CITY OF ALBUQUERQUE

Richard J. Berry, Mayor

May 24, 2017

Diane Hoelzer, P.E.
Mark Goodwin & Associates
PO Box 90606
Albuquerque, NM, 87199

RE: Oakland Ridge Subdivision
Grading Plan and Drainage Report
Stamp Date: 5/19/17
Hydrology File: C18D085

Dear Ms. Hoelzer:

Based upon the information provided in your submittal received 5/19/2017, the Grading Plan and Drainage Report **is not** approved for Preliminary Plat action by the DRB. The following comments need to be addressed for approval of the above referenced project:

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

1. More than 1 acre of disturbance is proposed, therefore an Erosion and Sediment Control Plan is required and is to be submitted to the storm water quality engineer (Curtis Cherne, PE, ccherne@cabq.gov). An approval for this must be given prior to Hydrology's approval for Grading Permit.

Drainage Repot:

1. Under Design Criteria and Previous Reports, please add that the NAA MDP design analysis was modified by the Eagle Rock Drainage Plan. A storm pipe and Manhole on Oakland Ave. was installed with the construction of Oakland Estates. This pipe was designed to capture the drainage of the east portion of Basin 117.2 and discharges into a storm sewer system on Eagle Rock Ave.

2. Please note that the proposed 30-in storm pipe on Oakland Ave. which will tie into the above mentioned existing manhole and storm sewer is currently at best only about 20% constructed. This has a completion date in August and accepted by the City two or three months after the completion date. Depending on the quickness of this project, a temporary retention pond may be needed until the storm sewer system is accepted by the City.

3. Under Developed Drainage Conditions, it states that the existing storm drain in Oakland Avenue with inlets will intercept the North basin's flow. As stated above, the existing storm sewer system on Oakland is currently not accepting drainage from Basin 117.2. Once the system is accepted, it will be open to the drainage.

Orig: Drainage File

Please provide the inlet capacity calculations on the existing inlet constructed by the adjacent development downstream to demonstrate that there will be downstream capacity once the Oakland storm sewer is accepted by the City.

4. Under Developed Drainage Conditions, it states that South basin will discharge 7.05 cfs which will be conveyed through a proposed storm pipe to an inlet on Alameda. However, according to the Drainage Letter Report for Alameda Boulevard San Pedro to Wyoming Project dated January 2012 by Thompson Engineering Consultants, the storm system on Alameda was designed to take 3.82 cfs/acre from Basin 117.3. For this project, The area which is part of Basin 117.3 is the two southern existing lots. The combined area of these two lots is 1.61 acres and therefore the allowable maximum discharge is 6.16 cfs. See attached report and basin exhibit. Please change the North and South drainage basis, so that the South basin will only discharge 6.16 cfs or less.

5. Please update Figure 4 as outlined above. Also please state the acreage of the North basin and the South basin.

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6. Please update Figure 5. This should reflect the new basins, so Lot 6 & 7 information should be moved from the South basin to the North basin. Also Lot 18 & 19 information should be moved from the South basin to the North basin.

7. Please provide inlet capacity and weir calculations for the proposed Type A inlet.

8. Please provide the calculation for the 100 year HGL through the proposed 24" storm pipe from the existing inlet to the proposed Type A inlet.

9. Please provide an exhibit showing the profile of the proposed 24" storm pipe from the existing inlet to the proposed Type A inlet. Please include the HGL.

Grading Plan:

1. Please provide the street slopes.

2. The retaining wall along the East property line appears to have a constructability problem with undermining the existing sidewalk. Please provide a cross section.

3. Please add the site floodplain information.

4. On the Typical Depressed Area Detail, Notes #4 & 5 are missing. Please correct the Detail.

CITY OF ALBUQUERQUE

Richard J. Berry, Mayor

5. On the Typical Front Yard First Flush Detail, Please show the property line that goes through the middle of the majority of the ponds. Also cross section would greatly improve the readability and show that the first flush volume is only within the 6-inch depth. Also this pond should have gravel mulch within the first flush volume.

6. Please clarify the Typical Lot Grading Scheme. It appears that the back lot drainage will just travel either to the north or south depending on the grading without being directed to the first flush ponds.

7. It appears that the first flush ponds will not collect the majority of the lot runoff as designed. Please show that each first flush basin is designed for its drainage basin. Pond location or another layout may be necessary.

8. Please show better line weight between the existing sidewalks & ramps and the proposed sidewalks & ramps.

9. Please provide the Grate elevation for the Type A inlet.

10. At the Proposed Type A inlet, is the proposed sidewalk supposed to connect to the proposed sidewalk along Alameda Blvd? If so, then please remove the retaining wall at the connection.

11. Please provide proposed grade points at the southwest corner (on the proposed sidewalk), at the Type A inlet (on the proposed sidewalk), at the northeast corner (on the proposed sidewalk), at the end of the wall on Lot 1, and at the end of the curved wall on Lot 13 (on the proposed sidewalk).

12. Along the northern half of the existing retaining wall along the western property line, starting at Lot 6 the proposed grades are higher than the top of the existing retaining wall. There are considerable constructability issues here. Please clarify and provide a cross section of the existing retaining wall.

If you have any questions, please contact me at 924-3995 or rbrissette@cabq.gov.

Sincerely,

Renee C. Brissette

Reneé C. Brissette, P.E.
Senior Engineer, Hydrology
Planning Department

Orig: Drainage File

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Oakland Ridge Subdivision Building Permit #: _____ City Drainage #: _____

DRB#: 1010793 EPC#: _____ Work Order#: _____

Legal Description: Lots 15, 16, 17, 18, Block 28, Tract A, Unit B, North Albuquerque Acres

City Address: Oakland Ave and Olivine Ct.

Engineering Firm: Mark Goodwin & Associates, PA Contact: Diane Hoelzer, PE

Address: PO BOX 90606, Albuquerque, NM 87199

Phone#: 505-828-2200 Fax#: _____ E-mail: diane@goodwinengineers.com

Owner: Brian Urlacher, a Single Man Contact: Bo Johnson, Bokay Construction

Address: 5160 San Francisco NE, Albuquerque, NM 87109

Phone#: 505-450-4616 Fax#: _____ E-mail: bo@bokayconst.com

Architect: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Other Contact: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE

_____ TRAFFIC/ TRANSPORTATION

_____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

_____ ENGINEER/ ARCHITECT CERTIFICATION

_____ CONCEPTUAL G & D PLAN

X GRADING PLAN

_____ DRAINAGE MASTER PLAN

_____ DRAINAGE REPORT

_____ CLOMR/LOMR

_____ TRAFFIC CIRCULATION LAYOUT (TCL)

_____ TRAFFIC IMPACT STUDY (TIS)

_____ EROSION & SEDIMENT CONTROL PLAN (ESC)

_____ OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

_____ BUILDING PERMIT APPROVAL

_____ CERTIFICATE OF OCCUPANCY

X PRELIMINARY PLAT APPROVAL

_____ SITE PLAN FOR SUB'D APPROVAL

_____ SITE PLAN FOR BLDG. PERMIT APPROVAL

_____ FINAL PLAT APPROVAL

_____ SIA/ RELEASE OF FINANCIAL GUARANTEE

_____ FOUNDATION PERMIT APPROVAL

_____ GRADING PERMIT APPROVAL

_____ SO-19 APPROVAL

_____ PAVING PERMIT APPROVAL

_____ GRADING/ PAD CERTIFICATION

_____ WORK ORDER APPROVAL

_____ CLOMR/LOMR

_____ PRE-DESIGN MEETING

_____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: _____ Yes X No

DATE SUBMITTED: May 19, 2017 By: Diane Hoelzer, PE

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

Oakland Ridge Subdivision

Drainage Management Plan

Prepared by
Mark Goodwin & Associates, P.A.

May 2017

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Oakland Ridge Subdivision Building Permit #: _____ City Drainage #: _____

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Owner: Brian Urlacher, a Single Man Contact: Bo Johnson, Bokay Construction

Address: 5160 San Francisco NE, Albuquerque, NM 87109

Phone#: 505-450-4616 Fax#: _____ E-mail: bo@bokayconst.com

Architect: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Other Contact: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE

_____ TRAFFIC/ TRANSPORTATION

_____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

_____ ENGINEER/ ARCHITECT CERTIFICATION

_____ CONCEPTUAL G & D PLAN

X GRADING PLAN

_____ DRAINAGE MASTER PLAN

_____ DRAINAGE REPORT

_____ CLOMR/LOMR

_____ TRAFFIC CIRCULATION LAYOUT (TCL)

_____ TRAFFIC IMPACT STUDY (TIS)

_____ EROSION & SEDIMENT CONTROL PLAN (ESC)

_____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: _____ Yes X No

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

_____ BUILDING PERMIT APPROVAL

_____ CERTIFICATE OF OCCUPANCY

X PRELIMINARY PLAT APPROVAL

_____ SITE PLAN FOR SUB'D APPROVAL

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_____ PAVING PERMIT APPROVAL

_____ GRADING/ PAD CERTIFICATION

_____ WORK ORDER APPROVAL

_____ CLOMR/LOMR

_____ PRE-DESIGN MEETING

_____ OTHER (SPECIFY) _____

DATE SUBMITTED: May 19, 2017 By: Diane Hoelzer, PE

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

Oakland Ridge Subdivision

Table of Contents

I. PROJECT DESCRIPTION

The proposed Oakland Ridge Subdivision covers an area of approximately 2.83 acres. It is bounded by Oakland Ave. to the north, Louisiana Blvd. to the east, Alameda Blvd. to the south and a new subdivision currently under construction to the west. The subdivision will consist of 23 single family residential homes.

II. DESIGN CRITERIA AND PREVIOUS REPORTS

The design criteria used in this report was in accordance with Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria, January 1993 edition. The 100-year 6-hour storm event was analyzed to determine flow to be conveyed within the roadways using P(1 hr)=2.10", P(6-hr)=2.50". The onsite Land Treatment values were determined based on Table A-5 Percent Treatment D for single family residential. First Flush volumes were calculated using 0.34 inches of precipitation over the new impervious areas (60%), which is the latest "design criteria" used by the City of Albuquerque.

There is an approved North Albuquerque Acres Master Drainage Plan (Dixon, 10-28-98). This project site lies within sub basins 117.2 and 117.3 in the NAA MDP report. Half of our site is allowed free discharge to the north in Oakland Avenue and half as allowable flows south to Alameda Blvd. In the NAA MDP report Land treatment values for future developed conditions were assumed to be Treatment A/B/C/D = 0/34/16/50. The 100 year discharge in this report used Treatment values of 0/20/20/60. A comparison was made between the allowable discharge based on the NAA MDP report and the actual discharge based on treatment values used in this project. The allowable discharge is 11.51 cfs as compared to the actual 12.21 cfs. There is a 0.7 cfs difference between these values, which for the 100 year storm event is considered an insignificant increase.

The project site is in FEMA flood zone X as shown on FIRM Panel 137 of 825, map number 35001C0137H, August 16, 2012 (Figure 3).

III. EXISTING DRAINAGE CONDITIONS

Under existing drainage conditions, onsite runoff is conveyed as overland surface flow in a westerly direction. There is a current development underway that is blocking the natural flow westward. They have constructed temporary ponds on this project site to prevent this site's runoff from flowing onto their property. Since this property is bounded by developed streets with curb and gutter on the other three sides, no offsite runoff enters this site.

IV. DEVELOPED DRAINAGE CONDITIONS

The total peak 100 year 6 hour discharge under developed conditions from this project site is 12.21 cfs. The North Sub basin will discharge 5.15 cfs into Oakland Avenue. There is an existing storm drain in Oakland Avenue with inlets that would intercept these flows. The South Sub basin will discharge 7.05 cfs into Alameda Avenue. There is an existing storm drain in Alameda with an existing inlet close enough to our project site, that an onsite inlet can connect to the existing inlet in Alameda Blvd. and convey the 7.05 cfs.

V. FIRST FLUSH PONDS

It is proposed to construct first flush ponds in the front yard areas and along the landscape strip between the curb and sidewalk as illustrated in Figure 4. These ponds should be constructed to be 6" deep (typical) with side slopes no greater than 3:1 (maximum). The grading plan shows the area required for each of the front yard ponds.

A summary of First Flush pond calculations and exhibit can be found in Figure 5 and 4, respectively. Additional first flush volume calculations can be found in Appendix A as well.

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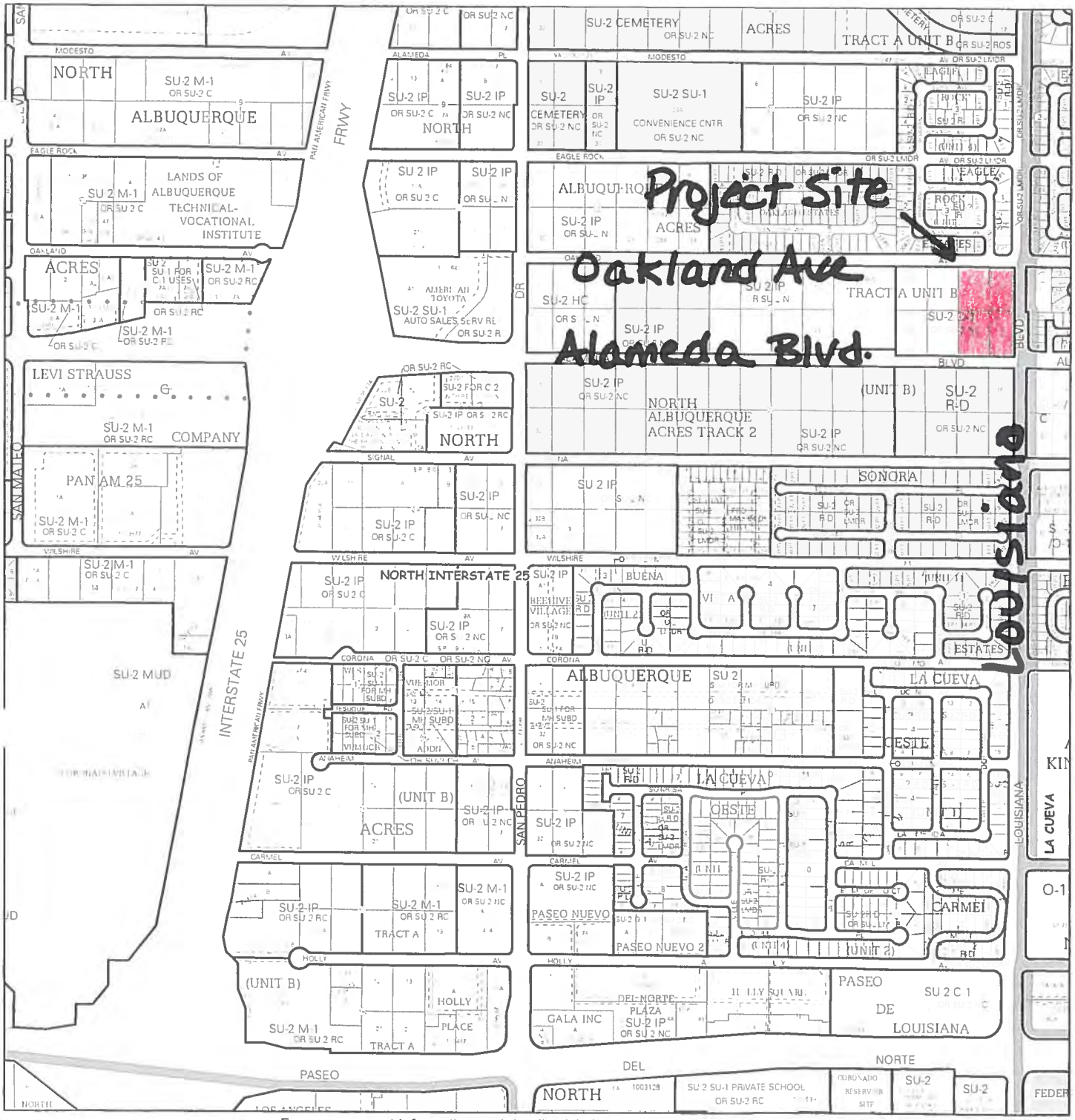


For more current information and details visit: http://www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: 4/2/2012

Zone Atlas Page:

C-18-Z

Selected Symbols

- SECTOR PLANS
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

FIGURE 1

Project Site
Alameda Blvd
Louisiana Blvd NE
Oakland Ave NE
Alameda Blvd NE
Limestone Ave NE
Glen Mohr Ln NE
© 2016 Google

FIGURE 2

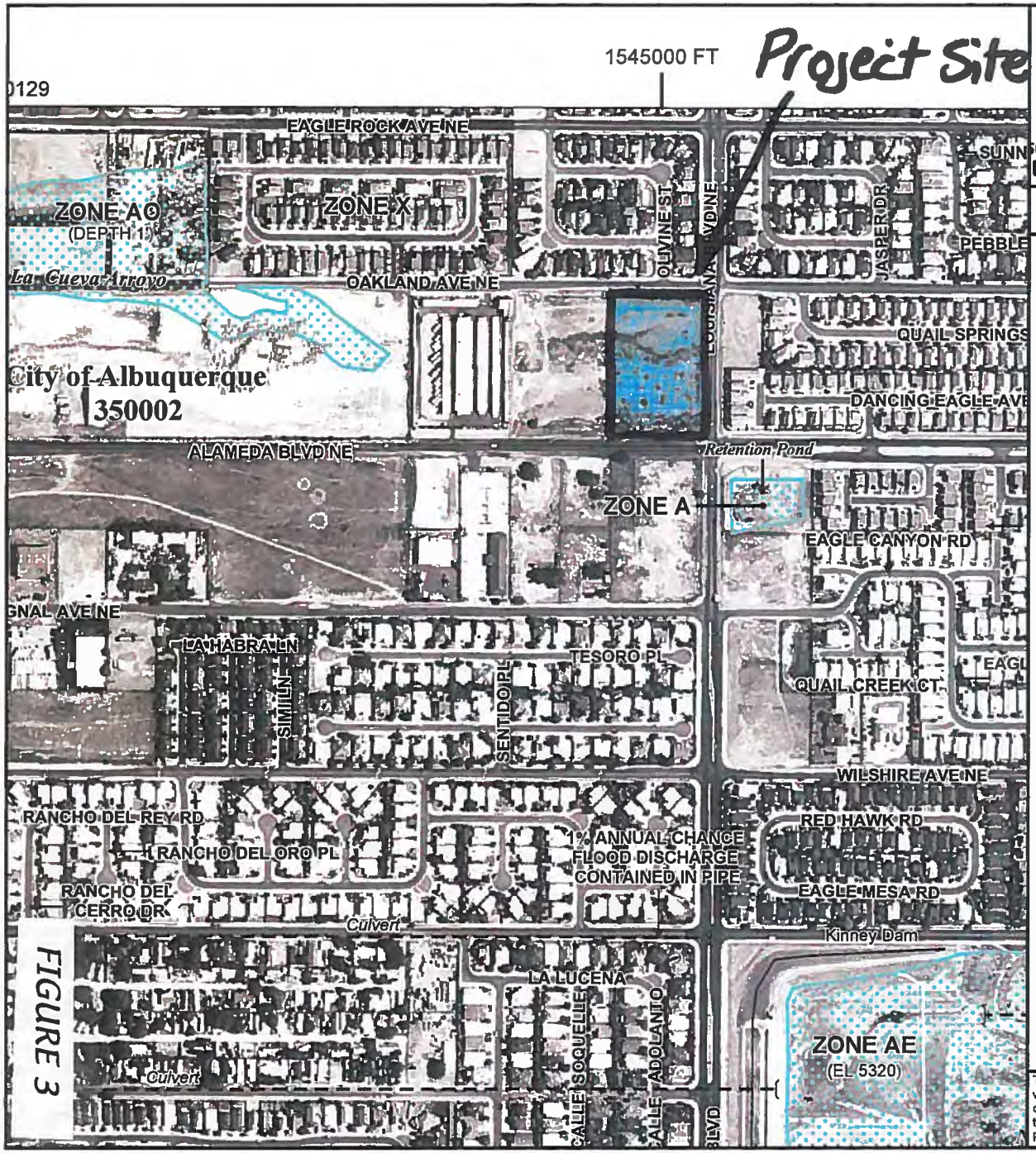


FIGURE 3

MAP SCALE 1" = 500'

500 0 500 1000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0137H

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 137 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0137	H
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0137	H

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0137H

MAP REVISED
AUGUST 16, 2012

Federal Emergency Management Agency

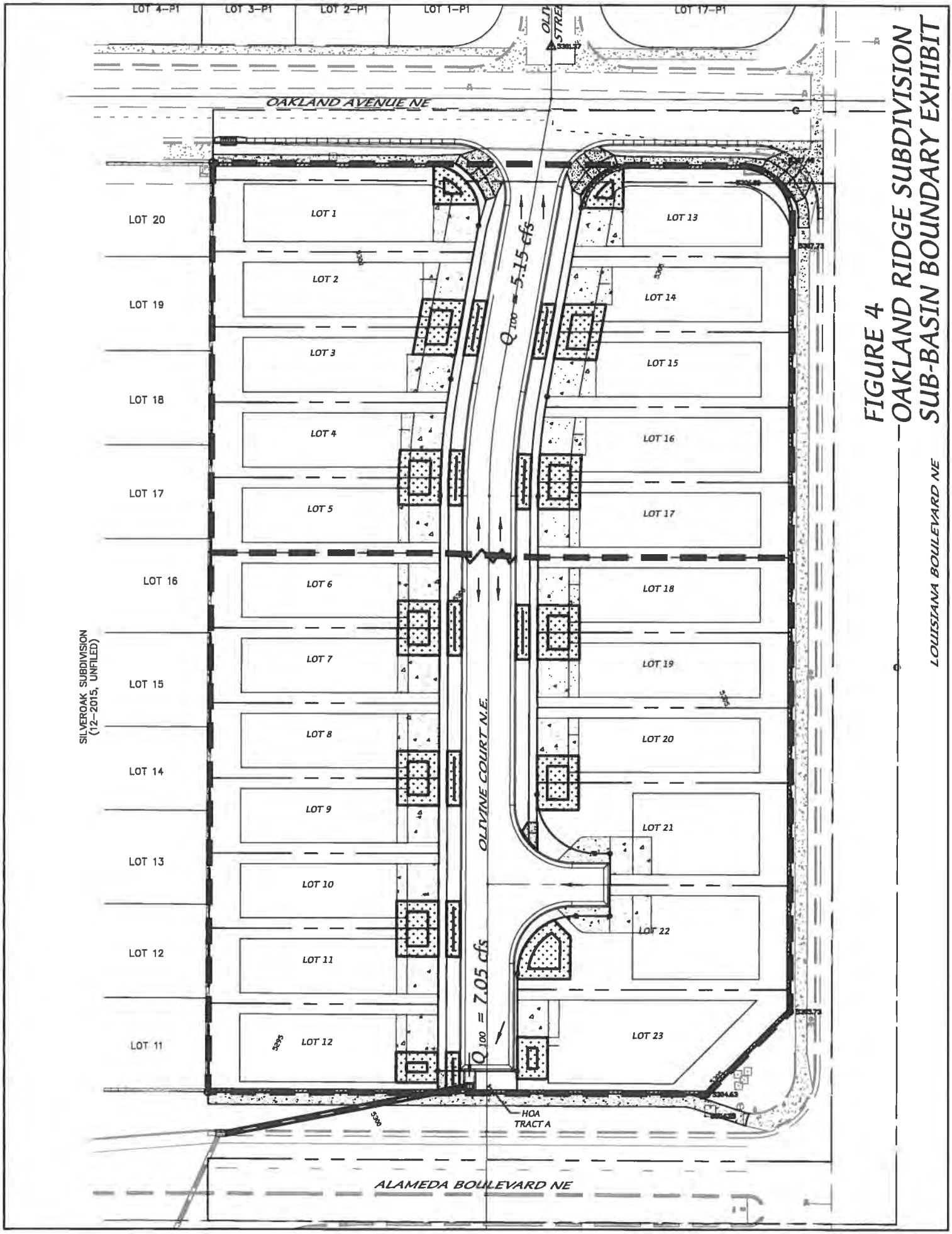


FIGURE 4
–OAKLAND RIDGE SUBDIVISION
SUB-BASIN BOUNDARY EXHIBIT

OAKLAND RIDGE FIRST FLUSH POND CALCULATIONS					
NORTH BASIN			SOUTH BASIN		
LOCATION	Front Yard	Curbside	LOCATION	Front Yard	Curbside
	cu.ft.	cu.ft.		cu.ft.	cu.ft.
Lot 1	72.2				
Lot 2 & 3	166.0	30.5			
Lot 4 & 5	163.5	30.3			
			Lot 6 & 7	161.4	30.0
			Lot 8 & 9	161.4	30.0
			Lot 10 & 11	165.1	30.8
			Lot 12	74.9	20.1
Lot 13	74.5				
Lot 14 & 15	166.3	30.5			
Lot 16 & 17	162.6	30.3			
			Lot 18 & 19	161.4	30.0
			Lot 20 & 21	161.4	
			Lot 22	180.4	
			Lot 23	74.9	
	805.0	**121.5**		**1140.9**	**140.9**
Totral provided		**926.5**			**1281.7**
Total required		**885**			**1,211**

FIGURE 5

Current DRC
Project Number:_____

FIGURE 12

INFRASTRUCTURE LIST

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

Date Submitted: 5/19/17
Date Site Plan Approved:_____
Date Preliminary Plat Approved:_____
Date Preliminary Plat Expires:_____
DRB Project No.: 1010793
DRB Application No.:_____

Oakland Ridge Subdivision
PROPOSED NAME OF PLAT AND/OR SITE DEVELOPMENT PLAN

Lots 15,16,17, and 18, Block 28, Tract A, Unit B, N.A.A.
EXISTING LEGAL DESCRIPTION PRIOR TO PLATTING ACTION

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
			ON-SITE PAVING						
		25'FF	Res Pvmt	Olivine Court	Oakland Ave	Lot 12 and 23	/	/	/
			Curb & Gutter						
		4'	Sidewalk (west side) (1)	Olivine Court	Oakland Ave	Lot 12	/	/	/
		4'	Sidewalk (east sides) (1)	Olivine Court	Oakland Ave	Lot 21	/	/	/
		20' FF	Res Pvmt	Olivine Stub	Olivine Court	Lot 21 & 22	/	/	/
			Curb & Gutter	"	"	"			
		4'	Sidewalk (south side)	Oakland Ave	West P.L.	Louisiana	/	/	/
		6'	Sidewalk (north side)	Alameda Blvd	West P.L.	Louisiana	/	/	/
			WATER						
		8"	Waterline	Olivine Court	Ex. WL Oakland Ave	Ex WL Alameda	/	/	/
			SANITARY SEWER						
		8"	SAS	Olivine Court	Ex SAS Oakland Ave	Lot 12/23	/	/	/
		PRO-RATA	$1,293.30	WATER			/	/	/
		PRO-RATA	$1,526.85	SANITARY SEWER			/	/	/
			DRAINAGE						
		24"	RCP	Olivine Court	South End of ROW	Ex. Inlet Alameda	/	/	/

D. MARK GOODWIN & ASSOCIATES

The items listed below are on the CCIP and approved for Impact Fee credits. Signatures from the Impact Fee Administrator and the City User Department is required prior to DRB approval of

Financially Guaranteed DRC #	Constructed Under DRC #	Size	Type of Improvement	Location	From	To

Construction Certification

Private Inspector P.E.		City Cnst Engineer
/	/	/
/	/	/

Approval of Creditable Items:

Impact Fee Admistrator Signature Date

Approval of Creditable Items:

City User Dept. Signature Date

1 Sidewalks to be Deferred per approved exhibit
2 Street Lights Per DPM
3 Water Infrastructure includes Valves, Fittings, Valve Boxes, Fire Hydrants, and Appurtenances.
4 Sanitary Sewer includes manholes and service connection to property line
5 Grading & Drainage certification per DPM for releast of SIA & Financial Guaranty's. Financial Guaranty's are not required for grading.

AGENT / OWNER

Diane Hoelzer, P.E.
NAME (print)

MARK GOODWIN & ASSOCIATES
FIRM

Diane Hoelzer 5-19-17
SIGNATURE - date

MAXIMUM TIME ALLOWED TO CONSTRUCT THE IMPROVEMENTS WITHOUT A DRB EXTENSION: N/A

DEVELOPMENT REVIEW BOARD MEMBER APPROVALS

DRB CHAIR - date

PARKS & GENERAL SERVICES - date

TRANSPORTATION DEVELOPMENT - date

AMAFCA - date

UTILITY DEVELOPMENT - date

_____ - date

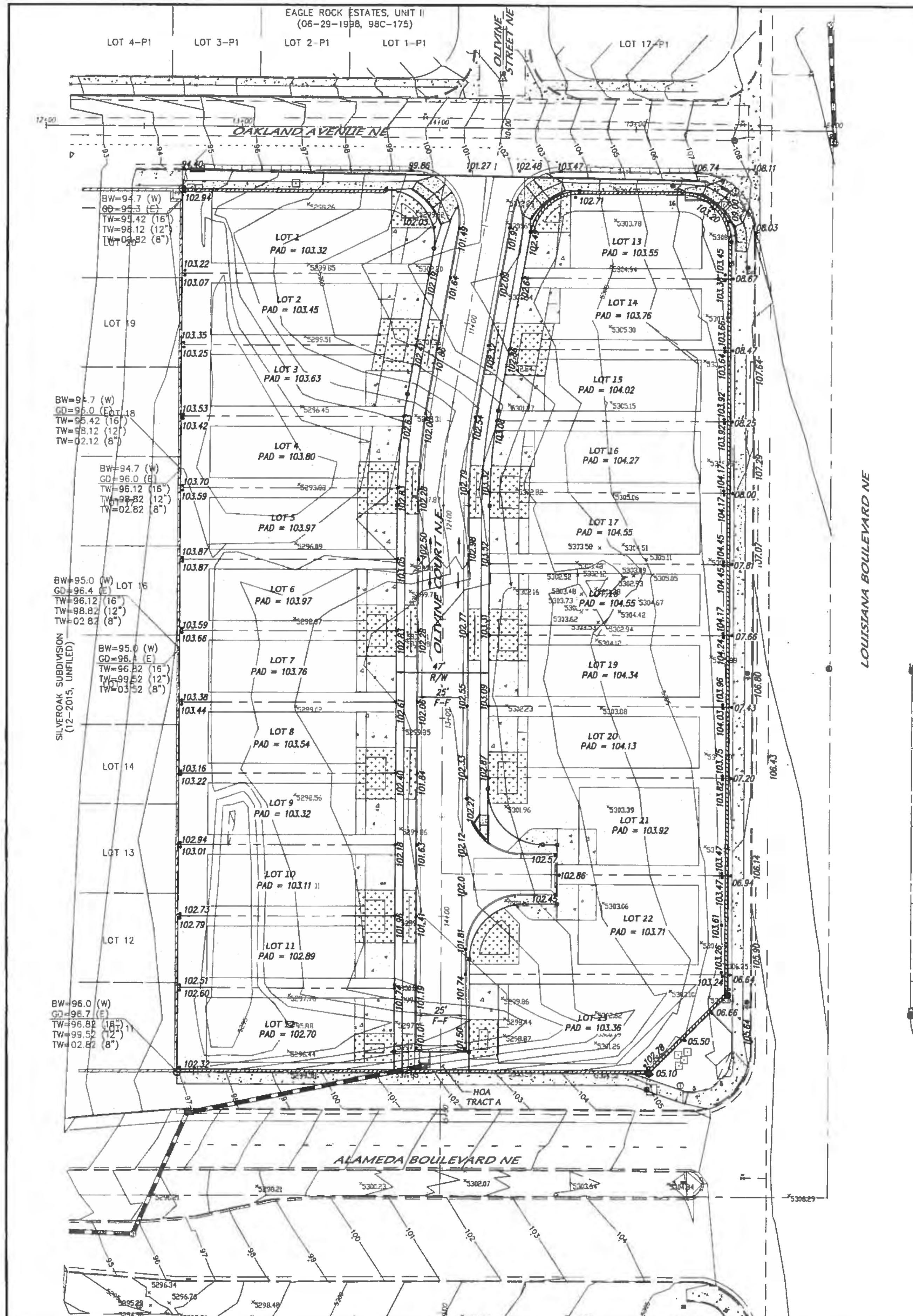
CITY ENGINEER - date

_____ - date

DESIGN REVIEW COMMITTEE REVISIONS

REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT /OWNER

D. MARK GOODWIN & ASSOCIATES



EAGLE ROCK ESTATES, UNIT III (05 13-1999, 99C-118) LOT 9-P1

VISTA DEL AGUILA, UNIT 3 (03-25-2004, 2004C-101)

LOT 38

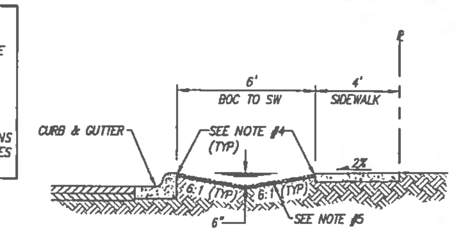
LOT 39

LOT 40

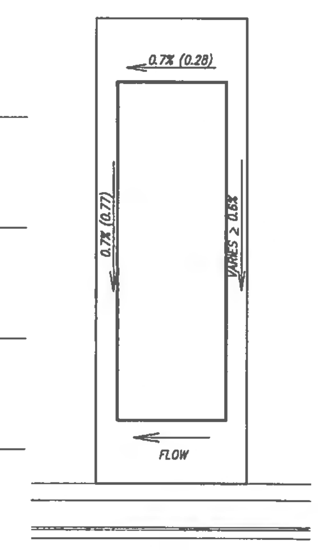
LOT 41

LOT 42

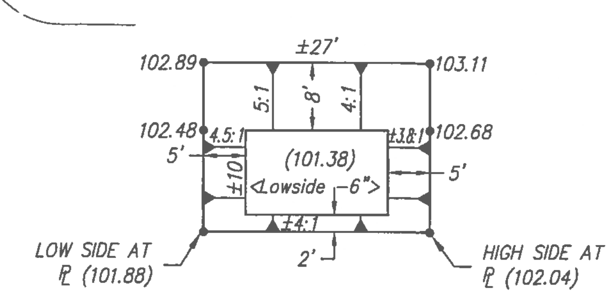
CAUTION:
NOTE THAT ALL EXISTING UTILITIES MAY NOT BE SHOWN. ALL EXISTING SERVICE CONNECTIONS ARE NOT SHOWN. ANY EXISTING UTILITIES THAT ARE SHOWN ARE APPROXIMATE LOCATION ONLY. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT ALL THE UTILITY OWNERS AND TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO ANY EXCAVATIONS TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS.



SECTION A - A
TYPICAL DEPRESSED AREA
ON-SITE BETWEEN SIDEWALK & BACK OF CURB
1"=5'



TYPICAL LOT GRADING SCHEME



TYPICAL FRONT YARD
FIRST FLUSH CONSTRUCTION

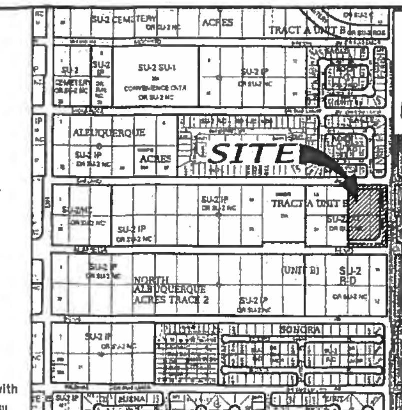
SCALE: 1" = 30'

LANDSCAPE BUFFER NOTES:

1. Surface between back of curb and sidewalk to be covered with gravel mulch (minimum 3/4"), cobbles or rip-rap. Do not fill entire swale.
2. Landscape fabric is recommended, but not required, between the dirt and the stone. If landscape fabric is to be used it is to be permeable.
3. The 6" depth is measured from top of curb to top of landscape rock material or gravel mulch.

LEGEND

Symbol	Description
	EXISTING CONCRETE
	EXISTING BLOCK WALL
—D—	EXISTING METAL FENCE
	EXISTING METAL FENCING W/BLOCK PILASTERS
WV	EXISTING WATER VALVE
	EXISTING FIRE HYDRANT
	EXISTING SANITARY SEWER MANHOLE
	EXISTING STORM DRAIN MANHOLEMANHOLE
	EXISTING STORM DRAIN INLET INLET
	EXISTING UTILITY PEDESTAL
—G—	EXISTING UNDERGROUND GAS LINE
—SAS—	EXISTING UNDERGROUND SANITARY SEWER
—SD—	EXISTING UNDERGROUND STORM DRAIN LINE
—W—	EXISTING UNDERGROUND WATER LINE
5075.50	EXISTING SPOT ELEVATION
BC 5075.50	EXISTING BACK OF CURB ELEVATION
FL 5075.50	EXISTING FLOW LINE ELEVATION
TOP 5075.50	EXISTING TOP ELEVATION
TOE 5075.50	EXISTING TOE ELEVATION
TC 5075.50	EXISTING TOP OF CONCRETE ELEVATION
	NEW STANDARD CURB & GUTTER
	NEW MOUNTABLE CURB & GUTTER
	NEW RIGHT-OF-WAY
	NEW CENTERLINE
	NEW LOT LINES
	NEW EASEMENTS
69.53TW 68.25BW	NEW TOP OF WALL ELEVATION / NEW BOTTOM OF WALL ELEVATION
+81.77	NEW SPOT ELEVATIONS
	NEW FLOW DIRECTION
	NEW STORM DRAIN



VICINITY MAP (NTS) ZONE ATLAS MAP C-18-Z

LEGAL DESCRIPTION

A TRACT OF LAND SITUATE WITHIN THE ELENA GALLEGOS GRANT, PROJECTED SECTION 13, TOWNSHIP 11 NORTH, RANGE 3 EAST, NEW MEXICO PRINCIPAL MERIDIAN, CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO, BEING LOT 15, 16, 17 & 18, BLOCK 28, TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES, AS THE SAME IS SHOWN AND DESIGNATED ON SAID PLAT, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON APRIL 24, 1936, IN PLAT BOOK D, PAGE 130, AND CONTAINING 4.0446 GROSS ACRES MORE OR LESS.

EXCEPTING THEREFROM, AN AREA OF UNDEDICATED RIGHT-OF-WAY BEING PORTIONS OF OAKLAND AVENUE NE, LOUISIANA BOULEVARD NE AND ALAMEDA BOULEVARD NE, AS THE SAME IS SHOWN AND DESIGNATED ON SAID PLAT, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON APRIL 24, 1936, IN PLAT BOOK D, PAGE 130, AND CONTAINING 0.8236 ACRES MORE OR LESS.

FURTHER EXCEPTING THEREFROM, A TRACT OF LAND FOR PUBLIC RIGHT-OF-WAY, DEDICATED TO THE CITY OF ALBUQUERQUE, AS THE SAME IS SHOWN AND DESIGNATED IN WARRANTY DEED, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON OCTOBER 29, 2013, IN DOCUMENT NO. 2013118575, AND CONTAINING 0.4433 ACRES MORE OR LESS.

COMPRISING 2.7777 NET ACRES, MORE OR LESS.

GENERAL NOTES

1. *CONTRACTOR MUST OBTAIN A TOPSOIL DISTURBANCE PERMIT FROM THE ENVIRONMENTAL HEALTH DIVISION PRIOR TO CONSTRUCTION.*
2. *CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION SHALL GOVERN ALL WORK.*
3. *THE CONTRACTOR SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL DUST CONTROL MEASURES AND REQUIREMENTS AND WILL BE RESPONSIBLE FOR PREPARING AND OBTAINING ALL NECESSARY APPLICATIONS AND APPROVALS.*
4. *THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE LOTS INTO PUBLIC RIGHT-OF-WAY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AND WETTING THE SOIL TO KEEP IT FROM BLOWING.*
5. *THE EARTHWORK CONTRACTOR SHALL STOCKPILE ENOUGH MATERIAL ADJACENT TO RETAINING WALL LOCATIONS TO BE UTILIZED FOR WALL BACKFILL.*

AS BUILT INFORMATION: CONTRACTOR; WORK STAKED BY — DATE; INSPECTOR'S ACCEPTANCE BY — DATE; FIELD VERIFICATION BY — DATE; DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION: RECORDED BY — DATE; NO.

BENCH MARKS: A.G.R.S. MONUMENT "10-C18" HAVING AN ELEVATION OF 5222.09 (NAVD 1988)

SURVEY INFORMATION — FIELD NOTES: NO. | BY | DATE

ENGINEER'S SEAL: DIANE HOELZER, NEW MEXICO, 11087, LICENSED PROFESSIONAL ENGINEER — 5-18-17

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DMG	DATE	01/17
DRAWN BY	DER	DATE	01/17
CHECKED BY	DMG	DATE	01/17

MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PLANNING DEPARTMENT

TITLE: *OAKLAND RIDGE SUBDIVISION GRADING AND DRAINAGE PLAN*

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO. | ZONE MAP NO. C-18-Z | SHEET 1 OF 1

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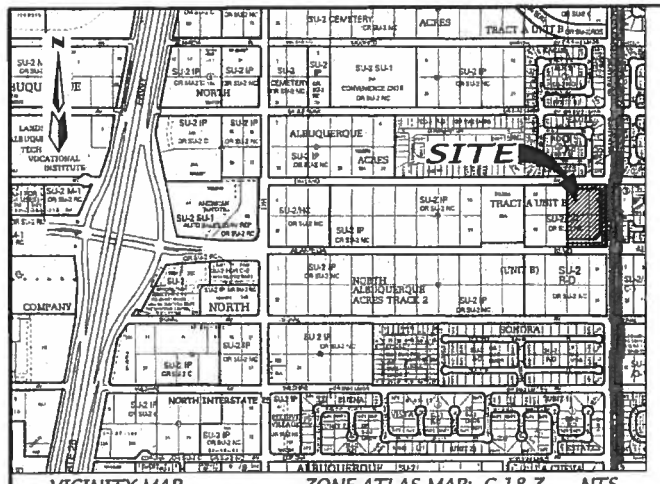
PRELIMINARY PLAT
FOR
OAKLAND RIDGE SUBDIVISION

WITHIN THE
ELENA GALLEGOS GRANT
PROJECTED SECTION 13
TOWNSHIP 11 NORTH, RANGE 3 EAST, NMPM
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO
FEBRUARY, 2017



VICINITY MAP ZONE ATLAS MAP: C-18-Z NTS

AGRS MONUMENT
"10-C18"
N=1524123.885
E=1542565.263
G-G=0.999665042
$\Delta\alpha$=-00°11'19.43"
ELEVATION=5222.09
CENTRAL ZONE
(NAD83/NAVD88)

N85°55'49"W
2495.27'

EAGLE ROCK ESTATES, UNIT II
(06-29-1998, 98C-175)

EAGLE ROCK ESTATES, UNIT III
(05-13-1999, 99C-118)

OLIVINE STREET N.E.
(46' R/W)

OAKLAND AVENUE NE

(EAST)
S89°57'30"E

(330.00')
330.29'

98'

61.11'

64.82'

64.59'

56.61'

3.50'
(3.00')

(S89°47'00"E)
S89°47'00"E

248.95'
(250.00')

952.0 S.Q. FEET
VACATED

799.0 S.Q. FEET
VACATED

(300.00')
298.94'

49.99'
(49.99')

533.51'
(528.00')

(528.00')
532.43'

367.06'
(367.08')

468.99'
(469.06')

LOT 4-P1 | LOT 3-P1 | LOT 2-P1 | LOT 1-P1 | LOT 17-P1 | LOT 9-P1

LOT 20
LOT 19
LOT 18
LOT 17
LOT 16
LOT 15
LOT 14
LOT 13
LOT 12
LOT 11

LOT 15 | LOT 16 | LOT 18 | LOT 17

100'
93'
20'

SILVEROAK SUBDIVISION
(12-2015, UNFILED)

436.93'
(436.89')

PREVIOUS LOTLINE ELIMINATED
WITH THIS PLAT (TYP)

LOUISIANA BOULEVARD NE

LOT 38
LOT 39
LOT 40
LOT 41
LOT 42

VISTA DEL AGUILA, UNIT 3
(03-25-2004, 2004C-101)

S00°12'07"W
(S00°12'07"W)

S45°12'53"W
(S45°12'53"W)
56.46'
(56.46')

239.47'
(239.61')

S00°12'07"W
(SOUTH)

N89°46'20"W
(N89°46'20"W)

32.00'
(32.00')

30'

(NORTH)
N00°15'45"E

30.00'
(30.00')

299.44'
(299.58')

124'

N89°46'20"W
(WEST)

330.85'
(330.00')

62'

ALAMEDA BOULEVARD NE

S65°16'57"W
2575.72'

AGRS MONUMENT
"9-C18"
N=1521497.624
E=1542501.428
G-G=0.999664563
$\Delta\alpha$=-00°11'19.69"
ELEVATION=5232.47
CENTRAL ZONE
(NAD83/NAVD88)

N
40' 20' 0 40' 80'
SCALE: 1" = 40'

PROPERTY CORNERS

- ● FOUND 5/8" REBAR WITH ALUMINUM CAP OR PK WITH TAG "LS 11599" (TYP.)
- □ FOUND CROSS SCRIBED IN CONCRETE
- △ FOUND C.O.A. CENTERLINE MONUMENT "LS 7719" (TYP.)
- ○ SET 1/2" REBAR WITH CAP "LS 7719" (TYP.)

SITE BENCHMARK

A.G.R.S. MONUMENT
"10-C18"
ELEVATION=5222.09
(NAVD 1988)

PURPOSE OF PLAT

1. SUBDIVIDE LOT 15, LOT 16, LOT 17 & LOT 18, BLOCK 28, TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES. INTO 17 RESIDENTIAL LOTS.
2. DEDICATE PUBLIC RIGHT-OF-WAY AS SHOWN.
3. GRANT NEW EASEMENTS AS SHOWN.
4. VACATE EXISTING ROADWAY & UTILITY EASEMENT.

NOTES

1. BEARINGS ARE GRID BASED ON THE NEW MEXICO STATE PLANE COORDINATE SYSTEM (CENTRAL ZONE).
2. ALL DISTANCES ARE GROUND DISTANCES.
3. BEARINGS AND DISTANCES IN PARENTHESIS ARE RECORD.
4. BASIS OF BOUNDARY ARE THE FOLLOWING PLATS OF RECORD ENTITLED:

   "NORTH ALBUQUERQUE ACRES, TRACT A, UNIT B", (07-28-2005, 2005C-263)
   "OAKLAND ESTATES SUBDIVISION", (11-05-2004, 2004C-352)
   "VISTA DEL AGUILA, UNIT 3", (03-25-2004, 2004C-101)
   "EAGLE ROCK ESTATES, UNIT III", (05-13-1999, 99C-118)
   "EAGLE ROCK ESTATES, UNIT II", (06-29-1998, 98C-175)
   "QUAIL SPRINGS SUBDIVISION", (04-01-1997, 97C-101)
   "SONORA SUBDIVISION", (10-04-1994, 94C-334)
   "NORTH ALBUQUERQUE ACRES, TRACT A, UNIT B", (04-24-1936, D-130)
   "SILVEROAK SUBDIVISION", (Dated December, 2015, unfiled)

   ALL BEING RECORDS OF BERNALILLO COUNTY, NEW MEXICO.
5. FIELD SURVEY PERFORMED IN JULY, 2016.
6. CITY OF ALBUQUERQUE, NEW MEXICO ZONE: SU-2.
7. 100 YEAR FLOOD ZONE DESIGNATION: ZONE X, AS SHOWN ON PANEL 137 OF 825, FLOOD INSURANCE RATE MAP, CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO, DATED AUGUST 16, 2012. THIS PROPERTY DOES NOT LIE IN THE 100 YEAR FLOOD ZONE.
8. TITLE REPORT: OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY. FILE NO. 1700417 (EFFECTIVE DATE: JANUARY 19, 2017).
9. ALL STREET CENTERLINE MONUMENTATION SHALL BE INSTALLED AT ALL CENTERLINE PC'S, PT'S, ANGLE POINTS, AND STREET INTERSECTIONS AND SHOWN THUS , ▲ WILL BE MARKED BY A FOUR INCH (4") ALUMINUM CAP STAMPED:

   "CITY OF ALBUQUERQUE CENTERLINE MONUMENTATION"
   "DO NOT DISTURB"
   N.M.P.S.#7719
10. MANHOLES WILL BE OFFSET AT ALL POINTS OF CURVATURE, POINTS OF TANGENCY, STREET INTERSECTIONS, AND ALL OTHER ANGLE POINTS TO ALLOW USE OF CENTERLINE MONUMENTATION.

EASEMENTS/RIGHT-OF-WAY

① EXISTING ROADWAY AND UTILITY EASEMENT (04-24-1936, D-130),

② EXISTING C.O.A. ADDITIONAL PUBLIC RIGHT-OF-WAY (10-29-2013, 2013118575)

③ EXISTING 10' PUE (12-2015, UNFILED)

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	47.12'	30.00'	89°59'07"	S 44°47'26" W	42.42'
	(47.12')	(30.00')	(89°59'07")	(S44°47'27"E)	(42.42')

LEGAL DESCRIPTION

A TRACT OF LAND SITUATE WITHIN THE ELENA GALLEGOS GRANT, PROJECTED SECTION 13, TOWNSHIP 11 NORTH, RANGE 3 EAST, NEW MEXICO PRINCIPAL MERIDIAN, CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO, BEING LOT 15, 16, 17 & 18, BLOCK 28, TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES, AS THE SAME IS SHOWN AND DESIGNATED ON SAID PLAT, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON APRIL 24, 1936, IN PLAT BOOK D, PAGE 130, AND CONTAINING 4.0446 GROSS ACRES MORE OR LESS.

EXCEPTING THEREFROM, AN AREA OF UNDEDICATED RIGHT-OF-WAY BEING PORTIONS OF OAKLAND AVENUE NE, LOUISIANA BOULEVARD NE AND ALAMEDA BOULEVARD NE, AS THE SAME IS SHOWN AND DESIGNATED ON SAID PLAT, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON APRIL 24, 1936, IN PLAT BOOK D, PAGE 130, AND CONTAINING 0.8238 ACRES MORE OR LESS.

FURTHER EXCEPTING THEREFROM, A TRACT OF LAND FOR PUBLIC RIGHT-OF-WAY, DEDICATED TO THE CITY OF ALBUQUERQUE, AS THE SAME IS SHOWN AND DESIGNATED IN WARRANTY DEED, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON OCTOBER 29, 2013, IN DOCUMENT NO. 2013118575, AND CONTAINING 0.4433 ACRES MORE OR LESS.

COMPRISING 2.7777 NET ACRES, MORE OR LESS.

SUBDIVISION DATA

GROSS ACREAGE	2.7777 AC
ZONE ATLAS NO.	C-18-Z
NO. OF EXISTING LOTS	4 LOTS
NO. OF EXISTING TRACTS	0 TRACTS
NO. OF TRACTS CREATED	1 TRACTS
NO. OF LOTS CREATED	23 LOTS
AREA OF PUBLIC RIGHT-OF-WAY DEDICATED	1.2267 AC
AREA OF RESIDENTIAL	2.8179 AC
ZONING	SU-2
DATE OF SURVEY	JULY, 2016

APPROVED

OWNER LOTS 15, 16, 17 & 18, BLOCK 28, TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES

BRIAN URLACHER - A SINGLE MAN — DATE 5-7-17

CITY SURVEYOR, CITY OF ALBUQUERQUE, N.M. — DATE 5/9/17

OWNER

BRIAN URLACHER
5160 SAN FRANCISCO NE
ALBUQUERQUE, N.M. 87109

AGENT

BOKAY CONSTRUCTION INC.
ATTN: BO K. JOHNSON
5160 SAN FRANCISCO NE
ALBUQUERQUE, N.M. 87109
(505) 899-9656

ENGINEERS

D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200

SURVEYOR

ALDRICH LAND SURVEYING.
P.O. BOX 30701
ALBUQUERQUE, N.M. 87190
(505) 884-1990

DRB PROJECT No. _____

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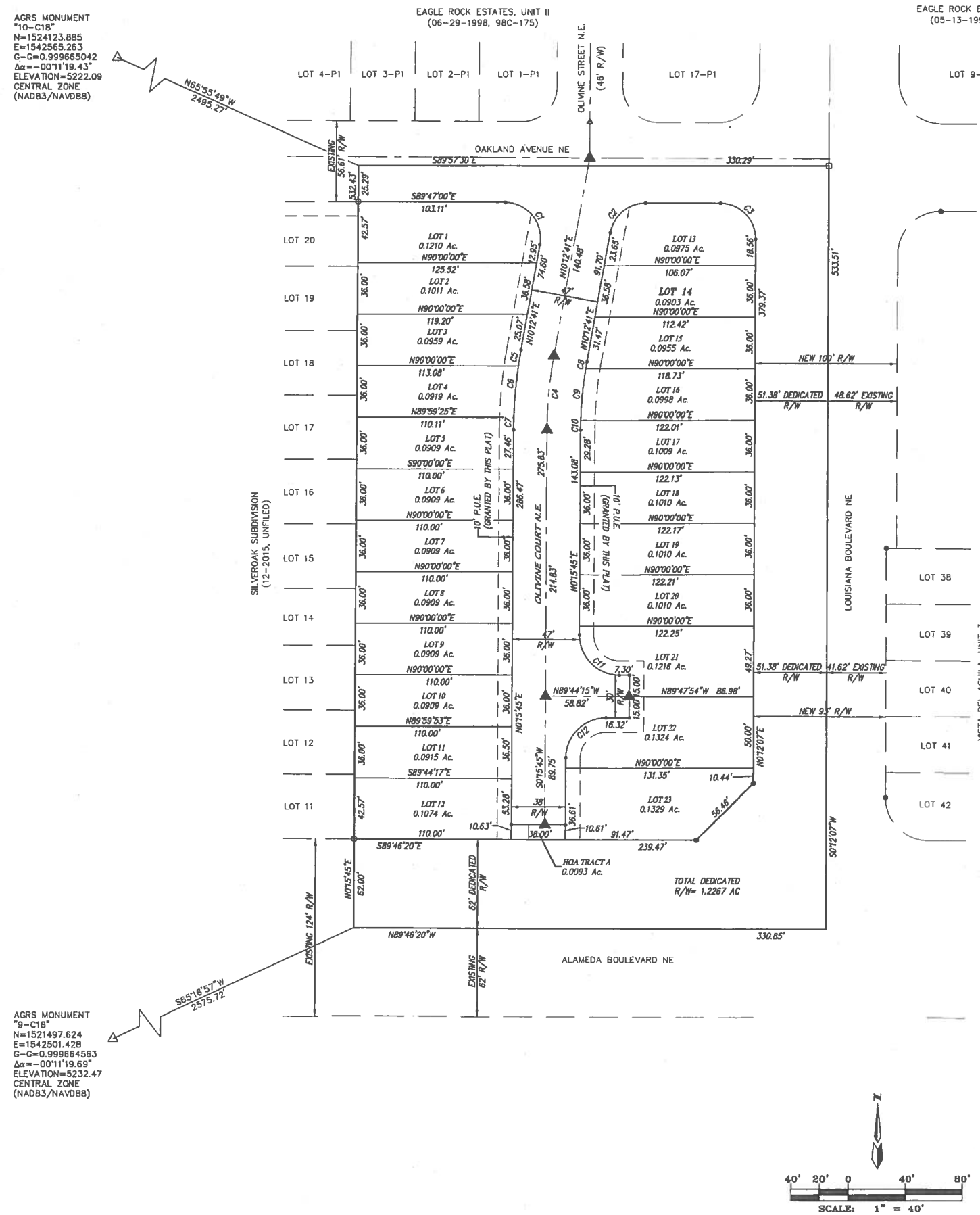
PRELIMINARY PLAT
FOR
OAKLAND RIDGE SUBDIVISION

WITHIN THE
ELENA GALLEGOS GRANT
PROJECTED SECTION 13
TOWNSHIP 11 NORTH, RANGE 3 EAST, NMPM
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO
FEBRUARY, 2017



PROPERTY CORNERS

- ● FOUND 5/8" REBAR WITH ALUMINUM CAP OR PK WITH TAG "LS 11599" (TYP.)
- □ FOUND CROSS SCRIBED IN CONCRETE
- △ FOUND C.O.A. CENTERLINE MONUMENT "LS 7719" (TYP.)
- ○ SET 1/2" REBAR WITH CAP "LS 7719" (TYP.)

Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C1	43.31	25.00	99.27	S39° 25' 19"E	38.10
C2	34.90	25.00	80.00	N50° 12' 34"E	32.14
C3	39.26	25.00	89.99	S44° 47' 26"E	35.35
C4	52.09	300.00	9.95	S5° 14' 13"W	52.03
C5	56.17	323.50	9.95	N5° 14' 13"E	56.10
C6	56.17	323.50	9.95	N5° 14' 13"E	56.10
C7	56.17	323.50	9.95	N5° 14' 13"E	56.10
C8	48.01	276.50	9.95	N5° 14' 13"E	47.95
C9	48.01	276.50	9.95	N5° 14' 13"E	47.95
C10	48.01	276.50	9.95	N5° 14' 13"E	47.95
C11	43.98	28.00	90.00	S44° 44' 15"E	39.60
C12	43.98	28.00	90.00	S45° 15' 45"W	39.60

DRB PROJECT No. _____

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APPENDIX A

First Flush Calculations
AHYMO printouts
Excerpts from N.A.A. Master Drainage Plan

OAKLAND RIDGE SUBDIVISION

First Flush Calculations:

Project Site Area = 123,350 SF

Impervious Area:

NUMBER OF LOTS = 23

N value = 23/2.83 = 8.12

Therefore Treatment D = 60 %

((123,350 SF) x (0.6)) (0.34")/(12) = **2,097 cu.ft.**

Total required treatment volume = 2,097 cubic feet

North Sub basin area = 42.22% x 2097 cu.ft. = 885 cu.ft.

South Sub basin area = 57.78% x 2097 cu.ft. = 1212 cu.ft.

FIRST FLUSH TREATMENT PONDS DESIGN DIMENSIONS

Front Yards: Dimensions as shown on the plan,

6" maximum depth with varying side slopes, with a 3:1 maximum on any one side

Curbside: Six feet wide, 6" maximum depth, with 6:1 side slopes (typical).

DMG-dlh 5-19-7

```
    AHYMO PROGRAM (AHYMO-S4)                    - Version: S4.01a - Rel: 01a
         RUN DATE (MON/DAY/YR) = 05/17/2017
         START TIME (HR:MIN:SEC) = 09:30:51     USER NO.= M-GoodwinNMSiteA90075759
         INPUT FILE = C:\Program Files (x86)\AHYMO-S4\oakland.dat

START                TIME=0.0 HR PUNCH CODE=0 PRINT LINES=-6
LOCATION             NEW MEXICO
     State of New Mexico soil infiltration values (LAND FACTORS) used for computations.
     Land Treatment     Initial Abstr.(in)    Unif. Infilt.(in/hour)
          A             0.65                  1.67
          B             0.50                  1.25
          C             0.35                  0.83
          D             0.10                  0.04

*s**********************************************************
*S******************  FILE: OAKLAND.DAT  REV: 5-16-17  DLH
*s******************  ZONE ATLAS
*S**********************************************************
*S**********************************************************
*S                    100 YEAR 6 HOUR STORM EVENT
*S**********************************************************
*S**********************************************************
RAINFALL             TYPE=1 RAIN QUARTER=0.0
                     RAIN ONE=2.1 IN RAIN SIX=2.50 IN
                     RAIN DAY=2.85 IN DT=0.05 HRS

               6-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE AREAS (NM & AZ) - D1
               DT =   0.050000 HOURS       END TIME =     6.000000 HOURS
*S**********************************************************
*S            DEVELOPED CONDTIONS
*S            SUB BASIN 100
*S            AREA= 2.8317 ACRES
*S**********************************************************
COMPUTE NM HYD       ID=1  HYD NO=100. AREA= 0.004425 SQ MI
                     PER A=0  PER B=20  PER C=20  PER 60
                     TP=-.1333 HR  MASS RAIN=-1

     K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =  7.106428
     UNIT PEAK =   10.482    CFS   UNIT VOLUME =   0.9981       B =   526.28      P60 = 2.1000
     AREA =     0.002655 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.050000


     K =  0.120817HR    TP =  0.133300HR    K/TP RATIO =  0.906356     SHAPE CONSTANT, N =  3.908407
     UNIT PEAK =   4.6344    CFS   UNIT VOLUME =   0.9984       B =   349.02      P60 = 2.1000
     AREA =     0.001770 SQ MI    IA =   0.42500 INCHES    INF =   1.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.050000

PRINT HYD            ID=1 CODE=1

                                  PARTIAL HYDROGRAPH   100.00

    RUNOFF VOLUME =     1.81394 INCHES      =       0.4281 ACRE-FEET
    PEAK DISCHARGE RATE =      12.21 CFS  AT   1.500 HOURS   BASIN AREA =  0.0044 SQ. MI.
*s**********************************************************
    FINISH   END TIME (HR:MIN:SEC) = 09:30:51
```

North Basin (42.22%)
Q = 5.16cfs
South Basin (57.78%)
Q = 7.05cfs

FINAL
NORTH ALBUQUERQUE ACRES
MASTER DRAINAGE PLAN

Prepared For:

City of Albuquerque

Prepared By:

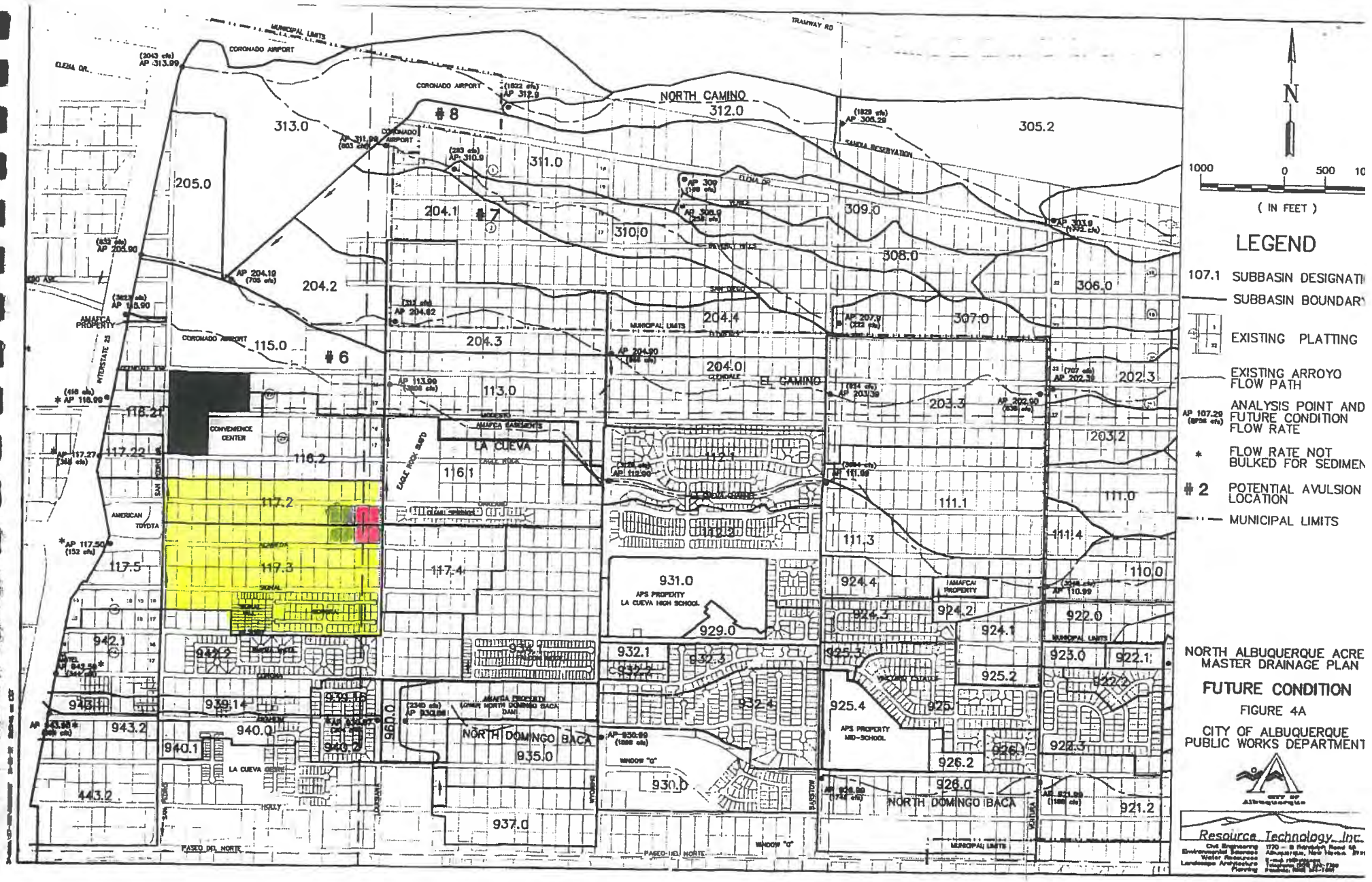
Resource Technology, Inc.

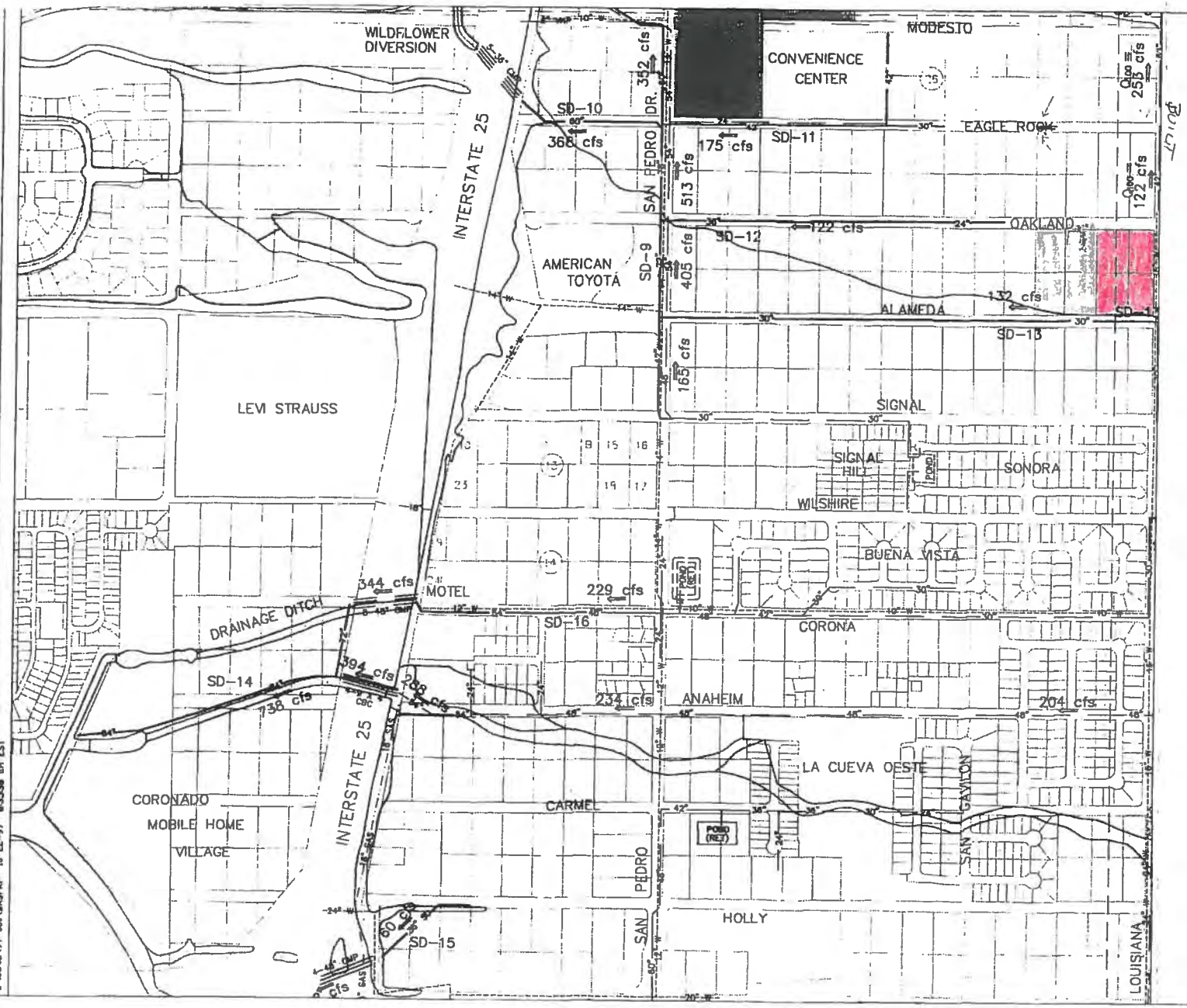
ENGINEERS AND ENVIRONMENTAL SCIENTISTS
1720-B Randolph Road SE, Albuquerque, NM 87106
Telephone (505) 243-7300
Fax (505) 243-7400
rti@nmia.com

DONALD S. DUNCAN
NEW MEXICO
11043
REGISTERED PROFESSIONAL

10/28/98

October 1998


N
1000 0 500
(IN FEET)
LEGEND
107.1 SUBBASIN DESIGNATI
SUBBASIN BOUNDAR
EXISTING PLATTING
EXISTING ARROYO FLOW PATH
AP 107.29 (8756 cfs) ANALYSIS POINT AND FUTURE CONDITION FLOW RATE
* FLOW RATE NOT BULKED FOR SEDIMEN
# 2 POTENTIAL AVULSION LOCATION
MUNICIPAL LIMITS
NORTH ALBUQUERQUE ACRE MASTER DRAINAGE PLAN
FUTURE CONDITION
FIGURE 4A
CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT
Resource Technology, Inc.
NORTH CAMINO
EL CAMINO
LA CUEVA
NORTH DOMINGO BACA
PASEO DEL NORTE
CORONADO AIRPORT
MUNICIPAL LIMITS
8
7
6
313.0
312.0
305.2
311.0
205.0
204.1
309.0
310.0
204.2
308.0
306.0
204.4
307.0
204.3
115.0
204.0
202.3
113.0
203.3
118.2
203.2
116.2
117.22
116.1
117.2
111.1
111.0
117.5
117.3
117.4
111.3
111.4
931.0
924.4
110.0
929.0
924.3
924.2
924.1
922.0
942.1
932.1
932.3
925.3
923.0
922.1
925.2
939.14
932.4
925.4
922.2
943.1
943.2
940.0
926.1
922.3
940.1
926.2
926.0
930.0
921.2
443.2
937.0



N

500 0 250 500

(IN FEET)

LEGEND

- MUNICIPAL LIMITS
- EXISTING PLATTING
- EXISTING ARROYO FLOW PATH
- 10" W — EXISTING WATER LINE
- 10" SAS — EXISTING SANITARY SEWER
- 12" WIP — EXISTING GAS LINE
- 78" — EXISTING STORM DRAIN
- 54" — PROPOSED STORM DRAIN
- CHANNEL — PROPOSED CHANNEL
- PROPOSED STRUCTURE OR ROAD
- PROPOSED DIKE
- #5 AV-5 — POTENTIAL AVULSION

NOTE:
All flow rates shown are future condition 100-year.

NORTH ALBUQUERQUE ACRES
MASTER DRAINAGE PLAN

STORM DRAIN FACILITIES
C-18

FIGURE 5D

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

Resource Technology, Inc.
Civil Engineering
Environmental Sciences
Water Resources
Landscape Architecture
Planning
1720 - B Randolph Road SE
Albuquerque, New Mexico 87106
E-mail: rti@rmia.com
Telephone: (505) 243-7300
Facsimile: (505) 243-7400

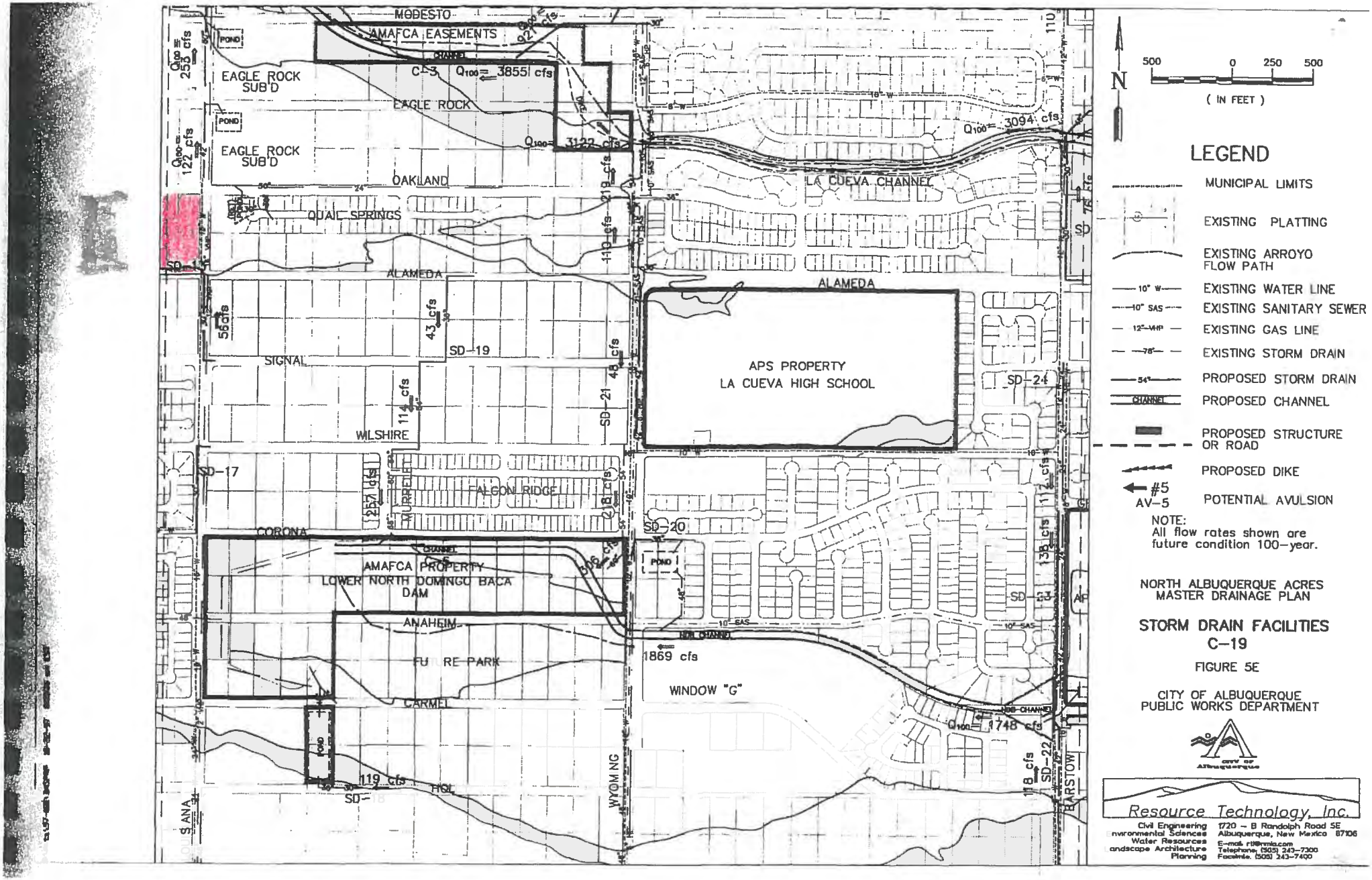
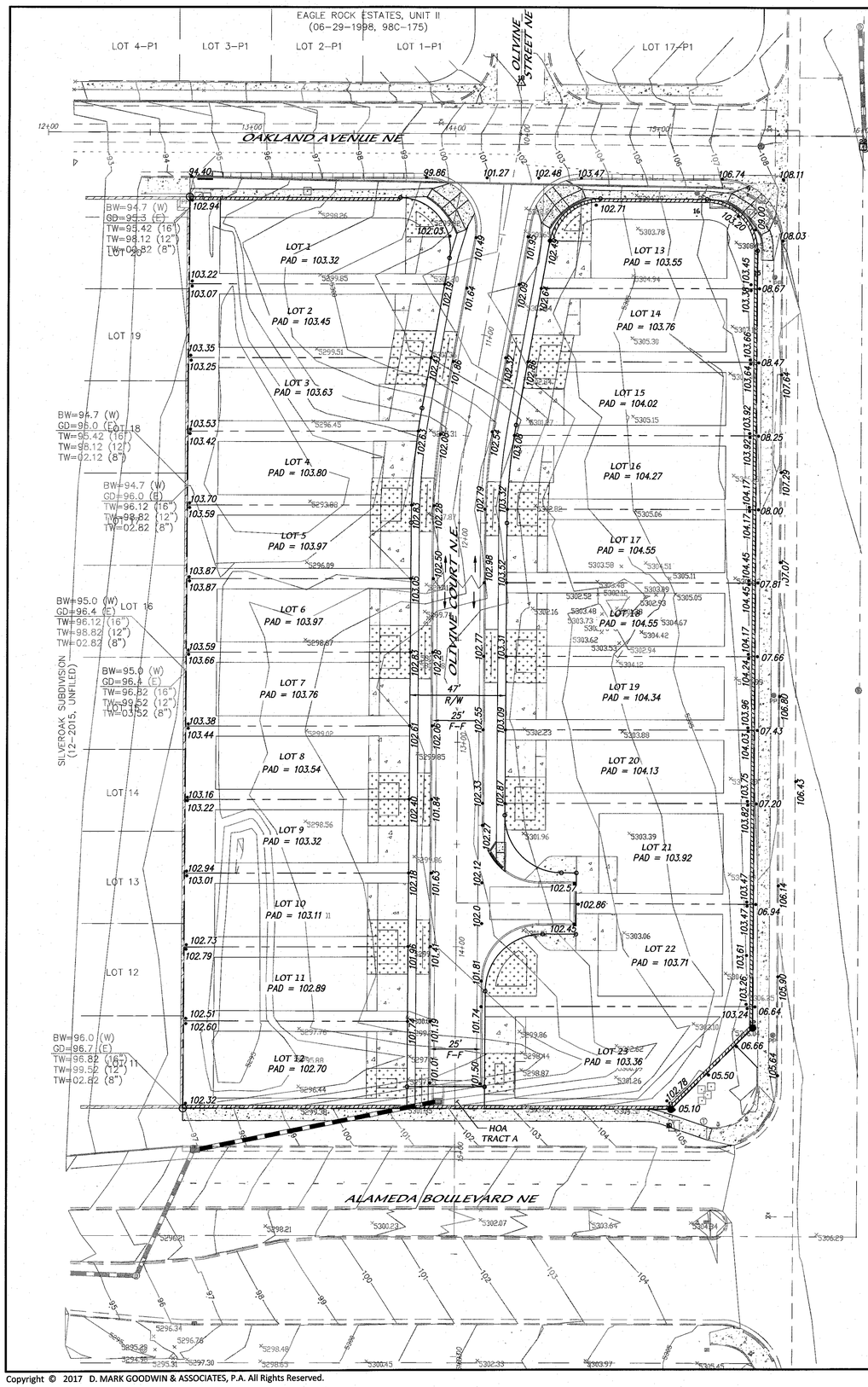

MODESTO
AMAFCA EASEMENTS
POND
EAGLE ROCK SUB'D
C-3
Q100= 3855 cfs
EAGLE ROCK
Q100= 3122 cfs
Q100= 3094 cfs
LA CUEVA CHANNEL
OAKLAND
QUAIL SPRINGS
ALAMEDA
APS PROPERTY
LA CUEVA HIGH SCHOOL
SD-19
SD-21
SD-24
SIGNAL
WILSHIRE
C-17
FALCON RIDGE
CORONA
SD-20
AMAFCA PROPERTY
LOWER NORTH DOMINGO BACA DAM
ANAHEIM
FU RE PARK
CARMEL
1869 cfs
WINDOW "G"
Q100= 1748 cfs
SD-22
119 cfs
HGL
WYOM NG
BARSTOW
SANA
N
500 0 250 500
(IN FEET)
LEGEND
MUNICIPAL LIMITS
EXISTING PLATTING
EXISTING ARROYO FLOW PATH
10" W EXISTING WATER LINE
10" SAS EXISTING SANITARY SEWER
12"-MHP EXISTING GAS LINE
78" EXISTING STORM DRAIN
54" PROPOSED STORM DRAIN
CHANNEL PROPOSED CHANNEL
PROPOSED STRUCTURE OR ROAD
PROPOSED DIKE
#5 AV-5 POTENTIAL AVULSION
NOTE:
All flow rates shown are future condition 100-year.
NORTH ALBUQUERQUE ACRES MASTER DRAINAGE PLAN
STORM DRAIN FACILITIES C-19
FIGURE 5E
CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT
Resource Technology, Inc.
Civil Engineering
Environmental Sciences
Water Resources
Landscape Architecture
Planning
1720 - B Randolph Road SE
Albuquerque, New Mexico 87106
E-mail: rti@rtiaa.com
Telephone: (505) 243-7200
Facsimile: (505) 243-7400

TABLE A-2 (cont.)

LA CUEVA ARROYO SUB-BASIN CHARACTERISTICS

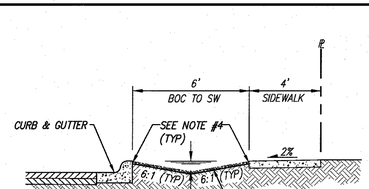
Basin ID	Hydrologic Condition	Basin Area (mi^2)	Land Treatment (%)				TP (hrs)
			A	B	C	D	
113*	Existing	.1136	80	0	15	5	.133
	Future	.1000	0	25	15	60	.133
115*	Existing	.1337	80	0	15	5	.133
	Future	.1202	0	26	12	62	.133
116*	Existing	.1309	80	0	5	15	.133
116.1	Future	.1000	0	25	15	50	.133
116.2	Future	.0719	0	25	15	60 ~~50~~	.133
116.21	Future	.0344	0	40	20	40	.133
117.2*	Existing	.1391	73	0	7	20	.22
	Future	.0500	0	34	16	50	.133
117.21*	Existing	.0234	0	34	16	50	.133
117.22*	Future	.0156	0	20	10	70	.133
117.3*	Existing	.0863	65	5	15	15	.133
	Future	.1172	0	34	16	50	.133
117.31*	Existing	.0250	0	34	16	50	.133
117.32*	Existing	.0090	0	34	16	50	.133
117.4*	Existing	.0750	85	0	5	10	.133
	Future	.0512	0	25	15	60	.133
117.5*	Existing	.0550	0	10	20	70	.133
	Future	.0550	0	10	20	70	.133
118	Existing	.0649	0	20	10	70	.133
	Future	.0649	0	20	10	70	.133
118.1	Existing	.0306	75	5	10	10	.133
	Future	.0306	0	20	30	50	.133
119	Existing	.0549	0	20	10	70	.133
	Future	.0549	0	20	10	70	.133
120	Existing	.0268	50	0	0	50	.133
	Future	.0268	0	20	10	70	.133
121	Existing	.0489	80	0	15	5	.133
	Future	.0489	0	20	10	70	.133

*Modified for COA NAA MDP 9/97



EAGLE ROCK ESTATES, UNIT III
(05-13-1999, 99C-118)
LOT 9-P1

CAUTION:
NOTE THAT ALL EXISTING UTILITIES MAY NOT BE SHOWN. ALL EXISTING SERVICE CONNECTIONS ARE NOT SHOWN. ANY EXISTING UTILITIES THAT ARE SHOWN ARE APPROXIMATE LOCATION ONLY. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT ALL THE UTILITY OWNERS AND TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO ANY EXCAVATIONS TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS.



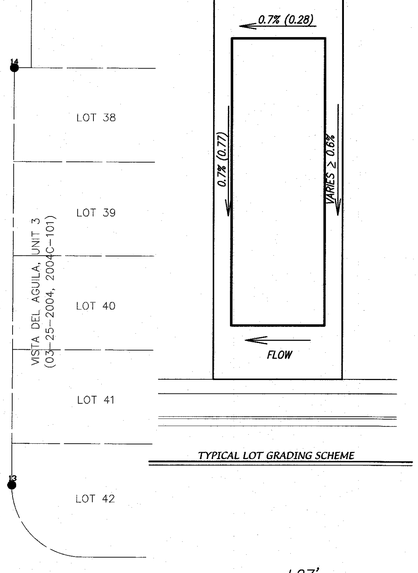
SECTION A - A
TYPICAL DEPRESSED AREA
ON-SITE BETWEEN SIDEWALK & BACK OF CURB
1"=5'

LANDSCAPE BUFFER NOTES:

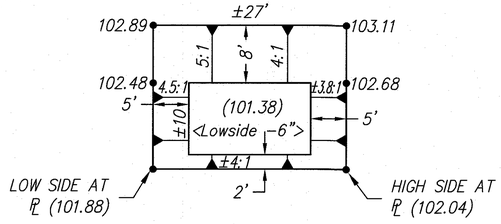
1. Surface between back of curb and sidewalk to be covered with gravel mulch (minimum 3/4"), cobbles or rip-rap. Do not fill entire swale.
2. Landscape fabric is recommended, but not required, between the dirt and the stone. If landscape fabric is to be used it is to be permeable.
3. The 6" depth is measured from top of curb to top of landscape rock material or gravel mulch.

LEGEND

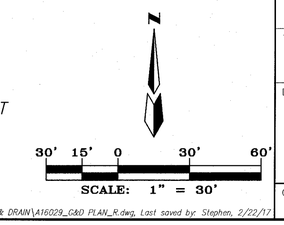
	EXISTING CONCRETE
	EXISTING BLOCK WALL
	EXISTING METAL FENCE
	EXISTING METAL FENCING W/BLOCK PILASTERS
WV	*EXISTING WATER VALVE*
	EXISTING FIRE HYDRANT
S	*EXISTING SANITARY SEWER MANHOLE*
D	*EXISTING STORM DRAIN MANHOLEMANHOLE*
	EXISTING STORM DRAIN INLET INLET
	EXISTING UTILITY PEDESTAL
G	*EXISTING UNDERGROUND GAS LINE*
SAS	*EXISTING UNDERGROUND SANITARY SEWER*
SD	*EXISTING UNDERGROUND STORM DRAIN LINE*
W	*EXISTING UNDERGROUND WATER LINE*
5075.50	*EXISTING SPOT ELEVATION*
BC 5075.50	*EXISTING BACK OF CURB ELEVATION*
FL 5075.50	*EXISTING FLOW LINE ELEVATION*
TOP 5075.50	*EXISTING TOP ELEVATION*
TOE 5075.50	*EXISTING TOE ELEVATION*
TC 5075.50	*EXISTING TOP OF CONCRETE ELEVATION*
	NEW STANDARD CURB & GUTTER
	NEW MOUNTABLE CURB & GUTTER
	NEW RIGHT-OF-WAY
	NEW CENTERLINE
	NEW LOT LINES
	NEW EASEMENTS
69.53TW / 68.25BW	*NEW TOP OF WALL ELEVATION / NEW BOTTOM OF WALL ELEVATION*
•81.77	*NEW SPOT ELEVATIONS*
	NEW FLOW DIRECTION
	NEW STORM DRAIN

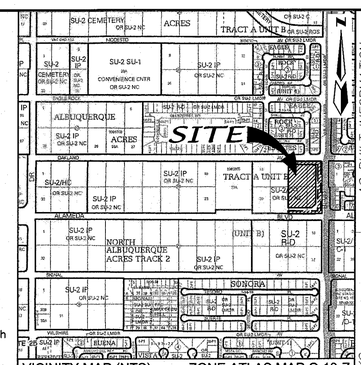


TYPICAL LOT GRADING SCHEME



TYPICAL FRONT YARD
FIRST FLUSH CONSTRUCTION





VICINITY MAP (NTS) ZONE ATLAS MAP C-18-Z

LEGAL DESCRIPTION

A TRACT OF LAND SITUATE WITHIN THE ELENA GALLEGOS GRANT, PROJECTED SECTION 13, TOWNSHIP 11 NORTH, RANGE 3 EAST, NEW MEXICO PRINCIPAL MERIDIAN, CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO, BEING LOT 15, 16, 17 & 18, BLOCK 28, TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES, AS THE SAME IS SHOWN AND DESIGNATED ON SAID PLAT, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON APRIL 24, 1936, IN PLAT BOOK D, PAGE 130, AND CONTAINING 4.0446 GROSS ACRES MORE OR LESS.

EXCEPTING THEREFROM, AN AREA OF UNDEDICATED RIGHT-OF-WAY BEING PORTIONS OF OAKLAND AVENUE NE, LOUISIANA BOULEVARD NE AND ALAMEDA BOULEVARD NE, AS THE SAME IS SHOWN AND DESIGNATED ON SAID PLAT, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON APRIL 24, 1936, IN PLAT BOOK D, PAGE 130, AND CONTAINING 0.8236 ACRES MORE OR LESS.

FURTHER EXCEPTING THEREFROM, A TRACT OF LAND FOR PUBLIC RIGHT-OF-WAY, DEDICATED TO THE CITY OF ALBUQUERQUE, AS THE SAME IS SHOWN AND DESIGNATED IN WARRANTY DEED, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON OCTOBER 29, 2013, IN DOCUMENT NO. 2013118575, AND CONTAINING 0.4433 ACRES MORE OR LESS.

COMPRISING 2.7777 NET ACRES, MORE OR LESS.

GENERAL NOTES

1. *CONTRACTOR MUST OBTAIN A TOPSOIL DISTURBANCE PERMIT FROM THE ENVIRONMENTAL HEALTH DIVISION PRIOR TO CONSTRUCTION.*
2. *CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION SHALL GOVERN ALL WORK.*
3. *THE CONTRACTOR SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL DUST CONTROL MEASURES AND REQUIREMENTS AND WILL BE RESPONSIBLE FOR PREPARING AND OBTAINING ALL NECESSARY APPLICATIONS AND APPROVALS.*
4. *THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE LOTS INTO PUBLIC RIGHT-OF-WAY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AND WETTING THE SOIL TO KEEP IT FROM BLOWING.*
5. *THE EARTHWORK CONTRACTOR SHALL STOCKPILE ENOUGH MATERIAL ADJACENT TO RETAINING WALL LOCATIONS TO BE UTILIZED FOR WALL BACKFILL.*

SURVEY INFORMATION
FIELD NOTES NO. BY DATE
BENCH MARKS
A.G.R.S. MONUMENT "10-C18" HAVING AN ELEVATION OF 5222.09 (NAVD 1988)
AS BUILT INFORMATION
CONTRACTOR
STAKED BY DATE
INSPECTOR'S CHANGE BY DATE
FIELD VERIFICATION BY DATE
AS-BUILTS CORRECTED BY DATE
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

ENGINEER'S SEAL
DENNIS HOELZER NEW MEXICO 11967 REGISTERED PROFESSIONAL ENGINEER
5/18/17

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
	DATE	01/17	
DESIGNED BY		DMG	
DRAWN BY	DATE	01/17	
		DER	
CHECKED BY	DATE	01/17	
		DMG	

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PLANNING DEPARTMENT

TITLE:
OAKLAND RIDGE SUBDIVISION GRADING AND DRAINAGE PLAN

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO. | ZONE MAP NO. C-18-Z | SHEET 1 OF 1

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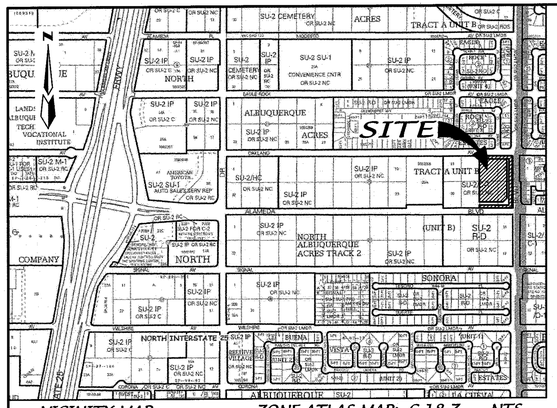
PRELIMINARY PLAT
FOR
OAKLAND RIDGE SUBDIVISION

WITHIN THE
ELENA GALLEGOS GRANT
PROJECTED SECTION 13
TOWNSHIP 11 NORTH, RANGE 3 EAST, NMPM
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO
FEBRUARY, 2017



VICINITY MAP ZONE ATLAS MAP: C-18-Z NTS

AGRS MONUMENT
"10-C18"
N=1524123.885
E=1542565.263
G-G=0.999665042
$\Delta\alpha$=-00°11'19.43"
ELEVATION=5222.09
CENTRAL ZONE
(NAD83/NAVD88)

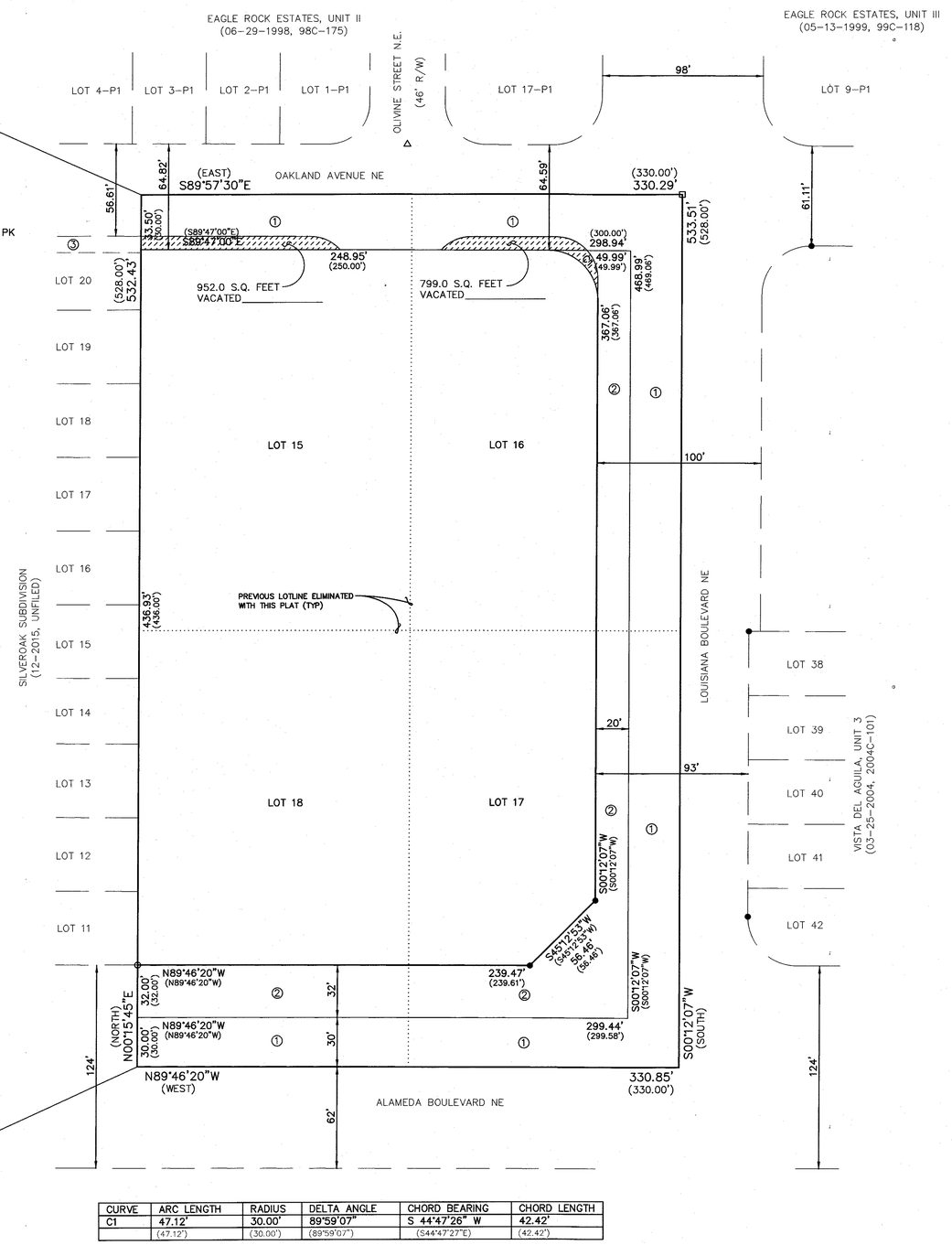
N65°55'49"W
2495.27'

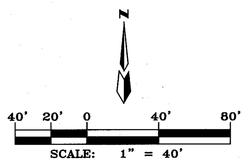
PROPERTY CORNERS

- ● FOUND 5/8" REBAR WITH ALUMINUM CAP OR PK WITH TAG "LS 11599" (TYP.)
- □ FOUND CROSS SCRIBED IN CONCRETE
- △ FOUND C.O.A. CENTERLINE MONUMENT "LS 7719" (TYP.)
- ○ SET 1/2" REBAR WITH CAP "LS 7719" (TYP.)

SITE BENCHMARK

A.G.R.S. MONUMENT
"10-C18"
ELEVATION=5222.09
(NAVD 1988)





AGRS MONUMENT
"9-C18"
N=1521497.624
E=1542501.428
G-G=0.99966456 3
$\Delta\alpha$=-00°11'19.69"
ELEVATION=5232.47
CENTRAL ZONE
(NAD83/NAVD88)

S65°16'57"W
2575.72'

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	47.12'	30.00'	89°59'07"	S 44°47'26" W	42.42'
	(47.12')	(30.00')	(89°59'07")	(S44°47'27"E)	(42.42')

PURPOSE OF PLAT

1. SUBDIVIDE LOT 15, LOT 16, LOT 17 & LOT 18, BLOCK 28, TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES. INTO 17 RESIDENTIAL LOTS.
2. DEDICATE PUBLIC RIGHT-OF-WAY AS SHOWN.
3. GRANT NEW EASEMENTS AS SHOWN.
4. VACATE EXISTING ROADWAY & UTILITY EASEMENT.

NOTES

1. *BEARINGS ARE GRID BASED ON THE NEW MEXICO STATE PLANE COORDINATE SYSTEM (CENTRAL ZONE).*
2. *ALL DISTANCES ARE GROUND DISTANCES.*
3. *BEARINGS AND DISTANCES IN PARENTHESIS ARE RECORD.*
4. *BASIS OF BOUNDARY ARE THE FOLLOWING PLATS OF RECORD ENTITLED:*

   "NORTH ALBUQUERQUE ACRES, TRACT A, UNIT B", (07-28-2005, 2005C-263)
   "OAKLAND ESTATES SUBDIVISION", (11-05-2004, 2004C-352)
   "VISTA DEL AGUILA, UNIT 3", (03-25-2004, 2004C-101)
   "EAGLE ROCK ESTATES, UNIT III", (05-13-1999, 99C-118)
   "EAGLE ROCK ESTATES, UNIT II", (06-29-1998, 98C-175)
   "QUAIL SPRINGS SUBDIVISION", (04-03-1997, 97C-101)
   "SONORA SUBDIVISION", (10-04-1994, 94C-334)
   "NORTH ALBUQUERQUE ACRES, TRACT A, UNIT B", (04-24-1936, D-130)
   "SILVEROAK SUBDIVISION", (Dated December, 2015, unfiled)

   ALL BEING RECORDS OF BERNALILLO COUNTY, NEW MEXICO.
5. *FIELD SURVEY PERFORMED IN JULY, 2016.*
6. *CITY OF ALBUQUERQUE, NEW MEXICO ZONE: SU-2.*
7. *100 YEAR FLOOD ZONE DESIGNATION: ZONE X, AS SHOWN ON PANEL 137 OF 825, FLOOD INSURANCE RATE MAP, CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO, DATED AUGUST 16, 2012. THIS PROPERTY DOES NOT LIE IN THE 100 YEAR FLOOD ZONE.*
8. *TITLE REPORT: OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY. FILE NO. 1700417 (EFFECTIVE DATE: JANUARY 19, 2017).*
9. *ALL STREET CENTERLINE MONUMENTATION SHALL BE INSTALLED AT ALL CENTERLINE PC'S, PT'S, ANGLE POINTS, AND STREET INTERSECTIONS AND SHOWN THUS , ▲ WILL BE MARKED BY A FOUR INCH (4") ALUMINUM CAP STAMPED:*

   "CITY OF ALBUQUERQUE CENTERLINE MONUMENTATION"
   "DO NOT DISTURB"
   N.M.P.S.#7719
10. *MANHOLES WILL BE OFFSET AT ALL POINTS OF CURVATURE, POINTS OF TANGENCY, STREET INTERSECTIONS, AND ALL OTHER ANGLE POINTS TO ALLOW USE OF CENTERLINE MONUMENTATION.*

EASEMENTS/RIGHT-OF-WAY

① EXISTING ROADWAY AND UTILITY EASEMENT (04-24-1936, D-130),

② EXISTING C.O.A. ADDITIONAL PUBLIC RIGHT-OF-WAY (10-29-2013, 2013118575)

③ EXISTING 10' PUE (12-2015, UNFILED)

LEGAL DESCRIPTION

A TRACT OF LAND SITUATE WITHIN THE ELENA GALLEGOS GRANT, PROJECTED SECTION 13, TOWNSHIP 11 NORTH, RANGE 3 EAST, NEW MEXICO PRINCIPAL MERIDIAN, CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO, BEING LOT 15, 16, 17 & 18, BLOCK 28, TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES, AS THE SAME IS SHOWN AND DESIGNATED ON SAID PLAT, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON APRIL 24, 1936, IN PLAT BOOK D, PAGE 130, AND CONTAINING 4.0446 GROSS ACRES MORE OR LESS.

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FURTHER EXCEPTING THEREFROM, A TRACT OF LAND FOR PUBLIC RIGHT-OF-WAY, DEDICATED TO THE CITY OF ALBUQUERQUE, AS THE SAME IS SHOWN AND DESIGNATED IN WARRANTY DEED, FILED FOR RECORD IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO, ON OCTOBER 29, 2013, IN DOCUMENT NO. 2013118575, AND CONTAINING 0.4433 ACRES MORE OR LESS.

COMPRISING 2.7777 NET ACRES, MORE OR LESS.

SUBDIVISION DATA

GROSS ACREAGE	2.7777 AC
ZONE ATLAS NO.	C-18-Z
NO. OF EXISTING LOTS	4 LOTS
NO. OF EXISTING TRACTS	0 TRACTS
NO. OF TRACTS CREATED	1 TRACTS
NO. OF LOTS CREATED	23 LOTS
AREA OF PUBLIC RIGHT-OF-WAY DEDICATED	1.2267 AC
AREA OF RESIDENTIAL	2.8179 AC
ZONING	SU-2
DATE OF SURVEY	JULY, 2016

APPROVED

OWNER LOTS 15, 16, 17 & 18, BLOCK 28, TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES

BRIAN URLACHER - A SINGLE MAN — 5-7-17 DATE

CITY SURVEYOR, CITY OF ALBUQUERQUE, N.M. — P.S. 5/9/17 DATE

OWNER

BRIAN URLACHER
5160 SAN FRANCISCO NE
ALBUQUERQUE, N.M. 87109

AGENT

BOKAY CONSTRUCTION INC.
ATTN: BO K. JOHNSON
5160 SAN FRANCISCO NE
ALBUQUERQUE, N.M. 87109
(505) 899-9656

ENGINEERS

D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200

SURVEYOR

ALDRICH LAND SURVEYING.
P.O. BOX 30701
ALBUQUERQUE, N.M. 87190
(505) 884-1990

DRB PROJECT No. _____

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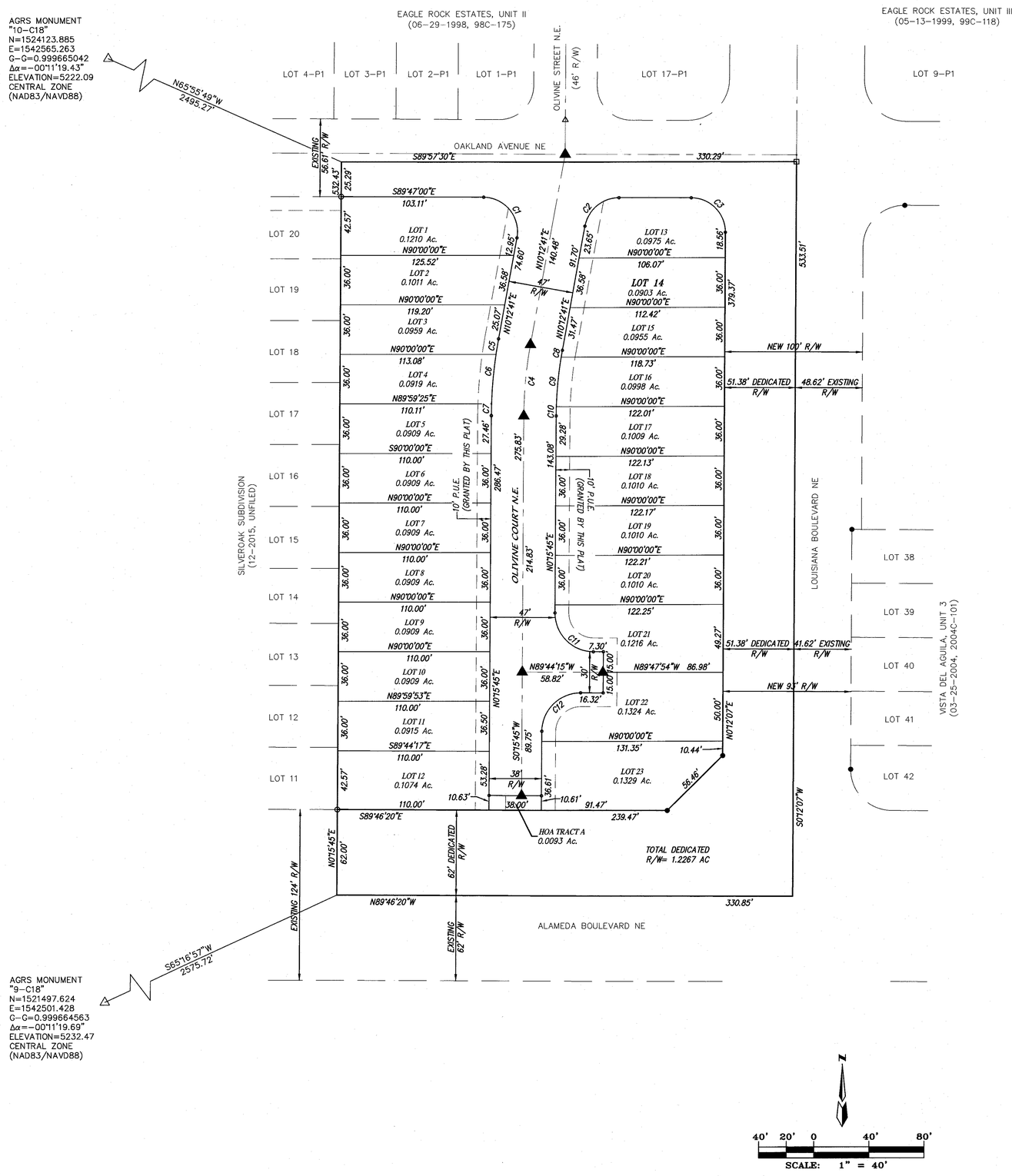
PRELIMINARY PLAT
FOR
OAKLAND RIDGE SUBDIVISION

WITHIN THE
ELENA GALLEGOS GRANT
PROJECTED SECTION 13
TOWNSHIP 11 NORTH, RANGE 3 EAST, NMPM
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO
FEBRUARY, 2017



PROPERTY CORNERS

- ● FOUND 5/8" REBAR WITH ALUMINUM CAP OR PK WITH TAG "LS 11599" (TYP.)
- □ FOUND CROSS SCRIBED IN CONCRETE
- △ FOUND C.O.A. CENTERLINE MONUMENT "LS 7719" (TYP.)
- ○ SET 1/2" REBAR WITH CAP "LS 7719" (TYP.)

Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C1	43.31	25.00	99.27	S39° 25' 19"E	38.10
C2	34.90	25.00	80.00	N50° 12' 34"E	32.14
C3	39.26	25.00	89.99	S44° 47' 26"E	35.35
C4	52.09	300.00	9.95	S5° 14' 13"W	52.03
C5	56.17	323.50	9.95	N5° 14' 13"E	56.10
C6	56.17	323.50	9.95	N5° 14' 13"E	56.10
C7	56.17	323.50	9.95	N5° 14' 13"E	56.10
C8	48.01	276.50	9.95	N5° 14' 13"E	47.95
C9	48.01	276.50	9.95	N5° 14' 13"E	47.95
C10	48.01	276.50	9.95	N5° 14' 13"E	47.95
C11	43.98	28.00	90.00	S44° 44' 15"E	39.60
C12	43.98	28.00	90.00	S45° 15' 45"W	39.60

DRB PROJECT No. _____

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DRAINAGE LETTER REPORT
FOR
ALAMEDA BOULEVARD SAN PEDRO TO WYOMING PROJECT
CITY PROJECT NO. 7663.91

January 2012

DRAINAGE LETTER REPORT
FOR
ALAMEDA BOULEVARD SAN PEDRO TO WYOMING PROJECT
CITY PROJECT NO. 7663.91

Prepared by:
Thompson Engineering Consultants, Inc.
P.O. Box 65760
Albuquerque, NM 87193

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I. INTRODUCTION AND SITE LOCATION

Part of the Alameda Boulevard Widening Project from I-25 to Wyoming includes the installation of a storm drain that will tie into a proposed 72" storm drain in San Pedro Drive on the west and tie into an existing 36" storm drain in Alameda Boulevard just east of Louisiana Boulevard. The storm drain system will also extend south in Louisiana Boulevard to Signal Avenue and then east to an existing 36" storm drain in Signal Avenue. The construction of the proposed storm drain is sized to accept the runoff from the ultimate Alameda street section and the adjacent properties and will eliminate the need for three existing retention ponds in the project area.

The Alameda storm drain discharges to the recently constructed or soon to be constructed storm drain included as part of the San Pedro Storm Drain Project. There is also an existing parallel storm drain system in San Pedro ranging from 48" to 54" diameter. The eventual outfall for both San Pedro Storm Drains are either 5-36" RCP culverts under I-25 north of Eagle Rock or the 8-36" RCP culverts under I-25 north of Alameda Place. The peak runoff for the developed condition is determined by following the basins and hydrology in the North Albuquerque Acres Master Drainage Plan (NAAMDP), by Resource Technology Inc. dated October 1998 and revising the basins based on subsequent drainage reports in the drainage area.

II. METHODOLOGY

A hydrologic analysis was not performed for this report. The hydrology given in the NAADMP was used to determine the peak flows that drain to the San Pedro Storm Drain. The hydrologic analyses in the NAAMDP was based on Section 22 of the City of Albuquerque Development Process Manual (DPM), entitled "Drainage, Flood Control, and Erosion Control," January, 1993.

The hydraulic analyses of the proposed storm drain system was also based on Section 22 of the DPM for determining pressure flow conditions and head losses at manholes. Microsoft Excel spreadsheet software was used to calculate the hydraulic grade line in storm drains under pressure and for determining head losses at manholes. Graphs given in Section 22 of the DPM were used to determine storm inlet capacities.

Pipe sizes, invert and rim elevations, and system geometry were taken from the record drawings provided by the COA as well as survey data taken for the project by the design team.

III. DRAINAGE ANALYSIS

A. HYDROLOGY

The scope of work identified reviewing the drainage basins in the NAADMP and revising those basins based on subsequent drainage reports that affect the basins that drain to Alameda within the project area. The NAADMP and San Pedro Storm Drain Project DAR identified basins 117.32 and 117.4 draining to Alameda Boulevard. For the developed condition, these basins have Land Treatment Type D percentages ranging from 50% to 60%.

Basins 117.32 and 117.4 were further divided based on previous drainage reports in the project area or on the proposed storm inlet locations along Alameda Boulevard. Basin 117.32 was divided into 9 sub-basins and Basin 117.4 was divided into 4 sub-basins (refer to Exhibit I). For each of the revised basins it was assumed that the Land Treatment D percentage would be the same for the similar basins in the NAADMP. Therefore, the revised basin area was multiplied by the unit peak flow (CFS/ACRE) to determine the peak flow from that basin. To be conservative, the peak flows from each basin were added instead of routed. Exhibit I shows the revised drainage basins and peak flows for each basin and at critical analysis points. Table 1 shows the peak flows for the revised drainage basins.

Table 1 Revised Drainage Basin Peak Flows

Basins	Area (acres)	Type D Land Treatment (%)	CFS/Acre	100yr Peak Flow (CFS)
117.321	0.54	50	3.82	2.06
117.322	2.44	50	3.82	9.32
117.323	2.68	50	3.82	10.24
117.324	1.37	50	3.82	5.23
117.325	1.25	50	3.82	4.77
117.326	5.96	50	3.82	22.77
117.327	4.80	50	3.82	18.34
117.328	5.34	50	3.82	20.40
117.329	6.74	50	3.82	25.75
117.41	17.75	60	4.02	71.36
117.42	14.29	60	4.02	57.45
117.43	0.85	60	4.02	3.42
117.44	0.43	60	4.02	1.33

B. STORM DRAIN HYDRAULICS

1. INTRODUCTION

The proposed storm drain system was modeled using record drawings and topographic and planimetric survey data obtained in the field. The design survey was produced in the NAVD 88 vertical datum. Two systems were modeled to determine the hydraulic grade line (HGL) of the proposed systems. The proposed storm drain system data were input to the models and flows were input at various points in the system represented by locations future flow interception points.

2. STORM INLET CAPACITIES

Storm inlet capacities were determined for the proposed storm drain to be constructed in Alameda and Louisiana. Graphs given in Section 22 of the DPM were used to determine storm inlet capacities. First, the depth of flow in the ultimate street section was determined using Plate 22.3 D-4. The proposed street slope and one-half of the street flows are inputs to the graph to obtain the depth of flow. Then the depth of flow and street slope are input to Plate 22.3 D-6 for

double grate inlets to determine the inlet capacity. It is assumed that each double grate will be 50% clogged and therefore the inlet capacity is reduced by half. Table 2 gives the inlet capacities for the proposed storm drain system.

Table 2 Storm Inlet Capacities

Inlet Station	Contributing Basins	½ Street Flow (CFS)	Street Slope (%)	Flow Depth (FT)	Inlet Capacity (CFS)	Number of Inlets	Bypass Flow (CFS)
29+00	117.325 & 117.321	3.42	2.83	0.29	1.85	2	0.00
24+50	117.326	11.39	3.11	0.41	3.40	3	1.19
20+00	117.327	10.36	2.40	0.40	3.30	3	0.46
15+50	117.328	10.66	2.61	0.40	3.35	3	0.61
11+00	117.329	13.49	3.00	0.44	4.80	3	0.00

3. STORM DRAIN HYDRAULICS

The hydraulic grade line analysis for the proposed storm drain was completed using an Excel spreadsheet that was developed using the methodology given in Section 22.3 of the DPM. The analysis showed that the downstream portion of the proposed Alameda Storm Drain System just east of San Pedro Drive is under pressure flow. The pressure flow unseals between the manholes at station 11+00 and station 15+50 and continues in gravity flow conditions.

The remainder of the storm drain system flows in gravity flow conditions. Therefore, between manholes the hydraulic grade line equals the normal depth of the storm drain. Table 3 gives the normal depths for each pipe segment under gravity flow conditions.

Table 3 Storm Drain Normal Depth

Segment Stations	Pipe Dia. (IN)	Pipe Slope (%)	Peak Flow (CFS)	Velocity (FPS)	Normal Depth (FT)
Alameda					
15+50 to 20+00	48	2.89	205.0	21.77	2.81
20+00 to 24+50	48	2.61	185.2	20.51	2.70
24+50 to 27+10	42	2.85	165.1	20.12	2.78
27+10 to 29+00	42	2.83	159.8	20.01	2.71
29+00 to 29+80	42	2.94	153.0	20.25	2.56
29+80 to 31+45	42	2.94	142.8	20.04	2.43
31+45 to 33+50	42	2.18	133.5	17.47	2.59
33+50 to 36+67	42	2.10	133.5	17.18	2.63
36+67 to 38+04	36	6.43	71.4	22.91	1.36
38+04 to 40+77	36	2.54	63.2	15.68	1.67
Louisiana					
11+10 to 12+74	36	0.80	60.9	9.61	2.52
7+54 to 11+10	36	0.65	57.5	8.53	2.72
12+74 to 13+59	24	1.42	1.33	4.45	0.30
Signal	36	1.88	57.5	13.67	1.73

The head losses through the manholes equals the heal loss due to bend losses, junction losses, and manhole losses. Table 4 shows the total head losses at each of the manholes.

Table 4 Manhole Head Losses

Station	Bend Loss (FT)	Junction Loss (FT)	Manhole Loss (FT)	Total Losses (FT)
Alameda				
20+00	0.00	1.60	0.33	1.93
24+50	0.00	1.27	0.31	1.58
27+10	0.00	0.38	0.31	0.69
29+00	0.00	0.32	0.32	0.64
29+80	0.00	0.73	0.31	1.04
31+45	0.00	1.68	0.24	1.92
33+50	0.00	0.00	0.23	0.23
36+67	0.00	2.51	0.41	2.92
38+04	0.00	2.56	0.21	2.77
Louisiana				
7+05	0.00	0.00	0.15	0.15
7+55	0.58	0.00	0.15	0.73
11+10	0.00	0.41	0.06	0.47

APPENDIX A
HYDRAULIC CALCULATIONS

STREET CAPACITY

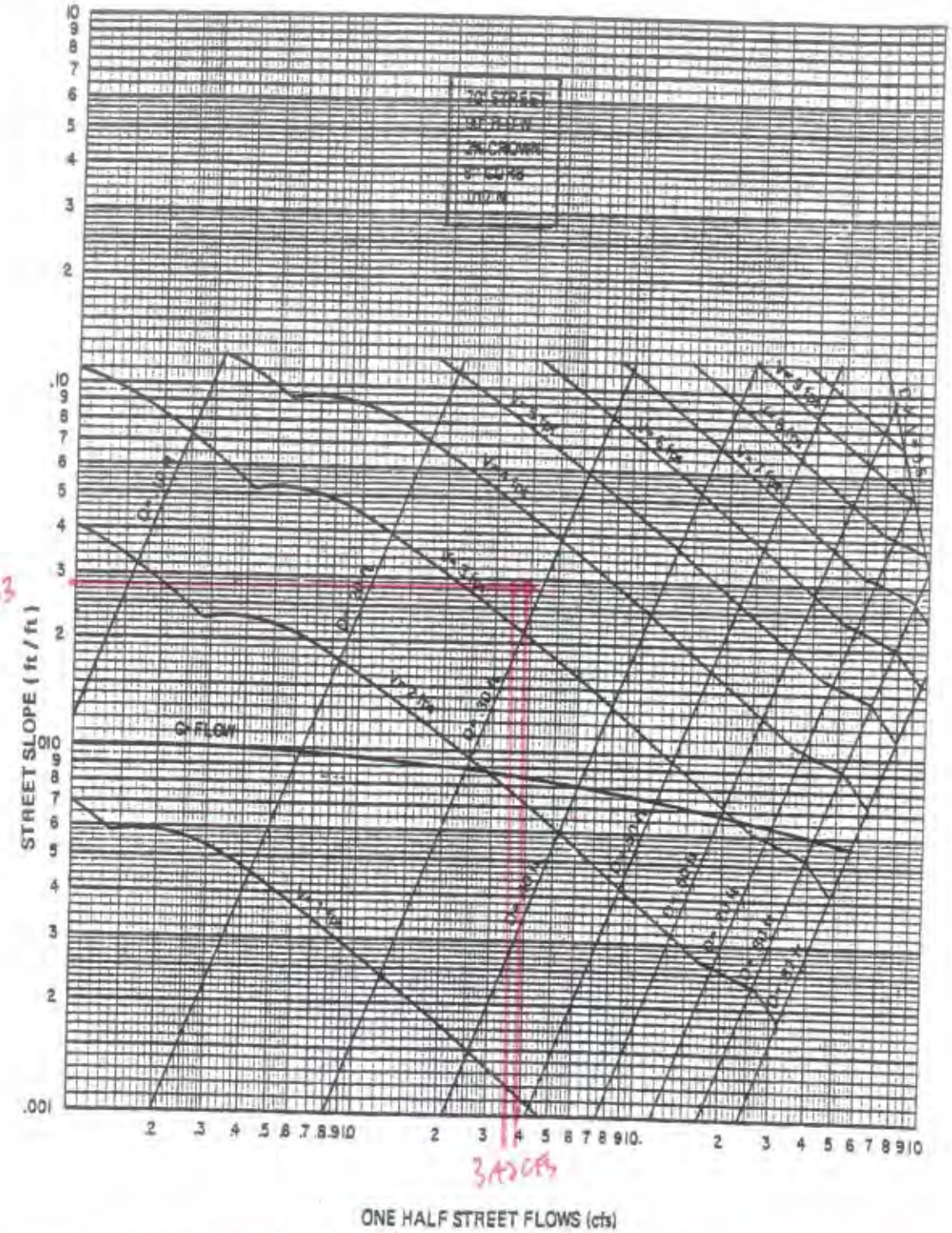


PLATE 22.3 D-4

BASIN 117.32S

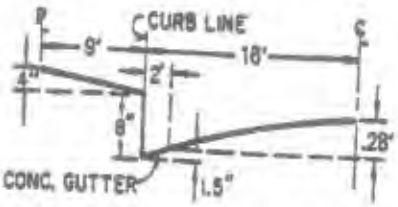
½ Q = 2.39 CFS + (½ Q Basin 117.32H) 1.03 = 3.42 CFS

S = 2.83%

Depth = 0.24'

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION (ABOVE BASIN)

3.7CFS ASSUME 50% CLOGGING

1.85CFS per inlet

3.42 ÷ 1.85 = 1.84

use 2 inlets

All flow is Captured

PLATE 22.3 D-6

BASIN 117.325

STREET CAPACITY

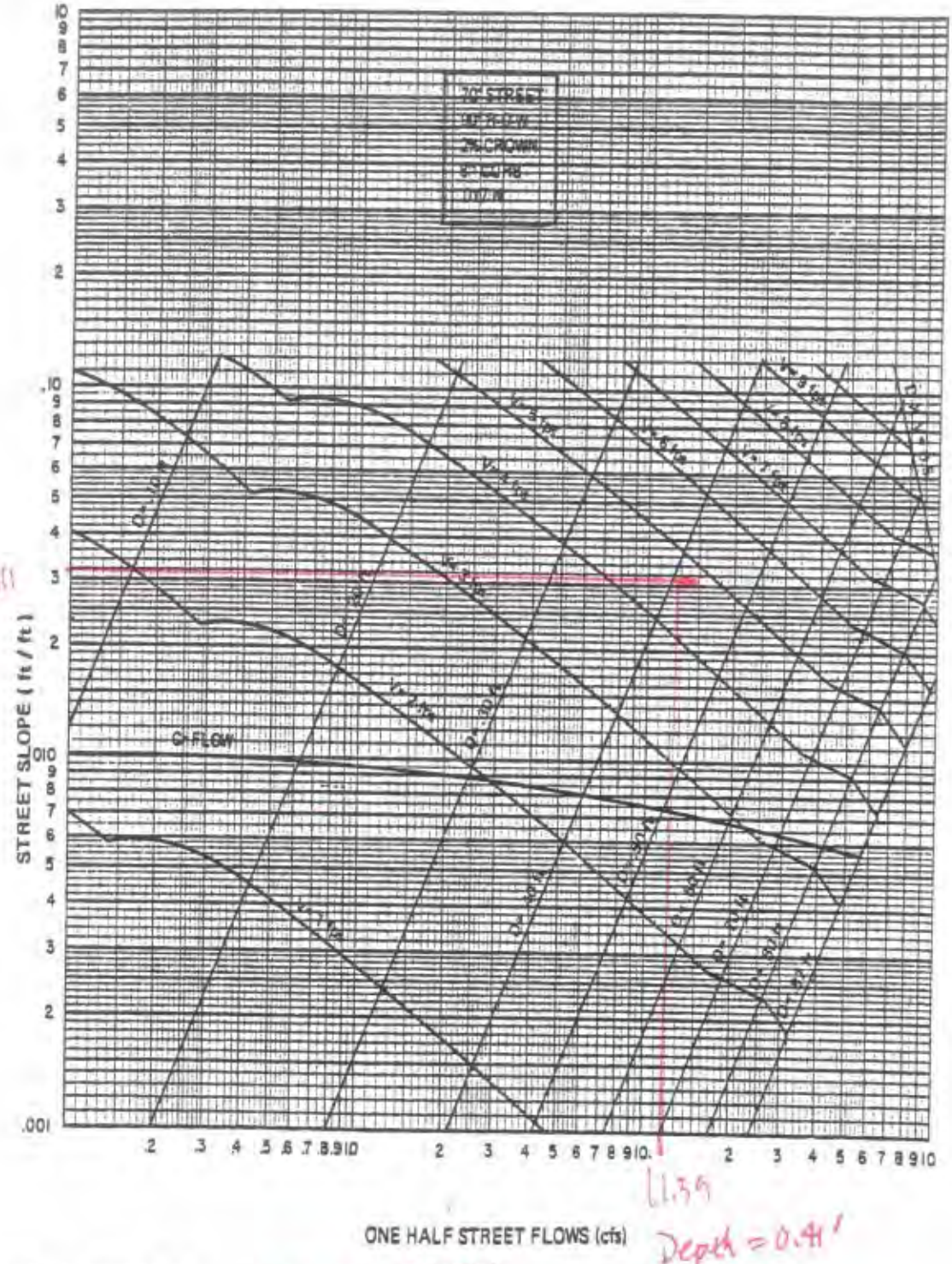
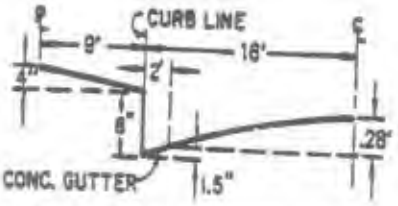


PLATE 22.3 D-4

BASIN 117326
½ Q = 11.39 CFS
S = 3.11%

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

6.8 CFS
Assume 50% Clogging
3.4 CFS per inlet
11.39 CFS ÷ 3.4 = 3.35
use 3 inlets
bypass 4.19 CFS

PLATE 22.3 D-6

BASIN 17.326

STREET CAPACITY

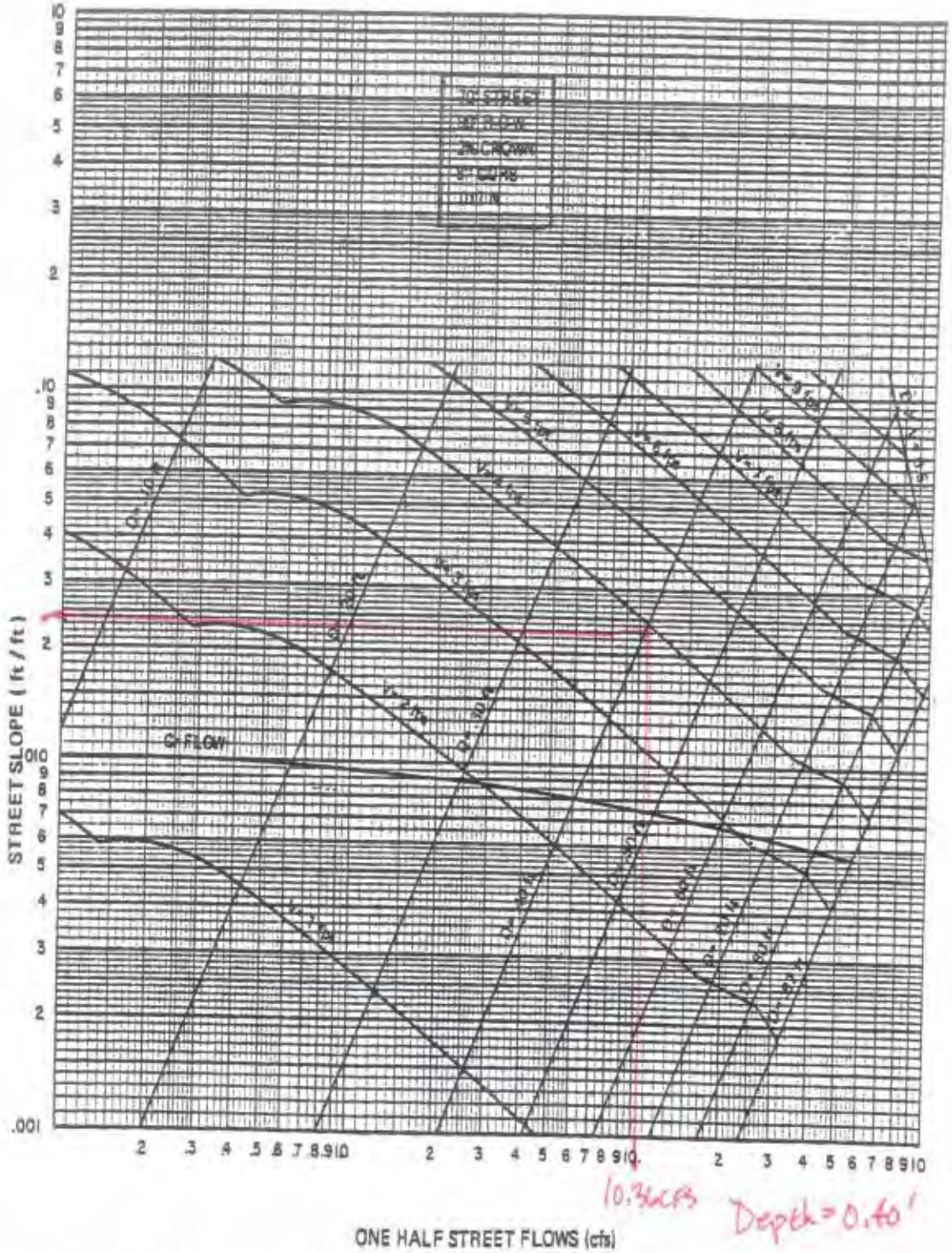


PLATE 22.3 D-4

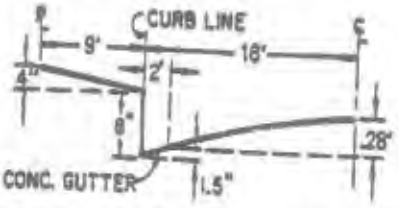
BASIN 117.327 bypass from 117326

½ Q = 9.17 CFS + 1.19 CFS = 10.36 CFS

S = 2.40%

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

1.6 CFS per inlet
Assume 50% Clogging
3.3 CFS per inlet
10.36 CFS ÷ 3.3 = 3.13
use 3 inlets
bypass Q = 0.46 CFS

PLATE 22.3 D-6

BASIN 117.327

STREET CAPACITY

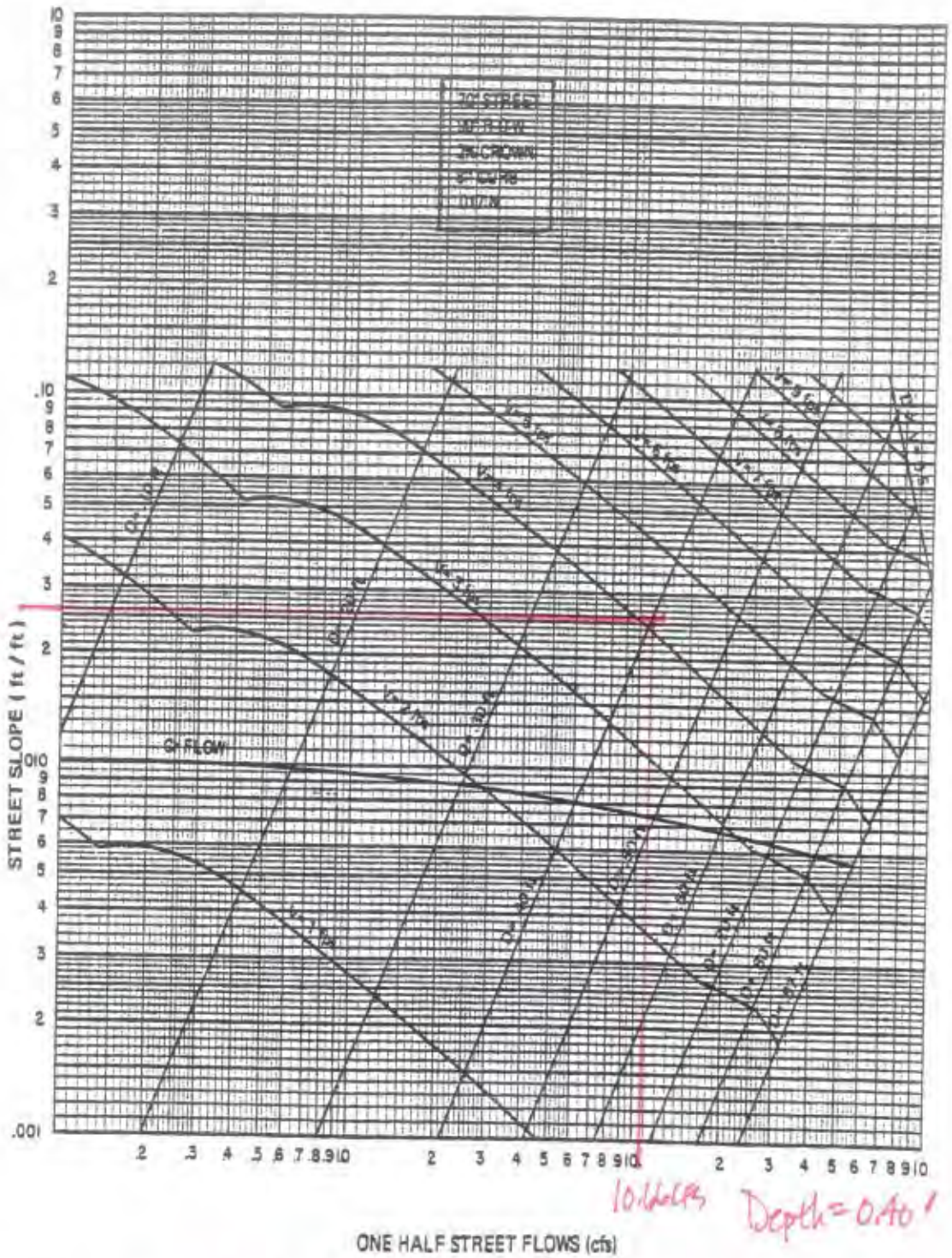


PLATE 22.3 D-4

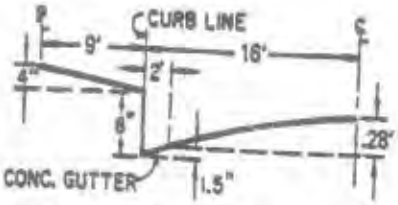
BASIN 117328 bypass Q from 117327

½Q = 10.20 CFS + 0.46 CFS = 10.66 CFS

S = 2.61%

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION (ABOVE BASIN)

6.70 CFS
Assume 50% Clogging
3.35 CFS per inlet
10 CFS ÷ 3.35 = 3.18
Use 3 inlets
Bypass Q = 0.6 CFS

PLATE 22.3 D-6

BASIN 117.32B

STREET CAPACITY

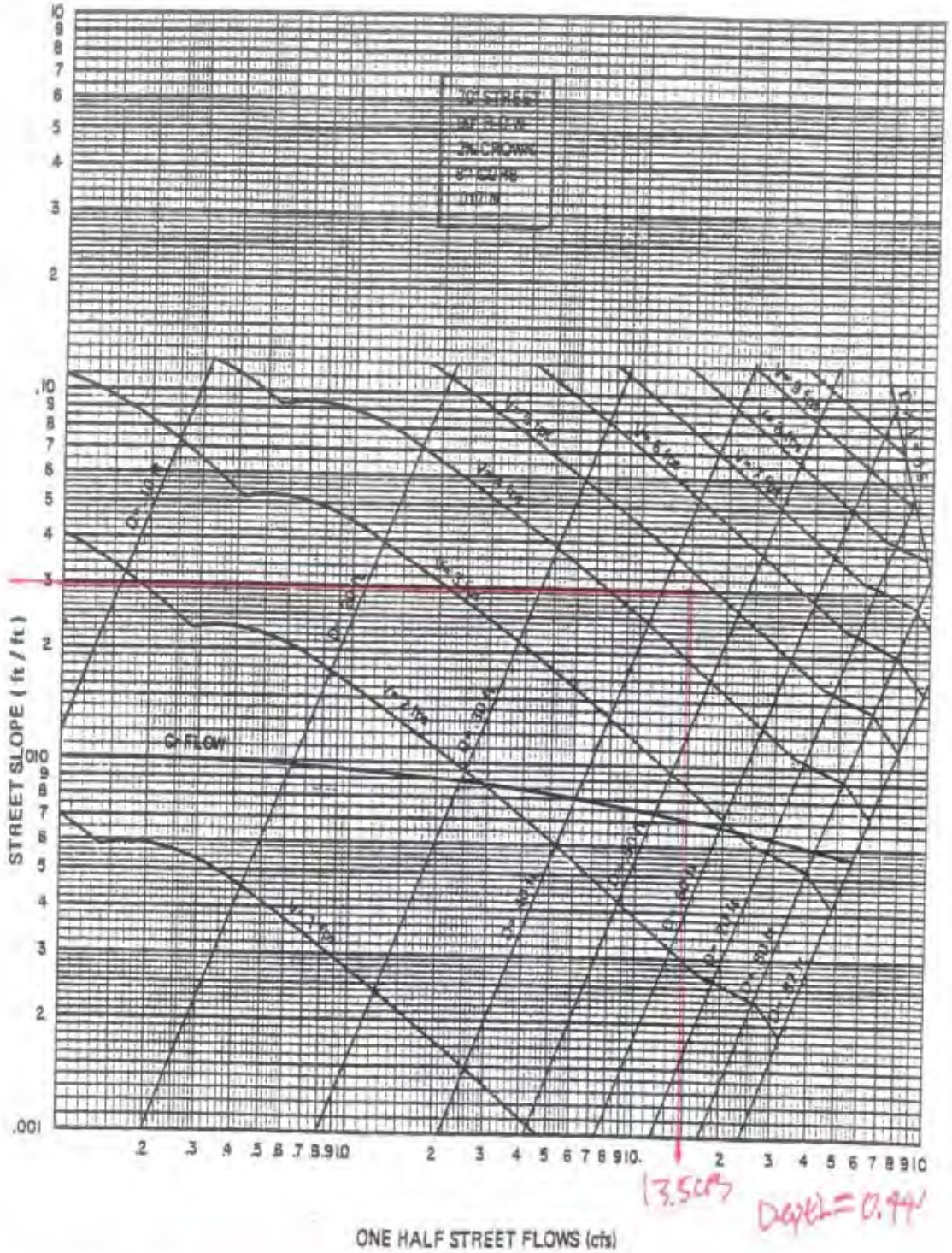


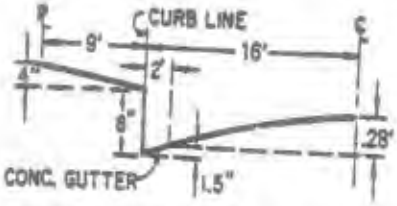
PLATE 22.3 D-4 BASIN 117.329 BYPASS Q 117.328

$\frac{1}{2}Q = 12.88 CFS + 0.61 CFS = 13.49 CFS$

$S = 3.0\%$

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"

GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

96 CFS
Assume 50% Clogging
4.8 CFS per inlet
13.4 CFS ÷ 4.8 CFS = 2.8
Use 3 inlets
NO BYPASS FLOWS

PLATE 22.3 D-6

BASIN 117.3S

SUMMARY OF HYDRAULIC CALCULATIONS

CLOSED CONDUIT

BY: DBT

DATE: 1/10/12

SHEET: 1 of 1

PROJECT: ALAMEDA FROM SAN PEDRO TO EAST OF LOUISIANA AND LOUISIANA FROM SIGNAL TO ALAMEDA

100 year

1	2	3	4	5	6	7	8	9	10		11	12	13	14		15	16	17	18	19	20	21	22	23
											JUNCTION		LOSSES												
STATION	STRUCT	D	Q	A	V	K	Sf	L	DELTA	Q	D	ANGLE	hf	hb	Aavg	hj	hmh	ht	hmisc	SUM	E.G.	hv	H.G.	GROUND ELEV.
																							5228.70	
10+23.88	WYE													0.00					0.00	0.00	5231.26	2.56	5228.70	5230.00
		60	252	19.64	12.83	2606	0.0094	19					0.18							0.18	5231.44	2.56	5228.88	
10+44.56	BEND								45					0.36	19.64	0.00	0.13	0.00		0.49	5231.92	2.56	5229.37	5230.00
		60	252	19.64	12.83	2606	0.0094	56					0.52							0.52	5232.45	2.56	5229.89	
11+00	MH									27	24	80		0.00	17.77	0.02	0.00	0.00		0.02	5232.47	3.11	5229.36	5231.50
		54	225	15.90	14.15	1967.6	0.0131	450					5.88							5.88	5238.35	3.11	5235.24	
15+50	MH													0.00	15.90	0.00	0.16	0.00		0.16	5238.51	3.11	5235.40	5244.00
		54	225	15.90	14.15	1967.6	0.0131	0					0.00							0.00	5238.51	3.11	5235.40	

REMARKS: BETWEEN STATION 11+00 AND 15+50 HGL BECOMES NON-PRESSURE

AND CONTINUES UNDER GRAVITY FLOW CONDITIONS

Manning's n: 0.013

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	4.00	48	Station 15+50 to Station 20+00				
Slope	0.0289	ft/ft					
Manning's N	0.013						
Percent full	70%						
Depth	2.81	ft					
theta	3.97						
Area	9.42	sf					
Wetted Perimeter	7.94	ft					
Surface Width	3.661	ft					
Q	**205.02**	cfs					
V	**21.77**	fps					
Depth	theta	A		T	Q	V	
0.20	0.90	0.23	1.80	1.74	**1.17**	**4.99**	
0.40	1.29	0.65	2.57	2.40	**5.10**	**7.80**	
0.60	1.59	1.18	3.18	2.86	**11.87**	**10.04**	
0.80	1.85	1.79	3.71	3.20	**21.38**	**11.95**	
1.00	2.09	2.46	4.19	3.46	**33.45**	**13.62**	
1.20	2.32	3.17	4.64	3.67	**47.82**	**15.08**	
1.40	2.53	3.92	5.06	3.82	**64.21**	**16.38**	
1.60	2.74	4.69	5.48	3.92	**82.29**	**17.53**	
1.80	2.94	5.48	5.88	3.98	**101.71**	**18.55**	
2.00	3.14	6.28	6.28	4.00	**122.10**	**19.43**	
2.20	3.34	7.08	6.68	3.98	**143.03**	**20.20**	
2.40	3.54	7.87	7.09	3.92	**164.06**	**20.84**	
2.60	3.75	8.65	7.50	3.82	**184.71**	**21.36**	
2.80	3.96	9.40	7.93	3.67	**204.45**	**21.76**	
3.00	4.19	10.11	8.38	3.46	**222.67**	**22.03**	
3.20	4.43	10.78	8.86	3.20	**238.69**	**22.15**	
3.40	4.69	11.38	9.38	2.86	**251.63**	**22.10**	
3.60	5.00	11.91	9.99	2.40	**260.26**	**21.85**	
3.80	5.38	12.33	10.76	1.74	**262.39**	**21.28**	
4.00	6.28	12.57	12.57	0.00	**244.19**	**19.43**	Full

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	4.00	48	Station 20+00 to Station 24+50				
Slope	0.0261	ft/ft					
Manning's N	0.013						
Percent full	68%						
Depth	2.70	ft					
theta	3.86						
Area	9.03	sf					
Wetted Perimeter	7.72	ft					
Surface Width	3.746	ft					
Q	**185.21**	cfs					
V	**20.51**	fps					
Depth	theta	A		T	Q	V	
0.20	0.90	0.23	1.80	1.74	**1.11**	**4.74**	
0.40	1.29	0.65	2.57	2.40	**4.84**	**7.41**	
0.60	1.59	1.18	3.18	2.86	**11.28**	**9.54**	
0.80	1.85	1.79	3.71	3.20	**20.32**	**11.36**	
1.00	2.09	2.46	4.19	3.46	**31.79**	**12.94**	
1.20	2.32	3.17	4.64	3.67	**45.45**	**14.33**	
1.40	2.53	3.92	5.06	3.82	**61.02**	**15.57**	
1.60	2.74	4.69	5.48	3.92	**78.20**	**16.66**	
1.80	2.94	5.48	5.88	3.98	**96.66**	**17.62**	
2.00	3.14	6.28	6.28	4.00	**116.03**	**18.47**	
2.20	3.34	7.08	6.68	3.98	**135.92**	**19.19**	
2.40	3.54	7.87	7.09	3.92	**155.91**	**19.80**	
2.60	3.75	8.65	7.50	3.82	**175.53**	**20.30**	
2.80	3.96	9.40	7.93	3.67	**194.29**	**20.68**	
3.00	4.19	10.11	8.38	3.46	**211.61**	**20.93**	
3.20	4.43	10.78	8.86	3.20	**226.83**	**21.05**	
3.40	4.69	11.38	9.38	2.86	**239.13**	**21.00**	
3.60	5.00	11.91	9.99	2.40	**247.33**	**20.76**	
3.80	5.38	12.33	10.76	1.74	**249.35**	**20.22**	
4.00	6.28	12.57	12.57	0.00	**232.06**	**18.47**	Full

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	3.50	42	Station 24+50 to Station 27+10				
Slope	0.0285	ft/ft					
Manning's N	0.013						
Percent full	80%						
Depth	2.78	ft					
theta	4.41						
Area	8.21	sf					
Wetted Perimeter	7.71	ft					
Surface Width	2.823	ft					
Q	**165.10**	cfs					
V	**20.12**	fps					
Depth	theta	A		T	Q	V	
0.18	0.90	0.18	1.58	1.53	**0.82**	**4.54**	
0.35	1.29	0.50	2.25	2.10	**3.55**	**7.08**	
0.53	1.59	0.90	2.78	2.50	**8.26**	**9.12**	
0.70	1.85	1.37	3.25	2.80	**14.87**	**10.86**	
0.88	2.09	1.88	3.67	3.03	**23.27**	**12.37**	
1.05	2.32	2.43	4.06	3.21	**33.26**	**13.70**	
1.23	2.53	3.00	4.43	3.34	**44.66**	**14.88**	
1.40	2.74	3.59	4.79	3.43	**57.24**	**15.93**	
1.58	2.94	4.20	5.15	3.48	**70.75**	**16.85**	
1.75	3.14	4.81	5.50	3.50	**84.92**	**17.65**	
1.93	3.34	5.42	5.85	3.48	**99.48**	**18.35**	
2.10	3.54	6.03	6.20	3.43	**114.11**	**18.93**	
2.28	3.75	6.62	6.56	3.34	**128.48**	**19.41**	
2.45	3.96	7.19	6.94	3.21	**142.20**	**19.77**	
2.63	4.19	7.74	7.33	3.03	**154.88**	**20.01**	
2.80	4.43	8.25	7.75	2.80	**166.02**	**20.12**	
2.98	4.69	8.72	8.21	2.50	**175.02**	**20.08**	
3.15	5.00	9.12	8.74	2.10	**181.02**	**19.85**	
3.33	5.38	9.44	9.42	1.53	**182.51**	**19.33**	
3.50	6.28	9.62	11.00	0.00	**169.85**	**17.65**	Full

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	3.50	42	Station 27+10 to Station 29+00				
Slope	0.0283	ft/ft					
Manning's N	0.013						
Percent full	77%						
Depth	2.71	ft					
theta	4.30						
Area	7.99	sf					
Wetted Perimeter	7.52	ft					
Surface Width	2.930	ft					
Q	**159.80**	cfs					
V	**20.01**	fps					
Depth	theta	A		T	Q	V	
0.18	0.90	0.18	1.58	1.53	**0.81**	**4.52**	
0.35	1.29	0.50	2.25	2.10	**3.53**	**7.06**	
0.53	1.59	0.90	2.78	2.50	**8.23**	**9.09**	
0.70	1.85	1.37	3.25	2.80	**14.82**	**10.82**	
0.88	2.09	1.88	3.67	3.03	**23.18**	**12.33**	
1.05	2.32	2.43	4.06	3.21	**33.14**	**13.65**	
1.23	2.53	3.00	4.43	3.34	**44.50**	**14.83**	
1.40	2.74	3.59	4.79	3.43	**57.04**	**15.87**	
1.58	2.94	4.20	5.15	3.48	**70.50**	**16.79**	
1.75	3.14	4.81	5.50	3.50	**84.63**	**17.59**	
1.93	3.34	5.42	5.85	3.48	**99.13**	**18.28**	
2.10	3.54	6.03	6.20	3.43	**113.71**	**18.87**	
2.28	3.75	6.62	6.56	3.34	**128.02**	**19.34**	
2.45	3.96	7.19	6.94	3.21	**141.70**	**19.70**	
2.63	4.19	7.74	7.33	3.03	**154.34**	**19.94**	
2.80	4.43	8.25	7.75	2.80	**165.44**	**20.05**	
2.98	4.69	8.72	8.21	2.50	**174.40**	**20.01**	
3.15	5.00	9.12	8.74	2.10	**180.39**	**19.78**	
3.33	5.38	9.44	9.42	1.53	**181.86**	**19.26**	
3.50	6.28	9.62	11.00	0.00	**169.25**	**17.59**	Full

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	3.50	42	Station 29+00 to Station 29+80				
Slope	0.0294	ft/ft					
Manning's N	0.013						
Percent full	73%						
Depth	2.56	ft					
theta	4.11						
Area	7.55	sf					
Wetted Perimeter	7.19	ft					
Surface Width	3.098	ft					
Q	**153.00**	cfs					
V	**20.25**	fps					
Depth	theta	A		T	Q	V	
0.18	0.90	0.18	1.58	1.53	**0.83**	**4.61**	
0.35	1.29	0.50	2.25	2.10	**3.60**	**7.19**	
0.53	1.59	0.90	2.78	2.50	**8.39**	**9.27**	
0.70	1.85	1.37	3.25	2.80	**15.11**	**11.03**	
0.88	2.09	1.88	3.67	3.03	**23.63**	**12.56**	
1.05	2.32	2.43	4.06	3.21	**33.78**	**13.92**	
1.23	2.53	3.00	4.43	3.34	**45.36**	**15.11**	
1.40	2.74	3.59	4.79	3.43	**58.13**	**16.18**	
1.58	2.94	4.20	5.15	3.48	**71.86**	**17.11**	
1.75	3.14	4.81	5.50	3.50	**86.25**	**17.93**	
1.93	3.34	5.42	5.85	3.48	**101.04**	**18.64**	
2.10	3.54	6.03	6.20	3.43	**115.90**	**19.23**	
2.28	3.75	6.62	6.56	3.34	**130.49**	**19.71**	
2.45	3.96	7.19	6.94	3.21	**144.43**	**20.08**	
2.63	4.19	7.74	7.33	3.03	**157.31**	**20.32**	
2.80	4.43	8.25	7.75	2.80	**168.62**	**20.44**	
2.98	4.69	8.72	8.21	2.50	**177.76**	**20.39**	
3.15	5.00	9.12	8.74	2.10	**183.86**	**20.16**	
3.33	5.38	9.44	9.42	1.53	**185.36**	**19.63**	
3.50	6.28	9.62	11.00	0.00	**172.51**	**17.93**	Full

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	3.50	42	Station 29+80 to Station 31+45				
Slope	0.0294	ft/ft					
Manning's N	0.013						
Percent full	69%						
Depth	2.43	ft					
theta	3.94						
Area	7.13	sf					
Wetted Perimeter	6.89	ft					
Surface Width	3.226	ft					
Q	**142.81**	cfs					
V	**20.04**	fps					
Depth	theta	A		T	Q	V	
0.18	0.90	0.18	1.58	1.53	**0.83**	**4.61**	
0.35	1.29	0.50	2.25	2.10	**3.60**	**7.19**	
0.53	1.59	0.90	2.78	2.50	**8.39**	**9.27**	
0.70	1.85	1.37	3.25	2.80	**15.11**	**11.03**	
0.88	2.09	1.88	3.67	3.03	**23.63**	**12.56**	
1.05	2.32	2.43	4.06	3.21	**33.78**	**13.92**	
1.23	2.53	3.00	4.43	3.34	**45.36**	**15.11**	
1.40	2.74	3.59	4.79	3.43	**58.13**	**16.18**	
1.58	2.94	4.20	5.15	3.48	**71.86**	**17.11**	
1.75	3.14	4.81	5.50	3.50	**86.25**	**17.93**	
1.93	3.34	5.42	5.85	3.48	**101.04**	**18.64**	
2.10	3.54	6.03	6.20	3.43	**115.90**	**19.23**	
2.28	3.75	6.62	6.56	3.34	**130.49**	**19.71**	
2.45	3.96	7.19	6.94	3.21	**144.43**	**20.08**	
2.63	4.19	7.74	7.33	3.03	**157.31**	**20.32**	
2.80	4.43	8.25	7.75	2.80	**168.62**	**20.44**	
2.98	4.69	8.72	8.21	2.50	**177.76**	**20.39**	
3.15	5.00	9.12	8.74	2.10	**183.86**	**20.16**	
3.33	5.38	9.44	9.42	1.53	**185.36**	**19.63**	
3.50	6.28	9.62	11.00	0.00	**172.51**	**17.93**	Full

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	3.50	42	Station 31+45 to Station 33+50				
Slope	0.0218	ft/ft					
Manning's N	0.013						
Percent full	74%						
Depth	2.59	ft					
theta	4.15						
Area	7.64	sf					
Wetted Perimeter	7.26	ft					
Surface Width	3.067	ft					
Q	**133.51**	cfs					
V	**17.47**	fps					
Depth	theta	A		T	Q	V	
0.18	0.90	0.18	1.58	1.53	**0.71**	**3.97**	
0.35	1.29	0.50	2.25	2.10	**3.10**	**6.19**	
0.53	1.59	0.90	2.78	2.50	**7.22**	**7.98**	
0.70	1.85	1.37	3.25	2.80	**13.01**	**9.50**	
0.88	2.09	1.88	3.67	3.03	**20.35**	**10.82**	
1.05	2.32	2.43	4.06	3.21	**29.09**	**11.98**	
1.23	2.53	3.00	4.43	3.34	**39.06**	**13.02**	
1.40	2.74	3.59	4.79	3.43	**50.06**	**13.93**	
1.58	2.94	4.20	5.15	3.48	**61.87**	**14.74**	
1.75	3.14	4.81	5.50	3.50	**74.27**	**15.44**	
1.93	3.34	5.42	5.85	3.48	**87.01**	**16.05**	
2.10	3.54	6.03	6.20	3.43	**99.80**	**16.56**	
2.28	3.75	6.62	6.56	3.34	**112.36**	**16.97**	
2.45	3.96	7.19	6.94	3.21	**124.37**	**17.29**	
2.63	4.19	7.74	7.33	3.03	**135.46**	**17.50**	
2.80	4.43	8.25	7.75	2.80	**145.20**	**17.60**	
2.98	4.69	8.72	8.21	2.50	**153.07**	**17.56**	
3.15	5.00	9.12	8.74	2.10	**158.32**	**17.36**	
3.33	5.38	9.44	9.42	1.53	**159.62**	**16.91**	
3.50	6.28	9.62	11.00	0.00	**148.55**	**15.44**	Full

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	3.50	42	Station 33+50 to Station 36+67				
Slope	0.0210	ft/ft					
Manning's N	0.013						
Percent full	75%						
Depth	2.63	ft					
theta	4.20						
Area	7.77	sf					
Wetted Perimeter	7.35	ft					
Surface Width	3.020	ft					
Q	**133.50**	cfs					
V	**17.18**	fps					
Depth	theta	A		T	Q	V	
0.18	0.90	0.18	1.58	1.53	**0.70**	**3.89**	
0.35	1.29	0.50	2.25	2.10	**3.04**	**6.08**	
0.53	1.59	0.90	2.78	2.50	**7.09**	**7.83**	
0.70	1.85	1.37	3.25	2.80	**12.77**	**9.32**	
0.88	2.09	1.88	3.67	3.03	**19.97**	**10.62**	
1.05	2.32	2.43	4.06	3.21	**28.55**	**11.76**	
1.23	2.53	3.00	4.43	3.34	**38.34**	**12.77**	
1.40	2.74	3.59	4.79	3.43	**49.13**	**13.67**	
1.58	2.94	4.20	5.15	3.48	**60.73**	**14.46**	
1.75	3.14	4.81	5.50	3.50	**72.90**	**15.15**	
1.93	3.34	5.42	5.85	3.48	**85.40**	**15.75**	
2.10	3.54	6.03	6.20	3.43	**97.95**	**16.25**	
2.28	3.75	6.62	6.56	3.34	**110.28**	**16.66**	
2.45	3.96	7.19	6.94	3.21	**122.07**	**16.97**	
2.63	4.19	7.74	7.33	3.03	**132.95**	**17.18**	
2.80	4.43	8.25	7.75	2.80	**142.51**	**17.27**	
2.98	4.69	8.72	8.21	2.50	**150.24**	**17.24**	
3.15	5.00	9.12	8.74	2.10	**155.39**	**17.04**	
3.33	5.38	9.44	9.42	1.53	**156.66**	**16.59**	
3.50	6.28	9.62	11.00	0.00	**145.80**	**15.15**	Full

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	3.00	36	Station 36+67 to Station 38+04				
Slope	0.0643	ft/ft					
Manning's N	0.013						
Percent full	45%						
Depth	1.36	ft					
theta	2.95						
Area	3.12	sf					
Wetted Perimeter	4.43	ft					
Surface Width	2.987	ft					
Q	**71.39**	cfs					
V	**22.91**	fps					
Depth	theta	A		T	Q	V	
0.15	0.90	0.13	1.35	1.31	**0.81**	**6.15**	
0.30	1.29	0.37	1.93	1.80	**3.53**	**9.60**	
0.45	1.59	0.66	2.39	2.14	**8.22**	**12.37**	
0.60	1.85	1.01	2.78	2.40	**14.81**	**14.72**	
0.75	2.09	1.38	3.14	2.60	**23.17**	**16.76**	
0.90	2.32	1.78	3.48	2.75	**33.12**	**18.57**	
1.05	2.53	2.20	3.80	2.86	**44.47**	**20.17**	
1.20	2.74	2.64	4.11	2.94	**56.99**	**21.59**	
1.35	2.94	3.09	4.41	2.98	**70.45**	**22.84**	
1.50	3.14	3.53	4.71	3.00	**84.57**	**23.93**	
1.65	3.34	3.98	5.01	2.98	**99.06**	**24.87**	
1.80	3.54	4.43	5.32	2.94	**113.63**	**25.66**	
1.95	3.75	4.86	5.63	2.86	**127.93**	**26.30**	
2.10	3.96	5.29	5.95	2.75	**141.60**	**26.79**	
2.25	4.19	5.69	6.28	2.60	**154.23**	**27.12**	
2.40	4.43	6.06	6.64	2.40	**165.32**	**27.27**	
2.55	4.69	6.40	7.04	2.14	**174.28**	**27.22**	
2.70	5.00	6.70	7.49	1.80	**180.26**	**26.90**	
2.85	5.38	6.94	8.07	1.31	**181.73**	**26.20**	
3.00	6.28	7.07	9.42	0.00	**169.13**	**23.93**	Full

Circular Pipe Flow			Alameda Boulevard				
Diameter (ft..in)	3.00	36	Station 38+10 to Station 40+77				
Slope	0.0254	ft/ft					
Manning's N	0.013						
Percent full	56%						
Depth	1.67	ft					
theta	3.36						
Area	4.03	sf					
Wetted Perimeter	5.04	ft					
Surface Width	2.982	ft					
Q	**63.18**	cfs					
V	**15.68**	fps					
Depth	theta	A		T	Q	V	
0.15	0.90	0.13	1.35	1.31	**0.51**	**3.86**	
0.30	1.29	0.37	1.93	1.80	**2.22**	**6.03**	
0.45	1.59	0.66	2.39	2.14	**5.17**	**7.77**	
0.60	1.85	1.01	2.78	2.40	**9.31**	**9.25**	
0.75	2.09	1.38	3.14	2.60	**14.56**	**10.54**	
0.90	2.32	1.78	3.48	2.75	**20.82**	**11.67**	
1.05	2.53	2.20	3.80	2.86	**27.95**	**12.68**	
1.20	2.74	2.64	4.11	2.94	**35.82**	**13.57**	
1.35	2.94	3.09	4.41	2.98	**44.28**	**14.35**	
1.50	3.14	3.53	4.71	3.00	**53.15**	**15.04**	
1.65	3.34	3.98	5.01	2.98	**62.26**	**15.63**	
1.80	3.54	4.43	5.32	2.94	**71.42**	**16.13**	
1.95	3.75	4.86	5.63	2.86	**80.41**	**16.53**	
2.10	3.96	5.29	5.95	2.75	**89.00**	**16.84**	
2.25	4.19	5.69	6.28	2.60	**96.93**	**17.05**	
2.40	4.43	6.06	6.64	2.40	**103.90**	**17.14**	
2.55	4.69	6.40	7.04	2.14	**109.54**	**17.11**	
2.70	5.00	6.70	7.49	1.80	**113.29**	**16.91**	
2.85	5.38	6.94	8.07	1.31	**114.22**	**16.47**	
3.00	6.28	7.07	9.42	0.00	**106.30**	**15.04**	Full

Circular Pipe Flow			Louisiana Boulevard				
Diameter (ft..in)	3.00	36	Station 11+10 to Station 12+74				
Slope	0.0080	ft/ft					
Manning's N	0.013						
Percent full	84%						
Depth	2.52	ft					
theta	4.64						
Area	6.34	sf					
Wetted Perimeter	6.95	ft					
Surface Width	2.201	ft					
Q	**60.90**	cfs					
V	**9.61**	fps					
Depth	theta	A		T	Q	V	
0.15	0.90	0.13	1.35	1.31	**0.29**	**2.17**	
0.30	1.29	0.37	1.93	1.80	**1.25**	**3.39**	
0.45	1.59	0.66	2.39	2.14	**2.90**	**4.36**	
0.60	1.85	1.01	2.78	2.40	**5.22**	**5.19**	
0.75	2.09	1.38	3.14	2.60	**8.17**	**5.91**	
0.90	2.32	1.78	3.48	2.75	**11.68**	**6.55**	
1.05	2.53	2.20	3.80	2.86	**15.69**	**7.11**	
1.20	2.74	2.64	4.11	2.94	**20.10**	**7.61**	
1.35	2.94	3.09	4.41	2.98	**24.85**	**8.05**	
1.50	3.14	3.53	4.71	3.00	**29.83**	**8.44**	
1.65	3.34	3.98	5.01	2.98	**34.94**	**8.77**	
1.80	3.54	4.43	5.32	2.94	**40.08**	**9.05**	
1.95	3.75	4.86	5.63	2.86	**45.12**	**9.28**	
2.10	3.96	5.29	5.95	2.75	**49.95**	**9.45**	
2.25	4.19	5.69	6.28	2.60	**54.40**	**9.57**	
2.40	4.43	6.06	6.64	2.40	**58.31**	**9.62**	
2.55	4.69	6.40	7.04	2.14	**61.47**	**9.60**	
2.70	5.00	6.70	7.49	1.80	**63.58**	**9.49**	
2.85	5.38	6.94	8.07	1.31	**64.10**	**9.24**	
3.00	6.28	7.07	9.42	0.00	**59.66**	**8.44**	Full

Circular Pipe Flow			Louisiana Boulevard				
Diameter (ft..in)	3.00	36	Station 7+54 to Station 11+10				
Slope	0.0065	ft/ft					
Manning's N	0.013						
Percent full	91%						
Depth	2.72	ft					
theta	5.05						
Area	6.74	sf					
Wetted Perimeter	7.58	ft					
Surface Width	1.734	ft					
Q	**57.50**	cfs					
V	**8.53**	fps					
Depth	theta	A		T	Q	V	
0.15	0.90	0.13	1.35	1.31	**0.26**	**1.95**	
0.30	1.29	0.37	1.93	1.80	**1.12**	**3.05**	
0.45	1.59	0.66	2.39	2.14	**2.61**	**3.93**	
0.60	1.85	1.01	2.78	2.40	**4.71**	**4.68**	
0.75	2.09	1.38	3.14	2.60	**7.37**	**5.33**	
0.90	2.32	1.78	3.48	2.75	**10.53**	**5.90**	
1.05	2.53	2.20	3.80	2.86	**14.14**	**6.41**	
1.20	2.74	2.64	4.11	2.94	**18.12**	**6.86**	
1.35	2.94	3.09	4.41	2.98	**22.40**	**7.26**	
1.50	3.14	3.53	4.71	3.00	**26.89**	**7.61**	
1.65	3.34	3.98	5.01	2.98	**31.50**	**7.91**	
1.80	3.54	4.43	5.32	2.94	**36.13**	**8.16**	
1.95	3.75	4.86	5.63	2.86	**40.68**	**8.36**	
2.10	3.96	5.29	5.95	2.75	**45.02**	**8.52**	
2.25	4.19	5.69	6.28	2.60	**49.04**	**8.62**	
2.40	4.43	6.06	6.64	2.40	**52.56**	**8.67**	
2.55	4.69	6.40	7.04	2.14	**55.41**	**8.65**	
2.70	5.00	6.70	7.49	1.80	**57.31**	**8.55**	
2.85	5.38	6.94	8.07	1.31	**57.78**	**8.33**	
3.00	6.28	7.07	9.42	0.00	**53.77**	**7.61**	Full

Circular Pipe Flow			Louisiana Boulevard				
Diameter (ft..in)	3.00	36	Station 7+54 to Station 11+10				
Slope	0.0188	ft/ft					
Manning's N	0.013						
Percent full	58%						
Depth	1.73	ft					
theta	3.44						
Area	4.21	sf					
Wetted Perimeter	5.16	ft					
Surface Width	2.966	ft					
Q	**57.51**	cfs					
V	**13.67**	fps					
Depth	theta	A		T	Q	V	
0.15	0.90	0.13	1.35	1.31	**0.44**	**3.32**	
0.30	1.29	0.37	1.93	1.80	**1.91**	**5.19**	
0.45	1.59	0.66	2.39	2.14	**4.45**	**6.69**	
0.60	1.85	1.01	2.78	2.40	**8.01**	**7.96**	
0.75	2.09	1.38	3.14	2.60	**12.53**	**9.07**	
0.90	2.32	1.78	3.48	2.75	**17.91**	**10.04**	
1.05	2.53	2.20	3.80	2.86	**24.05**	**10.91**	
1.20	2.74	2.64	4.11	2.94	**30.82**	**11.67**	
1.35	2.94	3.09	4.41	2.98	**38.09**	**12.35**	
1.50	3.14	3.53	4.71	3.00	**45.73**	**12.94**	
1.65	3.34	3.98	5.01	2.98	**53.56**	**13.45**	
1.80	3.54	4.43	5.32	2.94	**61.44**	**13.87**	
1.95	3.75	4.86	5.63	2.86	**69.18**	**14.22**	
2.10	3.96	5.29	5.95	2.75	**76.57**	**14.49**	
2.25	4.19	5.69	6.28	2.60	**83.39**	**14.66**	
2.40	4.43	6.06	6.64	2.40	**89.39**	**14.75**	
2.55	4.69	6.40	7.04	2.14	**94.24**	**14.72**	
2.70	5.00	6.70	7.49	1.80	**97.47**	**14.55**	
2.85	5.38	6.94	8.07	1.31	**98.27**	**14.17**	
3.00	6.28	7.07	9.42	0.00	**91.45**	**12.94**	Full

Circular Pipe Flow			Louisiana Boulevard				
Diameter (ft..in)	2.00	24	Station 12+74 to Station 13+59				
Slope	0.0142	ft/ft					
Manning's N	0.013						
Percent full	15%						
Depth	0.30	ft					
theta	1.60						
Area	0.30	sf					
Wetted Perimeter	1.60	ft					
Surface Width	1.432	ft					
Q	**1.33**	cfs					
V	**4.45**	fps					
Depth	theta	A		T	Q	V	
0.10	0.90	0.06	0.90	0.87	**0.13**	**2.20**	
0.20	1.29	0.16	1.29	1.20	**0.56**	**3.44**	
0.30	1.59	0.30	1.59	1.43	**1.31**	**4.43**	
0.40	1.85	0.45	1.85	1.60	**2.36**	**5.28**	
0.50	2.09	0.61	2.09	1.73	**3.69**	**6.01**	
0.60	2.32	0.79	2.32	1.83	**5.28**	**6.66**	
0.70	2.53	0.98	2.53	1.91	**7.09**	**7.23**	
0.80	2.74	1.17	2.74	1.96	**9.08**	**7.74**	
0.90	2.94	1.37	2.94	1.99	**11.23**	**8.19**	
1.00	3.14	1.57	3.14	2.00	**13.48**	**8.58**	
1.10	3.34	1.77	3.34	1.99	**15.79**	**8.92**	
1.20	3.54	1.97	3.54	1.96	**18.11**	**9.20**	
1.30	3.75	2.16	3.75	1.91	**20.39**	**9.43**	
1.40	3.96	2.35	3.96	1.83	**22.57**	**9.61**	
1.50	4.19	2.53	4.19	1.73	**24.58**	**9.73**	
1.60	4.43	2.69	4.43	1.60	**26.35**	**9.78**	
1.70	4.69	2.85	4.69	1.43	**27.78**	**9.76**	
1.80	5.00	2.98	5.00	1.20	**28.73**	**9.65**	
1.90	5.38	3.08	5.38	0.87	**28.97**	**9.40**	
2.00	6.28	3.14	6.28	0.00	**26.96**	**8.58**	Full

SUMMARY OF HYDRAULIC CALCULATIONS

CLOSED CONDUIT - HEAD LOSS AT MANHOLES

BY:

DATE:

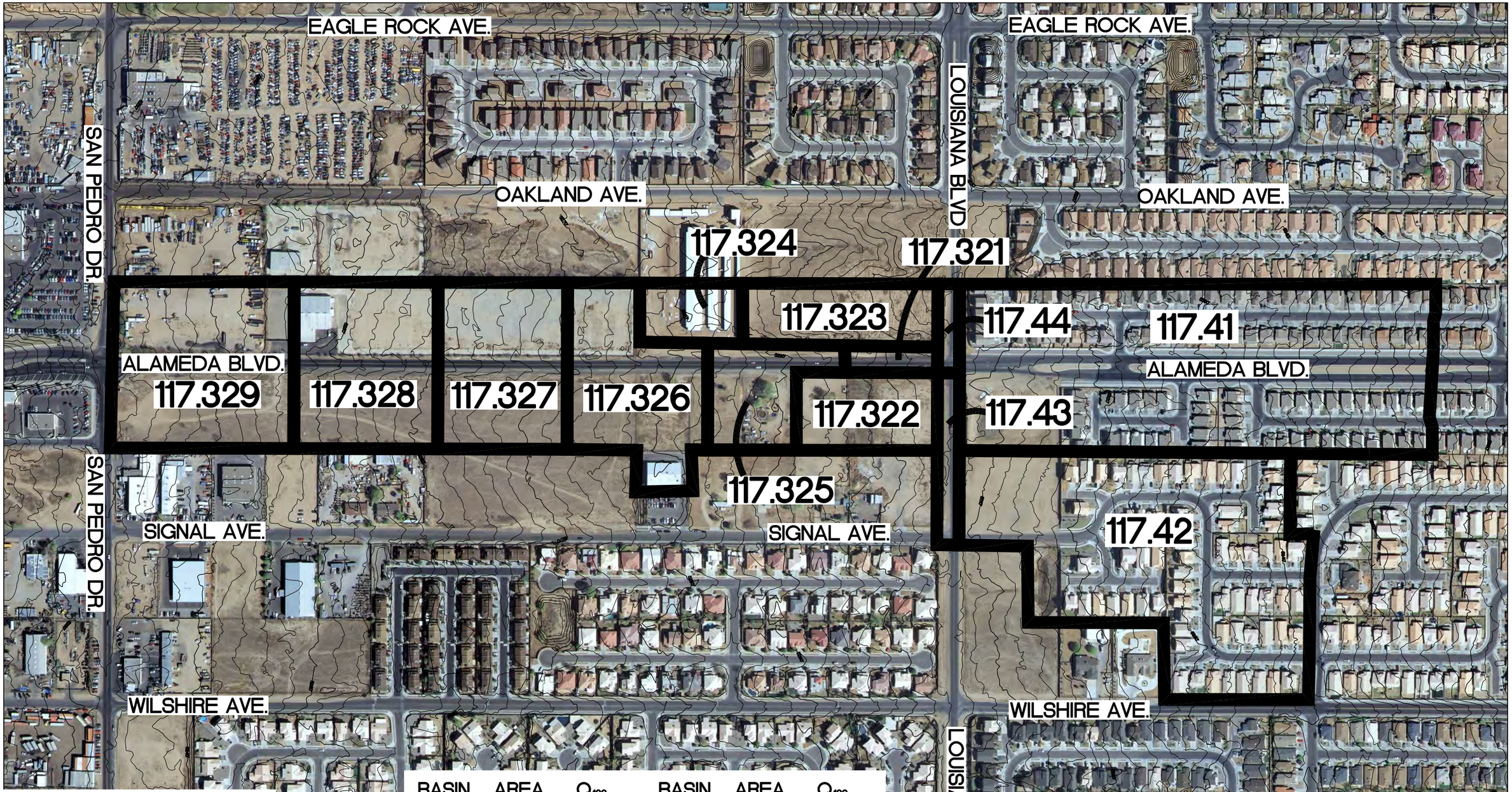
SHEET: 1 of 1

PROJECT: ALAMEDA FROM SAN PEDRO TO EAST OF LOUISIANA AND LOUISIANA FROM SIGNAL TO ALAMEDA

100 year

1	2	3	4	5	6	7	8	9	10		11	12	13	14		15	16	17	18	19	21	23
											JUNCTION		LOSSES									
STATION	STRUCT	D	Q	A	V	K	Sf	L	DELTA	Q	D	ANGLE	hf	hb	Aavg	hj	hmh	ht	hmisc	SUM	hv	GROUND ELEV.
15+50	MH																		0.00	0.00	7.36	5244.00
		48	205	12.57	21.77	1437.2	0.0203	450												0.00	7.36	
20+00	MH									20	24	80			12.57	1.60	0.33	0.00		1.92	6.53	5257.00
		48	185	12.57	20.51	1437.2	0.0166	450												0.00	6.53	
24+50	MH									20	24	80			11.09	1.27	0.31	0.00		1.58	6.29	5269.00
		42	165	9.62	20.12	1006.6	0.0269	260												0.00	6.29	
27+10	MH									5	24	80			9.62	0.38	0.31	0.00		0.69	6.22	5277.00
		42	160	9.62	20.01	1006.6	0.0253	190												0.00	6.22	
29+00	MH									7	24	80			9.62	0.32	0.32	0.00		0.64	6.37	5282.00
		42	153	9.62	20.25	1006.6	0.0231	80												0.00	6.37	
29+80	MH									10	24	80			9.62	0.73	0.31	0.00		1.04	6.24	5284.00
		42	143	9.62	20.04	1006.6	0.0202	165												0.00	6.24	
31+45	MH									9	24	80			9.62	1.68	0.24	0.00		1.92	4.74	5290.00
		42	134	9.62	17.47	1006.6	0.0177	205												0.00	4.74	
33+50	MH									0					9.62	0.00	0.23	0.00		0.23	4.58	5298.00
		42	134	9.62	17.18	1006.6	0.0177	318												0.00	4.58	
36+67	MH									63	36	90			8.34	2.51	0.41	0.00		2.92	8.15	5307.00
		36	71	7.07	22.91	667.28	0.0113	137												0.00	8.15	
38+04	MH									8	24	90			7.07	2.56	0.21	0.00		2.77	4.27	5311.00
		36	63	7.07	16.58	667.28	0.0089	267												0.00	4.27	
																						5307.00
12+75	MH													0.00					0.00	0.00	1.43	
		36	60.9	7.07	9.61	667.28	0.0083	164												0.00	1.43	
11+10	MH									3.4	24	80		0.00	7.07	0.41	0.06	0.00		0.47	1.13	5306.00
		36	57.5	7.07	8.53	667.28	0.0074	355												0.00	1.13	
7+55	MH								90	0				0.58	7.07	0.00	0.15	0.00		0.73	2.90	5309.00
		36	57.5	7.07	13.67	667.28	0.0074	50												0.00	2.90	
7+05	MH									4.5				0.00	7.07	0.00	0.15	0.00		0.15	2.90	5310.00
		36	53	7.07	13.67	667.28	0.0063	0												0.00	2.90	
0+00	MH									53				0.00	3.53	0.00	0.00	-0.58		-0.58	0.00	

REMARKS: Manning's n: 0.013



BASIN	AREA	Q_{100}	BASIN	AREA	Q_{100}
117.321	0.54 AC	2.06 CFS	117.328	5.34 AC	20.40 CFS
117.322	2.44 AC	9.32 CFS	117.329	6.74 AC	25.75 CFS
117.323	2.68 AC	10.24 CFS	117.41	17.75 AC	71.36 CFS
117.324	1.37 AC	5.23 CFS	117.42	14.29 AC	57.45 CFS
117.325	1.25 AC	4.77 CFS	117.43	0.85 AC	3.42 CFS
117.326	5.96 AC	22.77CFS	117.44	0.43 AC	1.33 CFS
117.327	4.80 AC	18.34 CFS			

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N

SCALE: 1"=300'

ALAMEDA BLVD. PROJECT

C.O.A. PROJECT # 7663.91

BASIN EXHIBIT

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