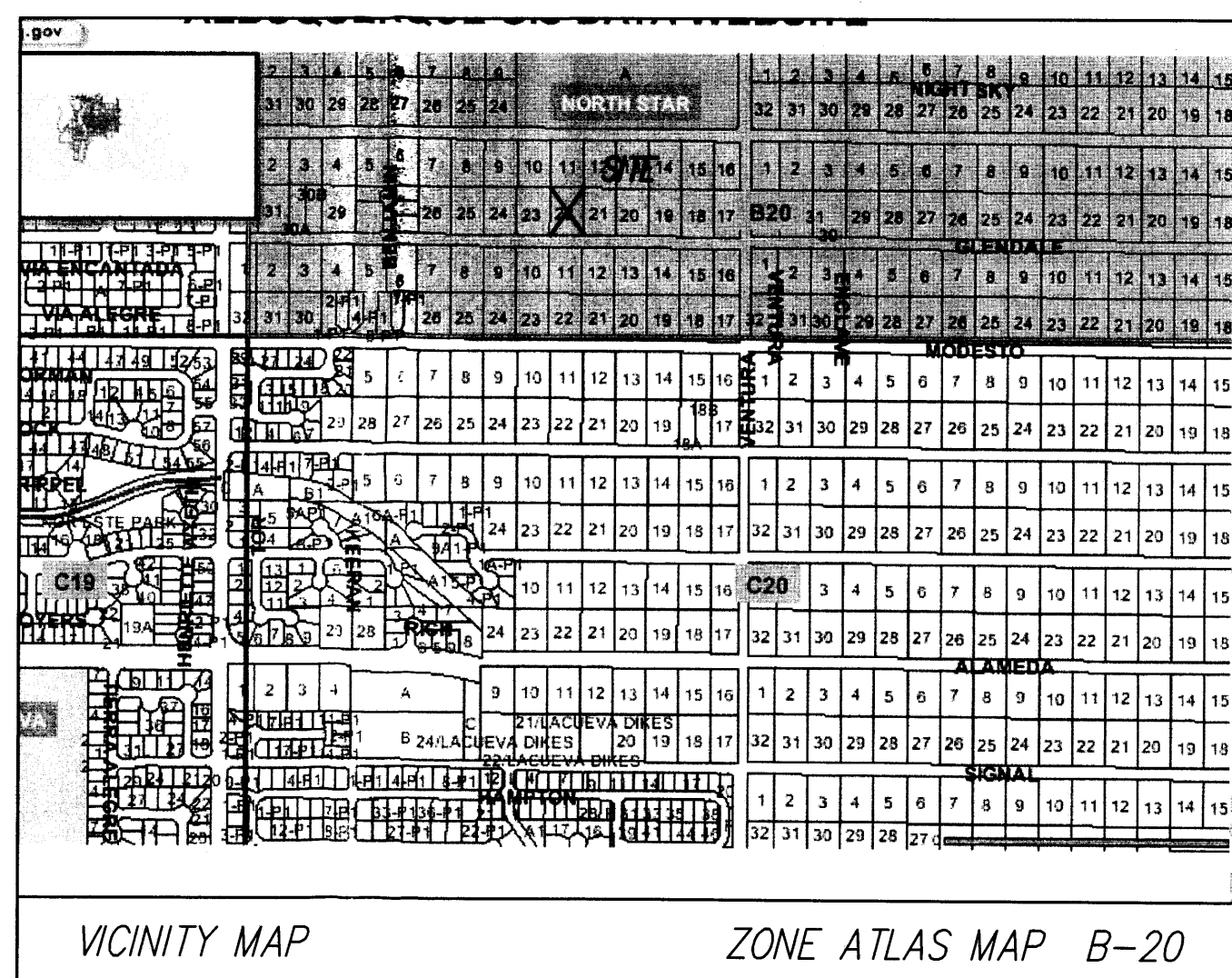
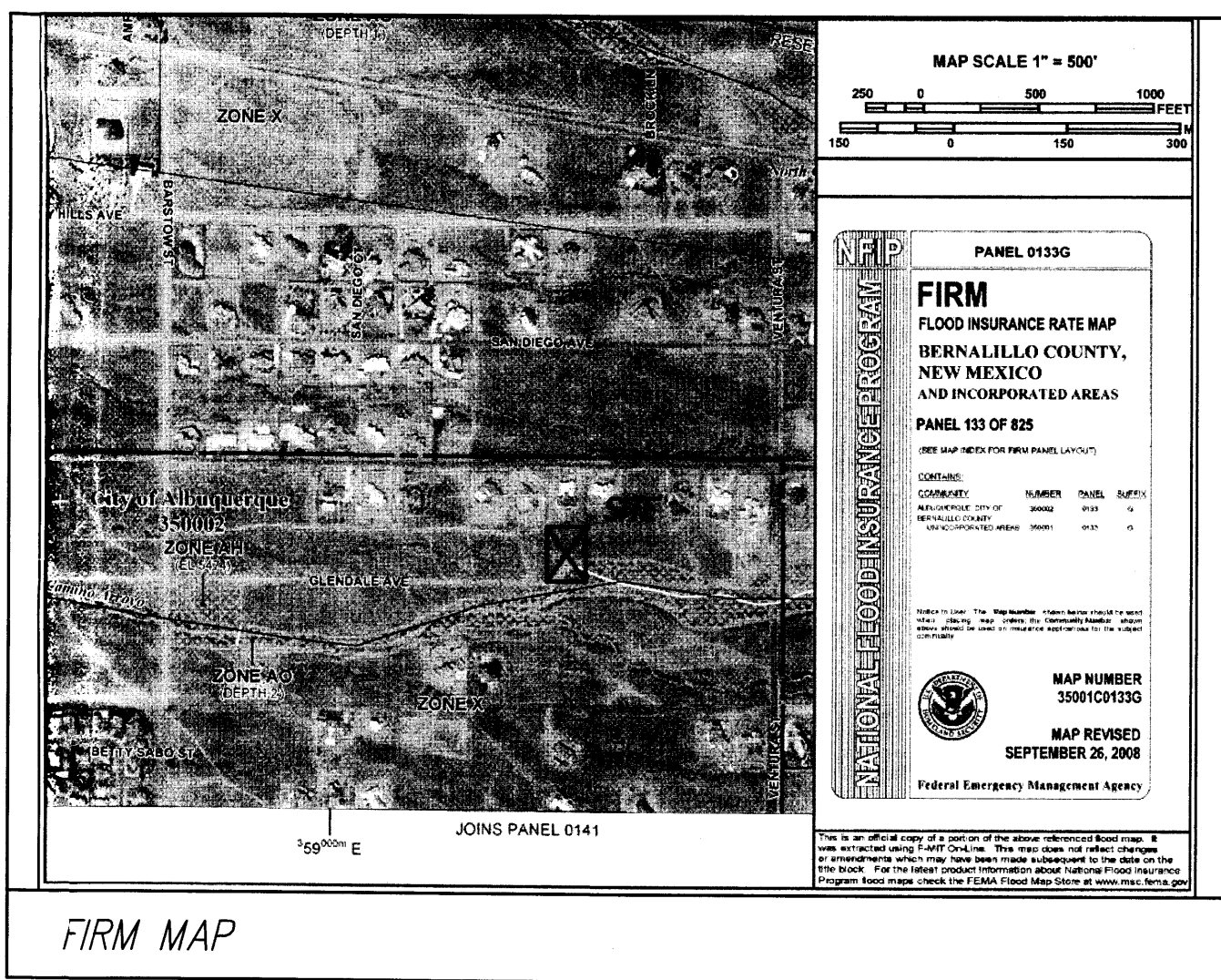
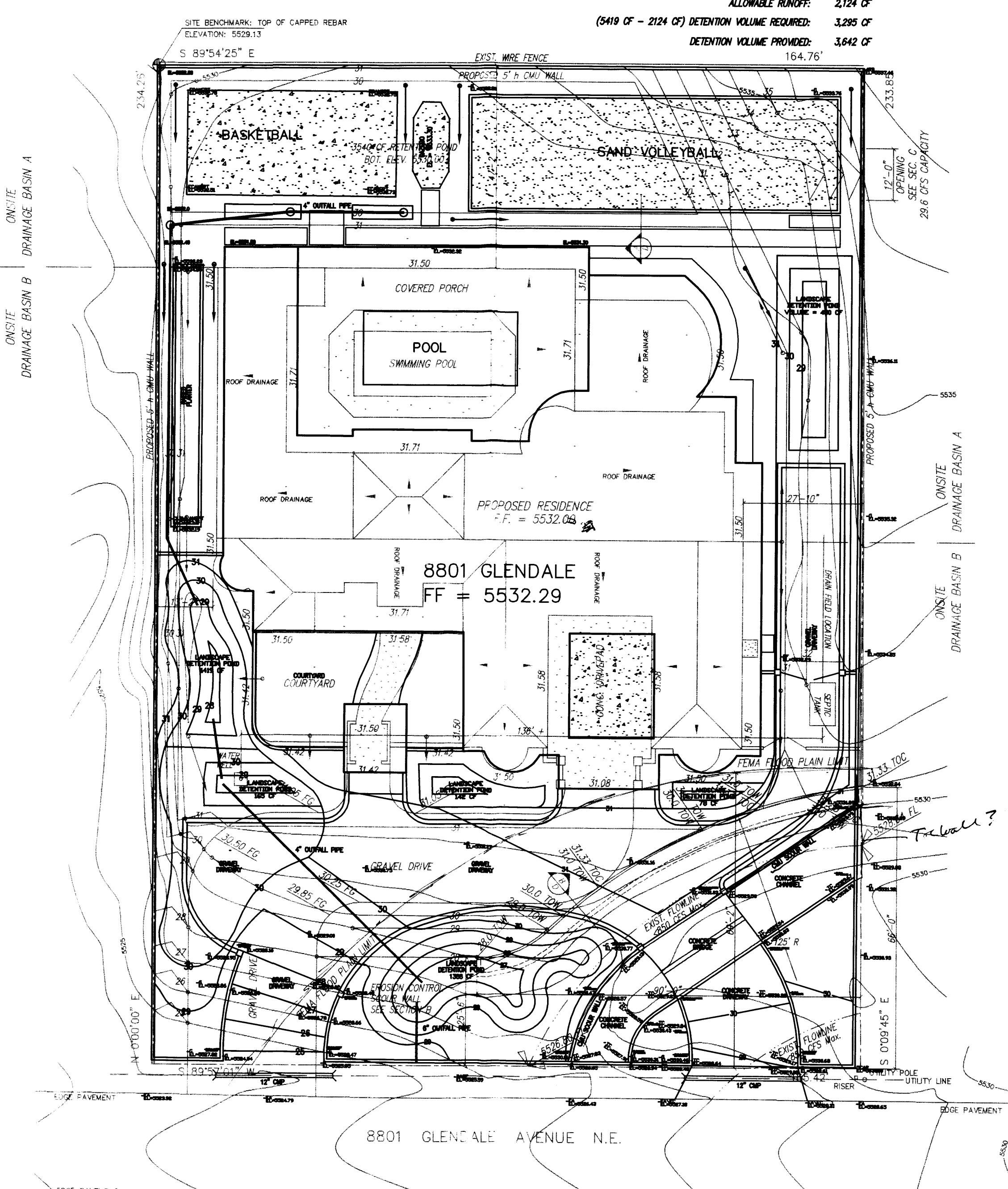


DRAINAGE CALCULATIONS AND SUMMARY									
LAND TREATMENTS					EXCESS PRECIPITATION - E*				
		A	B	C	D	100 YR.	10 YR.	100 YR.	10 YR.
EXISTING UNDEVELOPED CONDITIONS	OFFSITE	209,524 SF	0 SF	0 SF	0 SF	0.66	0.19	11,524 CF	3,317 CF
	ONSITE	38,610 SF	0 SF	0 SF	0 SF	0.66	0.19	2,124 CF	611 CF
								13,647 CF	3,929 CF
PROPOSED DEVELOPED CONDITIONS	OFFSITE	BASIN A 90,095 SF	41,905 SF	41,095 SF	35,619 SF	1.13	0.53	19,678 CF	9,301 CF
	ONSITE	BASIN B 1,000 SF	3,000 SF	6,223 SF	5,464 SF	1.55	0.85	2,029 CF	1,110 CF
		BASIN A 12,098 SF	1,296 SF	3,367 SF	6,162 SF	1.22	0.61	2,339 CF	1,175 CF
								24,046 CF	11,586 CF
PROPOSED DEVELOPED CONDITIONS	AS-BUILT	BASIN A 0 SF	0 SF	9,038 SF	6,649 SF	1.74	0.99	2,279 CF	1,298 CF
		BASIN B 0 SF	500 SF	14,673 SF	7,750 SF	1.64	0.91	3,140 CF	1,742 CF
								5,419 CF	



GENERAL NOTES:

- It is the applicant's responsibility to obtain all other appropriate Federal, State, and Local permits.
- Any changes to this drainage plan would have to be approved by the design engineer and the City of Albuquerque.
- Sidewalk culverts in the COA ROW are required to be permitted by on S019 Permit and built per COA Std. Dwg. 2236.
- See Architectural drawings for all dimensions not shown.

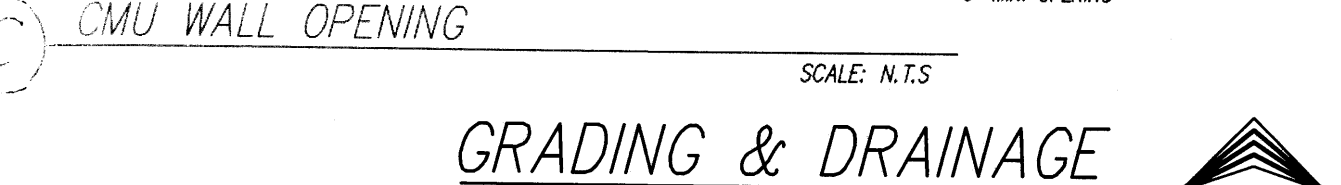
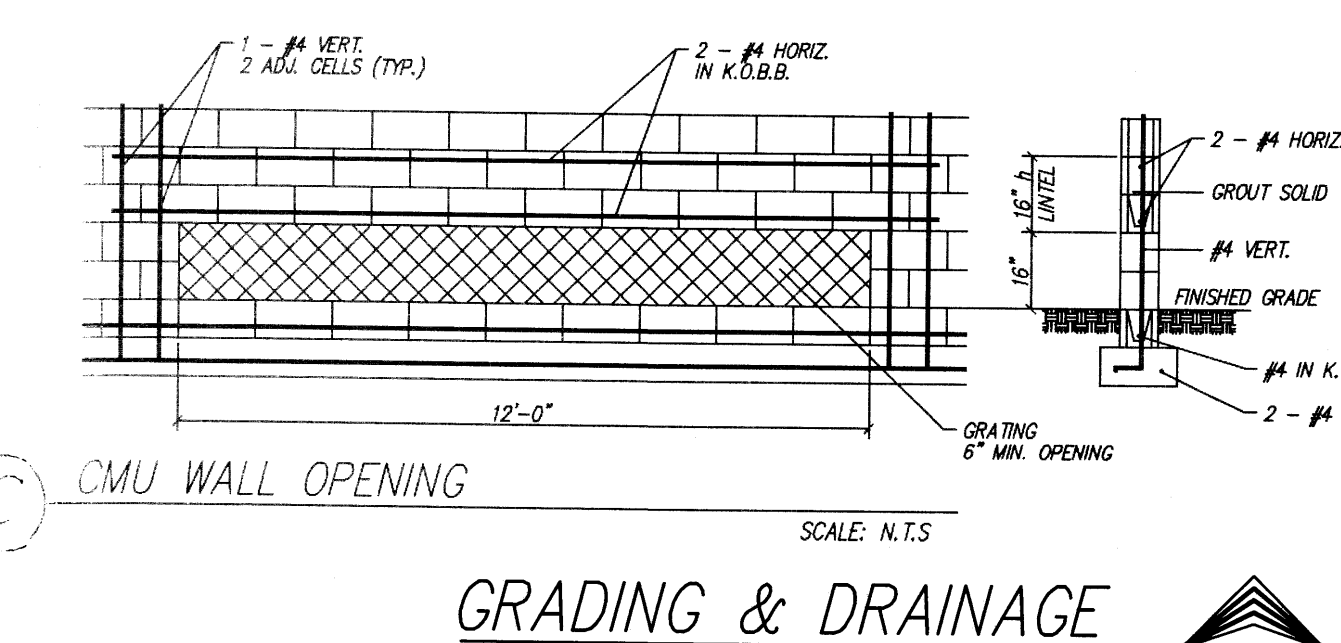
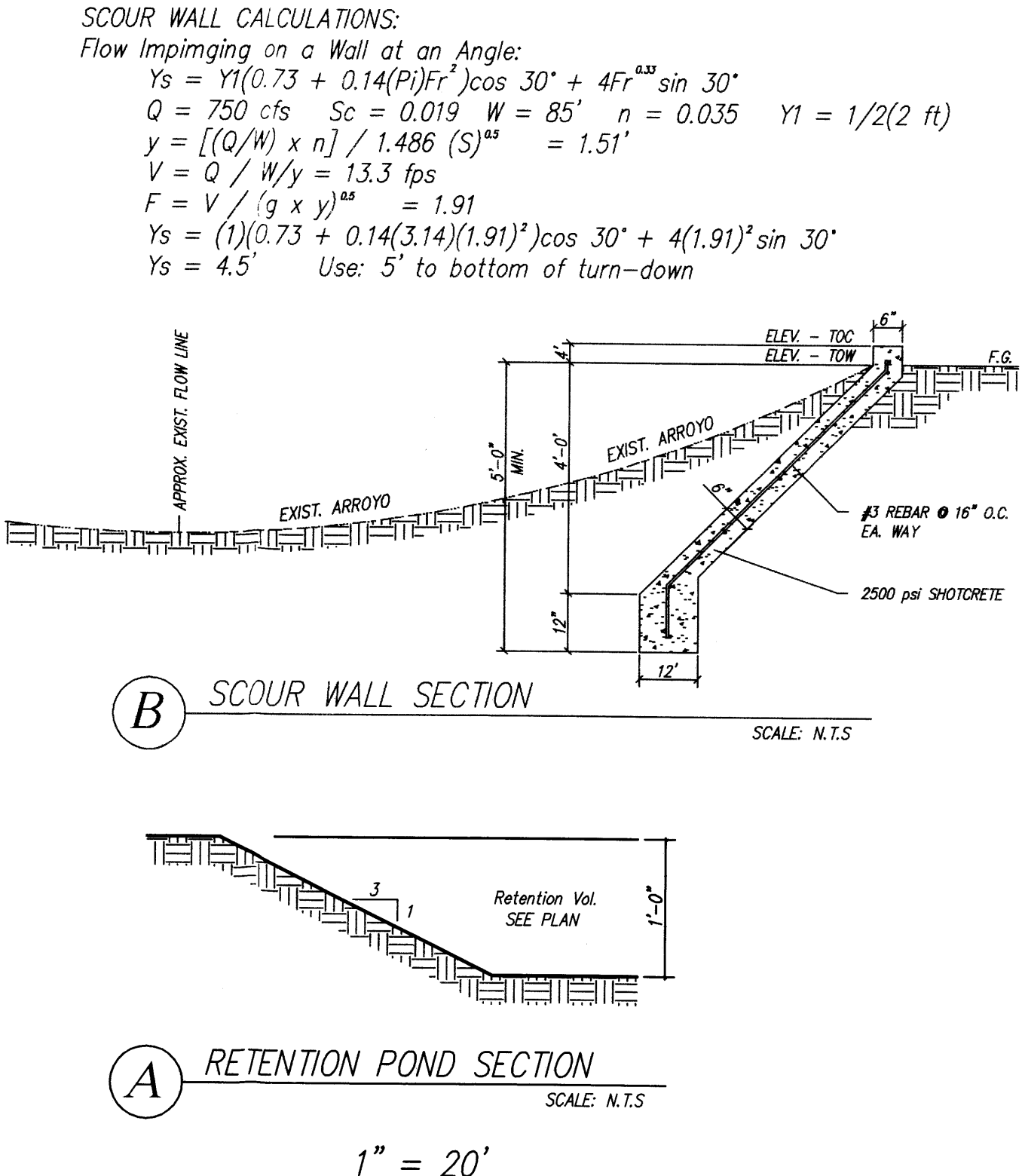
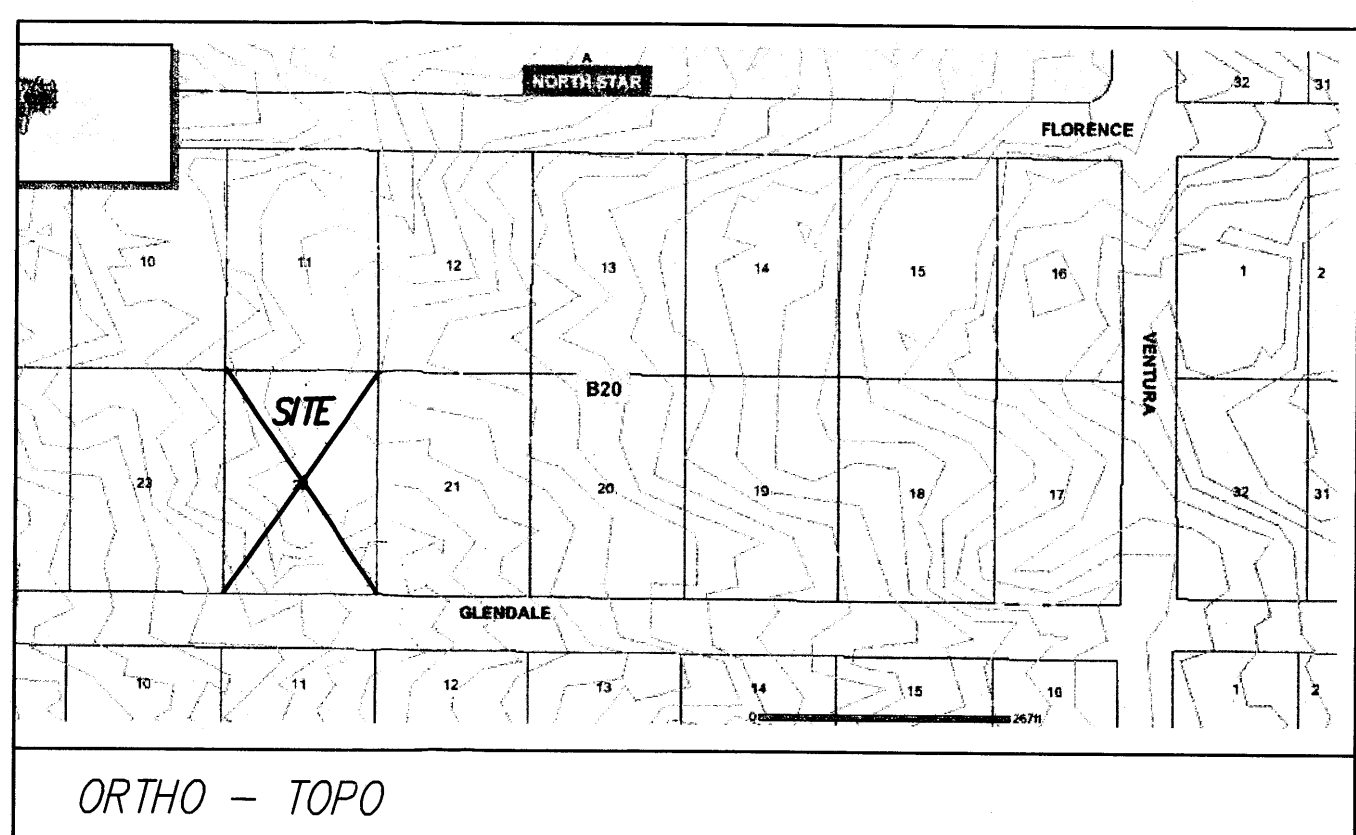
PROCEDURE AND HYDRAULIC CALCULATIONS FOR 40 ACRE AND SMALLER CONTRIBUTORY WATERSHEDS.

REFERENCE:
Volume 2, City of Albuquerque Development Process Manual, Section 22.2, Hydrology.

CRITERIA:
Precipitation Zone: 3
Design Storm: 10 year - 6-hour event; Storm depth = 1.73 inches
Design Storm: 100 year - 6-hour event; Storm depth = 2.60 inches

EXISTING CONDITIONS:
Presently the site is located north of Glendale Ave. and east of Barstow Ave. Currently, the site drains from the north to the south through sheet flow into the unimproved El Camino Arroyo at the south boundary of the property. There is a small offsite basin to the NE that generates approximately 13 CFS that enters the property at the northeast corner and drains into the El Camino arroyo at the southern end of the property. The offsite flow from the El Camino arroyo enters the southern third of the property and flows through the southeast corner of the property through multiple flowlines. The El Camino arroyo generates approximately 660 CFS of undeveloped flow in this area as outlined in the North Albuquerque Acres Master Drainage Plan. The maximum depth of runoff in the El Camino Arroyo is 2' deep. There is a current C.O.A. Drainage file #B20D021.

PROPOSED CONDITIONS:
A single family residence and associated improvements are proposed for this site. Finish grading will allow the site to drain into to basins. The northern portion of the lot will drain into Basin A and the southern portion of the lot will drain into the El Camino Arroyo at the south boundary of the property. The finished floor elevation will be a minimum of 4' above the median arroyo invert. The residence will be placed out of the flood plain boundary as shown on the FIRM map. Erosion mitigation measures, in the form of a concrete scour wall will need to be installed along a portion of the north edge of the flood plain limit to mitigate potential lateral erosion of the gravel drives and front landscaping areas. The El Camino arroyo generates approximately 850 CFS of fully developed flow in this area as outlined in the Master Drainage Plan. Provide retention for additional developed onsite runoff from Basin A.



I, TIMOTHY K. HIGHTOWER, NMPE 10815, OF THE FIRM THAMES ENGINEERING, HEREBY CERTIFY THAT THE PROJECT SHOWN ON THIS PLAN HAS BEEN GRADED AND WILL DRAIN IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED 08/01/13. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT HAS BEEN OBTAINED BY NMPS 13240, OF THE FIRM AM SURVEYING. I FURTHER CERTIFY THAT I HAVE PERSONALLY VISITED THE PROJECT SITE AND HAVE DETERMINED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS CERTIFICATION IS SUBMITTED IN SUPPORT OF A REQUEST FOR CERTIFICATE OF OCCUPANCY.

THE INFORMATION PRESENTED HEREON IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE GRADING AND DRAINAGE ASPECTS OF THIS PROJECT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY OTHER PURPOSES.

Timothy K. Hightower
TIMOTHY K. HIGHTOWER, NMPE 10815
DATE: 3/1/13

LEGAL DESCRIPTION	
LOT 22, BLOCK 16, TRACT 1, UNIT 3, NORTH ALBUQUERQUE ACRES	
PROPERTY ADDRESS	
8801 GLENDALE AVE. NE; ALBUQUERQUE, NM 87122	
UPC NO: 102 006 517 406 930 211	
LEGEND	
EXISTING ELEVATION	62.5
NEW CONTOUR	5865
SPOT ELEVATION	62.5
FLOWLINE	
DRAINAGE SWALE	
PROPERTY LINE	

BENCH MARK:	
C.O.A. MONUMENT:	7-B20
ELEVATION:	5566.66
TEMPORARY SITE BENCH MARK:	
TOP OF CAPPED REBAR, NW PROPERTY CORNER	
ELEVATION:	5529.13

I, TIM HIGHTOWER, A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NEW MEXICO, HAVE FOUND THE LOT REFERED TO IN THIS DRAINAGE PLAN TO BE IN AN IMPROVED STATE. REGRADING OF THIS LOT WILL BE NECESSARY TO ACCOMMODATE THE PROPOSED IMPROVEMENTS AND TO DIRECT ALL ONSITE AND OFFSITE RUNOFF TO THE EXISTING FLOOD PLAIN FLOWLINE AND TO THE PAVED CITY STREET.

LOT 22
BLOCK 16
TRACT 1, UNIT 3
N. ABQ. ACRES

GARY PADILLA RESIDENCE
8801 GLENDALE AVE. NE
ALBUQUERQUE, NEW MEXICO 87122

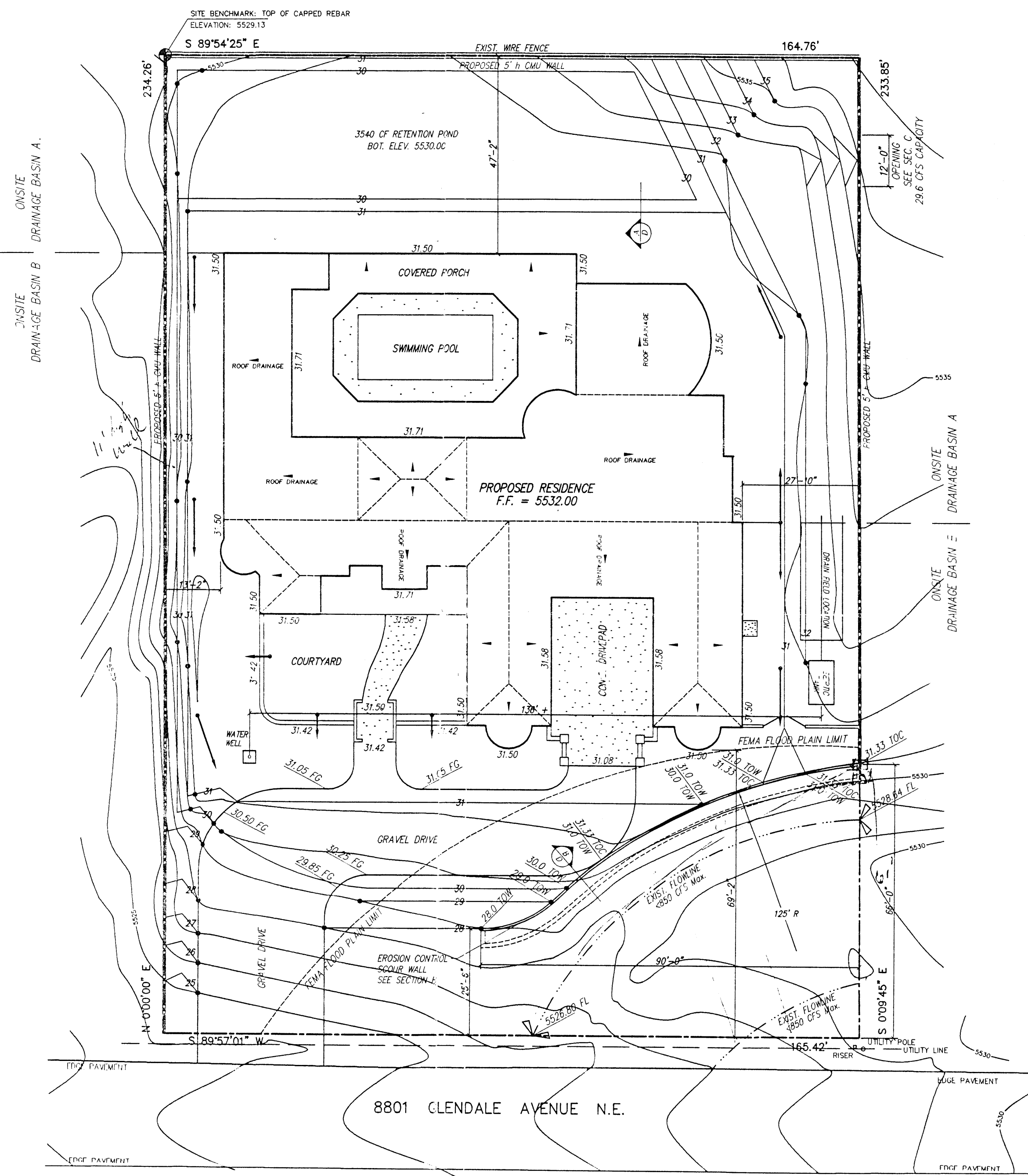
DATE: JULY, 2011
SCALE: 1" = 20'-0"
FILE: 8801 - DRN

THAMES
ENGINEERING AND DESIGN

10212 ARROYO BEND NW • ALBUQUERQUE, NEW MEXICO 87114 • 505-944-6216

DRAINAGE

DRAINAGE CALCULATIONS AND SUMMARY									
		LAND TREATMENTS							
		A	B	C	D	TOTAL			
EXISTING UNDEVELOPED	OFFSITE	209,524 SF	0 SF	0 SF	0 SF	209,524 SF	EXISTING UNDEVELOPED CONDITIONS	OFFSITE	
	ON-SITE	15,610 SF	0 SF	0 SF	0 SF	15,610 SF		ON-SITE	
						248,134 SF			
PROPOSED DEVELOPED CONDITIONS	OFFSITE	BASIN A 90,095 SF	41,905 SF	41,095 SF	35,619 SF	209,524 SF	PROPOSED DEVELOPED CONDITIONS	OFFSITE	
		SEE N.A.A. MASTER DRAINAGE REPORT FOR EL CAMINO ARROYO							
	ON-SITE	BASIN A 1,000 SF	3,000 SF	6,223 SF	5,464 SF	15,687 SF		ON-SITE	
		BASIN B 12,098 SF	1,296 SF	3,367 SF	6,162 SF	22,923 SF			
						248,134 SF			
		EXCESS PRECIPITATION - E*					RUNOFF VOLUME		
		100 YR. 10 YR.					100 YR. 10 YR.		
EXISTING UNDEVELOPED	OFFSITE	0.66	0.19				11,524 CF	3,317 CF	
	ON-SITE	0.66	0.19				2,124 CF	611 CF	
							13,647 CF	3,929 CF	
PROPOSED DEVELOPED CONDITIONS	OFFSITE	BASIN A 1.13	0.53				19,678 CF	9,301 CF	
		SEE N.A.A. MASTER DRAINAGE REPORT FOR EL CAMINO ARROYO							
	ON-SITE	BASIN A 1.55	0.85				2,029 CF	1,110 CF	
		BASIN B 1.22	0.61				2,339 CF	1,175 CF	
							24,046 CF	11,586 CF	
		PEAK DISCHARGE					100 YR. 10 YR.		
EXISTING UNDEVELOPED	OFFSITE						8.99 CFS	2.79 CFS	
	ON-SITE						1.66 CFS	0.51 CFS	
PROPOSED DEVELOPED CONDITIONS	OFFSITE	BASIN A					13.79 CFS	7.04 CFS	
		SEE N.A.A. MASTER DRAINAGE REPORT FOR EL CAMINO ARROYO							
	ON-SITE	BASIN A					1.34 CFS	0.81 CFS	
		BASIN B					1.57 CFS	0.83 CFS	



GRADING & DRAINAGE

1" = 20'

LEGAL DESCRIPTION

LOT 22, BLOCK 16, TRACT 1, UNIT 3, NORTH ALBUQUERQUE ACRES

PROPERTY ADDRESS

8801 GLENDALE AVE. NE, ALBUQUERQUE, NM 87122

UPC NO: 102 006 517 406 930 211

LEGEND

EXISTING ELEVATION
NEW CONTOUR
SPOT ELEVATION
FLOWLINE
DRAINAGE SWALE
PROPERTY LINE

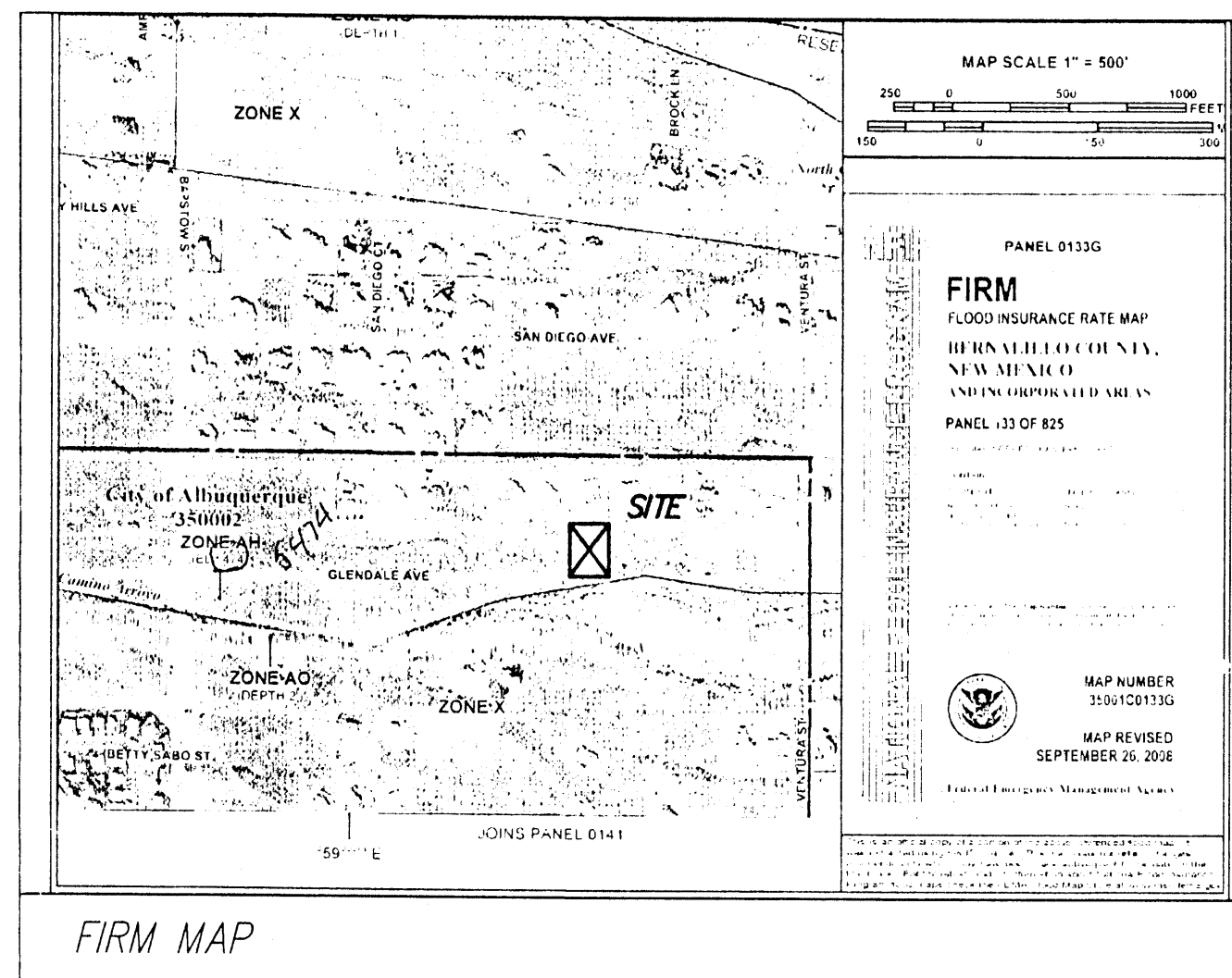
BENCH MARK:

C.O.A. MONUMENT: 7 B20
ELEVATION: 5566.66

TEMPORARY SITE BENCH MARK:

TOP OF CAPPED REBAR, NW PROPERTY CORNER
ELEVATION: 5529.13

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FIRM MAP

GENERAL NOTES:

- It is the applicants responsibility to obtain all other appropriate Federal, State, and Local permits.
- Any changes to this drainage plan would have to be approved by the design engineer and the City of Albuquerque.
- Sidewalk culverts in the COA ROW are required to be permitted by an S019 Permit and built per COA Std. Dwg. 2236.
- See Architectural drawings for all dimensions not shown.

PROCEDURE AND HYDRAULIC CALCULATIONS FOR 40 ACRE AND SMALLER CONTRIBUTORY WATERSHEDS.

REFERENCE:

Volume 2, City of Albuquerque Development Process Manual, Section 22.2, Hydrology.

CRITERIA:

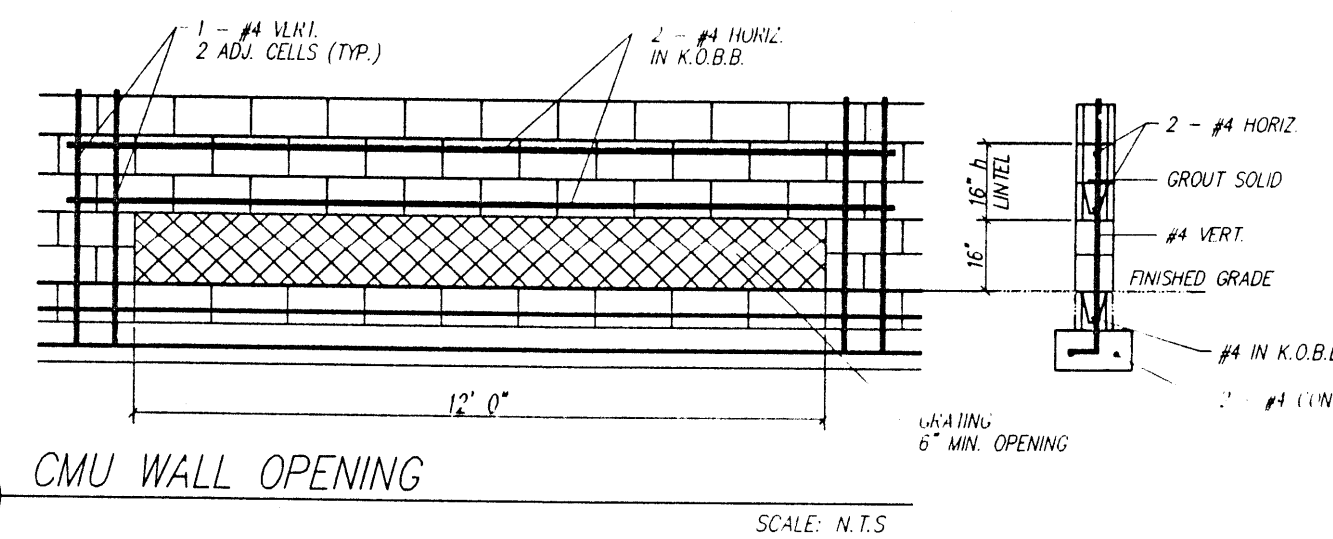
Precipitation Zone: 3
Design Storm: 10 year - 6-hour event; Storm depth = 1.73 inches
Design Storm: 100 year - 6-hour event; Storm depth = 2.60 inches

EXISTING CONDITIONS:

Presently the site is located north of Glendale Ave. and east of Barstow Ave. Currently, the site drains from the north to the south through sheet flow into the unimproved El Camino Arroyo at the south boundary of the property. There is a small offsite basin to the NE that generates approximately 13 CFS that enters the property at the northeast corner and drains into the El Camino arroyo at the southern end of the property. The offsite flow from the El Camino arroyo enters the southern third of the property and flows through the southeast corner of the property through multiple flowlines. The El Camino arroyo generates approximately 660 CFS of undeveloped flow in this area as outlined in the North Albuquerque Acres Master Drainage Plan. The maximum depth of runoff in the El Camino Arroyo is 2' deep. There is a current C.O.A. Drainage file #B20D021.

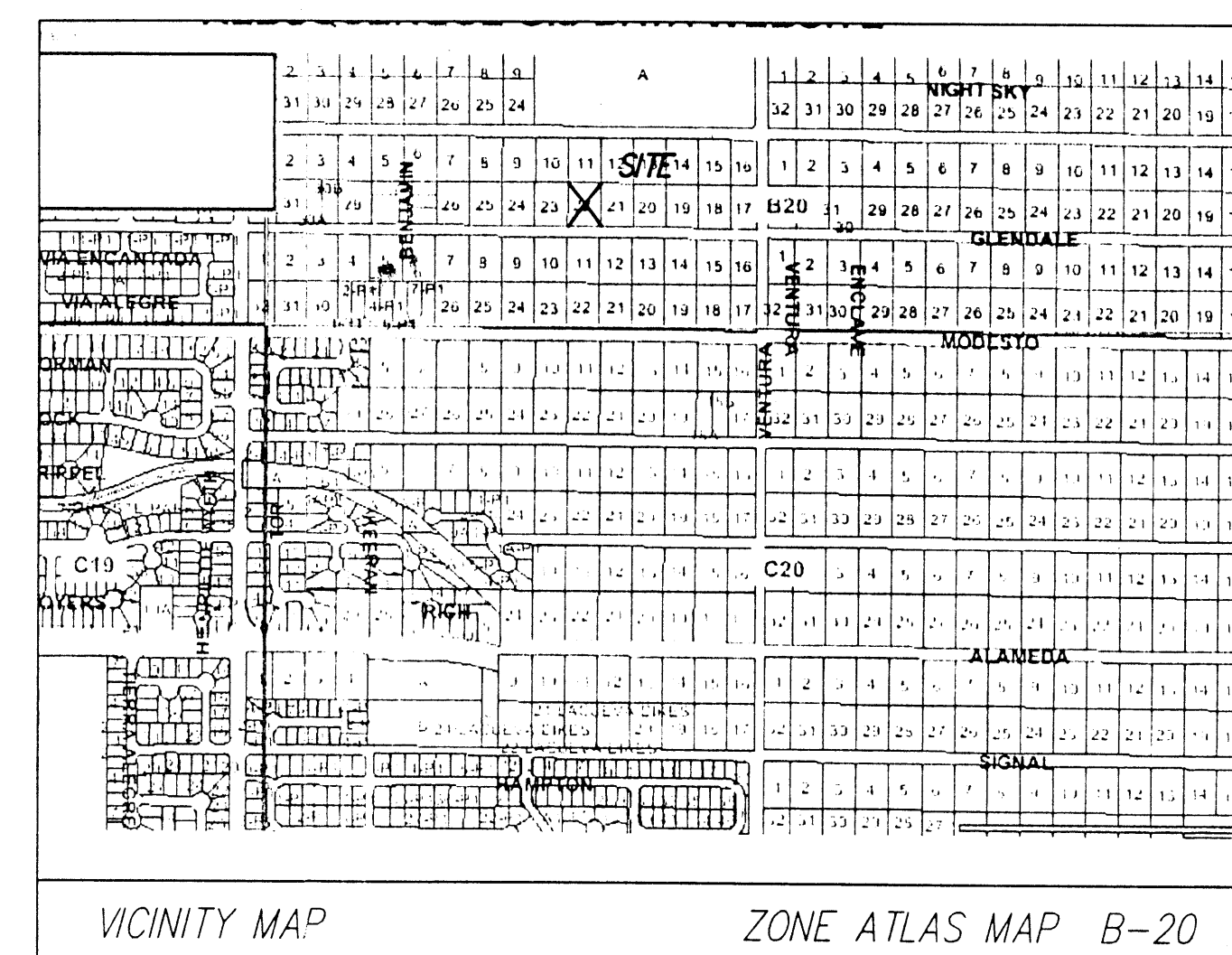
PROPOSED CONDITIONS:

A single family residence and associated improvements are proposed for this site. Finish grading will allow the site to drain into to basins. The northern portion of the lot will drain into Basin A and the southern portion of the lot will drain into the El Camino Arroyo at the south boundary of the property. The finished floor elevation will be a minimum of 4' above the median arroyo invert. The residence will be placed out of the flood plain boundary as shown on the FIRM map. Erosion mitigation measures, in the form of a concrete scour wall will need to be installed along a portion of the north edge of the flood plain limit to mitigate potential lateral erosion of the gravel drives and front landscaping areas. the El Camino arroyo generates approximately 850 CFS of fully developed flow in this area as outlined in the Master Drainage Plan. Provide retention for additional developed onsite runoff from Basin A.



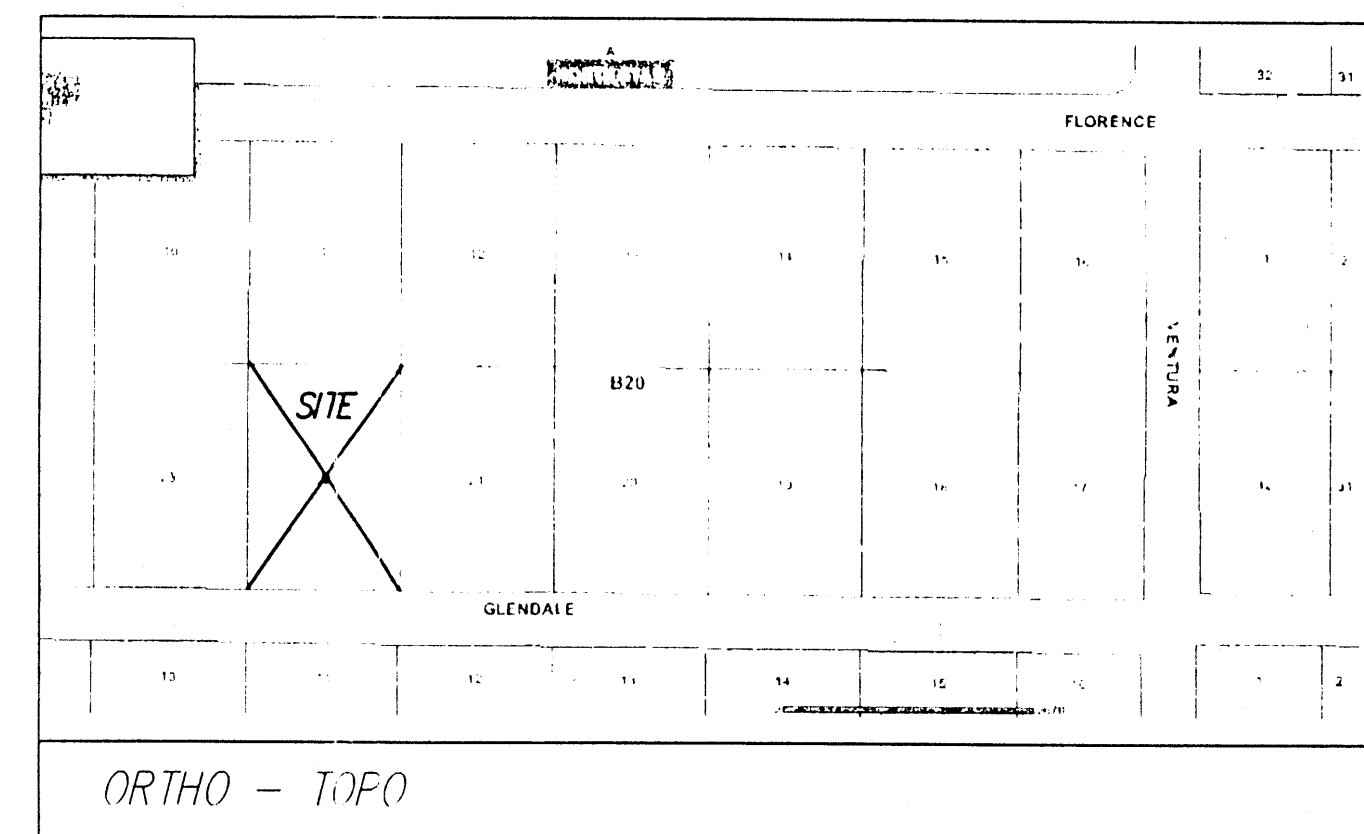
CMU WALL OPENING

SCALE: N.T.S.



VICINITY MAP

ZONE ATLAS MAP B-20



ORTHO - TOPO

SCOUR WALL CALCULATIONS:

Flow Impinging on a Wall at an Angle:

$$Y_s = Y(0.73 + 0.14(P)Fr^2) \cos 30^\circ + 4Fr^{0.5} \sin 30^\circ$$

$$Q = 750 \text{ cfs} \quad S = 0.019 \quad W = 35' \quad n = 0.035 \quad Y = 1.2(11)$$

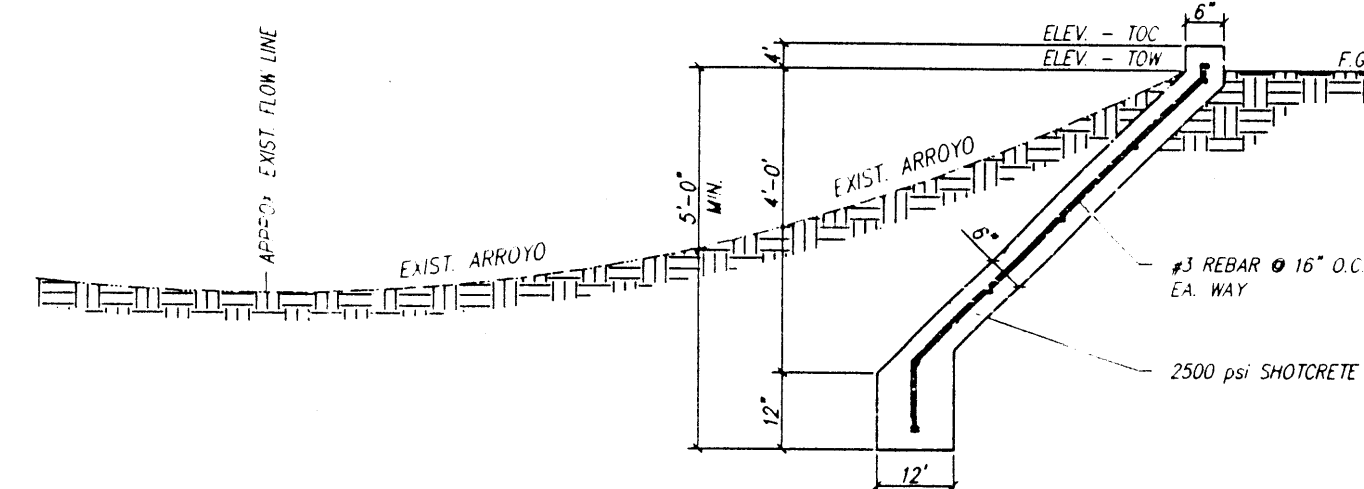
$$y = [(Q/W) \times n] / 1.486 (S)^{0.58} = 1.51'$$

$$V = Q / W/y = 13.3 \text{ fps}$$

$$F = V / (g \times y)^{0.5} = 1.91$$

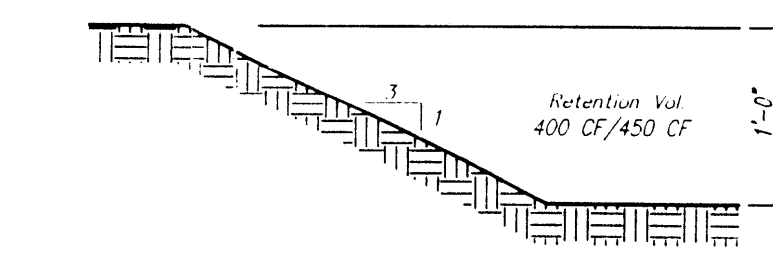
$$Y_s = (1)(0.73 + 0.14(3.14)(1.91)^2) \cos 30^\circ + 4(1.91)^{0.5} \sin 30^\circ$$

$$Y_s = 4.5' \quad \text{Use: } 5' \text{ to bottom of turn-down}$$



SCOUR WALL SECTION

SCALE: N.T.S.



RETENTION POND SECTION

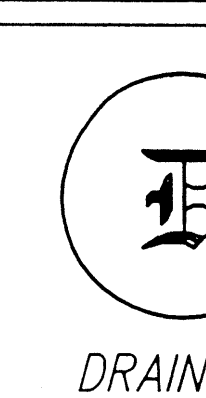
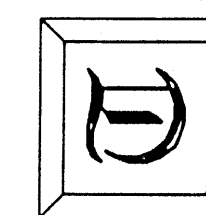
SCALE: N.T.S.

THAMES

ENGINEERING AND DESIGN

LICENSE NO. 10815

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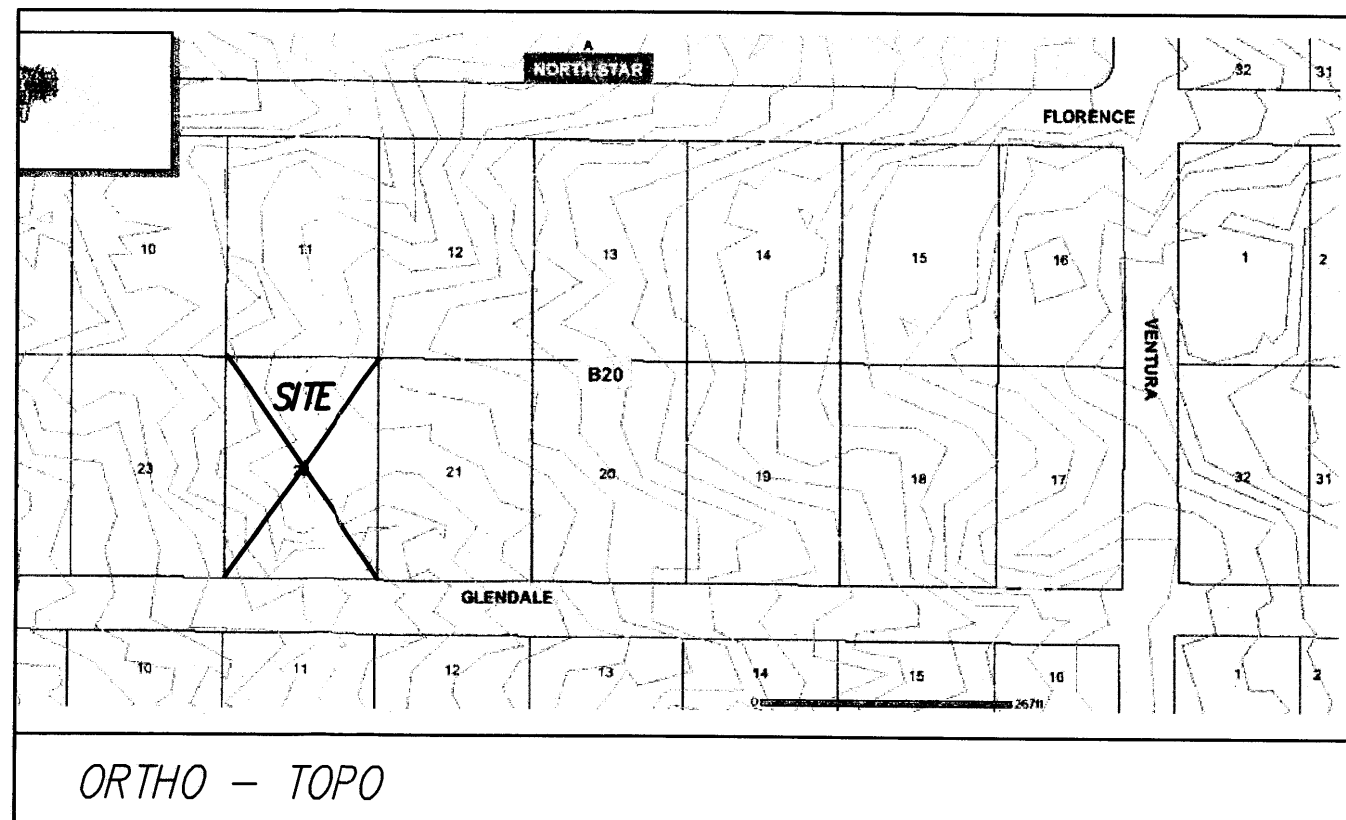
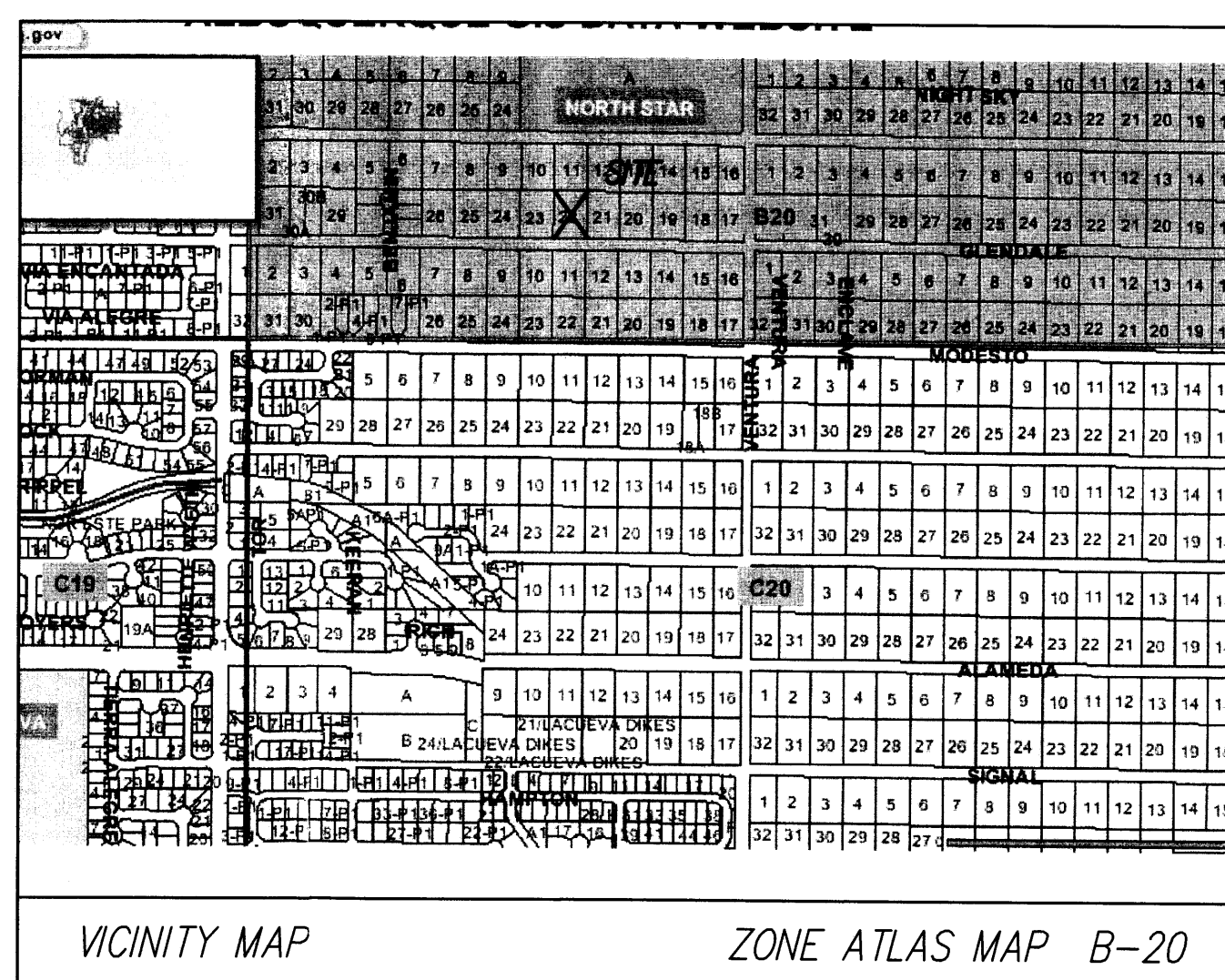
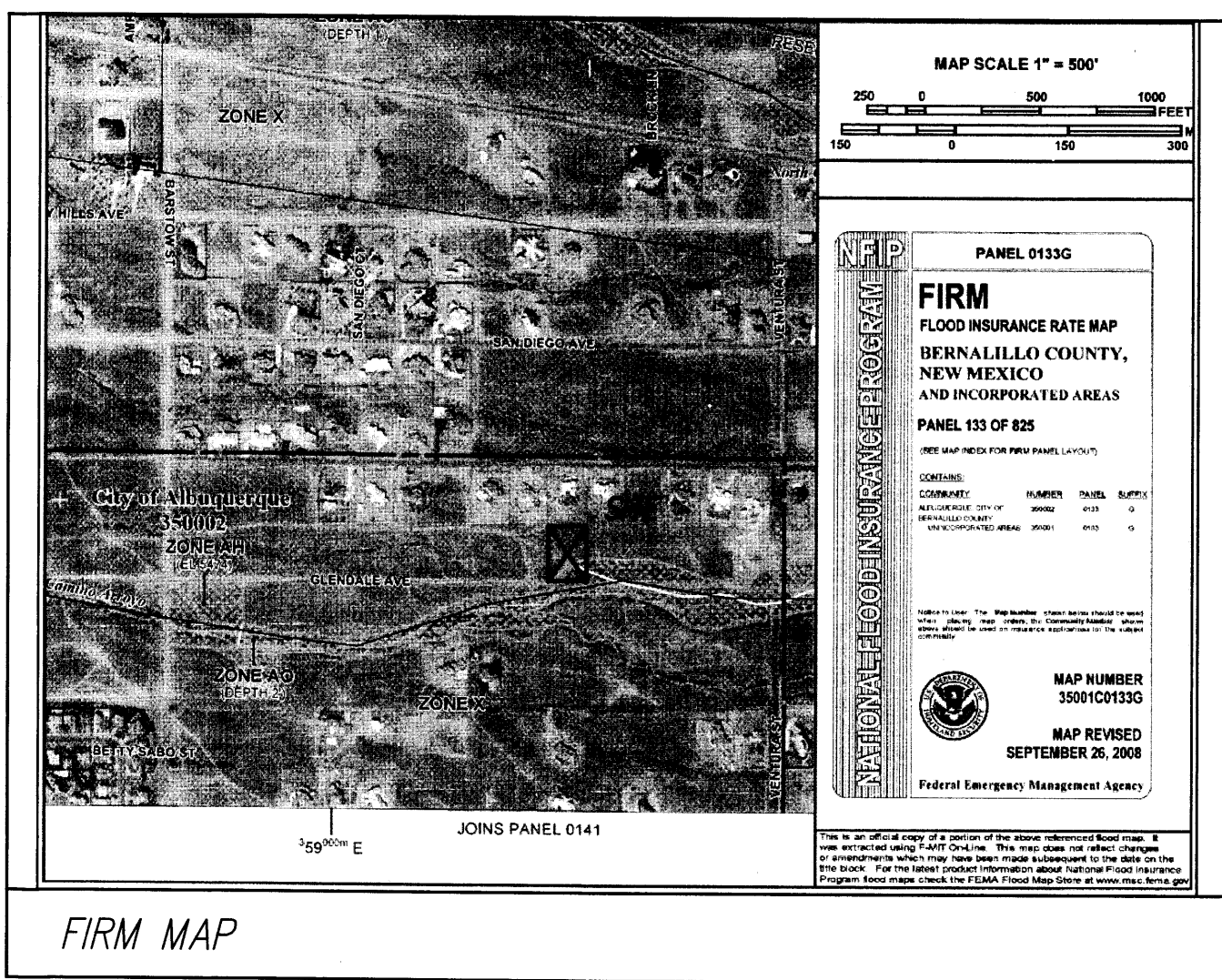
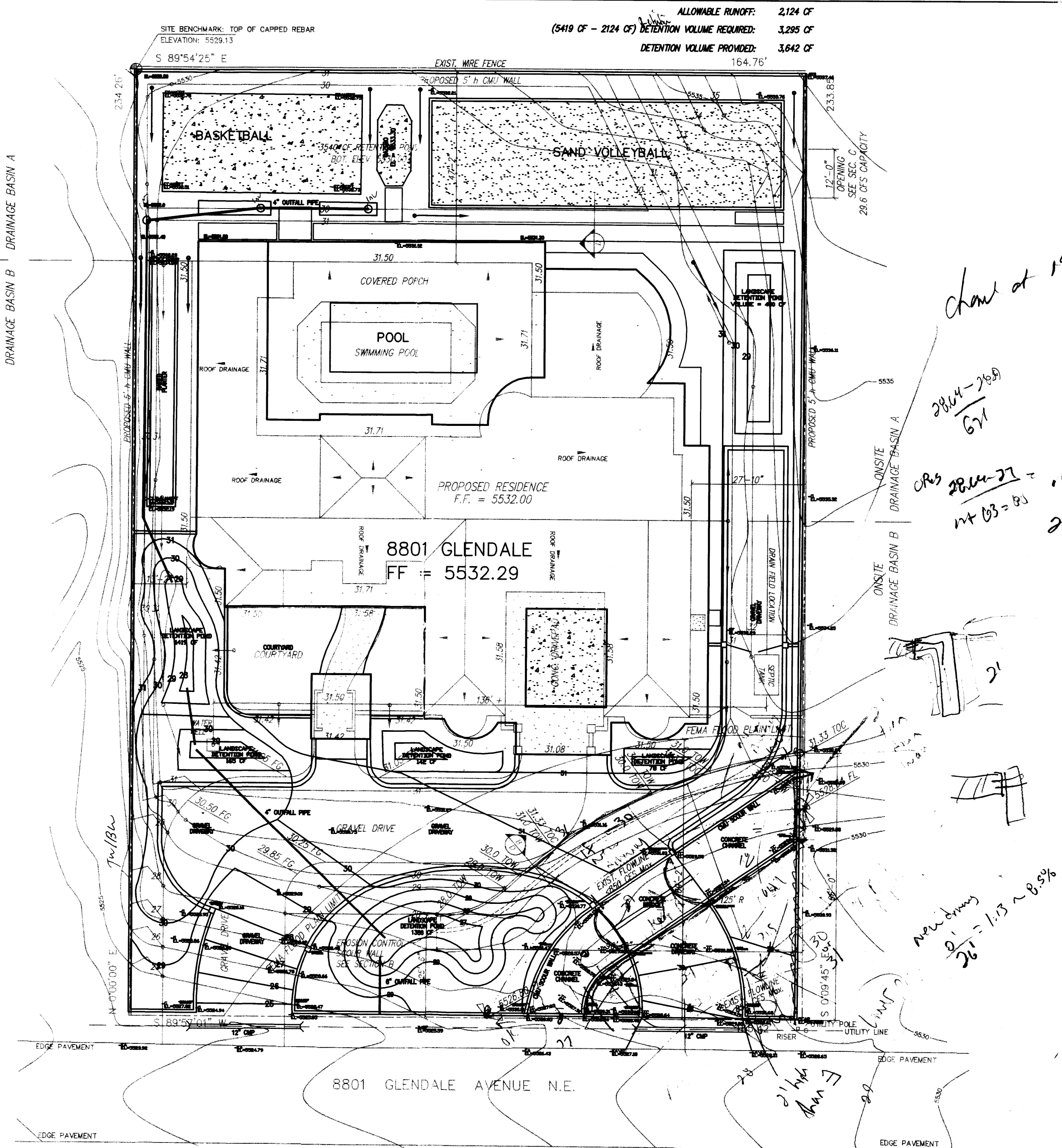
LOT 22
BLOCK 16
TRACT 1, UNIT 3
N. ABQ. ACRES

GARY PADILLA RESIDENCE
8801 GLENDALE AVE. NE
ALBUQUERQUE, NEW MEXICO 87122

DATE:
JULY, 2011
SCALE:
1" = 20'-0"
FILE:
8801 - DRN

GRADING & DRAINAGE

DRAINAGE CALCULATIONS AND SUMMARY																		
		LAND TREATMENTS							EXCESS PRECIPITATION - E*			RUNOFF VOLUME		PEAK DISCHARGE				
		A	B	C	D	TOTAL			100 YR.	10 YR.	100 YR.	10 YR.	100 YR.	10 YR.				
EXISTING UNDEVELOPED CONDITIONS	OFFSITE	208,524 SF	0 SF	0 SF	0 SF	208,524 SF	EXISTING UNDEVELOPED CONDITIONS	OFFSITE	0.66	0.19	11,524 CF	3,317 CF	8.99 CFS	2.79 CFS				
	ONSITE	38,610 SF	0 SF	0 SF	0 SF	38,610 SF			0.66	0.19	2,124 CF	611 CF	1.66 CFS	0.51 CFS				
PROPOSED DEVELOPED CONDITIONS	OFFSITE	BASIN A	90,095 SF	41,905 SF	41,095 SF	35,619 SF	208,524 SF	PROPOSED DEVELOPED CONDITIONS	OFFSITE	BASIN A	1.13	0.53	19,678 CF	5,301 CF	13.79 CFS	7.04 CFS		
		BASIN B	SEE N.A.A. MASTER DRAINAGE REPORT FOR EL CAMINO ARROYO							BASIN B	SEE N.A.A. MASTER DRAINAGE REPORT FOR EL CAMINO ARROYO							
	ONSITE	BASIN A	1,000 SF	3,000 SF	6,223 SF	5,464 SF	15,687 SF		ONSITE	BASIN A	1.55	0.85	2,029 CF	1,110 CF	1.34 CFS	0.81 CFS		
		BASIN B	12,098 SF	1,296 SF	3,367 SF	6,162 SF	22,923 SF			BASIN B	1.22	0.61	2,339 CF	1,175 CF	1.57 CFS	0.83 CFS		
							248,134 SF								24,046 CF	11,586 CF		
PROPOSED DEVELOPED CONDITIONS AS-BUILT	ONSITE	BASIN A	0 SF	0 SF	9,039 SF	6,649 SF	15,687 SF	PROPOSED DEVELOPED CONDITIONS AS-BUILT	ONSITE	BASIN A	1.74	0.99	2,279 CF	1,298 CF	1.48 CFS	0.83 CFS		
		BASIN B	0 SF	500 SF	14,673 SF	7,790 SF	22,923 SF			BASIN B	1.64	0.91	3,140 CF	1,742 CF	2.09 CFS	1.29 CFS		
							38,610 SF					5,419 CF						



GENERAL NOTES:

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PROCEDURE AND HYDRAULIC CALCULATIONS FOR 40 ACRE AND SMALLER CONTRIBUTORY WATERSHEDS.

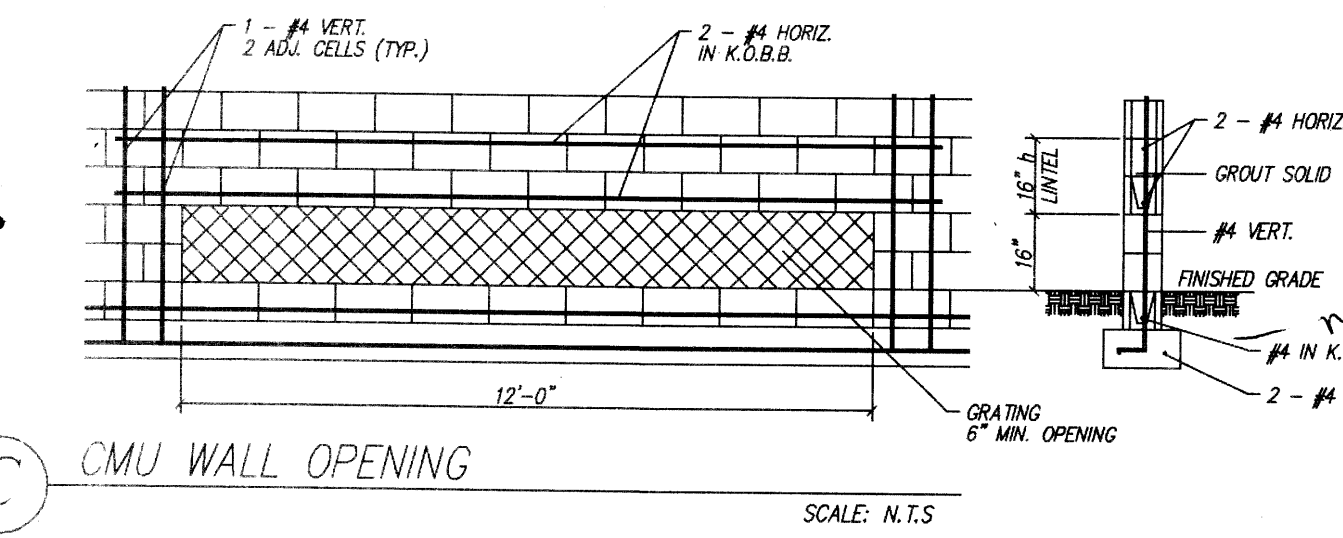
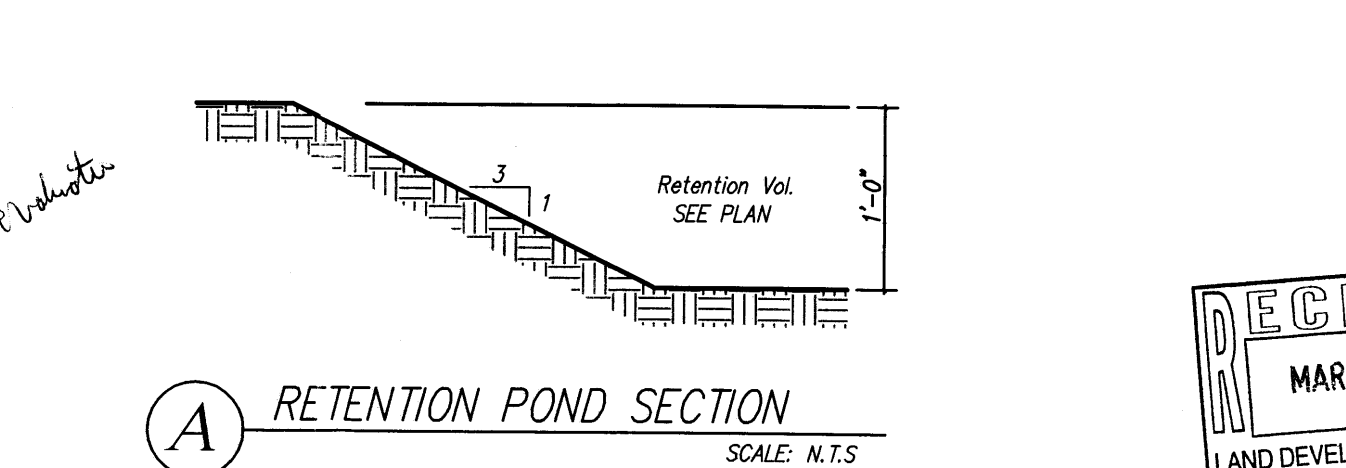
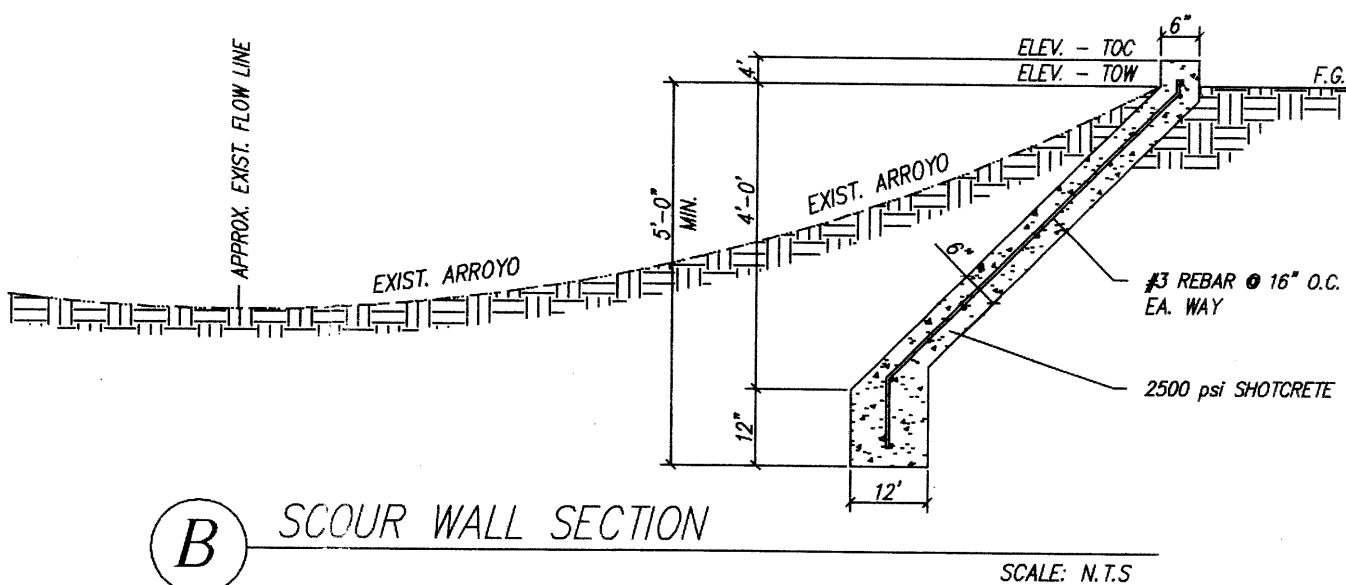
REFERENCE:
Volume 2, City of Albuquerque Development Process Manual, Section 22.2, Hydrology.

CRITERIA:
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Design Storm: 10 year - 6-hour event; Storm depth = 1.73 inches
Design Storm: 100 year - 6-hour event; Storm depth = 2.60 inches

EXISTING CONDITIONS:
Presently the site is located north of Glendale Ave. and east of Barstow Ave. Currently, the site drains from the north to the south through sheet flow into the unimproved El Camino Arroyo at the south boundry of the property. There is a small offsite basin to the NE that generates approximately 13 CFS that enters the property at the northeast corner and drains into the El Camino arroyo at the southern end of the property. The offsite flow from the El Camino arroyo enters the southern third of the property and flows through the southeast corner of the property through multiple flowlines. The El Camino arroyo generates approximately 660 CFS of undeveloped flow in this area as outlined in the North Albuquerque Acres Master Drainage Plan. The maximum depth of runoff in the El Camino Arroyo is 2' deep. There is a current C.O.A. Drainage file #B20D021.

PROPOSED CONDITIONS:
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SCOUR WALL CALCULATIONS:
Flow Impinging on a Wall at an Angle:
 $Y_s = Y(0.73 + 0.14(Pi)Fr^2 \cos 30^\circ + 4Fr^{0.5} \sin 30^\circ)$
 $Q = 750 \text{ cfs}$ $Sc = 0.019$ $W = 85'$ $n = 0.035$ $Y_1 = 1/2(2 \text{ ft})$
 $y = [(Q/W) \times n] / 1.486 (S)^{0.58} = 1.51'$
 $V = Q / W/y = 13.3 \text{ fps}$
 $F = V / \sqrt{g \times y} = 1.91$
 $Y_s = (1)(0.73 + 0.14(3.14)(1.91)^2 \cos 30^\circ + 4(1.91)^{0.5} \sin 30^\circ)$
 $Y_s = 4.5'$ Use: 5' to bottom of turn-down



GRADING & DRAINAGE

I, TIMOTHY K. HIGHTOWER, NMPE 10815, OF THE FIRM THAMES ENGINEERING, HEREBY CERTIFY THAT THE PROJECT SHOWN ON THIS PLAN HAS BEEN GRADED AND WILL DRAIN IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED 03/01/12. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT HAS BEEN OBTAINED BY NMPS 13240, OF THE FIRM AM SURVEYING. I FURTHER CERTIFY THAT I HAVE PERSONALLY VISITED THE PROJECT SITE AND HAVE DETERMINED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS CERTIFICATION IS SUBMITTED IN SUPPORT OF A REQUEST FOR CERTIFICATE OF OCCUPANCY.

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Timothy K. Hightower, NMPE 10815
DATE: 3/1/13

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UPC NO: 102 006 517 406 930 211

LEGEND

EXISTING ELEVATION ——— 62.5

NEW CONTOUR ——— 5865

SPOT ELEVATION ——— 62.5

FLOWLINE ———→

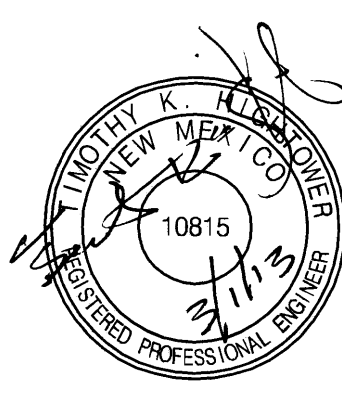
DRAINAGE SWALE ———→

PROPERTY LINE ———

BENCH MARK:
C.O.A. MONUMENT: 7-B20
ELEVATION: 5566.66

TEMPORARY SITE BENCH MARK:
TOP OF CAPPED REBAR, NW PROPERTY CORNER
ELEVATION: 5529.13

I, TIM HIGHTOWER, A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NEW MEXICO, HAVE FOUND THE LOT REFERED TO IN THIS DRAINAGE PLAN TO BE IN AN IMPROVED STATE. REGRADING OF THIS LOT WILL BE NECESSARY TO ACCOMODATE THE PROPOSED IMPROVEMENTS AND TO DIRECT ALL ONSITE AND OFFSITE RUNOFF TO THE EXISTING FLOOD PLAIN FLOWLINE AND TO THE PAVED CITY STREET.



LOT 22
BLOCK 16
TRACT 1, UNIT 3
N. ABQ. ACRES

GARY PADILLA RESIDENCE
8801 GLENDALE AVE. NE
ALBUQUERQUE, NEW MEXICO 87122

GRADING & DRAINAGE

DATE: JULY, 2011
SCALE: 1" = 20'-0"
FILE: 8801 - DRN

THAMES
ENGINEERING AND DESIGN

LICENSE NO. 10815
10212 ARROYO BEND NW • ALBUQUERQUE, NEW MEXICO 87114 • 505-944-6216

RECEIVED
MAR 18 2013
LAND DEVELOPMENT SECTION

