DRAINAGE REPORT FOR
RINCON SUBDIVISION
ALBUQUERQUE, NEW MEXICO

prepared for

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LIST OF FIGURES AND TABLES

FIGURES

TABLES

DRAINAGE REPORT FOR
RINCON SUBDIVISION

- TABLE OF CONTENTS -

INTRODUCTION

This report analyzes the existing and proposed drainage conditions and presents the Drainage Plan for the Rincon Subdivision. The Site Plan for this subdivision provides for single family residential units. The developer of this subdivision is Roberson Construction Company; surveying was conducted by Lynn Engineering and Surveying.

The Sketch Plat for this subdivision was reviewed by the Development Review Board on January 21, 1986. Because the developer of this subdivision is also the developer of adjacent subdivisions on the north, south and east sides of Rincon, the Development Review Board (DRB) has suggested that all remaining developable lands in the area be combined into a single (Rincon) subdivision and developed in several construction phases. The subdivisions to be combined are the original Rincon Subdivision as described in the Conceptual Drainage Plan for Rincon Subdivision which included a replat of the western portion of Santa Fe Village Unit I (approved March 27, 1986), and Santa Fe Village Unit II Tracts 2A and 4A as described in the Conceptual Drainage Plan for Santa Fe Village Unit II (Tracts 2A and 4A) which was approved April 14, 1986. The combined subdivisions will be called Rincon Subdivision and will be developed in four phases. This report presents the drainage plan for the four phases of the new Rincon Subdivision, based on the approved Conceptual Plans. A detailed grading and erosion control plan is shown for Phase 1 for which construction will begin as soon as possible. The grading shown for Phase 1 is based on the

proposed street design which is complete for Phase 1. A detailed grading and erosion control plan for the other 3 phases will be submitted to the City Design Hydrology Section for approval prior to the time of their development. This drainage report covers all four development phases because the drainage from each phase is related and therefore drainage design must consider the drainage from all phases.

This report was developed in accordance with criteria in the City of Albuquerque Development Process Manual (DPM), and consultations with the City Engineering, Parks and Open Space staff.

SITE LOCATION AND DESCRIPTION

The Rincon Subdivision is located northwest of Santa Fe Village Unit III and west of Santa Fe Village Unit I. A replatted portion of Unit I is included in the eastern part of Rincon Subdivision. Santa Fe Village Unit II lies north of the Rincon Subdivision. The northern portions of Rincon Subdivision were originally Tracts 2A and 4A of Unit II. Figure 1 shows the location of the Rincon Subdivision which is approximately 96.2 acres in area. The proposed development is bounded on the west by the volcanic escarpment.

The Rincon Subdivision will be developed in four phases. Phase 1 is bounded on the east by Santa Fe Village Unit I, on the north by the Middle Branch of San Antonio Arroyo, and on the south by the South Branch of San Antonio Arroyo. Atrisco Road NW (Unser Blvd. NW) is about 900 feet to the east. Phases 2 and 3 are bounded on the north by Santa

Fe Village Unit II and on the south by the Middle Branch of San Antonio Arroyo. Atrisco Road NW (Unser Boulevard NW) lies approximately 500 feet east of Phase 3. The remaining area to be developed, which lies west of Phase 1, will be Phase 4.

Existing and Proposed Development

The area included in all four phases of the Rincon Subdivision is currently undeveloped (except for some cut areas along the boundary with Santa Fe Village Unit I). Phase 3 is currrently a privately owned and operated temporary detention pond that is no longer needed and will be developed into single family homes. At present, runoff from phases 1 and 4 drains into both the Middle and South Branches of San Antonio Arroyo and into Santa Fe Village Unit I; runoff from phases 2 and 3 drain into the Middle Branch of San Antonio Arroyo.

The proposed development will consist of single family homes (R-1 type). Figure 2 (located in the pocket at the end of this report) shows the preliminary plat and the 4 proposed phase boundaries of the Rincon Subdivision. All lots will drain to the streets, except the lots adjacent to the Middle and South Branches of San Antonio Arroyo. On the lots adjacent to the arroyos, the roofs and front yards will drain into the street. The backyards will drain to a swale (located in a private drainage easement) located along the back lot line and parallel to each arroyo.

All streets will be paved with curb and gutter; and wherever

possible, mountable curbs will be used.

Soils

Figure 3 shows the on- and off-site soils for the site as determined by the U.S. Soil Conservation Service and given in "Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico." The project site is located on the Bluepoint - Kokan association (BKD) which is in Hydrologic Soil Group A. BKD soils are about 50% Bluepoint loamy fine sand with 5% to 15% slopes, and 40% Kokan gravelly sand with 15% to 40% slopes. The native vegetation is dominated by mesa dropseed and Indian ricegrass with some giant dropseed and black gramma.

The contributing off-site area is composed of three soil types. The first soil type is the Kokan-Rock Outcrop Association (KR) with 40% basalt rock outcrop which is also in Hydrologic Soil Group A, and is located on the escarpment west of the proposed subdivision. The KR soils are about 75% Kokan gravelly sand with 25% to 45% slopes, and 10% nearly vertical slopes which have 3 to 4 foot diameter basalt boulders covering 40% of the surface. The second soil type is the Alemeda Soil Series (AmB) which is in Hydrologic Soil Group C and is located west of the subdivision above the escarpment with 15% to 30% basalt rock outcrop. Slopes range from 0% to 9%. The native vegetation consists of mesa dropseed, galleta, black gramma, winterfat, broom snakeweed, annual weeds and some juniper.

The third soil type is the Madurez-Wink Association (MWA) which is in Hydrologic Soil Group B and is located above the escarpment. This soil is about 55% Madurez fine sandy loam with 1% to 5% slopes and 25% Wink fine sandy loam with 1% to 7% slopes.

Middle Branch of San Antonio Arroyo

The total watershed areas of the Middle and South Branches of San Antonio Arroyo are 1,521 acres and 855 acres, respectively. Figure 4 shows both arroyo watersheds and the off-site drainage basins for the Rincon Subdivision.

A drainage report has been submitted to the City Design Hydrology Section which describes the hydrology and hydraulics for the Middle Branch of San Antonio Arroyo. That report is titled "Conceptual Drainage Plan for Santa Fe Village Unit II (Tracts 2A and 4A), Albuquerque, NM". This analysis will utilize the results presented in the previous report where possible.

The Middle Branch of San Antonio Arroyo will remain natural and no developed flows will enter the arroyo west of the Carrick Street crossing (box culvert). The south bank of the arroyo, from the volcanic escarpment to Carrick Street, has a steep slope; but east of Carrick Street, the bank slope is mild. A Prudent Line Analysis was conducted for this arroyo and is described in the referenced report (S.F.V.U. II Tracts 2A and 4A). This report was approved by City Design Hydrology on April 14, 1986.

The results of the Prudent Line Analysis are only discussed briefly here. A prudent line may be defined as the boundary, along both sides of a channel, within which development would not be prudent because of either flooding or erosion hazards. The lateral migration potential for a 100-yr. storm or 25 years of average storms for the arroyo is determined and the distance of the horizontal lateral migration is plotted. These plotted lines, offset tangents, form the prudent line outside 100-yr. flood plain limits.

The analysis indicated that the arroyo will aggrade west of the Carrick Street crossing and, therefore, the 100-yr. flood plain limit is the prudent line for that reach. The arroyo is expected to degrade east of the Carrick Street crossing to the AMAFCA gabion grade control structure and the offset tangent lines are slightly outside of the 100-yr. flood plain in several locations. Therefore, at present, the 100-yr. flood plain is the prudent line throughout most of this reach except for several locations as shown on Figures 5A through 5G (located in pocket at end of this report).

However, east of Carrick Street the arroyo low flow channel will be graded to the equilibrium slope and thus very little degradation is expected. The computations and discussion of the procedure used in determining the equilibrium slope is presented in the following paragraphs.

The elevation difference resulting from changing the existing slope to the equilibrium slope was computed for the 2-yr. (long term) and the

100-yr. (short term) flows. The purpose in determining this elevation difference was to check if the channel could be regraded for equilibrium slope when the Carrick Street box culvert and rip-rap transition are constructed. If the equilibrium channel slope is constructed then the minor degradation which was predicted in the Prudent Line Analysis would be virtually eliminated. The following table and computations determine the elevation difference (drop) required to reach equilibrium slope over the total distance of sub-reaches 5 and 6, which are located east of Carrick Street.

Sub-reach	Average Existing Slope (ft./ft.)	2-yr. Equilibrium Slope (Long Term) (ft./ft.)	100-yr. Equilibrium Slope (Short Term) (ft./ft.)	Total Length of Reach (ft.)
5	0.00803	0.00485	0.00502	345
6	0.00669	0.00700	0.00506	628

2-yr. (LONG TERM)

In Sub-reach 6 the existing slope is almost the same as equilibrium slope, therefore the drop would probably occur in Sub-reach 5.

Thus, in sub-reach 5

Existing elevation difference = 0.00803 (345) = 2.77 ft.
Equilibrium elevation difference = 0.00485 (345) = 1.67 ft.
Elevation difference from existing slope to equilibrium slope = 1.10 ft.

100-yr. (SHORT TERM)

Sub-reaches 5 and 6 would degrade in the short term.

Thus, in Sub-reach 5

Existing elevation difference = 0.00803(345) = 2.77 ft.
Equilibrium elevation difference = 0.00502(345) = 1.73 ft.
Elevation difference from existing slope to equilibrium slope = 1.04 ft.

In Sub-reach 6

Existing elevatiion difference = 0.00669(628) = 4.20 ft.
Equilibrium elevation difference = 0.00506(628) = 3.18 ft.
Elevation difference from existing slope to equilibrium slope = 1.02 ft.

Therefore, the maximum elevation difference from existing slope to the equilibrium slope for Sub-reach 5 is 1.10 ft. and for Sub-reach 6 is 1.02 ft. for a total of 2.12 ft.

The equilibrium slope will be staked out and graded along the low flow sandy channel bottom only. The existing healthy vegetation along the banks, composed of Chamisa (Rabbit Brush) and other species, will be protected during grading of the low flow channel. Chamisa is a vigorous, very desirable soil stabilizing plant which is probably a major factor in the relatively consistant arroyo alignment discovered in the aerial photograph analysis. In addition, some grading and revegetation in and along the channel centerline will be necessary anyway due to previous construction activities which have damaged the channel bottom. In Sub-reach 6 a large volume of soil has been dumped in the channel and much of the original vegetation has been destroyed. All disturbed areas will be revegetated according to Open Space Division Guidelines.

In summary, degradation in sub-reaches 5 and 6 will be virtually eliminated by grading the channel to equilibrium slope. Furthermore, sub-reaches 5 and 6 are expected to remain relatively stable due to the existing Chamisa (along with other vegetation) and the proposed revegetation which will occur in sub-reaches 5 and 6. Thus after

construction and reclamation of sub-reaches 5 and 6, very little maintenance is expected in these reaches.

Conversations with the City Design Hydrology Section and City Parks and Open Space produced the following conclusions to prevent damage from nuisance flows and pollution from the lots adjacent to the arroyo. A concrete block wall will be built along the back property line of all lots adjacent to the arroyos with at least 12-inches above ground. This will prevent gullies which may begin from the rear lot lines as a result of excess irrigation water, etc. Steel sleeves will be set in the top of the header curb and a steel bar, see through fence will be built to allow adjacent home-owners to see and enjoy the natural arroyo and thus may prevent people from polluting the arroyo. The concrete block wall and see through fence will be enforced through deed restrictions.

Figure 6 shows the typical arroyo cross-section with swale, fence and concrete block wall. A maintenance vehicle access road will also be provided for the Middle Branch of San Antonio Arroyo west and east of the Carrick Street box culvert. Figure 5 shows the location of the vehicle access roads. The entrance to the roads will have a fenced gate to prevent access to the arroyo by un-authorized motor vehicles. The City Parks and Open Space Department will maintain the arroyo west of Carrick Street and the Storm Drainage Maintenance Section will maintain the arroyo east of Carrick Street.

South Branch of San Antonio Arroyo

The South Branch of San Antonio Arroyo will remain natural from the volcanic escarpment to the Vulcan Parkway crossing (box culvert) where the arroyo will be realigned by means of a concrete lined channel. No developed flows will enter the arroyo west of the Vulcan Parkway crossing. The 100-yr. flood plain for the arroyo was determined previously as described in the reports titled "Prudent Line Analysis for the South Branch of San Antonio Arroyo, Albuquerque, NM," and "Drainage Report for Santa Fe Village Unit III, Phases I and II, Albuquerque, NM". Prudent Line Analysis for the South Branch of San Antonio Arroyo has been submitted for approval to the City Design Hydrology Section for the arroyo reach from the base of the escarpment to Vulcan Parkway.

A brief discussion of the prudent line analysis results are as follows. The upper two-thirds of the arroyo from the escarpment to Vulcan Parkway will aggrade and the 100-yr. flood plain limit was determined as the prudent line. The last third of the reach, immediately upstream from the rip-rap transition at Vulcan Parkway, will degrade. The resulting offset tangent lines, which generally exceed the 100-yr. flood plain, were determined for the degradation conditions. Figure 5 shows the prudent line.

OFF-SITE FLOWS

Phase 1

The off-site flows contributing to Phase 1 originate in or come through Phase 4. A berm will be located at the Phase 1 and Phase 4 boundary after construction of Phase 1 to prevent off-site sediment from washing into Phase 1 (see Figure 5).

Phase 2

Figure 4 shows the off-site basins labled F and G that discharge into Phase 2. Each off-site area was checked in the field (above and below the escarpment) to more accurately define the watershed boundaries of each area.

Off-site Basin F is located above and on the escarpment. The existing rough grading of the roads on top of the escarpment for the proposed Volcano Cliffs Subdivision Unit II accounts for the watershed boundary shown in Figure 4. Most of the present flow from Off-site Basin F is sheet flow across the project site except for some flow concentration due to the small arroyo within the site.

Figure 5 shows the sub-basins which will contribute flow to each lot. These flows will be conveyed to Esquina Court through private easements between each lot. Table 1 lists the C factors for undeveloped and developed conditions (assuming development of Volcano Cliffs Unit II). The assumed developed weighted C is 0.58 and is based

on the developed C as determined in Table 5 for the On-site Flow Section.

The undeveloped weighted C is 0.47 and the developed weighted C is 0.48, thus they are nearly the same and only the developed 10-yr. and 100-yr. hydrology was determined in Table 1 which also lists the time of concentration, design rainfall and runoff rates.

Flows entering the proposed subdivision from the existing Santa Fe Village Unit II and Off-site Basins G1, G2, H, I and J were determined previously by Adam, Hamlyn and Anderson (A.H.A.) Consulting Engineers in a report titled "Santa Fe Village Unit II Drainage Report Revision October, 1982." This report was approved by the City of Albuquerque Design Hydrology Section and the hydrology presented in the report was used in this Drainage Plan.

Off-site basins G1 and G2 are also located above and on the escarpment. The A.H.A. report planned for the contributing flow from the escarpment to be carried in a trapezoidal shaped stone lined swale west and adjacent to Montano Drive. This swale was designed to carry the 100-yr. peak Q of 36.0 cfs and enter Montano Drive through a concrete curb cut approximately 420 feet south of Bangor Avenue. Currently, neither the stone lined swale nor the section through the curb exists. After initial runoff fills up a minor pond behind the curb, additional flow drains over the curb and onto Montano Road. The 100-yr. peak Q at the current end of Montano Road (approximately 100-ft. south of Mayo Court) is 37.6 cfs., which includes runoff from

the street area.

A second earth channel west and adjacent to Montano Drive also carries runoff from the escarpment to the present end of Montano Drive near Foxford Avenue. The 100-yr. peak Q in this channel is 11.5 cfs.. This report shows the new plan to carry the combined 100-yr. Q of 37.6 cfs. and 11.5 cfs., for a total of 49.1 cfs., from Basin G, down Foxford Avenue which will drain to the Middle Branch of San Antonio Arroyo.

The swale along Montano Road is existing up to the edge of existing pavement of Montano Road (see Figure 5). This swale is currently unlined. The existing swale will be continued from the end of Montano Road to the proposed curb cut and will be a permanent drainage structure. The swale will carry the 100-yr. peak discharge which is 11.5 cfs. This swale will be trapezoidal in cross-section with the following dimensions and hydraulics:

bottom width = 4 ft.
side slopes = 2H:1V
channel slope = 3.61 %
n = 0.027
flow depth = 0.45 ft.
velocity = 5.39 ft./sec.
flow top width = 5.80 ft.

The curb cut and approach will act as a weir with the following dimensions determined for Q=CLH**3/2

C = 2.89
H = 0.45 ft.
L = 13.18 ft.
Q = 11.50 cfs.

This swale will be located within a tract on the west side of Montano Road, which will be dedicated for drainage only.

Phase 3

Phase 3 is currently a detention pond which will be filled and developed. The off-site flows from existing Santa Fe Village Unit II and flows from the escarpment will be carried through Phase 3 in a 9-foot wide concrete rundown which will exit into the Middle Branch of San Antonio Arroyo.

Phase 4

Figure 7 shows the off-site basins for Phase 4 which are 44.91 acres in area. These basins are part of Boca Negra Park which is an open space preserve of the City of Albuquerque. Therefore, this off-site area will remain undeveloped. Each lot located at the base of the escarpment will be provided with a private drainage easement to convey the off-site flow to the street in front of the lot.

Five off-site basins were determined from street drainage divides along with street and lot orientation. Each off-site basin (A, B, etc.) was divided into sub-basins (A1, B1, etc.) to determine the drainage area which will contribute flow to each lot. Hydrologic data were determined only for sub-basins B1, C1, D5 and E1, which are the largest sub-basins within each basin. The hydrology for two sub-basins, A2 and A3 in Basin A, was also determined.

The 100-yr. peak discharge from these sub-basins was used to size all

private drainage easements for the lots adjoining the corresponding basins. In Basin A, the three sub-basins are extremely different in area and therefore the 100-yr. peak discharge from Sub-basin A2 was used to size the private drainage easements for the lots adjoining sub-basins A1 and A2. Because Sub-basin A3 is very large, the 100-yr. peak discharge from this sub-basin was used to size the drainage easement for the adjoining lot.

The Runoff Coefficients "C" were determined as an area weighted average of the "C" factors for each soil type within the sub-basin. As discussed previously, the off-site area is part of Boca Negra Park and therefore will remain undeveloped. Table 2 lists the weighted Runoff Coefficient "C" factor determination for the off-site basins.

The Time of Concentration (Tc) was determined for the longest off-site flow path which is in Sub-basin E1. The Tc for Sub-basin E1 is less than 10 minutes and is therefore assumed to be 10 minutes according to DPM criteria for Tc. The flow path lengths for all other sub-basins are much smaller than Sub-basin E1 and therefore all Tc's are assumed to be 10 minutes.

Table 3 lists the Tc, 10- and 100-yr. design rainfall, peak discharge and runoff volumes from each off-site sub-basin. These data were used to size the private drainage easements for the lots adjacent to the escarpment. The total runoff from the off-site basins were computed with the on-site basin hydrology and include the appropriate developed areas.

Private Drainage Easements

where?

The 100-yr. peak discharges for sub-basins F1 through F8 are all similar and therefore the widths of all drainage easements for the lots adjoining these basins will be based on the largest discharge which is 2.29 cfs. from Sub-basin F2.

The 100-yr. peak discharge for the largest off-site sub-basin was given in Table 3 for basins A, B, C, D and E with the exception of Basin A in which two sub-basins were determined. The size of the drainage easements for the lots joining these sub-basins were all sized according to the flow rates for the sub-basins given in Table 3.

Most lots located at the base of the escarpment will have a 3-foot drop or greater across the 100-foot depth of the lot. Thus the slope of the drainage easement will be assumed at 3 percent. Manning's Formula was used to determine the swale hydraulics assuming a 3 percent slope, n = 0.03 (grass-weeds) and a "V" shaped swale with side slopes of 1V:5H. The results for all sub-basins adjoining lots are as follows. If necessary, the side slopes will be increased to 1V:3H to allow best siting for the house slab.

Sub-basin	100-yr. Qp (cfs.)	Velocity (ft./sec.)	Flow Depth (ft.)	Flow Top Width (ft.)
F2	2.29	2.93	0.40	4.0

A2	1.55	2.68	0.35	3.5
A3	21.60	5.12	0.93	9.3
B1	6.08	3.74	0.58	5.8
C1	2.46	2.98	0.41	4.1
D5	6.74	3.83	0.60	6.0
E1	14.71	4.63	0.80	8.0

ON-SITE FLOWS

General

All off-site flows entering the subdivsion from the escarpment will drain to the streets through private drainage easements (located on appropriate lots) and the combined on- and off-site flows will be carried in the streets and in a storm sewer. The on-site basins are shown on Figure 5 along with the flow directions, proposed spot elevations and proposed street slopes. No developed flows will be allowed into either arroyo west of the Carrick Street or Vulcan Parkway box culverts.

Phases 1 and 4

The drainage for Phases 1 and 4 is discussed together because Phase 4 will drain into Phase 1. The on- and off-site basins which do not drain to either box culvert will drain into Santa Fe Village Unit I.

The most current drainage report for Santa Fe Village Unit I is titled "Drainage Report for Santa Fe Village Unit I, February 1986" prepared by Adam Hamlyn Anderson, Consulting Engineers, Inc. (A.H.A.). The drainage structures presented in the A.H.A. report allowed for all

developed condition flows from the Rincon Subdivision entering Santa Fe Village Unit I.

The southern portion of Santa Fe Village Unit I is currently under construction with many homes finished. The northern portion of Santa Fe Village Unit I is rough graded, and development is expected in the near future.

The contours shown on Figure 5 indicate several high ridges with steep slopes within Phases 1 and 4 of the Rincon Subdivision. These high points will be graded down extensively as shown by the lot elevations on Figure 5 and the fill thus obtained will be used in other locations within and on adjacent developments.

Phases 2 and 3

The drainage for phases 2 and 3 is discussed together because some flow from Phase 2 will drain into Phase 3. Much of the flow in Phase 2 will be carried in the streets until reaching a 9-foot wide concrete rundown located within a 10-foot drainage right-of-way at the lowest point on Cienega Road. This concrete rundown will have an outlet at the rip-rap transition leading into the Carrick Street box culvert. The remaining area in Phase 2 will drain down Foxford Avenue until reaching the storm inlets near the intersection of Foxford Avenue and Carrick Street. The corresponding storm sewer will discharge into the Middle Branch of San Antonio Arroyo on the downstream side of the Carrick Street box culvert. REVISED 6/26/86

West of Carrick Street, no lots will extend into the 100-yr. flood plain of the Middle Branch of San Antonio Arroyo, and all flood plain areas will be dedicated as Open Space right-of-way. No structures, including fences, will be built or allowed within the flood plain areas. Flows which drain into the small tributary arroyo within the site will be confined to the streets and its valley area will be reclaimed from the flood plain by filling.

Phase 3 is currently a detention pond with an earthern berm along the west and south sides, and a concrete spillway in the southeast corner. Foxford Avenue forms the northern edge. A series of sidewalk culverts and a depressed sidewalk rundown convey flow from the street into the pond. The eastern edge of the pond is a cut slope. This privately owned detention pond located on Tract 4A is assumed to be no longer needed because of the improved San Antonio Arroyo channel from this location to Coors Blvd. NW. Therefore Tract 4A may be reclaimed for development of residential lots.

A 9-foot wide concrete channel located within a 10-foot drainage right-of-way will convey all runoff which presently drains into the pond from Foxford Avenue directly into the arroyo, as shown in Figure 5. The outlet of the concrete rundown will be rip-rap lined to reduce velocities and prevent erosion in the Middle Branch of San Antonio Arroyo and the rip-rap will be extended across the arroyo to the opposite property line. The sidewalk culverts will be removed and replaced with standard curb and gutter because the concrete rundown

will discharge all of the runoff remaining after depletion by the storm sewer.

As discussed previously a Prudent Line Analysis was conducted for the Middle Branch of San Antonio Arroyo. This analysis determined that the reach west of the Carrick Street box culvert was aggrading and the 100-yr. flood plain limits would coincide with the Prudent Line for development purposes.

East of the Carrick Street box culvert some degradation is possible along the arroyo but because the AMAFCA gabion drop structure is a fixed downstream grade control, significant degradation below the equilibrium slope for this reach is unlikely. Therefore, this reach will be regraded for equilibrium slope. Furthermore, the outlet of the Carrick Street box culvert will be a stilling basin to reduce velocities and prevent scour. Details on this basin are provided later in this report.

Time of Concentration (Tc)

The Tc's for the flow paths leading to various analysis points (points of interest for hydrologic and hydraulic analysis) were determined. The longest Tc is for Analysis Point 26, which is 13.4 minutes, was determined as follows.

> The earth flow path begins at the top of Off-site Sub-basin A3 and ends at Rockcress Court. The street flow path begins at the cul-de-sac in Rockcress Court and continues along Lamar Avenue to Analysis Point 26.

Earth flow path
Length = 725 ft.
Elevation difference = 138 ft.
Tc = 2.4 min.
Average velocity = 5.03 ft./sec.

Street flow path
Length = 2,500 ft.
Elevation difference = 50 ft.
Tc = 14.5 min.
Average velocity = 2.87 ft./sec.
[DPM Plate 22.2 B-2]
Adjusted Tc = 11.0 min.
[DPM Sec. 22.2 p. 4]

Total Tc = 2.4 + 11.0 = 13.4 min.

All other Tc's greater than 10 minutes are listed below and their computation, as described in the original report, is similar to the computation shown above. The Tc for Analysis Point 8 is 12.6 minutes. Analysis Point 7 is slightly upstream from Analysis Point 8 and the drainage areas are almost equal, therefore the same Tc was used for both analysis points.

The Tc's for analysis points 15 and 16 is 11.9 minutes, and 10.45 minutes for Analysis Point 20. The Tc's for analysis points 21 and 26 are 12.19 minutes and 13.4 minutes respectively.

The Tc's for all other analysis points are less than 10 minutes and are therefore assumed to be 10 minutes.

Hydrology At Analysis Points

Analysis Points are points of interest for street hydraulics and hydrology, and consequently they provide data necessary for design.

Figure 5 shows the locations of 40 analysis points within the Rincon Subdivision.

Analysis Points 34, 35, 36, and 37 - the hydrology at these analysis points was determined previously by A.H.A.. However, the hydrology given by A.H.A. at these analysis points will change due to the following reasons.

A.H.A. had intended to discharge runoff from Off-site Basin G1 (100-yr. Qp = 11.5 cfs.) into a future retention pond on Tract 2A (Phase 2 of Rincon). This report proposes to carry runoff from Basin G1 along with runoff from Basin G2 in a swale along Montano Road which will exit through a curb cut (see Figure 5) and then down Foxford Avenue.

The 100-yr. peak discharges given by A.H.A. at analysis points 34 and 35 are 37.6 cfs. and 41.3 cfs., respectively. However, because the peak discharge from Basin G1 (100-yr. Qp = 11.5 cfs.) will be added to the peak discharges at analysis points 34 and 35, the new 100-yr. peak discharges at these analysis points are 49.1 cfs. and 52.8 cfs., respectively.

The A.H.A. report did include On-site Sub-basin 37. On-site sub-basins 36 and 38 will also contribute flow to Foxford Avenue, however, the peak discharges from sub-basins 36 and 38 should not be added to the peak at Analysis Point 35 because of the differences in Tc. All Tc's within the development are less than 10 minutes and

therefore are assumed to be 10 minutes. The Tc for Analysis Point 35 is 36 minutes (determined by A.H.A.) and therefore the flow from Sub-area 36 and 38 will peak earlier; consequently the peak flows are not coincident.

Thus, the 100-yr. peak discharge reaching Analysis Point 35 is 52.80 cfs.. Four catch basins will be located at Analysis Point 35 and the capacity of these catch basins and corresponding storm sewer is 39 cfs.. Therefore, the 100-yr. peak discharge downstream from Analysis Point 35 is reduced to 13.8 cfs..

The 100-yr. peak discharge reaching Analysis Point 36 is equal to the remaining flow from anlaysis Point 35 (13.8 cfs.) plus the 100-yr. peak down Carrick Street from Off-site Basin H (25.4 cfs.) which is Santa Fe Village Unit II (existing). A.H.A. determined the Q of 25.4 cfs.. Thus the total at Analysis Point 36 is 39.2 cfs..

Analysis Point 37 is located at the present concrete rundown structure which has a capacity of 59.7 cfs.. The 100-yr. peak Q at this analysis point is 83.3 cfs. as determined by A.H.A. The six sidewalk culverts currently located approximately 30 feet west of Creggs Street, have the capacity to discharge the remaining 23.6 cfs. of the 83.3 cfs.. However, the storm sewer and storm inlets to be located at the intersection of Carrick Street and Foxford Avenue will ensure that 39 cfs. will drain south down Carrick Street towards the box culverts and thus the 6 existing sidewalk culverts will be removed and replaced with a standard curb and gutter. The 100-yr. peak

discharge reaching Analysis Point 37 will be 55.3 cfs. determined as follows.

The 100-yr. peak discharge from Analysis Point 36 (39.2 cfs.) was added to the 100-yr. peak discharge from Off-site basins I (8.1 cfs.) and J (8.0 cfs.) which were determined by A.H.A. Thus the 100-yr. peak discharge at Analysis Point 37 is 55.3 cfs. (39.2 + 8.1 + 8.0). Therefore the existing concrete rundown with a capacity of 59.7 cfs. will remain. The curb opening will transition from 42 feet into a 9-foot wide concrete rundown structure which will drain to the Middle Branch of San Antonio Arroyo.

The A.H.A. report did not give the 10-yr. peak discharge for anlaysis points 34, 35, 36 or 37 or the 10-yr. and 100-yr. runoff volumes. For the present report, the 10-yr. peak discharge for these analysis points was determined by mulitplying the 100-yr. peak Q by the ratio of the 10-yr. to 100-yr. peak discharges for Analysis Point 26. This ratio of peak discharges is (47.16/71.64 cfs.) = 0.66. Thus, the 10-yr. peak discharges for analysis points 34, 35, 36 and 37 were determined as 66 percent of the 100-yr. flow rates. No attempt was made to determine the volumes.

Design rainfall data for all analysis points were determined for the computed Tc. Table 4 lists the rainfall data used for determination of peak discharges and runoff volumes at all analysis points.

Figure 5 shows the drainage basins which were used to calculate the

hydrology at all analysis points. The basins were determined based on proposed elevations, streets and lot lines and the locations of analysis points.

Table 5 lists the derivation of the composite developed Runoff Coefficient - C which is 0.58. Runoff Coefficients "C", were determined as an area weighted average of the "C" factors of all soil types within the contributing area of an analysis point. Table 6 shows the composite C determination for the contributing area of an analysis point.

Table 7 gives the on-site hydrology at the analysis points and Table 8 gives the hydraulics at the analysis points.

Basins 26B, 27, 28, 39 and 42 are the basins located along the Middle and South Branches of San Antonio Arroyo. Flows from these basins will be carried in swales located at the back of the lots except for Basin 26B where all lots drain to the street. These swales will only carry flow from the backyards, which are assumed to be vegetated in grass, etc. The front yards and roofs will drain to the street in front of the lots except for Basin 39 where the total lot area will drain to the swale. The C value for backyard on-site undeveloped conditions is 0.30 based on the soil type and classification (BKD - Hydrologic Soil Group A) and the developed on-site C is 0.25 as determined in Table 6.

The swales from basins 27 and 28 will outlet into the street through a 2-foot wide sidewalk culvert which has a capacity of 4.74 cfs.

(determined in the next section). The swale from Basin 42 will drain into the concrete rundown from Cienega Road and Basin 39 will drain into the concrete rundown at Foxford Avenue. As discussed previously, a concrete block wall with 12 inches above ground will be located along the rear lot lines of all lots adjacent to the arroyos to prevent any nuisance flows from entering the arroyo from adjacent lots. Figure 6 shows a typical cross-section through a lot adjacent to the Middle Branch of San Antonio Arroyo with the swale located in a drainage easement. The treatment along the South Branch of San Antonio Arroyo will be similar.

Swale and Concrete Rundown Hydraulics

Swale - The swale from Basins 27, 28 39 and 42 will be continuous from lot to lot. It will be located along the rear lot line adjacent to the 18-inch header curb (or retaining wall). The swale hydraulics were determined for the 100-yr. peak discharge, using Manning's Formula and assuming a minimum slope of 0.005 ft./ft., n = 0.03 (grass, weeds), a "V" shaped swale with side slopes of 1V:5H or 1V:3H. Table 9 gives the results and the private drainage easement widths will be based on these results.

The swales from basins 39 and 42 will enter the corresponding concrete rundowns through a "V" notch in the top of rundown wall with the same top width, depth and side slope as the swale.

The end of the swales from basins 27 and 28 will join the street

through sidewalk culverts sized to carry the 100-yr. peak discharge. The entrance to the culverts (rectangular) was sized using the the formula Q=0.67 L(2g**0.5)H**1.5 (King and Brater, p.4-5). Assuming H=0.58 feet and solving for L, the results are as follows:

Basin	Q100 (cfs.)	H (ft.)	L (ft.)
27	2.15	0.58	0.91
28	0.94	0.58	0.40

The results indicate that a 1-foot wide sidewalk culvert could carry the flow. However, to provide a wider transition from the earth swale to the culvert entrance, 2-foot wide sidewalk culverts will be constructed at analysis points 27 and 28.

The depressed sidewalk entrance existing at Foxford Avenue (Analysis Point 37) has a capacity of 59.7 cfs. (determined by A.H.A.) and the 100-yr. peak discharge will be 55.3 cfs.. Therefore, the present entrance will be used to pass flow into the proposed 9-foot wide concrete rundown.

Concrete Rundowns - The depressed sidewalk entrance to the Cienega Road 9-foot wide concrete rundown was sized using the weir formula Q = CLH**1.5. Assuming a 1-foot tall curb height at the entrance, C = 3.13 and Q100 = 36.69 cfs., then L = 11.72 feet (Analysis Point 33). Thus L = 11.72 feet and a transition will be made through the 9-foot strip from curb line to edge of right-of-way to join the 9-foot wide concrete rundown. A detail is shown on Figure 5.

The concrete ruundown hydraulics were determined using Manning's Formula and Table 9 gives the results. Both rundowns have a 9-foot bottom width and will be located within a 10-foot right-of-way and will be constructed according to City Standard Drawing K-23 (Type B).

Storm Sewer

A Type A and Type B catch basin will be located on each side of Foxford Avenue approximately 50 feet west of Carrick Street. The Type A catch basin will drain into the Type B catch basin through an 18-inch R.C.P.. The Type B catch basin will drain to the main storm sewer (30-inch R.C.P.) through a 24-inch R.C.P.. The main line 30-inch R.C.P. will travel through a manhole (non pressure) at the intersection of Foxford Avenue and Carrick Street and will outlet into the stilling basin below Carrick Street. Figure 8 shows the plan for the storm sewer. The grating capacities of the Type A and Type B grate were determined using DPM Plates 22.3 D-5 and 22.3 D-7, respectively. The proposed street slope is 1.14 percent and the 100-yr. peak Q is 52.8 cfs. The flow depths at each grate were determined using Plate 22.3 D-1 in the DPM.

The capacity of the Type A and B grates are 9 cfs. and 10.5 cfs. respectively. Therefore, a total of 19.5 cfs. (from each flow line) will be subtracted from the total flow of 52.80 cfs.. Thus, the total flow subtracted is 39 cfs. leaving 13.8 cfs. as street flow downstream from the inlets. Table 10 shows the hydraulic grade line determination for the total storm sewer.

updated 6/26/86

Vulcan Parkway Box Culvert

The box culvert proposed at Vulcan Parkway was discussed in the previously mentioned drainage plan for Santa Fe Village Unit III which has been approved by the City Design Hydrology Section and the construction drawings are currently under review by the City Engineering Staff. The box culvert will be located at a low point in Vulcan Parkway. A large depressed sidewalk section will be located along each side of Vulcan Parkway above the box culvert. The sizes of the depressed sidewalks were determined in a previous submittal to the City Design Hydrology Section and were approved. The following is a summary of the required depressed sidewalk lengths.

The 100-yr. peak discharges reaching the Vulcan Parkway crossing from Rincon and Santa Fe Village Unit III are 81.57 cfs. and 25.72 cfs., respectively, for a total of 107.29 cfs.. The depressed sidewalk lengths required were determined using the formula Q = 0.67 (L)(2(32.2)**0.5)(H*1.5) (King and Brater, p. 4-5). The length required to pass 53.65 cfs. (0.5*107.29 cfs.) through the depressed sidewalk at each flow line (assuming H = 0.67 feet) is 18.20 feet.

However, due to the large 100-yr. Q of 107.29 cfs., the depressed sidewalk entrance capacity was checked using a standard weir formula, Q = CLH**3/2. The assumed C = 3.13 (Table 5-13, Figure 5-23, King and Brater) and H = 0.67 feet. The maximum length at the east flowline was limited by the concrete channel width and the length of the 12-foot

sidewalk transition. The available length is 25 feet and the maximum capacity is 43 cfs. at a depth of 0.67 feet. Therefore, (107.29 cfs. - 43 cfs.) 64.29 cfs. must pass through the depressed sidewalk section at the west flowline. The length of the west depressed sidewalk section is 38 feet. Therefore, the 100-yr. peak discharge will be safely discharged into the lined channel below Vulcan Parkway.

Carrick Street Box Culvert

The box culvert proposed at Carrick Street was discussed in the Conceptual Drainage Plan for Santa Fe Village Unit II Tracts 2A and 4A which has been approved by the City Design Hydrology Section. However, the previous report specified two 6 feet tall x 12 feet wide box culverts. This report will plan for three 6 feet tall x 10 feet wide box culverts. The box culverts will be located at a low point in Carrick Street (Analysis Point 39), therefore flows from phases 2 and 3 and some flow from phases 1 and 4 will drain to the low point and discharge to the lined channel below through a depressed sidewalk section.

? riprap @ Crossing

The 100-yr. peak discharge at Analysis Point 39 is 4.7 cfs. (determined previously). However, one half of the peak flow from analysis points 16 and 36 could be added to the 4.7 cfs.. This is done to provide adequate capacity at the depressed sidewalk. Therefore, one half of the 100-yr. peak discharge at analysis points 16 and 36 equals 33.85 cfs. and 19.6 cfs., respectively. Therefore, the 100-yr. peak discharge at Analysis Point 39 equals 4.7 + 33.85 + 19.6 = 58.15 cfs..

The assumption is made that one half of the flow will reach each flow line. Each depressed sidewalk length was sized for 29.08 cfs. using the standard weir formula Q=CLH**3/2, with C = 3.13 and H = 0.67. Thus, L = 16.94 feet and each depressed sidewalk length will be 17 feet.

Equilibrium Slope

As discussed previously, the Middle Branch of San Antonio Arroyo will be graded to its equilibrium slope from the AMAFCA gabion grade control structure to the Carrick Street stilling basin. Figure 9 shows the arroyo profile with existing and proposed equilibrium slope. Figure 10 shows the arroyo cross-sections which indicate that very little of the over banks will be disturbed to achieve the equilibrium slope. The arroyo in the disturbed portions of this reach will be revegetated.

Sloped Drop Structure-Stilling Basin

The sloped drop structure-stilling basin below the Carrick Street box culvert will reduce velocities of flow from the concrete box culvert, thus reducing the erosion potential in the arroyo. Figure 11 shows a plan view of the sloped drop structure-stilling basin. The sloped drop structure-stilling basin was designed using the procedures given in "Design Guidelines and Criteria for Channels and Hydraulic Structures on Sandy Soil" by Simons Li and Associates, June, 1981.

The HEC-2 Water Surface Profiles program developed by the U.S. Army Corps of Engineers was used to determine the 100-yr. flood plain from the AMAFCA gabion drop structure to the reach upstream from the box

culvert.

The rip-rap size required to resist movement at the stilling basin outlet and other locations were determined using Monograph No. 25 published by the U.S. Bureau of Reclamation in July 1963 and titled "Hydraulic Design of Stilling Basins and Energy Dissipators."

The velocity leaving the stilling basin is 2.35 ft./sec. (Cross-section 16) and required rip-rap size is 3-inches (median diameter). The velocity at the beginning of the rip-rap transition leading into the box culvert (Cross-section 28.1) is 11.09 ft./sec. and the required rip-rap size is 10-inches (median diameter).

Rip-Rap Rundown

The 10-foot wide rectangular concrete rundown located at Foxford Avenue will have a 9-foot bottom width and this rundown will outlet into a rip-rap rundown, which extends across the main arroyo and is 30 feet wide.

The rip-rap rundown will a bottom width of 9 feet, side follow the existing main arroyo ground contours. The rundown hydraulics were determined using Manning's Formula assuming n = 0.045, S = 0.159 ft./ft. and the 100-yr. peak discharge of 55.30 cfs. (Analysis Point 37). Thus, the flow depth, velocity and top width equal 0.61 feet, 8.48 ft./sec. and 12.66 feet, respectively. The swale will be constructed to reduce all velocities below non-erodible levels before reaching the unlined section of the arroyo.

The rip-rap size required to resist movement from the rundown velocity is 10-inches. The velocity in the arroyo resulting from the 100-yr. peak flow is 5.66 ft./sec. (Cross-section 7).

EROSION CONTROL PLAN

The following erosion control plan will be implemented at the beginning of and throughout the construction phase of the subdivision.

The Phase 1 boundary along the Middle Branch of San Antonio Arroyo will have a concrete block wall (with 12-inches above ground) constructed at the beginning of construction which will prevent sediment and runoff from entering the arroyo.

A trapezoidal shaped berm and snow fence will be located along the other boundaries of Phase 1 as shown on Figure 5. The berm will have a 2-foot top width, side slopes of 2H:1V and a height of 2 feet for a total width of 10 feet. The snow fence will be located at the inside base of the berm to keep out unauthorized traffic and to protect undisturbed arroyo and subdivision areas. Berms will also be located along the Phase 1 - Phase 4 boundary and will prevent off-site flow from entering Phase 1 lots. However, the berms will divert water into the temporary turnarounds located at the Phase 1 boundary which will then drain into the streets. Note that no grading will be allowed in the Phase 4 area and therefore, the exisiting vegetation in Phase 4 will minimize the amount of sediment that may deposit in or pass through Phase 1.

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

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

May 19, 1986

Elvidio Diniz
Resource Technology, Inc.
2620 San Mateo Blvd., NE
Albuquerque, New Mexico 87110

RE: DRAINAGE & GRADING PLAN SUBMITTAL OF RINCON SUBDIVISION PHASE I RECEIVED MAY 19, 1986 FOR PRELIMINARY PLAT APPROVAL (F-10/D3)

Dear Elvidio:

The above referenced submittal, drawings dated May 15, 1986, is approved for Preliminary Plat purposes. Prior to Final Plat sign-off by the City Engineer, the following items are required:

1. An executed Subdivision Improvements Agreement.

2. An executed Drainage Covenant for the swales, side yard slump block walls with drains, and rear yard block walls along arroyo.

3. An executed revegetative and maintenance agreement for the arroyo east of Carrick Street.

4. Final copy of the Prudent Line and Thalweg survey of existing arroyo.

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

Cordially,

Roger A. Green, PE

Roger A. Green, P.E.
C.E./Hydrology Section

cc: Coda Roberson

RAG/bsj

RESOURCE TECHNOLOGY, INCORPORATED

~~7800 MARBLE AVENUE NE, SUITE 6~~
~~ALBUQUERQUE, NEW MEXICO 87110~~
~~(505) 266-0020~~
2620 SAN MATEO NE, SUITE B
ALBUQUERQUE, NM 87110
(505) 884-0059

June 25, 1986

F10/D3

Mr. Roger Green
CE, Design Hydrology
Design Hydrology Section
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: REVISIONS TO DRAINAGE REPORT FOR RINCON SUBDIVISION, ALBUQUERQUE, NEW MEXICO

Dear Roger:

The following paragraphs describe revisions of the approved drainage report for the Rincon Subdivision (Zone Atlas Page No. F-10). We discussed these revisions with you (at your office) on June 18, 1986.

The first revision involves elimination of the proposed storm sewer and associated inlets at the intersection of Foxford Avenue and Carrick Street. The proposed storm sewer will be eliminated due to problems in physically locating the water main and other utilities in Carrick Street; and more important, the storm sewer is not necessary.

A closer look at the hydrology and sizing of drainage structures as presented in "Santa Fe Village Unit II Drainage Report Revision October, 1982" by Adam, Hamlyn, Anderson Consulting Engineers, Inc. (A.H.A.) reveals that the storm sewer is not necessary to control the 100-yr. peak discharge because the A.H.A. report added all peak discharges regardless of the Time of Concentration (Tc). The following table is a summary of peak discharge and Tc for our analysis points which may be compared with those given in the A.H.A. report (Sheet 4 of 5 and Plate IV).

R.T.I. Analysis Point/Sub-basin	100-yr. Qp (cfs.)	Tc (min.)	Comment
Original Report:			
35	52.8	36	Tc (A.H.A)
H	25.4	10	Qp, Tc (A.H.A.)
I	8.1	10	Qp, Tc (A.H.A.)
J	8.0	10	Qp, Tc (A.H.A.)

37	94.3	37	Tc (A.H.A.) Sum of Qp = 52.8 + 25.4 + 8.1 + 8.0 = 94.3 cfs. without a storm sewer.
37	55.3	37	Qp = 94.3 - 39 = 55.3 cfs., with storm sewer (39 cfs. capacity) as in R.T.I Drainage Report Tc (A.H.A.)
Revision:			
37	52.8	37	Hydrographs from Sub-basin H, I, and J will be gone before the peak of 52.8 cfs. at Analysis Point 35 occurs.

As we discussed, if we assume 1/3 Tp for the rising limb and 2/3 Tp for the falling limb, the hydrographs from sub-basin H, I and J will be gone in 30 minutes or less because Tc is less than 10 minutes; therefore the 100-yr. Qp is 52.8 cfs. at the existing curb opening located on Foxford Avenue (Analysis Point 37). For your information R.T.I. independently determined the Tc at Analysis Point 37 to be 35 minutes which agrees very well with 37 minutes as determined by A.H.A..

The existing capacity of the curb opening was determined by A.H.A. (Sheet 11 of 15) as 59.7 cfs. using the standard weir formula. However, the C used in their computations is 2.6 which is very low. We believe the C should be higher and we recomputed the capacity using a C of 3.00 due to the smooth entrance conditions. The C value was obtained from Handbook of Hydraulics by King and Brater (Fifth Edition) assuming Figure 5-23 (p. 5-27) was most similar to the actual approach of the curb opening and Figure 5-24 is most similar to the gradual slope from the curb opening to the concrete rundown. The C value of 3.00 was assumed based on Table 5-13 (King & Brater p. 5-20).

Using the weir formula (Q = CLH**1.5) we solved for H using the 100-yr. Qp of 52.8 cfs. (considering Tc) and 94.3 (not considering Tc). The results are given in the following table.

Q (cfs.)	C	L (ft.)	H (ft.)
52.8	3.00	42	0.56
94.3	3.00	42	0.82

The maximum capacity with H = 0.67 ft. (standard curb height) = 69 cfs.

Therefore, the existing curb opening length of 42 feet will be just adequate in discharging the 100-yr. Qp into the concrete rundown, and the proposed storm sewer is not necessary.

The second revision includes the removal of the proposed depressed sidewalk section located at Analysis Point 39. A high point will be located in Carrick Street as shown on the grading plan (submitted to you on June 25, 1986 which will direct all flows from lots adjacent to Carrick Street towards Foxford Avenue or Lamar Avenue. The high point and associated street grades will prevent flows heading east down Lamar Avenue or Foxford Avenue from turning down Carrick Street. Consequently, the depressed sidewalk section in Carrick Street is no longer necessary.

At your request, we also checked all street intersections in Phase 1 for possible hydraulic jumps and a brief discussion of the results follows.

The flow in most streets will be supercritical as may be expected due to the steep slopes. The greatest sequent depth (depth after hydraulic jump) will occur at Analysis Point 8 where the sequent depth for the 100-yr. Qp of 82 cfs. is 0.82 feet as compared to 0.74 feet before the hydraulic jump. Two additional points will have sequent depths of 0.72 feet. All other points will have sequent depths below curb height. Analysis Point 14 had the greatest change from initial depth to the sequent depth; it was 0.35 feet (initial) and 0.70 feet (sequent).

Based on the analysis hydraulic jumps and the above discussion, the elevations shown on the grading plan are adequate for the 100-yr. peak discharge.

If you have any questions or wish to discuss this information in more detail, please feel free to call me or Pat Stovall.

Very truly yours,

Elvidio V. Diniz, P.E.
Principal Engineer

EVD/PS/ec

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

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

June 26, 1986

Elvidio Diniz, P.E.
Resource Technology, Inc.
2620 San Mateo Blvd., NE Suite B
Albuquerque, New Mexico 87110

RE: REVISION TO THE DRAINAGE REPORT OF RINCON SUBDIVISION RECEIVED JUNE 25, 1986 FOR WORK ORDER AND ROUGH GRADING PERMIT APPROVAL (F-10/D3)

Dear Elvidio:

The above referenced submittal is approved, which eliminates the storm drain at Foxford Avenue and Carrick Street, and makes Carrick Street over the arroyo the high point, thus eliminating the need for depressed sidewalks on Carrick Street Crossing.

The mylars of the revised Grading Plan have been signed for Rough Grading Permit approval.

Provide this office copies of the revised final Grading Plan for our final review and approval at the same time the construction set is submitted to D.R.C. for review and approval. Keep in mind that wherever street flow depths or hydraulic jump depths at intersections are greater than 0.53', standard curb and gutter must be specified.

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

Cordially,

Roger A. Green, PE

Roger A. Green, P.E.
C.E./Hydrology Section

cc: Andre Houle, D.R.C.
Coda Roberson Construction

RAG/bsj

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

September 16, 1986

Mr. Coda C. Roberson
Roberson Construction
6001 Atrisco NW
Albuquerque, NM 87120

RE: Rincon Subdivision Phase I No. 2870

Dear Mr. Roberson:

Enclosed is a copy of subject Subdivision Improvements Agreement, Sidewalk Variance Agreement and Letter of Credits for subject project as filed with the City Clerk's Office.

Please call me if I may be of further assistance.

Sincerely,

Della Gallegos

Della Gallegos
Administrative Assistant

Enclosures

cc: Resource Technology
Fred Aguirre, Hydrology Division, PWD
Project File

2582E

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

F-10/D3

January 5, 1987

Mr. Robby Roberson
Roberson Construction Co.
6001 Atrisco NW
Albuquerque, NM 87120

RE: PROJECT NO.#2879 - Rincon Subdivision Ph. I

Dear Mr. Roberson:

Enclosed is a executed copy of the Drainage Covenant for the above noted project as filed with the City Clerk's Office.

Please call me if I may be of further assistance.

Sincerely,

Della Gallegos

Della Gallegos
Administrative Assistant

Enclosures

cc: Fred Aguirre, Hydrology
Project File

2582E

FILE CO

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 2, 1988

Ray Gomez
Resource Technology, Inc.
2129 Osuna Road, NE Suite 2A
Albuquerque, New Mexico 87113

RE: REVISED GRADING & DRAINAGE PLAN OF RINCON SUBDIVISION, PHASE I, LOTS 6 - 15, RECEIVED JANUARY 25, 1988 FOR GRADING PERMIT APPROVAL (F-10/D3) (W.O. #2879)

Dear Mr. Gomez:

The above referenced submittal dated January 21, 1988 is approved. After backfilling specifications are added to the construction drawings or specifications referenced, then this office can sign the mylar as approved for grading.

Please check with the Planning Department to make sure this revised Grading Plan is not in conflict with any approved Site Development Plan. The work order construction drawings should also be revised so that the record drawings include this revision.

If you have any questions, call me at 768-2650.

Cordially,

Roger A. Green, PE

Roger A. Green, P.E.
C.E./Hydrology Section

xc: Andre Houle, DRC

RAG/bsj

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
KEN SCHULTZ

CHIEF ADMINISTRATIVE OFFICER
GENE ROMO

DEPUTY CAO DEVELOPMENT & ENTERPRISE SERVICES
LARRY LARRANAGA

DEPUTY CAO PUBLIC SERVICES
DAN WEAKS

October 6, 1988

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Robby Roberson
Roberson Construction Company & Home Mortgage
6001 Atrisco Road N.W.
Albquerque, N.M. 87120

F10103

RE: PROJECT NO. 3250, RINCON SUBDIVISION, PHASE IV, (MAP NO. ~~G-13~~)

Dear Mr. Roberson:

This is to certify that the City of Albuquerque accepts Project No. 3250 as being completed according to approved plans and construction specifications. If all required right-of-ways and/or easements have been dedicated, the City of Albuquerque will accept for continuous maintenance all public infrastructure improvements constructed as part of Project No. 3250. If the required right-of-ways and/or easements have not been dedicated, the City of Albuquerque cannot accept the project for continuous maintenance and said maintenance will be the responsibility of the developer. When a final plat has been filed it will be the developer's responsibility to provide the Construction Management Division with a copy, at which time the City will fully accept Project No. 3250.

The private infrastructure improvements in the amount of $79,280.00 are not included as part of this acceptance.

The project is described as follows:

- Installed an 8" PVC water main and sanitary sewer main with complete water and sanitary sewer services. Also constructed curb, gutter, and paving.

- The contractor's warranty begins the date of this letter and will be effective for a period of one (1) year.

Sincerely,

Russell B. Givler, P.E.
Chief Construction Engineer
Construction Mgmt. Division
Engineering Group
Public Works Department

RBG:rvg

MATCH LINE

PREVIOUS PROPERTY BOUNDARY

1000 E

SCALE 1"=50'

ROSEMARY RD

ROCKCRESS RD

SNAPDRAGON RD

ASTAIR AVE

RINCON PHASE I

SANTA FE VILLAGE UNIT III

SOUTH BRANCH SAN ANTONIO ARROYO

GARDEN WALL ACTUALLY LOCATED ON PROPERTY LINE

GARDEN WALL ACTUALLY LOCATED ON PROPERTY LINE

RETAINING WALL ACTUALLY LOCATED ON PROPERTY LINE

4' WIDE PRIVATE DRAINAGE EASEMENT

SNOW FENCE

SWALES TO BE GRADED AT TIME OF FINAL LOT GRADING

5250 5240 5230 5220 5210 5200 5190 5180 5170 5160

TBM PAINTED CROSS TOP CURB ELEVATION= 5158.21

FOREPAW

SAN ANTONIO ARROYO

MIDDLE BRANCH

LARGE

RINCON PHASE IV AREA

N75

TEMPORARY BENCH MARK LOCATION MAP

TEMPORARY EROSION CONTROL BERM & SNOW FENCE

NO SCALE

2H:1V 2.0' BERM 2.0' 2H:1V EXISTING GRADE

TYPICAL SIDEYARD SWALE/ GARDEN WALL CROSS SECTION

NO SCALE

3.0' 2.0' 3.0' 2.0' ℄ SWALE SLAB 6" SWALE 0.33' 1.5' 0.3' 4" 1.5' 0.3' 1.5' 4.0' 0.33' SLAB GARDEN WALL

GARDEN WALL DETAIL

4" SOLID CAP

LEAVE REBAR EXPOSED FOR FUTURE EXTENTION OF WALL BY OTHERS

8"x8"x16" C.M.U.

SWALE

4@16" O.C. 1.5"ø "KEY" 8"x8"x16" C.M.U.

2"ø 4'S

COMPACT SUBGRADE TO 90% PER ASTM D1557

ARROYO 1'-0" MIN. 2'-0" 1'-0" 8" 8" 8" 2'-0"

SWALE AND SIDE WALL DETAILS

NOTE: SWALE, GARDEN WALL, AND SIDEWALL APPLY TO LOTS ADJACENT TO MIDDLE AND SOUTH BRANCHES OF SAN ANTONIO ARROYO.

NOTE: SWALE & SIDEWALL WITHIN (a) PRIVATE DRAIN ESMT. ALONG MIDDLE BRANCH SAN ANTONIO ARROYO. SWALE & SIDEWALL WITHIN +/- PRIVATE DRAIN ESMT. ALONG SOUTH BRANCH SAN ANTONIO ARROYO.

PVC PIPES (4"ø) WILL CONTINUE FLOW IN SWALE.

SEE NOTE AT LEFT 0.00' SWALE 2% SH.IV BACKYARD SEE GARDEN WALL DETAIL 1' ABOVE GROUND MIN. OFF SITE DRAINAGE 1'-0" LFTG. ARROYO

PROFILE NTS

BACKYARD LOT LINE 2' 4" PVC RIP RAP (D50=2") SEE NOTE AT LEFT SH.IV SWALE SEE GARDEN WALL DETAIL ARROYO

PLAN NTS

NOTE: THE ELEVATIONS SHOWN ON THIS SHEET ARE FOR ROUGH GRADING ONLY

RETAINING WALLS WITHIN BLOCK 3 PRIVATE—NOT PART OF THIS WORK ORDER

REFER TO SOILS REPORT FOR EARTHWORK SPECIFICATIONS

CONTRACTOR MUST CONTACT CITY OF ALBUQUERQUE ENVIRONMENTAL HEALTH DEPT. TO OBTAIN TOPSOIL DISTURBANCE PERMIT.

APPROVED FOR ROUGH GRADING ± 1'
Roger A Green 9-3-87
CITY ENGINEER DATE

LEGEND	
	N.W. MESA ESCARPMENT CORRIDOR PLAN FENCE
	PHASE BOUNDARY
(1)	BLOCK DESIGNATION
5.00	PROPOSED SPOT ELEVATION
	FLOW DIRECTION
	GARDEN WALL
	TEMPORARY EROSION CONTROL BERM & SNOW FENCE
	RETAINING WALL

NOTE: ALL RETAINING WALLS ARE ACTUALLY LOCATED ON PROPERTY LINES.

SURVEY INFORMATION — FIELD NOTES BY DATE NO.

BENCH MARKS — AS BUILT INFORMATION

CONTROL: BENCH MARK A.C.S. "16-E10" CONTRACTOR

A □ CHISLED ON TOP OF CONCRETE CURB AT THE N.E. CURB RETURN AT THE INTERSECTION OF ATRISCO ROAD N.W. AND FLOR DEL SOL PLACE N.W.

WORK STARTED BY DATE
INSPECTOR'S ACCEPTANCE BY DATE
VERIFICATION BY DATE
DRAWINGS CORRECTED BY DATE
MICRO-FILM INFORMATION

M.S.L. ELEVATION = 5134.777'

RECORDED BY DATE

NO

ENGINEER'S SEAL

NO. DATE REMARKS BY

REVISIONS

DESIGNED BY P.S. DATE 4-87
DRAWN BY C.M., M.S., V.M., C.S. DATE 4-87
CHECKED BY P.S., E.D. DATE 4-87

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

TITLE: RINCON PHASE IV SUBDIVISION
GRADING & EROSION CONTROL PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
City Engineer			Liquid Waste		
A.C.E.-Design			Traffic		
A.C.E.-Hydrology	Roger A Green	10-2-87	Water		

DRAWING NO. 3250 | MAP NO. E, F-10 | SHEET 5 OF 22