

JEFF MORTENSEN AND ASSOCIATES, INC. ☐ 6010-B MIDWAY PARK BLVD. N.E. ■ NEW MEXICO 87109 SURVEYORS (505) 345-4250

TRANSMITTAL

TO: KELLS + CRAIG ARCHITECTS

DATE:

12/9/2005

JEFF MORTENSEN FROM:

PROJECT: BIKE PARK ENLARGED PLAN

SHEET C104

ATTN: JONATHAN CRAIG

JOB NO:

2004.068.3

BRAD BINGHAM XC:

FILE

L15/D13A

VIA:

☑ Delivery

☐ Pickup

☐ MaiL/FED EX

WE ARE SENDING:

QTY.

DESCRIPTION

FOR

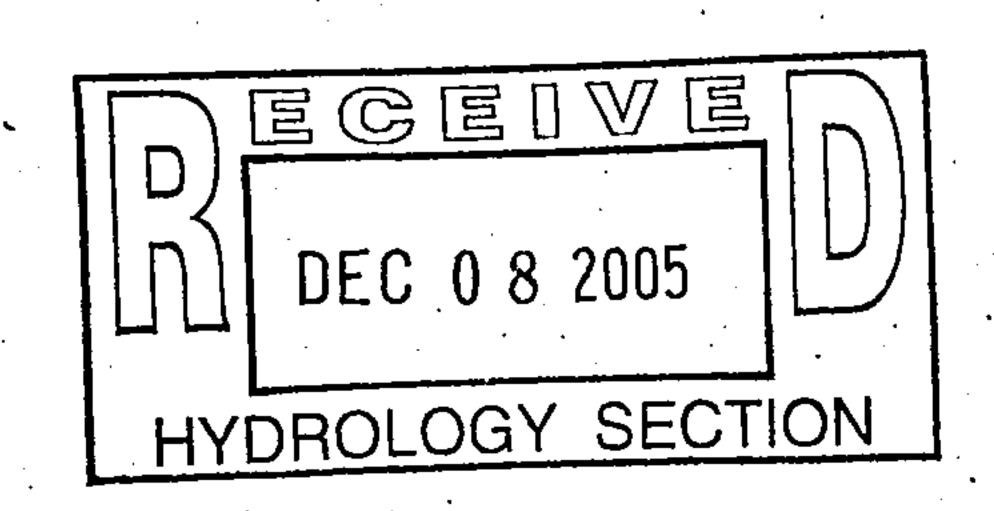
FINAL MYLAR

ADDENDUM

REMARKS:

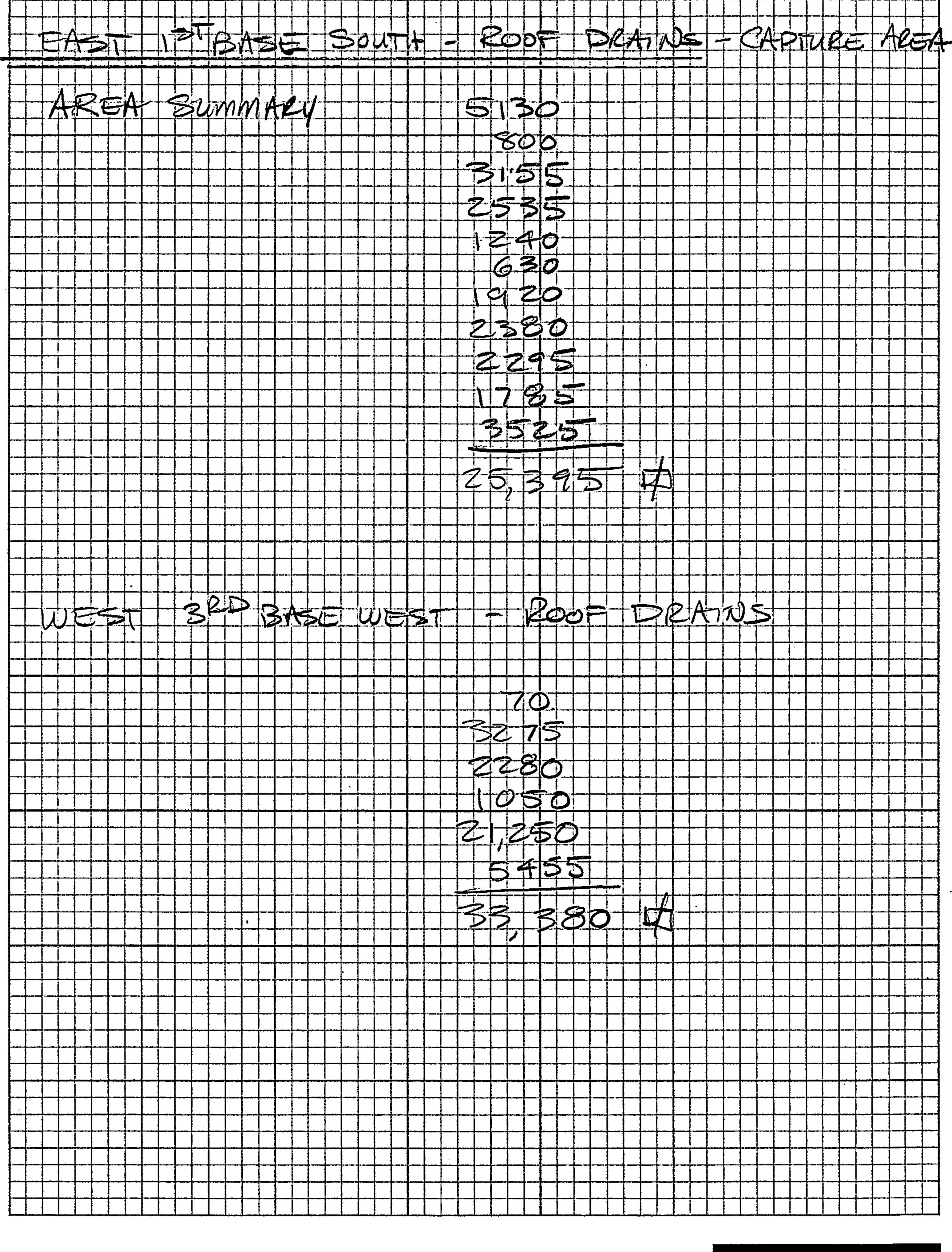
YOU WILL NOTE THAT WE HAVE PROVIDED A FILE COPY TO MR. BRAD! BINGHAM, CITY HYDROLOGIST, FOR INCLUSION ON THE CITY DRAINAGE FILE. THIS DETAIL CONCLUDES THE DESIGN PHASE OF THIS PROJECT.

IF YOU SHOULD HAVE ANY QUESTIONS OR COMMENTS, PLEASE DO NOT HESITATE TO CALL.



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PROJECT NAME	HAA BALFARK	SHEET	4	OF	-		
PROJECT NO.	020240	BY	Aw	DATE	2/11/02	ENGINEERS PLANNERS	PHOTOGRAMMETRISTS
SUBJECT AREA	4 # Q15	CH'D		DATE	3/1/02		WARE DEVELOPERS



Bohannan 🔺 Huston

PROJECT NAME_AAA	BALLPARK	_ SHEET	5	_ OF		
PROJECT NO	0240	BY	2AW	DATE	2/11/02	ENGINEERS PLANNERS PHOTOGRAMMETRISTS
SUBJECT DOOF D	PRAIN AREAS	CH'D	-	DATE	3/1/02	SURVEYORS SOFTWARE DEVELOPERS

BALLPARK Q FLOWS AT BASIN AREAS

NORTH WEST LINE

BASIN	<u>DESCR</u>	AREA	CFS/AC-10	CFS/AC-100	Q10	Q100
Α	ROAD/EAST	0.88	2.21	2.46	1.94	2.16
В	BATTERS EYE	0.28	1.71	3.14	0.48	0.88
C	PICNIC AREA	0.36	3.14	4.7	1.13	1.69
D	LEFT FENCE	0.51	1.71	3.14	0.87	1.60
ш	EMBANK	0.015	1.71	3.14	0.03	0.05
IL.	RAMP	0.05	3.14	4.7	0.16	0.24
N-1	NORTH SEATS	0.13	3.14	4.7	0.41	0.61
N-2	NORTH SEATS	0.21	3.14	4.7	0.66	0.99
N-3	NORTH SEATS	0.22	3.14	4.7	0.69	1.03

		INLET Q10	PIPE FLOW
INLET AT ROAD	Q10=	1.94	1.94
INLET AT BTR EYE	Q10=	0.48	2.42
INLET AT PICNIC	Q10=	2.03	4.45
INLET AT RAMP	Q10=	0.16	4.61
TIE TO MH	Q10=	6.37	6.37

NORTH EAST LINES

BASIN	DESCR	AREA	CFS/AC-10	CFS/AC-100	Q10	Q100
R1	EMBANK SEATING	0.2	1.71	3.14	0.34	0.63
R2	EMBANK SEATING	0.25	1.71	3.14	0.43	0.79
R3 S-1	EMBANK SEATING	0.22	1.71	3.14	0.38	0.69
S-1	SOUTH SEATS	0.2	3.14	4.7	0.63	0.94
S-2	SOUTH SEATS	0.27	3.14	4.7	0.85	1.27
S-2 S-3	SOUTH SEATS	0.16	3.14	4.7	0.50	0.75
S-4	SOUTH SEATS	0.23	3.14	4.7	0.72	1.08

TOTAL FOR SOUTH PIPE	=	3.85

ROOF DRAINS

	AREA(SQFT)	AREA(AC)	Q10/AC	Q10
WEST 3RD BASE LINE	33380	0.77	3.14	2.41
SOUTH 1ST BASE LINE	25395	0.58	(3.14)	1.83

CONSERVATIVE, MORMALLY ROOF DRAIN LINES SIZED

EASTERN MOST UNDEVELOPED AREA
(OUTSIDE PROTECT LIMITS, BALLPARK -> COURTS) AREA FLOWING TO EAST CURB CUT ROAD AREA = 23,000 P = 53 AC. TYPE C $Q_{10} = (1.71).53 = .91$ $Q_{100} = (3.14).53 = 1.7$ SHEET FLOW WEST STURM DRAIN! Q100 = 21.7 CFS Q100=16.6CFS Q10 = 14.5 CFS (DESIGN) Q10=10.9cfs FLOW) SHEET FLOW SOUTH 17.87 CFS # 010 = 11.5 CFS AUENIDA CESAR OFF SITE EAST FLOW CHAVEZ

3

Q100 = 1.7 CFS Q10 = .91 CFS

CLIENT/COURIER TRANSMITTAL

TO:	Requested By. 12-02-12
DRAD BING LAM	Time Due: This A.M. This A.M. By
Job No.:	Job Name: BASEBALL STADIL
DELIVERY VIA	PICK UP Item:
Courier	
Other	
	RIPTION ALLA REDOUT & DWGS
	AWAGE KEROLT & DWG
	HINAUTE REPORT 4
COMMENTS/INSTRUCTIONS	AINACTE REVOCI 4
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	-KINALTE CEVOCI 4
	KINAGE CERUEI 4
	RINAGA REVUEL 4 TO
COMMENTS/INSTRUCTIONS	

www.bhinc.com

March 4, 2002

BOHANNAN-HUSTON, INC.

Brad Bingham

Hydrology/Utility Development

Courtyard One

City of Albuquerque P. O. Box 1293

7500 JEFFERSON NE

Albuquerque, NM 87103

Albuquerque

Re:

Meeting With Hydrology Department, Grading and Drainage, AAA Ballpark, Albuquerque, NM

NM 87109-4335

Dear Brad:

voice 505.823.1000

The purpose of this letter is to document our meeting of February 25, 2002, regarding the renovation of the AAA Stadium located at the corner of University and Cesar Chavez. A list of items discussed in our meeting is shown in Attachment A to this letter.

fax 505.798.7988

In addition, I am including copies of the drainage calculation for the AAA Stadium, as well as copies of the grading and drainage sheets from the construction plan set. Pursuant to your request, we have also included a calculation showing total runoff, both 10 year and 100 year, for the parcel. As discussed in our meeting, the renovation is resulting in runoff flows that are very close to those in the old stadium configuration.

If you have any questions or require any additional information, please do not hesitate to contact our office.

Thank you for your assistance.

Sincerely,

Bohannan Huston, Inc.

Gordon A. Walhood, Jr., P.E.

Vice President and Managing Partner Facilities Planning and Engineering Group

Ladn Adalhad 12

GAW/ca

Enclosures

ERGIRE CRS - PEARREDS - MARKEDS AND CONTRACTOR STANSON .

ATTACHMENT A

ITEMS DISCUSSED IN MEETING WITH HYDROLOGY SECTION, CITY OF ALBUQUERQUE AAA BALLPARK

Following were the items discussed:

- 1. An aerial photo image was reviewed showing the old configuration of the stadium and the basic "swaps" of land coverage type between the old configuration and the new. Basically, the east first base line, now covered with sod, will be concreted and the outfield area covered with steep slope lava rock will be replaced with gentle slope turf and landscape areas. Our copy of the aerial image was left with Brad Bingham for record copy on the old stadium.
- 2. A review was done of the interior storm collector system to convey runoff from the field and outfield areas. Calculations show this line size to be equivalent to the one in place. We are proposing replacing the existing RCP line with PVC conduit for potential cost and corrosion reasons. The current drain line is a 15" RCP going down the third base line. This approximate alignment will be reutilized with the PVC line; however, a leg of storm drain to the east and north will be added on to drain the north side of the batter's eye and the end of the existing cul-de-sac.
- 3. The first base line will have a 12" PVC drain line that will route to the east and then north along the right field retaining wall line. This line will drain any nuisance flows that occur along that right field retaining wall line. Flows in this area are anticipated to be minor since the areas will be landscaped and turfed.
- 4. The existing 15" RCP that goes under the stands will remain in place. We will be extending it approximately 6 feet to the east and constructing a new manhole as well as relocating the west manhole outside the building limit. A video was made of this line and shows the line to be in generally good condition with only one gasket at approximately the 57-foot length on the tape to be slightly dislodged.
- 5. The next discussion included the review of the older problems emanating from the storm drain system. Because of this, it was decided the drains for the dugouts will be connected to the sanitary drain system as opposed to the storm drain system. Further, it was discussed that decomposition of any food material in the lines might likely foster somewhat more corrosive environment. Hence, there is mutual concurrence that PVC may be a better material for the drain lines. This solution is also more cost effective
- 6. Calculation had been run attempting to tie all roof drain lines into the storm drain line but we felt this to somewhat overwhelm the capacity of the final leg of the storm drain system. For that reason, the drain lines are day-lighted to the parking lot area where they sheet flow out toward Cesar Chavez and University Boulevards.
- 7. Upon completion, Brad requested we provide him a calculation showing the total 100 year runoff from the parcel, both sheet flow and what is captured in the storm drain for documentation purposes. In addition, we will deliver to him copies of the four sheets showing grading and drainage and any applicable detail sheets for the drainage file. A drainage information sheet will be completed and included in the drainage file.



BOHANNAN HUSTON

Courtyard One

7500 JEFFERSON NE

Albuquerque

NEW MEXICO 87109

voice 505.823.1000

fax 505.821.0892

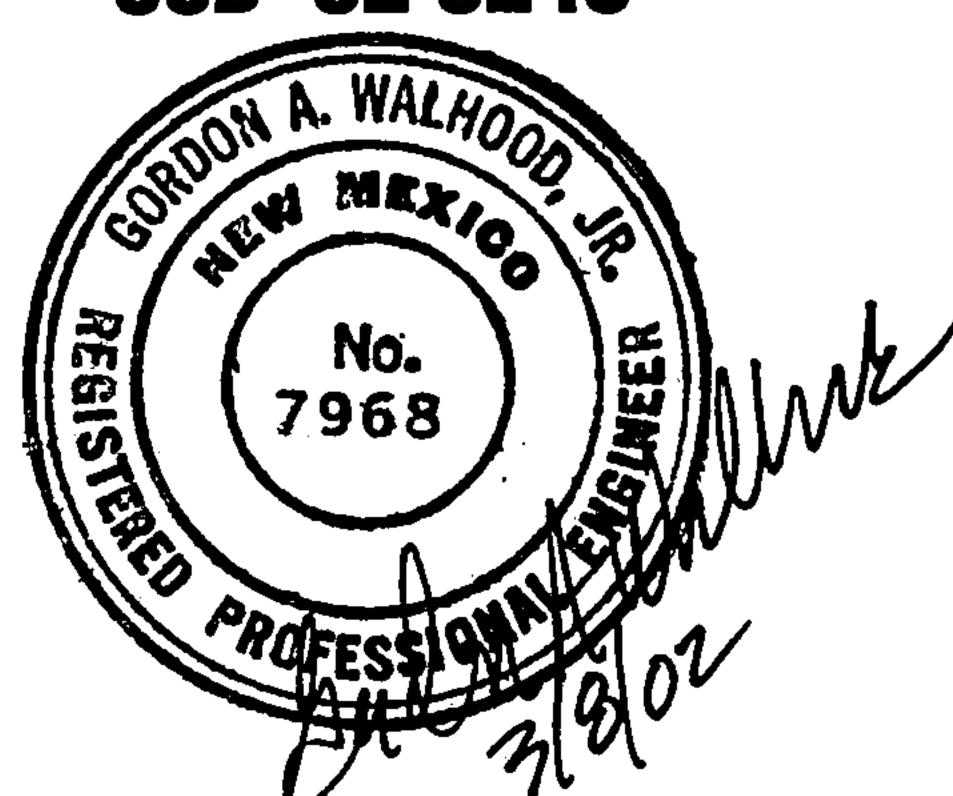
AAA BALLPARK

DRAINAGE CALCULATIONS

February 2002

GORDON A. WALHOOD, JR., P.E. BOHANNAN HUSTON, INC.

JOB 02 0240



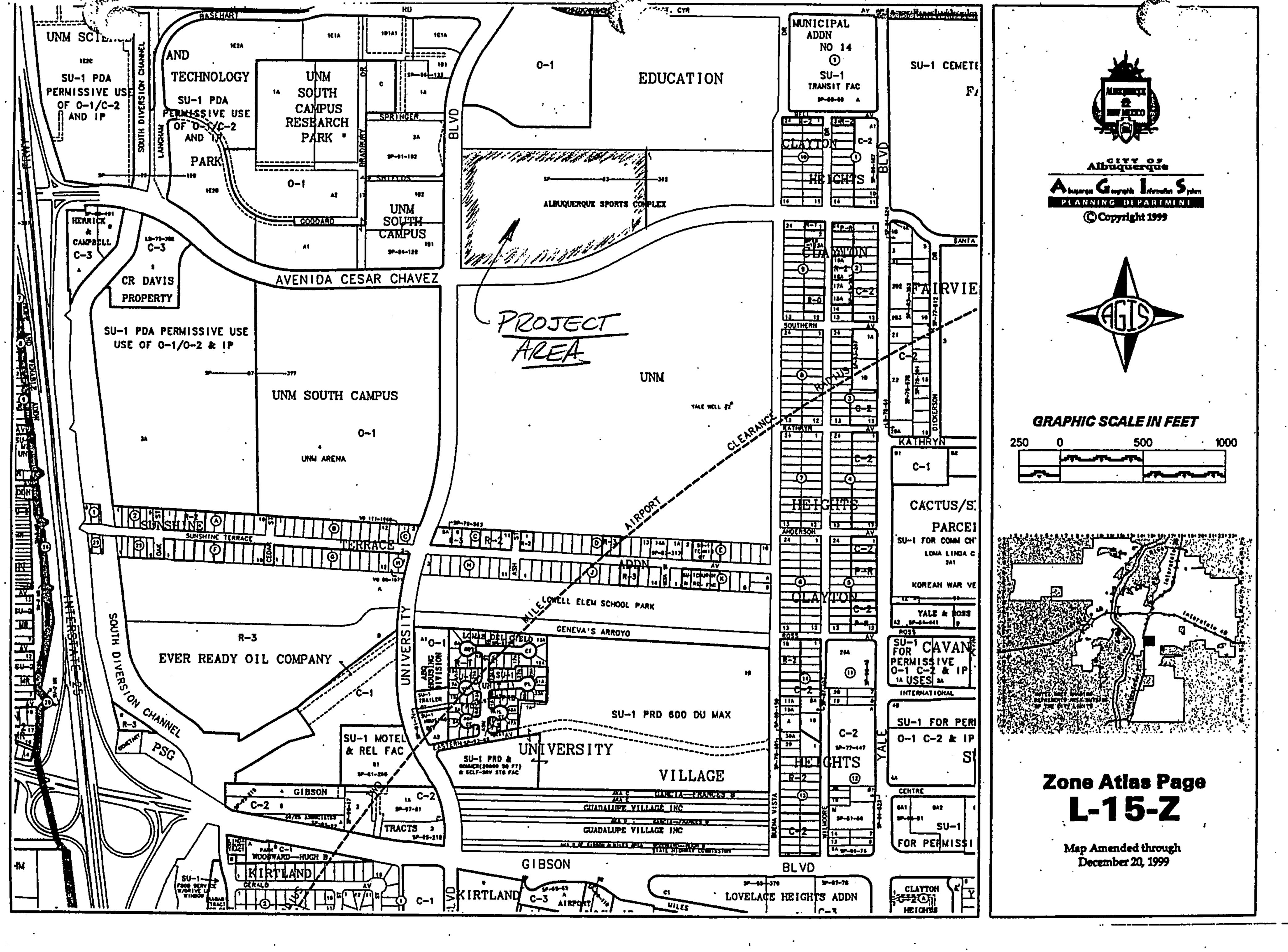
DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/11/2002).

DRB #:	AAA BALPA2K EPC#:		_ZONE MAP/DRG. FIL _WORK ORDER#:		
LEGAL DESCRIPTION	ON: TRACT CA-AU INIVERSITY BLUD	BUQ SPORT AT CESAIR	S COMPLEX CHAVEZ	FILED	722-183
ENGINEERING FIRM ADDRESS: CITY, STAT	M: Bohannan Huston, Inc. 7500 Jefferson NE – Co		CONTACT: C	•	WALHOOD, Pe
ADDRESS:	TY OF ALBUQ PO BOX 1293 E: ALBUQ MM		CONTACT: PHONE: ZIP CODE:	ED AO1 768-3	
ADDRESS:	OK - SPORT VEN 323 W 8TH ST E: KANSAS CITY,	· STE 700	CONTACT: /_ PHONE: ZIP CODE:	16-221-	1500
SURVEYOR: ADDRESS: CITY, STAT			CONTACT: PHONE: ZIP CODE:	12ADIMIN 884-20 87107	2 JIRIK 36
CONTRACTOR: ADDRESS: CITY, STAT			CONTACT: PHONE: ZIP CODE:		
GRADING F EROSION C ENGINEER CLOMR/LO TRAFFIC C ENGINEER	REPORT PLAN JAL GRADING & DRAINAGE PLAN PLAN CONTROL PLAN 'S CERTIFICATION (HYDROLO	AN GY)	CK TYPE OF APPROVAL SIA / FINANCIAL GUA PRELIMINARY PLAT S. DEV. PLAN FOR SI SECTOR PLAN APPROVAL FINAL PLAT APPROVAL FOUNDATION PERMIT AI CERTIFICATE OF OCCUPATION PERMIT AI OF AVING PERMIT APPROVAL WORK ORDER APPROVAL OTHER (SPECIFY)	RANTEE RELIGIONAL APPROVAL APPROVAL APPROVAL CUPANCY (PERCUPANCY (TERPROVAL APPROVAL	APPROVAL
WAS A PRE-DESIGNATION OF THE PROPERTY OF THE P	N CONFERENCE ATTENDED:	•			
DATE SUBMITTED:	3/4/02	BY:	ndm Wallo	a lake	2—

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of 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.



FUTURE RUNOFF TEAKS.

PICNIC AREA
BATTERS EYE
LEFT OUTFIELD
RIGHT OUTFIELD
CUL-DE-SACISTEGET.
EAST SLOPE.

SEE STORM DRAW CALC. Q10 = Q100 =

South SHEET FLOW TO AVENIDA CESAR CHAVEZ
FROM PARKING AREAS + STREET.

EAST AREA - 1.09 AC
WEST AREA = 3.10 AC

TOTAL AREA 4.19 AC

LANDSCAPE AREA. = 37,800 \$\dot = .75 AC

PAVED AREA = 3.44 AC. (TYPE D) LAWDSCAPE = .75 AC (TYPE B)

 $Q_{10} = [(95)(75)] + [(3.14)(3.44)] = 11.5 cfs = Q_{10}$ $Q_{100} = [(2.28(75))] + [(4.76)(3.44)] = 17.87 cfs = Q_{100}$

WEST SHEET FLOW TO UNIVERSITY FROM PARKING AREAS + STREET

TOTAL AREA = 3.74 AC DAVED AREA = 3.35 AC US AREA = .39 AC.

 $Q_{10} = [(.95)(.39)] + [(3.14) 3.35] = 10.9 \text{ CFS} = Q_{10}$ $Q_{100} = [(2.28)(.39)] + [(4.70) 3.35] = 16.6 \text{ CFS} = Q_{100}$



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 1, 2002

Gordon Walhood
Bohannan-Huston, Inc.
7500 Jefferson NE
Courtyard One
Albuquerque, New Mexico 87109

RE: Grading and Drainage Plans for AAA Ballpark (L15-D13) Dated March 8, 2002

Dear Mr. Walhood:

Thank you for sending us a copy of the grading and drainage plan for the referenced stadium. I realize that the building permit is already signed, but we will keep this information on file.

If you have any questions please call me at 924-3982.

Sincerely,

Carlos A. Montoya

City Floodplain Administrator

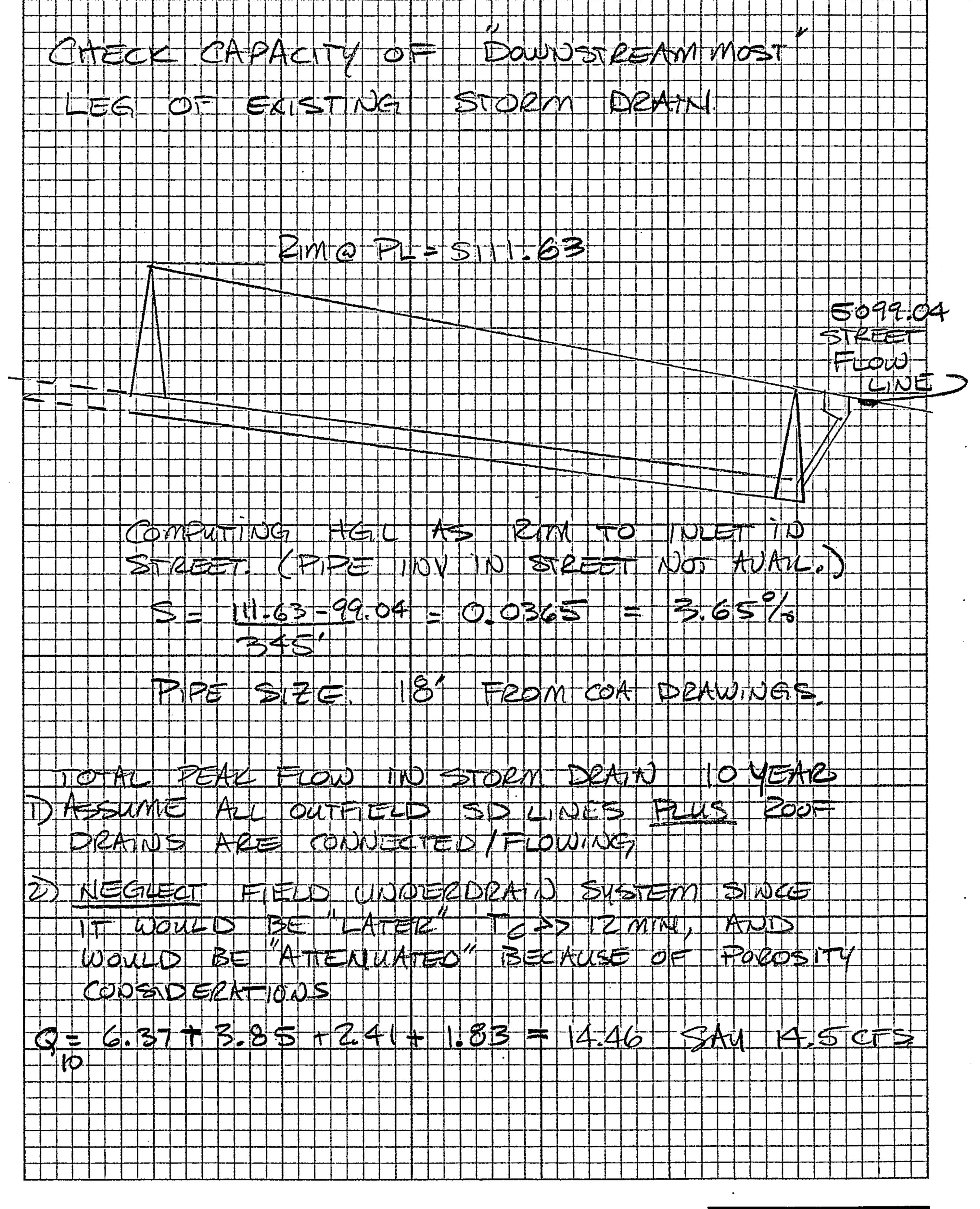
18 INCH DIAMETER PIPE

Manning's N= .013 Increment= 1 in.SLP= .0365

FLOW DEPTH INCHES 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00 10.00 11.00 12.00 13.00 14.00 15.00 16.00 17.00	FLOW AREA SQ. FT. 0.04 0.11 0.19 0.29 0.40 0.52 0.64 0.76 0.88 1.01 1.13 1.25 1.37 1.47 1.57 1.66 1.73	DISCHARGE CFS 0.12 0.52 1.21 2.17 3.38 4.81 6.42 8.18 10.03 11.95 13.86 15.73 17.49 19.06 20.36 21.27 21.58	VELOCITY FPS. 3.12 4.87 6.26 7.43 8.45 9.33 10.10 10.78 11.36 11.85 12.25 12.57 12.80 12.92 12.94 12.91 12.94 12.91	Q10 = 4.5CFS Df10w = 11"to 12"	

18 ø works.

GAW 2/10/02



Bohannan & Huston

PROJECT NAME AAA BALLPACK	_ SHEET	OF	
PROJECT NO. OZOZ4O	BY GARD	_ DATE 2/11/02	ENGINEERS PLANNERS PHOTOGRAMMETRISTS
SUBJECT DOWNST REAM SD	CH'D	_ DATE 3/1/02	SURVEYORS SOFTWARE DEVELOPERS

15 INCH DIAMETER PIPE

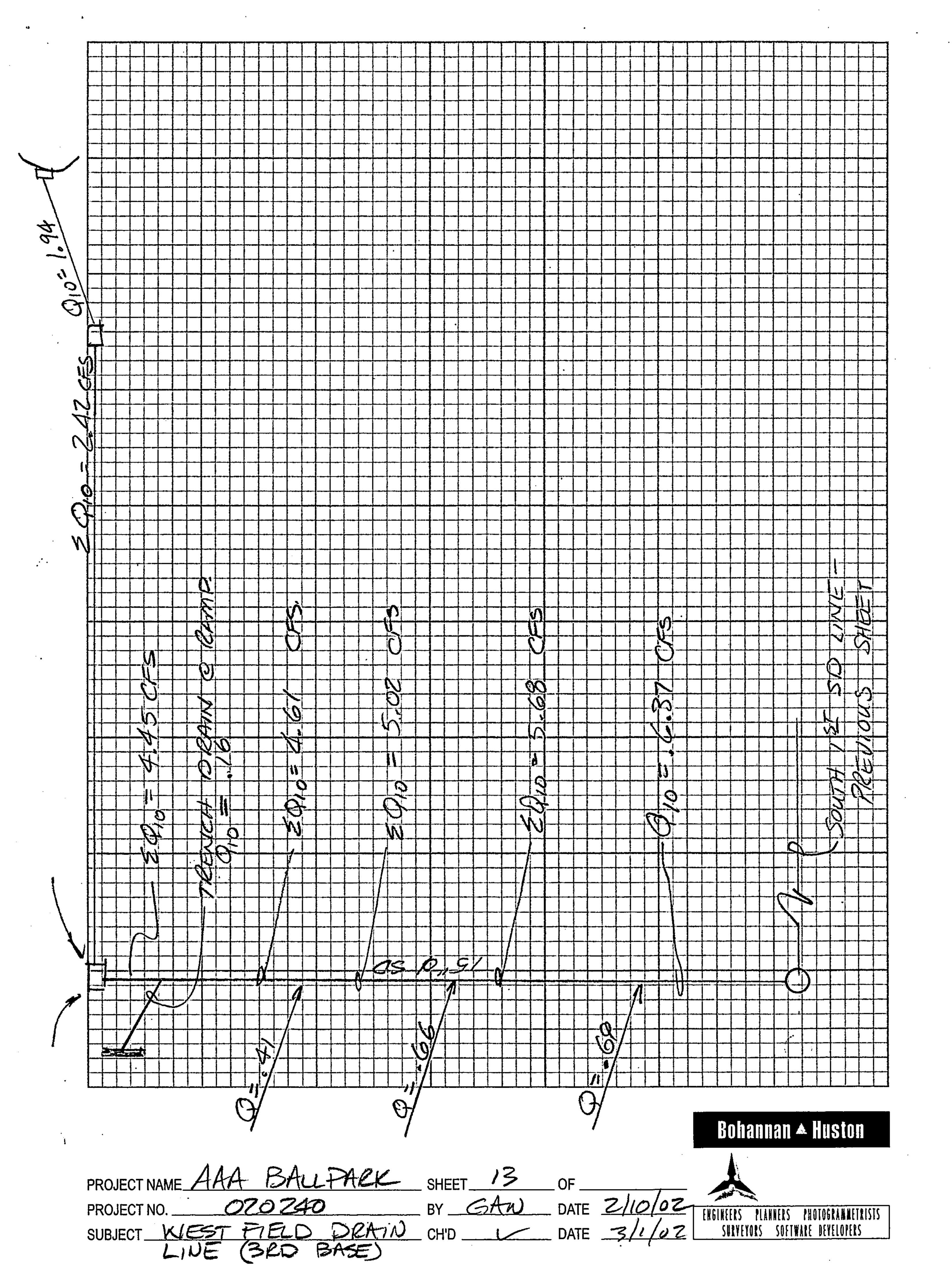
Manning's N= .013 Increment= 1 in.SLP= .0365

FLOW DEPTH	FLOW AREA	DISCHARGE	VELOCITY
INCHES	SQ. FT.	CFS ·	FPS.
1.00	0.04	0.11	3.11
2.00	0.10	0.47	4.83
3.00	0.17	1.08	6.19
4.00	0.26	1.92	7.31
5.00	0.36	2.96	8.26
6.00	0.46	4.16	9.07
7.00	0.56	5.48	9.76
8.00	0.67	6.87	10.33
9.00	0.77	8.29	10.79
10.00	0.87	9.67	11.13
11.00	0.96	10.96	11.36
12.00	1.05	12.06	11.46
13.00	1.13	12.89	11.41
14.00	1.19	13.27	11.14
15.00	1.23	12.34	10.06

EQuo Q outfall pipo = 14.5 CFS

Ocap = 123 CFS
IF OUTFOUR IS 15" & THEN PIPE

IS UNDERCAPACITY.



15 INCH DIAMETER PIPE

Manning's N= .013 Increment= 1 in.SLP= .0467

FLOW DEPTH	FLOW AREA	DISCHARGE	VELOCITY
INCHES	SQ. FT.	CFS ·	FPS.
1.00	0.04	0.12	3.52
2.00	0.10	0.53	5.47
3.00	0.17	1.22	7.00
4.00	0.26	2.17	8.27
5.00	0.36	3.35	9.35
6.00	0.46	4.70	10.26
7.00	0.56	6.20	11.04
8.00	0.67	7.78	11.68
9.00	0.77	9.38	12.20
10.00	0.87	10.94	12.59
11.00	0.96	12.39	12.85
12.00	1.05	13.65	. 12.97
13.00	1.13	14.58	12.90
14.00	1.19	15.01	12.60
15.00	1.23	13.96	11.38

15) INCH DIAMETER PIPE

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Manning's N= .015	Increment= 1	in.SLP=(.014) HEIL

FLOW DEPTH	FLOW AREA	DISCHARGE	VELOCITY
INCHES	SQ. FT.	CFS .	FPS.
1.00	0.04	0.06	1.67
2.00	0.10	0.25	2.59
3.00	0.17	0.58	3.32
4.00	0.26	1.03	3.92
5.00	0.36	1.59	4.43
6.00	0.46	2.23	4.87
7.00	0.56	2.94	5.24
8.00	0.67	3.69	5.54
9.00	0.77	4.45	5.79
10.00	0.87	5.19	5.97
11.00	0.96	5.88	6.10
12.00	1.05	6.47	6.15
13.00	1.13	6.92	6.12
14.00	1.19	7.12	5.98
15.00	1.23	m6.62)	5.40

GAW - 2/10/02 -

12) INCH DIAMETER PIPE

Manning's N= .015 Increment= 1 in.SLP= .014

FLOW DEPTH	FLOW AREA	DISCHARGE	VELOCITY
INCHES	SQ. FT.	CFS .	FPS.
1.00	0.03	0.05	1.66
2.00	0.09	0.22	2.56
3.00	0.15	0.50	3.26
4.00	0.23	0.88	3.82
5.00	0.31	1.33	4.28
6.00	0.39	1.83	4.65
7.00	0.48	2.35	4.94
8.00	0.56	2.86	5.15
9.00	0.63	3.33	5.27
10.00	0.70	3.71	5.30
11.00	0.75	3.92	5.20
12.00	0.79	3.65	4.65

GAW 2/10/12

12 INCH DIAMETER PIPE

Manning's N= .015 Increment= 1 in.SLP=..0173

FLOW DEPTH	FLOW AREA	DISCHARGE	VELOCITY
INCHES	SQ. FT.	CFS .	FPS.
1.00	0.03	0.06	1.85
2.00	0.09	0.25	2.85
3.00	0.15	0.56	3.62
4.00	0.23	0.97	4.25
5.00	0.31	1.47	4.76
6.00	0.39	2.03	5.17 · ·
7.00	0.48	2.61	5.49
8.00	0.56	3.18	5.72
9.00	0.63	3.70	5.86
10.00	0.70	4.12	5.89
11.00	0.75	4.36	5.78
12.00	0.79	4.06	5.17
		_	

GAW Z/10/02

INCH DIAMETER PIPE

Manning's N= .015 Increment= 1 in.SLP=(

FLOW DEPTH	FLOW AREA	DISCHARGE	VELOCITY
INCHES	SQ. FT.	CFS.	FPS.
1.00	0.03	0.03	1.38
2.00	0.07	0.14	2.10
3.00	0.12	0.31	2.62
4.00	0.17	0.52	3.00
5.00	0.23	0.75	3.26
6.00	0.28	0.96	3.40
7.00	0.32	1.10	3.40
8.00	0.35	(1.05)	3.00

•

•

·

GAW 2/10/02 17

15 INCH DIAMETER PIPE

13.00

14.00

15.00

Manning's N	anning's N= .015 Increment= 1 in.SLP= .005				SLOPE
FLOW DEPTH	FLOW AREA	DISCHARGE	VELOCITY		
INCHES	SQ. FT.	CFS .	FPS.		
1.00	0.04	0.04	1.00		
2.00	0.10	0.15	1.55		
3.00	0.17	0.35	1.98		
4.00	0.26	0.62	2.34	i	
5.00	0.36	0.95	2.65		
6.00	0.46	1.33	2.91	•	
7.00	0.56	1.76	3.13		
8.00	0.67	2.21	3.31		
9.00	0.77	2.66	3.46		
10.00	0.87	3.10	3.57		
11.00	0.96	3.51	3.64		
12.00	1.05	3.87	3.68		

3.66

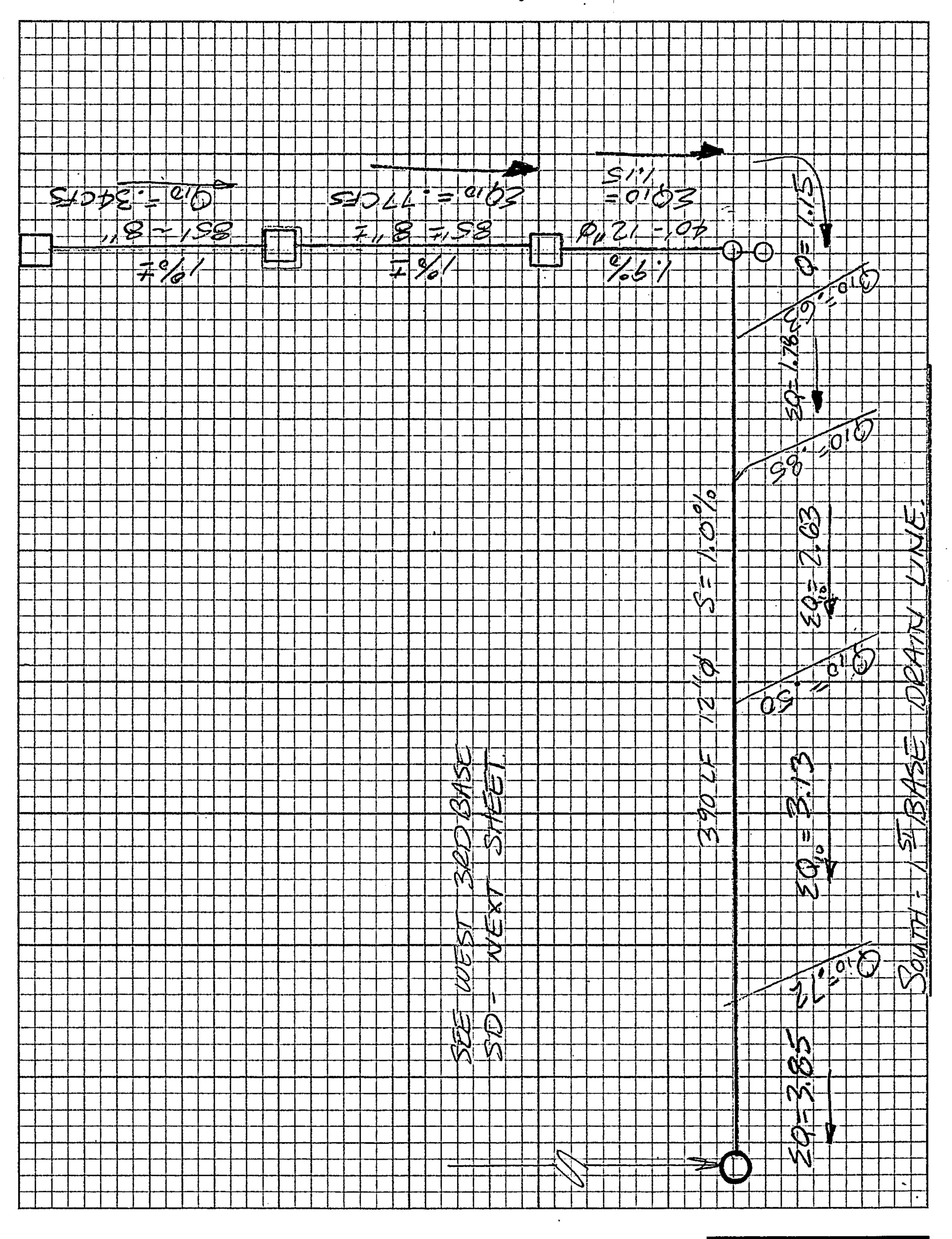
3.57

4.13

4.26

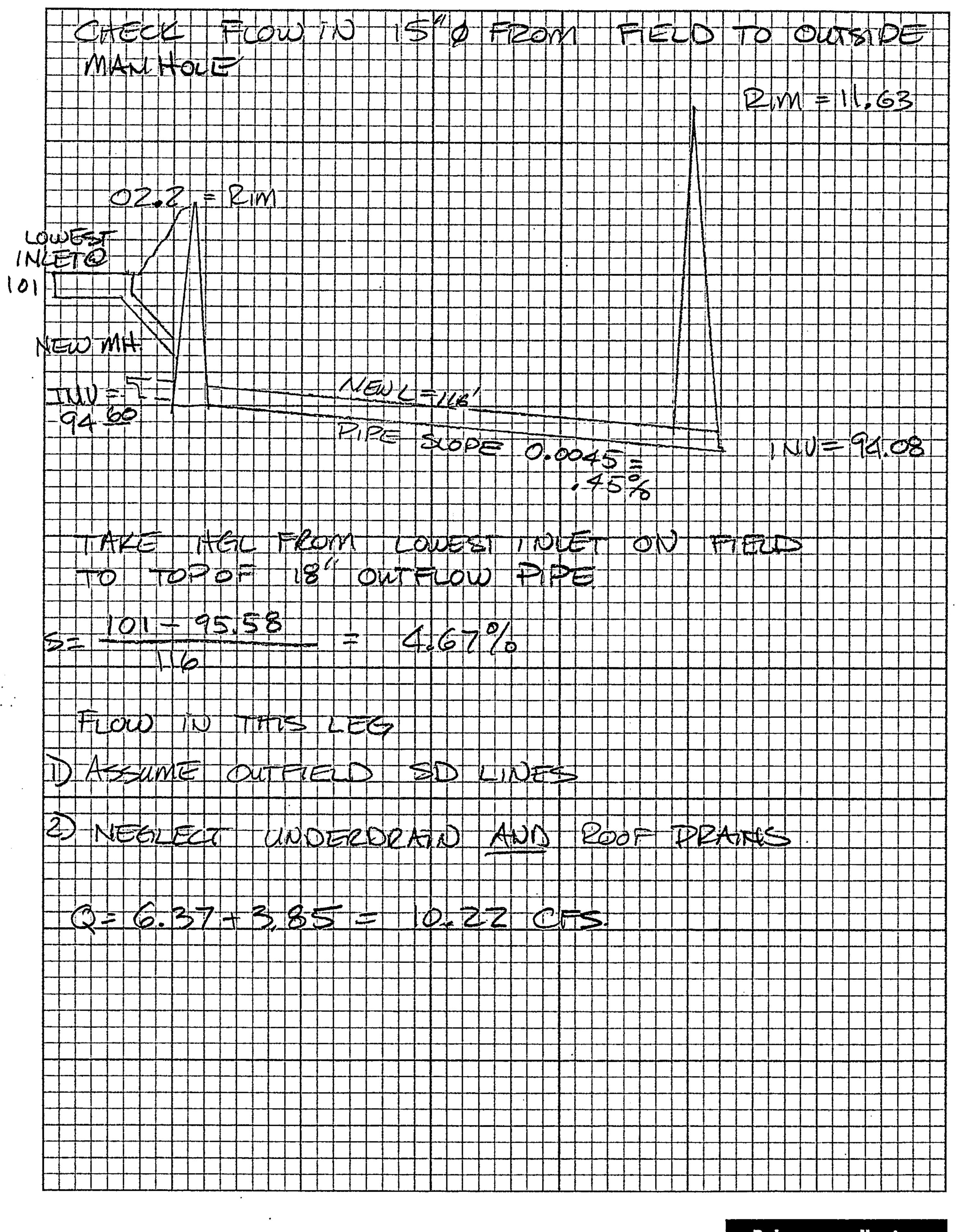
3.96

1.23



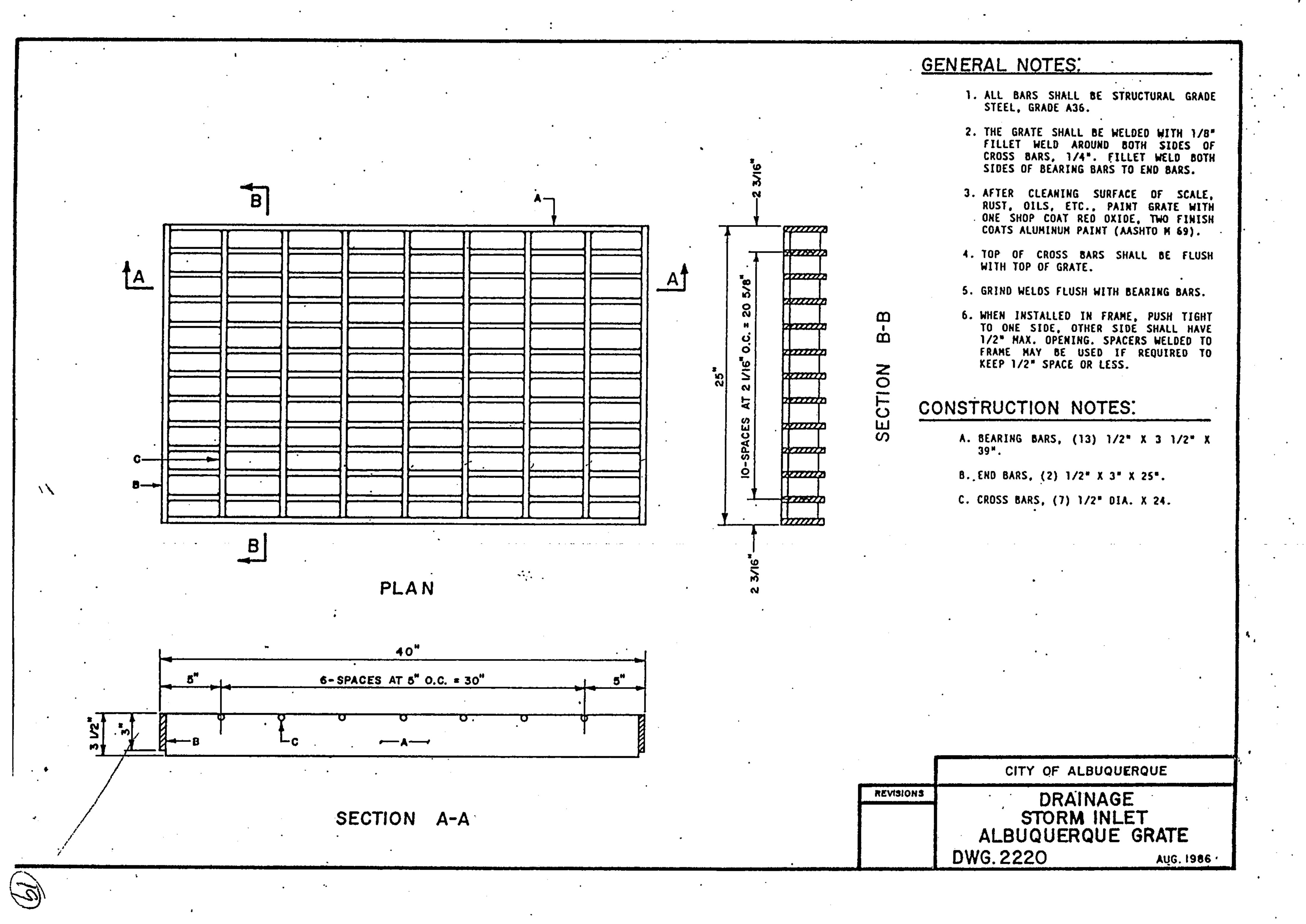
Bohannan 🔺 Huston

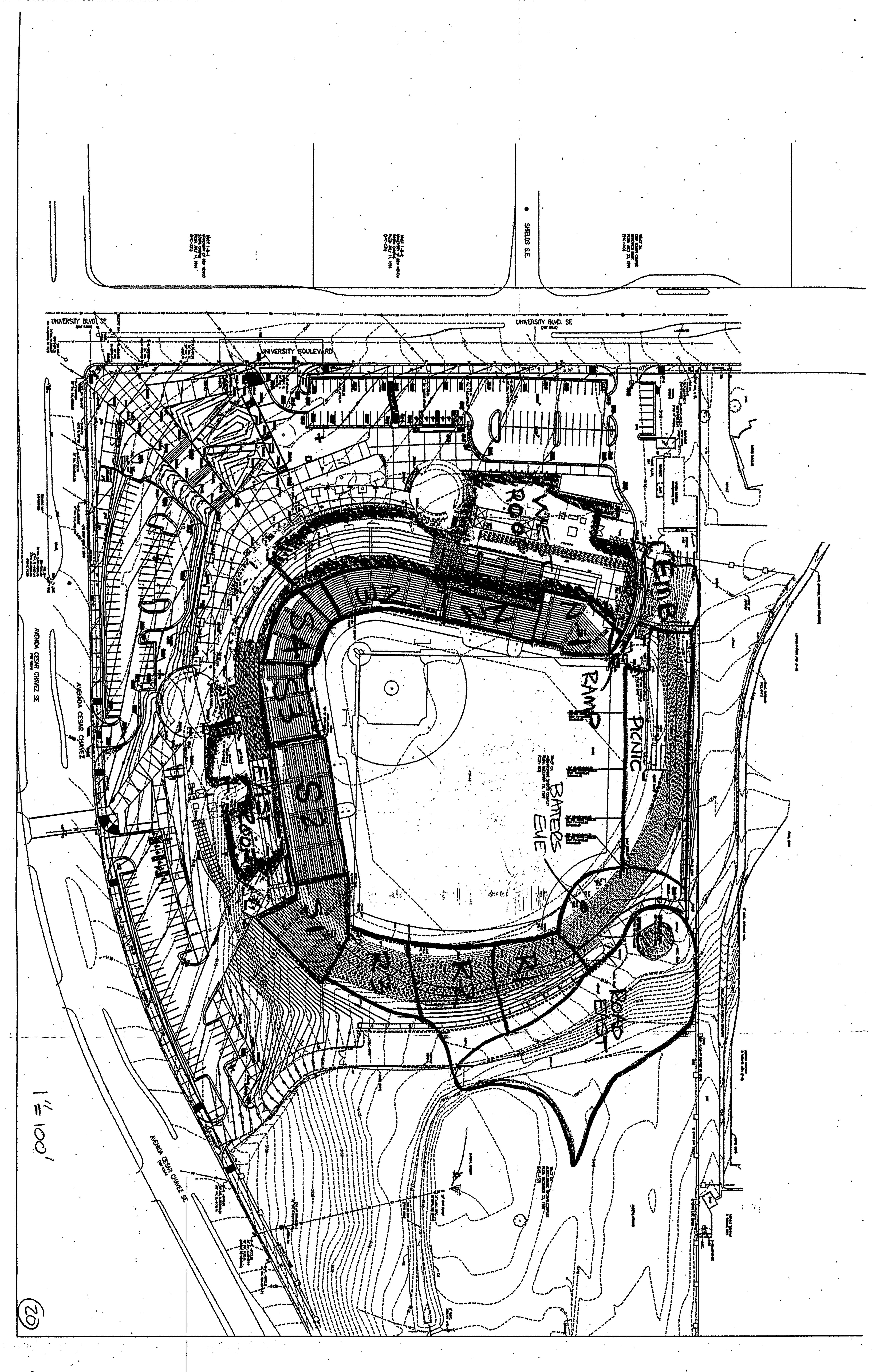
PROJECT NAME AAA	BAZIPARK	SHEET 12	_ OF	<u> </u>	
PROJECT NO	20240	BY SAW	DATE	2/10/02	HEERS PLANNERS PHOTOGRAMMETRISTS
SLIBJECT SOUTH I	DOAIN LINE	CHID	DΔTF	3/1/02	SURVEYORS SOFTWARE DEVELOPERS



Bohannan 🔺 Huston

PROJECT NAME AAA BAZLFACK	_ SHEET	_OF	
PROJECT FIFI D TO PAQUILLO	BY SAW CH'D	DATE 2/002 DATE 3/1/02	ENGINEERS PLANNERS PHOTOGRAMMETRISTS SURVEYORS SOFTWARE DEVELOPERS
SD CAPACITY		···-	





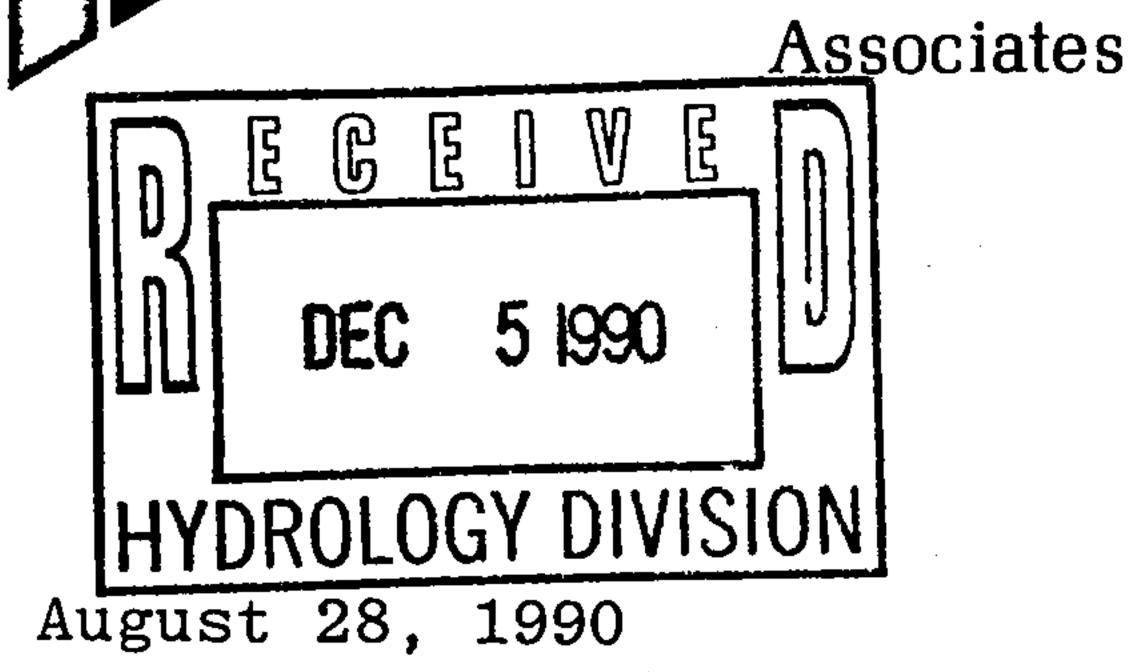
CITY OF ALBUQUERQUE PARKS & RECREATION DEPARTMENT

ENGINEERING STUDY

ALBUQUERQUE SPORTS STADIUM FLOODING

Isaacson & Arfman, P.A.

Consulting Engineering



Ms. Sandy Zuschlag, Assistant Superintendent
Design & Development Division
Parks & Recreation Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Albuquerque Sports Stadium Flooding Study

Dear Ms. Zuschlag:

We have completed our study of the July 14, 1990, flooding of the Albuquerque Sports Stadium. Transmitted are 6 copies of our report.

We appreciate the opportunity of providing professional services to the City of Albuquerque.

Very truly yours,

Thomas O. Isaacson

TOI/anw

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керо	
	Introduction
	Tennis Complex Storage Pond Hydrology 1-2
	Buena Vista Drive Flooding
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	Appendix B Ponding Calculations
	Appendix C Preliminary Spillway Sizing Calculations
	Appendix D Conceptual Cost Estimate
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I INTRODUCTION

On July 14, 1990, a heavy thunderstorm developed over the southeast heights section of Albuquerque. The Weather Bureau at the Albuquerque International Airport recorded 1.12 inches of rainfall for the day with heavy hail and rain occurring between 6:30 and 7:00 p.m. However, even more intense rainfall fell north of the Airport with 2.60 inches measured at the Puerta del Sol golf course, located at the northeast corner of Gibson and Girard. The AMAFCA South Diversion Channel, which intercepts runoff from the southeast heights, recorded its all-time peak flow.

The Albuquerque Sports Stadium, located at the northeast corner of Stadium and University Blvd., experienced flood damage resulting from a large flow running down the riprap surfaced slope opposite the right centerfield section of the baseball field. This flow eroded the slope and deposited a large volume of silt and water in the outfield area of the baseball field. Four days of cleanup work and drying time were required to bring the field into an acceptable condition for the professional baseball team.

Isaacson and Arfman was engaged by the City of Albuquerque Parks and Recreation Department to investigate the cause of the flooding at the Sports Stadium. This report presents the results of that study.

II TENNIS COMPLEX STORAGE POND HYDROLOGY

General. The Albuquerque Tennis Complex is located approximately 1/4 mile east of the Sports Stadium on Stadium Blvd. Drainage from the tennis courts is collected and stored in an earthen storage pond located between the tennis courts and the baseball stadium. During the July 14 storm the storage pond filled and overflowed along its west embankment. These flows then proceeded west into the Sports Stadium outfield causing the flooding which occurred at the Stadium. The runoff potential into the pond and the pond storage capacity were calculated to determine if the pond was adequate for the predicted runoff.

Figure 1 shows the general layout of the Sports Stadium, Tennis Complex and storage pond.

Predicted Runoff. The predicted runoff into the storage pond is determined by the Rational formula for calculating runoff. Using a tributary drainage area of 6.84 acres, a runoff coefficient of 0.66, and a rainfall intensity of 5.46 inches per hour, the calculated peak runoff rate is 24.6 cfs (cubic feet per second).

The predicted volume of runoff from a 2.6 inch rainfall is calculated to be 18,600 cubic feet.

Appendix 'A' shows calculations for the runoff rate and volume. A rainfall value of 2.60 inches, as measured at the Puerta del Sol golf course, has been used for the 6-hour rainfall volume for a 100-year frequency. This value exceeds the City of Albuquerque design criteria rainfall volume of 2.27 inches.

Storage Pond. The Tennis Complex storage pond is located immediately west of the tennis courts. Field surveys were performed to measure the pond size and capacity. The pond was found to occupy an area of approximately $1\frac{1}{2}$ acres. It can store water to a depth of $3\frac{1}{2}$ feet and has a storage volume, at full capacity, of 102,000 cubic feet. Appendix 'B' gives the pond storage volume calculations.

The storage pond capacity of 102,000 cubic feet far exceeds the calculated runoff from the natural drainage basin of 18,600 cubic feet. Consequently, additional runoff from outside the natural drainage basin must have occurred to produce the flood volume needed to fill and overflow the pond.

III BUENA VISTA DRIVE FLOODING

Interviews with Tennis Complex staff, UNM Student Family Housing staff, and residents living on Buena Vista Drive lead us to believe that flood water levels on Buena Vista Drive rose to sufficient heights to overflow into the Tennis Complex and lead to the eventual flooding of the Sports Stadium. This opinion is substantiated by evidence of overland flow (erosion) in the area between Buena Vista Drive and the Tennis Complex.

The maintenance lead man for the UNM Student Family Housing, Allan Field, related that during the July 14 storm one of the apartments was flooded. The flooded unit was located along Buena Vista Drive opposite Bell Avenue. According to Mr. Field, heavy flows running west on Bell Avenue flooded the intersection at Buena Vista with waters overflowing the west curb of Buena Vista and running into the apartment.

Staff of the Albuquerque Tennis Complex indicated that the storm deposited up to one inch of silt on the tennis courts with the heaviest concentrations of silt occurring on the northwest, northeast, and southeast portions of the courts. Siltation was so heavy that it was necessary to shovel some courts and use the Fire Department to wash off the courts. The maintenance man for the complex, who lives at the northeast corner of Stadium and Buena Vista, saw the flooding occur from his house and stated that the storm drain inlets in Buena Vista were plugged and that flow was running west from Buena Vista across the Speech and Hearing Center parking lot onto the tennis courts.

We also interviewed the family residing at 1008 Buena Vista SE (located on the east side of Buena Vista between Bell and Stadium). This family described Buena Vista as a "river" during the storm. They informed us that flood waters rose over the curb and ran into their backyard flooding an addition to their house. They said that very large flows were running west on Bell and turning south on Buena Vista. According to them, the storm drain manhole cover in Buena Vista was popped open by pressure in the storm drain. Their neighbor's car, which was parked along the east curb, was washed approximately 50 feet downstream. They also said the Speech and Hearing parking lots were under water.

Inspection of the Speech and Hearing Center parking lot showed signs of flow across the lot to the west. The heaviest flow occurred on the north side of the office building where portions of the parking lot were eroded.

We believe additional contributing flows also came into the site from the UNM Student Family Housing development on the north. This facility, which has a drainage area of approximately 11 acres flowing to Buena Vista Drive, would have been prevented from flowing to Buena Vista by the high water level in the street and the pressurized condition of the storm drain line (part of the site drainage enters the Buena Vista storm sewer from a private storm sewer).

IV RECOMMENDED IMPROVEMENTS

We recommend an erosion resistant spillway be constructed in the south embankment of the storage pond to provide an overflow to Stadium Blvd. This modification will direct pond overflow away from the Sports Stadium and prevent breaching of the embankment in the event of a similar storm and flooding event. Preliminary calculations (See Appendix 'C') indicate that a spillway with a capacity of 31 cfs would prevent a recurrence of flooding. A concrete spillway section 10 feet wide and one foot deep will have a 31 cfs capacity satisfying this criteria.

In addition, we recommend a pond drain line be constructed to evacuate the storage pond. City drainage criteria requires all ponds to empty in 24 hours. Preliminary calculations indicate that a 6-inch diameter drain line will accomplish this requirement. An inlet structure to prevent clogging will be necessary along with an outlet connection through the face of the curb of Stadium Blvd. Installation of this drain line will provide an additional factor of safety in the operation of the pond insuring that the pond will be empty from the previous day's runoff should a major storm occur.

The estimated construction cost for the spillway and drain line is \$14,000. Appendix 'D' gives the detailed cost breakdown.

V SUMMARY

On July 14, 1990, an extremely intense thunderstorm dropped up to 2.6 inches of rain in the southeast section of Albuquerque. Runoff from this storm overflowed and partially breached an earthen storage pond located between the Albuquerque Tennis Complex and the Albuquerque Sports Stadium. This overflow severely eroded the riprap surfaced bank behind the centerfield portion of the outfield of the Sports Stadium. Runoff water and silt covered the outfield of the Stadium requiring four days of cleanup and drying time to bring the field back to a playing condition.

The Tennis Complex storage pond was surveyed to measure its capacity, and its tributary drainage area was analyzed to determine the runoff potential into the pond. The pond capacity was found to be 102,000 cubic feet; however, the runoff potential from its tributary drainage was calculated to be only 18,600 cubic feet. From this examination it is obvious that additional runoff must have found its way into the pond to fill and overflow it.

Interviews with staff personnel from the Tennis Complex and the UNM Student Family Housing apartments (located immediately north of the Tennis Complex) along with families residing on Buena Vista Drive reveal the source of this additional runoff. Storm runoff exceeded the street carrying capacity of Buena Vista Drive and also the capacity of the storm drain in Buena Vista Drive. Runoff from the street overflowed onto the tennis courts and subsequently filled the storage pond and flooded the Sports Stadium. The overflow from Buena Vista Drive is estimated to be approximately 30 cfs.

Two recommendations are made to prevent future occurrences of this flood. A spillway is recommended for the storage pond to direct pond overflows to Stadium Blvd. and away from the Sports Stadium. A drain should be added to the storage pond to empty the pond into Stadium Blvd. The estimated cost of these two modifications is \$14,000.

APPENDIX 'A' RUNOFF CALCULATIONS

PROJECT: Alb Sports Stadium Analysis Point# @ Storage Fond
DRAINAGE AREA:
Planimeter Rdg. 1985 x .015
x Map Scale 100 2 ÷ 43,560 $A = 6.84$ acres
TIME OF CONCENTRATION:
Drainage Basin Data:
L = <u>530</u> ft., fall = <u>/.8</u> ft., slope = <u>.0034</u> ft/ft
🔀 Overland Flow:
v = -85 ft/sec (P1 22.2 B-1)
Tc = 623 sec. = 10.4 min. $Tc = 10.4$ min.
Street Flow:
v =ft/sec. (P1 22.2 B-2)
Tc = sec. = min. Tc = min.
Arroyo Flow:
$Tc = 0.0078 \frac{L0.77}{S0.385} = \frac{min.}{S0.385}$ min. $Tc = \frac{min.}{S0.385}$
$\sum Tc = min.$
RUNOFF COEFFICIENT: Development C x A* ÷ 100 Cc**
Streets, Drives & Walks $.\overline{95}$ $.\overline{45}$ $.\overline{43}$
Roofs .90 ${}$
Lawns & Landscaping .25. Undeveloped .40 $\overline{54}$ $\overline{.22}$
••• <u>54</u>
= .66 c = .66
RAINFALL INTENSITY:
100 year depth = $\frac{\mathcal{L}.\phi}{\mathcal{L}}$ " (P1. 22.2 D-1)
Intensity Factor = $\frac{2.10}{2.10}$ (P1.22.2 D-2) Intensity = depth x factor I = $\frac{5.46}{hr}$.
inconsity depth x factor
PEAK RUNOFF RATE:
$Q = CIA = 166 \times 5.46 \times 6.84 Q = 24.6 cfs$
$x 0.657 = Q_{10} =cfs$
VOLUME OF RUNOFF:
Soil Group AB C D
CN (Pervious) = 54 (P1 22.2 C-2)
Percent Impervious = 46 % CN (Composite) = 75 (P1 22.2 C-3)
Direct Runoff, $q_{100} = .75$ " (P1 22.2 C-4)
V ₁₀₀ = q A = ,75 x <u>6.84</u> ac x 43,560 = <u>/8,600</u> cu. ft.
12
* Percent of Total Area
** C Value Component
(11/86) * Recorded Value @ Puerts del Sal Sheet Noof
GUIF Course

DETENTION PONDING CALCULATIONS

Pond	E/ev	Arza		Av9	Depth	Volume
#-		Planimeter Edg.	Squere ft.	Arez (s.f.)	(f)	(cu. 44.)
	36,5	15	562			
	* * .x .			6015	,5	3,008
	37.0	305	11,438			
			,	13,688	.5	6,844
	37.5	425	15,938			
				18,863	,5	9.432
	38.0	58/	21,788			
				25,856	,5	12,928
	38.5	798	29,925			
	<u></u>			35,175	15	17.587
	39.0	1078	40,425	j !	-	
				46,650	,5	23,325
	39.5	1410	52,875			
				57,843	,5	28,922
	40.0	1675	62,812			
		1	1	!	ume =	102,046

Isaacson & Arfman, P.A.

SUBJECT Albuquerque Sports Spaism JOB NO.____
BY 70/ DATE 8/24/90 SHEET NO.___OF___

SIZE PROPOSED SPILLWAY:

Calculated Fond Inflow from Natural Drainage Basin
= 18,600 cubic feet (See Appendix A')
Flow Volume from Byen= Vista Overflow
= 102,046 - 18,600 = 85,646 cu ft.

Assume Overflow occurred during a
45 minute duration & compute flow rate
85,646 - 45-60 = 31.7 cfs

Use a 10' wide Spillway of computer Depth of Flow for 32 cfs

Q= 3.09 41.5 L

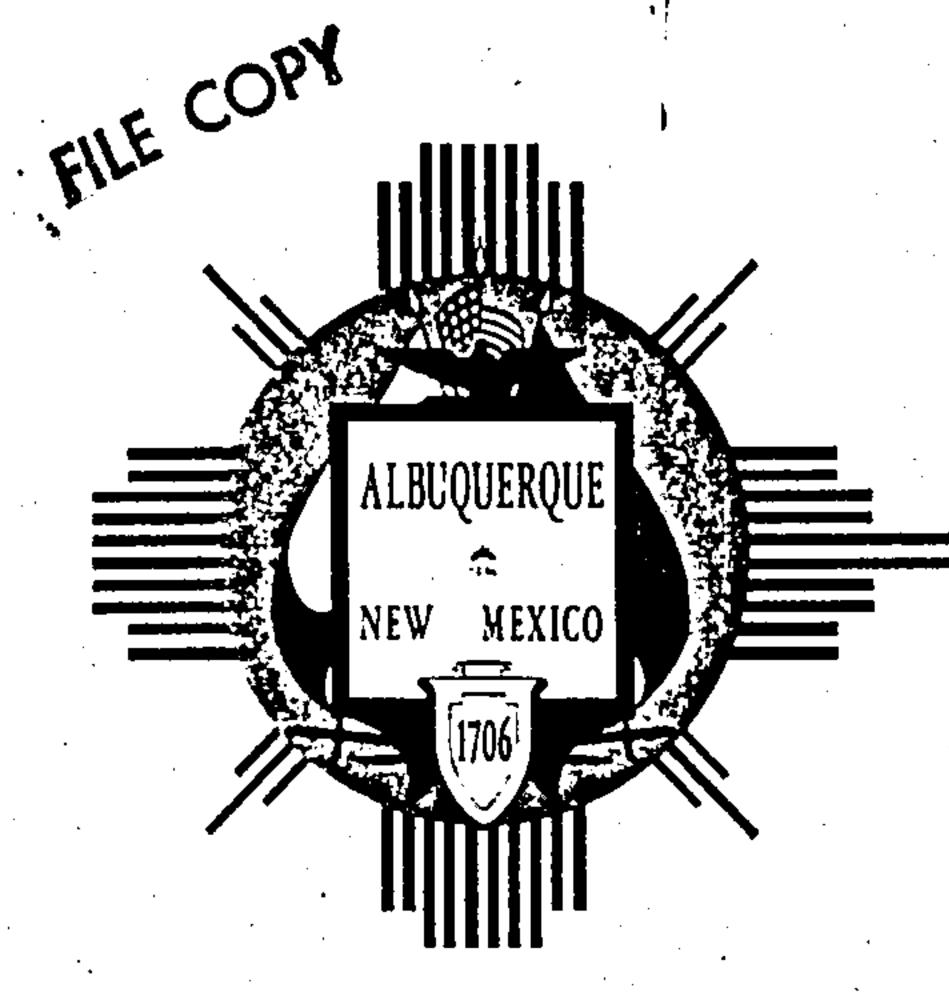
Tri2/ H (2)

0.5' 11 0.75' 20.1 1.0 30.9

APPENDIX 'D'

COST ESTIMATE

1. Repair & Compact Breached Pond Embankment	\$ 2,000
2. Prepare Subgrade for Spillway	500
3. Reinforced Spillway Concrete, 13 cy @ \$400 =	5,200
4. 6" Drain Line, 300' @ \$10.50 =	3,150
5. Curb Face Bore	150
6. Drain Line Inlet Structure	1,000
	\$12,000
+ 15% Contingencies	1,800
	\$13,800
Rounded Estimate	\$14,000
$\frac{1}{2}$	



P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 29, 1991

Tom Issacson, P.E.
Issacson & Arfman, P.A.
128 Monroe Street, NE
Albuquerque, New Mexico 87108

RE: DRAINAGE PLAN FOR ALBUQUERQUE SPORTS STADIUM DRAINAGE POND MODIFICATION, (L-15/D13), ENGINEER'S STAMP DATED JANUARY 17, 1991

Dear Mr. Issacson:

Based on the information provided on the referenced submittal received January 17, 1991, the plan is approved for work order.

If you should have any question, please do not hesitate to call me at 768-2650.

Gilbert Aldaz, P.E. & P.S.

Civil Engineer/Hydrology

xc: Roger Green, DRC Chairman
Sandy Zuschlag, City Parks & Recreation

GA (WP+2356)

PUBLIC WORKS DEPARTMENT



P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

JANUARY 17, 1991

December 11, 1990

Tom Issacson, P.E.
Issacson & Arfman, PA
128 Monroe Street, NE
Albuquerque, New Mexico 87108

RE: DRAINAGE PLAN FOR ALBUQUERQUE SPORTS STADIUM DRAINAGE POND MODIFICATION, RECEIVED DECEMBER 5, 1990 FOR APPROVAL (L-15/D13)

Dear Mr. Issacson:

The Hydrology Development Section would like to state for the record that the proposed pond modification is a real benefit for reducing possible future flood damages to the Albuquerque Sports Complex. However, Hydrology Development Section feels that the design should go one step further in order to prevent possible flood damages to Stadium Boulevard, and therefore has the following concerns which should be addressed prior to approval by this office.

1. Flows that would overtop the spillway would be highly erosive due to the steep slope from the spillway to Stadium Boulevard. Flows leaving the spillway are proposed to sheetflow and are not confined to a permanent improvement. We feel that the design would cause severe sediment erosion into Stadium Boulevard and possible damages to street infrastructure. Hydrology recommends that you look at some type of permanent spillway conveyance from the spillway to Stadium Boulevard.

The proposed 4" drain line would probably become clogged during the first rainstorm and would also create a real maintenance problem. Hydrology recommends that an 18" minimum drainline be used, and if transitioning into the existing curb and gutter is a problem, then a sidewalk culvert transition should be utilized.

3. You might want to consider a perforated CMP with a beehive trash rack for the proposed orifice control outlet. The holes on the CMP could be sized to control the discharge rate. The CMP and beehive grate may be less costly than the proposed trash rack.

PUBLIC WORKS DEPARTMENT

Walter H. Nickerson, Jr., P.E. Assistant Director Public Works

ENGINEERING GROUP

Telephone (505) 768-2500

AN EQUAL OPPORTUNITY EMPLOYER

Tom Issacson, P.E. December 11, 1990 Page

What Is

Based on a field visit, it appears earthwork is being performed in a non-structural manner on the berm that failed during the summer storm of 1990. I would strongly recommend that you consider providing engineering and specification requirements on this plan, as defined on the D.P.M. requirements for construction of levees and berms. The contractor should follow your requirements to assure that the pond will not fail at the same location during the next big storm.

Could you also include a drainage basin boundary map on your next submittal. If you should have any questions, please do not hesitate to call me at 768-2650.

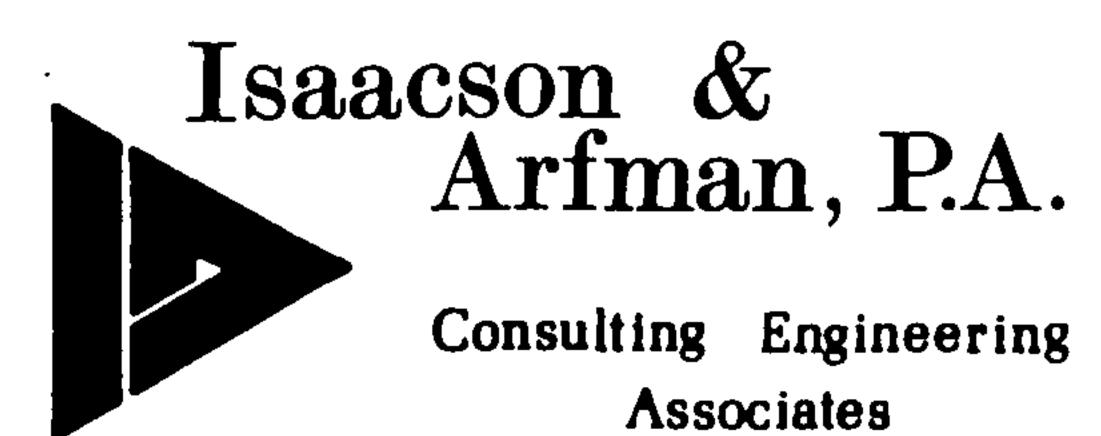
Cordially.

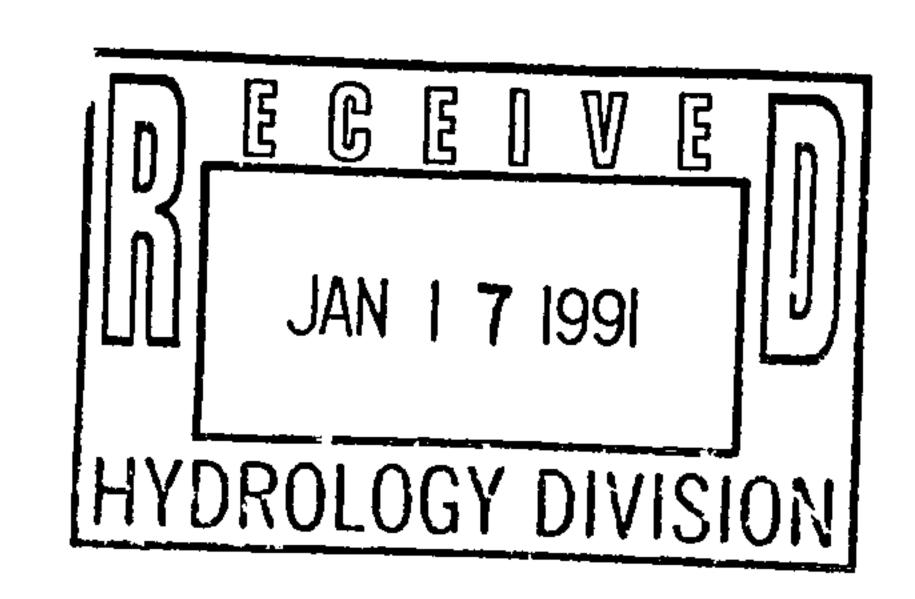
GHIbert Aldaz, P.E. & P. Civil Engineer/Hydrology

xc: Roger Green, DRC Chairman Sandy Zuschlag, City Parks & Recreation

wn+2356

DRAINAGE INFO	RMATICI, 3
PROJECT TITLE: Disinger Pond ZON	E ATLAS/DRAINAGE FILE # 2-15 DIB
LEGAL DESCRIPTION: Tract CA, Albuque	
CITY ADDRESS: 1903 Stadium 7	3 Ivd SE
ENGINEERING FIRM: Isaacson & Arfman	PA CONTACT: Jon Isaceson
ADDRESS: 128 Nonroe 75	87/08 PHONE: 368-8828
OWNER: City of Albusium in Porks of A	Derietin Upt CONTACT: Sandy Zuschie
ADDRESS:	PHONE: 857-8640
ARCHITECT:	CONTACT:
ADDRESS:	PHONE:
SURVEYOR: ISOSSM & Arman PA	CONTACT:
ADDRESS: Same	PHONE:
CONTRACTOR: City of Alboannail Parks	* Kerrusia CONTACT:
ADDRESS:	PHONE:
PRE-DESIGN MEETING:	
YES	DRB.NO.
10	EPC NO.
COPY OF CONFERENCE RECAP SHEET PROVIDED	PROJECT NO.
TYPE OF SUBMITTAL:	CHECK TYPE OF APPROVAL SOUGHT:
DRAINAGE REPORT	SECTOR PLAN APPROVAL
DRAINAGE PLAN	SKETCH PLAT APPROVAL
CONCEPTUAL GRADING & DRAIN PLAN	PRELIMINARY PLAT APPROVAL
GRADING PLAN	SITE DEVELOPMENT PLAN APPROVAL .
EROSION CONTROL PLAN	FINAL PLAT APPROVAL
ENGINEER'S CERTIFICATION	BUILDING PERMIT APPROVAL
IN B B I W B	FOUNDATION PERMIT APPROVAL
	CERTIFICATE OF OCCUPANCY APPROVAL
JAN 17 1991	ROUGH GRADING PERMIT APPROVAL
DATE SUBMITTED: 1/5/99/10/10/10/10/10/10/10/10/10/10/10/10/10/	GRADING/PAVING PERMIT APPROVAL
REV. 6/85	OTHER(SPECIFY)



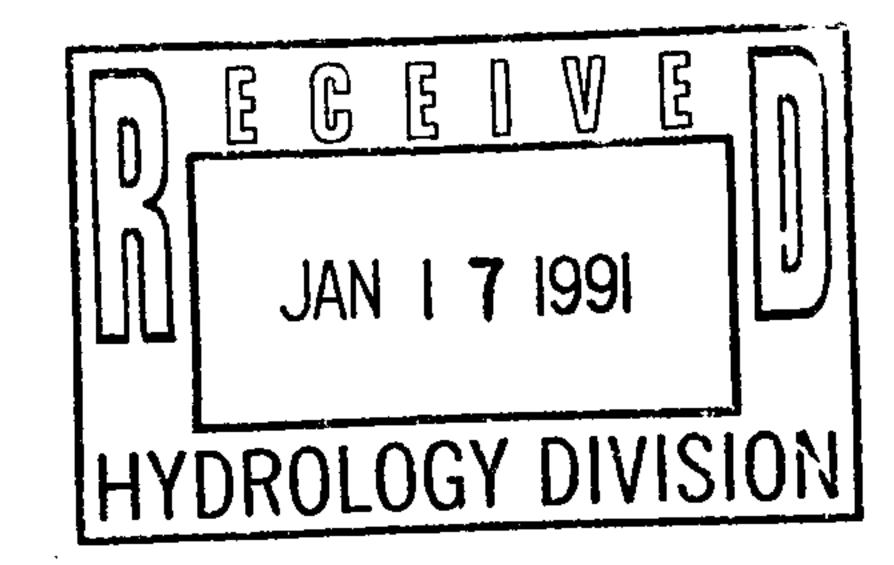


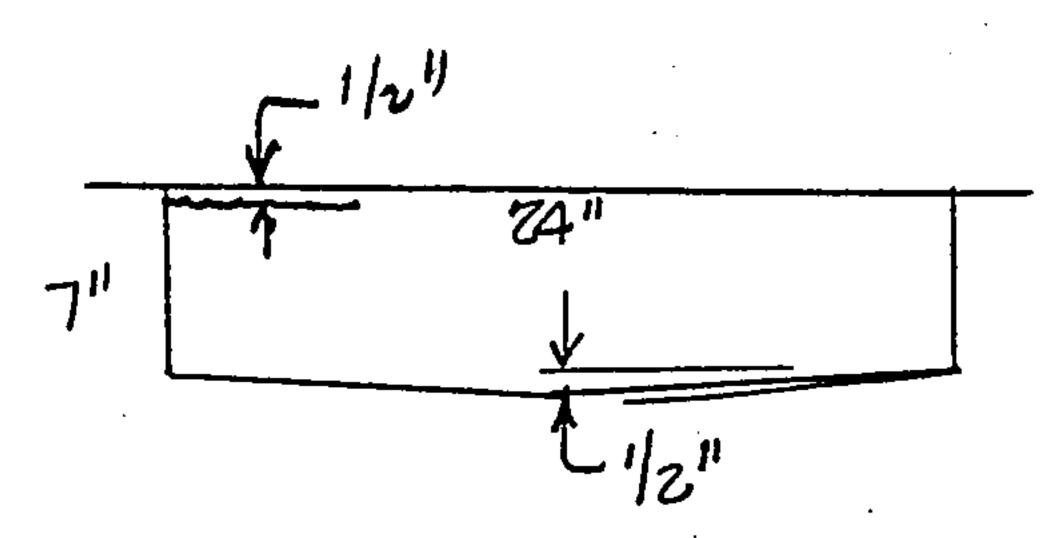
Letter of Transmittal

To Eydology Division	
PND	Job No
Pity of Albuguerque	
Attn: Gilbert Aldaz	
Reference Alb. Sports Stadium Dr=	inse Fond Modifiation
Gentlemen:	
We transmit to youcopy(ies) (of the following
Plats	Shop Drawings
Vised Plans	Submittals
Specifications	Material Specifications
Report,	Copy of Letter
Desing Information Sheet	
Delcalatione	• • • • • • • • • • • • • • • • • • •
This information is transmitted:	
As per your request For your review & approval	For your files
	For your use
For your information	Please review & return
For your attention	For return to your files
For your signature	Please advise
	·
	·
Remarks:	
	
By: Im facient Co	niae Ta
	pies To

128 Monroe, NE • Albuquerque, NM 87108 • (505) 268 - 8828

CALC SIDEWALK CULVERT CAPACITY:





$$A = 16\frac{1}{2} + 7$$
; $\times 12$ 2 Sider = 162. # $\frac{1}{7} + 144 = 1.13$ #

Netted Perimeter = 6.5+6.5 +12+12 = 37", -12 = 3.08'
R= A/NP = 1.13/3.08=.0.37

n= ,0/3

5 = .02

$$= \frac{1.486}{.013} \cdot 0.37^{2/3} / .13 (.02)^{1/2}$$

need 3 ea Culvert, Q = 3 x 9.0 = 2B.Z cfs, OK

Isaacson & Arfman, P.A.



P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

PROJECT REVIEW COMMITTEE MEETING

| JAN | 4 | 199| | 1:30 | P.M. | HYDROLOGY DIVISION

PROJECT:

Sports Stadium Drainage Pond

PROJECT NO.: 4036.92

CONSULTANT:

Isaacson & Arfman

ATTENDEES:

Roger Green, DRC Chairman
Gilbert Aldaz, Hydrology
Richard Dourte, Transportation

Greg Olson, Water/Wastewater Diane Scena, Parks & Recreation

Tom Isaacson, Consultant

COMMENTS:

- 1. Marked up plan sets provided by Roger Green, Richard Dourte and Gilbert Aldaz.
- 2. Written comments provided by Greg Olson.

No further DRC meeting required. Bring mylars into master scheduler for signatures after comments are addressed. Return all marked up plan sets.

WP+125128

PUBLIC WORKS DEPARTMENT

Walter H. Nickerson, Jr., P.E. Assistant Director Public Works

ENGINEERING GROUP

Telephone (505) 768-2500

	DRAINAGE INFORMATION	
*	Albuqueque sports Stagium ZONE ATLAS/	DRAINAGE FILE # 2-15/D13
	LEGAL DESCRIPTION: Tract CA, Albuguerque J	
	CITY ADDRESS: 1903 Stadium Blvd S	
	ENGINEERING FIRM: Isoscon & Arfman, PA	CONTACT: Tom Issaes
	ADDRESS: 128 Nonroe 75 8710	9 PHONE: 368-8828
	OWNER: City of Albuquing us Porks of Roeriestin	Best CONTACT: Sandy Zusche
•	ADDRESS:	PHONE: 857-8640
•	ARCHITECT:	CONTACT:
•	ADDRESS:	PHONE:
	SURVEYOR: Isacson & Arfman PA	CONTACT:
	ADDRESS: Same	PHONE:
	CONTRACTOR: City of Alboquingue Parks & Rieru	fine Light CONTACT:
	ADDRESS:	PHONE:
· · · · · · · · · · · · · · · · · · ·	PRE-DESIGN MEETING: [] [] [] [] [] [] [] [] [] [
	YES	NO
		NO.
•	COPY OF CONFERENCE PROJUED PROJUED	ECT NO
•	TYPE OF SUBMITTAL: CHECK TYP	E OF APPROVAL SOUGHT:
	DRAINAGE REPORTSECT	OR PLAN APPROVAL
	X DRAINAGE PLANSKET	CH PLAT APPROVAL
	CONCEPTUAL GRADING & DRAIN PLAN PREL	IMINARY PLAT APPROVAL
. •	GRADING PLANSITE	DEVELOPMENT PLAN APPROVAL .
	EROSION CONTROL PLAN FINA	L PLAT APPROVAL
	ENGINEER'S CERTIFICATION BUIL	DING PERMIT APPROVAL
•	FOUNI FOUNI	DATION PERMIT APPROVAL
į		IFICATE OF OCCUPANCY APPROVAL
	JAN 8 1991 ROUG	H GRADING PERMIT APPROVAL
	DATE SUBMITTED: //S/99 DROLOGY DIVISION GRAD	ING/PAVING PERMIT APPROVAL
	BY MELLEUM OTHER	R(SPECIFY)

REV. 6/85

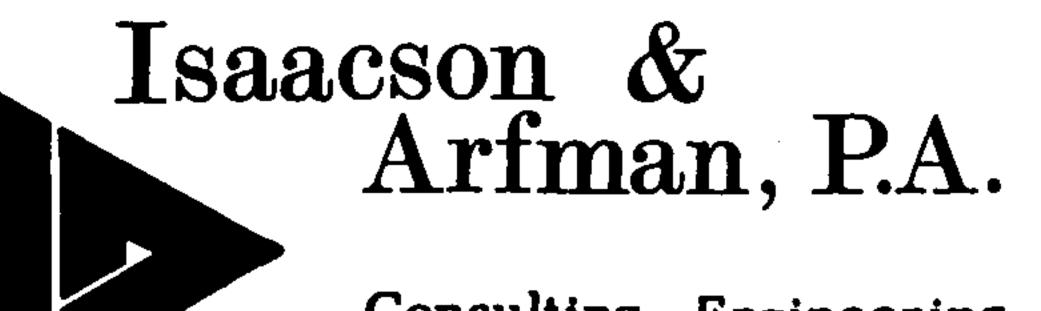
FIGURE 6

CITY OF ALBUQUERQUE NOTICE OF D.R.C. MEETING

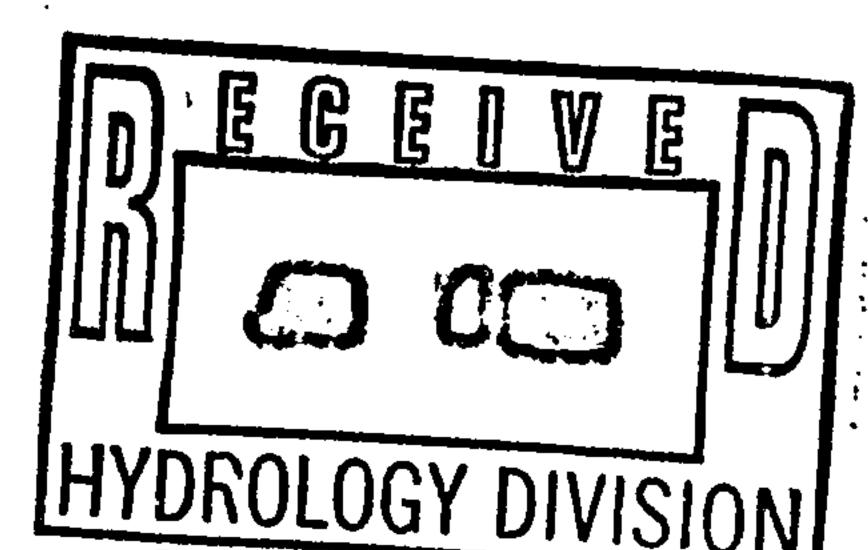
/-4-91 (DATE)

PROJECT NO: 4036.92

PR	ROJECT NAME:	ALBQ. Sf	DRIS STADIUM -	DRAINAGE MODIFIC
TY	PE OF PROJECT	: CIP XX	PWC SAD	PRIVATE
	Contact Per	rson: Jom. Firm: JSSAC	ISSACSON SON + ARFMAN	Phone: 268-8828
Schedu	led with the I	DRC on /-	//-9/ at /:30 in	On-6 D 2007
o the	3rd Floor of	the old City	Hall Building.	Cont. Room 302
	oject Is Sched			•
	/ Design Repor / Pre-Design N / Preliminary	Meeting	// Final Plan Review // Signoff of Plans	(Mylars Required)
The Pr	oject Relates	To:		· .
			/ Paving > Storm	Drainage / /
The At	tached Package	Includes:		
/D	/ Drawings /	//Spec's	//Estimate //Re	port /// Memo Only
respons	nts and are in siblity to not led meetings o	nvited to attributed to attribute consultion all CIP pro	tend. It will be the ing engineering firms ojects.	he Project Managers of date and time of
/D/ Ros	ger Green		Project Review	A11
	chard Dourte		Transportation Dev.	· · · · · · · ·
/D/ Gre	eg Olson		Utility Design	A11
7	dro Repres.		Hydrology	All
	ian Speicher		Construction	A11
	11 Coleman	· ·	Traffic Operations	A11
	Chavez		Street Maint.	A11
	rgio Miranda		Water -Shutoff Plan	
	ane Scena		Parks & Rec.	Memos
_	ert McArthur	•	Transit Dept.	CIP/Memos
	Luehring		Utility Coordinator	PWC & CIP
	k Roybal		Construction Coordi	nator CIP/DWGS.
/ / Jin			Line Maintenance	CIP/SAS
	Dellalonga Lunsford		City Architect	ARCHITECTURAL
			SAD Engineer	SAD
	tt Locke ly Goolsby	1	Transportation Dev.	
	e Frey		Utility Design	
	nn Coontz		Project Coordinator	•
	en Jackson	• ·	General Services Der	
	thia Bruce		PWD/City Attorney	SPECIFICATIONS
	Manager		Planning Department CIP	
/ /			~~~~	CIP/Memos



Consulting Engineering Associates



Letter of Transmittal

rence //s	sinoge ford Moditi	i anims	- Albojungue Sport
	ou copy		
	Plats		Shop Drawings
<u>X</u>	Plans		Submittals
Specifi	cations		Material Specifications
	Report		Copy of Letter
	in Calculation		,
information	is transmitted:		
As per	your request		For your files
	ır review & approval		For your use
For you	ır information		Please review & return
For you	ır attention		For return to your files
For you	ır signature		Please advise
ırks:			

128 Monroe, NE • Albuquerque, NM 87108 • (505) 268 - 8828

INLET CAPACITY

Compute for Weir Flow (low head on inlet)
Therp Edge Weir Formub:

 $Q = KLH^{3/2}$ L = TTD = TT 1.5 = 4.71'reduce for grates

12 en e 1" = 12" = 1'

Obtain K from Table 37, p89, Handbook
of Hydraulics

 $\beta r H = 1^{T}, p = 1.25'$ L = 3.5

 $Q = 3.5 \times 3.7/ \times 1^{3/2} = 13 \text{ cfs}$

Elev	4	9
36.75		13.0
39.0	1.25	18.2
39.2	1.45	22.7

DEAINAGE HOLE CAPACITY

 $A_{6''+blo} = \pi \left(\frac{3}{12}\right)^2 = 0.2 \, \text{4}$ Use Orifice formula for discharge, 4 hobs

Elev H Q = CA V2gh

38.75 = 2.0' 5.5

39.0 2.25 5.8

Isaacson & Arfman, P.A.

SUBJECT Alb. Sport Stadium JOB NO._
BY 701 DATE 1/3/91 SHEET NO. OF_

EMERGENCY SPILLWAY DISCHARGE

 $A = 3.09 L + \frac{4}{2}$ Use L = 14' $0.2 \qquad 3.9$

39.2 0.2 3.9 40.0 43

COMBINED DISCHARGE

Ebu

E60	INLET	DEAINAGES	EMBRABACY SPILLWAY	TOTAL
38.75	13.0	5.5		18.5
39.0	18.2	5.8	•	z4.0
39.2	ZZ, 7	6.0	3.9	32.6
•				

32 cts dosign flows

Isaacson & Arfman, P.A.



P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

December 11, 1990

Tom Issacson, P.E.
Issacson & Arfman, PA
128 Monroe Street, NE
Albuquerque, New Mexico 87108

RE: DRAINAGE PLAN FOR ALBUQUERQUE SPORTS STADIUM DRAINAGE POND MODIFICATION, RECEIVED DECEMBER 5, 1990 FOR APPROVAL (L-15/D13)

Dear Mr. Issacson:

The Hydrology Development Section would like to state for the record that the proposed pond modification is a real benefit for reducing possible future flood damages to the Albuquerque Sports Complex. However, Hydrology Development Section feels that the design should go one step further in order to prevent possible flood damages to Stadium Boulevard, and therefore has the following concerns which should be addressed prior to approval by this office.

- 1. Flows that would overtop the spillway would be highly erosive due to the steep slope from the spillway to Stadium Boulevard. Flows leaving the spillway are proposed to sheetflow and are not confined to a permanent improvement. We feel that the design would cause severe sediment erosion into Stadium Boulevard and possible damages to street infrastructure. Hydrology recommends that you look at some type of permanent spillway conveyance from the spillway to Stadium Boulevard.
- 2. The proposed 4" drain line would probably become clogged during the first rainstorm and would also create a real maintenance problem. Hydrology recommends that an 18" minimum drainline be used, and if transitioning into the existing curb and gutter is a problem, then a sidewalk culvert transition should be utilized.
- 3. You might want to consider a perforated CMP with a beehive trash rack for the proposed orifice control outlet. The holes on the CMP could be sized to control the discharge rate. The CMP and beehive grate may be less costly than the proposed trash rack.

PUBLIC WORKS DEPARTMENT

Walter H. Nickerson, Jr., P.E. Assistant Director Public Works

ENGINEERING GROUP

Telephone (505) 768-2500

Tom Issacson, P.E. December 11, 1990 Page

4. Based on a field visit, it appears earthwork is being performed in a non-structural manner on the berm that failed during the summer storm of 1990. I would strongly recommend that you consider providing engineering and specification requirements on this plan, as defined on the D.P.M. requirements for construction of levees and berms. The contractor should follow your requirements to assure that the pond will not fail at the same location during the next big storm.

Could you also include a drainage basin boundary map on your next submittal. If you should have any questions, please do not hesitate to call me at 768-2650.

Cordially.

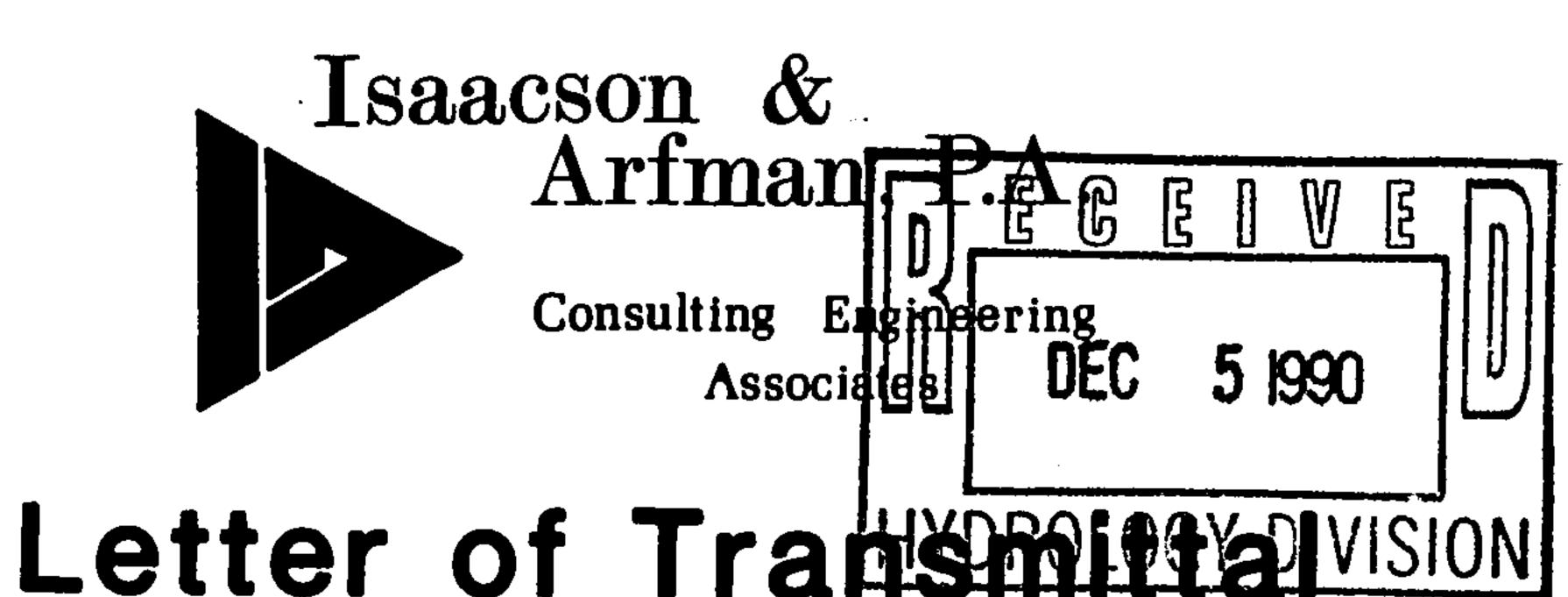
Gilbert Aldaz, P.E. & V.E. Civil Engineer/Hydrology

xc: Roger Green, DRC Chairman Sandy Zuschlag, City Parks & Recreation

wp + 2356

DRAINAGE IN	VEORMATION SHE
PROJECT TITLE: Drainage Fond	VFORMATION SHE ZONE ATLAS/DRAINAGE FILE #_Z-15/1013
LEGAL DESCRIPTION: Tract CA, Albug	
CITY ADDRESS: 1903 Stadium	Blvd SE
ENGINEERING FIRM: Isaacson & Arfma	m, PA CONTACT: Tom Issacson
ADDRESS: 128 Nonroe 75	87108 PHONE: 368-8828
OWNER: City of Albuquing us Parks of	Recreatin Dest CONTACT: Sandy Zuschte
ADDRESS:	PHONE: 857-8640
ARCHITECT:	CONTACT:
ADDRESS:	PHONE:
SURVEYOR: Isacson & Arfman, PA	CONTACT:
ADDRESS: Same	PHONE:
CONTRACTOR: City of Albaquingue fork	Les & Reeneurin Light CONTACT:
ADDRESS:	PHONE:
PRE-DESIGN MEETING:	
YES	DRB NO
NO NO	EPC NO
COPY OF CONFERENCE RECAP SHEET PROVIDED	PROJECT NO.
TYPE OF SUBMITTAL:	CHECK TYPE OF APPROVAL SOUGHT:
DRAINAGE REPORT	SECTOR PLAN APPROVAL
DRAINAGE PLAN	SKETCH PLAT APPROVAL
CONCEPTUAL GRADING & DRAIN PLAN	PRELIMINARY PLAT APPROVAL
GRADING PLAN	SITE DEVELOPMENT PLAN APPROVAL
EROSION CONTROL PLAN	FINAL PLAT APPROVAL
ENGINEER'S CERTIFICATION	BUILDING PERMIT APPROVAL
	FOUNDATION PERMIT APPROVAL
TEGENE	CERTIFICATE OF OCCUPANCY APPROVAL
DEC 5 1990	ROUGH GRADING PERMIT APPROVAL
DATE SUBMITTED: 115/90	GRADING/PAVING PERMIT APPROVAL
REV. 6/85	OTHER(SPECIFY)
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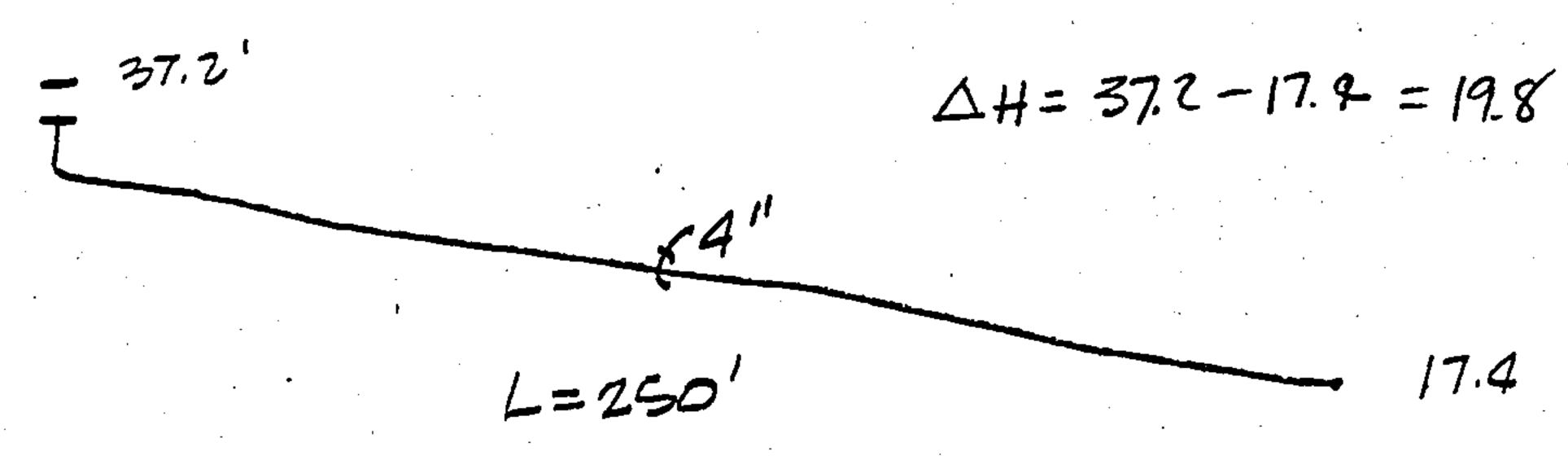


Attn: Albuquerque Sport Stadium Drainge And Modification Gentlemen: We transmit to you _____copy(ies) of the following Shop Drawings Plats Submittals Plans Specifications Material Specifications Copy of Letter Report (matrice Am Information Shut This information is transmitted: For your files As per your request For your use For your review & approval For your information Please review & return For your attention For return to your files For your signature Please advise Remarks: per our telephone convention. Copies To_____

128 Monroe, NE • Albuquerque, NM 87108 • (505) 268 - 8828

FINAL DESIGN. DRAW LINE VIZING III DEC 5 1990

Steep Stope, Outlet Control. Tristy DROLOGY DIVISIC Estation for discharge. Assume l'water depth in bosin & solve for discharge



Triz/ a (apm)	(Aps)	L.	Migor	Berry/ Loss	Z
100	Z-55	/	. 2_	1.65	1.55
200	5.11	. 9-	. B	5.9	6.7
250	6.38	.63	1.3	9.0	10.3
30	7,64	,91	1.8	12.6	14.4
350	8.9	1.24	25	16.7	19.2

drain line will grovide a high expecity. Circle evecution times

Isaacson & Arfman, P.A.

TIME TO DRAIN:

Assume Runoff from Natural Drainage Basin only, V = 18,600 c4.ff.

Assume amstert drain line discharge rate of 350 gpm.

Gout = 350/449 = .78 cfs T = 18,600/.78 = 23,840 seemsh -60 = 397 minute -60 = 6.6 hrs , OK

CALC TIME TO EVACUATE Full RESERVOIR:

V= 41,000/.78 ×60×60 = 14.6 hrs, OK

SPILLWAY CALCE!