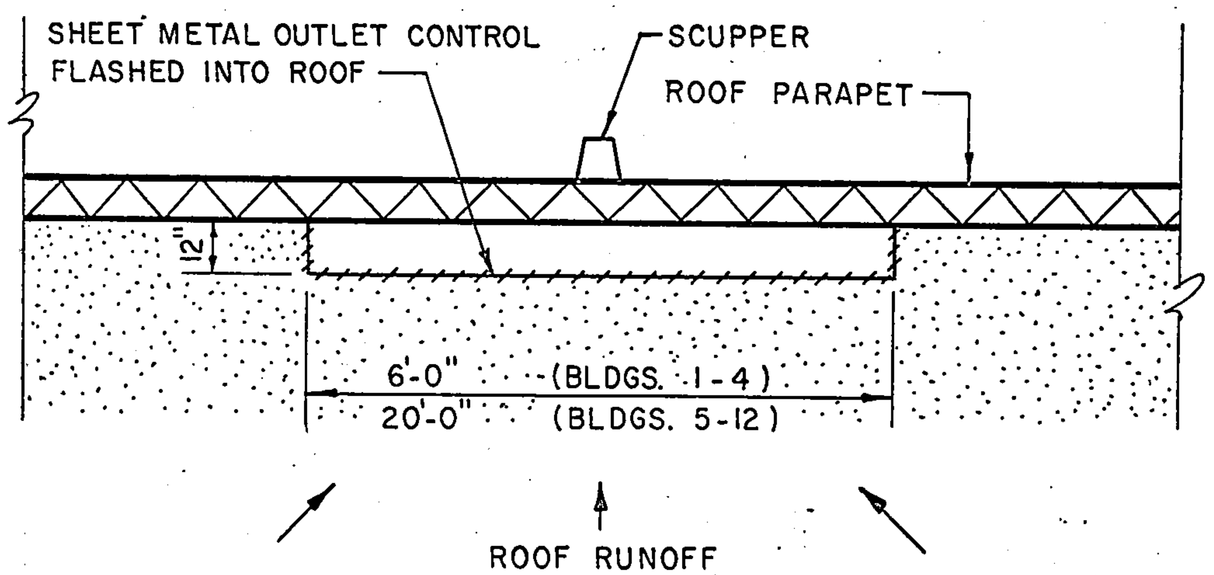


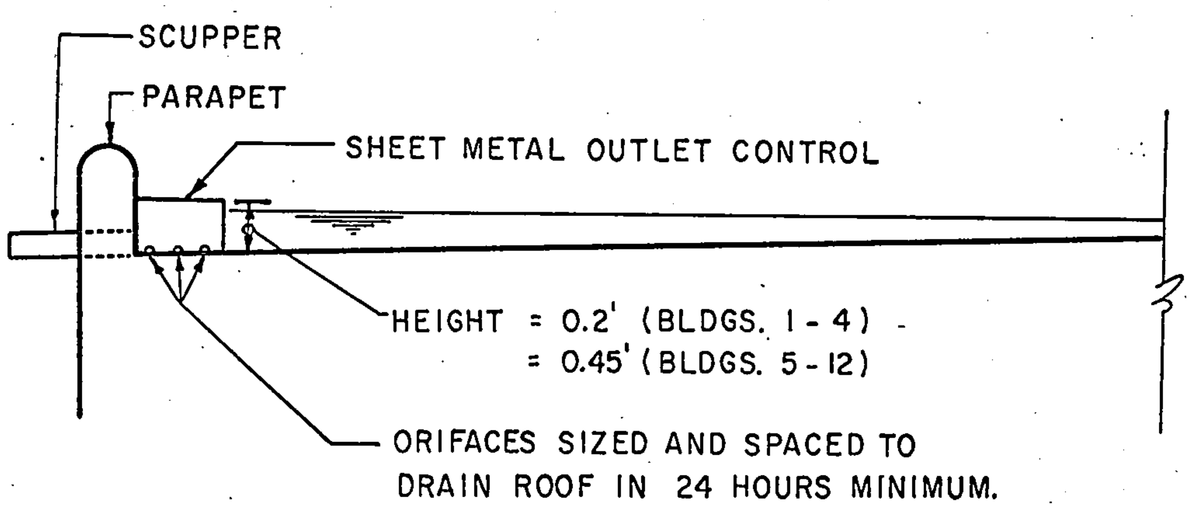
PLATE II

SCUPPER OUTLET CONTROL



PLAN

N.T.S.



SECTION

N.T.S.

DRAINAGE REPORT
for

NEWPORT BUSINESS PARK

in

ALBUQUERQUE, NEW MEXICO

Prepared by
A & E Engineering

DRAINAGE REPORT

FOR

NEWPORT BUSINESS PARK

PREPARED FOR:

CRADDOCK DEVELOPMENT COMPANY

2600 Yale Avenue SE
Albuquerque, New Mexico

PREPARED BY:

A & E ENGINEERING, INC.
5823 Lomas N.E.
Albuquerque, New Mexico

September, 1974

Theodore M. Conrardy
P.E. & L.S. No. 2933

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

October 16, 1974

Mr. David Werner
Craddock Development Company
2600 Yale Boulevard SE
Albuquerque, New Mexico

Dear Sir:

We are submitting this drainage report to you on the Newport Business Center. The control of the runoff shall comply with the requirements of the Albuquerque Metropolitan Arroyo Flood Control Authority and with present City of Albuquerque policies.

We do appreciate this opportunity to serve you. If any questions develop we will be available to assist you in your response.

Sincerely,

A & E ENGINEERING, INC.

John F. Esquibel, President

JFE:mhe

4100 SILVER S.E. ALBUQUERQUE, NEW MEXICO 87108 505/266-8791

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NEWPORT BUSINESS CENTER

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Onsite Drainage Calculations
Conclusion
Pond Drains
Pond Drain Pipe Calculations
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Drainage Plan

GENERAL

This report consists of a hydrologic study of a probable 100-year storm affecting this proposed development being all of Tracts B, C, D & E, of the Airport Industrial Park and referred to herein as Newport Business Center.

LOCATION AND DESCRIPTION

The Newport Business Center parcel is a proposed business office and warehouse development containing 19 acres. This development is situated in the City of Albuquerque; Bernalillo County, New Mexico, and located in the northwest $\frac{1}{4}$ of Section 34 T10N, R3E, NMPM. This development is located southeasterly of the intersection of Yale Boulevard and Alamo Drive, the northern limits of which lie 1593 feet along the southern right of way line of Alamo Drive. The average width of the property is about 525 feet, as is shown on Plate I.

The natural terrain slopes in a northwesterly direction and the present runoff flows into Alamo Drive. There is offsite runoff affecting this parcel as well as the property to the east.

DEVELOPMENT

This parcel of land is to be developed into office buildings and warehouses. The area will be paved, landscaped, and ponding depressions will be constructed throughout the lanscape areas. The pondings depression capacity will be sized to contain the additional amount of water generated due to paving, rooftops and building sidewalks. The architect has designed the roofs to drain the water onto the parking and landscape areas.

OFFSITE DRAINAGE

This parcel of land is subject to offsite drainage runoff, Plate II is the offsite drainage plan and shows all of the areas contributing offsite runoff to this parcel. The drainage flows from the southeast to to the northwest. A large amount of runoff is being intercepted by an existing 60" concrete pipe which traverses across this subject parcel, and flows into the existing 60" storm drain pipe and system in Alamo Drive. Offsite runoff from the south primarily from the Airport Marina Hotel complex, is also being intercepted by a 30" concrete pipe which flows into the existing storm drain system in Alamo Drive. The drainage map shows the amount of runoff that each area contributes to this parcel.

The total amount of offsite runoff presently generated by the areas of the airport parking lots and immediate area as well as the runoff generated by the Airport Marina Hotel, will be handled by the two above mentioned pipes. The airport's most northerly parking lot is constructed so that it contains the runoff generated by a 100-year storm. The parking lot is seven feet lower in elevation than the existing road therefore it has a damlike facility which forms a pond. This parking lot is drained by an existing 36" concrete pipe which traverses under the road and empties into an existing eroded earth channel and then the runoff flows westerly along said channel into the existing 60" concrete pipe beginning at the south property line of this property.

DISCUSSION OF METHOD

The City of Albuquerque will install a 36" concrete storm pipe from the end of the existing 36" to the existing 60" concrete pipe along the existing eroded channel bottom. A junction structure will be

constructed where the new pipe connects both of these pipes. An inlet structure will be constructed at the point where the proposed 36" concrete pipe and the existing 60" concrete pipe connect. This inlet structure will collect the natural runoff flowing from the south properties and convey it through the existing 60" concrete pipe.

The 60" concrete pipe is capable of carrying 146 cfs,capacity. This pipe has the capability of carrying the runoff flow that could be generated by a 100-year storm. The quantities of runoff for each portion of the offsite drainage area are tabulated herein.

OFFSITE RUNOFF QUANTITIES

The quantities of storm offsite runoff that is to be expected from each drainage area was determined by using the Rational Method Formula Q = CIA, where Q = quantity of storm runoff in cubic feet per second; C = coefficient of runoff dependent upon the type of surface drained; I= Intensity of rainfall in inches per hour for a duration equal to the total accumulation time in minutes; and A = area contributing water shed in acres.

$$Q = CIA \text{ (Rational Method Formula)}$$

$$t_c = \left[\frac{11.2\ (L)^3}{H}\right]^{0.385}$$

$$I = \frac{189}{t_c + 25} \quad \text{(100 year frequency)}$$

$$c = 0.9$$

OFFSITE RUNOFF CALCULATIONS

AREA NO. 1

Undeveloped land East of this parcel

Area = 16.0 acres H = 50' L = 1330' = 0.252 mi.

T_c = 6.86 min. I = 5.93 C = 0.6

Q = C. I. A. = 0.6 x 5.93 x 16.0 = 56.9 cfs

AREA NO. 2.

Undeveloped land South and Southeast of this parcel

Area = 22.0 acres H = 78' L = 1800' = 0.341 mi.

T_c = 8.20 min. I = 5.7 C = 0.6

Q = C. I. A. = 0.6 x 5.7 x 22 = 75.1 cfs

AREA NO. 3

Developed land South of this parcel primary the Marina Hotel Area

Area = 13.8 acres H = 69" L = 1250' = 0.24 mi.

T_c = 5.64 min. I = 6.17 C = 0.9

Q = C.I.A. = 0.90 x 6.17 x 13.8 = 76.6 cfs

208.6

Runoff from area 1 and 2 will flow into existing 60" concrete pipe as well as flow across this parcel within the landscaped areas and ponding depressions.

PROPOSED ONSITE DRAINAGE PLANS

The Developed area is proposed to be graded so that the total drainage area will be divided into eight onsite drainage areas. These drainage areas A through H sheet flow across the paved parking lots into ponding depressions throughout the development as can be seen on Plate II the Onsite Drainage Plan. The onsite runoff generated is conveyed to the ponding depressions by paved swales within the parking lots.

The entire 19 acres of this development is considered as the total onsite drainage area. There will be approximately six acres of undeveloped land which will be used as landscape and ponding depression areas. Each of the onsite drainage areas A through H are designed to handle all of the additional drainage generated by their developed acreage. We can assume that 70% of the total onsite drainage area (19 acres) will produce or cause to generate sheet flow. Therefore, 19 acres x 70 = 13.3 (13.0 acres) will generate the total amount which must be controlled.

DISCUSSION OF METHOD

Development of this area will be controlled by the guidelines set forth in the recent Resolution of the Alb. Metropolitan Arroyo Flood Control Authority.

The amount of storm water is computed by using a 100-year storm, this being a storm consisting of 100-year; six-hour 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 following calculations for runoff will determine the amount of runoff that will be contained by ponding and the total amount which may sheet flow off into the street.

ONSITE UNDEVELOPED RUNOFF CALCULATIONS

Percolation factor	60%
Undeveloped area (acres)	19.0 acres
The 100-year 6-hour precipitation factor for subject area	2.4 in.
Runoff factor	40%
Runoff	66,211 cu. ft.

$$(19.0 \text{ acres} \times \frac{43{,}560 \text{ sq. ft.}}{1 \text{ acre}} \times \frac{2.4 \text{ in}}{1 \text{ hr}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times 0.40 = 66{,}211 \text{ cu.ft.}$$

ONSITE DEVELOPED RUNOFF CALCULATIONS

Area generating runoff	13.0 acres
The 100-year 6-hr. precipitation factor for subject area	2.4 in.
Runoff factor	95%
Runoff	107,593 cu. ft.

$$13.0 \text{ acres} \times \frac{43{,}560 \text{ sq. ft}}{1 \text{ acre}} \times \frac{2.4 \text{ in}}{1 \text{ hr.}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times 0.95 = 107{,}593 \text{ cu. ft.}$$

Additional runoff that will be generated by this development shall be contained by ponding depressions within the limits of this development.

ONSITE DRAINAGE CALCULATIONS

The following calculations will determine the amount for each of the onsite drainage areas, "A" through "F" respectively. These computations will determine the size of the ponding depressions for each respective drainage area.

Drainage Area "A" (4.5 acres)

Developed area generating runoff	3.7 acres
100 year in/hr precipitation factor for subject area	2.4 in/hr
Undeveloped runoff factor	40%
Developed runoff factor	95%
Undeveloped runoff	15,680 cu. ft.
$(4.5 \text{ ac} \times \frac{43,560 \text{ sq. ft.}}{1 \text{ ac}} \times \frac{2.4 \text{ in}}{1 \text{ hr}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times 0.40 =$	15,680 cu. ft.)

Landscape and ponding depression areas = 0.7 acres

Drainage Area "A" Continued

Developed Runoff	30,622 cu. ft.
$(3.7 \text{ ac} \times \frac{43560 \text{ sq. ft.}}{1 \text{ ac}} \times \frac{2.4 \text{ in}}{1 \text{ hr}} \times \frac{1 \text{ ft}}{12 \text{in}} \times 0.95 =$	30,622 cu. ft.

The pond size shall be as per plan and detail as shown in this report.

Depth of pond	2.0'
Side of Slopes	3:1
Pond Areas	8500 sq. ft.
Total Capacity	17000 cu. ft.

Drainage Area "B" (5.1 acres)

Developed area generating runoff	3.6 acres
100 year in/hr precipitation factor	2.4 in/hr
Undeveloped runoff factor	40%
Developed runoff factor	95%
Undeveloped Runoff	17773 cu. ft.
Developed Runoff	29795 cu. ft.
Runoff (29795 - 17773)	12022 cu. ft.

The pond size shall be as per plan and detail as shown in this report.

Depth of Pond	2.5'
Side Slopes	3:1
Pond Area	34000
Total Capacity	85000 cu. ft.

Drainage Area "C" (1.5 acres)

Developed area generating runoff	1.0 acres
100 year in/hr precipitation factor for subject area	2.4 in/hr
Undeveloped runoff factor	40%
Developed runoff factor	95%

Drainage Area "C" Continued

Undeveloped runoff	5225 cu. ft.
Developed runoff	8276
Runoff (8276 - 5225)	3051 cu. ft.

The pond size shall be as per plan and detail as shown in this report.

Depth of Pond	1.5'
Side Slopes	3:1
Pond Area	4000'
Total Capacity	6000 cu. ft.

Drainage Area "D" (4.0 acres)

Developed area generating runoff	2.5 acres
100 year in/hr precipitation factor	2.4 in/hr
Undeveloped runoff factor	40%
Developed runoff factor	95%
Undeveloped Runoff	13940 cu. ft.
Developed Runoff	20690 cu. ft.
Runoff	6750 cu. ft.

The pond size shall be as per plan and detail as shown in this report.

Depth of Pond	2.0'
Side Slopes	3:1
Pond Area	7000 sq. ft.
Total Capacity	14000 cu. ft.

Drainage Area "E" (2.0 acres)

Developed area generating runoff	1.1 acres
100 year in/hr precipitation factor	2.4 in/hr
Undeveloped runoff factor	40%
Developed runoff factor	95%
Undeveloped Runoff	6970 cu. ft.
Developed Runoff	9105 cu. ft.
Runoff	2135 cu. ft.

The pond size shall be as per plan and detail as shown in this report.

Depth of Pond	1.5'
Side Slopes	3:1
Pond Area	8000'
Total Capacity	12000 cu. ft.

Drainage Area "F" (1.9 acres)

Developed area generating runoff	1.1 acres
100 year in/hr precipitation factor	2.4 in/hr
Undeveloped runoff factor	40%
Developed runoff factor	95%
Undeveloped Runoff	6623 cu. ft.
Developed Runoff	9105 cu. ft.
Runoff (9105-6623)	2482 cu. ft.

The pond size shall be as per plan and detail as shown in this report.

Depth of Pond	1.5'
Side Slopes	3:1
Pond Area	7500'
Total Capacity	11250 cu. ft.

CONCLUSION

The total amount of runoff that has been generated due to the development of this parcel of land is 60,282 cu. ft., and the total amount of runoff that will be ponded and contained onsite is 145,250 cu. ft. There is about 55,750 cu. ft. of offsite runoff that is conveyed through Area "B" and contained and controlled by pond drains into the 60" concrete pipe and the existing catch basins in Alamo Drive.

POND DRAINS

Pond drains will be installed to insure that water ponded will drain from the ponding areas within a period of 24 hours so that it will not allow for the breeding of mosquitoes or become a nuisance.

POND DRAIN PIPE CALCULATIONS

Reference: Civil Engineering Handbook
4th Edition by Urquhart
Pages 4-32, 4-33

Orifice opening = $\frac{1}{2}$" diameter
Average head $\left(\frac{2.5 - 0}{2}\right)$ = 1.25' per pond
Assume water temperature = 60° F

Formula $d = \frac{\sqrt{gh}}{\mu} p$

where:
d = orifice diameter in feet
g = gravitational acceleration = 32.2 ft/sec
h = average head in feet
p = density in slugs/cu.ft. $= \frac{62.4}{32.2}$
μ = viscosity = 0.00002359 slugs/ft sec

Computation to determine coefficient of discharge "C"

$$\frac{0.5/12 \sqrt{32.2\ (1.25)} \quad \left(\frac{62.4}{32.2}\right)}{0.00002359} = 21{,}680$$

From Fig. 35, Page 4-32, C = 0.64

$Q_{orifice} = C\ a \sqrt{2gh}$
$a = \pi d^2/4 = 0.0014\ ft^2$
d = diameter of orifice = 0.0416 ft.
h = 1.25
g = 32.2
C = 0.64 (from above computation)

$$Q = (0.64)\ (0.0014\ ft.^2)\ \sqrt{2(32.2)\ (1.25)} = 0.0080\ cfs$$

0.0080 cfs (86,400 sec/day) = 691 ft^3/day

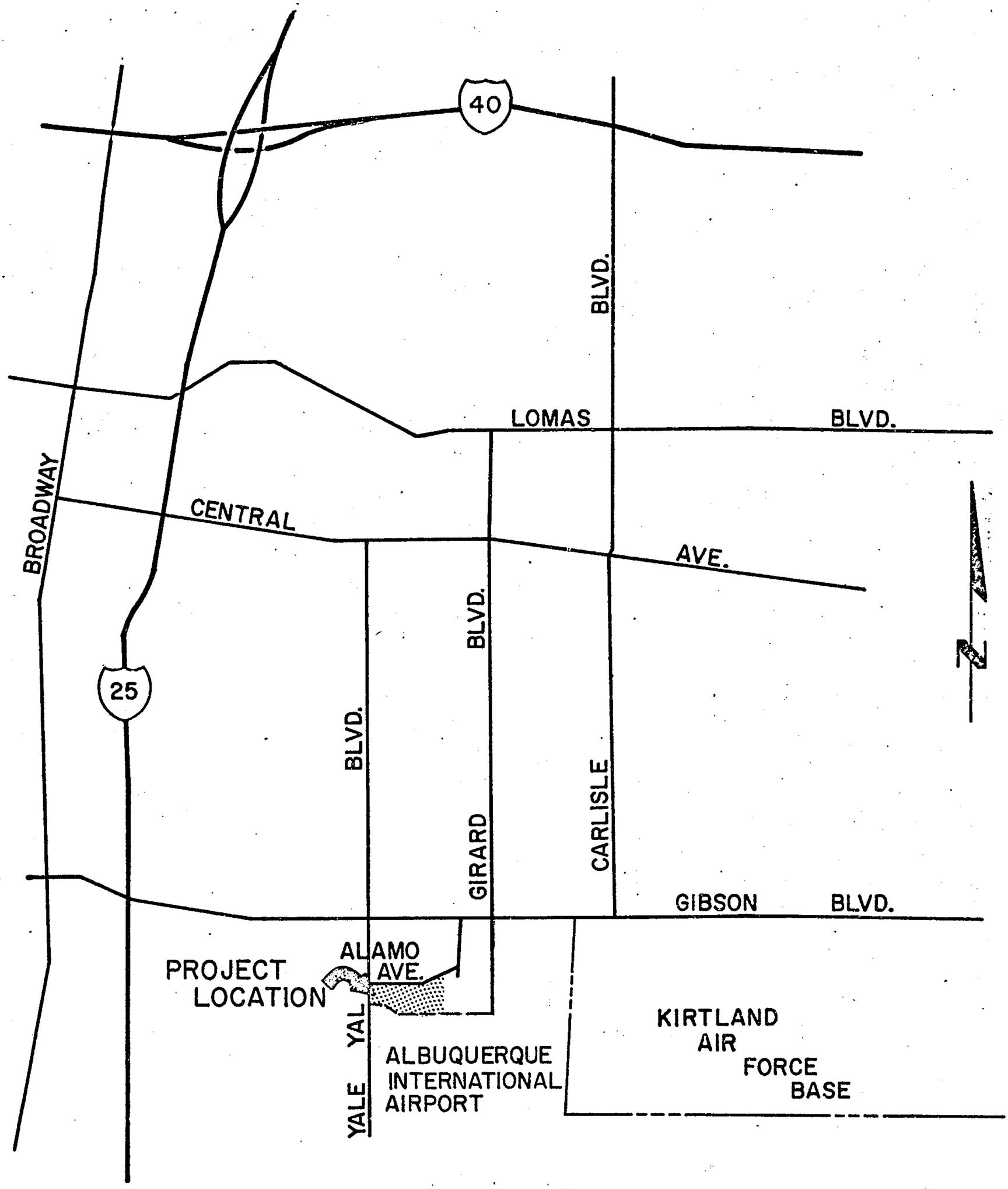
TABLE

Area	Pond Volume	Number of Orifices
A	17,000 cu.ft.	25
B	85,000 " "	50 + overflow (offsite runoff)
C	6,000 " "	10
D	14,000 " "	21
E	12,000 " "	18
F	11,250 " "	16

NOTE: Minimun hole spacing to be 2" centers. Where more holes are required than will accomodate this spacing, provide two rows of holes 1" apart and stagger holes.

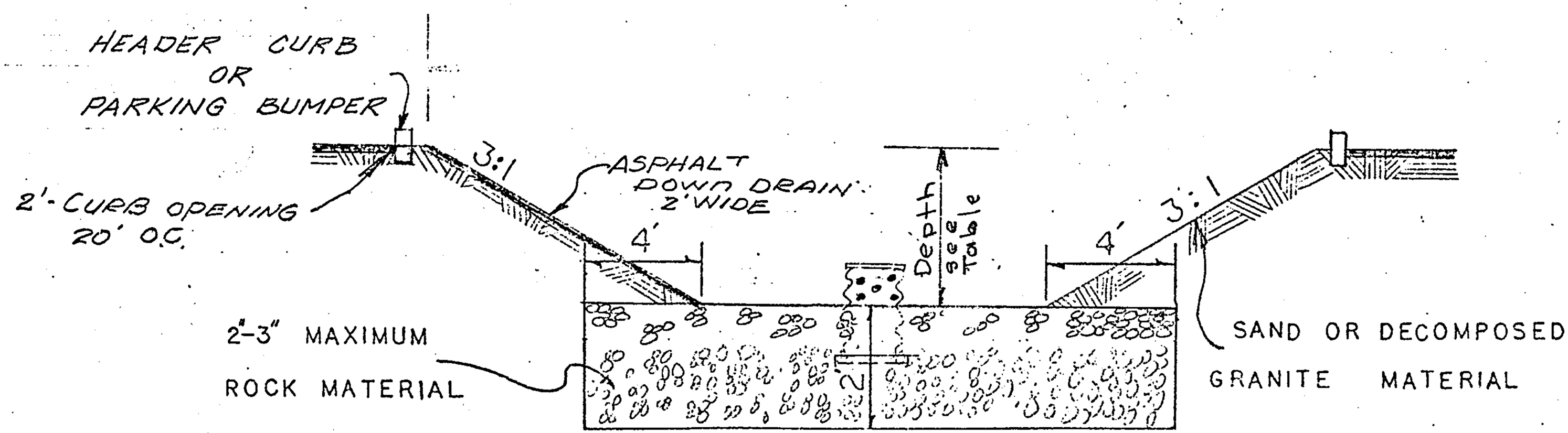
SUMMARY

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



LOCATION MAP

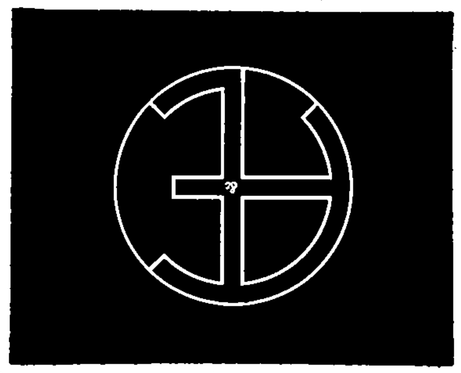
PLATE I



PONDING CROSS SECTION

NO SCALE

PONDING DETAIL TYP.



11104

DRAINAGE INFORMATION SHEET

PROJECT TITLE: NEWPORT EAST BUSINESS PARK ZONE ATLAS/DRNG. FILE #: M-16/D11

LEGAL DESCRIPTION: TRACTS X, Y, Z, A-1, C-1 & M, AIRPORT PARK

CITY ADDRESS: ALAMO SE

ENGINEERING FIRM: TOM MANN & ASSOC. CONTACT: J.G. MORTENSEN

ADDRESS: 811 DALLAS NE. PHONE: 265-5611

DEVELOPER: ~~OWNER:~~ CRADDOCK DEV. CO. CONTACT: DON MURPHY

ADDRESS: PHONE:

ARCHITECT: N/A CONTACT:

ADDRESS: PHONE:

SURVEYOR: TOM MANN & ASSOC. CONTACT: J.G. MORTENSEN

ADDRESS: 811 DALLAS NE PHONE: 265-5611

CONTRACTOR: N/A CONTACT:

ADDRESS: PHONE:

RECEIVED MAR 07 1986 HYDROLOGY SECTION

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. 86-71

EPC NO.

PROJ. NO.

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

✓ CONCEPTUAL GRADING & DRAINAGE PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

✓ OTHER UPDATE AS (SPECIFY) REQUESTED BY FRED J. AGUIRRE @ DRB ON 02-04-86 & ADDRESS COMMENTS OF CARLOS MONTOYA'S 02-27-86 LETTER.

DATE SUBMITTED: 03-07-86 ~~02-06-86~~

BY: J.G. MORTENSEN

11104

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

February 27, 1986

RECEIVED
MAR 07 1986
HYDROLOGY SECTION

Jeff Mortensen
Tom Mann & Associates, Inc.
811 Dallas, NE
Albuquerque, New Mexico 87110

RE: UPDATED DRAINAGE PLAN FOR NEWPORT EAST BUSINESS PARK
RECEIVED FEBRUARY 7, 1986 (M-16/D11)

Dear Mr. Mortensen:

I have reviewed the referenced plan and forward the following comments:

1. Is there a drainage easement for the runoff from Tract Z-1 that travels west.

2. Please explain how the runoff from Tract Z-7 is handled.

3. Please submit a copy of the plat for Tracts Z-1 thru Z-7.

If you have any questions regarding this project, call me at 766-7644.

Cordially,

Carlos A. Montoya

Carlos A. Montoya, P.E.
City/County Floodplain Administrator

CAM/bsj

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE November 2, 1981 REF. NO._____

TO: Bob Gill, Aviation Department
Brian Burnett, City Engineering

FROM: Deborah Slade, Assistant City Attorney DS

SUBJECT: Craddock Development Co., Drainage Problem and Oil Pool

For your information, attached please find a copy of a letter I received from Gary Keenan concerning the above-referenced matter.

DS/mk
Attachment (1)

BRANCH, PERKAL AND ASSOCIATES, P. A.
ATTORNEYS AT LAW

TELEPHONE
AREA CODE 505
243-3501

SUITE 301 NEWPORT WEST
2501 YALE BOULEVARD, S. E.
ALBUQUERQUE, NEW MEXICO 87106

RECEIVED
NOV 03 1981
CITY ENGINEER

BRANCH, PERKAL AND ASSOCIATES, P. A.
ATTORNEYS AND COUNSELORS AT LAW
SUITE 301 NEWPORT WEST
2501 YALE BOULEVARD, S. E.
ALBUQUERQUE, NEW MEXICO 87106

TURNER W. BRANCH
ROSS B. PERKAL
ALLEN M. SOWLE
ROGER V. EATON

TELEPHONE
AREA CODE 505
243-3501

October 28, 1981

Deborah Clark Slade
Assistant City Attorney
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Re: Craddock Development Co., Drainage Problem and Oil Pool

Dear Mrs. Slade:

I am writing to confirm the agreement we reached on October 16, 1981 in regards to the drainage problem and oil pool, existing on Craddock Development Company's land. The two problem areas are located along the northern border of the City's land at the Albuquerque International Airport between Yale Blvd. and Girard Blvd. I met with Mr. Bob Gill, Mr. Brian Burnett and yourself on October 16, 1981 to view the oil pool and the drainage problem at Craddock's Multiplex VI building.

The agreement the four of us reached, was proposed by Mr. Gill as an immediate temporary solution. Mr. Gill promised to have an airport crew grade the City's land which lays just south of Craddock's Multiplex VI building. The reason for grading this land was to insure that any future rainfall would run-off to the south instead of toward the Multiplex VI building to the north. This grading was proposed as a temporary solution, to prevent any future erosion and the possible collapse of the dirt embankment bordering the Multiplex VI building.

With respect to the pool of oil and water, Mr. Gill promised to have an airport crew clean up the area. Again, this was proposed as an immediate, temporary solution. Mr. Gill stated that both the grading and the oil spill clean-up would occur within thirty (30) days of October 16, 1981.

As I understood it, the permanent solution to the drainage problem at the Multiplex VI building was the erection of a retaining wall encasing the dirt embankment. Both Mr. Gill and Mr. Burnett

expressed doubt as to whether or not the City had a drainage easement running along the boundary line in this area. Mr. Burnett promised to conduct an investigation to determine whether the City does in fact have an easement in this area. In addition, it was my understanding that you would make a determination as to which particular department of the City was responsible for the construction of the retaining wall.

With respect to the pool of oil and water, the permanent solution proposed was to connect the open drainage pipe to the City's existing drainage system. Mr. Gill remembered that Airport personnel had verbally agreed to undertake this construction as far back as 1972. Again, doubt was expressed as to which particular department of the City would be responsible for the costs of such construction. I would appreciate it if you could supply me with this information. You also mentioned that it may be necessary to have the pool of oil and water declared a health hazard. What steps must be taken to obtain such a declaration.

I would appreciate an early response from you regarding these matters. The necessary steps should be taken to insure that these problems will be remedied as soon as possible and not forgotten about for another eight years. Thank you for your attention in this matter.

Sincerely yours,

BRANCH, PERKAL & ASSOCIATES, P.A.

Gary M. Keenan

GMK:aa

cc: Dick Johnston

M-16.

12-7-81

INFORMED CLAUDIO VIGIL THAT WE NEED A COMPREHENSIVE GRADING AND DRAINAGE PLAN SHOWING COMPLIANCE WITH APPROVED DRAINAGE REPORT

FDL 12-7-81

Craddock
Development Company

Claudio A. Vigil
Architect

2501 Yale Blvd., S.E.
Albuquerque, New Mexico 87106

(505) 842-9136

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE November 10, 1981 REF. NO._____

TO: Deborah Slade, Assistant City Attorney

FROM: Brian G. Burnett, Hydrology Section BGB

SUBJECT: CRADDOCK DEVELOPMENT DRAINAGE PROBLEM AND OIL POOL

This correspondence is in reference to your memo dated November 2, 1981 concerning the referenced development and drainage problems. Before I address specific concerns outlined in the letter from Mr. Gary Keenan concerning this subject, let me try to outline key aspects of the drainage plan per our records and correspondence.

1. In early 1975, a drainage report for the business park was prepared by A & E Engineering. One of the major aspects of the report was the connection of the 36" culvert running from Airport to the 60" culvert running under the development. However, the report did not specify whether the City or the developer would be financially responsible for the connection. I have enclosed a copy of a note from Mr. Bob Kielich to Mr. Varn Kimmick indicating that no City or Airport funds were available at the time (Item 1). You will also find a copy from Mr. John Robert at AMAFCA concerning the drainage report (Item 2).

2. In October of 1976, the Craddock Development Corporation changed engineers since it felt that the design prepared by A & E Engineering proved unsatisfactory due to the space requirements for on-site ponding. This report served as an addendum to the original A & E Report for purposes of revising the on-site drainage scheme.

3. I have enclosed the revised drainage plan for the business park per a submittal by the consulting firm of Community Sciences Corporation, dated February 16, 1978 (Item 3). This was an addendum to the October 1976 report. Let me briefly outline the major drainage considerations for the site.

   Area A was designed to directly discharge into Yale Boulevard and Area C was designed to discharge freely into Alamo Drive. Area B was to drain to a deep inponding basin covering a portion of the parking lot and some landscaped area. I direct your attention to several statements placed on the plan:

a. "That the developer shall connect the 36" storm sewer to 60" storm sewer per City specifications" and "that a 1' high berm or wall shall be placed along the eastern boundary of the development to direct flow into the drive." I should point out that a letter of transmittal with this Addendum states that these changes as outlined in the 1978 plan were agreed upon with The Craddock Development (Item 4). It is my understanding that this report stands as the approved plan even though our records show that no written acknowledgement to this affect was made.

4. I will now address specific concerns expressed by Mr. Keenan in his letter of October 28, 1981.

a. A recorded plat does show that a 20' drainage and utility easement runs along the southern boundary of the property from Yale Boulevard to Tract C of the Municipal Addition #9 which is located just west of Girard Boulevard (Item 5). A review of old topography maps show that the easement ran along an existing arroyo which drained the area east of the development. It is obvious that the development of Building #6, #7, and #10 has caused the arroyo to be obliterated and the natural drainage pattern altered. A field inspection indicated that cuts up to 20' in height have occurred along this drainage easement and that severe slope stability problems now exist along the southern boundary of the property.

b. Mr. Keenan in this letter states that I would be checking on which particular department of the City was responsible for the construction of a retaining wall in the area of outlined in "a." above. It is the concurrence of this Department that the City is not responsible for a retaining wall along the southern boundary since it appears that the easement has been encroached upon by the development.

c. Per our discussion in the field, Mr. Keenan discussed with us who would be responsible for connecting the 36" pipe to the 60" pipe called for in the Master Plan for drainage. As I indicated earlier, the approved plan dated February 16, 1978, calls out for the developer to make the connection per City specifications. This contradicts Mr. Gill's statement that the City would be responsible for the connection. There are no City funds available for this type of work.

d. Mr. Keenan was concerned with sediment being washed from the area east of the development onto the existing pavement. I again reference the approved drainage plan which states that a one-foot high berm or wall shall be provided to direct flow into the drive. It is not the resonsibility of the City to provide a temporary or permanent sedimentation facility to handle this problem. The plan clearly states that this is the responsibility of the developer.

5. In summary, it appears that there is some confusion regarding who is responsible for connecting the two existing storm sewers. However, let me again reinterate that there are no City funds available for this type of work. It also appears that the City would not be responsible for handling the severe slope problems along the southern boundary. As I indicated to you before, we are currently struggling with how to handle and to maintain the many easements located throughout the City. As dedicated by the plat, the easement is technically our responsibility. However, encroachment has been made into that easement by the development and therefore, some legal ramifications concerning the project have surfaced.

I hope this outline provides you with the needed information for pursuing a course of action. I will be glad to assist in any way possible. I will be glad to discuss this situation further.

BGB:gc
9054A
cc f/Drainage File
f/Reading

JOHN B. ROBERT
EXECUTIVE ENGINEER

B. H. SWINBURNE, CHAIRMAN
FRED LUTHY, JR., VICE-CHAIRMAN
RICHARD H. CLOUGH, SEC.-TREAS.
WILLIAM V. HEREFORD, DIRECTOR
FRANCES McCOY, DIRECTOR

Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority

2112 GIRARD N.E.
P. O. BOX 25851 - ALBUQUERQUE, N. M. 87125
TELEPHONE 268-4519

Bob —
Are you aware of this?
L.

February 27, 1975

A & E Engineering, Inc.
4100 Silver S.E.
Albuquerque, New Mexico 87108

Attention: Mr. John Esquibel

Dear Mr. Esquibel:

I have reviewed the revised drainage report for the Newport Business Park which you transmitted with your letter of February 17, 1975 and find that it meets the requirements of AMAFCA Resolution #1972-2. In order to make the drainage system work in conformance with your plan, I am sure that you have cleared with the City of Albuquerque for the 36 inch storm sewer line connection between the existing outlet of the North Airport parking lot, to the 60 inch storm drain along the south boundary of the Newport Business Park tract.

In my opinion, this storm sewer and the connecting drains from the planned ponding areas should be installed prior to any extensive site development.

Sincerely yours,

John B. Robert
Executive Engineer

cj

cc: Craddock Development Company
Mr. Vern Kimmick

Community Sciences Corporation
P. O. Box 1328
CORRALES, NEW MEXICO 87048

(505) 897-0000

LETTER OF TRANSMITTAL

DATE 2/16/78 JOB NO.

ATTENTION

RE:

TO Bruce Cunningham
City Engineering

GENTLEMEN:

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☒ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			Revised Drainage Plan Sheet III of Drainage Report for Newport Park

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please substitute this sheet for the one you now have. The changes which we understand were agreed upon with Craddock have been shown. Report text remains the same.

COPY TO Dave Werner - Craddock

SIGNED: Kent M. Nelson

FORM 240 3 Available from (Name) Townsend, Mass 01469

If enclosures are not as noted, kindly notify us at once.

x-tra

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

February 27, 1986

Jeff Mortensen
Tom Mann & Associates, Inc.
811 Dallas, NE
Albuquerque, New Mexico 87110

RE: UPDATED DRAINAGE PLAN FOR NEWPORT EAST BUSINESS PARK
RECEIVED FEBRUARY 7, 1986 (M-16/D11)

Dear Mr. Mortensen:

I have reviewed the referenced plan and forward the following comments:

1. Is there a drainage easement for the runoff from Tract Z-1 that travels west.

2. Please explain how the runoff from Tract Z-7 is handled.

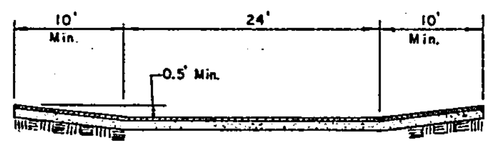
3. Please submit a copy of the plat for Tracts Z-1 thru Z-7.

If you have any questions regarding this project, call me at 766-7644.

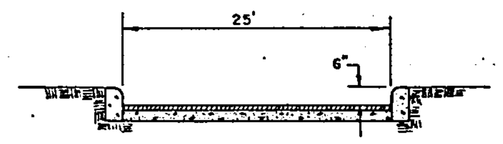
Cordially,

Carlos A. Montoya, P.E.
City/County Floodplain Administrator

CAM/bsj



ALTERNATE SECTION "A"
INVERTED CROWN SECTION
Not applicable at East Boundary
N.T.S.



SECTION "A"
FLAT STREET SECTION
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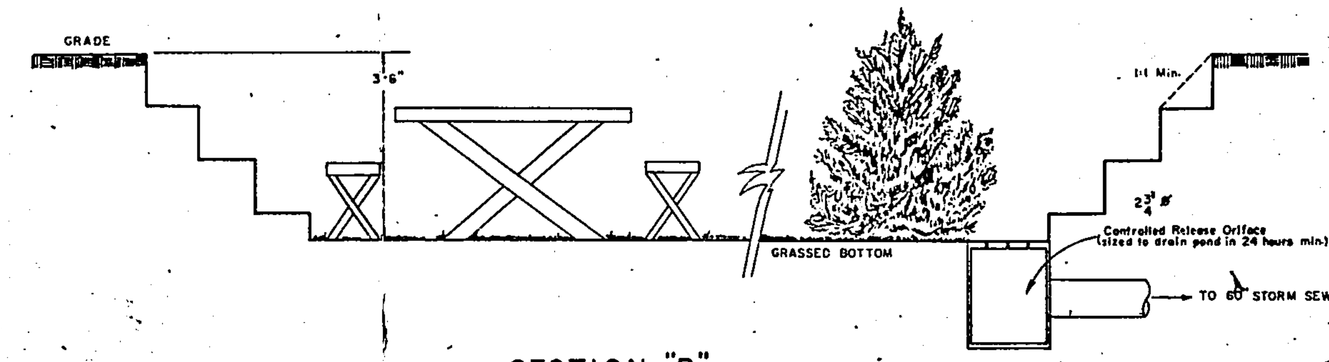
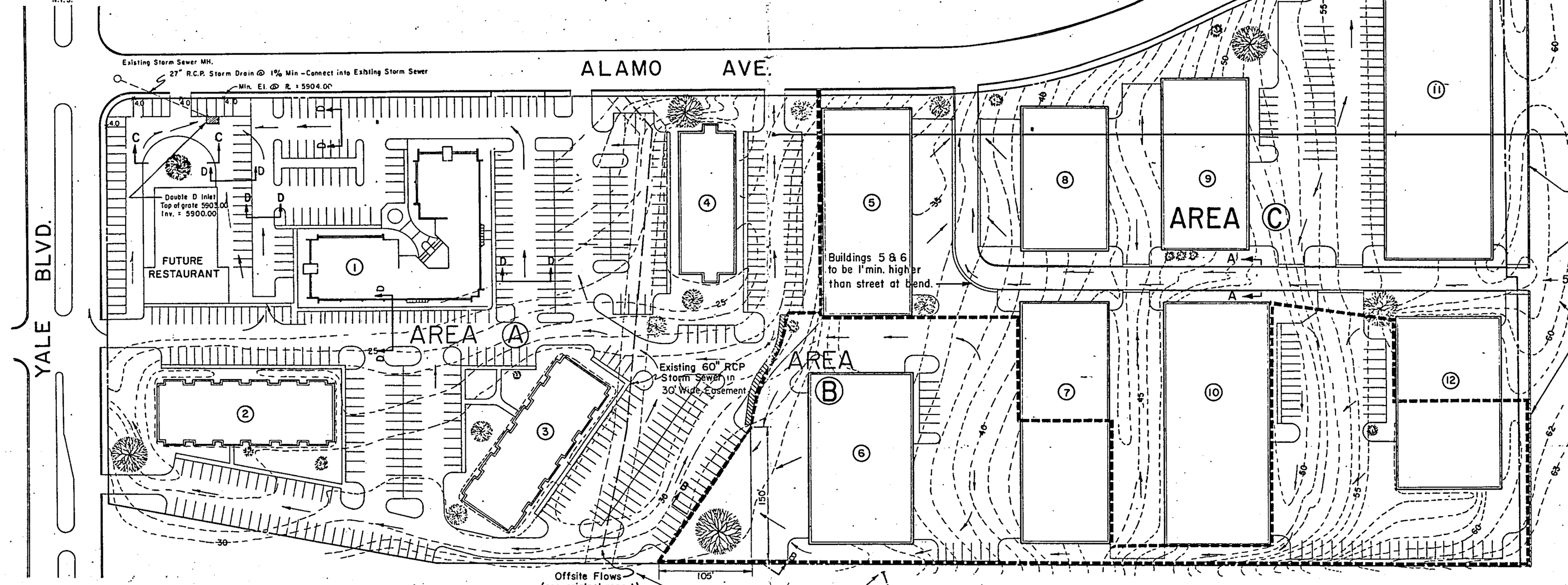
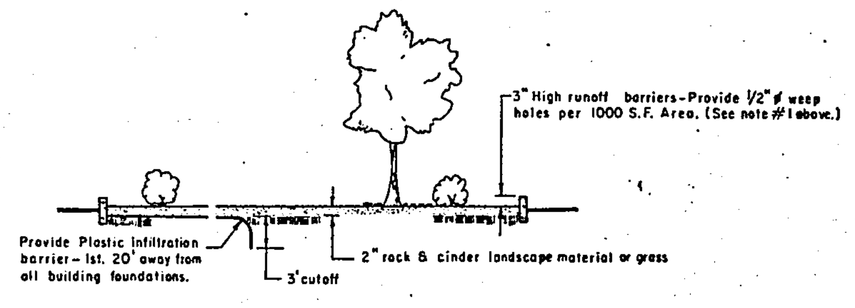


SECTION "B"
IMPONDING BASIN
N.T.S.





SECTION "C"
TYPICAL LANDSCAPED AREA
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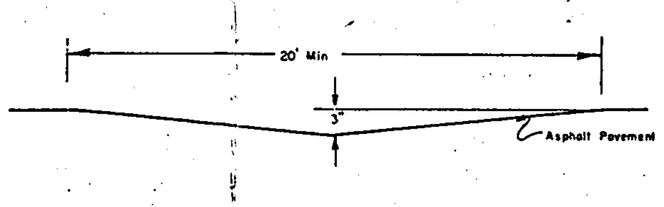

SECTION "D"
TYPICAL PARKING LOT SWALE
N.T.S.

LEGEND

- Drainage Area Boundary
- ③ Building Identification
- Flow Leader
- Water Block

NOTES:

(1) 15% of total land area shall be landscaped and constructed according to Section C below to prevent any runoff from escaping. Tiering shall be used as necessary to accomplish said objective.

(2) Roof areas shall hold runoff for period of 24 hours for storms of up to 100 year frequency.

(3) Areas A, B, C drain directly into streets excluding roof and landscape surfaces.

PLATE III

DRAINAGE PLAN

NEWPORT BUSINESS PARK

DATE	SEPT 1976
SCALE	1" = 60'
DESIGNED	K.W.
DRAWN	R.D.O.
JOB NO	18-1-0011

ADDENDUM

TO

DRAINAGE REPORT

FOR

NEWPORT BUSINESS PARK

DECEMBER 1977

PREPARED FOR:

CRADDOCK DEVELOPMENT COMPANY

ALBUQUERQUE, NEW MEXICO

KENT M. WHITMAN
STATE OF NEW MEXICO
NO. 6170
REGISTERED PROFESSIONAL ENGINEER

Kent M. Whitman

Kent M. Whitman, P.E.

SURVEYING
ENGINEERING
LAND PLANNING

P.O. Box 1328

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Plate I - Location Map	
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ADDENDUM TO DRAINAGE REPORT

NEWPORT BUSINESS PARK

A. PURPOSE & SCOPE

Craddock Development Corporation is currently building Newport Business Park, a nineteen acre development in the southeastern quadrant of Albuquerque. (See Location Map, Plate I). A previously compiled drainage report, prepared by A & E Engineering, has proven unsatisfactory to Craddock due to the space requirements for on-site ponding. The function of this report shall be to serve as an addendum to the original A&E report for purposes of revising the on-site drainage scheme. The reader is referred to the original report as a prelude to this addendum.

B. OFF-SITE DRAINAGE

The original A&E report shows drainage approaching the subject property from both the south and the east. Said report states that the drainage originating east of the Craddock property must necessarily be routed through the development, while flows from the south will be intercepted by an existing (and future planned) pipe system. This report will not comment further on these off-site flows except to suggest a routing method for the flows from the east as shown on Plate III.

C. DESIGN CRITERIA

(1) Engineering Parameters

Coefficients of runoff equal to 0.4 for the natural state and 0.95 for the developed state were assumed for all calculations. In addition a 100 year-6 hour rainfall of 2.4 inches has been used as a basis for design per AMAFCA requirements.

(2) Flood Control Regulations

The drainage plan presented in this report has been designed to comply with the 1972 AMAFCA Resolution in regard to rate and volume of runoff leaving the

site. That Resolution has been interpreted to say that the rate and volume of runoff allowed to leave the site after development shall be no greater than the rate and volume running off prior to development.

D. PLAN FOR ON-SITE RUNOFF CONTROL

The basis for the runoff control plan presented in this report is the replacement of most of the surface ponds (as proposed in the original report) with retention on alternate surfaces, ie., roofs and landscaped areas. Plate III illustrates the scheme, and each building has been given a number for further reference. Drainage area designations A, B, and C refer to the net areas outlined after roof areas are subtracted.

It is proposed that outlet controls be placed at the scuppers of all roof drains as shown on Plate II. (The only exception to this application will be the Restaurant to be located in the Northwest corner of the property. All water ponded up to the crest of the scupper control would be allowed to dissipate via small oriface outlets over a minimum 24 hour period thus contributing virtually no runoff during hours of peak storm intensity. In addition a minimum of 12% of the gross land area will be landscaped and constructed to retain all 100 year storm volumes falling on these areas for a minimum of 24 hours.

Area A will discharge freely into Yale Boulevard and Area C will discharge freely into Alamo Drive. Area B will drain to a triangular 105' X 150' X 3 1/2' deep imponding basin which will have a landscaped bottom to facilitate infiltration. The basin will have a controlled drain leading into the existing 60" storm sewer which crosses the property. This drain will have a 2 3/4" ø controlled release oriface which has been sized to dissipate the basin volume over a 24 hour period.

E. VOLUMETRIC QUANTITIES

Referring to the calculations in Appendix A and subtracting the estimated natural runoff volume (66,200 cubic feet) from the estimated developed runoff volume (1,572,550 cubic feet) leaves a ponding requirement of 91,050 cubic feet. Table I below itemizes the volumes ponded by the various methods discussed. As shown at the bottom of the Table, 91,063 cubic feet can be retained for a 24 hour period by the methods described. This will satisfy the requirement exactly.

F. STRUCTURAL CONSIDERATIONS

The feasibility of ponding water on the roof systems has been determined based on the following structural criteria:

(1) All roofs are supported by prestressed double tee members designed to carry 20#/square feet live loadings. Double tees are 8 feet wide, have 2 inch thick flanges, have 5 3/4 inches wide tapering to 3 3/4 inches wide webs, and are 24 inches deep. Concrete has a compressive strength of 5,000 psi. Spans are 50 feet to 60 feet.

(2) Roofs on buildings 1-4 are flat.

(3) Roofs on buildings 5-12 are pitched 1 in 120

(4) Maximum scupper spacings are 40 feet o.c.

G. SUMMARY OF RECOMMENDATIONS

In conclusion we make the following recommendations regardin control of runoff for the Newport Business Park:

(1) That scupper outlet controls per detail on Plate II be added to all roof drains to retain roof water for 24 hours.

(2) That a minimum of 12% of the gross land area (99,316 square feet) be dedicated to landscaping, and that these areas be constructed to hold all runoff occuring on them for a minimum of 24 hours. See detail, Plate III.

(3) That flows from area B be directed into a triangular 105' X 150' X 3 1/2' deep pond and allowed to dissipate over a minimum 24 hour period.

(4) That areas A & C be allowed to discharge freely since ponding requirements can be met by 1-3 above.

APPENDIX 6A - SAMPLE CALCULATIONS

(1) Runoff Volumes

$C_{DEV} = 0.95$
$C_{NAT} = 0.4$
Area = 19 Acres = 827,640 S.F.
Design Rainfall = 2.4" = 0.2'

$V_{DEV} = 0.95 \times 0.2 \times 827{,}640 = 157{,}259$ C.F.

$V_{NAT} = 0.4 \times 0.2 \times 827{,}640 = 66{,}210$ C.F.

(2) Roof Ponding Volumes - Buildings 5-10

Roof Pitch = 1:120 = .00833
Max. Span @ indicated Pitch = 60'
Scupper Control Heighth= 0.45'

Required Area/Ft. length = 60 x 0.2 = 12 S.F

Distance back to 0 Water Surface Elevation = 0.45/.00833 = 54'

∴ Ponded area/F.t. length = 0.5 x 0.45 x 54 = 12.15 >12 O.K.

(3) Interior Street - Flow Capacity

Q = 52 c.f.s.
Slope = 1% min.
BW = 25'
Sideslopes = 0
n = 0.015

from Manning

$$Q = A \frac{(1.49)}{n} R^{2/3} s^{1/2}$$

solving for depth

D = 0.4' < 0.5' O.K.

(4) Velocity Head @ Street Curve

V = 8 f.p.s.

$$V_h = \frac{V^2}{2g} = 1'$$

(5) Ponding Depth @ Inflow to Street

Q = 52 c.f.s.
Width = 25'

$\therefore$ q = 2.08 c.f.s.

$$y_c = \frac{(q^2)}{(g)}^{1/3} = 0.51'$$

V_c = 4.08 f.p.s.

$$\text{Velocity Head} = \frac{V_c^2}{2g} = 0.26'$$

Total Ponding Depth = 0.51' + 0.26'
= 0.77' < 1' O.K.

(6) Volume Delivered - Area B Pond

Net area = 134265 SF
C = 0.95
R = 0.2'

Vol. = 0.2 X 0.95 X 134265
= 25510 c.f.

(7) Percent of Landscaped Area

Approximate Area of Landscaping shown = 101350 SF
Gross Area = 827,640 SF

% of Gross Area Landscaped = 101,350/827,640 X 100 = 12.25%

(8) Oriface Size - Pond Outlet

A_r = 7875
T = 86400 Sec
Y_1 = 4.5'
Y_2 = 1'
Dd = 0.62

$$Ao = \frac{2A_r}{CA\ T\sqrt{2g}} (\sqrt{Y_1} - \sqrt{Y_2})$$

= .0411 SF

$$= \frac{\pi d^2}{4}$$

d = 0.23'
= 2 3/4" ø oriface

TABLE I

PONDING VOLUMES

AREA DESIGNATION	SURFACE AREA (Square feet)	AVERAGE PONDING DEPTH (feet)	VOLUME PONDED (Cubic feet)
Buildings 1-10	197064	0.2	39410
Buildings 11&12	62784	0.1	6280
Landscaped Areas	99316	0.2	19863
Area B Pond	7440(avg.)	3'5"	25510
TOTAL			91,063

PLATE I

LOCATION MAP

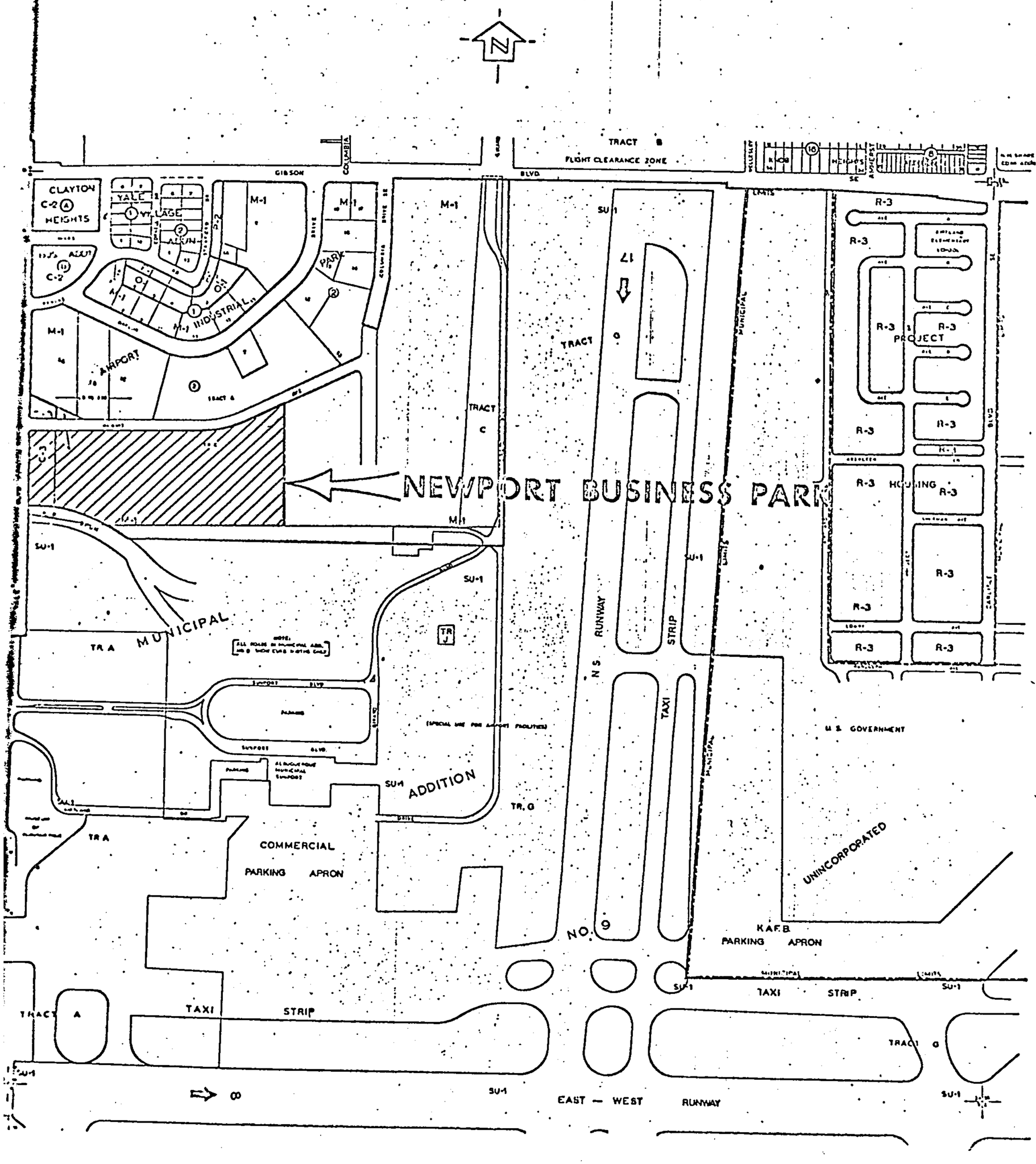
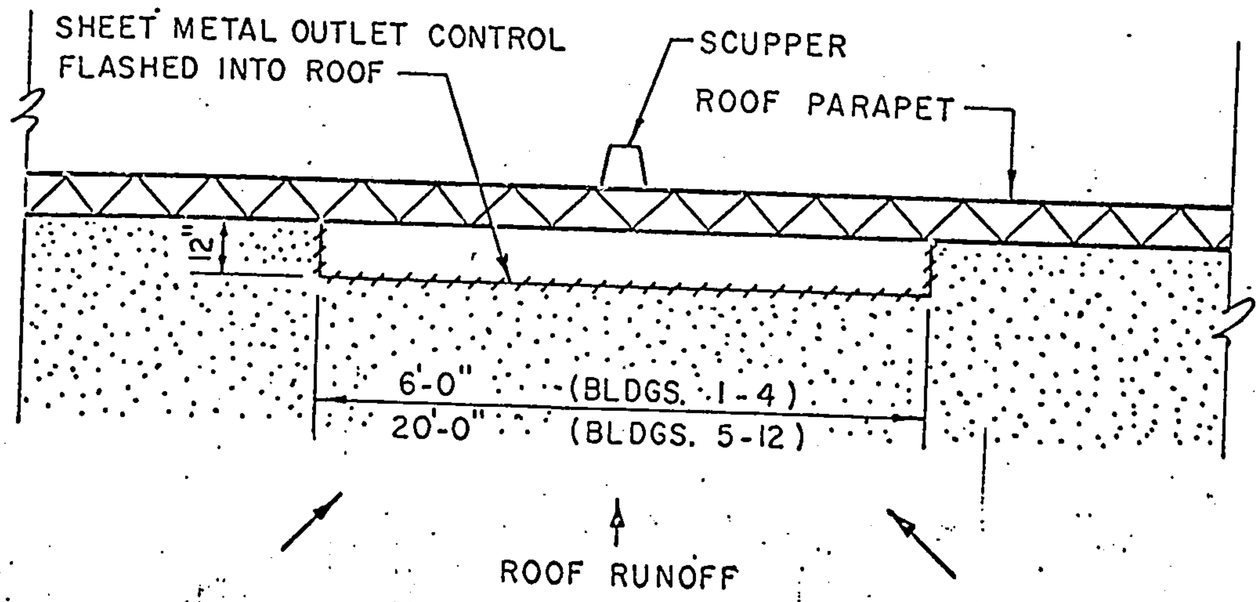


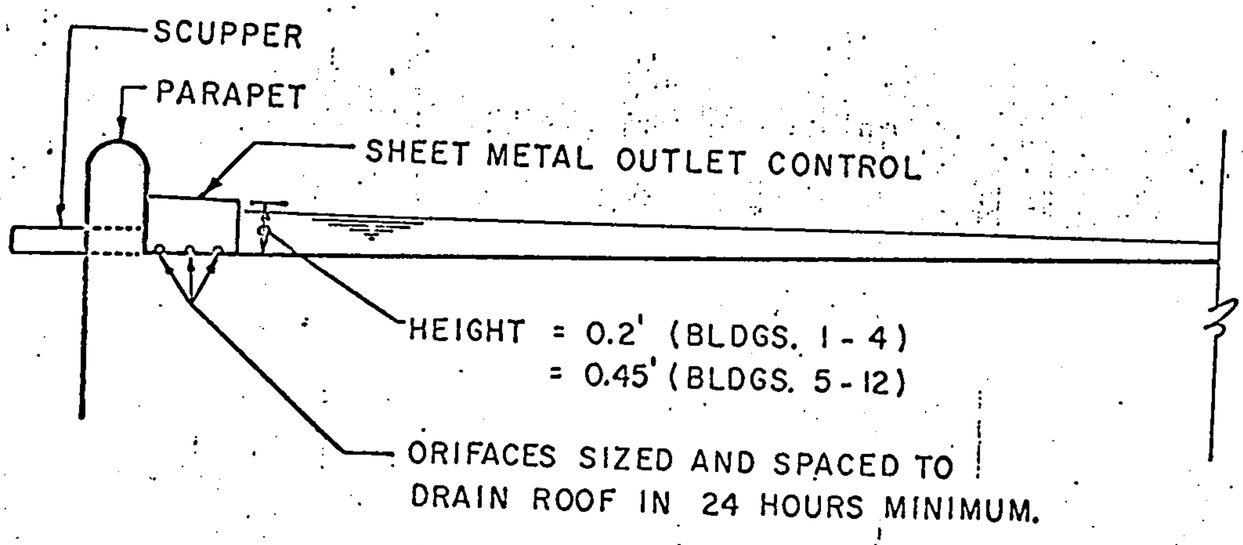
PLATE II

SCUPPER OUTLET CONTROL



PLAN

N.T.S.



SECTION

N.T.S.

Craddock
Development Company

2501 Yale Blvd., S.E., Albuquerque, New Mexico 87106 (505) 842-9136

DRAINAGE

Kathryn
842-9136

2500 YALE S.E.

November 15, 1976

M16-D11

Mr. Kent M. Whitman
Community Sciences Corporation
P. O. Box 1328
Corrales, New Mexico 87048

RE: NEWPORT BUSINESS PARK

Dear Mr. Whitman:

The addendum to drainage report for Newport Business Park is acceptable. Control flow drains for existing building should be submitted for review and installed rapidly as possible. New buildings should have calculations submitted with the building permits.

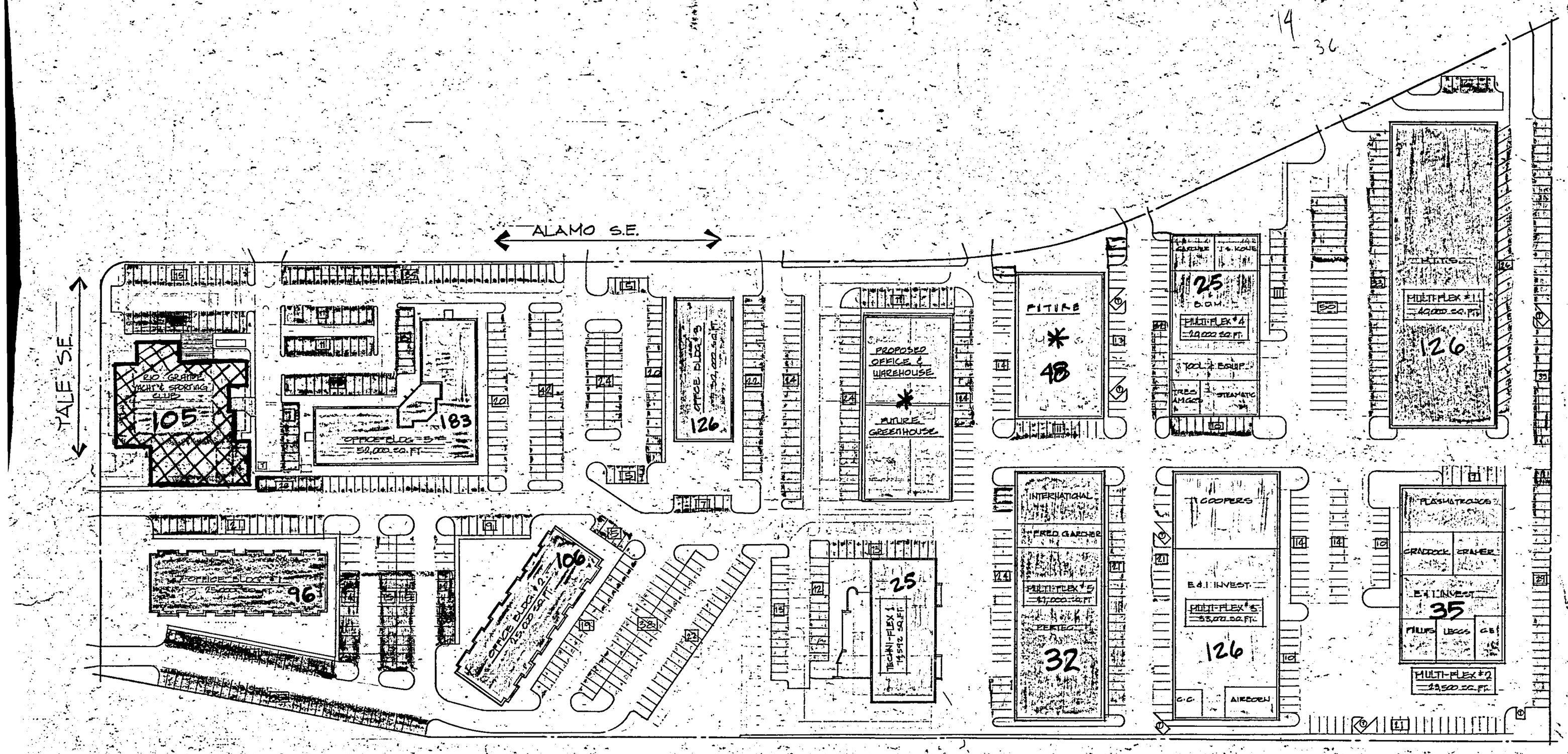
Very truly yours,

Kleston H. Laws
Assistant City Engineer-Hydrology

KHL/fs

cc: John Robert

MASTER PLAN



NEWPORT OFFICE PARK

SCALE: 1" = 50'

ALBUQUERQUE
CODE ADMIN.
AUG 15 1979
U.B.C.
PLAN CHECK
SECTION

STATE of NEW MEXICO
ken hovey
no. 1055
REGISTERED ARCHITECT

ken hovey, architect

Craddock Development Company

REVISIONS:

PROJECT:
DATE:
DRAWN:
CHECKED:

SHEET: