HYDROLOGY K12/D4 13 PLANS 1 of 2

K12/D4

13 PLANS

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

October 25, 1983

Mr. Robert Sykes, PE
Wilson & Company
1321 San Pedro NE
Albuquerque, NM 87110

REF: LA VIDA NUEVA SUBDIVISION REVISED STORM DRAIN PLAN (K12-D4)

Dear Mr. Sykes:

The revised plan, as submitted September 9, 1983, is hereby approved.

If you have any further questions, please feel free to call me at 766-7644.

Sincerely,

John Armstrong
Civil Engineer/Hydrology

JA:mrk

WILSON & COMPANY
ENGINEERS & ARCHITECTS

505 262-2116

Office Location... 1321 SAN PEDRO N.E. ▪ ALBUQUERQUE, NEW MEXICO 87110

Mailing Address... P.O. BOX 3548 ▪ ALBUQUERQUE, NEW MEXICO 87190

ENGINEERS
ARCHITECTS
PLANNERS

An Equal Opportunity Employer

September 9, 1983

RECEIVED
SEP 9 RECD
HYDROLOGY SECTION

Mr. John Armstrong
Engineering Division/Hydrology
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Re: La Vida Nueva Revised Storm Drain Plan (K12-D4)
WCEA File: 83-510

Dear Mr. Armstrong:

Enclosed are two copies of the revised drainage report which incorporates the revisions requested in your letter dated August 18, 1983.

1. Report contains a paragraph addressing offsite flows.

2. Attached is print with M.R.G.C.D. signature of approval.

3. We have revised the plan showing the 8" PVC drain.

4. We have added a note to plans stating any work done in public right-of-way must be approved by City Engineer/Design Section.

Very truly yours,
WILSON & COMPANY

Robert F. Sykes, P.E.

xc: Marilynn Cooper
Homes by Marilynn

Enclosures

-sap

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

August 18, 1983

Mr. Bob Sykes, PE
Wilson & Co.
1321 San Pedro NE
Albuquerque, NM 87110

REF: LA VIDA NUEVA SUBDIVISION REVISED STORM DRAIN PLAN (K12-D4)

Dear Mr. Sykes:

The above mentioned plan will be approved when you provide the following:

1. Address offsite flows and justify how these will be handled.
2. Submit a copy of M.R.G.C.D. approval to discharge into the drain.
3. Investigate the existing 8" pvc drain in Area-2 and modify plan if necessary. It appears that it drains to the south.
4. Any work within the public Right-of-Way must be approved by the City Engineer/Design Section.

If you have any questions, please feel free to call me at 766-7644.

Sincerely,

John Armstrong
Civil Engineer/Hydrology

JA:mrk

WILSON & COMPANY
ENGINEERS & ARCHITECTS

505 262-2116

Office Location... 1921 SAN PEDRO N.E. • ALBUQUERQUE, NEW MEXICO 87110

Mailing Address... P.O. BOX 3548 • ALBUQUERQUE, NEW MEXICO 87190

ENGINEERS
ARCHITECTS
PLANNERS

An Equal Opportunity Employer

June 23, 1983

Mr. Fred Aquirre
Engineering Division
Municipal Development Department
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

RECEIVED
JUN 24 1983
ENGINEERING

Re: La Vida Nueva Subdivision
Zone Map K-12
WCEA File: 83-510

Dear Mr. Aquirre:

Enclosed are two copies of the drainage report for the La Vida Nueva Subdivision for your review and comment. The report is also being submitted to MRGCD for their review and approval for discharge to the Isleta Drain.

I will be glad to answer any questions you might have.

Very truly yours,
WILSON & COMPANY

Robert F. Sykes, P.E.

xc: Marilyn Cooper

Enclosures

-sap

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

March 10, 1983

James E. Blackwell, P.E.
Academy Engineering, Inc.
5353 Wyoming Blvd. N.E., Suite 3
Albuquerque, N.M. 87109

RE: LA VIDA NUEVA REVISED DRAINAGE PLAN (K12-D4)

Dear Mr. Blackwell:

The revised drainage plan for the referenced site does not fulfill the City's drainage plan requirements (see D.P.M. Vol. 2, Sec. 22.7, pages 106-109), consequently, this plan is being returned. Please use the information provided in the D.P.M. to prepare your re-submittal.

If you have any further questions regarding the above plan, please feel free to contact me.

Very truly yours,

Fred J. Aguirre, P.E.
Civil Engineer

JFA/tsl

MIDDLE RIO GRANDE CONSERVANCY DISTRICT
POST OFFICE BOX 581
1930 SECOND ST., S.W. PHONE 243-6796
ALBUQUERQUE, NEW MEXICO 87103

RECEIVED MAR 9 1983

February 25, 1983

Ms. Marilyn Cooper
2017 Yale SE
Albuquerque, NM 87108

Re: La Vida Nueva - Isleta Drain

Dear Ms. Cooper:

We have reviewed your plans for La Vida Nueva storm drain. A drain inlet into Isleta Drain with silt and grease trap as shown in plan is acceptable. Adequate amount of rip rap needs to be placed along the cross section of Isleta Drain for a 40' long section to avoid erosion due to drain inlet.

A detailed license will be issued at a later date.

Should you need further information, please do not hesitate to contact us.

Sincerely,

Subhas K. Shah
District Engineer

SKS:cj

c c: Charles R. Martinez, General Manager

K-12-D4

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO
June 29, 1982

REF. NO._____

INTER-OFFICE CORRESPONDENCE

TO: Phil Garcia, Assistant City Planner, Planning Division

FROM: Fred J. Aguirre, Civil Engineer/Hydrology FJA

SUBJECT: LA VIDA NUEVA

RECEIVED
JUN 30 1982
CITY ENGINEER

The one day turn-around time indicated in your memo to Mr. Wall for reviewing and approving the revised drainage plan for La Vida Nueva is not a realistic one. A week to ten days is more in line with our processing time, i.e., if the plans satisfy our drainage requirements.

Therefore, I suggest you reevaluate any schedules or commitments you have made to reflect this processing time.

FJA/el

cc: Carl Rodolph, Municipal Development Department
Anita Miller, Legal Department
Charles Wall, Municipal Development Department
√Chuck Easterling, City Engineers

FRED AGUIARE

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

RECEIVED
JUN 29 1982
CITY ENGINEER

June 25, 1982

K-12-D4

Ms. Margaret I. Candelaria
4631 La Vida Nueva del Norte S.W.
Albuquerque, New Mexico 87105

Dear Ms. Candelaria:

This is in response to your letter to Mr. Albert Chavez and Ms. Anita Miller, dated June 8, 1982, in which you asked two questions:

(1) "IS THE RESIDENT'S PETITION FOR AN AMENDED DECISION ON THE REFUSE PROBLEM FORGOTTEN OR HAVE OTHER, MORE PRESSING PROBLEMS BEEN A FACTOR IN THE DELAY FOR AN AMENDED DECISION?"

Mr. Albert Chavez will respond to this question directly. However, he has informed us that his decision will not be amended.

Our interpretation of Mr. Chavez' decision of March 15, 1982 is that it did not order that a turn-around adequate for City refuse trucks be constructed. The decision was that if such a turn-around was constructed the City would provide residential refuse collection.

(2) "WHAT DOES THE CITY PROPOSE TO DO ABOUT THE NON-COMPLIANCE OF THE DEVELOPER WITH RESPECT TO CARL RODOLPH'S JANUARY 25, 1982 LETTER?"

a. There is agreement between the City and Marilyn Cooper to construct a turn-around adequate for automobiles to turn. Marilyn Cooper has submitted a revised site development plan incorporating it. However, approval of the site development plan was delayed by the City due to certain problems related to surface drainage for the overall development of La Vida Nueva which must be resolved prior to sign-off of the plans; hence, the delay in constructing the turn-around.

We have met with Marilyn Cooper and her engineer and we have agreed that she would have the turn-around constructed no later than August 1, 1982.

b. The trailer, as you are aware, has been removed.

c. As I indicated to you in my letter of March 3, 1982, the Fire Department has reassured me that the existing units can be serviced without the fire access gate.

d. We have not scheduled a public hearing by the Environmental Planning Commission to review the site development plan since progress is being made to comply with the officially adopted site development plan.

Sincerely,

Carl P. Rodolph

Carl P. Rodolph, Director
Municipal Development Department

CPR:PG:jd/1248B

cc: Mayor Harry Kinney
Anita Miller
Albert Chavez
Marilyn Cooper
Robert Romero
Everette Naranjo
Richard Heller
Chuck Easterling
John Finley

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

REF. NO._____

INTER-OFFICE CORRESPONDENCE

June 24, 1982

TO: Charlie Hall

FROM: Phil Garcia

SUBJECT: La Vida Nueva

On Wednesday, June 23, Marilyn Cooper, Chris Joschke, Chuck Easterling, Fred Aguire, and I met to discuss the drainage problems related to La Vida Nueva development.

It appeared from the discussion, that the problems were relatively minor. Those present agreed that Jim Blackwell, the engineer for La Vida Nueva, would be able to submit the necessary drainage information by June 30, 1982 which would allow the City Engineer to sign-off on the site development plan by June 30, 1982.

The additional questions for which you needed a response are answered in the attached letter to Mrs. Candelaria.

PG:pa
cc: Carl Rodolph
Chuck Easterling
Fred Aguire
Anita Miller

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

June 24, 1982

Ms. Margaret I. Candelaria
4631 La Vida Nueva del Norte S.W.
Albuquerque, New Mexico 87105

Dear Ms. Candelaria:

This is in response to your letter to Mr. Albert Chavez and Ms. Anita Miller, dated June 8, 1982, in which you asked two questions:

(1) "IS THE RESIDENT'S PETITION FOR AN AMENDED DECISION ON THE REFUSE PROBLEM FORGOTTEN OR HAVE OTHER, MORE PRESSING PROBLEMS BEEN A FACTOR IN THE DELAY FOR AN AMENDED DECISION?"

Mr. Albert Chavez will respond to this question directly. However, he has informed us that his decision will not be amended.

Our interpretation of Mr. Chavez' decision of March 15, 1982 is that it did not order that a turn-around adequate for City refuse trucks be constructed. The decision was that if such a turn-around was constructed the City would provide residential refuse collection.

(2) "WHAT DOES THE CITY PROPOSE TO DO ABOUT THE NON-COMPLIANCE OF THE DEVELOPER WITH RESPECT TO CARL RODOLPH'S JANUARY 25, 1982 LETTER?"

a. There is agreement between the City and Marilyn Cooper to construct a turn-around adequate for automobiles to turn. Marilyn Cooper has submitted a revised site development plan incorporating it. However, approval of the site development plan was delayed by the City due to certain problems related to surface drainage for the overall development of La Vida Nueva which must be resolved prior to sign-off of the plans; hence, the delay in constructing the turn-around.

We have met with Marilyn Cooper and her engineer and we have agreed that she would have the turn-around constructed no later than July 15, 1982.

b. The trailer, as you are aware, has been removed.

c. As I indicated to you in my letter of March 3, 1982, the Fire Department has assured us that the existing units can be serviced without the fire access gate.

d. We have not scheduled a public hearing by the Environmental Planning Commission to review the site development plan since progress is being made to comply with the officially adopted site development plan.

Sincerely,

Carl P. Rodolph, Director
Municipal Development Department

CPR:PG:jd/1248B

cc: Mayor Harry Kinney
Anita Miller
Albert Chavez
Marilyn Cooper
Robert Romero
Everette Naranjo
Richard Heller
Chuck Easterling
John Finley

FILE:
LA VIDA NUEVA

homes by marilynn, inc.
planners builders
2017 yale s.e. albuquerque, n.m. 87106 (505) 842-0185

K12-04

RECEIVED
MAY 12 1982
CITY ENGINEER

May 11, 1982

Mr. Charles M. Easterling
Princ. Asst. City Eng./Hydrology
City of Albuquerque
Municipal Development Department
Engineering Division
P.O. Box 1293
Albuquerque, New Mexico 87103

Dear Mr. Easterling:

I am in receipt of your letter of April 30, 1982 addressing a number of variances between the as built drainage facilities and the existing drainage plan for the La Vida Nueva Subdivision. We recognize that these variances exist and plan to move expeditiously to satisfy the city's drainage requirements with respect to La Vida Nueva.

I plan to meet with our engineer within the next several days to review the situation at La Vida Nueva and come up with a schedule for completion of drainage improvements. Once I have completed the schedule and determined whether or not to complete the improvements as presently submitted or to submit a letter of certification of improvements as currently built I will contact your office to see if your requirements have been satisfied.

If you have any questions please do not hesitate to call me.

Sincerely,

Chrys B. Jaschke
Vice President

CBJ/pm

CC. CARL RODOLPH
FRED AGUIRE

City of Albuquerque

April 30, 1982

Ms. Marilyn Cooper
Homes by Marilyn
2017 Yale Blvd. SE
Albuquerque, New Mexico 87106

RE: LA VIDA NUEVA SUBDIVISION (K12-D4)

Dear Ms. Cooper:

A field survey by this office revealed the referenced subdivision to be at variance with the City Engineer's construction plans dated May 14, 1979 and the supplemental plan by Goldberg Mann Engineering. See attached list of variances.

Consequently, this office has no choice but to postpone the approval of your SU-1 development plan until such time that compliance with the approved plan is accomplished; or the submittal of an as-built plan with calculations and details supporting the site's compliance with the previously approved drainage concepts and certified by a New Mexico Registered Engineer.

If your Engineer determines that drainage improvements are warranted, this office will require an as-built drainage plan with the proposed improvements supported with calculations and references. The plan should be of sufficient detail to determine the feasibility of the proposed improvements.

Your immediate response to this problem will obviate this office from taking any further action as authorized under Section 205 of the Uniform Administrative Code. If you have any questions concerning this matter, please feel free to call me at 766-7467.

Sincerely,

Charles M. Easterling
Princ. Asst. City Eng./Hydrology

CME/FA/el

cc: Drainage File
Reading File
Carl P. Rudolph, Director, MDD
Richard S. Heller, City Engineer

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE February 8, 1982 REF. NO._____

TO: Chuck Easterling, Principal Assistant City Engineer/Hydrology

FROM: Fred J. Aguirre, Civil Engineer/Hydrology FJA

SUBJECT: LA VIDA NUEVA SUBDIVISION SUPPLEMENTAL DRAINAGE PLAN DATED 8/80 (BY GOLDBERG MANN ENGINEERING) FILE NO. K12-D4

Per yourinstructions I researched our files and also contacted Tom Mann for information regarding the approval of the referenced drainage report to no avail. The last entry regarding the approval or disapproval of the subject report was a reject by me dated January 23, 1981. Therefore, as our records stand the plan dated May 14, 1979 is the only City approved plan on file with this office.

Also, as you requested I field inspected the subject site and found the as-built conditions at variance with both the approved plan dated May 14, 1979 and Mr. Mann's plan dated 8/80. Therefore, I recommend that the developer submit an as-built plan with the required improvements (if improvements are warranted) to bring the site into compliance with the approved concepts of the originally approved report.

FJA/el

cc: Drainage File
Reading File

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE February 8, 1982 REF. NO.

TO: Chuck Easterling, Principal Assistant City Engineer/Hydrology

FROM: Fred J. Aguirre, Civil Engineer/Hydrology FJA

SUBJECT: LA VIDA NUEVA SUBDIVISION SUPPLEMENTAL DRAINAGE PLAN DATED 8/80 (BY GOLDBERG MANN ENGINEERING) FILE NO. K12-D4

Per yourinstructions I researched our files and also contacted Tom Mann for information regarding the approval of the referenced drainage report to no avail. The last entry regarding the approval or disapproval of the subject report was a reject by me dated January 23, 1981. Therefore, as our record stands the plan dated May 14, 1979 is the only City approved plan on file with this office.

Also, as you requested I field inspected the subject site and found the as-built conditions at variance with both the approved plan dated May 14, 1979 and Mr. Mann's plan dated 8/80. Therefore, I recommend that the developer submit an as-built plan with the required improvements (if improvements are warranted) to bring the site into compliance with the approved concepts of the originally approved report.

FJA/el

cc: Drainage File
Reading File

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

January 25, 1982

Mr. and Mrs. Delfino Candelaria, Jr.
4631 La Vida Nueva Del Norte SW
Albuquerque, NM 87105

Dear Mr. and Mrs. Candelaria

I have received your letter dated January 4, 1982, and was quite surprised to receive this communication in view of our two previous telephone conversations concerning the highlights of my meetings with Ms. Marilynn Cooper. I have never made any commitment to provide you with a written response. However, it would seem apropriate at this time to recapitulate our previous conversation concerning the meeting with Ms. Cooper.

Ms. Cooper has agreed to provide a "hammerhead" turn around at the east end of the existing private street. Initially it will be gravelled, but will be paved by June 1, 1982. This turn around will allow automobiles to turn at the east end without using private driveways.

Although City refuse trucks are prohibited from serving residences located on private streets, the Refuse Department will continue to pick up refuse twice a week at a dumpster located at the west end of the street.

The trailer that had been used as a construction office in the area has been relocated.

The Fire Department has indicated that the homes along the private street can be served by the necessary equipment. As you are aware, a fire access gate is located at the east end. Ms. Cooper will be contacting the property owner to obtain her permission to relocate, at Ms. Cooper's expense, the tree which is blocking access to that gate.

Your question about the installation of a "speed bump" adjacent to the entrance to La Vida Nueva cannot be accomplished unless that street (47th Street) was to become a private street.

As I previously mentioned to you, the vast majority of your concerns can only be addressed by the developer, and it appears that Ms. Cooper is making every effort to address these concerns.

In view of the above, and since a hearing was held by the Environmental Planning Commission at the time zoning was approved for the La Vida Nueva development, we do not feel it is necessary to hold another hearing. However, it should be noted that under the SU-1 zoning regulations, the Planning Commission must review the plan and progress of development every four years until it is fully implemented. Since this plan was approved in June, 1978, that review and public hearing could be scheduled for sometime in June, 1982.

I hope this letter affirms our previous discussions. If I can be of further assistance relative to City matters, please contact me.

Sincerely,

Carl P. Rodolph

Carl P. Rodolph, Director
Municipal Development Department

CPR:PG:amc

cc: E. J. Stuckman
Paula and Ray Pompa
Mr. and Mrs. Christopher M. Brown
Chris Gibbons
Martha Milligan
Robert Jarrett
Mayor Harry Kinney, City Hall
Mr. Roy Gonzales, Fire Department, 131 Adams NE, 87108
Mr. John Finely, Refuse Department
Mr. Sam Trujillo, Refuse Department
Mr. Vern Hagen, Planning Division
Mr. Phil Garcia, Planning Division
Mr. Robert Romero, Zoning Department
Mr. Charles N. Estes, Legal Department
Ms. Anita Miller, Legal Department

Heller - Eng.

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
David Rusk

J12-04

November 25, 1981

Ms. Marilynn Cooper
Homes by Marilynn
2017 Yale Blvd. S.E.
Albuquerque, New Mexico 87106

RECEIVED
NOV 27 1981
CITY ENGINEER

Re: La Vida Nueva

Dear Ms. Cooper:

On Monday, November 23, I met with several City officials who have been involved in the controversy concerning La Vida Nueva. Attending the meeting were Phil Garcia, Anita Miller, Nick Estes, Bob Casias, Bob Romero, Everett Naranjo, and Richard Heller. Phil Garcia and Anita Miller gave a report concerning the agreement which you had made at their meeting on Tuesday, November 17. It is my understanding that, on that occasion, you stated that you were moving your trailer onto your Barelas project, as soon as possible. You also stated that you would build a "hammerhead" turnaround at the end of the private street. You will gravel it temporarily, and pave it as part of your total paving project when the remaining townhouses are built. In any event, the turnaround will be paved by June 1, 1982.

You further agreed to remove the trees blocking the fire gate. The Fire Department and Traffic Engineering insist that the fire access from 46th Street be paved.

You have indicated that the necessities of drainage had caused you to eliminate drive pads which were originally planned, as well as to change the configuration of planned landscaping. Before these changes can be approved, we would like to see your approved drainage plan. You are delegated to provide as much of the originally planned landscaping as possible--particularly, the planned number of backyard trees. It is also understood that you are to provide additional off-street parking to compensate for the drive pads which have been eliminated if we determine that the originally planned

PSH	PMA	ADM	
HRO		SUR	
CDS		COUN	
DES		SEC	
INSP		FILE	
HYDR	ME	RETURN	

AN EQUAL OPPORTUNITY EMPLOYER

T-11-30-1

drive pads cannot be provided. Anita Miller stated that your architect had prepared a rough drawing showing how "parking bays" could be incorporated into the private road at such time as the remaining townhouses are built. Although Phil Garcia did not feel that it was necessary for you to provide this parking, it is the consensus of the remaining City officials that these parking spaces should be included as you proceed with development.

You have agreed to submit an "as built" site plan, as well as a drainage plan for our approval. We would also like to meet with you, your architects, and your engineers concerning future plans for the entire development, so that we can avoid future problems in the area, particularly as to fire protection and refuse service.

I would like to schedule a meeting for December 4, in the City Legal Department, 615 First Street, N. W., Third Floor, at 2:00 p.m. Looking forward for your cooperation in this matter.

Very truly yours,

Carl Rodolph, Director
Municipal Development Department

CR/AM/mk

cc: Phil Garcia, Planning Department
Bob Casias, Planning Department
Robert Romero, Zoning Enforcement Officer
Everett Naranjo, Refuse Department
Richard Heller, City Engineer
David Campbell, Mayor's Office
John Finley, Refuse Department

received from Tom Mann 2-9-82 [illegible]

0-71

March 20, 1981

Mr. Fred J. Aguirre
Engineering/Hydrology Division
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: La Vida Nueva Drainage Plan

Dear Fred:

I have received your inter-office memo of February 26, 1981, regarding your comments on the La Vida Nueva revised drainage plan. This letter is my response to your comments.

As previously stated, we utilized a drainage plan prepared by Bohannan-Huston as the basis for our modifications. We did not question their original calculations. All that we did was to re-adjust the area somewhat as defined by Bohannan and prepare a modified drainage plan.

1. Attached is a new print of our drawing showing the addition of the original Bohannan drainage boundaries. As you can see, we have combined their Areas 1 and 2 into a single area and have reduced the size of Area 2 slightly. The reduction was added to the combined area.

2. We did not question the volume contained in the Bohannan report. We took the volumes as stated in the report and proportioned them to the new drainage areas. If you will note, the required volumes as per the Bohannan report are 61,251 cubic feet. The volumes called for by our report are 60,845 cubic feet.

3. Refer to Item 1.

4. Attached is a subdivision plat of La Vida Nueva that shows the establishment of the private roads and the drainage easement for the 24-inch pipe. An easement has not been established through the future condominium area.

5. The proposed slopes of the 4 and 24-inch pipes are well within the perimeters of standard design. The 4-inch pipe is a pressure pipe; therefore, slope is not a factor. The owner has moved the pump to the north end of the pond as shown on the revised drawing. A slope of 0.002 and a 24-inch line will result in a velocity of approximately

3.2 feet per second. Standard design considers that anything above 2.0 feet per second will transport solids and 2.0 feet per second is generally the critical design point; therefore, I feel that this slope is adequate for the 24-inch line.

6. The 24-inch line is in existence. The Field Division of the Engineer's Office inspected the construction and approved it; therefore, I don't feel the details are necessary at this time.

7. a. We did not show the pad elevations on each pad since the last paragraph of the verbage said that all pads must be at an elevation of 51.5 or higher.

   b. We have shown proposed street grades along the private streets. The main access loop around the project is already constructed and those as-built drawings can be provided to you by the owner. Also, the townhouse units along the west, south and east sides of the project have already been completed and we did not have the as-built information on those, but I am sure they comply with the original drainage report. Our plan shows that the private streets do drain into the public streets, and I felt that was sufficient detail.

   c. Since this project is so flat, there is very little topographic definition. There are no sidewalks in this particular area, and planting areas are essentially shown as around the buildings. There is no detail that we have at this time for those. Along the property lines wooden fences will be constructed. There are no retaining walls.

   d. The direction of the roof drainage is to the front, since this is common wall construction along the backs of the buildings. The water is intended to go out into the street and down into the ponding areas.

   e. I do not feel that outlining a contributary drainage area is necessary. The majority of the project drains to a pond on the east side of the project. The tennis courts and the landscaping will be flooded to provide the ponding. The condominiums in the southwest corner have their own pond; therefore, the major drainage boundary lines, I feel, are the most significant.

   f. We have added a note to the drawing to say to drain all yards to the streets.

   g. We have shown the pond volume calculation for the pond for Areas 1 and 3. We did not establish a specific pond for Area 2. We called a required pond volume, but since

we do not know the configuration of that land, we did not specifically detail the pond. That should be required as part of the submittal for the dondominiums.

h. Refer to Item 1.

i. The ponding area for Areas 1 and 3 is a depressed pond. If it overflows, it will essentially be at the natural ground level when it overflows; therefore, we did not design an overflow section. We had designed the ponds and the inlets in the ponds to act similar to a tank riding on a water system. As the capacity of the outfall is maximized, the water will back up into the ponding area. As the dondition reverses, the flow will reverse from the ponds back into the pipe system. I feel that to try to determine a specific overflow point would be somewhat difficult and would require major construction and coordination with the MRGCD in order to release the water to the east. I feel that since the units are approximately 2.0 feet higher than the top of the pond, that general area flooding would be on a limited basis.

j. The owner will bbtain approval by MRGCD.

k. I believe that the plan and section are consistent. The pipe was designed to outlet above the flow line of the ditch. It is shown that way in both the plan and the section.

l. We have shown sufficient top of curb elevation for the streets which we were engaged to design, that being the private streets.

If you have any further questions or comments, please do not hesitate to call. It is my understanding that Marilynwill handle the coordination with you to complete this project. Thank you.

Yours truly,

GOLDBERG-MANN & ASSOCIATES, INC.

Thomas T. Mann, Jr., P.E.
President

TTM:bb
xc: Marilynn Cooper

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE February 26, 1981 REF. NO._____

TO: A.C.E. Hydrology

FROM: F.J. Aguirre

SUBJECT: COMMENTS ON LA VIDA NUEVA REVISED DRAINAGE PLAN

1) Subdrainage basins are not outlined

2) No balance shown between the storm runoff from the subdrainage basins and its respective catch basin

3) The drainage areas discussed in the narrative are not shown on the plan

4) Require a common easement for the private road and the proposed storm drains

5) The proposed slopes for the 4" and 24" storm drain pipes are 0.4% and 0.2%, respectively. These mild slopes would appear to allow sediment to be deposited in the pipe, with one possible exception, the 4" pipe which will be connected to a pump.

6) Adequate construction detail and calculations for the proposed 4" and 24" storm drain should be included with these plans. Approval by the A.C.E. - Design, required where construction crosses public right-of-way.

7) The grading plans are lacking in the following items:

   A) Pan elevations (per original report required elev. is 4951.5')
   B) Proposed and existing grades and/or contours
   C) Notes defining asphalt, sidewalks, planting areas, walls, ponding areas, and any other areas whose definition would increase clarity
   D) Direction of roof drainage including canales, gutters, and downspouts
   E) Outlined contributory drainage areas, including roof areas
   F) Flow lines with arrows and spot elevations for confirmation
   G) Pond Volume calculations
   H) Calculations showing the pond volume balance with area contributing to the pond.

Discussed comments with Tom Mann
2-26-81 FJA

I) The pond overflow point with a spot elevation and slope protection if necessary

J) Construction detail of the rip rap (approval by MRGCD required

K) Detailed cross-section of the discharge point into the Isleta Drain. (Plan indicates the discharge pipe to be located at the flowline of the drain but cross-section shows pipe located above flowline).

L) Sufficient top of curb elevations

FA/ kdb

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE February 26, 1981 REF. NO._____

TO: A.C.E. Hydrology

FROM: F.J. Aguirre

SUBJECT: COMMENTS ON LA VIDA NUEVA REVISED DRAINAGE PLAN

1) Subdrainage basins are not outlined

2) No balance shown between the storm runoff from the subdrainage basins and its respective catch basin

3) The drainage areas discussed in the narrative are not shown on the plan

4) Require a common easement for the private road and the proposed storm drains

5) The proposed slopes for the 4" and 24" storm drain pipes are 0.4% and 0.2%, respectively. These mild slopes would appear to allow sediment to be deposited in the pipe, with one possible exception, the 4" pipe which will be connected to a pump.

6) Adequate construction detail and calculations for the proposed 4" and 24" storm drain should be included with these plans. Approval by the A.C.E. - Design, required where construction crosses public right-of-way.

7) The grading plans are lacking in the following items:

   A) Plan elevations (per original report required elev. is 4951.5')
   B) Proposed and existing grades and/or contours
   C) Notes defining asphalt, sidewalks, planting areas, walls, ponding areas, and any other areas whose definition would increase clarity
   D) Direction of roof drainage including canales, gutters, and downspouts
   E) Outlined contributory drainage areas, including roof areas
   F) Flow lines with arrows and spot elevations for confirmation
   G) Pond Volume calculations
   H) Calculations showing the pond volume balance with area contributing to the pond.

I) The pond overflow point with a spot elevation and slope protection if necessary

J) Construction detail of the rip rap (approval by MRGCD required

K) Detailed cross-section of the discharge point into the Isleta Drain. (Plan indicates the discharge pipe to be located at the flowline of the drain but cross-section shows pipe located above flowline).

L) Sufficient top of curb elevations

FA/ kdb

To: A.C.E - Hydrology 1-23-81

From: F.J. Aguirre

Subject: Comments on La Vida Nueva Revised Drainage Plan

1) Subdrainage basins are not outlined

2) No balance shown between the storm runoff from the subdrainage basins and its respective catch basin.

3) The drainage areas discussed in the narrative are not shown on the plan.

4) Require a common easement for the private road and the proposed storm drains.

5) The proposed slopes for the 4" + 24" storm drain pipes are 0.4% + 0.2% respectivelly. These mild slopes would appear to allow sediment to be deposited in the pipe, with the one possible exception, the 4" pipe which will be connected to a pump.

6) Adequate construction detail + calculations for the proposed 4" + 24" storm drain should be included with these plans. Approval by the A.C.E. - Design required where construction crosses public right-of-way.

7) THE GRADING PLAN ARE LACKING IN THE FOLLOWING ITEMS:

A) PAD ELEVATIONS (PER ORIGINAL REPORT REQUIRED ELEV IS 4951.5')

B) PROPOSED AND EXISTING GRADES AND/OR CONTOURS

C) NOTES DEFINING ASPHALT, SIDEWALKS, PLANTING AREAS, WALLS, PONDING AREAS, AND ANY OTHER AREAS WHOSE DEFINITION WOULD INCREASE CLARITY.

D) DIRECTION OF ROOF DRAINAGE INCLUDING CANALES GUTTERS, AND DOWNSPOUTS

E) OUTLINED CONTRIBUTORY DRAINAGE AREAS, INCLUDING ROOF AREAS

F) FLOW LINES WITH ARROWS AND SPOT ELEVATIONS FOR CONFIRMATION.

G) POND VOLUME CALCULATIONS

H) CALCULATIONS SHOWING THE POND VOLUME BALANCE WITH AREA CONTRIBUTING TO THE POND.

I) THE POND OVERFLOW POINT WITH A SPOT ELEVATION AND SLOPE PROTECTION IF NECESSARY.

J) CONSTRUCTION DETAIL OF THE RIP RAP (APPROVAL by MRGCD REQUIRED)

K) DETAILED CROSS-SECTION OF THE DISCHARGE POINT INTO THE ISLETA DRAIN. (PLAN INDICATES THE DISCHARGE PIPE to be LOCATED AT THE FLOWLINE OF THE DRAIN BUT CROSS-SECTION SHOWS PIPE LOCATED ABOVE FLOWLINE)

L) SUFFICIENT TOP OF CURB ELEVATIONS

Goldberg - Mann & Associates, Inc.
Engineers - Planners
811 Dallas St., N.E. Albuquerque, New Mexico 87110 (505) 265-5611

0-71

September 29, 1980

Ms. Marilynn Cooper
Homes by Marilynn
2017 Yale Blvd., S.E.
Albuquerque, New Mexico 87106

Re: La Vida Nueva Drainage Plan

Dear Marilynn:

Attached hereto is a letter from F. M. Fox and Associates, Inc., agreeing to the lining of the pond with plastic.

Also attached is a letter from Kaiser Aluminum stating that they can supply you with 24-inch aluminum pipe with a Mannings coefficient of 0.017. If you choose to use the aluminum pipe rather than the reinforced concrete pipe as specified, you must modify the slope from 0.004 to 0.0054. There is sufficient depth in order to accomplish this on the project.

If you have any further questions or comments, please do not hesitate to call. Thank you.

Yours truly,

GOLDBERG-MANN & ASSOCIATES, INC.

Thomas T. Mann, Jr., P.E.
President

TTM:pe
Enc.

ALBUQUERQUE
CODE ADMIN.
OCT 2 1980
U.B.C.
PLAN CHECK
SECTION

wall for 1 2

FOX Consulting Engineers and Geologists

F.M. FOX & ASSOCIATES, INC.
3412 BRYN MAWR DRIVE, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 345-3681 — FMFOX

September 29, 1980

Goldberg-Mann & Associates, Inc.
811 Dallas, N.E.
Albuquerque, New Mexico 87110

Attention Mr. Thomas Mann

Subject: Drainage Ponding Area, La Vida Nueva Subdivision, Albuquerque, New Mexico

Gentlemen:

In the original report, Job No. 31100033900, dated October 25, 1978, it was recommended that drainage ponds be located a minimum of 15 feet from the proposed buildings. Because of space constraints, it has been brought to our attention that it will be necessary to place buildings within 3 to 5 feet of ponding areas.

To prevent excessive wetting of foundation soils, the following recommendations should be followed:

1. A polyethylene moisture barrier should be placed extending from the foundation walls of the buildings to the edge of the pond and down the side of the pond to a depth at or below the bottom of pond elevation. This moisture barrier may be covered with backfill material to stabilize its location.

2. The pond should be drained to a positive gravity outfall where accumulated moisture may be removed by pumping.

Give 4 mi. to foundation above the dirt grade —

slab

dirt grade

ALBUQUERQUE
CODE ADMIN.
OCT 2 1980
U.B.C.
PLAN CHECK
SECTION

KAISER ALUMINUM

KAISER ALUMINUM & CHEMICAL SALES, INC.

September 24, 1980

Mr. Tom Mann
811 Dallas NE
Albuquerque, NM 87110

Dear Mr. Mann:

The Manning's Coefficient (n) for 24" diameter helical pipe is 0.017, other pipe values can be found in our brochure. These values are based upon Silberman's Project Report 121 - Further Studies of Friction Factors for Corrugated Aluminum Pipes Flowing Full. Silberman derives the following relationship for helical pipe:

$$n = (7.13 \times 10^{-6}) \times \frac{\theta^{(1.82)}}{D^{(0.042)}}$$

θ = helical angle measured from the pipe axis

D = pipe diameter in feet

In addition, our pipe is gauged for HS-20 loading and the fill height/gauge requirements are summarized in our Storm Sewer brochure on Page 20. I have enclosed a copy for your office.

If I can be of further help, please call.

Sincerely,

Tom Nearn

Tom Nearn
Specification Engineer

TN:ir
enclosures

cc: Barbara Hydan - Rain For Rent, Inc., Albuquerque, NM
Chris Jaschke, 2017 Yale SE, Albuquerque, NM 87106

ALBUQUERQUE
CODE ADMIN.
OCT 2 1980
U.B.C.
PLAN CHECK
SECTION

SUITE 608 EXECUTIVE CLUB BUILDING
1776 SO. JACKSON STREET, DENVER, CO 80210, PHONE 303/758-0585

Goldberg - Mann & Associates, Inc.
Engineers - Planners
811 Dallas St., N.E. Albuquerque, New Mexico 87110 (505) 265-5611

July 14, 1980 0-71

Mr. Richard Heller
City Engineer
P.O. Box 1293
Albuquerque, New Mexico 87103

Re: La Vida Nueva Drainage Plan

Dear Mr. Heller:

As you know, Marilyn Cooper is attempting to get a subdivision plat signed for the La Vida Subdivision. We have prepared the subdivision plat and are subsequently modifying the Bohannan-Huston drainage report to take into account the new layout of the subdivision.

The original drainage report required a pond volume of 15,600 cubic feet for the Area 3 drainage area in which this subdivision is located. I have enclosed a print of the drainage plan which shows respective areas and also outlines the proposed subdivision. That portion of the subdivision that is already constructed I have assumed to be constructed in accordance with the Bohannan recommendation. However, for that portion that has not been constructed, I have calculated a new Composite C factor to determine the required pond volume. In addition, we have juggled the boundaries of the drainage area slightly so that the original pond volume must be modified somewhat.

My calculations indicate that the areas associated with the new drainage basins are as follows:

Area 1	4.46 acres
Area 2	2.00 acres
Area 3	2.13 acres

Since the area is being developed with less density than when the original drainage report was prepared, the runoff will be less and, as a consequence, the required ponding volume will be less. The pond volumes required for the respective areas are as follows:

Area 1	28,208 cubic feet
Area 2	will remain the same
Area 3	11,675 cubic feet

It is proposed that the drop inlet constructed at the northwest corner of the project site be utilized to drain into the ponding area along the west side of the project site. In addition, waters from the northern part of the site also will be allowed to drain into the pond. Waters from the southern part of the site will be allowed to drain to Pond 3, and runoff from both the north and south areas will be ponded in the rear yards of the extreme north and south units. The pond volume provided is 12,257 cubic feet.

This plan will meet the requirements of the original drainage report and take into consideration the lower densities.

If you have any questions or comments, please do not hesitate to call. Thank you.

Yours truly,

GOLDBERG-MANN & ASSOCIATES, INC.

Thomas T. Mann, Jr., P.E.
President

TTM:jj
Enc.
cc:Marilyn Cooper, w/o enc.

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE February 22, 1980 REF. NO._____

K12-D4

TO: Charles Volz, Chief Building Official

FROM: Richard Heller, City Engineer RH

SUBJECT: Building Permits in La Vita Nueva Subdivision

This memorandum is to request that no building permits be issued in La Vita Subdivision, until further notice.

Due to the lack of compliance with the approved grading plan, and related runoff storage areas, flooding conditions would affect both the existing buildings, and any proposed new construction.

The above requirement is made in compliance with the Flood Hazard Management Program.

RH/lc
cc: Marilyn Cooper
Bruno Conegliano
Drainage file

BOHANNAN-HUSTON INC.
4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000

October 16, 1978

Mr. H. R. Orr, Jr.
Acting Director of Public Works
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Drainage Report for La Vida Nueva Subdivision

Dear Mr. Orr:

Enclosed are two copies of the revised drainage report for the La Vida Nueva Subdivision. The revised report reflects all the changes and revisions as required by the city.

If there are any questions regarding this matter, please contact this office.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

Enclosures

cc: Ms. Marilynn Cooper

IJP/js
Job No. 78-127

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

September 18, 1978

Mike Emery
Bohannan-Huston, Inc.
4125 Carlisle Blvd. N.E.
Albuquerque, New Mexico 87107

RE: DRAINAGE REPORT FOR LA VIDA NUEVA

Dear Mr. Emery;

I have reviewed the captioned drainage report and I have reservations on whether the property under study can be developed at this time. The inadequacy of the outfall sewer that serves Central Avenue and that crosses this property, results in flooding of Central Avenue West of the Isleta drain, of 46th Street and of 47th Street.

According to the Bovay Study of drainage for the West Mesa some 950 cfs could be expected in the Central Avenue Storm Drainage System, with the 100 year storm. I cannot agree with the statement in the report which says "the area is unaffected by upland drainage from any of the surrounding areas" because of the conditions described above.

A thorough investigation of the flooding potential under existing conditions will have to be supplied before concurrence with any development scheme may be granted. This investigation will have to evaluate if the surcharged conditions in the 48" storm sewer outfall could result into an outflow onto this property and whether excess water conveyed to the Isleta drain would result in an overflow from this source as well.

It is conceivable that the individual townhouses and apartments could be flood proofed but the water surface elevation would have to be defined in order to specify the individual finished floor elevations.

The plan submitted does not show the presently platted location of Osage Rd. and abandonment of the existing Right-of-way would require the retention of a 10' drainage easement centered over the existing storm sewer alignment.

Even though draining the ponds would be desirable for both safety and health reasons, the City does not require such a positive outfall at this

time. In view of the fact that the owner has indicated her unwillingness of providing the small diameter outfall from the proposed ponds to the existing storm sewer, as recommended in the drainage report, an amendment to said report should be submitted reflecting more accurately the proposed drainage scheme. Finally, on the plat it should be noted that the owners and its successors will insure the integrity and the maintenance of the ponds which are to be constructed according to the plan on file in the City Engineer's Office.

Yours Truly,

Bruno Conegliano
Asst. City Engineer-Hydrolgoy

BC/tl

cc: Rick Leonard, AMAFCA
C. D. Sheppard, Acting City Engineer
Drainage File

RECEIVED
SEP 9 RECD
HYDROLOGY SECTION

ENGINEER'S

DRAINAGE REPORT

LA VIDA NUEVA SUBDIVISION

ZONE MAP K-12

WILSON & COMPANY

ENGINEERS & ARCHITECTS

1321 SAN PEDRO DRIVE N.E.

ALBUQUERQUE, NEW MEXICO

ROBERT F. SYKES
NEW MEXICO
4591
REGISTERED PROFESSIONAL ENGINEER

JUNE 1983

(83-510)

REV. SEPT. 1983

WILSON & COMPANY
ENGINEERS ARCHITECTS

DRAINAGE REPORT

LA VIDA NUEVA SUBDIVISION

ZONE MAP K-12

PURPOSE: The purpose of this report is to show existing drainage conditions within La Vida Nueva Subdivision and the proposed drainage improvements.

GENERAL: The drainage plan for the La Vida Nueva Subdivision has been revised several times in the past five years. Also, the City of Albuquerque's requirements for drainage control have been revised since the project was first initiated.

EXISTING CONDITIONS: The project site is very flat and streets have been graded and built with a sawtooth grading plan with catch basins constructed at low points. The catch basins discharge to on site ponding areas. The existing buildings are slab on grade and are constructed on fill with a slab elevation of at least 4951.50.

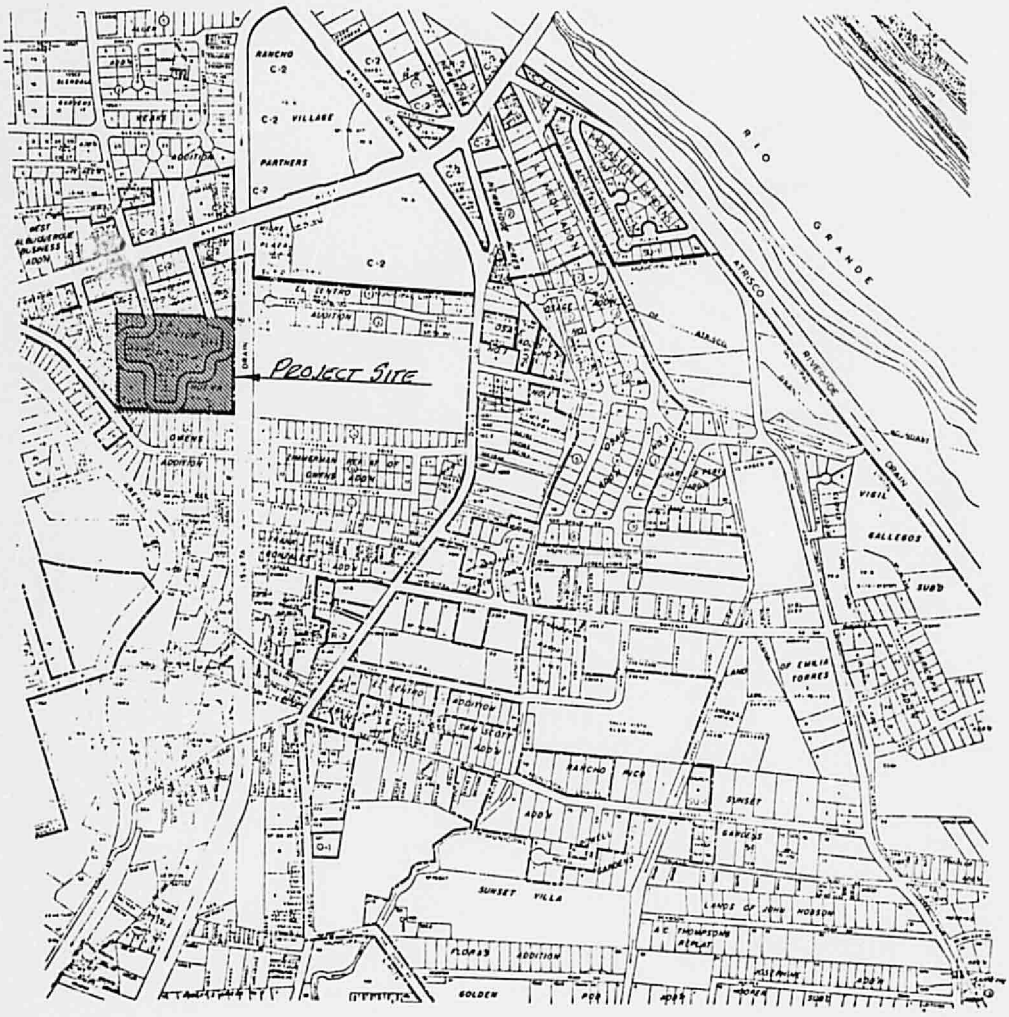
No offsite drainage enters the project site. It is the intent of the Developer to drain all on site drainage to catch basins. At locations where a wooden fence has been constructed an earth berm has been placed to keep storm water from flowing beneath the fence.

PROPOSED IMPROVEMENTS: It is proposed to eliminate the existing ponding areas and construct a storm drain system which discharges to the Isleta Drain. The size of the required storm drain is controlled by catch basin grate capacity. Since all the catch basins are located in a sump, the head or depth of ponding on the grate controls the rate of discharge to the storm drain. The maximum ponding depth for catch basin which serves Drainage Area 1 is about 0.55 ft. The maximum ponding depth for catch basins serving Drainage Area 2 and Drainage Area 3 will not exceed 0.40 feet.

A portion of the storm drain system will operate under pressure, with actual grade line of 0.42% and a hydraulic grade line of 0.50%.

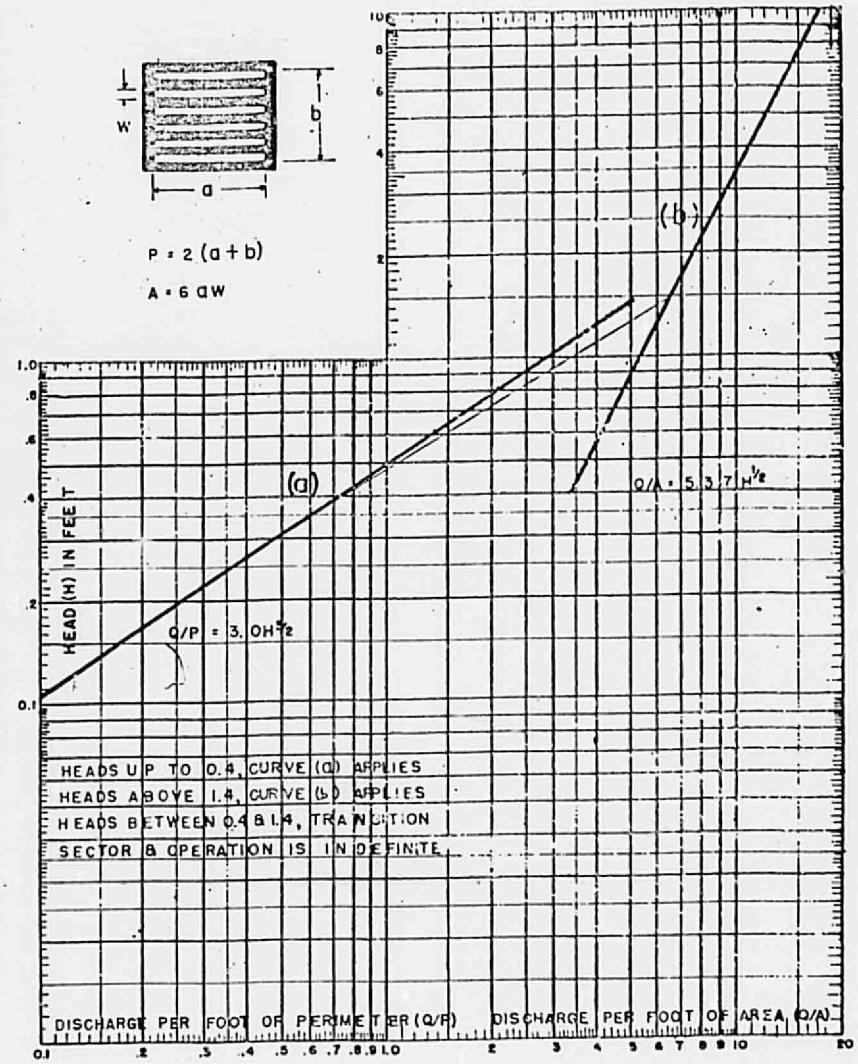
As required by the MRGCD, a silt trap will be constructed before the storm drain discharges to the Isleta Drain. Also rock rip-rap will be installed at the point of discharge to protect the banks of the Isleta Drain.

ATTACHMENTS: The attached Zone Map shows the location of the project. The calculations show the parameters used to calculate storm water runoff, the capacity of existing facilities and determine the size of proposed improvements. The attached plans show existing and proposed improvements.



JUNE 1982

K-12-Z



CAPACITY OF GRATE INLET IN SUMP
WATER PONDED ON GRATE

Fig. 8

COMP. RFS
CK.
DATE 10 June 1983

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC Albuquerque FILE 83-510
PROJ La Vida Nueva SHEET 1
SUBJ Drainage Rept. OF 6

DRAINAGE AREA.
TOTAL AREA = 8.79 Ac.

Sub Areas.
A-1 = 4.10 Ac.
A-2 = 2.17 Ac
A-3 = 2.07 Ac
A-4 = 0.45 Ac.

Run-Off Calc. Use Rational Formula Q=CiA

∴ AREA - A-1
Area = 4.10 Ac
i_{100} @ HR = 2.23 (DPM Vol. 2)
t_c = 10 min
i_{100} = 2.23 x 2.15 = 4.79
C = .78

75% Impervious = .75 x .90 = .68
25% Pervious = .25 x .40 = .10
Σ = .78

Q_{100} A-1 = CiA = .78 x 4.79 x 4.10 = 15.32 cfs.

AREA A-2
t_c = 10 min i_{100} = 4.79
C = .78
A = 2.17 Ac

Q_{100} = .78 x 4.79 x 2.17 = 8.11 cfs

AREA A-3
t_c = 10 min i_{100} = 4.79
C = .78
A = 2.07 Ac

Q_{100} = .78 x 4.79 x 2.07 = 7.73 cfs

COMP. RFS

CK.

DATE 10 June 1983

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC. Albuquerque FILE 83-510

PROJ. La Vida Nueva SHEET 2

SUBJ. Drainage Report OF 6

AREA 4

t_c = 10 min i_{100} = 4.79

C = 0.78

Area = 0.45 Ac

Q_{100} = CiA = 0.78 x 4.79 x 0.45 = <u>1.68 cfs</u>

Area discharge to two inlets at So End 46th St.

COMP. RFS

CK.

DATE 10 June 88

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC. Albuquerque FILE 83-510

PROJ. La Vida Nueva SHEET 3

SUBJ. Drainage Report OF 6

AREA A-1 =

tc min	i	C	A Acres	Q cfs	Total Inflow c.f	1-INLET @ .5 Depth TOTAL OUTFLOW Q=9.9 cfs	.3 Depth TOTAL OUTFLOW Q=4.95 cfs
10	4.79	.78	4.10	15.32	9192	5940	2970
15	3.90			12.48	11,232	8910	4455
20	3.35			10.70	12,837	11880	5940
25	3.01			9.63	14,441	**14850	7425
30	2.72			8.70	15,661	17820	8910
40	2.34			7.49	17,971		11880
50	2.07			6.63	19,897		14850
60	1.90			6.06	21,822		17820
70	1.74			5.56	23,371		20790
80	1.63			5.21	24,989		23760
90	1.54			4.92	26,572		**26730
100	1.45			4.64	27,813		29700
110	1.38			4.42	29,182		
120	1.32			4.21	30,295		
130	1.27			4.06	31,707		

AREA A-2

tc min	i	C	A Acres	Q cfs	Total Inflow c.f	1-Inlet .5' depth Total Outflow Q=9.9 cfs	1-Inlet .3' depth Total Outflow Q=4.95
10	4.79	.78	2.17	8.11	4866	*5940	2970
15	3.90			6.60	5940	8910	4455
20	3.35			5.67	6804	11880	5940
25	3.01			5.09	7642	14850	**7425
30	2.72					17820	8910
40	2.34						11880
50	2.07						14850
60	1.90						17820
70	1.74						
80	1.63						
90	1.54						

*Never gets .5 depth
** Outflow exceeds Inflow

COMP. RFS

CK.

DATE 10 June 83

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC Albuquerque FILE 83-510

PROJ La Vista Nueva SHEET 4

SUBJ Drainage Report OF 6

Area A-3

consider only 1-inlet since grate of one is 0.46' above the other.

tc min	i	C	A Ac.	Q cfs	Total Inflow cf	1-Inlet 0.5' depth Outflow Q=9.9cfs	1-Inlet 0.3' depth Outflow Q=4.95cfs
10	4.79	.78	2.07	7.73	4640	*5940	2970
15	3.90	↓	↓	6.30	5667	8910	4455
20	3.35	↓	↓	5.41	6490	11880	5940
25	3.01	↓	↓	4.86	7289	14850	**7425
30	2.72	↓	↓			17820	8910
40	2.34	↓	↓				11880
50	2.07	↓	↓				14850
60	1.90	↓	↓				17820

* Depth never reaches 0.5'
** Outflow exceeds inflow.

COMP. RFS
CK.
DATE 10 June 83

WILSON & COMPANY
ENGINEERS & ARCHITECTS

LOC Albuquerque FILE 83-510
PROJ La Vida Nueva SHEET 5
SUBJ Drainage Report OF 6

Capacity 24" CMP
From Area 3 to Area 2

Length = 192

Slope - $S = \frac{40.7 - 45.9}{192} = .0042$

$n = 0.021$ $R = 0.50$ $A = 3.14$

$V_{full} = \frac{1.486}{n} R^{2/3} S^{1/2}$

$V_{full} = \frac{1.486}{.021} \times .50^{2/3} \times .0042^{1/2}$

$V_{full} = 2.89$ ft/sec

$Q_{FULL} = 3.14 \times 2.89 = 9.07$ cfs.
Q required = 4.45 cfs. (based on Inlet Capacity)

Capacity 24" CMP
From Area 2 to Area 1

Length = 345

Slope $\frac{45.9 - 44.45}{345} = 0.0042\%$

$V_{full} = 2.89$ ft/sec

$Q_{full} = 9.07$ cfs

Q required = 9.90 cfs (2 Inlets) Hyd grade line - 0.0050'/ft

Pipe will be under pressure.

∴ If an $n = 0.017$ is accepted then capacity of 24"ϕ CMP is 11.20 cfs. I do not believe this to be a realistic number, and prefer the pipe to be under pressure.

COMP. RFS
CK.
DATE 10 June 83

WILSON & COMPANY
ENGINEERS & ARCHITECTS

LOC Albuquerque FILE 83-510
PROJ La Vida Nueva SHEET 6
SUBJ Drainage Report OF 6

CAPACITY 30" CMP

$Q = Av$

$A = 4.91$ sq ft.

slope = 0.80%

$n = 0.021$

$Q = 4.91 \times \frac{1.486}{n} \times r^{2/3} s^{1/2}$

$Q = 4.91 \times 70.76 \times .625^{2/3} \times .008^{1/2}$

$Q_{\text{cap full}} = 4.91 \times 70.76 \times .73 \times .089 = 22.7$ cfs

$Q_{\text{DESIGN}} = 20$ cfs.

ENGINEER'S

DRAINAGE REPORT

LA VIDA NUEVA SUBDIVISION

ZONE MAP K-12

WILSON & COMPANY

ENGINEERS & ARCHITECTS

1321 SAN PEDRO DRIVE N.E.

ALBUQUERQUE, NEW MEXICO

ROBERT F. SYKES
NEW MEXICO
4591
REGISTERED PROFESSIONAL ENGINEER

RECEIVED

JUN 24 1983

ENGINEERING

JUNE 1983

(83-510)

WILSON
COMPANY
ENGINEERS
ARCHITECTS

DRAINAGE REPORT

LA VIDA NUEVA SUBDIVISION

ZONE MAP K-12

PURPOSE: The purpose of this report is to show existing drainage conditions within La Vida Nueva Subdivision and the proposed drainage improvements.

GENERAL: The drainage plan for the La Vida Nueva Subdivision has been revised several times in the past five years. Also, the City of Albuquerque's requirements for drainage control have been revised since the project was first initiated.

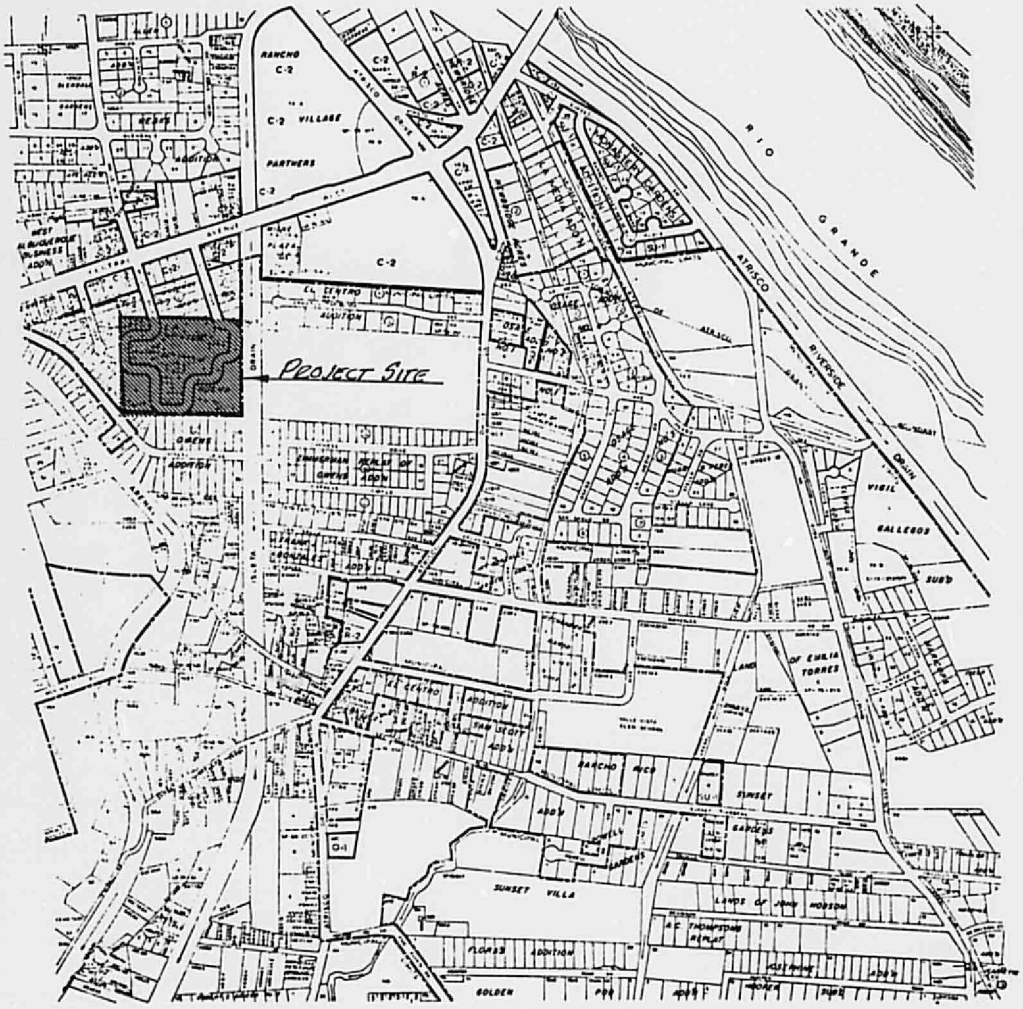
EXISTING CONDITIONS: The project site is very flat and streets have been graded and built with a sawtooth grading plan with catch basins constructed at low points. The catch basins discharge to on site ponding areas. The existing buildings are slab on grade and are constructed on fill with a slab elevation of at least 4951.50.

PROPOSED IMPROVEMENTS: It is proposed to eliminate the existing ponding areas and construct a storm drain system which discharges to the Isleta Drain. The size of the required storm drain is controlled by catch basin grate capacity. Since all the catch basins are located in a sump, the head or depth of ponding on the grate controls the rate of discharge to the storm drain. The maximum ponding depth for catch basin which serves Drainage Area 1 is about 0.55 ft. The maximum ponding depth for catch basins serving Drainage Area 2 and Drainage Area 3 will not exceed 0.40 feet.

A portion of the storm drain system will operate under pressure, with actual grade line of 0.42% and a hydraulic grade line of 0.50%.

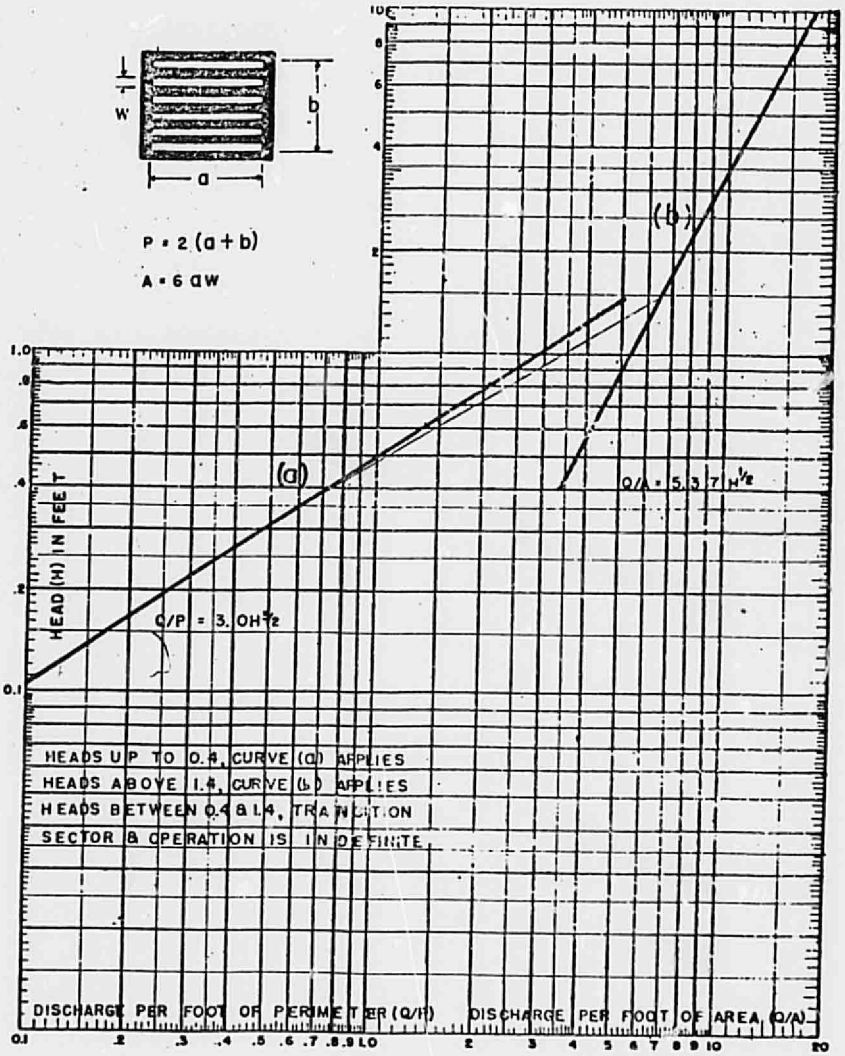
As required by the MRGCD, a silt trap will be constructed before the storm drain discharges to the Isleta Drain. Also rock rip-rap will be installed at the point of discharge to protect the banks of the Isleta Drain.

ATTACHMENTS: The attached Zone Map shows the location of the project. The calculations show the parameters used to calculate storm water runoff, the capacity of existing facilities and determine the size of proposed improvements. The attached plans show existing and proposed improvements.



JUNE 1987

K-12-Z



CAPACITY OF GRATE INLET IN SUMP
WATER PONDED ON GRATE

Fig. 8

COMP. RFS
CK.
DATE 10 June 1988

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC Albuquerque FILE 83-510
PROJ La Vida Nueva SHEET 1
SUBJ Drainage Rept. OF 6

DRAINAGE AREA.
TOTAL AREA = 8.79 Ac.

Sub Areas.
A-1 = 4.10 Ac.
A-2 = 2.17 Ac
A-3 = 2.07 Ac
A-4 = 0.45 Ac.

Run-Off Calc. Use Rational Formula Q=CiA

∴ AREA - A-1
Area = 4.10 Ac
i_{100} CHR = 2.23" (DPM Vol. 2)
t_c = 10min
i_{100} = 2.23 x 2.15 = 4.79
C = .78

75% Impervious = .75 x .90 = .68
25% Pervious = .25 x .40 = .10
Σ = .78

Q_{100} A-1 = CiA = .78 x 4.79 x 4.10 = 15.32 cfs.

AREA A-2
t_c = 10min i_{100} = 4.79
C = .78
A = 2.17 Ac

Q_{100} = .78 x 4.79 x 2.17 = 8.11 cfs

AREA A-3
t_c = 10min i_{100} = 4.79
C = .78
A = 2.07 Ac

Q_{100} = .78 x 4.79 x 2.07 = 7.73 cfs

COMP. IZFS
CK.
DATE 10 June 1983

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC Albuquerque FILE 83-510
PROJ La Vida Nueva SHEET 2
SUBJ Drainage Report OF 6

AREA 4
t_c = 10 min i_{100} = 4.79
C = 0.78
Area = 0.45 Ac

$Q_{100} = CiA = 0.78 \times 4.79 \times 0.45 =$ 1.68 cfs

Area discharge to two inlets at So End
46th St.

COMP. RFS

CK.

DATE 10 June 88

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC Albuquerque FILE 83-510

PROJ La Vida Nueva SHEET 3

SUBJ Drainage Report

AREA A-1

tc min	i	C	A Acres	Q cfs	Total Inflow c.f	1-INLET @ .5 Depth TOTAL OUTFLOW Q=9.9 c.f.	.3 Depth TOTAL OUTFLOW Q=4.95
10	4.79	.78	4.10	15.32	9192	5940	2970
15	3.90			12.48	11,232	8910	4455
20	3.35			10.70	12,837	11880	5940
25	3.01			9.63	14,441	**14850	7425
30	2.72			8.70	15,661	17820	8910
40	2.34			7.49	17,971		11880
50	2.07			6.63	19,897		14850
60	1.90			6.06	21,822		17820
70	1.74			5.56	23,571		20790
80	1.63			5.21	24,989		23760
90	1.54			4.92	26,572		**26,730
100	1.45			4.64	27,813		29700
110	1.38			4.42	29,182		
120	1.32			4.21	30,295		
130	1.27			4.06	31,707		

AREA A-2

tc min	i	C	A Acres	Q cfs	Total Inflow c.f	1-Inlet .5' depth Total Outflow Q=9.9 c.f	1-Inlet .3' depth Total Outflow Q=4.95
10	4.79	.78	2.17	8.11	4866	*5940	2970
15	3.90			6.60	5940	8910	4455
20	3.35			5.67	6804	11880	5940
25	3.01			5.09	7642	14850	**7425
30	2.72					17820	8910
40	2.34						11880
50	2.07						14850
60	1.90						17820
70	1.74						
80	1.63						
90	1.54						

*Never gets .5 depth
** Outflow exceeds Inflow

COMP. RFS
CK.
DATE 10 June 83

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC Albuquerque FILE 83-510
PROJ La Vida Nueva SHEET 4
SUBJ Drainage Report OF 6

Area A-3

consider only 1- inlet since grate of one is 0.46' above the other.

tc min	i	C	A Ac.	Q cfs	Total Inflow cf	1-Inlet 0.5' depth Outflow Q=9.9cfs	1-Inlet 0.3' depth Outflow Q=4.45cfs
10	4.79	.78	2.07	7.73	4640	*5940	2970
15	3.90	↓	↓	6.30	5667	8910	4455
20	3.35	↓	↓	5.41	6490	11880	5940
25	3.01	↓	↓	4.86	7289	14850	**7425
30	2.72	↓	↓			17820	8910
40	2.34	↓	↓				11880
50	2.07	↓	↓				14850
60	1.90	↓	↓				17820

* Depth never reaches 0.5'
** Outflow exceeds inflow.

COMP. RFS
CK.
DATE 10 June 83

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC. Albuquerque FILE 83-510
PROJ. La Vida Nueva SHEET 5
SUBJ. Drainage Report OF 6

Capacity 24" CMP
From Area 3 to Area 2

Length = 192

Slope - $S = \frac{46.7 - 45.9}{192} = .0042$

$n = 0.021$ $R = 0.50$ $A = 3.14$

$V_{full} = \frac{1.486}{n} R^{2/3} S^{1/2}$

$V_{full} = \frac{1.486}{.021} \times .50^{2/3} \times .0042^{1/2}$

$V_{full} = 2.89$ ft/sec

$Q_{FULL} = 3.14 \times 2.89 = 9.07$ cfs.
Q required = 4.45 cfs. (based on Inlet Capacity)

Capacity 24" CMP
From Area 2 to Area 1

Length = 345

Slope $\frac{45.9 - 44.45}{345} = 0.0042\%$

$V_{full} = 2.89$ ft/sec

$Q_{full} = 9.07$ cfs

Qrequired = 9.90 cfs (2 Inlets) Hyd grade line = 0.0050'/ft

Pipe will be under pressure.

∴ If an n = 0.017 is accepted then capacity of 24"ø CMP is 11.20 cfs. I do not believe this to be a realistic number, and prefer the pipe to be under pressure.

COMP. RFS

CK.

DATE 10 June 83

WILSON & COMPANY
ENGINEERS ARCHITECTS

LOC Albuquerque FILE 83-510

PROJ. La Vida Nueva SHEET 6

SUBJ. Drainage Report OF 6

CAPACITY 30" CMP

$Q = AV$

$A = 4.91$ sq ft

slope = 0.80%

$n = 0.021$

$Q = 4.91 \times \frac{1.486}{n} \times r^{2/3} S^{1/2}$

$Q = 4.91 \times 70.76 \times .625^{2/3} \times .008^{1/2}$

$Q_{cap\ full} = 4.91 \times 70.76 \times .73 \times .089 = 22.7$ cfs

$Q_{DESIGN} = 20$ cfs.

F. M. FOX & ASSOCIATES, INC.
Consulting Engineers and Geologists

2501 CANDELARIA ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 345-3681 — FMFOX

SOIL AND FOUNDATION INVESTIGATION
PROPOSED APARTMENT COMPLEXES
TRACTS A, B AND C
HEATHER RAE ADDITION
ALBUQUERQUE, NEW MEXICO

Prepared For
Bohannan-Huston, Inc.

Job No. 31100033900
October 25, 1978

ALBUQUERQUE • DENVER

HYDROLOGY K12/D4 13 PLANS 2 of 2

TABLE OF CONTENTS

GENERAL	Page	1
PROPOSED CONSTRUCTION AND SITE CONDITIONS		1
SUBSOIL CONDITIONS		2
FOUNDATIONS - CONVENTIONAL SPREAD FOOTINGS		3
INTERIOR FLOOR SLAB CONSTRUCTION		4
REINFORCING		5
BACKFILL AND SURFACE DRAINAGE		5
IRRIGATION OF LANDSCAPED AREAS		6
CONSTRUCTION INSPECTION		6
TEST HOLE LOCATION PLAN	Figure	1
LOGS OF TEST HOLES		2
SWELL-CONSOLIDATION TESTS		3 & 4
SUMMARY OF LABORATORY TEST DATA	Table	1
GUIDE SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL	Appendix	A-1

GENERAL

This report presents the results of a soil and foundation investigation conducted at the site of the proposed apartment complexes to be located on Tracts A, B and C of the replat of Heather Rae Addition, Albuquerque, New Mexico.

The purpose of this investigation is to determine the safest and most economical types and depths of foundations, allowable soil bearing pressures, ground water conditions, and any special precautions which should be taken in the design and construction of the proposed apartments.

The conclusions and recommendations presented in this report are based on factual data gathered during the site investigation, on the results of laboratory testing, and on our experience with similar soil conditions. Factual data gathered during the field and laboratory investigations are presented in Figures 1 through 4 and Table 1.

PROPOSED CONSTRUCTION AND SITE CONDITIONS

Although the construction plans have not been finalized at the time of this report, it is our understanding from information supplied by the office of Schlegel and Lewis, A.I.A., that the subject tracts will be developed with one, and/or two-story apartment complexes. The proposed complexes will be erected utilizing woodframe and stucco, or brick veneer-type construction.

No sublevels or basements are planned, and interior floors will be concrete slabs-on-grade. Building loads will be transmitted to the foundation soils through a system of bearing walls. For the purpose of this report, bearing wall loads are estimated to be a maximum of 2300 pounds per lineal foot.

The three proposed construction sites are located within the Heather Rae Addition, and within the specific areas as indicated on the Test Hole Location Plan, Figure 1. The Heather Rae Addition is bordered on the north by the Zimmerman Addition; on the west and south by the Owens Addition; and on the east by the Isleta Drain. The site is relatively flat, and is covered with a substantial amount of grass and brush, and moderate amounts of trash and debris. It is anticipated that only minor amounts of site grading will be required prior to construction.

SUBSOIL CONDITIONS

As shown on the Logs of Test Holes, Figure 2, subsoil conditions are fairly uniform, while varying with depth. The test holes generally encountered 4.0 to 6.0 feet of medium to fine-grained, silty to very silty, medium-dense to dense sand, overlying coarse to fine-grained, well to poorly graded, loose to medium-dense sand. At a depth of 1.5 feet, Test Hole #1 encountered a thin lens of very sandy silt and high-plasticity clay.

Ground water was encountered in all of the test holes at depths varying between 8.0 and 8.5 feet. Bedrock was not encoun-

tered in any of the test holes to a depth of 20.0 feet, the maximum depth of exploration.

The very sandy silt and high-plasticity clay encountered in Test Hole #1 will exhibit only a very low swell potential upon an increase in its natural moisture content. The silty to very silty sands, and clean to slightly silty sands will exhibit moderate consolidation potential upon saturation, and when subjected to the anticipated building loads. Refer to the results of the Swell-Consolidation Tests, Figures 3 and 4.

Possible settlement may be minimized by means of preconstruction densification of the foundation soils, as well as other positive methods designed to control the natural moisture content of the foundation soils.

FOUNDATIONS - CONVENTIONAL SPREAD FOOTINGS

The proposed structures may be supported on conventional spread footings founded on compacted natural soils, or structurally controlled fill, and designed for a maximum soil bearing pressure of 1500 pounds per square foot. Footings should be placed a minimum of 18 inches below final exterior grade for frost protection.

Prior to the placement of structurally controlled fill, and subsequent to final cuts in building areas, the natural soils should be scarified and moistened to optimum moisture content

(± 2%) for as deep as practicable, and compacted to a minimum of 95 % of maximum density as determined by ASTM D-1557 with the use of a heavy vibratory roller. Any structurally controlled fill should then be placed as detailed in the attached Appendix. Should the use of a heavy vibratory roller pose a threat to the structural integrity of the surrounding buildings, a heavy pneumatic roller may be used in its place. Subsequent to footing excavation, the bearing surfaces should be moistened to optimum moisture content (± 2%), and compacted to a minimum of 95% of maximum density as determined by ASTM D-1557.

The footings should be proportioned as much as practicable in order to minimize differential settlement. However, a minimum footing width of 16 inches is recommended.

INTERIOR FLOOR SLAB CONSTRUCTION

Interior floor slabs may be supported on compacted natural soils, or structurally controlled fill. Prior to the placement of slabs, the natural soils should be scarified and moistened to optimum moisture content (± 2%), and compacted to a minimum of 90% of maximum density as determined by ASTM D-1557. Fill placed for slab support should be compacted in accordance with the specifications as outlined in the attached Appendix. It is good practice to separate slabs from all bearing members and utility lines to allow their independent movement. However, if desired, slabs may be tied into foundation walls.

Where concentrated loads are anticipated, and to break capillary moisture rise, a minimum 4-inch gravel layer should be placed beneath the slab. Frequent joints should be scored in the slabs to help control the location of any cracking.

REINFORCING

It is recommended that the foundations be well reinforced to minimize the effects of differential settlement, refer to foundation design for details.

BACKFILL AND SURFACE DRAINAGE

Foundation soils should be prevented from being wetted after construction. Backfill around the foundations should be moistened and compacted to a minimum of 90% of maximum density as determined by ASTM D-1557. Only enough water should be added to the backfill material to allow proper compaction. Do not puddle or jet backfill.

The final grade should have a good slope away from the foundation walls on all sides. A minimum of 1 foot of fall in the first 10 feet from all foundation walls is recommended. Drainage from roofs, with or without gutters and downspouts, should discharge onto splash blocks where the ground surface is not protected by concrete slabs, or asphalt pavement. Surface water should not be allowed to pond in the backfill areas.

Ponding areas required for the control of surface runoff should be located as far from foundations as possible, a minimum of 15 feet.

IRRIGATION OF LANDSCAPED AREAS

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

CONSTRUCTION INSPECTION

The recommendations outlined above are based on current plans for the proposed apartment complexes. If the plans are modified in the future, we should be contacted to review our recommendations.

In any soil investigation it is necessary to assume that the soil conditions do not vary greatly from the conditions encountered in the test holes. Our experience has shown that variations do exist, and that they are usually apparent during the foundation excavation. For this reason, it is advisable that we be called to inspect the soils exposed in the founda-

tion excavation prior to construction, and to supervise fill placement.

We are available to discuss the details of this report with you. Thank you for the opportunity of working with you on this project.

F. M. Fox & Associates of the Southwest, Inc.

Joseph L. Sullivan
Staff Engineer

CHARLES M. MILLER
STATE OF
No. 6018
NEW MEXICO
REGISTERED PROFESSIONAL ENGINEER

Reviewed by:

Charles M. Miller
Professional Engineer

Copies: Bohannan-Huston, Inc. (3)

TEST HOLE LOCATION PLAN

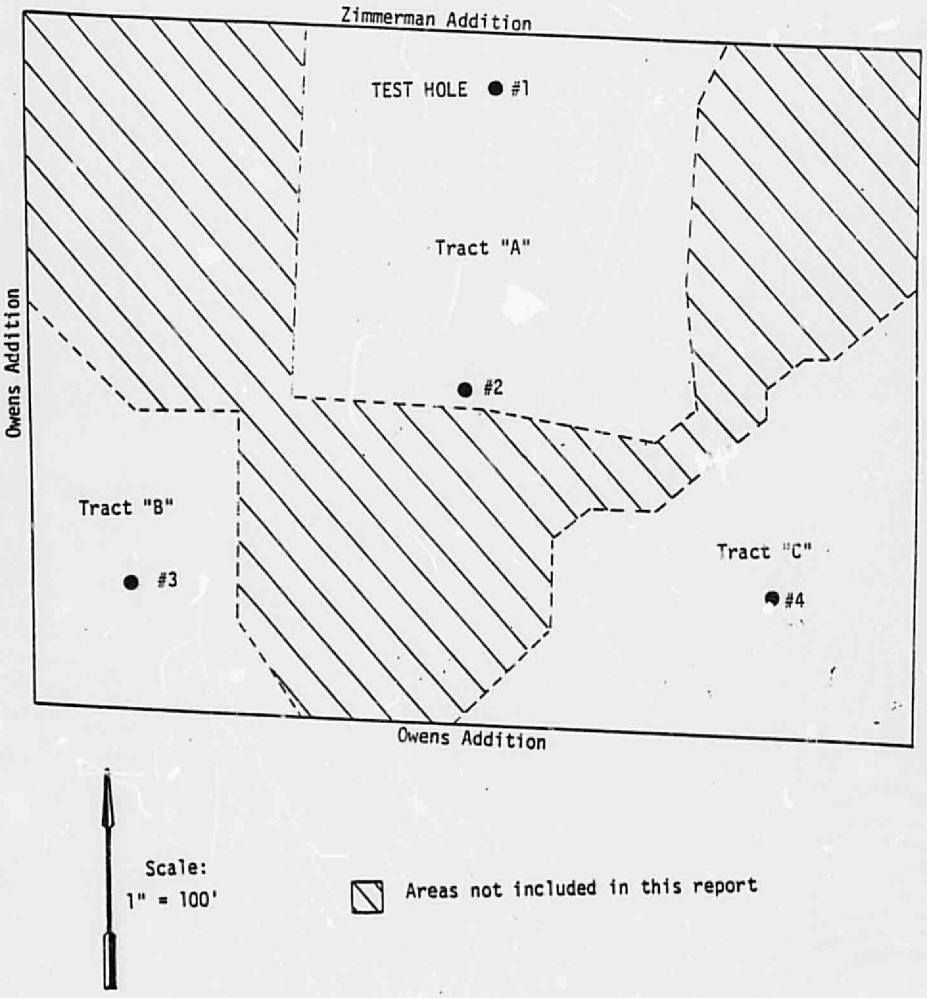
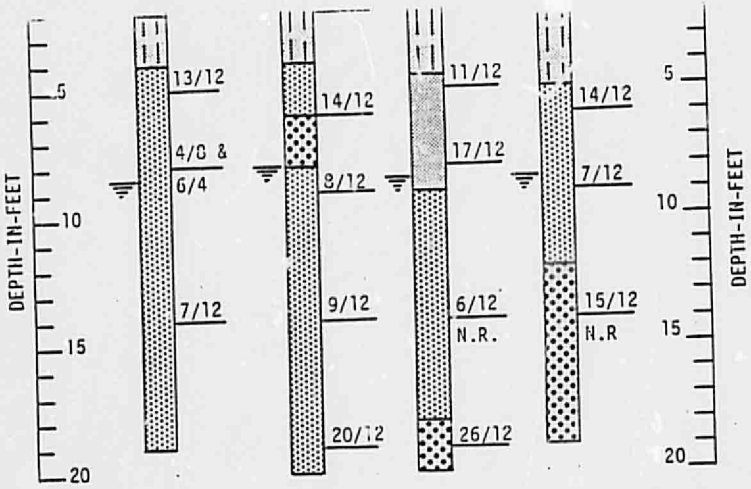


Figure 1



LEGEND

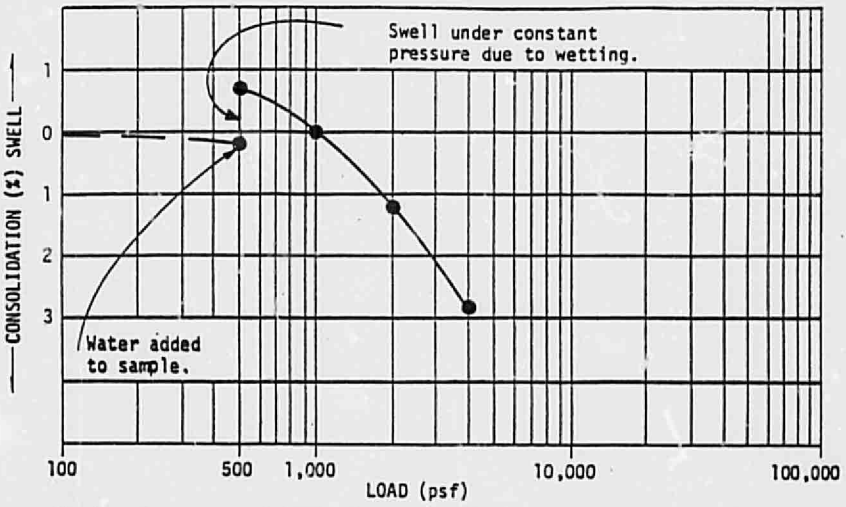
- SAND, coarse to fine-grained, silty, medium dense to dense, medium moist, some slightly calcareous, light brown to brown (SM)
- SILT AND CLAY, very sandy, stiff to very stiff, medium moist to moist, brown (ML,CH)
- SAND, medium to fine-grained, some scattered gravels, clean to slightly silty, loose to medium dense, moist to wet, light brown to gray (SP)
- SAND, coarse to fine-grained, with scattered gravel, medium dense, wet, gray (SW)
- SAND, medium to fine-grained, slightly silty, medium dense, medium moist to very moist, light brown (SP-SM)
- indicates depth of water table at time of drilling.

N.R. indicates no sample recovery.

NOTES

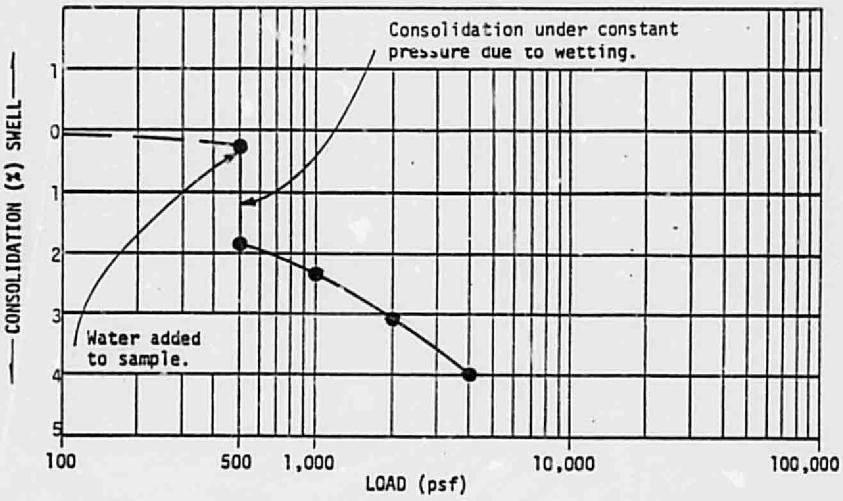
1. Test holes were drilled on October 13, 1978, with a 6-inch diameter continuous flight hollowstem power auger.
2. (26/12) location of Standard Penetration Test; indicates that 26 blows with a 140-pound hammer, falling 30 inches, were required to drive a 2-inch diameter sampler 12 inches.
3. Ground water was encountered in all test holes during drilling at the depths as indicated on the Logs of Test Holes.

Figure 2



Sample of very sandy SILT from test hole 1 from depth 1 feet.

Natural Moisture Content 4.4% Natural Dry Density 108 pcf

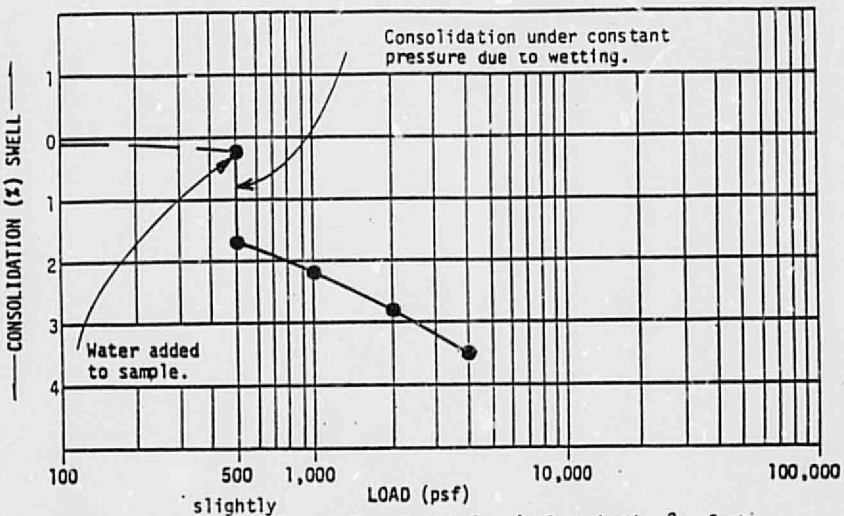


Sample of SAND from test hole 1 from depth 5 feet.

Natural Moisture Content 4.8% Natural Dry Density 95 pcf

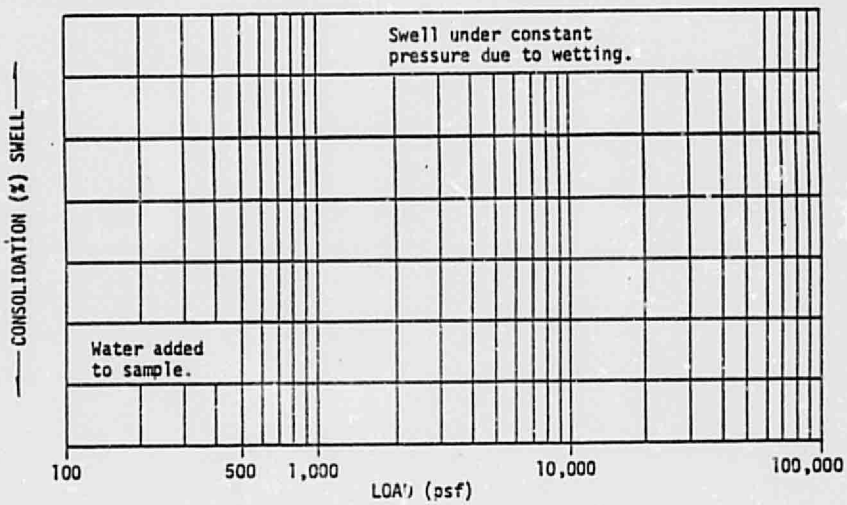
Form 1-109

FIGURE 3



Sample of slightly silty SAND from test hole 4 from depth 2 feet.

Natural Moisture Content 4.0% Natural Dry Density 101 pcf



Sample of _____ from test hole ____ from depth ____ feet.

Natural Moisture Content _____ Natural Dry Density _____

'orm 1-109

FIGURE 4

SUMMARY OF LABORATORY TEST DATA

Hole No.	Depth of Sample (ft)	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits LL	Atterberg Limits PI	Sieve Analysis % Passing No. 4	Sieve Analysis % Passing No. 10	Sieve Analysis % Passing No. 40	Sieve Analysis % Passing No. 200	Soil Description	Remarks
1	1	108	4.4	24	NP	100	100	99	51	very sandy SILT	Figure 3
1	5	95	4.8	NV	NP	100	99	69	1	SAND	Figure 3
4	2	101	4.0	NV	NP	100	99	68	5	slightly silty SAND	Figure 4

NV indicates No Value

NP indicates Non-Plastic

Table 1

APPENDIX

GUIDE SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL

GENERAL

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

Non-Expansive Fill Material

Non-expansive fill material shall be sands or gravels which have a plasticity index not greater than 12. The following criteria should be used for determination of acceptable amounts of fines in the non-swelling fill materials.

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

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

Preparation of Bearing Surfaces

The bearing surface under the foundations shall be scarified, moistened to optimum moisture content (± 2%) for as deep as practicable, and compacted with a heavy vibratory roller to a minimum of 95% maximum Proctor density.

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

Prior to the placement of site fill, and subsequent to

final grading in cut sections, the natural ground shall be scarified, moistened to optimum moisture content (± 2%) for as deep as practicable, and compacted with an approved roller to a minimum of 95% maximum Proctor density. Vegetation and topsoil shall be removed before beginning preparation of natural ground.

PLACING FILL

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

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

MOISTURE CONTROL

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

COMPACTION

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

When compacting cohesionless free-draining materials such as sands and gravels, the material shall be deposited in layers and compacted by treads of a crawler-type tractor, smooth or pneumatic rollers, or by any other means approved by the Soils Engineer. The thickness of the horizontal layers after compaction shall not exceed 6 inches compacted thickness, if compaction is performed by tractor treads, or similar equipment. The material may be ponded or flooded to aid in the compaction

only if free-draining material underlies the new fill.

DENSITY REQUIREMENTS

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

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

DRAINAGE REPORT
FOR
LA VIDA NUEVA SUBDIVISION

OCTOBER, 1978

BOHANNAN-HUSTON INC.

4125 CARLISLE BOULEVARD, NORTHEAST, ALBUQUERQUE, NEW MEXICO 87107 (505) 881-2000

DRAINAGE REPORT
FOR
LA VIDA NUEVA SUBDIVISION

OCTOBER, 1978

DRAINAGE REPORT
FOR
LA VIDA NUEVA SUBDIVISION

ZONE ATLAS SHEET K-12

OCTOBER, 1978

PREPARED FOR

Homes By Marilynn, Inc.
2017 Yale, S.E.
Albuquerque, NM 87106

PREPARED BY

Bohannan-Huston, Inc.
4125 Carlisle Blvd., N.E.
Albuquerque, NM 87107

STATE OF NEW MEXICO
MICHIAL M.
EMERY
No. 5194
REGISTERED PROFESSIONAL ENGINEER

Michial M. Emery, P.E.
N.M.P.E. No. 5194

TABLE OF CONTENTS

Purpose 1

Project Location and Description 1

Hydrology 2

Upland Drainage 2

Study Parcel Pre-Development 4

Study Parcel After Development 4

Recommendations 5

APPENDIX

Calculations & Illustrations

PLATES

Plate I Location of Study Parcel

Plate II La Vida Nueva Undeveloped Drainage Patterns and Flow Rates

Plate III La Vida Nueva Developed Drainage Patterns and Flow Rates

Plate IV Orthophoto Map Zone K-12 Showing Upland Area

Plate V Orthophoto Map Zone K-11 Showing Upland Areas

DRAINAGE REPORT

FOR

LA VIDA NUEVA SUBDIVISION

PURPOSE

The purpose of this report is to determine the run-off resulting from a 100-year frequency storm falling on a study parcel and its contributing areas under existing and developed conditions. Guidelines for development are established so that drainage patterns and flow rates can be defined. It should be noted that the West Side Drainage Study, prepared by Bovay Engineers, is recognized as a proposal for the ultimate storm drainage solution for this area. The drainage solutions herein proposed address the various drainage problems under the constraints posed by **existing** conditions only, and make no reference to proposed future solutions.

PROJECT LOCATION AND DESCRIPTION

The study parcel is located immediately west of the Isleta drain, and south of Central Avenue at the end of 46th Street and 47th Street. The parcel is currently platted as the re-plat of the Heather Rae Subdivision; however, it will be re-filed as the La Vida Nueva Subdivision. The parcel contains approximately 8.7 acres.

Existing topography in and around the study area indicates an extremely flat area with nearly undefinable slopes. The overall drainage basin includes areas with steep slopes running toward the site, as well as the flat areas immediately surrounding the parcel. The topographic study for the parcel reveals a flat area with elevations ranging between 4947 feet and 4950 feet. The berm on the Isleta drain, located on the west property line, has an average elevation of 4951.5 feet and is higher than the study area.

The visible soil on the site consists of a fine sand, and the entire area is covered sparsely

with small brush. The tract is zoned SU-1 and it is planned to develop the area with town-houses and apartment buildings.

HYDROLOGY

Peak flow rates for the study area and contributing areas were determined from the NOAA Precipitation Frequency Atlas of the Western United States, Volume IV. In addition, the West Side Drainage Study - 1977, prepared by Bovay Engineers, Inc., of Albuquerque, was used as a reference for the existing drainage conditions of the study area. The orthophoto topographic map for this portion of the west mesa, prepared for AMAFCA, was used in determining and outlining the contributing drainage basins.

The NOAA Atlas reveals that 2.4 inches of precipitation is expected to fall on this area of the city during a six hour period. The Bovay study indicates that the existing underground storm sewer system is unable to accommodate these runoffs, and consequently, there results a large amount of surface drainage. The orthophoto map indicates the drainage patterns of the surface flows.

UPLAND DRAINAGE

The important factors to consider in upland drainage are the contributing surface drainage areas, the existing storm sewers, and the valley ponding that occurs on the sites in the vicinity of the study parcel.

With reference to Bovay's West Side Drainage study, it is evident that the existing storm sewer functions more as a drain for the upland drainage. The study indicates that there is an extremely large network of storm sewers that are interconnected and continuous with only two outlets, those being a 24" outlet at the Arenal canal, and a 48" outlet at the Isleta drain. Both outlets combined can discharge less than 100 cfs. Since the majority of the network

is located over 120 feet above the outlet end, the head generated in the storm sewer is great enough to dislodge mannoles in various areas. It is noted that the area in which this problem occurs is such that the additional surface drainage runs in a direction away from the study parcel. The outlet in the Isleta drain discharges only 55 cfs; however, the report does not indicate a problem of dislodging manhole lids in this reach of storm sewer.

The more critical problem in the upland drainage area is that of surface drainage. Due to the over capacity storm sewer, run-off is forced to pond until such time that the storm sewer can drain those pond areas. However, for this report we will assume no valley ponding is available, and that all the run-off will proceed to gravitate to the lower basin area in which the site is located. Under this assumption, the contributing upland basin has been delineated as shown on the orthophoto map. The total area contributing run-off is 82.3 acres. The basin is contained in an area generally bounded on the south by Central Avenue, on the east by the Arenal canal, on the north by a section of Bluewater Drive and down to an area south of Avalon Road, and on the west by 59th Street. The surface run-off outlet is considered to be Central Avenue east to the Isleta drain. The area south and west of the delineated basin drains in a southerly direction and eventually into the Arenal canal. The area north of the basin gravitates to an area on Avalon Road and eventually to the Arenal canal. The area east of the basin and north of Central Avenue tends to retain its own run-off, and all excess run-off moves in a northerly direction. We have assumed that a calculated run-off of 177 cfs from the upland basin will terminate in a lower basin bounded by Central Avenue, Cypress Street and the Isleta drain. The study parcel is contained in this lower basin. It is evident that the run-off will pond in the basin until it reaches an elevation that will force an overflow into the Isleta drain. The existing overflow sections on the drain are located at the Cypress Street crossing of the drain and in the area near the Central Avenue opening of the drain. It is calculated that the

volume of run-off resulting from the 100-year storm, from the upper and lower basins, is approximately 322,548 cubic feet. The storage capacity of the Isleta drain, across a 1200 reach from Central Avenue to Cypress Street, including the constant water in the drain, is approximately 208,980 cubic feet. It is important to note that a portion of the run-off volume will overflow at the Cypress Street crossing, thus lowering the volume of overflow running into the upper reach of the Isleta drain. The lower reach of the drain, south of Cypress Street is of equal capacity as the upper reach, and can accommodate the overflow from the lower basins.

With reference to the Isleta drain, it is unlikely that the existing water level will increase much since the run-off into the open section of the drain is contained in a 36 inch pipe that daylights into the drain at the Central Street crossing.

STUDY PARCEL PRE-DEVELOPMENT

The most recent topographic data available was used to determine the drainage characteristics of the study parcel. The parcel is flat; however, it contains some small hills and basins. There is no definable slope across the tract, and it can be assumed that run-off gravitates to the low areas on the tract, and for the most part, remains on site. The possibility of overflow from the Isleta drain is remote due to the height of the berm surrounding the drain, as well as the existence of potential overflow areas on the east berm. Assuming a run-off coefficient of 0.4, a total volume of 29,969 cubic feet of run-off can be expected to be generated and for the most part, remain on-site. As discussed in the upland drainage portion of this report, run-off from the higher basins will pond in the lower basin, of which the site is a part, until an overflow into the Isleta drain occurs.

STUDY PARCEL AFTER DEVELOPMENT

In keeping with criteria for drainage in the south valley of Albuquerque, on-site ponding will be utilized to retain run-off generated on the developed tract. Using the NOAA Atlas

criteria of 2.4 inches of rainfall in a six hour period for the 100-year storm, it is calculated that a total volume of 60,112 cubic feet of run-off will be generated on-site under developed conditions. In order to store this volume of run-off, it is proposed to build on-site ponds with a total surface area of 0.45 acre at an average depth of 3 feet. It is expected that a combination of infiltration and evaporation will drain the ponds. A rock lining will be provided for the pond floors to prevent such problems as sod-rotting and standing nusiance water.

By utilizing a nearly flat grade and estate type curb, run-off from the paved areas will also gravitate to the detention ponds. The existing water table elevation is 8-9 feet below existing elevations and will not be deterrent to the principle of infiltration for pond drainage.

In order to retain the undeveloped condition storage volume capacities of the site, it is proposed to complete the necessary site grading with only the existing on-site quantities of earth. Since the overflow elevation of the drain is at 4950.5 feet, it is proposed to set the finished floor elevations at 4951.5. This can be accomplished by extending the foundation stem walls to the appropriate height to provide this finished floor elevation. All on-site streets shall be graded so as to retain all run-off on-site. Finished street grades will be proposed and presented by Wilson & Company Engineers, in plans prepared for paving District No. 191.

RECOMMENDATIONS

1. Grade site with available on-site earth quantities only.
2. Build stem walls of structures to provide finished floor elevations one foot higher than overflow elevations into Isleta drain.
3. Build nearly flat street grades with estate type curb.
4. Build on-site ponds to detain on-site run-off.

UPLAND DRAINAGE CALCULATIONS

UPLAND DRAINAGE AREA 1 = 63.2 ACRES
UPLAND DRAINAGE AREA 2 = 19.1 ACRES

TOTAL AREA = 82.3 ACRES

RUNOFF COEFFICIENT "C" = 0.45
GROUND FACTOR "B" = 0.77
AVERAGE SLOPE "S" = 4.5%
LENGTH OF WATERCOURSE "L" = 3600'

$T_c = \log^{-1}[.3641(B) + .2357 \log(3600) - .177 \log(4.5) - .3013]$

$= \log^{-1}[.280 + 1.37 - .128 - .3613]$

$T_c = 14.48$ MIN

$I = \frac{132}{14.48 + 22} = 4.72$ IN/HR

$Q_1 = CIA = 0.45(4.72)(82.3)$

$= 177$ CFS = RUNOFF FROM BASIN

WATER VOLUME TOTAL FROM UPLAND BASIN

2.4" RAIN ACCUMULATED FROM 100 YR STORM

$82.3 \text{ AC} \times \frac{2.4 \text{ IN}}{12 \text{ IN/FT}} \times 43{,}560 \frac{\text{FT}^2}{\text{AC}} =$

$= 382{,}642 \text{ FT}^3$

LEVEE DESIGN VOLUME

FIND FROM ELEVATION 60.0 AVG WATER DEPTH = 11.9
DEPTH TO WATER LEVEL = 7.9' AVG TOP WIDTH = 30'
AVG BOTTOM WIDTH AT WATER LEVEL = 13' AVG SIDE SLOPE 1:1

AREA OF CHANNELS = $\frac{1}{2}(W_1 + W_2)$
$= \frac{1}{2}(13)(7.9) = 171.15$

LENGTH BETWEEN CONTROL & WATERCOURSE = 1200'
$V = 1200 \times 171.15 = 205{,}380$ CU FT

SPILLPOINT ELEVATION AT WATERCOURSE = 48.37

PROJECT NAME [illegible] SHEET 1 OF 3
PROJECT NO. [illegible] BY [illegible] DATE [illegible]
SUBJECT [illegible] CALCULATIONS CH'D _____ DATE _____

DRAINAGE CALCULATIONS FOR LA VIDA NUEVA

TOTAL ACREAGE = 8.6 ACRES
HARDENED SURFACES 7.0 ACRES = 81%
LANDSCAPED AREAS = 1.6 ACRES = 19%

DETENTION PONDS TO BE PLACED IN THREE AREAS

AREA 1 4.3 ACRES
AREA 2 2.1 ACRES
AREA 3 2.2 ACRES

REFERENCE RAINFALL ATLAS INFORMATION FOR CITY OF ALBQ.
2.4 INCHES OF RAIN IS ACCUMULATED FOR 100 YR STORM

AREA 1
TOTAL ACREAGE = 4.3
LANDSCAPED = .8 ACRE HARDENED = 3.5

VOLUME OF RUNOFF = $\frac{2.4 \text{ in}}{12 \text{ in/ft}}$ X 3.5 ac X 43560 $\frac{ft^2}{ac}$ = 3.7 MCF 10^3

AREA 2
TOTAL ACREAGE = 2.1 ACRES
LANDSCAPED = 0.4 ACRES HARDENED = 1.7

VOLUME OF RUNOFF = $\frac{2.4}{12}$ X 1.7 X 43560 = 14,812 ft^3

AREA 3
AREA 3 IS THE SAME AS AREA 2

UNDEVELOPED FLOW VOLUMES
8.6 ACRES X $\frac{1}{4}$ X $\frac{2.4}{12}$ X 43,560 = 39,960 CF OVER SITE
SUMMER

PROJECT NAME	LA VIDA NUEVA	SHEET	OF 3
PROJECT NO.	23-[illegible]	BY	DATE
SUBJECT	DRAINAGE CALCULATIONS	CH'D	DATE

AREA ① PONDING AREA

AVAILABLE SPACE FOR PONDING = 15,000 SQ FT

NEED TO ACCOMODATE 20,492 ft^3

DEPTH = 20,492 ÷ 15,000 = 1.95 FT

USE DEPTH = 2 FT

SURFACE AREA = 10,164 SQ FT

AREA ② AND ③ PONDING (EACH)

AVAILABLE SPACE FOR PONDING = 7600 SQ FT (EACH)

NEED TO ACCOMODATE 14,310 ft^3

DEPTH = 14,310 ÷ 7600 = 1.94 ft

USE DEPTH = 2 FT

SURFACE AREA = 4986 SQ FT (EACH)

TOTAL SURFACE AREA BUILT = 20,286 ft^2 = .45 ACRE

= 23 % OF LANDSCAPED AREA

PROJECT NAME [illegible] SHEET 3 OF 3

PROJECT NO. [illegible] BY [illegible] DATE [illegible]

SUBJECT [illegible] CH'D DATE

K-12-Z

PLATE 1

LOCATION MAP

DRAINAGE REPORT
FOR
LA VIDA NUEVA SUBDIVISION

ZONE ATLAS SHEET K-12

AUGUST, 1978

DRAINAGE REPORT
FOR
LA VIDA NUEVA SUBDIVISION

ZONE ATLAS SHEET K-12

AUGUST, 1978

DRAINAGE REPORT
FOR
LA VIDA NUEVA SUBDIVISION

ZONE ATLAS SHEET K-12

AUGUST, 1978

PREPARED FOR

Homes By Marilynn, Inc.
2017 Yale, S.E.
Albuquerque, NM 87106

PREPARED BY

Bohannan-Huston, Inc.
4125 Carlisle Blvd., N.E.
Albuquerque, NM 87107

STATE OF NEW MEXICO
MICHIAL M.
EMERY
No. 5194
REGISTERED PROFESSIONAL ENGINEER

Michial M. Emery, P.E.
N.M.P.E. No. 5194

TABLE OF CONTENTS

Purpose 1

Project Location & Description 1

Hydrology 1

Upland Drainage 2

Study Parcel Pre-Development 2

Study Parcel After Development 3

Recommendations 4

APPENDIX

Calculations & Illustrations

PLATES

Plate I Location of Study Parcel

Plate II La Vida Nueva Undeveloped Drainage Patterns and Flow Rates

Plate III La Vida Nueva Developed Drainage Patterns and Flow Rates

DRAINAGE REPORT

FOR

LA VIDA NUEVA SUBDIVISION

PURPOSE

The purpose of this report is to determine the run-off resulting from a 100-year frequency storm falling on a study parcel and its contributing areas under existing and developed conditions. Guidelines for development are established so that drainage patterns and flow rates can be defined.

PROJECT LOCATION AND DESCRIPTION

The study parcel is located immediately west of the Isleta Drain, and south of Central Avenue at the end of 46th Street and 47th Street. The parcel is currently platted as the re-plat of the Heather Rae Subdivision; however, it will be re-filed as the La Vida Nueva Subdivision. The parcel contains approximately 8.7 acres.

Existing topography in the study area indicates an extremely flat area with nearly undefinable slopes. The topographic study reveals that there exist several small basins and domes on the tract, with most of the generated run-off remaining on site. The soil consists of a fine sand.

The tract is zoned SU-1 and it is anticipated that development will proceed in accordance with the typical SU-1 zoning, i.e., townhouses and apartments.

HYDROLOGY

Peak flow rates for the study area and any contributing areas were determined from the NOAA Precipitation Frequency Atlas of the Western United States, Volume IV.

UPLAND DRAINAGE

Bounding the tract on the east side is the Isleta Drain. Separating the study parcel and the drain is a large dike with a twenty foot access road on top of the dike. The dike is of substantial elevation to prevent storm run-off from emptying into the drain. Additionally, the water surface, as observed in the drain, is lower than the elevation of the study parcel.

On the south and west boundaries exist developed areas consisting of single family units. The lots on which these units are located drain away from the study parcel and onto the streets on which they front.

To the north of the site is another residential area with lots fronting on 46th and 47th Street. Although 46th Street has been constructed so that drainage runs south toward the study parcel, drop inlets have been constructed at the south end of the street to receive the run-off and discharge it into a 48' RCP which eventually empties into the Isleta Drain. 47th Street is as yet unpaved, but existing topography shows the street draining to the north toward Central Avenue. Plans for the paving of 47th Street are included in Paving District No. 191, for which Wilson & Co. Engineers is doing the design. The paving district also includes the street proposed for this subdivision. As yet, final grades for 47th Street have not been established.

In summary, the area is unaffected by upland drainage from any of the surrounding areas.

STUDY PARCEL PRE-DEVELOPMENT

The most recent topographic data available was used to determine drainage basins affecting the parcel. Reference Plate II of this drainage report.

The study area is extremely flat, with no more than a 2' variation in elevation throughout the parcel. The elevations along the perimeter of the tract remain constant within a foot of each other. There are some meandering trails on site, however

they form no drainage patterns or channels. It is evident that there is little, if any, run-off that leaves the site. As noted previously, there is no run-off generated off-site that effects the site.

STUDY PARCEL AFTER DEVELOPMENT

In keeping with criteria for drainage in the south valley of Albuquerque, on site ponding will be utilized for the drainage of the area. According to the **NOAA Atlas 2** which is the **Precipitation Frequency Atlas of the Western United States, Volume IV,** for New Mexico, 2.4 inches of rainfall is expected to fall in a 6 hour period in Albuquerque. Using this criteria, it is calculated that a total volume of 60,112 cubic feet of run-off will have to be ponded on site. There will be three (3) ponding areas to accommodate the run-off, each three feet deep, with a total surface area, for the three (3) ponds, of .45 acre. In order to control the problems created by standing water in the ponds, it is proposed to drain the ponds using a series of 8" VCP pipes draining from a type "D" inlet at the bottom of the pond and draining into the existing 48" RCP storm sewer at the north property line (Reference Plate III). The grade on the drainage pipe will be set at .004% to maintain the maximum depth possible so as to avoid conflicts with other underground facilities. Manholes will be placed at pipe junctions and at cleanout points where crossing the rights-of-way. Except for street-right-of-way crossings, the line shall be privately maintained. These 8" pipes will drain into the 48" RCP at such time that the 48" pipe drops below its total capacity for carrying run-off. This drainage system is necessary to prevent the ponds from evolving into lagoons which would be a detriment to the development.

It should be noted that in the **West Side Drainage Study - 1977,** prepared by Bovay Engineers, Inc., of Albuquerque, recommendations for drainage control for this area have been made. The report shows this study area divided into two drainage sectors. The northwest corner of the tract is contained in Sector C-6 which would

eventually drain into the poposed Central Avenue storm sewer network. The remainder of the parcel is contained in Sector SY-8 which would eventually drain intc the proposed south valley storm sewer and french drain system. The report does not make specific recommendations for each parcel contained in the study area, but only suggests drainage sectors into which they can be placed. As yet, the report has not been adopted by the city, and funds are not earmarked for construction in these two sectors. While recognizing the proposals of the West Side Drainage Study, it is apparent that they will not be implemented for some time. It would therefore be reasonable to apply the drainage solutions suggested in this report as a more immediate solution.

RECOMMENDATIONS

1. Detain all drainage on site.
2. Build ponding areas to receive drainage.
3. Build drainage system to drain ponds into 48" storm sewer line.

eventually drain into the poposed Central Avenue storm sewer network. The remainder of the parcel is contained in Sector SY-8 which would eventually drain into the proposed south valley storm sewer and french drain system. The report does not make specific recommendations for each parcel contained in the study area, but only suggests drainage sectors into which they can be placed. As yet, the report has not been adopted by the city, and funds are not earmarked for construction in these two sectors. While recognizing the proposals of the West Side Drainage Study, it is apparent that they will not be implemented for some time. It would therefore be reasonable to apply the drainage solutions suggested in this report as a more immediate solution.

RECOMMENDATIONS

1. Detain all drainage on site.
2. Build ponding areas to receive drainage.
3. Build drainage system to drain ponds into 48" storm sewer line.

DRAINAGE CALCULATIONS FOR LA VIDA NUEVA

TOTAL ACREAGE = 8.6 ACRES
HARDENED SURFACES = 7.0 ACRES = 81%
LANDSCAPED AREAS = 1.6 ACRES = 19%

DETENTION PONDS TO BE PLACED IN THREE AREAS

AREA 1 = 4.3 ACRES
AREA 2 = 2.1 ACRES
AREA 3 = 2.2 ACRES

REFERENCE RAINFALL ATLAS INFORMATION FOR CITY OF ALBQ.
2.4 INCHES OF RAIN IS ACCUMULATED FOR 100 YR STORM

AREA ①
TOTAL ACREAGE = 4.3
LANDSCAPED = .8 ACRE HARDENED = 3.5

VOLUME OF RUNOFF = $\frac{2.4 \text{ IN}}{12 \text{ IN/FT}} \times 3.5 \text{ AC} \times 43560 \frac{\text{FT}^2}{\text{AC}}$ = 30492 FT³

AREA ②
TOTAL ACREAGE = 2.1 ACRES
LANDSCAPED = 0.4 ACRES HARDENE = 1.7

VOLUME OF RUNOFF = $\frac{2.4}{12} \times 1.7 \times 43560$ = 14810 FT³

AREA ③
AREA ③ IS THE SAME AS AREA 2

PROJECT NAME LA VIDA NUEVA SHEET 1 OF 3
PROJECT NO. 78-127 BY [illegible] DATE 7-7-78
SUBJECT DRAINAGE CALCULATIONS CH'D DATE

AREA ① PONDING AREA

AVAILABLE SPACE FOR PONDING = 15,600 SQ FT

NEED TO ACCOMODATE 30,492 ft^3

DEPTH = 30,492 ÷ 15600 = 1.95 Ft

USE DEPTH = 2 FT

SURFACE AREA = 10,164 SQ FT

ARE ② AND ③ PONDING (EACH)

AVAILABLE SPACE FOR PONDING = 7600 SQ FT (EACH)

NEED TO ACCOMODATE 14,810 ft^3

DEPTH = 14,810 ÷ 7600 = 1.94 ft

USE DEPTH = 3 FT

SURFACE AREA = 4936 SQ FT (EACH)

TOTAL SURFACE AREA REQ'D = 20,036 ft^2 = .45 ACRE

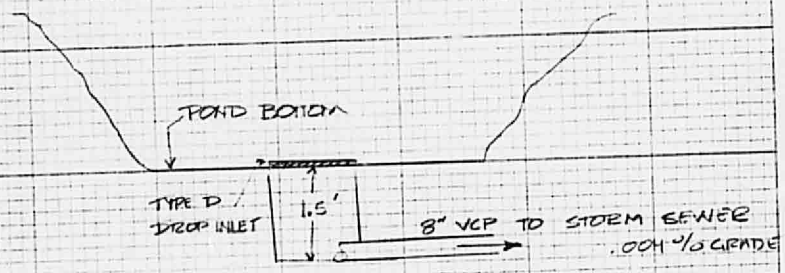
= 28 % OF LANDSCAPED AREA

PROJECT NAME LA VIDA NUEVA SHEET 2 OF 3

PROJECT NO. 78-[illegible] BY PIND DATE 8-7-78

SUBJECT DRAINAGE CALCULATIONS CH'D DATE

DRAINAGE CALCULATIONS CONT.



PROJECT NAME LA VIDA NUEVA SHEET 2 OF 3

PROJECT NO. 73-127 BY DAND DATE 8-7-78

SUBJECT DRAINAGE CALCULATIONS CH'D _____ DATE _____

K-12-Z
RIO GRANDE
RIVERSIDE
DRAIN
MARICOPA
SLEEPY
DRAIN
C-2
C-2
C-2