CITY OF ALBUQUERQUE

THREE HUNDRED YEARS
1706 * 2006
ALBUQUERQUE
Making History

Scan
attach
24x36"

February 16, 2006

Mr. Christian J. Sholtis, PE
BOHANNAN-HUSTON, INC.
7500 Jefferson St. NE
Albuquerque, NM 87109

RE: EL RANCHO GRANDE, UNIT 15 (N-9/D5)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 11/21/2003
Engineers Certification dated 02/13/2006

Dear Chris:

Based upon the information provided in your Engineer's Certification submittal dated 02/13/2006, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

If you have any questions, you can contact me at 924-3982

Sincerely,

Arlene V. Portillo

Arlene V. Portillo
Plan Checker, Planning Dept.- Hydrology
Development and Building Services

C: Marilyn Maldonado, COA# 699388
File

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

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

PROJECT TITLE: El Rancho Grande Unit 15 ZONE MAP/DRG. FILE #: N9/D5
DRB #. 1003030 EPC#. WORK ORDER #. 699388

LEGAL DESCRIPTION: El Rancho Grande Unit 15
CITY ADDRESS: SW Albuquerque

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Christian J. Sholtis, PE
ADDRESS: 7500 Jefferson Street NE PHONE: (505) 823-1000
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: Curb Inc. CONTACT: Bo Johnson
ADDRESS: 5160 San Francisco NE PHONE: 899-9656
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

ARCHITECT: N/A CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: Aldrich Land Surveying CONTACT: Timothy Aldrich
ADDRESS: P.O. Box 30701 PHONE: 884-1990
CITY, STATE: Albuquerque, NM ZIP CODE: 87190

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

CHECK TYPE OF SUBMITTAL:

- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN 1ST SUBMITTAL, ***REQUIRES TCL or equal***
- ____ DRAINAGE PLAN RESUBMITTAL
- ____ GRADING PLAN
- ____ EROSION CONTROL PLAN
- X ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR/LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEER'S CERTIFICATION (TCL)
- ____ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
- ____ OTHER

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 (PERM.)
- ____ CERTIFICATE OF OCCUPANCY (TEMP.)
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ WORK ORDER APPROVAL
- ____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- X NO
- ____ COPY PROVIDED

RECEIVED
FEB 13 2006
HYDROLOGY SECTION

DATE SUBMITTED: 2-13-06 BY: Christian J. Sholtis, PE

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.

CITY OF ALBUQUERQUE

February 28, 2005

Mr. Richard L. Beltramo, PE
BOHANNAN-HUSTON, INC.
7500 Jefferson St. NE
Albuquerque, NM 87109

RE: EL RANCHO GRANDE SUBDIVISION, UNIT 14 (N-9/D5)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 11/21/2003
Engineers Certification dated 02/23/2005

Dear Rick:

Based upon the information provided in your Engineer's Certification Submittal dated 02/24/2005, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

If you have any questions, you can contact me at 924-3982

Sincerely,

Arlene V. Portillo
Plan Checker, Planning Dept.- Hydrology
Development and Building Services

C: Marilyn Maldonado, COA# 699386
File

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

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

PROJECT TITLE: El Rancho Grande Unit 14 ZONE MAP/DRG. FILE #: N-9/D5
DRB #. 1002423 EPC#. WORK ORDER #. 699386

LEGAL DESCRIPTION: El Rancho Grande Unit 14
CITY ADDRESS: SE Corner of Gibson Blvd. SW and Messina Dr.

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Christian J. Sholtis, PE
ADDRESS: 7500 Jefferson Street NE PHONE: (505) 823-1000
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: Artistic Homes CONTACT:
ADDRESS: 4420 Tower Road SW, Ste A PHONE: 247-8400
CITY, STATE: Albuquerque, NM ZIP CODE: 87121

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

SURVEYOR: Aldrich Land Surveying CONTACT: Tim Aldrich
ADDRESS: P.O. Box 30701 PHONE: 884-1990
CITY, STATE: Albuquerque, NM ZIP CODE: 87190-0701

CONTRACTOR: New Concepts, Inc. CONTACT: Tom Lakeman
ADDRESS: P.O. Box 9555 PHONE: 452-8910
CITY, STATE: Albuquerque, NM ZIP CODE: 87119

CHECK TYPE OF SUBMITTAL:

- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN 1ST SUBMITTAL, ***REQUIRES TCL or equal***
- ____ DRAINAGE PLAN RESUBMITTAL
- ____ GRADING PLAN
- ____ EROSION CONTROL PLAN
- X ENGINEER'S CERTIFICATION (HYDROLOGY)
- ____ CLOMR/LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEER'S CERTIFICATION (TCL)
- ____ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
- ____ OTHER

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 (PERM.)
- ____ CERTIFICATE OF OCCUPANCY (TEMP.)
- ____ GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- X WORK ORDER APPROVAL
- ____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ____ YES
- X NO
- ____ COPY PROVIDED

RECEIVED
FEB 24 2005
HYDROLOGY SECTION

DATE SUBMITTED: 2-24-05 BY: Christian J. Sholtis, PE

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.

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

Scan
Bound
Report
and any 24x36 in Rept

November 26, 2003

Rick Beltramo, PE
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

Re: El Rancho Grande Unit 14 & 15 Subdivision Drainage Report
Engineer's Stamp dated 11-21-03 (N9/D5)

Dear Mr. Beltramo,

Based upon the information provided in your submittal dated 11-24-03, the above referenced report is approved for Preliminary Plat action by the DRB. Once that board has approved the plan, please submit a mylar copy for my signature in order to obtain a Grading Permit.

This project requires a National Pollutant Discharge Elimination System (NPDES) permit. Refer to the attachment that is provided with this letter for details. If you have any questions please feel free to call the Municipal Development Department, Hydrology section at 768-3654 (Charles Caruso) or 768-3645 (Brian Wolfe).

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept.
Development and Building Services

C: Chuck Caruso, CoA
file

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

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

N-9/D5

PROJECT TITLE: El Rancho Grande Subdivision, Units 14 and 15 ZONE MAP/DRG. FILE # N-8 and N-9
DRB #: 1003030 / 1003031 EPC#: WORK ORDER#:

LEGAL DESCRIPTION: Tract 14 and 15, El Rancho Grande
CITY ADDRESS: NW corner of Gibson Boulevard and De Anza Drive

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Rick Beltramo
ADDRESS: 7500 Jefferson NE – Courtyard I PHONE: (505) 823-1000
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: Curb Inc. CONTACT: Bo Johnson
ADDRESS: 6301 Indian School Rd, Suite 208 PHONE: 899-9656
CITY, STATE: Albuquerque, NM ZIP CODE: 87110

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

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

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

CHECK TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

____ YES
____ NO
____ COPY PROVIDED

RECEIVED
NOV 24 2003
HYDROLOGY SECTION

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 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.

CLIENT/COURIER TRANSMITTAL

BOHANNAN HUSTON
Courtyard One
7500 JEFFERSON NE
Albuquerque
NEW MEXICO 87109
voice 505.823.1000
fax 505.798.7988

To: Bradley Bingham
City Of Albuquerque
One-Stop Shop
600 2nd Street, 2nd Floor
Albuquerque, NM 87103
505-924-3986

Requested By: Elizabeth Smith

Date: **November 21, 2003**

Time Due: ☒ **This A.M.** ☐ **This P.M.**
☐ **Rush ____** ☐ **By Tomorrow**

Job No.: 040220

Job Name: El Rancho Grande Units 14 & 15

DELIVERY VIA

☒ Courier ☐ Federal Express
☐ Mail ☐ UPS
☐ Other _____

PICK UP

Item: _____
_____

ITEM NO.	QUANTITY	DESCRIPTION
1	1	Amended Drainage Report / Grading Plan
2	2	Revised Infrastructure Lists
3	1	Drainage Information Sheet

COMMENTS / INSTRUCTIONS

RECEIVED
NOV 24 2003
HYDROLOGY SECTION

REC'D BY: _____ ***DATE:*** _____ ***TIME:*** _____

Current DRC
Project No. _____

Date Submitted: November 21, 2003

Date Site Plan Approved: _____

Date Preliminary Plat Approved: _____

Date Preliminary Plat Expiers: _____

DRB Project No. 1003031

APPLICATION NO.

Figure 12

INFRASTRUCTURE LIST

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

EL RANCHO GRANDE UNIT 14 SUBDIVISION
PRELIMINARY PLAT

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 DRC 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 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.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC ROADWAY IMPROVEMENTS						
		30' EOA-F	ARTERIAL PAVING W/ PCC CURB & GUTTER AND PCC 6' WIDE SIDEWALK ON SOUTH SIDE ONLY	GIBSON BOULEVARD	MESSINA DRIVE	MESA ARENOSO DR	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON EAST SIDE ONLY	MESSINA DRIVE	GIBSON BOULEVARD	SOUTH BOUNDARY	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON WEST SIDE ONLY	MESA ARENOSO DR	GIBSON BOULEVARD	SOUTH BOUNDARY	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY*	SANDY RIDGE RD	WEST STUB TERMINUS	GHOST RANCH ST	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SANDY RIDGE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY*	SANDY RIDGE RD	BLUE SKY ST	EAST STUB TERMINUS	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	GHOST RANCH ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BLUE SKY ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SANDY CREEK RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		46' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES AND MEDIAN CURB	SANDY CREEK RD	BLUE SKY ST	MESA ARENOSO DR	/	/	/

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
		46' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES AND MEDIAN CURB	SANDY TRAIL RD	MESSINA DRIVE	GHOST RANCH ST	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SANDY TRAIL RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
			* SIDEWALKS TO BE DEFERRED PER DEFERRAL EXHIBIT 'B'. WAIVER OF SIDEWALK ON SOUTH SIDE OF SANDY RIDGE RD STUBS.				/	/	/
			STREET LIGHTS AS PER COA DPM						

ONSITE PUBLIC STORM DRAIN IMPROVEMENTS

		18"-48" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESSINA AVE	GIBSON BLVD	SOUTH BOUNDARY	/	/	/
		18"-36" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	BLUE SKY ST	SANDY CREEK RD	SOUTH BOUNDARY	/	/	/
		18" - 24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	SANDY CREEK RD	50' WEST OF BLUE SKY	BLUE SKY ST	/	/	/
			2.9 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**EL RANCHO GRANDE TRACT 15**			/	/	/
			0.55 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**EL RANCHO GRANDE TRACTS 15 AND 16**			/	/	/

NOTE: A GRADING AND DRAINAGE CERTIFICATION OF THE APPROVED GRADING PLAN IS REQUIRED PRIOR TO THE RELEASE OF FINANCIAL GUARANTEES.

THERE WILL BE NO RELEASE OF FINANCIAL GUARANTEE OR SIA UNTIL AGREEMENT IS PROCESSED AND APPROVED WITH AMAFCA FOR CONSTRUCTION OF THE AMOLE ARROYO IMPROVEMENTS.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC WATERLINE IMPROVEMENTS						
		6-12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OFFSITE PUBLIC EASEMENT	GIBSON BLVD	MESA ARENOSO DR	/	/	/
		6-8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SANDY RIDGE RD	MESSINA DR	MESA ARENOSO DR	/	/	/
		8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GHOST RANCH ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BLUE SKY ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SANDY CREEK RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		6-8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SANDY TRAIL RD	MESSINA DR	BLUE SKY ST	/	/	/
							/	/	/
			ONSITE PUBLIC SANITARY SEWER IMPROVEMENTS						
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SANDY RIDGE RD	WEST STUB TERMINUS	EAST STUB TERMINUS	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	GHOST RANCH ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLUE SKY ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SANDY CREEK RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SANDY TRAIL RD	MESSINA DR	BLUE SKY ST	/	/	/
		8-12" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OFFSITE PUBLIC EASEMENT	SOUTH BOUNDARY/ BLUE SKY ST	BLAKE ROAD	/	/	/
		12" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLAKE ROAD	OFFSITE PUBLIC EASEMENT	AMAFCA ROW SW MESA INTERCEPTOR	/	/	/
		8-24" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	AMAFCA ROW	BLAKE RD	UNSER BLVD	/	/	/

RICK BELTRAMO PREPARED BY: PRINT NAME	11/21/03 DATE	DRB CHAIR	DATE	PARKS & RECREATION DEPARTMENT	DATE
BOHANNAN HUSTON INC. FIRM:		TRANSPORTATION DEVELOPMENT	DATE	AMAFCA	DATE
SIGNATURE	DATE	UTILITY DEVELOPMENT	DATE	CITY ENGINEER	DATE
MAXIMUM TIME ALLOW TO CONSTRUCT IMPROVEMENTS WITHOUT A DRB EXTENSION		NEW MEXICO UTILITIES INC.	DATE		DATE

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT/OWNER

Current DRC
Project No. _____

Date Submitted: November 21, 2008

Date Site Plan Approved: _____

Date Preliminary Plat Approved: _____

Date Preliminary Plat Expiers: _____

DRB Project No. 1003030

APPLICATION NO.

Figure 12

INFRASTRUCTURE LIST

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

EL RANCHO GRANDE UNIT 15 SUBDIVISION
PRELIMINARY PLAT

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 DRC 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 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.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC ROADWAY IMPROVEMENTS						
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY	AMOLE MESA AVE	MESSINA DR	MESA ARENOSO DR	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON EAST SIDE ONLY	MESSINA DRIVE	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON WEST SIDE ONLY	MESA ARENOSO DR	GIBSON BLVD	AMOLE MESA AVE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SOLITUDE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		32' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES	OPEN RANGE AVE	GHOST RANCH ST	BLUE SKY ST	/	/	/
		46' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES	OPEN RANGE AVE	BLUE SKY ST	MESA ARENOSO DR	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	GHOST RANCH ST	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BLUE SKY ST	NORTH BOUNDARY	LONE TREE RD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SILVER STAR DR	SOLITUDE RD	LONE TREE RD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	LONE TREE RD	SILVER STAR DR	BLUE SKY ST	/	/	/

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK SOUTH SIDE ONLY*	LONE TREE RD	WEST STUB TERMINUS	SILVER STAR DR	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK SOUTH SIDE ONLY*	LONE TREE RD	BLUE SKY ST	EAST STUB TERMINUS	/	/	/
							/	/	/

* SIDEWALKS TO BE DEFERRED PER DEFERRAL EXHIBIT 'B'.
WAIVER OF SIDEWALK ON NORTH SIDE OF LONE TREE RD STUBS.

STREET LIGHTS AS PER COA DPM

ONSITE PUBLIC STORM DRAIN IMPROVEMENTS

		18"-48" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESSINA DR	NORTH BOUNDARY	OPEN RANGE AVE	/	/	/
		18"-72" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	OPEN RANGE AVE	MESSINA DR	MESA ARENOSO DR	/	/	/
		18" - 36" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	BLUE SKY ST	NORTH BOUNDARY	150' NORTH OF LONE TREE	/	/	/
		18-24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESA ARENOSO DR	50' NORTH OF OPEN RANGE AVE	OPEN RANGE AVE	/	/	/
			6.5 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**TRACT 33C-1-A LANDS OF CURB INC.**			/	/	/
			0.57 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**TRACT 30A-1 LANDS OF SALAZAR**			/	/	/

NOTE: A GRADING AND DRAINAGE CERTIFICATION OF THE APPROVED GRADING PLAN IS REQUIRED PRIOR TO THE RELEASE OF FINANCIAL GUARANTEES.

THERE WILL BE NO RELEASE OF FINANCIAL GUARANTEE OR SIA UNTIL AGREEMENT IS PROCESSED AND APPROVED WITH AMAFCA FOR CONSTRUCTION OF THE AMOLE ARROYO IMPROVEMENTS.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC WATERLINE IMPROVEMENTS						
		8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GHOST RANCH ST	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BLUE SKY ST	NORTH BOUNDARY	LONE TREE RD	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SILVER STAR DR	SOLITUDE RD	LONE TREE RD	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SOLITUDE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OPEN RANGE AVE	GHOST RANCH ST	BLUE SKY ST	/	/	/
		4-6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	LONE TREE RD	WEST STUB TERMINUS	EAST STUB TERMINUS	/	/	/
		20" DIA **	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	MESA ARENOSO DR	OPEN RANGE AVE	AMOLE MESA AVE	/	/	/
		8" DIA*	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OFFSITE PUBLIC EASEMENT	CARTAGENA AVE	NORTH BOUNDARY / GHOST RANCH ST	/	/	/
		6-12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OFFSITE PUBLIC EASEMENT	GIBSON BLVD	NORTH BOUNDARY / BLUE SKY ST	/	/	/
		8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	AMOLE MESA AVE	MESSINA DR	GHOST RANCH ST	/	/	/
							/	/	/

* DEFERRED ITEM
** TO BE CONSTRUCTED UNDER COA PROJECT #6795.81

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC SANITARY SEWER IMPROVEMENTS						
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	GHOST RANCH ST	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLUE SKY ST	NORTH BOUNDARY	LONE TREE RD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SILVER STAR DR	100' SOUTH OF SOLITUDE RD	100' NORTH OF LONE TREE RD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SOLITUDE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		8-10" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OPEN RANGE AVE	GHOST RANCH ST	MESA ARENOSO DR	/	/	/
		10-12" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OFFSITE PUBLIC EASEMENT	MESA ARENOSO DR	BLAKE ROAD	/	/	/
		10-12" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLAKE ROAD	OFFSITE PUBLIC EASEMENT	AMAFCA ROW SW MESA INTERCEPTOR	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	AMOLE MESA AVE	MESSINA DR	GHOST RANCH ST	/	/	/
		8-24" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	AMAFCA ROW	BLAKE RD	UNSER BLVD	/	/	/

RICK BELTRAMO 11/21/03
PREPARED BY: PRINT NAME DATE

DRB CHAIR DATE

PARKS & RECREATION DEPARTMENT DATE

BOHANNAN HUSTON INC.
FIRM:

TRANSPORTATION DEVELOPMENT DATE

AMAFCA DATE

SIGNATURE DATE

UTILITY DEVELOPMENT DATE

CITY ENGINEER DATE

MAXIMUM TIME ALLOW TO CONSTRUCT
IMPROVEMENTS WITHOUT A DRB EXTENSION

NEW MEXICO UTILITIES INC. DATE

DATE

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT/OWNER

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

November 7, 2003

RECEIVED
NOV 21 2003
HYDROLOGY SECTION

Rick Beltramo, PE
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

Re: El Rancho Grande Unit 14 & 15 Subdivision Drainage Report
Engineer's Stamp dated 10-10-03 (N9/D5)

Dear Mr. Beltramo,

Based upon the information provided in your submittal dated 10-10-03, the above referenced report cannot be approved until the following comments are addressed.

- Since approval of the Master Plan is still pending, this report should address enough of the offsite basins to adequately size infrastructure. In other words, you should include in your basin map the properties west of Messina (both north and south of Gibson). An analysis point at Gibson and Messina would also be appropriate.

- Please provide written permission to grade the offsite properties. Please add water surface elevation and retained volumes to the proposed ponds.

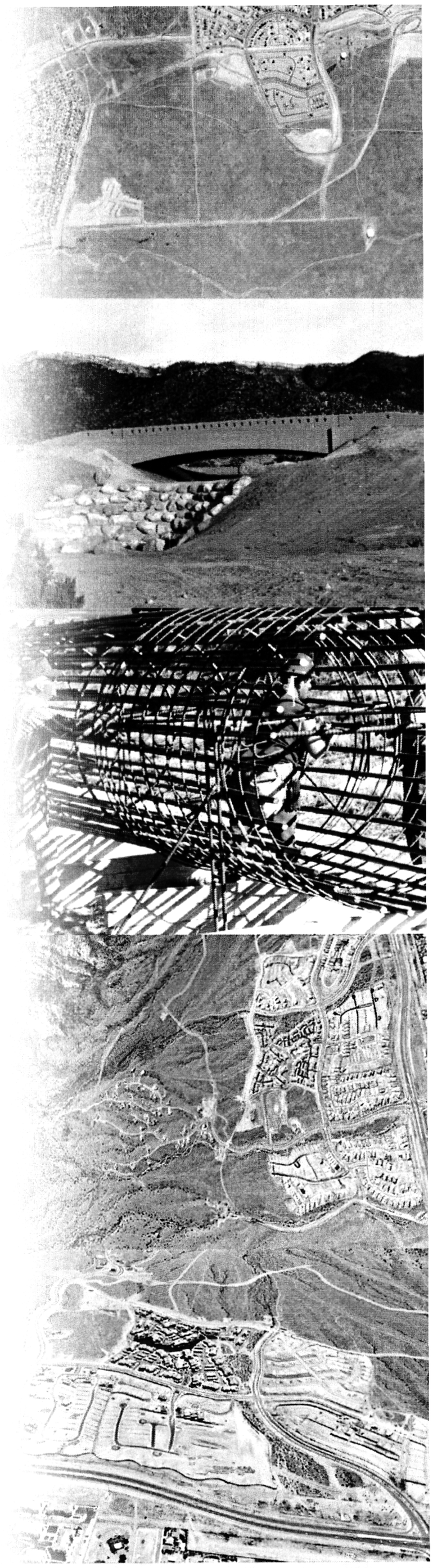
If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept.
Development and Building Services

C: file

DRAINAGE STUDY FOR EL RANCHO GRANDE UNITS 14 AND 15



OCTOBER 10, 2003

Revised November 21, 2003

Prepared for:

Curb Inc.

6301 Indian School NE. Suite 208

Albuquerque, NM 87109

RECEIVED
NOV 24 2003
HYDROLOGY SECTION

Bohannan ▲ Huston INC.

ENGINEERING ▲

SPATIAL DATA ▲

ADVANCED TECHNOLOGIES ▲

Table of Contents

TABLE OF CONTENTS

I. INTRODUCTION 1

II. METHODOLOGY 1

III. EXISTING CONDITIONS 2

A. Topography 2

B. Existing Drainage Patterns 2

IV. PROPOSED DEVELOPED CONDITIONS 3

A. Offsite Flows 3

B. Onsite Flows 3

C. FEMA Floodplain 4

D. Interim Improvements for Unit 14 5

V. CONCLUSION 5

APPENDICES

APPENDIX A - AHYMO INPUT AND SUMMARY FILES DEVELOPED CONDITIONS

APPENDIX B - STREET CAPACITY AND STORM DRAIN INLET ANALYSIS

APPENDIX C - INFRASTRUCTURE LISTS

EXHIBITS

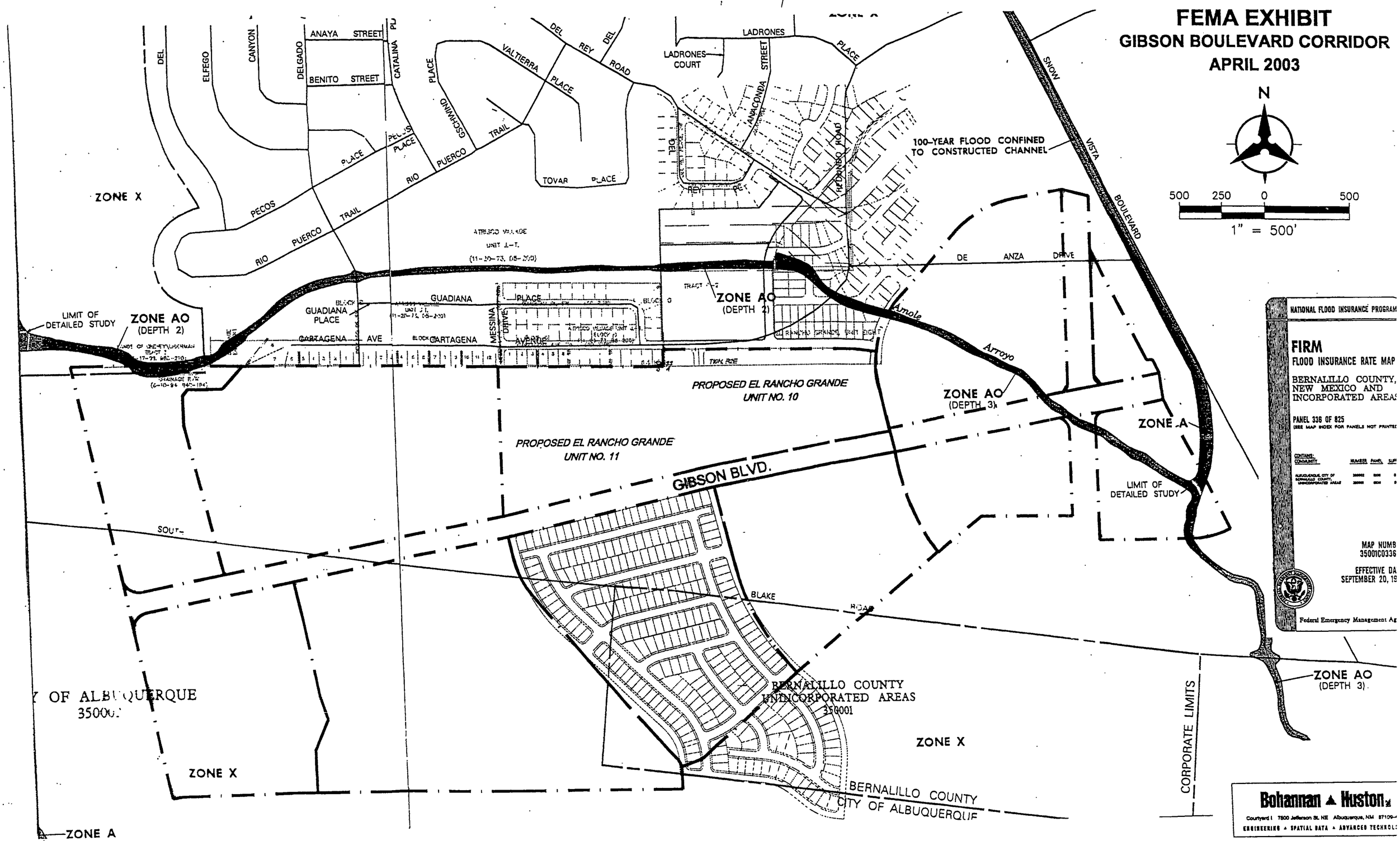
EXHIBIT 1 - PRELIMINARY PLATS

EXHIBIT 2 - GRADING PLANS

EXHIBIT 3 - DEVELOPED CONDITIONS BASIN MAP

EXHIBIT 4 – MASTER STORM DRAIN BASIN MAP

FEMA EXHIBIT
GIBSON BOULEVARD CORRIDOR
APRIL 2003



DRAINAGE STUDY
FOR
EL RANCHO GRANDE UNITS 14 AND 15

October 10, 2003
Revised
November 21, 2003

Prepared for:

CURB INC.
6301 INDIAN SCHOOL NE - SUITE 208
ALBUQUERQUE, NM 87110

Prepared by:

BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET NE
ALBUQUERQUE, NM 87109

PREPARED BY:

Elizabeth E. Smith, P.E. 11/21/03 Date

Rick L. Beltramo, P.E. 11/21/03 Date

I. INTRODUCTION

This drainage study establishes a drainage management plan for the proposed development of El Rancho Grande Unit 14 and El Rancho Grande Unit 15. Unit 14 is approximately 23 acres of residential (R-LT) land to be subdivided into 130 single family residential lots. Unit 15 is approximately 25 acres of residential (R-LT) land to be subdivided into 126 single family residential lots. Both properties are in the Rio Bravo Sector Plan. The subject properties are on Albuquerque's southwest mesa, south of the future Gibson Boulevard and east of Messina Drive.

El Rancho Grande Units 14 and 15 are in the Amole Arroyo Watershed and encompassed by the Amole-Hubbell Drainage Management Plan. In addition, a draft Drainage Management Plan (DMP) is being developed for the Gibson Boulevard corridor between 118th Street and the Amole Arroyo. The drainage area covered by the DMP is approximately 300 acres of residential, commercial, and special use zoned property that bound the north and south side of the future Gibson Boulevard between 118th Street to the west and the Amole Arroyo to the east. El Rancho Grande Units 14 and 15 are in the Drainage Management Plan (DMP) area. Approval of the Gibson Boulevard DMP by the City of Albuquerque and AMAFCA is not required for approval of this Drainage Study for El Rancho Grande Units 14 and 15.

This study provides hydrologic and hydraulic analysis and provides a drainage management plan as necessary to support the planned 130-unit and 126-unit developments. More specifically, this report is submitted in conjunction with the preliminary plat application. Preliminary plat approval and grading plan approval is requested. Prior to final plat and building permit approvals of this project, the City of Albuquerque (COA) must approve final grading plans and work order construction plans.

II. METHODOLOGY

Existing and proposed site hydrological conditions were analyzed for the 100-year, 6-hour storm in accordance with the revised Section 22.2, Hydrology, of the Development Process Manual (DPM) for the City of Albuquerque, dated January 1993. The Arid-lands Hydrologic Model (AHYMO) was utilized to determine peak flow rates for design of the storm

drainage improvements within the projects. The 100-year, 6-hour storm is used as the design event. The results are included in **Appendix A.** Street capacities were analyzed using Manning's equation, consistent with the revised DPM Section 22.2. The storm sewer system is analyzed using current DPM methods for gravity flow conditions. All data and calculations supporting this study are located in **Appendix B.**

The hydrologic analysis is also based on the approved drainage report: *Amole-Hubbell Drainage Management Plan, Volume I, Final Facilities Plan Report* dated July 22, 1999, prepared by Leedshill-Herkenhoff, Inc.

III. EXISTING CONDITIONS

A. Topography

El Rancho Grande Units 14 and 15 are currently undeveloped land with grades ranging from approximately 1% to 9%. The area generally slopes from northwest to southeast. Soils in the area have an SCS soil classification of BCC (Bluepoint loamy fine sand). BCC soils consist of deep, somewhat excessively drained soils formed in sandy alluvial soils, with rapid permeability, slow runoff characteristics, and severe hazard for wind erosion. Vegetation is light consisting mostly of native grasses.

B. Existing Drainage Patterns

El Rancho Grande Units 14 and 15 are located in the Amole Arroyo Drainage Basin. The site generally drains from northwest to southeast. The only development in the area that has altered the natural drainage pattern of the area is El Rancho Grande Unit 11. This development diverts the offsite flow at the northwest corner of Unit 14 and prevents it from entering the site. The majority of the remaining offsite flow is conveyed south by a natural arroyo that is parallel to the western boundary of Units 14 and 15. There is one remaining offsite swale that currently conveys flow across Unit 14. This swale carries approximately 17 cfs to the site.

IV. PROPOSED DEVELOPED CONDITIONS

El Rancho Grande Units 14 and 15 are proposed single-family residential developments with 130 lots on 23 acres and 126 lots on 25 acres, respectively. Proposed street configurations are shown on the *Preliminary Plat* for each development, **Exhibit 1.** The Amole-Hubbell DMP allows for full discharge of developed flows from the Amole Arroyo Basin to the Amole and Hubbell Lake storage facilities. The drainage concepts for Units 14 and 15 are consistent with those presented in the "Draft Master Drainage Study for the Gibson Boulevard Corridor between 118th Street and the Amole Arroyo". The Unit 14 and 15 drainage area corresponds to Basin DB7 in the Gibson Boulevard DMP.

The percent impervious land treatment for the proposed conditions is determined from Table A-5 of the DPM, Section 22.2. The land treatment values used in the AHYMO analysis are the same as the Gibson Boulevard DMP.

A. Offsite Flows

No offsite flows reach the site from the south or east because the natural ground slopes away from Units 14 and 15 on these sides. The offsite flow from the north is intercepted by El Rancho Grande Unit 11.

The property to the west of Units 14 and 15 is undeveloped. The majority of the offsite flow to the west is conveyed south by a natural arroyo that is parallel to the western boundary of Units 14 and 15. There is one remaining offsite swale that currently conveys flow across Unit 14 from approximately 7.8 acres. This swale carries approximately 17 cfs to the site. A drainage swale will be graded west of Messina Drive that will convey this flow into the natural arroyo parallel to the western boundary.

B. Onsite Flows

Developed runoff from Units 14 and 15 will be conveyed by the internal street system to Blue Sky Street, where it will be collected by a public storm drain system. Inlets are located along Blue Sky Street from Sandy Creek to the low point just north of Lone Tree Road. These inlets collect the runoff from the residential streets into a storm drain

that discharges to the east at Open Range Avenue. See **Appendix B** for street capacity and inlet capacity calculations. This drainage plan proposes discharging 160.8 cfs to the intersection of Open Range Avenue and Mesa Arenoso Drive.

The storm drain outfall alignment for Units 14 and 15 to the Amole Arroyo has not been identified at this time. The outfall alignment will be determined in the final Gibson Boulevard DMP and constructed with future phases of the El Rancho Grande development. Therefore, interim facilities will be constructed to accept developed flows from Units 14 and 15. A retention pond sized to retain the 100-year, 24-hour storm volume (6.5 acre-feet) will be constructed on Tract 33C-1-A, Lands of Curb Inc. just east of the intersection of Open Range Avenue and Mesa Arenoso Drive. The pond will remain in place until all downstream storm drain improvements identified in the Gibson Boulevard DMP are in place and/or Tract 33-C-1-A is developed. The retention pond is adjacent to an existing natural arroyo that drains to the Amole Arroyo. An emergency overflow will be incorporated in the pond berm adjacent to the swale to provide an outfall in the event that the pond capacity is exceeded. See **Exhibit 2**, *Grading Plan*, for the location of the swale and pond.

Some runoff will bypass the storm drain network discussed previously. Flow from the southern third of Mesa Arenoso and from Amole Mesa Avenue will flow to the southeast corner of the site and will be collected into a second temporary retention pond. This pond is also sized to hold the 100-year 24-hour storm (0.57 acre-feet). This pond will be removed when the downstream storm drain is constructed with future phases of El Rancho Grande. See **Exhibit 3**, Developed Conditions Basin Map, for basin and storm drain locations. See **Exhibit 2**, *Grading Plan*, for the location of the swales and ponds.

C. FEMA Floodplain

As designated on Panel 336 of 825 (Map number 35001C0336D) of the National Flood Insurance Program, Flood Insurance Rate Maps published by FEMA for Bernalillo County, New Mexico, effective date September 20, 1996, there is no existing flood hazard zone (zone AO) within the proposed development. See the FEMA Floodplain exhibit provided at the end of the report text.

D. Interim Improvements for Unit 14

If Unit 14 is constructed before Unit 15, two interim ponds will be constructed to collect the runoff. These ponds will be located at the boundary between Units 14 and 15 at the southern end of Ghost Ranch and Blue Sky Streets. The western pond will collect approximately 13.5 cfs from Messina Drive and Ghost Ranch Street and will hold 0.55 acre-feet of water. The eastern pond will collect approximately 62 cfs from the remainder of Unit 14 and will hold 2.9 acre-feet of water. These ponds will be temporary retention ponds, sized to hold the 100-year 24-hour storm, which will remain until Unit 15 is constructed.

V. CONCLUSION

This report provides a detailed study of the developed runoff and street capacities for the proposed El Rancho Grande Unit 14 and 15 Subdivisions. Included is the preliminary plat, proposed conditions basin map, grading plan, infrastructure list, and all necessary hydrologic and hydraulic analyses. This drainage plan maintains the overall drainage pattern of the area and allows for the safe management of storm runoff in permanent as well as interim conditions.

APPENDICES

APPENDIX A - AHYMO INPUT AND SUMMARY FILES FOR DEVELOPED CONDITIONS

APPENDIX B - STREET CAPACITY AND STORM DRAIN INLET ANALYSIS

APPENDIX C - INFRASTRUCTURE LISTS

APPENDIX A

AHYMO INPUT AND SUMMARY FILES

DEVELOPED CONDITIONS

```
*INPUT - 100-YEAR, 6-HOUR STORM
*
*S EL RANCHO GRANDE UNITS 14 & 15 / DEVELOPED CONDITIONS
* 09-26-03
START                RAINFALL BEGINS AT 0.00 HOURS
*                      100 YEAR RETURN PERIOD
*****************************************************************************
*
*       ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
*       ::                          MISC. DATA                           ::
*       ::        RAINFALL RETURN PERIOD_______________  100-YEAR        ::
*       ::        RAINFALL DURATION___________________   24-HOUR             ::
*       ::       ZONE 1                                                 ::
*       ::        RAINFALL DEPTHS: 1 HOUR (P60)___   1.90 INCHES        ::
*       ::        (UNADJUSTED)     6 HOUR (P360)__   2.20 INCHES        ::
*       ::                        24 HOUR (P1440)_   2.60 INCHES        ::
*       ::                                                              ::
*       ::        RAINFALL DATA TAKEN FROM NOAA.                        ::
*       ::                                                              ::
*       ::                HYDROGRAPH METHODOLOGY                        ::
*       ::                                                              ::
*       ::        CITY OF ALBQ. DPM VOL. 2, SECTION 22.2 July, 1997     ::
*       ::        INITIAL ABSTRACTION - INFILTRATION METHOD             ::
*       ::        Tc CALCULATIONS PER C.O.A. DPM 22.2-B.4               ::
*       ::        AMAFCA AHYMO VERSION MARCH 20,1992                    ::
*       ::                                                              ::
*       ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
*                             BEGIN  ANALYSIS
*****************************************************************************
*
RAINFALL              TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.90
                      RAIN SIX=2.20 RAIN DAY=2.60 DT=0.05
*
*****************************************************************
*S* COMPUTE DEVELOPED CONDITIONS, UNIT 14
*****************************************************************
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14A  *********
COMPUTE NM HYD        ID=2 HYD=14A  AREA=0.00953 PER A=0.0 PER B=22.5
                     PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD               ID=2   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14B  *********
*S AP2
COMPUTE NM HYD        ID=4 HYD=14B  AREA=0.0042 PER A=0.0 PER B=22.5
                     PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD               ID=4   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14C  *********
COMPUTE NM HYD        ID=6 HYD=14C  AREA=0.00758 PER A=0.0 PER B=22.5
                     PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD               ID=6   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14D  *********
COMPUTE NM HYD        ID=8 HYD=14D  AREA=0.00064 PER A=0.0 PER B=0.0
                     PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD               ID=8   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14E  *********
COMPUTE NM HYD        ID=10 HYD=14E  AREA=0.00275 PER A=0.0 PER B=22.5
                     PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD               ID=10   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14F  *********
COMPUTE NM HYD        ID=12 HYD=14F  AREA=0.0065 PER A=0.0 PER B=22.5
                     PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD               ID=12   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14G  *********
COMPUTE NM HYD        ID=14 HYD=14G  AREA=0.0026 PER A=0.0 PER B=0.0
                     PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD               ID=14   CODE=1
```

```
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14H  *********
COMPUTE NM HYD       ID=16 HYD=14H  AREA=0.00105 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=16   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14I  *********
*S AP3
COMPUTE NM HYD       ID=18 HYD=14I  AREA=0.00138 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=18   CODE=1
*
*************************************************************
*S* COMPUTE DEVELOPED CONDITIONS, UNIT 15
*************************************************************
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15A  *********
COMPUTE NM HYD       ID=20 HYD=15A  AREA=0.0044 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=20   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15B1  *********
COMPUTE NM HYD       ID=22 HYD=15B1  AREA=0.0062 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=22   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15B2  *********
COMPUTE NM HYD       ID=23 HYD=15B2  AREA=0.0013 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=23   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15C  *********
COMPUTE NM HYD       ID=24 HYD=15C  AREA=0.0037 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=24   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15D  *********
COMPUTE NM HYD       ID=26 HYD=15D  AREA=0.0015 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15E  *********
COMPUTE NM HYD       ID=28 HYD=15E  AREA=0.0011 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=28   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15F  *********
COMPUTE NM HYD       ID=30 HYD=15F  AREA=0.0022 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=30   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15G  *********
COMPUTE NM HYD       ID=32 HYD=15G  AREA=0.0022 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=32   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15H  *********
COMPUTE NM HYD       ID=34 HYD=15H  AREA=0.00094 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=34   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15I  *********
COMPUTE NM HYD       ID=36 HYD=15I  AREA=0.0006 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=36   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15J  *********
COMPUTE NM HYD       ID=38 HYD=15J  AREA=0.0022 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=38   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15K  *********
COMPUTE NM HYD       ID=40 HYD=15K  AREA=0.0021 PER A=0.0 PER B=22.5
```

```
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=40   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15L  *********
COMPUTE NM HYD       ID=42 HYD=15L  AREA=0.0033 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=42   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15M  *********
COMPUTE NM HYD       ID=44 HYD=15M  AREA=0.0049 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=44   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15N  *********
COMPUTE NM HYD       ID=46 HYD=15N  AREA=0.0014 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=46   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN OFFSITE1  *********
COMPUTE NM HYD       ID=48 HYD=OFF1  AREA=0.0122 PER A=20.0 PER B=40.0
                    PER C=40.0 PER D=0.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=48   CODE=1
*
************************************************
*S ADD UNIT 14 BASINS
************************************************
ADD HYD                 ID=51 HYD=AD ID I=2 ID II=8
PRINT HYD              ID=51   CODE=1
*
ADD HYD                 ID=53 HYD=ADC ID I=51 ID II=6
PRINT HYD              ID=53   CODE=1
*
ADD HYD                 ID=55 HYD=ADCF ID I=53 ID II=12
PRINT HYD              ID=55   CODE=1
*
*S***AP1, UNIT 14/15 EASTERN CONNECTION ********
ADD HYD                 ID=57 HYD=AP1 ID I=55 ID II=10
PRINT HYD              ID=57   CODE=1
*
************************************************
*S ADD UNIT 15 BASINS
************************************************
ADD HYD                 ID=59 HYD=U14E ID I=57 ID II=28
PRINT HYD              ID=59   CODE=1
*
ADD HYD                 ID=61 HYD=EA ID I=59 ID II=20
PRINT HYD              ID=61   CODE=1
*
ADD HYD                 ID=63 HYD=EAF ID I=61 ID II=30
PRINT HYD              ID=63   CODE=1
*
*S AP4
ADD HYD                 ID=65 HYD=AP4 ID I=63 ID II=26
PRINT HYD              ID=65   CODE=1
*
ADD HYD                 ID=67 HYD=B14B15 ID I=4 ID II=22
PRINT HYD              ID=67   CODE=1
*
ADD HYD                 ID=68 HYD=14I15H ID I=16 ID II=34
PRINT HYD              ID=68   CODE=1
*
ADD HYD                 ID=69 HYD=BBI ID I=67 ID II=36
PRINT HYD              ID=69   CODE=1
*
ADD HYD                 ID=70 HYD=BBIIH ID I=68 ID II=69
PRINT HYD              ID=70   CODE=1
*S AP5
ADD HYD                 ID=71 HYD=AP5 ID I=70 ID II=24
PRINT HYD              ID=71   CODE=1
*
ADD HYD                 ID=73 HYD=MJ ID I=38 ID II=44
```

```
PRINT HYD                ID=73   CODE=1
*
ADD HYD                   ID=75 HYD=KL ID I=40 ID II=42
PRINT HYD                ID=75   CODE=1
*
*S AP6
ADD HYD                   ID=77 HYD=AP6 ID I=73 ID II=75
PRINT HYD                ID=77   CODE=1
*
ADD HYD                   ID=79 HYD=AP45 ID I=65 ID II=71
PRINT HYD                ID=79   CODE=1
*
*S EAST ENTRANCE TO UNIT 15, AP7
ADD HYD                   ID=81 HYD=AP7 ID I=79 ID II=77
PRINT HYD                ID=81   CODE=1
*
ADD HYD                   ID=83 HYD=14GH ID I=14 ID II=18
PRINT HYD                ID=83   CODE=1
*
*S TEMPORARY POND #1 INPUT, AP 8
ADD HYD                   ID=85 HYD=AP8 ID I=83 ID II=81
PRINT HYD                ID=85   CODE=1
*
ADD HYD                   ID=87 HYD=B2N ID I=23 ID II=46
PRINT HYD                ID=87   CODE=1
*
*S TEMPORARY POND #2 INPUT, AP 9
ADD HYD                   ID=88 HYD=AP9 ID I=87 ID II=32
PRINT HYD                ID=88   CODE=1
FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =10/01/2003
INPUT FILE = P:\040219\cdp\hydro\Unit1415.txt USER NO.= AHYMO-S-9702c1BohanHu-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S EL RANCHO GRANDE UNITS 14 & 15 / DEVELOPED CONDITIONS										
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.200
S COMPUTE DEVELOPED CONDITIONS, UNIT 14										
COMPUTE NM HYD	14A	-	2	.00953	21.45	.740	1.45690	1.500	3.517	PER IMP= 55.00
*S AP2										
COMPUTE NM HYD	14B	-	4	.00420	9.46	.326	1.45690	1.500	3.520	PER IMP= 55.00
COMPUTE NM HYD	14C	-	6	.00758	17.06	.589	1.45690	1.500	3.517	PER IMP= 55.00
COMPUTE NM HYD	14D	-	8	.00064	1.79	.067	1.96862	1.500	4.382	PER IMP= 100.00
COMPUTE NM HYD	14E	-	10	.00275	6.20	.214	1.45690	1.500	3.522	PER IMP= 55.00
COMPUTE NM HYD	14F	-	12	.00650	14.63	.505	1.45690	1.500	3.518	PER IMP= 55.00
COMPUTE NM HYD	14G	-	14	.00260	7.27	.273	1.96862	1.500	4.369	PER IMP= 100.00
COMPUTE NM HYD	14H	-	16	.00105	2.94	.110	1.96862	1.500	4.375	PER IMP= 100.00
*S AP3										
COMPUTE NM HYD	14I	-	18	.00138	3.86	.145	1.96862	1.500	4.373	PER IMP= 100.00
S COMPUTE DEVELOPED CONDITIONS, UNIT 15										
COMPUTE NM HYD	15A	-	20	.00440	9.91	.342	1.45690	1.500	3.519	PER IMP= 55.00
COMPUTE NM HYD	15B1	-	22	.00620	13.96	.482	1.45690	1.500	3.518	PER IMP= 55.00
COMPUTE NM HYD	15B2	-	23	.00130	2.94	.101	1.45690	1.500	3.534	PER IMP= 55.00
COMPUTE NM HYD	15C	-	24	.00370	8.34	.287	1.45690	1.500	3.520	PER IMP= 55.00
COMPUTE NM HYD	15D	-	26	.00150	3.39	.117	1.45690	1.500	3.530	PER IMP= 55.00
COMPUTE NM HYD	15E	-	28	.00110	3.08	.115	1.96862	1.500	4.375	PER IMP= 100.00
COMPUTE NM HYD	15F	-	30	.00220	4.96	.171	1.45690	1.500	3.525	PER IMP= 55.00
COMPUTE NM HYD	15G	-	32	.00220	6.15	.231	1.96862	1.500	4.370	PER IMP= 100.00
COMPUTE NM HYD	15H	-	34	.00094	2.63	.099	1.96863	1.500	4.378	PER IMP= 100.00
COMPUTE NM HYD	15I	-	36	.00060	1.68	.063	1.96862	1.500	4.382	PER IMP= 100.00
COMPUTE NM HYD	15J	-	38	.00220	4.96	.171	1.45690	1.500	3.525	PER IMP= 55.00
COMPUTE NM HYD	15K	-	40	.00210	4.74	.163	1.45690	1.500	3.526	PER IMP= 55.00
COMPUTE NM HYD	15L	-	42	.00330	7.44	.256	1.45690	1.500	3.522	PER IMP= 55.00
COMPUTE NM HYD	15M	-	44	.00490	11.04	.381	1.45690	1.500	3.519	PER IMP= 55.00
COMPUTE NM HYD	15N	-	46	.00140	3.92	.147	1.96862	1.500	4.373	PER IMP= 100.00
COMPUTE NM HYD	OFF1	-	48	.01220	17.16	.480	.73748	1.500	2.198	PER IMP= .00
*S ADD UNIT 14 BASINS										
ADD HYD	AD	2& 8	51	.01017	23.24	.808	1.48904	1.500	3.571	
ADD HYD	ADC	51& 6	53	.01775	40.31	1.397	1.47530	1.500	3.548	
ADD HYD	ADCF	53&12	55	.02425	54.94	1.902	1.47036	1.500	3.540	
*S***AP1, UNIT 14/15 EASTERN CONNECTION ********										
ADD HYD	AP1	55&10	57	.02700	61.14	2.115	1.46898	1.500	3.538	
*S ADD UNIT 15 BASINS										
ADD HYD	U14E	57&28	59	.02810	64.22	2.231	1.48853	1.500	3.571	
ADD HYD	EA	59&20	61	.03250	74.13	2.573	1.48424	1.500	3.564	
ADD HYD	EAF	61&30	63	.03470	79.09	2.744	1.48250	1.500	3.562	
*S AP4										
ADD HYD	AP4	63&26	65	.03620	82.48	2.860	1.48143	1.500	3.560	
ADD HYD	B14B15	4&22	67	.01040	23.42	.808	1.45685	1.500	3.519	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	14I15H	16&34	68	.00199	5.57	.209	1.96834	1.500	4.377	
ADD HYD	BBI	67&36	69	.01100	25.10	.871	1.48474	1.500	3.566	
ADD HYD	BBIIH	68&69	70	.01299	30.68	1.080	1.55882	1.500	3.690	
*S AP5										
ADD HYD	AP5	70&24	71	.01669	39.01	1.367	1.53621	1.500	3.652	
ADD HYD	MJ	38&44	73	.00710	16.00	.552	1.45682	1.500	3.521	
ADD HYD	KL	40&42	75	.00540	12.18	.420	1.45681	1.500	3.523	
*S AP6										
ADD HYD	AP6	73&75	77	.01250	28.18	.971	1.45681	1.500	3.522	
ADD HYD	AP45	65&71	79	.05289	121.50	4.228	1.49871	1.500	3.589	
*S EAST ENTRANCE TO UNIT 15, AP7										
ADD HYD	AP7	79&77	81	.06539	149.67	5.199	1.49070	1.500	3.576	
ADD HYD	14GH	14&18	83	.00398	11.13	.418	1.96847	1.500	4.370	
*S TEMPORARY POND #1 INPUT, AP 8										
ADD HYD	AP8	83&81	85	.06937	160.81	5.617	1.51811	1.500	3.622	
ADD HYD	B2N	23&46	87	.00270	6.86	.248	1.72203	1.500	3.969	
*S TEMPORARY POND #2 INPUT, AP 9										
ADD HYD	AP9	87&32	88	.00490	13.01	.479	1.83268	1.500	4.149	
FINISH										

APPENDIX B

STREET CAPACITY AND
STORM DRAIN INLET ANALYSIS

El Rancho Grande Units 14 & 15
Inlet & Street Capacity Calculations
October 3, 2003

1. **Sandy Ridge Road**

Basin 14A (See AHYMO summary table or Basin Map)

S = 2.59%
Q = 21.5 cfs
D = 0.41' at 21.5 cfs

At 2.59%, a road with standard curb can handle 31.2 cfs.
No inlets are needed.
21.5 cfs / 43 lots = 0.5 cfs / lot
Roll curb can handle 9.1 cfs
9.1 cfs / 0.5 cfs/lot = 18.2 lots

2. **Sandy Creek Road**

Basin 14-C (See AHYMO summary table or Basin Map)

S = 2.47%
Q = 17.0 cfs
D = 0.39'
Q/grate = 5.2 cfs (see nomograph)

At 2.47%, a road with standard curb can handle 30.3 cfs. Install 2 inlets to ease flow at intersection. See PC stream output.

Water flows into intersection; add inlets to relieve intersection. Each inlet will collect 5.2 cfs. Two inlets will remove 10.4 cfs.

17.0
- 10.4
6.6 cfs bypass to intersection

17 cfs / 34 lots = 0.5 cfs / lot
Roll curb can handle 8.8 cfs
8.8 cfs / 0.5 cfs/lot = 17.6 lots

3. **Sandy Trail Road**

Basin 14-F (See AHYMO summary table or Basin Map)

S = 3.3%
Q = 14.6 cfs
D = 0.36'
At 3.3%, a road with standard curb can handle 27.6 cfs. No inlets are needed.

14.6 cfs / 28 lots = 0.52 cfs / lot
Roll curb can handle 7.4 cfs
7.4 cfs / 0.52 cfs/lot = 14.2 lots

4. Blue Sky Street

Blue Sky Street at Sandy Creek Rd

Basin 14-E, 14-D (See AHYMO summary table or Basin Map)

S = 2.46%

At Basin C, 4/11 lots (.36) of Basin D and E will contribute

Basin 14-E: 0.36*6.2 = 2.2 cfs

Basin 14-D: 0.36*1.8 = 0.65 cfs

Q = 2.2 cfs Contributing from Basin 14-E

0.65 cfs from Basin 14-D

+ 21.5 cfs Basin 14-A

24.4 cfs north of Sandy Creek Rd

- 7.0 cfs inlet north of Sandy Creek Rd

+ 6.6 cfs bypass from Basin 14-C

23.95 cfs south of Sandy Creek Rd

At 2.46%, a road with standard curb can handle 30.3 cfs. Install one inlet north of Sandy Creek Road.

A single grate type A or C inlet can carry 7 cfs at a depth of 0.45'. Install one inlet to remove 7 cfs.

Blue Sky Street flow north of Sandy Trail Road

Q = 23.95 cfs

+ 4 cfs from Basin 14-E

+ 1.2 cfs from Basin 14-D

29.15 cfs

S = 0.96%

D = 0.52'

At 0.96%, a road with standard curb can handle 39.1 cfs. Install one inlet north of Sandy Trail Road to relieve the intersection. The inlet will remove 6.6 cfs.

Blue Sky Street South of Sandy Trail Road

29.15 cfs

-6.6 cfs north of Sandy Trail Rd

+14.6 cfs from Basin 14-F

37.15 cfs south of Sandy Trail Rd

At 0.96%, a road with standard curb can handle 39.1 cfs. No inlets are needed. AP1 at south of Unit 14 sees 37.15 cfs in the street and 24 cfs in the storm drain.

Blue Sky Street North of Solitude Road
Q = 37.15 cfs
S = 0.96%
D= 0.57'
Install inlets north of Solitude Road. A single grate type A or C inlet can carry 7.5 cfs at a depth of 0.57'. Install three inlets to remove 22.5 cfs. The intersection will receive (37.15-22.5) 14.7 cfs.

5. **Unit 15, Solitude Road**

Basin 15-A (See AHYMO summary table or Basin Map)
S = 2.98%
Width = 28' F-F
Q = 9.9 cfs
D=0.26'
Q/grate = 3.8 cfs (see nomograph)

At 2.98%, a road with standard curb can handle 26.2 cfs. Therefore, no inlets needed. See PC stream output. 9.9 cfs flows into intersection.
If Ghost Ranch flow spills over into Solitude, the street capacity can handle it with standard curb and gutter. Therefore, no roll curb will be installed in Solitude Road.

6. **Blue Sky Street south of Solitude Road**

S = 1.95%
14.7 cfs on Blue Sky St
9.9 cfs from 15-A
Q = 24.6 cfs on Blue Sky St

At 1.95%, a road with standard curb can handle 34 cfs. Therefore, no inlets needed. See PC stream output. Water flows into intersection.

7. **Blue Sky Street north of Open Range Ave (AP 4)**

Basins 15-F, 15-E, 15-D (See AHYMO summary table or Basin Map)
S = 1.95%

24.6 cfs	Blue Sky St
3.4 cfs	Basin 15-D
3.1 cfs	Basin 15-E
5.0 cfs	Basin 15-F

Q =36.1 cfs
D=0.5'
Q/grate=8 cfs/grate (See nomograph)

At 1.95%, a road with standard curb can handle 33.1 cfs. See PC stream output. Add inlets 6 lots north of Open Range Avenue before flow exceeds 33 cfs. Each inlet will collect 8 cfs. Two inlets will remove 16 cfs from Blue Sky Street.
At AP4, 20 cfs will be in the road and 62.5 cfs will be in the storm drain.

8. Ghost Ranch Street

Basin 14-B, 15-B1 (See AHYMO summary table or Basin Map)
S = 2.5% / 4.0% / 1.41%
Width = 28' F-F

Q =	9.5 cfs	Basin 14-B
+	14.0 cfs	Basin 15-B1
	23.5 cfs	

At 2.5%, a road with standard curb can handle 30.6 cfs; at 4.0%, the road can handle 25.2 cfs; at 1.41%, the road can handle 36.4 cfs. Therefore no inlets are required. At 2.5%, a road with roll curb can handle 9.9 cfs. Therefore, roll curb is sufficient in Basin 14-B.

9. Open Range Avenue

Basin 15-I, 15-C (See AHYMO summary table or Basin Map)
S=1.39%
Width = 32' F-F

Q =	23.5 cfs	Ghost Ranch St
+	8.3 cfs	Silver Star Dr / 15-C
+	1.7 cfs	Open Range Ave / 15-I
	33.5 cfs	

At 1.39%, a road with standard curb can handle 42.8 cfs. Therefore, no inlets needed. See PC stream output. Add inlets to ease intersection with Blue Sky Street at AP 5.

A single grate type A or C inlet can carry 6.6 cfs at a depth of 0.5'. Install two inlets to remove 13.2 cfs. Add two additional inlets to remove an additional 10 cfs. The intersection will receive (33.5-13.2 -10) 10.3 cfs.

At AP5, there is 23.2 cfs in a storm drain and 10.3 cfs in the road.

10. Blue Sky Street south of Open Range Ave

Basin 15-L, 15-K (See AHYMO summary table or Basin Map)
S=1.73 28' F-F

Q =	10.3 cfs	Open Range Ave, AP 5
+	20.0 cfs	Blue Sky St, AP 4
+	4.7 cfs	Basin 15-K
+	7.4 cfs	Basin 15-L
	42.4 cfs	

At 1.73%, a road with standard curb can handle 35.8 cfs. Therefore, inlets are needed when street capacity is exceeded and at low point of street. At 35.8 cfs, the depth is 0.51'. A single type A or C drop inlet accepts 7.4 cfs at 0.51'. See PC stream output.

Basins 15-K and 15-L contribute 12.1 cfs with 23 lots (0.53 cfs/lot).
42.4 cfs
- 35.8 cfs
6.6 cfs excess

6.6 / 0.53 = 12.5 lots excess contribution
Two inlets will remove 14.8 cfs and bypass 27.6 cfs to the low-point of the road.

11. Lone Tree Road

Basin 15-J, 15-M (See AHYMO summary table or Basin Map)
S=2.59% 28' F-F
Q = 5.0 cfs Basin 15-J
+ 11.0 cfs Basin 15-M
16.0 cfs

At 2.59%, a road with standard curb can handle 31.2 cfs. Therefore, no inlets are required. In the event that some flow spills into Lone Tree Road from Open Range Avenue, the road has the capacity to handle it.

12. Low point of Blue Sky Street

Q = 27.6 cfs Blue Sky St
16.0 cfs Lone Tree Rd
43.6 cfs

A single grate inlet can accommodate 27.8 cfs in a sump within the curb height. Two inlets can accommodate 55.6 cfs. Two inlets will be installed in the sump of Blue Sky Street. This extra inlet capacity will be sufficient to account for any spill from Lone Tree Road into Open Range Avenue that travels to the low-point of Blue Sky Street.

13. Messina Road

Basin 14-I, Basin 15-H
S = 3.1%
Q = 3.9 cfs Basin 14-I
2.6 cfs Basin 15-H
6.5 cfs

At 3.1%, a road with standard curb can handle 40 cfs. Therefore, no inlets are required. Install inlets to divert flow east. A single grate type A or C inlet can carry 2.7 cfs at a depth of 0.27'. Install two inlets to remove 5.4 cfs, 1.1 cfs will continue to Amole Mesa.

14. Amole Mesa Avenue

Basin 15-N, Messina overflow
S = 2.31%
Q = 3.9 cfs Basin 15-N
1.1 cfs Messina
5 cfs

At 2.31%, a road with standard curb can handle 31.8 cfs. Therefore, no inlets are required.

15. Mesa Arenoso north of Open Range Avenue

Basin 14-H and Gibson overflow
Width = 40' f-f
S = 1.29%
Q = 7.3 cfs Gibson
2.9 cfs Basin 14-H
2.1 cfs 33% of Basin 15-G
12.3 cfs

At 1.29%, a road with standard curb can handle 53.1 cfs. See PC stream output. Therefore, no inlets needed. Add inlets at Open Range Avenue to divert flow east. A single grate type A or C inlet can carry 3.1 cfs at a depth of 0.36'. Install two inlets to remove 6.2 cfs, 6.1 cfs will continue.

16. Mesa Arenoso at Amole Mesa

Flow from Mesa Arenoso and Amole Mesa and Basin 15-G
S = 0.6%
Width = 40' f-f
Q = 6.1 cfs Mesa Arenoso
4.1 cfs remainder of 15-G
5.0 cfs Amole Mesa
15.2 cfs

At 0.6%, a road with standard curb can handle 58.3 cfs. See PC stream output. Therefore, no inlets needed. A temporary pond will be constructed to collect the 15.2 cfs until future storm drain improvements are constructed.

Sandy Ridge Road

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

MANNING'S N= .017 SLOPE= .0259

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)
0.01	0.01	0.00	0.0	0.33	0.40	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.63	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.83	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	1.00	1.25	0.02	0.06
0.05	0.05	0.04	0.0	1.64	1.16	1.56	0.02	0.07
0.06	0.06	0.06	0.1	1.97	1.31	1.88	0.03	0.09
0.07	0.07	0.08	0.1	2.30	1.46	2.19	0.03	0.10
0.08	0.08	0.10	0.2	2.63	1.59	2.50	0.04	0.12
0.09	0.09	0.13	0.2	2.96	1.72	2.81	0.05	0.14
0.10	0.10	0.16	0.3	3.29	1.85	3.13	0.05	0.15
0.11	0.11	0.19	0.4	3.62	1.97	3.44	0.06	0.17
0.12	0.12	0.23	0.5	3.95	2.08	3.75	0.07	0.19
0.13	0.13	0.26	0.6	4.28	2.20	4.07	0.08	0.21
0.14	0.14	0.31	0.7	5.15	2.16	4.93	0.07	0.21
0.15	0.15	0.36	0.8	6.03	2.16	5.79	0.07	0.22
0.16	0.16	0.43	0.9	6.91	2.19	6.65	0.07	0.23
0.17	0.17	0.50	1.1	7.79	2.24	7.51	0.08	0.25
0.18	0.18	0.58	1.3	8.67	2.31	8.38	0.08	0.26
0.19	0.19	0.66	1.6	9.54	2.38	9.24	0.09	0.28
0.20	0.20	0.76	1.9	10.42	2.46	10.10	0.09	0.29
0.21	0.21	0.87	2.2	11.30	2.54	10.96	0.10	0.31
0.22	0.22	0.98	2.6	12.18	2.62	11.83	0.11	0.33
0.23	0.23	1.10	3.0	13.06	2.71	12.69	0.11	0.34
0.24	0.24	1.23	3.4	13.93	2.79	13.55	0.12	0.36
0.25	0.25	1.37	4.0	14.81	2.88	14.41	0.13	0.38
0.26	0.26	1.52	4.5	15.69	2.97	15.27	0.14	0.40
0.27	0.27	1.68	5.1	16.57	3.06	16.14	0.15	0.42
0.28	0.28	1.84	5.8	17.45	3.14	17.00	0.15	0.43
0.29	0.29	2.02	6.5	18.32	3.23	17.86	0.16	0.45
0.30	0.30	2.20	7.3	19.20	3.32	18.72	0.17	0.47
0.31	0.31	2.39	8.2	20.08	3.41	19.59	0.18	0.49
0.32	0.32	2.59	9.1	20.96	3.49	20.45	0.19	0.51
0.33	0.33	2.80	10.0	21.84	3.58	21.31	0.20	0.53
0.34	0.34	3.02	11.1	22.71	3.66	22.17	0.21	0.55
0.35	0.35	3.25	12.2	23.59	3.75	23.03	0.22	0.57
0.36	0.36	3.48	13.3	24.47	3.83	23.90	0.23	0.59
0.37	0.37	3.72	14.6	25.35	3.92	24.76	0.24	0.61
0.38	0.38	3.98	15.9	26.23	4.00	25.62	0.25	0.63
0.39	0.39	4.24	17.3	27.10	4.08	26.48	0.26	0.65
0.40	0.40	4.50	18.8	27.98	4.16	27.35	0.27	0.67
0.41	0.41	4.78	20.3	28.86	4.24	28.21	0.28	0.69
0.42	0.42	5.06	22.3	28.88	4.41	28.21	0.30	0.72
0.43	0.43	5.35	24.4	28.90	4.57	28.22	0.32	0.75
0.45	0.45	5.91	28.8	28.94	4.88	28.23	0.37	0.82
0.46	0.46	6.19	31.2	28.96	5.03	28.23	0.39	0.85
0.47	0.47	6.48	33.5	28.98	5.18	28.24	0.42	0.89
0.48	0.48	6.76	36.0	29.01	5.33	28.24	0.44	0.92
0.49	0.49	7.04	38.5	29.03	5.47	28.25	0.46	0.95
0.50	0.50	7.32	41.1	29.05	5.61	28.25	0.49	0.99
0.51	0.51	7.61	43.8	29.07	5.76	28.26	0.51	1.02
0.52	0.52	7.89	46.5	29.09	5.89	28.26	0.54	1.06
0.53	0.53	8.17	49.3	29.11	6.03	28.27	0.56	1.09
0.54	0.54	8.45	52.1	29.13	6.17	28.27	0.59	1.13
0.55	0.55	8.74	55.0	29.15	6.30	28.28	0.62	1.17
0.56	0.56	9.02	58.0	29.17	6.43	28.28	0.64	1.20
0.57	0.57	9.30	61.1	29.19	6.56	28.29	0.67	1.24
0.58	0.58	9.59	64.1	29.21	6.69	28.29	0.70	1.28

roll curb limit

Standard curb limit

Sandy Creek Road

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

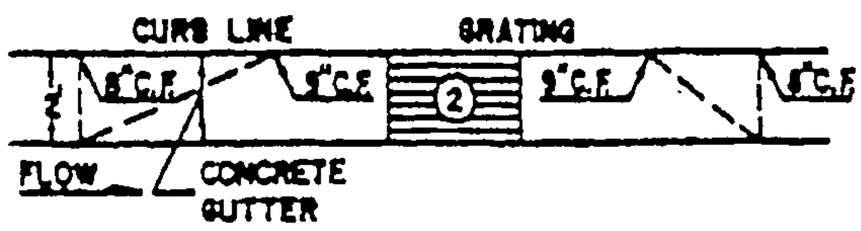
MANNING'S N= .017 SLOPE= .0247

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

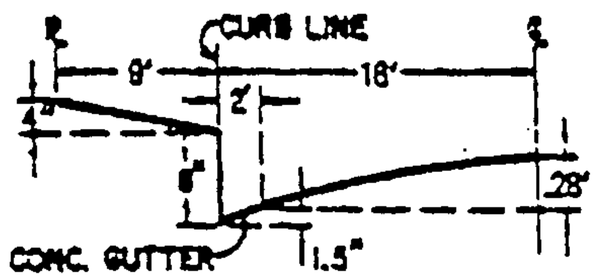
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)	
0.01	0.01	0.00	0.0	0.33	0.39	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.61	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.80	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	0.97	1.25	0.01	0.05	
0.05	0.05	0.04	0.0	1.64	1.13	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.28	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.42	2.19	0.03	0.10	
0.08	0.08	0.10	0.2	2.63	1.55	2.50	0.04	0.12	
0.09	0.09	0.13	0.2	2.96	1.67	2.81	0.04	0.13	
0.10	0.10	0.16	0.3	3.29	1.80	3.13	0.05	0.15	
0.11	0.11	0.19	0.4	3.62	1.91	3.44	0.06	0.17	
0.12	0.12	0.23	0.5	3.95	2.03	3.75	0.06	0.18	
0.13	0.13	0.26	0.6	4.28	2.14	4.07	0.07	0.20	
0.14	0.14	0.31	0.6	5.15	2.10	4.93	0.07	0.21	
0.15	0.15	0.36	0.8	6.03	2.10	5.79	0.07	0.22	
0.16	0.16	0.43	0.9	6.91	2.13	6.65	0.07	0.23	
0.17	0.17	0.50	1.1	7.79	2.18	7.51	0.07	0.24	
0.18	0.18	0.58	1.3	8.67	2.24	8.38	0.08	0.26	
0.19	0.19	0.66	1.5	9.54	2.31	9.24	0.08	0.27	
0.20	0.20	0.76	1.8	10.42	2.39	10.10	0.09	0.29	
0.21	0.21	0.87	2.1	11.30	2.47	10.96	0.09	0.30	
0.22	0.22	0.98	2.5	12.18	2.55	11.83	0.10	0.32	
0.23	0.23	1.10	2.9	13.06	2.63	12.69	0.11	0.34	
0.24	0.24	1.23	3.4	13.93	2.72	13.55	0.11	0.35	
0.25	0.25	1.37	3.8	14.81	2.80	14.41	0.12	0.37	
0.26	0.26	1.52	4.4	15.69	2.89	15.27	0.13	0.39	
0.27	0.27	1.68	5.0	16.57	2.97	16.14	0.14	0.41	
0.28	0.28	1.84	5.6	17.45	3.06	17.00	0.15	0.43	
0.29	0.29	2.02	6.3	18.32	3.14	17.86	0.15	0.44	
0.30	0.30	2.20	7.1	19.20	3.23	18.72	0.16	0.46	
0.31	0.31	2.39	7.9	20.08	3.31	19.59	0.17	0.48	
0.32	0.32	2.59	8.8	20.96	3.40	20.45	0.18	0.50	roll curb
0.33	0.33	2.80	9.8	21.84	3.48	21.31	0.19	0.52	
0.34	0.34	3.02	10.8	22.71	3.56	22.17	0.20	0.54	
0.35	0.35	3.25	11.8	23.59	3.65	23.03	0.21	0.56	
0.36	0.36	3.48	13.0	24.47	3.73	23.90	0.22	0.58	
0.37	0.37	3.72	14.2	25.35	3.81	24.76	0.23	0.60	
0.38	0.38	3.98	15.5	26.23	3.89	25.62	0.23	0.61	
0.39	0.39	4.24	16.8	27.10	3.97	26.48	0.24	0.63	
0.40	0.40	4.50	18.2	27.98	4.05	27.35	0.25	0.65	
0.41	0.41	4.78	19.7	28.86	4.13	28.21	0.26	0.67	
0.42	0.42	5.06	21.7	28.88	4.29	28.21	0.29	0.71	
0.43	0.43	5.35	23.8	28.90	4.44	28.22	0.31	0.74	
0.45	0.45	5.91	28.1	28.94	4.75	28.23	0.35	0.80	
0.46	0.46	6.19	30.3	28.96	4.89	28.23	0.37	0.83	standard curb
0.47	0.47	6.48	32.6	28.98	5.04	28.24	0.39	0.86	
0.48	0.48	6.76	35.0	29.01	5.18	28.24	0.42	0.90	
0.49	0.49	7.04	37.5	29.03	5.32	28.25	0.44	0.93	
0.50	0.50	7.32	40.0	29.05	5.46	28.25	0.46	0.96	
0.51	0.51	7.61	42.6	29.07	5.60	28.26	0.49	1.00	
0.52	0.52	7.89	45.2	29.09	5.73	28.26	0.51	1.03	
0.53	0.53	8.17	47.9	29.11	5.87	28.27	0.53	1.06	
0.54	0.54	8.45	50.7	29.13	6.00	28.27	0.56	1.10	
0.55	0.55	8.74	53.5	29.15	6.13	28.28	0.58	1.13	
0.56	0.56	9.02	56.4	29.17	6.26	28.28	0.61	1.17	
0.57	0.57	9.30	59.4	29.19	6.38	28.29	0.63	1.20	

Sandy Creek Road

GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

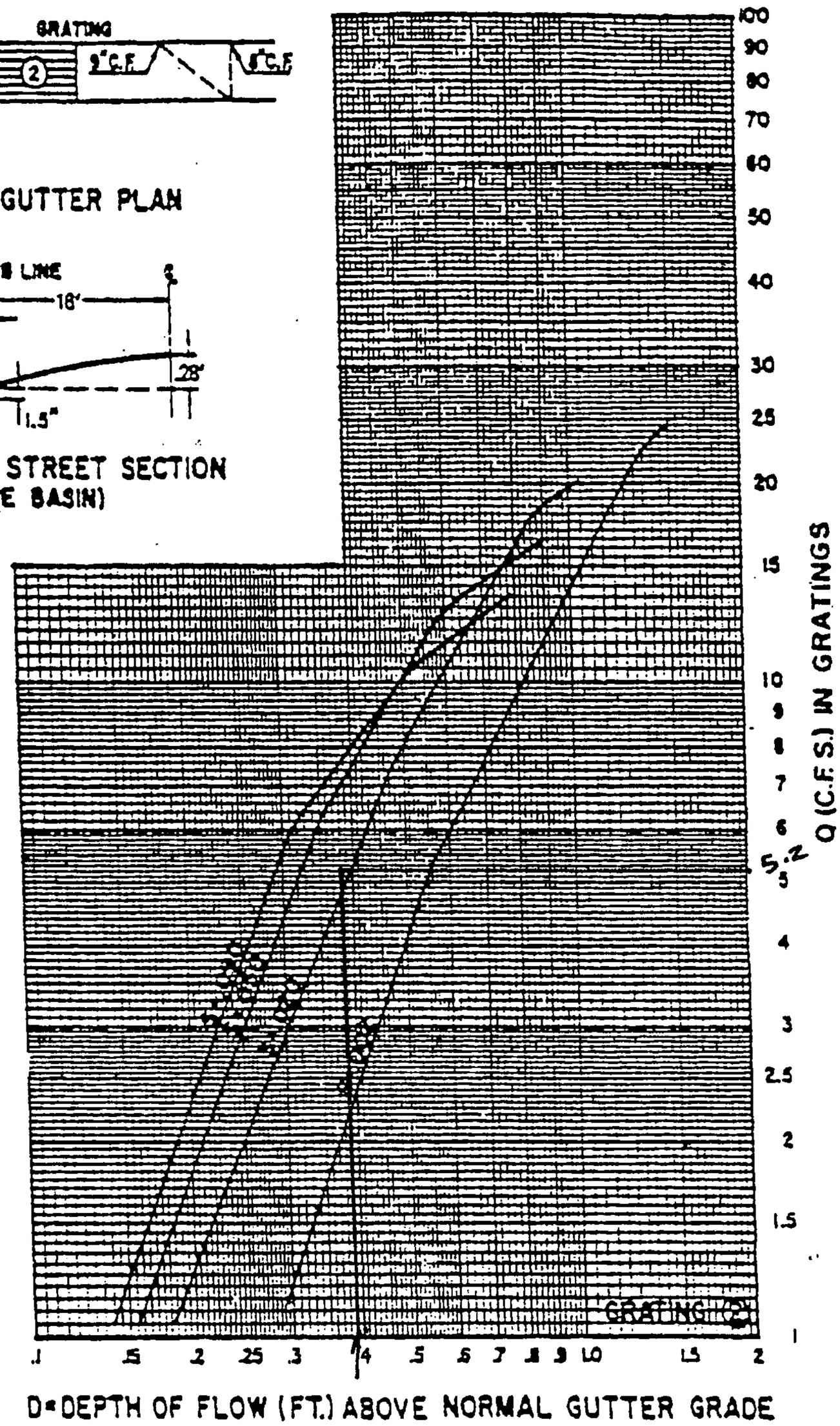


PLATE 22.3 D-5

D=0.39
S=2.47%
Q=5.2cfs/grate

Sandy Trail Road

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

MANNING'S N= .017 SLOPE= .033

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)	
0.01	0.01	0.00	0.0	0.33	0.45	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.71	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.94	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	1.13	1.25	0.02	0.06	
0.05	0.05	0.04	0.1	1.64	1.31	1.56	0.03	0.08	
0.06	0.06	0.06	0.1	1.97	1.48	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.65	2.19	0.04	0.11	
0.08	0.08	0.10	0.2	2.63	1.80	2.50	0.05	0.13	
0.09	0.09	0.13	0.2	2.96	1.95	2.81	0.06	0.15	
0.10	0.10	0.16	0.3	3.29	2.09	3.13	0.07	0.17	
0.11	0.11	0.19	0.4	3.62	2.22	3.44	0.08	0.19	
0.12	0.12	0.23	0.5	3.95	2.36	3.75	0.09	0.21	
0.13	0.13	0.26	0.7	4.28	2.49	4.07	0.10	0.23	
0.14	0.14	0.31	0.8	5.15	2.44	4.93	0.09	0.23	
0.15	0.15	0.36	0.9	6.03	2.44	5.79	0.09	0.24	
0.16	0.16	0.43	1.1	6.91	2.48	6.65	0.10	0.26	
0.17	0.17	0.50	1.3	7.79	2.54	7.51	0.10	0.27	
0.18	0.18	0.58	1.5	8.67	2.61	8.38	0.11	0.29	
0.19	0.19	0.66	1.8	9.54	2.69	9.24	0.11	0.30	
0.20	0.20	0.76	2.1	10.42	2.78	10.10	0.12	0.32	
0.21	0.21	0.87	2.5	11.30	2.87	10.96	0.13	0.34	
0.22	0.22	0.98	2.9	12.18	2.96	11.83	0.14	0.36	
0.23	0.23	1.10	3.4	13.06	3.06	12.69	0.15	0.38	
0.24	0.24	1.23	3.9	13.93	3.16	13.55	0.15	0.39	
0.25	0.25	1.37	4.5	14.81	3.26	14.41	0.16	0.41	
0.26	0.26	1.52	5.1	15.69	3.36	15.27	0.17	0.43	
0.27	0.27	1.68	5.8	16.57	3.46	16.14	0.19	0.46	
0.28	0.28	1.84	6.6	17.45	3.56	17.00	0.20	0.48	
0.29	0.29	2.02	7.4	18.32	3.65	17.86	0.21	0.50	roll curb
0.30	0.30	2.20	8.3	19.20	3.75	18.72	0.22	0.52	
0.31	0.31	2.39	9.2	20.08	3.85	19.59	0.23	0.54	
0.32	0.32	2.59	10.2	20.96	3.95	20.45	0.24	0.56	
0.33	0.33	2.80	11.3	21.84	4.05	21.31	0.25	0.58	
0.34	0.34	3.02	12.5	22.71	4.14	22.17	0.27	0.61	
0.35	0.35	3.25	13.8	23.59	4.24	23.03	0.28	0.63	
0.36	0.36	3.48	15.1	24.47	4.33	23.90	0.29	0.65	
0.37	0.37	3.72	16.5	25.35	4.43	24.76	0.30	0.67	
0.38	0.38	3.98	18.0	26.23	4.52	25.62	0.32	0.70	
0.39	0.39	4.24	19.5	27.10	4.61	26.48	0.33	0.72	
0.40	0.40	4.50	21.2	27.98	4.71	27.35	0.34	0.74	
0.41	0.41	4.78	22.9	28.86	4.80	28.21	0.36	0.77	
0.42	0.42	5.06	25.2	28.88	4.98	28.21	0.39	0.81	
0.43	0.43	5.35	27.6	28.90	5.16	28.22	0.41	0.84	Standard curb
0.45	0.45	5.91	32.6	28.94	5.52	28.23	0.47	0.92	
0.46	0.46	6.19	35.2	28.96	5.69	28.23	0.50	0.96	
0.47	0.47	6.48	37.9	28.98	5.86	28.24	0.53	1.00	
0.48	0.48	6.76	40.7	29.01	6.02	28.24	0.56	1.04	
0.49	0.49	7.04	43.6	29.03	6.19	28.25	0.59	1.08	
0.50	0.50	7.32	46.5	29.05	6.35	28.25	0.63	1.13	
0.51	0.51	7.61	49.5	29.07	6.51	28.26	0.66	1.17	
0.52	0.52	7.89	52.6	29.09	6.66	28.26	0.69	1.21	
0.53	0.53	8.17	55.7	29.11	6.82	28.27	0.72	1.25	
0.54	0.54	8.45	58.9	29.13	6.97	28.27	0.75	1.29	
0.55	0.55	8.74	62.2	29.15	7.12	28.28	0.79	1.34	
0.56	0.56	9.02	65.6	29.17	7.27	28.28	0.82	1.38	
0.57	0.57	9.30	69.0	29.19	7.42	28.29	0.85	1.42	

Blue Sky Street at Sandy Creek Rd

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

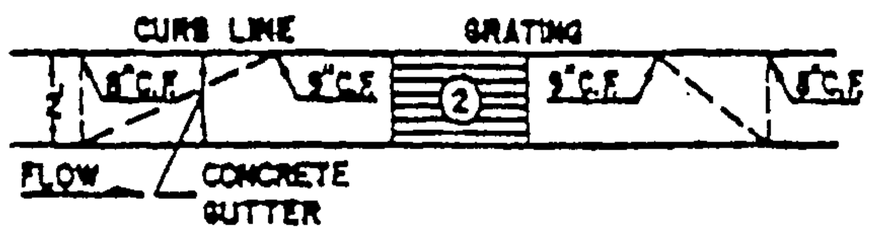
MANNING'S N= .017 SLOPE= .0246

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

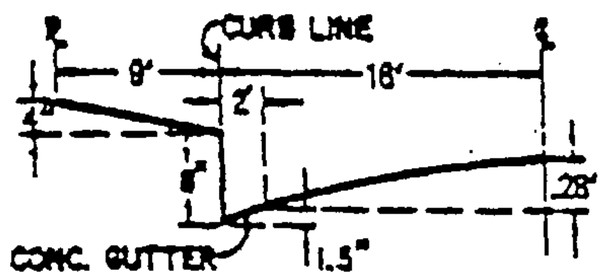
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)	
0.01	0.01	0.00	0.0	0.33	0.39	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.61	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.80	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	0.97	1.25	0.01	0.05	
0.05	0.05	0.04	0.0	1.64	1.13	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.28	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.42	2.19	0.03	0.10	
0.08	0.08	0.10	0.2	2.63	1.55	2.50	0.04	0.12	
0.09	0.09	0.13	0.2	2.96	1.67	2.81	0.04	0.13	
0.10	0.10	0.16	0.3	3.29	1.80	3.13	0.05	0.15	
0.11	0.11	0.19	0.4	3.62	1.91	3.44	0.06	0.17	
0.12	0.12	0.23	0.5	3.95	2.03	3.75	0.06	0.18	
0.13	0.13	0.26	0.6	4.28	2.14	4.07	0.07	0.20	
0.14	0.14	0.31	0.6	5.15	2.10	4.93	0.07	0.21	
0.15	0.15	0.36	0.8	6.03	2.10	5.79	0.07	0.22	
0.16	0.16	0.43	0.9	6.91	2.13	6.65	0.07	0.23	
0.17	0.17	0.50	1.1	7.79	2.18	7.51	0.07	0.24	
0.18	0.18	0.58	1.3	8.67	2.24	8.38	0.08	0.26	
0.19	0.19	0.66	1.5	9.54	2.31	9.24	0.08	0.27	
0.20	0.20	0.76	1.8	10.42	2.39	10.10	0.09	0.29	
0.21	0.21	0.87	2.1	11.30	2.47	10.96	0.09	0.30	
0.22	0.22	0.98	2.5	12.18	2.55	11.83	0.10	0.32	
0.23	0.23	1.10	2.9	13.06	2.63	12.69	0.11	0.34	
0.24	0.24	1.23	3.4	13.93	2.72	13.55	0.11	0.35	
0.25	0.25	1.37	3.8	14.81	2.80	14.41	0.12	0.37	
0.26	0.26	1.52	4.4	15.69	2.89	15.27	0.13	0.39	
0.27	0.27	1.68	5.0	16.57	2.97	16.14	0.14	0.41	
0.28	0.28	1.84	5.6	17.45	3.06	17.00	0.15	0.43	
0.29	0.29	2.02	6.3	18.32	3.14	17.86	0.15	0.44	
0.30	0.30	2.20	7.1	19.20	3.23	18.72	0.16	0.46	
0.31	0.31	2.39	7.9	20.08	3.31	19.59	0.17	0.48	
0.32	0.32	2.59	8.8	20.96	3.40	20.45	0.18	0.50	roll curb
0.33	0.33	2.80	9.8	21.84	3.48	21.31	0.19	0.52	
0.34	0.34	3.02	10.8	22.71	3.56	22.17	0.20	0.54	
0.35	0.35	3.25	11.8	23.59	3.65	23.03	0.21	0.56	
0.36	0.36	3.48	13.0	24.47	3.73	23.90	0.22	0.58	
0.37	0.37	3.72	14.2	25.35	3.81	24.76	0.23	0.60	
0.38	0.38	3.98	15.5	26.23	3.89	25.62	0.23	0.61	
0.39	0.39	4.24	16.8	27.10	3.97	26.48	0.24	0.63	
0.40	0.40	4.50	18.2	27.98	4.05	27.35	0.25	0.65	
0.41	0.41	4.78	19.7	28.86	4.13	28.21	0.26	0.67	
0.42	0.42	5.06	21.7	28.88	4.29	28.21	0.29	0.71	
0.43	0.43	5.35	23.8	28.90	4.44	28.22	0.31	0.74	
0.45	0.45	5.91	28.1	28.94	4.75	28.23	0.35	0.80	
0.46	0.46	6.19	30.3	28.96	4.89	28.23	0.37	0.83	standard curb
0.47	0.47	6.48	32.6	28.98	5.04	28.24	0.39	0.86	
0.48	0.48	6.76	35.0	29.01	5.18	28.24	0.42	0.90	
0.49	0.49	7.04	37.5	29.03	5.32	28.25	0.44	0.93	
0.50	0.50	7.32	40.0	29.05	5.46	28.25	0.46	0.96	
0.51	0.51	7.61	42.6	29.07	5.60	28.26	0.49	1.00	
0.52	0.52	7.89	45.2	29.09	5.73	28.26	0.51	1.03	
0.53	0.53	8.17	47.9	29.11	5.87	28.27	0.53	1.06	
0.54	0.54	8.45	50.7	29.13	6.00	28.27	0.56	1.10	
0.55	0.55	8.74	53.5	29.15	6.13	28.28	0.58	1.13	
0.56	0.56	9.02	56.4	29.17	6.26	28.28	0.61	1.17	
0.57	0.57	9.30	59.4	29.19	6.38	28.29	0.63	1.20	

Blue Sky Street at Sandy Creek Rd

GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

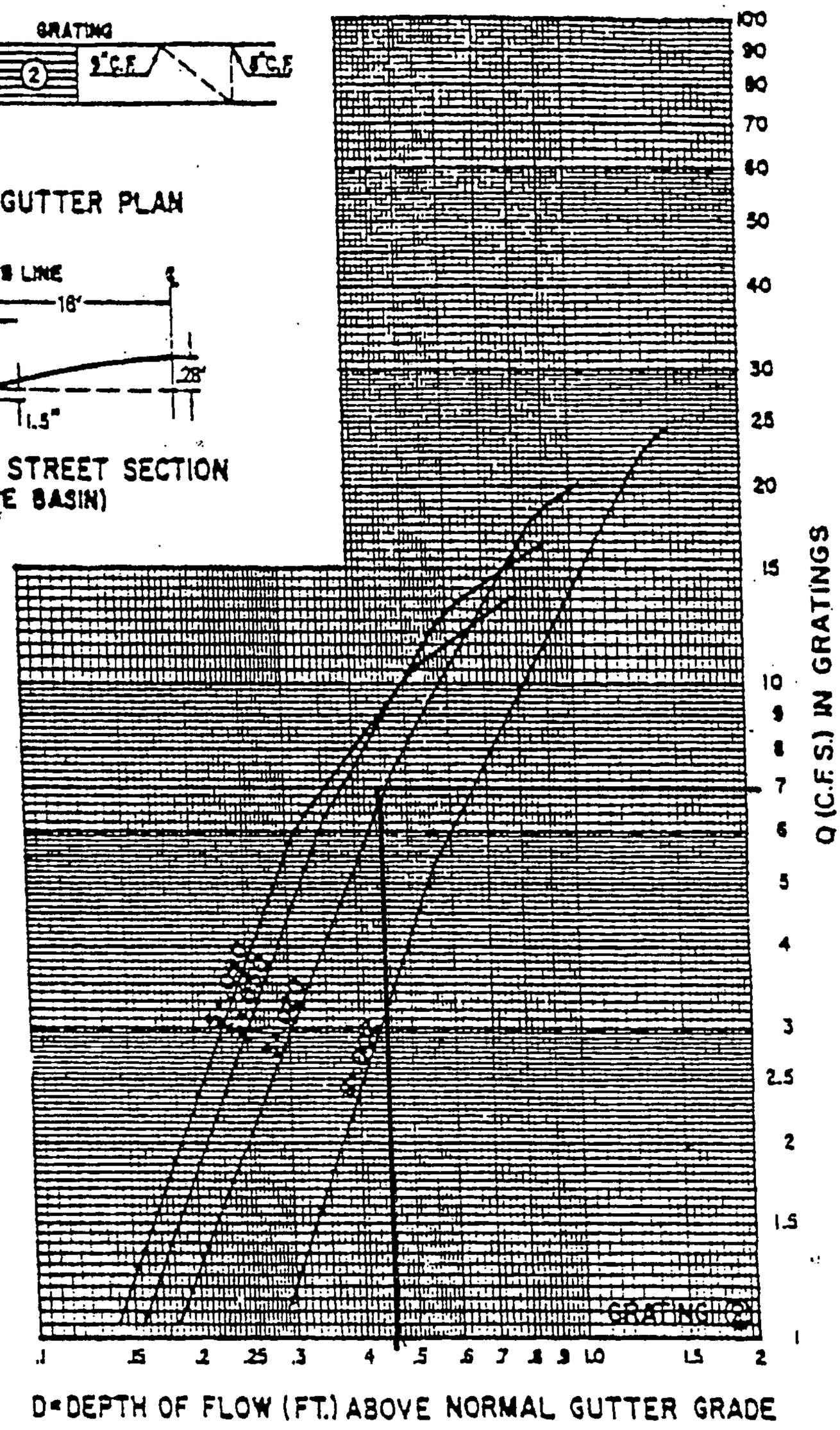


PLATE 22.3 D-5

D = 0.45'
S = 2.46%
Q = 7 cfs/grate

Blue Sky Rd north of Sandy Trail

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

MANNING'S N= .017 SLOPE= .0096

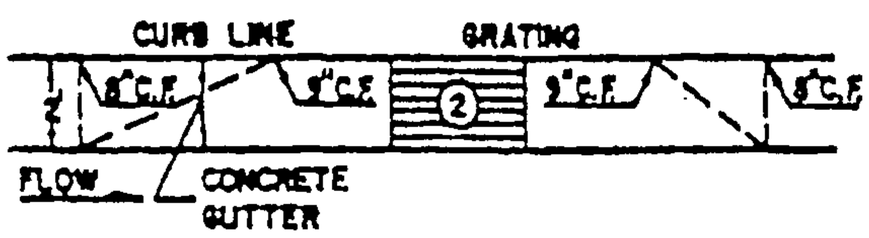
POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

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)
0.01	0.01	0.00	0.0	0.33	0.24	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.38	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.50	0.94	0.00	0.03
0.04	0.04	0.03	0.0	1.32	0.61	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	0.71	1.56	0.01	0.06
0.06	0.06	0.06	0.0	1.97	0.80	1.88	0.01	0.07
0.07	0.07	0.08	0.1	2.30	0.89	2.19	0.01	0.08
0.08	0.08	0.10	0.1	2.63	0.97	2.50	0.01	0.09
0.09	0.09	0.13	0.1	2.96	1.05	2.81	0.02	0.11
0.10	0.10	0.16	0.2	3.29	1.12	3.13	0.02	0.12
0.11	0.11	0.19	0.2	3.62	1.20	3.44	0.02	0.13
0.12	0.12	0.23	0.3	3.95	1.27	3.75	0.03	0.15
0.13	0.13	0.26	0.4	4.28	1.34	4.07	0.03	0.16
0.14	0.14	0.31	0.4	5.15	1.31	4.93	0.03	0.17
0.15	0.15	0.36	0.5	6.03	1.31	5.79	0.03	0.18
0.16	0.16	0.43	0.6	6.91	1.33	6.65	0.03	0.19
0.17	0.17	0.50	0.7	7.79	1.37	7.51	0.03	0.20
0.18	0.18	0.58	0.8	8.67	1.40	8.38	0.03	0.21
0.19	0.19	0.66	1.0	9.54	1.45	9.24	0.03	0.22
0.20	0.20	0.76	1.1	10.42	1.50	10.10	0.03	0.23
0.21	0.21	0.87	1.3	11.30	1.54	10.96	0.04	0.25
0.22	0.22	0.98	1.6	12.18	1.60	11.83	0.04	0.26
0.23	0.23	1.10	1.8	13.06	1.65	12.69	0.04	0.27
0.24	0.24	1.23	2.1	13.93	1.70	13.55	0.04	0.28
0.25	0.25	1.37	2.4	14.81	1.75	14.41	0.05	0.30
0.26	0.26	1.52	2.8	15.69	1.81	15.27	0.05	0.31
0.27	0.27	1.68	3.1	16.57	1.86	16.14	0.05	0.32
0.28	0.28	1.84	3.5	17.45	1.91	17.00	0.06	0.34
0.29	0.29	2.02	4.0	18.32	1.97	17.86	0.06	0.35
0.30	0.30	2.20	4.4	19.20	2.02	18.72	0.06	0.36
0.31	0.31	2.39	5.0	20.08	2.07	19.59	0.07	0.38
0.32	0.32	2.59	5.5	20.96	2.13	20.45	0.07	0.39
0.33	0.33	2.80	6.1	21.84	2.18	21.31	0.07	0.40
0.34	0.34	3.02	6.7	22.71	2.23	22.17	0.08	0.42
0.35	0.35	3.25	7.4	23.59	2.28	23.03	0.08	0.43
0.36	0.36	3.48	8.1	24.47	2.33	23.90	0.08	0.44
0.37	0.37	3.72	8.9	25.35	2.38	24.76	0.09	0.46
0.38	0.38	3.98	9.7	26.23	2.43	25.62	0.09	0.47
0.39	0.39	4.24	10.5	27.10	2.48	26.48	0.10	0.49
0.40	0.40	4.50	11.4	27.98	2.53	27.35	0.10	0.50
0.41	0.41	4.78	12.4	28.86	2.58	28.21	0.10	0.51
0.42	0.42	5.06	13.6	28.88	2.68	28.21	0.11	0.53
0.43	0.43	5.35	14.9	28.90	2.78	28.22	0.12	0.55
0.45	0.45	5.91	17.6	28.94	2.97	28.23	0.14	0.59
0.46	0.46	6.19	19.0	28.96	3.06	28.23	0.15	0.61
0.47	0.47	6.48	20.4	28.98	3.15	28.24	0.15	0.62
0.48	0.48	6.76	21.9	29.01	3.24	28.24	0.16	0.64
0.49	0.49	7.04	23.5	29.03	3.33	28.25	0.17	0.66
0.50	0.50	7.32	25.0	29.05	3.42	28.25	0.18	0.68
0.51	0.51	7.61	26.6	29.07	3.50	28.26	0.19	0.70
0.52	0.52	7.89	28.3	29.09	3.59	28.26	0.20	0.72
0.53	0.53	8.17	30.0	29.11	3.67	28.27	0.21	0.74
0.54	0.54	8.45	31.7	29.13	3.75	28.27	0.22	0.76
0.55	0.55	8.74	33.5	29.15	3.84	28.28	0.23	0.78
0.56	0.56	9.02	35.3	29.17	3.92	28.28	0.24	0.80
0.57	0.57	9.30	37.2	29.19	4.00	28.29	0.25	0.82
0.58	0.58	9.59	39.1	29.21	4.07	28.29	0.26	0.84
0.59	0.59	9.87	41.0	29.23	4.15	28.30	0.27	0.86

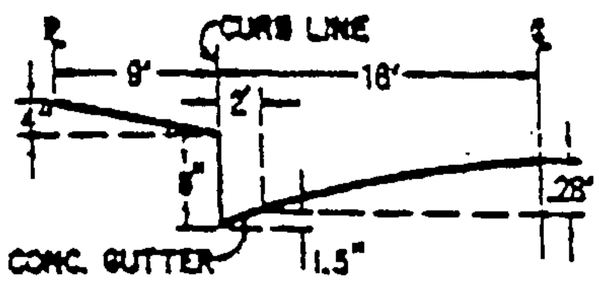
Standard curb

Blue Sky Street north of Sandy Trail

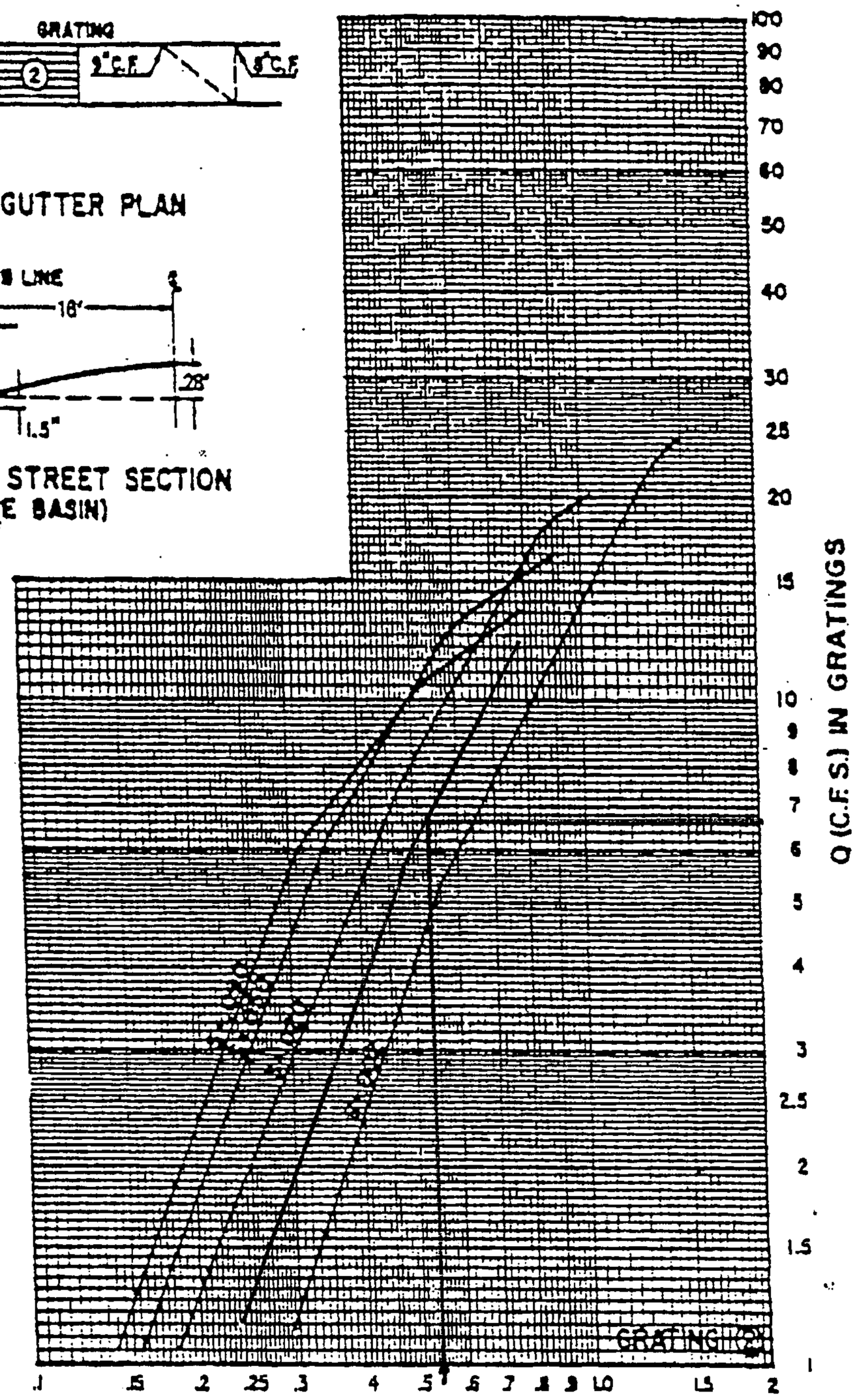
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



S = 0.96%

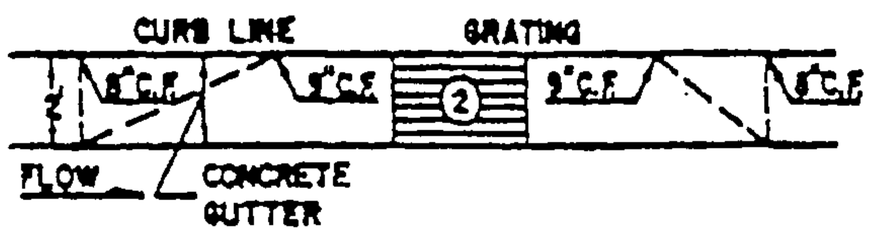
D = 0.52'

Q = 6.6 cfs/grate

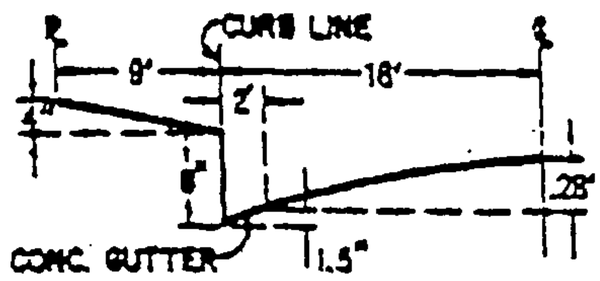
PLATE 22.3 D-5

Blue Sky Street north of Solitude Road

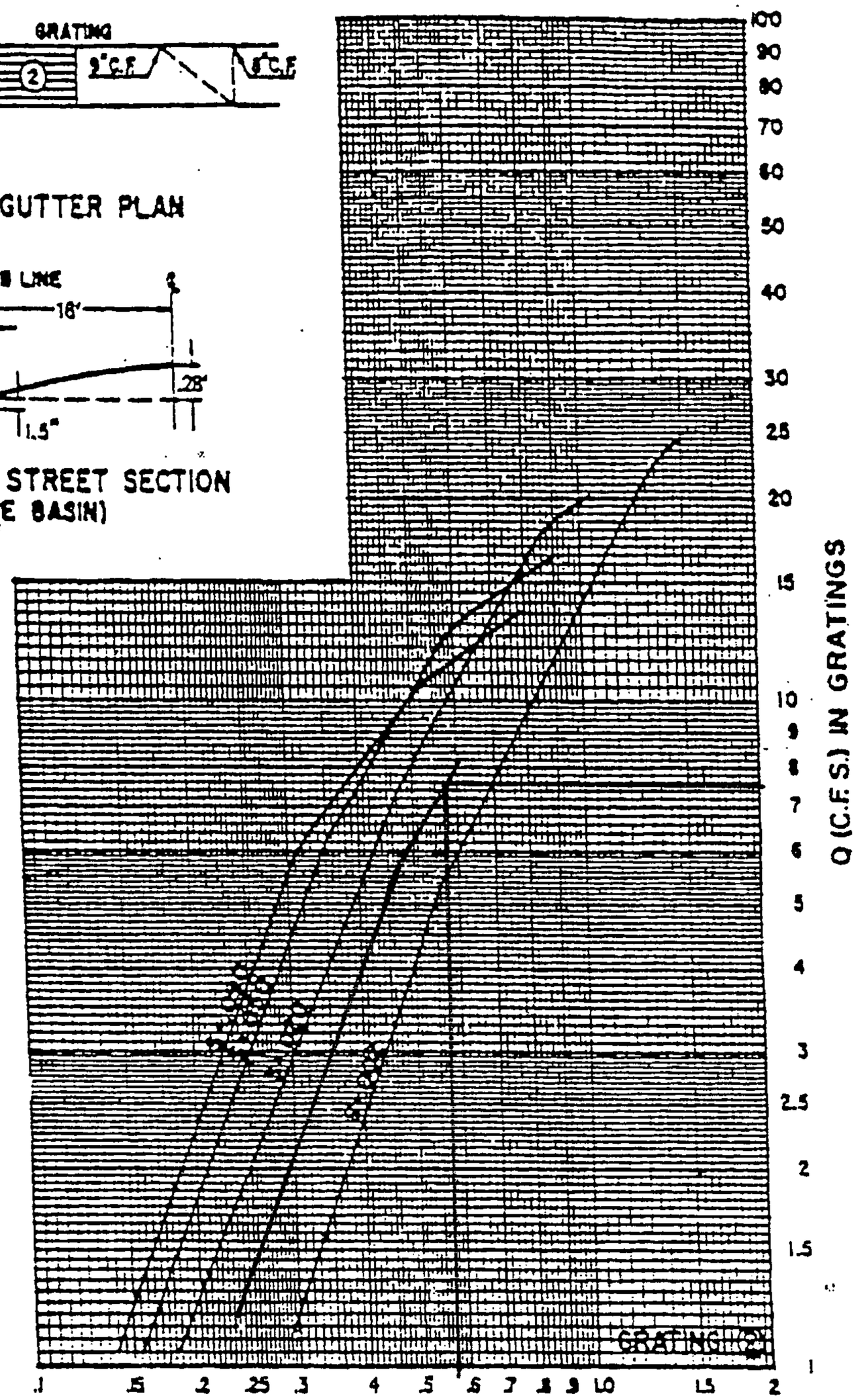
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



S= 0.96%

D= 0.5ft

Q= 7.5 cfs/grate

PLATE 22.3 D-5

Solitude Road

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

MANNING'S N= .017 SLOPE= .0298

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)	
0.01	0.01	0.00	0.0	0.33	0.43	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.68	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.89	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	1.07	1.25	0.02	0.06	
0.05	0.05	0.04	0.0	1.64	1.25	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.41	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.56	2.19	0.04	0.11	
0.08	0.08	0.10	0.2	2.63	1.71	2.50	0.05	0.13	
0.09	0.09	0.13	0.2	2.96	1.85	2.81	0.05	0.14	
0.10	0.10	0.16	0.3	3.29	1.98	3.13	0.06	0.16	
0.11	0.11	0.19	0.4	3.62	2.11	3.44	0.07	0.18	
0.12	0.12	0.23	0.5	3.95	2.24	3.75	0.08	0.20	
0.13	0.13	0.26	0.6	4.28	2.36	4.07	0.09	0.22	
0.14	0.14	0.31	0.7	5.15	2.31	4.93	0.08	0.22	
0.15	0.15	0.36	0.8	6.03	2.32	5.79	0.08	0.23	
0.16	0.16	0.43	1.0	6.91	2.35	6.65	0.09	0.25	
0.17	0.17	0.50	1.2	7.79	2.41	7.51	0.09	0.26	
0.18	0.18	0.58	1.4	8.67	2.47	8.38	0.10	0.28	
0.19	0.19	0.66	1.7	9.54	2.55	9.24	0.10	0.29	
0.20	0.20	0.76	2.0	10.42	2.63	10.10	0.11	0.31	
0.21	0.21	0.87	2.4	11.30	2.72	10.96	0.11	0.32	
0.22	0.22	0.98	2.8	12.18	2.81	11.83	0.12	0.34	
0.23	0.23	1.10	3.2	13.06	2.90	12.69	0.13	0.36	
0.24	0.24	1.23	3.7	13.93	3.00	13.55	0.14	0.38	
0.25	0.25	1.37	4.2	14.81	3.09	14.41	0.15	0.40	
0.26	0.26	1.52	4.8	15.69	3.18	15.27	0.16	0.42	
0.27	0.27	1.68	5.5	16.57	3.28	16.14	0.17	0.44	
0.28	0.28	1.84	6.2	17.45	3.37	17.00	0.18	0.46	
0.29	0.29	2.02	7.0	18.32	3.47	17.86	0.19	0.48	
0.30	0.30	2.20	7.8	19.20	3.56	18.72	0.20	0.50	
0.31	0.31	2.39	8.7	20.08	3.65	19.59	0.21	0.52	roll curb
0.32	0.32	2.59	9.7	20.96	3.75	20.45	0.22	0.54	
0.33	0.33	2.80	10.8	21.84	3.84	21.31	0.23	0.56	
0.34	0.34	3.02	11.9	22.71	3.93	22.17	0.24	0.58	
0.35	0.35	3.25	13.0	23.59	4.02	23.03	0.25	0.60	
0.36	0.36	3.48	14.3	24.47	4.11	23.90	0.26	0.62	
0.37	0.37	3.72	15.6	25.35	4.20	24.76	0.27	0.64	
0.38	0.38	3.98	17.1	26.23	4.29	25.62	0.29	0.67	
0.39	0.39	4.24	18.5	27.10	4.38	26.48	0.30	0.69	
0.40	0.40	4.50	20.1	27.98	4.47	27.35	0.31	0.71	
0.41	0.41	4.78	21.8	28.86	4.55	28.21	0.32	0.73	
0.42	0.42	5.06	23.9	28.88	4.73	28.21	0.35	0.77	
0.43	0.43	5.35	26.2	28.90	4.90	28.22	0.37	0.80	standard
0.45	0.45	5.91	30.9	28.94	5.23	28.23	0.43	0.88	
0.46	0.46	6.19	33.4	28.96	5.40	28.23	0.45	0.91	
0.47	0.47	6.48	36.0	28.98	5.56	28.24	0.48	0.95	
0.48	0.48	6.76	38.6	29.01	5.71	28.24	0.51	0.99	
0.49	0.49	7.04	41.3	29.03	5.87	28.25	0.53	1.02	
0.50	0.50	7.32	44.1	29.05	6.02	28.25	0.56	1.06	
0.51	0.51	7.61	47.0	29.07	6.17	28.26	0.59	1.10	
0.52	0.52	7.89	49.9	29.09	6.32	28.26	0.62	1.14	
0.53	0.53	8.17	52.9	29.11	6.47	28.27	0.65	1.18	
0.54	0.54	8.45	55.9	29.13	6.61	28.27	0.68	1.22	
0.55	0.55	8.74	59.0	29.15	6.76	28.28	0.71	1.26	
0.56	0.56	9.02	62.2	29.17	6.90	28.28	0.74	1.30	
0.57	0.57	9.30	65.5	29.19	7.04	28.29	0.77	1.34	

Blue Sky Street south of Solitude Road / North of Open Range

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

MANNING'S N= .017 SLOPE= .0195

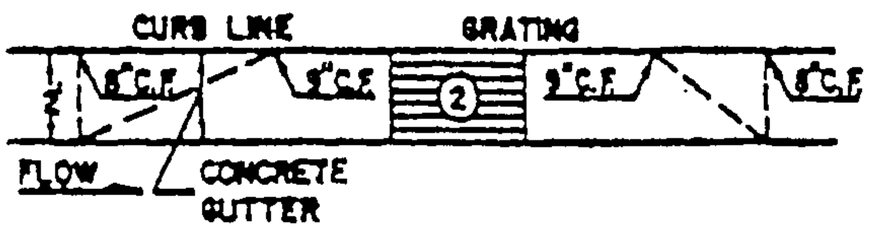
POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

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)
0.01	0.01	0.00	0.0	0.33	0.34	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.54	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.71	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.86	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	1.00	1.56	0.02	0.07
0.06	0.06	0.06	0.1	1.97	1.13	1.88	0.02	0.08
0.07	0.07	0.08	0.1	2.30	1.25	2.19	0.02	0.09
0.08	0.08	0.10	0.1	2.63	1.37	2.50	0.03	0.11
0.09	0.09	0.13	0.2	2.96	1.48	2.81	0.03	0.12
0.10	0.10	0.16	0.2	3.29	1.59	3.13	0.04	0.14
0.11	0.11	0.19	0.3	3.62	1.69	3.44	0.04	0.15
0.12	0.12	0.23	0.4	3.95	1.79	3.75	0.05	0.17
0.13	0.13	0.26	0.5	4.28	1.89	4.07	0.06	0.19
0.14	0.14	0.31	0.6	5.15	1.85	4.93	0.05	0.19
0.15	0.15	0.36	0.7	6.03	1.85	5.79	0.05	0.20
0.16	0.16	0.43	0.8	6.91	1.88	6.65	0.06	0.22
0.17	0.17	0.50	1.0	7.79	1.93	7.51	0.06	0.23
0.18	0.18	0.58	1.1	8.67	1.98	8.38	0.06	0.24
0.19	0.19	0.66	1.4	9.54	2.04	9.24	0.06	0.25
0.20	0.20	0.76	1.6	10.42	2.11	10.10	0.07	0.27
0.21	0.21	0.87	1.9	11.30	2.18	10.96	0.07	0.28
0.22	0.22	0.98	2.2	12.18	2.25	11.83	0.08	0.30
0.23	0.23	1.10	2.6	13.06	2.32	12.69	0.08	0.31
0.24	0.24	1.23	3.0	13.93	2.40	13.55	0.09	0.33
0.25	0.25	1.37	3.4	14.81	2.47	14.41	0.10	0.35
0.26	0.26	1.52	3.9	15.69	2.55	15.27	0.10	0.36
0.27	0.27	1.68	4.4	16.57	2.63	16.14	0.11	0.38
0.28	0.28	1.84	5.0	17.45	2.70	17.00	0.11	0.39
0.29	0.29	2.02	5.6	18.32	2.78	17.86	0.12	0.41
0.30	0.30	2.20	6.3	19.20	2.85	18.72	0.13	0.43
0.31	0.31	2.39	7.0	20.08	2.93	19.59	0.13	0.44
0.32	0.32	2.59	7.8	20.96	3.00	20.45	0.14	0.46
0.33	0.33	2.80	8.6	21.84	3.07	21.31	0.15	0.48
0.34	0.34	3.02	9.5	22.71	3.15	22.17	0.15	0.49
0.35	0.35	3.25	10.4	23.59	3.22	23.03	0.16	0.51
0.36	0.36	3.48	11.5	24.47	3.29	23.90	0.17	0.53
0.37	0.37	3.72	12.5	25.35	3.36	24.76	0.18	0.55
0.38	0.38	3.98	13.7	26.23	3.43	25.62	0.18	0.56
0.39	0.39	4.24	14.8	27.10	3.50	26.48	0.19	0.58
0.40	0.40	4.50	16.1	27.98	3.58	27.35	0.20	0.60
0.41	0.41	4.78	17.4	28.86	3.64	28.21	0.21	0.62
0.42	0.42	5.06	19.2	28.88	3.78	28.21	0.22	0.64
0.43	0.43	5.35	21.0	28.90	3.92	28.22	0.24	0.67
0.45	0.45	5.91	24.8	28.94	4.19	28.23	0.27	0.72
0.46	0.46	6.19	26.8	28.96	4.32	28.23	0.29	0.75
0.47	0.47	6.48	28.8	28.98	4.45	28.24	0.31	0.78
0.48	0.48	6.76	30.9	29.01	4.57	28.24	0.32	0.80
0.49	0.49	7.04	33.1	29.03	4.70	28.25	0.34	0.83
0.50	0.50	7.32	35.3	29.05	4.82	28.25	0.36	0.86
0.51	0.51	7.61	37.6	29.07	4.94	28.26	0.38	0.89
0.52	0.52	7.89	39.9	29.09	5.06	28.26	0.40	0.92
0.53	0.53	8.17	42.3	29.11	5.18	28.27	0.42	0.95
0.54	0.54	8.45	44.8	29.13	5.30	28.27	0.44	0.98
0.55	0.55	8.74	47.3	29.15	5.41	28.28	0.45	1.00
0.56	0.56	9.02	49.8	29.17	5.52	28.28	0.47	1.03
0.57	0.57	9.30	52.4	29.19	5.64	28.29	0.49	1.06

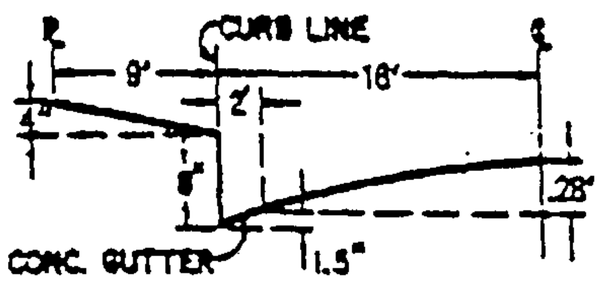
Standard curb capacity

Blue Sky Street north of Open Range Ave

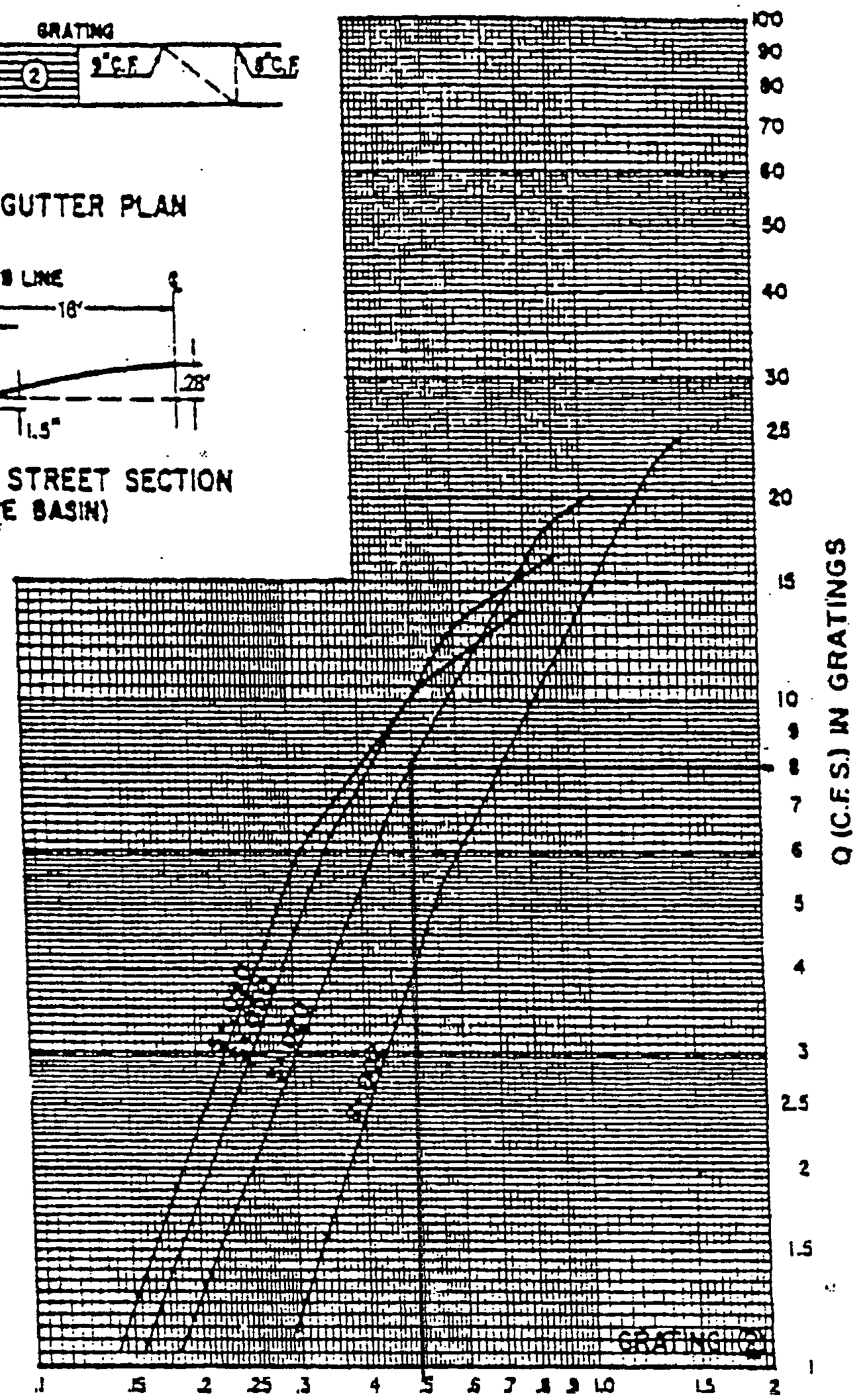
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D = 0.49'

Q = 33 cfs

S = 1.95%

Q = 8 cfs/grate

PLATE 22.3 D-5

Ghost Ranch Street

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

MANNING'S N= .017 SLOPE= .025

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)	
0.01	0.01	0.00	0.0	0.33	0.39	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.62	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.81	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	0.98	1.25	0.02	0.06	
0.05	0.05	0.04	0.0	1.64	1.14	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.29	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.43	2.19	0.03	0.10	
0.08	0.08	0.10	0.2	2.63	1.56	2.50	0.04	0.12	
0.09	0.09	0.13	0.2	2.96	1.69	2.81	0.04	0.13	
0.10	0.10	0.16	0.3	3.29	1.81	3.13	0.05	0.15	
0.11	0.11	0.19	0.4	3.62	1.93	3.44	0.06	0.17	
0.12	0.12	0.23	0.5	3.95	2.05	3.75	0.07	0.19	
0.13	0.13	0.26	0.6	4.28	2.16	4.07	0.07	0.20	
0.14	0.14	0.31	0.7	5.15	2.12	4.93	0.07	0.21	
0.15	0.15	0.36	0.8	6.03	2.12	5.79	0.07	0.22	
0.16	0.16	0.43	0.9	6.91	2.15	6.65	0.07	0.23	
0.17	0.17	0.50	1.1	7.79	2.20	7.51	0.08	0.25	
0.18	0.18	0.58	1.3	8.67	2.27	8.38	0.08	0.26	
0.19	0.19	0.66	1.6	9.54	2.34	9.24	0.08	0.27	
0.20	0.20	0.76	1.8	10.42	2.41	10.10	0.09	0.29	
0.21	0.21	0.87	2.2	11.30	2.49	10.96	0.10	0.31	
0.22	0.22	0.98	2.5	12.18	2.58	11.83	0.10	0.32	
0.23	0.23	1.10	2.9	13.06	2.66	12.69	0.11	0.34	
0.24	0.24	1.23	3.4	13.93	2.74	13.55	0.12	0.36	
0.25	0.25	1.37	3.9	14.81	2.83	14.41	0.12	0.37	
0.26	0.26	1.52	4.4	15.69	2.92	15.27	0.13	0.39	
0.27	0.27	1.68	5.0	16.57	3.00	16.14	0.14	0.41	
0.28	0.28	1.84	5.7	17.45	3.09	17.00	0.15	0.43	
0.29	0.29	2.02	6.4	18.32	3.18	17.86	0.16	0.45	
0.30	0.30	2.20	7.2	19.20	3.26	18.72	0.17	0.47	
0.31	0.31	2.39	8.0	20.08	3.35	19.59	0.17	0.48	
0.32	0.32	2.59	8.9	20.96	3.43	20.45	0.18	0.50	
0.33	0.33	2.80	9.9	21.84	3.52	21.31	0.19	0.52	roll curb
0.34	0.34	3.02	10.9	22.71	3.60	22.17	0.20	0.54	
0.35	0.35	3.25	12.0	23.59	3.68	23.03	0.21	0.56	
0.36	0.36	3.48	13.1	24.47	3.77	23.90	0.22	0.58	
0.37	0.37	3.72	14.3	25.35	3.85	24.76	0.23	0.60	
0.38	0.38	3.98	15.6	26.23	3.93	25.62	0.24	0.62	
0.39	0.39	4.24	17.0	27.10	4.01	26.48	0.25	0.64	
0.40	0.40	4.50	18.4	27.98	4.09	27.35	0.26	0.66	
0.41	0.41	4.78	19.9	28.86	4.17	28.21	0.27	0.68	
0.42	0.42	5.06	21.9	28.88	4.33	28.21	0.29	0.71	
0.43	0.43	5.35	24.0	28.90	4.49	28.22	0.31	0.74	
0.45	0.45	5.91	28.3	28.94	4.79	28.23	0.36	0.81	
0.46	0.46	6.19	30.6	28.96	4.94	28.23	0.38	0.84	standard curb
0.47	0.47	6.48	33.0	28.98	5.09	28.24	0.40	0.87	
0.48	0.48	6.76	35.4	29.01	5.23	28.24	0.43	0.91	
0.49	0.49	7.04	37.8	29.03	5.38	28.25	0.45	0.94	
0.50	0.50	7.32	40.4	29.05	5.52	28.25	0.47	0.97	
0.51	0.51	7.61	43.0	29.07	5.65	28.26	0.50	1.01	
0.52	0.52	7.89	45.7	29.09	5.79	28.26	0.52	1.04	
0.53	0.53	8.17	48.4	29.11	5.93	28.27	0.55	1.08	
0.54	0.54	8.45	51.2	29.13	6.06	28.27	0.57	1.11	
0.55	0.55	8.74	54.1	29.15	6.19	28.28	0.59	1.14	
0.56	0.56	9.02	57.0	29.17	6.32	28.28	0.62	1.18	
0.57	0.57	9.30	60.0	29.19	6.45	28.29	0.65	1.22	

Ghost Ranch Street

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

MANNING'S N= .017 SLOPE= .04

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)
0.01	0.01	0.00	0.0	0.33	0.49	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.78	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	1.03	0.94	0.02	0.05
0.04	0.04	0.03	0.0	1.32	1.25	1.25	0.02	0.06
0.05	0.05	0.04	0.1	1.64	1.45	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.63	1.88	0.04	0.10
0.07	0.07	0.08	0.1	2.30	1.81	2.19	0.05	0.12
0.08	0.08	0.10	0.2	2.63	1.98	2.50	0.06	0.14
0.09	0.09	0.13	0.3	2.96	2.14	2.81	0.07	0.16
0.10	0.10	0.16	0.4	3.29	2.29	3.13	0.08	0.18
0.11	0.11	0.19	0.5	3.62	2.44	3.44	0.09	0.20
0.12	0.12	0.23	0.6	3.95	2.59	3.75	0.10	0.22
0.13	0.13	0.26	0.7	4.28	2.73	4.07	0.12	0.25
0.14	0.14	0.31	0.8	5.15	2.68	4.93	0.11	0.25
0.15	0.15	0.36	1.0	6.03	2.68	5.79	0.11	0.26
0.16	0.16	0.43	1.2	6.91	2.72	6.65	0.12	0.28
0.17	0.17	0.50	1.4	7.79	2.79	7.51	0.12	0.29
0.18	0.18	0.58	1.6	8.67	2.87	8.38	0.13	0.31
0.19	0.19	0.66	2.0	9.54	2.96	9.24	0.14	0.33
0.20	0.20	0.76	2.3	10.42	3.05	10.10	0.14	0.34
0.21	0.21	0.87	2.7	11.30	3.15	10.96	0.15	0.36
0.22	0.22	0.98	3.2	12.18	3.26	11.83	0.16	0.38
0.23	0.23	1.10	3.7	13.06	3.36	12.69	0.18	0.41
0.24	0.24	1.23	4.3	13.93	3.47	13.55	0.19	0.43
0.25	0.25	1.37	4.9	14.81	3.58	14.41	0.20	0.45
0.26	0.26	1.52	5.6	15.69	3.69	15.27	0.21	0.47
0.27	0.27	1.68	6.4	16.57	3.80	16.14	0.22	0.49
0.28	0.28	1.84	7.2	17.45	3.91	17.00	0.24	0.52
0.29	0.29	2.02	8.1	18.32	4.02	17.86	0.25	0.54
0.30	0.30	2.20	9.1	19.20	4.13	18.72	0.26	0.56
0.31	0.31	2.39	10.1	20.08	4.23	19.59	0.28	0.59
0.32	0.32	2.59	11.3	20.96	4.34	20.45	0.29	0.61
0.33	0.33	2.80	12.5	21.84	4.45	21.31	0.31	0.64
0.34	0.34	3.02	13.7	22.71	4.55	22.17	0.32	0.66
0.35	0.35	3.25	15.1	23.59	4.66	23.03	0.34	0.69
0.36	0.36	3.48	16.6	24.47	4.76	23.90	0.35	0.71
0.37	0.37	3.72	18.1	25.35	4.87	24.76	0.37	0.74
0.38	0.38	3.98	19.8	26.23	4.97	25.62	0.38	0.76
0.39	0.39	4.24	21.5	27.10	5.07	26.48	0.40	0.79
0.40	0.40	4.50	23.3	27.98	5.17	27.35	0.42	0.82
0.41	0.41	4.78	25.2	28.86	5.27	28.21	0.43	0.84
0.42	0.42	5.06	27.7	28.88	5.48	28.21	0.47	0.89
0.43	0.43	5.35	30.3	28.90	5.68	28.22	0.50	0.93
0.45	0.45	5.91	35.8	28.94	6.06	28.23	0.57	1.02
0.46	0.46	6.19	38.7	28.96	6.25	28.23	0.61	1.07
0.47	0.47	6.48	41.7	28.98	6.44	28.24	0.64	1.11
0.48	0.48	6.76	44.7	29.01	6.62	28.24	0.68	1.16
0.49	0.49	7.04	47.9	29.03	6.80	28.25	0.72	1.21
0.50	0.50	7.32	51.1	29.05	6.98	28.25	0.76	1.26
0.51	0.51	7.61	54.4	29.07	7.15	28.26	0.79	1.30
0.52	0.52	7.89	57.8	29.09	7.32	28.26	0.83	1.35
0.53	0.53	8.17	61.2	29.11	7.50	28.27	0.87	1.40
0.54	0.54	8.45	64.8	29.13	7.66	28.27	0.91	1.45
0.55	0.55	8.74	68.4	29.15	7.83	28.28	0.95	1.50
0.56	0.56	9.02	72.1	29.17	7.99	28.28	0.99	1.55
0.57	0.57	9.30	75.9	29.19	8.16	28.29	1.03	1.60

standard curb

Ghost Ranch Street

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

MANNING'S N= .017 SLOPE= .0141

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)
0.01	0.01	0.00	0.0	0.33	0.29	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.47	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.61	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.74	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	0.86	1.56	0.01	0.06
0.06	0.06	0.06	0.1	1.97	0.97	1.88	0.01	0.07
0.07	0.07	0.08	0.1	2.30	1.07	2.19	0.02	0.09
0.08	0.08	0.10	0.1	2.63	1.17	2.50	0.02	0.10
0.09	0.09	0.13	0.2	2.96	1.27	2.81	0.03	0.12
0.10	0.10	0.16	0.2	3.29	1.36	3.13	0.03	0.13
0.11	0.11	0.19	0.3	3.62	1.45	3.44	0.03	0.14
0.12	0.12	0.23	0.3	3.95	1.54	3.75	0.04	0.16
0.13	0.13	0.26	0.4	4.28	1.62	4.07	0.04	0.17
0.14	0.14	0.31	0.5	5.15	1.59	4.93	0.04	0.18
0.15	0.15	0.36	0.6	6.03	1.59	5.79	0.04	0.19
0.16	0.16	0.43	0.7	6.91	1.62	6.65	0.04	0.20
0.17	0.17	0.50	0.8	7.79	1.66	7.51	0.04	0.21
0.18	0.18	0.58	1.0	8.67	1.70	8.38	0.04	0.22
0.19	0.19	0.66	1.2	9.54	1.75	9.24	0.05	0.24
0.20	0.20	0.76	1.4	10.42	1.81	10.10	0.05	0.25
0.21	0.21	0.87	1.6	11.30	1.87	10.96	0.05	0.26
0.22	0.22	0.98	1.9	12.18	1.93	11.83	0.06	0.28
0.23	0.23	1.10	2.2	13.06	2.00	12.69	0.06	0.29
0.24	0.24	1.23	2.5	13.93	2.06	13.55	0.07	0.31
0.25	0.25	1.37	2.9	14.81	2.13	14.41	0.07	0.32
0.26	0.26	1.52	3.3	15.69	2.19	15.27	0.07	0.33
0.27	0.27	1.68	3.8	16.57	2.26	16.14	0.08	0.35
0.28	0.28	1.84	4.3	17.45	2.32	17.00	0.08	0.36
0.29	0.29	2.02	4.8	18.32	2.39	17.86	0.09	0.38
0.30	0.30	2.20	5.4	19.20	2.45	18.72	0.09	0.39
0.31	0.31	2.39	6.0	20.08	2.51	19.59	0.10	0.41
0.32	0.32	2.59	6.7	20.96	2.58	20.45	0.10	0.42
0.33	0.33	2.80	7.4	21.84	2.64	21.31	0.11	0.44
0.34	0.34	3.02	8.2	22.71	2.70	22.17	0.11	0.45
0.35	0.35	3.25	9.0	23.59	2.77	23.03	0.12	0.47
0.36	0.36	3.48	9.8	24.47	2.83	23.90	0.12	0.48
0.37	0.37	3.72	10.8	25.35	2.89	24.76	0.13	0.50
0.38	0.38	3.98	11.7	26.23	2.95	25.62	0.14	0.52
0.39	0.39	4.24	12.8	27.10	3.01	26.48	0.14	0.53
0.40	0.40	4.50	13.8	27.98	3.07	27.35	0.15	0.55
0.41	0.41	4.78	15.0	28.86	3.13	28.21	0.15	0.56
0.42	0.42	5.06	16.5	28.88	3.25	28.21	0.16	0.58
0.43	0.43	5.35	18.0	28.90	3.37	28.22	0.18	0.61
0.45	0.45	5.91	21.3	28.94	3.60	28.23	0.20	0.65
0.46	0.46	6.19	23.0	28.96	3.71	28.23	0.21	0.67
0.47	0.47	6.48	24.8	28.98	3.82	28.24	0.23	0.70
0.48	0.48	6.76	26.6	29.01	3.93	28.24	0.24	0.72
0.49	0.49	7.04	28.4	29.03	4.04	28.25	0.25	0.74
0.50	0.50	7.32	30.3	29.05	4.14	28.25	0.27	0.77
0.51	0.51	7.61	32.3	29.07	4.25	28.26	0.28	0.79
0.52	0.52	7.89	34.3	29.09	4.35	28.26	0.29	0.81
0.53	0.53	8.17	36.4	29.11	4.45	28.27	0.31	0.84
0.54	0.54	8.45	38.5	29.13	4.55	28.27	0.32	0.86
0.55	0.55	8.74	40.6	29.15	4.65	28.28	0.34	0.89
0.56	0.56	9.02	42.8	29.17	4.75	28.28	0.35	0.91

standard curb

Open Range Ave

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

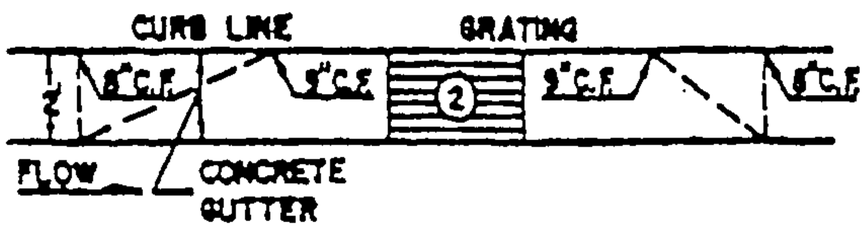
MANNING'S N= .017 SLOPE= .0139

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	41.17	0.67
2	8.38	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	0.83
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

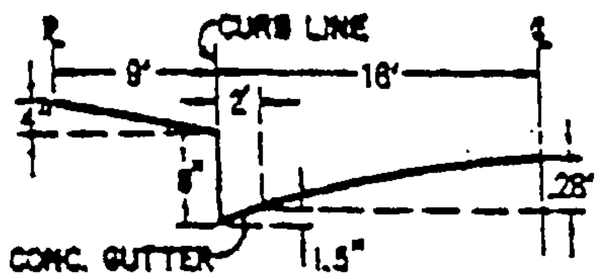
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)	
0.01	0.01	0.00	0.0	0.33	0.29	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.46	0.63	0.00	0.02	
0.03	0.03	0.01	0.0	0.99	0.61	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	0.73	1.25	0.01	0.05	
0.05	0.05	0.04	0.0	1.64	0.85	1.56	0.01	0.06	
0.06	0.06	0.06	0.1	1.97	0.96	1.88	0.01	0.07	
0.07	0.07	0.08	0.1	2.30	1.07	2.19	0.02	0.09	
0.08	0.08	0.10	0.1	2.63	1.17	2.50	0.02	0.10	
0.09	0.09	0.13	0.2	2.96	1.26	2.81	0.02	0.11	
0.10	0.10	0.16	0.2	3.29	1.35	3.13	0.03	0.13	
0.11	0.11	0.19	0.3	3.62	1.44	3.44	0.03	0.14	
0.12	0.12	0.23	0.3	3.95	1.53	3.75	0.04	0.16	
0.13	0.13	0.26	0.4	4.28	1.61	4.07	0.04	0.17	
0.14	0.14	0.31	0.5	5.30	1.55	5.07	0.04	0.18	
0.15	0.15	0.37	0.6	6.32	1.54	6.08	0.04	0.19	
0.16	0.16	0.43	0.7	7.34	1.56	7.08	0.04	0.20	
0.17	0.17	0.51	0.8	8.36	1.59	8.09	0.04	0.21	
0.18	0.18	0.59	1.0	9.38	1.64	9.09	0.04	0.22	
0.19	0.19	0.69	1.2	10.40	1.69	10.10	0.04	0.23	
0.20	0.20	0.80	1.4	11.42	1.74	11.10	0.05	0.25	
0.21	0.21	0.91	1.6	12.44	1.80	12.11	0.05	0.26	
0.22	0.22	1.04	1.9	13.46	1.87	13.11	0.05	0.27	
0.23	0.23	1.17	2.3	14.49	1.93	14.12	0.06	0.29	
0.24	0.24	1.32	2.6	15.51	1.99	15.12	0.06	0.30	
0.25	0.25	1.48	3.0	16.53	2.06	16.13	0.07	0.32	
0.26	0.26	1.64	3.5	17.55	2.12	17.13	0.07	0.33	
0.27	0.27	1.82	4.0	18.57	2.19	18.14	0.07	0.34	
0.28	0.28	2.00	4.5	19.59	2.25	19.14	0.08	0.36	
0.29	0.29	2.20	5.1	20.61	2.32	20.15	0.08	0.37	
0.30	0.30	2.41	5.7	21.63	2.38	21.15	0.09	0.39	
0.31	0.31	2.62	6.4	22.65	2.45	22.16	0.09	0.40	
0.32	0.32	2.85	7.2	23.67	2.51	23.16	0.10	0.42	
0.33	0.33	3.09	8.0	24.69	2.58	24.17	0.10	0.43	
0.34	0.34	3.33	8.8	25.71	2.64	25.17	0.11	0.45	
0.35	0.35	3.59	9.7	26.74	2.70	26.18	0.11	0.46	
0.36	0.36	3.86	10.7	27.76	2.77	27.18	0.12	0.48	
0.37	0.37	4.13	11.7	28.78	2.83	28.19	0.12	0.49	
0.38	0.38	4.42	12.8	29.80	2.89	29.19	0.13	0.51	roll curb
0.39	0.39	4.72	13.9	30.82	2.95	30.20	0.14	0.53	
0.40	0.40	5.03	15.1	31.84	3.01	31.20	0.14	0.54	
0.41	0.41	5.34	16.4	32.86	3.07	32.21	0.15	0.56	
0.42	0.42	5.66	18.1	32.88	3.19	32.21	0.16	0.58	
0.43	0.43	5.99	19.8	32.90	3.31	32.22	0.17	0.60	
0.45	0.45	6.63	23.5	32.94	3.54	32.23	0.19	0.64	
0.46	0.46	6.95	25.4	32.96	3.65	32.23	0.21	0.67	
0.47	0.47	7.28	27.4	32.98	3.76	32.24	0.22	0.69	
0.48	0.48	7.60	29.4	33.00	3.87	32.24	0.23	0.71	
0.49	0.49	7.92	31.5	33.03	3.98	32.25	0.25	0.74	
0.50	0.50	8.24	33.7	33.05	4.08	32.25	0.26	0.76	
0.51	0.51	8.57	35.9	33.07	4.19	32.26	0.27	0.78	
0.52	0.52	8.89	38.1	33.09	4.29	32.26	0.29	0.81	
0.53	0.53	9.21	40.5	33.11	4.39	32.27	0.30	0.83	
0.54	0.54	9.53	42.8	33.13	4.49	32.27	0.31	0.85	Standard curb
0.55	0.55	9.86	45.3	33.15	4.59	32.28	0.33	0.88	
0.56	0.56	10.18	47.7	33.17	4.69	32.28	0.34	0.90	
0.57	0.57	10.50	50.3	33.19	4.79	32.29	0.36	0.93	

Open Range Ave.

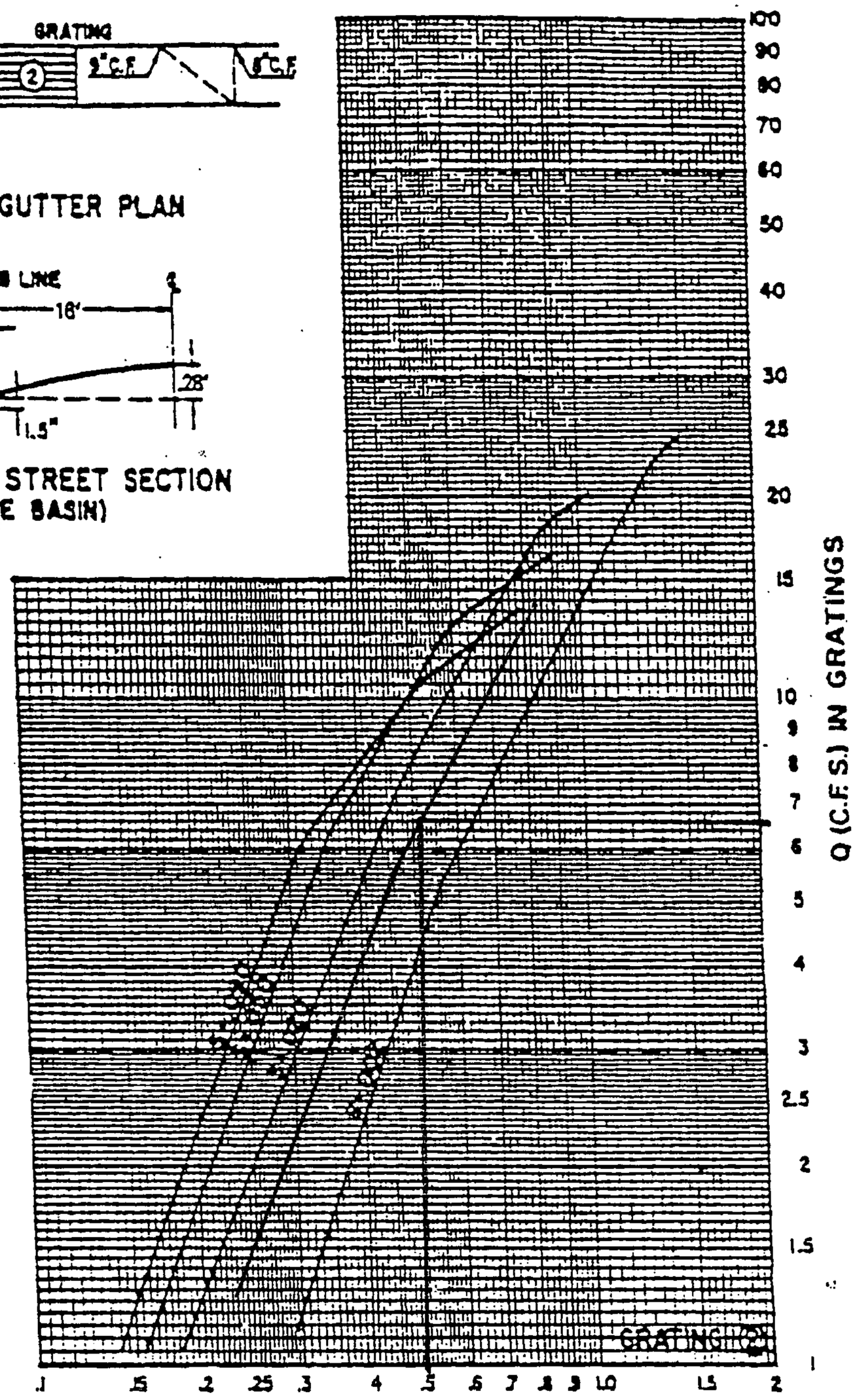
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D = 0.5'
S = 1.39%
Q = 6.6 cfs/grate

PLATE 22.3 D-5

Blue Sky Street south of Open Range Ave

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

MANNING'S N= .017 SLOPE= .0173

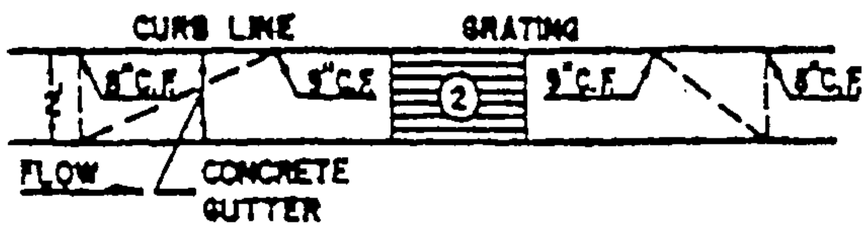
POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

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)
0.01	0.01	0.00	0.0	0.33	0.33	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.52	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.68	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.82	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	0.95	1.56	0.01	0.06
0.06	0.06	0.06	0.1	1.97	1.07	1.88	0.02	0.08
0.07	0.07	0.08	0.1	2.30	1.19	2.19	0.02	0.09
0.08	0.08	0.10	0.1	2.63	1.30	2.50	0.03	0.11
0.09	0.09	0.13	0.2	2.96	1.41	2.81	0.03	0.12
0.10	0.10	0.16	0.2	3.29	1.51	3.13	0.04	0.14
0.11	0.11	0.19	0.3	3.62	1.61	3.44	0.04	0.15
0.12	0.12	0.23	0.4	3.95	1.70	3.75	0.05	0.17
0.13	0.13	0.26	0.5	4.28	1.80	4.07	0.05	0.18
0.14	0.14	0.31	0.5	5.15	1.76	4.93	0.05	0.19
0.15	0.15	0.36	0.6	6.03	1.76	5.79	0.05	0.20
0.16	0.16	0.43	0.8	6.91	1.79	6.65	0.05	0.21
0.17	0.17	0.50	0.9	7.79	1.83	7.51	0.05	0.22
0.18	0.18	0.58	1.1	8.67	1.89	8.38	0.06	0.24
0.19	0.19	0.66	1.3	9.54	1.94	9.24	0.06	0.25
0.20	0.20	0.76	1.5	10.42	2.01	10.10	0.06	0.26
0.21	0.21	0.87	1.8	11.30	2.07	10.96	0.07	0.28
0.22	0.22	0.98	2.1	12.18	2.14	11.83	0.07	0.29
0.23	0.23	1.10	2.4	13.06	2.21	12.69	0.08	0.31
0.24	0.24	1.23	2.8	13.93	2.28	13.55	0.08	0.32
0.25	0.25	1.37	3.2	14.81	2.35	14.41	0.09	0.34
0.26	0.26	1.52	3.7	15.69	2.43	15.27	0.09	0.35
0.27	0.27	1.68	4.2	16.57	2.50	16.14	0.10	0.37
0.28	0.28	1.84	4.7	17.45	2.57	17.00	0.10	0.38
0.29	0.29	2.02	5.3	18.32	2.64	17.86	0.11	0.40
0.30	0.30	2.20	6.0	19.20	2.71	18.72	0.11	0.41
0.31	0.31	2.39	6.7	20.08	2.78	19.59	0.12	0.43
0.32	0.32	2.59	7.4	20.96	2.85	20.45	0.13	0.45
0.33	0.33	2.80	8.2	21.84	2.92	21.31	0.13	0.46
0.34	0.34	3.02	9.0	22.71	2.99	22.17	0.14	0.48
0.35	0.35	3.25	9.9	23.59	3.06	23.03	0.15	0.50
0.36	0.36	3.48	10.9	24.47	3.13	23.90	0.15	0.51
0.37	0.37	3.72	11.9	25.35	3.20	24.76	0.16	0.53
0.38	0.38	3.98	13.0	26.23	3.27	25.62	0.17	0.55
0.39	0.39	4.24	14.1	27.10	3.34	26.48	0.17	0.56
0.40	0.40	4.50	15.3	27.98	3.40	27.35	0.18	0.58
0.41	0.41	4.78	16.6	28.86	3.47	28.21	0.19	0.60
0.42	0.42	5.06	18.2	28.88	3.60	28.21	0.20	0.62
0.43	0.43	5.35	20.0	28.90	3.73	28.22	0.22	0.65
0.45	0.45	5.91	23.6	28.94	3.99	28.23	0.25	0.70
0.46	0.46	6.19	25.5	28.96	4.11	28.23	0.26	0.72
0.47	0.47	6.48	27.4	28.98	4.23	28.24	0.28	0.75
0.48	0.48	6.76	29.4	29.01	4.35	28.24	0.29	0.77
0.49	0.49	7.04	31.5	29.03	4.47	28.25	0.31	0.80
0.50	0.50	7.32	33.6	29.05	4.59	28.25	0.33	0.83
0.51	0.51	7.61	35.8	29.07	4.70	28.26	0.34	0.85
0.52	0.52	7.89	38.0	29.09	4.82	28.26	0.36	0.88
0.53	0.53	8.17	40.3	29.11	4.93	28.27	0.38	0.91
0.54	0.54	8.45	42.6	29.13	5.04	28.27	0.39	0.93
0.55	0.55	8.74	45.0	29.15	5.15	28.28	0.41	0.96
0.56	0.56	9.02	47.4	29.17	5.26	28.28	0.43	0.99
0.57	0.57	9.30	49.9	29.19	5.36	28.29	0.45	1.02

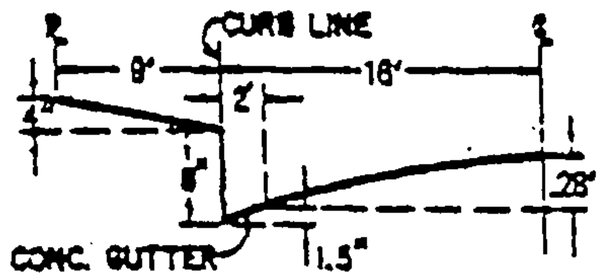
Standard curb

Blue Sky Street south of Open Range Ave

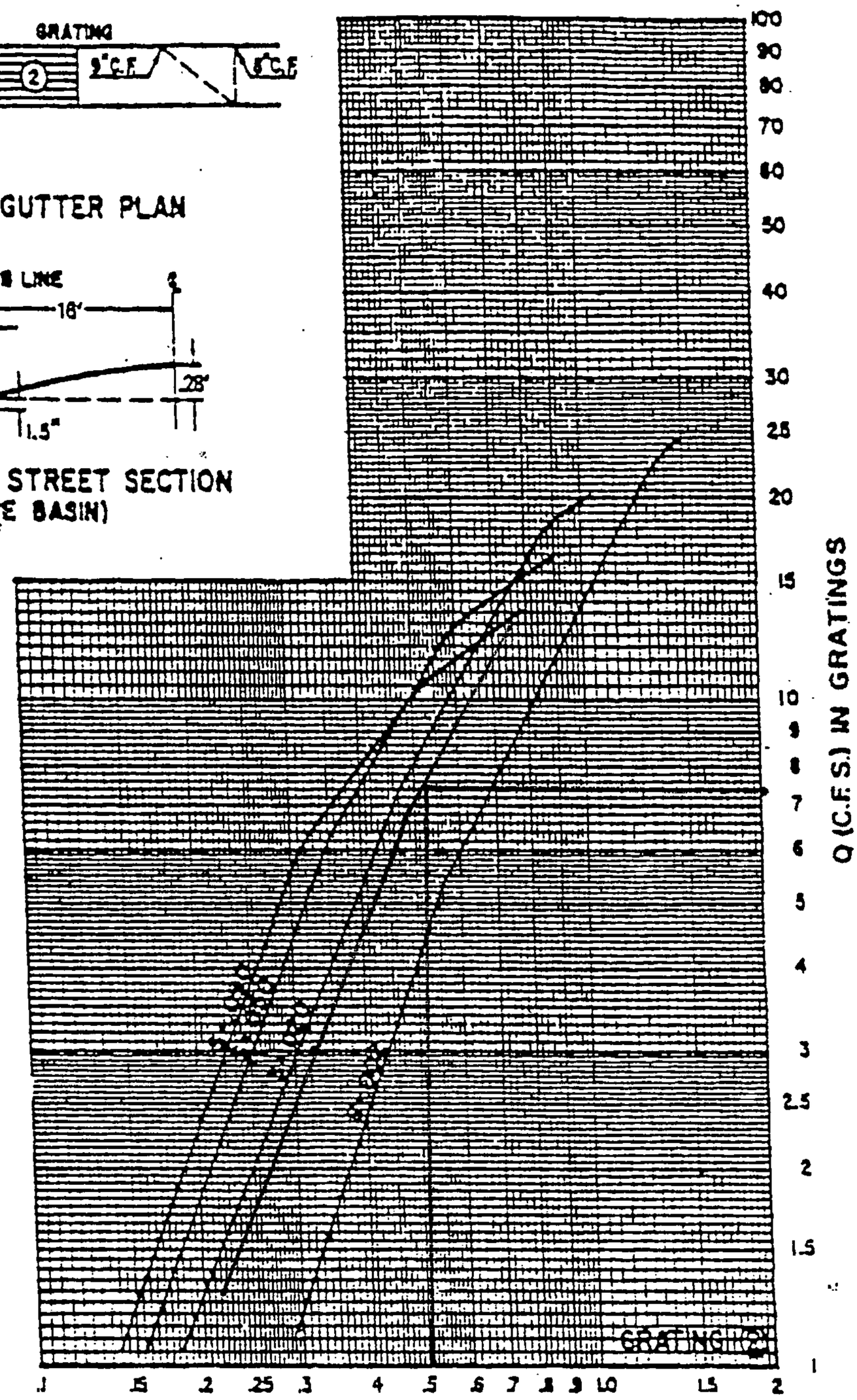
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D=0.51'
S=1.73%
Q=7.4 cfs/grate

PLATE 22.3 D-5

Lone Tree Road

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

MANNING'S N= .017 SLOPE= .0259

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

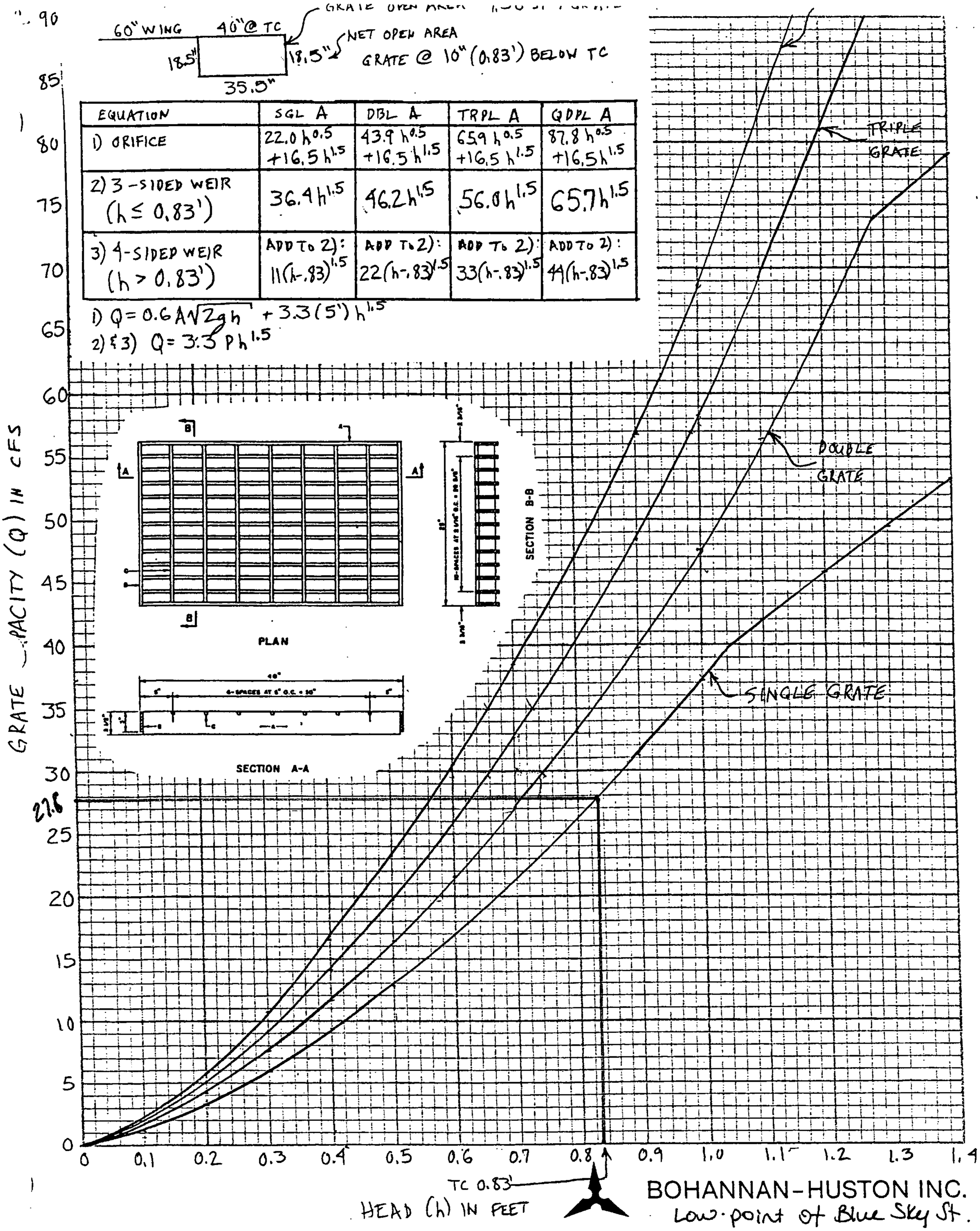
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)	
0.01	0.01	0.00	0.0	0.33	0.40	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.63	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.83	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	1.00	1.25	0.02	0.06	
0.05	0.05	0.04	0.0	1.64	1.16	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.31	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.46	2.19	0.03	0.10	
0.08	0.08	0.10	0.2	2.63	1.59	2.50	0.04	0.12	
0.09	0.09	0.13	0.2	2.96	1.72	2.81	0.05	0.14	
0.10	0.10	0.16	0.3	3.29	1.85	3.13	0.05	0.15	
0.11	0.11	0.19	0.4	3.62	1.97	3.44	0.06	0.17	
0.12	0.12	0.23	0.5	3.95	2.08	3.75	0.07	0.19	
0.13	0.13	0.26	0.6	4.28	2.20	4.07	0.08	0.21	
0.14	0.14	0.31	0.7	5.15	2.16	4.93	0.07	0.21	
0.15	0.15	0.36	0.8	6.03	2.16	5.79	0.07	0.22	
0.16	0.16	0.43	0.9	6.91	2.19	6.65	0.07	0.23	
0.17	0.17	0.50	1.1	7.79	2.24	7.51	0.08	0.25	
0.18	0.18	0.58	1.3	8.67	2.31	8.38	0.08	0.26	
0.19	0.19	0.66	1.6	9.54	2.38	9.24	0.09	0.28	
0.20	0.20	0.76	1.9	10.42	2.46	10.10	0.09	0.29	
0.21	0.21	0.87	2.2	11.30	2.54	10.96	0.10	0.31	
0.22	0.22	0.98	2.6	12.18	2.62	11.83	0.11	0.33	
0.23	0.23	1.10	3.0	13.06	2.71	12.69	0.11	0.34	
0.24	0.24	1.23	3.4	13.93	2.79	13.55	0.12	0.36	
0.25	0.25	1.37	4.0	14.81	2.88	14.41	0.13	0.38	
0.26	0.26	1.52	4.5	15.69	2.97	15.27	0.14	0.40	
0.27	0.27	1.68	5.1	16.57	3.06	16.14	0.15	0.42	
0.28	0.28	1.84	5.8	17.45	3.14	17.00	0.15	0.43	
0.29	0.29	2.02	6.5	18.32	3.23	17.86	0.16	0.45	
0.30	0.30	2.20	7.3	19.20	3.32	18.72	0.17	0.47	
0.31	0.31	2.39	8.2	20.08	3.41	19.59	0.18	0.49	
0.32	0.32	2.59	9.1	20.96	3.49	20.45	0.19	0.51	roll curb
0.33	0.33	2.80	10.0	21.84	3.58	21.31	0.20	0.53	
0.34	0.34	3.02	11.1	22.71	3.66	22.17	0.21	0.55	
0.35	0.35	3.25	12.2	23.59	3.75	23.03	0.22	0.57	
0.36	0.36	3.48	13.3	24.47	3.83	23.90	0.23	0.59	
0.37	0.37	3.72	14.6	25.35	3.92	24.76	0.24	0.61	
0.38	0.38	3.98	15.9	26.23	4.00	25.62	0.25	0.63	
0.39	0.39	4.24	17.3	27.10	4.08	26.48	0.26	0.65	
0.40	0.40	4.50	18.8	27.98	4.16	27.35	0.27	0.67	
0.41	0.41	4.78	20.3	28.86	4.24	28.21	0.28	0.69	
0.42	0.42	5.06	22.3	28.88	4.41	28.21	0.30	0.72	
0.43	0.43	5.35	24.4	28.90	4.57	28.22	0.32	0.75	
0.45	0.45	5.91	28.8	28.94	4.88	28.23	0.37	0.82	
0.46	0.46	6.19	31.2	28.96	5.03	28.23	0.39	0.85	standard curb
0.47	0.47	6.48	33.5	28.98	5.18	28.24	0.42	0.89	
0.48	0.48	6.76	36.0	29.01	5.33	28.24	0.44	0.92	
0.49	0.49	7.04	38.5	29.03	5.47	28.25	0.46	0.95	
0.50	0.50	7.32	41.1	29.05	5.61	28.25	0.49	0.99	
0.51	0.51	7.61	43.8	29.07	5.76	28.26	0.51	1.02	
0.52	0.52	7.89	46.5	29.09	5.89	28.26	0.54	1.06	
0.53	0.53	8.17	49.3	29.11	6.03	28.27	0.56	1.09	
0.54	0.54	8.45	52.1	29.13	6.17	28.27	0.59	1.13	
0.55	0.55	8.74	55.0	29.15	6.30	28.28	0.62	1.17	
0.56	0.56	9.02	58.0	29.17	6.43	28.28	0.64	1.20	
0.57	0.57	9.30	61.1	29.19	6.56	28.29	0.67	1.24	

GRATE @ 10" (0.83') BELOW TC

EQUATION	SGL A	DBL A	TRPL A	QDPL A
1) ORIFICE	$22.0\,h^{0.5} + 16.5\,h^{1.5}$	$43.9\,h^{0.5} + 16.5\,h^{1.5}$	$65.9\,h^{0.5} + 16.5\,h^{1.5}$	$87.8\,h^{0.5} + 16.5\,h^{1.5}$
2) 3-SIDED WEIR ($h \le 0.83'$)	$36.4\,h^{1.5}$	$46.2\,h^{1.5}$	$56.0\,h^{1.5}$	$65.7\,h^{1.5}$
3) 4-SIDED WEIR ($h > 0.83'$)	ADD TO 2): $11(h-.83)^{1.5}$	ADD TO 2): $22(h-.83)^{1.5}$	ADD TO 2): $33(h-.83)^{1.5}$	ADD TO 2): $44(h-.83)^{1.5}$

1) $Q = 0.6A\sqrt{2gh} + 3.3(5')h^{1.5}$

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



BOHANNAN-HUSTON INC.

Low-point of Blue Sky St.

PROJECT NAME El Rancho Grande SHEET ____ OF ____

PROJECT NO. ____ BY JPK DATE 4/9/92

SUBJECT RATING CURVE FOR TYPE A INLETS CH'D ____ DATE ____

Messina Road

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

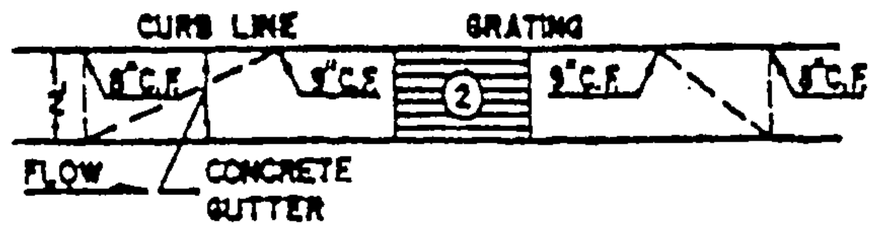
MANNING'S N= .017 SLOPE= .031

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.87	5	12.00	0.13	9	50.17	0.67
2	9.38	0.67	6	30.00	0.41	10	50.63	0.67
3	9.83	0.67	7	48.00	0.13	11	60.00	0.83
4	10.00	0.00	8	50.00	0.00	12	0.00	0.00

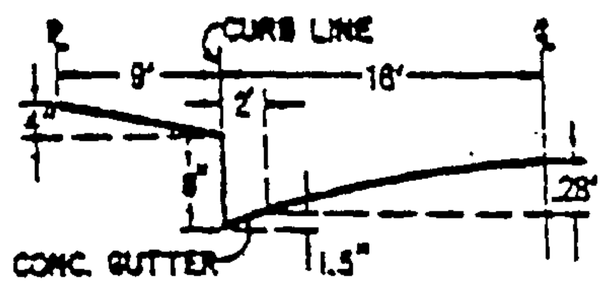
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)	
0.01	0.01	0.00	0.0	0.33	0.44	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.69	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.91	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	1.10	1.25	0.02	0.06	
0.05	0.05	0.04	0.0	1.64	1.27	1.56	0.03	0.08	
0.06	0.06	0.06	0.1	1.97	1.44	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.59	2.19	0.04	0.11	
0.08	0.08	0.10	0.2	2.63	1.74	2.50	0.05	0.13	
0.09	0.09	0.13	0.2	2.96	1.88	2.81	0.06	0.15	
0.10	0.10	0.16	0.3	3.29	2.02	3.13	0.06	0.16	
0.11	0.11	0.19	0.4	3.62	2.15	3.44	0.07	0.18	
0.12	0.12	0.23	0.5	3.95	2.28	3.75	0.08	0.20	
0.13	0.13	0.26	0.6	4.28	2.41	4.07	0.09	0.22	
0.14	0.14	0.31	0.7	5.58	2.25	5.36	0.08	0.22	
0.15	0.15	0.37	0.8	6.89	2.20	6.65	0.07	0.22	
0.16	0.16	0.44	1.0	8.20	2.20	7.94	0.08	0.24	
0.17	0.17	0.53	1.2	9.50	2.25	9.23	0.08	0.25	
0.18	0.18	0.63	1.5	10.81	2.31	10.52	0.08	0.26	
0.19	0.19	0.74	1.8	12.12	2.39	11.81	0.09	0.28	
0.20	0.20	0.87	2.1	13.42	2.47	13.10	0.10	0.30	
0.21	0.21	1.00	2.6	14.73	2.57	14.39	0.10	0.31	
0.22	0.22	1.15	3.1	16.04	2.66	15.68	0.11	0.33	
0.23	0.23	1.32	3.6	17.34	2.76	16.97	0.12	0.35	
0.24	0.24	1.49	4.3	18.65	2.86	18.26	0.13	0.37	
0.25	0.25	1.68	5.0	19.95	2.96	19.56	0.14	0.39	
0.26	0.26	1.88	5.8	21.26	3.06	20.85	0.15	0.41	
0.27	0.27	2.10	6.6	22.57	3.16	22.14	0.15	0.42	Actual flow
0.28	0.28	2.33	7.6	23.87	3.26	23.43	0.16	0.44	
0.29	0.29	2.57	8.6	25.18	3.36	24.72	0.18	0.47	
0.30	0.30	2.82	9.8	26.49	3.46	26.01	0.19	0.49	
0.31	0.31	3.09	11.0	27.79	3.56	27.30	0.20	0.51	
0.32	0.32	3.37	12.3	29.10	3.65	28.59	0.21	0.53	
0.33	0.33	3.66	13.7	30.41	3.75	29.88	0.22	0.55	
0.34	0.34	3.96	15.3	31.71	3.85	31.17	0.23	0.57	
0.35	0.35	4.28	16.9	33.02	3.94	32.46	0.24	0.59	
0.36	0.36	4.61	18.6	34.33	4.04	33.75	0.25	0.61	
0.37	0.37	4.96	20.5	35.63	4.13	35.04	0.27	0.64	
0.38	0.38	5.31	22.5	36.94	4.23	36.34	0.28	0.66	
0.39	0.39	5.68	24.5	38.25	4.32	37.63	0.29	0.68	
0.40	0.40	6.07	26.8	39.55	4.41	38.92	0.30	0.70	
0.41	0.41	6.46	29.1	40.86	4.50	40.21	0.31	0.72	
0.42	0.42	6.86	32.2	40.88	4.68	40.21	0.34	0.76	
0.43	0.43	7.27	35.3	40.90	4.86	40.22	0.37	0.80	Standard curb
0.45	0.45	8.07	42.1	40.94	5.21	40.23	0.42	0.87	
0.46	0.46	8.47	45.6	40.96	5.38	40.23	0.45	0.91	
0.47	0.47	8.88	49.3	40.98	5.55	40.24	0.48	0.95	
0.48	0.48	9.28	53.0	41.00	5.72	40.24	0.51	0.99	
0.49	0.49	9.68	56.9	41.02	5.88	40.25	0.54	1.03	
0.50	0.50	10.08	60.9	41.04	6.04	40.25	0.57	1.07	
0.51	0.51	10.49	65.0	41.07	6.19	40.26	0.60	1.11	
0.52	0.52	10.89	69.1	41.09	6.35	40.26	0.63	1.15	
0.53	0.53	11.29	73.4	41.11	6.50	40.27	0.66	1.19	
0.54	0.54	11.69	77.8	41.13	6.65	40.27	0.69	1.23	
0.55	0.55	12.10	82.3	41.15	6.80	40.28	0.72	1.27	
0.56	0.56	12.50	86.9	41.17	6.95	40.28	0.75	1.31	
0.57	0.57	12.90	91.6	41.19	7.10	40.29	0.78	1.35	

Messina Road

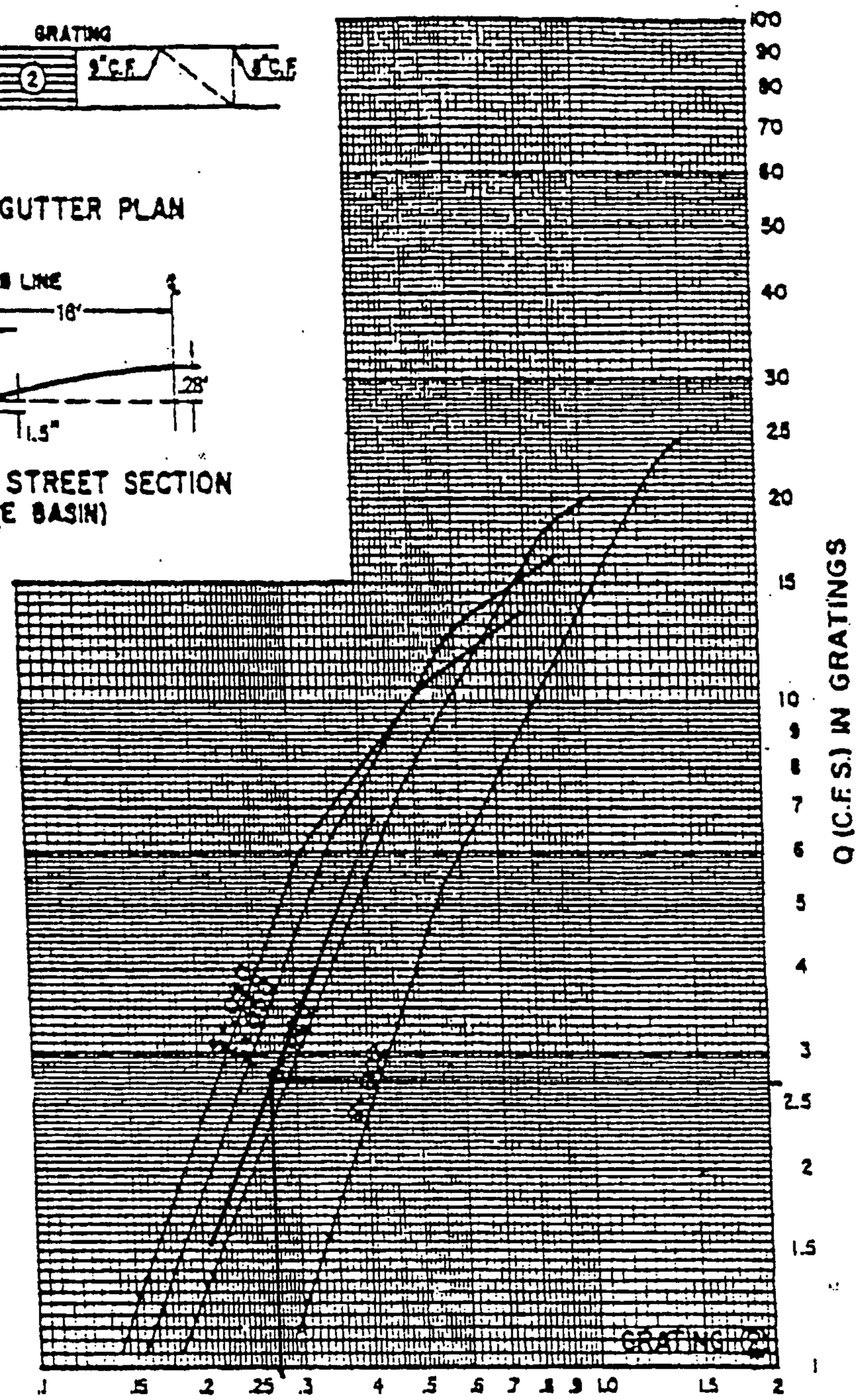
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



S= 3.1%

D= 0.27'

Q= 2.7 cfs/grate

PLATE 22.3 D-5

Amole Mesa Avenue

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

MANNING'S N= .017 SLOPE= .0231

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)
0.01	0.01	0.00	0.0	0.33	0.38	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.60	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.78	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.95	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	1.10	1.56	0.02	0.07
0.06	0.06	0.06	0.1	1.97	1.25	1.88	0.02	0.08
0.07	0.07	0.08	0.1	2.30	1.38	2.19	0.03	0.10
0.08	0.08	0.10	0.2	2.63	1.51	2.50	0.04	0.12
0.09	0.09	0.13	0.2	2.96	1.63	2.81	0.04	0.13
0.10	0.10	0.16	0.3	3.29	1.75	3.13	0.05	0.15
0.11	0.11	0.19	0.4	3.62	1.87	3.44	0.05	0.16
0.12	0.12	0.23	0.4	3.95	1.98	3.75	0.06	0.18
0.13	0.13	0.26	0.6	4.28	2.09	4.07	0.07	0.20
0.14	0.14	0.31	0.6	5.15	2.04	4.93	0.06	0.20
0.15	0.15	0.36	0.7	6.03	2.05	5.79	0.07	0.22
0.16	0.16	0.43	0.9	6.91	2.08	6.65	0.07	0.23
0.17	0.17	0.50	1.1	7.79	2.13	7.51	0.07	0.24
0.18	0.18	0.58	1.3	8.67	2.19	8.38	0.07	0.25
0.19	0.19	0.66	1.5	9.54	2.26	9.24	0.08	0.27
0.20	0.20	0.76	1.8	10.42	2.33	10.10	0.08	0.28
0.21	0.21	0.87	2.1	11.30	2.41	10.96	0.09	0.30
0.22	0.22	0.98	2.4	12.18	2.49	11.83	0.10	0.32
0.23	0.23	1.10	2.8	13.06	2.57	12.69	0.10	0.33
0.24	0.24	1.23	3.3	13.93	2.65	13.55	0.11	0.35
0.25	0.25	1.37	3.8	14.81	2.73	14.41	0.12	0.37
0.26	0.26	1.52	4.3	15.69	2.82	15.27	0.12	0.38
0.27	0.27	1.68	4.9	16.57	2.90	16.14	0.13	0.40
0.28	0.28	1.84	5.5	17.45	2.98	17.00	0.14	0.42
0.29	0.29	2.02	6.2	18.32	3.07	17.86	0.15	0.44
0.30	0.30	2.20	6.9	19.20	3.15	18.72	0.15	0.45
0.31	0.31	2.39	7.7	20.08	3.23	19.59	0.16	0.47
0.32	0.32	2.59	8.6	20.96	3.31	20.45	0.17	0.49
0.33	0.33	2.80	9.5	21.84	3.39	21.31	0.18	0.51
0.34	0.34	3.02	10.5	22.71	3.48	22.17	0.19	0.53
0.35	0.35	3.25	11.5	23.59	3.56	23.03	0.20	0.55
0.36	0.36	3.48	12.7	24.47	3.64	23.90	0.21	0.57
0.37	0.37	3.72	13.8	25.35	3.71	24.76	0.21	0.58
0.38	0.38	3.98	15.1	26.23	3.79	25.62	0.22	0.60
0.39	0.39	4.24	16.4	27.10	3.87	26.48	0.23	0.62
0.40	0.40	4.50	17.8	27.98	3.95	27.35	0.24	0.64
0.41	0.41	4.78	19.3	28.86	4.03	28.21	0.25	0.66
0.42	0.42	5.06	21.2	28.88	4.18	28.21	0.27	0.69
0.43	0.43	5.35	23.2	28.90	4.33	28.22	0.29	0.72
0.45	0.45	5.91	27.4	28.94	4.63	28.23	0.33	0.78
0.46	0.46	6.19	29.6	28.96	4.77	28.23	0.35	0.81
0.47	0.47	6.48	31.8	28.98	4.91	28.24	0.37	0.84
0.48	0.48	6.76	34.1	29.01	5.05	28.24	0.40	0.88
0.49	0.49	7.04	36.5	29.03	5.19	28.25	0.42	0.91
0.50	0.50	7.32	39.0	29.05	5.33	28.25	0.44	0.94
0.51	0.51	7.61	41.5	29.07	5.46	28.26	0.46	0.97
0.52	0.52	7.89	44.1	29.09	5.59	28.26	0.49	1.01
0.53	0.53	8.17	46.7	29.11	5.72	28.27	0.51	1.04
0.54	0.54	8.45	49.4	29.13	5.85	28.27	0.53	1.07
0.55	0.55	8.74	52.2	29.15	5.98	28.28	0.55	1.10
0.56	0.56	9.02	55.0	29.17	6.10	28.28	0.58	1.14
0.57	0.57	9.30	57.9	29.19	6.23	28.29	0.60	1.17

standard curb

Mesa Avenoso at Open Range

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

MANNING'S N= .017 SLOPE= .0129

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.87	5	12.00	0.13	9	50.17	0.67
2	9.38	0.67	6	30.00	0.41	10	50.63	0.67
3	9.83	0.67	7	48.00	0.13	11	60.00	0.83
4	10.00	0.00	8	50.00	0.00	12	0.00	0.00

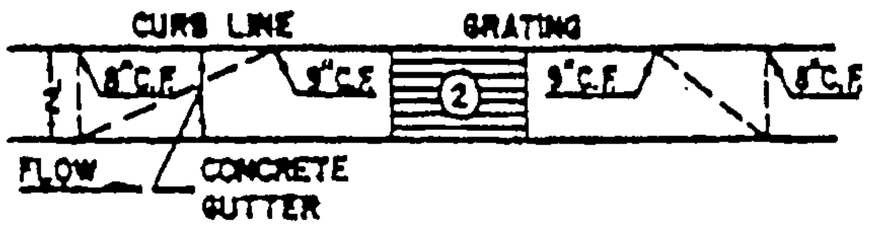
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.33	0.28	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.45	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.58	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.71	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	0.82	1.56	0.01	0.06
0.06	0.06	0.06	0.1	1.97	0.93	1.88	0.01	0.07
0.07	0.07	0.08	0.1	2.30	1.03	2.19	0.02	0.09
0.08	0.08	0.10	0.1	2.63	1.12	2.50	0.02	0.10
0.09	0.09	0.13	0.2	2.96	1.21	2.81	0.02	0.11
0.10	0.10	0.16	0.2	3.29	1.30	3.13	0.03	0.13
0.11	0.11	0.19	0.3	3.62	1.39	3.44	0.03	0.14
0.12	0.12	0.23	0.3	3.95	1.47	3.75	0.03	0.15
0.13	0.13	0.26	0.4	4.28	1.55	4.07	0.04	0.17
0.14	0.14	0.31	0.5	5.58	1.45	5.36	0.03	0.17
0.15	0.15	0.37	0.5	6.89	1.42	6.65	0.03	0.18
0.16	0.16	0.44	0.6	8.20	1.42	7.94	0.03	0.19
0.17	0.17	0.53	0.8	9.50	1.45	9.23	0.03	0.20
0.18	0.18	0.63	0.9	10.81	1.49	10.52	0.03	0.21
0.19	0.19	0.74	1.1	12.12	1.54	11.81	0.04	0.23
0.20	0.20	0.87	1.4	13.42	1.60	13.10	0.04	0.24
0.21	0.21	1.00	1.7	14.73	1.66	14.39	0.04	0.25
0.22	0.22	1.15	2.0	16.04	1.72	15.68	0.05	0.27
0.23	0.23	1.32	2.3	17.34	1.78	16.97	0.05	0.28
0.24	0.24	1.49	2.8	18.65	1.84	18.26	0.05	0.29
0.25	0.25	1.68	3.2	19.95	1.91	19.56	0.06	0.31
0.26	0.26	1.88	3.7	21.26	1.97	20.85	0.06	0.32
0.27	0.27	2.10	4.3	22.57	2.04	22.14	0.06	0.33
0.28	0.28	2.33	4.9	23.87	2.10	23.43	0.07	0.35
0.29	0.29	2.57	5.6	25.18	2.17	24.72	0.07	0.36
0.30	0.30	2.82	6.3	26.49	2.23	26.01	0.08	0.38
0.31	0.31	3.09	7.1	27.79	2.29	27.30	0.08	0.39
0.32	0.32	3.37	7.9	29.10	2.36	28.59	0.09	0.41
0.33	0.33	3.66	8.9	30.41	2.42	29.88	0.09	0.42
0.34	0.34	3.96	9.8	31.71	2.48	31.17	0.10	0.44
0.35	0.35	4.28	10.9	33.02	2.54	32.46	0.10	0.45
0.36	0.36	4.61	12.0	34.33	2.60	33.75	0.11	0.47
0.37	0.37	4.96	13.2	35.63	2.67	35.04	0.11	0.48
0.38	0.38	5.31	14.5	36.94	2.73	36.34	0.12	0.50
0.39	0.39	5.68	15.8	38.25	2.79	37.63	0.12	0.51
0.40	0.40	6.07	17.3	39.55	2.84	38.92	0.13	0.53
0.41	0.41	6.46	18.8	40.86	2.90	40.21	0.13	0.54
0.42	0.42	6.86	20.7	40.88	3.02	40.21	0.14	0.56
0.43	0.43	7.27	22.8	40.90	3.14	40.22	0.15	0.58
0.45	0.45	8.07	27.1	40.94	3.36	40.23	0.18	0.63
0.46	0.46	8.47	29.4	40.96	3.47	40.23	0.19	0.65
0.47	0.47	8.88	31.8	40.98	3.58	40.24	0.20	0.67
0.48	0.48	9.28	34.2	41.00	3.69	40.24	0.21	0.69
0.49	0.49	9.68	36.7	41.02	3.79	40.25	0.22	0.71
0.50	0.50	10.08	39.3	41.04	3.89	40.25	0.24	0.74
0.51	0.51	10.49	41.9	41.07	4.00	40.26	0.25	0.76
0.52	0.52	10.89	44.6	41.09	4.10	40.26	0.26	0.78
0.53	0.53	11.29	47.4	41.11	4.20	40.27	0.27	0.80
0.54	0.54	11.69	50.2	41.13	4.29	40.27	0.29	0.83
0.55	0.55	12.10	53.1	41.15	4.39	40.28	0.30	0.85
0.56	0.56	12.50	56.1	41.17	4.48	40.28	0.31	0.87
0.57	0.57	12.90	59.1	41.19	4.58	40.29	0.33	0.90

flow at inlet

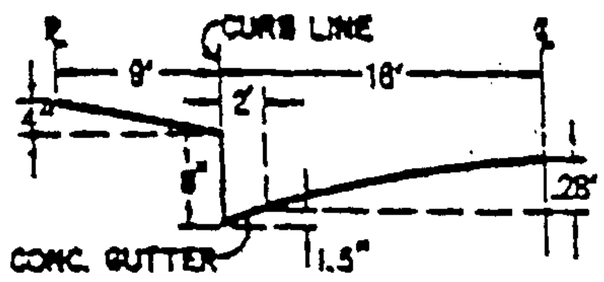
standard curb

Mesa Avenoso at Open Range

GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

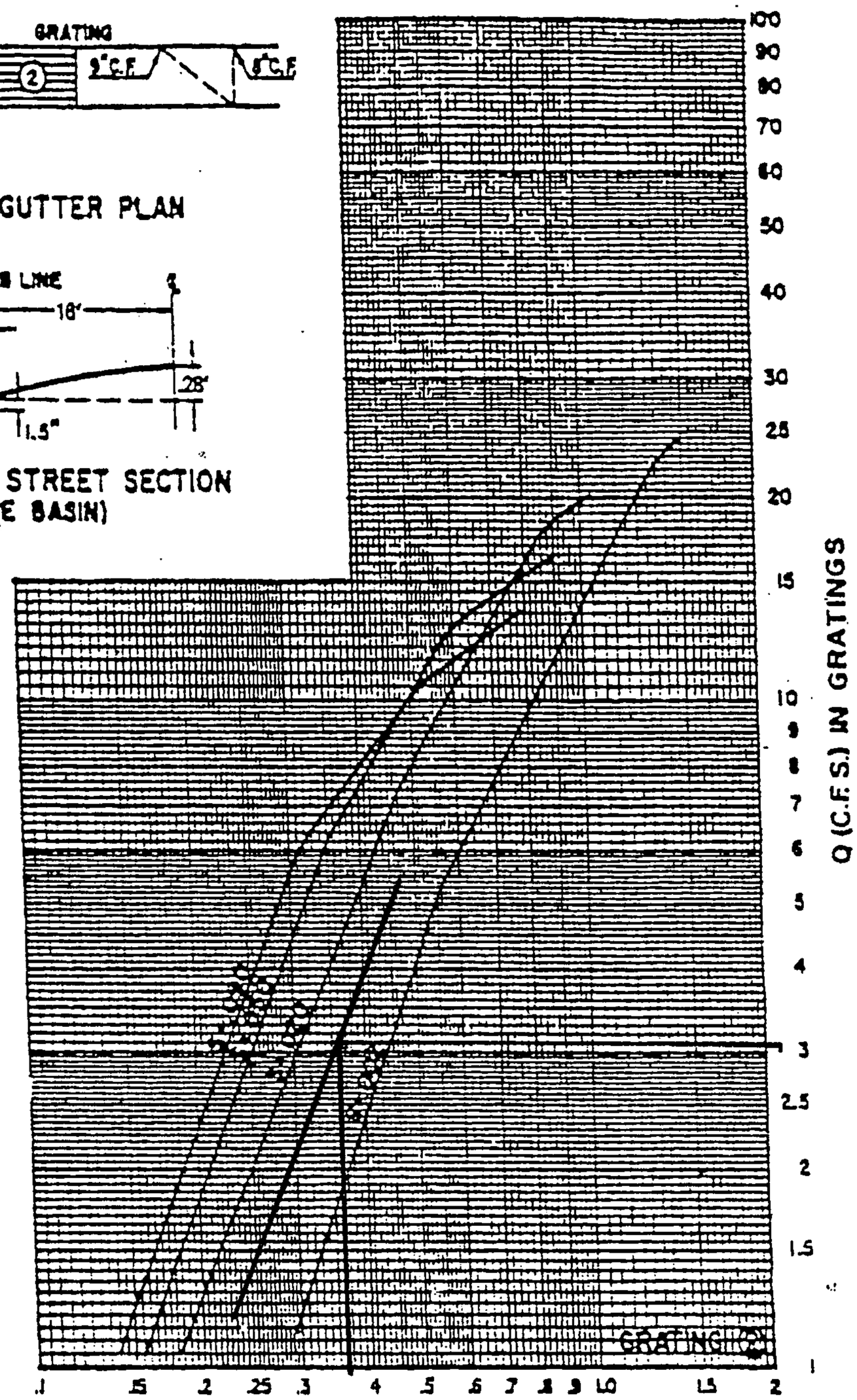


PLATE 22.3 D-5

S= 1.29%

D= 0.36'

Q= 3.1 cfs/grate

Mesa Avenoso at Amole Mesa

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

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.87	5	12.00	0.13	9	50.17	0.67
2	9.38	0.67	6	30.00	0.41	10	50.63	0.67
3	9.83	0.67	7	48.00	0.13	11	60.00	0.83
4	10.00	0.00	8	50.00	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)
0.01	0.01	0.00	0.0	0.33	0.19	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.30	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.40	0.94	0.00	0.03
0.04	0.04	0.03	0.0	1.32	0.48	1.25	0.00	0.04
0.05	0.05	0.04	0.0	1.64	0.56	1.56	0.00	0.05
0.06	0.06	0.06	0.0	1.97	0.63	1.88	0.01	0.07
0.07	0.07	0.08	0.1	2.30	0.70	2.19	0.01	0.08
0.08	0.08	0.10	0.1	2.63	0.77	2.50	0.01	0.09
0.09	0.09	0.13	0.1	2.96	0.83	2.81	0.01	0.10
0.10	0.10	0.16	0.1	3.29	0.89	3.13	0.01	0.11
0.11	0.11	0.19	0.2	3.62	0.95	3.44	0.01	0.12
0.12	0.12	0.23	0.2	3.95	1.00	3.75	0.02	0.14
0.13	0.13	0.26	0.3	4.28	1.06	4.07	0.02	0.15
0.14	0.14	0.31	0.3	5.58	0.99	5.36	0.02	0.16
0.15	0.15	0.37	0.4	6.89	0.97	6.65	0.01	0.16
0.16	0.16	0.44	0.4	8.20	0.97	7.94	0.01	0.17
0.17	0.17	0.53	0.5	9.50	0.99	9.23	0.02	0.19
0.18	0.18	0.63	0.6	10.81	1.02	10.52	0.02	0.20
0.19	0.19	0.74	0.8	12.12	1.05	11.81	0.02	0.21
0.20	0.20	0.87	0.9	13.42	1.09	13.10	0.02	0.22
0.21	0.21	1.00	1.1	14.73	1.13	14.39	0.02	0.23
0.22	0.22	1.15	1.3	16.04	1.17	15.68	0.02	0.24
0.23	0.23	1.32	1.6	17.34	1.21	16.97	0.02	0.25
0.24	0.24	1.49	1.9	18.65	1.26	18.26	0.02	0.26
0.25	0.25	1.68	2.2	19.95	1.30	19.56	0.03	0.28
0.26	0.26	1.88	2.5	21.26	1.35	20.85	0.03	0.29
0.27	0.27	2.10	2.9	22.57	1.39	22.14	0.03	0.30
0.28	0.28	2.33	3.3	23.87	1.43	23.43	0.03	0.31
0.29	0.29	2.57	3.8	25.18	1.48	24.72	0.03	0.32
0.30	0.30	2.82	4.3	26.49	1.52	26.01	0.04	0.34
0.31	0.31	3.09	4.8	27.79	1.56	27.30	0.04	0.35
0.32	0.32	3.37	5.4	29.10	1.61	28.59	0.04	0.36
0.33	0.33	3.66	6.0	30.41	1.65	29.88	0.04	0.37
0.34	0.34	3.96	6.7	31.71	1.69	31.17	0.04	0.38
0.35	0.35	4.28	7.4	33.02	1.73	32.46	0.05	0.40
0.36	0.36	4.61	8.2	34.33	1.78	33.75	0.05	0.41
0.37	0.37	4.96	9.0	35.63	1.82	35.04	0.05	0.42
0.38	0.38	5.31	9.9	36.94	1.86	36.34	0.05	0.43
0.39	0.39	5.68	10.8	38.25	1.90	37.63	0.06	0.45
0.40	0.40	6.07	11.8	39.55	1.94	38.92	0.06	0.46
0.41	0.41	6.46	12.8	40.86	1.98	40.21	0.06	0.47
0.42	0.42	6.86	14.1	40.88	2.06	40.21	0.07	0.49
0.43	0.43	7.27	15.6	40.90	2.14	40.22	0.07	0.50
0.45	0.45	8.07	18.5	40.94	2.29	40.23	0.08	0.53
0.46	0.46	8.47	20.1	40.96	2.37	40.23	0.09	0.55
0.47	0.47	8.88	21.7	40.98	2.44	40.24	0.09	0.56
0.48	0.48	9.28	23.3	41.00	2.51	40.24	0.10	0.58
0.49	0.49	9.68	25.0	41.02	2.59	40.25	0.10	0.59
0.50	0.50	10.08	26.8	41.04	2.66	40.25	0.11	0.61
0.51	0.51	10.49	28.6	41.07	2.73	40.26	0.12	0.63
0.52	0.52	10.89	30.4	41.09	2.79	40.26	0.12	0.64
0.53	0.53	11.29	32.3	41.11	2.86	40.27	0.13	0.66
0.54	0.54	11.69	34.2	41.13	2.93	40.27	0.13	0.67
0.55	0.55	12.10	36.2	41.15	2.99	40.28	0.14	0.69
0.56	0.56	12.50	38.2	41.17	3.06	40.28	0.15	0.71
0.57	0.57	12.90	40.3	41.19	3.12	40.29	0.15	0.72

Mesa Avenoso continued

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)
0.58	0.58	13.31	42.4	41.21	3.19	40.29	0.16	0.74
0.59	0.59	13.71	44.5	41.23	3.25	40.30	0.16	0.75
0.60	0.60	14.11	46.7	41.25	3.31	40.30	0.17	0.77
0.61	0.61	14.51	49.0	41.27	3.37	40.31	0.18	0.79
0.62	0.62	14.92	51.2	41.29	3.43	40.31	0.18	0.80
0.63	0.63	15.32	53.5	41.31	3.49	40.32	0.19	0.82
0.64	0.64	15.72	55.9	41.33	3.55	40.32	0.20	0.84
0.65	0.65	16.13	58.3	41.35	3.61	40.33	0.20	0.85
0.66	0.66	16.53	60.7	41.37	3.67	40.33	0.21	0.87
0.67	0.67	16.93	63.2	41.40	3.73	40.34	0.22	0.89
0.68	0.68	17.34	64.7	42.45	3.73	42.30	0.22	0.90
0.69	0.69	17.76	66.2	43.50	3.73	43.36	0.22	0.91
0.70	0.70	18.22	67.0	45.47	3.68	44.41	0.21	0.91
0.71	0.71	18.67	68.8	46.52	3.68	45.47	0.21	0.92
0.72	0.72	19.13	70.5	47.58	3.69	46.52	0.21	0.93
0.73	0.73	19.60	72.4	48.63	3.69	47.58	0.21	0.94
0.74	0.74	20.08	74.3	49.69	3.70	48.63	0.21	0.95
0.75	0.75	20.57	76.3	50.74	3.71	49.69	0.21	0.96
0.76	0.76	21.07	78.3	51.80	3.72	50.74	0.21	0.97
0.77	0.77	21.59	80.5	52.85	3.73	51.80	0.22	0.99
0.78	0.78	22.11	82.6	53.91	3.74	52.85	0.22	1.00
0.79	0.79	22.64	84.9	54.96	3.75	53.91	0.22	1.01
0.80	0.80	23.19	87.2	56.02	3.76	54.96	0.22	1.02
0.81	0.81	23.74	89.6	57.07	3.77	56.01	0.22	1.03
0.82	0.82	24.31	92.0	58.13	3.79	57.07	0.22	1.04
0.83	0.83	24.88	94.6	59.18	3.80	58.12	0.22	1.05
0.84	0.84	25.47	97.8	59.65	3.84	58.59	0.23	1.07
0.85	0.85	26.06	101.0	60.12	3.88	59.06	0.23	1.08
0.86	0.86	26.65	104.4	60.59	3.92	59.53	0.24	1.10
0.87	0.87	27.25	107.7	61.06	3.95	60.00	0.24	1.11

Standard curb

APPENDIX C

INFRASTRUCTURE LISTS

Current DRC
Project No. _____

Sub _____ Oc _____ 2003

Date Site Plan Approved: _____

Date Preliminary Plat Approved: _____

Date Preliminary Plat Expiers: _____

DRB Project No. _____

APPLICATION NO.

Figure 12

INFRASTRUCTURE LIST

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

EL RANCHO GRANDE UNIT 14 SUBDIVISION
PRELIMINARY PLAT

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 DRC 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 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.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC ROADWAY IMPROVEMENTS						
		30' EOA-F	ARTERIAL PAVING W/ PCC CURB & GUTTER AND PCC 6' WIDE SIDEWALK ON SOUTH SIDE ONLY	GIBSON BOULEVARD	MESSINA DRIVE	MESA ARENOSO DR	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON EAST SIDE ONLY	MESSINA DRIVE	GIBSON BOULEVARD	SOUTH BOUNDARY	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON WEST SIDE ONLY	MESA ARENOSO DR	GIBSON BOULEVARD	SOUTH BOUNDARY	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY*	SANDY RIDGE RD	WEST STUB TERMINUS	GHOST RANCH ST	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SANDY RIDGE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY*	SANDY RIDGE RD	BLUE SKY ST	EAST STUB TERMINUS	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	GHOST RANCH ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BLUE SKY ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SANDY CREEK RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		46' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES AND MEDIAN CURB	SANDY CREEK RD	BLUE SKY ST	MESA ARENOSO DR	/	/	/

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	Inspector	Engineer
		46' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES AND MEDIAN CURB	SANDY TRAIL RD	MESSINA DRIVE	GHOST RANCH ST	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SANDY TRAIL RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
			* SIDEWALKS TO BE DEFERRED PER DEFERRAL EXHIBIT 'B'. WAIVER OF SIDEWALK ON SOUTH SIDE OF SANDY RIDGE RD STUBS.				/	/	/
			STREET LIGHTS AS PER COA DPM						

ONSITE PUBLIC STORM DRAIN IMPROVEMENTS

		18"-48" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESSINA AVE	GIBSON BLVD	SOUTH BOUNDARY	/	/	/
		18"-42" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	BLUE SKY ST	SANDY CREEK RD	SOUTH BOUNDARY	/	/	/
		18" - 24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	SANDY CREEK RD	50' WEST OF BLUE SKY	BLUE SKY ST	/	/	/
			2.9 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**EL RANCHO GRANDE TRACT 15**			/	/	/
			0.55 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**EL RANCHO GRANDE TRACTS 15 AND 16**			/	/	/

NOTE: A GRADING AND DRAINAGE CERTIFICATION OF THE APPROVED GRADING PLAN IS REQUIRED PRIOR TO THE RELEASE OF FINANCIAL GUARANTEES.

THERE WILL BE NO RELEASE OF FINANCIAL GUARANTEE OR SIA UNTIL AGREEMENT IS PROCESSED AND APPROVED WITH AMAFCA FOR CONSTRUCTION OF THE AMOLE ARROYO IMPROVEMENTS.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	rivat Inspector	Inspector	t Engineer
			ONSITE PUBLIC WATERLINE IMPROVEMENTS						
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GIBSON BOULEVARD	MESA ARENOSO DR	DESERT RANCH STREET	/	/	/
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	MESA ARENOSO DR	GIBSON BOULEVARD	PUBLIC WATERLINE EASEMENT	/	/	/
		4-8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SANDY RIDGE RD	WEST STUB TERMINUS	EAST STUB TERMINUS	/	/	/
		8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GHOST RANCH ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BLUE SKY ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SANDY CREEK RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SANDY TRAIL RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
							/	/	/
			ONSITE PUBLIC SANITARY SEWER IMPROVEMENTS						
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SANDY RIDGE RD	WEST STUB TERMINUS	EAST STUB TERMINUS	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	GHOST RANCH ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLUE SKY ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SANDY CREEK RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SANDY TRAIL RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OFFSITE PUBLIC EASEMENT	SOUTH BOUNDARY BLUE SKY ST	BLAKE ROAD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLAKE ROAD	OFFSITE PUBLIC EASEMENT	BUTCH CASSIDY DR	/	/	/
							/	/	/

SCOTT STEFFEN PREPARED BY: PRINT NAME	10/09/03 DATE	DRB CHAIR	DATE	PARKS & RECREATION DEPARTMENT	DATE
BOHANNAN HUSTON INC. FIRM:		TRANSPORTATION DEVELOPMENT	DATE	AMAFCA	DATE
SIGNATURE	DATE	UTILITY DEVELOPMENT	DATE	CITY ENGINEER	DATE
MAXIMUM TIME ALLOW TO CONSTRUCT IMPROVEMENTS WITHOUT A DRB EXTENSION		NEW MEXICO UTILITIES INC.	DATE		DATE

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT/OWNER

ubmi Oct 03

Current DRC
Project No. _____

Date Site Plan Approved: _____

Date Preliminary Plat Approved: _____

Date Preliminary Plat Expiers: _____

DRB Project No. _____

APPLICATION NO.

Figure 12

INFRASTRUCTURE LIST

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

EL RANCHO GRANDE UNIT 15 SUBDIVISION
PRELIMINARY PLAT

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 DRC 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 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.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC ROADWAY IMPROVEMENTS						
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY	AMOLE MESA AVE	MESSINA DR	MESA ARENOSO DR	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON EAST SIDE ONLY	MESSINA DRIVE	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON WEST SIDE ONLY	MESA ARENOSO DR	GIBSON BLVD	AMOLE MESA AVE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SOLITUDE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		32' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES	OPEN RANGE AVE	GHOST RANCH ST	BLUE SKY ST	/	/	/
		46' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES	OPEN RANGE AVE	BLUE SKY ST	MESA ARENOSO DR	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	GHOST RANCH ST	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BLUE SKY ST	NORTH BOUNDARY	LONE TREE RD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SILVER STAR DR	SOLITUDE RD	LONE TREE RD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	LONE TREE RD	SILVER STAR DR	BLUE SKY ST	/	/	/

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Loc	Fro	To	ivate Inspector	Ci Inspector	(Engineer
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK SOUTH SIDE ONLY*	LONE TREE RD	WEST STUB TERMINUS	SILVER STAR DR	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK SOUTH SIDE ONLY*	LONE TREE RD	BLUE SKY ST	EAST STUB TERMINUS	/	/	/
							/	/	/

* SIDEWALKS TO BE DEFERRED PER DEFERRAL EXHIBIT 'B'.
WAIVER OF SIDEWALK ON NORTH SIDE OF LONE TREE RD STUBS.

STREET LIGHTS AS PER COA DPM

ONSITE PUBLIC STORM DRAIN IMPROVEMENTS

18"-48" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESSINA DR	NORTH BOUNDARY	OPEN RANGE AVE	/	/	/
18"-54" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	OPEN RANGE AVE	MESSINA DR	MESA ARENOSO DR	/	/	/
18" - 30" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	BLUE SKY ST	NORTH BOUNDARY	150' NORTH OF LONE TREE	/	/	/
36" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESA ARENOSO DR	50' SOUTH OF OPEN RANGE AVE	OPEN RANGE AVE	/	/	/
	6.5 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**TRACT 33C-1-A LANDS OF CURB INC.**			/	/	/
	0.57 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**TRACT 30A-1 LANDS OF SALAZAR**			/	/	/

NOTE: A GRADING AND DRAINAGE CERTIFICATION OF THE APPROVED GRADING PLAN IS REQUIRED PRIOR TO THE RELEASE OF FINANCIAL GUARANTEES.

THERE WILL BE NO RELEASE OF FINANCIAL GUARANTEE OR SIA UNTIL AGREEMENT IS PROCESSED AND APPROVED WITH AMAFCA FOR CONSTRUCTION OF THE AMOLE ARROYO IMPROVEMENTS.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	C Inspector	t Engineer
			ONSITE PUBLIC WATERLINE IMPROVEMENTS						
		8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GHOST RANCH ST	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BLUE SKY ST	NORTH BOUNDARY	LONE TREE RD	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SILVER STAR DR	SOLITUDE RD	LONE TREE RD	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SOLITUDE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OPEN RANGE AVE	GHOST RANCH ST	MESA ARENOSO DR	/	/	/
		4-6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	LONE TREE RD	WEST STUB TERMINUS	EAST STUB TERMINUS	/	/	/
		20" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	MESA ARENOSO DR	OPEN RANGE AVE	AMOLE MESA AVE	/	/	/
		8" DIA*	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OFFSITE PUBLIC EASEMENT	INTERSECTION OF GIBSON BLVD AND MESSINA DRIVE	NORTH BOUNDARY	/	/	/
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GIBSON BOULEVARD	MESA ARENOSO DR	DESERT RANCH STREET	/	/	/
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	MESA ARENOSO DR	GIBSON BOULEVARD	PUBLIC WATERLINE EASEMENT	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OFFSITE PUBLIC EASEMENT	MESA ARENOSO DR	NORTH BOUNDARY	/	/	/
							/	/	/

* DEFERRED ITEM

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Street Engineer
			ONSITE PUBLIC SANITARY SEWER IMPROVEMENTS						
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	GHOST RANCH ST	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLUE SKY ST	NORTH BOUNDARY	LONE TREE RD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SILVER STAR DR	SOLITUDE RD	LONE TREE RD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SOLITUDE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OPEN RANGE AVE	GHOST RANCH ST	MESA ARENOSO DR	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OFFSITE PUBLIC EASEMENT	MESA ARENOSO DR	BLAKE ROAD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLAKE ROAD	OFFSITE PUBLIC EASEMENT	BUTCH CASSIDY DR	/	/	/
							/	/	/

SCOTT STEFFEN PREPARED BY: PRINT NAME	10/09/03 DATE	DRB CHAIR	DATE	PARKS & RECREATION DEPARTMENT	DATE
BOHANNAN HUSTON INC. FIRM:		TRANSPORTATION DEVELOPMENT	DATE	AMAFCA	DATE
SIGNATURE	DATE	UTILITY DEVELOPMENT	DATE	CITY ENGINEER	DATE
MAXIMUM TIME ALLOW TO CONSTRUCT IMPROVEMENTS WITHOUT A DRB EXTENSION		NEW MEXICO UTILITIES INC.	DATE		DATE

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT/OWNER

EXHIBITS

EXHIBIT 1 - PRELIMINARY PLATS

EXHIBIT 2 - GRADING PLANS

EXHIBIT 3 - DEVELOPED CONDITIONS BASIN MAP

EXHIBIT 4 - MASTER STORM DRAIN BASIN MAP

EXHIBIT 1

PRELIMINARY PLATS

EXHIBIT 2

GRADING PLANS

EXHIBIT 3

DEVELOPED CONDITIONS BASIN MAP

EXHIBIT 4

MASTER STORM DRAIN BASIN MAP

Bohannan △ Huston INC.

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335

www.bhinc.com

voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

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

No Scan
or copy

November 7, 2003

Rick Beltramo, PE
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

Re: El Rancho Grande Unit 14 & 15 Subdivision Drainage Report
Engineer's Stamp dated 10-10-03 (N9/D5)

Dear Mr. Beltramo,

Based upon the information provided in your submittal dated 10-10-03, the above referenced report cannot be approved until the following comments are addressed.

- Since approval of the Master Plan is still pending, this report should address enough of the offsite basins to adequately size infrastructure. In other words, you should include in your basin map the properties west of Messina (both north and south of Gibson). An analysis point at Gibson and Messina would also be appropriate.

- Please provide written permission to grade the offsite properties. Please add water surface elevation and retained volumes to the proposed ponds.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept.
Development and Building Services

C: file

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

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/28/2003rd)

PROJECT TITLE: El Rancho Grande Subdivision, Units 14 and 15 ZONE MAP/DRG. FILE # N-8 and N-9
DRB #: _____ EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: Tract 14 and 15, El Rancho Grande
CITY ADDRESS: NW corner of Gibson Boulevard and De Anza Drive

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Rick Beltramo
ADDRESS: 7500 Jefferson NE – Courtyard I PHONE: (505) 823-1000
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: Curb Inc. CONTACT: Bo Johnson
ADDRESS: 6301 Indian School Rd, Suite 208 PHONE: 899-9656
CITY, STATE: Albuquerque, NM ZIP CODE: 87110

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

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

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

CHECK TYPE OF SUBMITTAL:

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

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ___ YES
- ___ NO
- ___ COPY PROVIDED

RECEIVED
OCT 10 2003
HYDROLOGY SECTION

DATE SUBMITTED: 10/10/03 BY: Rick Beltramo

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.

New

DRAINAGE STUDY FOR EL RANCHO GRANDE UNITS 14 AND 15

OCTOBER 10, 2003

Prepared for:

Curb Inc.

6301 Indian School NE. Suite 208

Albuquerque, NM 87109

RECEIVED
OCT 1 2003
HYDROLOGY SECTION

Bohannan ▲ Huston

ENGINEERING ▲

SPATIAL DATA ▲

ADVANCED TECHNOLOGIES ▲

TABLE OF CONTENTS

I. **INTRODUCTION** 1

II. **METHODOLOGY** 1

III. **EXISTING CONDITIONS** 2

A. Topography 2

B. Existing Drainage Patterns 2

IV. **PROPOSED DEVELOPED CONDITIONS** 3

A. Offsite Flows 3

B. Onsite Flows 3

C. FEMA Floodplain 4

D. Interim Improvements for Unit 14 5

V. **CONCLUSION** 5

APPENDICES

APPENDIX A - AHYMO INPUT AND SUMMARY FILES DEVELOPED CONDITIONS

APPENDIX B - STREET CAPACITY AND STORM DRAIN INLET ANALYSIS

APPENDIX C - INFRASTRUCTURE LISTS

EXHIBITS

EXHIBIT 1 - PRELIMINARY PLATS

EXHIBIT 2 - GRADING PLANS

EXHIBIT 3 - DEVELOPED CONDITIONS BASIN MAP

DRAINAGE STUDY
FOR
EL RANCHO GRANDE UNITS 14 AND 15

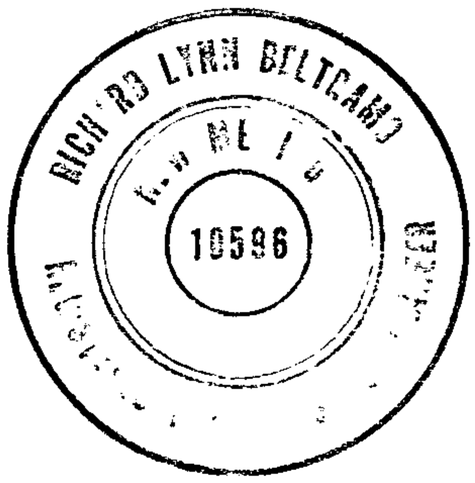
October 10, 2003

Prepared for:

CURB INC.
6301 INDIAN SCHOOL NE - SUITE 208
ALBUQUERQUE, NM 87110

Prepared by:

BOHANNAN HUSTON, INC.
COURTYARD I
7500 JEFFERSON STREET NE
ALBUQUERQUE, NM 87109



PREPARED BY:

Elizabeth E. Smith, P.E. 10/10/03 Date

Rick L. Beltramo, P.E. 10/10/03 Date

Bohannan Huston INC.

I. INTRODUCTION

This drainage study establishes a drainage management plan for the proposed development of El Rancho Grande Unit 14 and El Rancho Grande Unit 15. Unit 14 is approximately 23 acres of residential (R-LT) land to be subdivided into 130 single family residential lots. Unit 15 is approximately 25 acres of residential (R-LT) land to be subdivided into 126 single family residential lots. Both properties are in the Rio Bravo Sector Plan. The subject properties are on Albuquerque's southwest mesa, south of the future Gibson Boulevard and east of Messina Drive.

El Rancho Grande Units 14 and 15 are in the Amole Arroyo Watershed and encompassed by the Amole-Hubbell Drainage Management Plan. In addition, a draft Drainage Management Plan (DMP) is being developed for the Gibson Boulevard corridor between 118th Street and the Amole Arroyo. The drainage area covered by the DMP is approximately 300 acres of residential, commercial, and special use zoned property that bound the north and south side of the future Gibson Boulevard between 118th Street to the west and the Amole Arroyo to the east. El Rancho Grande Units 14 and 15 are in the Drainage Management Plan (DMP) area. Approval of the Gibson Boulevard DMP by the City of Albuquerque and AMAFCA is not required for approval of this Drainage Study for El Rancho Grande Units 14 and 15.

This study provides hydrologic and hydraulic analysis and provides a drainage management plan as necessary to support the planned 130-unit and 126-unit developments. More specifically, this report is submitted in conjunction with the preliminary plat application. Preliminary plat approval and grading plan approval is requested. Prior to final plat and building permit approvals of this project, the City of Albuquerque (COA) must approve final grading plans and work order construction plans.

II. METHODOLOGY

Existing and proposed site hydrological conditions were analyzed for the 100-year, 6-hour storm in accordance with the revised Section 22.2, Hydrology, of the Development Process Manual (DPM) for the City of Albuquerque, dated January 1993. The Arid-lands Hydrologic Model (AHYMO) was utilized to determine peak flow rates for design of the storm

drainage improvements within the projects. The 100-year, 6-hour storm is used as the design event. The results are included in **Appendix A.** Street capacities were analyzed using Manning's equation, consistent with the revised DPM Section 22.2. The storm sewer system is analyzed using current DPM methods for gravity flow conditions. All data and calculations supporting this study are located in **Appendix B.**

The hydrologic analysis is also based on the approved drainage report: *Amole-Hubbell Drainage Management Plan, Volume I, Final Facilities Plan Report* dated July 22, 1999, prepared by Leedshill-Herkenhoff, Inc.

III. EXISTING CONDITIONS

A. Topography

El Rancho Grande Units 14 and 15 are currently undeveloped land with grades ranging from approximately 1% to 9%. The area generally slopes from northwest to southeast. Soils in the area have an SCS soil classification of BCC (Bluepoint loamy fine sand). BCC soils consist of deep, somewhat excessively drained soils formed in sandy alluvial soils, with rapid permeability, slow runoff characteristics, and severe hazard for wind erosion. Vegetation is light consisting mostly of native grasses.

B. Existing Drainage Patterns

El Rancho Grande Units 14 and 15 are located in the Amole Arroyo Drainage Basin. The site generally drains from northwest to southeast. The only development in the area that has altered the natural drainage pattern of the area is El Rancho Grande Unit 11. This development diverts the offsite flow at the northwest corner of Unit 14 and prevents it from entering the site. The majority of the remaining offsite flow is conveyed south by a natural arroyo that is parallel to the western boundary of Units 14 and 15. There is one remaining offsite swale that currently conveys flow across Unit 14. This swale carries approximately 17 cfs to the site.

IV. PROPOSED DEVELOPED CONDITIONS

El Rancho Grande Units 14 and 15 are proposed single-family residential developments with 130 lots on 23 acres and 126 lots on 25 acres, respectively. Proposed street configurations are shown on the *Preliminary Plat* for each development, **Exhibit 1.** The Amole-Hubbell DMP allows for full discharge of developed flows from the Amole Arroyo Basin to the Amole and Hubbell Lake storage facilities. The drainage concepts for Units 14 and 15 are consistent with those presented in the "Draft Master Drainage Study for the Gibson Boulevard Corridor between 118th Street and the Amole Arroyo". The Unit 14 and 15 drainage area corresponds to Basin DB7 in the Gibson Boulevard DMP.

The percent impervious land treatment for the proposed conditions is determined from Table A-5 of the DPM, Section 22.2. The land treatment values used in the AHYMO analysis are the same as the Gibson Boulevard DMP.

A. Offsite Flows

No offsite flows reach the site from the south or east because the natural ground slopes away from Units 14 and 15 on these sides. The offsite flow from the north is intercepted by El Rancho Grande Unit 11.

The property to the west of Units 14 and 15 is undeveloped. The majority of the offsite flow to the west is conveyed south by a natural arroyo that is parallel to the western boundary of Units 14 and 15. There is one remaining offsite swale that currently conveys flow across Unit 14 from approximately 7.8 acres. This swale carries approximately 17 cfs to the site. A drainage swale will be graded west of Messina Drive that will convey this flow into the natural arroyo parallel to the western boundary.

B. Onsite Flows

Developed runoff from Units 14 and 15 will be conveyed by the internal street system to Blue Sky Street, where it will be collected by a public storm drain system. Inlets are located along Blue Sky Street from Sandy Creek to the low point just north of Lone Tree Road. These inlets collect the runoff from the residential streets into a storm drain

that discharges to the east at Open Range Avenue. See **Appendix B** for street capacity and inlet capacity calculations. This drainage plan proposes discharging 160.8 cfs to the intersection of Open Range Avenue and Mesa Arenoso Drive.

The storm drain outfall alignment for Units 14 and 15 to the Amole Arroyo has not been identified at this time. The outfall alignment will be determined in the final Gibson Boulevard DMP and constructed with future phases of the El Rancho Grande development. Therefore, interim facilities will be constructed to accept developed flows from Units 14 and 15. A retention pond sized to retain the 100-year, 24-hour storm volume (6.5 acre-feet) will be constructed on Tract 33C-1-A, Lands of Curb Inc. just east of the intersection of Open Range Avenue and Mesa Arenoso Drive. The pond will remain in place until all downstream storm drain improvements identified in the Gibson Boulevard DMP are in place and/or Tract 33-C-1-A is developed. The retention pond is adjacent to an existing natural arroyo that drains to the Amole Arroyo. An emergency overflow will be incorporated in the pond berm adjacent to the swale to provide an outfall in the event that the pond capacity is exceeded. See **Exhibit 2**, *Grading Plan*, for the location of the swale and pond.

Some runoff will bypass the storm drain network discussed previously. Flow from the southern third of Mesa Arenoso and from Amole Mesa Avenue will flow to the southeast corner of the site and will be collected into a second temporary retention pond. This pond is also sized to hold the 100-year 24-hour storm (0.57 acre-feet). This pond will be removed when the downstream storm drain is constructed with future phases of El Rancho Grande. See **Exhibit 3**, Developed Conditions Basin Map, for basin and storm drain locations. See **Exhibit 2**, *Grading Plan*, for the location of the swales and ponds.

C. FEMA Floodplain

As designated on Panel 336 of 825 (Map number 35001C0336D) of the National Flood Insurance Program, Flood Insurance Rate Maps published by FEMA for Bernalillo County, New Mexico, effective date September 20, 1996, there is no existing flood hazard zone (zone AO) within the proposed development. See the FEMA Floodplain exhibit provided at the end of the report text.

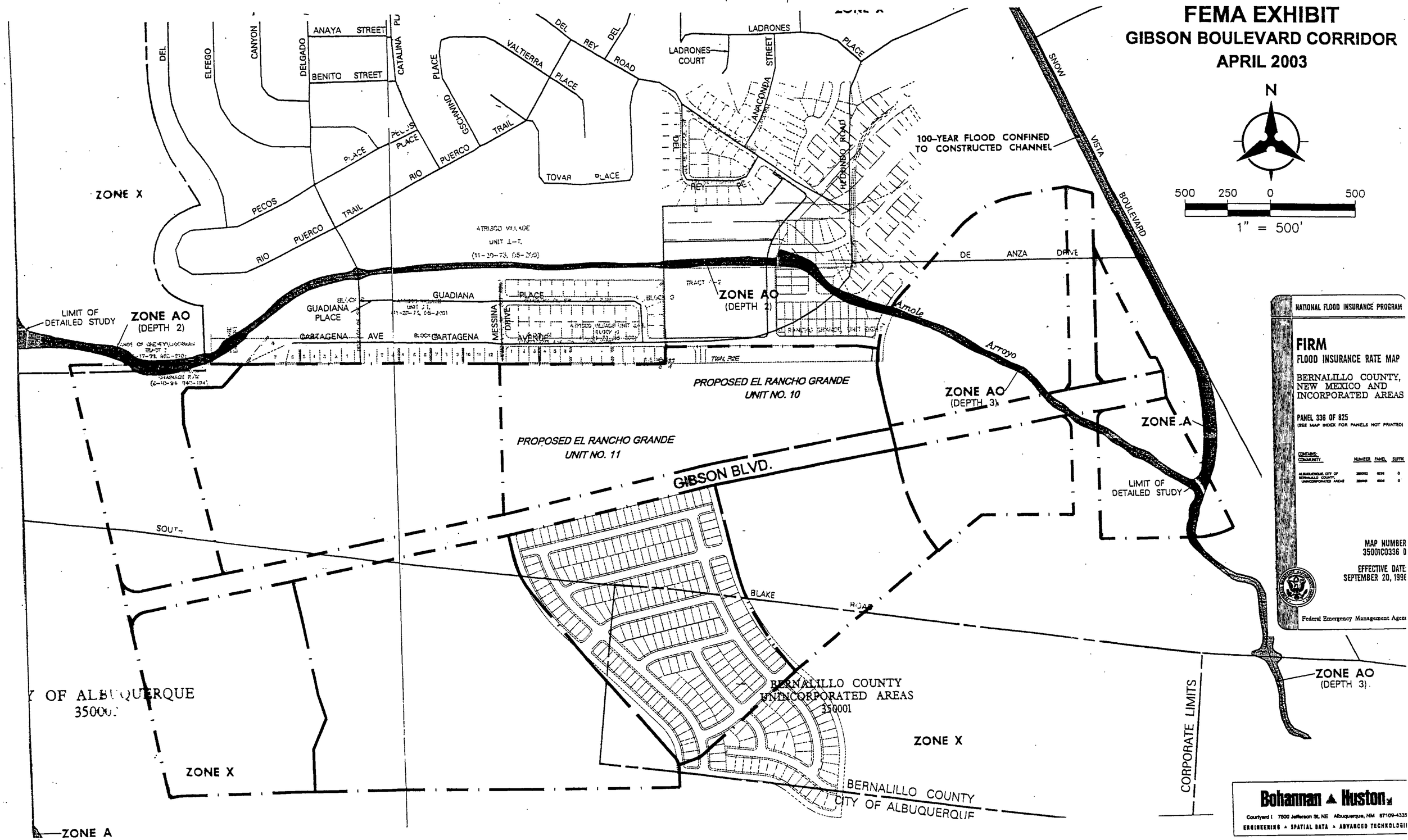
D. Interim Improvements for Unit 14

If Unit 14 is constructed before Unit 15, two interim ponds will be constructed to collect the runoff. These ponds will be located at the boundary between Units 14 and 15 at the southern end of Ghost Ranch and Blue Sky Streets. The western pond will collect approximately 13.5 cfs from Messina Drive and Ghost Ranch Street and will hold 0.55 acre-feet of water. The eastern pond will collect approximately 62 cfs from the remainder of Unit 14 and will hold 2.9 acre-feet of water. These ponds will be temporary retention ponds, sized to hold the 100-year 24-hour storm, which will remain until Unit 15 is constructed.

V. CONCLUSION

This report provides a detailed study of the developed runoff and street capacities for the proposed El Rancho Grande Unit 14 and 15 Subdivisions. Included is the preliminary plat, proposed conditions basin map, grading plan, infrastructure list, and all necessary hydrologic and hydraulic analyses. This drainage plan maintains the overall drainage pattern of the area and allows for the safe management of storm runoff in permanent as well as interim conditions.

FEMA EXHIBIT
GIBSON BOULEVARD CORRIDOR
APRIL 2003



Appendix

APPENDICES

APPENDIX A - AHYMO INPUT AND SUMMARY FILES FOR DEVELOPED CONDITIONS

APPENDIX B - STREET CAPACITY AND STORM DRAIN INLET ANALYSIS

APPENDIX C - INFRASTRUCTURE LISTS

APPENDIX A

AHYMO INPUT AND SUMMARY FILES

DEVELOPED CONDITIONS

```
*INPUT - 100-YEAR, 6-HOUR STORM
*
*S EL RANCHO GRANDE UNITS 14 & 15 / DEVELOPED CONDITIONS
* 09-26-03
START                RAINFALL BEGINS AT 0.00 HOURS
*                      100 YEAR RETURN PERIOD
*********************************************************************
*
*       :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
*       ::                        MISC. DATA                      ::
*       ::        RAINFALL RETURN PERIOD_____________  100-YEAR   ::
*       ::        RAINFALL DURATION__________________  24-HOUR        ::
*       ::       ZONE 1                                        ::
*       ::        RAINFALL DEPTHS: 1 HOUR (P60)___  1.90 INCHES  ::
*       ::        (UNADJUSTED)     6 HOUR (P360)__  2.20 INCHES  ::
*       ::                        24 HOUR (P1440)_  2.60 INCHES  ::
*       ::                                                       ::
*       ::        RAINFALL DATA TAKEN FROM NOAA.                 ::
*       ::                                                       ::
*       ::                HYDROGRAPH METHODOLOGY                 ::
*       ::                                                       ::
*       ::        CITY OF ALBQ. DPM VOL. 2, SECTION 22.2 July, 1997  ::
*       ::        INITIAL ABSTRACTION - INFILTRATION METHOD      ::
*       ::        Tc CALCULATIONS PER C.O.A. DPM 22.2-B.4        ::
*       ::        AMAFCA AHYMO VERSION MARCH 20,1992             ::
*       ::                                                       ::
*       :::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
*                            BEGIN  ANALYSIS
*********************************************************************
*
RAINFALL             TYPE=1 RAIN QUARTER=0.0 RAIN ONE=1.90
                     RAIN SIX=2.20 RAIN DAY=2.60 DT=0.05
*
*****************************************************************
*S* COMPUTE DEVELOPED CONDITIONS, UNIT 14
*****************************************************************
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14A  *********
COMPUTE NM HYD       ID=2 HYD=14A  AREA=0.00953 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=2   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14B  *********
*S AP2
COMPUTE NM HYD       ID=4 HYD=14B  AREA=0.0042 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=4   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14C  *********
COMPUTE NM HYD       ID=6 HYD=14C  AREA=0.00758 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=6   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14D  *********
COMPUTE NM HYD       ID=8 HYD=14D  AREA=0.00064 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=8   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14E  *********
COMPUTE NM HYD       ID=10 HYD=14E  AREA=0.00275 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=10   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14F  *********
COMPUTE NM HYD       ID=12 HYD=14F  AREA=0.0065 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=12   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14G  *********
COMPUTE NM HYD       ID=14 HYD=14G  AREA=0.0026 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=14   CODE=1
```

```
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14H  *********
COMPUTE NM HYD       ID=16 HYD=14H  AREA=0.00105 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=16   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 14I  *********
*S AP3
COMPUTE NM HYD       ID=18 HYD=14I  AREA=0.00138 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=18   CODE=1
*
*************************************************************
*S* COMPUTE DEVELOPED CONDITIONS, UNIT 15
*************************************************************
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15A  *********
COMPUTE NM HYD       ID=20 HYD=15A  AREA=0.0044 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=20   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15B1  *********
COMPUTE NM HYD       ID=22 HYD=15B1  AREA=0.0062 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=22   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15B2  *********
COMPUTE NM HYD       ID=23 HYD=15B2  AREA=0.0013 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=23   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15C  *********
COMPUTE NM HYD       ID=24 HYD=15C  AREA=0.0037 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=24   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15D  *********
COMPUTE NM HYD       ID=26 HYD=15D  AREA=0.0015 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15E  *********
COMPUTE NM HYD       ID=28 HYD=15E  AREA=0.0011 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=28   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15F  *********
COMPUTE NM HYD       ID=30 HYD=15F  AREA=0.0022 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=30   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15G  *********
COMPUTE NM HYD       ID=32 HYD=15G  AREA=0.0022 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=32   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15H  *********
COMPUTE NM HYD       ID=34 HYD=15H  AREA=0.00094 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=34   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15I  *********
COMPUTE NM HYD       ID=36 HYD=15I  AREA=0.0006 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=36   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15J  *********
COMPUTE NM HYD       ID=38 HYD=15J  AREA=0.0022 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD              ID=38   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15K  *********
COMPUTE NM HYD       ID=40 HYD=15K  AREA=0.0021 PER A=0.0 PER B=22.5
```

```
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD             ID=40   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15L  *********
COMPUTE NM HYD       ID=42 HYD=15L  AREA=0.0033 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD             ID=42   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15M  *********
COMPUTE NM HYD       ID=44 HYD=15M  AREA=0.0049 PER A=0.0 PER B=22.5
                    PER C=22.5 PER D=55.0  TP=.133  RAINFALL=-1
PRINT HYD             ID=44   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN 15N  *********
COMPUTE NM HYD       ID=46 HYD=15N  AREA=0.0014 PER A=0.0 PER B=0.0
                    PER C=0.0 PER D=100.0  TP=.133  RAINFALL=-1
PRINT HYD             ID=46   CODE=1
*
**** COMPUTE AND PRINT NM HYD DATA FOR BASIN OFFSITE1  *********
COMPUTE NM HYD       ID=48 HYD=OFF1  AREA=0.0122 PER A=20.0 PER B=40.0
                    PER C=40.0 PER D=0.0  TP=.133  RAINFALL=-1
PRINT HYD             ID=48   CODE=1
*
************************************************
*S ADD UNIT 14 BASINS
************************************************
ADD HYD                ID=51 HYD=AD ID I=2 ID II=8
PRINT HYD             ID=51   CODE=1
*
ADD HYD                ID=53 HYD=ADC ID I=51 ID II=6
PRINT HYD             ID=53   CODE=1
*
ADD HYD                ID=55 HYD=ADCF ID I=53 ID II=12
PRINT HYD             ID=55   CODE=1
*
*S***AP1, UNIT 14/15 EASTERN CONNECTION ********
ADD HYD                ID=57 HYD=AP1 ID I=55 ID II=10
PRINT HYD             ID=57   CODE=1
*
************************************************
*S ADD UNIT 15 BASINS
************************************************
ADD HYD                ID=59 HYD=U14E ID I=57 ID II=28
PRINT HYD             ID=59   CODE=1
*
ADD HYD                ID=61 HYD=EA ID I=59 ID II=20
PRINT HYD             ID=61   CODE=1
*
ADD HYD                ID=63 HYD=EAF ID I=61 ID II=30
PRINT HYD             ID=63   CODE=1
*
*S AP4
ADD HYD                ID=65 HYD=AP4 ID I=63 ID II=26
PRINT HYD             ID=65   CODE=1
*
ADD HYD                ID=67 HYD=B14B15 ID I=4 ID II=22
PRINT HYD             ID=67   CODE=1
*
ADD HYD                ID=68 HYD=14I15H ID I=16 ID II=34
PRINT HYD             ID=68   CODE=1
*
ADD HYD                ID=69 HYD=BBI ID I=67 ID II=36
PRINT HYD             ID=69   CODE=1
*
ADD HYD                ID=70 HYD=BBIIH ID I=68 ID II=69
PRINT HYD             ID=70   CODE=1
*S AP5
ADD HYD                ID=71 HYD=AP5 ID I=70 ID II=24
PRINT HYD             ID=71   CODE=1
*
ADD HYD                ID=73 HYD=MJ ID I=38 ID II=44
```

```
PRINT HYD                ID=73   CODE=1
*
ADD HYD                   ID=75 HYD=KL ID I=40 ID II=42
PRINT HYD                ID=75   CODE=1
*
*S AP6
ADD HYD                   ID=77 HYD=AP6 ID I=73 ID II=75
PRINT HYD                ID=77   CODE=1
*
ADD HYD                   ID=79 HYD=AP45 ID I=65 ID II=71
PRINT HYD                ID=79   CODE=1
*
*S EAST ENTRANCE TO UNIT 15, AP7
ADD HYD                   ID=81 HYD=AP7 ID I=79 ID II=77
PRINT HYD                ID=81   CODE=1
*
ADD HYD                   ID=83 HYD=14GH ID I=14 ID II=18
PRINT HYD                ID=83   CODE=1
*
*S TEMPORARY POND #1 INPUT, AP 8
ADD HYD                   ID=85 HYD=AP8 ID I=83 ID II=81
PRINT HYD                ID=85   CODE=1
*
ADD HYD                   ID=87 HYD=B2N ID I=23 ID II=46
PRINT HYD                ID=87   CODE=1
*
*S TEMPORARY POND #2 INPUT, AP 9
ADD HYD                   ID=88 HYD=AP9 ID I=87 ID II=32
PRINT HYD                ID=88   CODE=1
FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =10/01/2003
INPUT FILE = P:\040219\cdp\hydro\Unit1415.txt USER NO.= AHYMO-S-9702c1BohanHu-AH

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S EL RANCHO GRANDE UNITS 14 & 15 / DEVELOPED CONDITIONS										
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.200
S COMPUTE DEVELOPED CONDITIONS, UNIT 14										
COMPUTE NM HYD	14A	-	2	.00953	21.45	.740	1.45690	1.500	3.517	PER IMP= 55.00
*S AP2										
COMPUTE NM HYD	14B	-	4	.00420	9.46	.326	1.45690	1.500	3.520	PER IMP= 55.00
COMPUTE NM HYD	14C	-	6	.00758	17.06	.589	1.45690	1.500	3.517	PER IMP= 55.00
COMPUTE NM HYD	14D	-	8	.00064	1.79	.067	1.96862	1.500	4.382	PER IMP= 100.00
COMPUTE NM HYD	14E	-	10	.00275	6.20	.214	1.45690	1.500	3.522	PER IMP= 55.00
COMPUTE NM HYD	14F	-	12	.00650	14.63	.505	1.45690	1.500	3.518	PER IMP= 55.00
COMPUTE NM HYD	14G	-	14	.00260	7.27	.273	1.96862	1.500	4.369	PER IMP= 100.00
COMPUTE NM HYD	14H	-	16	.00105	2.94	.110	1.96862	1.500	4.375	PER IMP= 100.00
*S AP3										
COMPUTE NM HYD	14I	-	18	.00138	3.86	.145	1.96862	1.500	4.373	PER IMP= 100.00
S COMPUTE DEVELOPED CONDITIONS, UNIT 15										
COMPUTE NM HYD	15A	-	20	.00440	9.91	.342	1.45690	1.500	3.519	PER IMP= 55.00
COMPUTE NM HYD	15B1	-	22	.00620	13.96	.482	1.45690	1.500	3.518	PER IMP= 55.00
COMPUTE NM HYD	15B2	-	23	.00130	2.94	.101	1.45690	1.500	3.534	PER IMP= 55.00
COMPUTE NM HYD	15C	-	24	.00370	8.34	.287	1.45690	1.500	3.520	PER IMP= 55.00
COMPUTE NM HYD	15D	-	26	.00150	3.39	.117	1.45690	1.500	3.530	PER IMP= 55.00
COMPUTE NM HYD	15E	-	28	.00110	3.08	.115	1.96862	1.500	4.375	PER IMP= 100.00
COMPUTE NM HYD	15F	-	30	.00220	4.96	.171	1.45690	1.500	3.525	PER IMP= 55.00
COMPUTE NM HYD	15G	-	32	.00220	6.15	.231	1.96862	1.500	4.370	PER IMP= 100.00
COMPUTE NM HYD	15H	-	34	.00094	2.63	.099	1.96863	1.500	4.378	PER IMP= 100.00
COMPUTE NM HYD	15I	-	36	.00060	1.68	.063	1.96862	1.500	4.382	PER IMP= 100.00
COMPUTE NM HYD	15J	-	38	.00220	4.96	.171	1.45690	1.500	3.525	PER IMP= 55.00
COMPUTE NM HYD	15K	-	40	.00210	4.74	.163	1.45690	1.500	3.526	PER IMP= 55.00
COMPUTE NM HYD	15L	-	42	.00330	7.44	.256	1.45690	1.500	3.522	PER IMP= 55.00
COMPUTE NM HYD	15M	-	44	.00490	11.04	.381	1.45690	1.500	3.519	PER IMP= 55.00
COMPUTE NM HYD	15N	-	46	.00140	3.92	.147	1.96862	1.500	4.373	PER IMP= 100.00
COMPUTE NM HYD	OFF1	-	48	.01220	17.16	.480	.73748	1.500	2.198	PER IMP= .00
*S ADD UNIT 14 BASINS										
ADD HYD	AD	2& 8	51	.01017	23.24	.808	1.48904	1.500	3.571	
ADD HYD	ADC	51& 6	53	.01775	40.31	1.397	1.47530	1.500	3.548	
ADD HYD	ADCF	53&12	55	.02425	54.94	1.902	1.47036	1.500	3.540	
*S***AP1, UNIT 14/15 EASTERN CONNECTION ********										
ADD HYD	AP1	55&10	57	.02700	61.14	2.115	1.46898	1.500	3.538	
*S ADD UNIT 15 BASINS										
ADD HYD	U14E	57&28	59	.02810	64.22	2.231	1.48853	1.500	3.571	
ADD HYD	EA	59&20	61	.03250	74.13	2.573	1.48424	1.500	3.564	
ADD HYD	EAF	61&30	63	.03470	79.09	2.744	1.48250	1.500	3.562	
*S AP4										
ADD HYD	AP4	63&26	65	.03620	82.48	2.860	1.48143	1.500	3.560	
ADD HYD	B14B15	4&22	67	.01040	23.42	.808	1.45685	1.500	3.519	

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	14I15H	16&34	68	.00199	5.57	.209	1.96834	1.500	4.377	
ADD HYD	BBI	67&36	69	.01100	25.10	.871	1.48474	1.500	3.566	
ADD HYD	BBIIH	68&69	70	.01299	30.68	1.080	1.55882	1.500	3.690	
*S AP5										
ADD HYD	AP5	70&24	71	.01669	39.01	1.367	1.53621	1.500	3.652	
ADD HYD	MJ	38&44	73	.00710	16.00	.552	1.45682	1.500	3.521	
ADD HYD	KL	40&42	75	.00540	12.18	.420	1.45681	1.500	3.523	
*S AP6										
ADD HYD	AP6	73&75	77	.01250	28.18	.971	1.45681	1.500	3.522	
ADD HYD	AP45	65&71	79	.05289	121.50	4.228	1.49871	1.500	3.589	
*S EAST ENTRANCE TO UNIT 15, AP7										
ADD HYD	AP7	79&77	81	.06539	149.67	5.199	1.49070	1.500	3.576	
ADD HYD	14GH	14&18	83	.00398	11.13	.418	1.96847	1.500	4.370	
*S TEMPORARY POND #1 INPUT, AP 8										
ADD HYD	AP8	83&81	85	.06937	160.81	5.617	1.51811	1.500	3.622	
ADD HYD	B2N	23&46	87	.00270	6.86	.248	1.72203	1.500	3.969	
*S TEMPORARY POND #2 INPUT, AP 9										
ADD HYD	AP9	87&32	88	.00490	13.01	.479	1.83268	1.500	4.149	
FINISH										

APPENDIX B

STREET CAPACITY AND
STORM DRAIN INLET ANALYSIS

El Rancho Grande Units 14 & 15
Inlet & Street Capacity Calculations
October 3, 2003

1. **Sandy Ridge Road**

Basin 14A (See AHYMO summary table or Basin Map)
S = 2.59%
Q = 21.5 cfs
D = 0.41' at 21.5 cfs

At 2.59%, a road with standard curb can handle 31.2 cfs.
No inlets are needed.
21.5 cfs / 43 lots = 0.5 cfs / lot
Roll curb can handle 9.1 cfs
9.1 cfs / 0.5 cfs/lot = 18.2 lots

2. **Sandy Creek Road**

Basin 14-C (See AHYMO summary table or Basin Map)
S = 2.47%
Q = 17.0 cfs
D = 0.39'
Q/grate = 5.2 cfs (see nomograph)

At 2.47%, a road with standard curb can handle 30.3 cfs. Install 2 inlets to ease flow at intersection. See PC stream output.

Water flows into intersection; add inlets to relieve intersection. Each inlet will collect 5.2 cfs. Two inlets will remove 10.4 cfs.

17.0
- 10.4
6.6 cfs bypass to intersection

17 cfs / 34 lots = 0.5 cfs / lot
Roll curb can handle 8.8 cfs
8.8 cfs / 0.5 cfs/lot = 17.6 lots

3. **Sandy Trail Road**

Basin 14-F (See AHYMO summary table or Basin Map)
S = 3.3%
Q = 14.6 cfs
D = 0.36'
At 3.3%, a road with standard curb can handle 27.6 cfs. No inlets are needed.

14.6 cfs / 28 lots = 0.52 cfs / lot
Roll curb can handle 7.4 cfs
7.4 cfs / 0.52 cfs/lot = 14.2 lots

4. Blue Sky Street

Blue Sky Street at Sandy Creek Rd

Basin 14-E, 14-D (See AHYMO summary table or Basin Map)

S = 2.46%

At Basin C, 4/11 lots (.36) of Basin D and E will contribute

Basin 14-E: 0.36*6.2 = 2.2 cfs

Basin 14-D: 0.36*1.8 = 0.65 cfs

Q = 2.2 cfs Contributing from Basin 14-E

0.65 cfs from Basin 14-D

+ 21.5 cfs Basin 14-A

24.4 cfs north of Sandy Creek Rd

- 7.0 cfs inlet north of Sandy Creek Rd

+ 6.6 cfs bypass from Basin 14-C

23.95 cfs south of Sandy Creek Rd

At 2.46%, a road with standard curb can handle 30.3 cfs. Install one inlet north of Sandy Creek Road.

A single grate type A or C inlet can carry 7 cfs at a depth of 0.45'. Install one inlet to remove 7 cfs.

Blue Sky Street flow north of Sandy Trail Road

Q = 23.95 cfs

+ 4 cfs from Basin 14-E

+ 1.2 cfs from Basin 14-D

29.15 cfs

S = 0.96%

D = 0.52'

At 0.96%, a road with standard curb can handle 39.1 cfs. Install one inlet north of Sandy Trail Road to relieve the intersection. The inlet will remove 6.6 cfs.

Blue Sky Street South of Sandy Trail Road

29.15 cfs

-6.6 cfs north of Sandy Trail Rd

+14.6 cfs from Basin 14-F

37.15 cfs south of Sandy Trail Rd

At 0.96%, a road with standard curb can handle 39.1 cfs. No inlets are needed. AP1 at south of Unit 14 sees 37.15 cfs in the street and 24 cfs in the storm drain.

Blue Sky Street North of Solitude Road
Q = 37.15 cfs
S = 0.96%
D= 0.57'
Install inlets north of Solitude Road. A single grate type A or C inlet can carry 7.5 cfs at a depth of 0.57'. Install three inlets to remove 22.5 cfs. The intersection will receive (37.15-22.5) 14.7 cfs.

5. **Unit 15, Solitude Road**

Basin 15-A (See AHYMO summary table or Basin Map)
S = 2.98%
Width = 28' F-F
Q = 9.9 cfs
D=0.26'
Q/grate = 3.8 cfs (see nomograph)

At 2.98%, a road with standard curb can handle 26.2 cfs. Therefore, no inlets needed. See PC stream output. 9.9 cfs flows into intersection.
If Ghost Ranch flow spills over into Solitude, the street capacity can handle it with standard curb and gutter. Therefore, no roll curb will be installed in Solitude Road.

6. **Blue Sky Street south of Solitude Road**

S = 1.95%
14.7 cfs on Blue Sky St
9.9 cfs from 15-A
Q = 24.6 cfs on Blue Sky St

At 1.95%, a road with standard curb can handle 34 cfs. Therefore, no inlets needed. See PC stream output. Water flows into intersection.

7. **Blue Sky Street north of Open Range Ave (AP 4)**

Basins 15-F, 15-E, 15-D (See AHYMO summary table or Basin Map)
S = 1.95%

24.6 cfs	Blue Sky St
3.4 cfs	Basin 15-D
3.1 cfs	Basin 15-E
5.0 cfs	Basin 15-F

Q =36.1 cfs
D=0.5'
Q/grate=8 cfs/grate (See nomograph)

At 1.95%, a road with standard curb can handle 33.1 cfs. See PC stream output. Add inlets 6 lots north of Open Range Avenue before flow exceeds 33 cfs. Each inlet will collect 8 cfs. Two inlets will remove 16 cfs from Blue Sky Street.
At AP4, 20 cfs will be in the road and 62.5 cfs will be in the storm drain.

8. Ghost Ranch Street

Basin 14-B, 15-B1 (See AHYMO summary table or Basin Map)

S = 2.5% / 4.0% / 1.41%
Width = 28' F-F

Q =	9.5 cfs	Basin 14-B
	+ 14.0 cfs	Basin 15-B1
	23.5 cfs	

At 2.5%, a road with standard curb can handle 30.6 cfs; at 4.0%, the road can handle 25.2 cfs; at 1.41%, the road can handle 36.4 cfs. Therefore no inlets are required. At 2.5%, a road with roll curb can handle 9.9 cfs. Therefore, roll curb is sufficient in Basin 14-B.

9. Open Range Avenue

Basin 15-I, 15-C (See AHYMO summary table or Basin Map)

S=1.39%
Width = 32' F-F

Q =	23.5 cfs	Ghost Ranch St
	+ 8.3 cfs	Silver Star Dr / 15-C
	+ 1.7 cfs	Open Range Ave / 15-I
	33.5 cfs	

At 1.39%, a road with standard curb can handle 42.8 cfs. Therefore, no inlets needed. See PC stream output. Add inlets to ease intersection with Blue Sky Street at AP 5.

A single grate type A or C inlet can carry 6.6 cfs at a depth of 0.5'. Install two inlets to remove 13.2 cfs. Add two additional inlets to remove an additional 10 cfs. The intersection will receive (33.5-13.2 -10) 10.3 cfs.

At AP5, there is 23.2 cfs in a storm drain and 10.3 cfs in the road.

10. Blue Sky Street south of Open Range Ave

Basin 15-L, 15-K (See AHYMO summary table or Basin Map)

S=1.73 28' F-F

Q =	10.3 cfs	Open Range Ave, AP 5
	+ 20.0 cfs	Blue Sky St, AP 4
	+ 4.7 cfs	Basin 15-K
	+ 7.4 cfs	Basin 15-L
	42.4 cfs	

At 1.73%, a road with standard curb can handle 35.8 cfs. Therefore, inlets are needed when street capacity is exceeded and at low point of street. At 35.8 cfs, the depth is 0.51'. A single type A or C drop inlet accepts 7.4 cfs at 0.51'. See PC stream output.

Basins 15-K and 15-L contribute 12.1 cfs with 23 lots (0.53 cfs/lot).
42.4 cfs
- 35.8 cfs
6.6 cfs excess

6.6 / 0.53 = 12.5 lots excess contribution
Two inlets will remove 14.8 cfs and bypass 27.6 cfs to the low-point of the road.

11. Lone Tree Road

Basin 15-J, 15-M (See AHYMO summary table or Basin Map)
S=2.59% 28' F-F
Q = 5.0 cfs Basin 15-J
+ 11.0 cfs Basin 15-M
16.0 cfs

At 2.59%, a road with standard curb can handle 31.2 cfs. Therefore, no inlets are required. In the event that some flow spills into Lone Tree Road from Open Range Avenue, the road has the capacity to handle it.

12. Low point of Blue Sky Street

Q = 27.6 cfs Blue Sky St
16.0 cfs Lone Tree Rd
43.6 cfs

A single grate inlet can accommodate 27.8 cfs in a sump within the curb height. Two inlets can accommodate 55.6 cfs. Two inlets will be installed in the sump of Blue Sky Street. This extra inlet capacity will be sufficient to account for any spill from Lone Tree Road into Open Range Avenue that travels to the low-point of Blue Sky Street.

13. Messina Road

Basin 14-I, Basin 15-H
S = 3.1%
Q = 3.9 cfs Basin 14-I
2.6 cfs Basin 15-H
6.5 cfs

At 3.1%, a road with standard curb can handle 40 cfs. Therefore, no inlets are required. Install inlets to divert flow east. A single grate type A or C inlet can carry 2.7 cfs at a depth of 0.27'. Install two inlets to remove 5.4 cfs, 1.1 cfs will continue to Amole Mesa.

14. Amole Mesa Avenue

Basin 15-N, Messina overflow
S = 2.31%
Q = 3.9 cfs Basin 15-N
1.1 cfs Messina
5 cfs

At 2.31%, a road with standard curb can handle 31.8 cfs. Therefore, no inlets are required.

15. Mesa Arenoso north of Open Range Avenue

Basin 14-H and Gibson overflow
Width = 40' f-f
S = 1.29%
Q = 7.3 cfs Gibson
2.9 cfs Basin 14-H
2.1 cfs 33% of Basin 15-G
12.3 cfs

At 1.29%, a road with standard curb can handle 53.1 cfs. See PC stream output. Therefore, no inlets needed. Add inlets at Open Range Avenue to divert flow east. A single grate type A or C inlet can carry 3.1 cfs at a depth of 0.36'. Install two inlets to remove 6.2 cfs, 6.1 cfs will continue.

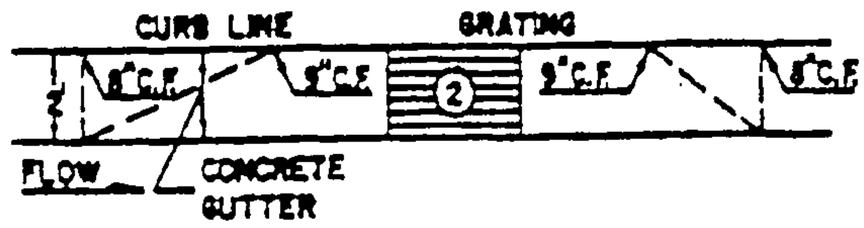
16. Mesa Arenoso at Amole Mesa

Flow from Mesa Arenoso and Amole Mesa and Basin 15-G
S = 0.6%
Width = 40' f-f
Q = 6.1 cfs Mesa Arenoso
4.1 cfs remainder of 15-G
5.0 cfs Amole Mesa
15.2 cfs

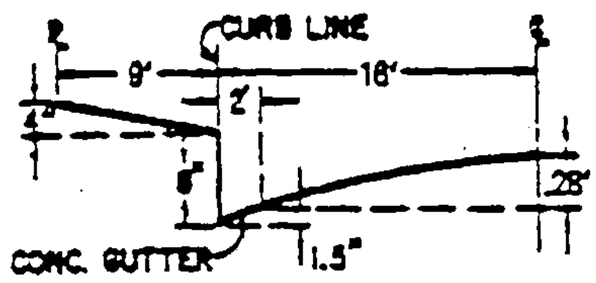
At 0.6%, a road with standard curb can handle 58.3 cfs. See PC stream output. Therefore, no inlets needed. A temporary pond will be constructed to collect the 15.2 cfs until future storm drain improvements are constructed.

Sandy Creek Road

GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

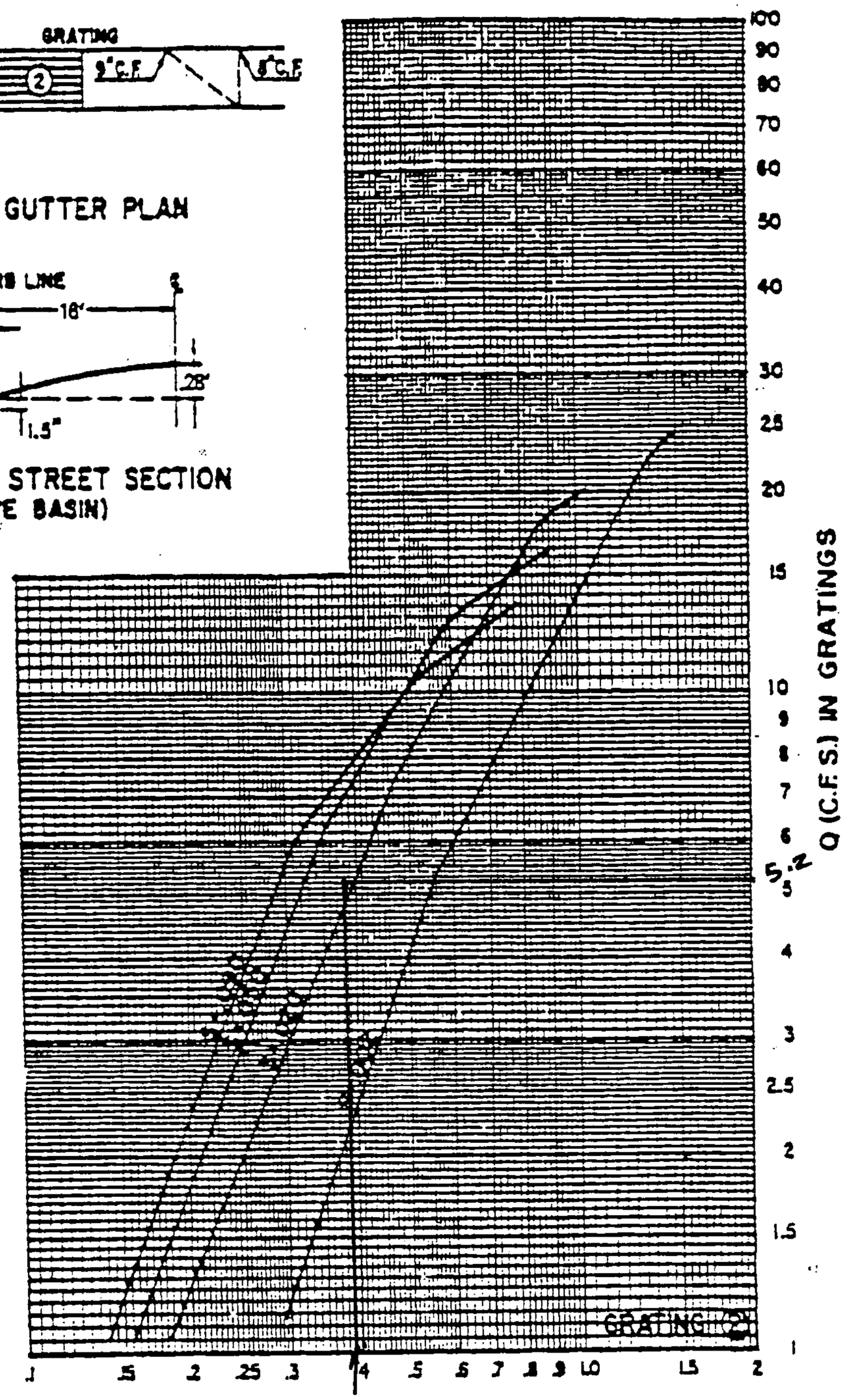


PLATE 22.3 D-5

D=0.39
S=2.47%
Q=5.2cfs/grate

Sandy Ridge Road

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

MANNING'S N= .017 SLOPE= .0259

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)
0.01	0.01	0.00	0.0	0.33	0.40	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.63	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.83	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	1.00	1.25	0.02	0.06
0.05	0.05	0.04	0.0	1.64	1.16	1.56	0.02	0.07
0.06	0.06	0.06	0.1	1.97	1.31	1.88	0.03	0.09
0.07	0.07	0.08	0.1	2.30	1.46	2.19	0.03	0.10
0.08	0.08	0.10	0.2	2.63	1.59	2.50	0.04	0.12
0.09	0.09	0.13	0.2	2.96	1.72	2.81	0.05	0.14
0.10	0.10	0.16	0.3	3.29	1.85	3.13	0.05	0.15
0.11	0.11	0.19	0.4	3.62	1.97	3.44	0.06	0.17
0.12	0.12	0.23	0.5	3.95	2.08	3.75	0.07	0.19
0.13	0.13	0.26	0.6	4.28	2.20	4.07	0.08	0.21
0.14	0.14	0.31	0.7	5.15	2.16	4.93	0.07	0.21
0.15	0.15	0.36	0.8	6.03	2.16	5.79	0.07	0.22
0.16	0.16	0.43	0.9	6.91	2.19	6.65	0.07	0.23
0.17	0.17	0.50	1.1	7.79	2.24	7.51	0.08	0.25
0.18	0.18	0.58	1.3	8.67	2.31	8.38	0.08	0.26
0.19	0.19	0.66	1.6	9.54	2.38	9.24	0.09	0.28
0.20	0.20	0.76	1.9	10.42	2.46	10.10	0.09	0.29
0.21	0.21	0.87	2.2	11.30	2.54	10.96	0.10	0.31
0.22	0.22	0.98	2.6	12.18	2.62	11.83	0.11	0.33
0.23	0.23	1.10	3.0	13.06	2.71	12.69	0.11	0.34
0.24	0.24	1.23	3.4	13.93	2.79	13.55	0.12	0.36
0.25	0.25	1.37	4.0	14.81	2.88	14.41	0.13	0.38
0.26	0.26	1.52	4.5	15.69	2.97	15.27	0.14	0.40
0.27	0.27	1.68	5.1	16.57	3.06	16.14	0.15	0.42
0.28	0.28	1.84	5.8	17.45	3.14	17.00	0.15	0.43
0.29	0.29	2.02	6.5	18.32	3.23	17.86	0.16	0.45
0.30	0.30	2.20	7.3	19.20	3.32	18.72	0.17	0.47
0.31	0.31	2.39	8.2	20.08	3.41	19.59	0.18	0.49
0.32	0.32	2.59	9.1	20.96	3.49	20.45	0.19	0.51
0.33	0.33	2.80	10.0	21.84	3.58	21.31	0.20	0.53
0.34	0.34	3.02	11.1	22.71	3.66	22.17	0.21	0.55
0.35	0.35	3.25	12.2	23.59	3.75	23.03	0.22	0.57
0.36	0.36	3.48	13.3	24.47	3.83	23.90	0.23	0.59
0.37	0.37	3.72	14.6	25.35	3.92	24.76	0.24	0.61
0.38	0.38	3.98	15.9	26.23	4.00	25.62	0.25	0.63
0.39	0.39	4.24	17.3	27.10	4.08	26.48	0.26	0.65
0.40	0.40	4.50	18.8	27.98	4.16	27.35	0.27	0.67
0.41	0.41	4.78	20.3	28.86	4.24	28.21	0.28	0.69
0.42	0.42	5.06	22.3	28.88	4.41	28.21	0.30	0.72
0.43	0.43	5.35	24.4	28.90	4.57	28.22	0.32	0.75
0.45	0.45	5.91	28.8	28.94	4.88	28.23	0.37	0.82
0.46	0.46	6.19	31.2	28.96	5.03	28.23	0.39	0.85
0.47	0.47	6.48	33.5	28.98	5.18	28.24	0.42	0.89
0.48	0.48	6.76	36.0	29.01	5.33	28.24	0.44	0.92
0.49	0.49	7.04	38.5	29.03	5.47	28.25	0.46	0.95
0.50	0.50	7.32	41.1	29.05	5.61	28.25	0.49	0.99
0.51	0.51	7.61	43.8	29.07	5.76	28.26	0.51	1.02
0.52	0.52	7.89	46.5	29.09	5.89	28.26	0.54	1.06
0.53	0.53	8.17	49.3	29.11	6.03	28.27	0.56	1.09
0.54	0.54	8.45	52.1	29.13	6.17	28.27	0.59	1.13
0.55	0.55	8.74	55.0	29.15	6.30	28.28	0.62	1.17
0.56	0.56	9.02	58.0	29.17	6.43	28.28	0.64	1.20
0.57	0.57	9.30	61.1	29.19	6.56	28.29	0.67	1.24
0.58	0.58	9.59	64.1	29.21	6.69	28.29	0.70	1.28

roll curb limit

Standard curb limit

Sandy Creek Road

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

MANNING'S N= .017 SLOPE= .0247

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)	
0.01	0.01	0.00	0.0	0.33	0.39	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.61	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.80	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	0.97	1.25	0.01	0.05	
0.05	0.05	0.04	0.0	1.64	1.13	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.28	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.42	2.19	0.03	0.10	
0.08	0.08	0.10	0.2	2.63	1.55	2.50	0.04	0.12	
0.09	0.09	0.13	0.2	2.96	1.67	2.81	0.04	0.13	
0.10	0.10	0.16	0.3	3.29	1.80	3.13	0.05	0.15	
0.11	0.11	0.19	0.4	3.62	1.91	3.44	0.06	0.17	
0.12	0.12	0.23	0.5	3.95	2.03	3.75	0.06	0.18	
0.13	0.13	0.26	0.6	4.28	2.14	4.07	0.07	0.20	
0.14	0.14	0.31	0.6	5.15	2.10	4.93	0.07	0.21	
0.15	0.15	0.36	0.8	6.03	2.10	5.79	0.07	0.22	
0.16	0.16	0.43	0.9	6.91	2.13	6.65	0.07	0.23	
0.17	0.17	0.50	1.1	7.79	2.18	7.51	0.07	0.24	
0.18	0.18	0.58	1.3	8.67	2.24	8.38	0.08	0.26	
0.19	0.19	0.66	1.5	9.54	2.31	9.24	0.08	0.27	
0.20	0.20	0.76	1.8	10.42	2.39	10.10	0.09	0.29	
0.21	0.21	0.87	2.1	11.30	2.47	10.96	0.09	0.30	
0.22	0.22	0.98	2.5	12.18	2.55	11.83	0.10	0.32	
0.23	0.23	1.10	2.9	13.06	2.63	12.69	0.11	0.34	
0.24	0.24	1.23	3.4	13.93	2.72	13.55	0.11	0.35	
0.25	0.25	1.37	3.8	14.81	2.80	14.41	0.12	0.37	
0.26	0.26	1.52	4.4	15.69	2.89	15.27	0.13	0.39	
0.27	0.27	1.68	5.0	16.57	2.97	16.14	0.14	0.41	
0.28	0.28	1.84	5.6	17.45	3.06	17.00	0.15	0.43	
0.29	0.29	2.02	6.3	18.32	3.14	17.86	0.15	0.44	
0.30	0.30	2.20	7.1	19.20	3.23	18.72	0.16	0.46	
0.31	0.31	2.39	7.9	20.08	3.31	19.59	0.17	0.48	
0.32	0.32	2.59	8.8	20.96	3.40	20.45	0.18	0.50	roll curb
0.33	0.33	2.80	9.8	21.84	3.48	21.31	0.19	0.52	
0.34	0.34	3.02	10.8	22.71	3.56	22.17	0.20	0.54	
0.35	0.35	3.25	11.8	23.59	3.65	23.03	0.21	0.56	
0.36	0.36	3.48	13.0	24.47	3.73	23.90	0.22	0.58	
0.37	0.37	3.72	14.2	25.35	3.81	24.76	0.23	0.60	
0.38	0.38	3.98	15.5	26.23	3.89	25.62	0.23	0.61	
0.39	0.39	4.24	16.8	27.10	3.97	26.48	0.24	0.63	
0.40	0.40	4.50	18.2	27.98	4.05	27.35	0.25	0.65	
0.41	0.41	4.78	19.7	28.86	4.13	28.21	0.26	0.67	
0.42	0.42	5.06	21.7	28.88	4.29	28.21	0.29	0.71	
0.43	0.43	5.35	23.8	28.90	4.44	28.22	0.31	0.74	
0.45	0.45	5.91	28.1	28.94	4.75	28.23	0.35	0.80	
0.46	0.46	6.19	30.3	28.96	4.89	28.23	0.37	0.83	standard curb
0.47	0.47	6.48	32.6	28.98	5.04	28.24	0.39	0.86	
0.48	0.48	6.76	35.0	29.01	5.18	28.24	0.42	0.90	
0.49	0.49	7.04	37.5	29.03	5.32	28.25	0.44	0.93	
0.50	0.50	7.32	40.0	29.05	5.46	28.25	0.46	0.96	
0.51	0.51	7.61	42.6	29.07	5.60	28.26	0.49	1.00	
0.52	0.52	7.89	45.2	29.09	5.73	28.26	0.51	1.03	
0.53	0.53	8.17	47.9	29.11	5.87	28.27	0.53	1.06	
0.54	0.54	8.45	50.7	29.13	6.00	28.27	0.56	1.10	
0.55	0.55	8.74	53.5	29.15	6.13	28.28	0.58	1.13	
0.56	0.56	9.02	56.4	29.17	6.26	28.28	0.61	1.17	
0.57	0.57	9.30	59.4	29.19	6.38	28.29	0.63	1.20	

Sandy Trail Road

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

MANNING'S N= .017 SLOPE= .033

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)	
0.01	0.01	0.00	0.0	0.33	0.45	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.71	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.94	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	1.13	1.25	0.02	0.06	
0.05	0.05	0.04	0.1	1.64	1.31	1.56	0.03	0.08	
0.06	0.06	0.06	0.1	1.97	1.48	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.65	2.19	0.04	0.11	
0.08	0.08	0.10	0.2	2.63	1.80	2.50	0.05	0.13	
0.09	0.09	0.13	0.2	2.96	1.95	2.81	0.06	0.15	
0.10	0.10	0.16	0.3	3.29	2.09	3.13	0.07	0.17	
0.11	0.11	0.19	0.4	3.62	2.22	3.44	0.08	0.19	
0.12	0.12	0.23	0.5	3.95	2.36	3.75	0.09	0.21	
0.13	0.13	0.26	0.7	4.28	2.49	4.07	0.10	0.23	
0.14	0.14	0.31	0.8	5.15	2.44	4.93	0.09	0.23	
0.15	0.15	0.36	0.9	6.03	2.44	5.79	0.09	0.24	
0.16	0.16	0.43	1.1	6.91	2.48	6.65	0.10	0.26	
0.17	0.17	0.50	1.3	7.79	2.54	7.51	0.10	0.27	
0.18	0.18	0.58	1.5	8.67	2.61	8.38	0.11	0.29	
0.19	0.19	0.66	1.8	9.54	2.69	9.24	0.11	0.30	
0.20	0.20	0.76	2.1	10.42	2.78	10.10	0.12	0.32	
0.21	0.21	0.87	2.5	11.30	2.87	10.96	0.13	0.34	
0.22	0.22	0.98	2.9	12.18	2.96	11.83	0.14	0.36	
0.23	0.23	1.10	3.4	13.06	3.06	12.69	0.15	0.38	
0.24	0.24	1.23	3.9	13.93	3.16	13.55	0.15	0.39	
0.25	0.25	1.37	4.5	14.81	3.26	14.41	0.16	0.41	
0.26	0.26	1.52	5.1	15.69	3.36	15.27	0.17	0.43	
0.27	0.27	1.68	5.8	16.57	3.46	16.14	0.19	0.46	
0.28	0.28	1.84	6.6	17.45	3.56	17.00	0.20	0.48	
0.29	0.29	2.02	7.4	18.32	3.65	17.86	0.21	0.50	roll curb
0.30	0.30	2.20	8.3	19.20	3.75	18.72	0.22	0.52	
0.31	0.31	2.39	9.2	20.08	3.85	19.59	0.23	0.54	
0.32	0.32	2.59	10.2	20.96	3.95	20.45	0.24	0.56	
0.33	0.33	2.80	11.3	21.84	4.05	21.31	0.25	0.58	
0.34	0.34	3.02	12.5	22.71	4.14	22.17	0.27	0.61	
0.35	0.35	3.25	13.8	23.59	4.24	23.03	0.28	0.63	
0.36	0.36	3.48	15.1	24.47	4.33	23.90	0.29	0.65	
0.37	0.37	3.72	16.5	25.35	4.43	24.76	0.30	0.67	
0.38	0.38	3.98	18.0	26.23	4.52	25.62	0.32	0.70	
0.39	0.39	4.24	19.5	27.10	4.61	26.48	0.33	0.72	
0.40	0.40	4.50	21.2	27.98	4.71	27.35	0.34	0.74	
0.41	0.41	4.78	22.9	28.86	4.80	28.21	0.36	0.77	
0.42	0.42	5.06	25.2	28.88	4.98	28.21	0.39	0.81	
0.43	0.43	5.35	27.6	28.90	5.16	28.22	0.41	0.84	standard curb
0.45	0.45	5.91	32.6	28.94	5.52	28.23	0.47	0.92	
0.46	0.46	6.19	35.2	28.96	5.69	28.23	0.50	0.96	
0.47	0.47	6.48	37.9	28.98	5.86	28.24	0.53	1.00	
0.48	0.48	6.76	40.7	29.01	6.02	28.24	0.56	1.04	
0.49	0.49	7.04	43.6	29.03	6.19	28.25	0.59	1.08	
0.50	0.50	7.32	46.5	29.05	6.35	28.25	0.63	1.13	
0.51	0.51	7.61	49.5	29.07	6.51	28.26	0.66	1.17	
0.52	0.52	7.89	52.6	29.09	6.66	28.26	0.69	1.21	
0.53	0.53	8.17	55.7	29.11	6.82	28.27	0.72	1.25	
0.54	0.54	8.45	58.9	29.13	6.97	28.27	0.75	1.29	
0.55	0.55	8.74	62.2	29.15	7.12	28.28	0.79	1.34	
0.56	0.56	9.02	65.6	29.17	7.27	28.28	0.82	1.38	
0.57	0.57	9.30	69.0	29.19	7.42	28.29	0.85	1.42	

Blue Sky Street at Sandy Creek Rd

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

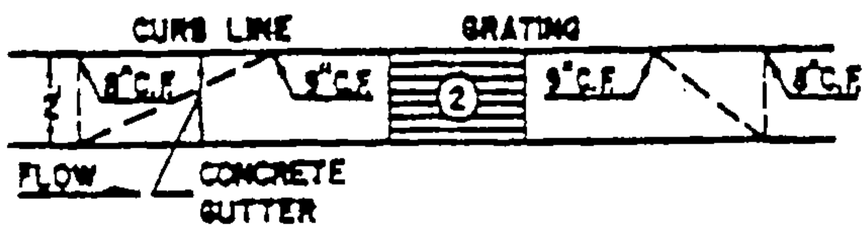
MANNING'S N= .017 SLOPE= .0246

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

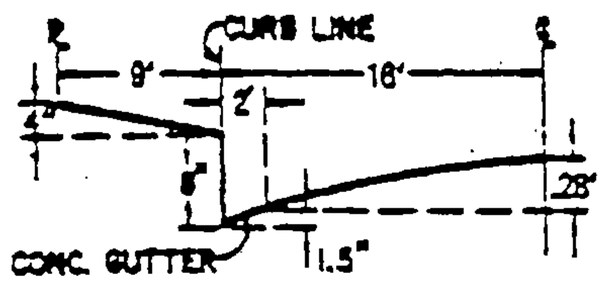
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)	
0.01	0.01	0.00	0.0	0.33	0.39	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.61	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.80	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	0.97	1.25	0.01	0.05	
0.05	0.05	0.04	0.0	1.64	1.13	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.28	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.42	2.19	0.03	0.10	
0.08	0.08	0.10	0.2	2.63	1.55	2.50	0.04	0.12	
0.09	0.09	0.13	0.2	2.96	1.67	2.81	0.04	0.13	
0.10	0.10	0.16	0.3	3.29	1.80	3.13	0.05	0.15	
0.11	0.11	0.19	0.4	3.62	1.91	3.44	0.06	0.17	
0.12	0.12	0.23	0.5	3.95	2.03	3.75	0.06	0.18	
0.13	0.13	0.26	0.6	4.28	2.14	4.07	0.07	0.20	
0.14	0.14	0.31	0.6	5.15	2.10	4.93	0.07	0.21	
0.15	0.15	0.36	0.8	6.03	2.10	5.79	0.07	0.22	
0.16	0.16	0.43	0.9	6.91	2.13	6.65	0.07	0.23	
0.17	0.17	0.50	1.1	7.79	2.18	7.51	0.07	0.24	
0.18	0.18	0.58	1.3	8.67	2.24	8.38	0.08	0.26	
0.19	0.19	0.66	1.5	9.54	2.31	9.24	0.08	0.27	
0.20	0.20	0.76	1.8	10.42	2.39	10.10	0.09	0.29	
0.21	0.21	0.87	2.1	11.30	2.47	10.96	0.09	0.30	
0.22	0.22	0.98	2.5	12.18	2.55	11.83	0.10	0.32	
0.23	0.23	1.10	2.9	13.06	2.63	12.69	0.11	0.34	
0.24	0.24	1.23	3.4	13.93	2.72	13.55	0.11	0.35	
0.25	0.25	1.37	3.8	14.81	2.80	14.41	0.12	0.37	
0.26	0.26	1.52	4.4	15.69	2.89	15.27	0.13	0.39	
0.27	0.27	1.68	5.0	16.57	2.97	16.14	0.14	0.41	
0.28	0.28	1.84	5.6	17.45	3.06	17.00	0.15	0.43	
0.29	0.29	2.02	6.3	18.32	3.14	17.86	0.15	0.44	
0.30	0.30	2.20	7.1	19.20	3.23	18.72	0.16	0.46	
0.31	0.31	2.39	7.9	20.08	3.31	19.59	0.17	0.48	
0.32	0.32	2.59	8.8	20.96	3.40	20.45	0.18	0.50	roll curb
0.33	0.33	2.80	9.8	21.84	3.48	21.31	0.19	0.52	
0.34	0.34	3.02	10.8	22.71	3.56	22.17	0.20	0.54	
0.35	0.35	3.25	11.8	23.59	3.65	23.03	0.21	0.56	
0.36	0.36	3.48	13.0	24.47	3.73	23.90	0.22	0.58	
0.37	0.37	3.72	14.2	25.35	3.81	24.76	0.23	0.60	
0.38	0.38	3.98	15.5	26.23	3.89	25.62	0.23	0.61	
0.39	0.39	4.24	16.8	27.10	3.97	26.48	0.24	0.63	
0.40	0.40	4.50	18.2	27.98	4.05	27.35	0.25	0.65	
0.41	0.41	4.78	19.7	28.86	4.13	28.21	0.26	0.67	
0.42	0.42	5.06	21.7	28.88	4.29	28.21	0.29	0.71	
0.43	0.43	5.35	23.8	28.90	4.44	28.22	0.31	0.74	
0.45	0.45	5.91	28.1	28.94	4.75	28.23	0.35	0.80	
0.46	0.46	6.19	30.3	28.96	4.89	28.23	0.37	0.83	standard curb
0.47	0.47	6.48	32.6	28.98	5.04	28.24	0.39	0.86	
0.48	0.48	6.76	35.0	29.01	5.18	28.24	0.42	0.90	
0.49	0.49	7.04	37.5	29.03	5.32	28.25	0.44	0.93	
0.50	0.50	7.32	40.0	29.05	5.46	28.25	0.46	0.96	
0.51	0.51	7.61	42.6	29.07	5.60	28.26	0.49	1.00	
0.52	0.52	7.89	45.2	29.09	5.73	28.26	0.51	1.03	
0.53	0.53	8.17	47.9	29.11	5.87	28.27	0.53	1.06	
0.54	0.54	8.45	50.7	29.13	6.00	28.27	0.56	1.10	
0.55	0.55	8.74	53.5	29.15	6.13	28.28	0.58	1.13	
0.56	0.56	9.02	56.4	29.17	6.26	28.28	0.61	1.17	
0.57	0.57	9.30	59.4	29.19	6.38	28.29	0.63	1.20	

Blue Sky Street at Sandy Creek Rd

GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

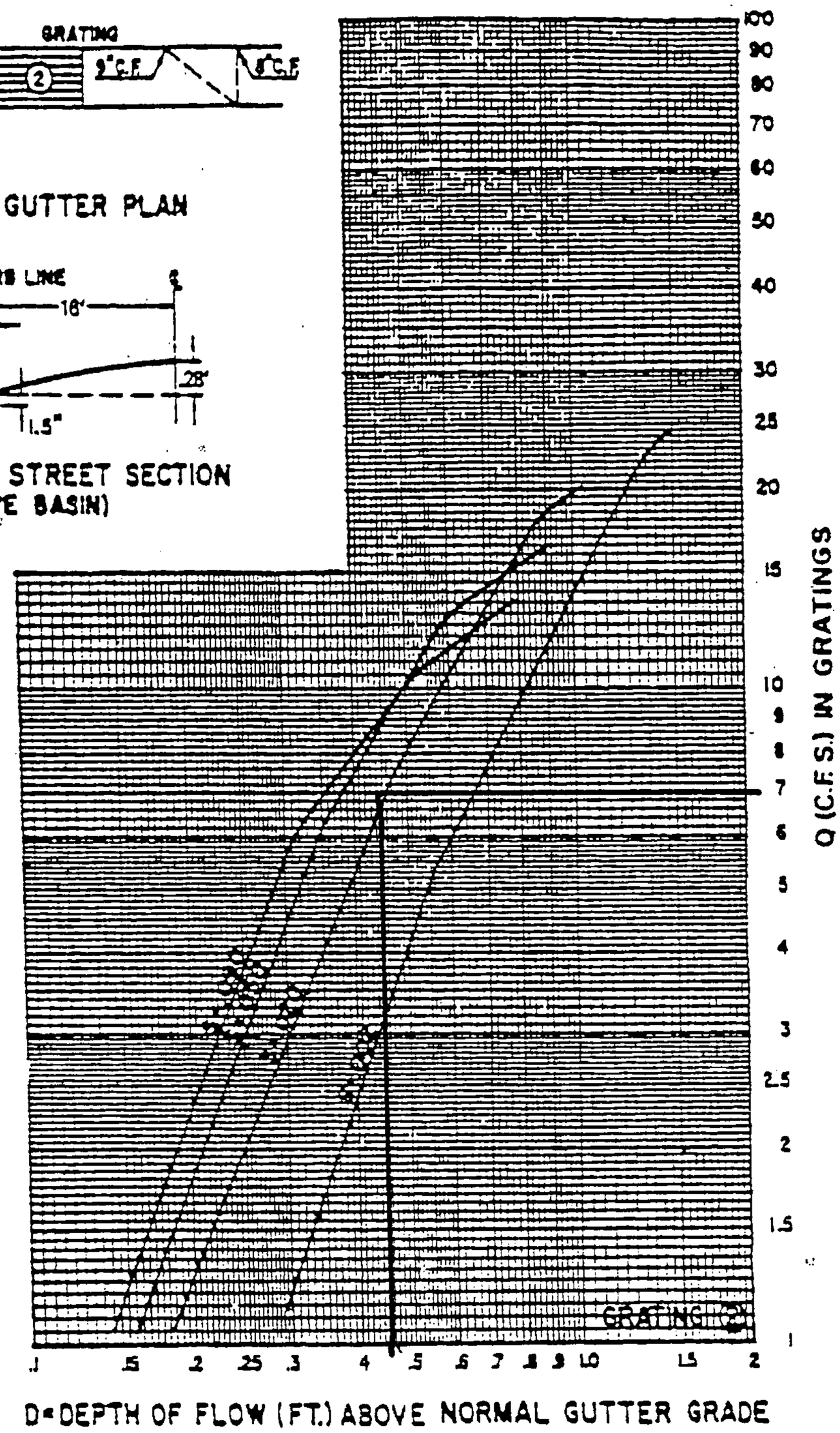


PLATE 22.3 D-5

D = 0.45'
S = 2.46%
Q = 7 cfs/grate

Blue Sky Rd north of Sandy Trail

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

MANNING'S N= .017 SLOPE= .0096

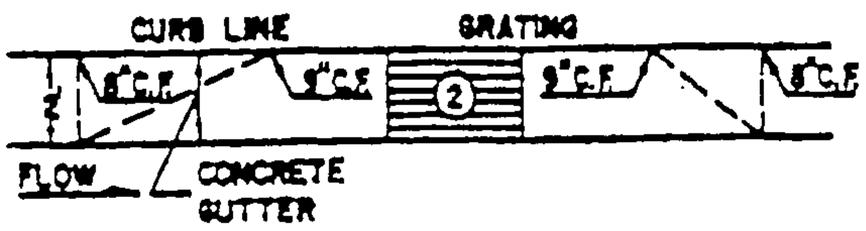
POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

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)
0.01	0.01	0.00	0.0	0.33	0.24	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.38	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.50	0.94	0.00	0.03
0.04	0.04	0.03	0.0	1.32	0.61	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	0.71	1.56	0.01	0.06
0.06	0.06	0.06	0.0	1.97	0.80	1.88	0.01	0.07
0.07	0.07	0.08	0.1	2.30	0.89	2.19	0.01	0.08
0.08	0.08	0.10	0.1	2.63	0.97	2.50	0.01	0.09
0.09	0.09	0.13	0.1	2.96	1.05	2.81	0.02	0.11
0.10	0.10	0.16	0.2	3.29	1.12	3.13	0.02	0.12
0.11	0.11	0.19	0.2	3.62	1.20	3.44	0.02	0.13
0.12	0.12	0.23	0.3	3.95	1.27	3.75	0.03	0.15
0.13	0.13	0.26	0.4	4.28	1.34	4.07	0.03	0.16
0.14	0.14	0.31	0.4	5.15	1.31	4.93	0.03	0.17
0.15	0.15	0.36	0.5	6.03	1.31	5.79	0.03	0.18
0.16	0.16	0.43	0.6	6.91	1.33	6.65	0.03	0.19
0.17	0.17	0.50	0.7	7.79	1.37	7.51	0.03	0.20
0.18	0.18	0.58	0.8	8.67	1.40	8.38	0.03	0.21
0.19	0.19	0.66	1.0	9.54	1.45	9.24	0.03	0.22
0.20	0.20	0.76	1.1	10.42	1.50	10.10	0.03	0.23
0.21	0.21	0.87	1.3	11.30	1.54	10.96	0.04	0.25
0.22	0.22	0.98	1.6	12.18	1.60	11.83	0.04	0.26
0.23	0.23	1.10	1.8	13.06	1.65	12.69	0.04	0.27
0.24	0.24	1.23	2.1	13.93	1.70	13.55	0.04	0.28
0.25	0.25	1.37	2.4	14.81	1.75	14.41	0.05	0.30
0.26	0.26	1.52	2.8	15.69	1.81	15.27	0.05	0.31
0.27	0.27	1.68	3.1	16.57	1.86	16.14	0.05	0.32
0.28	0.28	1.84	3.5	17.45	1.91	17.00	0.06	0.34
0.29	0.29	2.02	4.0	18.32	1.97	17.86	0.06	0.35
0.30	0.30	2.20	4.4	19.20	2.02	18.72	0.06	0.36
0.31	0.31	2.39	5.0	20.08	2.07	19.59	0.07	0.38
0.32	0.32	2.59	5.5	20.96	2.13	20.45	0.07	0.39
0.33	0.33	2.80	6.1	21.84	2.18	21.31	0.07	0.40
0.34	0.34	3.02	6.7	22.71	2.23	22.17	0.08	0.42
0.35	0.35	3.25	7.4	23.59	2.28	23.03	0.08	0.43
0.36	0.36	3.48	8.1	24.47	2.33	23.90	0.08	0.44
0.37	0.37	3.72	8.9	25.35	2.38	24.76	0.09	0.46
0.38	0.38	3.98	9.7	26.23	2.43	25.62	0.09	0.47
0.39	0.39	4.24	10.5	27.10	2.48	26.48	0.10	0.49
0.40	0.40	4.50	11.4	27.98	2.53	27.35	0.10	0.50
0.41	0.41	4.78	12.4	28.86	2.58	28.21	0.10	0.51
0.42	0.42	5.06	13.6	28.88	2.68	28.21	0.11	0.53
0.43	0.43	5.35	14.9	28.90	2.78	28.22	0.12	0.55
0.45	0.45	5.91	17.6	28.94	2.97	28.23	0.14	0.59
0.46	0.46	6.19	19.0	28.96	3.06	28.23	0.15	0.61
0.47	0.47	6.48	20.4	28.98	3.15	28.24	0.15	0.62
0.48	0.48	6.76	21.9	29.01	3.24	28.24	0.16	0.64
0.49	0.49	7.04	23.5	29.03	3.33	28.25	0.17	0.66
0.50	0.50	7.32	25.0	29.05	3.42	28.25	0.18	0.68
0.51	0.51	7.61	26.6	29.07	3.50	28.26	0.19	0.70
0.52	0.52	7.89	28.3	29.09	3.59	28.26	0.20	0.72
0.53	0.53	8.17	30.0	29.11	3.67	28.27	0.21	0.74
0.54	0.54	8.45	31.7	29.13	3.75	28.27	0.22	0.76
0.55	0.55	8.74	33.5	29.15	3.84	28.28	0.23	0.78
0.56	0.56	9.02	35.3	29.17	3.92	28.28	0.24	0.80
0.57	0.57	9.30	37.2	29.19	4.00	28.29	0.25	0.82
0.58	0.58	9.59	39.1	29.21	4.07	28.29	0.26	0.84
0.59	0.59	9.87	41.0	29.23	4.15	28.30	0.27	0.86

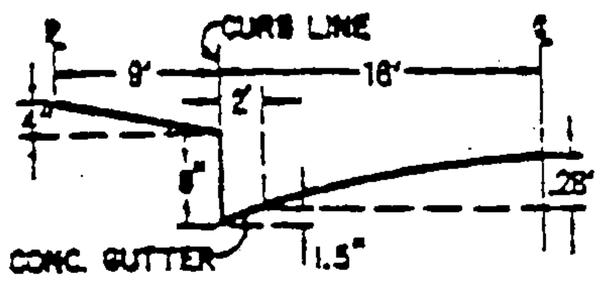
Standard curb

Blue Sky Street north of Sandy Trail

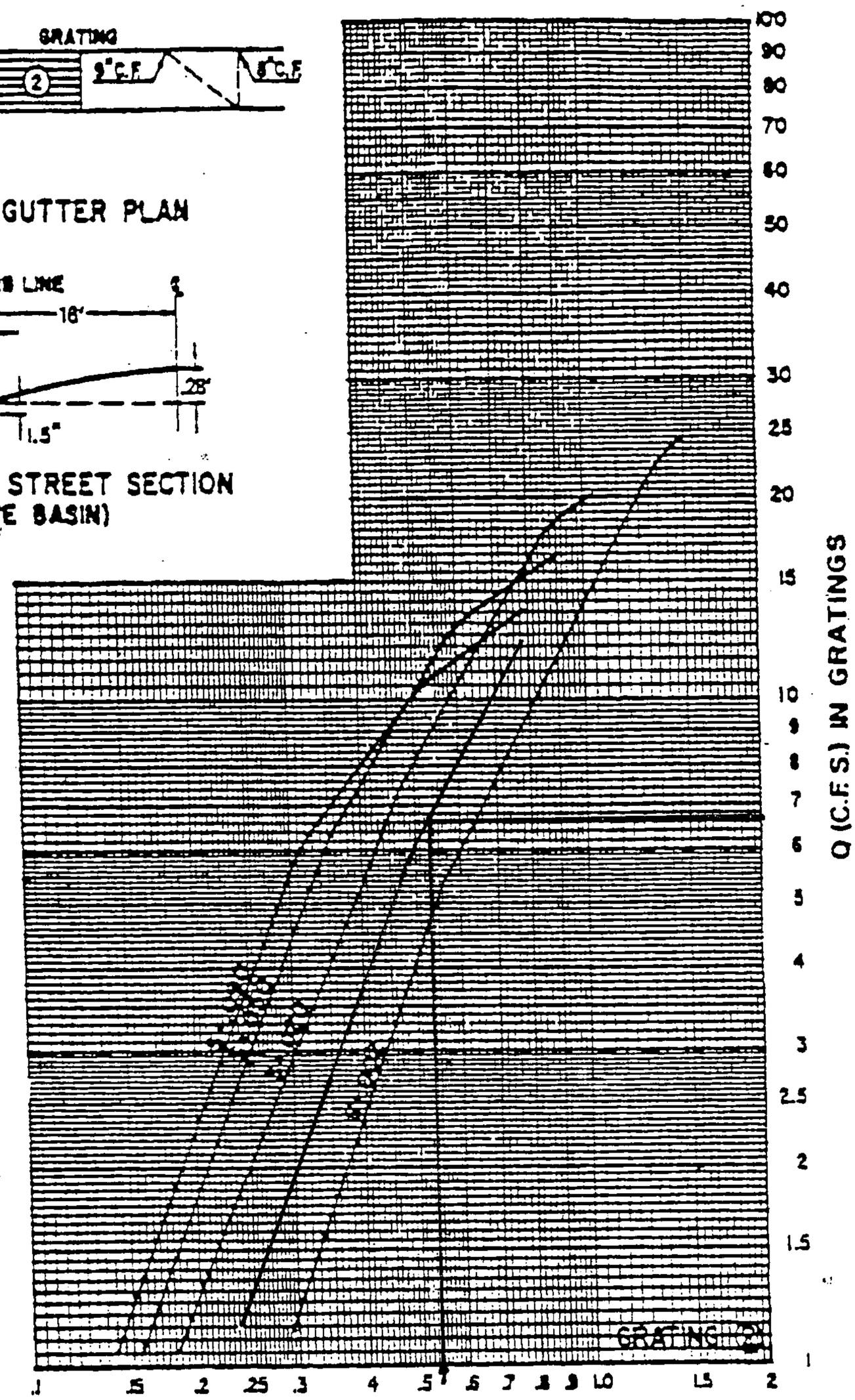
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



S = 0.96%

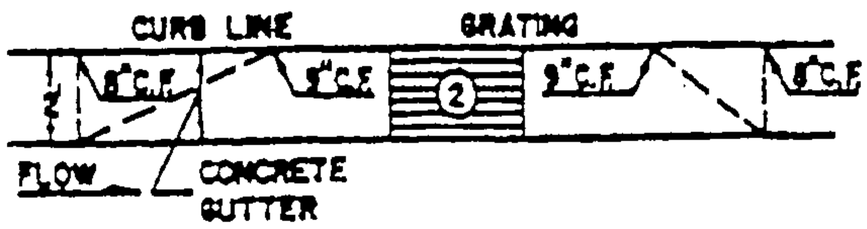
D = 0.52'

Q = 6.6 cfs/grate

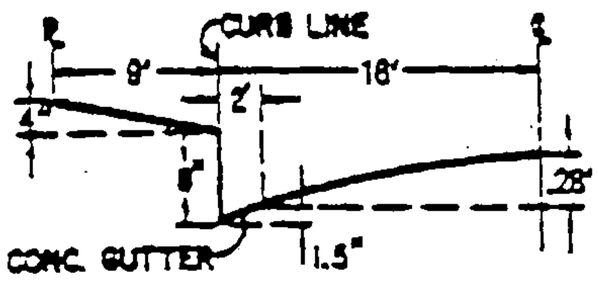
PLATE 22.3 D-5

Blue Sky Street north of Solitude Road

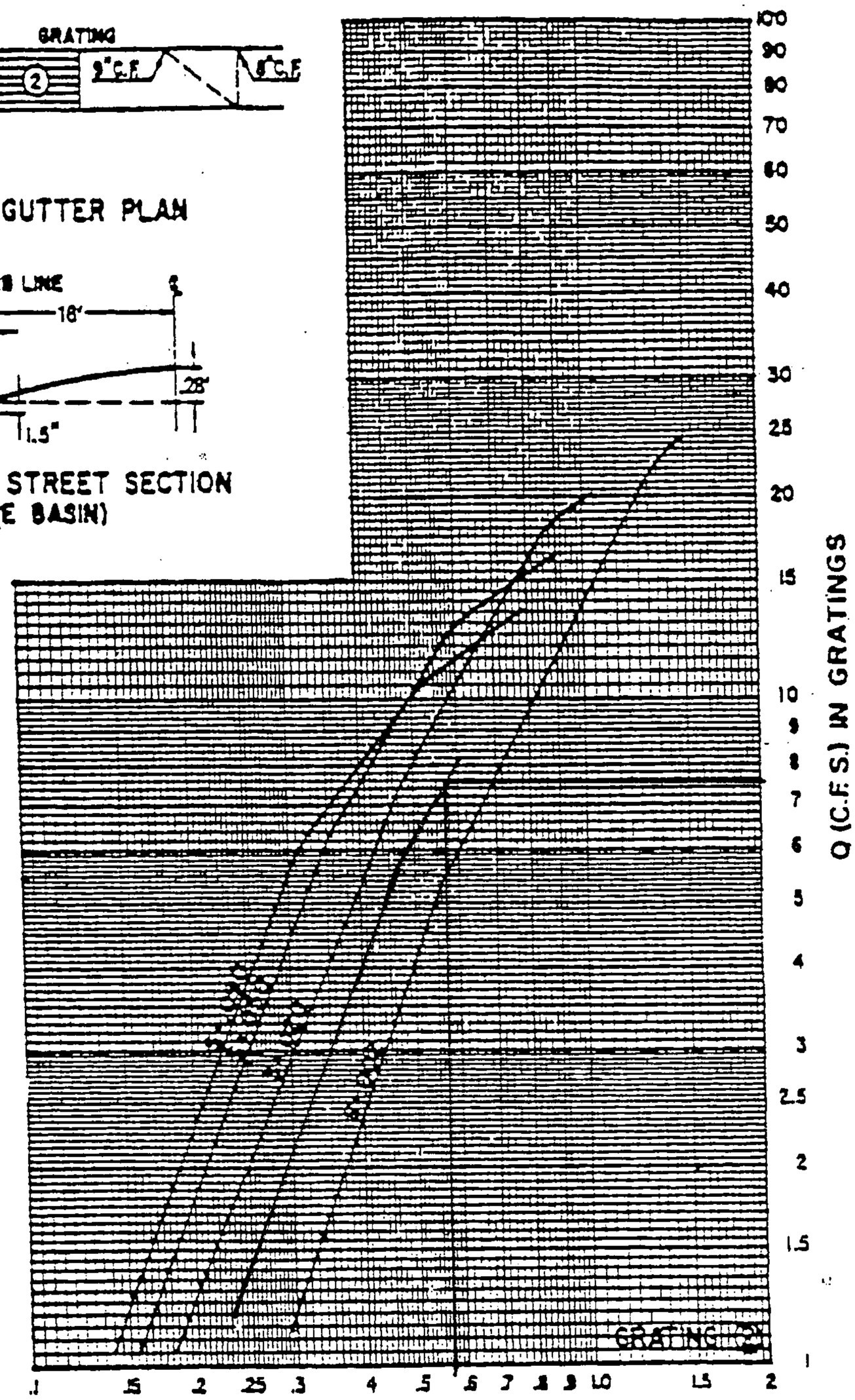
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



S= 0.96%
D= 0.59
Q= 7.5 cfs/grate

PLATE 22.3 D-5

Solitude Road

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

MANNING'S N= .017 SLOPE= .0298

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)	
0.01	0.01	0.00	0.0	0.33	0.43	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.68	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.89	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	1.07	1.25	0.02	0.06	
0.05	0.05	0.04	0.0	1.64	1.25	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.41	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.56	2.19	0.04	0.11	
0.08	0.08	0.10	0.2	2.63	1.71	2.50	0.05	0.13	
0.09	0.09	0.13	0.2	2.96	1.85	2.81	0.05	0.14	
0.10	0.10	0.16	0.3	3.29	1.98	3.13	0.06	0.16	
0.11	0.11	0.19	0.4	3.62	2.11	3.44	0.07	0.18	
0.12	0.12	0.23	0.5	3.95	2.24	3.75	0.08	0.20	
0.13	0.13	0.26	0.6	4.28	2.36	4.07	0.09	0.22	
0.14	0.14	0.31	0.7	5.15	2.31	4.93	0.08	0.22	
0.15	0.15	0.36	0.8	6.03	2.32	5.79	0.08	0.23	
0.16	0.16	0.43	1.0	6.91	2.35	6.65	0.09	0.25	
0.17	0.17	0.50	1.2	7.79	2.41	7.51	0.09	0.26	
0.18	0.18	0.58	1.4	8.67	2.47	8.38	0.10	0.28	
0.19	0.19	0.66	1.7	9.54	2.55	9.24	0.10	0.29	
0.20	0.20	0.76	2.0	10.42	2.63	10.10	0.11	0.31	
0.21	0.21	0.87	2.4	11.30	2.72	10.96	0.11	0.32	
0.22	0.22	0.98	2.8	12.18	2.81	11.83	0.12	0.34	
0.23	0.23	1.10	3.2	13.06	2.90	12.69	0.13	0.36	
0.24	0.24	1.23	3.7	13.93	3.00	13.55	0.14	0.38	
0.25	0.25	1.37	4.2	14.81	3.09	14.41	0.15	0.40	
0.26	0.26	1.52	4.8	15.69	3.18	15.27	0.16	0.42	
0.27	0.27	1.68	5.5	16.57	3.28	16.14	0.17	0.44	
0.28	0.28	1.84	6.2	17.45	3.37	17.00	0.18	0.46	
0.29	0.29	2.02	7.0	18.32	3.47	17.86	0.19	0.48	
0.30	0.30	2.20	7.8	19.20	3.56	18.72	0.20	0.50	
0.31	0.31	2.39	8.7	20.08	3.65	19.59	0.21	0.52	roll curb
0.32	0.32	2.59	9.7	20.96	3.75	20.45	0.22	0.54	
0.33	0.33	2.80	10.8	21.84	3.84	21.31	0.23	0.56	
0.34	0.34	3.02	11.9	22.71	3.93	22.17	0.24	0.58	
0.35	0.35	3.25	13.0	23.59	4.02	23.03	0.25	0.60	
0.36	0.36	3.48	14.3	24.47	4.11	23.90	0.26	0.62	
0.37	0.37	3.72	15.6	25.35	4.20	24.76	0.27	0.64	
0.38	0.38	3.98	17.1	26.23	4.29	25.62	0.29	0.67	
0.39	0.39	4.24	18.5	27.10	4.38	26.48	0.30	0.69	
0.40	0.40	4.50	20.1	27.98	4.47	27.35	0.31	0.71	
0.41	0.41	4.78	21.8	28.86	4.55	28.21	0.32	0.73	
0.42	0.42	5.06	23.9	28.88	4.73	28.21	0.35	0.77	
0.43	0.43	5.35	26.2	28.90	4.90	28.22	0.37	0.80	standard
0.45	0.45	5.91	30.9	28.94	5.23	28.23	0.43	0.88	
0.46	0.46	6.19	33.4	28.96	5.40	28.23	0.45	0.91	
0.47	0.47	6.48	36.0	28.98	5.56	28.24	0.48	0.95	
0.48	0.48	6.76	38.6	29.01	5.71	28.24	0.51	0.99	
0.49	0.49	7.04	41.3	29.03	5.87	28.25	0.53	1.02	
0.50	0.50	7.32	44.1	29.05	6.02	28.25	0.56	1.06	
0.51	0.51	7.61	47.0	29.07	6.17	28.26	0.59	1.10	
0.52	0.52	7.89	49.9	29.09	6.32	28.26	0.62	1.14	
0.53	0.53	8.17	52.9	29.11	6.47	28.27	0.65	1.18	
0.54	0.54	8.45	55.9	29.13	6.61	28.27	0.68	1.22	
0.55	0.55	8.74	59.0	29.15	6.76	28.28	0.71	1.26	
0.56	0.56	9.02	62.2	29.17	6.90	28.28	0.74	1.30	
0.57	0.57	9.30	65.5	29.19	7.04	28.29	0.77	1.34	

Blue Sky Street south of Solitude Road / North of Open Range

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

MANNING'S N= .017 SLOPE= .0195

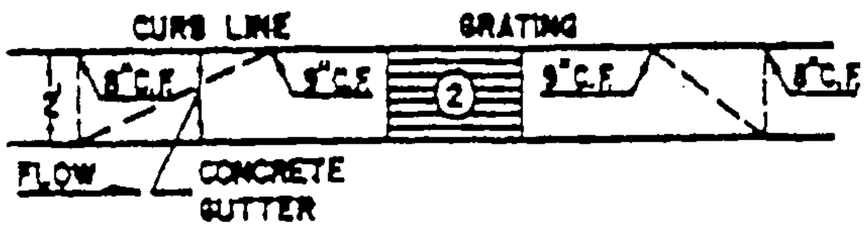
POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

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)
0.01	0.01	0.00	0.0	0.33	0.34	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.54	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.71	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.86	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	1.00	1.56	0.02	0.07
0.06	0.06	0.06	0.1	1.97	1.13	1.88	0.02	0.08
0.07	0.07	0.08	0.1	2.30	1.25	2.19	0.02	0.09
0.08	0.08	0.10	0.1	2.63	1.37	2.50	0.03	0.11
0.09	0.09	0.13	0.2	2.96	1.48	2.81	0.03	0.12
0.10	0.10	0.16	0.2	3.29	1.59	3.13	0.04	0.14
0.11	0.11	0.19	0.3	3.62	1.69	3.44	0.04	0.15
0.12	0.12	0.23	0.4	3.95	1.79	3.75	0.05	0.17
0.13	0.13	0.26	0.5	4.28	1.89	4.07	0.06	0.19
0.14	0.14	0.31	0.6	5.15	1.85	4.93	0.05	0.19
0.15	0.15	0.36	0.7	6.03	1.85	5.79	0.05	0.20
0.16	0.16	0.43	0.8	6.91	1.88	6.65	0.06	0.22
0.17	0.17	0.50	1.0	7.79	1.93	7.51	0.06	0.23
0.18	0.18	0.58	1.1	8.67	1.98	8.38	0.06	0.24
0.19	0.19	0.66	1.4	9.54	2.04	9.24	0.06	0.25
0.20	0.20	0.76	1.6	10.42	2.11	10.10	0.07	0.27
0.21	0.21	0.87	1.9	11.30	2.18	10.96	0.07	0.28
0.22	0.22	0.98	2.2	12.18	2.25	11.83	0.08	0.30
0.23	0.23	1.10	2.6	13.06	2.32	12.69	0.08	0.31
0.24	0.24	1.23	3.0	13.93	2.40	13.55	0.09	0.33
0.25	0.25	1.37	3.4	14.81	2.47	14.41	0.10	0.35
0.26	0.26	1.52	3.9	15.69	2.55	15.27	0.10	0.36
0.27	0.27	1.68	4.4	16.57	2.63	16.14	0.11	0.38
0.28	0.28	1.84	5.0	17.45	2.70	17.00	0.11	0.39
0.29	0.29	2.02	5.6	18.32	2.78	17.86	0.12	0.41
0.30	0.30	2.20	6.3	19.20	2.85	18.72	0.13	0.43
0.31	0.31	2.39	7.0	20.08	2.93	19.59	0.13	0.44
0.32	0.32	2.59	7.8	20.96	3.00	20.45	0.14	0.46
0.33	0.33	2.80	8.6	21.84	3.07	21.31	0.15	0.48
0.34	0.34	3.02	9.5	22.71	3.15	22.17	0.15	0.49
0.35	0.35	3.25	10.4	23.59	3.22	23.03	0.16	0.51
0.36	0.36	3.48	11.5	24.47	3.29	23.90	0.17	0.53
0.37	0.37	3.72	12.5	25.35	3.36	24.76	0.18	0.55
0.38	0.38	3.98	13.7	26.23	3.43	25.62	0.18	0.56
0.39	0.39	4.24	14.8	27.10	3.50	26.48	0.19	0.58
0.40	0.40	4.50	16.1	27.98	3.58	27.35	0.20	0.60
0.41	0.41	4.78	17.4	28.86	3.64	28.21	0.21	0.62
0.42	0.42	5.06	19.2	28.88	3.78	28.21	0.22	0.64
0.43	0.43	5.35	21.0	28.90	3.92	28.22	0.24	0.67
0.45	0.45	5.91	24.8	28.94	4.19	28.23	0.27	0.72
0.46	0.46	6.19	26.8	28.96	4.32	28.23	0.29	0.75
0.47	0.47	6.48	28.8	28.98	4.45	28.24	0.31	0.78
0.48	0.48	6.76	30.9	29.01	4.57	28.24	0.32	0.80
0.49	0.49	7.04	33.1	29.03	4.70	28.25	0.34	0.83
0.50	0.50	7.32	35.3	29.05	4.82	28.25	0.36	0.86
0.51	0.51	7.61	37.6	29.07	4.94	28.26	0.38	0.89
0.52	0.52	7.89	39.9	29.09	5.06	28.26	0.40	0.92
0.53	0.53	8.17	42.3	29.11	5.18	28.27	0.42	0.95
0.54	0.54	8.45	44.8	29.13	5.30	28.27	0.44	0.98
0.55	0.55	8.74	47.3	29.15	5.41	28.28	0.45	1.00
0.56	0.56	9.02	49.8	29.17	5.52	28.28	0.47	1.03
0.57	0.57	9.30	52.4	29.19	5.64	28.29	0.49	1.06

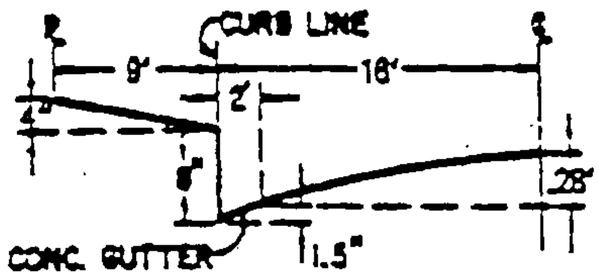
Standard curb capacity

Blue Sky Street north of Open Range Ave

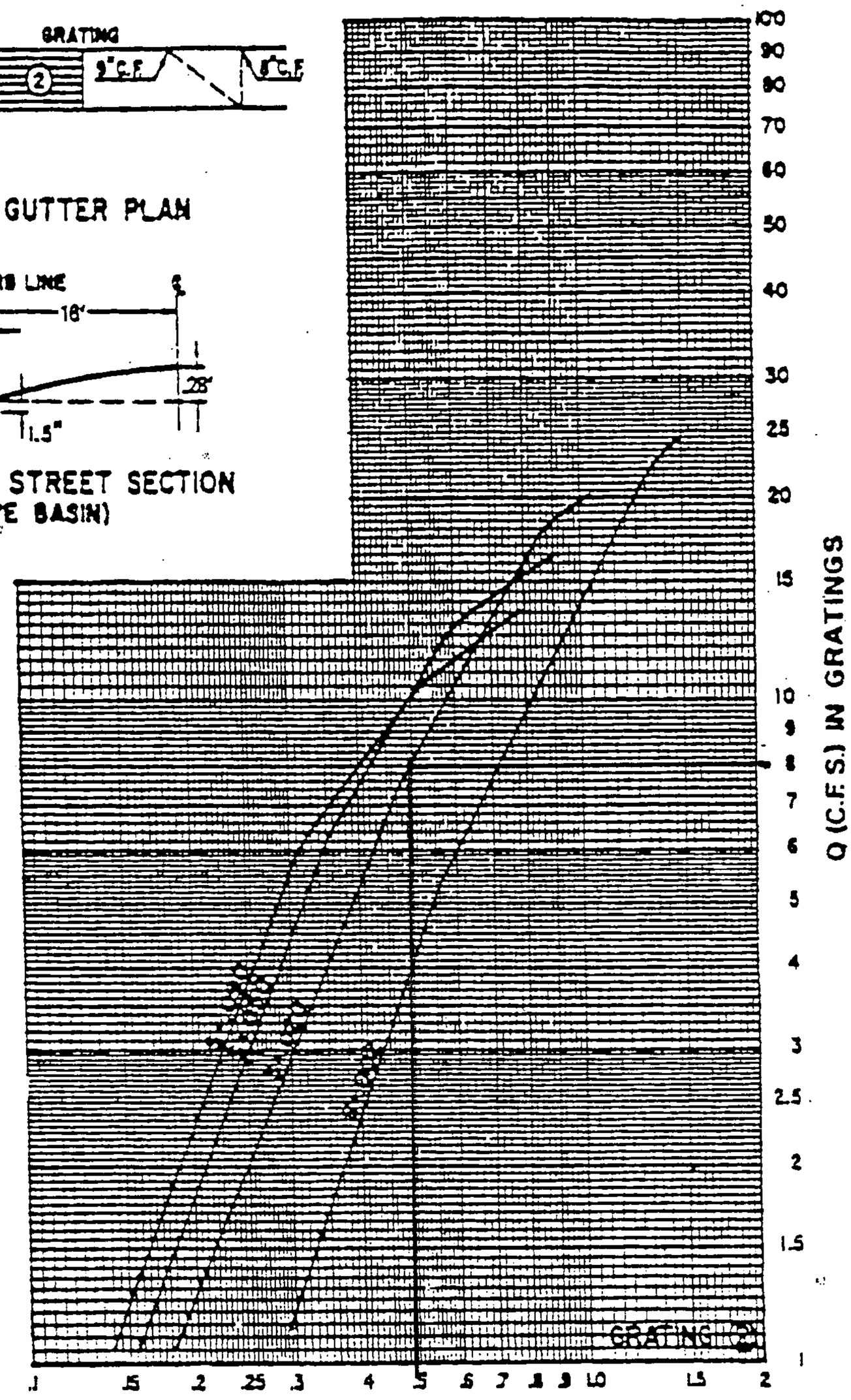
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D = 0.49'

Q = 33 cfs

S = 1.95%

Q = 8 cfs/grate

PLATE 22.3 D-5

Ghost Ranch Street

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

MANNING'S N= .017 SLOPE= .025

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)	
0.01	0.01	0.00	0.0	0.33	0.39	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.62	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.81	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	0.98	1.25	0.02	0.06	
0.05	0.05	0.04	0.0	1.64	1.14	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.29	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.43	2.19	0.03	0.10	
0.08	0.08	0.10	0.2	2.63	1.56	2.50	0.04	0.12	
0.09	0.09	0.13	0.2	2.96	1.69	2.81	0.04	0.13	
0.10	0.10	0.16	0.3	3.29	1.81	3.13	0.05	0.15	
0.11	0.11	0.19	0.4	3.62	1.93	3.44	0.06	0.17	
0.12	0.12	0.23	0.5	3.95	2.05	3.75	0.07	0.19	
0.13	0.13	0.26	0.6	4.28	2.16	4.07	0.07	0.20	
0.14	0.14	0.31	0.7	5.15	2.12	4.93	0.07	0.21	
0.15	0.15	0.36	0.8	6.03	2.12	5.79	0.07	0.22	
0.16	0.16	0.43	0.9	6.91	2.15	6.65	0.07	0.23	
0.17	0.17	0.50	1.1	7.79	2.20	7.51	0.08	0.25	
0.18	0.18	0.58	1.3	8.67	2.27	8.38	0.08	0.26	
0.19	0.19	0.66	1.6	9.54	2.34	9.24	0.08	0.27	
0.20	0.20	0.76	1.8	10.42	2.41	10.10	0.09	0.29	
0.21	0.21	0.87	2.2	11.30	2.49	10.96	0.10	0.31	
0.22	0.22	0.98	2.5	12.18	2.58	11.83	0.10	0.32	
0.23	0.23	1.10	2.9	13.06	2.66	12.69	0.11	0.34	
0.24	0.24	1.23	3.4	13.93	2.74	13.55	0.12	0.36	
0.25	0.25	1.37	3.9	14.81	2.83	14.41	0.12	0.37	
0.26	0.26	1.52	4.4	15.69	2.92	15.27	0.13	0.39	
0.27	0.27	1.68	5.0	16.57	3.00	16.14	0.14	0.41	
0.28	0.28	1.84	5.7	17.45	3.09	17.00	0.15	0.43	
0.29	0.29	2.02	6.4	18.32	3.18	17.86	0.16	0.45	
0.30	0.30	2.20	7.2	19.20	3.26	18.72	0.17	0.47	
0.31	0.31	2.39	8.0	20.08	3.35	19.59	0.17	0.48	
0.32	0.32	2.59	8.9	20.96	3.43	20.45	0.18	0.50	
0.33	0.33	2.80	9.9	21.84	3.52	21.31	0.19	0.52	roll curb
0.34	0.34	3.02	10.9	22.71	3.60	22.17	0.20	0.54	
0.35	0.35	3.25	12.0	23.59	3.68	23.03	0.21	0.56	
0.36	0.36	3.48	13.1	24.47	3.77	23.90	0.22	0.58	
0.37	0.37	3.72	14.3	25.35	3.85	24.76	0.23	0.60	
0.38	0.38	3.98	15.6	26.23	3.93	25.62	0.24	0.62	
0.39	0.39	4.24	17.0	27.10	4.01	26.48	0.25	0.64	
0.40	0.40	4.50	18.4	27.98	4.09	27.35	0.26	0.66	
0.41	0.41	4.78	19.9	28.86	4.17	28.21	0.27	0.68	
0.42	0.42	5.06	21.9	28.88	4.33	28.21	0.29	0.71	
0.43	0.43	5.35	24.0	28.90	4.49	28.22	0.31	0.74	
0.45	0.45	5.91	28.3	28.94	4.79	28.23	0.36	0.81	
0.46	0.46	6.19	30.6	28.96	4.94	28.23	0.38	0.84	standard curb
0.47	0.47	6.48	33.0	28.98	5.09	28.24	0.40	0.87	
0.48	0.48	6.76	35.4	29.01	5.23	28.24	0.43	0.91	
0.49	0.49	7.04	37.8	29.03	5.38	28.25	0.45	0.94	
0.50	0.50	7.32	40.4	29.05	5.52	28.25	0.47	0.97	
0.51	0.51	7.61	43.0	29.07	5.65	28.26	0.50	1.01	
0.52	0.52	7.89	45.7	29.09	5.79	28.26	0.52	1.04	
0.53	0.53	8.17	48.4	29.11	5.93	28.27	0.55	1.08	
0.54	0.54	8.45	51.2	29.13	6.06	28.27	0.57	1.11	
0.55	0.55	8.74	54.1	29.15	6.19	28.28	0.59	1.14	
0.56	0.56	9.02	57.0	29.17	6.32	28.28	0.62	1.18	
0.57	0.57	9.30	60.0	29.19	6.45	28.29	0.65	1.22	

Ghost Ranch Street

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

MANNING'S N= .017 SLOPE= .04

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)
0.01	0.01	0.00	0.0	0.33	0.49	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.78	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	1.03	0.94	0.02	0.05
0.04	0.04	0.03	0.0	1.32	1.25	1.25	0.02	0.06
0.05	0.05	0.04	0.1	1.64	1.45	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.63	1.88	0.04	0.10
0.07	0.07	0.08	0.1	2.30	1.81	2.19	0.05	0.12
0.08	0.08	0.10	0.2	2.63	1.98	2.50	0.06	0.14
0.09	0.09	0.13	0.3	2.96	2.14	2.81	0.07	0.16
0.10	0.10	0.16	0.4	3.29	2.29	3.13	0.08	0.18
0.11	0.11	0.19	0.5	3.62	2.44	3.44	0.09	0.20
0.12	0.12	0.23	0.6	3.95	2.59	3.75	0.10	0.22
0.13	0.13	0.26	0.7	4.28	2.73	4.07	0.12	0.25
0.14	0.14	0.31	0.8	5.15	2.68	4.93	0.11	0.25
0.15	0.15	0.36	1.0	6.03	2.68	5.79	0.11	0.26
0.16	0.16	0.43	1.2	6.91	2.72	6.65	0.12	0.28
0.17	0.17	0.50	1.4	7.79	2.79	7.51	0.12	0.29
0.18	0.18	0.58	1.6	8.67	2.87	8.38	0.13	0.31
0.19	0.19	0.66	2.0	9.54	2.96	9.24	0.14	0.33
0.20	0.20	0.76	2.3	10.42	3.05	10.10	0.14	0.34
0.21	0.21	0.87	2.7	11.30	3.15	10.96	0.15	0.36
0.22	0.22	0.98	3.2	12.18	3.26	11.83	0.16	0.38
0.23	0.23	1.10	3.7	13.06	3.36	12.69	0.18	0.41
0.24	0.24	1.23	4.3	13.93	3.47	13.55	0.19	0.43
0.25	0.25	1.37	4.9	14.81	3.58	14.41	0.20	0.45
0.26	0.26	1.52	5.6	15.69	3.69	15.27	0.21	0.47
0.27	0.27	1.68	6.4	16.57	3.80	16.14	0.22	0.49
0.28	0.28	1.84	7.2	17.45	3.91	17.00	0.24	0.52
0.29	0.29	2.02	8.1	18.32	4.02	17.86	0.25	0.54
0.30	0.30	2.20	9.1	19.20	4.13	18.72	0.26	0.56
0.31	0.31	2.39	10.1	20.08	4.23	19.59	0.28	0.59
0.32	0.32	2.59	11.3	20.96	4.34	20.45	0.29	0.61
0.33	0.33	2.80	12.5	21.84	4.45	21.31	0.31	0.64
0.34	0.34	3.02	13.7	22.71	4.55	22.17	0.32	0.66
0.35	0.35	3.25	15.1	23.59	4.66	23.03	0.34	0.69
0.36	0.36	3.48	16.6	24.47	4.76	23.90	0.35	0.71
0.37	0.37	3.72	18.1	25.35	4.87	24.76	0.37	0.74
0.38	0.38	3.98	19.8	26.23	4.97	25.62	0.38	0.76
0.39	0.39	4.24	21.5	27.10	5.07	26.48	0.40	0.79
0.40	0.40	4.50	23.3	27.98	5.17	27.35	0.42	0.82
0.41	0.41	4.78	25.2	28.86	5.27	28.21	0.43	0.84
0.42	0.42	5.06	27.7	28.88	5.48	28.21	0.47	0.89
0.43	0.43	5.35	30.3	28.90	5.68	28.22	0.50	0.93
0.45	0.45	5.91	35.8	28.94	6.06	28.23	0.57	1.02
0.46	0.46	6.19	38.7	28.96	6.25	28.23	0.61	1.07
0.47	0.47	6.48	41.7	28.98	6.44	28.24	0.64	1.11
0.48	0.48	6.76	44.7	29.01	6.62	28.24	0.68	1.16
0.49	0.49	7.04	47.9	29.03	6.80	28.25	0.72	1.21
0.50	0.50	7.32	51.1	29.05	6.98	28.25	0.76	1.26
0.51	0.51	7.61	54.4	29.07	7.15	28.26	0.79	1.30
0.52	0.52	7.89	57.8	29.09	7.32	28.26	0.83	1.35
0.53	0.53	8.17	61.2	29.11	7.50	28.27	0.87	1.40
0.54	0.54	8.45	64.8	29.13	7.66	28.27	0.91	1.45
0.55	0.55	8.74	68.4	29.15	7.83	28.28	0.95	1.50
0.56	0.56	9.02	72.1	29.17	7.99	28.28	0.99	1.55
0.57	0.57	9.30	75.9	29.19	8.16	28.29	1.03	1.60

standard curb

Ghost Ranch Street

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

MANNING'S N= .017 SLOPE= .0141

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)
0.01	0.01	0.00	0.0	0.33	0.29	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.47	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.61	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.74	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	0.86	1.56	0.01	0.06
0.06	0.06	0.06	0.1	1.97	0.97	1.88	0.01	0.07
0.07	0.07	0.08	0.1	2.30	1.07	2.19	0.02	0.09
0.08	0.08	0.10	0.1	2.63	1.17	2.50	0.02	0.10
0.09	0.09	0.13	0.2	2.96	1.27	2.81	0.03	0.12
0.10	0.10	0.16	0.2	3.29	1.36	3.13	0.03	0.13
0.11	0.11	0.19	0.3	3.62	1.45	3.44	0.03	0.14
0.12	0.12	0.23	0.3	3.95	1.54	3.75	0.04	0.16
0.13	0.13	0.26	0.4	4.28	1.62	4.07	0.04	0.17
0.14	0.14	0.31	0.5	5.15	1.59	4.93	0.04	0.18
0.15	0.15	0.36	0.6	6.03	1.59	5.79	0.04	0.19
0.16	0.16	0.43	0.7	6.91	1.62	6.65	0.04	0.20
0.17	0.17	0.50	0.8	7.79	1.66	7.51	0.04	0.21
0.18	0.18	0.58	1.0	8.67	1.70	8.38	0.04	0.22
0.19	0.19	0.66	1.2	9.54	1.75	9.24	0.05	0.24
0.20	0.20	0.76	1.4	10.42	1.81	10.10	0.05	0.25
0.21	0.21	0.87	1.6	11.30	1.87	10.96	0.05	0.26
0.22	0.22	0.98	1.9	12.18	1.93	11.83	0.06	0.28
0.23	0.23	1.10	2.2	13.06	2.00	12.69	0.06	0.29
0.24	0.24	1.23	2.5	13.93	2.06	13.55	0.07	0.31
0.25	0.25	1.37	2.9	14.81	2.13	14.41	0.07	0.32
0.26	0.26	1.52	3.3	15.69	2.19	15.27	0.07	0.33
0.27	0.27	1.68	3.8	16.57	2.26	16.14	0.08	0.35
0.28	0.28	1.84	4.3	17.45	2.32	17.00	0.08	0.36
0.29	0.29	2.02	4.8	18.32	2.39	17.86	0.09	0.38
0.30	0.30	2.20	5.4	19.20	2.45	18.72	0.09	0.39
0.31	0.31	2.39	6.0	20.08	2.51	19.59	0.10	0.41
0.32	0.32	2.59	6.7	20.96	2.58	20.45	0.10	0.42
0.33	0.33	2.80	7.4	21.84	2.64	21.31	0.11	0.44
0.34	0.34	3.02	8.2	22.71	2.70	22.17	0.11	0.45
0.35	0.35	3.25	9.0	23.59	2.77	23.03	0.12	0.47
0.36	0.36	3.48	9.8	24.47	2.83	23.90	0.12	0.48
0.37	0.37	3.72	10.8	25.35	2.89	24.76	0.13	0.50
0.38	0.38	3.98	11.7	26.23	2.95	25.62	0.14	0.52
0.39	0.39	4.24	12.8	27.10	3.01	26.48	0.14	0.53
0.40	0.40	4.50	13.8	27.98	3.07	27.35	0.15	0.55
0.41	0.41	4.78	15.0	28.86	3.13	28.21	0.15	0.56
0.42	0.42	5.06	16.5	28.88	3.25	28.21	0.16	0.58
0.43	0.43	5.35	18.0	28.90	3.37	28.22	0.18	0.61
0.45	0.45	5.91	21.3	28.94	3.60	28.23	0.20	0.65
0.46	0.46	6.19	23.0	28.96	3.71	28.23	0.21	0.67
0.47	0.47	6.48	24.8	28.98	3.82	28.24	0.23	0.70
0.48	0.48	6.76	26.6	29.01	3.93	28.24	0.24	0.72
0.49	0.49	7.04	28.4	29.03	4.04	28.25	0.25	0.74
0.50	0.50	7.32	30.3	29.05	4.14	28.25	0.27	0.77
0.51	0.51	7.61	32.3	29.07	4.25	28.26	0.28	0.79
0.52	0.52	7.89	34.3	29.09	4.35	28.26	0.29	0.81
0.53	0.53	8.17	36.4	29.11	4.45	28.27	0.31	0.84
0.54	0.54	8.45	38.5	29.13	4.55	28.27	0.32	0.86
0.55	0.55	8.74	40.6	29.15	4.65	28.28	0.34	0.89
0.56	0.56	9.02	42.8	29.17	4.75	28.28	0.35	0.91

Standard curb

Open Range Ave

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

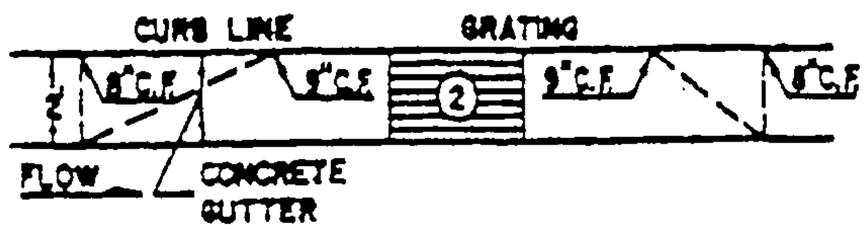
MANNING'S N= .017 SLOPE= .0139

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	41.17	0.67
2	8.38	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	0.83
4	9.00	0.00	8	41.00	0.00	12	0.00	0.00

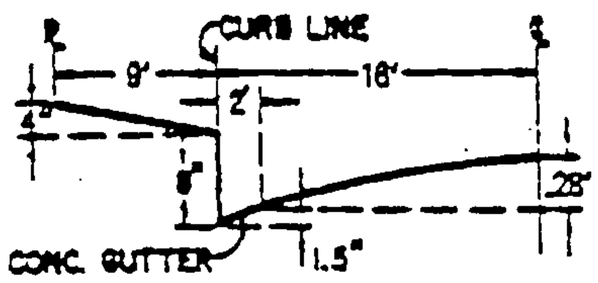
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)	
0.01	0.01	0.00	0.0	0.33	0.29	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.46	0.63	0.00	0.02	
0.03	0.03	0.01	0.0	0.99	0.61	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	0.73	1.25	0.01	0.05	
0.05	0.05	0.04	0.0	1.64	0.85	1.56	0.01	0.06	
0.06	0.06	0.06	0.1	1.97	0.96	1.88	0.01	0.07	
0.07	0.07	0.08	0.1	2.30	1.07	2.19	0.02	0.09	
0.08	0.08	0.10	0.1	2.63	1.17	2.50	0.02	0.10	
0.09	0.09	0.13	0.2	2.96	1.26	2.81	0.02	0.11	
0.10	0.10	0.16	0.2	3.29	1.35	3.13	0.03	0.13	
0.11	0.11	0.19	0.3	3.62	1.44	3.44	0.03	0.14	
0.12	0.12	0.23	0.3	3.95	1.53	3.75	0.04	0.16	
0.13	0.13	0.26	0.4	4.28	1.61	4.07	0.04	0.17	
0.14	0.14	0.31	0.5	5.30	1.55	5.07	0.04	0.18	
0.15	0.15	0.37	0.6	6.32	1.54	6.08	0.04	0.19	
0.16	0.16	0.43	0.7	7.34	1.56	7.08	0.04	0.20	
0.17	0.17	0.51	0.8	8.36	1.59	8.09	0.04	0.21	
0.18	0.18	0.59	1.0	9.38	1.64	9.09	0.04	0.22	
0.19	0.19	0.69	1.2	10.40	1.69	10.10	0.04	0.23	
0.20	0.20	0.80	1.4	11.42	1.74	11.10	0.05	0.25	
0.21	0.21	0.91	1.6	12.44	1.80	12.11	0.05	0.26	
0.22	0.22	1.04	1.9	13.46	1.87	13.11	0.05	0.27	
0.23	0.23	1.17	2.3	14.49	1.93	14.12	0.06	0.29	
0.24	0.24	1.32	2.6	15.51	1.99	15.12	0.06	0.30	
0.25	0.25	1.48	3.0	16.53	2.06	16.13	0.07	0.32	
0.26	0.26	1.64	3.5	17.55	2.12	17.13	0.07	0.33	
0.27	0.27	1.82	4.0	18.57	2.19	18.14	0.07	0.34	
0.28	0.28	2.00	4.5	19.59	2.25	19.14	0.08	0.36	
0.29	0.29	2.20	5.1	20.61	2.32	20.15	0.08	0.37	
0.30	0.30	2.41	5.7	21.63	2.38	21.15	0.09	0.39	
0.31	0.31	2.62	6.4	22.65	2.45	22.16	0.09	0.40	
0.32	0.32	2.85	7.2	23.67	2.51	23.16	0.10	0.42	
0.33	0.33	3.09	8.0	24.69	2.58	24.17	0.10	0.43	
0.34	0.34	3.33	8.8	25.71	2.64	25.17	0.11	0.45	
0.35	0.35	3.59	9.7	26.74	2.70	26.18	0.11	0.46	
0.36	0.36	3.86	10.7	27.76	2.77	27.18	0.12	0.48	
0.37	0.37	4.13	11.7	28.78	2.83	28.19	0.12	0.49	
0.38	0.38	4.42	12.8	29.80	2.89	29.19	0.13	0.51	roll curb
0.39	0.39	4.72	13.9	30.82	2.95	30.20	0.14	0.53	
0.40	0.40	5.03	15.1	31.84	3.01	31.20	0.14	0.54	
0.41	0.41	5.34	16.4	32.86	3.07	32.21	0.15	0.56	
0.42	0.42	5.66	18.1	32.88	3.19	32.21	0.16	0.58	
0.43	0.43	5.99	19.8	32.90	3.31	32.22	0.17	0.60	
0.45	0.45	6.63	23.5	32.94	3.54	32.23	0.19	0.64	
0.46	0.46	6.95	25.4	32.96	3.65	32.23	0.21	0.67	
0.47	0.47	7.28	27.4	32.98	3.76	32.24	0.22	0.69	
0.48	0.48	7.60	29.4	33.00	3.87	32.24	0.23	0.71	
0.49	0.49	7.92	31.5	33.03	3.98	32.25	0.25	0.74	
0.50	0.50	8.24	33.7	33.05	4.08	32.25	0.26	0.76	
0.51	0.51	8.57	35.9	33.07	4.19	32.26	0.27	0.78	
0.52	0.52	8.89	38.1	33.09	4.29	32.26	0.29	0.81	
0.53	0.53	9.21	40.5	33.11	4.39	32.27	0.30	0.83	
0.54	0.54	9.53	42.8	33.13	4.49	32.27	0.31	0.85	standard curb
0.55	0.55	9.86	45.3	33.15	4.59	32.28	0.33	0.88	
0.56	0.56	10.18	47.7	33.17	4.69	32.28	0.34	0.90	
0.57	0.57	10.50	50.3	33.19	4.79	32.29	0.36	0.93	

Open Range Ave.

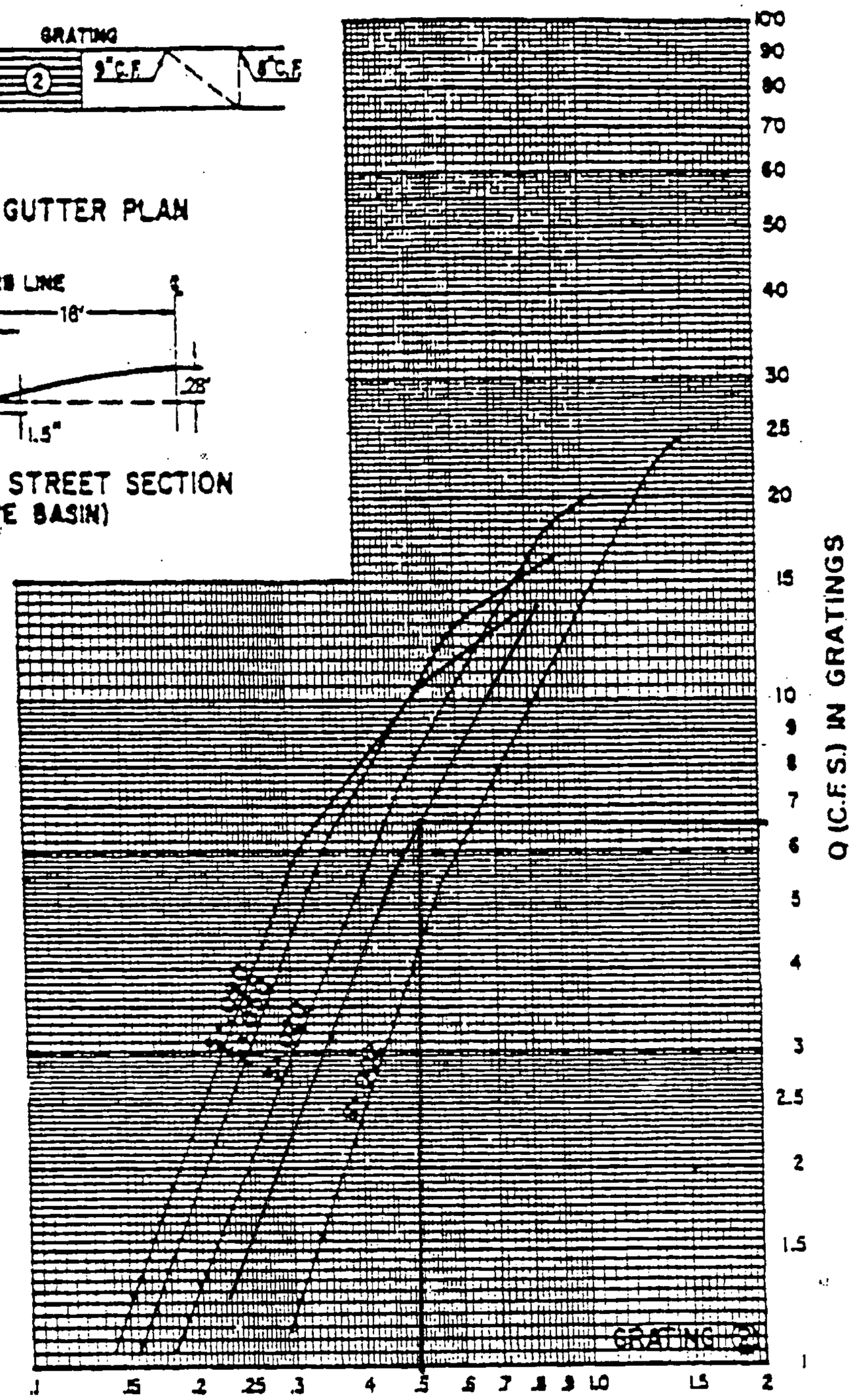
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D = 0.5'
S = 1.39%
Q = 6.6 cfs/grate

PLATE 22.3 D-5

Blue Sky Street south of Open Range Ave

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

MANNING'S N= .017 SLOPE= .0173

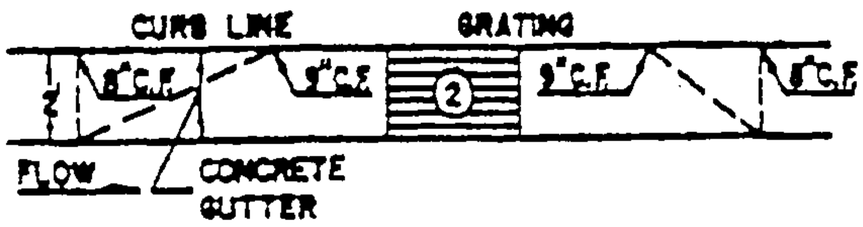
POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

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)
0.01	0.01	0.00	0.0	0.33	0.33	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.52	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.68	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.82	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	0.95	1.56	0.01	0.06
0.06	0.06	0.06	0.1	1.97	1.07	1.88	0.02	0.08
0.07	0.07	0.08	0.1	2.30	1.19	2.19	0.02	0.09
0.08	0.08	0.10	0.1	2.63	1.30	2.50	0.03	0.11
0.09	0.09	0.13	0.2	2.96	1.41	2.81	0.03	0.12
0.10	0.10	0.16	0.2	3.29	1.51	3.13	0.04	0.14
0.11	0.11	0.19	0.3	3.62	1.61	3.44	0.04	0.15
0.12	0.12	0.23	0.4	3.95	1.70	3.75	0.05	0.17
0.13	0.13	0.26	0.5	4.28	1.80	4.07	0.05	0.18
0.14	0.14	0.31	0.5	5.15	1.76	4.93	0.05	0.19
0.15	0.15	0.36	0.6	6.03	1.76	5.79	0.05	0.20
0.16	0.16	0.43	0.8	6.91	1.79	6.65	0.05	0.21
0.17	0.17	0.50	0.9	7.79	1.83	7.51	0.05	0.22
0.18	0.18	0.58	1.1	8.67	1.89	8.38	0.06	0.24
0.19	0.19	0.66	1.3	9.54	1.94	9.24	0.06	0.25
0.20	0.20	0.76	1.5	10.42	2.01	10.10	0.06	0.26
0.21	0.21	0.87	1.8	11.30	2.07	10.96	0.07	0.28
0.22	0.22	0.98	2.1	12.18	2.14	11.83	0.07	0.29
0.23	0.23	1.10	2.4	13.06	2.21	12.69	0.08	0.31
0.24	0.24	1.23	2.8	13.93	2.28	13.55	0.08	0.32
0.25	0.25	1.37	3.2	14.81	2.35	14.41	0.09	0.34
0.26	0.26	1.52	3.7	15.69	2.43	15.27	0.09	0.35
0.27	0.27	1.68	4.2	16.57	2.50	16.14	0.10	0.37
0.28	0.28	1.84	4.7	17.45	2.57	17.00	0.10	0.38
0.29	0.29	2.02	5.3	18.32	2.64	17.86	0.11	0.40
0.30	0.30	2.20	6.0	19.20	2.71	18.72	0.11	0.41
0.31	0.31	2.39	6.7	20.08	2.78	19.59	0.12	0.43
0.32	0.32	2.59	7.4	20.96	2.85	20.45	0.13	0.45
0.33	0.33	2.80	8.2	21.84	2.92	21.31	0.13	0.46
0.34	0.34	3.02	9.0	22.71	2.99	22.17	0.14	0.48
0.35	0.35	3.25	9.9	23.59	3.06	23.03	0.15	0.50
0.36	0.36	3.48	10.9	24.47	3.13	23.90	0.15	0.51
0.37	0.37	3.72	11.9	25.35	3.20	24.76	0.16	0.53
0.38	0.38	3.98	13.0	26.23	3.27	25.62	0.17	0.55
0.39	0.39	4.24	14.1	27.10	3.34	26.48	0.17	0.56
0.40	0.40	4.50	15.3	27.98	3.40	27.35	0.18	0.58
0.41	0.41	4.78	16.6	28.86	3.47	28.21	0.19	0.60
0.42	0.42	5.06	18.2	28.88	3.60	28.21	0.20	0.62
0.43	0.43	5.35	20.0	28.90	3.73	28.22	0.22	0.65
0.45	0.45	5.91	23.6	28.94	3.99	28.23	0.25	0.70
0.46	0.46	6.19	25.5	28.96	4.11	28.23	0.26	0.72
0.47	0.47	6.48	27.4	28.98	4.23	28.24	0.28	0.75
0.48	0.48	6.76	29.4	29.01	4.35	28.24	0.29	0.77
0.49	0.49	7.04	31.5	29.03	4.47	28.25	0.31	0.80
0.50	0.50	7.32	33.6	29.05	4.59	28.25	0.33	0.83
0.51	0.51	7.61	35.8	29.07	4.70	28.26	0.34	0.85
0.52	0.52	7.89	38.0	29.09	4.82	28.26	0.36	0.88
0.53	0.53	8.17	40.3	29.11	4.93	28.27	0.38	0.91
0.54	0.54	8.45	42.6	29.13	5.04	28.27	0.39	0.93
0.55	0.55	8.74	45.0	29.15	5.15	28.28	0.41	0.96
0.56	0.56	9.02	47.4	29.17	5.26	28.28	0.43	0.99
0.57	0.57	9.30	49.9	29.19	5.36	28.29	0.45	1.02

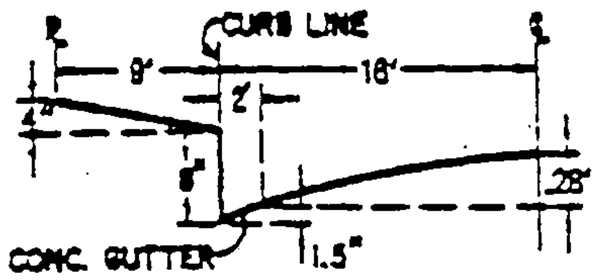
standard curb

Blue Sky Street south of Open Range Ave

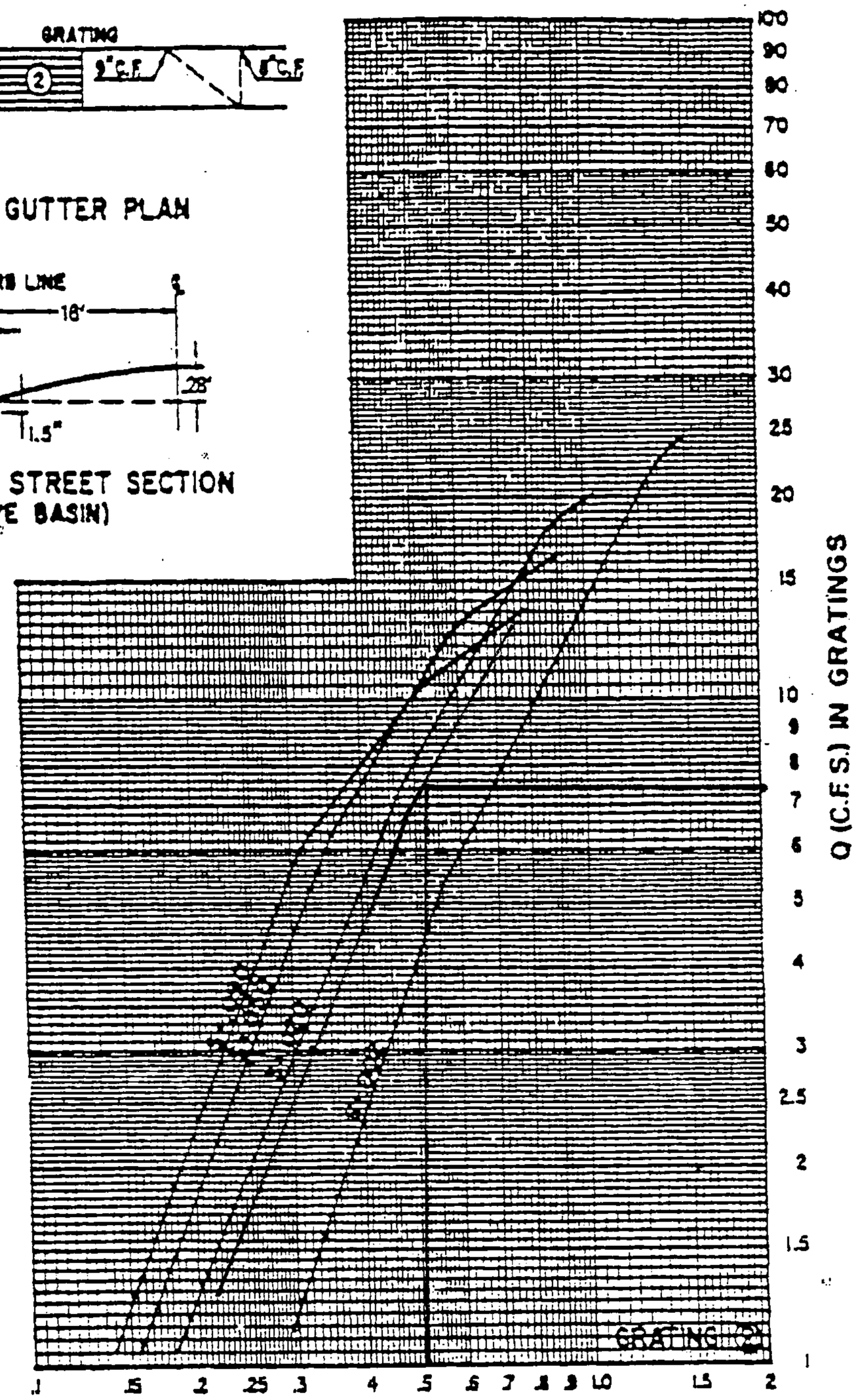
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D=0.51'
S=1.73%
Q=7.4 cfs/grate

PLATE 22.3 D-5

Lone Tree Road

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

MANNING'S N= .017 SLOPE= .0259

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)	
0.01	0.01	0.00	0.0	0.33	0.40	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.63	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.83	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	1.00	1.25	0.02	0.06	
0.05	0.05	0.04	0.0	1.64	1.16	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.31	1.88	0.03	0.09	
0.07	0.07	0.08	0.1	2.30	1.46	2.19	0.03	0.10	
0.08	0.08	0.10	0.2	2.63	1.59	2.50	0.04	0.12	
0.09	0.09	0.13	0.2	2.96	1.72	2.81	0.05	0.14	
0.10	0.10	0.16	0.3	3.29	1.85	3.13	0.05	0.15	
0.11	0.11	0.19	0.4	3.62	1.97	3.44	0.06	0.17	
0.12	0.12	0.23	0.5	3.95	2.08	3.75	0.07	0.19	
0.13	0.13	0.26	0.6	4.28	2.20	4.07	0.08	0.21	
0.14	0.14	0.31	0.7	5.15	2.16	4.93	0.07	0.21	
0.15	0.15	0.36	0.8	6.03	2.16	5.79	0.07	0.22	
0.16	0.16	0.43	0.9	6.91	2.19	6.65	0.07	0.23	
0.17	0.17	0.50	1.1	7.79	2.24	7.51	0.08	0.25	
0.18	0.18	0.58	1.3	8.67	2.31	8.38	0.08	0.26	
0.19	0.19	0.66	1.6	9.54	2.38	9.24	0.09	0.28	
0.20	0.20	0.76	1.9	10.42	2.46	10.10	0.09	0.29	
0.21	0.21	0.87	2.2	11.30	2.54	10.96	0.10	0.31	
0.22	0.22	0.98	2.6	12.18	2.62	11.83	0.11	0.33	
0.23	0.23	1.10	3.0	13.06	2.71	12.69	0.11	0.34	
0.24	0.24	1.23	3.4	13.93	2.79	13.55	0.12	0.36	
0.25	0.25	1.37	4.0	14.81	2.88	14.41	0.13	0.38	
0.26	0.26	1.52	4.5	15.69	2.97	15.27	0.14	0.40	
0.27	0.27	1.68	5.1	16.57	3.06	16.14	0.15	0.42	
0.28	0.28	1.84	5.8	17.45	3.14	17.00	0.15	0.43	
0.29	0.29	2.02	6.5	18.32	3.23	17.86	0.16	0.45	
0.30	0.30	2.20	7.3	19.20	3.32	18.72	0.17	0.47	
0.31	0.31	2.39	8.2	20.08	3.41	19.59	0.18	0.49	
0.32	0.32	2.59	9.1	20.96	3.49	20.45	0.19	0.51	roll curb
0.33	0.33	2.80	10.0	21.84	3.58	21.31	0.20	0.53	
0.34	0.34	3.02	11.1	22.71	3.66	22.17	0.21	0.55	
0.35	0.35	3.25	12.2	23.59	3.75	23.03	0.22	0.57	
0.36	0.36	3.48	13.3	24.47	3.83	23.90	0.23	0.59	
0.37	0.37	3.72	14.6	25.35	3.92	24.76	0.24	0.61	
0.38	0.38	3.98	15.9	26.23	4.00	25.62	0.25	0.63	
0.39	0.39	4.24	17.3	27.10	4.08	26.48	0.26	0.65	
0.40	0.40	4.50	18.8	27.98	4.16	27.35	0.27	0.67	
0.41	0.41	4.78	20.3	28.86	4.24	28.21	0.28	0.69	
0.42	0.42	5.06	22.3	28.88	4.41	28.21	0.30	0.72	
0.43	0.43	5.35	24.4	28.90	4.57	28.22	0.32	0.75	
0.45	0.45	5.91	28.8	28.94	4.88	28.23	0.37	0.82	
0.46	0.46	6.19	31.2	28.96	5.03	28.23	0.39	0.85	standard curb
0.47	0.47	6.48	33.5	28.98	5.18	28.24	0.42	0.89	
0.48	0.48	6.76	36.0	29.01	5.33	28.24	0.44	0.92	
0.49	0.49	7.04	38.5	29.03	5.47	28.25	0.46	0.95	
0.50	0.50	7.32	41.1	29.05	5.61	28.25	0.49	0.99	
0.51	0.51	7.61	43.8	29.07	5.76	28.26	0.51	1.02	
0.52	0.52	7.89	46.5	29.09	5.89	28.26	0.54	1.06	
0.53	0.53	8.17	49.3	29.11	6.03	28.27	0.56	1.09	
0.54	0.54	8.45	52.1	29.13	6.17	28.27	0.59	1.13	
0.55	0.55	8.74	55.0	29.15	6.30	28.28	0.62	1.17	
0.56	0.56	9.02	58.0	29.17	6.43	28.28	0.64	1.20	
0.57	0.57	9.30	61.1	29.19	6.56	28.29	0.67	1.24	

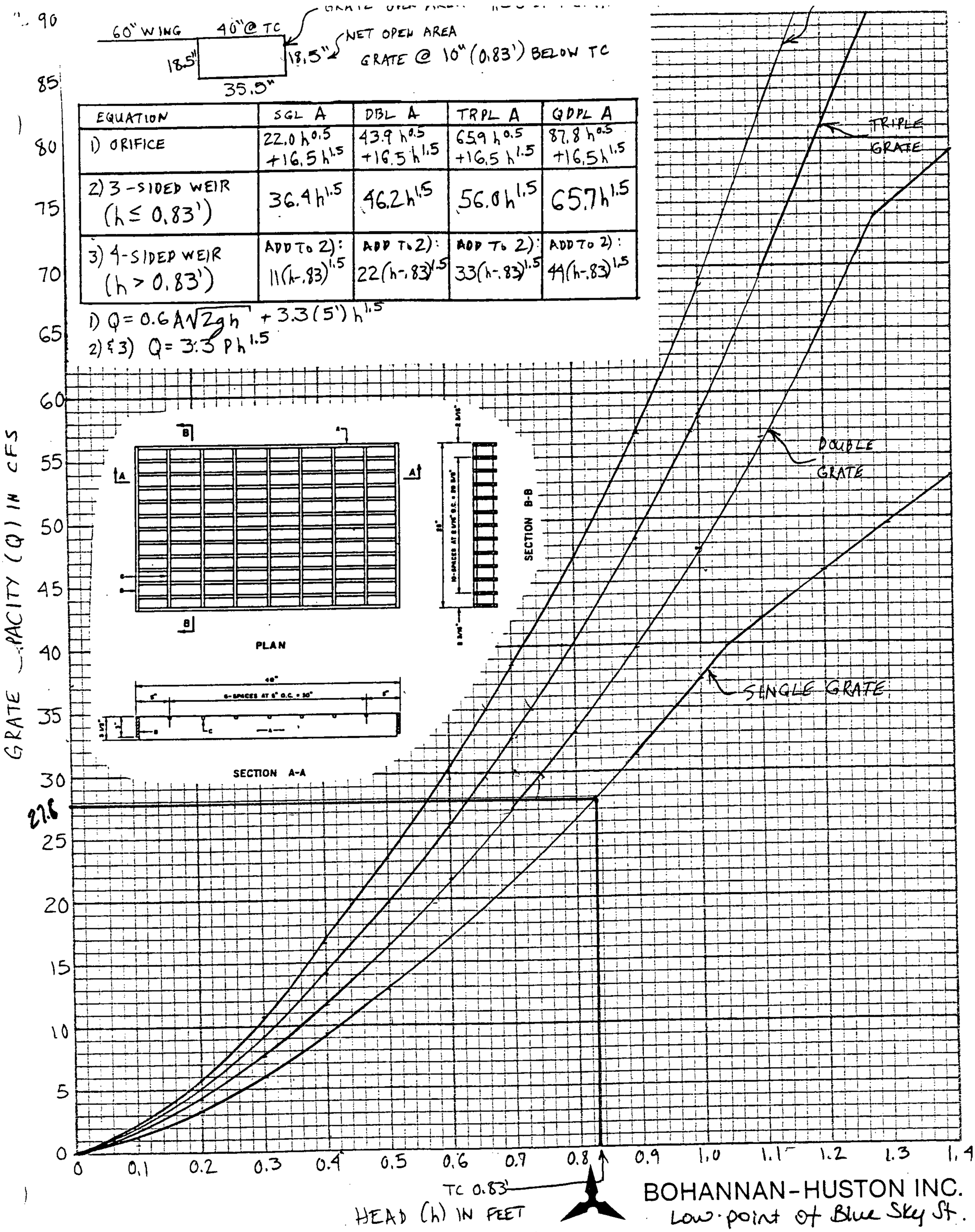
NET OPEN AREA

GRATE @ 10" (0.83') BELOW TC

EQUATION	SGL A	DBL A	TRPL A	QDPL A
1) ORIFICE	$22.0\,h^{0.5} + 16.5\,h^{1.5}$	$43.9\,h^{0.5} + 16.5\,h^{1.5}$	$65.9\,h^{0.5} + 16.5\,h^{1.5}$	$87.8\,h^{0.5} + 16.5\,h^{1.5}$
2) 3-SIDED WEIR ($h \le 0.83'$)	$36.4\,h^{1.5}$	$46.2\,h^{1.5}$	$56.0\,h^{1.5}$	$65.7\,h^{1.5}$
3) 4-SIDED WEIR ($h > 0.83'$)	ADD TO 2): $11(h-.83)^{1.5}$	ADD TO 2): $22(h-.83)^{1.5}$	ADD TO 2): $33(h-.83)^{1.5}$	ADD TO 2): $44(h-.83)^{1.5}$

1) $Q = 0.6A\sqrt{2gh} + 3.3(5')\,h^{1.5}$

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



BOHANNAN-HUSTON INC.

Low-point of Blue Sky St.

PROJECT NAME El Rancho Grande SHEET ____ OF ____

PROJECT NO. ____ BY JPK DATE 4/9/92

SUBJECT RATING CURVE FOR TYPE A INLETS CH'D ____ DATE ____

Messina Road

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

MANNING'S N= .017 SLOPE= .031

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.87	5	12.00	0.13	9	50.17	0.67
2	9.38	0.67	6	30.00	0.41	10	50.63	0.67
3	9.83	0.67	7	48.00	0.13	11	60.00	0.83
4	10.00	0.00	8	50.00	0.00	12	0.00	0.00

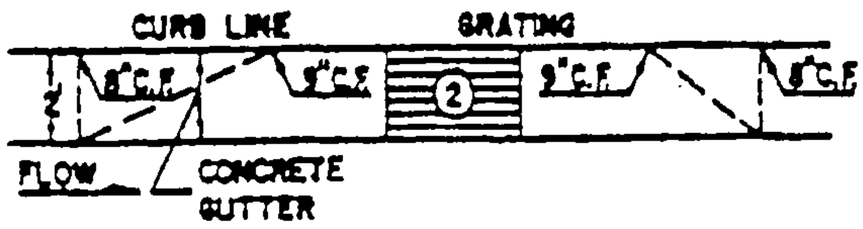
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.33	0.44	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.69	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.91	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	1.10	1.25	0.02	0.06
0.05	0.05	0.04	0.0	1.64	1.27	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.44	1.88	0.03	0.09
0.07	0.07	0.08	0.1	2.30	1.59	2.19	0.04	0.11
0.08	0.08	0.10	0.2	2.63	1.74	2.50	0.05	0.13
0.09	0.09	0.13	0.2	2.96	1.88	2.81	0.06	0.15
0.10	0.10	0.16	0.3	3.29	2.02	3.13	0.06	0.16
0.11	0.11	0.19	0.4	3.62	2.15	3.44	0.07	0.18
0.12	0.12	0.23	0.5	3.95	2.28	3.75	0.08	0.20
0.13	0.13	0.26	0.6	4.28	2.41	4.07	0.09	0.22
0.14	0.14	0.31	0.7	5.58	2.25	5.36	0.08	0.22
0.15	0.15	0.37	0.8	6.89	2.20	6.65	0.07	0.22
0.16	0.16	0.44	1.0	8.20	2.20	7.94	0.08	0.24
0.17	0.17	0.53	1.2	9.50	2.25	9.23	0.08	0.25
0.18	0.18	0.63	1.5	10.81	2.31	10.52	0.08	0.26
0.19	0.19	0.74	1.8	12.12	2.39	11.81	0.09	0.28
0.20	0.20	0.87	2.1	13.42	2.47	13.10	0.10	0.30
0.21	0.21	1.00	2.6	14.73	2.57	14.39	0.10	0.31
0.22	0.22	1.15	3.1	16.04	2.66	15.68	0.11	0.33
0.23	0.23	1.32	3.6	17.34	2.76	16.97	0.12	0.35
0.24	0.24	1.49	4.3	18.65	2.86	18.26	0.13	0.37
0.25	0.25	1.68	5.0	19.95	2.96	19.56	0.14	0.39
0.26	0.26	1.88	5.8	21.26	3.06	20.85	0.15	0.41
0.27	0.27	2.10	6.6	22.57	3.16	22.14	0.15	0.42
0.28	0.28	2.33	7.6	23.87	3.26	23.43	0.16	0.44
0.29	0.29	2.57	8.6	25.18	3.36	24.72	0.18	0.47
0.30	0.30	2.82	9.8	26.49	3.46	26.01	0.19	0.49
0.31	0.31	3.09	11.0	27.79	3.56	27.30	0.20	0.51
0.32	0.32	3.37	12.3	29.10	3.65	28.59	0.21	0.53
0.33	0.33	3.66	13.7	30.41	3.75	29.88	0.22	0.55
0.34	0.34	3.96	15.3	31.71	3.85	31.17	0.23	0.57
0.35	0.35	4.28	16.9	33.02	3.94	32.46	0.24	0.59
0.36	0.36	4.61	18.6	34.33	4.04	33.75	0.25	0.61
0.37	0.37	4.96	20.5	35.63	4.13	35.04	0.27	0.64
0.38	0.38	5.31	22.5	36.94	4.23	36.34	0.28	0.66
0.39	0.39	5.68	24.5	38.25	4.32	37.63	0.29	0.68
0.40	0.40	6.07	26.8	39.55	4.41	38.92	0.30	0.70
0.41	0.41	6.46	29.1	40.86	4.50	40.21	0.31	0.72
0.42	0.42	6.86	32.2	40.88	4.68	40.21	0.34	0.76
0.43	0.43	7.27	35.3	40.90	4.86	40.22	0.37	0.80
0.45	0.45	8.07	42.1	40.94	5.21	40.23	0.42	0.87
0.46	0.46	8.47	45.6	40.96	5.38	40.23	0.45	0.91
0.47	0.47	8.88	49.3	40.98	5.55	40.24	0.48	0.95
0.48	0.48	9.28	53.0	41.00	5.72	40.24	0.51	0.99
0.49	0.49	9.68	56.9	41.02	5.88	40.25	0.54	1.03
0.50	0.50	10.08	60.9	41.04	6.04	40.25	0.57	1.07
0.51	0.51	10.49	65.0	41.07	6.19	40.26	0.60	1.11
0.52	0.52	10.89	69.1	41.09	6.35	40.26	0.63	1.15
0.53	0.53	11.29	73.4	41.11	6.50	40.27	0.66	1.19
0.54	0.54	11.69	77.8	41.13	6.65	40.27	0.69	1.23
0.55	0.55	12.10	82.3	41.15	6.80	40.28	0.72	1.27
0.56	0.56	12.50	86.9	41.17	6.95	40.28	0.75	1.31
0.57	0.57	12.90	91.6	41.19	7.10	40.29	0.78	1.35

Actual flow

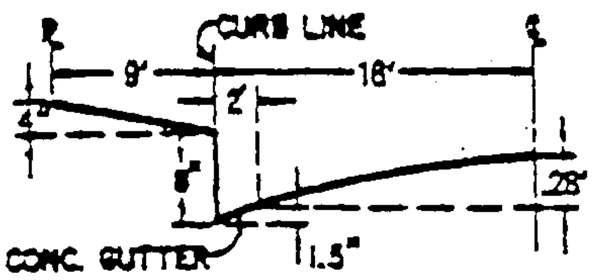
Standard curb

Messina Road

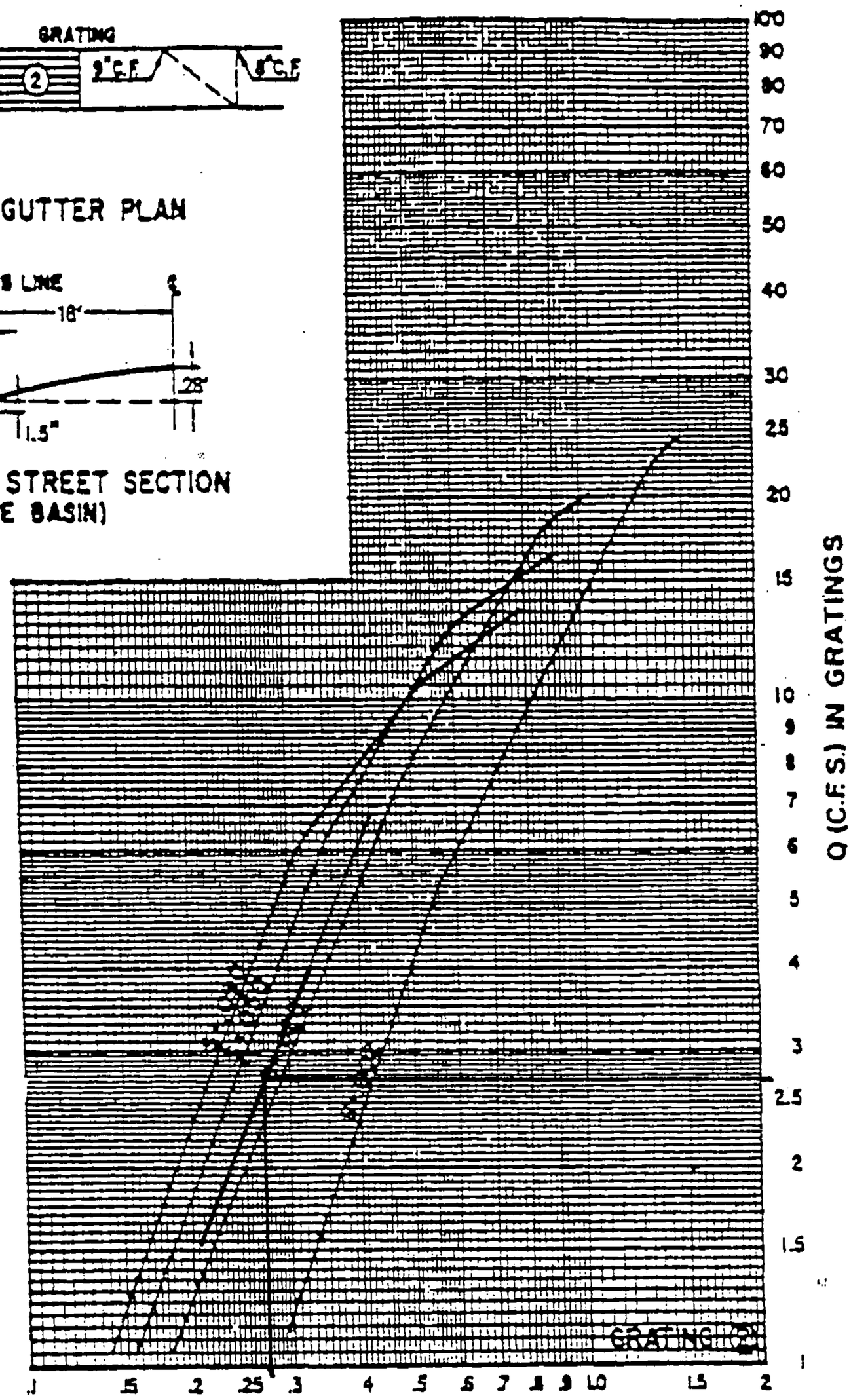
GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



S= 3.1%

D= 0.27'

Q= 2.7 cfs/grate

PLATE 22.3 D-5

Amole Mesa Avenue

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

MANNING'S N= .017 SLOPE= .0231

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
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)	
0.01	0.01	0.00	0.0	0.33	0.38	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.60	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.78	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	0.95	1.25	0.01	0.05	
0.05	0.05	0.04	0.0	1.64	1.10	1.56	0.02	0.07	
0.06	0.06	0.06	0.1	1.97	1.25	1.88	0.02	0.08	
0.07	0.07	0.08	0.1	2.30	1.38	2.19	0.03	0.10	
0.08	0.08	0.10	0.2	2.63	1.51	2.50	0.04	0.12	
0.09	0.09	0.13	0.2	2.96	1.63	2.81	0.04	0.13	
0.10	0.10	0.16	0.3	3.29	1.75	3.13	0.05	0.15	
0.11	0.11	0.19	0.4	3.62	1.87	3.44	0.05	0.16	
0.12	0.12	0.23	0.4	3.95	1.98	3.75	0.06	0.18	
0.13	0.13	0.26	0.6	4.28	2.09	4.07	0.07	0.20	
0.14	0.14	0.31	0.6	5.15	2.04	4.93	0.06	0.20	
0.15	0.15	0.36	0.7	6.03	2.05	5.79	0.07	0.22	
0.16	0.16	0.43	0.9	6.91	2.08	6.65	0.07	0.23	
0.17	0.17	0.50	1.1	7.79	2.13	7.51	0.07	0.24	
0.18	0.18	0.58	1.3	8.67	2.19	8.38	0.07	0.25	
0.19	0.19	0.66	1.5	9.54	2.26	9.24	0.08	0.27	
0.20	0.20	0.76	1.8	10.42	2.33	10.10	0.08	0.28	
0.21	0.21	0.87	2.1	11.30	2.41	10.96	0.09	0.30	
0.22	0.22	0.98	2.4	12.18	2.49	11.83	0.10	0.32	
0.23	0.23	1.10	2.8	13.06	2.57	12.69	0.10	0.33	
0.24	0.24	1.23	3.3	13.93	2.65	13.55	0.11	0.35	
0.25	0.25	1.37	3.8	14.81	2.73	14.41	0.12	0.37	
0.26	0.26	1.52	4.3	15.69	2.82	15.27	0.12	0.38	
0.27	0.27	1.68	4.9	16.57	2.90	16.14	0.13	0.40	
0.28	0.28	1.84	5.5	17.45	2.98	17.00	0.14	0.42	
0.29	0.29	2.02	6.2	18.32	3.07	17.86	0.15	0.44	
0.30	0.30	2.20	6.9	19.20	3.15	18.72	0.15	0.45	
0.31	0.31	2.39	7.7	20.08	3.23	19.59	0.16	0.47	
0.32	0.32	2.59	8.6	20.96	3.31	20.45	0.17	0.49	
0.33	0.33	2.80	9.5	21.84	3.39	21.31	0.18	0.51	
0.34	0.34	3.02	10.5	22.71	3.48	22.17	0.19	0.53	
0.35	0.35	3.25	11.5	23.59	3.56	23.03	0.20	0.55	
0.36	0.36	3.48	12.7	24.47	3.64	23.90	0.21	0.57	
0.37	0.37	3.72	13.8	25.35	3.71	24.76	0.21	0.58	
0.38	0.38	3.98	15.1	26.23	3.79	25.62	0.22	0.60	
0.39	0.39	4.24	16.4	27.10	3.87	26.48	0.23	0.62	
0.40	0.40	4.50	17.8	27.98	3.95	27.35	0.24	0.64	
0.41	0.41	4.78	19.3	28.86	4.03	28.21	0.25	0.66	
0.42	0.42	5.06	21.2	28.88	4.18	28.21	0.27	0.69	
0.43	0.43	5.35	23.2	28.90	4.33	28.22	0.29	0.72	
0.45	0.45	5.91	27.4	28.94	4.63	28.23	0.33	0.78	
0.46	0.46	6.19	29.6	28.96	4.77	28.23	0.35	0.81	
0.47	0.47	6.48	31.8	28.98	4.91	28.24	0.37	0.84	standard curb
0.48	0.48	6.76	34.1	29.01	5.05	28.24	0.40	0.88	
0.49	0.49	7.04	36.5	29.03	5.19	28.25	0.42	0.91	
0.50	0.50	7.32	39.0	29.05	5.33	28.25	0.44	0.94	
0.51	0.51	7.61	41.5	29.07	5.46	28.26	0.46	0.97	
0.52	0.52	7.89	44.1	29.09	5.59	28.26	0.49	1.01	
0.53	0.53	8.17	46.7	29.11	5.72	28.27	0.51	1.04	
0.54	0.54	8.45	49.4	29.13	5.85	28.27	0.53	1.07	
0.55	0.55	8.74	52.2	29.15	5.98	28.28	0.55	1.10	
0.56	0.56	9.02	55.0	29.17	6.10	28.28	0.58	1.14	
0.57	0.57	9.30	57.9	29.19	6.23	28.29	0.60	1.17	

Mesa Avenoso at Open Range

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

MANNING'S N= .017 SLOPE= .0129

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.87	5	12.00	0.13	9	50.17	0.67
2	9.38	0.67	6	30.00	0.41	10	50.63	0.67
3	9.83	0.67	7	48.00	0.13	11	60.00	0.83
4	10.00	0.00	8	50.00	0.00	12	0.00	0.00

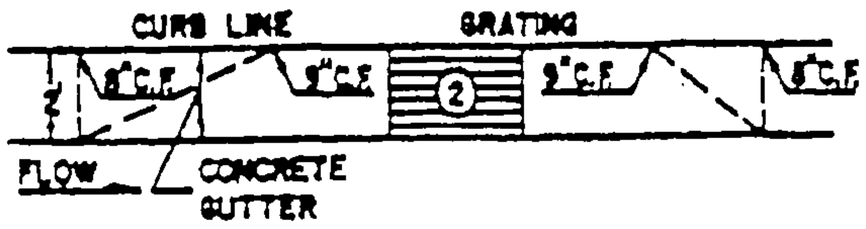
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.33	0.28	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.45	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.58	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.71	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	0.82	1.56	0.01	0.06
0.06	0.06	0.06	0.1	1.97	0.93	1.88	0.01	0.07
0.07	0.07	0.08	0.1	2.30	1.03	2.19	0.02	0.09
0.08	0.08	0.10	0.1	2.63	1.12	2.50	0.02	0.10
0.09	0.09	0.13	0.2	2.96	1.21	2.81	0.02	0.11
0.10	0.10	0.16	0.2	3.29	1.30	3.13	0.03	0.13
0.11	0.11	0.19	0.3	3.62	1.39	3.44	0.03	0.14
0.12	0.12	0.23	0.3	3.95	1.47	3.75	0.03	0.15
0.13	0.13	0.26	0.4	4.28	1.55	4.07	0.04	0.17
0.14	0.14	0.31	0.5	5.58	1.45	5.36	0.03	0.17
0.15	0.15	0.37	0.5	6.89	1.42	6.65	0.03	0.18
0.16	0.16	0.44	0.6	8.20	1.42	7.94	0.03	0.19
0.17	0.17	0.53	0.8	9.50	1.45	9.23	0.03	0.20
0.18	0.18	0.63	0.9	10.81	1.49	10.52	0.03	0.21
0.19	0.19	0.74	1.1	12.12	1.54	11.81	0.04	0.23
0.20	0.20	0.87	1.4	13.42	1.60	13.10	0.04	0.24
0.21	0.21	1.00	1.7	14.73	1.66	14.39	0.04	0.25
0.22	0.22	1.15	2.0	16.04	1.72	15.68	0.05	0.27
0.23	0.23	1.32	2.3	17.34	1.78	16.97	0.05	0.28
0.24	0.24	1.49	2.8	18.65	1.84	18.26	0.05	0.29
0.25	0.25	1.68	3.2	19.95	1.91	19.56	0.06	0.31
0.26	0.26	1.88	3.7	21.26	1.97	20.85	0.06	0.32
0.27	0.27	2.10	4.3	22.57	2.04	22.14	0.06	0.33
0.28	0.28	2.33	4.9	23.87	2.10	23.43	0.07	0.35
0.29	0.29	2.57	5.6	25.18	2.17	24.72	0.07	0.36
0.30	0.30	2.82	6.3	26.49	2.23	26.01	0.08	0.38
0.31	0.31	3.09	7.1	27.79	2.29	27.30	0.08	0.39
0.32	0.32	3.37	7.9	29.10	2.36	28.59	0.09	0.41
0.33	0.33	3.66	8.9	30.41	2.42	29.88	0.09	0.42
0.34	0.34	3.96	9.8	31.71	2.48	31.17	0.10	0.44
0.35	0.35	4.28	10.9	33.02	2.54	32.46	0.10	0.45
0.36	0.36	4.61	12.0	34.33	2.60	33.75	0.11	0.47
0.37	0.37	4.96	13.2	35.63	2.67	35.04	0.11	0.48
0.38	0.38	5.31	14.5	36.94	2.73	36.34	0.12	0.50
0.39	0.39	5.68	15.8	38.25	2.79	37.63	0.12	0.51
0.40	0.40	6.07	17.3	39.55	2.84	38.92	0.13	0.53
0.41	0.41	6.46	18.8	40.86	2.90	40.21	0.13	0.54
0.42	0.42	6.86	20.7	40.88	3.02	40.21	0.14	0.56
0.43	0.43	7.27	22.8	40.90	3.14	40.22	0.15	0.58
0.45	0.45	8.07	27.1	40.94	3.36	40.23	0.18	0.63
0.46	0.46	8.47	29.4	40.96	3.47	40.23	0.19	0.65
0.47	0.47	8.88	31.8	40.98	3.58	40.24	0.20	0.67
0.48	0.48	9.28	34.2	41.00	3.69	40.24	0.21	0.69
0.49	0.49	9.68	36.7	41.02	3.79	40.25	0.22	0.71
0.50	0.50	10.08	39.3	41.04	3.89	40.25	0.24	0.74
0.51	0.51	10.49	41.9	41.07	4.00	40.26	0.25	0.76
0.52	0.52	10.89	44.6	41.09	4.10	40.26	0.26	0.78
0.53	0.53	11.29	47.4	41.11	4.20	40.27	0.27	0.80
0.54	0.54	11.69	50.2	41.13	4.29	40.27	0.29	0.83
0.55	0.55	12.10	53.1	41.15	4.39	40.28	0.30	0.85
0.56	0.56	12.50	56.1	41.17	4.48	40.28	0.31	0.87
0.57	0.57	12.90	59.1	41.19	4.58	40.29	0.33	0.90

flow at inlet

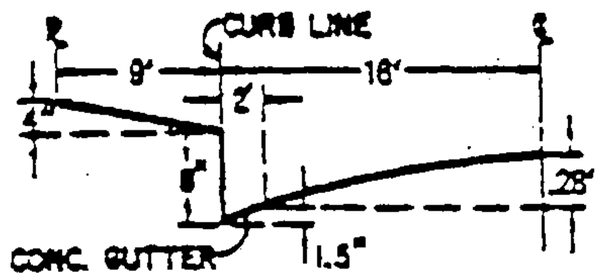
standard curb

Mesa Avenoso at Open Range

GRATING CAPACITIES FOR TYPE 'A', 'C' and 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

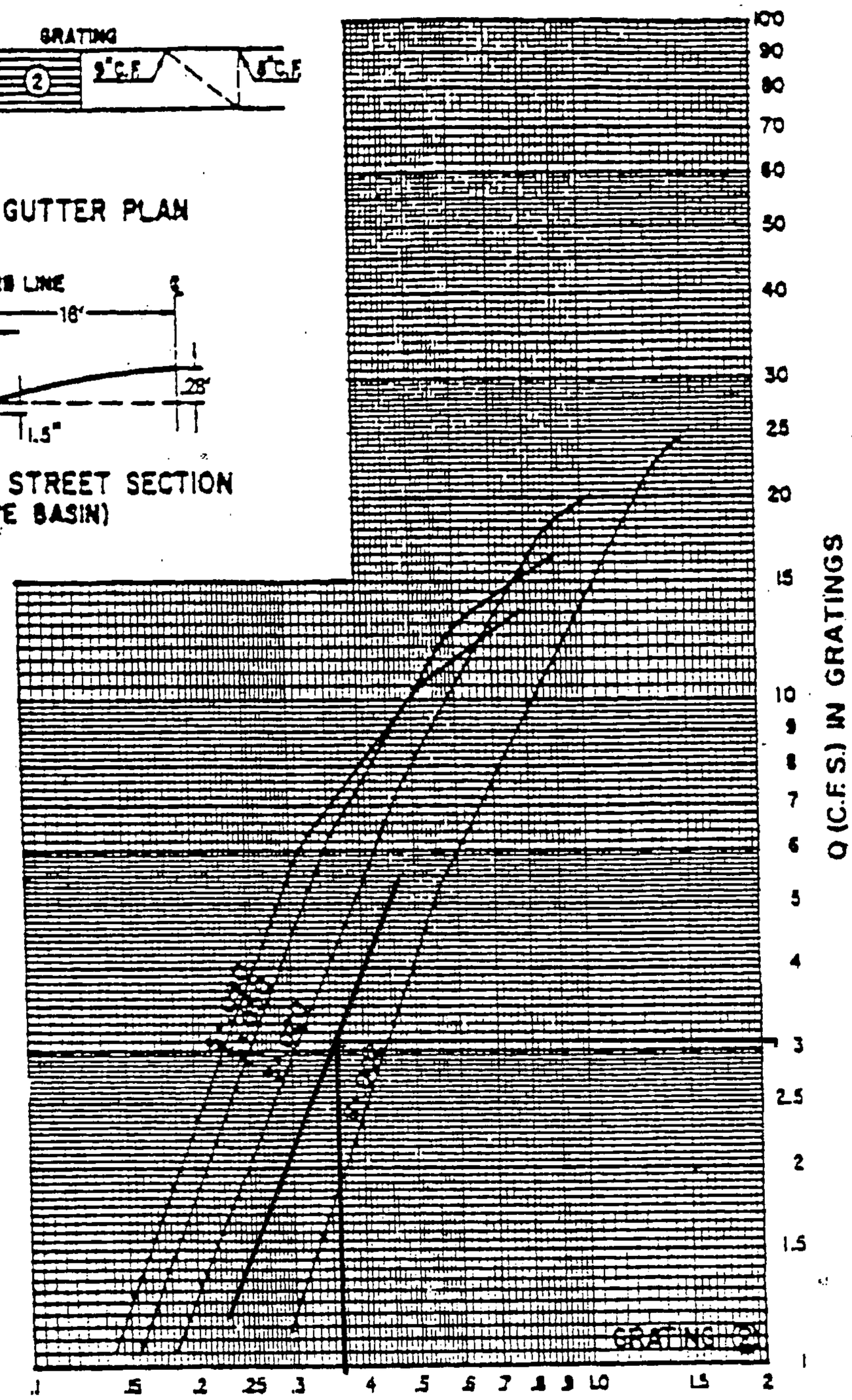


PLATE 22.3 D-5

S= 1.29%

D= 0.36'

Q= 3.1 cfs/grate

Mesa Avenoso at Amole Mesa

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

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.87	5	12.00	0.13	9	50.17	0.67
2	9.38	0.67	6	30.00	0.41	10	50.63	0.67
3	9.83	0.67	7	48.00	0.13	11	60.00	0.83
4	10.00	0.00	8	50.00	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)
0.01	0.01	0.00	0.0	0.33	0.19	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.30	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.40	0.94	0.00	0.03
0.04	0.04	0.03	0.0	1.32	0.48	1.25	0.00	0.04
0.05	0.05	0.04	0.0	1.64	0.56	1.56	0.00	0.05
0.06	0.06	0.06	0.0	1.97	0.63	1.88	0.01	0.07
0.07	0.07	0.08	0.1	2.30	0.70	2.19	0.01	0.08
0.08	0.08	0.10	0.1	2.63	0.77	2.50	0.01	0.09
0.09	0.09	0.13	0.1	2.96	0.83	2.81	0.01	0.10
0.10	0.10	0.16	0.1	3.29	0.89	3.13	0.01	0.11
0.11	0.11	0.19	0.2	3.62	0.95	3.44	0.01	0.12
0.12	0.12	0.23	0.2	3.95	1.00	3.75	0.02	0.14
0.13	0.13	0.26	0.3	4.28	1.06	4.07	0.02	0.15
0.14	0.14	0.31	0.3	5.58	0.99	5.36	0.02	0.16
0.15	0.15	0.37	0.4	6.89	0.97	6.65	0.01	0.16
0.16	0.16	0.44	0.4	8.20	0.97	7.94	0.01	0.17
0.17	0.17	0.53	0.5	9.50	0.99	9.23	0.02	0.19
0.18	0.18	0.63	0.6	10.81	1.02	10.52	0.02	0.20
0.19	0.19	0.74	0.8	12.12	1.05	11.81	0.02	0.21
0.20	0.20	0.87	0.9	13.42	1.09	13.10	0.02	0.22
0.21	0.21	1.00	1.1	14.73	1.13	14.39	0.02	0.23
0.22	0.22	1.15	1.3	16.04	1.17	15.68	0.02	0.24
0.23	0.23	1.32	1.6	17.34	1.21	16.97	0.02	0.25
0.24	0.24	1.49	1.9	18.65	1.26	18.26	0.02	0.26
0.25	0.25	1.68	2.2	19.95	1.30	19.56	0.03	0.28
0.26	0.26	1.88	2.5	21.26	1.35	20.85	0.03	0.29
0.27	0.27	2.10	2.9	22.57	1.39	22.14	0.03	0.30
0.28	0.28	2.33	3.3	23.87	1.43	23.43	0.03	0.31
0.29	0.29	2.57	3.8	25.18	1.48	24.72	0.03	0.32
0.30	0.30	2.82	4.3	26.49	1.52	26.01	0.04	0.34
0.31	0.31	3.09	4.8	27.79	1.56	27.30	0.04	0.35
0.32	0.32	3.37	5.4	29.10	1.61	28.59	0.04	0.36
0.33	0.33	3.66	6.0	30.41	1.65	29.88	0.04	0.37
0.34	0.34	3.96	6.7	31.71	1.69	31.17	0.04	0.38
0.35	0.35	4.28	7.4	33.02	1.73	32.46	0.05	0.40
0.36	0.36	4.61	8.2	34.33	1.78	33.75	0.05	0.41
0.37	0.37	4.96	9.0	35.63	1.82	35.04	0.05	0.42
0.38	0.38	5.31	9.9	36.94	1.86	36.34	0.05	0.43
0.39	0.39	5.68	10.8	38.25	1.90	37.63	0.06	0.45
0.40	0.40	6.07	11.8	39.55	1.94	38.92	0.06	0.46
0.41	0.41	6.46	12.8	40.86	1.98	40.21	0.06	0.47
0.42	0.42	6.86	14.1	40.88	2.06	40.21	0.07	0.49
0.43	0.43	7.27	15.6	40.90	2.14	40.22	0.07	0.50
0.45	0.45	8.07	18.5	40.94	2.29	40.23	0.08	0.53
0.46	0.46	8.47	20.1	40.96	2.37	40.23	0.09	0.55
0.47	0.47	8.88	21.7	40.98	2.44	40.24	0.09	0.56
0.48	0.48	9.28	23.3	41.00	2.51	40.24	0.10	0.58
0.49	0.49	9.68	25.0	41.02	2.59	40.25	0.10	0.59
0.50	0.50	10.08	26.8	41.04	2.66	40.25	0.11	0.61
0.51	0.51	10.49	28.6	41.07	2.73	40.26	0.12	0.63
0.52	0.52	10.89	30.4	41.09	2.79	40.26	0.12	0.64
0.53	0.53	11.29	32.3	41.11	2.86	40.27	0.13	0.66
0.54	0.54	11.69	34.2	41.13	2.93	40.27	0.13	0.67
0.55	0.55	12.10	36.2	41.15	2.99	40.28	0.14	0.69
0.56	0.56	12.50	38.2	41.17	3.06	40.28	0.15	0.71
0.57	0.57	12.90	40.3	41.19	3.12	40.29	0.15	0.72

Mesa Avenoso continued

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)
0.58	0.58	13.31	42.4	41.21	3.19	40.29	0.16	0.74
0.59	0.59	13.71	44.5	41.23	3.25	40.30	0.16	0.75
0.60	0.60	14.11	46.7	41.25	3.31	40.30	0.17	0.77
0.61	0.61	14.51	49.0	41.27	3.37	40.31	0.18	0.79
0.62	0.62	14.92	51.2	41.29	3.43	40.31	0.18	0.80
0.63	0.63	15.32	53.5	41.31	3.49	40.32	0.19	0.82
0.64	0.64	15.72	55.9	41.33	3.55	40.32	0.20	0.84
0.65	0.65	16.13	58.3	41.35	3.61	40.33	0.20	0.85
0.66	0.66	16.53	60.7	41.37	3.67	40.33	0.21	0.87
0.67	0.67	16.93	63.2	41.40	3.73	40.34	0.22	0.89
0.68	0.68	17.34	64.7	42.45	3.73	42.30	0.22	0.90
0.69	0.69	17.76	66.2	43.50	3.73	43.36	0.22	0.91
0.70	0.70	18.22	67.0	45.47	3.68	44.41	0.21	0.91
0.71	0.71	18.67	68.8	46.52	3.68	45.47	0.21	0.92
0.72	0.72	19.13	70.5	47.58	3.69	46.52	0.21	0.93
0.73	0.73	19.60	72.4	48.63	3.69	47.58	0.21	0.94
0.74	0.74	20.08	74.3	49.69	3.70	48.63	0.21	0.95
0.75	0.75	20.57	76.3	50.74	3.71	49.69	0.21	0.96
0.76	0.76	21.07	78.3	51.80	3.72	50.74	0.21	0.97
0.77	0.77	21.59	80.5	52.85	3.73	51.80	0.22	0.99
0.78	0.78	22.11	82.6	53.91	3.74	52.85	0.22	1.00
0.79	0.79	22.64	84.9	54.96	3.75	53.91	0.22	1.01
0.80	0.80	23.19	87.2	56.02	3.76	54.96	0.22	1.02
0.81	0.81	23.74	89.6	57.07	3.77	56.01	0.22	1.03
0.82	0.82	24.31	92.0	58.13	3.79	57.07	0.22	1.04
0.83	0.83	24.88	94.6	59.18	3.80	58.12	0.22	1.05
0.84	0.84	25.47	97.8	59.65	3.84	58.59	0.23	1.07
0.85	0.85	26.06	101.0	60.12	3.88	59.06	0.23	1.08
0.86	0.86	26.65	104.4	60.59	3.92	59.53	0.24	1.10
0.87	0.87	27.25	107.7	61.06	3.95	60.00	0.24	1.11

Standard curb

APPENDIX C

INFRASTRUCTURE LISTS

urre
Project No. _____

te S _____ 3, 20

Date Site Plan Approved: _____

Date Preliminary Plat Approved: _____

Date Preliminary Plat Expiers: _____

DRB Project No. _____

APPLICATION NO.

Figure 12

INFRASTRUCTURE LIST

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

EL RANCHO GRANDE UNIT 14 SUBDIVISION
PRELIMINARY PLAT

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 DRC 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 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.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC ROADWAY IMPROVEMENTS						
		30' EOA-F	ARTERIAL PAVING W/ PCC CURB & GUTTER AND PCC 6' WIDE SIDEWALK ON SOUTH SIDE ONLY	GIBSON BOULEVARD	MESSINA DRIVE	MESA ARENOSO DR	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON EAST SIDE ONLY	MESSINA DRIVE	GIBSON BOULEVARD	SOUTH BOUNDARY	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON WEST SIDE ONLY	MESA ARENOSO DR	GIBSON BOULEVARD	SOUTH BOUNDARY	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY*	SANDY RIDGE RD	WEST STUB TERMINUS	GHOST RANCH ST	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SANDY RIDGE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY*	SANDY RIDGE RD	BLUE SKY ST	EAST STUB TERMINUS	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	GHOST RANCH ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BLUE SKY ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SANDY CREEK RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		46' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES AND MEDIAN CURB	SANDY CREEK RD	BLUE SKY ST	MESA ARENOSO DR	/	/	/

Sequence #	DRC Project #		T	'mpro				Pri Inspector	Inspector	nst Engineer
		46' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES AND MEDIAN CURB	SANDY TRAIL RD	MESSINA DRIVE	GHOST RANCH ST		/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SANDY TRAIL RD	GHOST RANCH ST	BLUE SKY ST		/	/	/
			* SIDEWALKS TO BE DEFERRED PER DEFERRAL EXHIBIT 'B'. WAIVER OF SIDEWALK ON SOUTH SIDE OF SANDY RIDGE RD STUBS.					/	/	/
			STREET LIGHTS AS PER COA DPM							

ONSITE PUBLIC STORM DRAIN IMPROVEMENTS

		18"-48" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESSINA AVE	GIBSON BLVD	SOUTH BOUNDARY	/	/	/
		18"-42" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	BLUE SKY ST	SANDY CREEK RD	SOUTH BOUNDARY	/	/	/
		18" - 24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	SANDY CREEK RD	50' WEST OF BLUE SKY	BLUE SKY ST	/	/	/
			2.9 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**EL RANCHO GRANDE TRACT 15**			/	/	/
			0.55 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**EL RANCHO GRANDE TRACTS 15 AND 16**			/	/	/

NOTE: A GRADING AND DRAINAGE CERTIFICATION OF THE APPROVED GRADING PLAN IS REQUIRED PRIOR TO THE RELEASE OF FINANCIAL GUARANTEES.

THERE WILL BE NO RELEASE OF FINANCIAL GUARANTEE OR SIA UNTIL AGREEMENT IS PROCESSED AND APPROVED WITH AMAFCA FOR CONSTRUCTION OF THE AMOLE ARROYO IMPROVEMENTS.

Sequence #	DRC Project #						Pri Inspector	Inspector	nst Engineer
		ONSITE PUBLIC WATERLINE IMPROVEMENTS							
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GIBSON BOULEVARD	MESA ARENOSO DR	DESERT RANCH STREET	/	/	/
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	MESA ARENOSO DR	GIBSON BOULEVARD	PUBLIC WATERLINE EASEMENT	/	/	/
		4-8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SANDY RIDGE RD	WEST STUB TERMINUS	EAST STUB TERMINUS	/	/	/
		8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GHOST RANCH ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BLUE SKY ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SANDY CREEK RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SANDY TRAIL RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
							/	/	/
		ONSITE PUBLIC SANITARY SEWER IMPROVEMENTS							
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SANDY RIDGE RD	WEST STUB TERMINUS	EAST STUB TERMINUS	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	GHOST RANCH ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLUE SKY ST	SANDY RIDGE RD	SOUTH BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SANDY CREEK RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SANDY TRAIL RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OFFSITE PUBLIC EASEMENT	SOUTH BOUNDARY BLUE SKY ST	BLAKE ROAD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLAKE ROAD	OFFSITE PUBLIC EASEMENT	BUTCH CASSIDY DR	/	/	/
							/	/	/

SCOTT STEFFEN	10/09/03				
PREPARED BY: PRINT NAME	DATE	DRB CHAIR	DATE	PARKS & RECREATION DEPARTMENT	DATE
BOHANNAN HUSTON INC.					
FIRM:		TRANSPORTATION DEVELOPMENT	DATE	AMAFCA	DATE
SIGNATURE	DATE	UTILITY DEVELOPMENT	DATE	CITY ENGINEER	DATE
MAXIMUM TIME ALLOW TO CONSTRUCT IMPROVEMENTS WITHOUT A DRB EXTENSION		NEW MEXICO UTILITIES INC.	DATE		DATE

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT/OWNER

Curre
Project No. _____

ate S : _ 9, 20

Date Site Plan Approved: _____

Date Preliminary Plat Approved: _____

Date Preliminary Plat Expiers: _____

DRB Project No. _____

APPLICATION NO.

Figure 12

INFRASTRUCTURE LIST

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

EL RANCHO GRANDE UNIT 15 SUBDIVISION
PRELIMINARY PLAT

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 DRC 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 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.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC ROADWAY IMPROVEMENTS						
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY	AMOLE MESA AVE	MESSINA DR	MESA ARENOSO DR	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON EAST SIDE ONLY	MESSINA DRIVE	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON WEST SIDE ONLY	MESA ARENOSO DR	GIBSON BLVD	AMOLE MESA AVE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SOLITUDE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		32' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES	OPEN RANGE AVE	GHOST RANCH ST	BLUE SKY ST	/	/	/
		46' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES	OPEN RANGE AVE	BLUE SKY ST	MESA ARENOSO DR	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	GHOST RANCH ST	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BLUE SKY ST	NORTH BOUNDARY	LONE TREE RD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SILVER STAR DR	SOLITUDE RD	LONE TREE RD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	LONE TREE RD	SILVER STAR DR	BLUE SKY ST	/	/	/

SIA Sequence	COA DRC Project	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK SOUTH SIDE ONLY*	LONE TREE RD	WEST STUB TERMINUS	SILVER STAR DR	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK SOUTH SIDE ONLY*	LONE TREE RD	BLUE SKY ST	EAST STUB TERMINUS	/	/	/
			* SIDEWALKS TO BE DEFERRED PER DEFERRAL EXHIBIT 'B'. WAIVER OF SIDEWALK ON NORTH SIDE OF LONE TREE RD STUBS.				/	/	/
			STREET LIGHTS AS PER COA DPM						

ONSITE PUBLIC STORM DRAIN IMPROVEMENTS

		18"-48" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESSINA DR	NORTH BOUNDARY	OPEN RANGE AVE	/	/	/
		18"-54" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	OPEN RANGE AVE	MESSINA DR	MESA ARENOSO DR	/	/	/
		18" - 30" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	BLUE SKY ST	NORTH BOUNDARY	150' NORTH OF LONE TREE	/	/	/
		36" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESA ARENOSO DR	50' SOUTH OF OPEN RANGE AVE	OPEN RANGE AVE	/	/	/
			6.5 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**TRACT 33C-1-A LANDS OF CURB INC.**			/	/	/
			0.57 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	**TRACT 30A-1 LANDS OF SALAZAR**			/	/	/

NOTE: A GRADING AND DRAINAGE CERTIFICATION OF THE APPROVED GRADING PLAN IS REQUIRED PRIOR TO THE RELEASE OF FINANCIAL GUARANTEES.

THERE WILL BE NO RELEASE OF FINANCIAL GUARANTEE OR SIA UNTIL AGREEMENT IS PROCESSED AND APPROVED WITH AMAFCA FOR CONSTRUCTION OF THE AMOLE ARROYO IMPROVEMENTS.

Sequence #	DRC Project #		Impr	n			Pri Inspector	Inspector	Cnst Engineer
		ONSITE PUBLIC WATERLINE IMPROVEMENTS							
		8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GHOST RANCH ST	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BLUE SKY ST	NORTH BOUNDARY	LONE TREE RD	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SILVER STAR DR	SOLITUDE RD	LONE TREE RD	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	SOLITUDE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OPEN RANGE AVE	GHOST RANCH ST	MESA ARENOSO DR	/	/	/
		4-6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	LONE TREE RD	WEST STUB TERMINUS	EAST STUB TERMINUS	/	/	/
		20" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	MESA ARENOSO DR	OPEN RANGE AVE	AMOLE MESA AVE	/	/	/
		8" DIA*	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OFFSITE PUBLIC EASEMENT	INTERSECTION OF GIBSON BLVD AND MESSINA DRIVE	NORTH BOUNDARY	/	/	/
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GIBSON BOULEVARD	MESA ARENOSO DR	DESERT RANCH STREET	/	/	/
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	MESA ARENOSO DR	GIBSON BOULEVARD	PUBLIC WATERLINE EASEMENT	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	OFFSITE PUBLIC EASEMENT	MESA ARENOSO DR	NORTH BOUNDARY	/	/	/
							/	/	/

* DEFERRED ITEM

Sequence #	DRC Project #	T mpro					Pri Inspector	Inspector	nst Engineer
		ONSITE PUBLIC SANITARY SEWER IMPROVEMENTS							
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	GHOST RANCH ST	NORTH BOUNDARY	AMOLE MESA AVE	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLUE SKY ST	NORTH BOUNDARY	LONE TREE RD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SILVER STAR DR	SOLITUDE RD	LONE TREE RD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	SOLITUDE RD	GHOST RANCH ST	BLUE SKY ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OPEN RANGE AVE	GHOST RANCH ST	MESA ARENOSO DR	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	OFFSITE PUBLIC EASEMENT	MESA ARENOSO DR	BLAKE ROAD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BLAKE ROAD	OFFSITE PUBLIC EASEMENT	BUTCH CASSIDY DR	/	/	/
							/	/	/

SCOTT STEFFEN	10/09/03				
PREPARED BY: PRINT NAME	DATE	DRB CHAIR	DATE	PARKS & RECREATION DEPARTMENT	DATE
BOHANNAN HUSTON INC.					
FIRM:		TRANSPORTATION DEVELOPMENT	DATE	AMAFCA	DATE
SIGNATURE	DATE	UTILITY DEVELOPMENT	DATE	CITY ENGINEER	DATE
MAXIMUM TIME ALLOW TO CONSTRUCT IMPROVEMENTS WITHOUT A DRB EXTENSION		NEW MEXICO UTILITIES INC.	DATE		DATE

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT/OWNER

Exhibits

EXHIBITS

EXHIBIT 1 - PRELIMINARY PLATS

EXHIBIT 2 - GRADING PLANS

EXHIBIT 3 - DEVELOPED CONDITIONS BASIN MAP

EXHIBIT 1

PRELIMINARY PLATS

EXHIBIT 2

GRADING PLANS

EXHIBIT 3

DEVELOPED CONDITIONS BASIN MAP

Bohannan ▲ Huston INC.

Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335

www.bhinc.com

voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332