

**DRAINAGE REPORT**  
**FOR**  
**MODESTO SEVEN SUBDIVISION**

Albuquerque, New Mexico

Prepared For:

**Steve Slick**  
10112 San Bernardino Avenue NE  
Albuquerque, New Mexico 87122

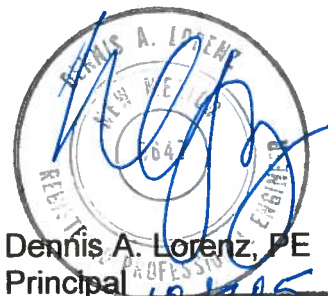
Prepared by:



**BRASHER AND LORENZ, INC.**

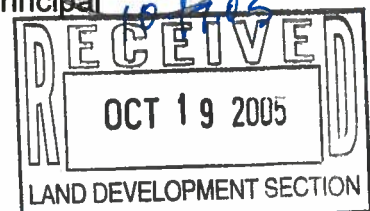
**Consulting Engineers**

2201 San Pedro NE, Building 1, Suite 1200  
Albuquerque, New Mexico 87110



Dennis A. Lorenz, PE  
Principal

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## PURPOSE AND SCOPE

Pursuant to City of Albuquerque Development Process Manual, this Drainage Report is presented to outline the drainage management criteria for controlling developed runoff generated by the project site, and to identify the storm drainage infrastructure recommended to protect the site from off-site runoff. A residential development is proposed on the existing 2.64-acre project site. Access, landscaping, grading, drainage and utility improvements will be provided to support the development. This Drainage Report is presented to support a Preliminary Plat request, including Infrastructure List and Grading Plan approval by the Development Review Board.

## SITE DESCRIPTION

Presently the project site is undeveloped. The site is located on Modesto Avenue NE, between Barstow Street and Ventura Street NE, in Albuquerque, New Mexico (see Figure 1). The site slopes from west to east at approximately 5 percent. The site is well vegetated with native plant species. The site is located in the far NE Heights of Albuquerque, in an area that is zoned RD/3DU/Acre. Intermixed with this zoning unit are existing single family residences constructed on the 1.0-acre North Albuquerque Acres lots.

The properties are impacted by the El Camino Arroyo which runs westward across the northern property line. The El Camino Arroyo is mapped as a Floodplain, Zone AO Depth 2 (see Figure 2). The arroyo is an unimproved natural floodway. The arroyo drains westward into an existing temporary detention pond located at the east side of Barstow Street NE at Glendale Avenue NE. The detention pond was constructed for Quivera Estates, and drains by a 78-inch storm drain.

Modesto Avenue is partially improved across the property frontage. Street, water sewer and storm sewer improvements exist from Barstow to the east property line of Lot 29.

## EXISTING DRAINAGE CONDITIONS

The site presently drains north into the El Camino Arroyo floodplain. The Off-site Drainage Map – Existing Conditions (see back pocket), illustrates the off-site drainage basins that impact the project site. Each off-site basin is described as follows:

1. The El Camino Arroyo Basin concentrates at the El Camino Arroyo floodplain along the north project boundary. The El Camino drains west into the temporary detention pond located at Barstow. The existing flowrate is estimated at 726 cfs by the Masterplan.
2. Basin OS-1 originates east of Ventura Street NE, draining across Modesto approximately 300 feet east of the site. The basin enters the site from the east

- (50.6 cfs), draining to the El Camino Arroyo.
3. Basin OS-2 represents a portion of Modesto Avenue and developed residential properties south of the site. The basin enters the site from the south (4.7 cfs), draining to the El Camino Arroyo.

As shown by the attached FIRM Panel (Figure 2), the project site is impacted by the El Camino Arroyo Floodplain.

## **DRAINAGE MASTERPLAN**

The current Drainage Masterplan for the site is the "Final Drainage Masterplan for North Albuquerque Acres", prepared by Resource Technology, Inc for the City of Albuquerque. Improvements recommended by the Study include a 30-inch storm drain in Modesto Avenue, designed to convey runoff from contributing off-site basins and portions of the project site. The Plan also recommends confining the El Camino Arroyo within a public storm drain to be constructed within Glendale Avenue NE.

## **PROPOSED CONDITIONS**

As shown by the Plan, the project consists of the development of the property into a 7 lot residential subdivision. Paving, water, sanitary sewer, and drainage improvements will be constructed as necessary to support the project. The Plan shows the elevations and details required to properly grade and construct the recommended improvements. The direction of the drainage flows are given by flow arrows.

The Grading and drainage Plan (see Sheet 1 located in back pocket) recommends construction of curb and gutter and one-half width paving improvements along Modesto Avenue. The site will drain in 2 directions: the north 1.34-acres Basin S-A, will drain 3.5 cfs north to the El Camino Arroyo. The southerly 1.30-acres, Basins S-B and S-C, will drain 5.1 cfs south to Modesto Avenue. Per criteria imposed by the City of Albuquerque, Basins S-B and S-C, which contain the proposed house pads, are required to drain south to Modesto Avenue.

The El Camino Arroyo will remain unimproved along the project frontage. All proposed buildings will be positioned outside the calculated Erosion Setback Limit of 110 feet from the arroyo centerline. Since no buildings will be constructed within the erosion setback area scour protection is not required for this project. A Floodway Easement and Prudent Line Easement will be granted to the City of Albuquerque to restrict development adjacent to the arroyo. Should future improvements eliminate the floodplain these easements may be vacated by the public hearing process.

The Off-site Drainage Map – Developed Conditions (see back pocket), illustrates the off-site drainage basins that impact the project site. Each off-site basin is described as follows:

1. The El Camino Arroyo Basin concentrates at the El Camino Arroyo floodplain along the north project boundary. The El Camino drains west into the temporary detention pond located at Barstow. The existing flowrate is developed at 924 cfs by the Masterplan. This study assumes the arroyo will remain unimproved. Should the improvements recommended by the Master Plan be implemented, the El Camino Arroyo will be confined to a 78-inch public storm drain to be constructed in Glendale Avenue.
2. Basin OS-1 will drain to a point approximately 300 feet east of the project site where flows will be intercepted by street improvements to Modesto Avenue. A 30-foot wide street section will convey flows west to an existing 30-inch storm drain. This project will construction an installation of catch basins to collect all runoff per the DMP. The 30-inch storm drain connects to the Glendale storm drain system which was constructed to convey the El Camino Arroyo.
3. Basin OS-2 represents a portion of Modesto Avenue and developed residential properties south of the site. This basin will combine with On-site Basin S-B and drain to the proposed catch basins described above..
4. Basin OS-3 represents a remnant of Existing Off-site Basin OS-1, located north of Modesto and east of the site. This Basin will drain to a private area inlet and storm drain outfalling at the El Camino Arroyo.

## **TEMPORARY EROSION CONTROL**

As required by the City of Albuquerque and the Environmental Protection Agency a detailed Storm Water Pollution Prevent Plan (SWPPP) will be prepared to outline criteria for the management of storm water flows and the discharge of potential pollutants, both during the construction phase and long term life of the project. The SWPPP will be completed and available for inspection prior to construction commencement.



EROSION SETBACK

PER "SEDIMENT + EROSION DESIGN GUIDE"

$Q_{100} = 924$  CFS DEVELOPED PER NAA MDP TABLE 13

$$Q_d = 0.2 Q_{100} = 184.8 \text{ CFS} \quad (3.77)$$

ASSUME  $Fr \sim 1.0$

$$W_b = 4.6 Q_d^{0.4} = 37.1 \text{ FT} \quad (3.78)$$

$$S_c = 0.037 Q_d^{-0.133} = 0.018 < 5 \quad (3.80)$$

$$\begin{aligned} \Delta_{MAX} &= \left[ 0.92 + 4.6 \log Q_d \right] Q_d^{0.4} \quad (3.81b) \\ &= 91.5 \text{ FT} \end{aligned}$$

$$CSB = \Delta_{MAX} + \frac{1}{2} W_b = 110.1 \text{ FT}$$

MODESTO SEVEN  
STORM DRAINS  
DEVELOPED OFF-SITE CONDITIONS

ANALYSIS POINT	Q100	STREET WIDTH	STREET SLOPE	STREET DEPTH	INLET TYPE	Qinlet	Qpipe	PIPE SLOPE	PIPE DIA	Qresidual
	cfs	feet	%	feet		cfs	cfs	%	inches	cfs
<b>MODESTO</b>										
1	67.4	30	2.7	0.48	A	2(8.5)	2(8.5)	1.00	18	50.4
1	50.4	30	2.7	0.43	CC	2(8.0)	2(16.5)	1.00	18	34.4
1	34.4	30	SUMP	0.67	CC	2(17.2)	2(33.4)	2.00	24	0
1	67.4	NA	NA	NA	NA	NA	67.4	2.80	30	0
2	2.1	30	2.9	0.13	A	2.1	2.1	13.80	18	0

**MODESTO SEVEN SUBDIVISION**  
**PROJECT HYDROLOGY SUMMARY**  
**AHYMO**

		LAND TREATMENTS						
BASIN	AREA	Aa	Ab	Ac	Ad	Ew	VOL 100/6	Q 100/6
	acres	%	%	%	%	inches	ac-feet	cfs
EXISTING CONDITIONS								
SITE	2.64	100	0	0	0	66	0.144	4.95
OS-1	18.22	48	17	18	17	1.15	1.743	50.62
OS-2 *	1.39	20	20	34	26	1.45	0.168	4.66
EL CAMINO								**726
DEVELOPED CONDITIONS								
SITE	2.64	20	20	34	26	1.45	0.318	8.83
S-A *	1.34	33	33	34	0	1.03	0.924	3.5
S-B *	0.76	0	27	27	46	1.86	0.118	3.01
S-C *	0.54	0	27	27	46	1.86	0.084	2.14
OS-1 *	17.27	20	20	34	26	1.45	2.081	57.65
OS-2 *	2.02	20	20	34	26	1.45	0.243	6.76
OS-3 *	1.1	20	20	34	26	1.45	0.133	3.69
EL CAMINO								**924
* LOW DENSITY RESIDENTIAL PER NAA MDP FIG 2A								
** EL CAMINO ANALYSIS PER NAA MDP TABLE 7B								





**FINAL  
NORTH ALBUQUERQUE ACRES  
MASTER DRAINAGE PLAN**

**Prepared For:**



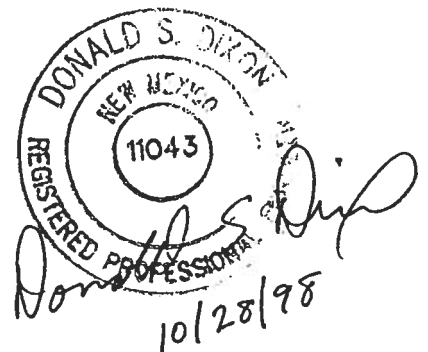
**City of Albuquerque**

**Prepared By:**



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

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- Commercial/Industrial (C/I): The area west of Louisiana Boulevard, north of Modesto Avenue and east of I-25 would develop as high density commercial and industrial. Also used for Paseo del Norte Corridor.
- Medium Density Industrial (MI): Campus type commercial/office facilities and APS schools sites.
- Sandia Tribal Lands (ST): Sandia tribal lands south of Tramway Road and north of the Sandia Pueblo Grant Boundary were allocated land treatments consistent with moderate levels of development even though there are no current plans to develop this area.

The relative weight of each type of Land Treatment is shown in Table 2.

<b>TABLE 2</b> <b>FUTURE FULL DEVELOPMENT HYDROLOGIC</b> <b>CONDITION ASSUMPTIONS</b>				
	Land Treatments (%)			
	A	B	C	D
Sandia Heights/Tramway (SH/TB)	20	40	5	35
North Albuquerque Acres (NAA)	22	23	38	17
Low Density Residential (LR)	20	20	34	26
Residential (R)	0	34	16	50
High Density Residential (HR)	0	25	15	60
Commercial/Industrial (C/I)	0	20	10	70
Medium Density Industrial (MI)	0	20	30	50
Sandia Tribal Lands (ST)	20	20	40	20
Primrose Pointe (PP)	0	40	20	40

TABLE 7b					
COMPARISON OF 100-YEAR HYDROLOGIC RESULTS					
STUDY LOCATION	THIS STUDY (CSF)	AMAFCA 1996 DMP (CFS)	NDB/SDB DMP 1991 (CFS)	FEMA 1983 (CFS)	AMAFCA WORST CASE 1997 (CFS)
<b>EL CAMINO</b>					
Ventura Existing	637	638	NA	3301	3165
Future	707	710			3237
Barstow Existing	726	726	NA	NR	3213
Future	924	920			3310
Wyoming Existing	790	790	NA	NR	3243
Future	967	1130			3380
Louisiana Existing		NR	NA	NR	NR
Future	312				
I-25 Existing	908	908	NA	3033	3286
Future	873	1335			3438
<b>NORTH CAMINO</b>					
Ventura Existing	1739	1736	NA	640	NA
Future	1800	1798			
Barstow Existing	1753	1739	NA	NR	NA
Future	1829	1829			
Wyoming Existing	1743	NR	NA	NR	NA
Future	1822				
Louisiana Existing	NR	NR	NA	NR	NA
Future					
I-25 Existing	1846	1846	NA	1760	2127
Future	2043	1982			2399
NA: Not part of study or not impacted by major avulsion. NR: No flow data reported for this location or condition.					

TABLE 5b

## FUTURE STORM DRAIN CAPACITY

	10-YR STREET CAP (CFS)	100-YR STREET CAP (CFS)	SD SIZE "	SD S %	SD CAP (CFS)	TOTAL 10-YR CAP	TOTAL 100-YR CAP	Q-10- YR (CFS)	Q-100 YR (CFS)	10-YR OK?	100-YR OK?
<b>SD-5 (LOUISIANA)</b>											
<b>ZONE MAP B-19</b>											
MODESTO TO LA CUEVA CHANNEL	19	81	60"	1.0	226	245	307	164	270	YES	YES
GLENDALE TO LA CUEVA CHANNEL	0	0	36"	1.5	71	71	71	40	66	YES	YES
<b>SD-6 (GLENDALE-CAMINO ARROYO PIPE)</b>											
<b>ZONE MAP B-19</b>											
VENTURA TO BARSTOW	NA	NA	84"	3.0	963	963	963	216	798	YES	YES
BARSTOW TO WYOMING	NA	NA	84"	3.0	963	963	963	384	880	YES	YES
WYOMING TO LA CUEVA CHANNEL	NA	NA	96"	1.3	906	906	906	402	921	YES	YES*
<b>SD-7 (BARSTOW)</b>											
<b>ZONE MAP B-19</b>											
MODESTO TO GLENDALE	12	84	36"	1.5	71	83	167	60	110	YES	YES
FLORENCE TO GLENDALE	0	0	42"	.5	61	61	61	30	55	YES	YES
<b>SD-8 (VENTURA)</b>											
<b>ZONE MAP B-20</b>											
MODESTO TO GLENDALE	19	81	60"	.84	207	226	288	151	302	YES	YES*

YES\*: HGL IS ABOVE TOP OF PIPE BUT DOES NOT RISE ABOVE GROUND