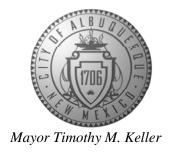
# CITY OF ALBUQUERQUE

Planning Department
David Campbell, Director



November 30, 2018

Don Briggs, P.E. Don Briggs Engineering, LLC 5324 Oakledge Ct NW Albuquerque, NM 87120

**RE:** Sunset Villa Subdivision Temporary Pond Recovery

**Grading Plan** 

Engineer's Stamp Date: 11/19/18

**Hydrology File: K12D003** 

Dear Mr. Briggs,

Based on the submittal received on 11/20/18, the Grading Plan cannot be approved until the following are corrected:

PO Box 1293

1. Show the work to remove the temporary RCP stubs into the temporary retention ponds and the work to activate the permanent pipe network into the County Pond.

Albuquerque

- 2. Provide the Design Analysis Report for the County Pond. The depending on the WSE in the pond, the pipe network might not be able to drain to it.
- 3. Provide written concurrence from the County allowing this discharge.

NM 87103

- 4. Provide existing and proposed contours on the grading plan and show the limits of grading.
- 5. This project requires an ESC Plan, submitted to the Stormwater Quality Engineer (Curtis Cherne PE, ccherne@cabq.gov or 924-3420).

www.cabq.gov

- 6. This project requires a Floodplain Permit, approved separately, prior to the Grading Permit being issued. The Floodplain Permit will need to demonstrate no rise to the BFE.
- 7. For Information. Prior to Building Permit for lots 46 and 47, a LOMR-F application will need to be approved by Hydrology and submitted to FEMA. Prior to Certificate of Occupancy for lots 46 and 47, the LOMR-F's must be issued by FEMA.

If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

Sincerely,

Dana Peterson, P.E.

Senior Engineer, Planning Dept. Development Review Services



# City of Albuquerque

## Planning Department

## Development & Building Services Division

## DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Project Title: Sonset Villa Sabd. B	nilding Permit #: Hydrology File #: <u>K12D003</u>
DRB#:E	PC#: Work Order#:
Legal Description: Lots 49A, 45A	, 16A, 23A and 59A Sunget Villa Subda
City Address: 524 Twilight	Vista La. 5W
Applicant: Don Briggs PE Address: 5324 Oak lodge CT N	11) Albuquerano NPI 87120
Phone#: <u>5057494843</u> F	x#: E-mail: cloubrage envicering
Other Contact: Mr. Wayne Che	Contact: Coun
Address:	
Phone#: 505 842 6363 F	x#:E-mail:
TYPE OF DEVELOPMENT:PLAT	RESIDENCE DRB SITE ADMIN SITE
Check all that Apply:	
DEPARTMENT:  HYDROLOGY/ DRAINAGE TRAFFIC/ TRANSPORTATION	TYPE OF APPROVAL/ACCEPTANCE SOUGHT: BUILDING PERMIT APPROVAL
TRAFFIC/ TRAINSFORTATION	CERTIFICATE OF OCCUPANCY
TYPE OF SUBMITTAL:	
ENGINEER/ARCHITECT CERTIFICATION	PRELIMINARY PLAT APPROVAL
PAD CERTIFICATION	SITE PLAN FOR SUB'D APPROVAL
CONCEPTUAL G & D PLAN	SITE PLAN FOR BLDG. PERMIT APPROVAL
X GRADING PLAN	FINAL PLAT APPROVAL
DRAINAGE REPORT	
DRAINAGE MASTER PLAN	SIA/ RELEASE OF FINANCIAL GUARANTEE
FLOODPLAIN DEVELOPMENT PERMIT API	LIC FOUNDATION PERMIT APPROVAL
ELEVATION CERTIFICATE	X GRADING PERMIT APPROVAL
CLOMR/LOMR	SO-19 APPROVAL
TRAFFIC CIRCULATION LAYOUT (TCL)	PAVING PERMIT APPROVAL
TRAFFIC IMPACT STUDY (TIS)	GRADING/ PAD CERTIFICATION
STREET LIGHT LAYOUT	WORK ORDER APPROVAL
OTHER (SPECIFY)	CLOMR/LOMR
PRE-DESIGN MEETING?	FLOODPLAIN DEVELOPMENT PERMIT
TRE-DESIGN WILDTING.	OTHER (SPECIFY)
IS THIS A RESUBMITTAL?: Yes No	
DATE SUBMITTED: 11-20-18	By: Don Briggs
COA STAFF:	ELECTRONIC SUBMITTAL RECEIVED:

FEE PAID:\_\_\_\_



November 19, 2018

Mr. Dana Peterson PE CFM Senior Engineer Planning Department 600 2<sup>nd</sup> St. NW Albuquerque, NM 87102

Dear Mr. Peterson,

Attached is a grading plan submittal associated with the Sunset Villa Subdivision located in south west Albuquerque. The plan completes the strategy outlined in "Updated Drainage Report for Sunset Villa" prepared by Rio Grande Engineering in January of 2015 (File: #K12D003). The plan was approved March 25, 2016 with the condition that a LOMR-F be completed for those lots located within the AH flood zone prior to requesting a building permit for those lots. The following is an outline of how we are proposing to complete the strategy and conditions of approval:

- 1) As the constructed storm drain system drains to the adjacent Bernalillo County Sunset Gardens/Five Points regional pond, Bernalillo County's approval has been sought for the discharge from the Sunset Villa Subdivision. Plans have been submitted for their review and approval to meet their requirements. Once we have secured their approval we will provide a copy of that approval to your office.
- 2) With Bernalillo County's acceptance of the storm drain system discharge, the inlets located within the Sunset Villa Subdivision can be modified as per the Drainage Report. This is a private storm drain system so a City Work Order for the modifications is not required.
- 3) Once the storm drain inlets are converted, the temporary ponds can be reclaimed per the Drainage Report. This submittal provides specific grading information for each lot.
- 4) As the City required for plat approval, that each of the temporary ponds be located on individual lots, once reclaimed, these lots will need to be subdivided into the originally proposed residential lots. This will require a platting action to complete.
- 5) Mr. Doug Hughes PE has raised the question of how the AH flood zone encumbering the property was handled. The Drainage Report indicates that turn blocks in the perimeter walls are required at every 8 feet to allow cross lot drainage. He also asked about the need for compensatory ponding which is addressed in the Drainage Report as not being required as all fill material within the flood zone area was placed at or above the base flood elevation.
- 6) As the drainage report indicated fill material was placed above the base flood elevation a LOMR-F would not be appropriate for these lots. However, a LOMA would be appropriate following building construction to relieve the burden of mandatory flood insurance.

We are proposing to run the Bernalillo County, City Hydrology and City Platting Action submittals concurrently to reduce total review time. Please let me know if you see a conflict with doing this.

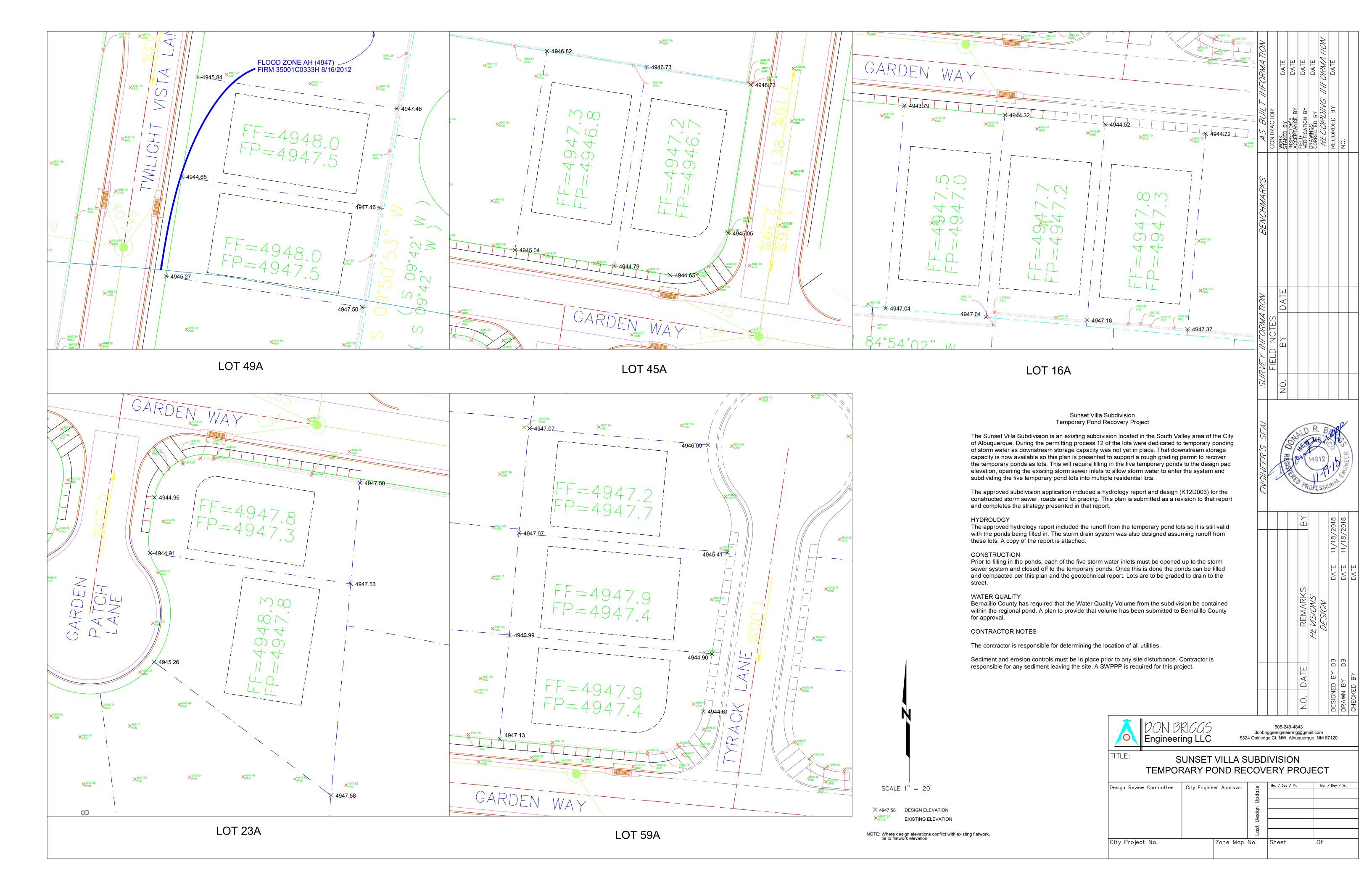
At this time we are asking for your approval for Grading Permit to fill in the ponds. If your review is completed prior to our securing Bernalillo County's approval we would ask that you list Bernalillo County's approval as a condition of approval for the Grading Permit.

Please call if you have any questions or comments.

Sincerely

Don Briggs PE CFM

Don Briggs Engineering LLC





# City of Albuquerque

### Planning Department

# Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Sunset Gardens Subdivision	Building Permit #:	City Drainage #:		
DRB#: EPC#:		Work Order#:		
Legal Description: lots 1-70 sunset gardens subdivision				
City Address:				
Engineering Firm: RIO GRANDE ENGINEERING		Contact: DAVID SOULE		
Address: PO BOX 93924, ALBUQUERQUE, NM 87199		Contact.		
Phone#: 505.321.9099 Fax#: 505.8	372.0999	E-mail: DAVID@RIOGRANDEENGINEERING.COM		
		Contact:		
Address:	<del></del>			
Phone#: Fax#:	<del></del>	E-mail:		
<del></del>				
Architect:		Contact:		
Address:	<del></del>			
Phone#: Fax#:		E-mail:		
Surveyor: CONSTRUCTION SURVEY INCORPORATED		Contact: JOHN GALLEGOS		
Address:	<u> </u>			
Phone#: 917.8921 Fax#:		E-mail:		
Contractor:		Contact:		
Address:				
Phone#: Fax#:		E-mail:		
TYPE OF SUBMITTAL:	CHECK TYPE OF APPROV	AL/ACCEPTANCE SOUGHT:		
DRAINAGE REPORT	SIA/FINANCIAL GUARAN			
DRAINAGE PLAN 1st SUBMITTAL	× PRELIMINARY PLAT APPI			
× DRAINAGE PLAN RESUBMITTAL	S. DEV. PLAN FOR SUB'D			
CONCEPTUAL G & D PLAN	S. DEV. FOR BLDG, PERM	IT APPROVAL		
GRADING PLAN	SECTOR PLAN APPROVAL			
EROSION & SEDIMENT CONTROL PLAN (ESC)	FINAL PLAT APPROVAL			
ENGINEER'S CERT (HYDROLOGY)	CERTIFICATE OF OCCUPA	ANCY (PERM)		
CLOMR/LOMR	CERTIFICATE OF OCCUPA	ANCY (TCL TEMP)		
TRAFFIC CIRCULATION LAYOUT (TCL)	FOUNDATION PERMIT AP	PROVAL		
ENGINEER'S CERT (TCL)	× BUILDING PERMIT APPRO	OVAL		
ENGINEER'S CERT (DRB SITE PLAN)	GRADING PERMIT APPRO	VAL SO-19 APPROVAL		
ENGINEER'S CERT (ESC)	PAVING PERMIT APPROV	AL ESC PERMIT APPROVAL		
SO-19	WORK ORDER APPROVAL	ESC CERT. ACCEPTANCE		
OTHER (SPECIFY)	GRADING CERTIFICATION	OTHER (SPECIFY)		
WAS A PRE-DESIGN CONFERENCE ATTENDED:	Yes XNo Co	opy Provided		
DATE SUBMITTED: 1/19/15	By:			

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

- 1. Conceptual Grading and Drainage Plan: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans
- 2. Drainage Plans: Required for building permits, grading permits, paving permits and site plans less than five (5) acres
- 3. Drainage Report: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more
- 4. Erosion and Sediment Control Plan: Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

### UPDATED DRAINAGE REPORT

For

# SUNSET VILLA Albuquerque, New Mexico

Prepared by

Rio Grande Engineering PO Box 93924 Albuquerque, New Mexico 87199

**JANUARY 2015** 



David Soule P.E. No. 14522

### **TABLE OF CONTENTS**

Purpose	
Purpose	3
Existing Conditions	
Exhibit A-Vicinity Map	4
Proposed Conditions	5
Summary	5
Appendix	
Site Hydrology	A
Hydraulic calculations	B
Storm Drain Profiles	C

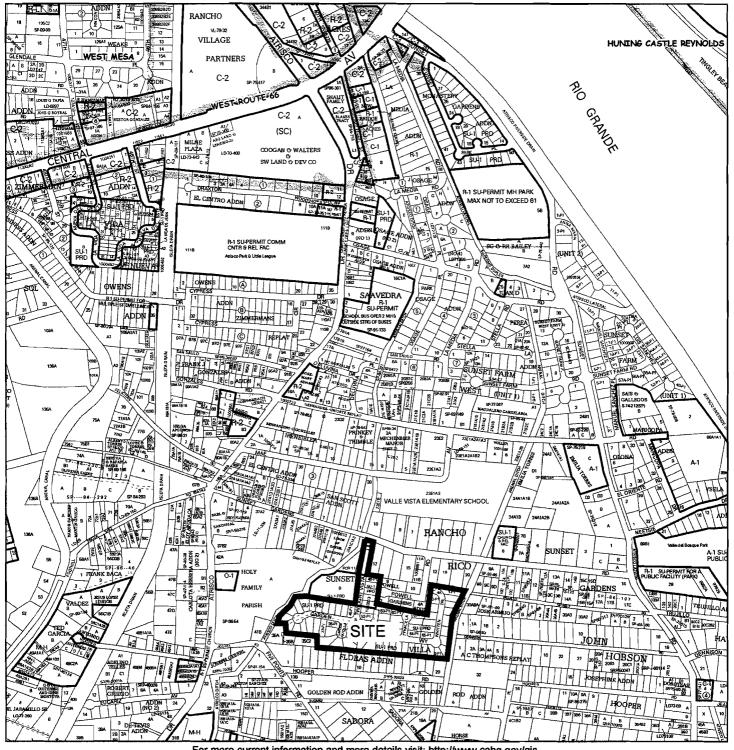
<u>Map</u> Site Grading and Drainage Plan

#### **PURPOSE**

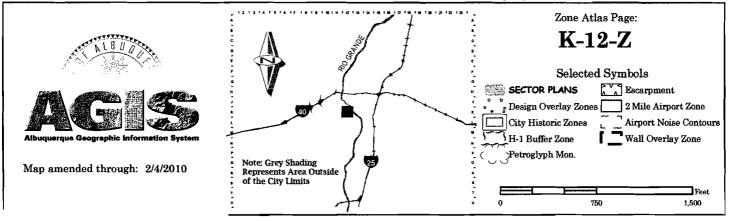
The purpose of this report is to provide the Updated Drainage Management Plan for the development of a 70-lot subdivision located on Sunset Boulevard between the Arenal ditch and the Atrisco Ditch in the southwest valley. This plan was prepared in accordance with the City of Albuquerque design regulations, utilizing the City of Albuquerque's Development Process Manual drainage guidelines. This report will demonstrate that the grading does not adversely affect the surrounding properties, nor the upstream or downstream facilities.

#### **INTRODUCTION**

The subject of this report, as shown on the Exhibit A, is a 12.3-acre parcel of land located on the south side of Sunset Boulevard between the Arenal ditch and the Atrisco Ditch in the southwest valley. The legal description of this site is Lots 1-70 Sunset Villa Subdivision. As shown on FIRM map35013C0333H, the majority of the site is located within Flood Zone X; a portion of the site is impacted by flood zone AH with base flood elevation of 4947. The site has had significant grading activities upon it over the past 10 years. The site is not in native condition. The site was graded in accordance with the approved grading plan prepared by Thompson Engineering. Due to the construction of raised pads and solid block perimeter walls, the site is not affected by any upland flow. The site currently retains its developed flows onsite, which is consistent with the surrounding properties. The development of the site will conform to the approved grading plan with the exception it will be graded in an interim condition due to the regional pond not having capacity for our discharge because it has not been completed with a drainage outfall. The subdivisions interim condition will retain the developed flow onsite in temporary drainage ponds.



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



#### **EXISTING CONDITIONS**

The site currently is a mass graded site with solid block perimeter walls. The site is not impacted by any upland flows. The site currently retains it flows onsite within the graded roadways. The site has been graded in accordance with the approved grading plan. The existing regional pond was constructed by Bernalillo County Public Works. The pond was designed to accept the developed flow from this site as well as flows from surrounding streets. The offsite flow is conveyed to this pond via and existing underground storm drain. The pond was designed to collect the regional water and pump it to a MRGCD drain west of this site. During the development of this site it was found the regional pond and mechanical outfall does not connect to the MRGCD drain as proposed. The county was contacted and notified this pond does not have capacity for our flow.

#### PROPOSED CONDITIONS

The proposed improvements consist of the completion of a new 70-lot subdivision serviced by a private paved roadway. The lots shall free discharge to the roadway and be conveyed within the roadway to the available downstream storm drain. The ultimate condition storm drain will be constructed. The inlets will be plugged at the storm drain outfall of each inlet and an opening thru the rear of the pond will be constructed. This allows the flow to enter into temporary drainage ponds. As shown in appendix A the site is comprised of 5 Drainage basins. Each basin drains to a single-A inlet. The entire 100-year 10-day volume will be temporarily retained within a pond for each basin. Due to the depth of the water table the ponds have minimum bottom elevation of 4939. The streets have been shown to adequately convey the storm water to the inlets. The inlets have been shown to adequately capture the storm water.

In the ultimate condition, the county will complete the pond outfall and the ponds can be reclaimed. The reclamation will entail plugging the temporary outfall in the back of each inlet and

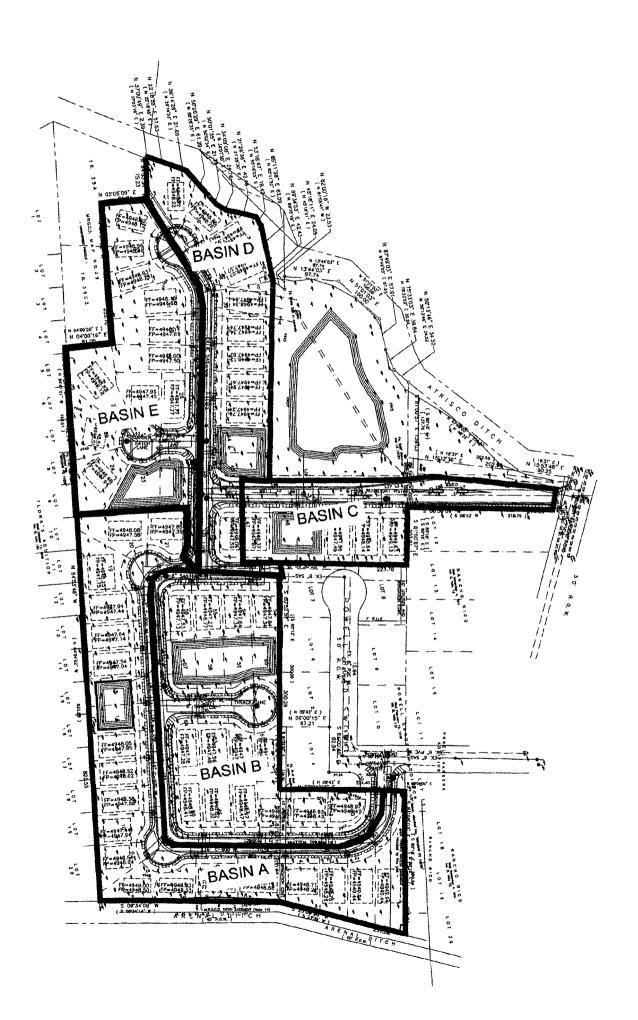
removing the plugs in the front. As shown the storm drain has the capacity to convey the peak developed storm water discharge.

Due to one lot being affected by the flood zone, and the fact it has been graded such that it is elevated, an elevation certificate will be issued showing the finished floor is 1' above the published flood plain, at time of construction

#### **SUMMARY AND RECOMMENDATIONS**

This project is a completion of a previously approved development of residential subdivision with the southwest valley. The development is hindered by the regional county pond not being completed. Therefore the interim grading plan allows for retention ponds to be located at the collection points of each basin. The permanent solution will be constructed and once the County pond is completed the ponds can be reclaimed and the storm drain will function as designed. Prior to this occurring the Pond and its outfall must be reanalyzed to assure all flows may be properly accommodated. The drainage infrastructure has been designed to accept and convey the 100-year peak flow and volumes. The site has been designed in accordance with City of Albuquerque Drainage ordinance. This drainage plan and report conforms to the governing drainage regulations of the City. Since the effected area site encompasses more than 1 acre, a NPDES permit will be required prior to any construction activity. An Elevation certificate will be required to be submitted and accepted prior to the release of building permits affected.

# APPENDIX A SITE HYDROLOGY



# Weighted E Method SUNSET VISTA

Existing	Devel	oped	Basins
----------	-------	------	--------

											100-Year, 6-hi	r.		10-day
Basin	Area	Area	Treatment	Α	Treatme	nt B	Treatm	ent C	Treatme	nt D	Weighted E	Volume	Flow	Volume
	(sf)	(acres)	%	(acres)	%	(acres)	%	(acres)	%	(acres)	(ac-ft)	(ac-ft)	cfs	(ac-ft)
BASIN A	150867	3.463	5%	0.17317	20.0%	0.693	25.0%	0.86586	55%	1.905	1.465	0.423	12,44	0.677
BASIN B	127921	2.937	5%	0.14683	20.0%	0.587	25.0%	0.73417	55%	1.615	1.487	0.364	10.55	0.579
BASIN C	56984	1.308	5%	0.06541	20.0%	0.262	25.0%	0.32704	55%	0.719	1.487	0.162	4.70	0.258
BASIN D	87633	2.012	5%	0.10059	20.0%	0.402	25.0%	0.50294	55%	1.106	1.487	0.249	7.23	0.397
BASIN E	112460	2.582	5%	0.12909	20.0%	0.516	25.0%	0.64543	55%	1.420	1.487	0.320	9.27	0.509
TOTAL	535865	12.302	0%	0	20.0%	2.460	25.0%	3.07544	55%	6.766	1.465	1.502	43.39	2.404

#### **Equations:**

Weighted E = Ea\*Aa + Eb\*Ab + Ec\*Ac + Ed\*Ad / (Total Area)

Volume = Weighted D \* Total Area

Flow = Qa \* Aa + Qb \* Ab + Qc \* Ac + Qd \* Ad

Where for 100-year, 6-hour storm (zone 1)

Ea= 0.44	Qa= 1.29
Eb= 0.67	Qb= 2.03
Ec= 0.99	Qc= 2.87
Ed= 1 97	Od= 4 37

The site initially will be gravel but ultimatly will be paved, land treatments will be for ultimate paved conditiosn

#### REQUIRED PROVIDED

POND A	0.677 0.681	ac-ft	12.44 c	fs	
POND B	0.579 1.02	ac-ft	10.55 cl	:fs	22.99 east reach storm drain
POND C	0.258 0.572	ac-ft	4.70 cl	:fs	
POND D	0.397 0.604	ac-ft	7.23 c	fs:	
POND E	0.509 0.7	ac-ft	9.27 cl	:fs	16.50 west reach storm drain
					39.48 southreach

# APPENDIX B HYDRAULIC CALCULATIONS

## **Street Capacity Calculations**

#### **GARDEN WAY EAST SECTION**

28' F-F Street Section with 8" curb

Slope= 0.006 Q=22.99 CFS

For water depths less than 0.125 feet

Y= Water depth

Area = 8\*Y^2

P= SQRT(257\*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.00	0.17	0.00	0.00	0.00	0.19	0.00	0.33	0.0018848
0.02	0.00	0.34	0.01	0.00	0.00_	0.30	0.01	0.38	0.0045908
0.04	0.01	0.68_	0.02	0.01	0.01	0.48	0.02	0.42	0.0111278
0.06	0.03	1.02	0.03	0.02	0.04	0.63	0.04	0.45	0.0186349
0.08	0.05	1.36	0.04	0.04	0.08	0.76	0.06	0.47	0.0268376
0.1	0.08	1.70	0.05	0.07	0.14	0.88	0.09	0.49	0.0355923
0.12	0.12	2.04	0.06	0.11	0.23	1.00	0.12	0.51	0.0448091
0.125	0.13	2.13	0.06	0.13	0.26	1.02	0.13	0.51	0.0471777

For water depths greater than 0.125 ft but less than 0.365 ft

Y1= Y-0.125

A2= A1 + 2\*Y1 + 25\*Y1^2 P2= P1 + SQRT(2501\*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.14	2.38	0.06	0.14	0.27	1.00	0.13	0.49	0.0460163
0.16	0.23	3.91	0.06	0.23	0.46	1.01	0.16	0.45	0.0486259
0.2	0.42	5.95	0.07	0.48	0.95	1.15	0.23	0.45	0.0623776
0.24	0.69	8.00	0.09	0.90	1.81	1.32	0.32	0.47	0.0806096
0.2846	1.08	10.27	0.11	1.63	3.26	1.51	0.43	0.50	0.1037171
0.32	1.47	12.08	0.12	2.43	4.87	1.66	0.53	0.52	0.1234692
0.3551	1.91	13.87	0.14	3.45	6.89	1.81	0.64	0.53	0.1440036
0.365	2.05	14.37	0.14	3.77	7.55	1.85	0.67	0.54	0.1499436

For water depths greater than 0.365 ft but less than 0.667 ft

Y2= Y - 0.365 A3= A2 + Y2\*14 P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.37	2.12	14.38	0.15	3.99	7.98	1.89	0.70	0.55	0.1556607
0.4556	3.31	14.46	0.23	8.40	16.80	2.54	1.16	0.66	0.2556985
0.4848	3.72	14.49	0.26	10.18	20.37	2.74	1.33	0.69	0.2906669
0.5	3.94	14.51	0.27	11.16	22.33	2.84	1.42	0.71	0.3090234
0.54	4.50	14.55	0.31	13.91	27.82	3.09	1.67	0.74	0.357805
0.5584	4.75	14.56	0.33	15.25	30.50	3.21	1.79	0.76	0.3804643
0.63	5.76	14.64	0.39	20.91	41.83	3.63	2.29	0.81	0.4698487
0.667	6.27	14.67	0.43	24.10	48.21	3.84	2.56	0.83	0.5167338

For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667

A4= A3 + 14 \* Y3 + 25 \* Y3^2 P4= P3 + SQRT( 2501 \* Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	6.76	16.32	0.41	25.44	50.89	3.76	2.63	0.79	0.5090958
0.72	7.09	17.32	0.41	26.43	52.87	3.73	2.69	0.77	0.5071856
0.74	7.43	18.32	0.41	27.55	55.10	3.71	2.74	0.76	0.5069788
0.76	7.79	19.32	0.40_	28.79	57.58	3.70	2.81	0.75	0.508251
0.78	8.17	20.32	0.40	30.16	60.31	3.69	2.88	0.74	0.5108175
0.8	8.58	21.32	0.40	31.64	63.29	3.69	2.95	0.73	0.5145251
0.847	9.60	23.68	0.41	35.63	71.26	3.71	3.14	0.71	0.5270333

## **Street Capacity Calculations**

#### **GARDEN WAY WEST SECTION**

28' F-F Street Section with 8" curb

Slope= 0.006 Q=16.56 CFS

For water depths less than 0.125 feet

Y= Water depth Area = 8\*Y^2

P= SQRT(257\*Y^2) + Y

n= 0.017

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.01	0.00	0.17	0.00	0.00	0.00	0.19	0.00	0.33	0.0018848
0.02	0.00	0.34	0.01	0.00	0.00	0.30	0.01	0.38	0.0045908
0.04	0.01	0.68	0.02	0.01	0.01	0.48	0.02	0.42	0.0111278
0.06	0.03	1.02	0.03	0.02	0.04	0.63	0.04	0.45	0.0186349
0.08	0.05	1.36	0.04	0.04	0.08	0.76	0.06	0.47	0.0268376
0.1	0.08	1.70	0.05	0.07	0.14	0.88	0.09	0.49	0.0355923
0.12	0.12	2.04	0.06	0.11	0.23	1.00	0,12	0.51	0.0448091
0.125	0.13	2.13	0.06	0.13	0.26	1.02	0.13	0.51	0.0471777

For water depths greater than 0.125 ft but less than 0.365 ft

Y1= Y-0.125

A2= A1 + 2\*Y1 + 25\*Y1^2 P2= P1 + SQRT(2501\*Y1^2)+Y1

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.13	0.14	2.38	0.06	0.14	0.27	1.00	0.13	0.49	0.0460163
0.16	0.23	3.91	0.06	0.23	0.46	1.01	0.16	0.45	0.0486259
0.2	0.42	5.95	0.07	0.48	0.95	1.15	0.23	0.45	0.0623776
0.24_	0.69	8.00	0.09	0.90	1.81_	1.32	0.32	0.47	0.0806096
0.2846	1.08	10.27	0.11	1.63	3.26	1.51	0.43	0.50	0.1037171
0.32	1.47	12.08	0.12	2.43	4.87	1.66	0.53	0.52	0.1234692
0.3551	1.91	13.87	0.14	3.45	6.89	1.81	0.64	0.53	0.1440036
0.365	2.05	14.37	0.14	3.77	7.55	1.85	0.67	0.54	0.1499436

For water depths greater than 0.365 ft but less than 0.667 ft

Y2= Y - 0.365 A3= A2 + Y2\*14 P3= P2 + Y2

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.37	2.12	14.38	0.15	3.99	7.98	1.89	0.70	0.55	0.1556607
0.4556	3.31	14.46	0.23	8.40	16.80	2.54	1.16	0.66	0.2556985
0.4848	3.72	14.49	0.26	10.18	20.37	2.74	1.33	0.69	0.2906669
0.5	3.94	14.51	0.27	11.16	22.33	2.84	1.42	0.71	0.3090234
0.54	4.50	14.55	0.31	13.91	27.82	3.09	1.67	0.74	0.357805
0.5584	4.75	14.56_	0.33	15.25	30.50	3.21	1.79	0.76	0.3804643
0.63	5.76	14.64	0.39	20.91	41.83	3.63	2.29	0.81	0.4698487
0.667	6.27	14.67	0.43	24.10	48.21	3.84	2.56	0.83	0.5167338

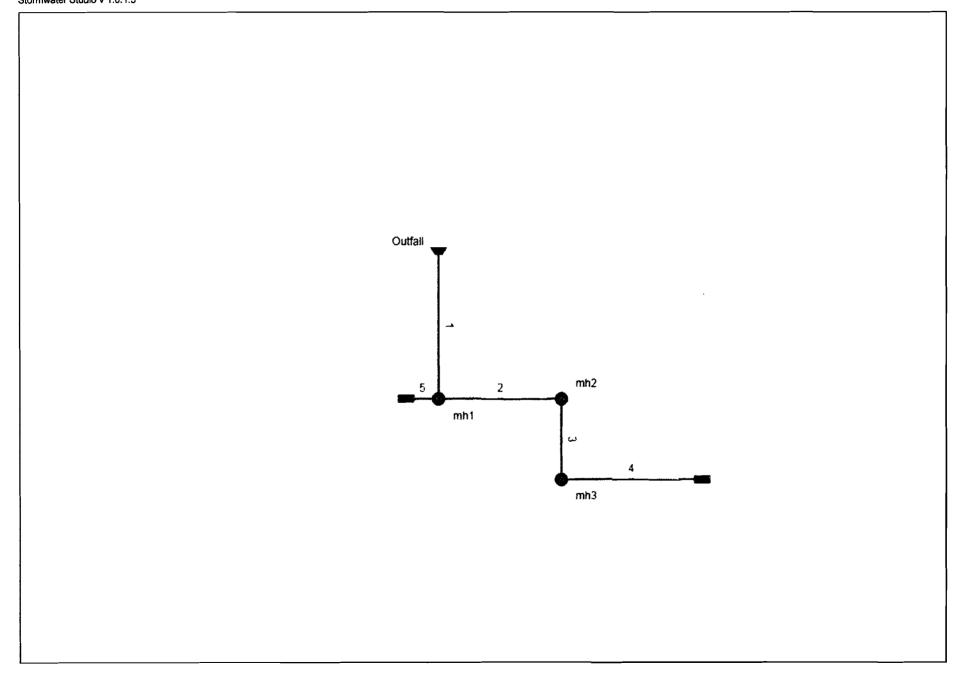
For water depths greater than 0.667 ft but less than 0.847 ft

Y3= Y - 0.667

A4= A3 + 14 \* Y3 + 25 \* Y3^2 P4= P3 + SQRT( 2501 \* Y3^2)

Depth (ft)	Area (ft^2)	P (ft)	R (A/P)	Q (cfs)	2Q (cfs)	Vel (ft/s)	D*V	Fr	D2 (ft)
0.7	6.76	16.32	0.41	25.44	50.89	3.76	2.63	0.79	0.5090958
0.72	7.09	17.32	0.41	26.43	52.87	3.73	2.69	0.77	0.5071856
0.74	7.43	18.32	0.41	27.55	55.10	3.71	2.74	0.76	0.5069788
0.76	7.79	19.32	0.40	28.79	57.58	3.70	2.81	0.75	0.508251
0.78	8.17	20.32	0.40	30.16	60.31	3.69	2.88	0.74	0.5108175
0.8	8.58	21.32	0.40	31.64	63.29	3.69	2.95	0.73	0.5145251
0.847	9.60	23.68	0.41	35.63	71.26	3.71	3.14	0.71	0.5270333

Stormwater Studio v 1.0.1.5



# **Storm Sewer Tabulation**

Stormwater Studio v 1.0.1.5

01-16-2015

(ft) (ac) (ac) (C) (min) (min) (in/hr) (cfs) (cfs) (ft/s) (in) (%) (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft	Line ID	Length	Drng Area   G x Area   Tc   Light   Drng Area   Drng Area   C x Area   Tc   Light   Drng Area   Drng		pe	Inver	t Elev	HGL Elev		Surface Elev		Line No										
Line 1 158 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.		تا	Incr	Total	Rat	Incr	Total	Iniet	Syst	활	₽	Сар	Vel	Size	Slope	Dn	Up	Dn	Up	Ðn	Up	
Line 2 143 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
Line 3 87.0 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Line 1	158	0.00	0.00	0.00	0.00	0.00	0.0	1.76	0.00	39.55	68.88	4.21	48	0.23	4938.57	4938.93	4941.50	4941.62	4944.50	4944.47	1
Line 4 164 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Line 2	143	0.00	0.00	0.00	0.00	0.00	0.0	1.03	0.00	22.99	30.04	3.27	36	0.20	4939.04	4939.33	4942.08	4942.23	4944.47	4945.14	2
	Line 3	87.0	0.00	0.00	0.00	0.00	0.00	0.0	0.58	0.00	22.99	29.47	3.25	36	0.20	4939.36	4939.53	4942.44	4942.53	4945.14	4944.60	3
Line 5 38.0 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Line 4	164	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	22.99	18.40	4.68	30	0.20	4939.56	4939.89	4942.63	4943.14	4944.60	4943.43	4
	Line 5	38.0	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	16.56	13.31	3.37	30	0.11	4939.08	4939.12	4942.07	4942.13	4944.47	4944.47	5

# **DROP INLET CALCULATIONS**

INLET	TYPE OF	AREA	Q	H	H ALLOW
	INLET	(SF)	(CFS)	(FT)	(FT)
1	SINGLE A	5.92	12.44	0.1905	0.67

## **ORIFICE EQUATION**

 $Q = CA \ sqrt(2gH)$ 

C = 0.6g = 32.2

The max flow is 12.44 from basin A

# APPENDIX C STORM DRAIN PROFILES

