CITY OF ALBUQUERQUE

FAX 897-4996



June 22, 2009

Shahab Biazar, P.E.
Advanced Engineering and Consulting, LLC
4416 Anaheim Ave NE
Albuquerque, NM 87113

Re: Villas Las Mananitas Commercial Grading and Drainage Plan Engineer's Stamp date 6-15-09 (H13/D050A)

Dear Mr. Biazar,

PO Box 1293

Albuquerque

NM 87103

www.cabq gov

Based upon the information provided in your submittal received 6-15-09, the above referenced plan is approved for Building Permit with the condition that a CMU wall be built along the east property line from Indian School north to the existing wall.

Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Prior to Certificate of Occupancy release for any of the buildings:

- Engineer Certification per the DPM checklist will be required.
- The wall along the east property line, as stated above, must be built.

If you have any questions, you can contact me at 924-3695.

Curtis A. Cherne, P.E.

Sincerely,

Littu a. Cheur

Senior Engineer, Planning Dept.

Development and Building Service

Development and Building Services

C: file .

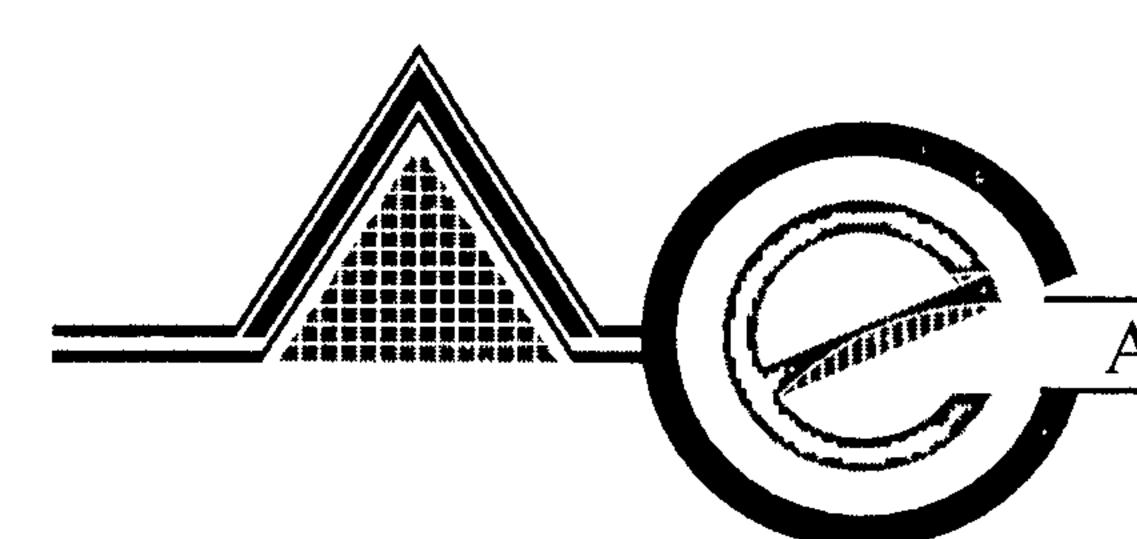
831-DRN

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (Rev. 12/05)

PROJECT TITLE: VILLAS LAS MANANITAS COMMERCIAL	ZONE ATLAS/DRG. FILE #: H13 / D050A
DRB #: EPC #:	WORK ORDER #:
LEGAL DESCRIPTION: TRACT A, VILLAS LAS MANA	ANITAS SUBDIVISION
CITY ADDRESS:	<u> </u>
ENGINEERING FIRM: Advanced Engineering and Consulting, LLC ADDRESS: 4416 Anaheim Ave., NE	CONTACT: Shahab Biazar PHONE: (505) 899-5570
CITY, STATE: Albuquerque, New Mexico	ZIP CODE: 87113
OWNER:	CONTACT: 50- 397-4996
ADDRESS:	PHONE:
CITY, STATE:	ZIP CODE:
ARCHITECT:	CONTACT:
ADDRESS:CITY, STATE:	PHONE:
CITT, STATE.	
SURVEYOR:	CONTACT:PHONE:
ADDRESS: CITY, STATE:	ZIP CODE:
	CONTACT:
CONTRACTOR: ADDRESS:	PHONE:
CITY, STATE:	ZIP CODE:
CHECK TYPE OF SUBMITTAL:	CHECK TYPE OF APPROVAL SOUGHT:
DRAINAGE REPORT	SIA / FINANCIAL GUARANTEE RELEASE
DRAINAGE PLAN 1ST SUBMITTAL	PRELIMINARY PLAT APPROVAL
DRAINAGE PLAN RESUBMITTAL	S. DEV. PLAN FOR SUB'D. APPROVAL
CONCEPTUAL GRADING & DRAINAGE PLAN	S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
X GRADING PLAN	SECTOR PLAN APPROVAL
EROSION CONTROL PLAN	FINAL PLAT APPROVAL
ENGINEER'S CERTIFICATION (HYDROLOGY)	FOUNDATION PERMIT APPROVAL
CLOMR / LOMR	X BUILDING PERMIT APPROVAL
TRAFFIC CIRCULATION LAYOUT (TCL)	CERTIFICATE OF OCCUPANCY (PERM.)
ENGINEER/ARCHITECT CERT (TCL)	CERTIFICATE OF OCCUPANCY (TEMP.)
ENGINEER/ARCHITECT CERT (DRB S.P.)	X GRADING PERMIT APPROVAL
ENGINEER/ARCHITECT CERT (AA)	PAVING PERMIT APPROVAL
OTHER (SPECIFY)	WORK ORDER APPROACH
	OTHER (SPECIFY
WAS A PRE-DESIGN CONFERENCE ATTENDED:	JUN 15 2003
YES	
X NO	HYDROLOGY
COPY PROVIDED	HYDROTON
DATE SUBMITTED: 06 / 15 / 2009	BY: Shahab Biazar, P.E.

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittals may be required based on the following:

- 1. Conceptual Grading and Drainage Plan: Required for approval of Site Development Plans greater than five (5) and Sector Plans.
- 2. Drainage Plans: Required for building permits, grading permits, paving permits and site plans less than five (5).
- 3. Drainage Report: Required for subdivisions containing more than ten (10) lots or containing five (5) acres or more.



ADVANCED ENGINEERING and CONSULTING, LLC

Consulting
Design
Development
Management
Inspection
Surveying

June 3, 2009

Mr. Curtis A Cherne, P.E.
Senior Engineer, Planning Dept.
Development and Building Services
600 Second Street NW
Albuquerque, New Mexico 87102

RE: REVISED GRADING AND DRAINAGE PLAN FOR VILLAS LAS MANANITAS COMMERCIAL (H13/D050A)

Dear Mr. Cherne:

Enclosed please find the revised grading plan for buildings Las Mananitas Commercial. The plans were modified to reflect the NGVD 1988. We had re-surveyed the existing building and there are three finished floor elevations. The lowest elevation is 4963.37. The following are the responses to your comments received dated March 2nd, 2009:

- We have added several spot elevation to assure that the runoff around the existing building will drain to the proposed drop inlet on site. There is an small area at the southwest corner of the property (behind the existing building) were the runoff appears to be trapped. Unfortunately the grades around the site (existing street flowlines are higher than the existing finished floor of the building. The only grade lower than the existing finished floor elevation are the existing inlets at the intersection of Indian School and Rio Grande Boulevard with elevation of 4962.71 and 4962.90.
- Additional spot elevations are shown for the existing entrance from Rio Grande Boulevard.

Please contact me if there are any questions or concerns regarding this submittal.

Sincerely yours,

Shahab Biazar, P.E.

CITY OF ALBUQUERQUE



March 2, 2009

Shahab Biazar, P.E. Advanced Engineering and Consulting, LLC 4416 Anaheim Ave., NE Albuquerque, NM 87113

Re: Villas Las Mananitas Commercial Grading and Drainage Plan Engineer's Stamp dated 2-20-09 (H13/D050A)

Dear Mr. Biazar,

Based upon the information provided in your submittal received 2-20-09, the above referenced plan is approved for Site Plan action by the DRB, but not approved for Grading Permit or Building Permit until the following comments are addressed:

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

- There is most likely little capacity in the storm drain in Rio Grande Blvd. The runoff from this site should enter the storm drain before the runoff peak in the storm drain. However, in the case where the system backs up, all of the buildings should be elevated. Since it is not possible to elevate the historic building, F.F. 4961.6, the design must provide a means to keep this building from flooding. In addition, more elevation data is required around this building so it is evident which way this area drains.
- Provide elevation data in the entrance (quarter points, at the high point, and to the subdivision entrance) off of Rio Grande Blvd.

If you have any questions, you can contact me at 924-3695.

Sincerely,
Litta a. Cheme

Curtis A. Cherne, P.E.

Senior Engineer, Planning Dept.

Development and Building Services

C: file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(Rev. 12/05)

PROJECT TITLE:	VILLAS LAS MANANITAS COMMERCIAL		Z	ONE ATLAS/DRG. FILE #:	$H_{13}/\mathcal{D}_{\mathcal{D}_{\mathcal{D}}}$	
DRB #:	EPC #:	· —	V	VORK ORDER #:		
LEGAL DESCRIPTION:	TRACT A, VILLAS LAS MANA	NITAS S	UBDIVISION			
CITY ADDRESS:			· · · · · · · · · · · · · · · · · · ·			
ENGINEERING FIRM:	Advanced Engineering and Consulting, LLC		CONTACT:	Shahab Biazar		
ADDRESS:	4416 Anaheim Ave., NE		PHONE:	(505) 899-5570		
CITY, STATE:	Albuquerque, New Mexico	- -	ZIP CODE:	87113		
OWNER:	······································		CONTACT:			
ADDRESS:			PHONE:			
CITY, STATE:			ZIP CODE:		· ······	
ARCHITECT:			CONTACT:			
ADDRESS:			PHONE:			
CITY, STATE:			ZIP CODE:			
SURVEYOR:			CONTACT:			
ADDRESS: CITY, STATE:			PHONE:			
CHI, SIAIE;			ZIP CODE:			
CONTRACTOR:	······································		CONTACT:			
ADDRESS:		_	PHONE:			
CITY, STATE:			ZIP CODE:			
CHECK TYPE OF SUBMIT	TAL:	CHEC	K TYPE OF APPR	OVAL SOUGHT:		
DRAINAGE REPO	ORT			AL GUARANTEE RELEASE		
	N 1ST SUBMITTAL	- '- '- '	<u>. </u>	Y PLAT APPROVAL		
DRAINAGE PLAN			_			
	RADING & DRAINAGE PLAN		_	FOR SUB'D. APPROVAL		
	RADING & DRAINAGE PLAN		-	FOR BLDG. PERMIT APPRO	VAL	
X GRADING PLAN			SECTOR PLAN		F	
EROSION CONTR			FINAL PLAT A	APPROVAL	+	Southern Control of the Party State of the Party St
	RTIFICATION (HYDROLOGY)		FOUNDATION	PERMIT APPROVAL	77	
CLOMR / LOMR		<u>X</u>	BUILDING PE	RMIT APPROVAL		
TRAFFIC CIRCUI	LATION LAYOUT (TCL)		CERTIFICATE	OF OCCUPANCY (PERM.)		* _
ENGINEER/ARCH	HITECT CERT (TCL)		CERTIFICATE	OF OCCUPANCY (TEMP.)	25	(b) _
ENGINEER/ARCH	HITECT CERT (DRB S.P.)	<u>X</u>	GRADING PER	RMIT APPROVAL		Ç. ≦
ENGINEER/ARCH	HITECT CERT (AA)		PAVING PERM	1IT APPROVAL	· • • • • • • • • • • • • • • • • • • •	
OTHER (SPECIFY	')		WORK ORDER	RAPPROVAL		
			OTHER (SPEC	IFY)	<u>-</u>	£
SVAC A DDE DECICNICONE	·					<i>"</i>
WAS A PRE-DESIGN CONF	EKENCE ATTENDED:	-7.	~ 1X \		, <u> </u>	
X NO		JU	, 1			_ #
		1				Partie - Annual Contract - Ann
COPY PROVIDED		n,V				
DATE SUBMITTED:	02 / 20 / 2009		BY	: Shahab Biazar, P.E.		
•						

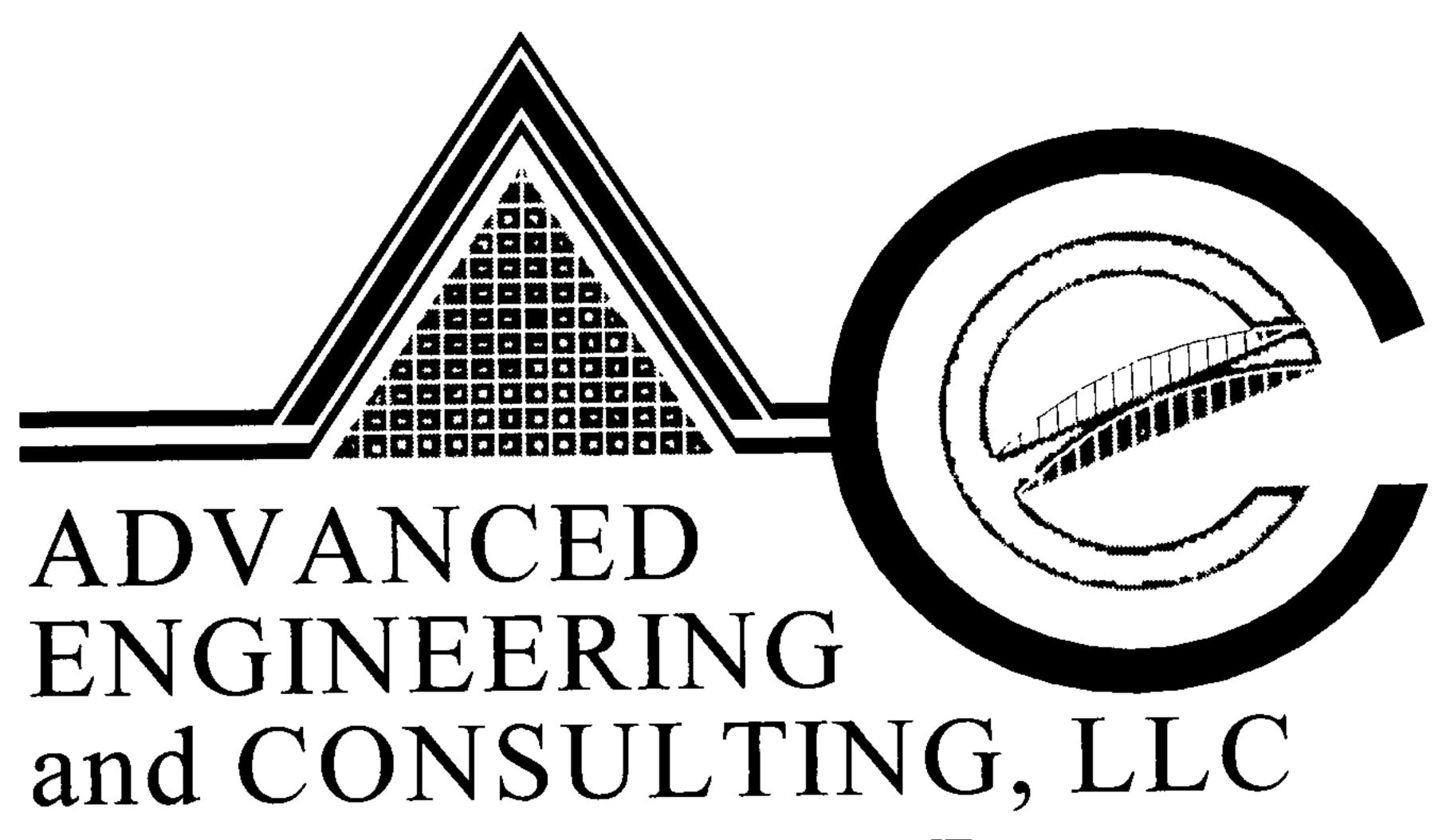
Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittals may be required based on the following:

- 1. Conceptual Grading and Drainage Plan: Required for approval of Site Development Plans greater than five (5) and Sector Plans.
- 2. Drainage Plans: Required for building permits, grading permits, paving permits and site plans less than five (5).
- 3. Drainage Report: Required for subdivisions containing more than ten (10) lots or containing five (5) acres or more.

DRAINAGE REPORT FOR

VILLAS LAS MAÑANITAS COMMERCIAL

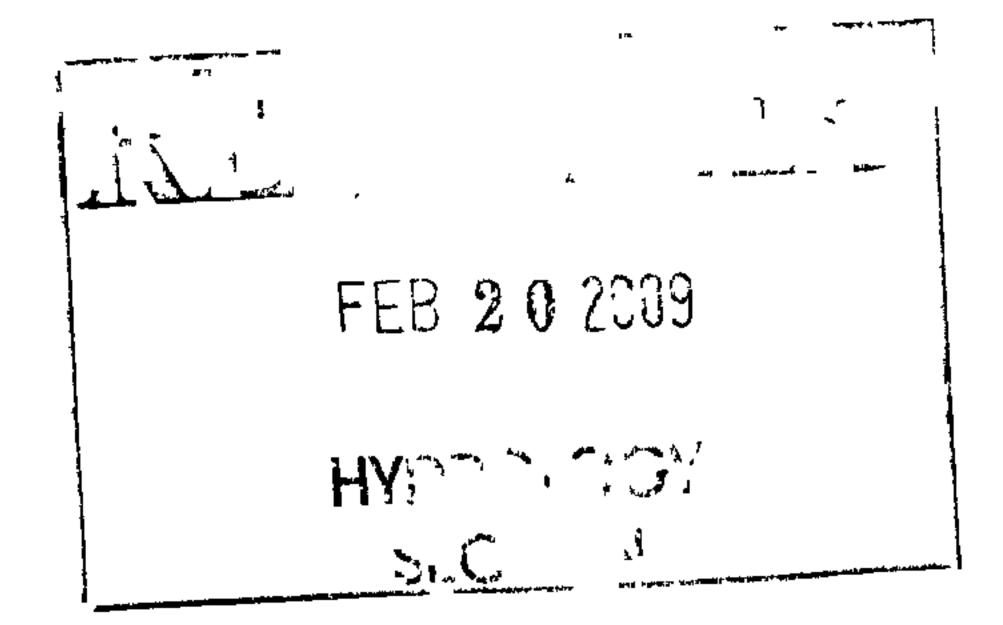
Prepared by:

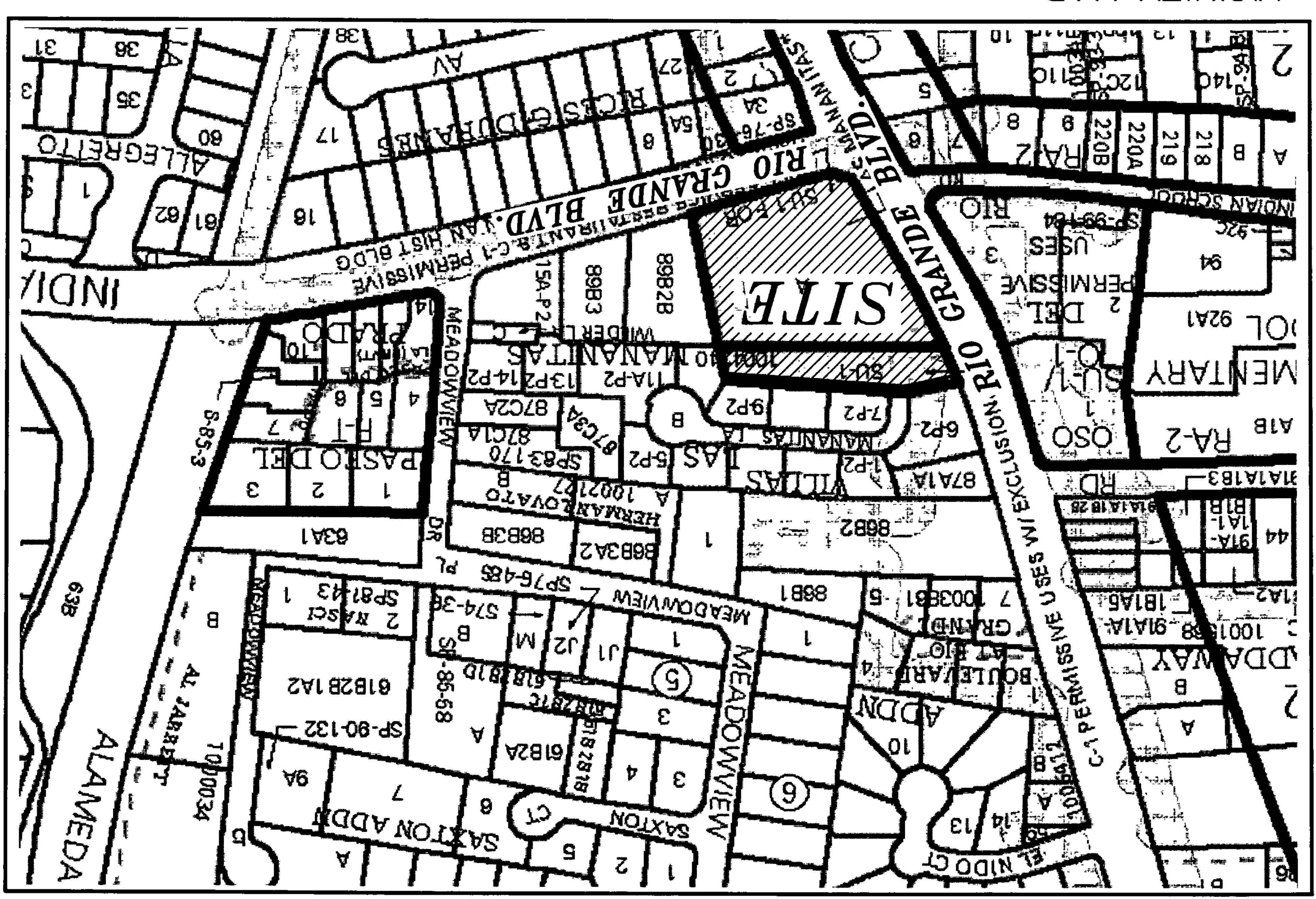


4416 Anaheim Ave., NE Albuquerque, New Mexico 87113

February 20, 2009

AB BIAND SHAPE SHAPE Shahab Biazar PE NO. 13479





Location

Villas Las Mañanitas Commercial is located at northeast corner of Rio Grande Boulevard and Indian School Road. See attached Zone Atlas page number H-13 for exact location.

Purpose

The purpose of this drainage report is to present a grading and drainage solution for the proposed site. We are requesting rough grading approval, building permit approval, and site plan for building permit approval.

Existing Drainage Conditions

This site is fairly flat. There are no offsite runoff. The runoff on-site partly drains to Rio Grande Boulevard and partly to Indian School Road. From there the runoff is intercepted by storm sewer inlets within the street. The site does not fall within a 100-Year Floodplain.

Proposed Conditions and On-Site Drainage Management Plan

The runoff on-site under the proposed conditions will be intercepted by a series of the inlets and then will drain to the exiting 24" pipe which is located within this site. The 24" pipe was constructed under the City Project Number 791581. The runoff from Villas Las Mañanitas Subdivision drains through this pipe, and it was designed under the City Drainage Number H13/D50. The 24" pipe has adequate capacity to handle the runoff from this project. See attached copy of the as-built for the existing 24" RCP.

Calculations

City of Albuquerque, Development Process Manuel, Section 22.2, Hydrology Section, was used for runoff calculations. See this report for Summary Table for runoff results. See also this report for ponding calculations as well as the AHYMO input and output files for runoff calculations.

RUNOFF CALCULATION RESULTS

BASIN	AREA (SF)	AREA (AC)	AREA (MI ²)
ON-SITE	86790.81	1.9924	0.003113

EXISTING

BASIN	Q-100	Q-10
	CFS	CFS
ON-SITE	3.11	0.74

PROPOSED

BASIN	Q-100	Q-10
	CFS	CFS
ON-SITE	8.82	1.79

RUNOFF CALCULATIONS

(INPUT DATA FOR AHYMO CALCULATIONS)

The site is @ Zone 2

DEPTH (INCHES) @ 100-YEAR STORM

 $P_{60} = 2.01$ inches

 $P_{360} = 2.35 \text{ inches}$

 $P_{1440} = 2.75 \text{ inches}$

DEPTH (INCHES) @ 10-YEAR STORM

 $P_{60} = 2.01 \times 0.667$ = 1.34 inches

 $P_{360} = 1.57$

 $P_{1440} = 1.83$

See this report for input file and summary output from AHYMO calculations.

Also see the following table for the runoff results.

AHYMO INPUT FILE

* ZONE 2	

*************	6-HR STORM (UNDER EXISITNG CONDITIONS) * ***********************************
START	TIME=0.0
RAINFALL	TYPE=1 RAIN QUARTER=0.0 IN
	RAIN ONE=2.01 IN RAIN SIX=2.35 IN
* ON-SITE	RAIN DAY=2.75 IN DT=0.03333 HR
COMPUTE NM HYD	ID=1 HYD NO ± 101.0 AREA=0.003113 SQ MI
	PER A=100.00 PÉR B=0.00 PER C=0.00 PER D=0.00
	TP=0.1333 HR MASS RAINFALL=-1
* 10-YEAR, **************	6-HR STORM (UNDER EXISTING CONDITIONS) ************************************
START	TIME=0.0
RAINFALL	TYPE=1 RAIN QUARTER=0.0 IN
	RAIN ONE=1.34 IN RAIN SIX=1.57 IN
	RAIN DAY=1.83 IN DT=0.03333 HR
* ON-SITE COMPUTE NM HYD	ID=1 HYD NO=111.0 AREA=0.003113 SQ MI
COME OTTO MAL LITTO	PER A=100.00 PER B=0.00 PER C=0.00 PER D=0.00
	TP=0.1333 HR MASS RAINFALL=-1

·	C TID CONCINT (TINIDED EDODOCED CONDITATIONS) *
* 100-YEAR, **************	6-HK STORM (ONDER EKOROSED CONDITIONS)
*****	6-HR STORM (UNDER PROPOSED CONDITIONS) * ******************** TIME=0.0
* 100-YEAR, ************************************	**************************************
**************************************	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN
**************************************	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR
**************************************	**************************************
**************************************	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00
************* START RAINFALL * ON-SITE COMPUTE NM HYD	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1
************** START RAINFALL * ON-SITE COMPUTE NM HYD ***********************************	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
************ START RAINFALL * ON-SITE COMPUTE NM HYD ***********************************	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
************** START RAINFALL * ON-SITE COMPUTE NM HYD ***********************************	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
************ START RAINFALL * ON-SITE COMPUTE NM HYD ***********************************	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
*************** START RAINFALL * ON-SITE COMPUTE NM HYD ***************** * 10-YEAR, ***********************************	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
************* START RAINFALL * ON-SITE COMPUTE NM HYD ************ * 10-YEAR, ************ START RAINFALL	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
************** START RAINFALL * ON-SITE COMPUTE NM HYD ************ * 10-YEAR, ************ START RAINFALL * ON-SITE	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
************* START RAINFALL * ON-SITE COMPUTE NM HYD ************ * 10-YEAR, ************ START RAINFALL	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
************** START RAINFALL * ON-SITE COMPUTE NM HYD *********** * 10-YEAR, ************ START RAINFALL * ON-SITE COMPUTE NM HYD	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
***************** START RAINFALL * ON-SITE COMPUTE NM HYD **************** * 10-YEAR, *************** START RAINFALL * ON-SITE COMPUTE NM HYD ***********************************	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************
************** START RAINFALL * ON-SITE COMPUTE NM HYD *********** * 10-YEAR, ************ START RAINFALL * ON-SITE COMPUTE NM HYD	TIME=0.0 TYPE=1 RAIN QUARTER=0.0 IN RAIN ONE=2.01 IN RAIN SIX=2.35 IN RAIN DAY=2.75 IN DT=0.03333 HR ID=1 HYD NO=103.0 AREA=0.003113 SQ MI PER A=0.00 PER B=7.00 PER C=7.00 PER D=86.00 TP=0.1333 HR MASS RAINFALL=-1 ***********************************

SUMMARY OUTPUT FILE

AHYMO PROGRAM INPUT FILE = 8	SUMMARY TABLE (831	AHYMO_	97) -			VERSION:	1997.02d	RUN DATE USER NO.=	•	/YR) =02/1 9702c01000	
COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT	RUNOFF	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE =	
COMPUTE NM HY			1	.00311	3.11	.088	.53121	. 1.533	1.560	TIME= RAIN6= PER IMP= TIME= RAIN6=	.00 2.350 .00 .00 1.570
COMPUTE NM HY START	E = 1 $D = 111.00$ $E = 1$	_	1	.00311	.74	.021	.12517	1.533	.373		.00
COMPUTE NM HY START		_	1	.00311	8.82	.324	1.95034	1.500	4.427	PER IMP= TIME= RAIN6=	86.00 .00 1.570
COMPUTE NM HY FINISH		_	1	.00098	1.79	.063	1.20373	1.500	2.866	PER IMP=	86.00

STORM DRAIN INLET EFFECTIVE AREA ASSUMING A 50% CLOGGING FACTOR

SINGLE 'D':

Area at the grate:

$$L = 38.375" - 7 (1/2"_{middle bars})$$

$$= 34.875"$$

$$= 2.906'$$

$$W = 25.5" - 13 (1/2_{\text{middle bars}})$$

$$= 19"$$

$$= 1.583'$$

Area =
$$1.583' \times 2.906'$$

= 4.601 ft^2

Effective Area
$$= 4.601 - 0.5 (4.601)$$

= 2.30 ft²

Effective Area = 2.30 ft^2

$$Q = CA \sqrt{(2gh)}$$

$$Q = 0.60x2.30 \sqrt{(2x32.2x1.00)}$$

Q = 11.07 cfs > 8.82 cfs (developed flow for the entire site)

PIPE FLOW CAPACITY CALCULATIONS

18" Pipe Flow Capacity Calculation Using Orifice Equation

Orifice Equation: $Q=CA\sqrt{2gh}$

h (head) = 5.90' (from invert of the pipe to top of inlet/grate elevation) A = 1.7671 sf g = 32.20

$$Q = 0.60 \times 1.7671 \times \sqrt{(2 \times 32.2 \times 5.90)}$$

Q = 20.67 cfs > 8.82 cfs (entire on-site runoff)

PIPE FLOW CAPACITY CALCULATIONS

Existing 24" Pipe Flow Capacity Calculation Using Orifice Equation

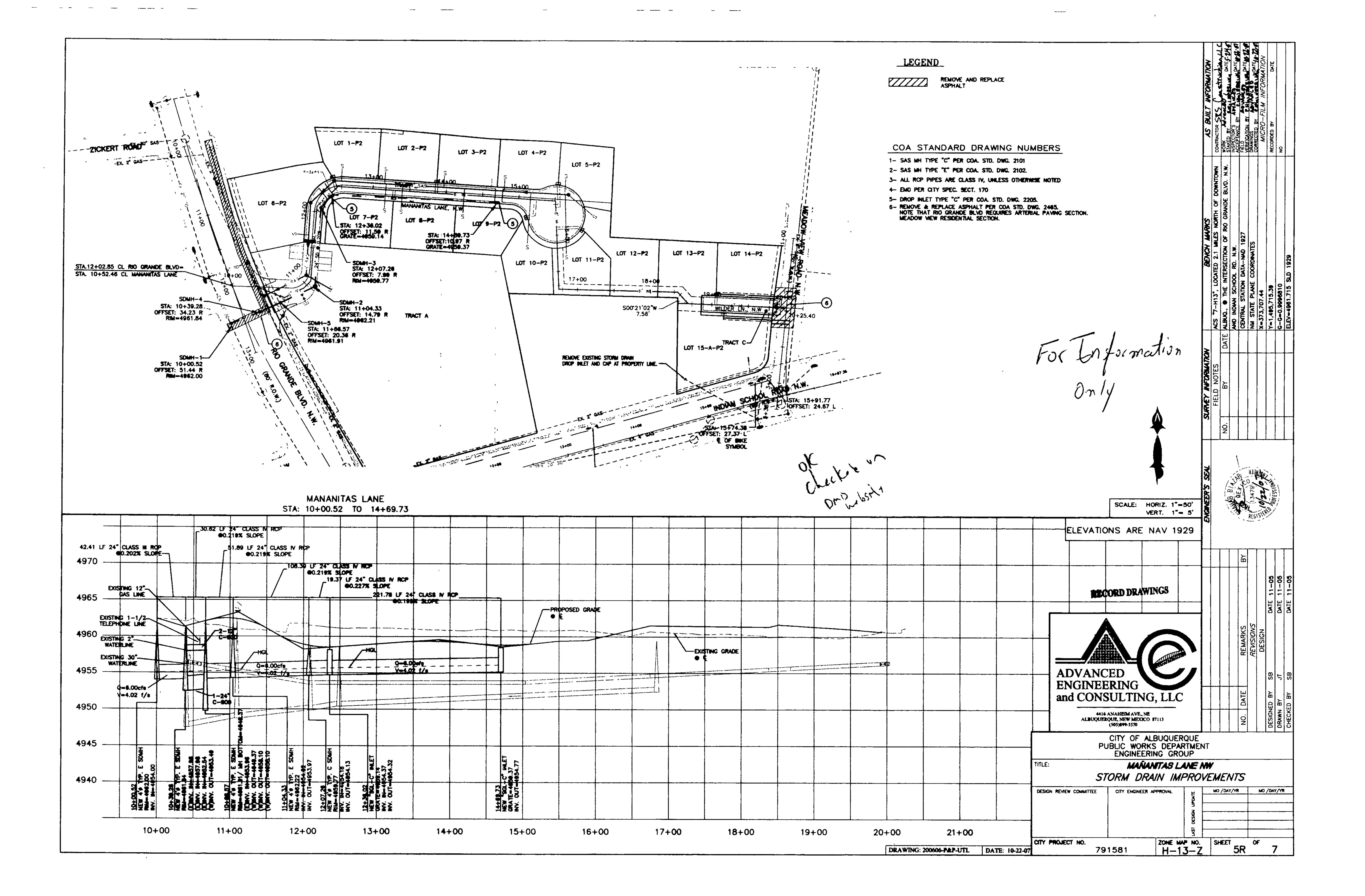
Orifice Equation: $Q=CA\sqrt{2gh}$

h (head) = 5.90' (difference between the lowest elevation 59.90 on site and invert 54.00 of

the 24" existing pipe)

A = 3.14 sfg = 32.20

> Q = $0.60 \times 3.14 \times \sqrt{(2 \times 32.2 \times 5.90)}$ = 36.72 cfs >> 14.82 cfs (existing 6 cfs in the pipe plus the 8.82 cfs from this project)



CITY OF ALBUQUERQUE

PLANNING DEPARTMENT

HYDROLOGY DEVELOPMENT SECTION

DEVELOPMENT REVIEW BOARD MEMO

DRB CASE NO/PROJECT NO: 1003812 AGENDA ITEM NO: 6

SUBJECT:

Site Plan for Subdivision and Building Permit

ENGINEERING COMMENTS:

Submit a plan to Hydrology that includes but is not limited to:

- Amount of proposed runoff
- Calculations to support proposed onsite infrastructure, if under capacity what is the WSE?

- Narrative supporting draining to the 30" SD in Indian School or the 21" SD at .0015 ft/ft in Rio Grande Blvd
- Capacity/HGL in storm drains in Indian School and Rio Grande

RESOLUTION:

APPROVED	; DENIED; DEFERRED; CC	MMENTS PROVIDED; WITHDRAWN
SIGNED-OFF:	(SEC-PLN) (SP-SUB) (SP-BP) (FP)	BY: (UD) (CE) (TRANS) (PKS) (PLNG)
DELEGATED:	(SEC-PLN) (SP-SUB) (SP-BP) (FP)	TO: (UD) (CE) (TRANS) (PKS) (PLNG)
SIGNED: Curtis C	Cherne	DATE : 2-4-09

Curtis Cherne City Engineer Designee 924-3695

- 5.

