CITY OF ALBUQUERQUE

April 25, 2005

Dennis Lorenz, P.E.
Brasher & Lorenz
2201 San Pedro NE, Building 1 Suite 1200
Albuquerque, NM 87110

Re: Thunderbird Little League, 3713 Bryn Mawr Drive NE, Grading and Drainage Plan
Engineer's Stamp dated 4-07-05 (G16-D133A)

Dear Mr. Lorenz,

Based upon the information provided in your submittal received 4-07-05, the above referenced plan is approved for Building Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions, you can contact me at 924-3981.

Sincerely,

Kristal D. Metro
Engineering Associate, Planning Dept.
Development and Building Services

C: File

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

G-16/D133A

PROJECT TITLE: TUNDERBIRD LITTLE LEAGUE
DRB #: NA EPC#:NA

ZONE MAP/DRG. FILE #:G16
WORK ORDER#:NA

LEGAL DESCRIPTION: COMANCHE PARK SOUTH, BLOCK C, INDIAN ACRES
CITY ADDRESS:3713 BRYN MAWR NE

ENGINEERING FIRM: BRASHER & LORENZ
ADDRESS: 2201 SAN PEDRO NE BLDG 1 SUITE 1200
CITY, STATE: ALBUQUERQUE, NEW MEXICO

CONTACT: D. LORENZ
PHONE: 888-6088
ZIP CODE: 87110

OWNER: THUNDERBIRD LITLE LEAGUE
ADDRESS: 3713 BRYN MAWR NE
CITY, STATE: ALBUQUERQUE, NEW MEXICO

CONTACT: UNKNOWN
PHONE:
ZIP CODE: 87107

ARCHITECT: NONE
ADDRESS: NA
CITY, STATE: NA

CONTACT: NA
PHONE: NA
ZIP CODE: NA

SURVEYOR: NA
ADDRESS: _
CITY, STATE: _

CONTACT: NA
PHONE:
ZIP CODE:

CONTRACTOR: SHIVER CONSTRUCTION
ADDRESS: 1412 BROADWAY NE
CITY, STATE: ALBUQUERQUE, NEW MEXICO

CONTACT: R. BILLS
PHONE: 344-3461
ZIP CODE: 87102

CHECK TYPE OF SUBMITTAL:

- ☐ DRAINAGE REPORT
- ☒ DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
- ☐ DRAINAGE PLAN RESUBMITTAL
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☐ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
- ☐ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SIA / FINANCIAL GUARANTEE RELEASE
- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D. APPROVAL
- ☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ☐ SECTOR PLAN APPROVAL
- ☐ FINAL PLAT APPROVAL
- ☒ FOUNDATION PERMIT APPROVAL
- ☒ BUILDING PERMIT APPROVAL
- ☐ CERTIFICATE OF OCCUPANCY (PERM.)
- ☐ CERTIFICATE OF OCCUPANCY (TEMP.)
- ☐ GRADING PERMIT APPROVAL
- ☐ PAVING PERMIT APPROVAL
- ☐ WORK ORDER APPROVAL
- ☐ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☒ YES
- ☐ NO
- ☐ COPY PROVIDED

RECEIVED
APR 07 2005
HYDROLOGY SECTION

DATE SUBMITTED: April 7, 2005

BY:DENNIS LORENZ

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature , location and scope ot the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report**: Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.


MAR 22 2005


RV STORAGE


MAR 22 2005

DRAINAGE REPORT

for

COMANCHE PARK – PHASE 1

CITY OF ALBUQUERQUE, NEW MEXICO

Prepared for:

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
PARK AND MEDIAN DESIGN DIVISION

FOR INFORMATION ONLY

December, 2003

Douglas L. Andrews
DOUGLAS L. ANDREWS REGISTERED PROFESSIONAL ENGINEER NEW MEXICO 11771
12-29-03

RECEIVED
DEC 29 2003
HYDROLOGY SECTION

Prepared by:

Smith Engineering Company
A Full-Service Engineering Company

I. INTRODUCTION

Comanche Park is located just east of the North Diversion Channel. The park is actually two parks (north and south) separated by Comanche Road. The primary purpose of the park or parks is to serve as a detention pond facility for storm water runoff. The southern portion of the park currently drains to the northern portion via an existing 36" storm drain pipe under Comanche Road. The southern portion is also the home of Thunderbird Little League while the northern portion is strictly an earthen detention pond facility. A lift/pump station currently lifts the storm water from the northern park/ponding area to the North Diversion Channel.

The City of Albuquerque Park and Median Design Division is planning to renovate the Thunderbird Little League baseball fields that lie within the southern portion of Comanche Park. The southern park consists of approximately 8.5 acres. Figure No. 1 shows the location of both parks.

Smith Engineering Company (SEC) has been retained by Consensus Planning Inc. to provide civil engineering services for the proposed park improvements. Included in the civil engineering scope of work is to provide drainage engineering services for the re-development of the site.

This drainage report will analyze both the existing hydraulic capacity of the south and north ponds as well as the impact the proposed improvements have on both the south and north detention pond facilities. The main purpose of this report is to show the proposed improvements to the south park will not negatively impact the pond volume of either pond.

II. DRAINAGE AREA BOUNDARIES

The off-site drainage basin that contributes to the Comanche Park detention facilities is generally bounded on the east by Carlisle Blvd., the south by Candelaria Road, the west by the North Diversion Channel and the north by the Hanh Arroyo. A small portion of the contributing drainage basin is located north of the Hahn Arroyo with these storm water flows routed to the north park via a 36" storm drain pipe under the existing concrete lined Hahn Arroyo. The drainage area boundary described above can be seen on Map No. 1 located in the back pocket of this report.

III. DRAINAGE CHARACTERISTICS

A. Existing Topography

The off-site contributing drainage basin generally slopes from the east to the west with a surface gradient varying from two to three percent with most of the storm water flows directed to public right of ways.

The southern park/pond is currently graded relatively flat (with fairly steep slopes at the parks outer boundaries) with the general grade from the south and southeast to the north to the existing 36-inch inlet structure connecting the south park/pond to the north park/pond. An existing small earthen channel currently exists within the south park transporting storm water through the park from the southeast corner of the park to the 36-inch concrete inlet structure mentioned above.

The northern park/pond is also currently graded relatively flat (with fairly steep slopes at the parks outer boundaries) from the east to the west and ultimately to the existing lift/pump station located in the north park/pond just east of the North Diversion Channel. The topography of both the off-site basins and the on-site basins are shown on Maps 1 through 3 located in the back pockets of this report

B. Existing Vegetation

The off-site drainage basin is approximately 95% developed. The analysis included in this report assumes the off-site drainage basin is 100% developed. The south park currently consists of five grass baseball fields and small sporadic dirt parking areas. The proposed south park improvements will consist of five dirt baseball fields, a concrete low flow channel and an unpaved (base course) parking area. The north pond is currently undeveloped and consists of native grass vegetation. No new proposed improvements to the north park will be analyzed as part of this report.

C. Land Use

Developed condition land uses were determined from City of Albuquerque Zone Atlas Maps as well as 1999 Aerial Photographs. Various land uses exist within the off-site basin including commercial, office and various types of residential. The north and south park sites are currently zoned residential which is typical for park zoning. Figure No. 2 shows current City of Albuquerque zoning. Map No. 1, located in the back pocket shows the 1999 Aerial Photograph used to verify the zoning and aid in the determining land use. Appendix A displays the various zoning designations and their associated land treatments used in the hydrologic analysis.

IV. EXISTING DRAINAGE FACILITIES

The primary source of storm water entering the south park/pond is via an unlined/earthen arroyo/channel located southeast of the south park. The open channel crosses Bryn Mawr Dr. and enters the park from the southeast corner of the park. It should be noted that there is no drainage crossing structure in/under Bryn Mawr Dr. to

convey the off-site flow under Bryn Mawr Dr. The storm water currently drains over the paved roadway and into the south park/pond. As stated above, an existing 36-inch storm drain pipe connects the south park/pond to the north park/pond. The 36-inch pipe drains water from the south pond to the north pond.

A storm drain system also exists at the intersection of Comanche Road and Bryn Mawr Drive. The system consists of seven catch basins, 18-inch to 30-inch connector pipes and a 36-inch storm drain pipe that empties into the northeast corner of the north park/pond. This storm drain system collects storm water runoff at low point at the intersection. This existing storm drain system is limited by the capacity of the 36" pipe emptying into the north park/pond (approximately 94 cfs) thus; the remaining flow overtops the curb and enters the south park/pond (at the northeast corner of the south park/pond) as overland flow.

Another existing 36" storm drain line also exists north of the North Park/Pond that currently drains water into the north pond. This is the same pipe discussed in a previous section that drains water from the north under the Hahn Arroyo and south to the north park/pond. Eventually, an existing lift/pump station located in the north park/pond pumps the storm water from the north park/pond into the North Diversion Channel.

Map No. 1, 2 and 3 located in the back pockets of the report, show all of the existing storm drain facilities impacting the Comanche Park detention pond facilities.

V. FLOOD PLAINS

After reviewing the Flood Insurance Rate Maps for Bernalillo County and Incorporated Areas (Panel 138 of 825 Map No. 35001C0138 D and Panel 351 of 825 Map No. 35001C0351 D) both dated September 20, 1996, flood plains do exist within both the south park/pond and the north park/pond. Figure 3 shows the existing flood plains that lie within the two parks. Since the proposed improvements to the south park will maintain the site as a detention pond facility with no increase in the High Water Level (HWL), no CLOMR or LOMR will be required.

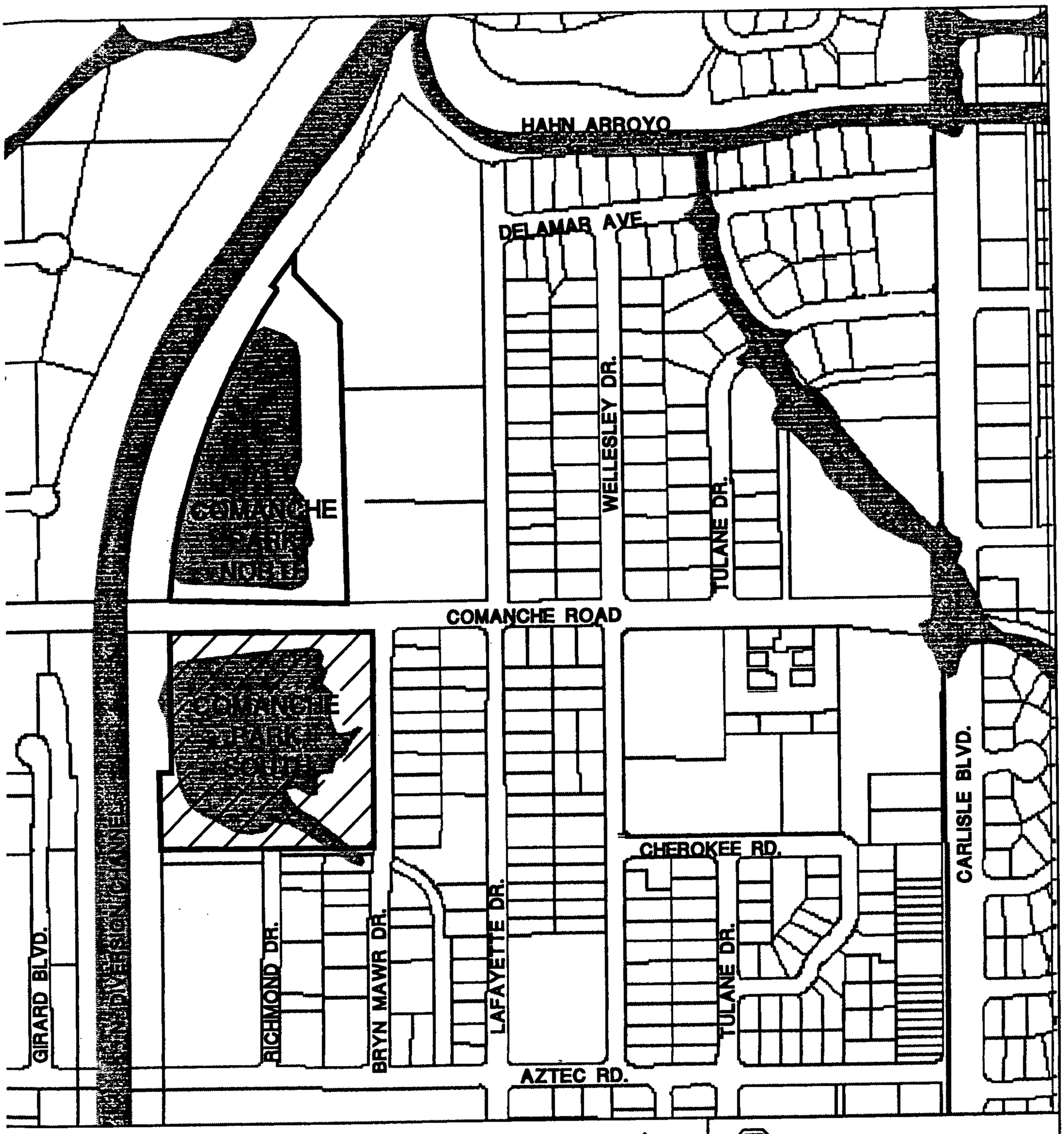
VI. HYDROLOGY

Frequency flows were quantified using the AHYMO computer program according to "Section 22.2 Hydrology of the Development Process Manual, Design Criteria for the City of Albuquerque, New Mexico". Mapping for the off-site hydrologic analysis utilized the orthophotography and vector contour composite images (part of the Bernalillo County Digital Mapping) obtained from the Albuquerque Metropolitan Arroyo and Flood Control Authority (AMAFCA). The south park/pond utilized a topographic/boundary survey performed by Albuquerque Surveying Company, Inc. dated January, 1997. The north park/pond utilized a topographic survey performed by Community Sciences Corporation dated December 2000.

Rainfall amounts for the frequency events were derived from the NOAA Atlas show in "Section 22.2 Hydrology of the Development Process Manual", figures C-1, C-2 and C-3. Developed condition sub-basins were generally broken down into platted lands while topographic features were utilized to determine existing condition drainage sub-basins.

Existing condition land treatments were determined utilizing the Bernalillo County mapping mentioned above. Developed condition land treatments were determined by correlating the proposed zoning mentioned above to the appropriate land treatments as shown in "Section 22.2 Hydrology of the Development Process Manual", tables A-4 and A-5. Appendix "A" links the zoning used for developed conditions to the appropriate land treatments used in the AHYMO computer models. A summary of Land Treatments used in the hydrologic analysis are shown in Appendix "A".

Time of concentration calculations utilized the SCS Upland Method as described in "Section 22.2 Hydrology of the Development Process Manual". Appendix "B" contains AHYMO basin parameter worksheets together with peak flows and volumes for each sub-basin. AHYMO output summary tables are included in Appendix "C". Detailed AHYMO computer model input and output files are available for observation at the offices of Smith Engineering Company. 2-year, 5-year, 10-year and 100-year peak flows and volumes at designated analysis points are shown on Map No. 1 located in the back pockets of this report.



OPY OF:

RM: FLOOD INSURANCE RATE MAP

ERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

ANEL: 138 & 351 OF 825

AP NUMBERS: 35001C0138 D & 35001C0351 D

FFECTIVE DATE: SEPTEMBER 20, 1996

EDERAL EMERGENCY MANAGEMENT AGENCY

N

NOT TO SCALE

Smith Engineering Company

A Full Service Engineering Company

5400 Uptown Boulevard, N.E. Suite 500E Albuquerque, New Mexico 87110

COMANCHE PARK

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
HYDROLOGY DEVELOPMENT GROUP

FLOOD PLAIN MAP

PROJECT NUMBER:	DRAWN BY:	DESIGNED BY:	DATE:	FIGURE NO.
101103	-	-	9/03	3

VII. PROPOSED IMPROVEMENTS

All of the improvements relative to the Comanche Park – Phase 1 Improvements project will take place within the south park/pond. The improvements include the construction of five new dirt baseball fields for the Thunderbird Little League, an aggregate base course parking lot along with a low flow concrete channel to direct flows through the site. Retaining walls will also be constructed at the southwest corner of the south park. Some concrete valley gutter will be constructed directing flow from the parking area to either the pond outlet structure or the concrete low flow channel. Civil Construction Drawings (Sheets 6 through 10 of 13) located in the back pockets of the report show the phase 1 improvements.

VIII. ANALYSIS

The analysis of the park site is simple. The only hydraulic characteristic of importance in this analysis is pond volume. The first step in the analysis is to determine the existing capacity of each pond and the second is to determine if the existing ponds contain or hold the 100% developed conditions flow that currently impacts the ponds. In other words, determine the HWL in each pond and check it verses the allowable HWL. Steps three and four are similar to the first two steps except the proposed improvements to the south park will be incorporated into the analysis. It is important to remember that the two ponds are connected by a 36" reinforced concrete pipe. With this in mind, the two ponds work together as one, meaning the north pond utilizes some of the south pond volume. Any change to one of the ponds effect the HWL and volume of the other pond. Below is a summary of the results of the analysis.

A. South Park – Existing Condition

The existing allowable volume of the south pond is 7.84 Ac.Ft. The existing allowable HWL in the south pond is 5082.00 feet. With the 100% developed condition 100-year, 24-hour storm event flow impacting the site, the existing HWL in the south pond is 5081.79 feet. Thus, the existing south pond contains the 100-year, 24-hour storm event.

The existing allowable volume of the north pond (including a portion of the south pond) is 61.44 Ac.Ft. The existing allowable HWL in the north pond is 5086.00 feet. With the 100% developed condition 100-year, 24-hour storm event flow impacting the site, the existing HWL in the north pond is 5079.06 feet. Thus, the existing north pond easily contains the 100-year, 24-hour storm event.

Table 1 shows the existing condition stage/storage discharge table for the south pond. Table 2 shows the existing condition stage/storage/discharge for the north detention pond. This information was utilized in the pond routing routines in the AHYMO computer model to determine high water levels in each pond. AHYMO summary tables can be found in Appendix C.

B. South Park – Proposed Condition

The proposed allowable volume of the south pond is 12.16 Ac.Ft. The proposed allowable HWL in the south park remains the same as the existing condition analysis at 5082.00 feet. The increase in allowable volume between the proposed condition and the existing condition is attributed to the regarding of the south park site. With the 100% developed condition 100-year, 24-hour storm event flow impacting the site, the proposed HWL in the south pond is 5081.11 feet. Thus, the proposed south park contains the storm water runoff from the 100-year, 24-hour storm event.

Due to the proposed improvements to the south park, the allowable volume of the north pond (including a portion of the south pond) increases from 61.44 Ac.Ft. to 65.77 Ac.Ft. The allowable HWL in the north pond remains the same as the existing condition at 5086.00 feet. With the 100% developed condition 100-year, 24-hour storm event flow impacting the site, the new HWL in the north pond is 5078.45 feet. Once again, the north park easily contains the runoff from the 100-year, 24-hour storm event.

Table 3 shows the proposed condition stage/storage discharge table for the south pond. Table 4 shows the proposed condition stage/storage/discharge for the north detention pond. This information was utilized in the pond routing routines in the AHYMO computer model to determine high water levels in each pond. AHYMO summary tables can be found in Appendix C.

TABLE 1

COMANCHE PARK
SOUTH DETENTION POND

EXISTING CONDITION

STAGE/STORAGE/DISCHARGE TABLE

ELEVATION (FT.)	AREA (SQ.FT.)	INCREMENTAL VOLUME (AC.FT.)	TOTAL VOLUME (AC.FT.)	DISCHARGE (CFS)
5076.37	0		0.00	0
		0.00		
5077.00	381		0.003	0
		0.02		
5078.00	1,190		0.02	0
		0.06		
5079.00	3,700		0.08	0
		0.75		
5080.00	61,863		0.83	28
		2.56		
5081.00	161,521		3.39	42
		4.45		
5082.00	225,820		7.84	53
		xx		
5083.00*	xx		xx	xx
		xx		
5084.00*	xx		xx	xx

* Elev. 5083 and 5084 extend outside the Comanche Park South area and into Bryn Mawr Dr. and into the channel southeast of the South Pond.

Discharge values obtained from Culvert Master for 36" RCP
L = 229 ft., S = 0.7074% and a tailwater elevation of 5079.25 ft. in the North Pond.

TABLE 2

COMANCHE PARK
NORTH DETENTION POND

EXISTING CONDITION

STAGE/STORAGE/DISCHARGE TABLE

(NORTH DETENTION POND VOLUME ONLY)

ELEVATION (FT.)	AREA (SQ.FT.)	INCREMENTAL VOLUME (AC.FT.)	TOTAL VOLUME (AC.FT.)	DISCHARGE (CFS)
5070.00	0		0.00	0
		0.01		
5071.00	652		0.01	0.23
		0.02		
5072.00	826		0.02	0.23
		0.02		
5073.00	1,041		0.05	0.23
		0.06		
5074.00	4,284		0.11	8.03
		0.86		
5075.00	70,792		0.97	15.83
		2.70		
5076.00	164,326		3.67	15.83
		4.06		
5077.00	189,662		7.73	15.83
		4.46		
5078.00	199,122		12.19	15.83
		4.64		
5079.00	205,416		16.84	15.83
		4.79		
5080.00	211,668		21.62	15.83
		4.93		
5081.00	217,939		26.56	15.83
		5.08		
5082.00	224,683		31.64	15.83
		5.24		
5083.00	232,228		36.88	15.83
		5.41		
5084.00	239,218		42.29	15.83
		5.57		
5085.00	246,236		47.86	15.83
		5.74		
5086.00	253,697		53.60	15.83

STAGE/STORAGE/DISCHARGE TABLE

(VOLUME COMBINED WITH SOUTH DETENTION POND)

	ELEVATION (FT.)	AREA (SQ.FT.)	INCREMENTAL VOLUME (AC.FT.)	TOTAL VOLUME (AC.FT.)	DISCHARGE (CFS)
	5070.00	0		0.00	0
			0.01		
	5071.00	652		0.01	0.23
			0.02		
	5072.00	826		0.02	0.23
			0.02		
	5073.00	1,041		0.05	0.23
			0.06		
	5074.00	4,284		0.11	8.03
			0.86		
	5075.00	70,792		0.97	15.83
			2.70		
	5076.00	164,326		3.67	15.83
			4.06		
*	5077.00	189,662		7.73	15.83
			4.46		
*	5078.00	199,122		12.21	15.83
			4.64		
*	5079.00	205,416		16.91	15.83
			4.79		
*	5080.00	211,668		22.45	15.83
			4.93		
*	5081.00	217,939		29.95	15.83
			5.08		
*	5082.00	224,683		39.48	15.83
			5.24		
	5083.00	232,228		44.72	15.83
			5.41		
	5084.00	239,218		50.13	15.83
			5.57		
	5085.00	246,236		55.70	15.83
			5.74		
	5086.00	253,697		61.44	15.83

Discharge values based upon "Final Report - Volume Two for Albuquerque Storm Water Pumping Stations Rehabilitation Study - Phase I Stations 26, 27, 32, 34, 35, 36, 37, and Alcalde (Proposed)", A/E Sercices Agreement 81-26 for Municipal Development Department City of Albuquerque, BovayEngineers, Inc.

Pump No. 1 - Sump Pump, Pumps at 103 gpm = 0.23 cfs.
Pump No. 2 - Storm Drain Pump, Pumps at 3500 gpm = 7.8 cfs at Elev. = 5074.00.
Pump No. 3 - Storm Drain Pump, Pumps at 3500 gpm = 7.8 cfs at Elev. = 5075.00.

* Storage from Elev. = 5077 to Elev. = 5082.00 uses the volume from the Comanche Park South Pond.

TABLE 3

COMANCHE PARK
SOUTH DETENTION POND

PROPOSED CONDITION

STAGE/STORAGE/DISCHARGE TABLE

ELEVATION (FT.)	AREA (SQ.FT.)	INCREMENTAL VOLUME (AC.FT.)	TOTAL VOLUME (AC.FT.)	DISCHARGE (CFS)
5076.37	0		0.00	0
		0.01		
5077.00	1,640		0.012	0
		0.34		
5078.00	28,105		0.35	0
		1.16		
5079.00	73,165		1.52	0
		2.31		
5080.00	128,151		3.83	28
		3.55		
5081.00	181,042		7.38	42
		4.79		
5082.00	236,000		12.16	53
		xx		
5083.00*	xx		xx	xx
		xx		
5084.00*	xx		xx	xx

* Elev. 5083 and 5084 extend outside the Comanche Park South area and into Bryn Mawr Dr. and into the channel southeast of the South Pond.

Discharge values obtained from Culvert Master for 36" RCP
L = 229 ft., S = 0.7074% and a tailwater elevation of 5079.25 ft. in the North Pond.

TABLE 4

COMANCHE PARK
NORTH DETENTION POND

PROPOSED CONDITION

STAGE/STORAGE/DISCHARGE TABLE

(NORTH DETENTION POND VOLUME ONLY)

ELEVATION (FT.)	AREA (SQ.FT.)	INCREMENTAL VOLUME (AC.FT.)	TOTAL VOLUME (AC.FT.)	DISCHARGE (CFS)
5070.00	0		0.00	0
		0.01		
5071.00	652		0.01	0.23
		0.02		
5072.00	826		0.02	0.23
		0.02		
5073.00	1,041		0.05	0.23
		0.06		
5074.00	4,284		0.11	8.03
		0.86		
5075.00	70,792		0.97	15.83
		2.70		
5076.00	164,326		3.67	15.83
		4.06		
5077.00	189,662		7.73	15.83
		4.46		
5078.00	199,122		12.19	15.83
		4.64		
5079.00	205,416		16.84	15.83
		4.79		
5080.00	211,668		21.62	15.83
		4.93		
5081.00	217,939		26.56	15.83
		5.08		
5082.00	224,683		31.64	15.83
		5.24		
5083.00	232,228		36.88	15.83
		5.41		
5084.00	239,218		42.29	15.83
		5.57		
5085.00	246,236		47.86	15.83
		5.74		
5086.00	253,697		53.60	15.83

STAGE/STORAGE/DISCHARGE TABLE

(VOLUME COMBINED WITH SOUTH DETENTION POND)

	ELEVATION (FT.)	AREA (SQ.FT.)	INCREMENTAL VOLUME (AC.FT.)	TOTAL VOLUME (AC.FT.)	DISCHARGE (CFS)
	5070.00	0		0.00	0
			0.01		
	5071.00	652		0.01	0.23
			0.02		
	5072.00	826		0.02	0.23
			0.02		
	5073.00	1,041		0.05	0.23
			0.06		
	5074.00	4,284		0.11	8.03
			0.86		
	5075.00	70,792		0.97	15.83
			2.70		
	5076.00	164,326		3.67	15.83
			4.06		
*	5077.00	189,662		7.74	15.83
			4.46		
*	5078.00	199,122		12.55	15.83
			4.64		
*	5079.00	205,416		18.35	15.83
			4.79		
*	5080.00	211,668		25.45	15.83
			4.93		
*	5081.00	217,939		33.93	15.83
			5.08		
*	5082.00	224,683		43.80	15.83
			5.24		
	5083.00	232,228		49.04	15.83
			5.41		
	5084.00	239,218		54.45	15.83
			5.57		
	5085.00	246,236		60.03	15.83
			5.74		
	5086.00	253,697		65.77	15.83

Discharge values based upon "Final Report - Volume Two for Albuquerque Storm Water Pumping Stations Rehabilitation Study - Phase I Stations 26, 27, 32, 34, 35, 36, 37, and Alcalde (Proposed)", A/E Sercices Agreement 81-26 for Municipal Development Department City of Albuquerque, BovayEngineers, Inc.

Pump No. 1 - Sump Pump, Pumps at 103 gpm = 0.23 cfs.
Pump No. 2 - Storm Drain Pump, Pumps at 3500 gpm = 7.8 cfs at Elev. = 5074.00.
Pump No. 3 - Storm Drain Pump, Pumps at 3500 gpm = 7.8 cfs at Elev. = 5075.00.

* Storage from Elev. = 5077 to Elev. = 5082.00 uses the volume from the Comanche Park South Pond.

TABLE 5

COMANCHE PARK

DETENTION POND RESULTS

SOUTH PARK EXISTING CONDITIONS

DETENTION POND	TOP OF POND ELEVATION WITHIN PROPERTY (FT.)	2-YEAR 24-HOUR HWL ELEVATION (FT.)	5-YEAR 24-HOUR HWL ELEVATION (FT.)	10-YEAR 24-HOUR HWL ELEVATION (FT.)	100-YEAR 24-HOUR HWL ELEVATION (FT.)
South Park Detention Pond	5,082.00	5,080.24	5,080.60	5,080.92	5,081.79
North Park Detention Pond	5,087.00	5,076.25	5076.91 *	5077.40 *	5079.06 *

* HWL's in the North Park Detention Pond above Elevation 5076.37' will "Back Up" into the South Park Detention Pond

SOUTH PARK PROPOSED CONDITIONS

DETENTION POND	TOP OF POND ELEVATION WITHIN PROPERTY (FT.)	2-YEAR 24-HOUR HWL ELEVATION (FT.)	5-YEAR 24-HOUR HWL ELEVATION (FT.)	10-YEAR 24-HOUR HWL ELEVATION (FT.)	100-YEAR 24-HOUR HWL ELEVATION (FT.)
South Park Detention Pond	5,082.00	5,079.49	5,079.85	5,080.12	5,081.11
North Park Detention Pond	5,087.00	5,075.72	5076.45 *	5076.97 *	5078.45 *

* HWL's in the North Park Detention Pond above Elevation 5076.37' will "Back Up" into the South Park Detention Pond

IX. CONCLUSIONS

The existing condition analysis shows that both the south park/pond and the north park/pond contain the 100% developed condition 100-year, 24-hour storm event water volume. The proposed condition analysis shows that both the south park/pond and the north park/pond also contains the 100-year, 24-hour storm water volume. In fact, the proposed improvements to the south park/pond increase overall volume in both ponds, thus, improving the hydraulic capacity of both ponds. Table 5 of this report displays the pond volume results for both the existing and proposed ponds.

OFF-SITE ANALYSIS

AHYMO BASIN PARAMETER WORKSHEET
PEAK BASIN FLOWS AND VOLUMES

DEVELOPED CONDITIONS *

BASIN	AREA (sq.mi.)	LENGTH (ft.)	ELEV. DIFF. (ft.)	SLOPE (%)	K	VEL (fps)	T(c) (hr.)	T(p) (hr.)	LAND TREATMENT (%)				2 YEAR		5 YEAR		10 YEAR		100 YEAR	
									A	B	C	D	PEAK FLOW (24hr.) (cfs)	RUNOFF VOLUME (24hr.) (ac.ft.)	PEAK FLOW (24hr.) (cfs)	RUNOFF VOLUME (24hr.) (ac.ft.)	PEAK FLOW (24hr.) (cfs)	RUNOFF VOLUME (24hr.) (ac.ft.)	PEAK FLOW (24hr.) (cfs)	RUNOFF VOLUME (24hr.) (ac.ft.)
PS-1	0.0777	250	3.0	1.20	1.0	1.10	0.06	0.04												
		150	2.0	1.33	1.0	1.15	0.04	0.02												
		160	6.0	3.75	2.0	3.87	0.01	0.01												
		200	4.0	2.00	2.0	2.83	0.02	0.01												
		100	5.0	5.00	2.0	4.47	0.01	0.00												
	TOTAL =	850	25.0	2.94	3.0	5.14	0.05	0.03												
							0.18	0.12	0	10	10	80	79	3.177	109	4.467	133	5.472	209	8.866
PS-2	0.0112	130	2.0	1.54	1.0	1.24	0.03	0.02												
	TOTAL =	700	7.5	1.07	3.0	3.11	0.06	0.04												
							0.09	0.06	0	15	15	70	10	0.406	15	0.580	18	0.717	29	1.186
PS-3	0.0061	400	3.0	0.75	1.0	0.87	0.13	0.09												
	TOTAL =	380	8.0	2.11	2.0	2.90	0.04	0.02												
							0.16	0.11	0	5	5	90	7	0.278	9	0.385	11	0.469	17	0.746
PS-4 *	0.0153	700	6.0	0.86	3.0	2.78	0.07	0.05												
	TOTAL =						0.07	0.05	0	60	40	0	2	0.051	7	0.171	12	0.279	25	0.713
PN-1	0.0323	200	2.0	1.00	1.0	1.00	0.06	0.04												
		800	21.0	2.63	3.0	4.86	0.05	0.03												
	TOTAL =	630	1.5	0.24	3.0	1.46	0.12	0.08												
							0.22	0.15	0	13	13	74	29	1.231	40	1.747	49	2.151	79	3.526
PN-2	0.0062	975	20.0	2.05	3.0	4.30	0.06	0.04												
	TOTAL =						0.06	0.04	0	13	13	74	6	0.236	8	0.335	10	0.413	16	0.677
PN-3	0.0074	130	4.0	3.08	1.0	1.75	0.02	0.01												
		100	0.5	0.50	1.0	0.71	0.04	0.03												
		170	5.0	2.94	1.0	1.71	0.03	0.02												
	TOTAL =	650	9.0	1.38	3.0	3.53	0.05	0.03												
							0.14	0.09	0	13	13	74	7	0.282	10	0.400	12	0.493	19	0.808
PN-4	0.0041	275	8.0	2.91	1.0	1.71	0.04	0.03												
	TOTAL =	300	10.0	3.33	3.0	5.48	0.02	0.01												
							0.06	0.04	0	20	20	60	3	0.130	5	0.189	6	0.236	10	0.401
PN-5	0.0067	300	14.0	4.67	1.0	2.16	0.04	0.03												
	TOTAL =	550	3.0	0.55	3.0	2.22	0.07	0.05												
							0.11	0.07	0	15	15	70	6	0.243	9	0.347	11	0.429	17	0.710
PN-6	0.0080	650	7.0	1.08	3.0	3.11	0.06	0.04												
	TOTAL =						0.06	0.04	0	15	15	70	7	0.290	10	0.415	13	0.512	21	0.847

AHYMO BASIN PARAMETER WORKSHEET
PEAK BASIN FLOWS AND VOLUMES

DEVELOPED CONDITIONS *

BASIN	AREA (sq.mi.)	LENGTH (ft.)	ELEV. DIFF. (ft.)	SLOPE (%)	K	VEL (fps)	T(c) (hr.)	T(p) (hr.)	LAND TREATMENT (%) A	B	C	D	2 YEAR PEAK FLOW (24hr.) (cfs)	2 YEAR RUNOFF VOLUME (24hr.) (ac.ft.)	5 YEAR PEAK FLOW (24hr.) (cfs)	5 YEAR RUNOFF VOLUME (24hr.) (ac.ft.)	10 YEAR PEAK FLOW (24hr.) (cfs)	10 YEAR RUNOFF VOLUME (24hr.) (ac.ft.)	100 YEAR PEAK FLOW (24hr.) (cfs)	100 YEAR RUNOFF VOLUME (24hr.) (ac.ft.)
PN-7	0.0009	330	4.0	1.21	3.0	3.30	0.03	0.02												
	TOTAL =						0.03	0.02	0	5	5	90	1	0.041	1	0.057	2	0.069	3	0.110
PN-8	0.0024	750	23.0	3.07	3.0	5.25	0.04	0.03												
	TOTAL =						0.04	0.03	0	5	5	90	3	0.109	4	0.152	4	0.184	7	0.294
PN-9	0.0297	150	1.0	0.67	0.7	0.57	0.07	0.05												
		470	4.5	0.96	3.0	2.94	0.04	0.03												
		300	2.5	0.83	3.0	2.74	0.03	0.02												
		230	5.0	2.17	3.0	4.42	0.01	0.01												
		100	10.0	10.00	3.0	9.49	0.00	0.00												
		380	4.0	1.05	3.0	3.08	0.03	0.02												
	TOTAL =						0.20	0.13	0	30	30	40	18	0.666	29	1.034	37	1.333	65	2.413
PN-10	0.0024	330	5.0	1.52	0.7	0.86	0.11	0.07												
	TOTAL =						0.11	0.07	0	67	26	7	0.5	0.014	1	0.034	2	0.052	4	0.122
PN-11	0.0184	150	1.5	1.00	0.7	0.70	0.06	0.04												
		825	12.0	1.45	3.0	3.62	0.06	0.04												
		315	2.0	0.63	3.0	2.39	0.04	0.02												
		170	1.0	0.59	3.0	2.30	0.02	0.01												
	TOTAL =						0.18	0.12	0	19	19	62	15	0.599	22	0.870	28	1.084	45	1.828
PN-12	0.0142	200	3.0	1.50	1.0	1.22	0.05	0.03												
		400	1.0	0.25	2.0	1.00	0.11	0.07												
		400	8.0	2.00	2.0	2.83	0.04	0.03												
	TOTAL =						0.20	0.13	0	15	15	70	13	0.515	19	0.736	23	0.909	36	1.504
PN-13 *	0.0015	100	19.0	19.00	1.0	4.36	0.01	0.00												
		400	1.0	0.25	2.0	1.00	0.11	0.07												
	TOTAL =						0.12	0.08	50	0	50	0	1	0.021	5	0.113	8	0.210	21	0.589

* LAND TREATMENTS FOR COMANCHE PARK SOUTH SHOWN IN THIS WORKSHEET INDICATE EXISTING CONDITIONS

PS-4 **	0.0153	1,100	5.4	0.49	4.0	2.80	0.11	0.07												
	TOTAL =						0.11	0.07	0	0	94	6	7	0.161	13	0.318	17	0.452	31	0.960

** LAND TREATMENTS FOR COMANCHE PARK SOUTH SHOWN DIRECTLY ABOVE INDICATE DEVELOPED CONDITIONS