CITY OF
Albuquerque

November 17, 1997

Martín J. Chávez, Mayor

Kevin Patton, P.E.
Bohannan-Huston, Inc.
7500 Jefferson Blvd. NE
Albuquerque, NM 87109

RE: MASTER PLAN FOR ALTURA WEST (G11-D14). DRAINAGE MANAGEMENT PLAN FOR SITE DEVELOPMENT PLAN FOR SUBDIVISION APPROVAL AND FINAL PLAT. ENGINEER'S STAMP DATED 10-22-97.

Dear Mr. Patton:

Based on the information provided on your October 23, 1997 submittal, the above referenced project is approved for Site Development Plan for Subdivision Approval.

Prior to Final Plat approval, your report and plans must indicate that no developed runoff may be directed to the landscaping/water harvesting ponds.

When Basin "K" is ready for development, the City will require that a *Stormcepter* type manhole be installed between the detention pond outlet structure and the City maintained storm drain line. The *Stormcepter* manhole will be maintained by the homeowners association.

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

Lisa Ann Manwill, P.E.
Hydrology

c: Andrew Garcia
File

MASTER DRAINAGE PLAN FOR ALTURA WEST AND ARCHDIOCESE OF SANTA FE PROPERTIES NEAR ST. PIUS HIGH SCHOOL

OCTOBER 21, 1997

BOHANNAN HUSTON

Courtyard One

7500 JEFFERSON NE

Albuquerque

NEW MEXICO 87109

voice 505.823.1000

fax 505.821.0892

PREPARED FOR:

ALTURA WEST LTD.
414 SILVER AVENUE SW
SUITE 110
ALBUQUERQUE, NM 87103

ARCHDIOCESE OF SANTA FE
4000 ST. JOSEPHS PLACE NW
ALBUQUERQUE, NM 87120

BOHANNAN HUSTON

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October 20, 1997

Lisa Ann Manwill, P.E.
City of Albuquerque
Hydrology Division/PWD
P.O. Box 1293
Albuquerque, NM 87102

Re: Master Drainage Plan for Altura West, Site Development Plan for Subdivision Plan Approval (COA Drainage File No. G11-D14)

Dear Lisa:

The purpose of this letter is to respond to your comments and request final approval of the enclosed Master Drainage Plan. Below I have addressed the comments from your letter dated August 19, 1997.

Comments Prior to Site Development for Subdivision approval:

1. After meeting with you, Fred Aguirre and Loren Meinz, it is my understanding that a permanent detention pond may be constructed in the private park, so as to drop out contaminants. It is our intention to filter out as much debris and contaminants before the nuisance and storm water flows reach the river.
2. Due to the nature of the existing topography and the existing utilities along Coors Boulevard, it is unfeasible to provide one regional detention pond.
3. The report has been revised to reflect landscaping ponds instead of water harvesting ponds. Although developed runoff may be directed to these ponds naturally, the report does not provide for (take credit for) the capacity.
4. The private park will be maintained by the homeowners association. It will be the homeowners association's responsibility to maintain the outlet structure and connector pipe.
5. Basins "C", "O4", "O5" and "O6" have been defined more clearly so as to denote how they drain.

Comments Prior to Preliminary Plat Approval:

1. The appropriate permits will be provided. However, a 404 permit is not required for this site. I am enclosing a copy of a letter from the Army Corps of Engineers which reflects that a 404 permit is not required.
2. The development of Parcel F, the first phase of construction and development, is currently moving forward. The first infrastructure list for this development will provide for the outfall structure and the corresponding storm drain necessary to serve this Parcel.
3. After reviewing the latest FEMA Floodplain Maps for this area, a LOMR or CLOMR will not be required.

I have revised the enclosed Drainage Master Plan to reflect the above responses to your comments. Upon your receipt of the revised plan, I am requesting final approval. If you have any questions or require additional information, please give me a call 823-1000.

Sincerely,
Bohannan Huston

Kevin Patton, P.E.
Project Manager
Community Development and Planning Group

KP/hjh

Enclosures
cc: Tom Keleher, Altura West Ltd.
Jim Rogers, Commercial Investment Group Inc.

DEPARTMENT OF THE ARMY
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS
4101 JEFFERSON PLAZA NE
ALBUQUERQUE, NEW MEXICO 87109-3435
FAX (505) 342-3498

REPLY TO
ATTENTION OF:
Operations Division
Regulatory Branch

September 10, 1997

Mr. Kevin Patton
Bohannan-Huston
Courtyard 1
7500 Jefferson Street, NE
Albuquerque, New Mexico 87109

Dear Mr. Patton:

Reference is made to your September 10, 1997, letter regarding Altura West's proposed storm sewer outfall and Parcel F subdivision construction on lands adjacent to the Rio Grande in Albuquerque, Bernalillo County, New Mexico. (Action No. 1997-00323)

We have studied the project description, other records, and documents available to us. A field inspection was made on August 11, 1997. The storm sewer outfall will be constructed in an existing erosion rill and on a sediment fan entering the riparian bosque adjacent to the river. The rill and sediment fan are not waters of the United States. At other locations on the property, two erosion gullies have formed downstream of existing storm drain culverts east of St. Pius High School. These storm drains will be connected to the subdivision system and the gullies will be regraded for development. The gullies do not connect to waters of the United States and are not jurisdictional waters.

The project is not regulated under the provisions of Section 404 of the Clean Water Act and a Department of the Army permit will not be required. This determination was made because the project does not include any discharges of dredged or fill material into waters of the United States.

If you have any questions, please feel free to write or call me at (505) 342-3216.

Sincerely,

Jean E. Manger
Regulatory Project Manager

MASTER DRAINAGE PLAN
FOR ALTURA WEST AND
ARCHDIOCESE OF SANTA FE PROPERTIES
NEAR ST. PIUS HIGH SCHOOL

OCTOBER 21, 1997

PREPARED BY:

BOHANNAN-HUSTON INC.
COURTYARD I, 7500 JEFFERSON STREET N.E.
ALBUQUERQUE, NM 87109

PREPARED FOR:

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Archdiocese of Santa Fe
4000 St. Josephs Place NW
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KEVIN G. PATTON
NEW MEXICO
13685
REGISTERED PROFESSIONAL ENGINEER

JAMES R. TOPMILLER
NEW MEXICO
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REGISTERED PROFESSIONAL ENGINEER

PREPARED BY:

Kevin Patton, P.E. — Date 10/22/97

UNDER THE SUPERVISION OF:

James Topmiller, P.E. — Date

G-11/D14

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I. INTRODUCTION

This Master Drainage Report supports the development of the Altura West properties located near St. Pius High School along Coors Boulevard. These properties are legally described as (1) Annexation Plat Land in Section 2, TION, R2E, N.M.P.M. Section 35, TIIN, R2E, N.M.P.M. and (2) Tracts X-1 and X-2 of a Portion of the University of Albuquerque Urban Center. Additional properties considered in this report include nearby Archdiocese of Santa Fe properties (Parcels I, II and St. Pius High School). The Vicinity Map in Exhibit 1 of this report illustrates the location of these properties.

The Altura West property is vacant land, zoned SU-3, Special Center Zone, and described as Parcels A, B, C, D, E and F of the University of Albuquerque Area Land Use Plan (see Exhibit 3). Parcels A and B (Tracts X-1 and X-2, respectively) are located along the west side of Coors Boulevard, whereas, Parcels C, D and E are located along the east side of Coors Boulevard, just south of St. Pius High School Parcel F is east of St. Pius High School and St. Josephs Place and west of the Rio Grande.

The amendment to the University of Albuquerque Area Land Use Plan changes the land use designation of Parcels A and B to Mixed Residential: A minimum of 40 acres within Parcels A and B shall be developed for Apartments (R-3) at 20 to 25 du/acre and the balance of the property (approx. 19 acres) shall be developed as commercial (C-2) and/or office (0-1).

The amendment to the University of Albuquerque Area Land Use Plan changes the land use designation of Parcels C, D, E and F to Mixed Residential: residential development not to exceed 25 du/acre and neighborhood commercial/office (C-1 and 0-1 uses). Specifically, there shall be a minimum of five acres (adjacent to Coors Boulevard) developed with town homes or apartments at not less than eight du/acre and an additional 3 to 5 acres (at the corner of Coors Boulevard and St. Josephs Road) that shall be developed with either neighborhood commercial, office, and/or town homes or apartments at not less than 8 du/acre. The balance of Parcels C, D and E shall be developed at an average 4 to 8 du/acre. Parcel F shall be developed at 1 to 3 du/acre. Archdiocese of Santa Fe Parcels I and II are also vacant and zoned SU-3, Special Center Zone. The University of Albuquerque Area Land Use Plan designates Parcel I for the following land uses: employment center, technical services, light industrial, and/or campus-type office park. This land use plan designates Parcel II for mixed use: commercial, office, and multi-

family residential. St. Pius High School is an existing school campus, formerly occupied by the University of Albuquerque.

This report presents a conceptual plan for a storm sewer which ultimately drains to the Rio Grande. This proposed storm sewer collects storm water from the proposed, developed Altura West Parcels A through F and Archdiocese of Santa Fe Parcels I, II and the east third of St. Pius High School. This report also summarizes the existing and proposed conditions of the site, as well as the methods used to analyze these conditions.

II. METHODOLOGY

Existing undeveloped and proposed developed conditions were analyzed for the 100-year, 6-hour storm event in accordance with the revised Section 22.2, Hydrology, of the Development Process Manual (DPM) for the City of Albuquerque, January, 1993. Appendix 1 of this report contains the hydrologic calculations determining the flows generated under existing conditions and the proposed developed conditions. Appendix 2 of this report contains the calculations determining the pond volumes required for interim and proposed developed conditions. Appendix 3 of this report contains the hydraulic calculations determining the size, slope and capacity of the proposed Rio Grande storm sewer.

III. EXISTING CONDITIONS

A. Site Description and Existing Drainage Patterns

The properties discussed herein are currently undeveloped with vegetation consisting primarily of Mesa Dropseed, Indian Ricegrass, Black Gramma and Sand Sagebrush. The soil at the site has been given the SCS soil classification of BKD (Bluepoint-Kokan association, hilly) and MWA (Madurez-wink association, gently sloping). The BKD soils are in the hydrologic soil Group A, which have the highest rate of rainfall absorption. The MWA soils are in the hydrologic soil Group B, which also absorb more water than typical. The existing drainage basins and patterns are shown graphically on the Existing Drainage Conditions Map in Exhibit 4.

1. *Basin A*

Tract X-1, also known as Altura West Parcel A, is designated as Basin A and has slopes ranging up to 5% and is not located within a FEMA floodplain. A ridge running northwest divides Tract X-1 into two drainage basins, Basin AI on the southwest portion and Basin A2 on the northeast portion. Basin AI (10.97 acres) currently drains in a southwest direction to the detention pond in the Ladera Drive right-of-way. The 100-year, 6-hour storm currently generates 14.74 cfs of peak flow from Basin AI.

Basin A2 (20.49 acres) currently drains to the northeast corner of the tract, where it collects in a depressed basin. This depressed basin also collects storm water from the west side of Coors Boulevard, designated as Basin 09. The 100-year, 6-hour storm currently generates 27.54 cfs of peak flow from Basin A2 and 7.16 cfs from Basin 09, the west half of Coors Boulevard. The section "Off-Site Drainage Basins," on page 7 of this report, discusses the drainage impacts of accepting storm water from Coors Boulevard.

2. *Basin B*

Tract X-2, also known as Altura West Parcel B, is designated as Basin B and has slopes ranging from 1% to 4%. The site is not located within a FEMA floodplain, as shown on the floodplain map provided in Exhibit 2. A ridge running northeast divides Tract X-2 into two drainage basins, Basin BI on the southeast portion and Basin B2 on the northwest portion. Basin BI (16.63 acres) currently drains in a southeast direction to the adjacent Villa De Paz Subdivision. The 100-year, 6-hour storm currently generates 22.36 cfs of peak flow from Basin BI. Basin B does not collect storm water from the west side of Coors Boulevard. Rather, the west half of Coors Boulevard also drains to the Villa De Paz Subdivision. The section "Off-Site Drainage Basins," on page 7 of this report, discusses the existing drainage patterns of Coors Boulevard.

The 100-year, 6-hour storm currently generates 14.22 cfs of peak flow from Basin B2. This basin (10.58 acres) currently drains in a northwest direction to a detention pond in the Ladera Drive right-of-way (Basin 08), located between Tracts X-1 and X-2. This

detention pond collects storm water from Basins B2 and AI and from portions of Ladera Drive and Atrisco Drive. This detention pond controls the discharge to the existing storm sewer in the Ladera Drive right-of-way. The existing drainage patterns of Ladera Drive and Atrisco Drive are discussed in more detail on pages 7 and 8 of this report.

3. Basins C Through K

The Annexation Plat Land can be subdivided into eight main drainage basins, Basins C through K. Basins C through J comprise the majority of Altura West Parcel F. Basin K consists of Altura West Parcels C, D, E and a portion of Parcel F, St. Josephs Place, and the south half of St. Josephs Road.

Basin K (35.58 acres) has slopes ranging up to 4%. Storm runoff naturally drains to a FEMA floodplain called Yucca Circle (15.8 acres) centrally located along the south boundary of Basin K. The Flood Insurance Rate Map designates the floodplain as Zone AH, which is defined as an area of 100-year shallow flooding where depths are between one and three feet. Currently, 47% of the contributing flows to the floodplain are generated from Basin K, and 7% from Basin 012, the east half of Coors Boulevard. The remaining flows contributed to the floodplain (i.e., 46%) are generated from Mesa West Subdivision, located south of Basin K. Approximately 4.1 acres of this floodplain (only 26% of the entire floodplain) are located on Altura West Parcels C, D and E. The 100-year, 6-hour storm currently generates 47.83 cfs of peak flow from Basin K.

Basins C through J are located on the west bank of the Rio Grande. Runoff from these basins flows unimpeded from west to east directly to the river. These flows reach the river fairly quickly due to the steep slopes on the east half of the property. The relatively high velocities generated have created an erosion problem at the river edge. Significant amounts of silt have been deposited in the river bottom at the locations where the runoff becomes concentrated. Large cuts in the bank are evident at these locations. These basins are not located within a FEMA floodplain.

Basins C through G are located east of St. Pius High School, with slopes ranging from 4% to 84% at the edge of the escarpment that falls steeply to the river. Basins C (5.06 acres), D (11.22 acres), E (0.48 acres), F (5.83 acres) and G (7.07 acres) currently drain to the Rio Grande generating peak discharges of 6.67 cfs, 14.78 cfs, 0.63 cfs, 7.68 cfs and 9.31 cfs, respectively, during the 100-year, 6-hour storm. Basin C receives 1.03 cfs sheet flow and 6.22 cfs concentrated flows generated off-site from St. Pius High School Basin D receives 3.21 cfs sheet flow and 29.89 cfs concentrated flows from St. Pius High School. Basin F receives 3.32 cfs sheet flow from St. Pius High School. Basin G receives 2.64 cfs of sheet flow from St. Pius High School. The section "Off-Site Drainage Basins," addresses the impacts of these offsite flows in greater detail.

Basins H through J are located east of St. Josephs Pl., with slopes ranging from 6% to 86% at the edge of the escarpment that falls steeply to the river. Basins H (10.77 acres), I (11.88 acres), and J (3.48 acres) currently drain to the Rio Grande generating peak discharges of 14.18 cfs, 15.65 cfs, and 7.13 cfs, respectively, during the 100-year, 6-hour storm.

4. Archdiocese of Santa Fe Parcels I and II

The Archdiocese of Santa Fe Parcels I and II are located between Coors Boulevard and the Rio Grande, south of Namaste Road and north of St. Pius High School and Altura West Parcel F.

These parcels make up Basin L (38.01 acres) and slope toward the Rio Grande at 1% to 14%. This basin currently drains to the Rio Grande generating peak discharges of 51.10 cfs during the 100-year, 6-hour storm.

B. Off-Site Drainage Basins

1. St. Pius High School

St. Pius High School has a detention pond in the northwest corner of the site that collects runoff from the east half of Coors Boulevard and the west two-thirds of St. Pius

High School. However, the eastern third of the campus concentrates its runoff at two locations, Basins 01 and 02, and discharges directly onto the Basins C and D through two storm drains. Significant erosion has occurred at the pipe outlets and extends east toward the river. Some of the erosion occurring along the drop off at the river can be attributed to these concentrated flows. Basins 03 through 06 sheet flow runoff onto Basins D through G.

Basin 01, (approx. 8.77 acres) lies on the southeast side of St. Pius High School and drains approx. 29.89 cfs from the 100-year, 6-hour storm event onto Basin C. Basin 02 (approximately 1.83 acres) lies on the northeast side of St. Pius High School and drains approximately 6.22 cfs from the 100-year, 6-hour storm event onto Basin D. Basin 03 (approximately 0.78 acres) sheet flows approximately 1.03 cfs from the 100-year, 6-hour storm event into Basin C. Basin 04 (approx. 2.44 acres) sheet flows approximately 3.21 cfs from the 100-year, 6-hour storm event onto Basin D. Basin 05 (approximately 2.52 acres) sheet flows approximately 3.32 cfs from the 100-year, 6-hour storm event onto Basin F. Basin 06 (approximately 2.01 acres) sheet flows approximately 2.64 cfs from the 100-year, 6-hour storm event onto Basin G. Basin 07 (approximately 0.43 acres) sheet flows approximately 1.46 cfs from the 100-year, 6-hour storm event onto Basin K.

2. Additional Adjacent Off-Site Parcels

The Villa De Paz subdivision, south of Basin BI, currently accepts runoff from Basins BI and 011, the west half of Coors Boulevard. The Monolithic Site, north of Basin A2 currently accepts minor flow from Basins A2 and 09, the west half of Coors Boulevard Northern Heights and River Ranch subdivisions, south of Basin J, and vacant land to the north of Basin C do not have an impact on the drainage of Basins C and J.

3. Namaste Rd.

Namaste Road is located along the north boundary of Archdiocese of Santa Fe Parcels I and II. The runoff from Namaste Road collects in the drainage swales alongside the road within the right-of-way, and ultimately drains to the Rio Grande. The existing

drainage of Namaste Road does not impact the drainage of Archdiocese of Santa Fe Parcels I and II.

4. Ladera Dr.

Ladera Drive is located between Tracts X-1 and X-2. The north half of this right-of-way drains to an existing inlet on the northwest end of Ladera Drive, where it discharges to the existing detention pond, located across the street within the right-of-way. The south half of the Ladera Drive right-of-way currently sheet flows to this detention pond. This detention pond also accepts runoff from adjacent Basins B2 and Al and the east half of Atrisco Drive and then discharges to the existing storm sewer in Ladera Drive. Basin 08 (approximately 6.26 acres) consists of portions of Ladera Drive and Atrisco Drive and currently generates approximately 25.67 of peak flow from the 100-year, 6-hour storm.

5. St. Josephs Rd. and St. Josephs Place

The crown in St. Josephs Road divides the flow so that it collects in the drainage swales along the shoulder of the road. The north half of St. Josephs Road ultimately drains to St. Pius High School and the south half to Basin K. St. Josephs Place drains to the south and ultimately on to Basin K. The flows from St. Josephs Road and St. Josephs Place that are contributing to Basin K are calculated as part of Basin K.

6. Coors Boulevard

The intersection of Coors Boulevard and St. Josephs Road/Ladera Drive is a high point, dividing Coors Boulevard into four drainage basins: Northwest (Basin 09); northeast (Basin 010); southwest (Basin 011); and southeast (Basin 012). The crown in Coors Boulevard divides the flow so that it collects in the drainage swales along the shoulder of the road. The drainage swales intermittently discharge the runoff to small depressed basins along the road.

Coors Boulevard, northwest of this intersection, is designated as Basin 09 (approximately 1.74 acres) and currently drains 7.16 cfs to the depressed basin in Basin A. Coors Boulevard, northeast of this intersection, is designated as Basin 010 (approximately 1.26 acres) and currently drains 5.18 cfs to the depressed basin on St. Pius High School campus. Coors Boulevard, southwest of this intersection, is designated as Basin 011 (approximately 1.12 acres) and currently drains 4.61 cfs to the Villa be Paz Subdivision, south of Altura West Tract X-2. Coors Boulevard, southeast of this intersection, is designated as Basin 012 (approximately 1.79 acres) and currently drains 7.36 cfs to the Mesa West Subdivision, located south of Basin K.

7. Atrisco Dr.

The crown in Atrisco Drive divides the flow so that it collects in the drainage swales along the shoulder of the road. These flows are kept within the right-of-way and ultimately drain to the detention pond in Ladera Drive right-of-way. This detention pond also accepts runoff from adjacent Basins B2 and Al and Ladera Drive and then discharges to the existing storm sewer in Ladera Drive Basin 08 (approximately 6.26 acres) consists of portions of Ladera Drive and Atrisco Drive and currently generates approximately 25.67 cfs of peak flow from the 100-year, 6-hour storm.

IV. PROPOSED DEVELOPED CONDITIONS

A. Master Drainage Plan Concepts

The Proposed Drainage Conditions Map located in Exhibit 5 identifies the proposed drainage patterns of individual watersheds within the master plan area and the proposed storm sewer for the proposed development. The storm sewer sizes shown on this map are approximate and shall be refined in the final grading and drainage plans for each parcel developed. St. Josephs Place right-of-way currently separates Altura West Parcels C, D and E from Parcel F.

Altura West is proposing to vacate a portion of the existing St. Josephs Place right-of-way beginning at the intersection with Alamogordo Drive continuing approximately 900 linear feet north toward St. Pius X High School. It is our plan to redirect St. Josephs Place to the north around St. Pius X High School, where it will connect to the existing Namaste Road. The subdivision layout proposed for Parcels C, D and E includes a minor roadway connection to a roadway, which includes pedestrian and bicycle access, connection is proposed from Alamogordo Drive to the remaining St. Josephs Place. The existing sanitary sewer, located in the proposed vacated section of St. Josephs Place, will be vacated and redirected north to the existing City Lift Station #24 with the development of Parcel F.

A storm sewer will be designed and constructed to accept storm water from the proposed, developed Altura West Parcels A and B, Parcels C, D and E (referred to as the Oxbow Mesa Subdivision), Parcel F (referred to as the Oxbow Bluff Subdivision), the Archdiocese of Santa Fe Parcels I and II, and some isolated areas along the eastern property edge of St. Pius High School. This storm sewer will then discharge to the Rio Grande. In order to minimize the size and cost of this storm sewer, Altura West Parcels A and B, Parcels C, D and E (referred to as the Oxbow Mesa Subdivision) and the Archdiocese of Santa Fe Parcels I and II are proposed to use permanent detention ponds.

1. Basins A and B

Tracts X-1 and X-2 (Basins A and B, respectively) are assumed to be developed with 85% impervious and 15% landscape areas. Flows from the future development of these tracts will be carried by the proposed internal local streets and discharged to the proposed onsite detention ponds which will control the discharge to the proposed Rio Grande storm sewer. Curb and gutter will be installed on Ladera Drive and Atrisco Drive so that off-site flows will be contained within the right-of-way, as it currently does and ultimately drain to the Ladera storm drain via inlets. The north boundary of Tract X-1 and south boundary of Tract X-2 will be graded so that flows will stay within these tracts instead of draining off-site. Basins A and B will generate 128.39 cfs and 111.09 cfs, respectively, from the 100-year, 6-hour storm event.

The proposed 1.0-acre detention pond of Basin A is designed to discharge 31.5 cfs through a 30" connector pipe to the master plan storm sewer. This 4.0'-deep pond will contain 3.494 acre-feet of storm water. The pond on Basin A will be located so that Basin A will continue to accept runoff from Coors Boulevard.

The proposed 1.0-acre detention pond for Basin B is designed to discharge 13.6 cfs through an 18" connector pipe to the master plan storm sewer. This 4.0'-deep pond will contain 3.494 acre-feet of storm water.

2. Basins C Through E (Parcel F)

The proposed Oxbow Bluff Subdivision consists of three main drainage basins, Basins C through E. Phase1 will be developed in conjunction with the construction of the Rio Grande storm sewer and will continue to accept existing off-site drainage from St. Pius High School. Basins C through E are proposed to be developed with approximately 2.0 dwelling units/acre. Flows from the future development of these basins will be carried by both the proposed streets and the proposed underground storm sewer systems with street inlets, and will ultimately drain to the Rio Grande. Basins C, D, and E generate 61.41 cfs, 34.36 cfs, and 67.39 cfs respectively, from the 100-year, 6-hour storm event.

3. Basin K (Parcel C, D and E)

The Oxbow Mesa Subdivision, designated as Basin K, is proposed to be developed into a combination of townhouse and single-family residential housing consisting of approximately 194 dwelling units and related streets and infrastructure. Flows from the future development of this land will be carried by the proposed internal local streets and discharged to the proposed onsite detention pond which will control the discharge to the proposed Rio Grande storm sewer. Basin K generates 117.23 cfs from the 100-year, 6-hour storm event.

Curb and gutter will be installed on the south side of St. Josephs Rd. and the east and west sides of Oxbow Drive so that runoff generated from these roads can collect in the gutter and ultimately be discharged to Basin K through inlets and various entrances, i.e., subdivision entrances and curb cuts at pedestrian accesses and utility easements. The north half of St. Josephs Road will continue to drain to St. Pius High School.

The south boundary of Basin K will be graded so that the floodplain is removed from this basin and so that Basin K no longer contributes flow to the existing floodplain on the adjacent property to the south. Currently, 47% of the contributing flows to the floodplain are generated from Basin K, and 7% from Basin 012, the east half of Coors Boulevard. The remaining flows contributed to the floodplain (i.e., 46%) are generated from Mesa West Subdivision, located south of Basin K. Approximately 4.1 acres of this floodplain (only 26% of the entire floodplain) are currently located on Basin K. With the development of the Oxbow Mesa Subdivision, 47% (from Basin K) of the contributing flows to the floodplain will no longer drain to the floodplain. With the construction of the Rio Grande storm sewer and outfall, 54% (from Basin K and Coors Boulevard) of the contributing flows to the floodplain will no longer drain to the floodplain. Since the portion of the floodplain on Basin K to be removed with the development of the Oxbow Mesa Subdivision only amounts to 26% of the floodplain, the remaining floodplain on Mesa West Subdivision will collect less storm water volume (approx. 28% less) than it currently does in its existing condition. Therefore, the development of Parcels C, D, E and F actually benefits the remaining floodplain by relieving it of a significant amount of storm water retention.

A 0.6-acre private park located in the proposed Oxbow Mesa will be designed as detention pond, accepting flows from Basin K, and St. Josephs Rd (Basin 013). Please refer to Appendix D which contains letters from Louis Saavedra, former Mayor of the City of Albuquerque, and Roger Green, Public Works Hydrology Division, regarding the City of Albuquerque requirements for retention and detention ponds. If the Oxbow Mesa Subdivision is constructed before the remaining 10 acres in Parcel F, temporary retention ponds will be necessary. The temporary retention ponds must retain two times the volume

generated from the 100-year, 24-hour storm event. Should a temporary pond be necessary, it will be built to retain a total of 8.8 ac-ft in three locations for Phase 2. The private park could be used as a temporary retention pond which could be 4" deep and would require fencing until it is converted into a detention pond. The remaining temporary retention ponds could occupy ten lots and would be 10' deep and also require fencing. In order to prevent mosquitoes from breeding in the ponds, these ponds could have a temporary bleed-off system, discharging not more than 1.0 cfs to the existing storm sewer in Mesa West Subdivision or the Oxbow Bluff Subdivision.

After the development of the remaining ten acres in Parcel F, the proposed private park will be designed as a detention pond discharging to the master storm sewer. At that time, the ten lots occupied by the temporary retention pond will be developed. The detention pond will collect all flows from Basins K and 013, and control the discharge to the Rio Grande storm sewer. The proposed 0.6-acre detention pond in Basin K is designed to discharge 48.4 cfs through a 36" connector pipe to the Rio Grande storm sewer. This 4'-deep pond will contain 2.11 acre-feet of storm water. This detention pond does not require a permanent fence.

A request for a Letter of Map Revision (LOMR) is required after construction of the detention pond and master plan storm sewer in order to revise the FEMA zone classification of the existing floodplain to that of a non-flooding zone.

4. Archdiocese of Santa Fe Parcels I and II

In addition to the off-site flows of St. Pius High School, the master plan storm sewer will be designed to accept drainage from the Archdiocese Parcels I and II located north of St. Pius High School. The drainage from Parcels I and II will be controlled via a detention pond. These parcels are designated as Basin L and generate 120.74 cfs from the 100-year, 6-hour storm event, under the proposed development conditions described below.

Archdiocese Parcels I and II are proposed to be developed into the following: (1) skilled nursing facility with 50 beds; (2) assisted living facility with 20 beds; (3) apartment complex consisting of 200 to 300 dwelling units; (4) approximately 50 to 60 townhouses; and (5) approximately 32,000 square feet of retail space, which will be geared toward the residents who will reside on Parcels I and II.

Two ponds will be required for draining Basin L: (1) a detention pond located on the west side of the east main entrance road; and (2) a retention pond located along the east boundary of Parcel II. Approximately 90.6 cfs (3.0 acre-feet) will collect in the detention pond along the east main road. This pond will be strategically located in order to produce a discharge of 22 cfs through a 24" connector pipe to the Rio Grande storm sewer. The volume required for this pond is approximately 1.92 acre-feet, which can be accomplished with an 18"-deep, 1.3 ac pond.

Approximately 30.2 cfs (1.0 acre-feet) will collect in the retention pond located along the east boundary of Parcel II. Therefore, the volume required for the water harvesting pond is approximately 1.0 acre-feet, which can be accomplished with an 18"-deep, 0.7-ac pond. If a storm occurs resulting in flows that are twice the 100-year, 6-hour storm event, this pond will have an emergency spillway that would allow 30.2 cfs (1.0 acre-feet) to the discharge to the Rio Grande which would not exceed historical flows. Basin L historically discharges 51.1 cfs (1.47 acre-feet) to the Rio Grande.

B. Phasing

The development of the master drainage plan area will occur in three main phases.

Phase 1 consists of developing most of Parcel F, the Oxbow Bluff Subdivision. Ten acres within Parcel F may be developed in Phase 2 or 3. This ten acres in Parcel F will divide the Oxbow Bluff Subdivision (the majority of Parcel F) from the Oxbow Mesa Subdivsion (Parcels C, D and E) and is reserved for town homes or patio homes, no more than five dwelling units per acre. The first phase includes (1) installing the portion of the master plan storm sewer within the Phase 1

boundary, (2) constructing the storm sewer outfall to the Rio Grande River, and (3) providing storm sewer stub-outs for future phases.

Phase 2 could consist of developing; (1) the remaining ten acres in Parcel F; or (2) Parcels C, D, and E; or (3) developing either Parcel A or B; or (4) the Archdiocese Parcels I and II.

If the remaining ten acres in Parcel F is developed, it will provide the necessary storm sewer stub-outs for Parcels C, D and E.

If Parcels C, D and E, the Oxbow Mesa Subdivision, are developed prior to the remaining ten acres in Parcel F an on-site temporary retention pond will be necessary before a storm drain connection can be made to the Oxbow Bluff Subdivision.

If Parcels A and/or B are developed prior to Parcels C, D, E and the remaining ten acres in F, on-site temporary retention pond(s) will be necessary within Parcels A and/or B before a storm drain connection can be made to the Oxbow Bluff Subdivision through C, D and E and the remaining ten acres in Parcel F.

Since the development of the Oxbow Bluff Subdivision provides the storm drain connection for The Archdiocese Parcels I and II, these parcels may be developed at any time after the first phase as been completed and accepted.

Phase 3 consists of developing the remaining Parcels not developed in Phase 2 above. This would remove any temporary retention ponds and complete the master storm drain for the overall development.

Each proposed phase will be required to provide site-specific subdivision layouts and normal hydrologic and hydraulic calculations for city review and approval. Unless justified otherwise, each proposed phased development shall adhere to the requirements of this master plan.

C. Off-Site Drainage Management

1. St. Pius High School

As indicated previously, St. Pius High School discharges concentrated and sheet flows onto Basins C through E of the proposed Oxbow Bluff Subdivision. The master drainage plan shows that these flows will continue to be accepted, collected and discharged by the proposed storm sewer in the Oxbow Mesa Subdivsion. The concentrated off-site flows from Basins 01 and 02 will be collected at the St. Pius pipe outlets via the proposed roadway or storm sewer and eventually discharged to the Rio Grande. Basins 01 and 02 generate 29.89 cfs and 6.22 cfs, respectively, from the 100-year, 6-hour storm event. All sheet flow currently accepted from St. Pius High School (Basins 03 through 06) will sheet flow to the proposed roadway and discharge to the proposed storm sewer in Oxbow Bluff Subdivision. Basins 03 , 04, 05 and 06 generate 1.03 cfs, 3.21 cfs, 3.32 cfs and 2.64 cfs, respectively, from the 100-year, 6-hour storm event.

2. Additional Adjacent Off-Site Parcels

The Villa De Paz Subdivision, south of Basin B, currently accepts runoff from existing Basins B and 011, the west half of Coors Boulevard Basin B will be graded so that all runoff from this basin flows to the proposed detention pond on Basin B, ultimately discharging to the Rio Grande via storm drain. The Monolithic Site, north of -developed Basin A currently accepts minor flow from Basins A and 09, the west half of Coors Boulevard Basin A will be graded so that all runoff from this basin flows to the proposed detention pond on Basin A, ultimately discharging to the Rio Grande via storm drain. Northern Heights and River Ranch subdivisions, south of Basin J, and vacant land to the north of Basin C currently do not have an impact on the drainage of Basins C and J.

3. Namaste Rd.

The runoff from Namaste Road currently collects in the drainage swales alongside the road within the right-of-way, and ultimately drains to the Rio Grande. This drainage

pattern does not have and impact on the Archdiocese parcels; therefore, this drainage pattern will not be changed with the development of the Archdiocese parcels.

4. Ladera Dr.

As mentioned previously, Ladera Drive right-of-way storm runoff drains to a detention pond within the right-of-way, which discharges to the storm sewer in Ladera Drive. The detention pond in Ladera Drive also collects some drainage from adjacent Basins A and B and portions of Atrisco Drive (Basin 08). Basins A and B will be graded so that all runoff from these basins flow to the proposed detention ponds on Basins A and B, ultimately discharging to the Rio Grande via storm drain.

5. St. Josephs Road

The crown in St. Josephs Road divides the flow so that it can collect in the drainage swales along the shoulder of the road. The north half of St. Josephs Road ultimately drains to St. Pius High School and the south half to Basin K. Oxbow Drive drains to the east and ultimately on to the Oxbow Bluff Subdivision. Curb and gutter will be installed on the south side of St. Josephs Road and the each side of Oxbow Trail Drive so that runoff generated from the roads can collect in the gutter and ultimately be discharged to the master storm drain through various entrances; i.e., entrances to the subdivision and curb cuts at pedestrian accesses and utility easements. The north half of St. Josephs Road will continue to drain to St. Pius High School.

6. Coors Boulevard

The intersection of Coors Boulevard and St. Josephs Road/Ladera Drive is a high point, dividing Coors Boulevard into four drainage basins: northwest; northeast; southeast; and southwest. The crown in Coors Boulevard divides the flow so that it can collect in the drainage swales along the shoulder of the road. The drainage swales intermittently discharge the runoff to small depressed basins along the road. Coors Boulevard, northwest of this intersection, currently drains to the depressed basin in Basin

A. Upon the development of Basin A, the proposed detention pond in Basin A will accept flows from the northwest portion of Coors Boulevard.

Coors Boulevard, southeast of the intersection of Coors Boulevard and St. Josephs Rd., currently drains to the Mesa West Subdivision, located south of Basin K. Prior to the construction of the remaining ten acres in Parcel F, a small pond at the southwest corner of Oxbow Mesa Subdivision may be constructed to collect isolated flows from Coors Boulevard. This pond will collect storm water from the southeast section of Coors Boulevard. The excess flows created from the Oxbow Mesa Subdivision improvements along Coors Boulevard will be collected in this pond. The flows historically drained to the Mesa West Subdivision will continue to do so. After the construction of the outfall to the Rio Grande, this pond will discharge slowly to the Rio Grande storm sewer via an inlet at the bottom of the pond so to discontinue draining historical flows to the Mesa West Subdivision.

Northeast of the intersection of Coors Boulevard and St. Josephs Road, Coors Boulevard currently drains to the depressed basin on St. Pius High School campus. Coors Boulevard, southwest of this intersection, currently drains to the Villa De Paz subdivision, south of Basin B. Since these existing drainage patterns do not have and impact on Altura West or Archdiocese parcels, these drainage patterns will not be changed with the development of Altura West or Archdiocese parcels.

7. Atrisco Drive

The crown in Atrisco Drive divides the flow so that it can collect in the drainage swales along the shoulder of the road. These flows are kept within the right-of-way and ultimately drain to the detention pond in Ladera Drive right-of-way. This drainage pattern does not have an impact on the Altura West parcels; therefore, this drainage pattern will not be changed with the development of the Altura West parcels.

D. Rio Grande

This master drainage plan identifies one major direct connection to the Rio Grande. The storm sewer discharging to the Rio Grande will convey 300.3 cfs of developed flows from Altura West Parcels A and B, Oxbow Bluff and the Oxbow Mesa Subdivision , Archdiocese of Santa Fe Parcels I and II, and off-site flows from St. Pius High School, Coors Boulevard, St. Josephs Road and Oxbow Trail Drive. This storm water will be discharged to the Rio Grande through a Type 6 desilting basin and energy dissipater. The permit obtained to discharge storm water to the Rio Grande will allow a maximum of 400 cfs to discharge to the Rio Grande.

Currently, Marron and Associates is conducting an environmental impact assessment of the Rio Grande storm sewer on the Rio Grande. The report summarizing their findings will include: (1) archeological records search and reconnaissance archaeological survey; (2) threatened and endangered species survey; (3) wetlands impact and habitat enhancement; and (4) water quality coordination with federal, state, local, and tribal governments.

V. CONCLUSION

This report has provided hydrologic and hydraulic considerations of the proposed development of Altura West Parcels A and B, Oxbow Bluff Subdivision, the Oxbow Mesa Subdivision and Archdiocese of Santa Fe Parcels I and II. This information provides adequate supporting documentation and guidance for approval of this report and to guide future development and phasing of the properties previously mentioned.

APPENDICES

APPENDIX A: HYDROLOGICAL CALCULATIONS: EXISTING AND PROPOSED CONDITIONS

APPENDIX B: POND CALCULATIONS

APPENDIX C: HYDRAULIC CALCULATIONS RIO GRANDE STORM DRAIN

APPENDIX D: LETTERS FROM LOUIS SAAVEDRA AND ROGER GREEN REGARDING RETENTION AND DETENTION POND CRITERIA

APPENDIX A

HYDROLOGICAL CALCULATIONS: EXISTING AND PROPOSED CONDITIONS

DRAINAGE MASTER PLAN FOR ALTURA WEST PROPERTIES COORS & ST. JOSEPH DRIVE
EXISTING CONDITIONS

BASIN	AREA (ACRES)	% LAND TREATMENT*				ZONE 1 PEAK DISCHARGE - (CFS/ACRE)**				Q(100-YR) UNDEVELOPED (CFS)
		A	B	C	D	A	B	C	D	
A1	16.63	90.00	10.00	0.00	0.00	1.29	2.03	2.87	4.37	22.68
A2	10.58	90.00	10.00	0.00	0.00	1.29	2.03	2.87	4.37	14.43
B1	10.97	90.00	10.00	0.00	0.00	1.29	2.03	2.87	4.37	14.96
B2	20.49	90.00	10.00	0.00	0.00	1.29	2.03	2.87	4.37	27.95
C	5.06	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	6.99
D	11.22	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	15.51
E	0.48	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	0.66
F	5.83	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	8.06
G	7.07	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	9.77
H	10.77	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	14.89
I	11.88	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	16.42
J	3.48	0.00	97.00	0.00	3.00	1.29	2.03	2.87	4.37	7.31
K	35.58	90.00	10.00	0.00	0.00	1.29	2.03	2.87	4.37	48.53
L	38.01	90.00	10.00	0.00	0.00	1.29	2.03	2.87	4.37	51.85
O1	8.77	0.00	25.00	50.00	25.00	1.29	2.03	2.87	4.37	26.62
O2	1.83	0.00	25.00	50.00	25.00	1.29	2.03	2.87	4.37	5.55
O3	0.78	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	1.08
O4	2.44	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	3.37
O5	2.52	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	3.48
O6	2.01	97.00	0.00	0.00	3.00	1.29	2.03	2.87	4.37	2.78
O7	0.43	0.00	25.00	50.00	25.00	1.29	2.03	2.87	4.37	1.31
O8	6.26	0.00	5.00	85.00	10.00	1.29	2.03	2.87	4.37	18.64
O9	1.74	0.00	5.00	85.00	10.00	1.29	2.03	2.87	4.37	5.18
O10	1.26	0.00	5.00	85.00	10.00	1.29	2.03	2.87	4.37	3.75
O11	1.12	0.00	5.00	85.00	10.00	1.29	2.03	2.87	4.37	3.34
O12	1.79	0.00	5.00	85.00	10.00	1.29	2.03	2.87	4.37	5.33
										340.46

DRAINAGE MASTER PLAN FOR ALTURA WEST PROPERTIES COORS & ST. JOSEPH DRIVE
PROPOSED CONDITIONS

BASIN	AREA (ACRES)	% LAND TREATMENT* A	B	C	D	ZONE 1 PEAK DISCHARGE - (CFS/ACRE)** A	B	C	D	Q(100-YR) DEVELOPED (CFS)
A	27.21	0.00	7.50	7.50	85.00	1.29	2.03	2.87	4.37	111.07
B	31.45	0.00	7.50	7.50	85.00	1.29	2.03	2.87	4.37	128.38
C	20.83	0.00	36.90	36.90	26.20	1.29	2.03	2.87	4.37	61.51
D	11.65	0.00	36.90	36.90	26.20	1.29	2.03	2.87	4.37	34.40
E	22.85	0.00	36.90	36.90	26.20	1.29	2.03	2.87	4.37	67.48
K	33.12	0.00	21.57	21.57	56.86	1.29	2.03	2.87	4.37	117.30
L	38.01	0.00	31.00	31.00	38.00	1.29	2.03	2.87	4.37	120.86
01	8.77	0.00	25.00	25.00	50.00	1.29	2.03	2.87	4.37	29.91
02	1.83	0.00	25.00	25.00	50.00	1.29	2.03	2.87	4.37	6.24
03	0.78	97.00	0.00	3.00	0.00	1.29	2.03	2.87	4.37	1.04
04	2.44	97.00	0.00	3.00	0.00	1.29	2.03	2.87	4.37	3.26
05	2.52	97.00	0.00	3.00	0.00	1.29	2.03	2.87	4.37	3.37
06	2.01	97.00	0.00	3.00	0.00	1.29	2.03	2.87	4.37	2.69
07	0.43	0.00	25.00	25.00	50.00	1.29	2.03	2.87	4.37	1.47
08	6.26	0.00	5.00	10.00	85.00	1.29	2.03	2.87	4.37	25.68
09	1.74	0.00	5.00	10.00	85.00	1.29	2.03	2.87	4.37	7.14
010	1.26	0.00	5.00	10.00	85.00	1.29	2.03	2.87	4.37	5.17
011	1.12	0.00	5.00	10.00	85.00	1.29	2.03	2.87	4.37	4.60
012	1.79	0.00	5.00	10.00	85.00	1.29	2.03	2.87	4.37	7.34
013	2.15	0.00	5.00	10.00	85.00	1.29	2.03	2.87	4.37	8.82
										747.73

NOTES:
Obtained from Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, January, 1993
* Table A-4
** Table A-9

APPENDIX B

POND CALCULATIONS

Detention Pond Volume Calculations

BASIN: A

Peak Flow per Acre - DPM Sectio 22.2 Table A-9

Zone	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.7
3	1.87	2.6	3.45	5.02
4	2.2	2.92	3.73	5.25

Choose Zone (1 - 4): 1
Basin Area = (acres): 36.18

Exist Condtions				**Proposed Conditions**			
Treatment	Percentage	Area	Q (cfs)	Treatment	Percentage	Area	Q (cfs)
A	90.0%	29.87	38.53	A	0.0%	0.00	0.00
B	10.0%	3.32	6.74	B	7.5%	2.49	5.05
C	0.0%	0.00	0.00	C	7.5%	2.49	7.14
D	0.0%	0.00	0.00	D	85.0%	28.21	123.28
		Q Peak - exist.=	**45.27**			Peak Q Developed=	**135.48**

Use my calculated exist cond. flow as the peak controlled discharge (1 = yes, or N) ?? N
If No, what is the maximum allowable discharge (CFS)? 31.5

Excess Precipitation - DPM Section 22.2 Table A-8

Zone	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.8	1.08	1.46	2.64

Determine Developed E (avg excess precipitation for the developed basin)

%A x E = 0.00
%B x E = 0.05
%C x E = 0.07
%D x E = 1.67
Avg E(in) = 1.80

Determine Tb (hours)

Tb = 0.716

Determine Tc (Note: Tc is assumed to be 0.2 hours, this should be checked using DPM 22.2.B.2)

Tc = 0.2

Determine Tp and Duration of Peak (hours)

Tp = 0.2025
Peak Duration = 0.2125

Compute the required retention volume using the simple hydrograph, Figure A-3 in DPM Section 22.2

Time to Control Q (hrs) = 0.047
Time to end of Control Q (hrs)= 0.646083
Duration of Control Q (hrs)= 0.599

Required Detention Volume (CF) = 151886

Required Detention Volume (ACRE-FT) = 3.4868

Detention Pond Volume Calculations

BASIN: B

Peak Flow per Acre - DPM Sectio 22.2 Table A-9

Zone	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.7
3	1.87	2.6	3.45	5.02
4	2.2	2.92	3.73	5.25

Choose Zone (1 - 4): 1
Basin Area = (acres): 27.21

Exist Condtions				**Proposed Conditions**			
Treatment	Percentage	Area	Q (cfs)	Treatment	Percentage	Area	Q (cfs)
A	90.0%	24.49	31.59	A	0.0%	0.00	0.00
B	10.0%	2.72	5.52	B	7.5%	2.04	4.14
C	0.0%	0.00	0.00	C	7.5%	2.04	5.86
D	0.0%	0.00	0.00	D	85.0%	23.13	101.07
		Q Peak - exist.=	**37.11**			Peak Q Developed=	**111.07**

Use my calculated exist cond. flow as the peak controlled discharge (1 = yes, or N) ?? N
If No, what is the maximum allowable discharge (CFS)? 18.64

Excess Precipitation - DPM Section 22.2 Table A-8

Zone	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.8	1.08	1.46	2.64

Determine Developed E (avg excess precipitation for the developed basin)

%A x E = 0.00
%B x E = 0.05
%C x E = 0.07
%D x E = 1.67
Avg E(in) = 1.80

Determine Tb (hours)

Tb = 0.716

Determine Tc (Note: Tc is assumed to be 0.2 hours, this should be checked using DPM 22.2.B.2)

Tc = 0.2

Determine Tp and Duration of Peak (hours)

Tp = 0.2025
Peak Duration = 0.2125

Compute the required retention volume using the simple hydrograph, Figure A-3 in DPM Section 22.2

Time to Control Q (hrs) = 0.025
Time to end of Control Q (hrs)= 0.679112
Duration of Control Q (hrs)= 0.654

Required Detention Volume (CF) = 152006

Required Detention Volume (ACRE-FT) = 3.4896

Detention Pond Volume Calculations

BASIN: K

Peak Flow per Acre - DPM Sectio 22.2 Table A-9

Zone	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.7
3	1.87	2.6	3.45	5.02
4	2.2	2.92	3.73	5.25

Choose Zone (1 - 4): 1
Basin Area = (acres): 35.27

Exist Condtions				**Proposed Conditions**			
Treatment	Percentage	Area	Q (cfs)	Treatment	Percentage	Area	Q (cfs)
A	90.0%	31.74	40.95	A	0.0%	0.00	0.00
B	10.0%	3.53	7.16	B	21.6%	7.61	15.44
C	0.0%	0.00	0.00	C	21.6%	7.61	21.83
D	0.0%	0.00	0.00	D	56.9%	20.06	87.65
		Q Peak - exist.=	**48.11**			Peak Q Developed=	**124.93**

Use my calculated exist cond. flow as the peak controlled discharge (1 = yes, or N) ?? N
If No, what is the maximum allowable discharge (CFS)? 48.4

Excess Precipitation - DPM Section 22.2 Table A-8

Zone	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.8	1.08	1.46	2.64

Determine Developed E (avg excess precipitation for the developed basin)

%A x E = 0.00
%B x E = 0.14
%C x E = 0.21
%D x E = 1.12
Avg E(in) = 1.48

Determine Tb (hours)

Tb = 0.737

Determine Tc (Note: Tc is assumed to be 0.2 hours, this should be checked using DPM 22.2.B.2)

Tc = 0.2

Determine Tp and Duration of Peak (hours)

Tp = 0.225942
Peak Duration = 0.142175

Compute the required retention volume using the simple hydrograph, Figure A-3 in DPM Section 22.2

Time to Control Q (hrs) = 0.088
Time to end of Control Q (hrs)= 0.594232
Duration of Control Q (hrs)= 0.507

Required Detention Volume (CF) = 89387

Required Detention Volume (ACRE-FT) = 2.052

Detention Pond Volume Calculations

BASIN: [redacted]

Peak Flow per Acre - DPM Sectio 22.2 Table A-9

Zone	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.7
3	1.87	2.6	3.45	5.02
4	2.2	2.92	3.73	5.25

Choose Zone (1 - 4) [redacted]
Basin Area = (acres) [redacted]

Exist Condtions				**Proposed Conditions**			
Treatment	Percentage	Area	Q (cfs)	Treatment	Percentage	Area	Q (cfs)
A	[redacted]	25.66	33.10	A	[redacted]	0.00	0.00
B	[redacted]	2.85	5.79	B	[redacted]	8.84	17.94
C	[redacted]	0.00	0.00	C	[redacted]	8.84	25.37
D	[redacted]	0.00	0.00	D	[redacted]	10.83	47.34
	Q Peak - exist.=		**38.89**		Peak Q Developed=		**90.65**

Use my calculated exist cond. flow as the peak controlled discharge (1 = yes, or N) ?? [redacted]
If No, what is the maximum allowable discharge (CFS)? [redacted]

Excess Precipitation - DPM Section 22.2 Table A-8

Zone	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.8	1.08	1.46	2.64

Determine Developed E (avg excess precipitation for the developed basin)

%A x E = 0.00
%B x E = 0.21
%C x E = 0.31
%D x E = 0.75
Avg E(in) = 1.26

Determine Tb (hours)

Tb = 0.742

Determine Tc (Note: Tc is assumed to be 0.2 hours, this should be checked using DPM 22.2.B.2)

Tc = [redacted]

Determine Tp and Duration of Peak (hours)

Tp = 0.241667
Peak Duration = 0.095

Compute the required retention volume using the simple hydrograph, Figure A-3 in DPM Section 22.2

Time to Control Q (hrs) = 0.059
Time to end of Control Q (hrs)= 0.643686
Duration of Control Q (hrs)= 0.585

Required Detention Volume (CF) = 84032

Required Detention Volume (ACRE-FT) = 1.9291

APPENDIX C

HYDRAULIC CALCULATIONS RIO GRANDE STORM DRAIN

Master Drainage Plan for Altura West and the Archdiocese of Santa Fe Properties

***** HYDRAULIC GRADE LINE CALCULATIONS *****

Manning's n = 0.013
for pipe

Station	Structure	Diam. (in.)	Q (cfs)	Area	Vel.	K	Sf	Length (ft.)	MH Dia. (ft.)	JNCT Angle	Hf	Hb	Hj	Hmh	Ht	Total Losses	HGL(dn)	HGL(up)	Low Point	HV	EGL(dn)	EGL(up)
0+00	OUTFALL								0.0	0.0		0.00	0.00	0.00	0.00	0.00		4978.50	4979.00	2.48	4980.98	4980.98
		66	300.3	23.76	12.64	3358	0.0080	285.00			2.28					2.28						
2+85	MH#1								8.00	0.0		0.00	3.48	0.00	0.02	3.50	5009.75	5025.34	5028.00	1.54	5023.38	5026.88
		48	125.3	12.57	9.97	1436	0.0076	240.00			1.83					1.83						
5+25	MH#11								8.00	15.00		0.11	0.00	0.00	0.00	0.11	5027.16	5027.72	5036.00	1.09	5028.71	5028.81
		48	105.3	12.57	8.38	1436	0.0054	360.00			1.93					1.93						
8+85	MH#12								6.00	0.00		0.00	0.00	0.00	0.00	0.00	5029.66	5029.89	5058.00	0.86	5030.75	5030.75
		48	93.5	12.57	7.44	1436	0.0042	320.00			1.36					1.36						
12+05	MH#13								6.00	0.00		0.00	0.00	0.04	0.00	0.04	5031.25	5031.29	5108.00	0.86	5032.10	5032.15
		48	93.5	12.57	7.44	1436	0.0042	200.00			0.85					0.85						
14+05	MH#14								8.00	60.00		0.16	0.00	0.04	0.00	0.21	5032.14	5032.34	5110.00	0.86	5033.00	5033.20
		48	93.5	12.57	7.44	1436	0.0042	75.00			0.32					0.32						
14+80	MH#15								8.00	35.00		0.11	0.00	0.04	0.00	0.15	5032.66	5032.81	5107.00	0.86	5033.52	5033.67
		48	93.5	12.57	7.44	1436	0.0042	80.00			0.34					0.34						
15+60	MH#16								8.00	90.00		0.17	0.00	0.04	0.00	0.21	5033.15	5033.36	5109.00	0.86	5034.01	5034.22
		48	93.5	12.57	7.44	1436	0.0042	200.00			0.85					0.85						
17+60	MH#17								8.00	90.00		0.17	0.00	0.04	0.00	0.21	5034.21	5034.42	5103.00	0.86	5035.07	5035.28
		48	93.5	12.57	7.44	1436	0.0042	150.00			0.64					0.64						
19+10	MH#18								8.00	10.00		0.06	0.00	0.04	0.00	0.10	5035.06	5035.16	5102.00	0.86	5035.92	5036.02
		48	93.5	12.57	7.44	1436	0.0042	160.00			0.68					0.68						
20+70	MH#19								8.00	80.00		0.16	0.00	0.04	0.00	0.21	5035.84	5036.04	5102.00	0.86	5036.70	5036.90
		48	93.5	12.57	7.44	1436	0.0042	120.00			0.51					0.51						
21+90	MH#20								8.00	45.00		0.10	1.10	0.00	0.00	1.21	5036.55	5037.99	5101.00	0.63	5037.41	5038.62
		36	45.1	7.07	6.38	667	0.0046	450.00			2.06					2.06						
26+40	MH#21								6.00	0.00		0.00	0.00	0.03	0.00	0.03	5040.04	5040.08	5102.00	0.63	5040.68	5040.71
		36	45.1	7.07	6.38	667	0.0046	440.00			2.01					2.01						
30+80	MH#22								6.00	0.00		0.00	0.03	0.03	0.00	0.06	5042.09	5042.15	5103.00	0.63	5042.72	5042.78
		36	45.1	7.07	6.38	667	0.0046	180.00			0.82					0.82						
32+60	MH#23								6.00	90.00		0.21	0.00	0.00	0.04	0.25	5042.97	5042.29	5104.00	1.56	5043.60	5043.85
		24	31.5	3.14	10.03	226	0.0194	450.00			8.72					8.72						
37+10	MH#24								4.00	0.00		0.00	0.00	0.08	0.00	0.08	5051.02	5051.09	5108.00	1.56	5052.58	5052.65
		24	31.5	3.14	10.03	226	0.0194	380.00			7.37					7.37						
40+90	MH#25								4.00	0.00		0.00	0.00	0.08	0.00	0.08	5058.46	5058.54	5111.00	1.56	5060.02	5060.10
		24	31.5	3.14	10.03	226	0.0194	150.00			2.91					2.91						
42+40	MH#26								4.00	0.00		0.00	0.00	0.08	0.00	0.08	5061.45	5061.53	5112.00	1.56	5063.01	5063.09
		24	31.5	3.14	10.03	226	0.0194	450.00			8.72					8.72						
46+90	MH#27								4.00	0.00		0.00	0.00	0.00	0.00	0.00	5070.25	5071.81	5110.00	0.00	5071.81	5071.81
		24	0.0	3.14	0.00	226	0.0000	0.00			0.00					0.00						
	POND								0.00	0.00		0.00	0.00	0.00	0.00	0.00	5071.81	5071.81	5104.00	0.00	5071.81	5071.81

Master Drainage Plan for Altura West and the Archdiocese of Santa Fe Properties

***** HYDRAULIC GRADE LINE CALCULATIONS *****

Manning's n = 0.013
for pipe

Station	Structure	Diam. (in.)	Q (cfs)	Area	Vel.	K	Sf	Length (ft.)	MH Dia. (ft.)	JNCT Angle	Hf	Hb	Hj	Hmh	Ht	Total Losses	HGL(dn)	HGL(up)	Low Point	HV	EGL(dn)	EGL(up)	
0+00	OUTFALL								0.0	0.0		0.00	0.00	0.00	0.00	0.00		4978.50	4979.00	2.48	4980.98	4980.98	
		66	300.3	23.76	12.64	3358	0.0080	285.00			2.28					2.28							
2+85	MH#1								8.00	90.0		0.36	2.00	0.00	0.04	2.41	4980.78	4984.43	5028.00	1.23	4983.26	4985.67	
		60	175.0	19.63	8.91	2604	0.0045	430.00			1.94					1.94							
7+15	MH#2								8.00	10.00		0.06	0.00	0.00	0.00	0.06	4986.37	4986.96	5020.00	0.71	4987.61	4987.67	
		60	133.0	19.63	6.77	2604	0.0026	375.00			0.98					0.98							
10+90	MH#3								8.00	0.00		0.00	0.00	0.00	0.00	0.00	4987.94	4988.04	5022.00	0.61	4988.65	4988.65	
		60	123.0	19.63	6.26	2604	0.0022	430.00			0.96					0.96							
15+20	MH#4								6.00	0.00		0.00	0.17	0.00	0.00	0.17	4989.00	4989.00	5024.00	0.78	4989.61	4989.78	
		54	112.6	15.90	7.08	1966	0.0033	290.00			0.95					0.95							
18+10	MH#5								6.00	0.00		0.00	0.25	0.00	0.00	0.26	4989.95	4989.96	5020.00	1.03	4990.73	4990.99	
		48	102.4	12.57	8.14	1436	0.0051	275.00			1.40					1.40							
20+85	MH#6								6.00	45.00		0.22	1.08	0.00	0.04	1.33	4991.35	4991.61	5034.00	2.11	4992.38	4993.72	
		36	82.4	7.07	11.66	667	0.0153	260.00			3.97					3.97							
23+45	MH#7								6.00	10.00		0.11	0.58	0.00	0.00	0.69	4995.57	4997.16	5040.00	1.21	4997.68	4998.37	
		36	62.4	7.07	8.83	667	0.0088	100.00			0.88					0.88							
24+45	MH#8								6.00	0.00		0.00	4.92	0.00	0.38	5.29	4998.03	4998.41	5048.00	6.13	4999.24	5004.54	
		24	62.4	3.14	19.86	226	0.0761	150.00			11.41					11.41							
25+95	MH#9								6.00	75.00		1.12	0.47	0.00	0.00	1.58	5009.83	5011.42	5050.00	6.12	5015.95	5017.53	
		24	62.4	3.14	19.85	226	0.0760	400.00			30.38					30.38							
29+95	MH#10								0.00	0.00		0.00	-0.01	0.00	0.00	0.01	5041.80	5041.80	5082.00	6.13	5047.92	5047.93	
		24	62.4	3.14	19.86	226	0.0761	0.00			0.00					0.00							
												#REF!	0.00	#REF!	#REF!	#REF!	5041.80	#REF!		#REF!	5047.93	#REF!	#REF!

Note: Pressure flow for storm drain along bluff

APPENDIX D

LETTERS FROM LOUIS SAAVEDRA AND ROGER GREEN REGARDING RETENTION AND DETENTION POND CRITERIA

1974:

I, Louis E. Saavedra, Mayor of the City of Albuquerque, have determined that there are urgent and compelling reasons to include certain rules in the Development Process Manual relating to the Minimum Standards for the design of Subdivisions.

This modification of rules is necessary to preclude possible inaccuracies and inconsistencies in the application of certain design criteria for the design of drainage management and flood control systems within the platting and planning jurisdiction of the City of Albuquerque.

I, therefore, declare that the following modifications to the Development Process Manual of the City of Albuquerque shall become effective immediately:

Volume II, of the Development Process Manual shall be modified as follows:

Chapter 22, page 7. Expand part C.3. to include the following:

All Detention ponds must be evacuated in 24 hours or less. Ponds that take more than six hours to drain will be designed for a 24 hour storm. Credit for evacuation by means of percolation will not be taken into account.

Retention ponds will only be permitted on a temporary basis and will only be allowed on a case by case basis as determined by the City Engineer. The criteria for temporary ponds may include but are not limited to the following:

Design of the pond volume will be based on a 100 year 10 day storm with no percolation credit for volume reduction; (OR 2×100-YEAR 24-HR)

The inclusion of an emergency spillway with the pond to carry the 100 year design flow which enters the pond;

The acceptance by the owner of maintenance responsibilities and legal liabilities of the pond;

Approval by the State Engineer if the pond comes under that agent's jurisdiction; and,

Fencing as required by the City Engineer.

Additional modifications may be incorporated into the next periodic update of the Development Process Manual.

For further information regarding this matter, contact the City Engineer at telephone number 768-2650 or by mail at City/County Government Center, One Civic Plaza, Public Works Department, Engineering Group, 3rd Floor, 87103.

Louis E. Saavedra, Mayor

TO BE PUBLISHED IN THE ALBUQUERQUE JOURNAL AND ALBUQUERQUE TRIBUNE ON _____.
date

June 6, 1986

MEETING PARTICIPANTS:

TO: Fred Aguirre - Hydrology
Jim Fink - Planning
Dan Hogan - Utilities
Andre Houle - Design Review
John Kelly - Storm Drain Maintenance
Bob Born - Storm Drain Maintenance

FROM: Roger A. Green, Hydrology Roger

SUBJECT: DETENTION POND CRITERIA MEETING, HELD JUNE 5, 1986

Following is my summary of agreed to items from our meeting on June 5, 1986 regarding design criteria for the City's acceptance of operation and maintenance of detention ponds in residential subdivisions:

A. Dedication to City by plats:
   1. Interim or temporary facilities shall be dedicated as Public Drainage Easements over a tract of land larger than that needed for the final permanent facility, and shall have a Covenant requiring construction and maintenance be done by the developer.

   2. Permanent facilities shall be dedicated as Drainage Rights-of-Way to the City before final acceptance.

B. Operation and Maintenance:
   1. City storm drain maintenance crews will only accept O & M for public facilities within public rights-of-ways.
   2. Parks and Recreation could accept O & M if the facility is jointly used as a City park facility.
   3. Open space could accept O & M if facility is dedicated as City open space.
   4. It is not desirable to have the developer responsible for O & M.
   5. A Homeowners or Neighborhood Association should only be responsible for O & M if the facility is private, contains no public runoff, and is within a private drainage easement.

If you have any further comments or disagree with any above items, please let me know. A field trip to see existing retention or detention facilities may be appropriate along with another meeting before submitting our recommendations for implementation.

RAG:mrk

cc: Walt Nickerson
C. Dwayne Sheppard
Dan Sabo, AMAFCA

C. Design Requirements:

1. Access into facility shall be opposite outlet if possible with a minimum width of 12'. Maximum slope grade shall be equal to 3 on 1 or flatter. Standard design tube or pipe gates shall be installed to restrict vehicle access. Gates shall be set back 50' from arterial or collector streets so equipment does not have to park in the street.
2. Emergency spillways shall always be provided, be erosion resistant, and discharge to public right-of-way.
3. Facility outlets shall always be gravity flow and located in a corner or accessible edge of facility, opposite of facility access point if possible. Outlet pipe materials shall be 12" dia. RCP minimum with a slope such that when flowing at 1/4 full, velocity is 3 fps or greater. No horizontal outlet structure inlets will be allowed, and any orfices shall be protected against plugging. Pumped outlets will not be allowed.
4. Facility bottoms shall be designed to control nuisance flows and carry directly from inlet to outlet.
5. Side slope and bottom treatment:
   a. Vegetation will be accepted if native grasses are used and irrigation system is supplied until the stand is established and accepted by the City.
   b. Aggregate or riprap may be used as a erosion control mulch.
   c. Concrete may be used if designed and constructed to discourage skateboard use, etc.
   d. Paving blocks may be used.
   e. Soil reports shall determine whether impermeable lining is required and setback requirements from structures and streets.
6. Fencing:
   a. A determination from Risk Management is needed to clarify liability risks involved with the fencing of retention and detention ponds.
   b. Detention ponds will not require fencing unless vertical walls are used on facility.
   c. All retention ponds over 18" in depth will require fencing.
   d. If fencing is required a minimum heighth will be 4'.

Exhibits

EXHIBITS

EXHIBIT 1: VICINITY MAP

EXHIBIT 2: FEMA FLOOD INSURANCE RATE MAP

EXHIBIT 3: AMENDMENT TO THE UNIVERSITY OF ALBUQUERQUE LAND USE PLAN

EXHIBIT 4: EXISTING CONDITIONS MAP

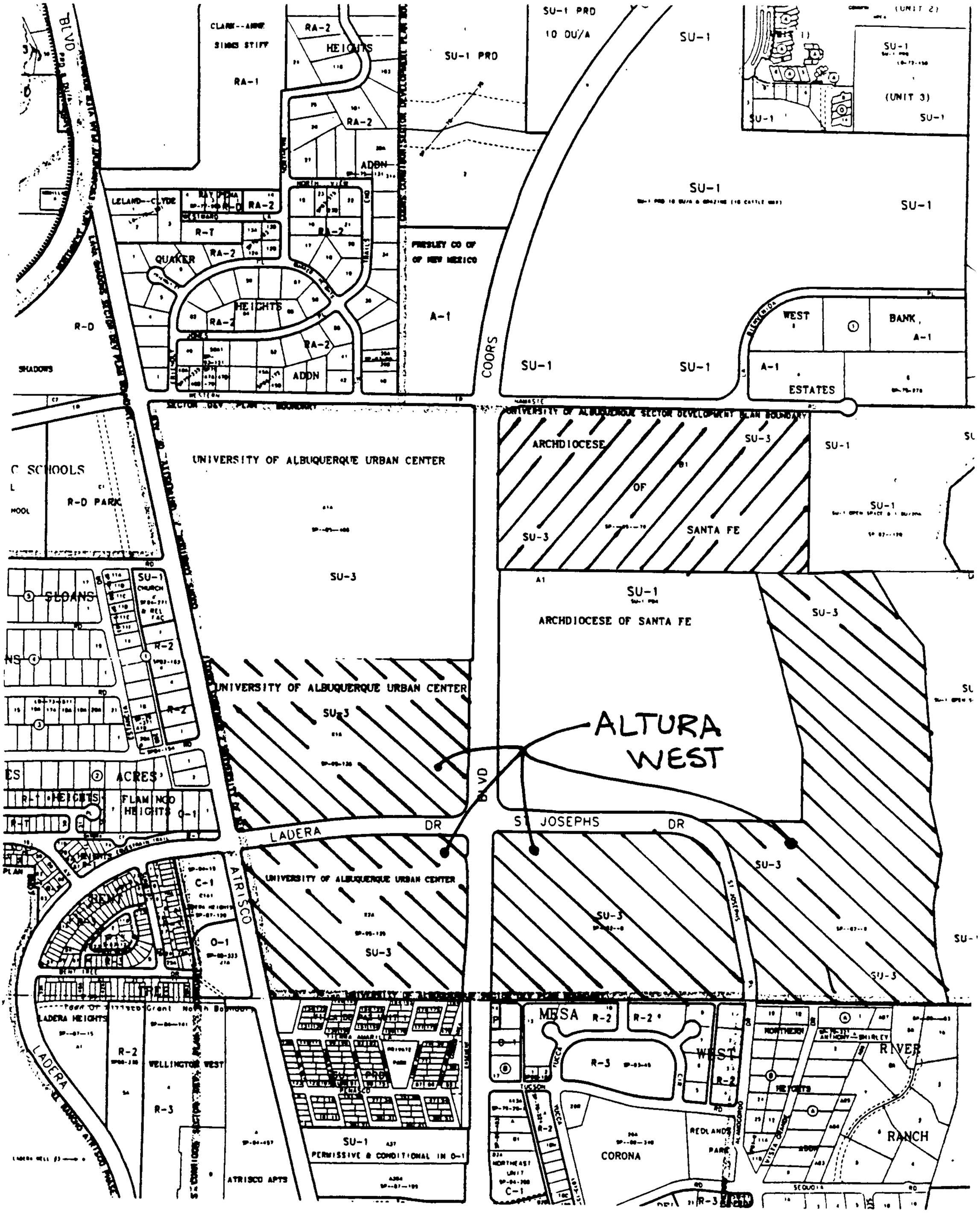
EXHIBIT 5: PROPOSED DRAINAGE CONDITIONS MAP

EXHIBIT 6: SKETCH PLAT: OXBOW SUBDIVISION UNIT 1

EXHIBIT 7: ARCHDIOCESE OF SANTA FE PARCELS I AND II

EXHIBIT 1

VICINITY MAP

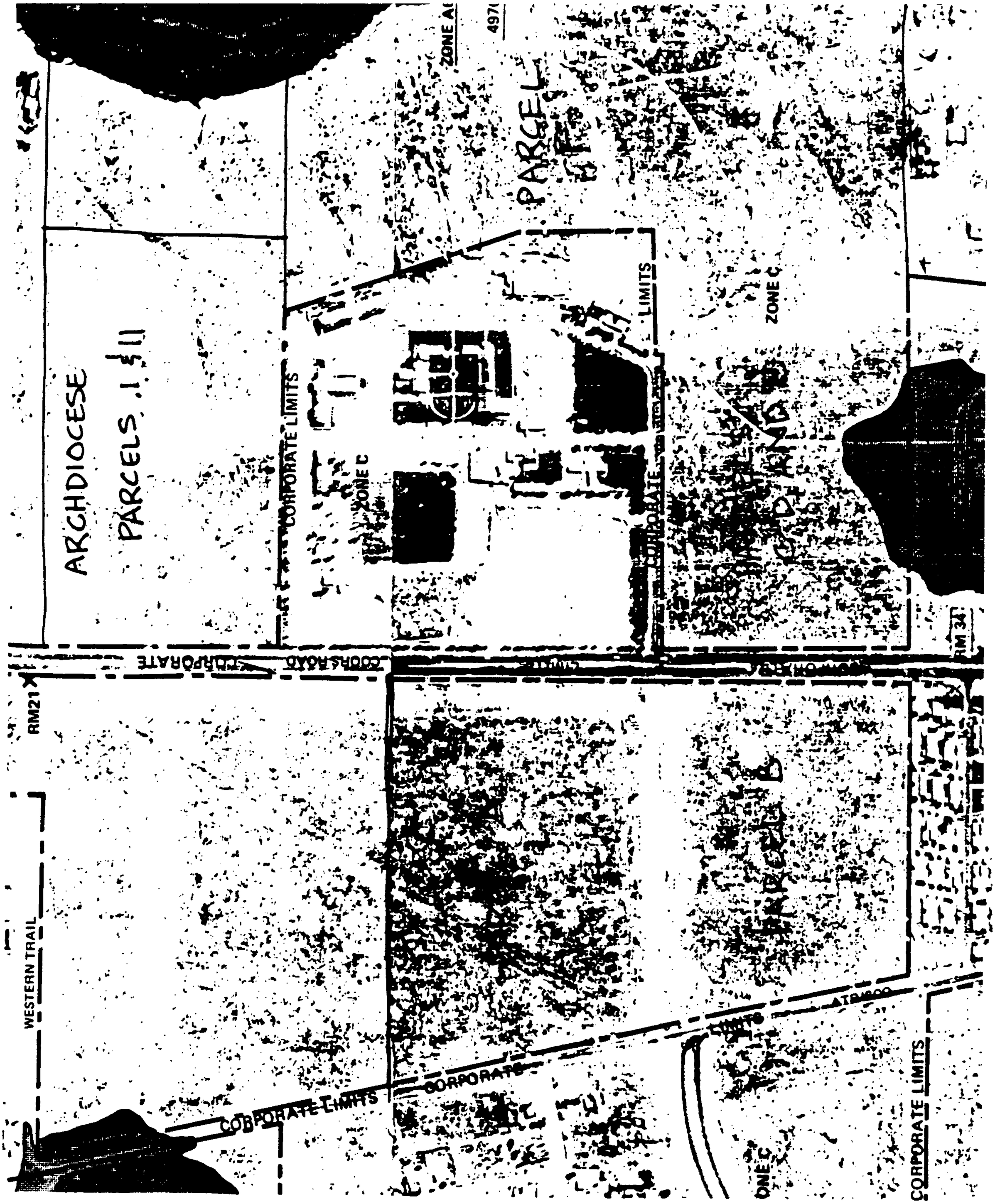


VICINITY MAP

AGIS Zone Maps F-11 & G-11

EXHIBIT 2

FEMA FLOOD INSURANCE RATE MAP



FEMA FLOOD INSURANCE RATE MAP

Panels 14 & 21 of 50

EXHIBIT 3

AMENDMENT TO THE UNIVERSITY OF ALBUQUERQUE LAND USE PLAN

EXHIBIT 4

EXISTING CONDITIONS MAP

EXHIBIT 5

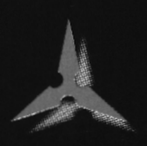
PROPOSED DRAINAGE CONDITIONS MAP

EXHIBIT 6

SKETCH PLAT: OXBOW SUBDIVISION UNIT 1

EXHIBIT 7

ARCHDIOCESE OF SANTA FE PARCELS I AND II LAYOUT



BOHANNAN HUSTON

Courtyard One

7500 JEFFERSON NE

Albuquerque

NEW MEXICO 87109

voice 505.823.1000

fax 505.821.0892

CITY OF
Albuquerque

August 21, 1996

Martin J. Chávez, Mayor

Tamara Morgan, P.E.
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

RE: MASTER PLAN FOR ALTURA WEST (G11-D14). DRAINAGE MANAGEMENT PLAN FOR SITE DEVELOPMENT PLAN FOR SUBDIVISION AND SECTOR PLAN APPROVAL. ENGINEER'S STAMP DATED 7-8-96.

Dear Ms Morgan:

Based on the information provided on your July 29, 1996 submittal, City Hydrology has the following comments:

1. The first development in will require the storm drain improvements. For this reason temporary retention ponds will not be necessary.

2. No ponding will be allowed in single family residence areas.

3. Since the City will be responsible for the maintenance of this storm drain system, one regional detention pond is desired.

4. If you plan on using a detention pond as a park, you will need concurrence from the Parks and General Services Department, as they will maintain the facility.

5. I believe you will need drainage easements from the appropriate entities to discharge at the proposed location.

If I can be of further assistance, please feel free to contact me at 768-3622.

Sincerely,

Lisa Ann Manwill
Engineering Assoc./Hyd.

c: Andrew Garcia
File

CITY OF
Albuquerque

August 19, 1997

Martin J. Chávez, Mayor

Kevin Patton, P.E.
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

RE: MASTER PLAN FOR ALTURA WEST (G11-D14). DRAINAGE MANAGEMENT PLAN FOR SITE DEVELOPMENT PLAN FOR SUBDIVISION PLAN APPROVAL. ENGINEER'S STAMP DATED 7-25-97.

Dear Mr. Patton:

Based on the information provided on your July 25, 1997 submittal, City Hydrology has the following comments prior to Site Development for Subdivision approval:

1. No permanent ponding will be allowed in single family residential areas. If there is downstream capacity, ponds will not be permitted at all. It appears that downstream capacity exists.

2. Since the City will be responsible for the maintenance of the storm drain system, one regional detention pond is desired.

3. I was unable to locate your water harvesting pond. A water harvesting pond is exactly like a landscaping pond, meaning, no developed run off may be directed to the pond. What falls in the pond is all that may be retained. Also, you may not "take credit" for the volume retained by the landscaping pond.

4. Who will maintain the private park/pond in Basin "K?" Who is responsible for the ponds outlet structure and connector pipe?

5. How do Basins "C," "4," "5," and "6" drain?

6. Exhibit #5 does not show where St. Joseph's Place is redirected north, around St. Pius X High School, to Namaste.

Prior to Preliminary Plat approval, please address the following comments:

1. The appropriate permits (404 permit) will be required.

2. The first development in, will require the bonding of all on-site and downstream storm drain improvements.

4. The LOMR will be a required as a condition of SIA and release of the Financial Guarantees.

If I can be of further assistance, please feel free to contact me at 924-3984.

Sincerely,

Lisa Ann Manwill, P.E.
Engineering Assoc./Hyd.

c: Fred Aguirre - COA
Andrew Garcia - COA
File

ENGINEERS PLANNERS SURVEYORS
PHOTOGRAMMETRISTS LANDSCAPE ARCHITECTS

BOHANNAN-HUSTON INC.
COURTYARD I, 7500 JEFFERSON STREET, NE ALBUQUERQUE, NM 87109-4355
TEL (505) 823-1000 FAX (505) 821-0892

August 9, 1996

C11/014

Kurt Browning, P.E.
Technical Engineer
Albuquerque Metropolitan Arroyo
Flood Control Authority
2600 Prospect NE
Albuquerque, NM 87107

Re: Altura West Drainage Management Plan for Altura West and Archdiocese of Santa Fe Properties

Dear Kurt:

Your comments concerning Z96-99 in the planning report for the Altura West project indicated a conceptual grading/drainage plan was required. The planning report was for a site plan for subdivision to be heard by EPC. The conceptual grading/drainage plan for the subdivision will be prepared along with the preliminary plat to be submitted to DRB.

Based upon your comments and interest in the project, we are providing you with a copy of the Master Drainage Plan for Altura West and Archdiocese of Santa Fe Properties for all the area around St. Pius High School. As you are aware, AMAFCA prohibited tying to the storm drain that drains the Ladera Golf Course. This plan respects that wish and takes all of the flow to the river from both north and south of Coors Blvd. If you have any questions once your have reviewed this plan, please call.

Sincerely,

Michial M. Emery, P.E.
President

MME/kc

Enclosure - Drainage Management Plan

cc: Tom Keleher, Altura West
Jim Rogers, Commercial Investment
Fred Aguirre, COA
Tamara Morgan, BHI

AUG 16 1996

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BOHANNAN-HUSTON INC.
COURTYARD I, 7500 JEFFERSON STREET, NE ALBUQUERQUE, NM 87109-4355
TEL (505) 823-1000 FAX (505) 821-0892

July 8, 1996

Mr. Fred Aguirre
Hydrology Division
Public Works Department
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

Re: Master Drainage Plan for Altura West and Archdiocese of Santa Fe Properties near St. Pius High School

Dear Fred:

Attached for your review is a copy of the Master Drainage Plan for Altura West and Archdiocese of Santa Fe Properties near St. Pius High School. This document should be considered a Drainage Management Plan for the area whose concepts will be used to develop individual tracts within the area.

The first of these tracts will be a residential subdivision known as the Oxbow Subdivision, Phase I south of St. Pius High School. This subdivision is presently before the Environmental Planning Commission as a site plan for subdivision. In approximately three weeks, we will be submitting a preliminary plat for the subdivision to DRB along with a detailed drainage and grading plan for that project only.

If you or the person who is given responsibility for the review of this document has any questions, please feel free to call. We look forward to receiving your positive response to this submittal.

Sincerely,

Michial M. Emery, P.E.
President

MME/rac

cc: Tom Keleher, Altura West
John Huckmala, Archdiocese of Santa Fe
Tamara Morgan, BHI
Karen Banks, BHI

JUL 2 9 19

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BOHANNAN-HUSTON INC.
ENGINEERS • PLANNERS • PHOTOGRAMMETRISTS • SURVEYORS • LANDSCAPE ARCHITECTS
COURTYARD I, 7500 JEFFERSON NE, ALBUQUERQUE, NM 87109 TEL (505) 823-1000 FAX (505) 821-0892

FACSIMILE TRANSMITTAL COVER SHEET

Date: July 22, 1996 **FAX No.:** _____

To: Dolores - City Hydrology 768-2650 fax 768-3629

Company: _____

From: Keith Donnelly 823-1000 ext 235

Job No. : DRB # 96-295 **Job Name:** Altura West

Number of pages (Including this cover page): 3

RE: _____

Comments: You requested a letter zone atlas map to replace the location map included on our drainage report. I have pasted together several atlas maps and crosshatched the Altura West Properties. I am also faxing the original drainage information sheet in the hope that this will be useful in referencing our project. If there are any further questions please call Keith Donnelly 823-1000 ext 235.

Original to Follow: ☐ **Yes** ☐ **No**

If you do not receive all pages, please contact _____

DRAINAGE INFORMATION SHEET

9/1/414

PROJECT TITLE: Master Drainage Plan for Altura We **ZONE ATLAS/DRNG. FILE #** F-11/G-11
Related
DRB #: 96-295 (for sketch pla **EPC #:** SD-80-3-2 **WORK ORDER #:** N/A
LEGAL DESCRIPTION: Univ. of Albuquerque Sector Dev. Plan (Excluding Parcels III, IV, V and VI)
CITY ADDRESS:

ENGINEERING FIRM: BOHANNAN HUSTON, INC. **CONTACT:** Tamara Morgan, P.E.
ADDRESS: 7500 JEFFERSON NE, ALB. NM 87109 **PHONE:** 823-1000
OWNER: Altura West **CONTACT:** Tom Keleher
ADDRESS: 414 Silver Ave. SW, 87103 **PHONE:** (505) 842-6262
ARCHITECT: N/A **CONTACT:**
ADDRESS: **PHONE:**
SURVEYOR: BHI **CONTACT:** Tamara Morgan, P.E.
ADDRESS: 7500 Jefferson NE, Ct Yard I, 87109 **PHONE:** (505) 823-1000
CONTRACTOR: N/A **CONTACT:**
ADDRESS: **PHONE:**

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN
___ CONCEPTUAL GRADING & DRAINAGE PLAN
___ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION
XX OTHER DRAINAGE MANAGEMENT PLAN FOR MULTIPLE PROPERTIES

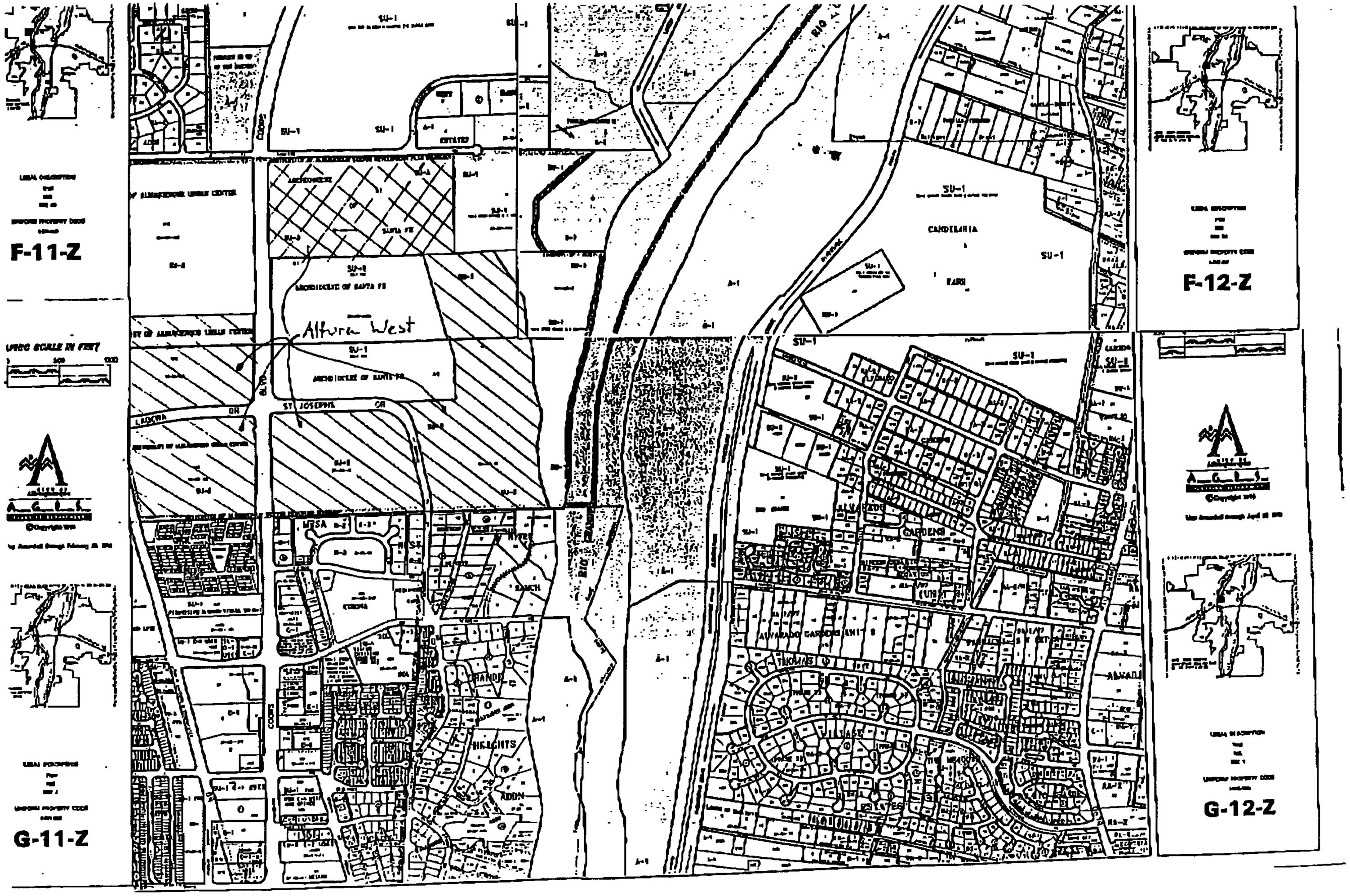
PRE-DESIGN MEETING:

___ YES
___ NO
___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
XX S. DEV. PLAN FOR SUB'D. APPROVAL (AT E.P.C.)
___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
XX SECTOR PLAN APPROVAL (REVISION ALREADY APPROVED BY E.P.C.)
___ FINAL PLAT APPROVAL
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ S.A.D. DRAINAGE REPORT
___ DRAINAGE REQUIREMENTS
___ OTHER _____ (SPECIFY)

DATE SUBMITTED: JULY 8, 1996 JUL 2 9 1996
BY: TAMARA MORGAN, P.E.



DRAINAGE INFORMATION SHEET

PROJECT TITLE: ALTURA WEST DEVELOPMENT ZONE ATLAS/DRNG. FILE # G11/D-14

DRB #: 97-237 EPC #: Z-97-103 WORK ORDER #: _____

LEGAL DESCRIPTION: ANNEXATION PLT LAND IN SECTION 2 TION RZE NMPM SECTION 35 TIIN, RZE, NMDM AND TRACT X-1 AND X-2 OF A PORTION OF UNIVERSITY OF ALBUQUERQUE URBAN CENTER

CITY ADDRESS: COORS AND ST. JOSEPH DRIVE

ENGINEERING FIRM: BOHANNAN-HUSTON INC. CONTACT: KEVIN PATTON

ADDRESS: 7500 JEFFERSON NE, ALB. NM 87109 PHONE: (505) 823-1000

OWNER: ALTURA WEST DEVELOPMENT CONTACT: TOM KELEHER

ADDRESS: 913 VIRGINIA NE 87108 PHONE: 505-346-4646

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT (MASTER)
- _____ DRAINAGE PLAN
- _____ FINAL GRADING & DRAINAGE PLAN
- _____ GRADING PLAN
- _____ EROSION CONTROL PLAN
- _____ ENGINEER'S CERTIFICATION
- _____ OTHER

PRE-DESIGN MEETING:

- _____ YES
- _____ NO
- _____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- _____ SKETCH PLAT APPROVAL
- _____ PRELIMINARY PLAT APPROVAL
- X S. DEV. PLAN FOR SUB'D. APPROVAL
- _____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- _____ SECTOR PLAN APPROVAL
- X FINAL PLAT APPROVAL (BULK LAND)
- _____ FOUNDATION PERMIT APPROVAL
- _____ BUILDING PERMIT APPROVAL
- _____ CERTIFICATE OF OCCUPANCY APPROVAL
- _____ GRADING PERMIT APPROVAL
- _____ PAVING PERMIT APPROVAL
- _____ S.A.D. DRAINAGE REPORT
- _____ DRAINAGE REQUIREMENTS
- _____ OTHER _____ (SPECIFY)

RECEIVED
OCT 23 1997
HYDROLOGY SECTION

DATE SUBMITTED: 10/23/97

BY: KEVIN PATTON

RECEIVED
OCT 23 1997
HYDROLOGY SECTION