HYDROLOGY

F21/D32

F21/D32

LAGRIMA DE ORO

DEVELOPMENT

3 PLANS

EARL L. MAYNE – ARCHITECT

1221 Central, N.E.
Albuquerque, New Mexico 87106
(505) 243-3717

19 August, 1981

City of Albuquerque
Municipal Development Department
Planning Division

Re: Environmental Planning Commission Report, August 20, 1981.
No. Z - 78 - 69 - 2

Gentlemen:

The following comments and attached drawings are provided in response to the findings and recommendations given in the August 20, 1981 report on Z-78-69-2.
Summary finding # 1 - No comment required.
Summary finding # 2
Summary finding # 3 - Drive pads and private drives are sub-standard and to be corrected per Traffic Engineer comments.
COMMENTS:

a. The setback in front of the garages, based on the 15 feet building offset as initially submitted, varied from 18 feet 7 inches, at the shallow end, to 23 feet 5 inches, . . the deep end. (The buildings are at an angle to the right-of-way line.) The buildings have been re-sited with a 16.4 feet offset, providing for a setback on front of the garages of 20 feet ¼ inches at the shallow end, to 24 feet 10 inches at the deep end.

b. The private drives running generally North-South are 20 feet wide. These access roads will also be dedicated as easement for right of way for access to the lots immediately south, should this be necessary. The East-West drive is 18 feet wide, and provides two 9 feet wide travel lanes. This 18 feet wide drive does meet Federal Housing Administration standards.

Summary finding # 4 - No justification for the requested sidewalk variance has been given. No sidewalk variance should be allowed.

COMMENTS:

a. The reason for requesting placement of the sidewalk adjacent to the curb was to provide for a larger block of house lot and landscaping between the sidewalk and the house. Also, placing the sidewalk adjacent to the curb would eliminate the parkway which, in many cases, becomes an untended and weedy area.

b. In as much as the Traffic Engineer Department has stated that the offset sidewalk is required to meet Federal standards for the Handicapped, I withdraw the request for a variance.

Your approval of the attached site development plans is requested.

Sincerely,

EARL L. MAYNE/ARCHITECT P.A.

MRK

Marvin R. Kortum

MRK:aa

Enclosures

Summary finding # 5 - The landscaping plan is inadequate and should be revised to include the entire site, grassed areas and street trees along Lagrima De Oro. A statement as to maintenance is also required.
COMMENTS:

a. A revised landscaping plan is submitted showing typical landscaping and plantings. The final detailed landscaping plan will depend partially upon the development of the final site and grading plan, addressed in SUMMARY FINDING 7, below.

b. The maintenance of the landscaping will be the responsibility of the individual land owners to whom the property is deeded. The landscaping will be maintained by the developer during construction and the initial warrantee period.

Summary finding # 6 - Greater detail regarding the retaining wall height and materials is required.
COMMENT:

a. Detailed drawings on the locations, heights, and materials will be provided when the final site and grading plan is developed as addressed in SUMMARY FINDING 9, below.

Summary finding # 7 - A revised site and landscaping plan addressing the above concerns is required.
COMMENT:

a. Attached is a drawing at a larger scale than originally submitted which shows in more detail the concerns listed above. The development of the final site and landscaping plan will depend in part on the subject addressed in SUMMARY FINDING 9, below.

Summary finding # 8 - Road alignments and access, and drainage treatment is at present undetermined for the special use site.

Summary finding # 9 - The City Hydrologist's comments indicate the request is pre-mature in the absence of the necessary infra-structures to allow development.
COMMENTS:

a. These proposed development has been prepared based on findings and a resolution of the Environmental Planning Commission, May 18, 1978, which acted upon a request for a change of zone from R-1 to SU-1 for certain parcels of land, to include the land upon which this development is to be placed. The findings were:

1. The request is in accord with a plan adopted by the City in 1973.
2. The request is consistent with all of the City's plans and policies.
3. The zone change would stabilize the zoning for the subject property.

b. The proposed layout of the streets in the associative of the 80 was obtained from the city. It is our understanding that most of the land required for the right-of-way has been or is being acquired by the city. At any rate, the portion of Lagrima De Oro Road from Eubank to the intersection of Pitt Street, and three hundred feet beyond does not appear to have any problems associated with the city's procurement of the proposed right-of-way.

c. We have worked with the City Engineering Department and the City Hydrologist attempting to get information on the proposed development. Definitive information on this profile has not been made available, due, apparently to the lack of a conceptual plan for development of the complete area. Development of our final site, grading, drainage and landscaping plan, and certain other construction details, depends on establishment of this Lagrima De Oro Road profile.

d. Lacking definitive information from the city on the Lagrima De Oro Road, we have proposed a profile which we feel is technically sound. This street profile will accomodate any reasonable drainage plan for the majority of the lots within the associative of the 80, with the exception of these lots immediately adjacent of either Montgomery Blvd., or Eubank Blvd. This proposed profile will permit drainage to Eubank, and to the major arroyo to the north.

e. The site, drainage, and grading plan submitted for the development is based on this proposed street profile. The drainage plan provides for retention and ponding of substantially all precipitation which fall on the property, to include roof, driveway and street run off. The proposed development will decrease the current run off to Montgomery Blvd.

f. We feel that this development readily fits any reasonable overall plan for the development of the associative of the 80. The proposed development ties closely with work by the city already completed or underway. This development follows previous guidance from the Environmental Protection Commission, and further delay seems superfluous.

We request that the Environmental Planning Commission approve the concept and site plan for this development, with the provision that the details of the street profile and drainage plan be completed by coordination with the City Engineer, and that the detailed site plans be adapted to this approved profile.

EARL L. MAYNE/ARCHITECT

T. H. Roback

Thomas H. Roback

THR:aa

Enclosure

EARL L. MAYNE – ARCHITECT

1221 Central, N.E.
Albuquerque, New Mexico 87106
(505) 243-3717

22 October, 1981

Traffic Engineer
City Engineer/Hydrology
City Engineer
P.O. Box 1293
Albuquerque, New Mexico

Reference: Proposed development of a 3.1 acre site located on Lagrima De Oro Road, near the intersection of Eubank Blvd. and Montgomery Blvd. Planning Department File No. 2-78-69-2.

Gentlemen:

Attached are revised site development plans for approval and signature for the referenced development plan. The site development plans have incorporated all findings of the Environmental Planning Commission and detailed and specific comments of the City Departments as stated in the EPC Agenda Item 14, August 20, 1981. (Encl. 2)

The following comments address specific findings of the EPC as expressed in the Notification of Decision August 26, 1981. (Encl. 1)

Finding 1: The Summary Plat is being prepared based on the attached site development plan which meets the EPC Development Criteria.

Finding 2: The Landscaping Plan has been revised incorporating comments of the EPC. The landscaping is integral with the ponding and drainage plan, and appropriate comments on maintenance have been incorporated into the drainage covenant.

Finding 3: The Developer is aware of the requirement for participation in a future drainage district.

Finding 4: The developer will develop Lagrima De Oro Road as required. Preliminary design has been prepared by the Developer and coordinates with the City Staff and construction drawings are being prepared.

Finding 5: The developer will extend sewer and water to this project. The preliminary design has been prepared by the developer and coordinated with the City Staff and construction drawings are being prepared.

Finding 6: The necessary impoundment and temporary drainage are covered in the attached drainage plan.

FOX Consulting Engineers and Geologists

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

November 6, 1981

New Beginnings, Inc.
740 Supper Rock Road, NE
Albuquerque, New Mexico 87123

Attention: T. H. Roback

Subject: Addendum to the Subsoil Investigation for the proposed Townhouses located on the northeast corner of Eubank Boulevard and Montgomery Boulevard, NE, Albuquerque, New Mexico - Job No. 0108170

Gentlemen:

Recent information indicates that plans for the ponding areas for the proposed townhouses do not comply with recommendations outlined in our subsoil investigation. We have reviewed our report and the proposed drainge and ponding plans, and do not anticipate problems as a result of the proposed modifications if the following recommendations are carefully followed.

It is our understanding that current plans for the townhouses are to waterproof the below grade portions of the walls. It will be possible at the time of waterproofing to apply a polyethylene moisture barrier to the walls, and to extend it below the ground surface to the ponding areas. The moisture barrier should extend into the ponding areas as far as practicable to minimize moisture infiltration near the foundation walls.

November 16, 1981

City of Albuquerque

Gentlemen:

This letter acknowledges that we, the owners of the property plotted as Lagrima De Oro Addition I , are aware of the conditions imposed by the City of Albuquerque in accepting the construction proposed by Case I, sheet C-4, of the site development plan for Lagrima De Oro Addition I, revised to November 13, 1981.

The construction proposed by the Case I alternative is to not do any street improvement and associated construction on and along Lagrima De Oro from about Station 11 + 70 to Station 13 + 01.58 until after completion, by the City of Albuquerque, of a master drainage plan and establishment of a special assessment district for the effected area, which is generally that unplotted area known as the west 80 of the Association of 160, Sec. 33, T11N, R4E, NMPM. The purpose of the proposed Case I alternative is to leave the terrain and drainage from the small arroyo which crosses this portion of Lagrima De Oro Road in a reasonably unaltered and natural state until this drainage can be safely and properly diverted or otherwise accounted for in accordance with the above mentioned master drainage plan and special assessment district. The construction to be done under the Case I alternative will include a retaining wall perpendicular to Lagrima De Oro Road at about Station 11 + 70, running to the south property line, and thence west as shown on the approved site development plan.

The conditions imposed by the City of Albuquerque are that the south half of Lagrima De Oro Road, with the curb, gutter and sidewalks, will be subsequently completed by the owners in accordance with the City of Albuquerque requirements, and that the adjacent private property will then be completed substantially in accordance with the approved site development plans, or otherwise as approved by the City of Albuquerque, this construction to be completed within six (6) months from the receipt, by the owners, of a notice to proceed by the City of Albuquerque.

As an alternative to the above, if the master drainage plan and special assessment district are not completed prior to the completion and sale of the houses and lots 6-A and 6-D, the owner will deposit with the City of Albuquerque such funds as are necessary for the completion of the required work, such funds being completed based on the contracted costs in the Contract Documents for City-wide utilities and cash paving, using the then current contracting document.

Frank R. Lane

FRANK LANE

OFFICIAL SEAL
Deborah Lynn Harper
NOTARY PUBLIC - NEW MEXICO
Notary Bond Filed with Secretary of State
My Commission Expires 7-15-85

Deborah Lynn Harper

CITY OF ALBUQUERQUE

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

DRAINAGE REPORT INFORMATION SHEET

PROJECT TITLE Lagrima De Oro Addition 1

ZONE ATLAS PAGE NO. F-21-Z CITY ADDRESS 9702 to 9930 Lagrima De Oro Rd. NE 87111

LEGAL ADDRESS

ENGINEERING FIRM Earl L. Mayne/Architect P.A. CONTACT Marvin Kortum P.E.

ADDRESS 1221 Central Avenue NE 87106 PHONE 243 - 3717

OWNER Frank Lane Associates CONTACT Thomas Roback

ADDRESS 3733 Eubank NE 87111 PHONE 294 - 0687

ARCHITECT/SURVEYOR Earl L. Mayne/Architect P.A. CONTACT Marvin Kortum P.E.

ADDRESS 1221 Central Avenue NE 87106 PHONE 243 - 3717

DATE SUBMITTED October 22, 1981

BY Marvin R. Kortum
P.E. 6519 State of New Mexico

MARVIN R. KORTUM
NEW MEXICO
6519
REGISTERED PROFESSIONAL ENGINEER

City of Albuquerque

Gentlemen:

This letter acknowledges that we, the owners of the property platted as Laguna De Oro Addition 1, are aware of the conditions imposed by the city of Albuquerque in accepting the construct proposed by Case I, sheet C-4, of the site development plan for Laguna De Oro Addition 1, revised to November 13 1981.

The construction proposed by the Case I alternative is to not do any street improvement and associated construction on and along Laguna De Oro from about station 11+70 to station 13+01.58 until after completion by the city of Albuquerque of a master drainage plan and established of a special assessment district for the effected area, which is generally that unplatted area known as the west 80 of the Association of 160, Sec 33, T11N, R4E, NMPM. The purpose of the proposed Case I alternative is to leave the terrain and drainage from the small arroyo which crosses the portion of Laguna De Oro Road in a reasonably unaltered and natural state until this drainage can be safely and properly directed or otherwise accounted for in accordance with the above mentioned master drainage plan and special assessment district. The construction to be done under the case I alternative will include a retaining wall perpendicular to Laguna De Oro Road at about station 11+70, running to the south property line, and thence west as shown on the approved site development Plan.

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

The conditions imposed by the City of Albuquerque are that the south half of Loquinio De Oro Road, with the curb, gutter and sidewalks, will be subsequently completed by the owners in accordance with City of Albuquerque requirements, and that the adjacent private property will then be completed substantially in accordance with the approved site development plans, or otherwise as approved by the City of Albuquerque, this construction to be completed within Six (6) months from the receipt by the owners of a notice to proceed by the City of Albuquerque.

As an alternative to the above, if the master drainage plan and special assessment district are not completed prior to completion and sale of the houses and lots 6-A and 6-B, the owner will deposit with the City of Albuquerque such funds as are necessary for the completion of the required work, such funds being computed based on the contracted costs in the Contract Documents for City-wide utilities and Cash Bonds, using the then current contracting document.

FRANK LANDE

City of Albuquerque

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

F21 - D32

December 7, 1981

Mr. Marvin Kortum
Earl L. Mayre, Architects P.A.
1221 Central Ave. N.E.
Albuquerque, N.M. 87106

RE: LAGRIMA DE ORO DRAINAGE REPORT

Dear Marvin:

This letter is to acknowledge that the referenced drainage report is approved.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/tsl

cc: Mr. Thomas Roback

La Vida Llena
THE FULL LIFE
11200 Montgomery Blvd. N.E.
Albuquerque, New Mexico 87111
(505) 293-4001

April 20, 1982

Mr. Harold W. Jackson
Resident Administrator
Joseph M. Montoya Campus
Albuquerque Technical-Vocational Institute
4700 Morris NE
Albuquerque, NM 87111

Dear Mr. Jackson:

TVI is in the unique position of being able to do its new neighbor, La Vida Llena, a favor without doing a single thing itself!

Let me explain how this strange circumstance occurs. When the city approved our zoning, they also required that a road be constructed along the southern boundary of our land, curving northward a little to miss the ball diamonds in Hahn Park, and stretching between Morris and Juan Tabo, with an entrance to our property from the southeast corner and the southwest corner from this road.

Unfortunately, the city will not have the money to build this road until sometime in 1983, and we expect to open in the summer of 1983. The City has suggested as a temporary measure, until the road south of us is built, that we build a "breakaway" gate in our north fence so that emergency vehicles can come south on Morris from Spain to the entrance to TVI, east on your entry road to the gate and break through the breakaway gate if necessary. Another suggestion is that they would come through your parking lot from Juan Tabo to the gate, but I notice you close off that entrance with a non-breakaway gate on weekends so that alternative is not available except during the week.

I have been told that within the next year, Morris will be paved and brought over to your entry road from Spain. What we would like from you is a statement that you have no intention of extending your southern fence further west at the present time; but that if you did, you would be willing to install temporarily a breakaway gate opposite our similar gate so that emergency vehicles could get into our property in the unlikely circumstance that our main entrance at the southwest corner of our property was not usable for some reason. The breakaway gate would never be used if our main gate was usable, and it would be replaced when Lagrima de Oro was built from Morris to Juan Tabo, hopefully in 1983. I would hope the breakaway gate would never be used at all.

Sincerely,

Wendell E. Carter

Wendell E. Carter, President
La Vida Llena (The Full Life)

WEC/sjp

CITY OF ALBUQUERQUE, NEW MEXICO

CITY ENGINEER'S OFFICE

MEMORANDUM- 04·28·82
(DATE)

TO:
- [x] Robert Fosnaugh, Traffic Engineer
- [ ] Water Resources Department - 2 Copies
- [ ] Chuck Easterling, Assistant City Engineer-Hydrology
- [ ] Bill Kearney, Assistant City Engineer-Field
- [ ] Bob Kielich, Assistant City Engineer-Design/Design Engineer
- [ ] Monte Urban Chief Surveyor/ Grant Snyder
- [ ] George Paul, Street Maintenance Engineer
- [ ]
- [ ]

FROM: Q.R. Kielich, Assistant City Engineer-Design

SUBJECT: 1406 La Vida Llena
Lagrima De Oro Rd

Attached drawing are for WATER, SANITARY SEWER, STORM SEWER, PAVING, STREET GRADES, DRAINAGE, AND Combination, for subject proposed project.

Request review and comments on attached drawings. Typed comments will be submitted thru the (MASTER SCHEDULER) Adam Salas, BY 05·06·82, ENGINEER Phil Fischer

QRK/tl
Attachments

NOTE: IF YOU CANNOT RETURN COMMENTS BY THE INDICATED DATE, PLEASE NOTIFY THE CONSULTANT AND/OR ENGINEER AS TO WHEN COMMENTS WILL BE SUBMITTED.

Traffic Engineering:

Sheet 1 About what point is paving section rotated Section C to B? North Curb? ROTATION ABOUT NW CORNER

Sheet 2 A vertical curve on Morr is needs to be constructed at the intersection with Lagrima de Oro. 100'
Temporary pavement needs to be extended to Juan Tabo Blvd. 5/12/82

Albuquerque Technical-Vocational Institute

Main Campus: 525 Buena Vista S.E. • Albuquerque, New Mexico 87106 • (505) 243-7250
Joseph M. Montoya Campus: 4700 Morris N.E. • Albuquerque, New Mexico 87111 • (505) 298-5461

May 11, 1982

Mr. Wendell Carter
LaVida Llena
11200 Montgomery Blvd. NE
Albuquerque, NM 87111

Dear Mr. Carter

This is to inform you that T-VI, at the present, has no intention of extending our southern fence any further to the west. However, if this did occur sometime in the future we would install a temporary breakway gate.

Sincerely

Harold W. Jackson
Resident Administrator
Joseph M. Montoya Campus

/da

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT, ENGINEERING DIVISION

Estimate Date: 8/3/82
Requestor:
Bohrman–Huston, Inc.
4125 Carlisle Blvd., N.E.
Albuquerque, New Mexico 87107

Job No. 1406
Work Order
Map No. F-22

Project for Water, Sanitary Sewer, Paving, Storm Drainage and/or Miscellaneous

Name of Subdivision to be Served: La Vida Llena

Specific Location:	**W**	**SAS**	**SD**	**P**
Lagrima de Oro from Morris Street to Station 21+37.40	X	X	X	
Lagrima de Oro Road from Morris Street to East Boundary of La Vida Llena Development				X

Item No.	Short Description	Contract Unit Price	Estimated Quantity	Estimated Amount	As-Built Quantity	As-Built Amount
Water						
W-2	6" DIP		376 LF			
W-3	8" DIP		2295 LF			
W-26	PRESS CONN		1 Ea.			
W-28	N-PRESS CONN (4"–8")		4 Ea.			
W-36	MJ FIT (4"–14")		3,113 Lb.			
W-51	8" GV		5 Ea.			
W-65	V BOX-A		5 Ea.			
W-149	BLKG		5.9 CY			
TOTAL AHBA WATER CONTRACT						
Testing & Furvey Fee						
Excavation Fees						
Subtotal						
4% Gross Receipts Tax						
TOTAL WATER CONTRACT						
6% Engineering Fee (To be paid by Developer)						
Sanitary Sewer						
S-2	6" DIP		192 LF			
S-3	8" VCP		1,850 LF			
S-12	TRCHG (6"–16") 6'–8' D		2,042 LF			
S-22	4' MH 6'–10' D		7 Ea.			
TOTAL AHBA SEWER CONTRACT						
Testing & Survey Fee						
Excavation Fees						
Subtotal						
4% Gross Receipts Tax						
TOTAL SEWER CONTRACT						
6% City Engineering Fee (To be paid by Developer)						

Item No.	Short Description	Contract Unit Price	Estimated Quantity	Estimated Amount	As-Built Quantity	As-Built Amount
Paving						
P-4	Grading		6,100 SY			
P-5	SUBG STERIL		6,100 SY			
P-17	Proc 4" Subbs		2,991 SY			
P-25	1½" AC BS-1500-M		2,991 SY			
P-30	TK CT		2,991 SY			
P-32	1½" AC SF-1500-M		2,991 SY			
P-33	2" AC SF-1500-M		3,109 SY			
P-38	AC Curb		2,432 LF			
P-42	4" PCC SDWK		7,000 SF			
P-44	PCC VLY G		1,161 SF			
P-46	PCC STD C & G		1,422 LF			
P-51	MH ADJ W/RGS		7 Ea.			
P-53	V Box ADJ		5 Ea.			
P-56	GDRL		40 LF			
P-57	GDRL ANCH-A		2 Ea.			
	CURB OUTLET		1 Ea.			
TOTAL AHBA PAVEMENT CONTRACT						

Permit Items
Subtotal
Engineering
Testing Fee 2%
Subtotal
4% Gross Receipts Tax
TOTAL PAVING CONTRACT
6% Engineering Fee
(To be paid by Developer)

NOTES:

1. All construction will be paid for under City Policy 1c.
2. For Staking, construction and inspection use drawing No. 1406
3. This work shall be done in accordance with the specifications to Block-to-Block Contract No. 30.
4. All utilities and utility service lines shall be installed prior to paving.
5. Backfill compaction shall be according to specified street use.
6. Tack coat requirements shall be determined by the city engineer.
7. Sidewalks and wheelchair ramps within the curb returns shall be constructed on the returns for Spain Road.
8. The developer shall be responsible for repair or replacement of all curb and gutter or sidewalk damaged during construction operations prior to final acceptance by the city engineer.

SUBMITTED BY:

Michael M. Emery — 8-3-82

Design Engineer — Date

Date 8-3-82

Sheet 3 of 3
Job No. 1406

FOR ESTIMATE

RECOMMENDED: CONCURRENCE:

Assistant City Engineer/Date Requesting Office /Date

APPROVED:

City Engineer /Date

OFFICE OF THE CITY TREASURER
RECEIPT OF ESCROW FUNDS

Receipt from the above applicant of the sum of $_____ is hereby acknowledged to be held in escrow until the completion of work described above.

Debit City Account _____ Credit 233200-7000820

$ _____

Journal Voucher No. _____

Date _____

Accountant Treasurer

FOR CONSTRUCTION

Outside funds have been received by Contract Manager and Contract Documentation Completed _____

Funds are available _____

APPROVED APPROVED:

City Engineer /Date Contract Manager /Date

WORK ORDER RECEIVED: PROPOSED STARTING DATE:

Contractor /Date

FOR ACCEPTANCE

RECOMMENDED:

Assistant City Engineer/Date

APPROVED: ACCEPTANCE COMPLETED:

City Engineer /Date Contract Manager /Date

465

BOHANNAN-HUSTON INC.

4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000
6712 VISCOUNT BLVD., EL PASO, TEXAS 79925 915 778-4491
330 GARFIELD, SANTA FE, NEW MEXICO 87501 505 988-7671

RECEIVED
JUL 19 1982
CITY ENGINEER

July 13, 1982

Mr. Richard Heller
City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: Lagrima de Oro Road Improvements -- La Vida Llena Project (Job 1406)

Dear Mr. Heller:

Transmitted herewith are the original construction drawings for the above-referenced project with the review prints from the various departments. Please process these original drawings for approval signatures at your earliest convenience.

On June 4, 1982, I attended a meeting with Bob Kielich and Jim Hicks of the City of Albuquerque, Bob Sheppard of Flatow, Moore, Bryan & Associates, and Wendell Carter of La Vida Llena. At this meeting, we discussed the above-referenced project and agreed upon the following points:

1. The improvement of Morris Street will be a portion of the work to be completed with the Montgomery Manor Project.

2. The improvements for Lagrima de Oro Road shall end at the easterly right-of-way of Morris Street as shown on the La Vida Llena drawings.

3. The drainage swale from Lagrima de Oro Road to Montgomery Boulevard and catch basin shall be paid for by La Vida Llena. Drainage will remain as outlined in the approved drainage report with the deletion of the storm sewer and addition of the paved drainage swale as recommended by the City Engineer.

The original drawings have incorporated these changes into their content and scope. Your prompt attention to this matter is greatly appreciated.

RSH	RSA	ADM	
HRO		SUR	
CDS		COUN	
DES		SEC	
INSP		FILE	
HYDRO		RETURN	

PRINCIPALS
JERRY R. BOHANNAN, P.E. & L.S.
LARRY W. HUSTON
DONALD T. CREMANS, P.E.
C.J. (SKIP) MEAD, P.E.
MICHAL M. EMERY, P.E.

ASSOCIATES
ANDRES ARAGON VIAMONTE, P.E.
JACK EICHORN
ROBERT H. GREENLEE, P.E.
G. LEE TRUSSELL
ISAAC J. PINO, P.E.
RAMON LARA, P.E.
DARRELL L. WADE, P.E.
PATRICK J. FITCHER, P.E.
DAVID M. X. MULLIGAN, P.E.

In reference to Bob Fosnaugh's request for an alternate emergency access to La Vida Llena, enclosed are copies of the correspondence securing an emergency access through the TVI property to the north. Access shall be obtained to La Vida Llena from Spain Road by way of Morris Street and the south service road for TVI. A breakaway gate will be provided from the TVI service road to the La Vida Llena parking lot. It is understood this access will only be used in emergency situations when the main entrance to La Vida Llena is unuseable. The improvements to Morris Street and its crossing structure over the Bear Canyon Arroyo are presently under construction.

If you have any questions, please do not hesitate to call Dave Woods or me at this office.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

cc: Major General Wendell Carter
Mr. Bob Sheppard
Mr. Bob Fosnaugh

Enclosures

DWW/dlh
Job No. 1 089 2

OFFICIAL NOTICE

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
PLANNING DIVISION
P.O. Box 1293, Albuquerque, New Mexico 87103

Thomas H. Roback
740 Supper Rock Drive, N.E.
Albuquerque, NM 87123

DATE: August 26, 1981

NOTIFICATION OF DECISION

File: Z-78-69-2

Location: Development plan for an unplatted 3.1 acre site located in the NE 1/4 of the SE 1/4 of the SW 1/4 of the SW 1/4 of Section 33, T11N, R4E, situated east of Eubank and north of Montgomery Boulevard, N.E.

On August 20, 1981, the Environmental Planning Commission approved the above-mentioned request, based on the following Findings:

1. The request meets the development criteria established by the Environmental Planning Commission, regarding density and the size of the development plan area.
2. The landscaping plan is inadequate and should be revised to include the entire sight, grassed areas and street trees along Lagrima de Oro. A statement as to the maintenance is also requested. Grass and sod should be included in the plan.
3. Participation by the developer in a future drainage district is a condition of approval.
4. Lagrima de Oro shall be developed at the developer's expense to Eubank and meet the full City standards for the south half of the street and temporary paving standards for the north half of the street in order to provide a fully-paved access to the site, satisfactory to Traffic Engineer to include cross section, profile, and drainage.
5. Water and sewer extensions will be at the developer's expense.
6. The City Engineer shall be satisifed as to the necessary impoundment and temporary type drainage until such time an overall drainage district is required.

9-4-81

If you wish to appeal this decision, you must do so by_____in the manner described below. A non-refundable filing fee of $40 is required at the time the appeal is filed.

Appeal to the City Council. Any person aggrieved with any determination of the Environmental Planning Commission acting under this ordinance may file an appeal to the City Council by submitting written application on the Planning Division form to the Planning Division within 15 days of the Planning Commission's decision. The date the determination in question is issued is not included in the 15-day period for filing an appeal, and if the fifteenth day falls on a Saturday, Sunday or holiday as listed in the Merit System Ordinance, the next working day is considered as the deadline for filing the appeal. The City Council may decline to hear the appeal if it finds that all City plans, policies and ordinances have been properly followed. If it decides that all City plans, policies and ordinances have not been properly followed, it shall hear the appeal. Such appeal, if heard, shall be heard within 60 days of its filing.

You will receive notice if any other person files an appeal. If there is no appeal you can receive building permits any time after the appeal deadline quoted above provided all conditions imposed at the time of approval have been met. Successful applicants are reminded that other regulations of the City must be complied with, even after approval of the referenced application(s).

IF YOU RECEIVE APPROVAL FOR ANY REQUEST WHICH REQUIRES A SITE DEVELOPMENT PLAN, SEE ATTACHED SHEET FOR FURTHER INFORMATION.

Sincerely,

Elizabeth Marquez
Secretary

Letter of Advice

ENDA ITEM 14

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
PLANNING DIVISION

ENVIRONMENTAL PLANNING COMMISSION
August 20, 1981
Z-78-69-2

Z-78-69-2 Thomas H. Robach requests development plan approval for an unplatted 3.1 acre site located in the NE 1/4 of the SE 1/4 of the SW 1/4 of the SW 1/4 of Section 33, T11N, R4E, currently zoned SU-1 (Special Use for a Planned Residential Development) situated east of Eubank and north of Montgomery Boulevard, N.E., specifically described as a portion of the 160 acres Master Plan. (F-21)

COMMENTS FROM OTHER DEPARTMENTS, 8-20-81:

Traffic Engineering	"Minimum setback in front of a garage is 20 feet; some setbacks only scale 17-18 feet. Private roadway width of pavement should be 20 feet. Setback sidewalk should be required. If approved at curb, an additional 1' of sidewalk (5') total should be required."
Transportation	"Drive pad lengths appear to be substandard.":
Transit	"No reply received."
COG	"No adverse comment."
CIP	"No adverse comment."
City Engineer	"a. A drainage study will be submitted for approval prior to approval of plat. b. Definitely need an approved master plan for this area."
City Hydrologist	"The application is premature. In the absence of the infrasturctures necessary to allow development at this time. In the foreseeable future, drainage and flood protection facilities are unavailable now. The parcel of the applicant was planned for inclusion in the proposed SAD 204 that could not be funded under the present financial restraints binding the City. The required public contribution to the mentioned SAD 204, were estimated to exceed 1.5 million dollars; this level of funding is just not available. Regarding the plan itself the application is not supported by a satisfactory grading and drainage plan for the internal provisions. In order to provide guidance in the preparation of an acceptable site development plan, a drainage checklist is attached."
AMAFCA	"Defer to City Engineers comments."
Water Resources	"Within the lands of the 160 Montgomery master plan, the City has planned for the extension of Lagrima de Oro. Water service will require the extension of a waterline in Lagrima de Oro at the developer's expense. The Water Resources Department will not allow either line extension in any corridor other than the proposed Lagrima de Oro right-of-way."
Parks & Recreation	"In accordance with Ordinance 7-1976, as amended, the developer is required to pay a development fee at building permit time, plus dedicate land or cash-in-lieu of land."
Refuse	"No adverse comment."
Police Department	"No adverse comment."
Fire Department	"Development must comply with Fire Code Ordinance 50-1975. - Provide required fire flow and fire hydrant distribution - Provide sufficient access for fire fighting equipment."
Environmental Health	"No adverse comment."
Human Services	"No comment."
Neighborhood Coordination	"Problems with access to Eubank."
Redevelopment	"Not applicable."
Real Estate Officer	"No adverse comment."
APS	"No adverse comment."
Zoning Enforcement	"No comment."

PLANNING DIVISION COMMENTS TO THE ENVIRONMENTAL PLANNING COMMISSION, 8-20-81:

The applicant is requesting site plan approval for a 3.14 acre tract containing approximately 24 units, zoned SU-1 for a Planned Residential Development, located within the 160 Acre Master Plan. A gross density of 7.67 DU/AC is proposed.

Area Characteristics and Zoning History

The site and area generally surrounding the site is vacant. The corner of Eubank Blvd. and Montgomery Blvd. is zoned O-1 and C-2 and developed with offices. A church is located to the southeast and zoned for special use. The site is located within the 160 Acre Master Plan which was approved 12-10-73 by the City Council. The zoning for the Master Plan area was established in 5-18-78 (Z-78-69).

There have been several amendments to the 160 Acre Master Plan. Most notably affecting this request is Z-79-41 approved 7-19-79 and Z-79-126 approved 10-16-79. Those requests established R-T zoning for the area immediately north of this request. These changes are not reflected on the zone map due to pending land swaps with the City or other outstanding requirements imposed by the Environmental Planning Commission.

Applicable Plans and Policies

The site is located within the Established Urban Area of the Comprehensive Plan which established a density of 3-9 DU/A.

Development within the 160 Acre Master Plan has been slow, primarly due to diverse ownership, floating easements and the absence of an overall drainage plan. Acquisition of easements, as established by the Master Plan, west of Morris have all but been resolved. However, several issues require further study before significant development can occur. First, the area of this request lacks detailed drainage analysis. This area was to be included in SAD 204 (see hydrologist comments). Finally, the 160 Master Plan established an east/west (Lagrima de Oro Road) and a north/south (Morris) alignment. However, the infrastructure for the remaining areas is uncertain. Being one of the first developments west of Morris, this request raises significant issues concerning future development.

It should be noted that the request is consistent with development criteria established by the EPC regarding the special use parcel. However, the issue of traffic circulation was not and has not been addressed. Staff's concern is that the parcels immediately south of the request may not have adequate access. Access from Montgomery Blvd. will be provided to those parcels fronting Montgomery, but access for the parcels between Montgomery and this request will be limited.

Information concerning development to the south to make the proper assessments necessary to insure traffic circulation is not available.

Decisions made at this time may limit future development to the south. The history of this area is long and complicated, it has involved much compromise on part of the City and property owners. To lose sight of the goal, which is to achieve a unified and quality development pattern, at this time would simply not be fair to the City and more importantly to the property owners within the 160 Acre Master Plan.

Site Plan Analysis

Traffic and Pedestrian Circulation
Traffic Engineering has indicated that drive pads and private drives are substandard.

The applicant has requested a sidewalk variance. No justification for the variance was submitted. Given the uncertainty of development in the area, a variance should not be granted as a precident would be established along Lagrima De Oro Road for sidewalk variances.

Landscaping Plan
The landscape plan indicates southwest landscaping with rock and pebble surface covering. Some trees have been indicated; however, a revised landscaping plan indicating all landscaping for all lots is required. The use of rock and pebble surface covering is not totally appropriate, some grassed areas should be provided with street trees along Lagrima De Oro Road. A statement as to maintenance should be included on the plan.

Other
The site plan indicates a retaining wall along the south property line. Wall elevation and construction material should be provided on the plan.

SUMMARY OF FINDINGS:

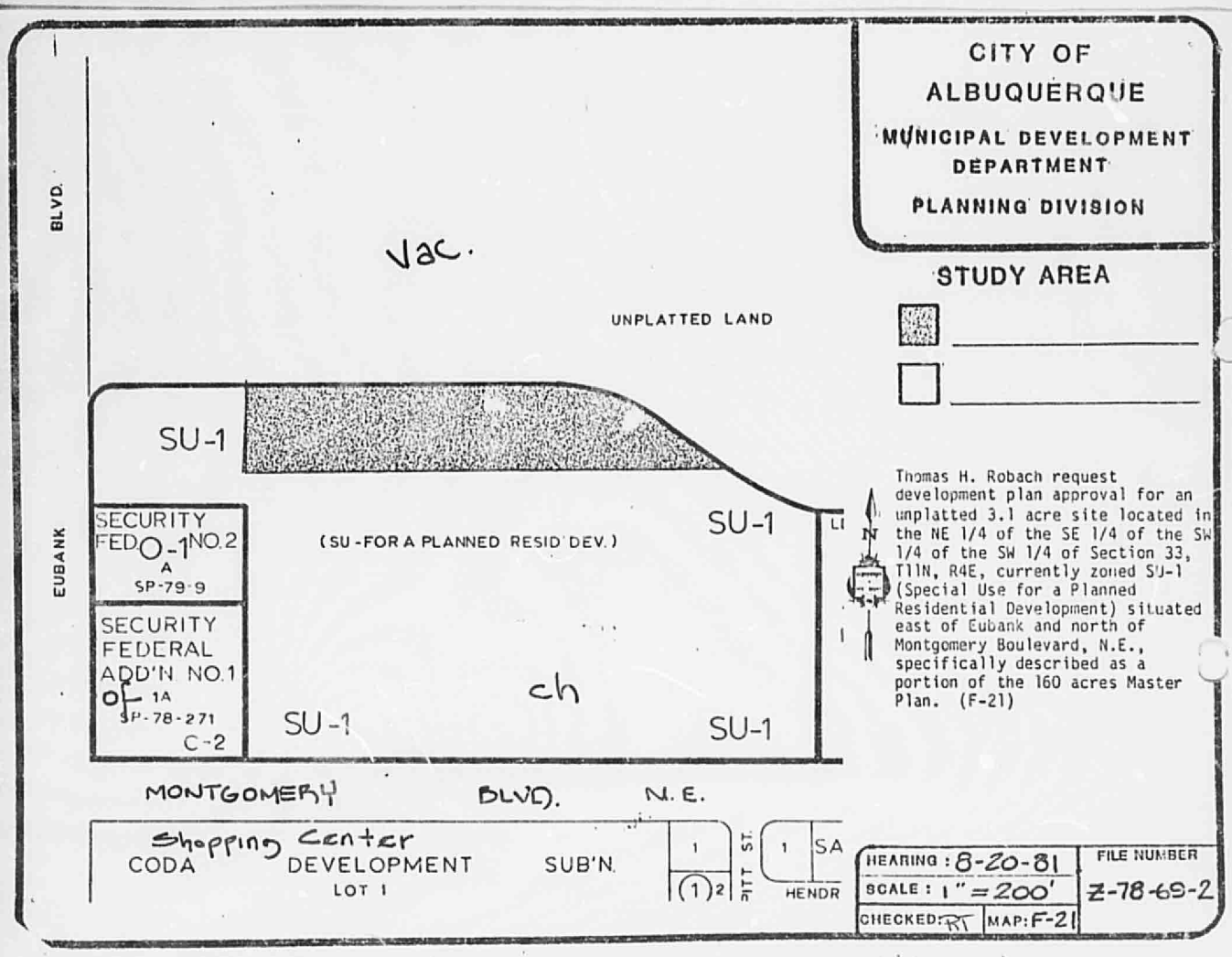
1. This is the first requested development plan approval for this particular special use area of the 160 Acre Master Plan.
2. The request meets the development criteria established by EPC, regarding density and the size of the development plan area.
3. Drive pads and private drives are substandard and to be corrected per the Traffic Engineers comments.
4. No justification for the requested sidewalk variance has been given. No sidewalk variance should be allowed.
5. The landscaping plan is inadequate and should be revised to include the entire sight, grassed areas and street trees along Lagrima De Oro. A statement as to maintenance is also required.
6. Greater detail regarding the retaining wall height and materials is required.
7. A revised site and landscaping plan addressing the above concerns is required.
8. Road alignments and access, and drainage treatment is at present undetermined for the special use site.
9. The City Hydrologist's comments indicates the request is premature in the absence of the necessary infrastructures to allow development.

RECOMMENDATION: INDEFINITE DEFERRAL OF Z-78-69-2 IS RECOMMENDED UNTIL SUCH TIME AS FINDINGS 8-9 ARE RESOLVED, AND A REVISED SITE DEVELOPMENT PLAN ADDRESSING THE ABOVE FINDINGS IS SUBMITTED.

Randy Traynor, Planner

RT:mes
cc: Thomas H. Roback, 740 Supper Rock Drive, NE.; 87123

IT IS REQUESTED THAT THE APPLICANT/AGENT BE PRESENT AT THE MEETING.


CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
PLANNING DIVISION
STUDY AREA
Vac.
UNPLATTED LAND
SU-1
SU-1
SECURITY FED. NO.2
O-1
A
SP-79-9
(SU-FOR A PLANNED RESID DEV.)
SECURITY FEDERAL ADD'N NO.1
of 1A
SP-78-271
C-2
ch
SU-1
SU-1
EUBANK BLVD.
MONTGOMERY BLVD. N.E.
Shopping Center
CODA DEVELOPMENT SUB'N.
LOT 1
PITT ST.
HENDR
SA
Thomas H. Robach request development plan approval for an unplatted 3.1 acre site located in the NE 1/4 of the SE 1/4 of the SW 1/4 of the SW 1/4 of Section 33, T11N, R4E, currently zoned SU-1 (Special Use for a Planned Residential Development) situated east of Eubank and north of Montgomery Boulevard, N.E., specifically described as a portion of the 160 acres Master Plan. (F-21)
HEARING: 8-20-81
SCALE: 1" = 200'
CHECKED: RT
MAP: F-21
FILE NUMBER
Z-78-69-2

EARL L. MAYNE – ARCHITECT

1221 Central, N.E.
Albuquerque, New Mexico 87106
(505) 243-3717

20 October, 1981

Drainage Analysis
Lagrima De Oro Addition 1
Section 33, T. 11 N, R 4 E, N.M.P.M.
Albuquerque Zone Atlas F-21-2

This drainage analysis covers a portion of the Southwest Corner of Section 33, in that area generally to the North and East of the intersection of Montgomery Boulevard and Eubank Boulevard. The area to be analysed extends to the Northeast, almost to Morris Street and to the North to the ridge which is the drainage divide between Bear Canyon, and Area 3 of the Albuquerque Master Drainage Study. The area is shown on the attached map drawing as sub areas A, B, C, D, E, and F.

The area at present is largely undeveloped, with the exception of a bank building and grounds at the corner of Eubank and Montgomery Boulevard, and a church and parking area located east on Montgomery, about half-way to Morris Street. Much of the area is covered with native grasses, with a profusion of weeds covering those areas that have been disturbed in recent times. The area is criss-crossed with numerous dirt vehicle trails, and the outer edges of the area, particularly along Montgomery Boulevard, have been worn to bare packed earth from heavy vehicle traffic. There are large quantities of trash, plant cuttings and trimmings, and construction refuse scattered about. The area is unplatted, but a street network has been designed and right of way property obtained by the city of Albuquerque for this street network.

The Lagrima De Oro Addition 1 project consists of twenty four Townhouses, arranged in six separate buildings with four two bedroom units in each building. The Lagrima De Oro Addition covers 2.47 Acres of private land, subdivided into 24 separate and individually owned properties, each with a dwelling unit, with the size of the real estate holding being from .23 Acres to .07 Acres. In addition the developer will construct the south half of the Lagrima De Oro Road, from Eubank, and along his property, a distance of about 1260 feet (.87 Acres).

Present drainage in the analysed area is mostly onto Montgomery Boulevard. The sub areas marked A and B are well defined natural drainage areas, each with it's natural drainage channel which empties onto Eubank Boulevard. The runoff from sub areas A and B, and that portion of Eubank marked Sub Area D, (from 200 feet South of Lagrima De Oro Road, to 50 feet North of Gutierrez Avenue) flows down Dona Marguerita Avenue until it's intersection with Lagrima De Oro Road, then on Westerly until Lagrima De Oro Road intersects with Piedra Negra Street, then South a couple of hundred feet to the intersection with Montgomery Boulevard. At the intersection of Piedra Negra Street and Montgomery is a storm drain inlet. Major run-off would continue on West on Montgomery Boulevard.

At the intersection of Dona Marguerita Avenue and Eubank Boulevard, before the flow starts down Dona Marguerita Avenue, there is a 24" diameter reinforced concrete storm drain, with two curbside inlets with 15" RCP feeders to the 24" storm drain. At the present this storm drain and inlet system is mostly ineffective, picking up but a minor trickle in the south gutter flow line at Eubank Boulevard. In addition to the poorly designed or poorly constructed inlet, the 24" storm drain itself is also ineffective in that it is currently half full of sand for about 100 feet of its 150 foot length. Because of these factors, almost all major run off from the existing undeveloped sub areas A and B, as well as sub area D will flow to the West and South down the residential street system as outlined above. The proposed construction at Lagrima De Oro Road will not change the present drainage pattern from sub-areas A, B or D.

At present, the sub areas C, E, and F contribute run-off directly to Montgomery Boulevard. Sub area C is well defined, and has a natural drainage channel which outflows directly to Montgomery Boulevard. The run-off from Sub areas E and F is primarily in the form of sheet flow, contributing to several less well defined flow channels before outflowing onto Eubank Boulevard, near its intersection with Montgomery Boulevard, or onto Montgomery Boulevard directly.

There is no Approved Master Drainage Plan for the area of Section 33, North of Montgomery, between Eubank and Morris, and South of the ridge line by Bear Canyon. Preliminary planning indicates that an underground drainage channel, generally along the line of Pitt Street, could provide for intercept of run-off at the intersection of Pitt Street and Lagrima De Oro Road, and also at the corner of Pitt Street and Gutierrez Avenue. This drainage structure would divert water directly to the Bear Canyon Channel, as shown on the map. Some additional drainage structures may be required farther up hill, perhaps along Inca Street, depending on ponding criteria that is required for subsequent developments. Under this preliminary master plan, the area to the west of the line of Pitt Street would generally drain toward Eubank, and either use existing drainage structures, or new structures, if required, to divert drainage toward the Bear Canyon Drainage. This drainage analysis for the Lagrima De Oro Addition 1 confirms this preliminary planning. The extent of additional drainage structures needed in large part depends on the requirements imposed on future developments.

Initially, it appears that existing drainage structures along Eubank with minor improvements, could satisfactorily take care of run off for the area generally West of Pitt Street, if appropriate ponding and retention criteria could be imposed on future developments in the sub areas A and B.

The Lagrima De Oro Addition 1 development has been designed with a large number of small ponding areas. The composite ponding meets the Interim Drainage Guidelines November 1979, for ponding volume. The development plan also provides for a positive discharge at the ponded volume. Because of the large munber of small ponds, the overflow spillway is less of a problem, but is provided for. All ponding, drainage and soil stabilization is provided for in perpetuity by covenant.

I strongly recommend acceptance of the case I construction schedule, with work on the last 100 feet of Lagrima De Oro Road, and adjacent property, being delayed until formation of a special assessment district, and design and construction of the probable drainage structures in this vicinity, draining run-off toward Bear Canyon along the Pitt Street line. I also recommend that work on an improved storm drain inlet at the intersection of Dona Marguerita Avenue and Eubank Boulevard be done as a rapid and relatively inexpensive method of diverting drainage run off to Bear Canyon, and relieving the outflow on the Dona Marguerita Avenue residential street. Consideration should also be given to the use of adjacent City property near the present well site for ponding, using

the existing 15" storm drain for controlled outflow.

If the first two recommendations in the paragraph above are accepted, there will be less run-off down the Dona Marguerita Avenue and Montgomery Boulevard overflow channels after development of Lagrima De Oro Addition 1 than at present for equal storms. If the recommendations are not accepted, the outflow down Dona Marguerita Avenue will increase appreciably, but the composite outflow down Montgomery Boulevard West of the Piedra Negra Street intersection will be changed very little.

A summary of the drainage analysis results are presented in Appendix I. Detailed computations and rational are presented in Appendix 2. Drawings for the Site Development Plan, Lagrima De Oro Addition 1, sheets C-1, C-2, C-3, C-4 and C-5 are part of this drainage analysis.

Sincerely,

EARL L. MAYNE/ARCHITECT P.A.

Marvin R. Kortum
PE 6519, State of New Mexico

MARVIN R. KORTUM
NEW MEXICO
6519
REGISTERED PROFESSIONAL ENGINEER

MRK:aa

Appendix 1 Summary
Drainage Analysis Lagrima De Oro Addition 1
Section 33 T. 11 N., R 4 E, N.M.P.M.
Albuquerque Zone Atlas F-21-Z.

A. Flow Rate Analysis

I. Results of the Drainage Analysis Prior to the Development of Lagrima De Oro Addition 1.
Drainage Design Point 1 is the intersection of Dona Marguerita Avenue with Eubank Boulevard. (True Drainage Point).
Drainage Design Point 2 is the South Boundary of the Lagrima De Oro Addition 1. (Arbitrary Drainage Point).

		Drain. Point 1				Drain. Point 2				
Sub Areas		A	B	D	D.P1	C	E	F	D.P.2	
Period (Yrs.)	Size(Acres)	10	7	15		9.52	2.47	1.27		=31.76
100	All Flow				34.2	16.6	8			
10	Rates In				23.8	11.5	5.4			
5	CFS				20.0	9.9	4.8			

II After Development of Lagrima De Oro Addition 1

Drain. Point 1 All Flow Rates in CFS

Case 1

Sub Areas	AB & D	A,B,D & F	A,B,D,F, & E	Δ Increase
100 year	34.2	39.0	40.6	6.4
10 year	23.8	27.2	28.8	5.0
5 year	20.0	22.8	24.4	4.4

Case II

Sub Areas	A,B & D	A,B,D,C, & F	A,B,D,C,F, & E	Δ Increase
100 year	34.2	49.2	50.8	16.6
10 year	23.8	34.1	35.7	11.9
5 year	20.0	29.5	31.1	11.1

CASE I is for development of Lagrima De Oro Addition 1 and the adjacent one half of Lagrima De Oro Road up to about STA 12 + 00, leaving the last 100 feet of road way and adjacent Private Lands undeveloped until such time as the special assessment district is firmed, and appropriate drainage dtructures constructed to divert this flow to the Bear Canyon Drainage. In the Interim, runoff from Sub Area C would continue much as it does now. The last structures on Lagrima De Oro would be protected with a retaining wall.

CASE II is for completion of the Lagrima De Oro Addition 1 Development, up to STA 13 + 01 on Lagrima De Oro Road. The Lagrima De Oro Road will then intercept the flow from Sub AreaC, channeling this flow down the road (street) to the drainage concentration point at Dona Marguerite Avenue and Eubank Blvd.

B. PONDING VOLUME

Criteria; V ponding = V 100 developed - V 100 undeveloped

V 100 developed - Private Land - ($C=1.0$, $R_{100} = 2.4"$, $A=107{,}700 Ft.^2$) = 21,540 CF

½ R.O.W. - Lagrima De Oro Road - ($C= .9$, $R_{100} = 2.4"$, $A= 37{,}700 Ft.^2$) = 6,800 CF

V 100 Dev. = 28,340 CF

V 100 Undeveloped = 13,068
V 100 Ponding = 18,390
31,458 CF ≥ 28,340 CF

C. OUTFLOW CRITERIA

Criteria Positive Discharge = Q_s undeveloped

Q_s Undeveloped ($C=.4$)($I=3.2^{in}/hr$)($A=3.75$ Acres) = 4.8 CFS

Q_s Outflow from ponding, 100 year, average = 1.3 CFS
Q_s Outflow from street, 100 year = 2.8 CFS
4.1 CFS

See also drawings for outflow time of individual ponds.

D. SPILLWAY FOR OVERFLOW

Each pond is constructed with a lined overflow and channel. See drawings and covenant.

APPENDIX 2 - CALCULATIONS AND RATIONAL
DRAINAGE ANALYSIS LAGRANA DE ORO ADDITION 1
SEC 33 T 11N R4E NMPM
ALBUQUERQUE ZONE ATLAS F-21-Z

(1)

RATIONAL METHOD: $Q = C I A$

C = RUN OFF COEFFICIENT

C = .4 for sparse native grasses, with scattering of weeds, trash piles, and small depressions.

C = .9 for asphalt paved surface and adjacent median strips, sidewalks and parkways within the right of way.

I = Rainfall intensity for the design storm at the time of concentration for a particular design point. Rainfall intensity is from NOAA Atlas 2, Volume IV New Mexico Precipitation Data, San Pedro Blvd East (CHART FROM HYDROLOGY, CITY OF ALBUQUERQUE)

T. of concentration:

SHEET FLOW:

Use each of three curves for purpose of estimating the time of overland flow, use consensus of the curves.

CURVE 1 - SEELYE page 12-01

CURVE 2 - Denver Regional Council of Governments

CURVE 3 - Corps of Engineers

CHANNELIZED AND DITCH FLOW:

Use Manning Equation $V = \frac{1.486}{n} R^{2/3} S^{1/2}$

or one of various charts and computer solutions.

where n = Mannings coefficient of

$n = .016$ for poor quality asphalt pavement.

$n = .013$ for new asphalt pavement and concrete gutter

$n = .024$ for bare soil, no vegetation, natural channel

$n = .04$ for natural channel with weeds, grasses, and scattering of trash.

$n = .08$ for natural channel, considerable weeds and grasses, and heavy trash. (Broken Concrete, car parts, heavy brush.

R = Hydraulic radius = $\frac{\text{Cross section area}}{\text{wetted perimeter}}$

s = slope

SUB AREA A : 10.0 ACRES

C = .4

SHEET FLOW : 1

600 feet to start of natural channel

Slope $\frac{5630 - 5605}{600} = 4.17\ \%$

CHANNEL FLOW :

800 feet at slope of $\frac{5605 - 5578}{800} = 3.375\ \%$

CROSS SECTION :

SHEET FLOW

CURVE 1 - Poor grass surface : TOC = 17 MINUTES

CURVE 2 - MUST INTERPOLATE FOR SLOPE TOC = 21 MINUTES

CURVE 3 - POOR TURF TOC = 14 MINUTES

BARE SOIL TOC = 11 MINUTES

USE TOC = 15 MINUTES

FOR WHICH $I_{100} = 4.81$

$I_{10} = 3.33$

$I_5 = 2.9$

CONSIDER AREA INTO NATURAL CHANNEL AS AREA ABOVE CHANNEL

PLUS ½ OF FOREGROUND :

370 x 550 + 370 x 400 = 8.07 ACRES

$\therefore Q^{100\,yr}_{\text{ABOVE CHANNEL}} = .4\ (4.81)\ (8.07) = 15.5$ CFS

10 yr = .4 (3.33) 8.07 = 10.75 CFS

5 yr = .4 (2.9) (8.07) = 9.4 CFS

FROM CURVE 3, TOC FOR BARE SOIL, 800 feet and 3.4 % slope, equal ≅ 9 MINUTES OR V = $\frac{800}{9 \text{ MIN}}$ = 1.5 ft/s

$V = \frac{1.49}{n} R^{2/3} S^{1/2}$ $Q = Va$

(4)

For Slope $S = 3.575\%$ $n = .04$ $K = 6.824291$

H	a	P	R	V	Q
.5	1.61243	4.934	.326822	3.2382	5.22
.6	2.114	5.412322	.3906	3.64694	7.71
.7	2.65721	5.85444	.4529	4.03	10.71
.8	3.238	6.267778	.5166	4.39415	14.23
.9	3.85365	6.658	.5788	4.74	18.267
1.0	4.50	7.03	.6405	5.07	22.83

For Slope $S = 3.0\%$ $n = .04$ $K = 6.4345687$

H	V	Q
.5	3.053	4.92
.6	3.4384	7.27
.7	3.80	10.1
.8	4.143	13.42
.9	4.47	17.22
1.0	4.79	21.52

For TOC 100 use 4.5 fps or $\frac{800}{4.5 \times 60}$ 3 min

TOC 10 use 4.0 fps or 3.33 min

TOC 5 use 3.7 fps or 3.6 min

(For Sub Area A, At outflow curve on enclosure

	TOC	I	Q = C I A	
100 yr	18.0	4.45	17.8	CFS
10 yr	12.3	3.09	12.36	CFS
5 yr	12.6	2.65	10.60	CFS

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

SUB AREA B A = 7 ACRES

C = .4

SHEET FLOW

700 feet to natural channel

slope = $\frac{5621 - 5594}{700}$ = 3.86 %

CHANNEL FLOW

470 feet at slope $\frac{5594 - 5578}{470}$ = $\frac{16}{470}$ = 3.4 %

SHEET FLOW

CHART 1 - Poor grass TOC = 17 min

CHART 2 - OFF CHART

CHART 3 - Poor turf. TOC = 16 min

USE TOC = 16 min

∴ I_{100} = 4.70

I_{10} = 3.26

I_5 = 2.82

CONSIDER AREA WITH NATURAL CHANNEL AS AREA WITH NATURAL CHANNEL PLUS 1/2 OF REMAINING AREA.

650 x 320 + 235 x 320 = 6.5 ACRES

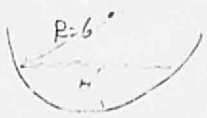
∴ Q_{100} = 12.22 CFS

Q_{10} = 8.48 CFS

Q_5 = 7.33 CFS

COMPUTE TIME FOR DITCH SECTION:

CONSIDER SAME GENERAL CHANNEL SHAPE



Slope and flow rates are similar to Sub area A, Therefore, use TOC as follows FOR CHANNEL SECTION

Period	V	TOC $\frac{410}{V \times 60}$
100 yr	4.2	1.87 min
10 yr	3.8	2.06 min
5 yr	3.5	2.24 min

FOR SUB AREA B AT OUTFLOW, CROSS ON CURVE

Period	TOC	I	Q = C I A = (.4) I 7	
100 yr	18.0	4.45	12.46	CFS.
10 yr	18.2	3.07	8.60	CFS.
5 yr	18.5	2.65	7.42	CFS.

SUB AREA D A = 1.5 ACRES

SHEET FLOW

PATH LENGTH = 500 feet of paved asphalt surface with some flow from center median and sidewalk. Parkway. Since flow will considerably overflow the gutters and must cross from the east gutter to inlets at Dove Mountain street, considering west flow, the street slope is .004, which will also contribute toward slower, deep flow.

TOC

CURVE 1 TOC = 10 minutes

CURVE 2 TOC = 11 minutes

CURVE 3 TOC = 11 minutes

∴ USE TOC = 11 minutes

And, since all is sheet flow:

Period	TOC min	I (in/hr)	Q = CIA = .9 I 1.5	
100 yr	11	5.55	7.50	CFS
10 yr	11	3.87	5.22	CFS
5 yr	11	3.30	4.46	CFS

SUB AREAS A, B AND D COMBINED AT INLET, DOWN MARGUERITA RD.

SINCE TOC FOR SUB AREAS A & B AT THE CURB ON EVERSOR ARE ABOUT THE SAME, USE THE FLOW PATH FROM B OUTFLOW TO INLET AT DOWN MARGUERITA.

DISTANCE = 300' SLOPE = .004

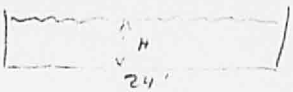
CONSIDER THE EAST SIDE OF EVERSOR AS A 24' WIDE SHALLOW CHANNEL, WITH A FLOW OF Q FROM B, PLUS 1/3 OF D, AS INITIAL TRIAL Q

∴ Q_{100} = 12.22 + 7.50 = 19.72

Q_{10} = 8.48 + 5.22 = 13.70

Q_{5} = 7.33 + 4.46 = 11.79

AND n = .016 AND →



A = 24 × H
P = 24 + 2H

$V = \frac{1.486}{n} R^{2/3} S^{1/2}$ $V = K R^{2/3}$, where K = 5.873933734

H	A	P	R	V	Q		Time of Flow
.1	2.4	24.2	.0992	1.26	3.02		300 / V×60
.2	4.8	24.4	.19837	2.00	9.60	V_5 = 2.2	2.27 min
.3	7.2	24.6	.29283	2.59	18.21	V_{10} = 2.4	2.07
.4	9.6	24.8	.3871	3.12	29.95	V_{100} = 2.6	1.92
.25	6.4	24.7	.2401	2.262	14.47		
.32	7.68	24.64	.3117	2.[illegible]	20.74		

3. TIME OF FLOW, AND CONVERSION TOC, FOR 100, 10

PERIOD	TOC	I	Q = .4 I(10+7)	+ .9 I(10)	= Q+
100	18.0 + 1.92 = 19.9	4.20	28.56	+ 5.67	= 34.23
10	18.2 + 2.1 = 20.3	2.92	19.86	+ 3.94	= 23.80
5	18.5 + 2.3 = 20.8	2.45	16.66	+ 3.31	= 19.97

SUBAREA C

CONSIDER DESIGN POINT WHERE SUBAREA C natural channel intersects Longwood Dr Ore Road near station 12+00, ie, 1160 feet from culvert Gutter.

SHEET FLOW

800 feet to natural channel, slope: $\frac{5644-5621}{800} = 2.875\%$

AREA 450 × 650 = 6.215 ACRES

CHANNEL FLOW

350 FEET, SLOPE $\frac{5621-5611}{350} = 2.86\%$

AREA = 350 × 350 = 2.81 ACRES

SHEET FLOW

CURVE 1 (TOC = 20 – 21 MIN PER ACRE)(17 – 18 MIN PER ACRE)

CURVE 2 OFF OF CHART

CURVE 3 POOR TIMES - 20 MINUTES

BETTER SOIL - 15 MINUTES

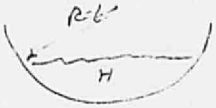
∴ USE TOC = 18 MINUTES FOR TRIAL RUN INTO CHANNEL SECTION. AREA WITHIN SUBAREA C WHICH IS BELOW CHANNEL SECTION BUT NOT OVER CHANNEL WITH INTERSECTION POINT WITH LONGWOOD DR ORE ROAD.

$\therefore Q = C I A = .4\ I\ (6.7)$

PERIOD	I	Q
100	4.45	11.95
10	3.10	8.33
5	2.70	7.25

CONSIDER CHANNEL SECTION SIMILAR TO ABOVE

$n = .04$, SLOPE: 2.86 %



$V = \frac{1.486}{n} R^{2/3} S^{1/2} = K R^{2/3}$, $K = 6.2\ 826\ 2507$ (20)

H	a	P	R	V	Q
.5	1.61243	4.934	.326822	2.9809	4.80
.6	2.114	5.412322	.2906	3.3575927	7.10
.7	2.65721	5.85444	.4539	3.71064	9.86
.8	3.238	6.267778	.5166	4.045	13.10
.9	3.85365	6.658	.5788	4.363425	16.82
1.0	4.50	7.03	.6405	4.66826	21.01

$\therefore$ FLOW TIME IN CHANNEL IS

100 yr $\frac{350}{3.9 \times 60} = 1.50$ min

10 yr $\frac{350}{3.5 \times 60} = 1.67$ min

5 yr $\frac{350}{3.4 \times 60} = 1.72$ min

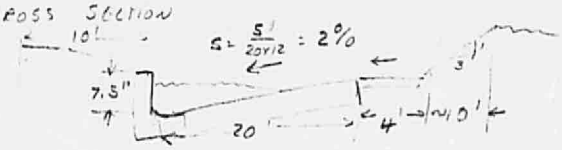
$\therefore$

PERIOD	TOC		I	Q = (.4)I(9.525)
100	18+1.5	= 19.5	4.36	16.61
10	18+1.67	= 19.7	3.02	11.54
5		= 19.7	2.60	9.90

c. 100 yr. OUT FLOW FROM SUBAREA C AT THE POINT OF INTERSECTION WITH LANGMAN DE ORO ROAD WILL CONSIST OF 16.5 TO 1700 CFS AT 4.3 TO 4.4 FPS AT A DEPTH OF .9 FT.

SUBAREA F

SUBAREA F IS A NEWLY PLACED STREET WITH GUTTER ALONG THE SOUTH SIDE, WITH 20 FEET OF PERMANENT PAVEMENT, AND 4 FEET OF TEMPORARY ASPHALT, WITH A CROSS SECTION



THE ROAD SLOPES TOWARD GUTTER AS FOLLOWS

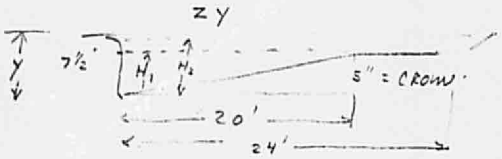
SECTION	STA	TO	STA	LENGTH (FT)	SLOPE %	AREA ACRE	PROJECT VELOC	TOTAL PATH
J	1300	-	1200	100	.43	.10	20.3	20.5
K	1200	-	1050	150	.43	.15	20.3	20.5
L	1050	-	400	650	2.77	.66	34.2	48.2
M	400	-	150	250	4.80	.25	52.0	66.0
N	150	-	041	109	1.5	.11	25.0	[illegible]
						1.27		

	J	K	L	M	N
FLOW					
CURVE 1 - OFF CHART					
CURVE 2 -	2 MIN	2 MIN	2 MIN	2.5	2 MIN
CURVE 3 - OFF CHART					

CONSIDER STREET FLOW CAPACITY AND TIME OF FLOW, SOUTH SIDE OF LAGERMA DE ORO

$n = .014$

$5'' = .42'$



USE NOMOGRAPH 6-1 FOR SOLUTION TO FORMULA $Q = .56 \frac{z}{n} S^{1/2} y^{5/2}$

" FIGURE 6-2 FOR VELOCITY REDUCTION FACTOR

INITIAL THEORETICAL CAPACITY - CONSIDER FULL ENCROACHMENT TO ℄,

IE $zy = 20'$, $y = 5''$; $z = \frac{20 \times 12}{5} = 48$

SECTION	z/n	SLOPE %	Q CFS	VELOCITY REDUCTION FACTOR	NONWHIRL Q
J	3428.6	.43	12	.6	7.2
K	"	.43	12	.6	7.2
L	"	2.77	35	.78	27.3
M	"	4.8	40	.5	20
N	"	1.5	28	.8	22.4

∴ STREET SECTION K WILL PERMIT RUN OFF FROM SECTIONS C WITHOUT ENCROACHING OVER THE CROWN FOR A 10 year period storm, BUT NOT FOR A 100 YR STORM. ∴ TRY $y = 7''$ CURB HEIGHT. CONSIDER TEMPORARY PROTECT AS LIKELY : $z \approx \frac{24 \times 12}{7} = 41$.

$z/n = 2927$ $\qquad y = \frac{7}{12} = .58$

SLOPE = .43

$Q = 25$ CFS $\times .6 = 15$ CFS

∴ OUT FLOW FROM SUB AREA C COULD FLOW DOWN THE SOUTH HALF OF LAGRANA DE ORO WITHOUT OVERFLOW OF THE CURB

ACTUAL Q AND VELOCITY FOR EACH SECTION OF STREET WILL BE DETERMINED BELOW. USE 4 FPS AS INITIAL VELOCITY TO DETERMINE A Q

CASE I - NO CONTRIBUTION FROM SUB AREA C. IE, FLOW FROM SUB AREA C CONTINUES ON PAST LAGRANA DE ORO W ITS NATURAL CHANNEL - LAGRANA DE ORO STREET STARTS AT ROAD STA 12+00

SECTION	LENGTH (FT)	SLOPE (%)	FLOW TIME (MIN)	AREA ac
K	150	.43	$\frac{1159}{4 \times 60}$ = 4.8 MIN	.15
L	650	2.77		.66
M	250	4.8		.25
N	109	1.5		.11
	1159 ft			1.17

FOR OUTLET FLOW AT THE INTERSECTION OF LAGRANA DE ORO WITH CHERRY, CONSIDER A FLOW TIME OF 7.0 MINUTES (CULVERT FLOW TIME PLUS INITIAL CHANNEL FLOW) (4.8 + 2) ≈ 7.0

∴ $Q_{OUTFLOW}$ = C I A .9 I A

PERIOD YR	I (IN/HR)	Q_F (CFS)
100	6.6	6.95
10	4.5	4.74
5	3.9	4.11

CONSIDER Q = 7.0 CFS, VELOCITY AND FLOW TIME IN EACH SECTION. (NOTE: THIS WILL GIVE A HIGHER FLOW AND VELOCITY THAN IS CORRECT FOR NORMAL FLOW CONDITION CONSIDERED, BUT THIS WILL PERMIT INPUT OF FLOW FROM SUB REACH E)

$a = \frac{1}{2} y(2y) = \frac{1}{2} y^2 2 = 24 y^2$

SECTION N SLOPE = 1.5%, n = .014; z = 48 z/n = 3428.6

y (ft)	a ft²	Q CFS	V fps
.1	.24	.45	1.88
.2	.96	3.0	3.13
.3	2.16	9.0	4.17
.4	3.84	21.0	5.5
.25	1.5	6.0	4.0

∴ AT FLOW RATE = 7 CFS V ≈ 4.05 FPS, AND FLOW TIME

$= \frac{150}{4.05 \times 60} = .62$ MIN

SECTION M SLOPE = 4.8%, n .2, z/n as above

y (ft)	a (ft²)	Q (CFS)	V (fps)
.1	.24	.9	3.75
.15	.54	2.8	5.19
.2	.96	6.0	6.25
.25	1.50	11.0	7.33
.21	1.06	7.0	6.60
.22	1.16	8.0	6.90
.32	2.46	20.0	8.13

∴ AT FLOW RATE 6.6 FPS, FLOW TIME = $\frac{200}{6.6 \times 60}$ = .63

SECTION L SLOPE = 2.77 n, z, z/n as above

y (ft)	a (ft²)	Q CFS	v (fps)
.1	.24	.7	2.92
.15	.54	2.0	3.70
.18	.78	3.2	4.12
.20	.96	4.3	4.48
.21	1.06	4.8	4.53
.22	1.16	5.3	4.57
.23	1.27	6.0	4.73
.24	1.38	6.8	4.93
.25	1.50	7.6	5.07
.30	2.16	12.0	5.56
.35	2.94	20.0	6.80

AT FLOW RATE 7 CFS v ≈ 5 fps, AND TIME OF FLOW =

$$\frac{650}{5 \times 60} = 2.17 \text{ min}$$

AT FLOW RATE 3.5 CFS v ≈ 4.2 fps AND TIME OF FLOW =

$$\frac{650}{4.2 \times 60} = 2.58 \text{ min}$$

SECTION K Slope = .43 n, z, z/n as above

y ft	a ft²	Q CFS	v fps
.1	.24	.3	1.25
.15	.54	.8	1.48
.2	.96	1.8	1.88
.25	1.50	3.1	2.07
.30	2.16	5.1	2.36
.32	2.46	6.0	2.44
.35	2.94	8.0	2.72

Y (cont)			
.4	3.84	11	2.86
.5	6.0	21	3.5

AT FLOW RATE OF 2 CFS $V \simeq 2$ fps, and flow time is about $\frac{150}{2 \times 6} = 1.25$ min

∴ TOTAL FLOW TIME ON LINGBINN DE ORO, CASE I =

$1.25 + 2.58 + .63 + .62 \simeq 5.08$

AND ORIGINAL ASSUMPTION IS VALID AND CONSERVATIVE.

CASE II OUT FLOW FROM SUB AREA C AS WELL AS THE SOUTH SIDE OF LINGBINN DE ORO ROAD

ADDED FLOW TIME CONSIDERING LINGBINN DE ORO ROAD AS DITCH FOR OUT FLOW FROM SUB AREA C.

AT $Q \simeq 15$ TO 20 CFS

SECTION	L ft	V fps	FLOW TIME min
K	150	3.4	.73
L	650	6.8	1.6
M	250	8.1	.51
N	100	5.5	.33
			3.17 min

FLOW TIME FROM LINGBINN DE ORO RD INTERSECTING WITH EUBANK, TO SAME SEWER INLET AT DOWN MIDDLEBROOK –

$L = 300$ FT, USE $Q_C = Q_E + Q_E$

PERIOD $Q_C + Q_F + Q_E$, USE 1 CFS FOR Q_E

PERIOD	$Q_C + Q_F + Q_E = Q_T$	SEE (7) V_D FPS	TIME $\left(\frac{300}{V \times 60}\right)$ MIN
100	16.6 + 7.0 + 1 = 24.6	2.9	1.72 MIN
10	11.5 + 4.75 + 1 = 17.25	2.7	1.85
5	9.5 + 4.1 + 1 = 14.6	2.5	2.0

∴ CONCENTRATION TIME TO INLET AT DONA MARGARITA CASE II

SUBAREA C, F, E, AND D =

PERIOD	C (9) +	F (11) +	E +	D	= T_2 MIN
100	19.5	3.17	–	1.72	= 24.4
10	19.7	3.17(+)	–	1.85	= 24.7
5	19.7	3.17(+)	–	2.0	= 24.9

AND FOR SUBAREAS A, B, AND D – SEE PAGE (5)

100	19.9
10	20.3
5	20.8

THEREFORE USE T_2 TO DETERMINE MAX INFLOW TO INLET DONA MARGARITA, CASE II (LESS Q_E)

PERIOD	TOC	I	C A (.4) ( )	C A .9 A	CFS Q_{T_2}
100	24.4	3.75	10.47 + 9.525 = 26.525	1.5 + 1.27 = 2.77 (.9)	49.2
10	24.7	2.60	= 10.61	= 2.5	34.1
5	24.9	2.25	10.61 + 2.5 = 13.11		29.5

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

CONCENTRATION TIME AT DONA MARGARITA, CASE I, LESS Q_E

FLOW TIME WILL BE GOVERNED BY SUBREACH A, B YD,

FOR WHICH:

PERIOD	TOC	I	$C_1 A$ (.4)(10+7)	$C_2 A_2$ (.9)(1.5+1.27)	Q_{T4} (CFS
100	19.9	4.2	= 6.8	2.5	39.00
10	20.3	2.92	= 9.3		27.16
5	20.8	2.45			22.80

∴ COMPARE FLOW AT INLET DONA MARGARITA

PERIOD	PRESENT CFS	CASE I − Q_E CFS	Δ INCREASE
100 yr	34.2	39.0	4.8
10 yr	23.8	27.2	3.4
5 yr	20.0	22.8	2.8

CONTRIBUTION FROM Q_E WILL BE 1.57 CFS FROM PONDING DRAWS DURING ACCUMULATION. THERE WILL BE NO SIGNIFICANT OVERFLOW USING THE TOC FOR MAXIMUM OUTFLOW, EITHER WITH CASE I OR II

FOR TOTAL PRECIPITATION ACCUMULATION AT THE DONA MARGARITA INLET, USE 2.4" FOR THE 100 yr PERIOD STORM $V = \frac{2.4}{12} \times$ [illegible] $\times$ 43560 ft²/ac = V

SUBREACH	A	B	C	D	E	F
AREA ACRES	10	7	9.5	1.5	2.47	1.27
C.	.4	.4	.4	.9	–	.9
V TOTAL FOR SUB	34,848	24,394	33,106	14,520	5370	9,958

	PRESENT		ROOFS	=	TOTAL CF
V_T CASE I	= 74,142	+	13,048	=	87,190
V_T CASE II	= 74,142	+	46,154	=	120,296

CONCLUSIONS: FLOW RATES TO DONA MARGARITA INLET, CFS

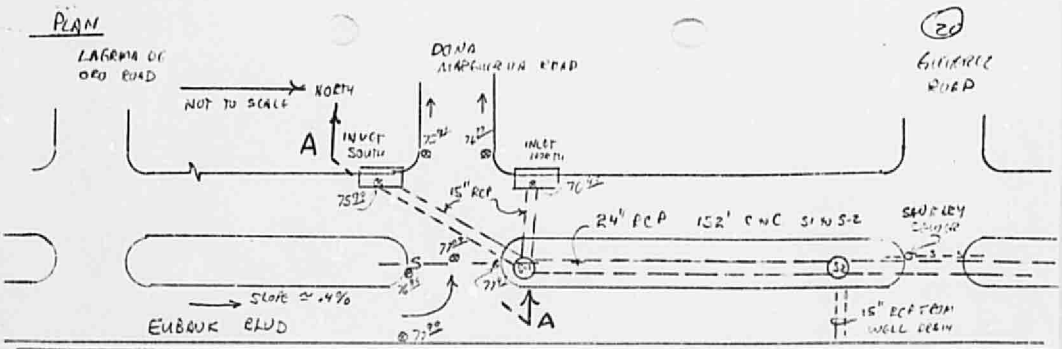
	ALL FLOWS IN CFS AS OF OCT 19 1981				
PERIOD	AT PRESENT	CASE I	Δ INCREASE	CASE II	Δ INCREASE
100 yr	34.2	40.6	6.4	50.8	16.6
10 yr	23.8	28.8	5.0	35.7	11.9
5 yr	20.0	23.4	3.4	31.1	11.1

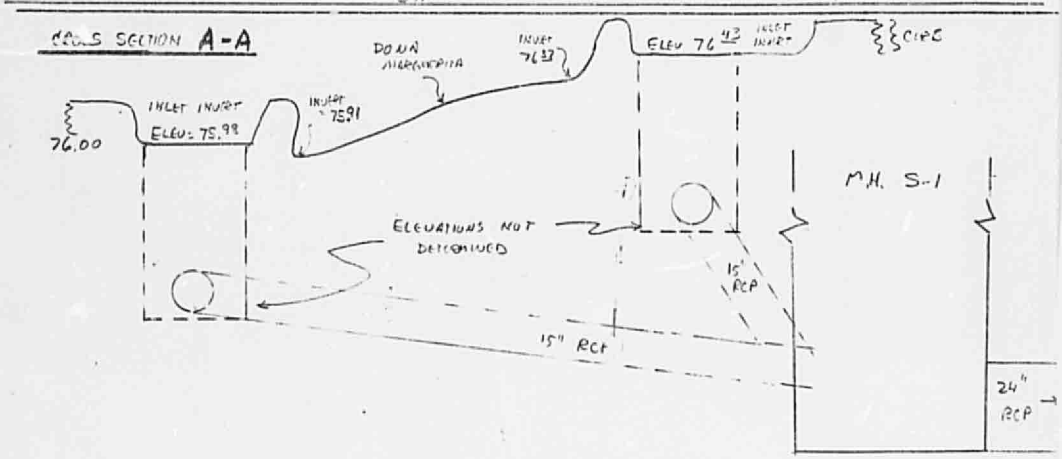
OUTFLOW AT DONA MARGUERITA AND EUBANK INTERSECTION.

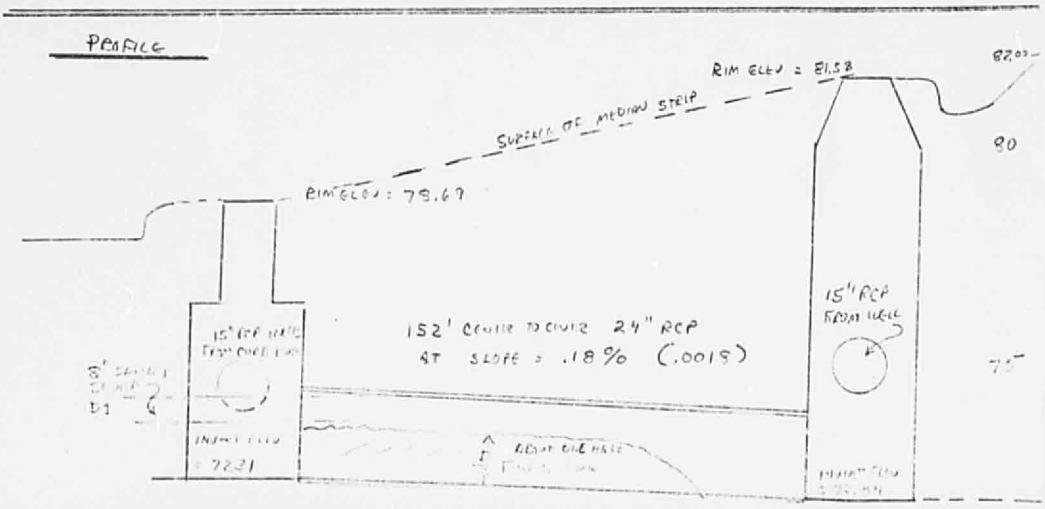
WATER WHICH HAS REACHED THE LOW SPOT ON EUBANK, AT THE INTERSECTION WITH DONA MARGUERITA WILL FLOW OUT BY THE FOLLOWING TWO ROUTES. (NOTE: RUN OFF IS PREVENTED FROM FLOWING NORTH ON EUBANK, AND THEN TO ARROYO DE LOS OSO, BY A 6 FT RISE IN THE ROADWAY).

OUTFLOW ROUTE #1: CONTINUE WEST ON DONA MARGUERITA UNTIL DONA MARGUERITA INTERSECTS WITH LAGUNA DE ORO ROAD, THEN CONTINUE WEST ON LAGUNA DE ORO UNTIL IT INTERSECTS WITH PIEDRA NEGRA, THEN SOUTH UNTIL IT INTERSECTS WITH MONTGOMERY. THERE IS A STORM DRAIN INLET AT THE PIEDRA NEGRA AND MONTGOMERY INTERSECTION. FLOW DOWN THIS ROUTE IS WELL CHANNELIZED, WITH ALL HOUSES RAISED TWO FEET OR MORE ABOVE THE CURB, AND DEFINITE THEN DIRECTION, WITH LITTLE RISK OF OVERFLOW TO OPPOSITE SIDE OF T INTERSECTIONS.

OUTFLOW ROUTE #2: THERE ARE TWO INLETS TO A STORM DRAIN, ONE INLET NORTH, AND ONE INLET SOUTH, OF DONA MARGUERITA, ON THE WEST SIDE OF EUBANK. AT THE PRESENT TIME, THESE INLETS ACCEPT A TRICKLE OF WATER, PRIMARILY THAT WHICH FLOWS DOWN THE WEST CURB AND FLOW LINE OF EUBANK. SEE SKETCH, PAGE 20


PLAN
LAGUNA DE ORO BLVD
NORTH
NOT TO SCALE
DONA MARGARITA ROAD
GUIDANCE ROAD
A
INLET SOUTH
INLET NORTH
15" RCP
24" RCP 152' CNC S1 N S-2
SHUTTLEY CIRCLE
SLOPE ≈ .4%
EUBANK BLVD
15" RCP FROM WELL BELOW


CROSS SECTION A-A
DONA MARGARITA
INLET INVERT
ELEV 76.42
CIRC
INLET INVERT ELEV: 75.99
76.00
MH. S-1
ELEVATIONS NOT DETERMINED
15" RCP
24" RCP


PROFILE
RIM ELEV = 81.58
SUPERELEV OF MEDIAN STRIP
80
RIM ELEV: 79.69
15" RCP FROM WELL
152' CENTER TO CENTER 24" RCP
AT SLOPE = .18% (.0015)

Sub Areas E and F

Prior to development, sub areas E and F will contribute run off in the form of sheet flow to the area south and west of these areas, flowing eventually to a concentration point at the intersection of Eubank and Montgomery. For purposes of evaluating the before and after development impact, this run off is determined as follows:

Average path length to channel flow:		400 feet
Average slope		3.5 %
Area contributing	Acres	3.75

C = 0.4

TOC	Curve 1	Poor grass	16 minutes
		Bare soil	12 minutes
	Curve 2	Off of chart	
	Curve 3	Poor turf	13 minutes
		Bare soil	10 minutes

∴ use 12 minutes as TOC, for which I is as below

Period	I in/hr	Q = CIA (CFS)
100 yr	5.3	7.95
10 yr	3.6	5.4
5 yr	3.2	4.8

And volume of runoff

$V_{100\,yr\ undeveloped} = 3.75\ Ac. \times \frac{43560\ ft^2}{Ac} \times \frac{3.4'}{12''} \times .4 = 13{,}069$

Ponding Criteria: Interim Drainage Guidelines Nov 1979 IP B5a

Actual useable ponding capacity CF

Ponding volume − overponding

21,900 − 3510 = 18,390 CF

Ponding volume required ≧ V_{100} developed − V_{100} undeveloped

or V_{100} developed ≦ Ponding volume + V_{100} undeveloped

V_{100} developed (assumes all precipitation collected, ie, C = 1.0)

= 21 540 CF for developed private area

V_{100} developed (for ½ Longmire Dr Ove Road)

$= 1259' \times 30' \times \frac{3.4'}{12''} \times .9 = 6800$ CF

∴ V_{100} DEV	V_{100} undev + V_{pond}
21,540	18 390
6800	13 069
28,340 CF	31,458 CF

∴ $V_{100\,DEV} \leq V_{Ponding} + V_{100\,undev}$

And ponding criteria, B 5a of Interim Drainage Guidelines November 1979 are met, to include the private lands as well as the public right of way.

Out flow criteria : Req B 5 b

Positive discharge = Qs undeveloped to street or storm drain :

From above, the Qsu for the total area private land and public R.O.W (sub area E and F) is 4.8. The drains from the private lands cumulatively amount to 1.26 CFS average. Qs developed from the public R.O.W is equal to 2.8 CFS, for a total of 4.1 CFS.

Out flow from each pond drain is based on discharge under low head through a submerged orifice *

$$Q = C a \sqrt{2gh}$$ for flow at any given head h

and

$$Q = \frac{\frac{2}{3} C a \sqrt{2g} \left(h_2^{3/2} - h_1^{3/2}\right)}{h_2 - h_1}$$ = average discharge

* Civil Engineering Handbook, Urquhart page 4-34

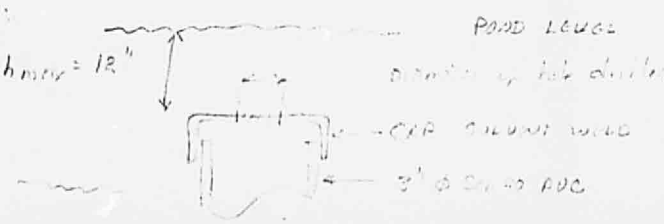
The orifice is a hole drilled into the cap at the end of the drain line. The drain will start functioning as soon as the ponding level reaches the drain level, which is installed six inches or so above the bottom of the ponding area to preclude inadvertent outflow from grass and plant watering. The size of the hole will determine the rate of outflow.

THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

Rigorously, the outflow from the fixed drain at the base of the ponding area will be dependent on the height of the water above the drain, and, in turn, on the rate of inflow of water to the ponding area. However, because of the relatively long time for outflow, compared to the relative short period of inflow, the calculation for average outflow is based on on the draining of a full pond, without consideration for continued input, or for outflow during the period of filling. The outflow so calculated is thus a maximum average outflow. Pond depth is reasonably restricted to 18 inches, so that the maximum depth above the drain may be considered as one foot.

The coefficient C used is .75, which is an experimentally determined coefficient for a re-entrant tube. (Page 4-28). An alternate coefficient for a sharp edged circular orifice at one foot head is .62, but the larger value is used as a more conservative value, that is, providing for less discharge in the field than calculated.

The values for discharge are as follows, based on:



$Q = C_d \sqrt{2gh}$ $\qquad Q_{AV} = \frac{2}{3} C_d \sqrt{2g} \frac{h_m^{3/2}}{h_{max}}$

DIAMETER OF ORFICE (INCHES) AND AREA (FT^2)

		1" (.0054542)		1¼" (.0085222)		1½" (.012272)	
head	coefficient	.75	.62	.75	.62	.75	.62
3"		.0164135	.01357	.02565	.02106	.03693	.03053
6"		.02321	.01919	.03627	.03000	.05223	.0432
12"		.03283	.02714	.05129	.04240	.07386	.06106
Average		.021885	.01809	.034195	.02827	.04924	.04071
Q_{AV} 3 outlets		.81		1.26		1.82	
Q_{MAX} 3 outlets		1.21		1.90		2.73	

Select 1¼" diameter hole, with $Q_{AVERAGE}$ = 1.26 CFS

Q_{MAX} = 1.90 CFS

OVERFLOW SPILLWAY (REQUIREMENT B S C)

EACH PONDING AREA IS CONSTRUCTED WITH A STONE LINED OR CONCRETE OVERFLOW AREA, EACH OF WHICH DRAINS THE OVERFLOW TO THE ADJACENT PONDING AREA, OR ROADWAY. THE FLOW RATE AND TOTAL VOLUME AT THE 100 YEAR STORM OR LARGER WILL NOT ERODE OR CAUSE A FAILURE IN THE POND EMBANKMENT.

THE ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY RESOLUTION NO 1980-15 DRAINAGE POLICY Section 4, STATES THAT THE OUTFLOW FROM AN ALTERED PROPERTY WILL NOT EXCEED THE CAPACITY OF STORM DRAINAGE FACILITIES DOWNSTREAM, OR, IN THE ALTERNATIVE, WILL OUTFLOW REASONABLY SIMILAR TO THAT WHICH EXISTED BEFORE ALTERATION.

Such conditions are met for both Case I and Case II, if the drainage design point is taken as the intersection of Piedra Negra with Montgomery Blvd. However, this seems to be an unnecessary division of outflow from that which presently runs down Montgomery Blvd, to re-routing that outflow through a residential neighborhood only to again meet and run down Montgomery Blvd. Accordingly the interim construction plan, Case I, is recommended.

A number of alternatives are also suggested which will reduce the flow rate and volume of run off down Dona Marguerita Avenue. These alternatives are discussed below.

1. Improve the existing 24" storm drain at the Dona Marguerita Ave and Eubank Blvd intersection by a the of the following:

A. Provide a header, or weir across Dona Marguerita which will provide a staging basin,

facilitating entry of water into the existing inlets. The disadvantage of this is that there would be a basin created in the major thoroughfare (Eubank Blvd), which must be at least 12" ± deep to make use of both inlets.

b. Install a new inlet, probably in the median turn around. The catchment basin could be sufficiently lower than the main roadways, preventing ponding in the traffic lanes, and permitting sufficient catchment to fully use the 24" drain pipe toward Bear Canyon. Overflow down Dona Marguerita would be much less, by 15CFS ±, for all storms, but Dona Marguerita would still take overflow beyond this.

2. Provide for greater detention on the existing drainage sub areas A and B. Significant improvements could be made just by pushing the existing construction debris and trash into the existing natural drainage channels. Sediment would be a minor problem until such time that major earth work is started up channel. Such action would require some easement or right of way being obtained.

3. Provide an inlet to the existing 15" drain line from the well, which drains into the storm drain at manhole S-2 (S802, This would be preferable proposition if ponding were present on city property near the well