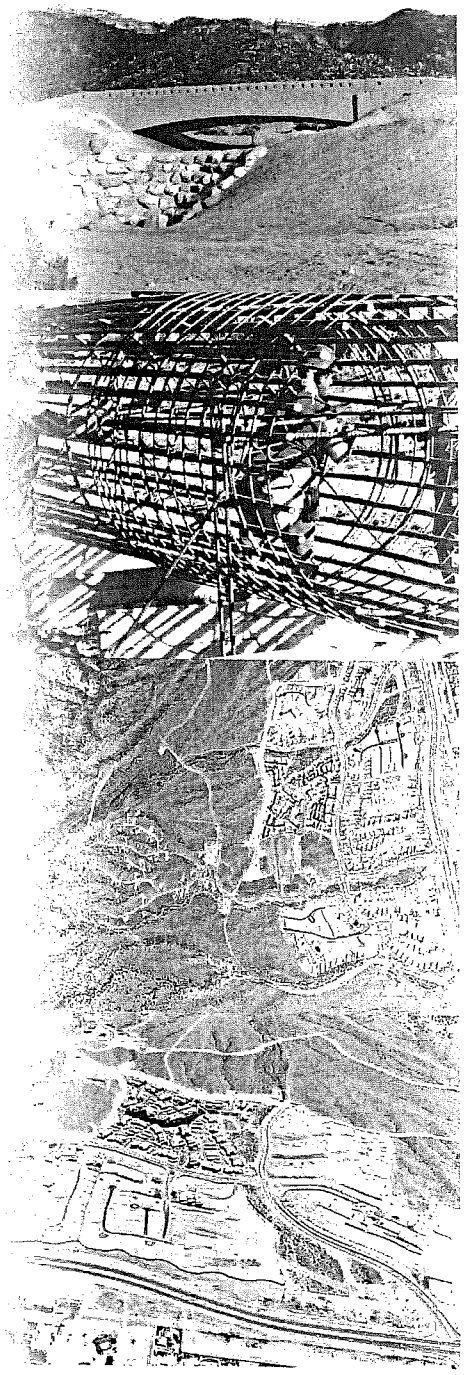
DRAINAGE STUDY FOR SIERRA RANCH SUBDIVISION



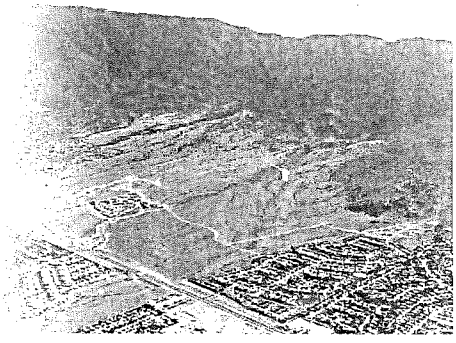
DECEMBER 16, 2004

Prepared for:

Curb Inc.
5160 San Francisco NE
Albuquerque, NM 87109

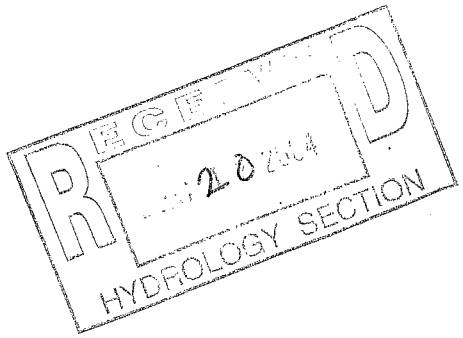
Bohannan Huston INC.

ENGINEERING
SPATIAL DATA
ADVANCED TECHNOLOGIES



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

May 24, 2004



Mr. Bo K. Johnson, P.E.
Curb, Inc.
5160 San Francisco DR. NE
Albuquerque, NM 87109

RE: Water and Sewer Availability Statement N-8
Tract 1A, 1B, 1C and 1D of the Lands of Rio Bravo Partners

Mr. Johnson:

Project Information: The project site consists of approximately 103 acres of undeveloped property both north and south of Gibson west of Messina in southwest Albuquerque. Current zoning is R-LT as governed by the Rio Bravo Sector Plan. Recent sketch plat submittals have suggested that this site will be subdivided into approximately 590 individual lots which will be developed as single family residences. Please be advised that this configuration will not be allowed due to the fact that some of these proposed lots would be located above serviceable elevations. Based on the existing topography, the dwellings within tracts 1B and 1C will have pad elevations between 5,160 and 5,255 feet and will be serviceable within the 2W pressure zone. Tracts 1A and 1D are located within the 3W pressure zone and are, therefore, not serviceable.

Existing Conditions: As of the date of this correspondence, there are no existing structures present on-site. Nearby construction projects include the El Rancho Grande subdivisions as well as a 20- / 18-inch bottom of zone water transmission line which will supply pressure zones 2W and 2WR. Please refer to project number 679581 for specifics regarding this line. The Snow Vista sanitary sewer interceptor, which will be the outfall for the region, is currently in the design phase and will be located east of the site.

Metered Water Service will be contingent on the completion and acceptance of the improvements associated with the adjacent El Rancho Grande developments and the 18-inch bottom of zone transmission line in Mesa Arenosco Drive. Service to tracts 1B and 1C will require the extension of a 20-inch Master Plan top of zone 2W line south from Cartagena to Gibson. At Gibson, the line will reduce to an 18-inch and proceed west across the northern frontage of tract 1B. A 12-inch must also be constructed south of tract 1C from the 18-inch Mesa Arenosco line west to the southwest corner of tract 1C. In addition to the perimeter lines described, looped water lines must be constructed at standard locations within each of the rights-of-way internal to the subdivision. Internal lines for tract 1B will connect to both the 20-inch top of zone line and the proposed 8-inch main in Messina. Internal lines for tract 1C will be connected to both the 18-inch top of zone line and the new 12-inch line to the south. These lines will be a combination of 8-inch and 6-inch mains to which routine service connections may be made.

Sanitary Sewer Service will be contingent on the completion and acceptance of the Snow Vista Interceptor and the improvements associated with the adjacent El Rancho Grande developments. Minimum 8-inch collectors along with manholes at regular intervals must be constructed within each of the rights-of-way internal to the subdivision. The sewer lines within tract 1B will outfall to the southern 8-inch line in Unit 11. Tract 1C will outfall to the 10-inch at the southwest corner

of Unit 15. Upon completion and acceptance of each of these improvements, service for each parcel will be available via routine connection.

Fire Protection: Fire flow rates are determined by the Fire Marshal based on both the size and type of construction. In addition to fire hydrants located at each street intersection, additional hydrants will be required so as not to exceed a maximum distance of 500 feet from any given structure. This distance is measured as the fire equipment travels. The precise number and location of each fire hydrant must be coordinated with the Fire Marshal and approved prior to DRC approval.

Design and Construction of all required improvements will be at the developer / property owner's expense and must be coordinated through the City of Albuquerque via the DRC / City Work Order process. Both water and sewer stubs to each property must be included with the design of the new lines. Designs must be by a New Mexico registered professional engineer. Construction must be by a licensed, bonded public utility contractor.

Easements: City of Albuquerque public water and sewer easements are required for all public lines to be constructed outside of dedicated rights-of-way. Minimum easement widths shall be 20-feet where single service lines are to be constructed and 25-feet where both water and sewer lines are included. Acceptable easements must be documented prior to DRC approval.

Utility Expansion Charges: In addition to installation and construction costs, both sanitary sewer and metered water service to each property will be subject to Utility Expansion Charges (UEC). These charges are payable at the time service is requested and will be based on the ordinances in effect at the time of connection.

Pro Rata Charges: Any and all outstanding pro rata charges assessed towards this property will be due at the time of development. The costs of perimeter and off-site water and sanitary sewer lines may be prorated against adjacent benefiting properties. Such assessments must be requested at the time of development in order to be considered.

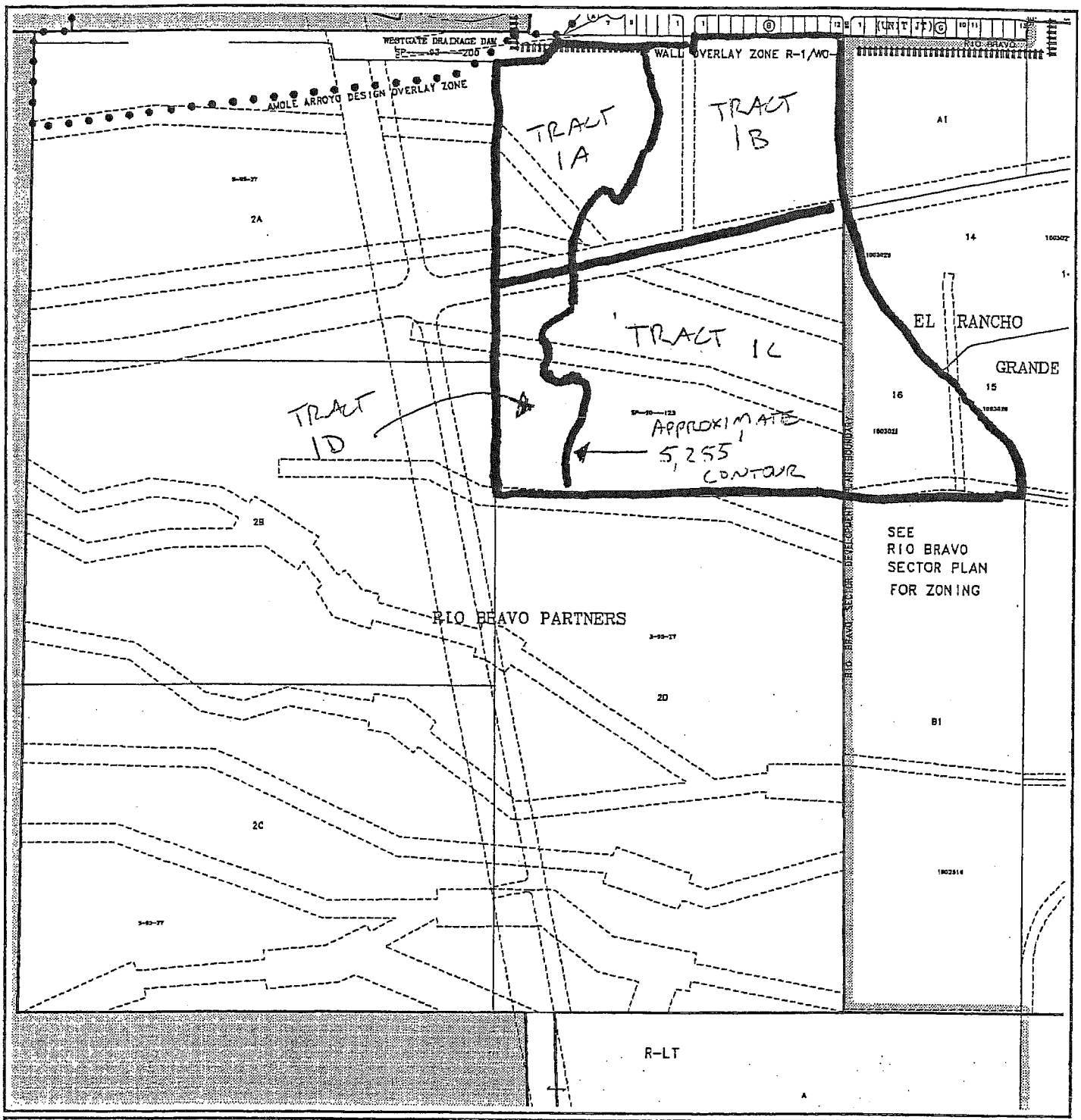
Closure: This statement of availability will remain in effect for a period of one (1) year from the date of issue and applies only to the development identified herein. Its validity is, in part, contingent upon the continuing accuracy of the information supplied by the developer. Changes in the proposed development may require reevaluation of availability and should be brought to the attention of the Utility Development Section of the City of Albuquerque as soon as possible. Any outstanding pro rata and standby assessments must be paid at the time service is taken. All charges and rates collected will be based on the ordinances and policies in effect at the time service is actually requested and authorized.

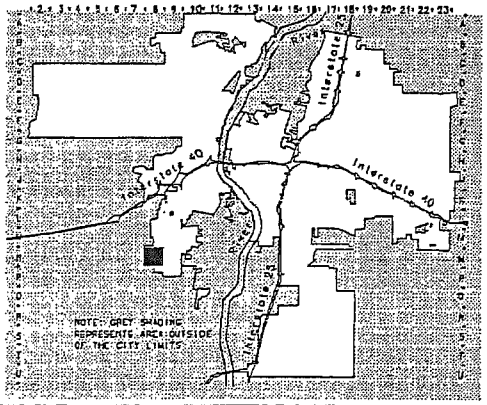
Please feel free to contact the undersigned at (505) 924-3987, or by fax at (505) 924-3864 if you have questions regarding the information presented herein or need additional information.

Sincerely,

Jeremy Hoover, E.I.T.
Engineering Associate
Utility Development Services
Public Works Department

Cc: Christian J. Sholtis, P.E. – Bohannan Huston
f/ availability N-8
f/ readers #40405
f/ DRB #1003429





CITY OF ALBUQUERQUE · NEW MEXICO · 1706

GRAPHIC SCALE IN FEET

250 0 750 1000

Albuquerque Geographic Information System

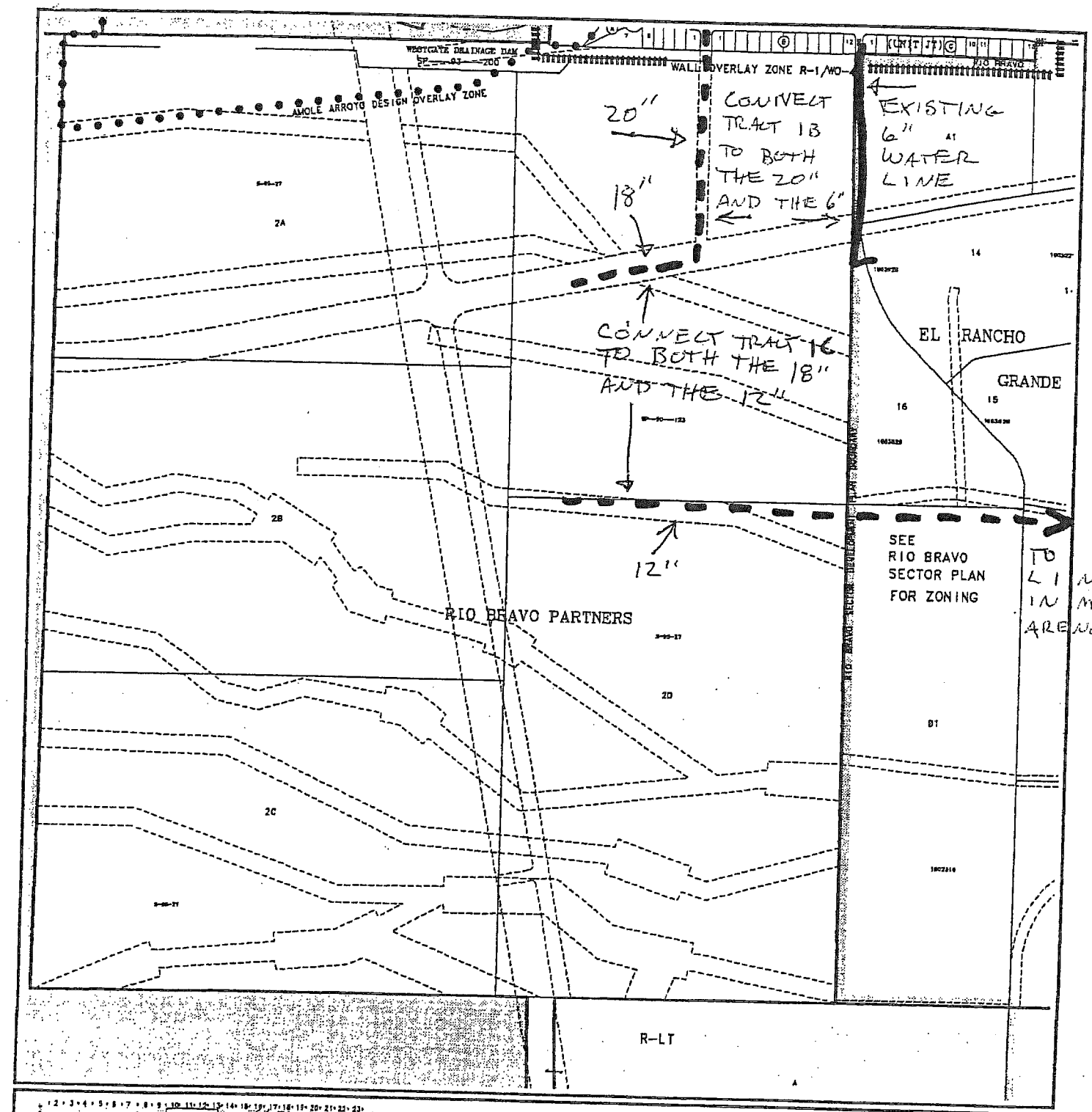
PLANNING DEPARTMENT

Zone Atlas Page

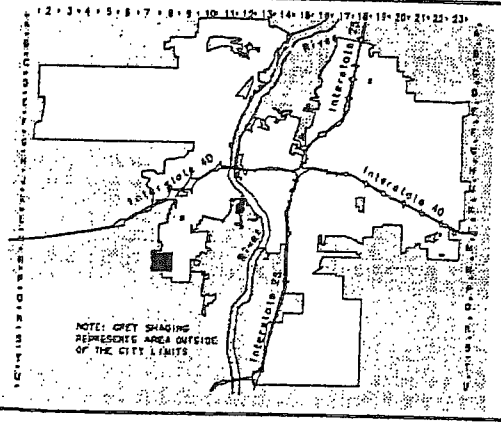
N-8-Z

Map Amended through May 05, 2004

SITE MAP



TO 12" LINE IN MESA AREA



CITY OF ALBUQUERQUE · NEW MEXICO · 1706

GRAPHIC SCALE IN FEET

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Albuquerque Geographic Information System

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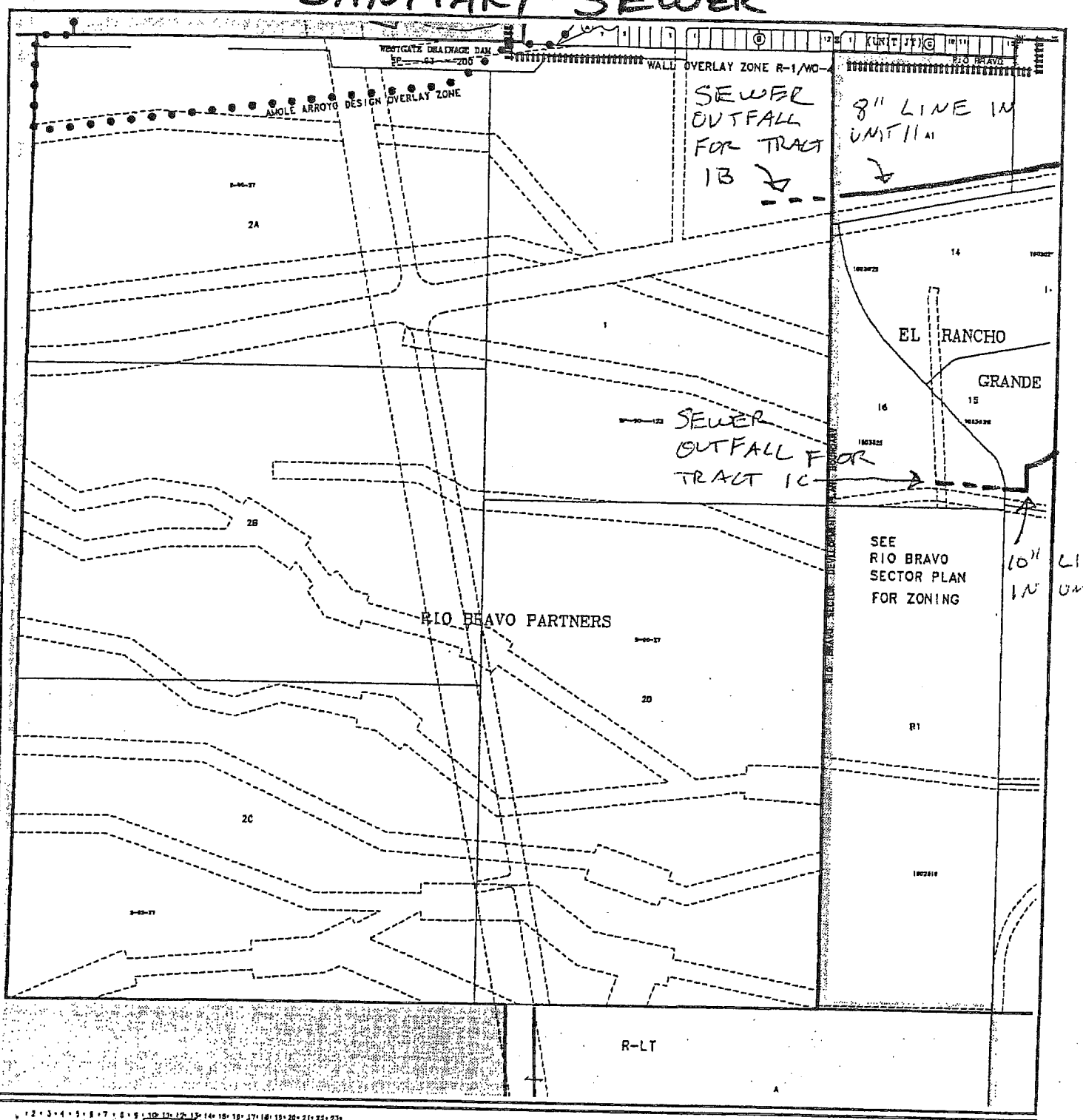
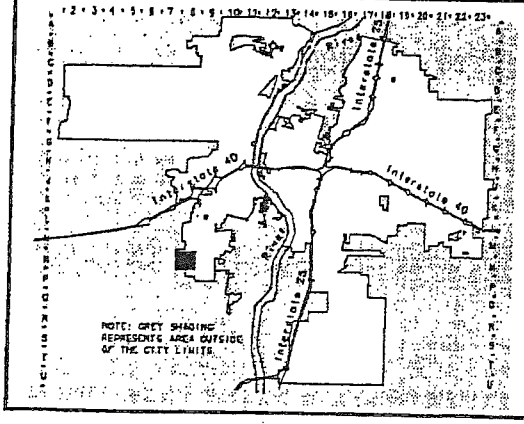
Zone Atlas Page

N-8-Z

Map Amended through May 05, 2004

SANITARY SEWER





CITY OF ALBUQUERQUE · NEW MEXICO · 1706

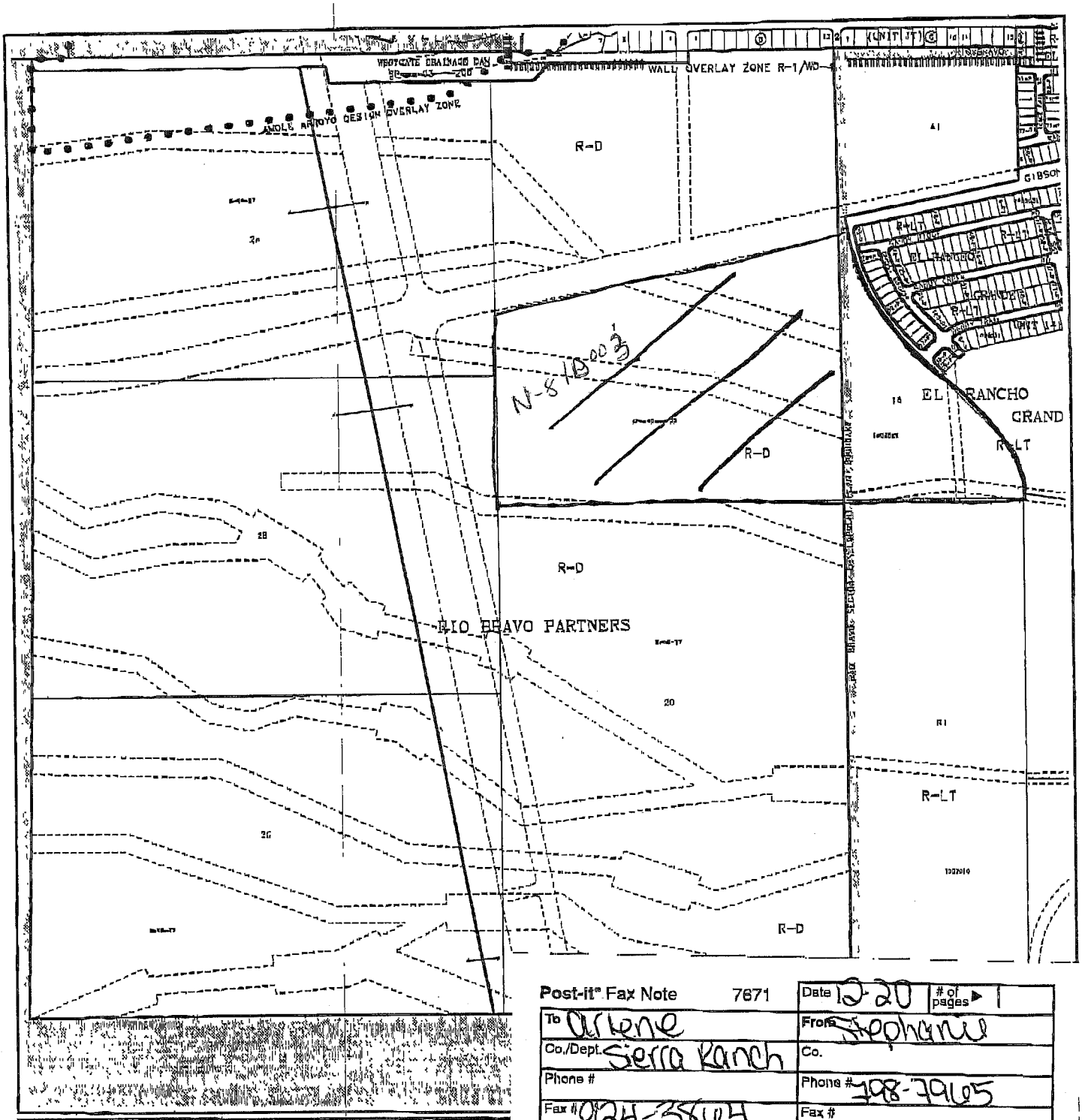
Albuquerque Geographic Information System
PLANNING DEPARTMENT

GRAPHIC SCALE IN FEET
250 0 750 1000

Zone Atlas Page

N-8-Z

Map Amended through May 05, 2004



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To Arlene	From Stephanie	
Co./Dept. Serra Ranch	Co.	
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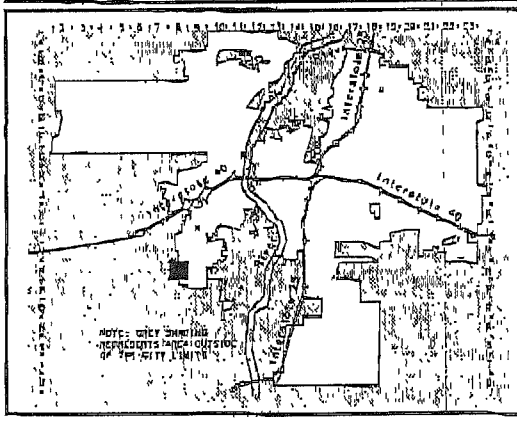
Fax # 924-3804	Fax #	



CITY OF ALBUQUERQUE 1706 NEW MEXICO

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A Municipal Geographic Information System
PLANNING DEPARTMENT

Zone Atlas Page

N-8-Z

Map Amended through December 03, 2004

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: SIERRA RANCH SUBDIVISION ZONE MAP/DRG. FILE # N-8/03
DRB #_____ EPC#:_____ WORK ORDER#:_____

LEGAL DESCRIPTION: El Rancho Grande Tracts 16B and 16C, Town of Atrisco Grant
CITY ADDRESS: South of Gibson Blvd., East of 118th Street, West of Messina Drive, North of Amole Mesa Avenue

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Scott Steffen
ADDRESS: 7500 Jefferson NE – Courtyard I 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:_____ 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
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- _____ 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)

Rec'd 12-20-04

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- _____ YES
- _____ NO
- _____ COPY PROVIDED

DATE SUBMITTED: December 16, 2004 BY: Scott Steffen

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.

DRAINAGE STUDY
FOR
SIERRA RANCH SUBDIVISION

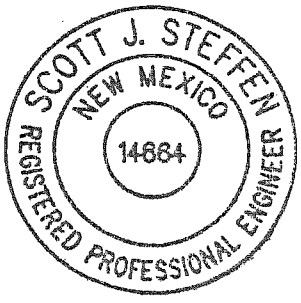
DECEMBER 16, 2004

Prepared for:

CURB INC.
5160 SAN FRANCISCO NE
ALBUQUERQUE, NM 87109

Prepared by:

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



PREPARED BY:

Scott Steffen, P.E. 12/16/04 Date

1-25-05

TABLE OF CONTENTS

APPENDICES

EXHIBITS

I. INTRODUCTION

This drainage study establishes a drainage management plan for the proposed development of Sierra Ranch. This subdivision is approximately 71 acres of residential (R-LT, R-D) land to be subdivided into 383 single family residential lots. The property is adjacent to the Rio Bravo Sector Plan and is located on Albuquerque's southwest mesa, south of the future Gibson Boulevard and east of 118th Street. Sierra Ranch is in the Amole Arroyo Watershed and encompassed by the Amole-Hubbell Drainage Management Plan.

This study provides hydrologic and hydraulic analysis and provides a drainage management plan as necessary to support the planned 383-unit development. 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 project. 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

Sierra Ranch is currently undeveloped land with grades ranging from approximately 3% to 6%. 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

Sierra Ranch is located in the Amole Arroyo Drainage Basin. The site generally drains from northwest to southeast. Areas to the east are currently being developed as residential subdivisions. Areas to the north and west of the site are currently undeveloped and discharge undeveloped runoff through the site.

IV. PROPOSED DEVELOPED CONDITIONS

Sierra Ranch subdivision is a proposed single-family residential development with 383 lots on 71 acres. Proposed street configurations are shown on the *Preliminary Plat*, **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 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 Sierra Ranch on these sides. The offsite flow from the north will be intercepted by El Rancho Grande Unit 16 or a temporary pond on that property. If Unit 16 or Gibson Blvd. is built before Sierra Ranch, then the undeveloped runoff from the north

offsite basin (See Offsite Basin Map) will be contained or intercepted by others. If Sierra Ranch is developed before Unit 16, then the undeveloped runoff from the north offsite basin will be contained by a temporary pond within Unit 16. This pond has been sized to contain flows produced from a 100-year 6-hour design storm. If a larger storm occurs, the pond will overflow to the Gibson Blvd. right-of-way.

The property to the west of Sierra Ranch is currently undeveloped. Temporary ponds will be placed to capture the western offsite historic flows until that property develops or 118th Street is built. Since Sierra Ranch will be developed with two phases, each phase must be analyzed separately for offsite flows.

When Phase 1 is developed, the offsite undeveloped flows from Phase 2 and offsite basins 3 and 4 will be contained with a temporary pond on Phase 2. If the Phase 1 development occurs before 118th Street is built, then the temporary pond on Phase 2 will be increased to accommodate additional undeveloped runoff from offsite basins 1 and 2. This pond (See Offsite Basin Map) has been sized to contain flows produced from a 100-year 6-hour design storm. If a larger storm occurs, the pond will overflow to the right-of-way of Walnut Canyon Road.

When Phase 2 is developed, the historic runoff from offsite basins 3 and 4 will be contained with temporary ponds on the property to the west of Phase 2 or the ponds will be located in Phase 2 on encumbered lots. If the Phase 2 development occurs before 118th Street is built, additional temporary ponds will be built on the adjacent parcel within the existing 150' drainage easement to accommodate runoff from offsite basins 1 and 2. These ponds are sized to contain twice the 100-year, 6-hour storm.

The Sierra Ranch subdivision is required to accept developed flows from the western offsite parcel. A storm drain stub will be provided through an easement at the western side of the subdivision. This storm drain will be sized to accept fully developed residential flows from the offsite parcel, based on current zoning.

B. Onsite Flows

Developed runoff from Sierra Ranch will be conveyed by the internal street system to Bison Springs Street, where it will be collected by a public storm drain system. See **Appendix B** for street capacity and inlet capacity calculations. This drainage plan proposes discharging 250 cfs to the storm drain in Messina Drive. Portions of Gibson Blvd., Messina Drive, and Amole Mesa will also discharge into the master storm drain system. (See Basin Map A for contributing basins.) The storm drain is part of the master planned system and has been designed to accept all of the developed runoff from Sierra Ranch.

A surge pond located in the park at the southeast corner of the subdivision is connected to the outfall storm drain system in Messina Drive. No developed flows from Sierra Ranch will directly discharge into the pond. The 100-year, 6-hour storm peak flow in the Messina Drive storm drain upstream of the surge pond is 514 cfs. The storm drain system downstream of the surge pond is designed to pass 226 cfs before the hydraulic grade line of the system rises to a level that water will surge into the pond. The peak flow of the 2-year storm is 171 cfs. The peak flow of the 5-year storm is 250 cfs. The storage volume required for the surge pond is 4.2 acre-feet. See **Exhibit 2**, *Grading Plan*, for the location of the pond.

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.

V. CONCLUSION

This report provides a detailed study of the developed runoff and street capacities for the proposed Sierra Ranch Subdivision. 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

N

500 250 0 500

1" = 500'

ZONE X

ZONE AO (DEPTH 2)

LIMIT OF DETAILED STUDY

ZONE AO (DEPTH 2)

ZONE AO (DEPTH 3)

ZONE A

100-YEAR FLOOD CONFINED TO CONSTRUCTED CHANNEL

PROPOSED EL RANCHO GRANDE UNIT NO. 10

PROPOSED EL RANCHO GRANDE UNIT NO. 11

GIBSON BLVD.

BLAKE ROAD

BERNALILLO COUNTY UNINCORPORATED AREAS 350001

CITY OF ALBUQUERQUE 350002

BERNALILLO COUNTY

CITY OF ALBUQUERQUE

CORPORATE LIMITS

ZONE X

ZONE A

ZONE AO (DEPTH 3)

DE ANZA DRIVE

SNOW VISTA BOULEVARD

LADRONES COURT

LADRONES STREET

LADRONES PLACE

DEL REY ROAD

VALTIERRA PLACE

TOVAR PLACE

ANACONDA ROAD

ANAYA STREET

BENITO STREET

DELGADO

CANYON

ELFEGO

CATALINA PLACE

PECOS TRAIL

RIO PUERCO

GUADIANA PLACE

CARTAGENA AVENUE

MESSINA DRIVE

Arroyo

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 336 OF 825
(SEE MAP INDEX FOR PANELS NOT PRINTED)

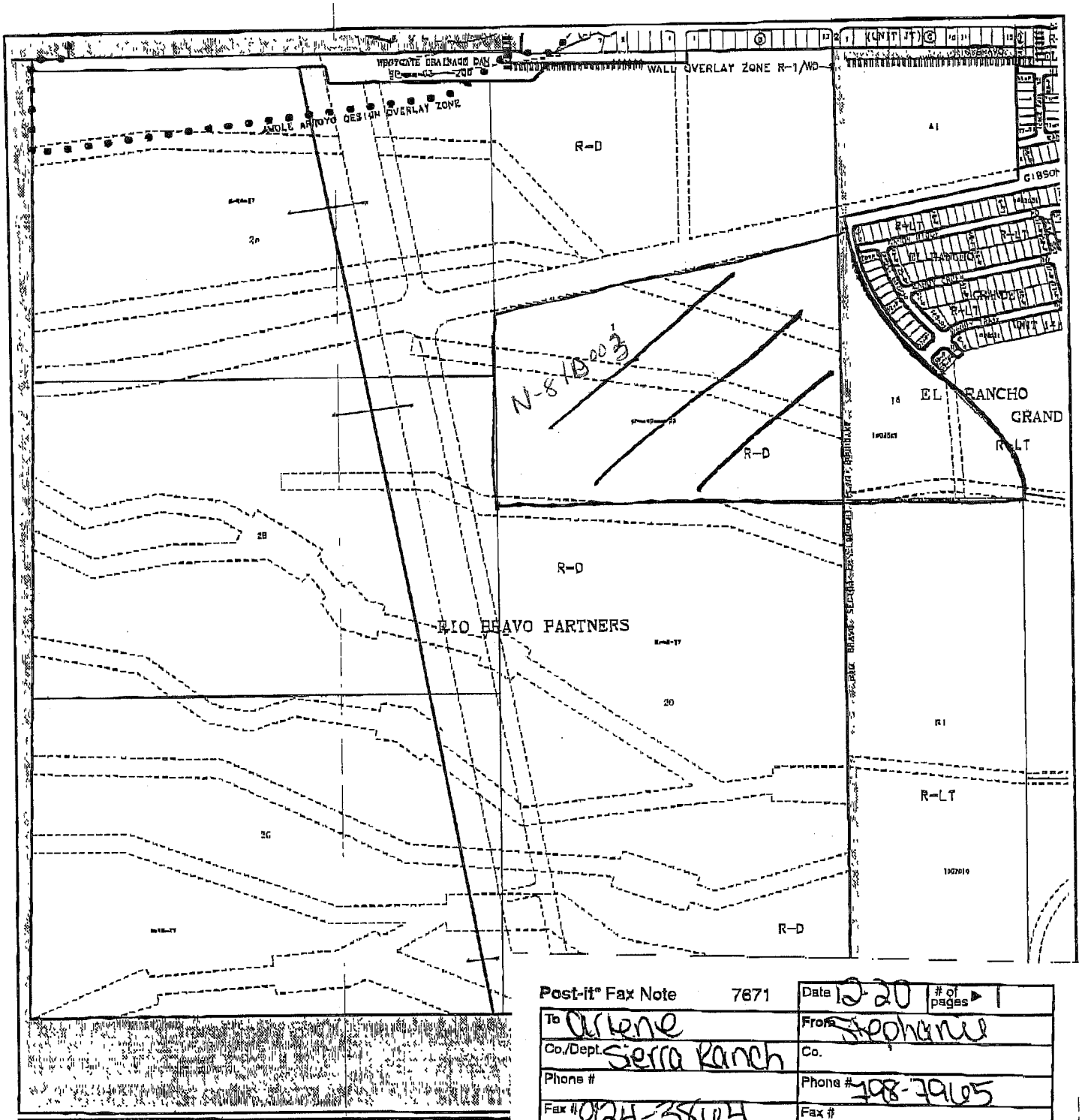
CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0336	D
BERNALILLO COUNTY, UNINCORPORATED AREAS	350001	0336	D

MAP NUMBER
35001C0336 D

EFFECTIVE DATE:
SEPTEMBER 20, 1996

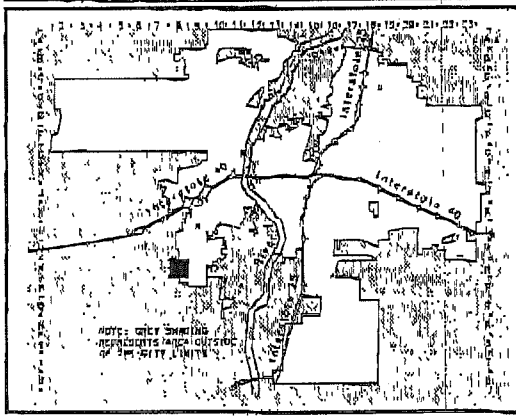
Federal Emergency Management Agency

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES



Post-it® Fax Note 7671 | Date 12-20 | # of pages ▶ 1

To Arlene	From Stephanie
Co./Dept. Sierra Ranch	Co.
Phone #	Phone # 798-7965
Fax # 924-3864	Fax #



CITY OF ALBUQUERQUE 1706 NEW MEXICO

250 0 750 1000

Albuquerque Geographic Information System
PLANNING DEPARTMENT

Zone Atlas Page

N-8-Z

Map Amended through December 03, 2004

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

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

LEGAL DESCRIPTION: El Rancho Grande Tracts 16B and 16C, Town of Atrisco Grant
CITY ADDRESS: South of Gibson Blvd., East of 118th Street, West of Messina Drive, North of Amole Mesa Avenue

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Scott Steffen
ADDRESS: 7500 Jefferson NE – Courtyard I 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:_____ 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***
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- _____ EROSION CONTROL PLAN
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- _____ CLOMR/LOMR
- _____ TRAFFIC CIRCULATION LAYOUT (TCL)
- _____ ENGINEERS CERTIFICATION (TCL)
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- _____ 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)

Rec'd 12-20-04

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- _____ YES
- _____ NO
- _____ COPY PROVIDED

DATE SUBMITTED: December 16, 2004 BY: Scott Steffen

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.

APPENDICES

APPENDIX A - AHYMO INPUT AND SUMMARY FILES FOR DEVELOPED CONDITIONS

APPENDIX B - STREET CAPACITY AND STORM DRAIN INLET ANALYSIS

APPENDIX C - INFRASTRUCTURE LIST

APPENDIX A

AHYMO INPUT AND SUMMARY FILES

FOR DEVELOPED CONDITIONS

```
*S*                    PROJECT NAME:  SIERRA RANCH SUBDIVISION (ERG 16SOUTH)
*S*                    DATE:  DECEMBER 9, 2004
*S*                    INPUT FILE NAME:  SIERRA.HYM
*S*                    OUTUPUT FILE NAME:  SIERRA.OUT
*S*                    PROJECT NUMBER:  050188
*S*                      COMMENTS: 100 YEAR-6 HOUR STORM
*S ////////////////////////////////////////////////////////////////////////////
START                  TIME=0.0 HR PUNCH CODE=0
RAINFALL               TYPE=1     RAIN QUARTER=0.0
                       RAIN ONE=1.90 IN    RAIN SIX=2.20 IN
                       RAIN DAY=2.60 IN    DT=0.05 HRS
*****************************************************************************
*S***************************************************************************
COMPUTE NM HYD         ID=1     HYD NO=BASIN.A    DA=0.016 SQ MI
                       PER A=0.0   PER B=20   PER C=20    PER D=60
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=1     CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=2     HYD NO=BASIN.B    DA=0.0195 SQ MI
                       PER A=0.0   PER B=20   PER C=20    PER D=60
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=2     CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=4     HYD NO=BASIN.C    DA=0.0209 SQ MI
                       PER A=0.0   PER B=20   PER C=20    PER D=60
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=4     CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=5     HYD NO=BASIN.D    DA=0.0211 SQ MI
                       PER A=0.0   PER B=20   PER C=20    PER D=60
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=5     CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=6     HYD NO=BASIN.E    DA=0.0183 SQ MI
                       PER A=0.0   PER B=20   PER C=20    PER D=60
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=6     CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=10    HYD NO=GIBSON.1   DA=0.00267 SQ MI
                       PER A=10   PER B=0   PER C=0    PER D=90
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=10    CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=11    HYD NO=GIBSON.2   DA=0.00242 SQ MI
                       PER A=10   PER B=0   PER C=0    PER D=90
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=11    CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=12    HYD NO=AMOLE.1    DA=0.000893 SQ MI
                       PER A=10   PER B=0   PER C=0    PER D=90
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=12    CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=13    HYD NO=AMOLE.2    DA=0.0023 SQ MI
                       PER A=10   PER B=0   PER C=0    PER D=90
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=13    CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=14    HYD NO=MESSINA    DA=0.00193 SQ MI
                       PER A=10   PER B=0   PER C=0    PER D=90
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=14    CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=15    HYD NO=OFF.PRCL   DA=0.00912 SQ MI
                       PER A=0   PER B=20   PER C=20    PER D=60
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=15    CODE=1
*S***************************************************************************
COMPUTE NM HYD         ID=16    HYD NO=PARK    DA=0.0099 SQ MI
                       PER A=0   PER B=50   PER C=50    PER D=0
                       TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD              ID=16    CODE=1
*S***************************************************************************
FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - - VERSION: 1997.02c RUN DATE (MON/DAY/YR) =12/09/2004
INPUT FILE = SIERRA.HYM 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	PROJECT NAME: SIERRA RANCH SUBDIVISION (ERG 16SOUTH)									
S	DATE: DECEMBER 9, 2004									
S	INPUT FILE NAME: SIERRA.HYM									
S	OUTUPUT FILE NAME: SIERRA.OUT									
S	PROJECT NUMBER: 050188									
S	COMMENTS: 100 YEAR-6 HOUR STORM									
*S	//									
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.200
*S**********										
COMPUTE NM HYD	BASIN.A	-	1	.01600	36.93	1.292	1.51376	1.500	3.606	PER IMP= 60.00
*S**********										
COMPUTE NM HYD	BASIN.B	-	2	.01950	45.01	1.574	1.51376	1.500	3.606	PER IMP= 60.00
*S**********										
COMPUTE NM HYD	BASIN.C	-	4	.02090	48.24	1.687	1.51376	1.500	3.606	PER IMP= 60.00
*S**********										
COMPUTE NM HYD	BASIN.D	-	5	.02110	48.70	1.703	1.51376	1.500	3.606	PER IMP= 60.00
*S**********										
COMPUTE NM HYD	BASIN.E	-	6	.01830	42.24	1.477	1.51376	1.500	3.606	PER IMP= 60.00
*S**********										
*S**********										
COMPUTE NM HYD	GIBSON.1	-	10	.00267	6.94	.259	1.81666	1.500	4.064	PER IMP= 90.00
*S**********										
COMPUTE NM HYD	GIBSON.2	-	11	.00242	6.30	.234	1.81667	1.500	4.065	PER IMP= 90.00
*S**********										
COMPUTE NM HYD	AMOLE.1	-	12	.00089	2.33	.087	1.81666	1.500	4.080	PER IMP= 90.00
*S**********										
COMPUTE NM HYD	AMOLE.2	-	13	.00230	5.98	.223	1.81667	1.500	4.066	PER IMP= 90.00
*S**********										
COMPUTE NM HYD	MESSINA	-	14	.00193	5.02	.187	1.81667	1.500	4.067	PER IMP= 90.00
*S**********										
COMPUTE NM HYD	OFF.PRCL	-	15	.00912	21.06	.736	1.51376	1.500	3.608	PER IMP= 60.00
*S**********										
COMPUTE NM HYD	PARK	-	16	.00990	15.66	.439	.83146	1.500	2.472	PER IMP= .00
*S**********										
FINISH										

```
*S*                    PROJECT NAME:  SIERRA RANCH SUBDIVISION (ERG 16SOUTH)
*S*                    DATE:  NOVEMBER 9, 2004
*S*                    INPUT FILE NAME:  OFFSITE.HYM
*S*                    OUTUPUT FILE NAME:  OFFSITE.OUT
*S*                    PROJECT NUMBER:  050188
*S*                    COMMENTS:     100 YEAR-6 HOUR STORM
*S ////////////////////////////////////////////////////////////////////
START                 TIME=0.0 HR PUNCH CODE=0
RAINFALL              TYPE=1     RAIN QUARTER=0.0
                      RAIN ONE=1.90 IN    RAIN SIX=2.20 IN
                      RAIN DAY=2.60 IN    DT=0.05 HRS
**********************************************************************
*S****IF SIERRA RANCH IS BUILT BEFORE GIBSON BLVD., A POND WILL BE BUILT ON THE
*S****NORTHERN TRACT TO ACCOMMODATE THIS OFFSITE BASIN.**************************
COMPUTE NM HYD        ID=1     HYD NO=NORTH    DA=0.1458 SQ MI
                      PER A=100   PER B=0   PER C=0    PER D=0
                      TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD             ID=1     CODE=1
*S*********************************************************************
COMPUTE NM HYD        ID=2     HYD NO=BASIN.1    DA=0.0351 SQ MI
                      PER A=100   PER B=0   PER C=0    PER D=0
                      TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD             ID=2     CODE=1
*S*********************************************************************
COMPUTE NM HYD        ID=4     HYD NO=BASIN.2    DA=0.0197 SQ MI
                      PER A=100   PER B=0   PER C=0    PER D=0
                      TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD             ID=4     CODE=1
*S*********************************************************************
*S****IF 118TH IS BUILT BEFORE SIERRA RANCH SUB., THEN PONDS WILL BE BUILT TO
*S****ACCOMMODATE FLOWS FROM BASINS 3 AND 4.*************************************
COMPUTE NM HYD        ID=5     HYD NO=BASIN.3    DA=0.00433 SQ MI
                      PER A=100   PER B=0   PER C=0    PER D=0
                      TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD             ID=5     CODE=1
*S*********************************************************************
COMPUTE NM HYD        ID=6     HYD NO=BASIN.4    DA=0.00433 SQ MI
                      PER A=100   PER B=0   PER C=0    PER D=0
                      TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD             ID=6     CODE=1
*S*********************************************************************
*S****IF SIERRA RANCH IS BUILT BEFORE 118TH, THEN PONDS WILL BE BUILT TO
*S****ACCOMMODATE FLOWS FROM BASINS 1&3 AND BASINS 2&4.**************************
ADD HYD               ID=7     HYD NO=BASIN.1.3    ID I=2    ID II=5
PRINT HYD             ID=7     CODE=1
*S*********************************************************************
ADD HYD               ID=8     HYD NO=BASIN.2.4    ID I=4    ID II=6
PRINT HYD             ID=8     CODE=1
*S*********************************************************************
*S*****PHASE 1 OF THE SIERRA RANCH SUBDIVISION WILL BE BUILT BEFORE PHASE 2,
*S*****THEREFORE, PONDS WILL BE BUILT ON PHASE 2 TO ACCOMMODATE OFFSITE FLOWS****
COMPUTE NM HYD        ID=9     HYD NO=PHASE.2    DA=0.0448 SQ MI
                      PER A=100   PER B=0   PER C=0    PER D=0
                      TP=-0.1333 HR     MASSRAIN=-1
PRINT HYD             ID=9     CODE=1
*S*********************************************************************
ADD HYD               ID=10     HYD NO=BASIN.1234    ID I=7  ID II=8
PRINT HYD             ID=10     CODE=1
*S*********************************************************************
*S*****IF PHASE 1 IS BUILT BEFORE 118TH, a POND WILL BE BUILT ON PHASE 2 TO
*S*****ACCOMMODATE ALL THE FLOW FROM THE OFFSITE WESTERN BASINS
ADD HYD               ID=11     HYD NO=WEST.TOTAL    ID I=9  ID II=10
PRINT HYD             ID=11     CODE=1
*S*********************************************************************
FINISH
```

```
AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) -                         - VERSION:  1997.02c      RUN DATE (MON/DAY/YR) =11/09/2004
INPUT FILE = OFFSITE.HYM                                                                   USER NO.= AHYMO-S-9702c1BohanHu-AH

                                     FROM  TO                 PEAK      RUNOFF               TIME TO   CFS      PAGE =   1
                        HYDROGRAPH    ID   ID      AREA     DISCHARGE   VOLUME     RUNOFF     PEAK     PER
COMMAND              IDENTIFICATION  NO.  NO.    (SQ MI)      (CFS)     (AC-FT)   (INCHES)   (HOURS)   ACRE      NOTATION

*S*                       PROJECT NAME:  SIERRA RANCH SUBDIVISION (ERG 16SOUTH)
*S*                       DATE:  NOVEMBER 9, 2004
*S*                       INPUT FILE NAME:  OFFSITE.HYM
*S*                       OUTUPUT FILE NAME:  OFFSITE.OUT
*S*                       PROJECT NUMBER:  050188
*S*                            COMMENTS: 100 YEAR-6 HOUR STORM
*S ////////////////////////////////////////////////////////////////////////                                      TIME=       .00
START                                                                                                            RAIN6=     2.200
RAINFALL   TYPE= 1
*S****IF SIERRA RANCH IS BUILT BEFORE GIBSON BLVD., A POND WILL BE BUILT ON THE
*S****NORTHERN TRACT TO ACCOMMODATE THIS OFFSITE BASIN.**************************
COMPUTE NM HYD          NORTH    -    1      .14580     128.08      3.492      .44903     1.500     1.373 PER IMP=       .00
*S*******************************************************************************
COMPUTE NM HYD        BASIN.1    -    2      .03510      29.51       .841      .44903     1.500     1.314 PER IMP=       .00
*S*******************************************************************************
COMPUTE NM HYD        BASIN.2    -    4      .01970      16.57       .472      .44903     1.500     1.314 PER IMP=       .00
*S*******************************************************************************
*S****IF 118TH IS BUILT BEFORE SIERRA RANCH SUB., THEN PONDS WILL BE BUILT TO
*S****ACCOMMODATE FLOWS FROM BASINS 3 AND 4.*************************************
COMPUTE NM HYD        BASIN.3    -    5      .00433       3.65       .104      .44903     1.500     1.316 PER IMP=       .00
*S*******************************************************************************
COMPUTE NM HYD        BASIN.4    -    6      .00433       3.65       .104      .44903     1.500     1.316 PER IMP=       .00
*S*******************************************************************************
*S****IF SIERRA RANCH IS BUILT BEFORE 118TH, THEN PONDS WILL BE BUILT TO
*S****ACCOMMODATE FLOWS FROM BASINS 1&3 AND BASINS 2&4.**************************
ADD HYD              BASIN.1.3  2& 5  7      .03943      33.16       .944      .44903     1.500     1.314
*S*******************************************************************************
ADD HYD              BASIN.2.4  4& 6  8      .02403      20.21       .575      .44903     1.500     1.314
*S*******************************************************************************
*S*****PHASE 1 OF THE SIERRA RANCH SUBDIVISION WILL BE BUILT BEFORE PHASE 2,
*S*****THEREFORE, PONDS WILL BE BUILT ON PHASE 2 TO ACCOMMODATE OFFSITE FLOWS***
COMPUTE NM HYD        PHASE.2    -    9      .04480      37.66      1.073      .44903     1.500     1.314 PER IMP=       .00
*S*******************************************************************************
ADD HYD             BASIN.1234  7& 8 10      .06346      53.37      1.520      .44903     1.500     1.314
*S*******************************************************************************
*S*****IF PHASE 1 IS BUILT BEFORE 118TH, a POND WILL BE BUILT ON PHASE 2 TO
*S*****ACCOMMODATE ALL THE FLOW FROM THE OFFSITE WESTERN BASINS
ADD HYD             WEST.TOTAL  9&10 11      .10826      91.03      2.593      .44903     1.500     1.314
*S*******************************************************************************
FINISH
```

A-4/4

APPENDIX B

STREET CAPACITY AND

STORM DRAIN INLET ANALYSIS

SIERRA RANCH SUBDIVISION
Internal Street and Storm Drain Inlet Capacity Calculations
December 2004

1. **Four Mile Road**
Basin A
Q = 37 cfs

The total amount of developed runoff produced from Basin A and a small amount from Gibson Blvd. exceeds the street capacity of Four Mile Road. Therefore, inlets will be placed at the eastern end of the street to intercept a portion of the flow (See Grading Plan for proposed inlet locations). Excess flow will continue on the surface east towards Bison Springs Street. Roll curb may be installed to Lot 254. See PC stream output and inlet nomograph.

2. **Corona Ranch Road**
Basin B
Q = 45 cfs

The total amount of developed runoff produced from Basin B exceeds the street capacity of Corona Ranch Road. Therefore, inlets will be placed before Salado Creek Street to intercept a portion of the flow (See Grading Plan for proposed inlet locations). Excess surface flow will continue east towards Bison Springs Street. Roll curb may be installed to Lot 276. See PC stream output and inlet nomograph. Developed runoff from the western offsite parcel will also discharge through Basin B, however, all the flow will be contained in the storm drain.

3. **Walnut Canyon Road**
Basin C
Q = 48 cfs

The total amount of developed runoff produced from Basin C exceeds the street capacity of Walnut Canyon Road. Therefore, inlets will be placed at the unit boundary to intercept a portion of the flow (See Grading Plan for proposed inlet locations). The remaining surface flow will continue east towards Bison Springs Street. Roll curb may be installed to Devils Tower Street. See PC stream output and inlet nomograph.

4. **Buck Island Road**
Basin D
Q = 49 cfs

The total amount of developed runoff produced from Basin D exceeds the street capacity of Buck Island Road. Therefore, inlets will be placed beginning at Lot 139 to intercept a portion of the flow (See Grading Plan for proposed inlet locations). The remaining surface flow will continue east towards Bison Springs Street. Roll curb may be installed to Mountaintop Drive. See PC stream output and inlet nomograph.

5. **Pipestone Road**
Basin E
Q = 42 cfs

The total amount of developed runoff produced from Basin E and a small amount from Amole Mesa Avenue exceeds the street capacity of Pipestone Road. Therefore, inlets will be placed at Mountaintop Drive and Gila Cliff Drive to intercept a portion of the flow (See Grading Plan for proposed inlet locations). The remaining surface flow will continue east towards Big Springs Road. Roll curb may be installed to Devils Tower Street. See PC stream output and inlet nomograph.

6. **Big Springs Road**
Basin D
Q = 49 cfs

The total amount of developed surface runoff at the east end of Big Springs Road is 21 cfs. A roadway the size of Big Springs Road with standard curb can carry more than 53 cfs. Therefore, inlets are not required in Big Springs Road. The flow will continue east towards Bison Springs Street. See PC stream output.

7. **Bison Springs Street**
Basins A, B, C, D, E, and offsite parcel
Q = 246 cfs

The total developed runoff from the subdivision and the western offsite parcel flows to Bison Springs Street on the roadway surface or in a storm drain. Any remaining surface flow will be captured by inlets in this street. At the southern stub terminus of Bison Springs Street, the internal storm drain connects to the master storm drain system in Messina Drive. The master storm drain system is planned to accommodate all the developed runoff from this subdivision.

The sump inlet located at the southern stub terminus of Bison Springs Street is designed to capture the remaining surface runoff produced from a 100-year 6-hour storm. If a greater storm event occurs, the stub street will act as an emergency overflow spillway towards the surge pond.

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

FOUR MILE ROAD

MANNING'S N= .017 SLOPE= .037

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	0.48	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.75	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.99	0.94	0.02	0.05	
0.04	0.04	0.03	0.0	1.32	1.20	1.25	0.02	0.06	
0.05	0.05	0.04	0.1	1.64	1.39	1.56	0.03	0.08	
0.06	0.06	0.06	0.1	1.97	1.57	1.88	0.04	0.10	
0.07	0.07	0.08	0.1	2.30	1.74	2.19	0.05	0.12	
0.08	0.08	0.10	0.2	2.63	1.90	2.50	0.06	0.14	
0.09	0.09	0.13	0.3	2.96	2.06	2.81	0.07	0.16	
0.10	0.10	0.16	0.3	3.29	2.21	3.13	0.08	0.18	
0.11	0.11	0.19	0.4	3.62	2.35	3.44	0.09	0.20	
0.12	0.12	0.23	0.6	3.95	2.49	3.75	0.10	0.22	
0.13	0.13	0.26	0.7	4.28	2.63	4.07	0.11	0.24	
0.14	0.14	0.31	0.8	5.15	2.58	4.93	0.10	0.24	
0.15	0.15	0.36	0.9	6.03	2.58	5.79	0.10	0.25	
0.16	0.16	0.43	1.1	6.91	2.62	6.65	0.11	0.27	
0.17	0.17	0.50	1.3	7.79	2.68	7.51	0.11	0.28	
0.18	0.18	0.58	1.6	8.67	2.76	8.38	0.12	0.30	
0.19	0.19	0.66	1.9	9.54	2.84	9.24	0.13	0.32	
0.20	0.20	0.76	2.2	10.42	2.94	10.10	0.13	0.33	
0.21	0.21	0.87	2.6	11.30	3.03	10.96	0.14	0.35	
0.22	0.22	0.98	3.1	12.18	3.13	11.83	0.15	0.37	
0.23	0.23	1.10	3.6	13.06	3.24	12.69	0.16	0.39	
0.24	0.24	1.23	4.1	13.93	3.34	13.55	0.17	0.41	
0.25	0.25	1.37	4.7	14.81	3.44	14.41	0.18	0.43	
0.26	0.26	1.52	5.4	15.69	3.55	15.27	0.20	0.46	
0.27	0.27	1.68	6.1	16.57	3.65	16.14	0.21	0.48	
0.28	0.28	1.84	6.9	17.45	3.76	17.00	0.22	0.50	
0.29	0.29	2.02	7.8	18.32	3.86	17.86	0.23	0.52	ROLL CURB LIMIT
0.30	0.30	2.20	8.7	19.20	3.97	18.72	0.24	0.54	
0.31	0.31	2.39	9.7	20.08	4.07	19.59	0.26	0.57	
0.32	0.32	2.59	10.8	20.96	4.17	20.45	0.27	0.59	
0.33	0.33	2.80	12.0	21.84	4.28	21.31	0.28	0.61	
0.34	0.34	3.02	13.2	22.71	4.38	22.17	0.30	0.64	
0.35	0.35	3.25	14.5	23.59	4.48	23.03	0.31	0.66	
0.36	0.36	3.48	15.9	24.47	4.58	23.90	0.33	0.69	
0.37	0.37	3.72	17.4	25.35	4.68	24.76	0.34	0.71	
0.38	0.38	3.98	19.0	26.23	4.78	25.62	0.35	0.73	
0.39	0.39	4.24	20.7	27.10	4.88	26.48	0.37	0.76	
0.40	0.40	4.50	22.4	27.98	4.98	27.35	0.38	0.78	
0.41	0.41	4.78	24.3	28.86	5.07	28.21	0.40	0.81	
0.42	0.42	5.06	26.7	28.88	5.27	28.21	0.43	0.85	
0.43	0.43	5.35	29.2	28.90	5.46	28.22	0.46	0.89	

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)
0.45	0.45	5.91	34.5	28.94	5.83	28.23	0.53	0.98
0.46	0.46	6.19	37.2	28.96	6.01	28.23	0.56	1.02
0.47	0.47	6.48	40.1	28.98	6.19	28.24	0.60	1.07
0.48	0.48	6.76	43.0	29.01	6.37	28.24	0.63	1.11
0.49	0.49	7.04	46.0	29.03	6.54	28.25	0.66	1.15

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

FOUR MILE ROAD

MANNING'S N= .017 SLOPE= .034

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	0.46	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.72	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.95	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	1.15	1.25	0.02	0.06
0.05	0.05	0.04	0.1	1.64	1.33	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.50	1.88	0.04	0.10
0.07	0.07	0.08	0.1	2.30	1.67	2.19	0.04	0.11
0.08	0.08	0.10	0.2	2.63	1.82	2.50	0.05	0.13
0.09	0.09	0.13	0.2	2.96	1.97	2.81	0.06	0.15
0.10	0.10	0.16	0.3	3.29	2.12	3.13	0.07	0.17
0.11	0.11	0.19	0.4	3.62	2.25	3.44	0.08	0.19
0.12	0.12	0.23	0.5	3.95	2.39	3.75	0.09	0.21
0.13	0.13	0.26	0.7	4.28	2.52	4.07	0.10	0.23
0.14	0.14	0.31	0.8	5.15	2.47	4.93	0.09	0.23
0.15	0.15	0.36	0.9	6.03	2.47	5.79	0.10	0.25
0.16	0.16	0.43	1.1	6.91	2.51	6.65	0.10	0.26
0.17	0.17	0.50	1.3	7.79	2.57	7.51	0.10	0.27
0.18	0.18	0.58	1.5	8.67	2.64	8.38	0.11	0.29
0.19	0.19	0.66	1.8	9.54	2.72	9.24	0.12	0.31
0.20	0.20	0.76	2.1	10.42	2.81	10.10	0.12	0.32
0.21	0.21	0.87	2.5	11.30	2.91	10.96	0.13	0.34
0.22	0.22	0.98	2.9	12.18	3.00	11.83	0.14	0.36
0.23	0.23	1.10	3.4	13.06	3.10	12.69	0.15	0.38
0.24	0.24	1.23	3.9	13.93	3.20	13.55	0.16	0.40
0.25	0.25	1.37	4.5	14.81	3.30	14.41	0.17	0.42
0.26	0.26	1.52	5.2	15.69	3.40	15.27	0.18	0.44
0.27	0.27	1.68	5.9	16.57	3.50	16.14	0.19	0.46
0.28	0.28	1.84	6.6	17.45	3.60	17.00	0.20	0.48
0.29	0.29	2.02	7.5	18.32	3.70	17.86	0.21	0.50
0.30	0.30	2.20	8.4	19.20	3.80	18.72	0.22	0.52
0.31	0.31	2.39	9.3	20.08	3.90	19.59	0.24	0.55
0.32	0.32	2.59	10.4	20.96	4.00	20.45	0.25	0.57
0.33	0.33	2.80	11.5	21.84	4.10	21.31	0.26	0.59
0.34	0.34	3.02	12.7	22.71	4.20	22.17	0.27	0.61
0.35	0.35	3.25	13.9	23.59	4.30	23.03	0.29	0.64
0.36	0.36	3.48	15.3	24.47	4.39	23.90	0.30	0.66
0.37	0.37	3.72	16.7	25.35	4.49	24.76	0.31	0.68
0.38	0.38	3.98	18.2	26.23	4.58	25.62	0.33	0.71
0.39	0.39	4.24	19.8	27.10	4.68	26.48	0.34	0.73
0.40	0.40	4.50	21.5	27.98	4.77	27.35	0.35	0.75
0.41	0.41	4.78	23.3	28.86	4.86	28.21	0.37	0.78
0.42	0.42	5.06	25.6	28.88	5.05	28.21	0.40	0.82
0.43	0.43	5.35	28.0	28.90	5.23	28.22	0.43	0.86

STREET CAPACITY

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)
0.45	0.45	5.91	33.0	28.94	5.59	28.23	0.49	0.94
0.46	0.46	6.19	35.7	28.96	5.76	28.23	0.52	0.98
0.47	0.47	6.48	38.4	28.98	5.93	28.24	0.55	1.02
0.48	0.48	6.76	41.2	29.01	6.10	28.24	0.58	1.06
0.49	0.49	7.04	44.1	29.03	6.27	28.25	0.61	1.10

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

CORONA RANCH ROAD

MANNING'S N= .017 SLOPE= .037

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	0.48	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.75	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.99	0.94	0.02	0.05
0.04	0.04	0.03	0.0	1.32	1.20	1.25	0.02	0.06
0.05	0.05	0.04	0.1	1.64	1.39	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.57	1.88	0.04	0.10
0.07	0.07	0.08	0.1	2.30	1.74	2.19	0.05	0.12
0.08	0.08	0.10	0.2	2.63	1.90	2.50	0.06	0.14
0.09	0.09	0.13	0.3	2.96	2.06	2.81	0.07	0.16
0.10	0.10	0.16	0.3	3.29	2.21	3.13	0.08	0.18
0.11	0.11	0.19	0.4	3.62	2.35	3.44	0.09	0.20
0.12	0.12	0.23	0.6	3.95	2.49	3.75	0.10	0.22
0.13	0.13	0.26	0.7	4.28	2.63	4.07	0.11	0.24
0.14	0.14	0.31	0.8	5.15	2.58	4.93	0.10	0.24
0.15	0.15	0.36	0.9	6.03	2.58	5.79	0.10	0.25
0.16	0.16	0.43	1.1	6.91	2.62	6.65	0.11	0.27
0.17	0.17	0.50	1.3	7.79	2.68	7.51	0.11	0.28
0.18	0.18	0.58	1.6	8.67	2.76	8.38	0.12	0.30
0.19	0.19	0.66	1.9	9.54	2.84	9.24	0.13	0.32
0.20	0.20	0.76	2.2	10.42	2.94	10.10	0.13	0.33
0.21	0.21	0.87	2.6	11.30	3.03	10.96	0.14	0.35
0.22	0.22	0.98	3.1	12.18	3.13	11.83	0.15	0.37
0.23	0.23	1.10	3.6	13.06	3.24	12.69	0.16	0.39
0.24	0.24	1.23	4.1	13.93	3.34	13.55	0.17	0.41
0.25	0.25	1.37	4.7	14.81	3.44	14.41	0.18	0.43
0.26	0.26	1.52	5.4	15.69	3.55	15.27	0.20	0.46
0.27	0.27	1.68	6.1	16.57	3.65	16.14	0.21	0.48
0.28	0.28	1.84	6.9	17.45	3.76	17.00	0.22	0.50
0.29	0.29	2.02	7.8	18.32	3.86	17.86	0.23	0.52
0.30	0.30	2.20	8.7	19.20	3.97	18.72	0.24	0.54
0.31	0.31	2.39	9.7	20.08	4.07	19.59	0.26	0.57
0.32	0.32	2.59	10.8	20.96	4.17	20.45	0.27	0.59
0.33	0.33	2.80	12.0	21.84	4.28	21.31	0.28	0.61
0.34	0.34	3.02	13.2	22.71	4.38	22.17	0.30	0.64
0.35	0.35	3.25	14.5	23.59	4.48	23.03	0.31	0.66
0.36	0.36	3.48	15.9	24.47	4.58	23.90	0.33	0.69
0.37	0.37	3.72	17.4	25.35	4.68	24.76	0.34	0.71
0.38	0.38	3.98	19.0	26.23	4.78	25.62	0.35	0.73
0.39	0.39	4.24	20.7	27.10	4.88	26.48	0.37	0.76
0.40	0.40	4.50	22.4	27.98	4.98	27.35	0.38	0.78
0.41	0.41	4.78	24.3	28.86	5.07	28.21	0.40	0.81
0.42	0.42	5.06	26.7	28.88	5.27	28.21	0.43	0.85
0.43	0.43	5.35	29.2	28.90	5.46	28.22	0.46	0.89

ROLL CURB LIMIT

□ 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)
0.45	0.45	5.91	34.5	28.94	5.83	28.23	0.53	0.98
0.46	0.46	6.19	37.2	28.96	6.01	28.23	0.56	1.02
0.47	0.47	6.48	40.1	28.98	6.19	28.24	0.60	1.07
0.48	0.48	6.76	43.0	29.01	6.37	28.24	0.63	1.11
0.49	0.49	7.04	46.0	29.03	6.54	28.25	0.66	1.15

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

CORONA RANCH ROAD

MANNING'S N= .017 SLOPE= .0316

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	0.44	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.70	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	1.11	1.25	0.02	0.06
0.05	0.05	0.04	0.1	1.64	1.28	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.45	1.88	0.03	0.09
0.07	0.07	0.08	0.1	2.30	1.61	2.19	0.04	0.11
0.08	0.08	0.10	0.2	2.63	1.76	2.50	0.05	0.13
0.09	0.09	0.13	0.2	2.96	1.90	2.81	0.06	0.15
0.10	0.10	0.16	0.3	3.29	2.04	3.13	0.06	0.16
0.11	0.11	0.19	0.4	3.62	2.17	3.44	0.07	0.18
0.12	0.12	0.23	0.5	3.95	2.30	3.75	0.08	0.20
0.13	0.13	0.26	0.6	4.28	2.43	4.07	0.09	0.22
0.14	0.14	0.31	0.7	5.15	2.38	4.93	0.09	0.23
0.15	0.15	0.36	0.9	6.03	2.39	5.79	0.09	0.24
0.16	0.16	0.43	1.0	6.91	2.42	6.65	0.09	0.25
0.17	0.17	0.50	1.2	7.79	2.48	7.51	0.10	0.27
0.18	0.18	0.58	1.5	8.67	2.55	8.38	0.10	0.28
0.19	0.19	0.66	1.7	9.54	2.63	9.24	0.11	0.30
0.20	0.20	0.76	2.1	10.42	2.71	10.10	0.11	0.31
0.21	0.21	0.87	2.4	11.30	2.80	10.96	0.12	0.33
0.22	0.22	0.98	2.8	12.18	2.90	11.83	0.13	0.35
0.23	0.23	1.10	3.3	13.06	2.99	12.69	0.14	0.37
0.24	0.24	1.23	3.8	13.93	3.09	13.55	0.15	0.39
0.25	0.25	1.37	4.4	14.81	3.18	14.41	0.16	0.41
0.26	0.26	1.52	5.0	15.69	3.28	15.27	0.17	0.43
0.27	0.27	1.68	5.7	16.57	3.38	16.14	0.18	0.45
0.28	0.28	1.84	6.4	17.45	3.47	17.00	0.19	0.47
0.29	0.29	2.02	7.2	18.32	3.57	17.86	0.20	0.49
0.30	0.30	2.20	8.1	19.20	3.67	18.72	0.21	0.51
0.31	0.31	2.39	9.0	20.08	3.76	19.59	0.22	0.53
0.32	0.32	2.59	10.0	20.96	3.86	20.45	0.23	0.55
0.33	0.33	2.80	11.1	21.84	3.95	21.31	0.24	0.57
0.34	0.34	3.02	12.2	22.71	4.05	22.17	0.25	0.59
0.35	0.35	3.25	13.4	23.59	4.14	23.03	0.27	0.62
0.36	0.36	3.48	14.7	24.47	4.23	23.90	0.28	0.64
0.37	0.37	3.72	16.1	25.35	4.33	24.76	0.29	0.66
0.38	0.38	3.98	17.6	26.23	4.42	25.62	0.30	0.68
0.39	0.39	4.24	19.1	27.10	4.51	26.48	0.32	0.71
0.40	0.40	4.50	20.7	27.98	4.60	27.35	0.33	0.73
0.41	0.41	4.78	22.4	28.86	4.69	28.21	0.34	0.75
0.42	0.42	5.06	24.7	28.88	4.87	28.21	0.37	0.79
0.43	0.43	5.35	27.0	28.90	5.04	28.22	0.40	0.83

STREET CAPACITY

□ 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)
0.45	0.45	5.91	31.9	28.94	5.39	28.23	0.45	0.90
0.46	0.46	6.19	34.4	28.96	5.56	28.23	0.48	0.94
0.47	0.47	6.48	37.1	28.98	5.72	28.24	0.51	0.98
0.48	0.48	6.76	39.8	29.01	5.88	28.24	0.54	1.02
0.49	0.49	7.04	42.6	29.03	6.04	28.25	0.57	1.06

alyzer Report

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Drainage Structure Analyzer

STORM DRAIN FROM OFFSITE PARCEL

pe Hydraulic Analysis

Date: Thursday, November 18, 2004 13:28:40

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Input Data

ape	Circular	
terial	RC C76-A	
Roughness	0.013000	
thod	Manning	
ow Rate	21.1	cfs
ope	2.000%	
Size (W x T):	24.00 x 2.5000	

tput Results

Flow Rate	21.1	cfs
ope	2.000%	
D	0.59	
apacity	32.0	cfs
Velocity	10.88	ft/s
pth	1.18	ft
itical Depth	1.64	ft
Size (W x T):	24.00 x 2.5000	

alyzer Report

Drainage Structure Analyzer

pe Hydraulic Analysis SALADO CREEK ST.

Date: Thursday, November 18, 2004 13:55:00

Input Data

ape	Circular
terial	RC C76-A
Roughness	0.013000
thod	Manning
ow Rate	36.9 cfs
ope	2.400%
Size (W x T):	24.00 x 2.5000

tput Results

Flow Rate	36.9 cfs
ope	2.400%
D	0.88
Capacity	35.0 cfs
Velocity	12.62 ft/s
pth	1.76 ft
itical Depth	1.93 ft
Size (W x T):	24.00 x 2.5000

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

WALNUT CANYON ROAD

MANNING'S N= .017 SLOPE= .0388

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	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(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	0.77	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	1.01	0.94	0.02	0.05
0.04	0.04	0.03	0.0	1.32	1.23	1.25	0.02	0.06
0.05	0.05	0.04	0.1	1.64	1.42	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.61	1.88	0.04	0.10
0.07	0.07	0.08	0.1	2.30	1.78	2.19	0.05	0.12
0.08	0.08	0.10	0.2	2.63	1.95	2.50	0.06	0.14
0.09	0.09	0.13	0.3	2.96	2.11	2.81	0.07	0.16
0.10	0.10	0.16	0.4	3.29	2.26	3.13	0.08	0.18
0.11	0.11	0.19	0.5	3.62	2.41	3.44	0.09	0.20
0.12	0.12	0.23	0.6	3.95	2.55	3.75	0.10	0.22
0.13	0.13	0.26	0.7	4.28	2.69	4.07	0.11	0.24
0.14	0.14	0.31	0.8	5.15	2.64	4.93	0.11	0.25
0.15	0.15	0.36	1.0	6.03	2.64	5.79	0.11	0.26
0.16	0.16	0.43	1.1	6.91	2.68	6.65	0.11	0.27
0.17	0.17	0.50	1.4	7.79	2.75	7.51	0.12	0.29
0.18	0.18	0.58	1.6	8.67	2.82	8.38	0.12	0.30
0.19	0.19	0.66	1.9	9.54	2.91	9.24	0.13	0.32
0.20	0.20	0.76	2.3	10.42	3.01	10.10	0.14	0.34
0.21	0.21	0.87	2.7	11.30	3.11	10.96	0.15	0.36
0.22	0.22	0.98	3.1	12.18	3.21	11.83	0.16	0.38
0.23	0.23	1.10	3.7	13.06	3.31	12.69	0.17	0.40
0.24	0.24	1.23	4.2	13.93	3.42	13.55	0.18	0.42
0.25	0.25	1.37	4.8	14.81	3.53	14.41	0.19	0.44
0.26	0.26	1.52	5.5	15.69	3.63	15.27	0.21	0.47
0.27	0.27	1.68	6.3	16.57	3.74	16.14	0.22	0.49
0.28	0.28	1.84	7.1	17.45	3.85	17.00	0.23	0.51
0.29	0.29	2.02	8.0	18.32	3.96	17.86	0.24	0.53
0.30	0.30	2.20	8.9	19.20	4.06	18.72	0.26	0.56
0.31	0.31	2.39	10.0	20.08	4.17	19.59	0.27	0.58
0.32	0.32	2.59	11.1	20.96	4.28	20.45	0.28	0.60
0.33	0.33	2.80	12.3	21.84	4.38	21.31	0.30	0.63
0.34	0.34	3.02	13.5	22.71	4.48	22.17	0.31	0.65
0.35	0.35	3.25	14.9	23.59	4.59	23.03	0.33	0.68
0.36	0.36	3.48	16.3	24.47	4.69	23.90	0.34	0.70
0.37	0.37	3.72	17.8	25.35	4.79	24.76	0.36	0.73
0.38	0.38	3.98	19.5	26.23	4.89	25.62	0.37	0.75
0.39	0.39	4.24	21.2	27.10	5.00	26.48	0.39	0.78
0.40	0.40	4.50	23.0	27.98	5.10	27.35	0.40	0.80
0.41	0.41	4.78	24.8	28.86	5.19	28.21	0.42	0.83
0.42	0.42	5.06	27.3	28.88	5.39	28.21	0.45	0.87
0.43	0.43	5.35	29.9	28.90	5.59	28.22	0.49	0.92

ROLL CURB LIMIT

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
0.45	0.45	5.91	35.3	28.94	5.97	28.23	0.55	1.00
0.46	0.46	6.19	38.1	28.96	6.16	28.23	0.59	1.05
0.47	0.47	6.48	41.1	28.98	6.34	28.24	0.62	1.09
0.48	0.48	6.76	44.1	29.01	6.52	28.24	0.66	1.14
0.49	0.49	7.04	47.2	29.03	6.70	28.25	0.70	1.19

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

WALNUT CANYON ROAD

MANNING'S N= .017 SLOPE= .0275

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	0.41	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.65	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.85	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	1.03	1.25	0.02	0.06
0.05	0.05	0.04	0.0	1.64	1.20	1.56	0.02	0.07
0.06	0.06	0.06	0.1	1.97	1.35	1.88	0.03	0.09
0.07	0.07	0.08	0.1	2.30	1.50	2.19	0.03	0.10
0.08	0.08	0.10	0.2	2.63	1.64	2.50	0.04	0.12
0.09	0.09	0.13	0.2	2.96	1.77	2.81	0.05	0.14
0.10	0.10	0.16	0.3	3.29	1.90	3.13	0.06	0.16
0.11	0.11	0.19	0.4	3.62	2.03	3.44	0.06	0.17
0.12	0.12	0.23	0.5	3.95	2.15	3.75	0.07	0.19
0.13	0.13	0.26	0.6	4.28	2.27	4.07	0.08	0.21
0.14	0.14	0.31	0.7	5.15	2.22	4.93	0.08	0.22
0.15	0.15	0.36	0.8	6.03	2.23	5.79	0.08	0.23
0.16	0.16	0.43	1.0	6.91	2.26	6.65	0.08	0.24
0.17	0.17	0.50	1.1	7.79	2.31	7.51	0.08	0.25
0.18	0.18	0.58	1.4	8.67	2.38	8.38	0.09	0.27
0.19	0.19	0.66	1.6	9.54	2.45	9.24	0.09	0.28
0.20	0.20	0.76	1.9	10.42	2.53	10.10	0.10	0.30
0.21	0.21	0.87	2.3	11.30	2.61	10.96	0.11	0.32
0.22	0.22	0.98	2.6	12.18	2.70	11.83	0.11	0.33
0.23	0.23	1.10	3.1	13.06	2.79	12.69	0.12	0.35
0.24	0.24	1.23	3.5	13.93	2.88	13.55	0.13	0.37
0.25	0.25	1.37	4.1	14.81	2.97	14.41	0.14	0.39
0.26	0.26	1.52	4.7	15.69	3.06	15.27	0.15	0.41
0.27	0.27	1.68	5.3	16.57	3.15	16.14	0.15	0.42
0.28	0.28	1.84	6.0	17.45	3.24	17.00	0.16	0.44
0.29	0.29	2.02	6.7	18.32	3.33	17.86	0.17	0.46
0.30	0.30	2.20	7.5	19.20	3.42	18.72	0.18	0.48
0.31	0.31	2.39	8.4	20.08	3.51	19.59	0.19	0.50
0.32	0.32	2.59	9.3	20.96	3.60	20.45	0.20	0.52
0.33	0.33	2.80	10.3	21.84	3.69	21.31	0.21	0.54
0.34	0.34	3.02	11.4	22.71	3.78	22.17	0.22	0.56
0.35	0.35	3.25	12.5	23.59	3.86	23.03	0.23	0.58
0.36	0.36	3.48	13.7	24.47	3.95	23.90	0.24	0.60
0.37	0.37	3.72	15.0	25.35	4.04	24.76	0.25	0.62
0.38	0.38	3.98	16.4	26.23	4.12	25.62	0.26	0.64
0.39	0.39	4.24	17.8	27.10	4.21	26.48	0.27	0.66
0.40	0.40	4.50	19.3	27.98	4.29	27.35	0.29	0.69
0.41	0.41	4.78	20.9	28.86	4.37	28.21	0.30	0.71
0.42	0.42	5.06	23.0	28.88	4.54	28.21	0.32	0.74
0.43	0.43	5.35	25.2	28.90	4.71	28.22	0.34	0.77

□ 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)
0.45	0.45	5.91	29.7	28.94	5.03	28.23	0.39	0.84
0.46	0.46	6.19	32.1	28.96	5.18	28.23	0.42	0.88
0.47	0.47	6.48	34.6	28.98	5.34	28.24	0.44	0.91
0.48	0.48	6.76	37.1	29.01	5.49	28.24	0.47	0.95
0.49	0.49	7.04	39.7	29.03	5.64	28.25	0.49	0.98

STREET CAPACITY

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

WALNUT CANYON ROAD

MANNING'S N= .017 SLOPE= .032

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

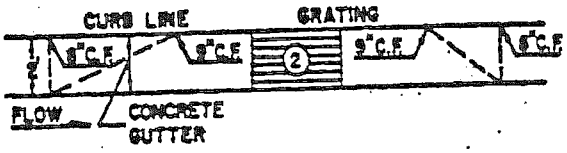
□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.33	0.44	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.70	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.92	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	1.11	1.25	0.02	0.06
0.05	0.05	0.04	0.1	1.64	1.29	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.46	1.88	0.03	0.09
0.07	0.07	0.08	0.1	2.30	1.62	2.19	0.04	0.11
0.08	0.08	0.10	0.2	2.63	1.77	2.50	0.05	0.13
0.09	0.09	0.13	0.2	2.96	1.91	2.81	0.06	0.15
0.10	0.10	0.16	0.3	3.29	2.05	3.13	0.07	0.17
0.11	0.11	0.19	0.4	3.62	2.19	3.44	0.07	0.18
0.12	0.12	0.23	0.5	3.95	2.32	3.75	0.08	0.20
0.13	0.13	0.26	0.6	4.28	2.44	4.07	0.09	0.22
0.14	0.14	0.31	0.7	5.15	2.40	4.93	0.09	0.23
0.15	0.15	0.36	0.9	6.03	2.40	5.79	0.09	0.24
0.16	0.16	0.43	1.0	6.91	2.44	6.65	0.09	0.25
0.17	0.17	0.50	1.2	7.79	2.49	7.51	0.10	0.27
0.18	0.18	0.58	1.5	8.67	2.56	8.38	0.10	0.28
0.19	0.19	0.66	1.8	9.54	2.64	9.24	0.11	0.30
0.20	0.20	0.76	2.1	10.42	2.73	10.10	0.12	0.32
0.21	0.21	0.87	2.4	11.30	2.82	10.96	0.12	0.33
0.22	0.22	0.98	2.9	12.18	2.91	11.83	0.13	0.35
0.23	0.23	1.10	3.3	13.06	3.01	12.69	0.14	0.37
0.24	0.24	1.23	3.8	13.93	3.11	13.55	0.15	0.39
0.25	0.25	1.37	4.4	14.81	3.20	14.41	0.16	0.41
0.26	0.26	1.52	5.0	15.69	3.30	15.27	0.17	0.43
0.27	0.27	1.68	5.7	16.57	3.40	16.14	0.18	0.45
0.28	0.28	1.84	6.4	17.45	3.50	17.00	0.19	0.47
0.29	0.29	2.02	7.3	18.32	3.59	17.86	0.20	0.49
0.30	0.30	2.20	8.1	19.20	3.69	18.72	0.21	0.51
0.31	0.31	2.39	9.1	20.08	3.79	19.59	0.22	0.53
0.32	0.32	2.59	10.1	20.96	3.88	20.45	0.23	0.55
0.33	0.33	2.80	11.1	21.84	3.98	21.31	0.25	0.58
0.34	0.34	3.02	12.3	22.71	4.07	22.17	0.26	0.60
0.35	0.35	3.25	13.5	23.59	4.17	23.03	0.27	0.62
0.36	0.36	3.48	14.8	24.47	4.26	23.90	0.28	0.64
0.37	0.37	3.72	16.2	25.35	4.35	24.76	0.29	0.66
0.38	0.38	3.98	17.7	26.23	4.45	25.62	0.31	0.69
0.39	0.39	4.24	19.2	27.10	4.54	26.48	0.32	0.71
0.40	0.40	4.50	20.8	27.98	4.63	27.35	0.33	0.73
0.41	0.41	4.78	22.6	28.86	4.72	28.21	0.35	0.76
0.42	0.42	5.06	24.8	28.88	4.90	28.21	0.37	0.79
0.43	0.43	5.35	27.1	28.90	5.08	28.22	0.40	0.83

STREET CAPACITY

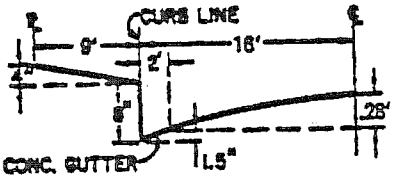
□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.45	0.45	5.91	32.1	28.94	5.42	28.23	0.46	0.91
0.46	0.46	6.19	34.6	28.96	5.59	28.23	0.49	0.95
0.47	0.47	6.48	37.3	28.98	5.76	28.24	0.51	0.98
0.48	0.48	6.76	40.0	29.01	5.92	28.24	0.54	1.02
0.49	0.49	7.04	42.8	29.03	6.08	28.25	0.57	1.06

WALNUT CANYON ROAD

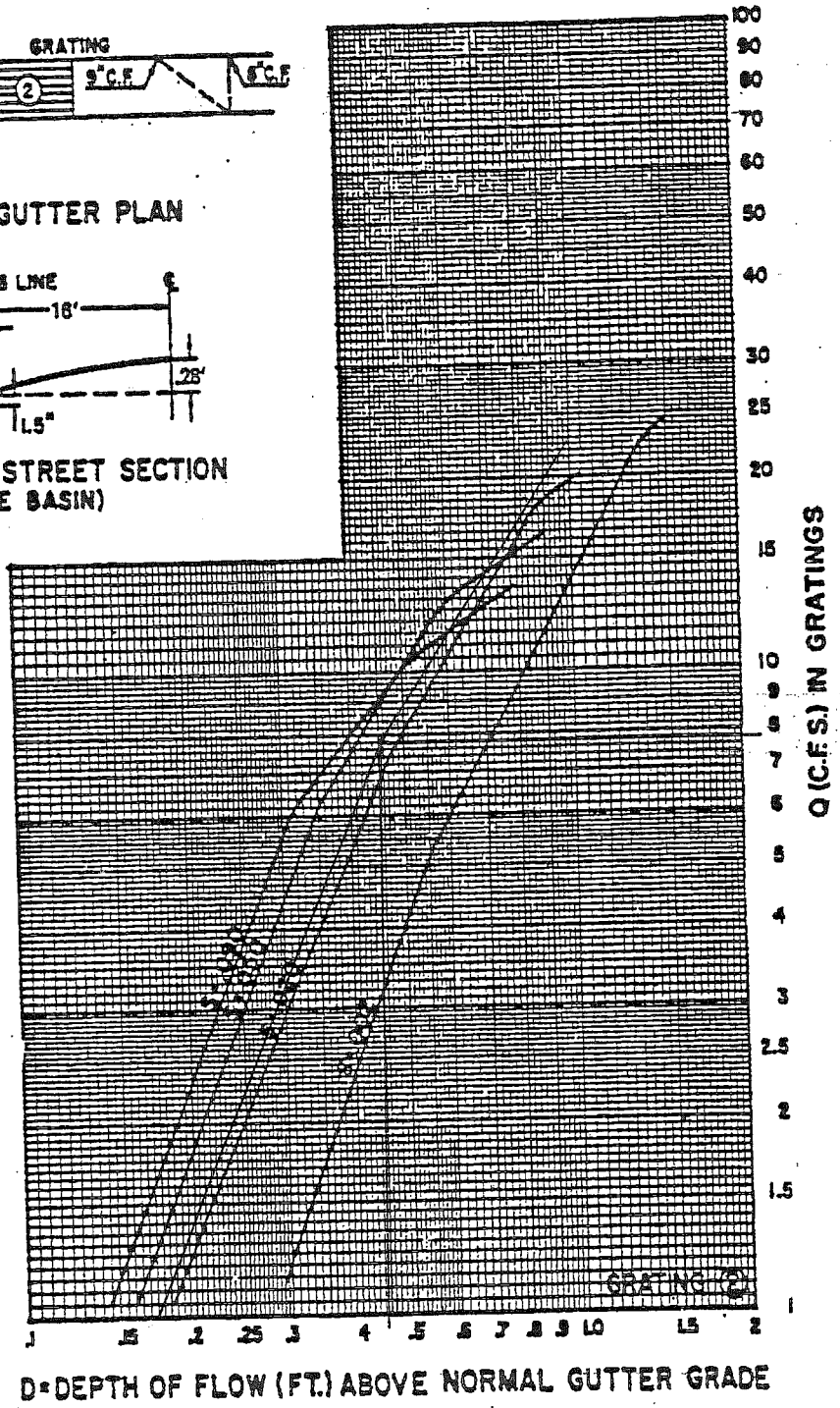
GRATING CAPACITIES FOR TYPE "A" , "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D = DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

SLOPE = 2.8%, D = 0.45, Q = 7.8 cfs

D = 0.44, Q = 7.6 cfs

SLOPE = 2.6%, D = 0.4, Q = 5.8 cfs

A alyzer Report

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Drainage Structure Analyzer

Pipe Hydraulic Analysis WALNUT CANYON RD.

Date: Thursday, November 18, 2004 13:57:30

==========

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	52.5 cfs
Slope	3.200%
Size (W x T):	30.00 x 2.7500

Output Results

Flow Rate	52.5 cfs
Slope	3.200%
d/D	0.63
Capacity	73.4 cfs
Velocity	16.25 ft/s
Depth	1.56 ft
Critical Depth	2.32 ft
Size (W x T):	30.00 x 2.7500

alyzer Report

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Drainage Structure Analyzer

pe Hydraulic Analysis

WALNUT CANYON ROAD.

Date: Thursday, November 18, 2004 13:58:57

==========

Input Data

ape	Circular
terial	RC C76-A
Roughness	0.013000
thod	Manning
ow Rate	67.7 cfs
Slope	2.600%
Size (W x T):	30.00 x 2.7500

tput Results

Flow Rate	67.7 cfs
ope	2.600%
D	0.84
Capacity	66.1 cfs
Velocity	15.34 ft/s
pth	2.11 ft
itical Depth	2.43 ft
Size (W x T):	30.00 x 2.7500

Analyzer Report

Drainage Structure Analyzer

Pipe Hydraulic Analysis

WALNUT CANYON RD.
SD TO MESSINA DR.

Date: Tuesday, December 14, 2004 08:04:26

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	124.0 cfs
Slope	2.000%
Size (W x T):	42.00 x 3.5000

Output Results

Flow Rate	124.0 cfs
Slope	2.000%
d/D	0.72
Capacity	142.3 cfs
Velocity	16.66 ft/s
Depth	2.53 ft
Critical Depth	3.27 ft
Size (W x T):	42.00 x 3.5000

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

BUCK ISLAND ROAD

MANNING'S N= .017 SLOPE= .034

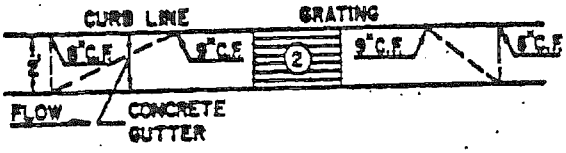
POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	37.17	0.67
2	8.38	0.67	6	23.00	0.41	10	37.63	0.67
3	8.83	0.67	7	35.00	0.13	11	46.00	0.83
4	9.00	0.00	8	37.00	0.00	12	0.00	0.00

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	0.46	0.31	0.00	0.01	
0.02	0.02	0.01	0.0	0.66	0.72	0.63	0.01	0.03	
0.03	0.03	0.01	0.0	0.99	0.95	0.94	0.01	0.04	
0.04	0.04	0.03	0.0	1.32	1.15	1.25	0.02	0.06	
0.05	0.05	0.04	0.1	1.64	1.33	1.56	0.03	0.08	
0.06	0.06	0.06	0.1	1.97	1.50	1.88	0.04	0.10	
0.07	0.07	0.08	0.1	2.30	1.67	2.19	0.04	0.11	
0.08	0.08	0.10	0.2	2.63	1.82	2.50	0.05	0.13	
0.09	0.09	0.13	0.2	2.96	1.97	2.81	0.06	0.15	
0.10	0.10	0.16	0.3	3.29	2.12	3.13	0.07	0.17	
0.11	0.11	0.19	0.4	3.62	2.25	3.44	0.08	0.19	
0.12	0.12	0.23	0.5	3.95	2.39	3.75	0.09	0.21	
0.13	0.13	0.26	0.7	4.28	2.52	4.07	0.10	0.23	
0.14	0.14	0.31	0.8	5.15	2.47	4.93	0.09	0.23	
0.15	0.15	0.36	0.9	6.03	2.47	5.79	0.10	0.25	
0.16	0.16	0.43	1.1	6.91	2.51	6.65	0.10	0.26	
0.17	0.17	0.50	1.3	7.79	2.57	7.51	0.10	0.27	
0.18	0.18	0.58	1.5	8.67	2.64	8.38	0.11	0.29	
0.19	0.19	0.66	1.8	9.54	2.72	9.24	0.12	0.31	
0.20	0.20	0.76	2.1	10.42	2.81	10.10	0.12	0.32	
0.21	0.21	0.87	2.5	11.30	2.91	10.96	0.13	0.34	
0.22	0.22	0.98	2.9	12.18	3.00	11.83	0.14	0.36	
0.23	0.23	1.10	3.4	13.06	3.10	12.69	0.15	0.38	
0.24	0.24	1.23	3.9	13.93	3.20	13.55	0.16	0.40	
0.25	0.25	1.37	4.5	14.81	3.30	14.41	0.17	0.42	
0.26	0.26	1.52	5.2	15.69	3.40	15.27	0.18	0.44	
0.27	0.27	1.68	5.9	16.57	3.50	16.14	0.19	0.46	
0.28	0.28	1.84	6.6	17.45	3.60	17.00	0.20	0.48	
0.29	0.29	2.02	7.5	18.32	3.70	17.86	0.21	0.50	
0.30	0.30	2.20	8.4	19.20	3.80	18.72	0.22	0.52	ROLL CURB LIMIT
0.31	0.31	2.39	9.3	20.08	3.90	19.59	0.24	0.55	
0.32	0.32	2.59	10.4	20.96	4.00	20.45	0.25	0.57	
0.33	0.33	2.80	11.5	21.84	4.10	21.31	0.26	0.59	
0.34	0.34	3.02	12.7	22.71	4.20	22.17	0.27	0.61	
0.35	0.35	3.25	13.9	23.59	4.30	23.03	0.29	0.64	
0.36	0.36	3.48	15.3	24.47	4.39	23.90	0.30	0.66	
0.37	0.37	3.72	16.7	25.35	4.49	24.76	0.31	0.68	
0.38	0.38	3.98	18.2	26.23	4.58	25.62	0.33	0.71	
0.39	0.39	4.24	19.8	27.10	4.68	26.48	0.34	0.73	
0.40	0.40	4.50	21.5	27.98	4.77	27.35	0.35	0.75	
0.41	0.41	4.78	23.3	28.86	4.86	28.21	0.37	0.78	
0.42	0.42	5.06	25.6	28.88	5.05	28.21	0.40	0.82	
0.43	0.43	5.35	28.0	28.90	5.23	28.22	0.43	0.86	STREET CAPACITY

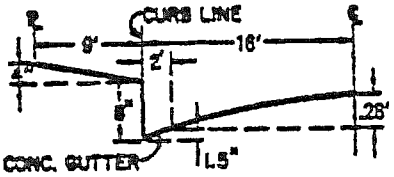
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.45	0.45	5.91	33.0	28.94	5.59	28.23	0.49	0.94
0.46	0.46	6.19	35.7	28.96	5.76	28.23	0.52	0.98
0.47	0.47	6.48	38.4	28.98	5.93	28.24	0.55	1.02
0.48	0.48	6.76	41.2	29.01	6.10	28.24	0.58	1.06
0.49	0.49	7.04	44.1	29.03	6.27	28.25	0.61	1.10

Buck Island Road

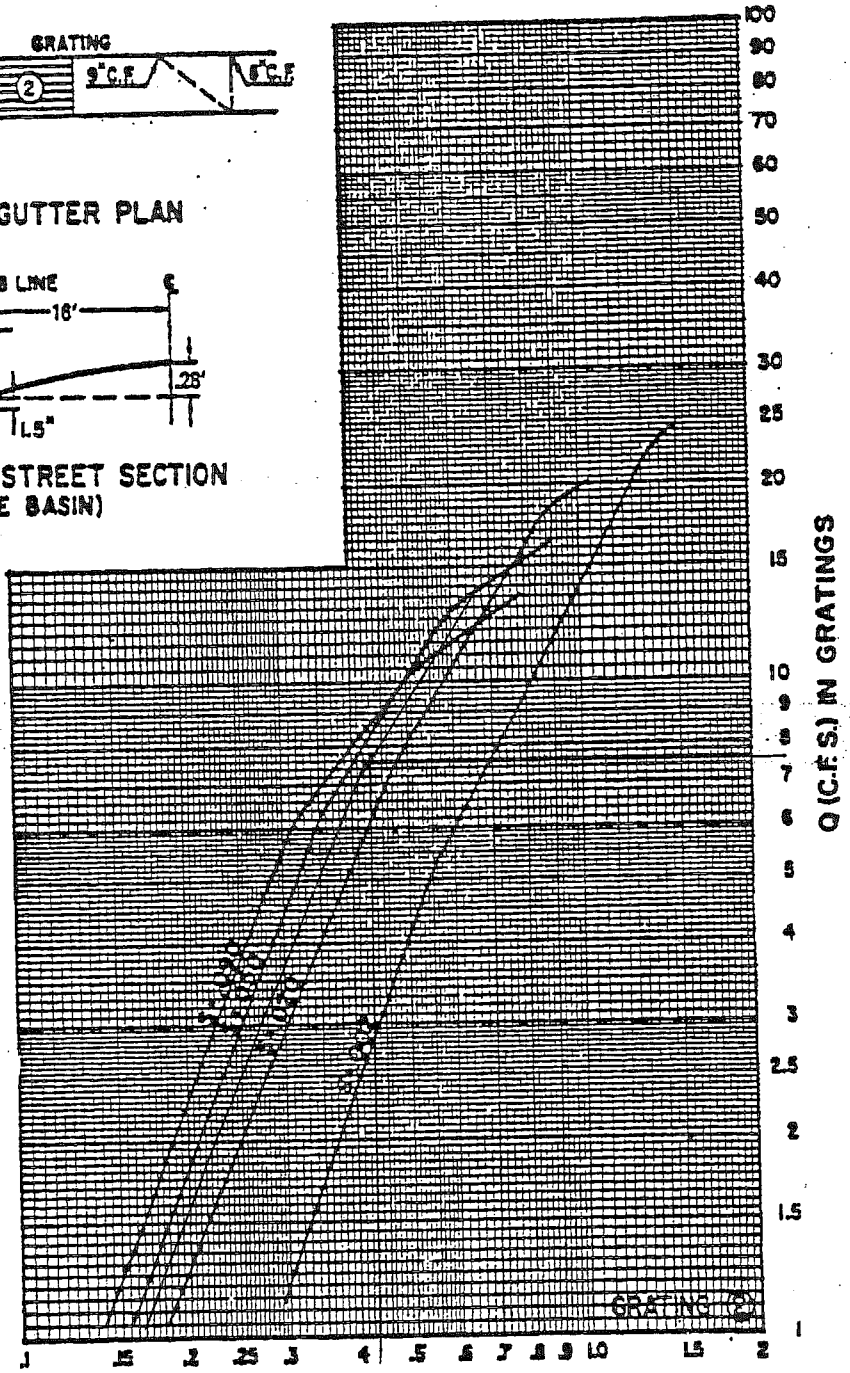
GRATING CAPACITIES FOR TYPE "A" , "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



Slope = 3.4%

D = 0.43, 7.5 cfs

D = 0.42, 7.4 cfs

PLATE 22.3 D-5

A lyzer Report

Drainage Structure Analyzer

Pipe Hydraulic Analysis — Buck Island Road

Date: Friday, November 12, 2004 11:05:43

Input Data

Shape	Circular
Material	RC C76-A
Roughness	0.013000
Method	Manning
Flow Rate	15.0 cfs
Slope	3.400%
Size (W x T):	18.00 x 2.0000

Output Results

Flow Rate	15.0 cfs
Slope	3.400%
d/D	0.66
Capacity	19.4 cfs
Velocity	12.11 ft/s
Depth	0.99 ft
Critical Depth	1.40 ft
Size (W x T):	18.00 x 2.0000

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

PIPESTONE ROAD

MANNING'S N= .017 SLOPE= .0447

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	0.52	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.83	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	1.09	0.94	0.02	0.05
0.04	0.04	0.03	0.0	1.32	1.32	1.25	0.03	0.07
0.05	0.05	0.04	0.1	1.64	1.53	1.56	0.04	0.09
0.06	0.06	0.06	0.1	1.97	1.73	1.88	0.05	0.11
0.07	0.07	0.08	0.1	2.30	1.91	2.19	0.06	0.13
0.08	0.08	0.10	0.2	2.63	2.09	2.50	0.07	0.15
0.09	0.09	0.13	0.3	2.96	2.26	2.81	0.08	0.17
0.10	0.10	0.16	0.4	3.29	2.43	3.13	0.09	0.19
0.11	0.11	0.19	0.5	3.62	2.58	3.44	0.10	0.21
0.12	0.12	0.23	0.6	3.95	2.74	3.75	0.12	0.24
0.13	0.13	0.26	0.8	4.28	2.89	4.07	0.13	0.26
0.14	0.14	0.31	0.9	5.15	2.83	4.93	0.12	0.26
0.15	0.15	0.36	1.0	6.03	2.84	5.79	0.12	0.27
0.16	0.16	0.43	1.2	6.91	2.88	6.65	0.13	0.29
0.17	0.17	0.50	1.5	7.79	2.95	7.51	0.13	0.30
0.18	0.18	0.58	1.7	8.67	3.03	8.38	0.14	0.32
0.19	0.19	0.66	2.1	9.54	3.12	9.24	0.15	0.34
0.20	0.20	0.76	2.5	10.42	3.23	10.10	0.16	0.36
0.21	0.21	0.87	2.9	11.30	3.33	10.96	0.17	0.38
0.22	0.22	0.98	3.4	12.18	3.44	11.83	0.18	0.40
0.23	0.23	1.10	3.9	13.06	3.56	12.69	0.20	0.43
0.24	0.24	1.23	4.5	13.93	3.67	13.55	0.21	0.45
0.25	0.25	1.37	5.2	14.81	3.79	14.41	0.22	0.47
0.26	0.26	1.52	5.9	15.69	3.90	15.27	0.24	0.50
0.27	0.27	1.68	6.7	16.57	4.02	16.14	0.25	0.52
0.28	0.28	1.84	7.6	17.45	4.13	17.00	0.27	0.55
0.29	0.29	2.02	8.6	18.32	4.25	17.86	0.28	0.57
0.30	0.30	2.20	9.6	19.20	4.36	18.72	0.30	0.60
0.31	0.31	2.39	10.7	20.08	4.48	19.59	0.31	0.62
0.32	0.32	2.59	11.9	20.96	4.59	20.45	0.33	0.65
0.33	0.33	2.80	13.2	21.84	4.70	21.31	0.34	0.67
0.34	0.34	3.02	14.5	22.71	4.81	22.17	0.36	0.70
0.35	0.35	3.25	16.0	23.59	4.92	23.03	0.38	0.73
0.36	0.36	3.48	17.5	24.47	5.04	23.90	0.39	0.75
0.37	0.37	3.72	19.2	25.35	5.14	24.76	0.41	0.78
0.38	0.38	3.98	20.9	26.23	5.25	25.62	0.43	0.81
0.39	0.39	4.24	22.7	27.10	5.36	26.48	0.45	0.84
0.40	0.40	4.50	24.6	27.98	5.47	27.35	0.46	0.86
0.41	0.41	4.78	26.7	28.86	5.58	28.21	0.48	0.89
0.42	0.42	5.06	29.3	28.88	5.79	28.21	0.52	0.94
0.43	0.43	5.35	32.1	28.90	6.00	28.22	0.56	0.99

STREET CAPACITY

□ 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)
0.45	0.45	5.91	37.9	28.94	6.41	28.23	0.64	1.09
0.46	0.46	6.19	40.9	28.96	6.61	28.23	0.68	1.14
0.47	0.47	6.48	44.1	28.98	6.80	28.24	0.72	1.19
0.48	0.48	6.76	47.3	29.01	7.00	28.24	0.76	1.24
0.49	0.49	7.04	50.6	29.03	7.19	28.25	0.80	1.29

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

PIPESTONE ROAD

MANNING'S N= .017 SLOPE= .0255

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

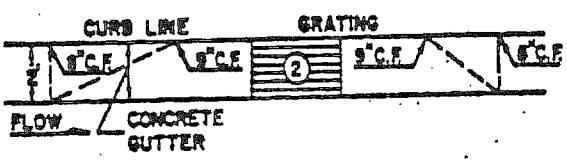
□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.33	0.39	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.63	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.82	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.99	1.25	0.02	0.06
0.05	0.05	0.04	0.0	1.64	1.15	1.56	0.02	0.07
0.06	0.06	0.06	0.1	1.97	1.30	1.88	0.03	0.09
0.07	0.07	0.08	0.1	2.30	1.44	2.19	0.03	0.10
0.08	0.08	0.10	0.2	2.63	1.58	2.50	0.04	0.12
0.09	0.09	0.13	0.2	2.96	1.71	2.81	0.05	0.14
0.10	0.10	0.16	0.3	3.29	1.83	3.13	0.05	0.15
0.11	0.11	0.19	0.4	3.62	1.95	3.44	0.06	0.17
0.12	0.12	0.23	0.5	3.95	2.07	3.75	0.07	0.19
0.13	0.13	0.26	0.6	4.28	2.18	4.07	0.07	0.20
0.14	0.14	0.31	0.7	5.15	2.14	4.93	0.07	0.21
0.15	0.15	0.36	0.8	6.03	2.14	5.79	0.07	0.22
0.16	0.16	0.43	0.9	6.91	2.18	6.65	0.07	0.23
0.17	0.17	0.50	1.1	7.79	2.23	7.51	0.08	0.25
0.18	0.18	0.58	1.3	8.67	2.29	8.38	0.08	0.26
0.19	0.19	0.66	1.6	9.54	2.36	9.24	0.09	0.28
0.20	0.20	0.76	1.9	10.42	2.44	10.10	0.09	0.29
0.21	0.21	0.87	2.2	11.30	2.52	10.96	0.10	0.31
0.22	0.22	0.98	2.5	12.18	2.60	11.83	0.11	0.33
0.23	0.23	1.10	3.0	13.06	2.69	12.69	0.11	0.34
0.24	0.24	1.23	3.4	13.93	2.77	13.55	0.12	0.36
0.25	0.25	1.37	3.9	14.81	2.86	14.41	0.13	0.38
0.26	0.26	1.52	4.5	15.69	2.95	15.27	0.13	0.39
0.27	0.27	1.68	5.1	16.57	3.03	16.14	0.14	0.41
0.28	0.28	1.84	5.8	17.45	3.12	17.00	0.15	0.43
0.29	0.29	2.02	6.5	18.32	3.21	17.86	0.16	0.45
0.30	0.30	2.20	7.3	19.20	3.29	18.72	0.17	0.47
0.31	0.31	2.39	8.1	20.08	3.38	19.59	0.18	0.49
0.32	0.32	2.59	9.0	20.96	3.47	20.45	0.19	0.51
0.33	0.33	2.80	9.9	21.84	3.55	21.31	0.20	0.53
0.34	0.34	3.02	11.0	22.71	3.64	22.17	0.21	0.55
0.35	0.35	3.25	12.1	23.59	3.72	23.03	0.21	0.56
0.36	0.36	3.48	13.2	24.47	3.80	23.90	0.22	0.58
0.37	0.37	3.72	14.5	25.35	3.89	24.76	0.23	0.60
0.38	0.38	3.98	15.8	26.23	3.97	25.62	0.24	0.62
0.39	0.39	4.24	17.2	27.10	4.05	26.48	0.25	0.64
0.40	0.40	4.50	18.6	27.98	4.13	27.35	0.26	0.66
0.41	0.41	4.78	20.1	28.86	4.21	28.21	0.28	0.69
0.42	0.42	5.06	22.1	28.88	4.37	28.21	0.30	0.72
0.43	0.43	5.35	24.2	28.90	4.53	28.22	0.32	0.75

ROLL CURB LIMIT

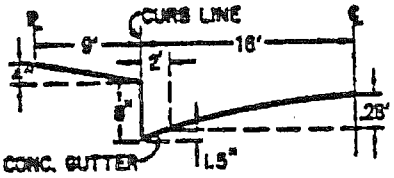
□ WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.45	0.45	5.91	28.6	28.94	4.84	28.23	0.36	0.81
0.46	0.46	6.19	30.9	28.96	4.99	28.23	0.39	0.85
0.47	0.47	6.48	33.3	28.98	5.14	28.24	0.41	0.88
0.48	0.48	6.76	35.7	29.01	5.29	28.24	0.43	0.91
0.49	0.49	7.04	38.2	29.03	5.43	28.25	0.46	0.95

PIPESTONE ROAD

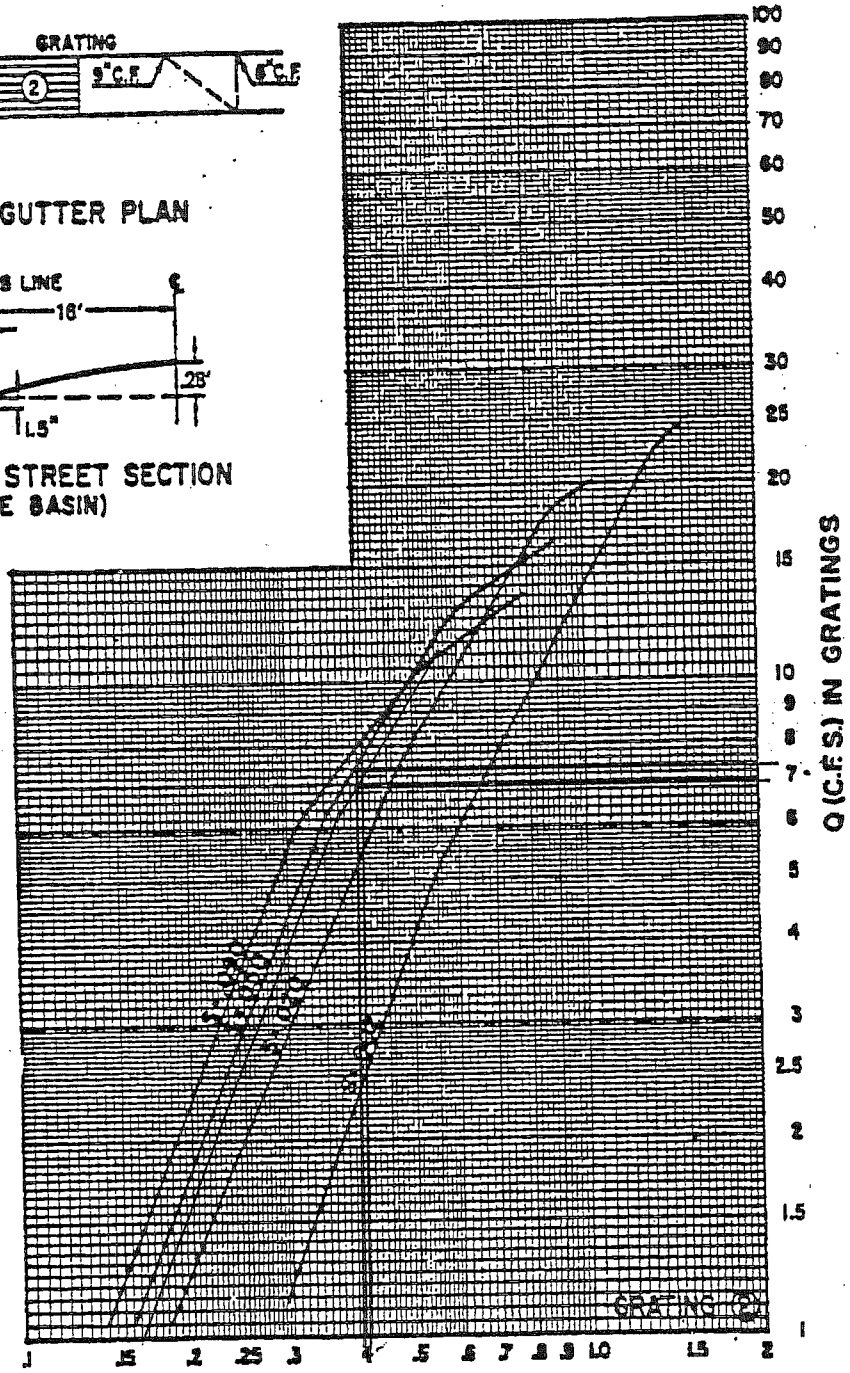
GRATING CAPACITIES FOR TYPE "A" , "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



Slope = 4.5%

D = 0.4, Q = 7.2 cfs

Slope = 4%, D = 0.41, Q = 7 cfs

PLATE 22.3 D-5

Analyzer Report

Drainage Structure Analyzer

Pipe Hydraulic Analysis

Pipe Stone Road

Date: Friday, November 12, 2004 11:07:02

Input Data

Shape	Circular	
Material	RC C76-A	
Roughness	0.013000	
Method	Manning	
Flow Rate	28.4	cfs
Slope	4.000%	
Size (W x T):	24.00 x 2.5000	

Output Results

Flow Rate	28.4	cfs
Slope	4.000%	
d/D	0.57	
Capacity	45.2	cfs
Velocity	15.22	ft/s
Depth	1.15	ft
Critical Depth	1.83	ft
Size (W x T):	24.00 x 2.5000	

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

Big Springs Road

MANNING'S N= .017 SLOPE= .006

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.83	5	11.00	0.13	9	45.17	0.67
2	8.38	0.67	6	27.00	0.45	10	45.63	0.67
3	8.83	0.67	7	43.00	0.13	11	54.00	0.83
4	9.00	0.00	8	45.00	0.00	12	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	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	5.30	1.02	5.07	0.02	0.16
0.15	0.15	0.37	0.4	6.32	1.01	6.08	0.02	0.17
0.16	0.16	0.43	0.4	7.34	1.02	7.08	0.02	0.18
0.17	0.17	0.51	0.5	8.36	1.05	8.09	0.02	0.19
0.18	0.18	0.59	0.6	9.38	1.07	9.09	0.02	0.20
0.19	0.19	0.69	0.8	10.40	1.11	10.10	0.02	0.21
0.20	0.20	0.80	0.9	11.42	1.15	11.10	0.02	0.22
0.21	0.21	0.91	1.1	12.44	1.19	12.11	0.02	0.23
0.22	0.22	1.04	1.3	13.46	1.23	13.11	0.02	0.24
0.23	0.23	1.17	1.5	14.49	1.27	14.12	0.02	0.25
0.24	0.24	1.32	1.7	15.51	1.31	15.12	0.03	0.27
0.25	0.25	1.48	2.0	16.53	1.35	16.13	0.03	0.28
0.26	0.26	1.64	2.3	17.55	1.40	17.13	0.03	0.29
0.27	0.27	1.82	2.6	18.57	1.44	18.14	0.03	0.30
0.28	0.28	2.00	3.0	19.59	1.48	19.14	0.03	0.31
0.29	0.29	2.20	3.4	20.61	1.52	20.15	0.04	0.33
0.30	0.30	2.41	3.8	21.63	1.57	21.15	0.04	0.34
0.31	0.31	2.62	4.2	22.65	1.61	22.16	0.04	0.35
0.32	0.32	2.85	4.7	23.67	1.65	23.16	0.04	0.36
0.33	0.33	3.09	5.2	24.69	1.69	24.17	0.04	0.37
0.34	0.34	3.33	5.8	25.71	1.73	25.17	0.05	0.39
0.35	0.35	3.59	6.4	26.74	1.78	26.18	0.05	0.40
0.36	0.36	3.86	7.0	27.76	1.82	27.18	0.05	0.41
0.37	0.37	4.13	7.7	28.78	1.86	28.19	0.05	0.42
0.38	0.38	4.42	8.4	29.80	1.90	29.19	0.06	0.44
0.39	0.39	4.72	9.1	30.82	1.94	30.20	0.06	0.45
0.40	0.40	5.03	9.9	31.84	1.98	31.20	0.06	0.46
0.41	0.41	5.34	10.8	32.86	2.02	32.21	0.06	0.47
0.42	0.42	5.67	11.7	33.88	2.06	33.21	0.07	0.49
0.43	0.43	6.01	12.6	34.90	2.09	34.22	0.07	0.50

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)
0.45	0.45	6.71	14.6	36.94	2.17	36.23	0.07	0.52
0.46	0.46	7.07	15.9	36.96	2.25	36.23	0.08	0.54
0.47	0.47	7.44	17.3	36.98	2.32	36.24	0.08	0.55
0.48	0.48	7.80	18.7	37.01	2.40	36.24	0.09	0.57
0.49	0.49	8.16	20.2	37.03	2.47	36.25	0.09	0.58
0.50	0.50	8.52	21.7	37.05	2.54	36.25	0.10	0.60
0.51	0.51	8.89	23.2	37.07	2.61	36.26	0.11	0.62
0.52	0.52	9.25	24.8	37.09	2.68	36.26	0.11	0.63
0.53	0.53	9.61	26.4	37.11	2.75	36.27	0.12	0.65
0.54	0.54	9.97	28.1	37.13	2.82	36.27	0.12	0.66
0.55	0.55	10.34	29.8	37.15	2.89	36.28	0.13	0.68
0.56	0.56	10.70	31.6	37.17	2.95	36.28	0.14	0.70
0.57	0.57	11.06	33.4	37.19	3.02	36.29	0.14	0.71
0.58	0.58	11.43	35.2	37.21	3.08	36.29	0.15	0.73
0.59	0.59	11.79	37.1	37.23	3.15	36.30	0.15	0.74
0.60	0.60	12.15	39.0	37.25	3.21	36.30	0.16	0.76
0.61	0.61	12.51	40.9	37.27	3.27	36.31	0.17	0.78
0.62	0.62	12.88	42.9	37.29	3.33	36.31	0.17	0.79
0.63	0.63	13.24	44.9	37.31	3.39	36.32	0.18	0.81
0.64	0.64	13.60	47.0	37.34	3.45	36.32	0.19	0.83
0.65	0.65	13.97	49.1	37.36	3.51	36.33	0.19	0.84
0.66	0.66	14.33	51.2	37.38	3.57	36.33	0.20	0.86
0.67	0.67	14.69	53.4	37.40	3.63	36.34	0.20	0.87
0.68	0.68	15.06	54.6	38.44	3.63	38.30	0.20	0.88

STREET CAPACITY

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

BISON SPRINGS ST.

MANNING'S N= .017 SLOPE= .031

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	0.44	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	5.15	2.36	4.93	0.09	0.23
0.15	0.15	0.36	0.9	6.03	2.36	5.79	0.09	0.24
0.16	0.16	0.43	1.0	6.91	2.40	6.65	0.09	0.25
0.17	0.17	0.50	1.2	7.79	2.45	7.51	0.09	0.26
0.18	0.18	0.58	1.5	8.67	2.52	8.38	0.10	0.28
0.19	0.19	0.66	1.7	9.54	2.60	9.24	0.11	0.30
0.20	0.20	0.76	2.0	10.42	2.69	10.10	0.11	0.31
0.21	0.21	0.87	2.4	11.30	2.78	10.96	0.12	0.33
0.22	0.22	0.98	2.8	12.18	2.87	11.83	0.13	0.35
0.23	0.23	1.10	3.3	13.06	2.96	12.69	0.14	0.37
0.24	0.24	1.23	3.8	13.93	3.06	13.55	0.15	0.39
0.25	0.25	1.37	4.3	14.81	3.15	14.41	0.15	0.40
0.26	0.26	1.52	4.9	15.69	3.25	15.27	0.16	0.42
0.27	0.27	1.68	5.6	16.57	3.34	16.14	0.17	0.44
0.28	0.28	1.84	6.3	17.45	3.44	17.00	0.18	0.46
0.29	0.29	2.02	7.1	18.32	3.54	17.86	0.19	0.48
0.30	0.30	2.20	8.0	19.20	3.63	18.72	0.20	0.50
0.31	0.31	2.39	8.9	20.08	3.73	19.59	0.22	0.53
0.32	0.32	2.59	9.9	20.96	3.82	20.45	0.23	0.55
0.33	0.33	2.80	11.0	21.84	3.92	21.31	0.24	0.57
0.34	0.34	3.02	12.1	22.71	4.01	22.17	0.25	0.59
0.35	0.35	3.25	13.3	23.59	4.10	23.03	0.26	0.61
0.36	0.36	3.48	14.6	24.47	4.19	23.90	0.27	0.63
0.37	0.37	3.72	16.0	25.35	4.28	24.76	0.29	0.66
0.38	0.38	3.98	17.4	26.23	4.38	25.62	0.30	0.68
0.39	0.39	4.24	18.9	27.10	4.47	26.48	0.31	0.70
0.40	0.40	4.50	20.5	27.98	4.55	27.35	0.32	0.72
0.41	0.41	4.78	22.2	28.86	4.64	28.21	0.33	0.74
0.42	0.42	5.06	24.4	28.88	4.82	28.21	0.36	0.78
0.43	0.43	5.35	26.7	28.90	5.00	28.22	0.39	0.82

□ 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)
0.45	0.45	5.91	31.6	28.94	5.34	28.23	0.44	0.89
0.46	0.46	6.19	34.1	28.96	5.50	28.23	0.47	0.93
0.47	0.47	6.48	36.7	28.98	5.67	28.24	0.50	0.97
0.48	0.48	6.76	39.4	29.01	5.83	28.24	0.53	1.01
0.49	0.49	7.04	42.1	29.03	5.99	28.25	0.56	1.05

STREET CAPACITY

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

BISON SPRINGS ST.

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
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

□ 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)
0.45	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
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

STREET CAPACITY

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

BISON SPRINGS ST.

MANNING'S N= .017 SLOPE= .035

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	0.46	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.73	0.63	0.01	0.03
0.03	0.03	0.01	0.0	0.99	0.96	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	1.17	1.25	0.02	0.06
0.05	0.05	0.04	0.1	1.64	1.35	1.56	0.03	0.08
0.06	0.06	0.06	0.1	1.97	1.53	1.88	0.04	0.10
0.07	0.07	0.08	0.1	2.30	1.69	2.19	0.04	0.11
0.08	0.08	0.10	0.2	2.63	1.85	2.50	0.05	0.13
0.09	0.09	0.13	0.3	2.96	2.00	2.81	0.06	0.15
0.10	0.10	0.16	0.3	3.29	2.15	3.13	0.07	0.17
0.11	0.11	0.19	0.4	3.62	2.29	3.44	0.08	0.19
0.12	0.12	0.23	0.5	3.95	2.42	3.75	0.09	0.21
0.13	0.13	0.26	0.7	4.28	2.56	4.07	0.10	0.23
0.14	0.14	0.31	0.8	5.15	2.51	4.93	0.10	0.24
0.15	0.15	0.36	0.9	6.03	2.51	5.79	0.10	0.25
0.16	0.16	0.43	1.1	6.91	2.55	6.65	0.10	0.26
0.17	0.17	0.50	1.3	7.79	2.61	7.51	0.11	0.28
0.18	0.18	0.58	1.5	8.67	2.68	8.38	0.11	0.29
0.19	0.19	0.66	1.8	9.54	2.76	9.24	0.12	0.31
0.20	0.20	0.76	2.2	10.42	2.85	10.10	0.13	0.33
0.21	0.21	0.87	2.6	11.30	2.95	10.96	0.14	0.35
0.22	0.22	0.98	3.0	12.18	3.05	11.83	0.14	0.36
0.23	0.23	1.10	3.5	13.06	3.15	12.69	0.15	0.38
0.24	0.24	1.23	4.0	13.93	3.25	13.55	0.16	0.40
0.25	0.25	1.37	4.6	14.81	3.35	14.41	0.17	0.42
0.26	0.26	1.52	5.3	15.69	3.45	15.27	0.18	0.44
0.27	0.27	1.68	6.0	16.57	3.55	16.14	0.20	0.47
0.28	0.28	1.84	6.7	17.45	3.66	17.00	0.21	0.49
0.29	0.29	2.02	7.6	18.32	3.76	17.86	0.22	0.51
0.30	0.30	2.20	8.5	19.20	3.86	18.72	0.23	0.53
0.31	0.31	2.39	9.5	20.08	3.96	19.59	0.24	0.55
0.32	0.32	2.59	10.5	20.96	4.06	20.45	0.26	0.58
0.33	0.33	2.80	11.7	21.84	4.16	21.31	0.27	0.60
0.34	0.34	3.02	12.9	22.71	4.26	22.17	0.28	0.62
0.35	0.35	3.25	14.1	23.59	4.36	23.03	0.29	0.64
0.36	0.36	3.48	15.5	24.47	4.46	23.90	0.31	0.67
0.37	0.37	3.72	17.0	25.35	4.55	24.76	0.32	0.69
0.38	0.38	3.98	18.5	26.23	4.65	25.62	0.34	0.72
0.39	0.39	4.24	20.1	27.10	4.74	26.48	0.35	0.74
0.40	0.40	4.50	21.8	27.98	4.84	27.35	0.36	0.76
0.41	0.41	4.78	23.6	28.86	4.93	28.21	0.38	0.79
0.42	0.42	5.06	25.9	28.88	5.12	28.21	0.41	0.83
0.43	0.43	5.35	28.4	28.90	5.31	28.22	0.44	0.87

STREET CAPACITY

☐ 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)
0.45	0.45	5.91	33.5	28.94	5.67	28.23	0.50	0.95
0.46	0.46	6.19	36.2	28.96	5.85	28.23	0.53	0.99
0.47	0.47	6.48	39.0	28.98	6.02	28.24	0.56	1.03
0.48	0.48	6.76	41.9	29.01	6.19	28.24	0.60	1.08
0.49	0.49	7.04	44.8	29.03	6.36	28.25	0.63	1.12

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

BISON SPRINGS ST.

MANNING'S N= .017 SLOPE= .018

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

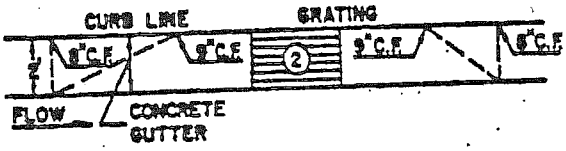
WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
0.01	0.01	0.00	0.0	0.33	0.33	0.31	0.00	0.01
0.02	0.02	0.01	0.0	0.66	0.53	0.63	0.00	0.02
0.03	0.03	0.01	0.0	0.99	0.69	0.94	0.01	0.04
0.04	0.04	0.03	0.0	1.32	0.84	1.25	0.01	0.05
0.05	0.05	0.04	0.0	1.64	0.97	1.56	0.01	0.06
0.06	0.06	0.06	0.1	1.97	1.09	1.88	0.02	0.08
0.07	0.07	0.08	0.1	2.30	1.21	2.19	0.02	0.09
0.08	0.08	0.10	0.1	2.63	1.33	2.50	0.03	0.11
0.09	0.09	0.13	0.2	2.96	1.43	2.81	0.03	0.12
0.10	0.10	0.16	0.2	3.29	1.54	3.13	0.04	0.14
0.11	0.11	0.19	0.3	3.62	1.64	3.44	0.04	0.15
0.12	0.12	0.23	0.4	3.95	1.74	3.75	0.05	0.17
0.13	0.13	0.26	0.5	4.28	1.83	4.07	0.05	0.18
0.14	0.14	0.31	0.6	5.15	1.80	4.93	0.05	0.19
0.15	0.15	0.36	0.7	6.03	1.80	5.79	0.05	0.20
0.16	0.16	0.43	0.8	6.91	1.83	6.65	0.05	0.21
0.17	0.17	0.50	0.9	7.79	1.87	7.51	0.05	0.22
0.18	0.18	0.58	1.1	8.67	1.92	8.38	0.06	0.24
0.19	0.19	0.66	1.3	9.54	1.98	9.24	0.06	0.25
0.20	0.20	0.76	1.6	10.42	2.05	10.10	0.07	0.27
0.21	0.21	0.87	1.8	11.30	2.11	10.96	0.07	0.28
0.22	0.22	0.98	2.1	12.18	2.18	11.83	0.07	0.29
0.23	0.23	1.10	2.5	13.06	2.26	12.69	0.08	0.31
0.24	0.24	1.23	2.9	13.93	2.33	13.55	0.08	0.32
0.25	0.25	1.37	3.3	14.81	2.40	14.41	0.09	0.34
0.26	0.26	1.52	3.8	15.69	2.48	15.27	0.10	0.36
0.27	0.27	1.68	4.3	16.57	2.55	16.14	0.10	0.37
0.28	0.28	1.84	4.8	17.45	2.62	17.00	0.11	0.39
0.29	0.29	2.02	5.4	18.32	2.69	17.86	0.11	0.40
0.30	0.30	2.20	6.1	19.20	2.77	18.72	0.12	0.42
0.31	0.31	2.39	6.8	20.08	2.84	19.59	0.13	0.44
0.32	0.32	2.59	7.6	20.96	2.91	20.45	0.13	0.45
0.33	0.33	2.80	8.4	21.84	2.98	21.31	0.14	0.47
0.34	0.34	3.02	9.2	22.71	3.05	22.17	0.14	0.48
0.35	0.35	3.25	10.1	23.59	3.13	23.03	0.15	0.50
0.36	0.36	3.48	11.1	24.47	3.20	23.90	0.16	0.52
0.37	0.37	3.72	12.2	25.35	3.26	24.76	0.17	0.54
0.38	0.38	3.98	13.3	26.23	3.33	25.62	0.17	0.55
0.39	0.39	4.24	14.4	27.10	3.40	26.48	0.18	0.57
0.40	0.40	4.50	15.6	27.98	3.47	27.35	0.19	0.59
0.41	0.41	4.78	16.9	28.86	3.54	28.21	0.19	0.60
0.42	0.42	5.06	18.6	28.88	3.67	28.21	0.21	0.63
0.43	0.43	5.35	20.4	28.90	3.81	28.22	0.23	0.66

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)
0.45	0.45	5.91	24.0	28.94	4.07	28.23	0.26	0.71
0.46	0.46	6.19	26.0	28.96	4.19	28.23	0.27	0.73
0.47	0.47	6.48	28.0	28.98	4.32	28.24	0.29	0.76
0.48	0.48	6.76	30.0	29.01	4.44	28.24	0.31	0.79
0.49	0.49	7.04	32.1	29.03	4.56	28.25	0.32	0.81
0.50	0.50	7.32	34.3	29.05	4.68	28.25	0.34	0.84
0.51	0.51	7.61	36.5	29.07	4.80	28.26	0.36	0.87
0.52	0.52	7.89	38.8	29.09	4.91	28.26	0.37	0.89
0.53	0.53	8.17	41.1	29.11	5.03	28.27	0.39	0.92
0.54	0.54	8.45	43.5	29.13	5.14	28.27	0.41	0.95
0.55	0.55	8.74	45.9	29.15	5.25	28.28	0.43	0.98
0.56	0.56	9.02	48.4	29.17	5.36	28.28	0.45	1.01

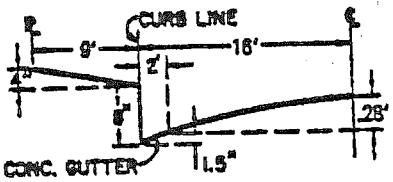
STREET CAPACITY

BISON SPRINGS ST.

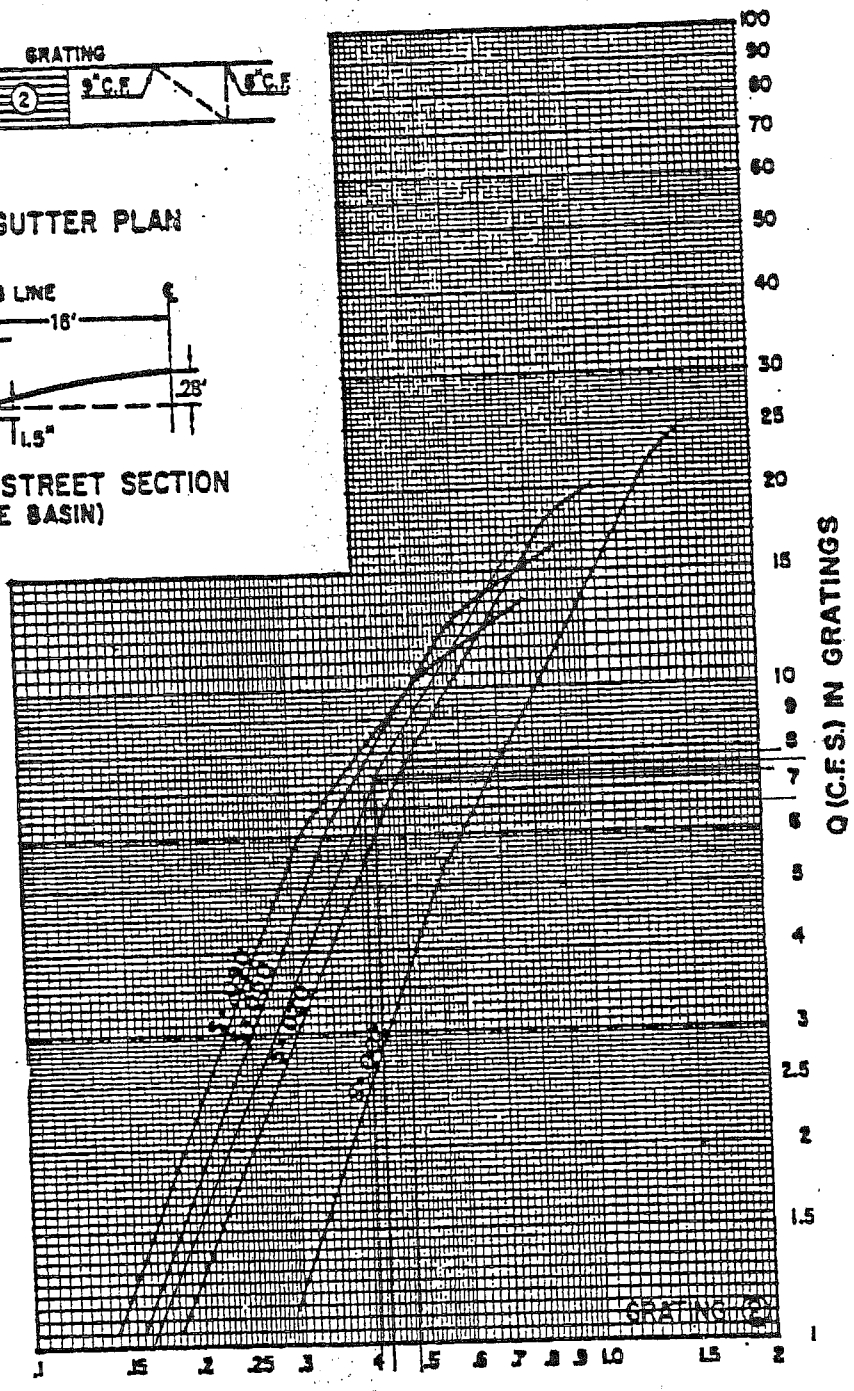
GRATING CAPACITIES FOR TYPE "A" , "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

Slope = 3.1%, D = 0.41, Q = 6.5 cfs

Slope = 2.5%, D = 0.48, Q = 7.8 cfs

D = 0.42, Q = 6.5 cfs

SLOPE = 3.5%, D = 0.43, Q = 7.3 cfs

SLOPE = 1.8%, D = 0.48, Q = 7.5 cfs

alyzer Report

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ainage Structure Analyzer

pe Hydraulic Analysis

Bison Springs St.

te: Friday, November 12, 2004 11:01:15

==========

Input Data

---

ape	Circular
terial	RC C76-A
Roughness	0.013000
thod	Manning
ow Rate	43.4 cfs
lope	2.500%
Size (W x T):	30.00 x 2.7500

Output Results

Flow Rate	43.4 cfs
lope	2.500%
/D	0.60
Capacity	64.9 cfs
Velocity	14.16 ft/s
epth	1.50 ft
ritical Depth	2.19 ft
Size (W x T):	30.00 x 2.7500

B.33

alyzer Report

==========

Drainage Structure Analyzer

BISON SPRINGS ST. SD
WALNUT CANYON TO BUCK ISLAND

pe Hydraulic Analysis

Date: Tuesday, December 14, 2004 08:05:00

==========

Input Data

iape	Circular
iterial	RC C76-A
Roughness	0.013000
Method	Manning
low Rate	14.6 cfs
lope	3.500%
Size (W x T):	18.00 x 2.0000

itput Results

Flow Rate	14.6 cfs
lope	3.500%
/D	0.64
apacity	19.7 cfs
Velocity	12.19 ft/s
epth	0.96 ft
ritical Depth	1.39 ft
Size (W x T):	18.00 x 2.0000

alyzer Report

Drainage Structure Analyzer

BISON SPRINGS ST. SD
BUCK ISLAND TO BIG SPRINGS

pe Hydraulic Analysis

Date: Tuesday, December 14, 2004 08:06:07

Input Data

ıape	Circular
ıterial	RC C76-A
Roughness	0.013000
ethod	Manning
low Rate	44.4 cfs
lope	1.800%
Size (W x T):	30.00 x 2.7500

ıtput Results

Flow Rate	44.4 cfs
lope	1.800%
/D	0.68
Capacity	55.0 cfs
Velocity	12.47 ft/s
epth	1.70 ft
ritical Depth	2.21 ft
Size (W x T):	30.00 x 2.7500

alyzer Report

Drainage Structure Analyzer

pe Hydraulic Analysis

BISON SPRINGS ST. SD
BIG SPRINGS TO SUMP

Date: Tuesday, December 14, 2004 08:07:09

Input Data

ıape	Circular
.terial	RC C76-A
Roughness	0.013000
Method	Manning
low Rate	87.8 cfs
lope	1.800%
Size (W x T):	36.00 x 3.0000

ıtput Results

Flow Rate	87.8 cfs
lope	1.800%
/D	0.80
apacity	89.5 cfs
Velocity	14.43 ft/s
epth	2.41 ft
ritical Depth	2.83 ft
ize (W x T):	36.00 x 3.0000

90

60" WING 40"@TC

18.5" 18.5" NET OPEN AREA

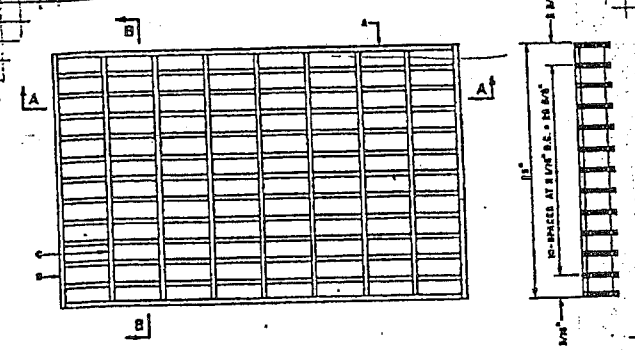
35.5"

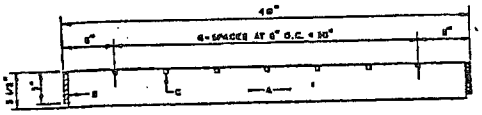
GRATE @ 10" (0.83') BELOW TC

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

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





GRATE CAPACITY (Q) IN CFS

HEAD (h) IN FEET

TRIPLE GRATE

DOUBLE GRATE

SINGLE GRATE

TC 0.83'

BOHANNAN-HUSTON INC.

PROJECT NAME BISON SPRINGS ST. SHEET ____ OF ____

PROJECT NO. SUMP CONDITION BY ____ DATE ____

SUBJECT RATING CURVE FOR TYPE A INLETS CH'D ____ DATE 8-87

alyzer Report

Drainage Structure Analyzer

pe Hydraulic Analysis

SUMP INLET TO MESSINA DR. SD IN EASEMENT

Date: Tuesday, December 14, 2004 08:08:35

Input Data

lape	Circular
terial	RC C76-A
Roughness	0.013000
ethod	Manning
low Rate	126.5 cfs
lope	1.800%
Size (W x T):	42.00 x 3.5000

Output Results

Flow Rate	126.5 cfs
lope	1.800%
/D	0.77
apacity	135.0 cfs
Velocity	15.95 ft/s
epth	2.69 ft
ritical Depth	3.29 ft
Size (W x T):	42.00 x 3.5000

APPENDIX C

INFRASTRUCTURE LIST

Current DRC
Project No. _____

Date Submitted: [illegible] 16, [illegible]

Date Site Plan Approved: _____

Date Preliminary Plat Approved: _____

Date Preliminary Plat Expires: _____

Figure 12

INFRASTRUCTURE LIST

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

DRB Project No. _____

SIERRA RANCH SUBDIVISION
PRELIMINARY PLAT

APPLICATION NO.

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 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
SIERRA RANCH SUBDIVISION - UNIT I									
			ONSITE PUBLIC ROADWAY IMPROVEMENTS						
		30' EOA-F	ARTERIAL PAVING W/ PCC CURB & GUTTER AND PCC 6' WIDE SIDEWALK ON SOUTH SIDE ONLY	GIBSON BOULEVARD	CHACO CANYON DR	MESSINA DRIVE	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON WEST SIDE ONLY	MESSINA DRIVE	GIBSON BOULEVARD	AMOLE MESA AVENUE	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY	AMOLE MESA AVE	WEST BOUNDARY	MESSINA DRIVE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	FOUR MILE ROAD	WEST BOUNDARY	BISON SPRINGS STREET	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY*	FOUR MILE ROAD	BISON SPRINGS STREET	EAST STUB TERMINUS	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	CORONA RANCH RD	WEST BOUNDARY	BISON SPRINGS STREET	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	WALNUT CANYON RD	WEST BOUNDARY	BISON SPRINGS STREET	/	/	/
		52' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	WALNUT CANYON RD	BISON SPRINGS STREET	MESSINA DRIVE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BUCK ISLAND ROAD	WEST BOUNDARY	BISON SPRINGS STREET	/	/	/

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			ONSITE PUBLIC ROADWAY IMPROVEMENTS (CONT.)						
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	PIPESTONE ROAD	WEST BOUNDARY	BIG SPRINGS ROAD	/	/	/
		36' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BIG SPRINGS ROAD	AMOLE MESA AVE	BISON SPRINGS STREET	/	/	/
		48' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	CHACO CANYON DR	GIBSON BOULEVARD	FOUR MILE ROAD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	SALADO CREEK ST	FOUR MILE ROAD	WALNUT CANYON ROAD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	CARIZZO PLAIN DR	WALNUT CANYON RD	BUCK ISLAND ROAD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BISON SPRINGS ST	FOUR MILE ROAD	SOUTH STUB TERMINUS	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON EAST SIDE ONLY*	GILA CLIFF DRIVE	NORTH STUB TERMINUS	PIPESTONE ROAD	/	/	/
		25' WIDE	6' AC TRAIL	PEDESTRIAN ACCESS BETWEEN LOTS 206/207	PIPESTONE ROAD	AMOLE MESA AVENUE	/	/	/
							/	/	/

* SIDEWALKS TO BE DEFERRED PER DEFERRAL EXHIBIT 'B'.
WAIVER OF SIDEWALK ON SOUTH SIDE OF FOUR MILE ROAD STUB AND WEST SIDE OF GILA CLIFF DRIVE

STREET LIGHTS AS PER COA DPM

2-2

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
SIERRA RANCH SUBDIVISION - UNIT I									
			ONSITE PUBLIC STORM DRAIN IMPROVEMENTS						
		18"-72" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	MESSINA DRIVE	GIBSON BLVD	AMOLE MESA AVENUE	/	/	/
		18" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	FOUR MILE ROAD	LOT 29	BISON SPRINGS STREET	/	/	/
		18"-24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	CORONA RANCH RD	WEST BOUNDARY	SALADO CREEK STREET	/	/	/
		24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	SALADO CREEK ST.	CORONA RANCH RD.	WALNUT CANYON ROAD	/	/	/
		18" - 30" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	WALNUT CANYON RD	WEST BOUNDARY	BISON SPRINGS STREET	/	/	/
		18" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	BUCK ISLAND ROAD	LOT 138	BISON SPRINGS STREET	/	/	/
		18" - 24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	PIPESTONE ROAD	WEST BOUNDARY	BIG SPRINGS ROAD	/	/	/
		24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	BIG SPRINGS ROAD	PIPESTONE ROAD	BISON SPRINGS STREET	/	/	/
		18" - 36" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	BISON SPRINGS ST	FOUR MILE ROAD	SOUTH STUB TERMINUS	/	/	/
		42" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	PUBLIC EASEMENT	BISON SPRINGS ST	MESSINA DRIVE	/	/	/
		42" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	WALNUT CANYON RD.	BISON SPRINGS ST	MESSINA DRIVE	/	/	/
			4.2 ACRE-FEET SURGE POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	PARK TRACT			/	/	/
			3.5 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	EL RANCHO GRANDE TRACT 16 NORTH			/	/	/
			2.6 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	SIERRA RANCH UNIT 2			/	/	/

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.

C-3

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
SIERRA RANCH SUBDIVISION - UNIT I									
			ONSITE PUBLIC WATERLINE IMPROVEMENTS						
		18" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	CHACO CANYON DR	GIBSON BLVD	FOUR MILE ROAD	/	/	/
		4-8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	FOUR MILE ROAD	WEST BOUNDARY	EAST STUB TERMINUS	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	CORONA RANCH RD	WEST BOUNDARY	BISON SPRINGS ST	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	WALNUT CANYON RD	WEST BOUNDARY	BISON SPRINGS ST	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BUCK ISLAND ROAD	WEST BOUNDARY	BISON SPRINGS ST	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	PIPESTONE ROAD	WEST BOUNDARY	BIG SPRINGS RD	/	/	/
		6-8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BIG SPRINGS ROAD	AMOLE MESA AVE	BISON SPRINGS ST	/	/	/
		4-6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BISON SPRINGS ST	FOUR MILE ROAD	SOUTH STUB TERMINUS	/	/	/
		4" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	GILA CLIFF DRIVE	NORTH STUB TERMINUS	PIPESTONE ROAD	/	/	/
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	AMOLE MESA AVE	WEST BOUNDARY	MESSINA DRIVE	/	/	/
		12" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	AMOLE MESA AVE	MESSINA DRIVE	MESA ARENOSA	/	/	/

C-4

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
SIERRA RANCH SUBDIVISION - UNIT I									
			ONSITE PUBLIC SANITARY SEWER IMPROVEMENTS						
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	FOUR MILE ROAD	WEST BOUNDARY	EAST STUB TERMINUS	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	CORONA RANCH RD	WEST BOUNDARY	BISON SPRINGS ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	WALNUT CANYON RD	WEST BOUNDARY	BISON SPRINGS ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BUCK ISLAND ROAD	WEST BOUNDARY	BISON SPRINGS ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	PIPESTONE ROAD	WEST BOUNDARY	BIG SPRINGS RD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BIG SPRINGS ROAD	PIPESTONE ROAD	BISON SPRINGS ST	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	GILA CLIFF DRIVE	NORTH STUB TERMINUS	PIPESTONE ROAD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BISON SPRINGS ST	FOUR MILE ROAD	SOUTH STUB TERMINUS	/	/	/
		10" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	PUBLIC EASEMENT	BISON SPRINGS ST	MESSINA DRIVE	/	/	/
		10" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	MESSINA DRIVE	PUBLIC EASEMENT	AMOLE MESA AVENUE	/	/	/
		10" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	AMOLE MESA AVE.	MESSINA DRIVE	PUBLIC EASEMENT IN EL RANCHO GRANDE UNIT 15	/	/	/
		8-10" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	PUBLIC EASEMENT IN EL RANCHO GRANDE UNIT 15	AMOLE MESA AVENUE	FUTURE OPEN RANGE AVE. EXISTING STUB	/	/	/

C-5.1

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Const Engineer
SIERRA RANCH SUBDIVISION - UNIT 2				NOTE: ALL UNIT 1 PUBLIC IMPROVEMENTS REQUIRED FOR UNIT 2.					
			ONSITE PUBLIC ROADWAY IMPROVEMENTS						
		30' EOA-F	ARTERIAL PAVING W/ PCC CURB & GUTTER AND PCC 6' WIDE SIDEWALK ON SOUTH SIDE ONLY	GIBSON BOULEVARD	WEST BOUNDARY	CHACO CANYON DR	/	/	/
		24' EOA-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY	AMOLE MESA AVE	WEST BOUNDARY	EAST BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	FOUR MILE ROAD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	CORONA RANCH RD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	WALNUT CANYON RD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		24' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON NORTH SIDE ONLY*	BUCK ISLAND ROAD	WEST STUB TERMINUS	ALAMO CANYON DRIVE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	BUCK ISLAND ROAD	ALAMO CANYON DR	EAST BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	PIPESTONE ROAD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	PIPESPRING STREET	FOUR MILE ROAD	PIPESTONE ROAD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	DEVILS TOWER ST	WALNUT CANYON RD	PIPESTONE ROAD	/	/	/
		48' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	ALAMO CANYON DR	PIPESTONE ROAD	AMOLE MESA AVENUE	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	ALAMO CANYON DR	BUCK ISLAND ROAD	PIPESTONE ROAD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	FOSTER RANCH ST	FOUR MILE ROAD	WALNUT CANYON ROAD	/	/	/
		28' F-F	RESIDENTIAL PAVING W/ PCC CURB & GUTTER AND PCC 4' WIDE SIDEWALK ON BOTH SIDES*	MOUNTAINTOP DR	BUCK ISLAND ROAD	PIPESTONE ROAD	/	/	/
							/	/	/

* SIDEWALKS TO BE DEFERRED PER DEFERRAL EXHIBIT 'B'.
WAIVER OF SIDEWALK ON SOUTH SIDE OF BUCK ISLAND ROAD STUB

STREET LIGHTS AS PER COA DPM

9-2

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
SIERRA RANCH SUBDIVISION - UNIT 2									
			ONSITE PUBLIC STORM DRAIN IMPROVEMENTS						
		18"-24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	PUBLIC EASEMENT	WEST BOUNDARY	PIPESPRING STREET	/	/	/
		18"-24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	PIPESPRING STREET	PUBLIC EASEMENT	CORONA RANCH ROAD	/	/	/
		18"-24" DIA	RCP W/ NEC. MH'S, LATERALS & INLETS	CORONA RANCH RD	PIPESPRING STREET	PHASE BOUNDARY	/	/	/
			1.6 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	150' AMAFCA DRAINAGE EASEMENT			/	/	/
			1.0 ACRE-FEET TEMPORARY RETENTION POND WITH PUBLIC EASEMENT AND COVENANT AND AGREEMENT	150' AMAFCA DRAINAGE EASEMENT			/	/	/

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.

C-7

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
SIERRA RANCH SUBDIVISION - UNIT 2									
			ONSITE PUBLIC WATERLINE IMPROVEMENTS						
		8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	FOUR MILE ROAD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	CORONA RANCH RD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	WALNUT CANYON RD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		4-6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	BUCK ISLAND ROAD	WEST STUB TERMINUS	EAST BOUNDARY	/	/	/
		6-8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	PIPESTONE ROAD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		8" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	PIPESPRING STREET	FOUR MILE ROAD	PIPESTONE ROAD	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	DEVILS TOWER ST	WALNUT CANYON RD	PIPESTONE ROAD	/	/	/
		6" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	MOUNTAINTOP DR	BUCK ISLAND ROAD	PIPESTONE ROAD	/	/	/
		20" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	PUBLIC EASEMENT IN EL RANCHO GRANDE UNIT 16	DELGADO	GIBSON BLVD. AT CHACO CANYON DRIVE	/	/	/
		18" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	FOUR MILE ROAD	FOSTER RANCH ST.	EAST BOUNDARY	/	/	/
		18" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	FOSTER RANCH ST.	FOUR MILE ROAD	WALNUT CANYON ROAD	/	/	/
		18" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	WALNUT CANYON RD.	DEVILS TOWER ST.	FOSTER RANCH ST.	/	/	/
		18" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	DEVILS TOWER ST.	WALNUT CANYON RD.	PIPESTONE ROAD	/	/	/
		18" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	PIPESTONE ROAD	DEVILS TOWER ST.	ALAMO CANYON DRIVE	/	/	/
		18" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	ALAMO CANYON DR.	PIPESTONE ROAD	AMOLE MESA AVENUE	/	/	/
		12-18" DIA	WATERLINE W/ NEC. VALVES FH'S, MJ'S & RJ'S	AMOLE MESA AVE	WEST BOUNDARY	EAST BOUNDARY	/	/	/

8-2

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	FOUR MILE ROAD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	CORONA RANCH RD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	WALNUT CANYON RD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	BUCK ISLAND ROAD	WEST STUB TERMINUS	EAST BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	PIPESTONE ROAD	PIPESPRING STREET	EAST BOUNDARY	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	PIPESPRING STREET	FOUR MILE ROAD	PIPESTONE ROAD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	DEVILS TOWER ST	WALNUT CANYON RD	PIPESTONE ROAD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	MOUNTAINTOP DR	BUCK ISLAND ROAD	PIPESTONE ROAD	/	/	/
		8" DIA	SANITARY SEWER W/ NEC. MH'S & SERVICES	PUBLIC EASEMENT	WEST BOUNDARY	PIPESPRING STREET	/	/	/

SCOTT STEFFEN — 12/16/04
PREPARED BY: PRINT NAME — DATE

BOHANNAN HUSTON INC.
FIRM:

Scott Steff — 12/16/04
SIGNATURE — DATE

MAXIMUM TIME ALLOW TO CONSTRUCT IMPROVEMENTS WITHOUT A DRB EXTENSION

DRB CHAIR — DATE

TRANSPORTATION DEVELOPMENT — DATE

UTILITY DEVELOPMENT — DATE

NEW MEXICO UTILITIES INC. — DATE

PARKS & RECREATION DEPARTMENT — DATE

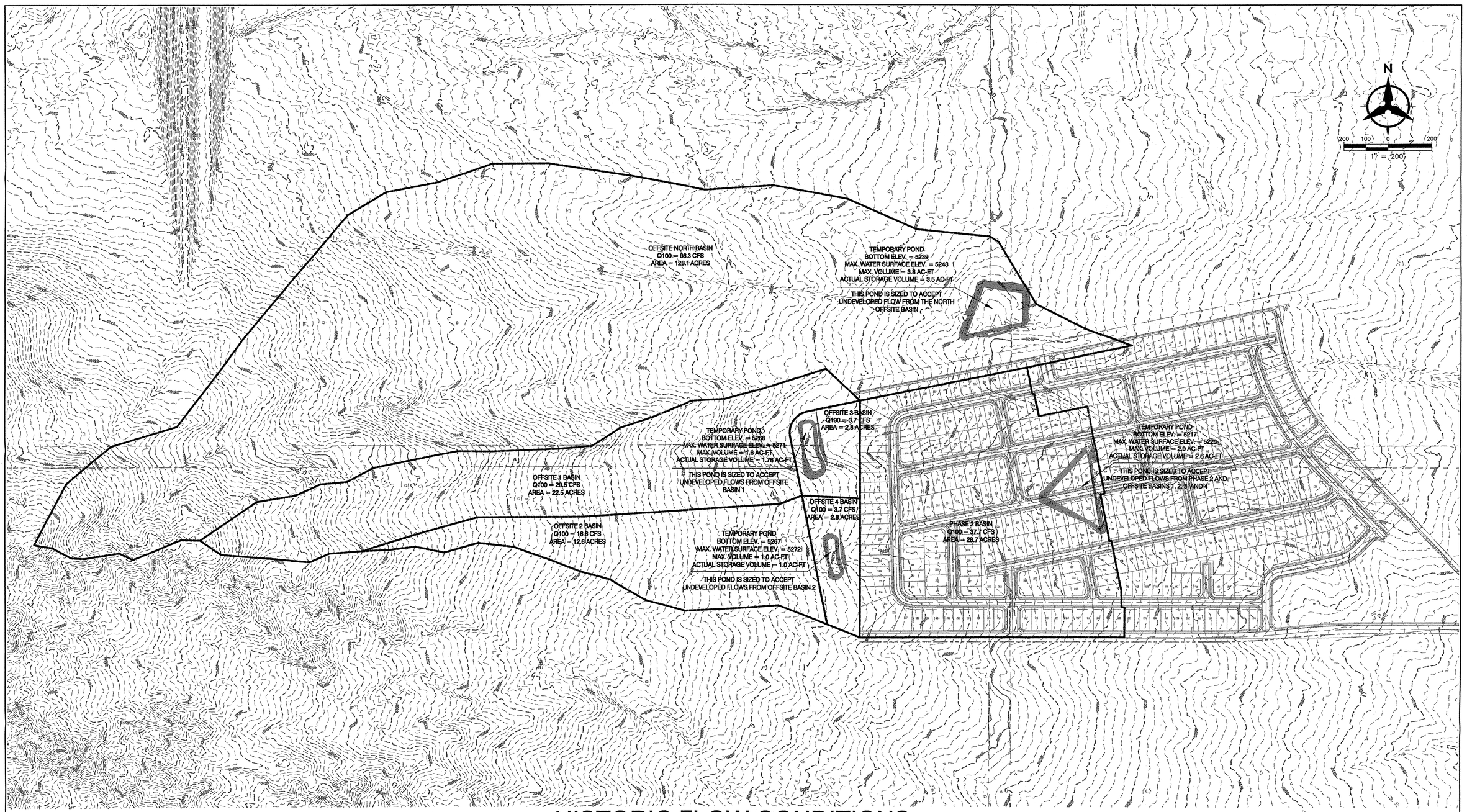
AMAFCA — DATE

CITY ENGINEER — DATE

DATE

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT/OWNER



HISTORIC FLOW CONDITIONS
OFF-SITE BASIN MAP
SIERRA RANCH SUBDIVISION
DECEMBER, 2004

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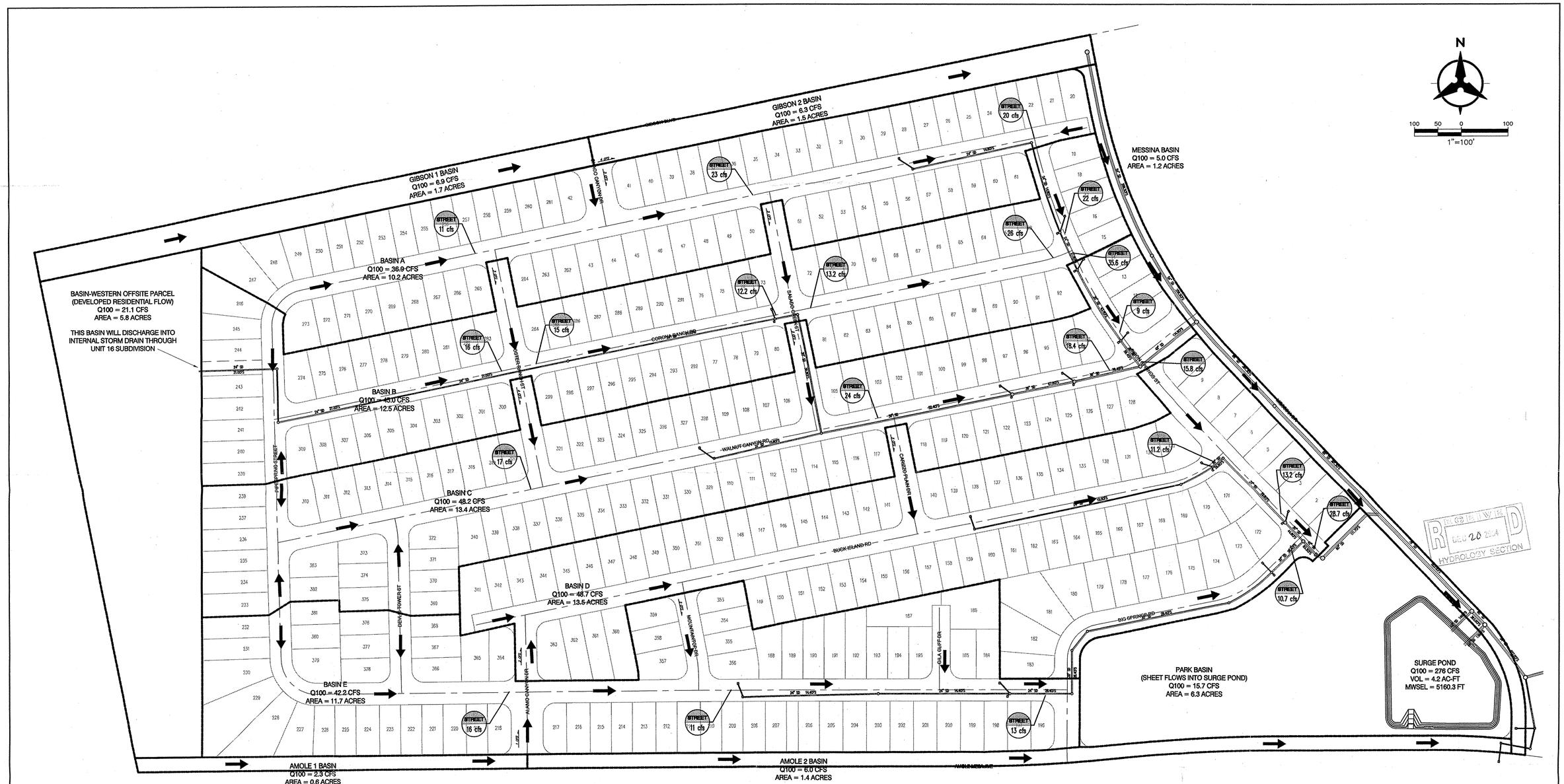
December 16, 2004 – 5:08pm

SCOTT L. SIES
NEW MEXICO
14664
REGISTERED PROFESSIONAL ENGINEER
12/16/04

RECEIVED
DEC 17 2004
HYDROLOGY SECTION

Bohannan Huston INC
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES



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DEC 20 2004
HYDROLOGY SECTION

DEVELOPED CONDITIONS
BASIN MAP
SIERRA RANCH SUBDIVISION
DECEMBER, 2004

Bohannan ▲ Huston INC.
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

PRELIMINARY PLAT FOR
SIERRA RANCH SUBDIVISION
WITHIN THE TOWN OF ATRISCO GRANT
TOWNSHIP 9 NORTH, RANGE 2 EAST, NMPM
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO
DECEMBER, 2004

LEGAL DESCRIPTION

TRACTS 16–B & 16–C, EL RANCHO GRANDE WITHIN THE TOWN OF ATRISCO GRANT PROJECTED SECTION 5
TOWNSHIP 9 NORTH, RANGE 2 EAST, NMPM
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO
(BOOK: _____, PAGE: _____, DATE: _____)

GENERAL NOTES

1. EXISTING ZONING: R–LT, R–D
   PROPOSED DEVELOPMENT: R–LT
2. PROPOSED NET ACREAGE: 71.3 AC
   NUMBER OF LOTS: 383
   PROPOSED DENSITY: 5.37 DU/AC
3. MIN. LOT DIMENSIONS: 45' X 105'
   MINIMUM LOT AREA: 4,725 SQFT
4. ALL STREETS, UTILITIES, AND STORM DRAIN IMPROVEMENTS ARE TO BE PUBLIC, AND TO BE DEDICATED TO THE CITY OF ALBUQUERQUE FOR MAINTENANCE.
5. LOT SETBACKS SHALL CONFORM TO R–LT ZONING REQUIREMENTS
6. NO INDIVIDUAL LOTS SHALL BE ALLOWED DIRECT ACCESS TO GIBSON BLVD., MESSINA DRIVE, AND/OR AMOLE MESA AVENUE.

SITE DATA

ZONE ATLAS NO.	N–8–Z
ZONING	R–LT, R–D
MILES OF FULL WIDTH STREETS CREATED	2.83 MILES
NO. OF EXISTING PARCELS	1
NO. OF LOTS CREATED	383
DENSITY	5.37 DU/AC

SURVEY NOTES:

1. ALL BOUNDARY CORNERS SHOWN (●) ARE FOUND REBAR W\CAP.
2. ALL STREET CENTERLINE MONUMENTATION SHALL BE INSTALLED AT ALL CENTERLINE PC'S, PTS, ANGLE POINTS, AND STREET INTERSECTIONS AND SHOWN THUS (▲) AND WILL BE MARKED BY (4") ALUMINUM CAP STAMPED "CITY OF ALBUQUERQUE CENTERLINE MONUMENTATION MARKED, DO NOT DISTURB PLS "7719".
3. THE SUBDIVISION BOUNDARY WILL BE TIED TO THE NEW MEXICO STATE PLANE COORDINATE SYSTEM AS SHOWN.
4. BASIS OF BEARINGS WILL BE NEW MEXICO STATE PLANE BEARINGS.
5. DISTANCES SHALL BE GROUND DISTANCES.
6. MANHOLES WILL BE OFFSET AT ALL POINTS OF CURVATURE, TANGENCY STREET INTERSECTIONS, AND ALL OTHER ANGLE POINTS TO ALLOW USE OF CENTERLINE MONUMENTATION.

ACS BRASS TABLET STAMPED "TRANS"
Geographic Position (NAD 1927)
N.M. State Plane Coordinates (Central Zone)
X= 354,899.45 Y= 1,471,822.67
Ground–to–Grid Factor = 0.99967921
Δα = -00°16'42"
SLD 1929 ELEVATION = 5118.43

PORTION OF EXISTING 100' DRAINAGE EASEMENT TO BE VACATED PER THIS PLAT.

LANDS OF RIO BRAVO PARTNERS
PARCEL 2-D
(4-17-96, 96C-160)

ROSNER TRACT
TRACT B-1
(03-27-03, 03C-80)

KEYED NOTES

- (A) 10' PUBLIC UTILITY EASEMENT
- (1) 30' PUBLIC SANITARY SEWER AND STORM DRAIN EASEMENT.
- (2) TRACT 16–B–1

LEGEND

▬▬	SUBDIVISION BOUNDARY LINE
– – –	EXISTING SUBDIVISION BOUNDARY
——	NEW LOT LINE
——	ADJOINING PROPERTY LINE
▲	CENTERLINE MONUMENT TO BE INSTALLED
△	CITY OF ALBUQUERQUE SURVEY CONTROL MONUMENT

APPROVED

[signature] 12/16/04
CITY SURVEYOR DATE

[signature] 12/16/04
BO JOHNSON DATE
VICE PRESIDENT, CURB INC.

Bohannan ▲ Huston INC.
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

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December 16, 2004 – 9:25am