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

November 4, 1999

Kevin Patton, P.E.
Bohannan Huston
7500 Jefferson St. NE
Albuquerque, New Mexico 87111

14C

RE: Drainage Reports and Grading and Drainage Plans for The Oxbow Park and Oxbow Village Subdivision (G11/D14B), Submitted for Preliminary and Final Plat Approval and Grading Permit Release, Reports Dated 10/1/99 and Engineer's Stamp Dated 11/2/99 on the Plans.

Dear Mr. Patton:

Based on the information provided, the above referenced reports, and Grading and Drainage Plans dated November 2, 1999, are approved for Site Development Plan and Preliminary Plat approval by the DRB.

The above referenced plans are also approved for Rough Grading provided that they are approved at the DRB. A separate top-soil disturbance permit must be obtained prior to grading on this site.

Prior to Final Plat sign-off, the Subdivision Improvements Agreement (SIA) must be in place. The Grading and Drainage certification is required prior to release of the SIA for these subdivisions.

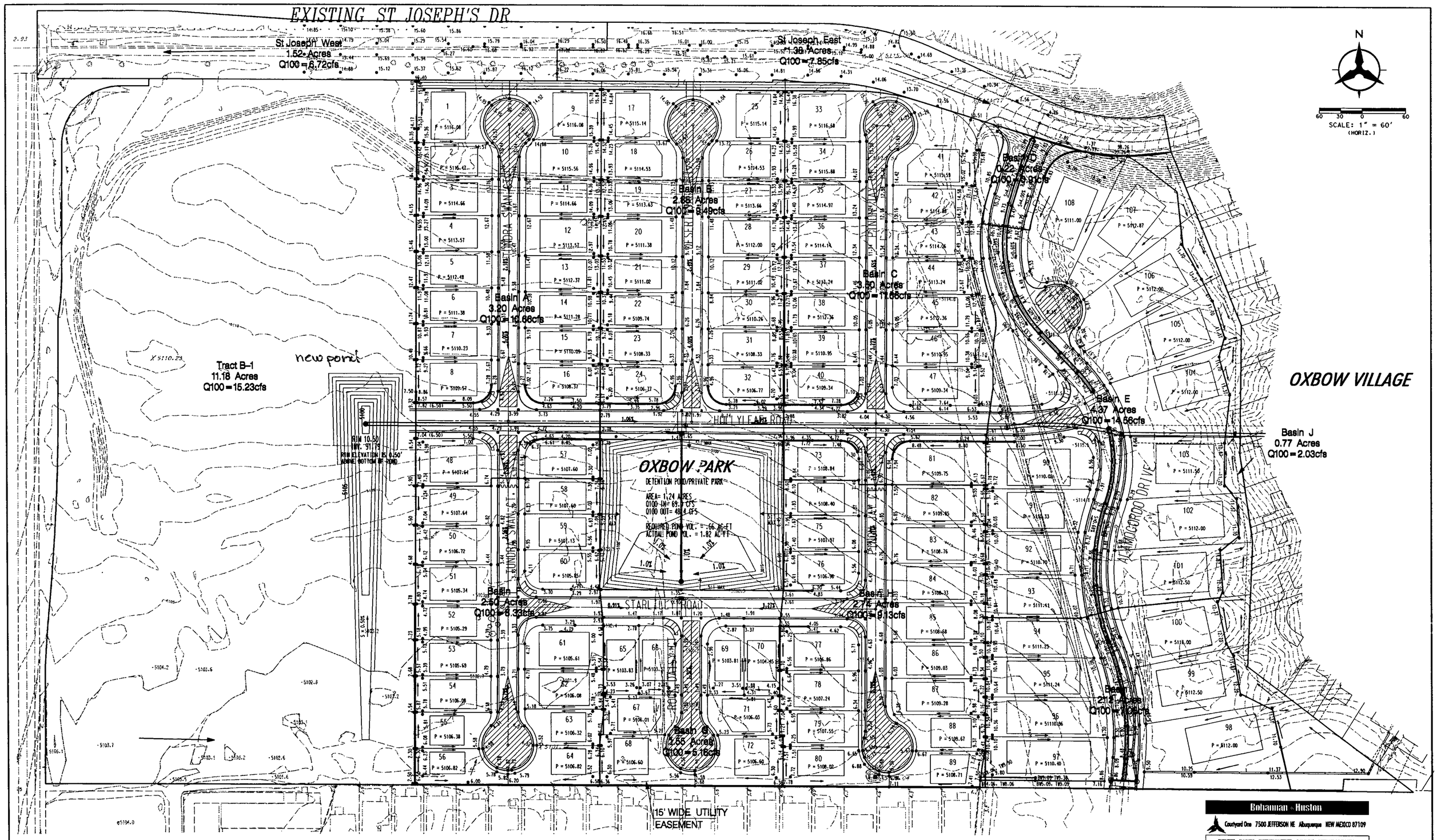
If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Whitney Reierson, City Hydrology
Tom Keleher, Altura West Development
File



Bohannan ≈ Huston

Courtyard One 7500 JEFFERSON NE Albuquerque NEW MEXICO 87109

ENGINEERS PLANNERS PHOTOGRAMMETRISTS SURVEYORS SOFTWARE DEVELOPERS

OXBOW PARK SUBDIVISION BASIN MAP

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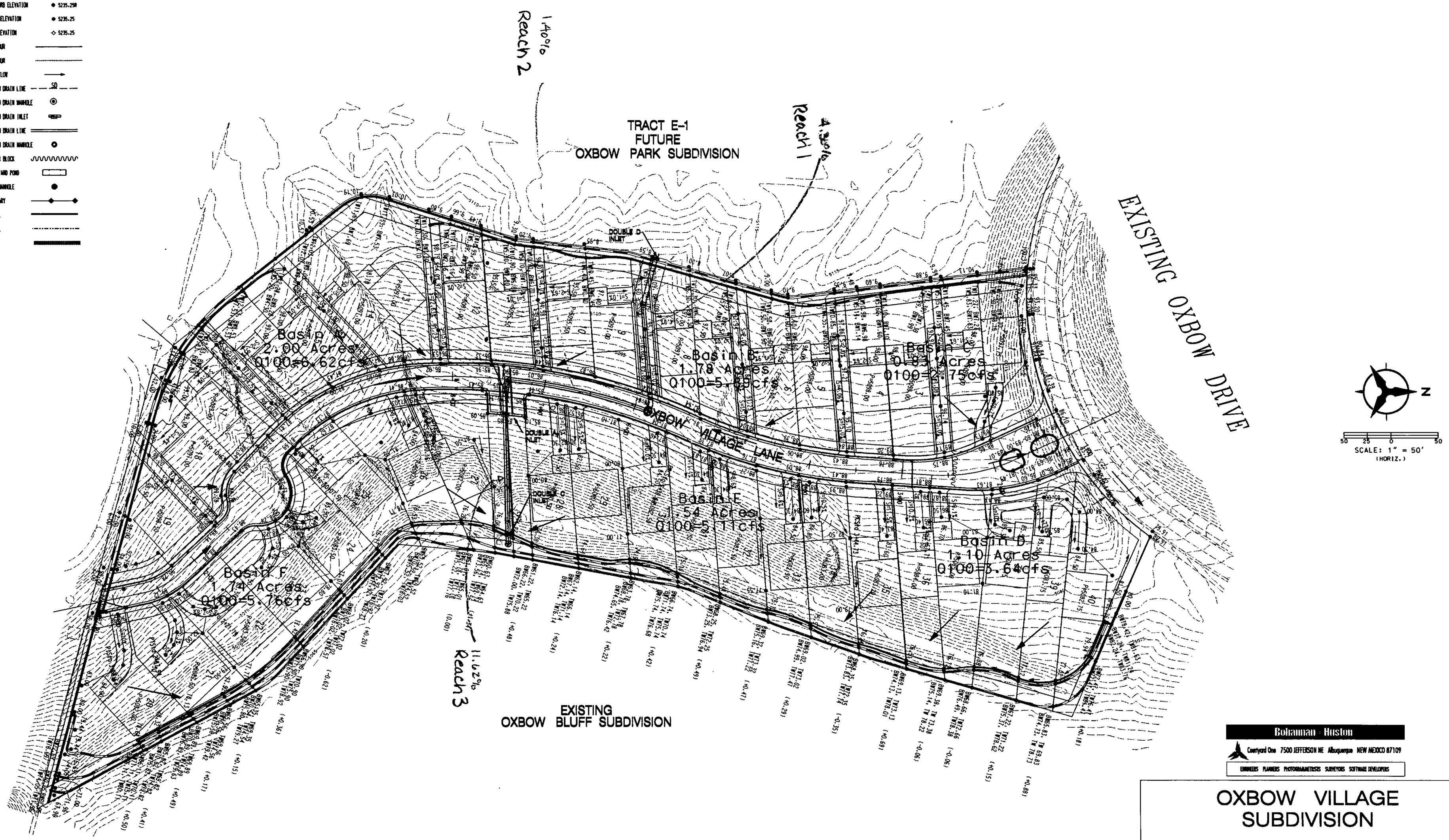
DATE: JUNE 1999

LEGEND

PROPOSED SPOT ELEVATION	● 5235.25
TOP OF ROLL CURB ELEVATION	● 5235.25R
EXISTING SPOT ELEVATION	● 5235.25
FUTURE SPOT ELEVATION	◇ 5235.25
PROPOSED CONTOUR	
EXISTING CONTOUR	
DIRECTION OF FLOW	
EXISTING STORM DRAIN LINE	SD
EXISTING STORM DRAIN MANHOLE	
PROPOSED STORM DRAIN INLET	
PROPOSED STORM DRAIN LINE	
PROPOSED STORM DRAIN MANHOLE	
PROPOSED WATER BLOCK	
PROPOSED BACKYARD POND	
EXISTING SAS MANHOLE	
PHASING BOUNDARY	
RETAINING WALL	
RIBBON CHANNEL	
SIDEWALK	



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OXBOW VILLAGE SUBDIVISION

BASIN MAP

E.P.C. CASE NO.	ZONE MAP NO.	SHEET OF

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DATE: JUNE 1999.

P:\00194\CDR\CEMERA\00194DR.DGN

EXISTING ST JOSEPH'S DR

St Joseph West
1.52 Acres
Q100 = 8.72cfs

St Joseph East
1.38 Acres
Q100 = 7.85cfs

N

SCALE: 1" = 60'
(HORIZ.)

Basin D
0.22 Acres
Q100 = 0.91cfs

Basin B
2.65 Acres
Q100 = 9.49cfs

Basin C
4.50 Acres
Q100 = 11.66cfs

Basin A
3.20 Acres
Q100 = 10.66cfs

Tract B-1
11.18 Acres
Q100 = 15.23cfs

.5%
Reach 1

OXBOW VILLAGE

Reach 4

Basin E
4.37 Acres
Q100 = 14.56cfs

Basin J
0.77 Acres
Q100 = 2.03cfs

HOLLY LEAF ROAD

OXBOW PARK
DETENTION POND/PRIVATE PARK
AREA= 1.24 ACRES
Q100 IN= 69.7 CFS
Q100 OUT= 48.4 CFS
REQUIRED POND VOL. = .65 AC-FT
ACTUAL POND VOL. = 1.82 AC-FT

Reach 3

Basin H
2.74 Acres
Q100 = 9.13cfs

Basin F
2.50 Acres
Q100 = 8.33cfs

Basin G
2.55 Acres
Q100 = 8.18cfs

Basin I
2.12 Acres
Q100 = 7.06cfs

STARLITE ROAD

15' WIDE UTILITY
EASEMENT

PARK RIDGE SUBDIVISION

Bohannan ▲ Huston
Courtyard One 7500 JEFFERSON NE Albuquerque NEW MEXICO 87109
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OXBOW PARK
SUBDIVISION
BASIN MAP

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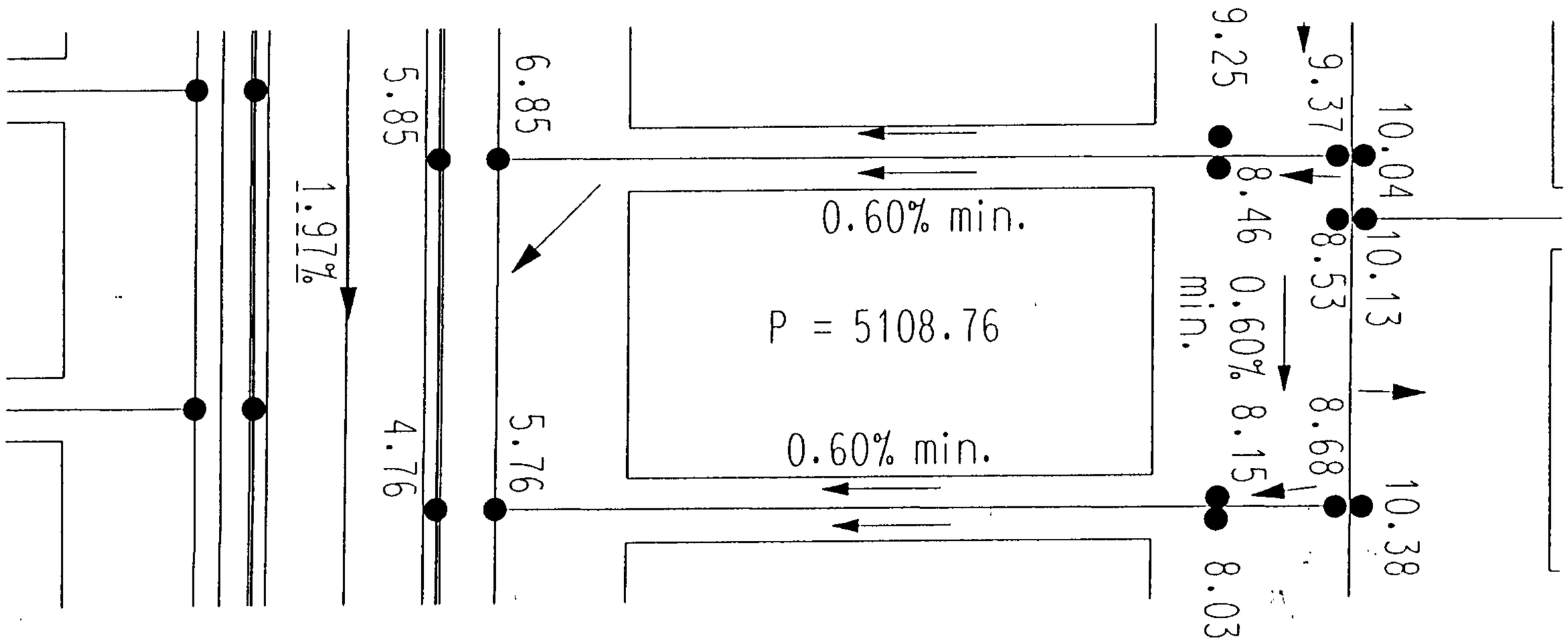
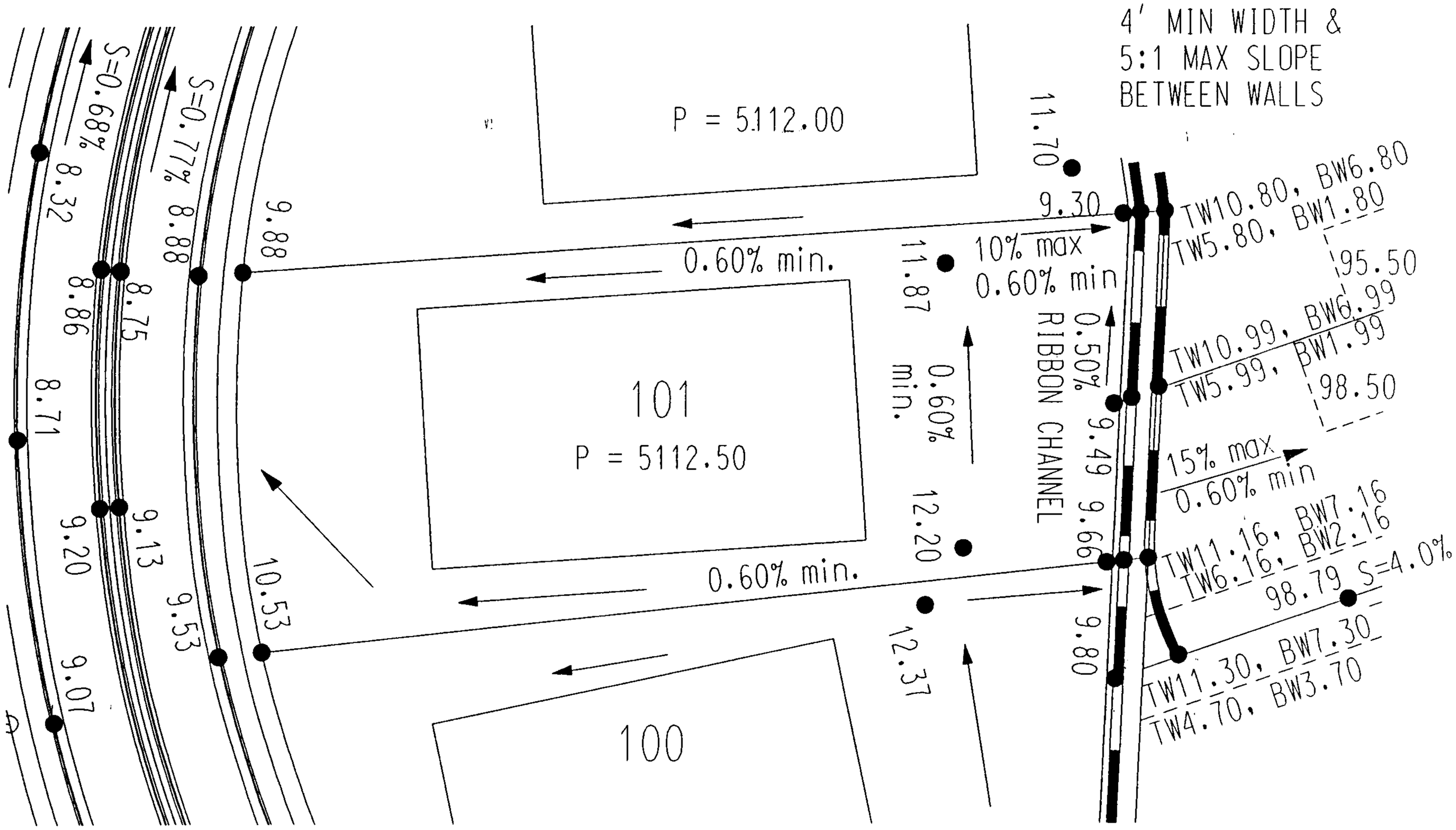
DATE: JUNE 1999

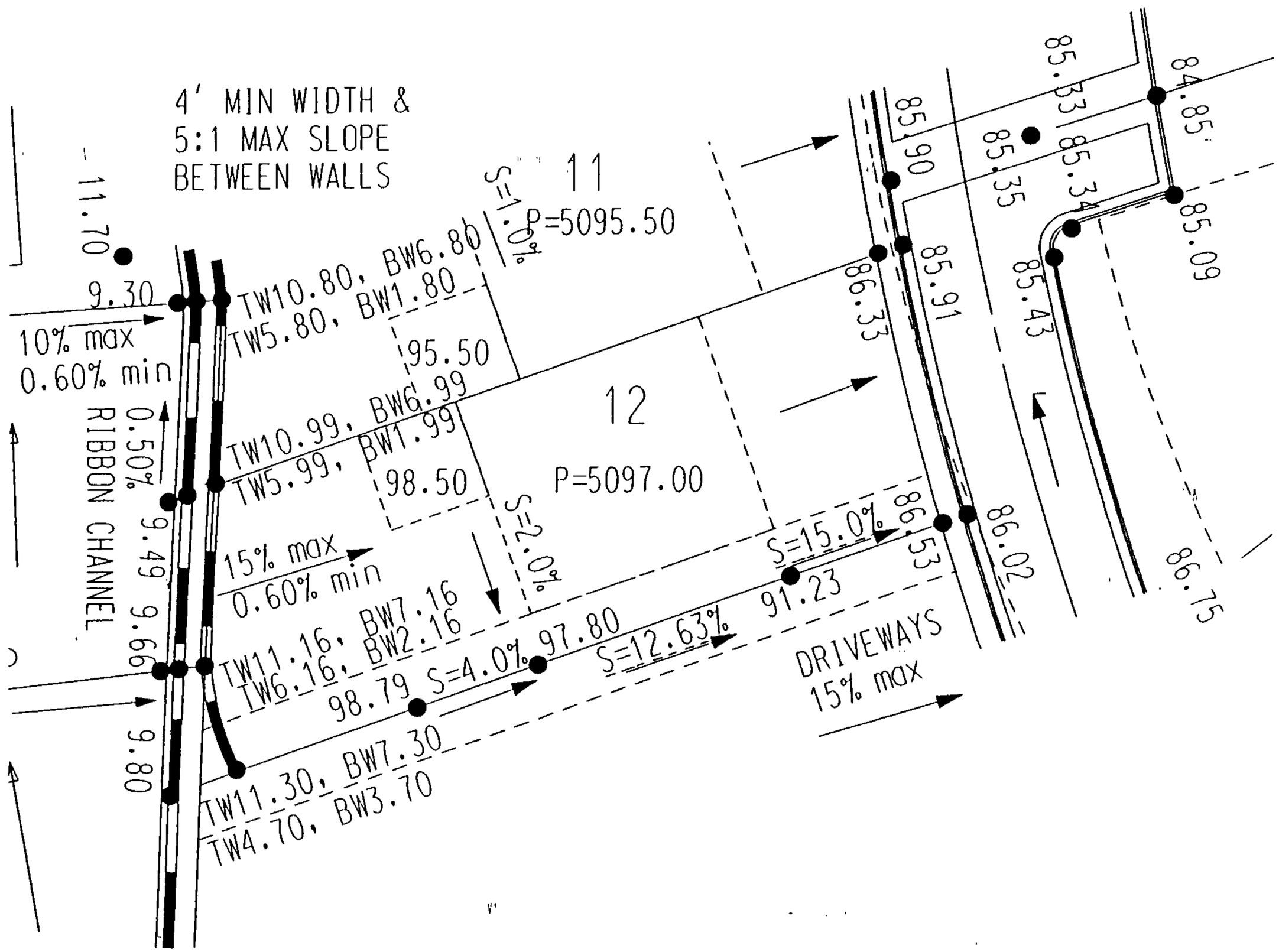
TYPICAL LOT
(OXBOW PARK)



TYPICAL LOT DOWNHILL SIDE
(OXBOW PARK)



TYPICAL LOT UPHILL SIDE
(OXBOW VILLAGE)



SUMMARY OF THE ROADWAY CAPACITY ANALYSIS FOR OXBOW PARK SUBDIVISION - TRACT B

Tundra Swan Court - Drainage Basins A & F

Max Q (cfs)=10.66

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
2.18	6.40	0.28	2.88	0.13	0.41	1.00	OK
4.00	10.66	0.30	4.13	0.26	0.56	1.00	OK
2.56	3.33	0.23	2.63	0.11	0.34	1.00	OK
0.79	4.17	0.29	1.77	0.05	0.34	1.00	OK

NOTE:
There is a 2% cross-slope along this roadway.

Desert Sage Court - Drainage Basins E

Max Q (cfs)=9.49

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
2.49	6.33	0.28	3.02	0.14	0.42	1.00	OK
4.00	9.49	0.29	4.01	0.25	0.54	1.00	OK

NOTE:
There is a 2% cross-slope along this roadway.

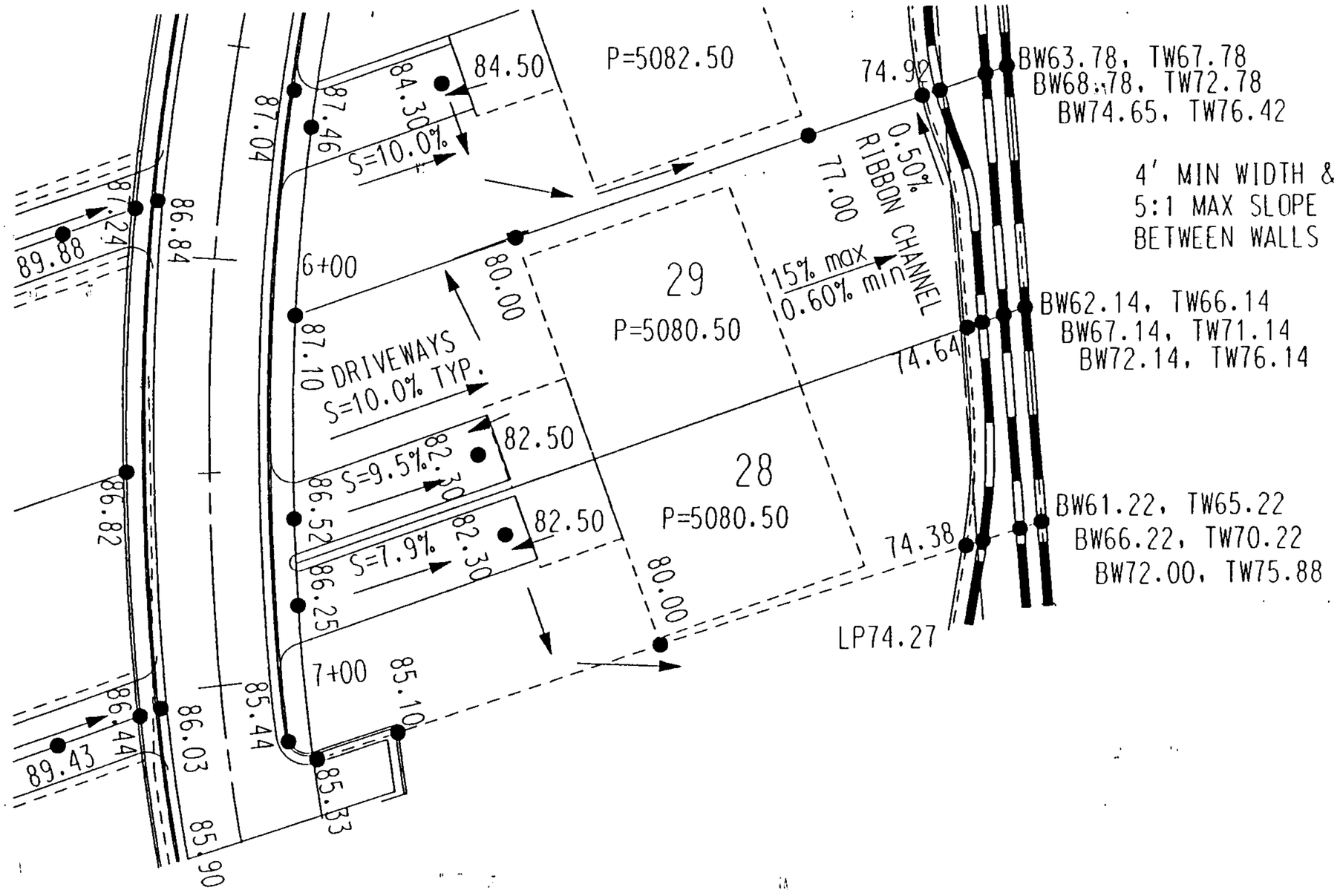
Pinon Jay Court - Drainage Basins C & H

Max Q (cfs)=11.66

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
1.65	5.83	0.29	2.54	0.10	0.39	1.00	OK
3.23	11.66	0.20	2.68	0.11	0.31	1.00	OK
1.97	4.57	0.26	2.57	0.10	0.36	1.00	OK
0.70	4.57	0.30	1.73	0.05	0.35	1.00	OK

NOTE:
There is a 2% cross-slope along this roadway.

TYPICAL LOT DOWN HILLSIDE
(OXBOW VILLAGE)



DRAINAGE INFORMATION SHEET

PROJECT TITLE: OXBOW PARK ZONE ATLAS/DRNG. FILE # G-11 / D014 C

DRB #: _____ EPC #: Z-97-103-1 WORK ORDER #: _____

LEGAL DESCRIPTION: TRACT B AND E OXBOW SUBDIVISION

CITY ADDRESS: COORS BLVD AND ST. JOSEPHS DRIVE

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

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

OWNER: ALTURA WEST DEVELOPMENT CONTACT: TOM KELEHER

ADDRESS: DRAWER AA, ALBUQUERQUE 87103 PHONE: 346-4696

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN
- ___ FINAL GRADING & DRAINAGE PLAN
- X GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION
- ___ OTHER

PRE-DESIGN MEETING:

- X YES
- ___ NO
- ___ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SKETCH PLAT APPROVAL
- X PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUBD. APPROVAL
- ___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- X 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
- ___ SUBDIVISION CERTIFICATION
- ___ OTHER _____ (SPECIFY)

DATE SUBMITTED: 10/1/99

BY: [signature]

Revised 02/98

RECEIVED
OCT 1 1999
HYDROLOGY SECTION

DRAINAGE REPORT FOR OXBOW PARK SUBDIVISION (TRACT B)

G11/D14C

BOHANNAN-HUSTON, INC.

Courtyard One

7500 JEFFERSON NE

Albuquerque

NM 87109-4335

voice 505.823.1000

fax 505.821.0892

OCTOBER 1, 1999

RECEIVED
OCT 1 1999
HYDROLOGY SECTION

PREPARED FOR:

ALTURA WEST LTD
P.O. DRAWER AA
ALBUQUERQUE, NEW MEXICO 87107

40 YEARS

DRAINAGE REPORT
FOR
OXBOW PARK SUBDIVISION
(TRACT B)

OCTOBER 1, 1999

PREPARED BY:

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

PREPARED FOR:

Altura West Ltd.
P.O. DRAWER AA
Albuquerque, NM 87107

PREPARED BY:

Yolanda Padilla 10/1/99

Yolanda Padilla, E.I. **Date**

UNDER THE SUPERVISION OF:

Kevin Patton 10/1/99

Kevin Patton, P.E. **Date**

KEVIN G. PATTON
NEW MEXICO
13685
REGISTERED PROFESSIONAL ENGINEER

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EXHIBIT 2: PRELIMINARY PLAT

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EXHIBIT 6: GRADING AND DRAINAGE PLAN

One

I. PURPOSE

The purpose of this report is to present historic and proposed drainage conditions for the area pertaining to this site, and to obtain work order, preliminary and final plat approvals.

II. METHODOLOGIES

Site conditions will be analyzed for a 10-year and 100-year, 6-hour storm event in accordance with the City of Albuquerque Drainage Ordinance and the Development Process Manual (DPM) Volume 2, Design Criteria, Section 22.2, Hydrology, for the City of Albuquerque, January 1993.

The site, as described in the 'Site Location and Characteristics' section below, is approximately 25.06 acres. Therefore, Part A of the DPM, Section 22.2, which provides a simplified procedure for projects with sub-basins smaller than 40 acres was used.

This report will reference the *Master Drainage Plan for Altura West and Archdiocese of Santa Fe Properties* dated October, 1997 (hereafter referred to as the Master Plan), which was prepared for Altura West LTD. and Archdiocese of Santa Fe and approved by the City of Albuquerque. That report was prepared to support future drainage plans submitted for the development of individual land parcels within Altura West Development, and to provide design guidance for the installation of major drainage infrastructure to be constructed in advance of, or simultaneously with individual parcel development. In addition, it provides fully developed flow rates for basins within the Altura West and Archdiocese of Santa Fe Properties.

This report differs slightly from the Master Plan by sub-dividing Existing Drainage Conditions Basins K into the proposed Oxbow Park Subdivision into Sub-Basins A through I. Please refer to the Proposed Conditions section of this report for more information regarding the relocation of basin boundaries and the new flows developed within Tract B and E-1 and the surrounding basins.

ENGINEERS PLANNERS PHOTOGRAMMETRISTS SURVEYORS SOFTWARE DEVELOPERS

III. SITE LOCATION AND CHARACTERISTICS

Please refer to the proposed Bulk Land Plat enclosed with this report and the A.G.I.S. vicinity map page G-11.

The Site, Oxbow Park Subdivision, Tract B and E-1 Altura West Development, is bounded by Oxbow Village Subdivision to the east, St. Pius High School and St. Joseph's Place to the north, Coors Boulevard to the west, and Park Ridge Subdivision to the south. The 25.06-acre site proposes to be developed into 106 lots of single family dwelling units. The main road, Alamogordo Drive, is oriented north/south along the eastern most portion of the site and will provide access to the subdivision from Coors Boulevard and St. Joseph's Place.

Vegetation on the site consists primarily of Mesa Dropseed, Indian Ricegrass, Blace Gramma and Sand Sagebrush. The soil at the site has been given the SCS soil classification of BKD (Bluepoint-Kokan association, hilly) and MWA (Madurez-wink Association, gently sloping). The BKD soils are in the hydrologic soil Group A, which have the highest rate of rainfall absorption. The MWA soils are in the hydrologic soil Group B, which also absorb more water than typical.

IV. EXISTING HYDRAULIC AND HYDROLOGIC CONDITIONS

The existing drainage basins and patterns are shown graphically on the Existing Drainage Conditions Map (Exhibit 3, which was taken from the Master Drainage Plan) located in the Exhibits section of this report.

The existing site consists of one on-site drainage basin, labeled Basins K. The runoff from the on-site basin is approximately 33.7cfs in the 100-year, 6-hour storm event. The runoff discharges to a natural playa at the south end of this basin. St. Joseph Drive currently drains to the west and into St. Pius Property and into Coors Boulevard. Coors Boulevard then drain to the south as it does currently.

For additional information regarding the existing drainage conditions, please refer to the approved Master Plan (October 1997).

V. PROPOSED HYDRAULIC AND HYDROLOGIC CONDITIONS

Discharge generated by Oxbow Park will flow through internal streets when fully developed. This site will be graded to convey runoff to the center of the subdivision, where it will be collected at the lowpoints of Starlilly Road and Hollyleaf Road by inlets. An orfice plate will be provided so as to control its discharge. During large storms the storm water will back up through a manhole, beehive grate and into the pond.

The detention pond is a 1.24-acre area, which will also serve as a private park for Oxbow Park. This pond is required to hold 0.66 acre-ft of storm water, however our design will hold 1.82 acre-feet of water with a minimum of one-foot freeboard. This detention pond does not require a permanent fence. For Additional assistance throughout this section, please refer to the Grading and Drainage Plan (Exhibit 6) or the Proposed On-site Conditions Map (Exhibit 5) enclosed with the Exhibit section of this report.

A. On-Site Basins

The proposed site is broken into nine (9) basins. Basin A (3.20ac, Q_{100}=10.66cfs) is located in the far northwest of the Oxbow Park Subdivision. Basin A consists of eighteen (18) lots, 1 through 46, 48, and 57. Runoff will flow in Tundra Swan Place into Hollyleaf Road, where it will flow east and be collected by one Type A double grate with wings on both sides and one single Type C at the lowpoint.

Basin B (2.85ac, Q_{100}=9.49cfs) is adjacent and ~~west~~ east of Basin A. Basin B consists of sixteen (16) lots, 17 through 32. Runoff will flow south on Desert Sage Court into Hollyleaf Road, where it will be collected by inlets at the lowpoint.

Basin C (3.50ac, Q_{100}=11.66cfs) is adjacent and ~~west~~ east of Basin B. Basin C consists of seventeen (17) lots, 33 through 47, 73, and 81. Runoff will flow in Pinon Jay Court into Hollyleaf Road, where it will flow west and be collected by inlets at the lowpoint.

Basin D (0.22ac, Q_{100}=0.91cfs) consists of the entrance to Oxbow Park. The runoff generated will flow north on Alamogordo Drive and discharge into St. Joseph's Drive and flow east down Oxbow Drive and be collected by collected by inlets at the intersection of Oxbow Drive and Mourning Dove Place. The runoff will then be conveyed the runoff to the Rio Grande Storm Drain, which was constructed with the Oxbow Bluff Subdivision.

Basin E (4.37ac, Q_{100}=14.56cfs) is located in the far northeastern corner of Oxbow Park. Basin E consists of twelve (12) lots, 90 through 93 and 101 through 108. Runoff will flow in Alamogordo Drive into Hollyleaf Road, where it will flow west and be collected by inlets at the lowpoint.

Basin F (2.50ac, Q_{100}=8.33cfs) is located in the far southwestern corner of Oxbow Park. Basin F consists of fifteen (15) lots, 49 through 56 and 58 through 64. Runoff will flow in Tundra Swan Place into Starlilly Road, where it will flow east and be collected by inlets at the lowpoint.

Basin G (1.55ac, Q_{100}=5.16cfs) is adjacent to and east of Basin F. Basin G consists of eight (8) lots, 65 through 56. Runoff will flow north on Rock Daisy Court into Starlilly Road, where it will be collected by inlets at the lowpoint.

Basin H (2.74ac, Q_{100}=9.13cfs) is located in the far southwestern corner of Oxbow Park. Basin F consists of fifteen (15) lots, 74 through 80 and 82 through 89. Runoff will flow in Pinon Jay Court into Starlilly Road, where it will flow west and be collected by inlets at the lowpoint.

Basin I (2.12ac, Q_{100}=7.06cfs) is located in the far southeast corner of the subdivision, adjacent to and east of Basin H. Basin I consists of seven (7) lots, 94 through 100. Runoff will flow south on Alamogordo Drive, where it will drain to a speed bump, which creates a low point, and be collected by inlets at south lot line of Lot 97.

Basin J (0.77ac, Q_{100}=2.03cfs) is located in the far east of the subdivision, adjacent to and east of Basins E and I. Basin J is the backyards of lots 98 through 107. Runoff will flow east and into a concrete ribbon channel, which will flow to a low point between lots 103 and 104 and be collect by double grate Type D inlet and discharged into the storm drain. The inlet is sized to collect 2x100 year flows.

B. OFF-SITE BASIN

St. Jospeh's Drive has a high point just west of the first entrance to St. Pius High School. The flow east of the high point flows east down St. Joseph's Drive/Oxbow Drive and will be collected by inlets at the intersection of Oxbow Drive and Mourning Dove Place. The flow west of the high point will flow west on St. Joseph's Drive and into Coors Boulevard and drain south as it does currently. Tract B-1, just west of Oxbow Park, is treated as a single off site basin, which will serve as a temporary retention pond for the Oxbow Park, Village and Bluff Subdivisions. Future development of this site will require a separate submittal through EPC and DRB.

A 48" RCP storm drain will connect to the existing 48" storm drain, which was constructed with the Oxbow Village Subdivision. The storm drain is located between Lots 103 and 104 on the eastern boundary of the Subdivision. The proposed 48" storm drain will continue westward through the Oxbow Park Subdivision in order to serve future development in accordance with the Master Drainage Report. The analysis is of this storm drain can be found in the appendix of this report, see Appendix F.

VI. CONCLUSION

This report has provided hydrologic and hydraulic considerations of the proposed development of Altura West Tract B, the Oxbow Park Subdivision. This information provides adequate supporting documentation and guidance for approval of this report and to guide future development and phasing of the properties previously mentioned. It is recommended that this plan be approved as requested.

APPENDICES

APPENDIX A: BASINS

APPENDIX B: STREET HYDRAULICS

APPENDIX C: INLET ANALYSIS

APPENDIX D: POND ANALYSIS

APPENDIX E: RIBBON CHANNEL

APPENDIX F: STORM DRAIN ANALYSIS

APPENDIX A

BASINS

OXBOW PARK (TRACT B & E-1)

BASIN I.D.	AREA (AC)	UNITS #	% LAND TREATMENT A	B	C	D[2]	RUNOFF (AC-FT) 10 YR	100 YR	DISCHARGE (CFS) 10 YR	100YR
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (EXISTING CALCULATED)										
Tract B	25.06		97.0%	0.0%	0.0%	3.0%	0.00	0.00	8.3	34.1
Tract E-1										
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (EXISTING)[1]										
Tract B	25.06		97.0%	0.0%	0.0%	3.0%				33.7
Tract E-1										
HYRDOLOGICAL VOLUMETRIC & DISCHARGE DATA (DEVELOPED)										
A	3.20	18	0.0%	27.0%	27.0%	46.0%	0.20	0.36	6.2	10.66
B	2.85	16	0.0%	27.0%	27.0%	46.0%	0.18	0.32	5.5	9.49
C	3.50	17	0.0%	27.0%	27.0%	46.0%	0.22	0.40	6.8	11.66
D	0.22	0	0.0%	10.0%	0.0%	90.0%	0.02	0.03	0.6	0.91
E	4.37	12	0.0%	27.0%	27.0%	46.0%	0.27	0.49	8.4	14.56
F	2.50	15	0.0%	27.0%	27.0%	46.0%	0.16	0.28	4.8	8.33
G	1.55	8	0.0%	27.0%	27.0%	46.0%	0.10	0.17	3.0	5.16
H	2.74	15	0.0%	27.0%	27.0%	46.0%	0.17	0.31	5.3	9.13
I	2.12	7	0.0%	27.0%	27.0%	46.0%	0.13	0.24	4.1	7.06
J	0.77	0	0.0%	45.0%	45.0%	10.0%	0.03	0.06	1.0	2.03
TOTAL	23.82	108								79.0
St Jo. W	1.52	0	0.0%	10.0%	10.0%	90.0%	0.10	0.18	4.3	6.72
St Jo. E	1.38	0	100.0%	10.0%	10.0%	90.0%	0.09	0.16	4.2	7.85
Tract B-1	11.18	0	97.0%	0.0%	0.0%	3.0%	0.75	1.33	3.7	15.23

NOTES: 1) In the "Master Drainage Plan for Altura West and Archdiocese of Santa Fe Properties Near St. Pius High School" is shows that Tract B lies primarily within existing Basins K. The existing 100yr discharge was also taken from this report , in which this tract is 70% of Basin K. See Exhibit 3.

2) Impervious percentages for developed flows were calculated from the DPM equation a-4. The remaining percentages were distributed evenly between land treatment types B and C, except for Basin D which were taken from Table A-5 and the rest placed in land treatment type B.

N=UNITS/ACRES = 4.5

%D= 7*SQRT((N*N)+(5*N)) = 46.0%

A-1

APPENDIX B

STREET HYDRAULICS

SUMMARY OF THE ROADWAY CAPACITY ANALYSIS FOR OXBOW PARK SUBDIVISION - TRACT B

Tundra Swan Court - Drainage Basins A & F

Max Q (cfs)=10.66

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
2.18	6.40	0.28	2.88	0.13	0.41	1.00	OK
4.00	10.66 2.13	0.18	2.89	0.13	0.31	1.00	OK
2.56	3.33	0.23	2.63	0.11	0.34	1.00	OK
0.79	4.17	0.29	1.77	0.05	0.34	1.00	OK

NOTE:
There is a 2% cross-slope along this roadway.

Desert Sage Court - Drainage Basins E B ?

Max Q (cfs)=9.49

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
2.49	6.33	0.28	3.02	0.14	0.42	1.00	OK
4.00	1.90	0.18	2.83	0.12	0.30	1.00	OK

NOTE: 9.49
There is a 2% cross-slope along this roadway.

Pinon Jay Court - Drainage Basins C & H

Max Q (cfs)=11.66

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
1.65	5.83	0.29	2.54	0.10	0.39	1.00	OK
3.23	3.89	0.11	2.10	0.07	0.18	1.00	OK
1.97	4.57	0.26	2.57	0.10	0.36	1.00	OK
0.70	4.57	0.30	1.73	0.05	0.35	1.00	OK

NOTE:
There is a 2% cross-slope along this roadway.

18-1

SUMMARY OF THE ROADWAY CAPACITY ANALYSIS FOR OXBOW PARK SUBDIVISION - TRACT B

Rock Daisy Court - Drainage Basins G

Max Q (cfs)=5.16

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
1.92	5.16	0.27	2.61	0.11	0.38	1.00	OK

NOTE:
There is a 2% cross-slope along this roadway.

Hollyleaf Road- Drainage Basins A, B, C, & E

Max Q (cfs)=35.71

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
1.06	10.66	0.37	2.49	0.10	0.47	1.00	OK
0.94	35.71	0.54	3.71	0.21	0.75	1.00	OK

NOTE:
There is a 2% cross-slope along this roadway.

Starlilly Road - Drainage Basin E ?

Max Q (cfs)=14.29

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
0.91	8.33	0.35	2.22	0.08	0.43	1.00	OK
1.27	14.29	0.39	2.98	0.14	0.53	1.00	OK

NOTE:
There is a 2% cross-slope along this roadway.

B-2

SUMMARY OF THE ROADWAY CAPACITY ANALYSIS FOR OXBOW PARK SUBDIVISION - TRACT B

ALAMOGORDO

Song Sparrow Road- Drainage Basin D, E & I

Max Q (cfs)=14.56

Roadway Grade (%)	Q(100 YR) in roadway (cfs)	Depth of water in roadway (ft)	Velocity of storm water in roadway (ft/s)	$V^2/2*g$ (ft)	EGL (ft)	ROW Elevation (ft)	COMMENTS
0.68	7.28	0.35	1.92	0.06	0.41	1.00	OK
0.60	7.28	0.46	2.29	0.08	0.54	1.00	OK
0.77	7.28	0.46	2.59	0.10	0.56	1.00	OK
0.70	7.06	0.35	1.93	0.06	0.41	1.00	OK

NOTE:
There is a transition from a 6% cross slope to a -0.60% to a -2% cross-slope along this roadway.

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Tundra Swan S=2.18%

MANNING'S N= .017 SLOPE= .0218

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	1.07	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.70	3.25	0.04	0.14
0.15	0.15	0.39	0.7	6.82	1.91	6.58	0.06	0.21
0.20	0.20	0.84	1.9	11.92	2.20	11.60	0.08	0.28
0.25	0.25	1.55	4.0	17.03	2.61	16.63	0.11	0.36
0.30	0.30	2.50	7.6	22.13	3.02	21.65	0.14	0.44
0.35	0.35	3.71	12.7	27.23	3.42	26.68	0.18	0.53
0.40	0.40	5.11	20.8	28.84	4.07	28.20	0.26	0.66
0.45	0.45	6.52	31.2	28.94	4.78	28.23	0.35	0.80
0.50	0.50	7.93	43.1	29.04	5.43	28.25	0.46	0.96
0.55	0.55	9.35	56.5	29.15	6.05	28.28	0.57	1.12
0.60	0.60	10.76	71.3	29.25	6.63	28.30	0.68	1.28
0.65	0.65	12.18	87.4	29.35	7.18	28.33	0.80	1.45
0.70	0.70	13.66	97.8	33.11	7.15	32.05	0.79	1.49
0.75	0.75	15.38	109.1	37.76	7.09	36.70	0.78	1.53
0.80	0.80	17.33	123.2	42.41	7.11	41.35	0.78	1.58
0.85	0.85	19.52	140.1	47.06	7.18	46.00	0.80	1.65

Q100 10.66

Q100 = 10.66

d = .33

Q = .49 x .67

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Tundra Swan S=4.0%

MANNING'S N= .017 SLOPE= .04

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.1	1.71	1.45	1.63	0.03	0.08
0.10	0.10	0.16	0.4	3.41	2.30	3.25	0.08	0.18
0.15	0.15	0.39	1.0	6.82	2.58	6.58	0.10	0.25
0.20	0.20	0.84	2.5	11.92	2.99	11.60	0.14	0.34
0.25	0.25	1.55	5.5	17.03	3.53	16.63	0.19	0.44
0.30	0.30	2.50	10.2	22.13	4.09	21.65	0.26	0.56
0.35	0.35	3.71	17.2	27.23	4.63	26.68	0.33	0.68
0.40	0.40	5.11	28.2	28.84	5.52	28.20	0.47	0.87
0.45	0.45	6.52	42.2	28.94	6.47	28.23	0.65	1.10
0.50	0.50	7.93	58.4	29.04	7.36	28.25	0.84	1.34
0.55	0.55	9.35	76.6	29.15	8.19	28.28	1.04	1.59
0.60	0.60	10.76	96.6	29.25	8.98	28.30	1.25	1.85
0.65	0.65	12.18	118.4	29.35	9.72	28.33	1.47	2.12
0.70	0.70	13.66	132.4	33.11	9.69	32.05	1.46	2.16
0.75	0.75	15.38	147.8	37.76	9.61	36.70	1.43	2.18
0.80	0.80	17.33	166.9	42.41	9.63	41.35	1.44	2.24
0.85	0.85	19.52	189.8	47.06	9.72	46.00	1.47	2.32

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Tundra Swan S=2.56%

MANNING'S N= .017 SLOPE= .0256

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	1.16	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.84	3.25	0.05	0.15
0.15	0.15	0.39	0.8	6.82	2.07	6.58	0.07	0.22
0.20	0.20	0.84	2.0	11.92	2.39	11.60	0.09	0.29
0.25	0.25	1.55	4.4	17.03	2.83	16.63	0.12	0.37
0.30	0.30	2.50	8.2	22.13	3.27	21.65	0.17	0.47
0.35	0.35	3.71	13.8	27.23	3.70	26.68	0.21	0.56
0.40	0.40	5.11	22.6	28.84	4.41	28.20	0.30	0.70
0.45	0.45	6.52	33.8	28.94	5.18	28.23	0.42	0.87
0.50	0.50	7.93	46.7	29.04	5.89	28.25	0.54	1.04
0.55	0.55	9.35	61.2	29.15	6.55	28.28	0.67	1.22
0.60	0.60	10.76	77.3	29.25	7.18	28.30	0.80	1.40
0.65	0.65	12.18	94.7	29.35	7.78	28.33	0.94	1.59
0.70	0.70	13.66	105.9	33.11	7.75	32.05	0.93	1.63
0.75	0.75	15.38	118.2	37.76	7.69	36.70	0.92	1.67
0.80	0.80	17.33	133.5	42.41	7.70	41.35	0.92	1.72
0.85	0.85	19.52	151.8	47.06	7.78	46.00	0.94	1.79

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Tundra Swan S=0.79%

MANNING'S N= .017 SLOPE= .0079

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.64	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.02	3.25	0.02	0.12
0.15	0.15	0.39	0.4	6.82	1.15	6.58	0.02	0.17
0.20	0.20	0.84	1.1	11.92	1.33	11.60	0.03	0.23
0.25	0.25	1.55	2.4	17.03	1.57	16.63	0.04	0.29
0.30	0.30	2.50	4.6	22.13	1.82	21.65	0.05	0.35
0.35	0.35	3.71	7.6	27.23	2.06	26.68	0.07	0.42
0.40	0.40	5.11	12.5	28.84	2.45	28.20	0.09	0.49
0.45	0.45	6.52	18.8	28.94	2.88	28.23	0.13	0.58
0.50	0.50	7.93	25.9	29.04	3.27	28.25	0.17	0.67
0.55	0.55	9.35	34.0	29.15	3.64	28.28	0.21	0.76
0.60	0.60	10.76	42.9	29.25	3.99	28.30	0.25	0.85
0.65	0.65	12.18	52.6	29.35	4.32	28.33	0.29	0.94
0.70	0.70	13.66	58.8	33.11	4.31	32.05	0.29	0.99
0.75	0.75	15.38	65.7	37.76	4.27	36.70	0.28	1.03
0.80	0.80	17.33	74.2	42.41	4.28	41.35	0.28	1.08
0.85	0.85	19.52	84.3	47.06	4.32	46.00	0.29	1.14

$Q_{100} = 8.33$

$d = .36$

$EH = .43 < .87$

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Desert Sage S=2.49%

MANNING'S N= .017 SLOPE= .0249

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	1.14	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.81	3.25	0.05	0.15
0.15	0.15	0.39	0.8	6.82	2.04	6.58	0.06	0.21
0.20	0.20	0.84	2.0	11.92	2.36	11.60	0.09	0.29
0.25	0.25	1.55	4.3	17.03	2.79	16.63	0.12	0.37
0.30	0.30	2.50	8.1	22.13	3.23	21.65	0.16	0.46
0.35	0.35	3.71	13.6	27.23	3.65	26.68	0.21	0.56
0.40	0.40	5.11	22.2	28.84	4.35	28.20	0.29	0.69
0.45	0.45	6.52	33.3	28.94	5.11	28.23	0.41	0.86
0.50	0.50	7.93	46.1	29.04	5.81	28.25	0.52	1.02
0.55	0.55	9.35	60.4	29.15	6.46	28.28	0.65	1.20
0.60	0.60	10.76	76.2	29.25	7.08	28.30	0.78	1.38
0.65	0.65	12.18	93.4	29.35	7.67	28.33	0.91	1.56
0.70	0.70	13.66	104.5	33.11	7.65	32.05	0.91	1.61
0.75	0.75	15.38	116.6	37.76	7.58	36.70	0.89	1.64
0.80	0.80	17.33	131.7	42.41	7.60	41.35	0.90	1.70
0.85	0.85	19.52	149.7	47.06	7.67	46.00	0.91	1.76

$Q_{100} = 9.49$

$d = .31$

$EH = .49 < .87$ ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Desert Sage S=4.0%

MANNING'S N= .017 SLOPE= .04

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.1	1.71	1.45	1.63	0.03	0.08
0.10	0.10	0.16	0.4	3.41	2.30	3.25	0.08	0.18
0.15	0.15	0.39	1.0	6.82	2.58	6.58	0.10	0.25
0.20	0.20	0.84	2.5	11.92	2.99	11.60	0.14	0.34
0.25	0.25	1.55	5.5	17.03	3.53	16.63	0.19	0.44
0.30	0.30	2.50	10.2	22.13	4.09	21.65	0.26	0.56
0.35	0.35	3.71	17.2	27.23	4.63	26.68	0.33	0.68
0.40	0.40	5.11	28.2	28.84	5.52	28.20	0.47	0.87
0.45	0.45	6.52	42.2	28.94	6.47	28.23	0.65	1.10
0.50	0.50	7.93	58.4	29.04	7.36	28.25	0.84	1.34
0.55	0.55	9.35	76.6	29.15	8.19	28.28	1.04	1.59
0.60	0.60	10.76	96.6	29.25	8.98	28.30	1.25	1.85
0.65	0.65	12.18	118.4	29.35	9.72	28.33	1.47	2.12
0.70	0.70	13.66	132.4	33.11	9.69	32.05	1.46	2.16
0.75	0.75	15.38	147.8	37.76	9.61	36.70	1.43	2.18
0.80	0.80	17.33	166.9	42.41	9.63	41.35	1.44	2.24
0.85	0.85	19.52	189.8	47.06	9.72	46.00	1.47	2.32

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Pinon Jay S=1.65%

MANNING'S N= .017 SLOPE= .0165

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.93	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.48	3.25	0.03	0.13
0.15	0.15	0.39	0.6	6.82	1.66	6.58	0.04	0.19
0.20	0.20	0.84	1.6	11.92	1.92	11.60	0.06	0.26
0.25	0.25	1.55	3.5	17.03	2.27	16.63	0.08	0.33
0.30	0.30	2.50	6.6	22.13	2.63	21.65	0.11	0.41
0.35	0.35	3.71	11.0	27.23	2.97	26.68	0.14	0.49
0.40	0.40	5.11	18.1	28.84	3.54	28.20	0.19	0.59
0.45	0.45	6.52	27.1	28.94	4.16	28.23	0.27	0.72
0.50	0.50	7.93	37.5	29.04	4.73	28.25	0.35	0.85
0.55	0.55	9.35	49.2	29.15	5.26	28.28	0.43	0.98
0.60	0.60	10.76	62.0	29.25	5.77	28.30	0.52	1.12
0.65	0.65	12.18	76.1	29.35	6.25	28.33	0.61	1.26
0.70	0.70	13.66	85.0	33.11	6.22	32.05	0.60	1.30
0.75	0.75	15.38	94.9	37.76	6.17	36.70	0.59	1.34
0.80	0.80	17.33	107.2	42.41	6.18	41.35	0.59	1.39
0.85	0.85	19.52	121.9	47.06	6.24	46.00	0.61	1.46

$Q_{100} = 11.64$

$Q_{100} = 11.66$

$d = .35$

$FH = .50 < .87$ ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Pinon Jay S=3.23%

MANNING'S N= .017 SLOPE= .0323

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.1	1.71	1.30	1.63	0.03	0.08
0.10	0.10	0.16	0.3	3.41	2.06	3.25	0.07	0.17
0.15	0.15	0.39	0.9	6.82	2.32	6.58	0.08	0.23
0.20	0.20	0.84	2.3	11.92	2.68	11.60	0.11	0.31
0.25	0.25	1.55	4.9	17.03	3.18	16.63	0.16	0.41
0.30	0.30	2.50	9.2	22.13	3.68	21.65	0.21	0.51
0.35	0.35	3.71	15.4	27.23	4.16	26.68	0.27	0.62
0.40	0.40	5.11	25.3	28.84	4.96	28.20	0.38	0.78
0.45	0.45	6.52	37.9	28.94	5.82	28.23	0.53	0.98
0.50	0.50	7.93	52.5	29.04	6.61	28.25	0.68	1.18
0.55	0.55	9.35	68.8	29.15	7.36	28.28	0.84	1.39
0.60	0.60	10.76	86.8	29.25	8.07	28.30	1.01	1.61
0.65	0.65	12.18	106.4	29.35	8.74	28.33	1.19	1.84
0.70	0.70	13.66	119.0	33.11	8.71	32.05	1.18	1.88
0.75	0.75	15.38	132.8	37.76	8.63	36.70	1.16	1.91
0.80	0.80	17.33	150.0	42.41	8.65	41.35	1.16	1.96
0.85	0.85	19.52	170.5	47.06	8.74	46.00	1.19	2.04

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Pinon Jay S=1.97%

MANNING'S N= .017 SLOPE= .0197

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	1.02	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.61	3.25	0.04	0.14
0.15	0.15	0.39	0.7	6.82	1.81	6.58	0.05	0.20
0.20	0.20	0.84	1.8	11.92	2.10	11.60	0.07	0.27
0.25	0.25	1.55	3.8	17.03	2.48	16.63	0.10	0.35
0.30	0.30	2.50	7.2	22.13	2.87	21.65	0.13	0.43
0.35	0.35	3.71	12.1	27.23	3.25	26.68	0.16	0.51
0.40	0.40	5.11	19.8	28.84	3.87	28.20	0.23	0.63
0.45	0.45	6.52	29.6	28.94	4.54	28.23	0.32	0.77
0.50	0.50	7.93	41.0	29.04	5.16	28.25	0.41	0.91
0.55	0.55	9.35	53.7	29.15	5.75	28.28	0.51	1.06
0.60	0.60	10.76	67.8	29.25	6.30	28.30	0.62	1.22
0.65	0.65	12.18	83.1	29.35	6.82	28.33	0.72	1.37
0.70	0.70	13.66	92.9	33.11	6.80	32.05	0.72	1.42
0.75	0.75	15.38	103.7	37.76	6.74	36.70	0.71	1.46
0.80	0.80	17.33	117.1	42.41	6.76	41.35	0.71	1.51
0.85	0.85	19.52	133.2	47.06	6.82	46.00	0.72	1.57

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Pinon Jay S=0.70%

MANNING'S N= .017 SLOPE= .007

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.61	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	0.96	3.25	0.01	0.11
0.15	0.15	0.39	0.4	6.82	1.08	6.58	0.02	0.17
0.20	0.20	0.84	1.1	11.92	1.25	11.60	0.02	0.22
0.25	0.25	1.55	2.3	17.03	1.48	16.63	0.03	0.28
0.30	0.30	2.50	4.3	22.13	1.71	21.65	0.05	0.35
0.35	0.35	3.71	7.2	27.23	1.94	26.68	0.06	0.41
0.40	0.40	5.11	11.8	28.84	2.31	28.20	0.08	0.48
0.45	0.45	6.52	17.7	28.94	2.71	28.23	0.11	0.56
0.50	0.50	7.93	24.4	29.04	3.08	28.25	0.15	0.65
0.55	0.55	9.35	32.0	29.15	3.43	28.28	0.18	0.73
0.60	0.60	10.76	40.4	29.25	3.75	28.30	0.22	0.82
0.65	0.65	12.18	49.5	29.35	4.07	28.33	0.26	0.91
0.70	0.70	13.66	55.4	33.11	4.05	32.05	0.26	0.96
0.75	0.75	15.38	61.8	37.76	4.02	36.70	0.25	1.00
0.80	0.80	17.33	69.8	42.41	4.03	41.35	0.25	1.05
0.85	0.85	19.52	79.4	47.06	4.07	46.00	0.26	1.11

$Q_{100} = 9.13$

$d = .37$

$E_{tt} = .44 < .87$ ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Rock Daisy S=1.92%

MANNING'S N= .017 SLOPE= .0192

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	37.17	0.67
2	8.37	0.67	6	23.00	0.37	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.85
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	1.00	1.63	0.02	0.07
0.10	0.10	0.16	0.3	3.41	1.59	3.25	0.04	0.14
0.15	0.15	0.39	0.7	6.82	1.79	6.58	0.05	0.20
0.20	0.20	0.84	1.7	11.92	2.07	11.60	0.07	0.27
0.25	0.25	1.55	3.8	17.03	2.45	16.63	0.09	0.34
0.30	0.30	2.50	7.1	22.13	2.83	21.65	0.12	0.42
0.35	0.35	3.71	11.9	27.23	3.21	26.68	0.16	0.51
0.40	0.40	5.11	19.5	28.84	3.82	28.20	0.23	0.63
0.45	0.45	6.52	29.2	28.94	4.49	28.23	0.31	0.76
0.50	0.50	7.93	40.5	29.04	5.10	28.25	0.40	0.90
0.55	0.55	9.35	53.0	29.15	5.67	28.28	0.50	1.05
0.60	0.60	10.76	66.9	29.25	6.22	28.30	0.60	1.20
0.65	0.65	12.18	82.0	29.35	6.74	28.33	0.70	1.35
0.70	0.70	13.66	91.7	33.11	6.71	32.05	0.70	1.40
0.75	0.75	15.38	102.4	37.76	6.66	36.70	0.69	1.44
0.80	0.80	17.33	115.6	42.41	6.67	41.35	0.69	1.49
0.85	0.85	19.52	131.5	47.06	6.74	46.00	0.70	1.55

$Q_{100} = 5.16$

$Q_{100} = 5.16$

$d = .27$

$E_H = .37 < .27$ ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Hollyleaf S=1.06%

MANNING'S N= .017 SLOPE= .0106

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.74	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.18	3.25	0.02	0.12
0.15	0.15	0.39	0.5	6.79	1.33	6.55	0.03	0.18
0.20	0.20	0.84	1.3	11.84	1.54	11.52	0.04	0.24
0.25	0.25	1.54	2.8	16.89	1.82	16.49	0.05	0.30
0.30	0.30	2.49	5.2	21.94	2.11	21.47	0.07	0.37
0.35	0.35	3.69	8.8	27.00	2.39	26.44	0.09	0.44
0.40	0.40	5.13	13.6	32.05	2.65	31.41	0.11	0.51
0.45	0.45	6.74	21.1	32.94	3.12	32.23	0.15	0.60
0.50	0.50	8.35	30.0	33.05	3.60	32.25	0.20	0.70
0.55	0.55	9.96	40.2	33.15	4.04	32.28	0.25	0.80
0.60	0.60	11.58	51.6	33.25	4.45	32.30	0.31	0.91
0.65	0.65	13.20	64.0	33.35	4.85	32.33	0.37	1.02
0.70	0.70	14.88	72.8	37.11	4.89	36.05	0.37	1.07
0.75	0.75	16.80	82.4	41.76	4.90	40.70	0.37	1.12
0.80	0.80	18.95	93.9	46.41	4.95	45.35	0.38	1.18
0.85	0.85	21.34	107.3	51.06	5.03	50.00	0.39	1.24

$Q_{100} = 10.66$

$Q_{100} = 10.66$

$d = .37$

$EH = .47 < .97$ ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Hollyleaf S=0.94%

MANNING'S N= .017 SLOPE= .0094

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	41.17	0.67
2	8.37	0.67	6	25.00	0.41	10	41.63	0.67
3	8.83	0.67	7	39.00	0.13	11	50.00	0.85
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.70	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.11	3.25	0.02	0.12
0.15	0.15	0.39	0.5	6.79	1.25	6.55	0.02	0.17
0.20	0.20	0.84	1.2	11.84	1.45	11.52	0.03	0.23
0.25	0.25	1.54	2.6	16.89	1.72	16.49	0.05	0.30
0.30	0.30	2.49	4.9	21.94	1.99	21.47	0.06	0.36
0.35	0.35	3.69	8.3	27.00	2.25	26.44	0.08	0.43
0.40	0.40	5.13	12.8	32.05	2.50	31.41	0.10	0.50
0.45	0.45	6.74	19.8	32.94	2.94	32.23	0.13	0.58
0.50	0.50	8.35	28.3	33.05	3.39	32.25	0.18	0.68
0.55	0.55	9.96	37.9	33.15	3.80	32.28	0.22	0.77
0.60	0.60	11.58	48.6	33.25	4.19	32.30	0.27	0.87
0.65	0.65	13.20	60.3	33.35	4.57	32.33	0.32	0.97
0.70	0.70	14.88	68.6	37.11	4.61	36.05	0.33	1.03
0.75	0.75	16.80	77.6	41.76	4.62	40.70	0.33	1.08
0.80	0.80	18.95	88.4	46.41	4.66	45.35	0.34	1.14
0.85	0.85	21.34	101.1	51.06	4.74	50.00	0.35	1.20

$Q_{100} = 21.15$

$Q_{100} = 31.81$

Q_{100} = Basin B + Basin C = 9.49 + 11.66 = 21.15

$Q_{100} = 21.15$

d = .46

EH = .66 < .87 ✓

B + C + E = 35.71

Q_{100} = A + B + C = 10.66 + 9.49 + 11.66 = 31.81

$Q_{100} = 31.81$

d = .52

EH = .71 < .87 ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Starlilly S=0.91%

MANNING'S N= .017 SLOPE= .0091

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	13.00	0.13	9	39.17	0.67
2	10.37	0.67	6	25.00	0.37	10	39.63	0.67
3	10.83	0.67	7	37.00	0.13	11	50.00	0.85
4	11.00	0.00	8	39.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.69	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.10	3.25	0.02	0.12
0.15	0.15	0.39	0.5	6.82	1.23	6.58	0.02	0.17
0.20	0.20	0.84	1.2	11.92	1.42	11.60	0.03	0.23
0.25	0.25	1.55	2.6	17.03	1.69	16.63	0.04	0.29
0.30	0.30	2.50	4.9	22.13	1.95	21.65	0.06	0.36
0.35	0.35	3.71	8.2	27.23	2.21	26.68	0.08	0.43
0.40	0.40	5.11	13.4	28.84	2.63	28.20	0.11	0.51
0.45	0.45	6.52	20.1	28.94	3.09	28.23	0.15	0.60
0.50	0.50	7.93	27.8	29.04	3.51	28.25	0.19	0.69
0.55	0.55	9.35	36.5	29.15	3.91	28.28	0.24	0.79
0.60	0.60	10.76	46.1	29.25	4.28	28.30	0.28	0.88
0.65	0.65	12.18	56.5	29.35	4.64	28.33	0.33	0.98
0.70	0.70	13.67	62.4	33.77	4.56	32.72	0.32	1.02
0.75	0.75	15.45	68.9	39.53	4.46	38.48	0.31	1.06
0.80	0.80	17.52	77.6	45.30	4.43	44.24	0.30	1.10
0.85	0.85	19.88	88.4	51.06	4.45	50.00	0.31	1.16

$Q_{100} = 8.33$

$d = .35$

EH = .43 < .87

F + G + H

$Q_{100} =$ [illegible]

$Q_{100} = 22.62$

$d = .46$

EH = .63 < .87 ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Starlilly S=1.27%

MANNING'S N= .017 SLOPE= .0127

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	13.00	0.13	9	39.17	0.67
2	10.37	0.67	6	25.00	0.37	10	39.63	0.67
3	10.83	0.67	7	37.00	0.13	11	50.00	0.85
4	11.00	0.00	8	39.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.82	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.29	3.25	0.03	0.13
0.15	0.15	0.39	0.6	6.82	1.45	6.58	0.03	0.18
0.20	0.20	0.84	1.4	11.92	1.68	11.60	0.04	0.24
0.25	0.25	1.55	3.1	17.03	1.99	16.63	0.06	0.31
0.30	0.30	2.50	5.8	22.13	2.30	21.65	0.08	0.38
0.35	0.35	3.71	9.7	27.23	2.61	26.68	0.11	0.46
0.40	0.40	5.11	15.9	28.84	3.11	28.20	0.15	0.55
0.45	0.45	6.52	23.8	28.94	3.65	28.23	0.21	0.66
0.50	0.50	7.93	32.9	29.04	4.15	28.25	0.27	0.77
0.55	0.55	9.35	43.1	29.15	4.62	28.28	0.33	0.88
0.60	0.60	10.76	54.4	29.25	5.06	28.30	0.40	1.00
0.65	0.65	12.18	66.7	29.35	5.48	28.33	0.47	1.12
0.70	0.70	13.67	73.7	33.77	5.39	32.72	0.45	1.15
0.75	0.75	15.45	81.4	39.53	5.27	38.48	0.43	1.18
0.80	0.80	17.52	91.6	45.30	5.23	44.24	0.42	1.22
0.85	0.85	19.88	104.4	51.06	5.25	50.00	0.43	1.28

Q100 = Basin G + Basin H = 5.16 + 9.13 = 14.29

Sinc = 4.29

d = .39

EH = .53 < .87 ✓

ALAMOGORDO

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Song Sparrow S=0.68% Right

MANNING'S N= .017 SLOPE= .0068

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	45.17	0.67
2	8.37	0.67	6	27.00	0.44	10	45.63	0.67
3	8.83	0.67	7	43.00	0.13	11	54.00	0.85
4	9.00	0.00	8	45.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.60	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	0.95	3.25	0.01	0.11
0.15	0.15	0.39	0.4	6.82	1.06	6.58	0.02	0.17
0.20	0.20	0.84	1.0	11.92	1.23	11.60	0.02	0.22
0.25	0.25	1.55	2.3	17.03	1.46	16.63	0.03	0.28
0.30	0.30	2.50	4.2	22.13	1.69	21.65	0.04	0.34
0.35	0.35	3.71	7.1	27.23	1.91	26.68	0.06	0.41
0.40	0.40	5.17	11.0	32.34	2.12	31.70	0.07	0.47
0.45	0.45	6.88	16.2	36.94	2.35	36.23	0.09	0.54
0.50	0.50	8.69	23.8	37.05	2.74	36.25	0.12	0.62
0.55	0.55	10.51	32.6	37.15	3.11	36.28	0.15	0.70
0.60	0.60	12.32	42.5	37.25	3.45	36.30	0.18	0.78
0.65	0.65	14.14	53.3	37.36	3.77	36.33	0.22	0.87
0.70	0.70	16.02	61.6	41.11	3.85	40.05	0.23	0.93
0.75	0.75	18.14	70.6	45.76	3.89	44.70	0.23	0.98
0.80	0.80	20.49	81.1	50.41	3.96	49.35	0.24	1.04
0.85	0.85	23.08	93.2	55.06	4.04	54.00	0.25	1.10

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Song Sparrow S=0.60% Left

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	45.17	0.67
2	8.37	0.67	6	27.00	0.44	10	45.63	0.67
3	8.83	0.67	7	43.00	0.13	11	54.00	0.85
4	9.00	0.00	8	45.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.56	1.63	0.00	0.05
0.10	0.10	0.16	0.1	3.41	0.89	3.25	0.01	0.11
0.15	0.15	0.39	0.4	6.82	1.00	6.58	0.02	0.17
0.20	0.20	0.84	1.0	11.92	1.16	11.60	0.02	0.22
0.25	0.25	1.55	2.1	17.03	1.37	16.63	0.03	0.28
0.30	0.30	2.50	4.0	22.13	1.58	21.65	0.04	0.34
0.35	0.35	3.71	6.7	27.23	1.79	26.68	0.05	0.40
0.40	0.40	5.17	10.3	32.34	1.99	31.70	0.06	0.46
0.45	0.45	6.88	15.2	36.94	2.21	36.23	0.08	0.53
0.50	0.50	8.69	22.4	37.05	2.58	36.25	0.10	0.60
0.55	0.55	10.51	30.7	37.15	2.92	36.28	0.13	0.68
0.60	0.60	12.32	39.9	37.25	3.24	36.30	0.16	0.76
0.65	0.65	14.14	50.1	37.36	3.54	36.33	0.19	0.84
0.70	0.70	16.02	57.9	41.11	3.61	40.05	0.20	0.90
0.75	0.75	18.14	66.3	45.76	3.65	44.70	0.21	0.96
0.80	0.80	20.49	76.1	50.41	3.72	49.35	0.21	1.01
0.85	0.85	23.08	87.5	55.06	3.79	54.00	0.22	1.07

Q_{100} = 15.46 cfs

d = .45

EH = .53 < 1.00 ✓

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Song Sparrow S=0.77% left

MANNING'S N= .017 SLOPE= .0077

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	45.17	0.67
2	8.37	0.67	6	27.00	0.44	10	45.63	0.67
3	8.83	0.67	7	43.00	0.13	11	54.00	0.85
4	9.00	0.00	8	45.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.63	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.01	3.25	0.02	0.12
0.15	0.15	0.39	0.4	6.82	1.13	6.58	0.02	0.17
0.20	0.20	0.84	1.1	11.92	1.31	11.60	0.03	0.23
0.25	0.25	1.55	2.4	17.03	1.55	16.63	0.04	0.29
0.30	0.30	2.50	4.5	22.13	1.79	21.65	0.05	0.35
0.35	0.35	3.71	7.5	27.23	2.03	26.68	0.06	0.41
0.40	0.40	5.17	11.7	32.34	2.26	31.70	0.08	0.48
0.45	0.45	6.88	17.2	36.94	2.50	36.23	0.10	0.55
0.50	0.50	8.69	25.4	37.05	2.92	36.25	0.13	0.63
0.55	0.55	10.51	34.7	37.15	3.30	36.28	0.17	0.72
0.60	0.60	12.32	45.2	37.25	3.67	36.30	0.21	0.81
0.65	0.65	14.14	56.7	37.36	4.01	36.33	0.25	0.90
0.70	0.70	16.02	65.6	41.11	4.09	40.05	0.26	0.96
0.75	0.75	18.14	75.1	45.76	4.14	44.70	0.27	1.02
0.80	0.80	20.49	86.3	50.41	4.21	49.35	0.28	1.08
0.85	0.85	23.08	99.1	55.06	4.30	54.00	0.29	1.14

$Q_{100} = 15.46$

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Song Sparrow S=1.39% Right

MANNING'S N= .017 SLOPE= .0139

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	45.17	0.67
2	8.37	0.67	6	27.00	0.44	10	45.63	0.67
3	8.83	0.67	7	43.00	0.13	11	54.00	0.85
4	9.00	0.00	8	45.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.85	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	1.35	3.25	0.03	0.13
0.15	0.15	0.39	0.6	6.82	1.52	6.58	0.04	0.19
0.20	0.20	0.84	1.5	11.92	1.76	11.60	0.05	0.25
0.25	0.25	1.55	3.2	17.03	2.08	16.63	0.07	0.32
0.30	0.30	2.50	6.0	22.13	2.41	21.65	0.09	0.39
0.35	0.35	3.71	10.1	27.23	2.73	26.68	0.12	0.47
0.40	0.40	5.17	15.7	32.34	3.04	31.70	0.14	0.54
0.45	0.45	6.88	23.1	36.94	3.36	36.23	0.18	0.63
0.50	0.50	8.69	34.1	37.05	3.92	36.25	0.24	0.74
0.55	0.55	10.51	46.7	37.15	4.44	36.28	0.31	0.86
0.60	0.60	12.32	60.7	37.25	4.93	36.30	0.38	0.98
0.65	0.65	14.14	76.2	37.36	5.39	36.33	0.45	1.10
0.70	0.70	16.02	88.1	41.11	5.50	40.05	0.47	1.17
0.75	0.75	18.14	100.9	45.76	5.56	44.70	0.48	1.23
0.80	0.80	20.49	115.9	50.41	5.66	49.35	0.50	1.30
0.85	0.85	23.08	133.2	55.06	5.77	54.00	0.52	1.37

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Song Sparrow S=0.70% Left & Right

MANNING'S N= .017 SLOPE= .007

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.85	5	11.00	0.13	9	45.17	0.67
2	8.37	0.67	6	27.00	0.44	10	45.63	0.67
3	8.83	0.67	7	43.00	0.13	11	54.00	0.85
4	9.00	0.00	8	45.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.04	0.0	1.71	0.61	1.63	0.01	0.06
0.10	0.10	0.16	0.2	3.41	0.96	3.25	0.01	0.11
0.15	0.15	0.39	0.4	6.82	1.08	6.58	0.02	0.17
0.20	0.20	0.84	1.1	11.92	1.25	11.60	0.02	0.22
0.25	0.25	1.55	2.3	17.03	1.48	16.63	0.03	0.28
0.30	0.30	2.50	4.3	22.13	1.71	21.65	0.05	0.35
0.35	0.35	3.71	7.2	27.23	1.94	26.68	0.06	0.41
0.40	0.40	5.17	11.1	32.34	2.15	31.70	0.07	0.47
0.45	0.45	6.88	16.4	36.94	2.39	36.23	0.09	0.54
0.50	0.50	8.69	24.2	37.05	2.78	36.25	0.12	0.62
0.55	0.55	10.51	33.1	37.15	3.15	36.28	0.15	0.70
0.60	0.60	12.32	43.1	37.25	3.50	36.30	0.19	0.79
0.65	0.65	14.14	54.1	37.36	3.83	36.33	0.23	0.88
0.70	0.70	16.02	62.5	41.11	3.90	40.05	0.24	0.94
0.75	0.75	18.14	71.6	45.76	3.95	44.70	0.24	0.99
0.80	0.80	20.49	82.3	50.41	4.01	49.35	0.25	1.05
0.85	0.85	23.08	94.5	55.06	4.10	54.00	0.26	1.11

Q_{100}=7.06

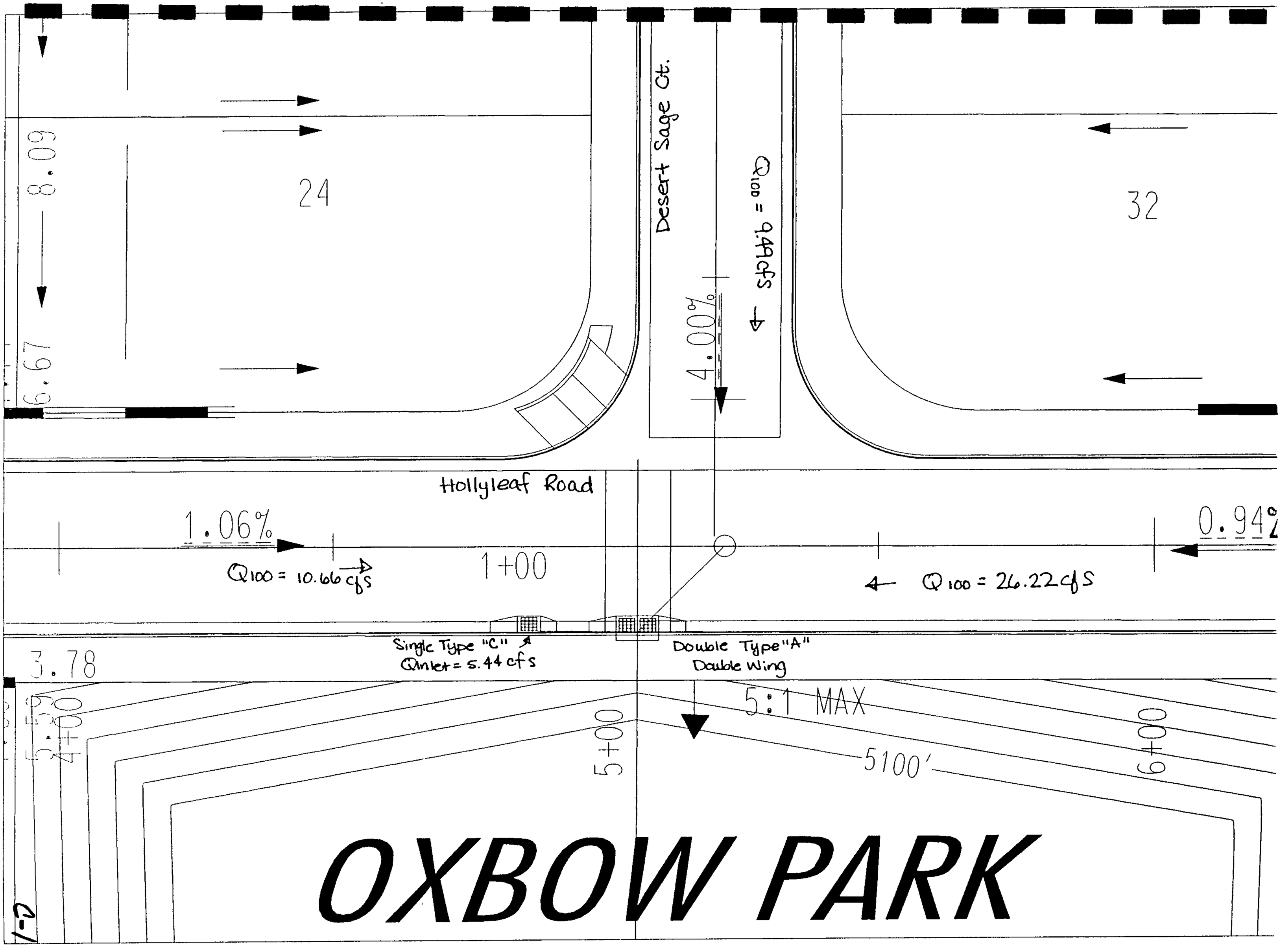
Q_{100}= 7.06

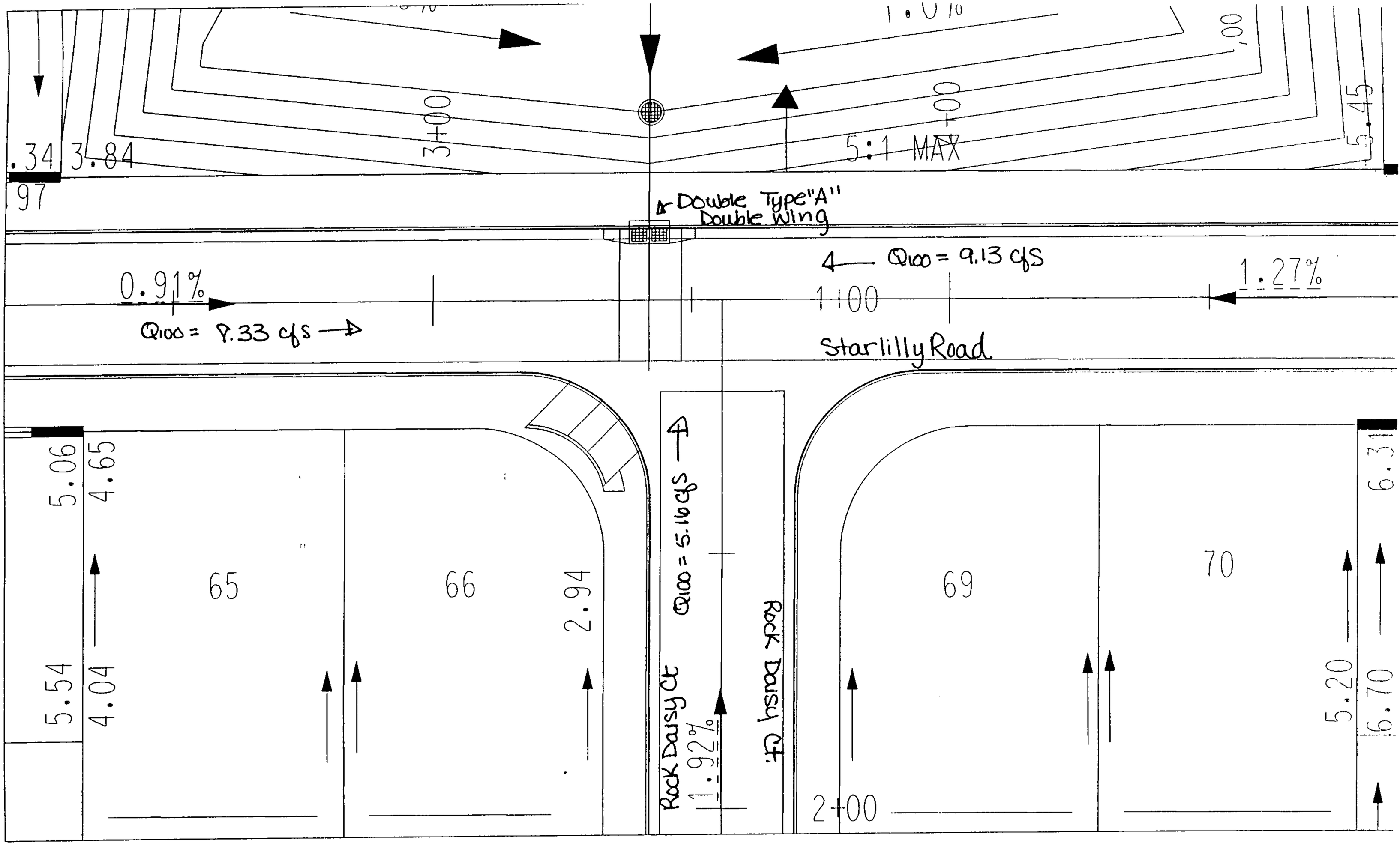
d= .35

ET = .41 < .87

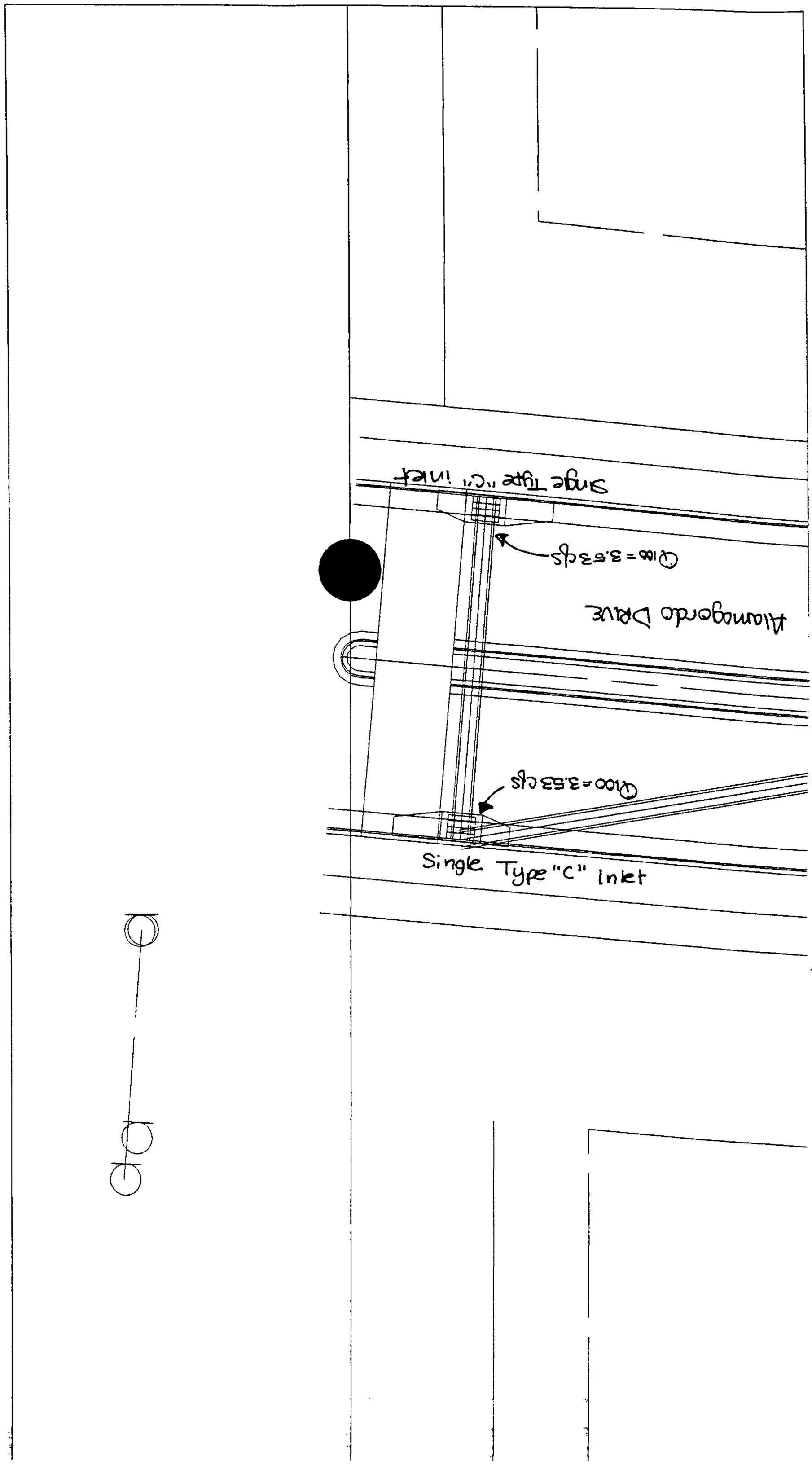
APPENDIX C

INLET ANALYSIS


Desert Sage Ct.
24
32
8.09
6.67
4.00%
Q100 = 9.46cfs
Hollyleaf Road
1.06%
0.94%
Q100 = 10.66 cfs
1+00
Q100 = 26.22cfs
Single Type "C"
Qinlet = 5.44 cfs
Double Type "A"
Double Wing
3.78
5:1 MAX
4+00
5+00
6+00
5100'
OXBOW PARK


3+00
1+00
5:1 MAX
.34
3.84
97
5.45
Double Type"A"
Double Wing
Q100 = 9.13 cfs
0.91%
1.27%
1+00
Q100 = 9.33 cfs
Starlilly Road
Q100 = 5.16 cfs
Rock Daisy Ct
1.92%
Rock Daisy Ct
5.06
4.65
5.54
4.04
65
66
2.94
69
70
6.31
5.20
6.70
2+00

C-8


Single Type "C" Inlet
Q100 = 3.53 cfs
Alamogordo Drive
Q100 = 3.53 cfs
Single Type "C" Inlet

C-3

Oxbow Park

ANALYSIS OF AN INLET IN A SUMP CONDITION - **Starlilly lowpoint**

INLET TYPE: Double Grate Type "A" with curb opening wings on both sides on inlet.

WEIR: Q=C*L*H^1.5		ORIFICE: Q=C*A*(2*G*H)**0.5	
Wing opening	Grate opeining	Grate opening	Wing opening
C= 3.0	C=3.0	C=0.6	C=0.6
L= 4.0 ft	L(double grate)=[2(2.67')+2(1.8')]=8	A(double grate)=8.19 sf	A=2.0 sf
Q=3.0(4.0')H**1.5= 12.0H**1.5	Q=3.0(8.94)H^1.5=26.82*H^1.5	Q=4.194*(64.4*H)^0.5	Q=1.2*(64.4*H)^0.5

	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR "A" OPENING	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at double "A" inlet w/ two wing openings
	0.10	0.10	0.38	0.85	12.47	1.61	Weir controls on grate analysis
	0.20	0.20	1.07	2.40	17.64	4.55	
	0.30	0.30	1.97	4.41	21.60	8.35	
	0.40	0.40	3.04	6.78	24.94	12.86	
	0.50	0.50	4.24	9.48	27.88	17.97	
	0.60	0.60	5.58	12.46	30.55	23.62	Q(100 yr) = 22.62 cfs is provided at this depth
TOP OF CURB	0.70	0.70	7.03	15.71	32.99	29.76	
	0.80	0.80	8.59	19.19	35.27	36.36	
	0.90	0.90	10.25	22.90	37.41	43.39	Q(2x100 yr) = 45.24 cfs is provided at this depth
ROW LIMIT	1.00	1.00	12.00	26.82	39.43	50.82	

NOTE: The total runoff intercepted by the inlet at the low point in the road is:

Qr(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)].

THE 100 YR STORM EVENT = 22.62 CFS at the sump condition

THE 2 x 100 YR STORM EVENT = 45.24 at the sump condition

C-4

MASTER STORM DRAIN HYDROLOGIC VOLUMETRIC & DISCHARGE DATA

HOLLYLEAF

HYDRAULIC EVALUATION OF INLETS - HEC12 METHOD
10-YEAR STORM - LEFT 1/2 STREET FLOWS W/ 20% CLOGGING FACTOR
15% REDUCTION IN ROUTED Q'S FOR ATTENUATION

Qi = Intercepted Flow
Qb = Bypass Flow
S = Longitudinal Slope
Sx = Cross Slope
Vo = Gutter Velocity where splash-over first occurs

Eo = Ratio of frontal flow to total gutter flow
Rf = Ratio of frontal flow intercepted to total frontal flow
Rs = Ratio of side flow intercepted to total side flow
E = Efficiency

Inlet ID	Total Rtd Q (cfs)	Inlet Width (ft)	Inlet Length (ft)	Ponding Width (ft)	Pond Depth (ft)	Qi (cfs)	Qb (cfs)	S (ft/ft)	Sx (ft/ft)	Vo (fps)	V (fps)	Eo	Rf	Rs	E
BASIN A															
1	10.66	1.54	5.32	16.92	0.34	5.44	5.22	0.0121	0.0200	9.5	3.7	0.22	1.0	0.4	0.51
		Section Total Intercepted Flow:				*5.44*									
			Total Intercepted Flow:			***5.44***									

46.37 cfs
- 5.44 cfs
40.93 cfs

C-5

Oxbow Park

ANALYSIS OF AN INLET IN A SUMP CONDITION - **Hollyleaf lowpoint**

INLET TYPE: Double Grate Type "A" with curb opening wings on both sides on inlet.

WEIR: Q=C*L*H^1.5		ORIFICE: Q=C*A*(2*G*H)**0.5	
Wing opening	Grate opeining	Grate opening	Wing opening
C= 3.0	C=3.0	C=0.6	C=0.6
L= 4.0 ft	L(double grate)=[2(2.67')+2(1.8')]=8	A(double grate)=8.19 sf	A=2.0 sf
Q=3.0(4.0')H**1.5= 12.0H**1.5	Q=3.0(8.94)H^1.5=26.82*H^1.5	Q=4.194*(64.4*H)^0.5	Q=1.2*(64.4*H)^0.5

	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR "A" OPENING	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at double "A" inlet w/ two wing openings
	0.10	0.10	0.38	0.85	12.47	1.61	Weir controls on grate analysis
	0.20	0.20	1.07	2.40	17.64	4.55	
	0.30	0.30	1.97	4.41	21.60	8.35	
	0.40	0.40	3.04	6.78	24.94	12.86	
	0.50	0.50	4.24	9.48	27.88	17.97	
	0.60	0.60	5.58	12.46	30.55	23.62	
TOP OF CURB	0.70	0.70	7.03	15.71	32.99	29.76	
	0.80	0.80	8.59	19.19	35.27	36.36	
	0.90	0.90	10.25	22.90	37.41	43.39	Q(100 yr) = 40.93 cfs is provided at this depth
ROW LIMIT	1.00	1.00	12.00	26.82	39.43	50.82	Q(2x100 yr) = 81.86 cfs is provided at this depth

NOTE: The total runoff intercepted by the inlet at the low point in the road is:

Qr(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)].

THE 100 YR STORM EVENT = 40.93 CFS at the sump condition

THE 2 x 100 YR STORM EVENT = 81.86 at the sump condition

C-9

ANALYSIS OF AN INLET IN A SUMP CONDITION - **Alamogordo Drive**

INLET TYPE: Single Grate Type "A" with curb opening wings on both sides on inlet.

WEIR: Q=C*L*H^1.5

Wing opening
C= 3.0
L= 4.0 ft
Q=3.0(4.0')H**1.5= 12.0H**1.5

Grate opeining
C=3.0
L(single grate)=[(2.67')+2(1.8')]=6.2
Q=3.0(6.27)H^1.5=18.81*H^1.5

ORIFICE: Q=C*A*(2*G*H)**0.5

Grate opening
C=0.6
A(single grate)=4.09 sf
Q=2.46*(64.4*H)^0.5

Wing opening
C=0.6
A=2.0 sf
Q=1.2*(64.4*H)^0.5

	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR WING OPENING	Q (CFS) WEIR SINGLE GRATE	Q (CFS) ORIFICE SINGLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at single "C" inlet
	0.10	0.10	0.38	0.59	6.24	1.35	Weir controls on grate analysis
	0.20	0.20	1.07	1.68	8.82	3.83	
	0.30	0.30	1.97	3.09	10.80	7.03	
	0.40	0.40	3.04	4.76	12.47	10.83	Q(100 yr) = 7.03 cfs is provided at this depth
	0.50	0.50	4.24	6.65	13.94	15.14	Q(2x100 yr) = 14.06 cfs is provided at this depth
	0.60	0.60	5.58	8.74	15.27	19.90	
TOP OF CURB	0.70	0.70	7.03	11.02	16.50	25.07	
	0.80	0.80	8.59	13.46	17.64	30.63	
	0.90	0.90	10.25	16.06	18.71	36.55	
ROW LIMIT	1.00	1.00	12.00	18.81	19.72	42.81	

NOTE: The total runoff intercepted by the inlet at the low point in the road is:

Q(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)].

THE 100 YR STORM EVENT = 7.03 CFS at the sump condition

THE 2 x 100 YR STORM EVENT = 14.06 CFS at the sump condition

C-7

APPENDIX D

POND ANALYSIS

Detention Pond Volume Calculations

NOTE: Blue shaded cells require user input, all other cells should not be edited.
ASSUMPTIONS:
1. Area less than 40 acres (simplified hydrograph method).
2. 100-year, 6-hour storm event

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

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

Basin Name :
Choose Zone (1 - 4) 4
Basin Area = (acres) 25.06

Exist Conditions				Proposed Conditions			
Treatment	Percentage	Area	Q (cfs)	Treatment	Percentage	Area	Q (cfs)
A	97.0%	24.31	31.36	A	0.0%	0.00	0.00
B	0.0%	0.00	0.00	B	25.4%	6.37	12.92
C	3.0%	0.75	2.16	C	24.3%	6.08	17.45
D	0.0%	0.00	0.00	D	50.4%	12.62	55.14
		Q Peak - exist.=	**33.52**			Peak Q Developed=	**69.00**

Use my calculated exist cond. flow as the peak controlled discharge (1 = yes, or N) ?? n
If No, what is the maximum allowable discharge ? 41.4

Excess Precipitation - DPM Section 22.2 Table A-8

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

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

%A x E = 0.00
%B x E = 0.17
%C x E = 0.24
%D x E = 0.99
Avg E(in) = 1.40

Determine Tb (hours)

Tb = 0.947

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

Tc = 0.2

Determine Tp and Duration of Peak (hours)

Tp = 0.231375
Peak Duration = 0.125875

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

Time to Control Q (hrs) = 0.139
Time to end of Control Q (hrs)= 0.593243
Duration of Control Q (hrs)= 0.454

Required Detention Volume (CF) = 28829

Required Detention Volume (ACRE-CF) = 0.66046

Grid Volume Report

Original Surface: 00192pondtop
Design Surface: 00192pond

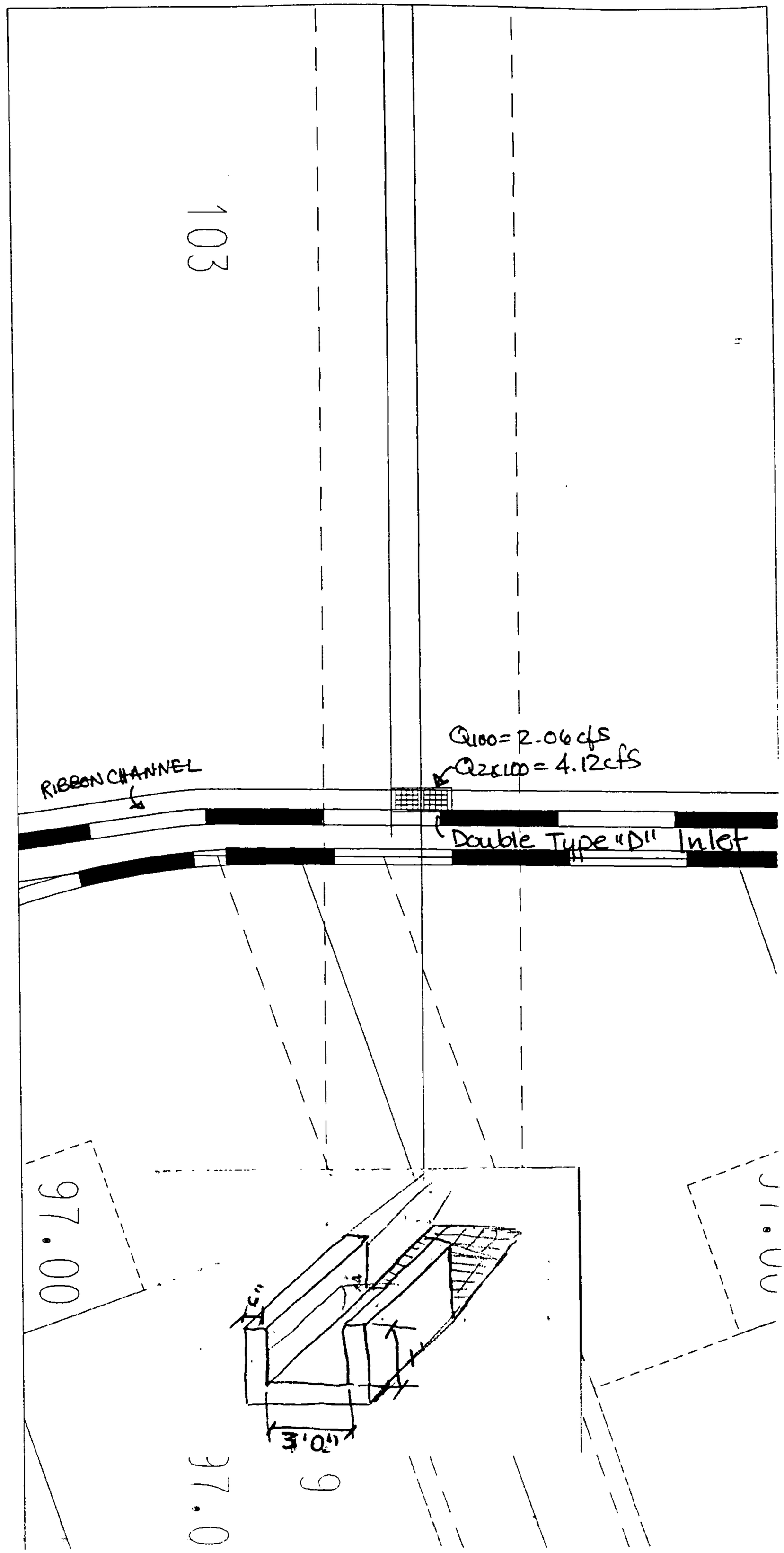
Ignore
Cut Factor: 1.0000
Fill Factor: 1.0000
Grid Interval: 5.0000

Cut: 79374.2017 cu ft → 1.82 Ac-ft
Fill: 25200.6627 cu ft
Net: 54173.5389 cu ft

Cut: 2939.7852 cu yd
Fill: 933.3579 cu yd
Net: 2006.4274 cu yd

APPENDIX E

RIBBON CHANNEL


103
Q100 = 2.06 cfs
Q2&100 = 4.12cfs
RIBBON CHANNEL
Double Type "D" Inlet
97.00
6"
3'0"
37.0
9
101.00

E-1

ANALYSIS OF AN INLET IN A SUMP CONDITION - **Ribbon Channel East of Lots on East side of Song Sparrow**

INLET TYPE: Double Grate Type "D" with curb opening wings on both sides on inlet.

WEIR: Q=C*L*H^1.5

Wing opening

C= 3.0

L= 4.0 ft

Q=3.0(4.0')H**1.5= 12.0H**1.5

Q=C*A*(2*G*H)**0.5

Wing opening

C=0.6

A=2.0 sf

Q=1.2*(64.4*H)^0.5

	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	Flow at "D" inlet orifice control on grate analysis
	0.10	0.10	0.85	12.47	Q(100 yr) = 2.03 cfs is provided at this depth
	0.20	0.20	2.40	17.64	Q(2x100 yr) = 4.06 cfs is provided at this depth
	0.30	0.30	4.41	21.60	
	0.40	0.40	6.78	24.94	
	0.50	0.50	9.48	27.88	
	0.60	0.60	12.46	30.55	
TOP OF CURB	0.70	0.70	15.71	32.99	
	0.80	0.80	19.19	35.27	
	0.90	0.90	22.90	37.41	
ROW LIMIT	1.00	1.00	26.82	39.43	

NOTE: The total runoff intercepted by the inlet at the low point in the road is:

Qr(100) = 2*[(runoff of the wing opening) + (the lesser of the weir or orifice amount taken by the double grate)].

THE 100 YR STORM EVENT = 2.03 CFS at the sump condition

THE 2 x 100 YR STORM EVENT = 4.06 at the sump condition

E-2

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

Ribbon Channel @ S=0.50%

MANNING'S N= .017 SLOPE= .005

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	1.00	4	3.00	0.00	7	0.00	0.00
2	0.50	1.00	5	3.00	1.00	8	0.00	0.00
3	0.50	0.00	6	3.50	1.00	9	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.05	0.05	0.13	0.1	2.60	0.82	2.50	0.01	0.06
0.10	0.10	0.25	0.3	2.70	1.27	2.50	0.02	0.12
0.15	0.15	0.38	0.6	2.80	1.62	2.50	0.04	0.19
0.20	0.20	0.50	1.0	2.90	1.91	2.50	0.06	0.26
0.25	0.25	0.63	1.4	3.00	2.17	2.50	0.07	0.32
0.30	0.30	0.75	1.8	3.10	2.40	2.50	0.09	0.39
0.35	0.35	0.88	2.3	3.20	2.60	2.50	0.11	0.46
0.40	0.40	1.00	2.8	3.30	2.79	2.50	0.12	0.52
0.45	0.45	1.13	3.3	3.40	2.96	2.50	0.14	0.59
0.50	0.50	1.25	3.9	3.50	3.11	2.50	0.15	0.65
0.55	0.55	1.38	4.5	3.60	3.25	2.50	0.16	0.71
0.60	0.60	1.50	5.1	3.70	3.39	2.50	0.18	0.78
0.65	0.65	1.63	5.7	3.80	3.51	2.50	0.19	0.84
0.70	0.70	1.75	6.3	3.90	3.62	2.50	0.20	0.90
0.75	0.75	1.88	7.0	4.00	3.73	2.50	0.22	0.97
0.80	0.80	2.00	7.7	4.10	3.83	2.50	0.23	1.03
0.85	0.85	2.13	8.3	4.20	3.92	2.50	0.24	1.09
0.90	0.90	2.25	9.0	4.30	4.01	2.50	0.25	1.15
0.95	0.95	2.38	9.7	4.40	4.10	2.50	0.26	1.21
1.00	1.00	2.50	10.4	4.50	4.18	3.50	0.27	1.27

= 2.03 cfs

APPENDIX F

STORM DRAIN ANALYSIS

48" @ 0.5%

CULVERT RATING TABLE

48. INCH DIAMETER PIPE

N = 0.01300 INCREMENT = 0.50 SLOPE = 0.00500

FLOW DEPTH (IN)	FLOW AREA (SQ FT)	DISCHARGE (CFS)	VELOCITY (FPS)
0.50000	0.02260	0.01670	0.73883
1.00000	0.06374	0.07452	1.16911
1.50000	0.11673	0.17825	1.52695
2.00000	0.17915	0.33030	1.84365
2.50000	0.24957	0.53214	2.13223
3.00000	0.32701	0.78472	2.39970
3.50000	0.41073	1.08861	2.65041
4.00000	0.50017	1.44412	2.88727
4.50000	0.59484	1.85138	3.11237
5.00000	0.69437	2.31033	3.32725
5.50000	0.79839	2.82081	3.53313
6.00000	0.90662	3.38253	3.73093
6.50000	1.01879	3.99511	3.92144
7.00000	1.13465	4.65809	4.10529
7.50000	1.25401	5.37092	4.28300
8.00000	1.37665	6.13301	4.45501
8.50000	1.50240	6.94370	4.62173
9.00000	1.63109	7.80227	4.78346
9.50000	1.76256	8.70796	4.94051
10.00000	1.89666	9.65994	5.09312
10.50000	2.03326	10.65740	5.24153
11.00000	2.17222	11.69940	5.38592
11.50000	2.31342	12.78504	5.52647
12.00000	2.45673	13.91335	5.66335
12.50000	2.60206	15.08333	5.79670
13.00000	2.74927	16.29395	5.92664
13.50000	2.89828	17.54414	6.05329
14.00000	3.04898	18.83283	6.17676
14.50000	3.20127	20.15888	6.29715
15.00000	3.35506	21.52117	6.41455
15.50000	3.51025	22.91851	6.52903
16.00000	3.66675	24.34972	6.64068
16.50000	3.82449	25.81357	6.74955
17.00000	3.98336	27.30881	6.85572
17.50000	4.14330	28.83418	6.95923
18.00000	4.30421	30.38837	7.06015
18.50000	4.46602	31.97008	7.15852
19.00000	4.62865	33.57796	7.25438
19.50000	4.79201	35.21067	7.34778
20.00000	4.95604	36.86679	7.43875
20.50000	5.12066	38.54494	7.52734
21.00000	5.28579	40.24367	7.61356
21.50000	5.45135	41.96154	7.69745
22.00000	5.61728	43.69707	7.77904
22.50000	5.78350	45.44876	7.85835
23.00000	5.94994	47.21510	7.93539
FLOW DEPTH (IN)	FLOW AREA (SQ FT)	DISCHARGE (CFS)	VELOCITY (FPS)

23.50000	6.11652	48.99452	8.01019
24.00000	6.28318	50.78545	8.08277
24.50000	6.44983	52.58632	8.15313
25.00000	6.61641	54.39550	8.22130
25.50000	6.78285	56.21132	8.28727
26.00000	6.94907	58.03212	8.35106
26.50000	7.11500	59.85622	8.41268
27.00000	7.28057	61.68187	8.47212
27.50000	7.44570	63.50729	8.52940
28.00000	7.61031	65.33073	8.58450
28.50000	7.77434	67.15033	8.63743
29.00000	7.93771	68.96426	8.68818
29.50000	8.10034	70.77061	8.73675
30.00000	8.26215	72.56744	8.78312
30.50000	8.42306	74.35281	8.82729
31.00000	8.58300	76.12468	8.86924
31.50000	8.74187	77.88101	8.90896
32.00000	8.89961	79.61965	8.94642
32.50000	9.05612	81.33849	8.98161
33.00000	9.21131	83.03528	9.01449
33.50000	9.36509	84.70774	9.04505
34.00000	9.51738	86.35355	9.07325
34.50000	9.66808	87.97025	9.09904
35.00000	9.81709	89.55538	9.12240
35.50000	9.96431	91.10632	9.14327
36.00000	10.10963	92.62039	9.16160
36.50000	10.25295	94.09479	9.17734
37.00000	10.39414	95.52662	9.19043
37.50000	10.53310	96.91277	9.20078
38.00000	10.66970	98.25004	9.20832
38.50000	10.80380	99.53501	9.21296
39.00000	10.93527	100.76410	9.21459
39.50000	11.06396	101.93339	9.21310
40.00000	11.18971	103.03875	9.20835
40.50000	11.31236	104.07568	9.20018
41.00000	11.43171	105.03925	9.18841
41.50000	11.54758	105.92402	9.17283
42.00000	11.65975	106.72392	9.15319
42.50000	11.76798	107.43212	9.12919
43.00000	11.87200	108.04067	9.10046
43.50000	11.97152	108.54033	9.06655
44.00000	12.06620	108.91998	9.02687
44.50000	12.15563	109.16583	8.98068
45.00000	12.23936	109.26022	8.92696
45.50000	12.31679	109.17947	8.86428
46.00000	12.38721	108.88951	8.79048
46.50000	12.44963	108.33668	8.70200
47.00000	12.50262	107.42326	8.59206
47.50000	12.54376	105.91371	8.44354
48.00000	12.56637	101.57108	8.08277

Reach 1

Q_{100} = 92.3 cfs
Depth = 35.9 in

48" @ 1%

CULVERT RATING TABLE

48. INCH DIAMETER PIPE

N = 0.01300 INCREMENT = 0.50 SLOPE = 0.01000

FLOW DEPTH (IN)	FLOW AREA (SQ FT)	DISCHARGE (CFS)	VELOCITY (FPS)
0.50000	0.02260	0.02362	1.04486
1.00000	0.06374	0.10539	1.65338
1.50000	0.11673	0.25208	2.15943
2.00000	0.17915	0.46711	2.60731
2.50000	0.24957	0.75256	3.01543
3.00000	0.32701	1.10976	3.39369
3.50000	0.41073	1.53952	3.74825
4.00000	0.50017	2.04229	4.08322
4.50000	0.59484	2.61824	4.40156
5.00000	0.69437	3.26730	4.70545
5.50000	0.79839	3.98923	4.99660
6.00000	0.90662	4.78362	5.27634
6.50000	1.01879	5.64994	5.54576
7.00000	1.13465	6.58753	5.80576
7.50000	1.25401	7.59563	6.05707
8.00000	1.37665	8.67339	6.30034
8.50000	1.50240	9.81988	6.53611
9.00000	1.63109	11.03407	6.76484
9.50000	1.76256	12.31491	6.98694
10.00000	1.89666	13.66123	7.20277
10.50000	2.03326	15.07184	7.41264
11.00000	2.17222	16.54545	7.61684
11.50000	2.31342	18.08078	7.81561
12.00000	2.45673	19.67645	8.00919
12.50000	2.60206	21.33105	8.19777
13.00000	2.74927	23.04312	8.38153
13.50000	2.89828	24.81116	8.56065
14.00000	3.04898	26.63364	8.73526
14.50000	3.20127	28.50897	8.90552
15.00000	3.35506	30.43553	9.07154
15.50000	3.51025	32.41168	9.23345
16.00000	3.66675	34.43571	9.39134
16.50000	3.82449	36.50591	9.54531
17.00000	3.98336	38.62049	9.69545
17.50000	4.14330	40.77769	9.84184
18.00000	4.30421	42.97565	9.98456
18.50000	4.46602	45.21252	10.12367
19.00000	4.62865	47.48642	10.25924
19.50000	4.79201	49.79541	10.39133
20.00000	4.95604	52.13752	10.51999
20.50000	5.12066	54.51078	10.64526
21.00000	5.28579	56.91315	10.76720
21.50000	5.45135	59.34259	10.88585
22.00000	5.61728	61.79700	11.00123
22.50000	5.78350	64.27427	11.11338
23.00000	5.94994	66.77224	11.22234
FLOW DEPTH (IN)	FLOW AREA (SQ FT)	DISCHARGE (CFS)	VELOCITY (FPS)

F-3

23.50000	6.11652	69.28872	11.32812
24.00000	6.28318	71.82148	11.43076
24.50000	6.44983	74.36829	11.53027
25.00000	6.61641	76.92686	11.62667
25.50000	6.78285	79.49482	11.71997
26.00000	6.94907	82.06982	11.81018
26.50000	7.11500	84.64948	11.89732
27.00000	7.28057	87.23133	11.98139
27.50000	7.44570	89.81288	12.06239
28.00000	7.61031	92.39160	12.14032
28.50000	7.77434	94.96491	12.21517
29.00000	7.93771	97.53020	12.28694
29.50000	8.10034	100.08476	12.35563
30.00000	8.26215	102.62587	12.42121
30.50000	8.42306	105.15076	12.48368
31.00000	8.58300	107.65657	12.54301
31.50000	8.74187	110.14039	12.59917
32.00000	8.89961	112.59921	12.65215
32.50000	9.05612	115.03001	12.70192
33.00000	9.21131	117.42962	12.74842
33.50000	9.36509	119.79485	12.79163
34.00000	9.51738	122.12238	12.83151
34.50000	9.66808	124.40874	12.86799
35.00000	9.81709	126.65044	12.90102
35.50000	9.96431	128.84381	12.93053
36.00000	10.10963	130.98503	12.95646
36.50000	10.25295	133.07013	12.97872
37.00000	10.39414	135.09505	12.99723
37.50000	10.53310	137.05537	13.01187
38.00000	10.66970	138.94655	13.02254
38.50000	10.80380	140.76378	13.02909
39.00000	10.93527	142.50197	13.03140
39.50000	11.06396	144.15559	13.02929
40.00000	11.18971	145.71881	13.02257
40.50000	11.31236	147.18524	13.01102
41.00000	11.43171	148.54793	12.99438
41.50000	11.54758	149.79919	12.97235
42.00000	11.65975	150.93044	12.94457
42.50000	11.76798	151.93198	12.91063
43.00000	11.87200	152.79259	12.87000
43.50000	11.97152	153.49922	12.82203
44.00000	12.06620	154.03613	12.76592
44.50000	12.15563	154.38380	12.70060
45.00000	12.23936	154.51730	12.62463
45.50000	12.31679	154.40312	12.53598
46.00000	12.38721	153.99304	12.43161
46.50000	12.44963	153.21121	12.30649
47.00000	12.50262	151.91943	12.15101
47.50000	12.54376	149.78462	11.94097
48.00000	12.56637	143.64320	11.43077

Reach 2
Q_{100} = 140.71 cfs
d = 38.48 in

Reach 4
Q_{100} = 147.77 cfs
d = 40.71 in

18" @ 3%

CULVERT RATING TABLE

18. INCH DIAMETER PIPE

N = 0.01300 INCREMENT = 0.50 SLOPE = 0.03000

FLOW DEPTH (IN)	FLOW AREA (SQ FT)	DISCHARGE (CFS)	VELOCITY (FPS)
0.50000	0.01377	0.02479	1.80011
1.00000	0.03862	0.10939	2.83223
1.50000	0.07034	0.25868	3.67777
2.00000	0.10733	0.47378	4.41423
2.50000	0.14864	0.75422	5.07405
3.00000	0.19359	1.09858	5.67474
3.50000	0.24166	1.50482	6.22711
4.00000	0.29240	1.97036	6.73845
4.50000	0.34548	2.49224	7.21390
5.00000	0.40056	3.06719	7.65728
5.50000	0.45736	3.69161	8.07149
6.00000	0.51564	4.36167	8.45880
6.50000	0.57514	5.07329	8.82099
7.00000	0.63565	5.82218	9.15947
7.50000	0.69694	6.60381	9.47538
8.00000	0.75883	7.41348	9.76962
8.50000	0.82110	8.24626	10.04288
9.00000	0.88357	9.09701	10.29572
9.50000	0.94604	9.96039	10.52851
10.00000	1.00831	10.83081	10.74150
10.50000	1.07020	11.70245	10.93481
11.00000	1.13150	12.56919	11.10843
11.50000	1.19201	13.42462	11.26221
12.00000	1.25151	14.26196	11.39583
12.50000	1.30978	15.07402	11.50882
13.00000	1.36659	15.85307	11.60049
13.50000	1.42167	16.59073	11.66992
14.00000	1.47474	17.27778	11.71582
14.50000	1.52549	17.90385	11.73647
15.00000	1.57355	18.45693	11.72946
15.50000	1.61850	18.92256	11.69140
16.00000	1.65981	19.28229	11.61714
16.50000	1.69681	19.51041	11.49830
17.00000	1.72852	19.56554	11.31923
17.50000	1.75337	19.35985	11.04149
18.00000	1.76715	18.19403	10.29572

Reach 3

Q100 = 7.06 cfs

d = 7.79 in

F-5

18" @ 3.5%

CULVERT RATING TABLE

18. INCH DIAMETER PIPE

N = 0.01300 INCREMENT = 0.50 SLOPE = 0.03500

FLOW DEPTH (IN)	FLOW AREA (SQ FT)	DISCHARGE (CFS)	VELOCITY (FPS)
0.50000	0.01377	0.02678	1.94434
1.00000	0.03862	0.11815	3.05916
1.50000	0.07034	0.27941	3.97244
2.00000	0.10733	0.51174	4.76792
2.50000	0.14864	0.81465	5.48060
3.00000	0.19359	1.18660	6.12941
3.50000	0.24166	1.62539	6.72605
4.00000	0.29240	2.12823	7.27836
4.50000	0.34548	2.69193	7.79190
5.00000	0.40056	3.31294	8.27080
5.50000	0.45736	3.98740	8.71821
6.00000	0.51564	4.71114	9.13655
6.50000	0.57514	5.47978	9.52776
7.00000	0.63565	6.28867	9.89336
7.50000	0.69694	7.13293	10.23458
8.00000	0.75883	8.00747	10.55240
8.50000	0.82110	8.90698	10.84756
9.00000	0.88357	9.82590	11.12065
9.50000	0.94604	10.75845	11.37209
10.00000	1.00831	11.69862	11.60215
10.50000	1.07020	12.64009	11.81095
11.00000	1.13150	13.57627	11.99848
11.50000	1.19201	14.50025	12.16458
12.00000	1.25151	15.40468	12.30890
12.50000	1.30978	16.28181	12.43095
13.00000	1.36659	17.12327	12.52997
13.50000	1.42167	17.92004	12.60495
14.00000	1.47474	18.66214	12.65453
14.50000	1.52549	19.33837	12.67683
15.00000	1.57355	19.93576	12.66927
15.50000	1.61850	20.43870	12.62815
16.00000	1.65981	20.82726	12.54794
16.50000	1.69681	21.07365	12.41959
17.00000	1.72852	21.13320	12.22616
17.50000	1.75337	20.91103	11.92618
18.00000	1.76715	19.65180	11.12065

F-6

Exhibits

EXHIBITS

EXHIBIT 1:	BULK LAND PLAT
EXHIBIT 2:	PRELIMINARY PLAT
EXHIBIT 3:	EXISTING DRAINAGE BASIN MAP
EXHIBIT 4:	PROPOSED DRAINAGE BASIN MAP
EXHIBIT 5:	PROPOSED ON-SITE BASIN MAP
EXHIBIT 6:	GRADING AND DRAINAGE PLAN

EXHIBIT 1

BULK LAND PLAT

EXHIBIT 2

PRELIMINARY PLAT

EXHIBIT 3

EXISTING DRAINAGE BASIN MAP

EXHIBIT 4

PROPOSED DRAINAGE BASIN MAP

EXHIBIT 5

PROPOSED ON-SITE BASIN MAP

EXHIBIT 6

GRADING AND DRAINAGE PLAN

BOHANNAN HUSTON, INC.

Courtyard One

7500 JEFFERSON NE

Albuquerque

NM 87109-4335

voice 505.823.1000

fax 505.821.0892

SUSAN 11/3

THESE ARE THE EXTRA SHEETS THAT YOU ASKED FOR. I DID NOT log the submittal in AGAIN.

— WHITNEY

FOR OXBOW PARK G-11 / D014C

DRB Case No. 99-292
DRC Project No.
Date Preliminary Plat Approved
Date Preliminary Plat Expires

Figure 12

INFRASTRUCTURE LIST

EXHIBIT "A"
TO SUBDIVISION IMPROVEMENTS AGREEMENT
DEVELOPMENT REVIEW BOARD (D.R.B.) REQUIRED INFRASTRUCTURE LIST

THE OXBOW PARK AND OXBOW VILLAGE
(TRACTS B & E, OXBOW SUBDIVISION)

Following is a summary of Public/Private Infrastructure required to be constructed or financially guaranteed for the above development. This listing is not necessarily a complete listing. During the SIA process and/or in the review of the construction drawings, if the DRB Chair determines that appurtenant items and/or unforeseen items have not been included in the infrastructure listing, the DRC Chair may include those items in the listing and related financial guarantee. Likewise, if the DRC Chair determines that appurtenant or non-essential items can be deleted from the listing, those items may be deleted as well as the related portions of the financial guarantees. All such revisions require approval by the DRC Chair, the User Department and agent/owner. If such approvals are obtained, these revisions to the listing will be incorporated administratively. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility will be required as a condition of project acceptance and close out by the City.

Size	Type Improvement	Location	From	To
UNIT 1 – OXBOW VILLAGE				
PRIVATE ROADWAY IMPROVEMENTS – (OXBOW VILLAGE)				
22' F-F/ IN 22' F-F/ OUT	RESIDENTIAL PAVING W/ PCC MNTBL MEDIAN CURB & ROLL OR STD CURB ON BOTH SIDES & A 4' WIDE W/ PCC SIDEWALK ON THE WEST SIDE*	OXBOW VILLAGE LANE	OXBOW DRIVE	TRANSITION FROM DIVIDED ENTRANCE TO 28' F-F
28' F-F	RESIDENTIAL PAVING W/ PCC STD OR MNTBL ROLL CURB ON BOTH SIDES & A PCC 4' WIDE SIDEWALK ON THE WEST SIDE*	OXBOW VILLAGE LANE	TRANSITION FROM DIVIDED ENTRANCE TO 28' F-F	SOUTH CUL-DE-SAC TERMINUS
24' F-F	RESIDENTIAL PAVING W/ PCC STD OR MNTBL ROLL CURB ON BOTH SIDES; NO SIDEWALK	OXBOW VILLAGE LANE STUB STREET	S. CUL-DE-SAC TERMINUS	SOUTH END OF STUB STREET

*SIDEWALKS TO BE DEFERRED

PUBLIC DRAINAGE IMPROVEMENTS- (OXBOW VILLAGE)

48" DIA	RCP W/ NEC. MANHOLES & INLETS	PUBLIC EASEMENT BTWN LOTS 27 & 28	EAST BOUNDARY	OXBOW VILLAGE LANE
48" DIA	RCP W/ NEC. MANHOLES & INLETS	OXBOW VILLAGE LANE (PBLIC ESMNT)	PUBLIC EASEMENT BTWN LOT 27 & 28	PUBLIC ESMNT BTWN LOTS 8 & 9
48" DIA	RCP W/ NEC. MANHOLES & INLETS	PUBLIC EASEMENT BTWN LOTS 8 & 9	OXBOW VILLAGE LANE	TRACT E-1

CONSTRUCTION OF A PCC RIBBON CHANNEL ALONG THE EASTERN BOUNDARY. GRADING AND DRAINAGE CERTIFICATION OF OXBOW VILLAGE IS REQUIRED PRIOR TO RELEASE OF FINANCIAL GUARANTY'S.

PUBLIC SANITARY SEWER IMPROVEMENTS – (OXBOW VILLAGE)

8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OXBOW VILLAGE LANE (PUBLIC EASEMENT)	PUBLIC ESMNT BTWN LOTS 27 & 28	NORTH ENTRANCE
8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OXBOW VILLAGE LANE STUB STREET (PUBLIC EASEMENT)	S. CUL-DE-SAC TERMINUS	SOUTH END OF STUB STREET

Size	Type Improvement	Location	From	To
PUBLIC WATERLINE IMPROVEMENTS – (OXBOW VILLAGE)				
6" DIA	WATER LINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OXBOW VILLAGE LANE (PBLIC ESMNT)	PUBLIC EASEMENT BTWN LOTS 27 & 28	LOT 1
8" DIA	WATER LINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OXBOW VILLAGE LANE (PBLIC ESMNT)	PUBLIC EASEMENT BTWN LOTS 27 & 28	PUBLIC ESMNT BTWN LOTS 16 & 17
6" DIA	WATER LINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OXBOW VILLAGE LANE STUB STREET (PUBLIC EASEMENT)	PUBLIC EASEMENT BTWN LOTS 16 & 17	SOUTH END OF STUB STREET
8" DIA	WATER LINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	PUBLIC EASEMENT BTWN LOTS 16 & 17	S. CUL-DE-SAC TERMINUS	ALAMOGORDO DRIVE
8" DIA	WATER LINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	PUBLIC EASEMENT BTWN LOTS 27 & 28	OXBOW VILLAGE LANE (PBLIC ESMNT)	MOURNING DOVE PLACE (OXBOW BLUFF SUBDVSN)
UNIT 2 – OXBOW PARK				
PUBLIC ROADWAY IMPROVEMENTS – (OXBOW PARK)				
22' F-F/ IN 22' F-F/ OUT	RESIDENTIAL PAVING W/ PCC MNTBL MEDIAN CURB & ROLL OR STD CURB ON BOTH SIDES & A 4' WIDE W/ PCC SIDEWALK ON ONE SIDE	ALAMOGORDO DRIVE	OXBOW DRIVE	TRANSITION TO 16' F-F EACH DIRECTION W/ 3" MNTBL MEDIAN
16' F-F EAST BND 16' F-F WEST BND	RESIDENTIAL PAVING W/ 3: PCC MNTBL MEDIAN & ROLL OR STD CURB ON BOTH SIDES & A 4' WIDE W/ PCC SIDEWALK ON ONE SIDE*	ALAMOGORDO DRIVE	TRANSITION FROM ENTRANCE TO OXBOW DRIVE	SOUTHERN TRACT BDRY
32' F-F	RESIDENTIAL PAVING W/ PCC STD OR MNTBL ROLL CURB ON BOTH SIDES & A PCC 4' WIDE SIDEWALK ON ONE SIDE	HOLLYLEAF ROAD	ALAMOGORDO DRIVE	TUNDRA SWAN COURT
28' F-F	RESIDENTIAL PAVING W/ PCC STD OR MNTBL ROLL CURB ON BOTH SIDES & A 4' WIDE SIDEWALK ON ONE SIDE*	TUNDRA SWAN COURT	S. CUL-DE-SAC TERMINUS	N. CUL-DE-SAC TERMINUS
28' F-F	RESIDENTIAL PAVING W/ PCC STD OR MNTBL ROLL CURB ON BOTH SIDES & A 4' WIDE SIDEWALK ON ONE SIDE*	PINON JAY COURT	S. CUL-DE-SAC TERMINUS	N. CUL-DE-SAC TERMINUS
28' F-F	RESIDENTIAL PAVING W/ PCC STD OR MNTBL ROLL CURB ON BOTH SIDES & A 4' WIDE SIDEWALK ON ONE SIDE*	DESERT SAGE COURT	HOLLYLEAF ROAD	N. CUL-DE-SAC TERMINUS
28' F-F	RESIDENTIAL PAVING W/ PCC STD OR MNTBL ROLL CURB ON BOTH SIDES & A 4' WIDE SIDEWALK ON ONE SIDE*	ROCK DAISY COURT	S. CUL-DE-SAC TERMINUS	STAR LILLY ROAD
28' F-F	RESIDENTIAL PAVING W/ PCC STD OR MNTBL ROLL CURB ON BOTH SIDES & A 4' WIDE SIDEWALK ON ONE SIDE*	STAR LILLY ROAD	TUNDRA SWAN COURT	PINON JAY COURT

*SIDEWALKS TO BE DEFERRED;
STREET LIGHTS PER THE COA DPM

Size	Type Improvement	Location	From	To
PUBLIC ROADWAY IMPROVEMENTS – (OXBOW PARK)				
25' F-F/ E.BND 16' MEDIAN 25' F-F/ W.BND	**ARTERIAL PAVING W/ PCC MNTBL MEDIAN CURB & ROLL OR STD CURB ON BOTH SIDES & A 4' WIDE W/ PCC SIDEWALK ON THE SOUTH SIDE	ST. JOSEPH'S DRIVE	COORS BOULEVARD	OXBOW DRIVE

**The developer is responsible for the necessary intersection improvements at St. Joseph's Drive and Coors Boulevard that will accommodate the widening of St. Joseph's Drive east of Coors Boulevard. This includes: 1) a northbound deceleration lane on Coors Blvd with a right turn lane eastbound onto St. Joseph's Drive; 2) a right turn lane on westbound St. Joseph's Drive for northbound Coors Blvd.; 3) the necessary signal improvements to accommodate items 1) and 2) above.

PUBLIC SANITARY SEWER IMPROVEMENTS – (OXBOW PARK)				
8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	ALAMOGORDO DRIVE	LOT 1	SOUTHERN TRACT BDRY
8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	HOLLYLEAF ROAD	ALAMOGORDO DRIVE	DESERT SAGE COURT
8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	TUNDRA SWAN COURT	S. CUL-DE-SAC TERMINUS	N. CUL-DE-SAC TERMINUS
8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	PINON JAY COURT	S. CUL-DE-SAC TERMINUS	N. CUL-DE-SAC TERMINUS
8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	DESERT SAGE COURT	HOLLYLEAF ROAD	N. CUL-DE-SAC TERMINUS
8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	ROCK DAISY COURT	S. CUL-DE-SAC TERMINUS	STAR LILLY ROAD
8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	STAR LILLY ROAD	TUNDRA SWAN COURT	PINON JAY COURT
8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	PUBLIC EASEMENT (TRACT B-4)	TUNDRA SWAN COURT	TRACT B-1
8" DIA	SANITARY SEWER REMOVAL	ALAMOGORDO DRIVE	OXBOW DRIVE	SOUTH TRACT BDRY
PUBLIC WATERLINE IMPROVEMENTS – (OXBOW PARK)				
8" DIA	WATER LINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	ALAMOGORDO DRIVE	OXBOW DRIVE	TUCSON DRIVE
8" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	PUBLIC EASEMENT (LOT 11)	ALAMOGORDO DRIVE	OXBOW VILLAGE SUBDIVISION
6" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	HOLLYLEAF ROAD	TUNDRA SWAN COURT	DESERT SAGE COURT
6" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	TUNDRA SWAN COURT	STAR LILLY ROAD	ST. JOSEPH'S DRIVE
4" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	TUNDRA SWAN COURT	S. CUL-DE-SAC TERMINUS	STAR LILLY ROAD
6" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	PINON JAY COURT	STAR LILLY ROAD	ST. JOSEPH'S DRIVE
4" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	PINON JAY COURT	S. CUL-DE-SAC TERMINUS	STAR LILLY ROAD
6" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	DESERT SAGE COURT	HOLLYLEAF ROAD	ST. JOSEPH'S DRIVE

Size	Type Improvement	Location	From	To
PUBLIC WATERLINE IMPROVEMENTS – (OXBOW PARK)				
4" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	ROCK DAISY COURT	S. CUL-DE-SAC TERMINUS	STAR LILLY ROAD
6" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	STAR LILLY ROAD	TUNDRA SWAN COURT	PINON JAY COURT
8" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	PUBLIC EASEMENT (TRACT B-4)	TUNDRA SWAN COURT	TRACT B-1
8" DIA	WATER LINE W/ NEC. VALVES NEC. MH'S & SERVICES	ST. JOSEPH'S DRIVE (~300 LF)	WEST ENTRANCE TO ST. PIUS X H.S.	EAST ENTRANCE TO ST. PIUS X HS
PUBLIC DRAINAGE IMPROVEMENTS – (OXBOW PARK)				
48" DIA	RCP W/ NEC. MANHOLES & INLETS	PUBLIC EASEMENT BTWN LOTS 103 & 104	SUBD (TRACT E-1) EAST BOUNDARY	ALAMOGORDO DRIVE
24" DIA	RCP W/ NEC. MANHOLES & INLETS	ALAMOGORDO DRIVE	HOLLYLEAF ROAD	SOUTHERN TRACT BDRY
48" DIA	RCP W/ NEC. MANHOLES & INLETS	HOLLYLEAF ROAD	ALAMOGORDO DRIVE	TUNDRA SWAN COURT
48" DIA	RCP W/ NEC. MANHOLES & INLETS	PUBLIC EASMENT (TRACT B-4)	TRACT B-1	TUNDRA SWAN COURT

CONSTRUCTION PERMANENT DETENTION POND W/IN PRIVATE PARK (TRACT B-3). GRADING AND DRAINAGE CERTIFICATION OF OXBOW PARK IS REQUIRED PRIOR TO RELEASE OF FINANCIAL GUARANTY'S.

Prepared by: Kevin Patton 10/27/99
Print Name: Kevin Patton, P.E.
Firm: Bohannan-Huston, Inc.

****

Development Review Board Member Approval

Traffic Date

Water Date

CIP Date

City Engineer/AMAFCA Date

DRB Chair Date

DRC REVISIONS

REVISIONS	DATE	DRC CHAIR	USER DEPT	AGENT/OWNER
1				
2				

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

December 12, 2000

Kevin Patton, PE
Bohannan Huston, Inc
7500 Jefferson NE
Albuquerque, NM 87109

Re: Grading and Drainage Certification – Oxbow Park (G-11/D014C),
Engineer's Stamp dated 11-2-1999
Engineering Certification dated 12-11-2000

Dear Mr. Patton:

Based upon the information provided in your submittal dated 12-12-2000, Engineering Certification for the above referenced subdivision is approved for Release of Financial Guaranty.

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

Sincerely,

Bradley L. Bingham, PE
Hydrology Review Engineer

C: Arlene Portillo, PWD – #628881
file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Oxbow Park ZONE MAP/DRG. FILE #: G11/D14 C
DRB #: 99-293 EPC#: WORK ORDER#: 628981

LEGAL DESCRIPTION: Oxbow Park
CITY ADDRESS:

ENGINEERING FIRM: Bohannan Huston CONTACT: Kevin Patton
ADDRESS: Courtyard I 7500 Jefferson Street PHONE: 823-1000
CITY, STATE: Albuq NM ZIP CODE: 87109

OWNER: Albuq West CONTACT: Tom Kelleher
ADDRESS: PHONE: 346-4646
CITY, STATE: ZIP CODE:

ARCHITECT: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: CONTACT:
ADDRESS PHONE:
CITY, STATE: ZIP CODE:

CONTRACTOR: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

TYPE OF SUBMITTAL:
- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN
- ____ CONCEPTUAL GRADING & DRAINAGE PLAN
- ____ GRADING PLAN
- ____ EROSION CONTROL PLAN
- X ENGINEER'S CERTIFICATION
- ____ CLOMR/LOMR
- ____ OTHER

WAS A PRE-DESIGN CONFERENCE ATTENDED:
- ____ YES
- ____ NO
- ____ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:
- X 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 APPROVAL
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ WORK ORDER APPROVAL
- ____ OTHER (SPECIFY)

DATE SUBMITTED: BY:

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.

RECEIVED
DEC 12 2000
HYDROLOGY SECTION

December 12, 2000

BOHANNAN-HUSTON, INC.

Courtyard One

7500 JEFFERSON NE

Albuquerque

NM 87109-4335

voice 505.823.1000

fax 505.821.0892

Brad Bingham, P.E.
Hydrology Section
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

14C 14B

Re: Engineer's Certification for Oxbow Park and Oxbow Village
(COA Project No. 628981-Oxbow Park; 628881-Oxbow Village; ~~626881 St. Joseph's Widening~~ OFFSITE
DRB 99-293; COA Drainage File No. G11/D14)

Dear Brad:

The purpose of this letter is to provide you with a copy of the Engineer's Drainage Certification for the above referenced property. I am enclosing a copy of the As Built Grading and Drainage Plan certifying that it is in substantial compliance with the DRB-Approved Grading and Drainage Plan.

The work order set of construction plans have been approved and accepted by the City of Albuquerque. I have enclosed copies of the infrastructure approval and acceptance letters from the city for your file.

The financial guarantee for this project expired November 7, 2000. The last day for the city to call on the guarantee is January 7, 2001. As you can see, it is very important that we expedite this request so that we can move forward with its release.

If you have any questions or require further information, please give me a call.

Sincerely,
Bohannan Huston, Inc.

Kevin Patton

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

RECEIVED
DEC 12 2000
HYDROLOGY SECTION

KP/am
Enclosures

cc: Tom Keleher, Altura West Ltd. Co. (w/ enclosures)
Jim Rogers, Commercial Investment (w/ enclosures)
Bill Vreeke, BHI (w/ enclosures)

P:\00184\cdp\corres\Bingham,Eng Cert,ltr.doc

FILE 00192 B in 2400

cc: Bill Vreeke
Tom Keleher
Jim Rogers
10/26/00 mailed

RECEIVED BHI OCT 25 2000

City of Albuquerque

P.O. Box 1293 Albuquerque, NM 87103
Public Works Department

October 18, 2000

Certificate of Work Order Completion

City Engineer
600 Second St.
Plaza Del Sol
Albuquerque, NM 87102

Re: **Oxbow Park Subdivision Project No. 6288.81**
Map No. K-20

Dear Sir:

This is to certify that Project No. 6288.81 has been completed according to approved plans and construction specifications. Please be advised this Certificate of Work-Order Completion does not constitute acceptance of the city infrastructure until all requirements of the subdivision improvements agreement have been satisfied and a Certificate of Completion and Acceptance is issued by the City Engineer.

Public Roadway Improvements - (Oxbow Park) -22' FF residential paving with PCC mountable median curb and roll or standard curb on both sides and a 4' wide with PCC sidewalk on both sides on Alamogordo Drive from Oxbow Drive to transition to 16' FF each direction with 3" mountable median, 16' FF north bound and 16' FF southbound residential paving with PCC mountable median and roll or standard curb on both sides and a 4' wide with PCC sidewalk on both sides* on Alamogordo Drive from transition from entrance to Oxbow Drive to southern tract boundary, 32' FF residential paving with PC standard or mountable roll curb on both sides and a PCC 4' sidewalk on one side on Hollyleaf Road from Alamogordo Drive to Tundra Swan Court, 28' FF residential paving with PCC standard or mountable roll curb on both sides and a 4' wide sidewalk on one side* (east) on Tundra Swan Court from south cul-de-sac terminus to north cul-de-sac terminus, 28' FF residential paving with PCC standard or mountable roll curb on both sides and a 4' sidewalk on one side* (west) on Pinion Jay Court from south cul-de-sac terminus to north cul-de-sac terminus, on Desert Sage Court from Hollyleaf Road to north cul-de-sac, on Rock Daisy Court from south cul-de-sac terminus to Star Lilly Road and on Star Lilly Road from Tundra Swan Court to Pinion Jay Court. 25' FF eastbound 16' median 25' FF westbound** arterial paving with PCC mountable median curb and roll or standard curb on both sides and a 4' wide with PCC sidewalk on the south side on St. Joseph's Drive from Coors Boulevard to Oxbow Drive.

- Sidewalks to be deferred; street lights per the COA DPM

** The developer is responsible for the necessary intersection improvements at St. Joseph's Drive and Coors Boulevard that will accommodate the widening of St. Joseph's Drive east of Coors Blvd. This includes 1) a northbound deceleration lane on Coors Blvd. with a right turn lane eastbound onto St. Joseph's Drive. 2) a right turn lane on westbound St. Joseph's Drive for northbound Coors Blvd; 3) the necessary signal improvements to accommodate items 1 and 2 above in accordance with T.I.S.

Public Sanitary Sewer Improvements - (Oxbow Park) - 8" diameter sanitary sewer with necessary manholes and services on Alamogordo Drive from Lot 1 to southern tract boundary, on Hollyleaf Road from Alamogordo Drive to Desert Sage Court, on Tundra Swan Court from south cul-de-sac terminus to north cul-de-sac terminus, on Desert Sage Court from Hollyleaf Road to north cul-de-sac terminus on Rock Daisy Court from south cul-de-sac terminus to Star Lilly Road, on Star Lilly Road from Tundra Swan Court to Pinion Jay Court, on public easement (Tract B-4) from Tundra Swan Court to Tract B-1, and on Alamogordo Drive from Oxbow Drive to south tract boundary.

Public Waterline Improvements - (Oxbow Park) - 8" diameter waterline with necessary valves FHs, MJs and RJ on Alamogordo Drive from Oxbow Drive to Tucson Drive, 8" diameter waterline with necessary valves necessary MHs and services on public easement (lot 98) from Alamogordo Drive to Oxbox Village Subdivision 6" diameter waterline with necessary valves necessary MHs and services on Hollyleaf Road from Tundra Swan Court to Desert Sage Court and on Tundra Swan Court from Star Lilly Road to St. Joseph's Drive, 4" diameter waterline with necessary valves necessary MHs and services on Tundra Swan Court from south cul-de-sac terminus to Star Lilly Road, 6" diameter waterline with necessary valves necessary MHs and services on Pinion Jay Court from Star Lilly to St Joseph's Drive, 4" diameter waterline with necessary valves, necessary valves, necessary MHs and services on Pinion Jay Court from south cul-de-sac terminus to Star Lilly Road, 6" diameter waterline with necessary valves, necessary MHs and services on Desert Sage Court from Hollyleaf Road to St. Joseph's Drive, 4" diameter waterline with necessary valves, necessary MHs and services on Rock Daisy Court from south cul-de-sac terminus to Star Lilly Road. 6" waterline with necessary valves, necessary MHs, and services on Star Lilly Road from Tundra Swan to Pinion Jay Court, and 8" diameter waterline with necessary valves, necessary MHs and services on public easement (Tract B-4) from Tundra Swan Court to Tract B-1.

Public Drainage Improvements -(Oxbow Park) - 48" diameter RCP with necessary manholes and inlets on public easement between lots 103 and 104 from subdivision (Tract E-1) east boundary to Alamogordo Drive 24" diameter RCP with necessary manholes and inlets on Alamogordo Drive from Hollyleaf Road to southern tract boundary, 48" RCP diameter RCP with necessary manholes and inlets from Hollyleaf Road from Alamogordo Drive to Tract B-1, and on public easement (Tract B-4) from Tract B-1 to Tundra Swan Court.

All as shown on sheets 1-39 of City approved project plans.

The contractor's correction period will begin the date of the City Engineers Certificate of Completion and Acceptance letter and is effective for a period of one (1) year.

Sincerely,

Peter Chang 10-20-00
RBZ-O

Peter Chang, P.E.
Chief Construction Engineer
Public Works Department

c: Sparling Construction
Bohannon-Huston
Master Scheduler
Project Administrator
Martin Barker, Materials Testing Lab
Sam Hall, Water Systems
Dave Harmon, Traffic Engineering, PWD
Josie Jaramillo, New Meter Sales, PWD
Richard Zamora, Maps & Records, PWD
Project No. 6288.81
Warranty:Contract