CITY OF
Albuquerque

Public Works Department

Martin J. Chávez, Mayor

Robert E. Gurulé, Dire

February 14, 1997

Joe Kelley
Chavez-Grieves Engineering
5639 Jefferson NE
Albuquerque, New Mexico 87109

RE: REVISED DRAINAGE PLAN FOR CRESTVIEW HEIGHTS PARK (H22-D08)
REVISION DATED 2/7/97

Dear Mr. Kelley:

Based on the information provided on your February 11, 1997 resubmittal, the above referenced site is approved for Grading/Paving permit.

Please be advised that after construction is completed, Engineer Certification per the DPM checklist will be required.

If I can be of further assistance, please contact me at 924-3986.

C: Andrew Garcia
File

Sincerely

Bernie J. Montoya CE
Engineering Associate

DRAINAGE INFORMATION

PROJECT TITLE: Crestview Heights Park ZONE ATLAS/DRNG. FILE #: H-22-Z /D8

DRB#: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: _____

CITY ADDRESS: Chandelle Loop _____

ENGINEERING FIRM: Chavez-Grieves CONTACT: Jeanne Wolfenbarger

ADDRESS: 5639 Jefferson NE PHONE: 344-4080

OWNER: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

_X_ DRAINAGE REPORT

_X_ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

_X_ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

____ OTHER

PRE-DESIGN MEETING:

_X_ YES

____ NO

_X_ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PRMT. APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

_X_ GRADING PERMIT APPROVAL

_X_ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

____ DRAINAGE REQUIREMENTS

____ OTHER _____ (SPECIFY)

DATE SUBMITTED: Jan. 14, 1997

BY: Jeanne Wolfenbarger, E.I.T.

CITY OF
Albuquerque
Public Works Department

Martin J. Chávez, Mayor

Robert E. Gurulé, Director

January 28, 1997

Joe Kelley
Chavez-Grieves
5639 Jefferson NE
Albuquerque, New Mexico 87109

RE: DRAINAGE PLAN FOR CRESTVIEW HEIGHTS PARK (H22-D08) ENGINEER'S STAMP DATED 1/7/97

Dear Mr. Kelley:

Based on the information provided on your January 14, 1997 submittal, listed are some concerns that will need to addressed prior to final approval:

1. Top of curb and flowline elevations on Chandelle Loop NE and on Indian Place Dr..
2. Typical swale detail on the plan drawing for the proposed cobble drainage swale.
3. What type of erosion and sediment control do you propose from the final outlet out towards the existing concrete rundown?.
4. How will you route the runoff between the existing channel and the proposed park towards the existing concrete rundown?

If I can be of further assistance, please feel free to contact me at 924-3986.

C: Andrew Garcia

Sincerely

Bernie J. Montoya CE
Engineering Associate

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.

5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344·4080 · FAX (505) 343·8759

February 10, 1997

Mr. Bernie Montoya
Hydrology Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: DRAINAGE PLAN FOR CRESTVIEW HEIGHTS PARK (H22-D08)

Dear Mr. Montoya:

I have addressed the following comments for Crestview Heights Park along with the resubmittal of the drainage plan and details sheet:

1. Top of curb elevations are shown along Chandelle Loop. The curb along both sides of Chandelle Loop is 8" high.

2. A typical swale detail for the proposed cobble drainage swale is shown on the new details sheet.

3. As shown on the grading plan, cobble riprap will be installed at the 12" pipe outlet. A riprap detail for this outlet is provided. Additionally, there will be some reseeding in the area from the final outlet to the existing concrete rundown.

4. Runoff will be distributed over the land to the west and then it will be conveyed toward the concrete rundown over the existing land slopes.

None of these comments affect the drainage report that has already been submitted. Please feel free to contact me at 344-4080 if there are any further questions.

Sincerely,

Jeanne Wolfenbarger

DRAINAGE INFORMATION

PROJECT TITLE: Crestview Heights Park ZONE ATLAS/DRNG. FILE #: H-22-Z D8

DRB#: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: _____

CITY ADDRESS: Chandelle Loop

ENGINEERING FIRM: Chavez-Grieves CONTACT: Jeanne Wolfenbarger

ADDRESS: 5639 Jefferson NE PHONE: 344-4080

OWNER: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

_X_ GRADING PLAN

_X_ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

____ OTHER

PRE-DESIGN MEETING:

_X_ YES

____ NO

____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PRMT. APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

_X_ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

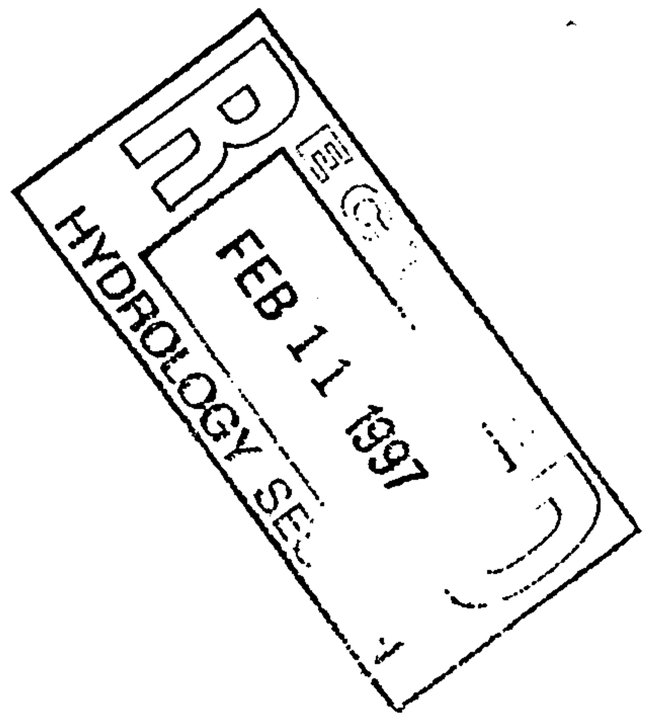
____ S.A.D. DRAINAGE REPORT

____ DRAINAGE REQUIREMENTS

____ OTHER (SPECIFY)

DATE SUBMITTED: Feb. 10, 1997

BY: Jeanne Wolfenbarger, E.I.T.



CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.

5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344-4080 · FAX (505) 343-8759

GRADING AND DRAINAGE PLAN

FOR

CRESTVIEW HEIGHTS PARK

ALBUQUERQUE, NEW MEXICO

JANUARY, 1997

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.

5639 JEFFERSON STREET NE · ALBUQUERQUE, NEW MEXICO 87109 · PHONE (505) 344-4080 · FAX (505) 343-8759

GRADING AND DRAINAGE PLAN

CRESTVIEW HEIGHTS PARK

JANUARY, 1997

LOCATION

This site is bordered by Tramway Boulevard on the east side and the Embudo Arroyo on the south side. Crestview Park Subdivision is located to the north of the site.

FLOOD HAZARD ZONES

As shown by panel 350002 0025 of the National Flood Insurance Rate Maps for the City of Albuquerque, dated October 14, 1983, the site is not located within a flood hazard zone. However, it is adjacent to the Embudo Arroyo which is in the flood hazard zone.

EXISTING SITE CONDITIONS AND DRAINAGE PATTERN

The site is currently undeveloped and slopes to the west at about 5%. Basin "A", which covers the entire on-site area, has an existing runoff of 5.37 cfs. As shown on the Grading and Drainage Plan, runoff from the park is currently directed to an existing concrete rundown which then directs runoff into the Embudo Arroyo. Because an existing retaining wall borders the west side of the site, on-site runoff is prevented from entering Crestview Heights Addition to the west.

As indicated by site observation, no off-site runoff enters the site. Any off-site runoff to the east of the site is intercepted by a berm along the west side of Tramway Boulevard and conveyed to the Embudo Arroyo. An existing storm drain system that runs from Chandelle Loop N.E. to the Embudo Arroyo collects runoff from Crestview Park Subdivision to the north of the site, and an existing standard curb and gutter along the south side of Chandelle Loop conveys this runoff to the existing storm drain system.

PREVIOUS DRAINAGE REPORTS

The Drainage Report for Crestview Park, which was written by Bohannan-Huston in 1977, shows that a total developed runoff of 25.6 cfs is directed to the Embudo Arroyo from both the park site and from Crestview Park Subdivision. 18.7 cfs of this runoff is from the subdivision and accumulates at the southwest corner of Chandelle Loop. According to this report and per as-built information, there was a channel designed to convey runoff from the low point of Crestview Park subdivision to the Embudo Arroyo through the park site.

The channel has since been replaced by three inlets at the low-point of Chandelle Loop which leads to a 30" RCP storm drain that discharges into the Embudo Arroyo. Using a percentage impervious of 75%, the calculated runoff coming from Crestview Park Subdivision under the "new hydrology" method is 39.21 cfs.

By using the Manning Equation at a 1.3% slope, the existing 30" storm drain has a full flow capacity of 46.76 cfs (page A-1). In sump condition, the three inlets discharging into the

storm drain have a total capacity of 69 cfs (pages A-2 and A-3). Therefore, this existing storm drain system is sufficient and allows no off-site runoff to cross over the park site.

PROPOSED SITE CONDITIONS AND DRAINAGE PATTERN

Following the same drainage pattern as for existing conditions, drainage from the proposed park will be conveyed to the Embudo Arroyo. Proposed park development will add 1.68 cfs, resulting in a total 100-year peak flow of 7.32 cfs (page 4). According to the Albuquerque Master Drainage Study, Volume III, the Embudo Channel Network had enough capacity to convey the 100-year discharge when it was an earth channel. The Embudo Arroyo has since been lined with concrete, providing more than enough capacity to accept the minimal added discharge from on-site.

Storm drains were created in the park for irrigation purposes. Subbasins A1 and A2 were created to analyze the capacity of the storm drain systems on-site. These are sufficient to carry the 100-year storm according to inlet capacity calculations on page A-3 and storm drain capacity calculations on pages A-4 and A-5.

CHAVEZ - GRIEVES / CONSULTING ENGINEERS

5639 Jefferson Street NE, Albuquerque, New Mexico 87109 *Phone (505) 344-4080 - Fax (505) 343-8759*

RUNOFF CALCULATIONS - SIMPLIFIED PROCEDURE

By: Jeanne Wolfenbarger Date: January 6, 1996

Project: Crestview Heights Park Zone Atlas: H-22

This procedure is in accordance with the City of Albuquerque Development Process Manual, Volume 2, Section 22.2, "Hydrology", peak discharge rate for small watersheds less than forty acres in size.

Precipitation Zone from Figure A-1: 4
Land treatment descriptions are in Table A-4.

1. RUNOFF RATE COMPUTATION

Use Equation a-10: $Q_P = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$

Values of Q_{pi} are from Table A-9, and are in CFS/acre. Area values are in acres.

BASIN	Q_{PA}	A_A	Q_{PB}	A_B	Q_{PC}	A_C	Q_{PD}	A_D	Q_P
EXISTING BASIN RATE OF RUNOFF (CFS)									
BASIN A	2.2	2.44	2.92	0	3.73	0	5.25	0	5.37
OFF-SITE	2.2	0	2.92	2.10	3.73	0	5.25	6.30	39.21
DEVELOPED BASIN RATE OF RUNOFF (CFS)									
BASIN A	2.2	0.48	2.92	1.7	3.73	0.04	5.25	0.22	7.32
BASIN A1	2.2	0.07	2.92	0.13	3.73	0.04	5.25	0.01	0.74
BASIN A2	2.2	0	2.92	0.34	3.73	0	5.25	0.10	1.52

2. RUNOFF VOLUME COMPUTATION

Use Equation a-5 to compute weighted excess precipitation:

Weighted E = "E" = $(E_A A_A + E_B A_B + E_C A_C + E_D A_D)/(A_A + A_B + A_C + A_D)$

$(A_A + A_B + A_C + A_D) = \sum A_i$

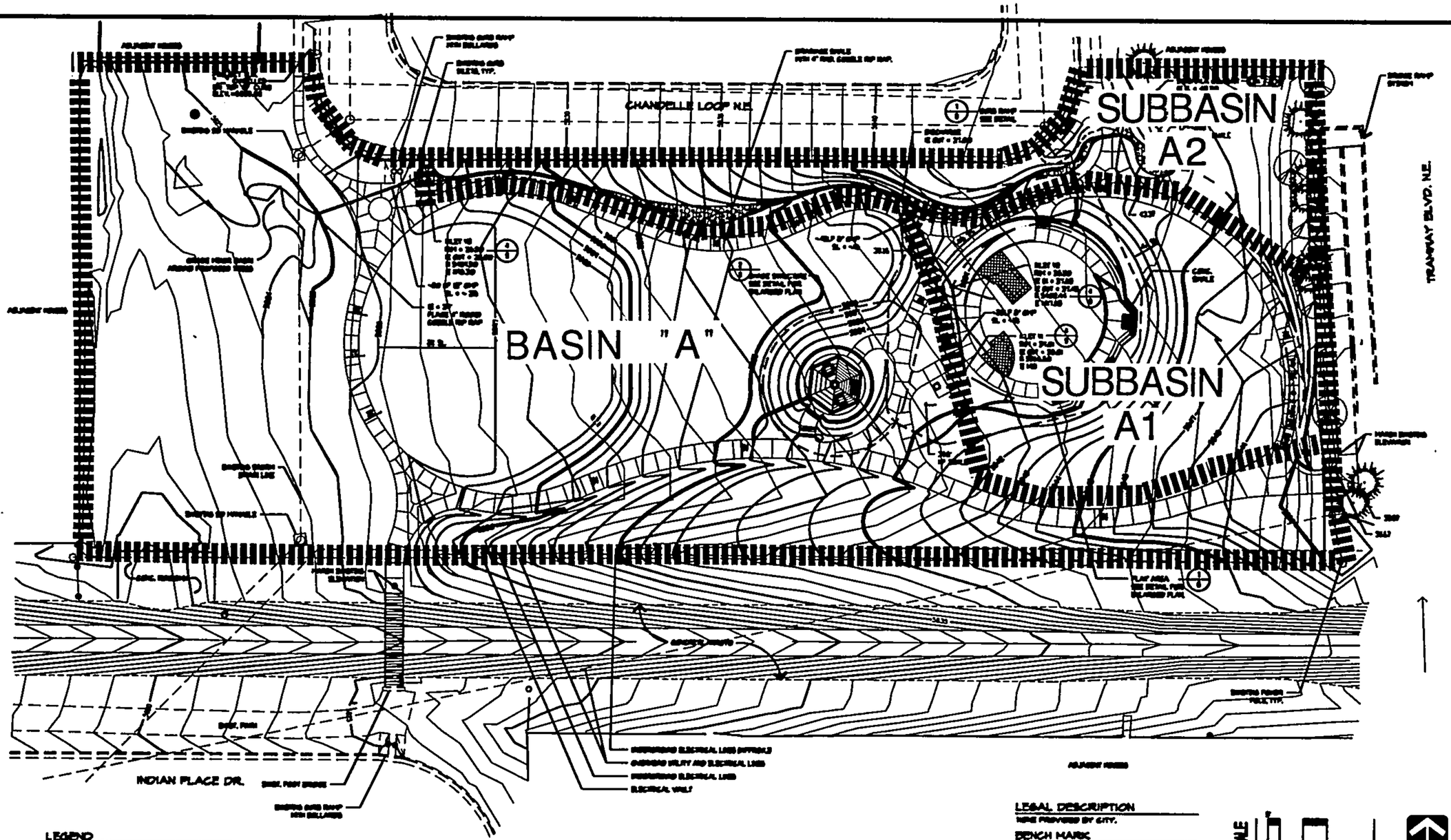
Use Equation a-6 to compute the volume:

V_{360} = "E" x $(A_A + A_B + A_C + A_D)$ x 3630 feet^3/acre·inch

Values of E_i are from Table A-8, and are in inches. Area values are in acres.

BASIN	E_A	A_A	E_B	A_B	E_C	A_C	E_D	A_D	$\sum A_i$	"E"	V_{360}
EXISTING BASIN VOLUME OF RUNOFF (CUBIC FEET)											
BASIN A	0.8	2.44	1.08	0	1.46	0	2.64	0	2.44	0.80	7086
OFF-SITE	0.8	0	1.08	2.1	1.46	0	2.64	6.3	8.4	2.25	68607
DEVELOPED BASIN VOLUME OF RUNOFF (CUBIC FEET)											
BASIN A	0.8	0.48	1.08	1.7	1.46	0	2.64	0.22	2.44	1.17	10379
BASIN A1	0.80	0.07	1.08	0.13	1.46	0.04	2.64	0.01	0.25	1.12	1021
BASIN A2	0.80	0	1.08	0.34	1.46	0	2.64	0.10	0.44	1.43	2291

BASIN BOUNDARY MAP



LEGEND

ABBREVIATIONS

LEGAL DESCRIPTION

BENCH MARK

SURVEYOR

EROSION CONTROL NOTES

SCALE

NORTH

PDS Southwest, Ltd.
Planning & Design Solutions

CHAVEZ - GRIEVES
CONSULTING ENGINEERS, INC.

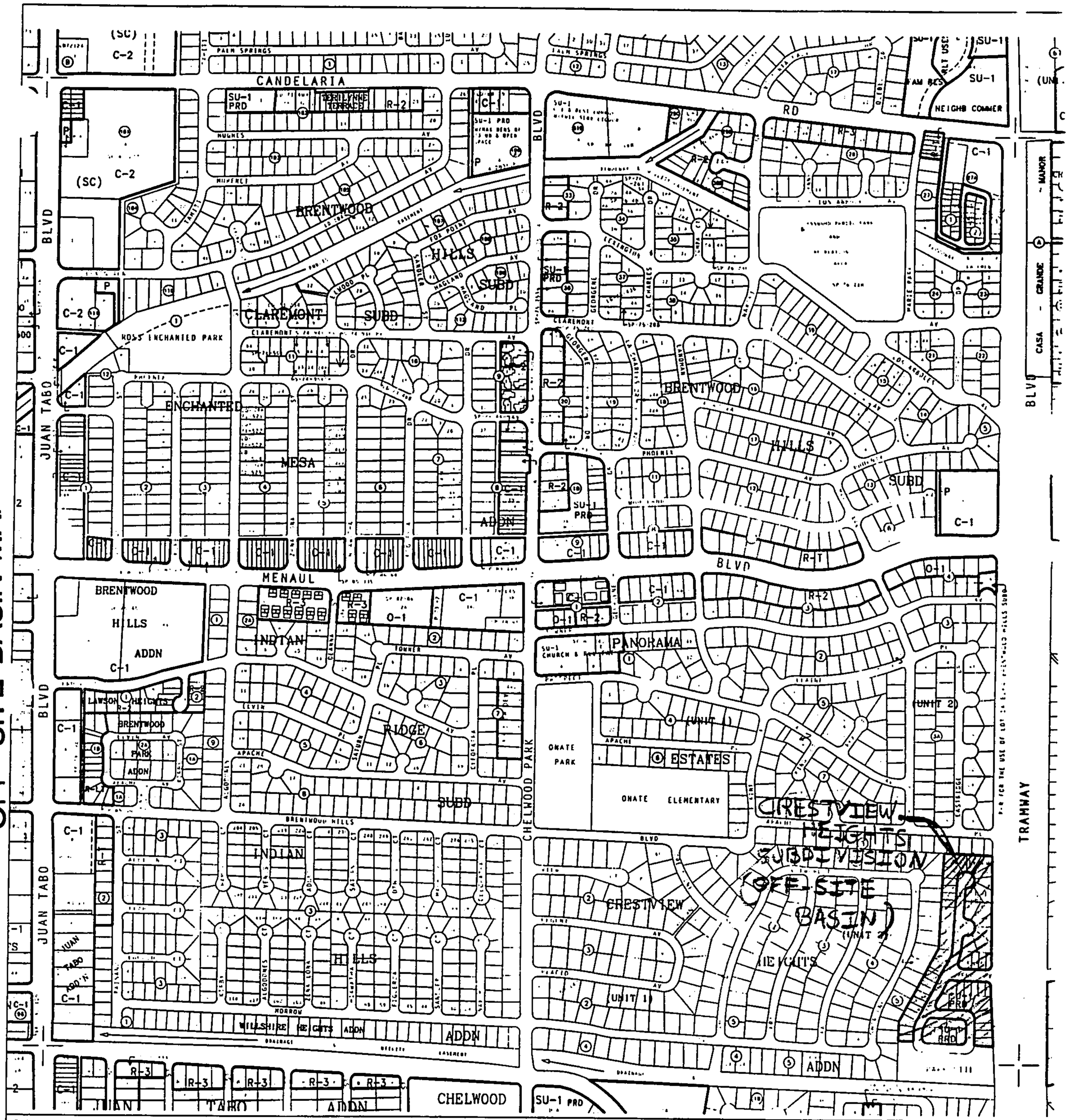
CITY OF ALBUQUERQUE
PARKS/GENERAL SERVICES
DESIGN & DEVELOPMENT

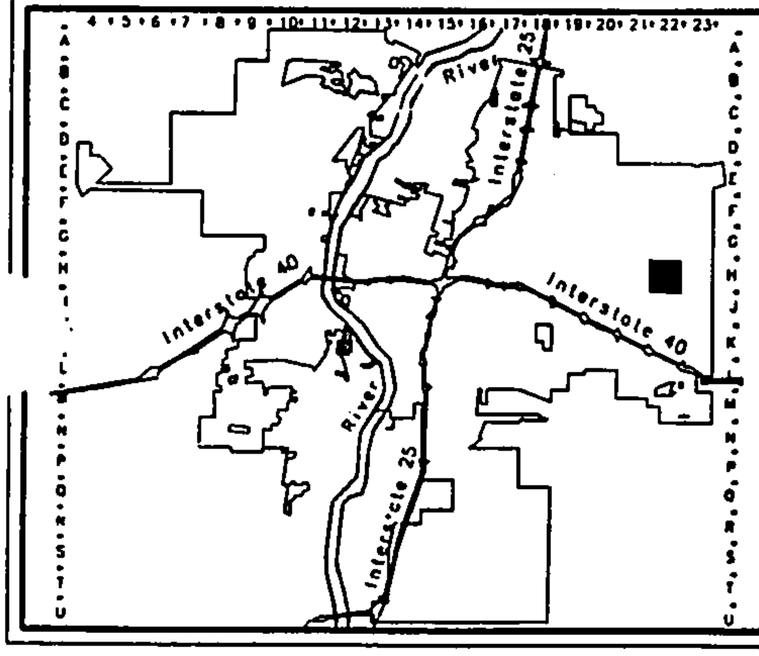
TITLE: CRESTVIEW HEIGHTS PARK — DEC. 12, 1996
CONSTRUCTION DOCUMENTS-100% SUBMITTAL
GRADING AND DRAINAGE PLAN

Bridge Review Committee | City Engineer Approval

City Project No. 4981.91 | Zone Map No. J-22 | Sheet 5 of 10

OFF-SITE BASIN MAP





North

750 375 0 750

Scale: 1" = 750'

AGIS Albuquerque Geographic Information System

City of Albuquerque

© Planning Department July 07, 1993

LEGAL DESCRIPTION

T10N

R4E

SEC 10

UNIFORM PROPERTY CODE

1-022-059

H-22-Z

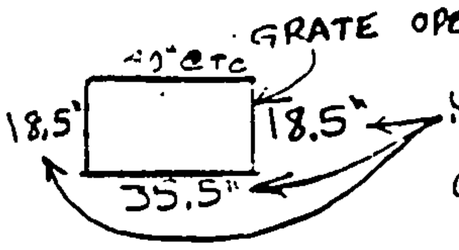
30" RCP STORM DRAIN CAPACITY
Worksheet for Circular Channel

Project Description	
Project File	g:\m23\102\stormdr.fm2
Worksheet	STORM_DRAINS
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.013000	ft/ft
Diameter	30.00	in

Results		
Depth	30.0	in
Discharge	46.76	cfs
Flow Area	4.91	ft²
Wetted Perimeter	7.85	ft
Top Width	0.00	ft
Critical Depth	2.25	ft
Percent Full	100.00	
Critical Slope	0.011427	ft/ft
Velocity	9.53	ft/s
Velocity Head	1.41	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	50.30	cfs
Full Flow Capacity	46.76	cfs
Full Flow Slope	0.013000	ft/ft

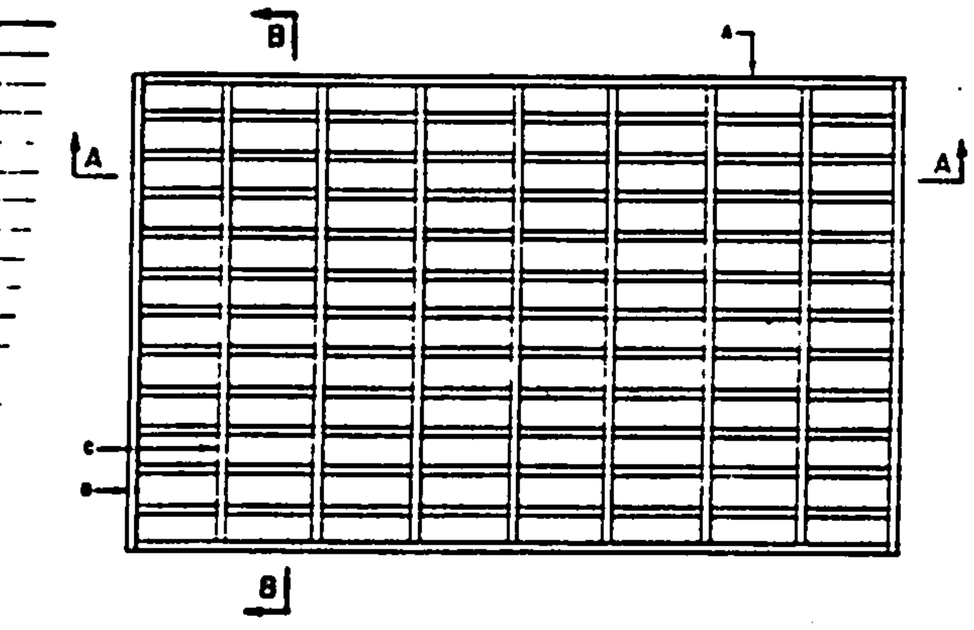
INLET CAPACITIES



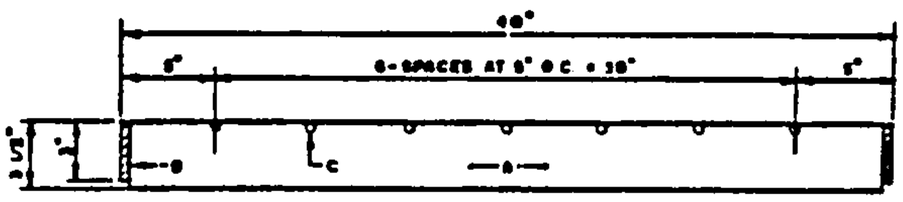
EQUATION	SGL C	DBL C	TRPL C	QDPL C
1) ORIFICE	$22.0\,h^{0.5}$	$43.9\,h^{0.5}$	$65.9\,h^{0.5}$	$87.8\,h^{0.5}$
2) 3-SIDED WEIR ($h \le TC$)	$19.9\,h^{1.5}$	$29.7\,h^{1.5}$	$39.5\,h^{1.5}$	$49.2\,h^{1.5}$
3) 4-SIDED WEIR ($h > TC$)	ADD TO 2): $11(h-.90)^{1.5}$	ADD TO 2): $22(h-.90)^{1.5}$	ADD TO 2): $33(h-.90)^{1.5}$	ADD TO 2): $44(h-.90)^{1.5}$

1) $Q = 0.6A\sqrt{2gh}$

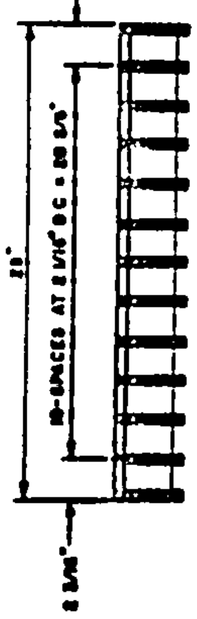
2) & 3) $Q = 3.3\,P\,h^{1.5}$



PLAN



SECTION A-A



SECTION B-B

FIGURE 1

CHAVEZ · GRIEVES
CONSULTING ENGINEERS, INC.
6638 JEFFERSON STREET NE • ALBUQUERQUE NEW MEXICO 87109
PHONE (505) 344-4080 • FAX (505) 343-8758

PROJECT NAME _____

PROJECT NO. _____ BY JPK DATE 8/20/92

SUBJECT RATING CURVE FOR TYPE C INLETS IN SUMP. NO CLOGGING FACTOR _____ CH'D _____ DATE _____

CHAVEZ • GRIEVES
CONSULTING ENGINEERS, INC.
5639 JEFFERSON STREET N.E. • ALBUQUERQUE, NEW MEXICO 87109
PHONE (505) 344-4080 • FAX (505) 343-8759

SHEET NO. _____ OF _____
JOB _____
SUBJECT _____
CLIENT _____ JOB NO. _____
BY JW DATE _____
CHECKED BY _____ DATE _____

Inlets in Sump Condition:

Inlet #2, #3 Capacity:

$Q = 0.6 A \sqrt{2gh}$

$Q = 0.6(0.78)\sqrt{2g(0.5)}$

$Q = 2.66$ CFS > 2.26 CFS OK

Inlet #1 Capacity:

$Q = 0.6 A \sqrt{2gh}$

$Q = 0.6(0.78)\sqrt{2g(1)}$

$Q = 3.76$ CFS > 1.52 CFS OK

Inlets in Chandelle Loop in Sump Condition:

2 DBL "A"s	1 SGL "A"
26 CFS CAPACITY EACH	17 CFS CAPACITY

TOTAL INLET CAPACITY IN CHANDELLE LOOP = 69 CFS

12" PVC STORM DRAIN CAPACITY
Worksheet for Circular Channel

Project Description	
Project File	g:\m23\102\stormdr.fm2
Worksheet	STORM_DRAINS
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.020000	ft/ft
Diameter	12.00	in

Results		
Depth	12.0	in
Discharge	5.04	cfs
Flow Area	0.79	ft²
Wetted Perimeter	3.14	ft
Top Width	0.00	ft
Critical Depth	0.92	ft
Percent Full	100.00	
Critical Slope	0.017372	ft/ft
Velocity	6.41	ft/s
Velocity Head	0.64	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	5.42	cfs
Full Flow Capacity	5.04	cfs
Full Flow Slope	0.020000	ft/ft

8" PVC STORM DRAIN CAPACITY
Worksheet for Circular Channel

Project Description	
Project File	g:\m23\102\stormdr.fm2
Worksheet	STORM_DRAINS
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010000	ft/ft
Diameter	8.00	in

Results		
Depth	8.0	in
Discharge	1.21	cfs
Flow Area	0.35	ft^2
Wetted Perimeter	2.09	ft
Top Width	0.00	ft
Critical Depth	0.52	ft
Percent Full	100.00	
Critical Slope	0.010992	ft/ft
Velocity	3.46	ft/s
Velocity Head	0.19	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	1.30	cfs
Full Flow Capacity	1.21	cfs
Full Flow Slope	0.010000	ft/ft

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
UTILITY DEVELOPMENT DIVISION/HYDROLOGY SECTION

PRE-DESIGN CONFERENCE

DRAINAGE FILE/ZONE ATLAS PAGE NO.: H-22/D8 DATE: 4-12-96

EPC NO.: _____ DRB NO.: _____ ZONE: _____

SUBJECT: Crestview Park

STREET ADDRESS: _____

LEGAL DESCRIPTION: _____

APPROVAL REQUESTED:

___ PRELIMINARY

___ SITE DEVELOP

X GRADING/PAVI

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 1
To JEAN W. CHAVEZ-GRIEGO | From WARREN MCCLUNG
Co. | Phone # PDS
Dept. | Fax #
Fax # 343-8759

ATTENDANCE:	WHO	REPRESENTING
	Karen Liffman	C.O.A. /Parks & G.S.
	Warren McClung	P.D.S. Southwest
	John Curtin	C.O.A./PWD/Hyd

FINDINGS:

FIRM Panel 25 indicates 100 year Flood is confined within the Channel Bohannan-Huston did report in 1977. Report indicates that Off-site flow from Crestview Park Subdivision crosses park to reach arroyo. G&D Plan must include Existing & Proposed runoff, offsite Flows and Downstream Capacity.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED:	John P. Curtin	SIGNED:	Warren F. McClung
TITLE:	CE/Hydrology	TITLE:	
DATE:	4-12-96	DATE:	4/12/96