



## City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87107

MAYOR  
David Rusk

April 26, 1979

Mr. John F. Esquivel  
A & E Engineering  
5823 Lomas Blvd. N. E.  
Albuquerque, New Mexico

RE: PUTT PUTT DEVELOPMENT

Dear Mr. Esquivel:

This letter is written to amend previous correspondence in regard to the caption development. The requirement that no increase in run-off will result as a consequence of this development is reiterated. Ponding provisions on site must be made in order to comply with this requirement.

In regard to the construction of the drainage facility, at of the Northwest boundry of the property, within the existing 30 ft. drainage easement, after discussions with Mr. Rip Orr and Mr. John Myers, the conclusion was reached that the development of this project will be granted if the developers construct the asphalt lined channel, indicated in the drainage report, from Aubright Street to the location where the water is currently discharging.

The main concern is to insure that no change in the location of this charge of the surface flow be made at this time and that no direct discharge onto Lomas Blvd. results from this development. At a future date, as the City funds become available, provisions will be made for the comprehensive solution of this problem.

Sincerely,

Bruno Conegliano  
Assistant City Engineer/Hydrology

BC/el

cc: Richard S. Heller, City Engineer  
Pat Gordon  
Rip Orr, Deputy Director, Municipal Devel.  
Drainage File

AN EQUAL OPPORTUNITY EMPLOYER



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

April 6, 1979

City of Albuquerque  
Mr. Dick Heller-City Engineer  
P.O. Box 1293  
Albuquerque, New Mexico  
87103

Re: Putt Putt Development

Dear Mr. Heller:

In behalf of our client, Mr. Pat Gordon (developer of Putt Putt Miniature Golf Courses), we are requesting a firm decision or resolution to the drainage problem effecting this subject development.

The reason we are making this request is that Mr. Pat Gordon is paying a contractor a fee of \$1,000.00 stand-by charges per day while this problem is resolved.

A letter dated March 30, 1979 from Mr. Bruno Conegliano (Assistant City Engineer-Hydrology) stated that the city anticipated to construct a storm sewer line to intercept and convey said runoff in the existing easement at the time the property to the west of our client is developed. The letter also stated that our client would have to deliver to the city a cash bond equal to the cost of future construction of the storm sewer line plus contingencies. Under these conditions the construction of a temporary asphalt channel would be acceptable and total cost to be borne by our client.

The original idea requesting a storm sewer pipe system was derived from maps which Mr. Conegliano presented to our firm. Said maps showed two (2) existing 72" storm sewer pipes crossing Lomas Boulevard, west of subject property. We (A & E Engineering) have performed an onsite field investigation and have not found these mentioned storm pipes crossing Lomas Boulevard. What we have found, in the same area, are two (2) paved downdrains carrying surface runoff from Lomas Boulevard as well as the runoff which we are in the process of controlling.

It is this firm's belief that the most practical and economical solution, to all parties, is to construct a concrete channel within the easement to convey the runoff similar to what the flow is presently doing. The cost should be assessed to the respective owners along the easement and a portion to be paid by the City of Albuquerque.

RECEIVED

APR 09 1979

CITY ENGINEERS

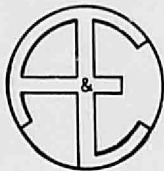
Secondly, we believe that a storm sewer pipe system constructed along the entire length of the easement, crossing under Lomas Boulevard, would be the most expensive method of conveying the subject runoff.

Thirdly, on behalf of our client, we feel that in lieu of a cash bond for an undisclosed amount of money at this time, a letter of credit for a set percentage of the estimated cost of the sewer system would be more beneficial to all parties involved.

Your immediate attention would be greatly appreciated!

*John F. Esquibel*  
A & E Engineering, Inc.  
John F. Esquibel-Pres.

cc: Bruno Conegliano



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

*Putt Putt*

April 5, 1979

City of Albuquerque  
Mr. Dick Heller-City Engineer  
P.O. Box 1293  
Albuquerque, New Mexico  
87103

Re: Putt Putt Development

Dear Mr. Heller:

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The reason we are making this request is because Mr. Gordon is paying a contractor a fee of \$1,000.00 stand-by charges per day while this problem is resolved.

In reference to a letter dated March 30, 1979 from Mr. Bruno Conegliano (assistant City Engineer-Hydrology) stated that the city anticipated to construct a storm sewer line to intercept and convey said runoff in the existing easement at the time the property to the west of our client is developed. Also that our client would have to deliver to the city a cash bond equal to the cost of future construction of the storm sewer line plus contingencies and that under these conditions the construction of a temporary asphalt channel would be acceptable, and total cost to be born by our client. At this time, a letter of credit for one-third of the estimated cost of the sewer system would be more beneficial to all parties.

You're immediate attention would be greatly appreciated.

Thank you,  
A & E Engineering, Inc.

cc: Bruno Conegliano  
Pat Gordon

  
John F. Esquibel-Pres.



## City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR

David Rusk

March 30, 1979

Mr. John Esquibel  
A & E Engineering Co.  
5823 Lomas Blvd., N.E.  
Albuquerque, N.M. 87110

Re: Putt Putt Development

Dear Mr. Esquibel:

The drainage report submitted for the captioned development is not acceptable since it is not in compliance with the AMAFCA RES. 72-2. The land to the west of this parcel is not presently subjected to uncontrolled developed runoff; in the absence of appropriate drainage facilities for the conveyance of the runoff and of public R.O.W. across that property, the runoff volume and rate from this development cannot be increased. As verbally indicated the construction of an asphalt-lined channel is not an acceptable ultimate solution for the conveyance of the flow from the northeast. It is anticipated that the City will construct a storm sewer line to intercept and convey said runoff in the 30ft drainage easement at the time of development of the property to the west.

In order to concur with this development and grant a building permit, the owner of this property will have to deliver to the City cash Bond equivalent to the cost of construction plus contingencies, of the storm sewer along the length of his property. Under these conditions the construction of a temporary asphalt channel will be acceptable.

At the time of construction of the storm sewer, the City will consider relinquishment of part of the existing surface easement if not in conflict with other requirements. Please submit two copies of a revised drainage and grading plan for this development.

Very truly yours,

Bruno Conegliano

Assistant City Engineer-Hydrology

BC/ms

cc - Rich Leonard  
Dick Heller  
Bob Kielich  
Pat Affholter (Gathman-Matotan)  
Drainage file ✓

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Assistant City Engineer-Hydrology

BC/ms

cc - Rich Leonard  
Dick Heller  
Bob Kielich  
Pat Affholter (Gathman-Matotan)  
Drainage file ✓

AN EQUAL OPPORTUNITY EMPLOYER

DRAINAGE REPORT  
for

**PUTT-PUTT**

in  
ALBUQUERQUE, NEW MEXICO

Prepared by  
A & E Engineering



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

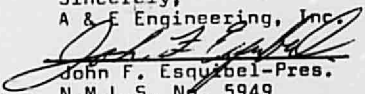
May 3, 1979

Gathman-Matotan Architects-Planners, Inc.  
Pat Affholter  
230 Truman NE  
Albuquerque, New Mexico  
87108

Dear Mr. Affholter:

We are submitting this revised drainage report to you on the Putt putt Golf Course Project in Albuquerque, New Mexico. The control of the runoff shall comply with the requirements of the Albuquerque Metropolitan Arroyo Flood Control Authority County of Bernalillo Building and Inspections Department and with present City of Albuquerque drainage control policies.

We 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. Esquivel-Pres.  
N.M.L.S. No. 5949



DRAINAGE REPORT

FOR

PUTT PUTT GOLF COURSE  
ALBUQUERQUE, NEW MEXICO

Prepared for:

Gathman-Matotan Architects  
Planners, Inc.

Albuquerque, New Mexico

By:

A & E Engineering, Inc.  
5823 Lomas NE  
Albuquerque, New Mexico  
March 13, 1979



DRAINAGE REPORT

FOR  
PUTT PUTT GOLF COURSE  
ALBUQUERQUE, NEW MEXICO

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#### GENERAL

This report consists of a hydrologic study of a probable 100-year storm effecting this proposed development referred to herein as Lomas and Walker Putt-Putt.

#### LOCATION AND DESCRIPTION

The Lomas and Walker Putt-Putt is a proposed miniature golf course with associated buildings and parking area on a tract of land north of Lomas Boulevard NE and west of Walker Drive, NE, said tract being and comprising of Lots 3,4,5,6,7 and 8, a vacated public alley abutting said lots together with the easterly 1/2 of a drainage Easement, all in Block "A" of Mesa Village, a subdivision in Albuquerque, New Mexico, as the same are shown and designated on the plat of said Block "A", filed in the office of the county clerk of Bernalillo County, New Mexico, on the 14th day of December, 1962.

The tract slopes from East to West at a slope of 1.72 percent.

#### DEVELOPMENT

Lots 3 & 4 of this tract will be developed into a miniature golf course with associated buildings and parking. Lots 5,6,7 and 8 along with the vacated alley will remain undeveloped at this time. The 30' drainage easement centered on the West property line will contain a trapezoidal asphalt line channel as detailed herein, designed to carry offsite runoff from the northeast of this tract as shown on the offsite drainage plan.

Additional runoff created by the development of this tract will be retained and ponded onsite.

#### PROPOSED DRAINAGE PLAN

The runoff from the drainage easement presently empties across Lomas to the southeast corner of Lomas Boulevard and Easterday; thence, the runoff drains into the tract between Lomas, Interstate 40 and Easterday. Four 10' square culverts drain this area into Interstate 40 Drainage Channel. This drainage pattern will remain unaltered.

Additional runoff created by the development of this tract will be retained in ponds to the west, south and east of the Putt-Putt Course.

The Putt-Putt Course will be graded and landscaped by others to retain and pond all runoff.

#### DISCUSSION OF METHOD

The cubic feet per second of offsite runoff was determined 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.

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

$$t_c = \frac{11.2 (L)^3}{H} \quad 0.385$$

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

$$c = \begin{array}{l} 0.9 \text{ offsite} \\ 0.8 \text{ onsite} \end{array}$$

The volume of onsite runoff was determined by methods described on attached "Standard requirements for drainage plans".

# ONSITE HYDROLOGIC CALCULATIONS

$$Q = CIA$$

$$t_c = \frac{11.2 \times (L)^3}{H} \quad 0.385$$

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

$$C = 0.8$$

$$A = 3.06 \text{ acres}$$

$$L = 580 \text{ feet} = 0.0996 \text{ miles}$$

$$H = 5415 - 5405 = 10 \text{ feet}$$

$$t_c = \frac{11.2 \times (0.0996)^3}{10} \quad 0.385 = 0.00110^{0.385} = 0728 \text{ hrs.}$$

$$t_c = 4.37 \text{ minutes}$$

$$I = \frac{189}{4.37 + 25} = 6.44$$

$$Q = 0.8 \times 6.44 \times 3.06 = 15.77 \text{ cfs.}$$

Volume of runoff required to be ponded:

$$(0.9 - 0.4) \times \frac{2.4}{12} \times 44,550.3 \text{ sq. ft. made impervious} = 4,455.03 \text{ cu.ft.}$$

## Area "A":

$$0.9 \times \frac{2.4}{12} \times 10,018.5 \text{ sq. ft. made impervious} = 1803.33 \text{ cu. ft.}$$

$$0.4 \times \frac{2.4}{12} \times 3,368 \text{ sq. ft. made impervious} = 269.44 \text{ cu. ft.}$$

$$\underline{2072.77 \text{ cu. ft.}}$$

Volume Pond "A":

$$10.0 \text{ sq. ft.} \times 4.2' \text{ deep} \times 1/3$$

$$= 1862.00 \text{ cu. ft.}$$

Overflow from Pond "A" to Area "B":

$$2072.77 \text{ cu. ft.} - 1862.00 \text{ cu. ft.}$$

$$= 210.77 \text{ cu. ft.}$$

Area "B":

$$\begin{aligned} 0.4 \times \frac{2.4}{12} \times 4255.0 \text{ sq. ft. landscaped} &= 340.40 \text{ cu. ft.} \\ \text{Overflow from pond "A"} &= 210.77 \text{ cu. ft.} \\ &= \underline{551.17 \text{ cu. ft.}} \end{aligned}$$

Volume Pond "B": 10' x 73' x 1.6' deep

$$\begin{aligned} 10' \times 10' \times 1.6' \text{ deep} \times 1/3 &= 53.33 \text{ cu. ft.} \\ 10' \times 63' \times 1.6' \text{ deep} \times 1/2 &= 504.00 \text{ cu. ft.} \\ &= \underline{557.33 \text{ cu. ft.}} \end{aligned}$$

Volume of Pond "B" exceeds runoff entering it.

Area "C":

$$\begin{aligned} 0.9 \times \frac{2.4}{12} \times 34,531.8 \text{ sq. ft. made imperious} &= 6215.72 \text{ cu.ft.} \\ 0.4 \times \frac{2.4}{12} \times 2,260 \text{ sq. ft. landscaped} &= 180.80 \text{ cu. ft.} \\ &= \underline{6396.52 \text{ cu.ft.}} \end{aligned}$$

Volume Pond "C":

$$\begin{aligned} 1325.0 \text{ sq. ft.} \times 3.5' \text{ deep} \times 1/3 &= 1545.83 \text{ cu.ft.} \\ 1325.0 \text{ sq. ft.} \times 0.5' \text{ deep} &= \underline{622.50 \text{ cu.ft.}} \\ &= 2168.33 \text{ cu.ft.} \end{aligned}$$

$$\begin{aligned} \text{Overflow from Pond "C" to drainage easement:} \\ 6396.52 \text{ cu. ft.} - 2168.33 \text{ cu. ft.} &= 4228.19 \text{ cu.ft.} \end{aligned}$$

Area "D":

Area "D" will remain undeveloped at this time and will continue drainage into drainage easement.

$$0.4 \times \frac{2.4}{12} \times 39,918.69 = 3193.5 \text{ cu.ft.}$$

Total Volume ponded onsite:

$$\begin{aligned} \text{Pond "A"} &= 1,862.00 \text{ cu.ft.} \\ \text{Pond "B"} &= 551.17 \text{ cu.ft.} \\ \text{Pond "C"} &= \underline{2,168.33 \text{ cu.ft.}} \\ &= 4,581.50 \text{ cu.ft.} \end{aligned}$$

Volume required to be ponded = 4,455.03 cu.ft.

Volume ponded in excess of requirements = 126.47 cu.ft.

# OFFSITE HYDROLOGIC CALCULATIONS

$$Q = CIA$$

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

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

$$C = 0.9$$

$$A = 39 \text{ acres}$$

$$L = 2800 \text{ feet} = 0.53 \text{ miles}$$

$$H = H_2 - H_1 = 5464 - 5410 = 54 \text{ feet}$$

$$t_c = \left[ \frac{11.2 \times (0.53)^3}{54} \right]^{0.385} = 0.26 \text{ hours}$$

$$t_c = 15.7 \text{ minutes}$$

$$I = \frac{189}{15.7 + 25} = \frac{189}{40.7} = 4.64$$

$$Q = 0.9 \times 4.64 \times 39_{ac2} = 162.89 \text{ cfs.}$$



SLOPE OF EASEMENT:  $5.7 \div 521.93 = 0.0109$

$Q$  (onsite) +  $Q$  (offsite) = total flow thru channel

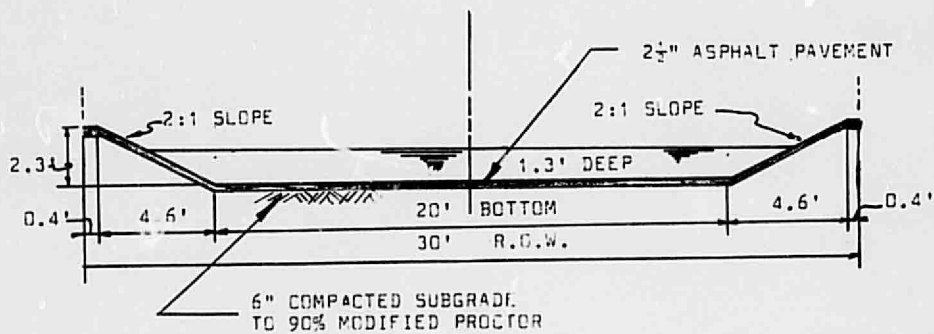
$15.77 + 162.89 = 178.66$  cfs.

$d = 1.3$  ft.

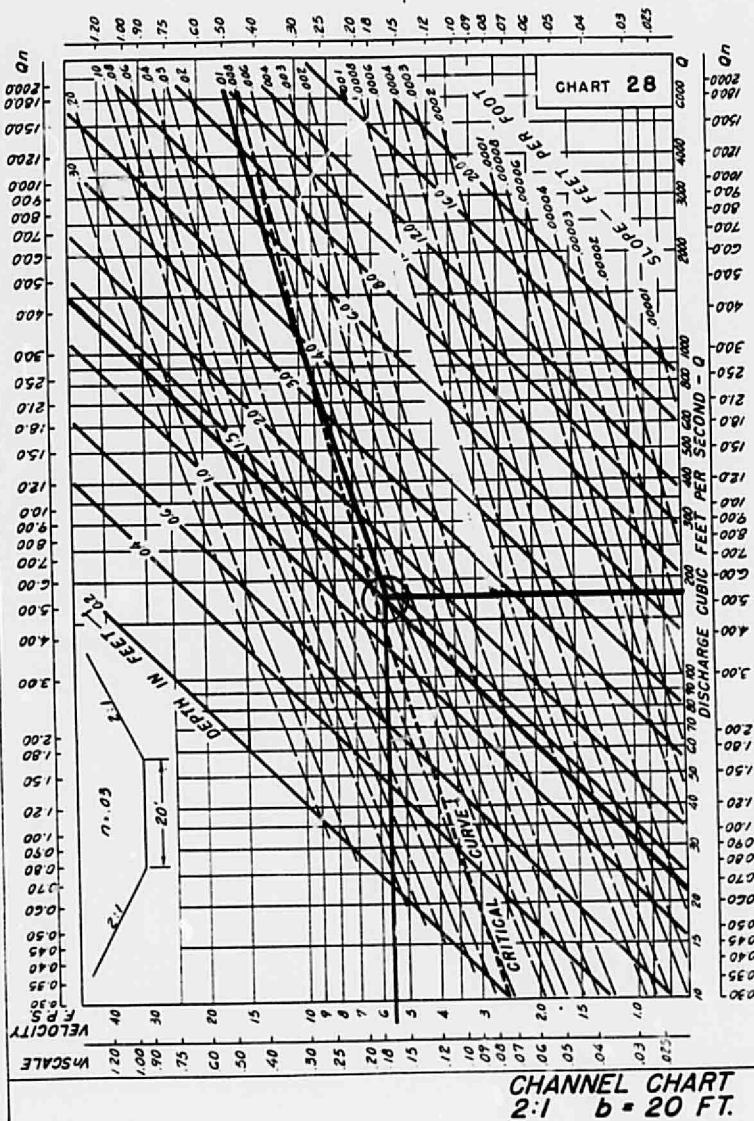
Free board = 1.0 ft.

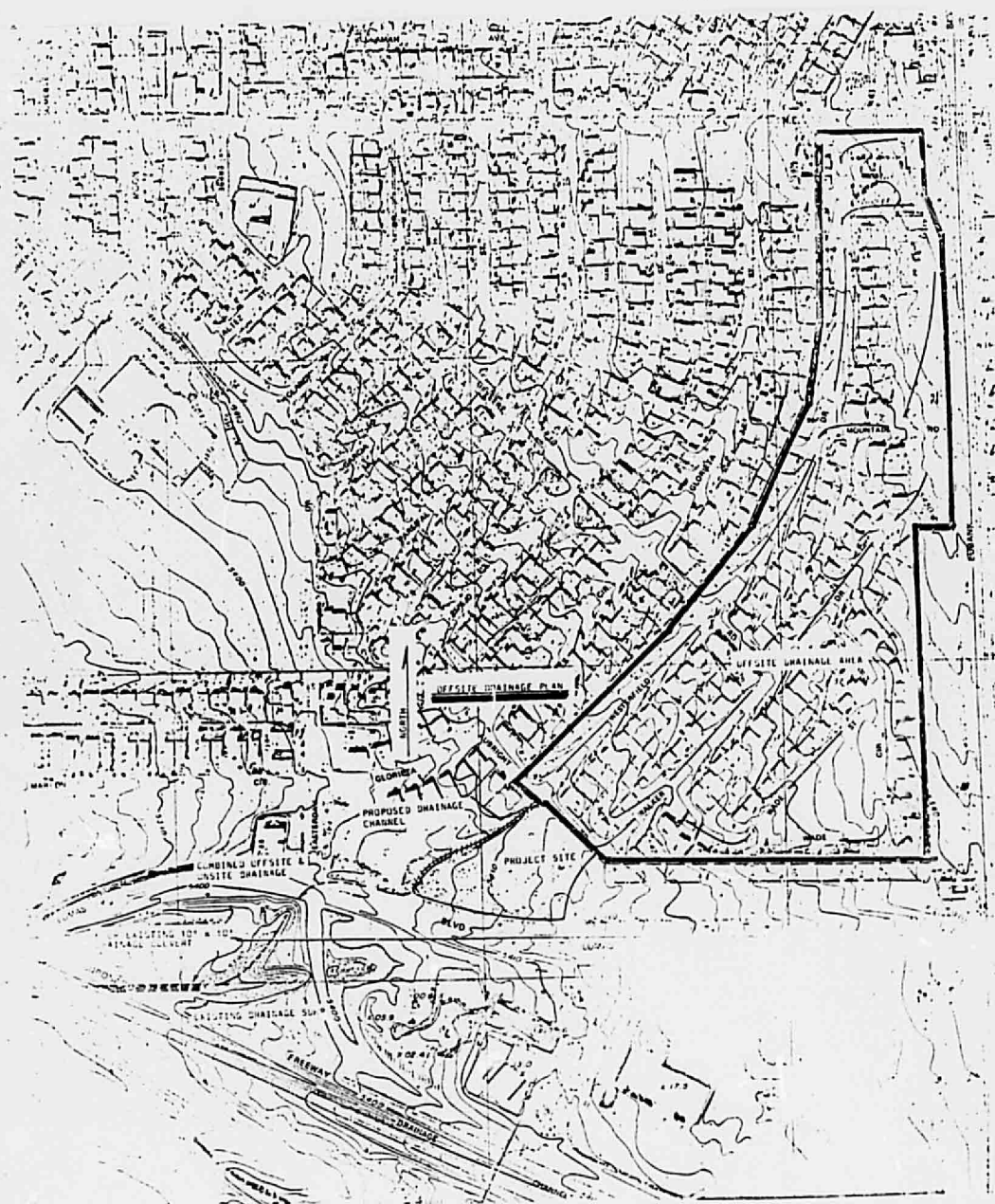
$V = 5.5$  fps

$n = 0.03$



DRAINAGE R.O.W. CHANNEL SECTION



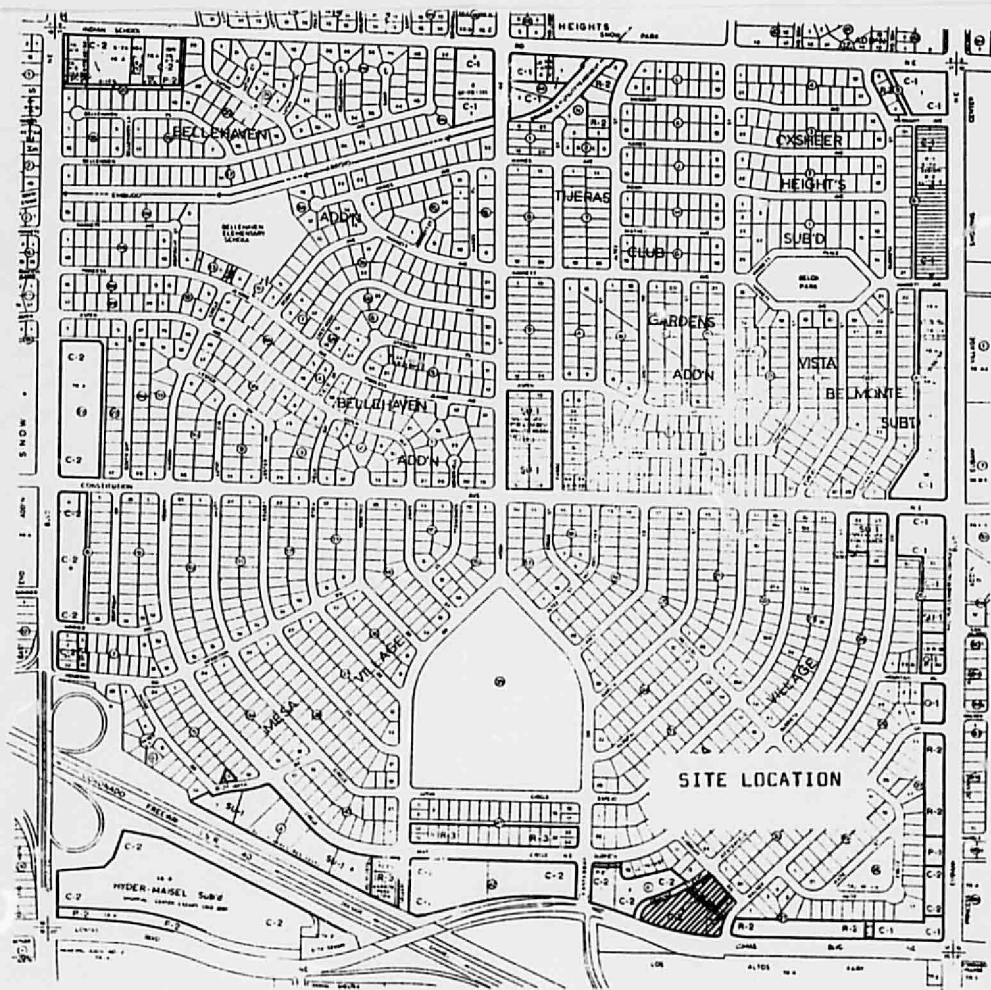


SUMMARY

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.

The asphalt channel side has been lowered on the west side as shown on the drainage plan to permit the runoff to flow into the low spot on the undeveloped tract of land to the west before flowing across Lomas Blvd. This maintains the existing runoff pattern.

This is in accordance with the attached letter from Bruno Conegliano Assistant Engineer/Hydrology, City of Albuquerque, and a phone conversation between this office and Mr. Conegliano on May 3, 1979.



**J-20-Z**



## City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR  
David Rusk

April 26, 1979

Mr. John F. Esquivel  
A & E Engineering  
5823 Lomas Blvd. N. E.  
Albuquerque, New Mexico

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In regard to the construction of the drainage facility, at of the Northwest boundry of the property, within the existing 30 ft. drainage easement, after discussions with Mr. Rip Orr and Mr. John Myers, the conclusion was reached that the development of this project will be granted if the developers construct the asphalt lined channel, indicated in the drainage report, from Aubright Street to the location where the water is currently discharging.

The main concern is to insure that no change in the location of this charge of the surface flow be made at this time and that no direct discharge onto Lomas Blvd. results from this development. At a future date, as the City funds become available, provisions will be made for the comprehensive solution of this problem.

Sincerely,

Bruno Conegliano  
Assistant City Engineer/Hydrology

BC/el

cc: Richard S. Heller, City Engineer  
Pat Gordon  
Rip Orr, Deputy Director, Municipal Devel.  
Drainage File

AN EQUAL OPPORTUNITY EMPLOYER

PLEASE RETURN WITH PLANS

STANDARD REQUIREMENTS FOR DRAINAGE PLANS

PURPOSE: The increasing volume of drainage plans submitted to this office makes it mandatory that such plans be standardized as much as possible in order to expedite reviews. This standardization is as much to the advantage of the developer and engineer as it is to the Hydrology Section which enforces the AMAFCA RES. 72-2. For parcels of land less than 20,000 sq. ft. in surface area no formal drainage report is required; the construction plans need only to include the standard form attached herein and the site drainage plan. Developers for larger parcels of land will have to submit a formal drainage report as specified in the Resolution.

RUNOFF PONDING: In most instances on site ponding is mandatory, with dispersal in the ground of the excess runoff arising from newly created impervious surfaces. The only exception allowed, is for those properties adjacent to a diversion channel which was designed for higher standard than 100 years frequency storm (existing conditions). For detailed computations of the runoff before and after development the assumed runoff coefficient recommended are  $C = 0.4$  for undeveloped, landscaped or similar open areas and  $C = 0.9$  for all other impervious surfaces, including areas in southwestern type landscaping with underlying polyethylene film and gravel covered parking areas where vehicular traffic will compact the soil and render it impervious. Due to the inadequacy of the existing drainage facilities in the valley area and to the limited capabilities of the City for providing relief, ponding requirements in the valley are higher than elsewhere.

COMPUTATION OF VOLUME OF RETENTION:

$$\text{Valley Area} = 1.0 \times \frac{2.2}{12} \times \text{Area (ft.)} = 0.18 \times A$$

$$\text{East and West Mesa} = (0.9 - 0.4) \times \frac{2.4}{12} \times \text{Area (ft.)} = 0.1 \times A$$

In order to facilitate the design of drainage facilities, a checklist that will be followed in the review process is listed below:

CHECK LIST

1 - Flooding potential - adjacent water courses

Is property located in the flood plain?

If so, is the finished floor above the 100 yrs. flood level?

Is property adjacent to a natural or artificial water course?

If so, what are the specific AMAFCA or City requirements?

2 COPIES OF SITE GRADING PLAN REQUIRED FOR MY RECORDS.



STANDARD REQUIREMENTS FOR  
DRAINAGE PLANS

-2-

Are drainage R.O.W or easements shown on, or in the proximity of property? If so, are there drainage problems?

2 - Relation of property to surroundings

Per topo map, does property intercept other drainage upstream?

If so, how is runoff conveyed across property?

May there be erosion associated with offsite runoff conveyance?

May erosion or siltation result from proposed construction activities?

Does development block drainage from adjacent property?

3 - Site grading

Does site plan show contours before development (extending a minimum of 25 ft. beyond property lines)?

Does site plan show proposed grading with adequate swale definition to convey water to ponds?

Is all runoff conveyed to ponding areas before it overflows to public facilities?

Does the proposed grading plan indicate that under cutting or back-filling adjacent to property lines may require retention walls?

Is there continuity between proposed new contours and old contours offsite?

Is elevation of property line at least 0.3 ft. above top of curb?

4 - Storm water retention

Is ponding volume adequate (supply detailed computation)?

Are ponds balanced with areas they drain (can area draining to each pond be easily identified and will actually water flow there)? The plot plan must outline each drainage area.

Can pond volume be computed and verified? (3:1 POND SLOPE REQUIRED)

Are ponds practical, can they be built as shown?

5 - Safety

Do the drainage provisions constitute an attractive nuisance, or safety hazard?



STANDARD REQUIREMENTS FOR  
DRAINAGE PLANS

-3-

If the pond depth is greater than 18", are safety provisions supplied?  
(Minimum 3.0 ft. high chain link fence or similar physical barrier  
of ponding areas are adjacent to public R.O.W.?)

In general, ponds of depth greater than 18" will not be accepted for  
both safety consideration and for long term effectiveness of the  
facilities. In those cases where limited space is available for  
ponding, the use of gravel pits under the parking areas is suggested.  
It must be pointed out that mainstream and effectiveness of these  
facilities is necessary and is the responsibility of the owner.  
Existing or planned City facilities (streets, channels, storm sewers)  
can accommodate the natural runoff volumes. Greater discharges would  
cause flooding downstream and need to be limited at the source.