City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: BEEHIVE HOMES Building Permit #: _____ City Drainage #: L23d022

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

Legal Description: TRACT 1-B2 FOUR HILLSVILLAGE SHOPPING CENTER & APARTMENT COMPLEX

City Address: SOUTH WEST CORNER OF WENONAH AND FOUR HILLS ROAD SE

Engineering Firm: RIO GRANDE ENGINEERING Contact: DAVID SOULE

Address: PO BOX 93924, ALBUQUERQUE, NM 87199

Phone#: 505.321.9099 Fax#: 505.872.0999 E-mail: DAVID@RIOGRANDEENGINEERING.COM

Owner: HOST CARE ,LLC Contact: _____

Address: 3535 PRINCETON NE, Albuquerqueb nm 87107

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

Architect: KEN HOVEY Contact: KEN HOVER

Address: 9215 SHOSHONE NE

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

Surveyor: CONSTRUCTION SURVEY TECHNOLOGIES Contact: JOHN GALLEGOS

Address: _____

Phone#: 917.8921 Fax#: _____ E-mail: _____

Contractor: _____ Contact: _____

Address: _____

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

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT
___ DRAINAGE PLAN 1st SUBMITTAL
___ DRAINAGE PLAN RESUBMITTAL
___ CONCEPTUAL G & D PLAN
x GRADING PLAN
___ EROSION & SEDIMENT CONTROL PLAN (ESC)
___ ENGINEER'S CERT (HYDROLOGY)
___ CLOMR/LOMR
___ TRAFFIC CIRCULATION LAYOUT (TCL)
___ ENGINEER'S CERT (TCL)
___ ENGINEER'S CERT (DRB SITE PLAN)
___ ENGINEER'S CERT (ESC)
___ SO-19
___ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

___ SIA/FINANCIAL GUARANTEE RELEASE
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D APPROVAL
___ S. DEV. FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ CERTIFICATE OF OCCUPANCY (PERM)
___ CERTIFICATE OF OCCUPANCY (TCL TEMP)
___ FOUNDATION PERMIT APPROVAL
X BUILDING PERMIT APPROVAL
X GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
___ WORK ORDER APPROVAL
___ GRADING CERTIFICATION

___ SO-19 APPROVAL
___ ESC PERMIT APPROVAL
___ ESC CERT. ACCEPTANCE
___ OTHER (SPECIFY)

RECEIVED
OCT 0 3 2013
LAND DEVELOPMENT SECTION

WAS A PRE-DESIGN CONFERENCE ATTENDED: ___ Yes X No ___ Copy Provided

DATE SUBMITTED: 8/1313 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 followin

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

DRAINAGE REPORT

For

BEEHIVE HOMES
TRACT 1B2
FOUR HILLSVILLAGE SHOPPING CENTER
Albuquerque, New Mexico

Prepared by

Rio Grande Engineering
PO Box 93924
Albuquerque, New Mexico 87199

JULY 2013

David Soule P.E. No. 14522

TABLE OF CONTENTS

Appendix

Map Pocket

Site Grading and Drainage Plan

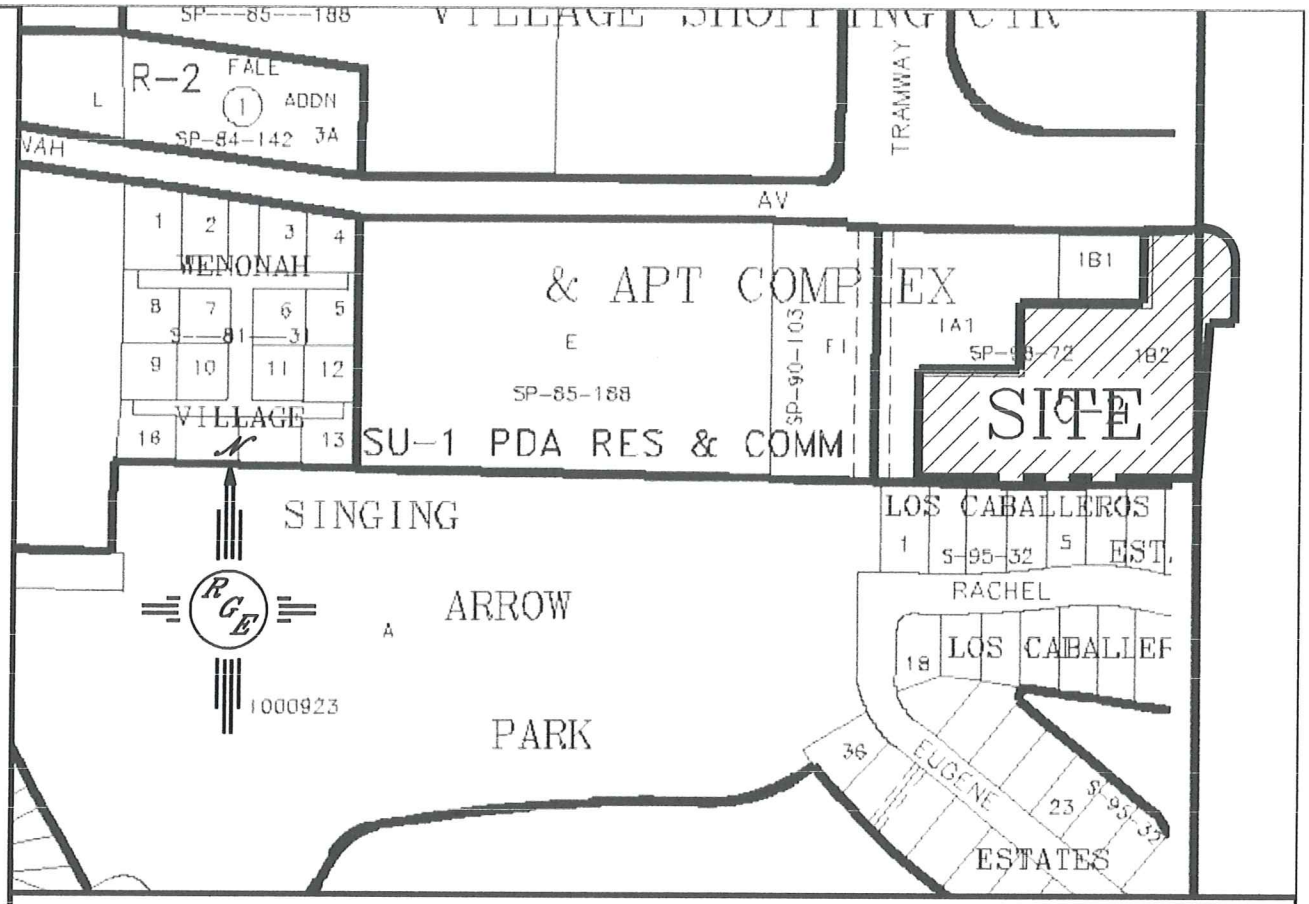
PURPOSE

The purpose of this report is to provide the Drainage Management Plan for the development of a 5 unit retirement facility. This plan will be utilized for the development of the subject property. This plan was prepared in accordance with the City of Albuquerque's Development Process Manual. This report will demonstrate that the proposed improvements do not adversely affect the surrounding properties, nor the upstream or downstream facilities.

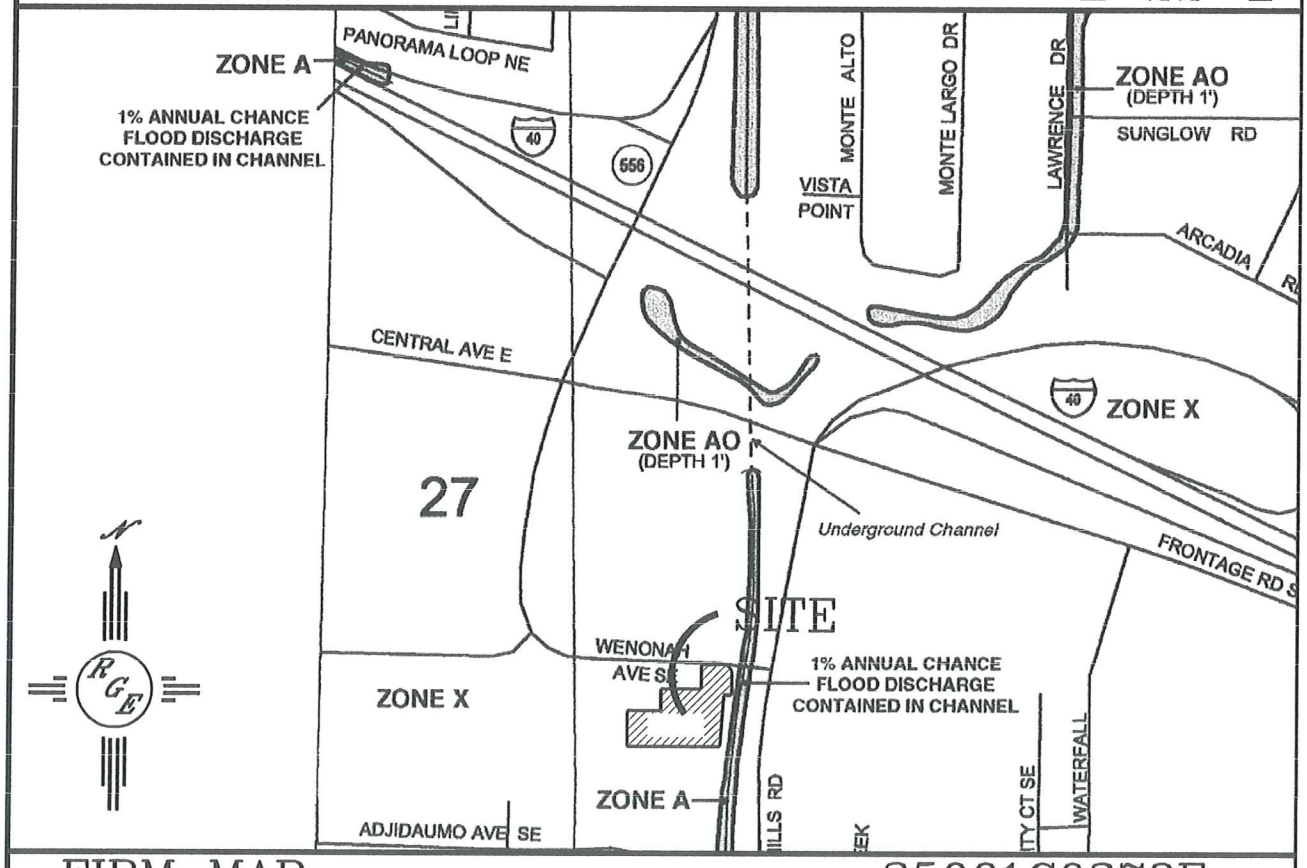
INTRODUCTION

The subject of this report, as shown on the Exhibit A, is a 3.87-acre parcel of land located on the southwest corner of Wenonah road and Four Hills road SE. The site is located in a fully developed area of the south east heights of Albuquerque. The legal description of this site is tract 1B2 Four Hill Center. As shown on FIRM map 35001C0378E, the site is located entirely within Flood Zone X. The site is currently undeveloped.

The site is located within the drainage basing of the Tijeras Arroyo. The site is adjacent to an ~~AMAFCA~~ CITY maintained four hills channel. This site shall be graded such that the developed flow safely enters this channel. Based upon the orthotopographical maps of the area, upland flows do affect the property. Water harvesting features will be constructed with the development.



ZONE ATLAS L-22-Z



FIRM MAP: 35001C0378E

EXISTING CONDITIONS

The site is currently undeveloped. It is part of a larger development and has had fill and utilities placed onsite. The site is not in native condition. The site currently accepts 9.8 cfs from the adjacent properties to the north and west, and the site itself generates 11.09 cfs onsite. The combined flow rate of 20.89 cfs discharges to the adjacent property at the south east corner of the site. This flow enters the AMAFCA four hills channel via a side inlet 300 feet south of the property line.

PROPOSED CONDITIONS

The proposed improvements consist of a 5 unit retirement facility project. The onsite grading will accept the upland flows and discharge all flows to a harvesting pond at the sites southeast corner. The pond will retain the first .44" of storm water generated on the site and then discharge via inlet and underground storm drain to the AMAFCA four hills channel via pipe penetration. As shown in appendix a, the site is affected by 3 upland basins and 5 onsite basins. The developed storm water is captured by several singe grate type d inlets. As shown in appendix A, each inlet has adequate capacity to capture all the contributing flow. The inlets are connected to the harvest pond via 18" underground storm drain, which as shown in appendix A has capacity without pressure flow. In the event pipe or inlets clog, the flow is conveyed within a rip-rap lined swale along the south property line. The entire flow from the site and upland flow enter the harvest pond. This pond fills to the grate of another type d inlet then discharges to the four hills channel via a 24" pipe penetration to the channel. As shown the inlet, pipe and emergency overflow have been sized to handle the 100 year peak events. The total site will generate 17.65 cfs, which is an increase of 6.56 cfs. The combined flow leaving the site will be 27.45 cfs. The adjacent downstream improvements are in place and can handle this increased flow. The discharge is near the bottom of the channel basin and shall pass prior to basin peak.

3.87 Ac ⊽ = 6,181 cf

The harvest pond will reduce the peak flow and allow for groundwater infiltration. As shown in appendix A, the developed storm water discharge rates were calculated using the simplified procedure for 40 acre and smaller basins as shown in chapter 23-part A of the Development Process Manual.

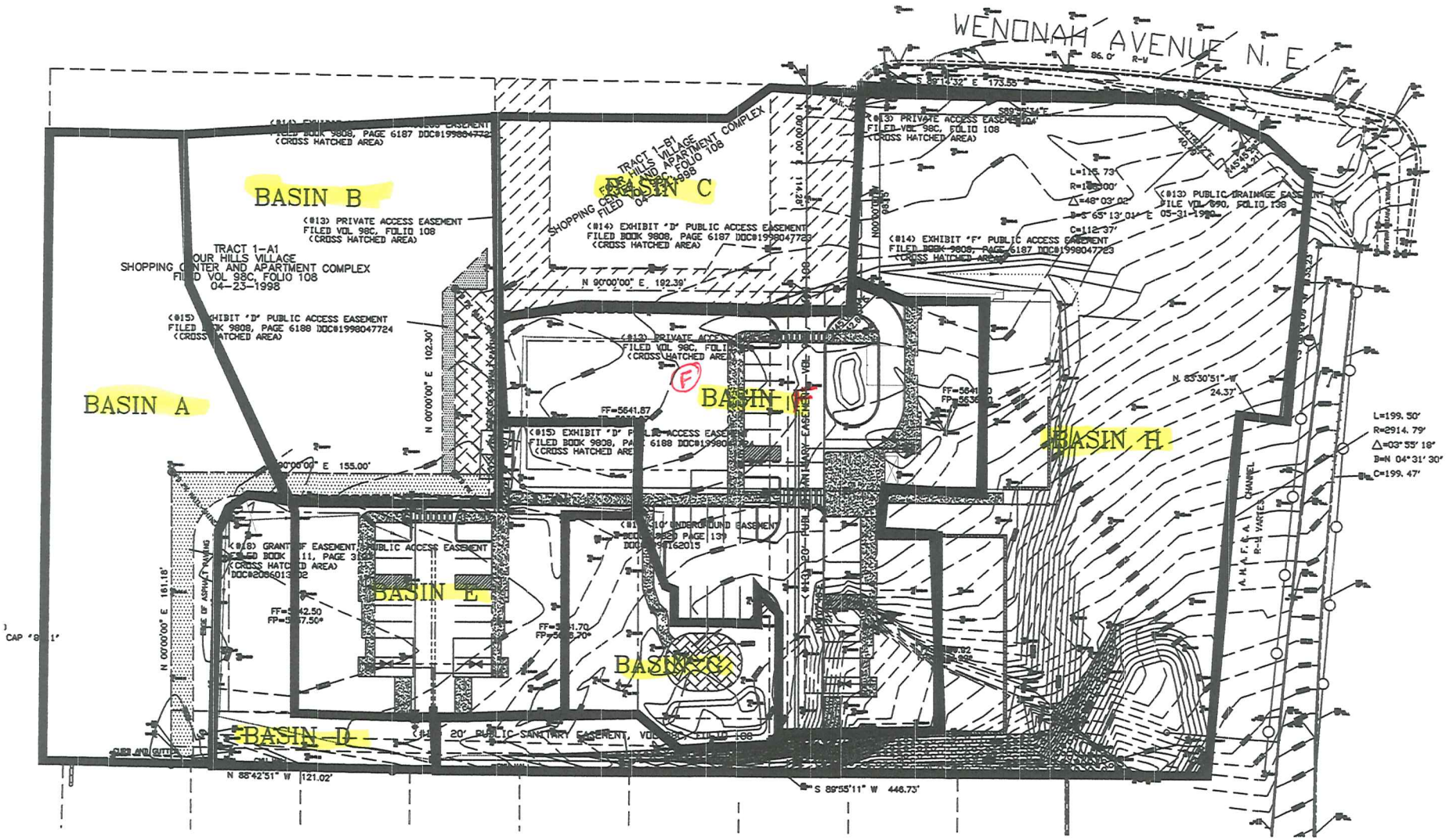
SUMMARY AND RECOMMENDATIONS

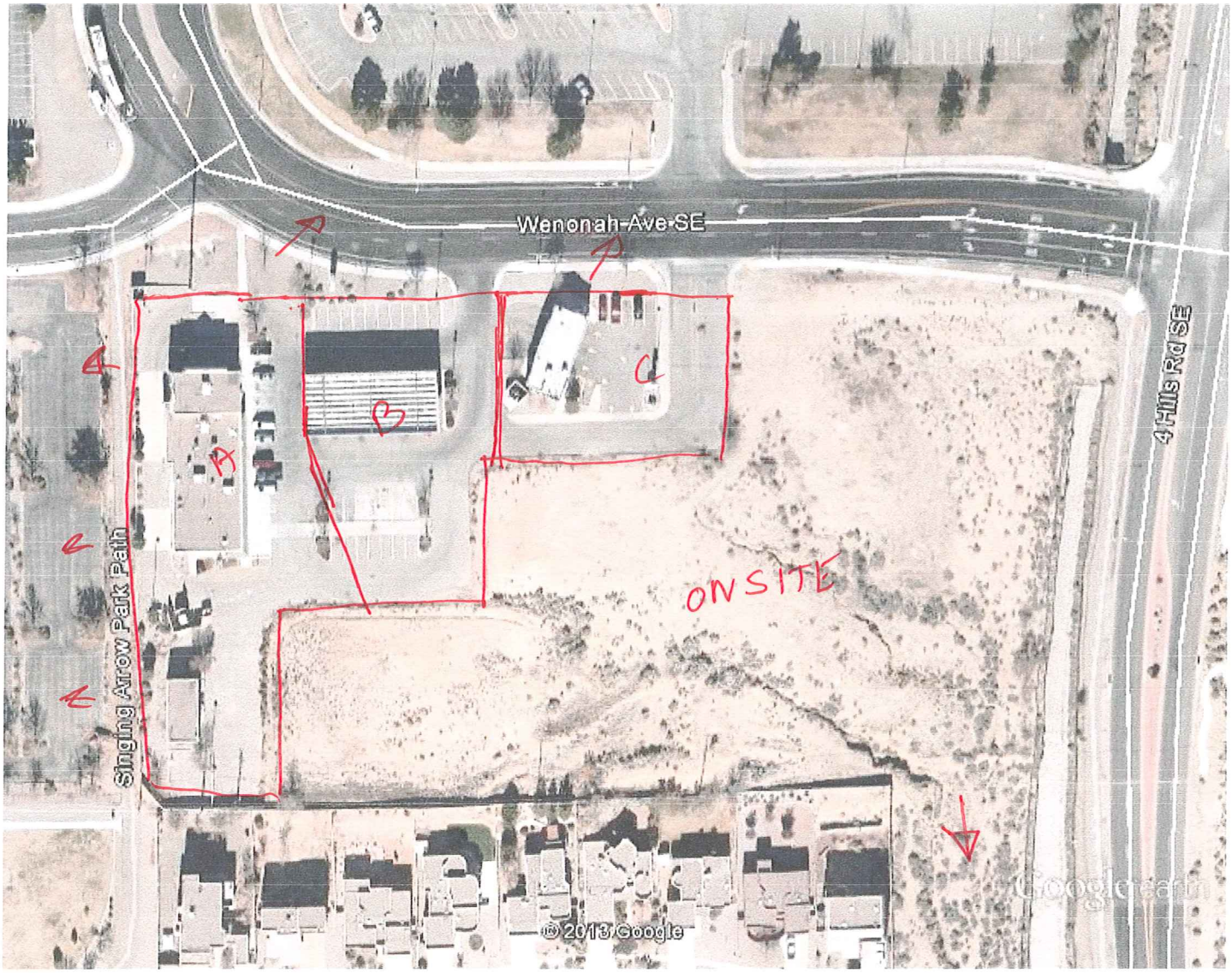
This site is a development of a parcel of land located within the southeast heights. The site is located within the Tijeras arroyo basin. The developed condition will produce a peak discharge rate greater than existing. The down stream infrastructure is in place and publicly maintained. The drainage infrastructure has been sized appropriately and emergency overflows and redundant inlets have been provided.

The proposed site development does not adversely affect the upstream or downstream facilities. The site was designed in conformance to City of Albuquerque Drainage Policy. Therefore, we request approval of the site-grading plan. Since this site encompasses more than 1 acre, a NPDES permit and SWPPP will be required prior to any construction activity.

APPENDIX A

SITE HYDROLOGY


WENONAH AVENUE N. E.
BASIN A
BASIN B
BASIN C
BASIN D
BASIN E
BASIN F
BASIN G
BASIN H
TRACT 1-A1
SHOPPING CENTER AND APARTMENT COMPLEX
FILED VOL 98C, FOLIO 108
04-23-1998
TRACT 1-B1
FILED VOL 98C, FOLIO 108
(#13) PRIVATE ACCESS EASEMENT
FILED VOL 98C, FOLIO 108
(CROSS HATCHED AREA)
(#14) EXHIBIT "D" PUBLIC ACCESS EASEMENT
FILED BOOK 9808, PAGE 6187 DOC#1998047723
(CROSS HATCHED AREA)
(#15) EXHIBIT "D" PUBLIC ACCESS EASEMENT
FILED BOOK 9808, PAGE 6188 DOC#1998047724
(CROSS HATCHED AREA)
(#13) PUBLIC DRAINAGE EASEMENT
FILE VOL 890, FOLIO 138
05-31-1962
(#18) GRANT OF EASEMENT FOR PUBLIC ACCESS EASEMENT
(CROSS HATCHED AREA)
DOC#2056013
(#10) 20' PUBLIC SANITARY EASEMENT, VOL 98C, FOLIO 108
(#11) 10' UNDERGROUND EASEMENT
DOC# 9162015
A.M.A.F.R.A. CHANNEL
P-1 WATER
N 90°00'00" E 192.39'
N 00°00'00" E 102.30'
N 90°00'00" E 155.00'
N 00°00'00" E 161.18'
N 88°42'51" W 121.02'
S 89°55'11" W 446.73'
N 83°30'51" W 24.37'
L=199.50'
R=2914.79'
Δ=03°55'18"
B=N 04°31'30"
C=199.47'
L=116.73'
R=139.00'
Δ=48°03'02"
B=S 65°13'01" E
C=112.37'
FF=5641.87
FP=5636.87
FF=5642.50
FP=5637.50
FF=5641.70
FP=5636.70
F



Google earth

feet 400

meters 100

Weighted E Method

BEEHIVE HOMES

Existing Developed Basins

Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		100-Year, 6-hr.		
			%	(acres)	%	(acres)	%	(acres)	%	(acres)	Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs
UPLAND A	32339	0.742	0%	0	10.0%	0.074	5.0%	0.03712	85%	0.631	2.425	0.150	3.67
UPLAND B	32047	0.736	0%	0	10.0%	0.074	5.0%	0.03678	85%	0.625	2.425	0.149	3.64
UPLAND C	21936	0.504	0%	0	10.0%	0.050	5.0%	0.02518	85%	0.428	2.425	0.102	2.49
D	8521	0.196	0%	0	60.0%	0.117	40.0%	0.07825	0%	0.000	1.232	0.020	0.63
E	21011	0.482	0%	0	70.0%	0.338	30.0%	0.1447	0%	0.000	1.194	0.048	1.53
F	39986	0.918	0%	0	65.0%	0.597	35.0%	0.32128	0%	0.000	1.213	0.093	2.94
G	10259.00	0.236	0%	0	60.0%	0.141	40.0%	0.09421	0%	0.000	1.232	0.024	0.76
H	75099.00	1.724	0%	0	40.0%	0.690	50.0%	0.86202	0%	0.000	1.162	0.167	5.23
TOTAL	241198.00	5.537										0.752	20.89

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 4)

Ea= 0.8	Qa= 2.2
Eb= 1.08	Qb= 2.92
Ec= 1.46	Qc= 3.73
Ed= 2.64	Qd= 5.25

DISCHARGE TO SE CORNER 20.89 CFS

Weighted E Method

BEEHIVE HOMES

Proposed Developed Basins

											100-Year, 6-hr.			10-day
Basin	Area (sf)	Area (acres)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (ac-ft)	Volume (ac-ft)	Flow cfs	Volume (ac-ft)
			%	(acres)	%	(acres)	%	(acres)	%	(acres)				
UPLAND A	32339	0.742	0%	0	10.0%	0.074	5.0%	0.03712	85%	0.631	2.425	0.150	3.67	0.234
UPLAND B	32047	0.736	0%	0	10.0%	0.074	5.0%	0.03678	85%	0.625	2.425	0.149	3.64	0.232
UPLAND C	21936	0.504	0%	0	10.0%	0.050	5.0%	0.02518	85%	0.428	2.425	0.102	2.49	0.159
D	8521	0.196	0%	0	20.0%	0.039	30.0%	0.05868	50%	0.098	1.974	0.032	0.85	0.045
E	21011	0.482	0%	0	0.0%	0.000	10.0%	0.04823	90%	0.434	2.522	0.101	2.46	0.159
F	39986	0.918	0%	0	65.0%	0.597	35.0%	0.32128	85%	0.780	3.457	0.264	7.04	0.368
G	10259.00	0.236	0%	0	20.0%	0.047	20.0%	0.0471	60%	0.141	2.092	0.041	1.06	0.060
H	75099.00	1.724	0%	0	50.0%	0.862	30.0%	0.51721	20%	0.345	1.506	0.216	6.26	0.262
Harvest amount	154876.00	3.555										5678.787	27.45	

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 4)

Ea= 0.8	Qa= 2.2
Eb= 1.08	Qb= 2.92
Ec= 1.46	Qc= 3.73
Ed= 2.64	Qd= 5.25

DISCHARGE TO SE CORNER	27.45	CFS
EXISTING DISCHARGE	20.89	CFS
INCREASE	6.56	

DROP INLET CALCULATIONS

BASIN	TYPE OF INLET	AREA (SF)	Q (CFS)	H (FT)	H ALLOW (FT)
A+D	Single 'D'	5.92	4.52	0.0251	0.5
B+E	Single 'D'	5.92	8.8	0.0953	0.5
C+F	Single 'D'	5.92	9.53	0.1118	0.5
G+.1H	Single 'D'	5.92	1.686	0.0035	0.5
OUTFALL	Single 'D'	5.92	27.45	0.9274	1

ORIFICE EQUATION

Q = CA sqrt(2gH)

C = 0.6

g = 32.2

Pipe Capacity

Pipe	D	Slope	Area	R	Q Provided	Q Required	Velocity
	(in)	(%)	(ft^2)		(cfs)	(cfs)	(ft/s)
WEST REACH	18	4	1.77	0.375	21.07	13.62	7.71
EAST READ	18	7	1.77	0.375	27.87	27.45	15.53
MAIN OUTFALL	24	1.6	3.14	0.5	28.69	27.45	8.74

.006

Manning's Equation:

Q = 1.49/n * A * R^(2/3) * S^(1/2)

A = Area
R = D/4
S = Slope
n = 0.013

EMERGENCY OVERFLOW

Weir Equation:

$$Q = CLH^{3/2}$$

Q= 12.72 cfs
C = 2.95
H = 0.67 ft
L = Length of weir

$$L = \frac{27.45}{2.95(.66)^{3/2}}$$

L = 17.09 ft
Use 20.00 feet for length of weir
Max Q=2.95(20)(.67^3/2)=32.36 cfs