Leo Lew
County Manager

PINAL COUNTY
WIDE OPEN OPPORTUNITY

APPLICATION FOR CHANGE OF ZONING REGULATIONS IN AN UNINCORPORATED AREA OF PINAL COUNTY, ARIZONA
(All Applications Must Be Typed or Written in Ink)

Formal Zoning Change & Property Information:
(feel free to include answers and to these questions in a Supplementary Narrative, when doing so write see narrative on the space provided)

1. Pinal County Staff Coordinator: _____
2. Date of Pre-application Review:__/_____/_____ Pre-Application Review No.: Z-PA-_____-_____
3. Current Zoning *(Please provide Acreage Breakdown)*: _____
4. Requested Zoning *(Please provide Acreage Breakdown)*: _____
5. Parcel Number(s): 410-12-001D
6. Parcel Size(s): _____
7. The existing use of the property is as follows: _____
8. The exact use proposed under this request: _____
9. What is the Comprehensive Plan Designation for the subject property: _____
10. Is the property located within three (3) miles of an incorporated community? ❑ YES ☒ NO
11. Is an annexation into a municipality currently in progress? ❑ YES ❑ NO
12. Is there a zoning violation on the property for which the owner has been cited? ❑ YES ☒ NO

    If yes, zoning violation # _____
13. Discuss any recent changes in the area that would support your application i.e.: zone change(s), subdivision approval, Planned Area Development (PAD), utility or street improvements, adopted comprehensive/area plan(s) or similar changes._____
14. Explain why the proposed development is needed and necessary at this time. _____

INV#:_____AMT:_____DATE:_____CASE:_____Xref:_____

SUPPORTING INFORMATION

1. Note any services that are not available to the site. Discuss any improvements of services that would be paid for by the public: The site currently has no water, sewer, or electrical. It is anticipated that the Red Rock Village PAD will develop these services to the shared boundary between the two PADs where the developer will then extend connections into the Smith-Rothberg PAD.

2. What is the amount of traffic to be generated (# of trips/day, deliveries/week)? Show ingress/egress on the site plan: Please see the PAD document for a discussion of anticipated traffic impacts.

3. How many parking spaces are to be provided (employees and customers)? Indicate these parking spaces on the site plan: This is a residential development that will provide appropriate parking for the homes dependent on number of bedrooms.

4. Is there a potential for excessive noise (I.E.; children, machinery) or the production of smoke, fumes, dust or glare with this proposed land use? If yes, how will you alleviate these problems for your neighbors?

As a residential subdivision, it is expected children will be present. Dedicated recreation areas will help alleviate noise around homes.

5. What type of landscaping are you proposing to screen this use from your neighbors?

The subdivision will be screened with a mix of trees and shrubs in landscape borders along the boundaries. A masonry wall will surround the rear yard of each home.

6. What type of signage are you proposing for the activity? Where will the signs be located?

Monumentation signage will be at each entrance of the subdivision.

7. If the proposed land use involves any type of manufacturing or production process, provide a short synopsis of the processes utilizing diagrams, flowcharts and/or a short narrative: N/A

8. Explain how the appearance and operation of the proposed land use will maintain the integrity and character of the zone in which the use is requested: The R-7 zone is meant to provide for single-family residential neighborhoods. This subdivision will be a single-family home subdivision that is of the same style as the nearby neighborhoods.

9. Have you discussed possible conditions that may be placed on the approval with the Planning Department?

❑ YES ❑ NO

10. Do you understand that if a condition is violated, that there is a public process by which your zoning may be reverted? ❑ YES ❑ NO

PROPERTY OWNERSHIP LIST
(Required for filing all applications)

Instructions: Print Name, Address, City, State, Zip Code and Tax Parcel Number for each property owner within 600 feet of the subject parcel boundary. Feel free to attach a separate list if generated digitally. Please see "How to use the Buffer Tool" on our FAQ's page if you are generating the list.

Parcel No.: 410-12-001E
Name: Global Water - Santa Cruz Water Co.
Address: 21410 N 19th Ave Ste 220
City/ST/Zip: Phoenix, AZ 85027

Parcel No.: 410-08-003A
Name: Arizona Public Service Company
Address: PO Box 53999 MS 9505
City/ST/Zip: Phoenix, AZ 85072

Parcel No.: 410-12-001J
Name: RRV South LP
Address: 6720 N Scottsdale Rd Ste 250
City/ST/Zip: Phoenix, AZ 85072

Parcel No.: 410-12-001D
Name: Smith Robin B
Address: 12 Cedric Rd
City/ST/Zip: Summit, NJ 07901

Parcel No.: 410-12-001H
Name: Red Rock Village Community Association
Address: 8360 E Villa de Venturea Blvd Ste L100
City/ST/Zip: Scottsdale, AZ 85258

Parcel No.:
Name:
Address:
City/ST/Zip:

Parcel No.: 410-09-007A
Name: Walton International Group (USA) Inc, et al
Address: 13155 Noel Rd, Ste 100-LB 73
City/ST/Zip: Dallas, TX 75240

Parcel No.:
Name:
Address:
City/ST/Zip:

Parcel No.: 410-12-0020, 410-13-0030, 410-08-0010
Name: Union Pacific Railroad
Address: 1400 Douglas St Stop 1640
City/ST/Zip: Omaha, NE 68179

Parcel No.:
Name:
Address:
City/ST/Zip:

I hereby verify that the name list above was obtained on the 1st day of February, 2023, at the office of The Planning Center and is accurate and complete to the best of my knowledge.
(Source of Information)

On this 23rd day of March, 2023, before me personally appeared Garrett Aldrete
(Name of signor)

Signature Garrett Aldrete Date 3/23/23

State of Arizona
)ss.
County of Pima

JACLYN MARTINEZ
Notary Public - Arizona
Pima County
Commission # 640020
My Comm. Expires Dec 6, 2026
(SEAL)

My Commission Expires Dec 06, 2026

Signature of Notary Public Jaclyn Martinez

I **certify the information included in this application is accurate, to the best of my knowledge. I have read the application and I have included the information, as requested. I understand if the information submitted is incomplete, this application cannot be processed. All notices will be sent to the applicant unless otherwise directed in writing**

Name of Applicant	Address	
Brian Underwood		
Signature of Applicant	E-Mail Address	Phone Number

Name of Agent/Representative	Address	
Brian Underwood		
Signature of Agent/Representative	E-Mail Address	Phone Number

The Agent/Representative has the authority to act on behalf of the landowner/applicant, which includes agreeing to stipulations. The agent will be the contact person for Planning staff and must be present at all hearings. Please use attached Agency Authorization form, if applicable.

Robin Smith	19750 Beach Rd Apt 601 Jupiter, Fl 334	
Name of Landowner	Address	
Robin B Smith	robinbsmith@gmail.com	561-339-47
Signature of Landowner	E-Mail Address	Phone Number 561-250-63

If landowner is not the applicant, then applicant must submit a signed notarized consent form from the landowner with this application. Please use attached Consent to Permit form, if applicable.

I **certify the information included in this application is accurate, to the best of my knowledge. I have read the application and I have included the information, as requested. I understand if the information submitted is incomplete, this application cannot be processed. All notices will be sent to the applicant unless otherwise directed in writing**

Name of Applicant	Address	
Brian Underwood		
Signature of Applicant	E-Mail Address	Phone Number

Name of Agent/Representative	Address	
Brian Underwood		
Signature of Agent/Representative	E-Mail Address	Phone Number

The Agent/Representative has the authority to act on behalf of the landowner/applicant, which includes agreeing to stipulations. The agent will be the contact person for Planning staff and must be present at all hearings. Please use attached Agency Authorization form, if applicable.

Joan Rothberg 12 Cedric Road Summit, NJ 07901		
Name of Landowner	Address	
Joan C Rothberg	joanrothberg10@gmail.com	908 277 1580
Signature of Landowner	E-Mail Address	Phone Number

If landowner is not the applicant, then applicant must submit a signed notarized consent form from the landowner with this application. Please use attached Consent to Permit form, if applicable.

I **certify the information included in this application is accurate, to the best of my knowledge. I have read the application and I have included the information, as requested. I understand if the information submitted is incomplete, this application cannot be processed. All notices will be sent to the applicant unless otherwise directed in writing**

Name of Applicant	Address	
Brian Underwood		
Signature of Applicant	E-Mail Address	Phone Number

Name of Agent/Representative	Address	
Brian Underwood		
Signature of Agent/Representative	E-Mail Address	Phone Number

The Agent/Representative has the authority to act on behalf of the landowner/applicant, which includes agreeing to stipulations. The agent will be the contact person for Planning staff and must be present at all hearings. Please use attached Agency Authorization form, if applicable.

Robert Rothberg 12 Cabrie Road Summit, NJ 07901		
Name of Landowner	Address	908.277.1580
Robert Rothberg	RobertRothberg10@gmail.com	
Signature of Landowner	E-Mail Address	Phone Number

If landowner is not the applicant, then applicant must submit a signed notarized consent form from the landowner with this application. Please use attached Consent to Permit form, if applicable.

AGENCY AUTHORIZATION

(To be completed by all landowners who do not represent themselves. Instructions for completing required information are in bold and brackets below lines. If applicant is a company, corporation, partnership, joint venture, trustee, etc., please use the corporate signature block and have the notary fill in the notarization section for corporations not individuals and cannot be submitted digitally)

TO: Pinal County Community Development
P.O. Box 2973
Florence, AZ 85232

Smith Robin B, and Rothberg Robert & Joan O

[Insert Name -- If a Corporation, Partnership or Association, Include State of Incorporation]

Hereinafter referred to as "Owner," is/are the owner(s) of 60 acres located at In Red Rock, AZ approximately half a mile south of the intersection of Aguirre Lane and Sasco Road., and further identified

[Insert Address of Property]

As assessor parcel number 410-12-001D and legally described as follows:

[Insert Parcel Number]

Insert Legal Description Here OR Attach as Exhibit A

Said property is hereinafter referred to as the "Property."
Owner hereby appoints The Planning Center

[Insert Agent's Name. If the Agent is a Company, Insert Company Name Only]

Hereinafter referred to as "Agent," to act on Owner's behalf in relation to the Property in obtaining approval from Pinal County for a minor land division and to file applications and make the necessary submittals for such approvals.

[Individual PROPERTY OWNER signature block and acknowledgment.
DO NOT SIGN HERE IF SIGNING AS AN OFFICER OF A CORPORATION SIGN NEXT PAGE]

[Signature]

19750 Beach Rd Apt 601 Jup. FL 33469
[Address]

Dated: 3/28/23

[Signature]

[Address]

Dated: _____

STATE OF FL)
) ss.
COUNTY OF PALM BEACH)

(SEAL)

The foregoing instrument was acknowledged before me, this 28 day MARCH, 2023
by ROBIN SMITH

My Commission Expires OCT 29, 2025

Signature of Notary Public

MURSHIDA UDDIN

Printed Name of Notary

Signature of Notary

MURSHIDA UDDIN
Notary Public - State of Florida
Commission # HH 170636
My Comm. Expires Oct 29, 2025

AGENCY AUTHORIZATION

(To be completed by all landowners who do not represent themselves. Instructions for completing required information are in bold and brackets below lines. If applicant is a company, corporation, partnership, joint venture, trustee, etc., please use the corporate signature block and have the notary fill in the notarization section for corporations not individuals and cannot be submitted digitally)

TO: Pinal County Community Development
P.O. Box 2973
Florence, AZ 85232

Smith Robin B, and Rothberg Robert & Joan O

[Insert Name -- If a Corporation, Partnership or Association, Include State of Incorporation]

Hereinafter referred to as "Owner," is/are the owner(s) of 60 acres located at In Red Rock, AZ approximately half a mile south of the intersection of Aguirre Lane and Sasco Road., and further identified

[Insert Address of Property]

As assessor parcel number 410-12-001D and legally described as follows:

[Insert Parcel Number]

Insert Legal Description Here OR Attach as Exhibit A

Said property is hereinafter referred to as the "Property."
Owner hereby appoints The Planning Center

[Insert Agent's Name. If the Agent Is a Company, Insert Company Name Only]

Hereinafter referred to as "Agent," to act on Owner's behalf in relation to the Property in obtaining approval from Pinal County for a minor land division and to file applications and make the necessary submittals for such approvals.

[Individual PROPERTY OWNER signature block and acknowledgment.
DO NOT SIGN HERE IF SIGNING AS AN OFFICER OF A CORPORATION SIGN NEXT PAGE]

Robert Rothberg
[Signature]
12 Cedric Road Sumit NJ 07901
[Address]

Dated: 3/28/23

Robert Rothberg
[Signature]
12 Cedric Rd Summit NJ 07901
[Address]

Dated: 3/28/23

STATE OF NEW JERSEY)
) ss.
COUNTY OF UNION)

GARY A WOODS
Notary Public - State of New Jersey
My Commission Expires Jan 13, 2026

(SEAL)

The foregoing instrument was acknowledged before me, this 28 day MARCH, 2023
by GARY WOODS

My Commission Expires 01/13/26

Signature of Notary Public

GARY WOODS
Printed Name of Notary

GARY A WOODS
Notary Public - State of New Jersey
My Commission Expires Jan 13, 2026

Signature of Notary

CORPORATE PROPERTY OWNER SIGNATURE BLOCK AND ACKNOWLEDGMENT

_____
[Insert Company's or Trust's Name]

By: _____
[Signature of Authorized Officer, or Trustee]

Its: _____
[Insert Title]

Dated: _____

STATE OF_____)
) ss.
COUNTY OF_____)

The foregoing instrument was acknowledged before me, this_____ day of _____, 20____ by

_____,_____ _____
[Insert Signor's Name] ***[Insert Title]***

_____, _____an,
[Name of Company or Trust] ***[Insert State of Incorporation, if applicable]***

And who being authorized to do so, executed the foregoing instrument on behalf of said entity for the purposes stated therein.

My Commission Expires: _____

_____ _____
Printed Name of Notary Signature of Notary

ALTERNATE: Use the following acknowledgment only when a second company is signing

On behalf of the owner:

STATE OF_____)
) ss. (Seal)
COUNTY OF_____)

The foregoing instrument was acknowledged before me, this_____ day of _____, 20____ by _____, who acknowledges himself/herself to be
[Insert Signor's Name]

_____, of _____
[Title of Office Held] ***[Second Company]***

As _____ for _____, and who being
[*i.e. member, manager, etc.]* ***[Owner's Name]***

Authorized to do so, executed the foregoing instrument on behalf of said entities for the purposes stated therein.

My Commission Expires_____

_____ _____
Printed Name of Notary Signature of Notary

Application Checklist:

A. Check the appropriate item:

❑ This Zone Change is being submitted without a PAD request

■ This Zone Change is being submitted in conjunction with a PAD request.

The applicant must complete a PAD application. – *(Please utilize the "PAD Book" and the "Site Plan" of the PAD application to fulfill the Zoning Application "Narrative" and "Site Plan" in lieu of while having separate copies for each application).*

B. Hold a Neighborhood/Community Meeting:

❑ Notify all property owners within 1200' (feet)

❑ Hold the meeting within five (5) miles of the subject property

❑ Hold the meeting between 5:00 pm – 9:00 pm

❑ Include with the application the following:

- Copy of Notice of Neighborhood/Community Meeting
- List of property owners notified - ***(Use page 5 of this application)***
- Minutes of the meeting
- Attendance sign-in sheet with names & addresses

C. Submit a completed **"Agency Authorization"** form *(if applicable).*

D. Submit a written **Narrative** concerning the proposed development ***(if not submitting in conjunction with a PAD Application)*** to include:

❑ **1.** Title Page

❑ **2.** Purpose of Request

❑ **3.** Description of Proposal

- **a.** Nature of the Project including Proposed Land Use
- **b.** Conformance to adopted Comprehensive Plan
- **c.** Answers to the questions from the **Supporting Information** sheet
- **d.** Location & Accessibility
- **e.** Utilities & Services
- **f.** Neighborhood Meeting Information
- **g.** Appendix, as applicable

E. Submit a **Site Plan** ***(if not submitting in conjunction with a PAD Application)*****.** The submittal shall be professionally prepared (*by a surveyor, architect, or other design professional*) and drawn at a sufficient scale as to not exceed a print size larger than 11" X 17". The lettering shall be of sufficient size to be legible when reduced to an 8½" X 11" print and include:

- ❑ **1.** Legal Description of total site.
- ❑ **2.** Name(s) of Landowner(s), Developer, Applicant and Person or Firm preparing plan.
- ❑ **3.** North Arrow, Scales (*written and graphic*), Preparation Date and Subsequent Revision Dates.
- ❑ **4.** Location of all Existing & Proposed Structures & Buildings
- ❑ **5.** Location of all Existing & Proposed Utilities with Location & Width of Associated Easements.
- ❑ **6.** All Existing & Proposed Public and/or Private Streets with Location & Width of Associated Easements & Right-of-Ways.
- ❑ **7.** All Points of Ingress & Egress.
- ❑ **8.** Location & Types of Existing & Proposed Landscaping.
- ❑ **9.** Indicate Location, Type, Height, & Materials for Proposed Walls, Fences & Signs.
- ❑ **10.** Show whether the property is adjacent to a projected regionally significant route (RSR) as identified on the Corridor Preservation Map (Figure 9) in the Regionally Significant Routes for Safety and Mobility (RSRSM), Final Report. If adjacent to a projected RSR, show how applicant will comply with the RSRSM Final Report and the RSRSM Access Management Manual.

F. Submit the following information regarding **Water Supply**:

- ❑ **1**. Identify the water service provider
- ❑ **2**. Provide an estimated range of water demand and include an explanation of the method used to obtain the estimate
- ❑ **3.** Provide information about water supply and source, including renewable and non-groundwater supplies
- ❑ **4**. If a portion of the water supply for the proposed project is groundwater, the application shall be accompanied by the following information that is publicly available from the Arizona Department of Water Resources (ADWR) and/or Arizona Geological Survey, or otherwise available to the land owner:
    - o Depth to bedrock & Depth to groundwater
    - o Known fissures or land subsidence in the area
    - o Known wells in the area, available information on status and water levels
    - o Summary of data-gathering efforts and sources of information

G. **Submit** a copy of a certified **A.L.T.A.** survey, including a legal description of proposed zoning districts.

H. Submit a **Drainage report** and a **TIA report.** ***(Public Works fees for these reviews will be due at the time of submittal and each subsequent review until deemed acceptable).***

I. **Aware** that earth fissure maps are available online from the Arizona State Geologic Survey.

J. **Submit a list of all property owners within 600' (feet)** of the subject property boundary showing name, mailing address and tax parcel numbers. This list must be obtained within 30 days prior to application submission. A map showing the 600' boundary and parcels must be included as well (*A Tax Assessor Parcel Map is Acceptable*). - ***(This list is a separate list from the "Neighborhood/Community Meeting list of 1,200' however use Page 5 of this application as well).***

K. **Complete and Submit** the "Comprehensive Plan Compliance Checklist" a copy of the Checklist can be found here: http://www.pinalcountyaz.gov/CommunityDevelopment/Planning/Documents/Planning%20Applications/CompPlan%20Checklist.pdf

L. **Submit** the Non-Refundable fees for a zone change outlined on page one of the Zone Change Application.

M. **Submit** all documentation outlined in the Zone Change application in a multi-PDF format per item of the application with all supporting documentation via the online portal site at: https://citizenaccess.pinalcountyaz.gov/CitizenAccess/. *

a. An ESRI shapefile for land use (conceptual) which shows all proposed zoning lines and zoning classifications for the project in NAD_1983_stateplan_arizona_central_fips_0202_intlfeet projection

** Your application must be submitted digitally via the online portal site. Please call or email the Planning Division for more information.*

N. **Aware to Install Broadcast Notification Sign(s) on the site in conformance with the information shown in this application.** (*See page 10 & 11 of this application for illustrative details*). **Aware** that newspaper advertising fees and postage must be paid **by the applicant.** *(in addition to application fees)*

O. Signature at the end of the **"Checklist"** stating you have reviewed and addressed all areas within it.

I certify that I have submitted all the required information listed above, and I understand that this application for a Zone Change cannot be processed until all required information is submitted.

Brian Underwood

Signature Date

Leo Lew
County Manager

PINAL COUNTY
WIDE OPEN OPPORTUNITY

APPLICATION FOR PLANNED AREA DEVELOPMENT (PAD) OVERLAY DISTRICT IN AN UNINCORPORATED AREA OF PINAL COUNTY, ARIZONA

(All Applications Must Be Typed or Written in Ink)

Formal PAD Application & Property Information:

(Feel free to include answers and to these questions in a Supplementary Narrative, when doing so write see narrative on the space provided)

1. Pinal County Staff Coordinator: _____
2. Date of Pre-application Review: 1 /____/_____ Pre-Application Review No.: Z-PA-_____-_____
3. Current Zoning *(Please provide Acreage Breakdown)*: _____
4. Requested Zoning *(Please provide Acreage Breakdown)*: _____
5. Parcel Number(s) (Please attach a separate list if more space is needed): 410-12-001D
6. Parcel Size(s): _____
7. The existing use of the property is as follows: _____
8. The exact use proposed under this request: _____
9. What is the Comprehensive Plan Designation for the subject property: _____
10. Is the property located within three (3) miles of an incorporated community? ☐ YES ☒ NO
11. Is an annexation into a municipality currently in progress? ☐ YES ☒ NO
12. Is there a zoning violation on the property for which the owner has been cited? ☐ YES ☒ NO

    If yes, zoning violation # _____
13. Is this a major PAD Amendment request (no zone accompanying change)? ☐ YES ☐ NO If yes what was the previous PAD case number PZ-PD-_____
14. Discuss any recent changes in the area that would support your application i.e.: zone change(s), subdivision approval, Planned Area Development (PAD), utility or street improvements, adopted comprehensive/area plan(s) or similar changes._____
15. Explain why the proposed development is needed and necessary at this time. _____

INV#:_____ AMT:_____ DATE:_____ CASE:_____ Xref:_____

PROPERTY OWNERSHIP LIST
(Required for filing all applications)

Instructions: Print Name, Address, City, State, Zip Code and Tax Parcel Number for each property owner within 600/ 1,200 (circle one) feet of the subject parcel boundary. Feel free to attach a separate list if generated digitally. Please see "How to use the Buffer Tool" on our FAQ's page if you are generating the list.

Parcel No.: 410-12-001E
Name: Global Water - Santa Cruz Water Co
Address: 21410 N 19th Ave Ste 220
City/ST/Zip: Phoenix, AZ 85027

Parcel No.: 410-08-003A
Name: Arizona Public Service Company
Address: PO Box 53999 MS 9505
City/ST/Zip: Phoenix, AZ 85072

Parcel No.: 410-12-001J
Name: RRV South LP
Address: 6720 N Scottsdale Rd Ste 250
City/ST/Zip: Phoenix, AZ 85072

Parcel No.: 410-12-001D
Name: Smith Robin B
Address: 12 Cedric Rd
City/ST/Zip: Summit, NJ 07901

Parcel No.: 410-12-001H
Name: Red Rock Village Community Association
Address: 8360 E Villa de Venturea Blvd Ste L100
City/ST/Zip: Scottsdale, AZ 85258

Parcel No.:
Name:
Address:
City/ST/Zip:

Parcel No.: 410-09-007A
Name: Walton International Group (USA) Inc, et al
Address: 13155 Noel Rd, Ste 100-LB 73
City/ST/Zip: Dallas, TX 75240

Parcel No.:
Name:
Address:
City/ST/Zip:

Parcel No.: 410-12-0020, 410-13-0030, 410-08-0010
Name: Union Pacific Railroad
Address: 1400 Douglas St Stop 1640
City/ST/Zip: Omaha, NE 68179

Parcel No.:
Name:
Address:
City/ST/Zip:

I hereby verify that the name list above was obtained on the 1st day of February, 2023, at the office of The Planning Center and is accurate and complete to the best of my knowledge.
(Source of Information)

On this 2nd day of February, 2023, before me personally appeared Garrett Aldrete
(Name of signor)

Signature Garrett Aldrete Date 2/2/2023

State of Arizona
)ss.
County of Pima

(SEAL)

My Commission Expires 02/01/2025

Signature of Notary Public

MONICA M. SNIEZEK
NOTARY PUBLIC - ARIZONA
Pima County
Commission # 597616
My Commission Expires
February 1, 2025

I certify the information included in this application is accurate, to the best of my knowledge. I have read the application and I have included the information, as requested. I understand if the information submitted is incomplete, this application cannot be processed. All notices will be sent to the applicant unless otherwise directed in writing

Name of Applicant	Address	
Brian Underwood		
Signature of Applicant	E-Mail Address	Phone Number

Name of Agent/Representative	Address	
Brian Underwood		
Signature of Agent/Representative	E-Mail Address	Phone Number

The Agent/Representative has the authority to act on behalf of the landowner/applicant, which includes agreeing to stipulations. The agent will be the contact person for Planning staff and must be present at all hearings. Please use attached Agency Authorization form, if applicable.

Robin Smith	19750 Beach Rd Apt 601 Jupiter FL 33469	
Name of Landowner	Address	
Robin B Smith	robinblumsmith@gmail.com	561-339-4705
Signature of Landowner	E-Mail Address	Phone Number 561-250-6335

If landowner is not the applicant, then applicant must submit a signed notarized consent form from the landowner with this application. Please use attached Consent to Permit form, if applicable.

I certify the information included in this application is accurate, to the best of my knowledge. I have read the application and I have included the information, as requested. I understand if the information submitted is incomplete, this application cannot be processed. All notices will be sent to the applicant unless otherwise directed in writing

Name of Applicant | Address

Brian Underwood

Signature of Applicant | E-Mail Address | Phone Number

Name of Agent/Representative | Address

Brian Underwood

Signature of Agent/Representative | E-Mail Address | Phone Number

The Agent/Representative has the authority to act on behalf of the landowner/applicant, which includes agreeing to stipulations. The agent will be the contact person for Planning staff and must be present at all hearings. Please use attached Agency Authorization form, if applicable.

[redacted] Joan Rothberg, 12 Cedric Road Summit, NJ 07901

Name of Landowner | Address

Joan C Rothberg, joanrothberg10@gmail.com, 908 277 4550

Signature of Landowner | E-Mail Address | Phone Number

If landowner is not the applicant, then applicant must submit a signed notarized consent form from the landowner with this application. Please use attached Consent to Permit form, if applicable.

I certify the information included in this application is accurate, to the best of my knowledge. I have read the application and I have included the information, as requested. I understand if the information submitted is incomplete, this application cannot be processed. All notices will be sent to the applicant unless otherwise directed in writing

Name of Applicant	Address	
Brian Underwood		
Signature of Applicant	E-Mail Address	Phone Number

Name of Agent/Representative	Address	
Brian Underwood		
Signature of Agent/Representative	E-Mail Address	Phone Number

The Agent/Representative has the authority to act on behalf of the landowner/applicant, which includes agreeing to stipulations. The agent will be the contact person for Planning staff and must be present at all hearings. Please use attached Agency Authorization form, if applicable.

[redacted] Robert Rothberg	12 Cedric Road Summit, NJ 07901	
Name of Landowner	Address	
Robert Rothberg	RobertRothberg10@gmail.com	908-377-1520
Signature of Landowner	E-Mail Address	Phone Number

If landowner is not the applicant, then applicant must submit a signed notarized consent form from the landowner with this application. Please use attached Consent to Permit form, if applicable.

AGENCY AUTHORIZATION

(To be completed by all landowners who do not represent themselves. Instructions for completing required information are in bold and brackets below lines. If applicant is a company, corporation, partnership, joint venture, trustee, etc., please use the corporate signature block and have the notary fill in the notarization section for corporations not individuals and cannot be submitted digitally)

TO: Pinal County Community Development
P.O. Box 2973
Florence, AZ 85232

Smith Robin B, and Rothberg Robert & Joan O

[Insert Name -- If a Corporation, Partnership or Association, Include State of Incorporation]

Hereinafter referred to as "Owner," is/are the owner(s) of 60 acres located at In Red Rock, AZ approximately half a mile south of the intersection of Aguirre Lane and Sasco Road., and further identified

[Insert Address of Property]

As assessor parcel number 410-12-001D and legally described as follows:

[Insert Parcel Number]

Insert Legal Description Here OR Attach as Exhibit A

Said property is hereinafter referred to as the "Property."

Owner hereby appoints The Planning Center

[Insert Agent's Name. If the Agent Is a Company, Insert Company Name Only]

Hereinafter referred to as "Agent," to act on Owner's behalf in relation to the Property in obtaining approval from Pinal County for a minor land division and to file applications and make the necessary submittals for such approvals.

[Individual PROPERTY OWNER signature block and acknowledgment.
DO NOT SIGN HERE IF SIGNING AS AN OFFICER OF A CORPORATION SIGN NEXT PAGE]

[Signature]
12 Cedric Road Summit NJ 07901
[Address]

Dated: 3/28/23

[Signature]
12 Cedric Rd Summit NJ 07901
[Address]

Dated: 3/28/23

STATE OF NEW JERSEY)
) ss.
COUNTY OF Union)

GARY A WOODS
Notary Public - State of New Jersey
My Commission Expires Jan 13, 2026

(SEAL)

The foregoing instrument was acknowledged before me, this 28 day of March, 2023
by [signature]

My Commission Expires 01/13/26

[signature]
Printed Name of Notary

[signature]
Signature of Notary

GARY A WOODS
Notary Public - State of New Jersey
My Commission Expires Jan 13, 2026

AGENCY AUTHORIZATION

(To be completed by all landowners who do not represent themselves. Instructions for completing required information are in bold and brackets below lines. If applicant is a company, corporation, partnership, joint venture, trustee, etc., please use the corporate signature block and have the notary fill in the notarization section for corporations not individuals and cannot be submitted digitally)

TO: Pinal County Community Development
P.O. Box 2973
Florence, AZ 85232

Smith Robin B, and Rothberg Robert & Joan O

[Insert Name -- If a Corporation, Partnership or Association, Include State of Incorporation]

Hereinafter referred to as "Owner," is/are the owner(s) of 60 acres located at In Red Rock, AZ approximately half a mile south of the intersection of Aguirre Lane and Sasco Road., and further identified

[Insert Address of Property]

As assessor parcel number 410-12-001D and legally described as follows:

[Insert Parcel Number]

Insert Legal Description Here OR Attach as Exhibit A

Said property is hereinafter referred to as the "Property."

Owner hereby appoints The Planning Center

[Insert Agent's Name. If the Agent is a Company, Insert Company Name Only]

Hereinafter referred to as "Agent," to act on Owner's behalf in relation to the Property in obtaining approval from Pinal County for a minor land division and to file applications and make the necessary submittals for such approvals.

[Individual PROPERTY OWNER signature block and acknowledgment.
DO NOT SIGN HERE IF SIGNING AS AN OFFICER OF A CORPORATION SIGN NEXT PAGE]

[Signature]

19750 Beach Rd Apt 601 Jupiter FL 33469

[Address]

Dated: 3/28/2023

[Signature]

[Address]

Dated: _____

STATE OF FL)
) ss.
COUNTY OF PALM BEACH)

(SEAL)

The foregoing instrument was acknowledged before me, this 28 day of MARCH, 20 23
by ROBIN SMITH

My Commission Expires OCT 29, 2025

MURSHIDA UDDIN
Printed Name of Notary

MURSHIDA UDDIN
Notary Public - State of Florida
Commission # HH 170636
My Comm. Expires Oct 29, 2025

Signature of Notary

CORPORATE PROPERTY OWNER SIGNATURE BLOCK AND ACKNOWLEDGMENT

The appropriate corporate officer or trustee signs this signature block NOT the block on the previous page

_____

[Insert Company's or Trust's Name]

By: _____

[Signature of Authorized Officer, or Trustee]

Its: _____

[Insert Title]

Dated: _____

STATE OF_____)

) ss.

COUNTY OF_____)

The foregoing instrument was acknowledged before me, this_____ day of _____, 20____ by

_____,_____ _____

[Insert Signor's Name] ***[Insert Title]***

_____, _____an,

[Name of Company or Trust] ***[Insert State of Incorporation, if applicable]***

And who being authorized to do so, executed the foregoing instrument on behalf of said entity for the purposes stated therein.

My Commission Expires: _____

_____ _____

Printed Name of Notary Signature of Notary

ALTERNATE: Use the following acknowledgment only when a second company is signing

On behalf of the owner:

STATE OF_____)

) ss. (Seal)

COUNTY OF_____)

The foregoing instrument was acknowledged before me, this_____ day of _____, 20____ by

_____, who acknowledges himself/herself to be

[Insert Signor's Name]

_____, of _____

[Title of Office Held] ***[Second Company]***

As _____ for _____, and who being

[i.e. member, manager, etc.] ***[Owner's Name]***

Authorized to do so, executed the foregoing instrument on behalf of said entities for the purposes stated therein.

My Commission Expires_____

_____ _____

Printed Name of Notary Signature of Notary

Application Checklist:

FOR A PROPOSED PLANNED AREA DEVELOPMENT (PAD) OVERLAY DISTRICT IN UNINCORPORATED PINAL COUNTY

A. Check the appropriate item:

❑ This PAD is being submitted without a zone change request

☒ This PAD is being submitted in conjunction with a zone change request.

The applicant must complete a zone change application. – ***(Please utilize the "PAD Book" and the "Site Plan" of the PAD application to fulfill the Zoning Application "Narrative" and "Site Plan" in lieu of while having separate copies for each application).***

B. Hold a Neighborhood/Community Meeting:

❑ **1.** Notify all property owners within 1200' (feet)

❑ **2.** Hold the meeting within five (5) miles of the subject property

❑ **3.** Hold the meeting between 5:00 pm – 9:00 pm

❑ **4.** Include with the application the following:

- ❑ Copy of Notice of Neighborhood/Community Meeting
- ❑ List of property owners notified - ***(Use page 2 of this application)***
- ❑ Minutes of the meeting
- ❑ Attendance sign-in sheet with names & addresses

❑ **5.** Applicant will be required to notify any jurisdiction within three (3) miles of the subject site boundary and provide proof via letter or email correspondence of sent notification and any jurisdiction response received.

C. Submit a completed **"Agency Authorization"** form ***(if applicable, Use page 4 of this application)***.

D. Submit a **"PAD Book"** (written narrative) concerning the proposed development to include the following sections – *Refer to Chapter 2.176.240 (B) of the PCDSC* for further clarification ***(NOTE: Please No Spiral Binding)***:

❑ **1.** Title Page

❑ **2.** Purpose of Request

❑ **3.** Description of Proposal

- ❑ Nature of the Project
- ❑ Proposed Land Uses
- ❑ Building Types & Densities
- ❑ Conformance to adopted Land Use Plans
- ❑ Circulation and Recreation Systems

❑ **4. Relationship to surrounding properties within onemile**

❑ **5. Schools**

❑ **6. Public Services/Community Services and how will the need for these services be addressed**

❑ **8. Location & Accessibility**

❑ **9. Compliance with RSRSM, Access Management Manual, October 2008**

❑ **10. Utilities & Services**

❑ **11. Ownership & Control – [*See Section 2.176.240(B)11*]**

❑ **12. Timing of Development (PhasingSchedule)**

❑ **13. Conformance with the Comprehensive Plan**

❑ **14. Recreational Amenities**

❑ **15. Fences, Walls & Screening**

❑ **16. Total number of dwellingunits**

❑ **17. Maximum Residential Density of each planningunit**

❑ **18. Total number of parking spaces for recreationalfacilities**

❑ **19. Type of landscaping**

❑ **20. Preliminary hydrologic data and a statement ondrainage**

❑ **21. Additional Information for Commercial & Industrial Uses *(if applicable)*:**

- ❑ Total Area in acres proposed *(Commercial & Industrial Separated)*
- ❑ Approximate retail sales floor area*(Commercial)*
- ❑ The uses proposed uses based on permitted uses in the basezone.
- ❑ The standards of height, open space, buffering, landscaping, pedestrian and vehicle circulation, off-street parking and loading, signs, outdoor lighting, and nuisance controls intended for the development.

❑ **22. Tables:**

- o **Land Use Table(s) to include the following:**
  - ❑ Total Acreage of the site
  - ❑ Total Area of arterial & collector streets
  - ❑ Total Area & Percent of Open Space
  - ❑ Total Number of each type of dwelling unit
  - ❑ Total Number of all dwelling units proposed including the range and mixture of lot sizes within each base zone
  - ❑ The Overall proposed Density

- **Amended Development Standards Table comparing proposed and current zoning code standards for:**
  - ❑ Minimum Lot Area
  - ❑ Minimum Lot Width
  - ❑ Minimum Building Setbacks
  - ❑ Maximum Building Height
  - ❑ Minimum Distance between main & detached accessory buildings
  - ❑ Buildable Area
- **Amended Use Tables:**
  - ❑ Permitted Uses
  - ❑ Non-Permitted Uses
- **Utilities & Services Table of type and source:**
  - ❑ Sewer
  - ❑ Water
  - ❑ Electric
  - ❑ Telephone
  - ❑ Police
  - ❑ Fire
  - ❑ Schools
  - ❑ Solid Waste Disposal

❑ 24. Appendix, as applicable (Cultural Biological/environmental studies, or other items)

E. **Submit** a **map** that shows the relationship to surrounding properties within one mile of the project boundaries. The map shall be drawn at a sufficient scale so as to not exceed a print size larger than 11" X 17". The lettering shall be of sufficient size to be legible when reduced to an 8½" X 11" print. The map shall contain the following information:

- ❑ Zoning Boundaries
- ❑ Street Alignment
- ❑ Open Space
- ❑ Trails

F. **Submit** a current preliminary **Title Report** *(dated within 60 daysprior to application)*

G. **Submit** a **Development Plan.** The submittal shall be drawn at a sufficient scale as to not exceed a print size larger than **24" X 36"** with **11" X 17"** reductions to be included in the PAD Overlay District Application where the lettering is of sufficient size to be readable. The Development Plan shall include:

❑ **1. Site Plan:**

- ❑ Title of project as shown in the narrative report, such as ***"Planned Area Development for (insert name of Development)"*** in bold letters.
- ❑ Name(s) of Landowner(s), Developer, Applicant, and Person or Firm preparing the plan.
- ❑ North Arrow, Scales *(written & graphic)*, Preparation Date & Subsequent Revision Dates.
- ❑ Vicinity Map showing project, surrounding development and applicable zoning districts *(scale no less than 1" = 2,000')*
- ❑ Existing Zone designation & requested zone change *(as applicable)*
- ❑ Legal Description of total site
- ❑ Boundaries of the proposed PAD Overlay Zoning District delineated and dimensioned by bearing and distance.
- ❑ All existing and proposed public and/or private streets, location and width of associated easements and rights-of-way and whether they will remain or be extinguished.
- ❑ Location & Identification of all existing and proposed utilities, location and width of associated easements.
- ❑ Location of all existing structures and significant natural features.
- ❑ Nearest regional significant routes to proposed development as projected in RSRSM Final Report, December 2008.
- ❑ All points of ingress and egress.
- ❑ Parking Areas.
- ❑ Identify & Delineate existing and/or proposed trails as shown on the Pinal County trails system master plan.
- ❑ Indicate and/or label *(as applicable)*:
    - Areas to be reserved for residential, commercial, industrial, open space, public use, facilities, drainage, and recreation.
    - Who will own, control and maintain the landscaping, recreational facilities, open areas, refuse disposal, streets, private utility systems.
    - Topography with a maximum contour interval of two feet except where existing ground is on a slope of less than two percent, then either one foot contours or spot elevation shall be provided where necessary.
    - Phase Lines *(as applicable)*
- ❑ Provide lot typical (typical should show building envelope, setbacks, lot dimensions and fences/walls) for:
    - Each type of dwelling unit
    - Lots in unusual locations (i.e. Cul-de-sacs, corners, hillside lots where clustering will occur.
- ❑ Indicate by notes the existing drainage pattern and proposed drainage plans for handling on-site and off-site storm water runoff
- ❑ Indicate location, type, height, and materials for proposed walls, fences, and signs.

- ❑ Location and types of existing and proposed landscaping.
- ❑ Designated Flood Zone

❑ **2. Quantitative Development Data Tables**

- ❑ Land Use table to include:
  - Total Gross Acreage of site
  - Total Area of Streets (Public & Private)
  - Total Area of Public Open Space
  - Total Net Area of all intended uses
  - Total Areas of Open Space for PAD Residents, and total Recreation Area Open Space
  - Total Dwelling Units permitted under base zoning district
  - Total number of each dwelling type including range and mixture of lot sizes within each base zone
  - Grand Total of Dwelling Units
  - Overall Density proposed
- ❑ Zoning Comparison Table of Existing & Proposed to include:
  - Lot area per dwelling unit
  - Setbacks
  - Minimum Lot Widths
  - Maximum Building Heights
- ❑ Parking (number of spaces)
- ❑ Utility & Services Table indicating type and source:
  - Sewer
  - Electric
  - Telephone
  - Water
  - Police/Security
  - Fire
  - Schools
  - Solid Waste Disposal
- ❑ Street Type Table indicating proposed rights-of-way and pavement widths for arterials, collectors, and neighborhood streets.

❑ **3. Submit** an **Open Space & Recreation Plan** ("OSRP") that includes – *Refer to Chapter 2.176*

- ❑ **Reviewed** the Pinal County Open Space & Recreational Area Guideline
- ❑ **Site Analysis**

- Aerial Photo
- Preferred scale of 1"=50' *(maximum scale of 1"=100')*
- Site Analysis should be produced in an **8½" X 11" format for text**
- Site Analysis should be produced in an **24" X 36" format for plans* (coordinate this requirement with your case coordinator)**

❑ Total acreage of proposed development

❑ Context Map showing the proximity and relationship to the County's trails, parks, or schools and connectivity to the adjacent neighborhoods, off-site trails, paths, bikeways, and transit areas.

❑ A concept drawing of the proposed development including:

- Gross Site Area
- Number of proposed lots
- Proposed Arterial & Collector street circulationsystem
- Proposed lot size(s),
- Proposed Retention/detention areas
- Proposed Development Phasing

❑ Context Map showing the proximity and relationship to the County's trails, parks, or schools and connectivity to the adjacent neighborhoods, off-site trails, paths, bikeways, and transit areas.

❑ A concept drawing of the proposed development including:

- Gross Site Area
- Number of proposed lots
- Proposed Arterial & Collector street circulationsystem
- Proposed lot size(s),
- Proposed Retention/detention areas
- Proposed Development Phasing

❑ A pedestrian circulation system

❑ A Slope Analysis identifying the following slope categories:

- 1) 0% - 5%
- 2) 5% - 10%
- 3) 10% and greater

❑ Identification of wash corridors and preliminary hydrologic information for the contributing watershed.

❑ Identification of the location of riparian vegetation and biological habitats. Aerial photos should be used to map the limits of notable vegetation.

❑ Identification of potential view corridors

- ❑ Identification of the projected 100-year floodplain and floodway boundary as required by FEMA.
- ❑ A record check through Arizona State Museum ("ASM") for archeological sites and identification of any sites or surveys
- ❑ The location and percentage of each proposed development to be preserved as conservation open space and the features to be protected including parcel size and minimum dimensions
- ❑ The location and percentage of each proposed development to be preserved as developed open space and the specific Recreation Areas, including amenities, parcel size and minimum dimensions.

❑ **4. Submit** a **Landscape Plan** that includes – *Refer to Chapter 2.176.240 (C) of the PCDSC*:

- ❑ A Vegetation Salvage Plan
- ❑ Proposed treatment of all ground surfaces (paving, turf, gravel, grading, etc.)
- ❑ Extent and location of all plant materials and other landscape features.
- ❑ Extent of decorative design elements such as fountains, pools, benches, sculptures, planters, and similar elements.
- ❑ Location of Water Outlets.

❑ **5. Submit a report utilizing the Arizona Game and Fish** ERT online review tool for Habitat and Riparian area identification.

❑ **Reviewed, Met,** and/or **addressed the** following in Chapter 2.176of the PCDSC:

- ❑ Minimum requirements for Open Space – (Section 130)
- ❑ Uses permitted within open space areas – (Section 140)
- ❑ Uses prohibited within open space areas – (Section 150)
- ❑ Minimum requirements for recreation areas – (Section 160)
- ❑ Minimum requirements for multi-use paths and trails – (Section 170)
- ❑ Minimum requirements for storm water retention & detention basins – (Section 180)
- ❑ Minimum requirements for streetscapes & entryways – (Section 190)
- ❑ Minimum requirements for conservation open space – (Section 200)

❑ **Submit** a **Master Sign Plan** detailing the location and type ofall proposed signage for the project. *(signage must be approved under separate permit, the PAD document cannot alter development standards for signs)*

❑ **Submit** a **Preliminary Drainage Report***

❑ **Submit** a **Preliminary Traffic Impact Assessment** (TIA)* (Your TIA must be approved prior to scheduling of your Public Hearing)

❑ **Submit** a copy of a certified **A.L.T.A.** survey, including a legal description of the PAD boundary and legal descriptions of all zoning district boundaries

❑ **Aware** that earth fissure maps are available online from the Arizona State Geologic Survey.

❑ **Submit a list of all property owners within 600' (feet)** of the subject property boundary showing name, mailing address and tax parcel numbers. This list must be obtained within 30 days prior to application submission. A map showing the 600' boundary and parcels must be included as well (*A Tax Assessor Parcel Map is Acceptable*). - ***(This list is a separate list from the "Neighborhood/Community Meeting list of 1,200' however use Page 5 of this application).***

❑ **Submit** separate preliminary reports or master plans for:

- ❑ Storm water drainage
- ❑ Wastewater & Domestic water service.

❑ **Submit** additional materials required for specific types of commercial and industrial uses as follows *(as applicable)*:

- ❑ **Commercial Uses:**
  - Retail sales floor area and total area proposed for commercial development
  - Type of uses proposed
- ❑ **Industrial Uses**
  - Total Area proposed for industrial uses
  - Types of uses proposed
  - Anticipated employment for development per major phases
- ❑ **Standards of:**
  - Height
  - Open Space
  - Buffering
  - Landscaping
  - Pedestrian & Vehicular circulation
  - off-street parking & Loading (the PAD document cannot alter minimum requirements for parking)

- Signs (the PAD document cannot alter the maximum amount of signage)
- Nuisance Controls

❑ **Complete and Submit the** "Comprehensive Plan Compliance Checklist"

❑ Non-Refundable filing fee for a Planned Area Development & Non-Refundable Public Works Fees

❑ **Submit** documentation outlined in the PAD application in a multi-PDF format per item of the application with all supporting documentation via the online portal at: https://citizenaccess.pinalcountyaz.gov/CitizenAccess/.
Please call or email the Planning Division for more information.

❑ **Submit**

❑ An ESRI shapefile for land use (conceptual) which shows all proposed zoning lines and zoning classifications for the project in NAD_1983_stateplan_arizona_central_fips_0202_intlfeet projection

OR

❑ An AutoCAD (.dwg file), which includes the following layers:

- Parcel
- Right-of-way
- Sub-perimeter
- Centerlines
- Section Lines
- Street names
- Lot-numbers
- Distances & Bearings tied by course and distance to two Pinal County survey control points or established city or county survey monuments. *(Information on these control points can be obtained from Public Works, Engineering Technicians at 520-866-6411).*

❑ **Aware to Install Broadcast Notification Sign(s) on the site in conformance with the information shown in this application.** (*See page 16 of this application for illustrative details*).

❑ **Aware** that all newspaper advertising fees must be paid by the applicant in addition to application fees.

❑ **Aware** that all public works fees are due at application submittal and for each subsequent submittal

❑ **Aware** that on property owner notifications that exceed 30 mail outs the applicant will be responsible for **notice prep and postage**

- ❑ **Aware** that this application will be submitted to AZGF Department for review and analysis with the ERT online review tool for Habitat and Riparian area identification.

- ❑ Signature at the end of the **"Checklist"** stating you have reviewed and addressed all areas within it.

I certify that I have submitted all the required information listed above, and I understand that this application for a Planned Area Development cannot be processed until all required information is submitted

Brian Underwood

Signature Date

Minor Comprehensive Plan Amendment for

Smith-Rothberg PAD

Pinal County, Arizona



The Planning Center
a division of TPC Group, Inc.

Minor Comprehensive Plan Amendment for Smith-Rothberg PAD
Red Rock, Arizona 85145

Submitted to:

Pinal County
Planning Division
31 North Pinal Street Building F
Florence, Arizona 85132

Prepared for:

RRV South, LP
6720 N Scottsdale Rd, Suite 250
Scottsdale, Arizona 85253

Prepared by:

The Planning Center
2 East Congress Street, Suite 600
Tucson, Arizona 85701
Telephone: (520) 623-6146

Table of Contents

I. PROJECT BACKGROUND 4

II. REQUEST 6

III. EXISTING LAND USE 9

IV. FUTURE LAND USE, PROPOSED COMPREHENSIVE PLAN DESIGNATION, AND PURPOSE 10

V. RECENT CHANGES IN THE AREA THAT WOULD SUPPORT THE REQUEST 10

VI. PROPOSED AMENDMENT IS NEEDED AND NECESSARY AT THIS TIME 10

VII. CONFORMANCE WITH COMPREHENSIVE PLAN VISION COMPONENTS 10

VIII. CONFORMANCE WITH COMPREHENSIVE PLAN'S KEY CONCEPTS 12

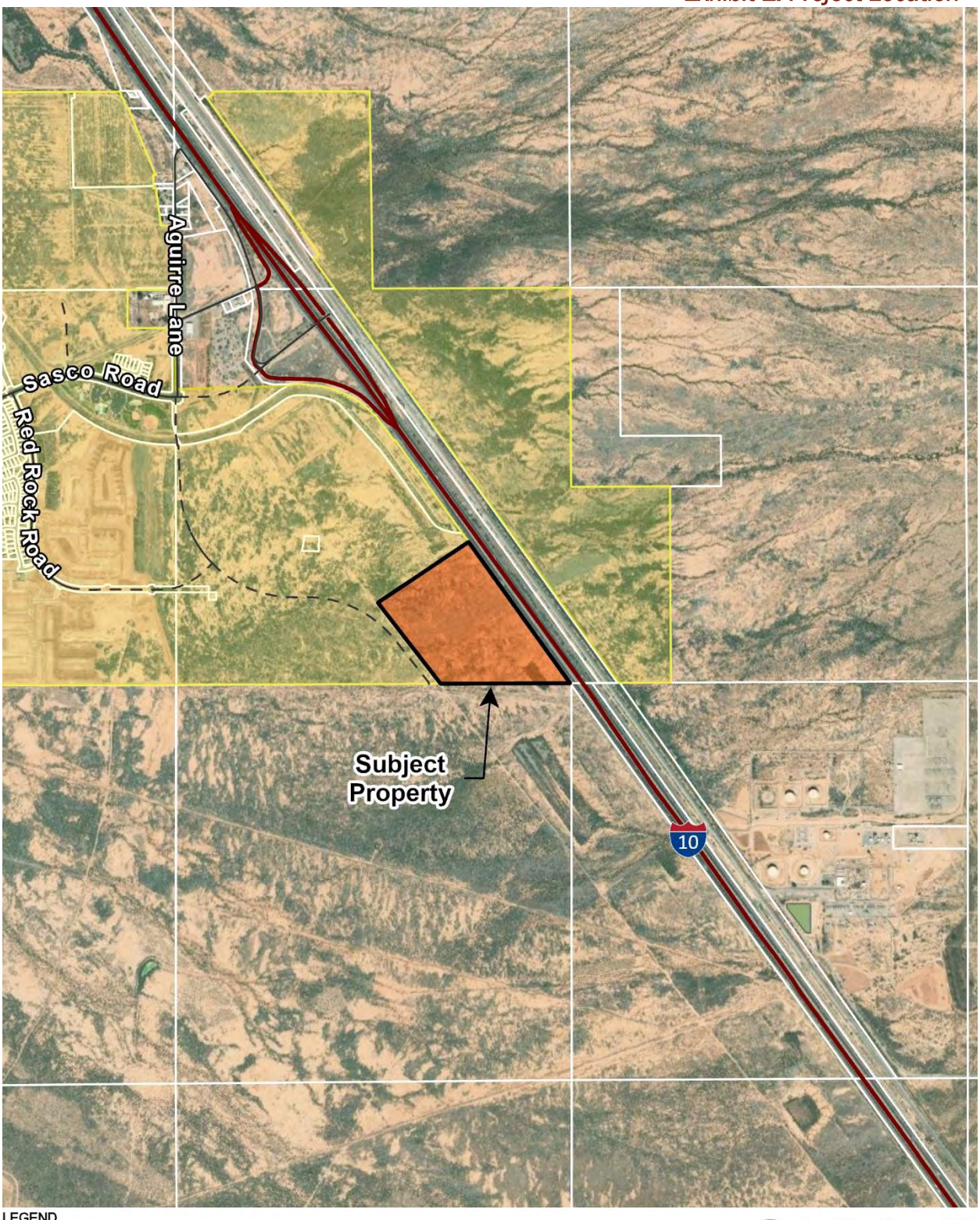
IX. MINOR COMPREHENSIVE PLAN AMENDMENT – APPROVAL CRITERIA 13

I. Project Background

The following document is part of the application for a Minor Comprehensive Plan Amendment for the Smith-Rothberg PAD. The proposed amendment encompasses approximately 60 acres located approximately three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane. See *Exhibit 1: Project Location*.

The State of Arizona has experienced rapid and continual population growth over the past five years and the need for new housing has become apparent. To maintain affordability for new and existing residents of Red Rock, the community must maintain a healthy housing supply by continuing to develop and plan for additional residential land uses. This proposed comprehensive plan amendment and accompanying rezoning and PAD overlay will provide the ability for a homebuilder to produce an additional 294 single-family homes in the Red Rock community.

Exhibit 1: Project Location



II. Request

The proposed request is to amend the Pinal County Comprehensive Plan Land Use Map designation for the parcel from Moderate Low Density Residential (MLDR) to Medium Density Residential. See *Exhibit 2: Existing Comprehensive Plan Map* and *Exhibit 3: Proposed Comprehensive Plan Map*.

Exhibit 2: Existing Comprehensive Plan Map

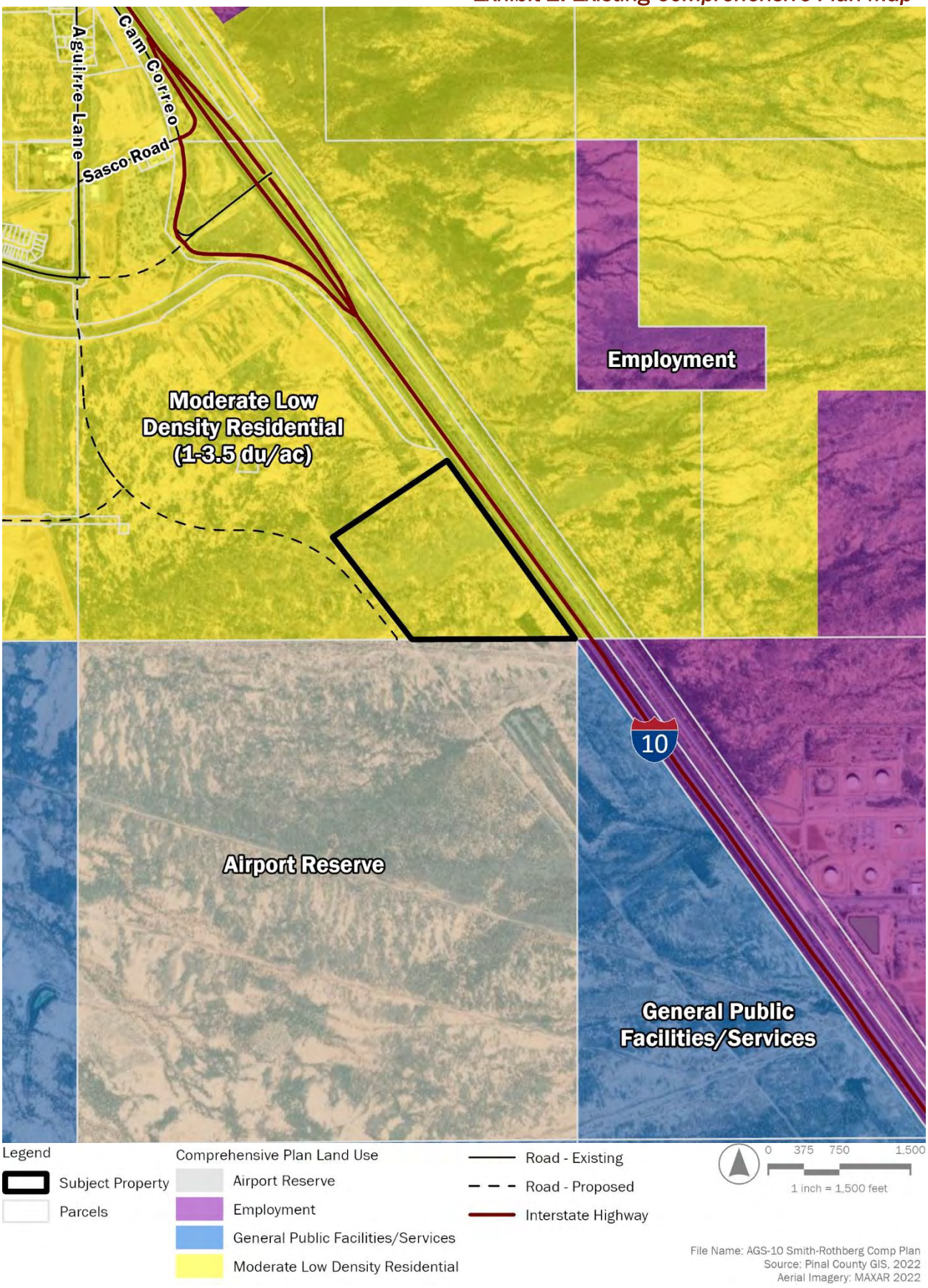
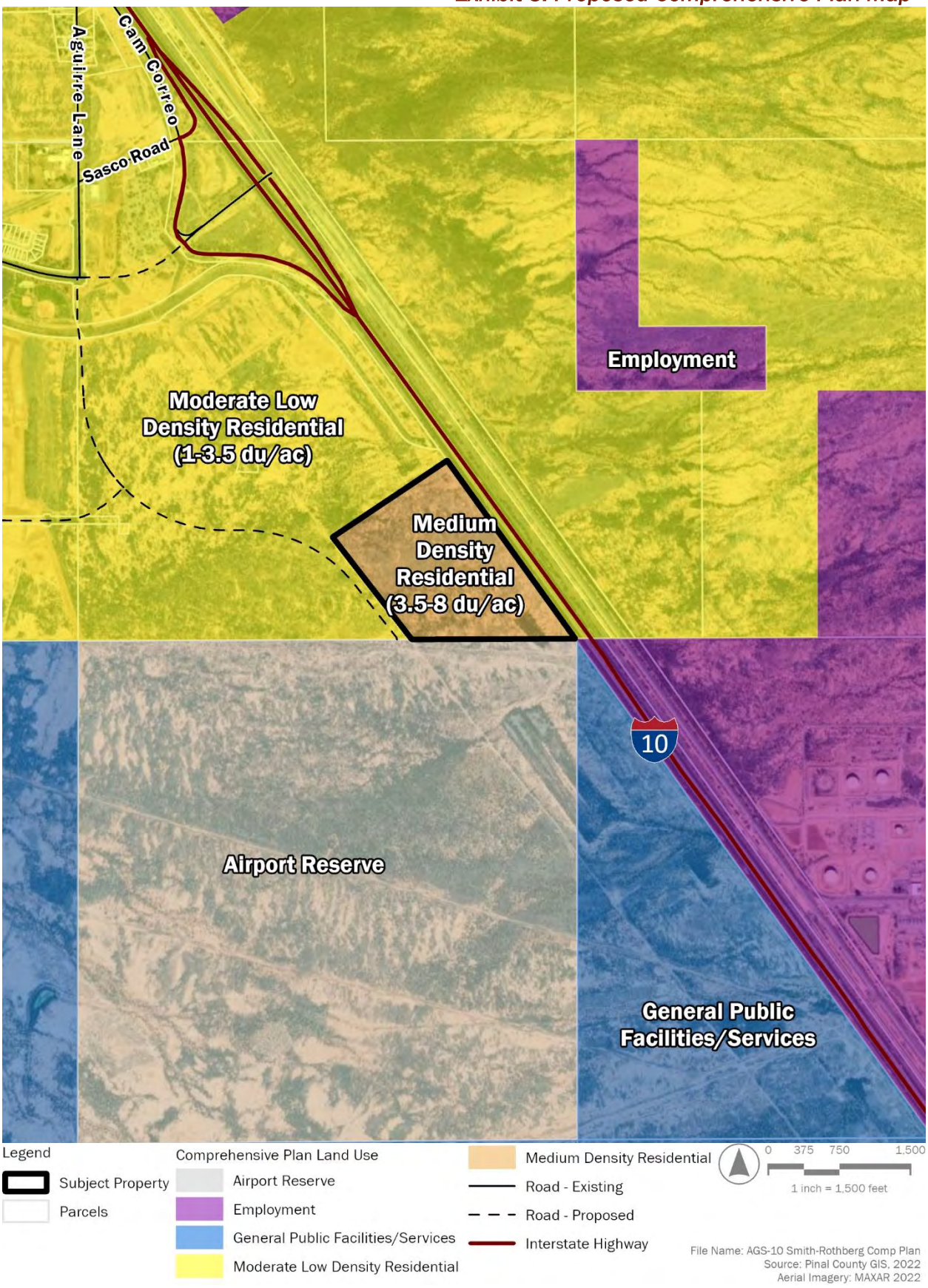


Exhibit 3: Proposed Comprehensive Plan Map



III. Existing Land Use

The project site is currently vacant. The below table provides the existing zoning, land use, and comprehensive plan designation for adjacent properties.

Smith Rothberg PAD – Existing Zoning and Land Use			
Direction	**Existing Zoning**	**Comprehensive Plan Land Use**	**Existing Use**
North	CR-3, CR-4 (within Red Rock Village PAD)	Moderate Low Density Residential (1-3.5 du/ac)	Vacant (Planned Residential)
East	GR, CI-2	Moderate Low Density Residential (1-3.5 du/ac)	I-10, Vacant (Planned Industrial)
South	GR	Airport Reserve	Vacant
West	CR-3 (within Red Rock Village PAD)	Moderate Low Density Residential (1-3.5 ac/du)	Vacant (Planned Residential)

IV. Future Land Use, Proposed Comprehensive Plan Designation, and Purpose

The project site will be the location of a single-family home subdivision. This application requests the amendment of the Pinal County Comprehensive Plan designation of Moderate Low Density Residential (1-3.5 du/ac) to Medium Density Residential (4-8 du/ac) to accommodate the proposed density of 4.89 du/ac. This proposal is meant to address the shortage of homes currently contributing to the affordability crisis for potential homeowners. Amending the comprehensive plan designation for the property will allow it to be rezoned to provide lot sizes and homes that align with the current market and are attainable for potential buyers.

V. Recent Changes in the Area that Would Support the Request

The Red Rock Village PAD is currently being built out by a collection of different homebuilders. These homebuilders have crafted a series of neighborhoods with varying densities, some more than 3.5 du/ac. As these neighborhoods are completed, the current shortage and demand for housing will require new neighborhoods in Red Rock. This project will provide entitlements to continue the existing development pattern in the area.

VI. Proposed Amendment is Needed and Necessary at this Time

Arizona is experiencing a housing shortage and housing affordability problem that is also being felt in several other states throughout the nation. These two issues go hand-in-hand and can be alleviated by providing new market-rate housing that will increase the housing supply and help bring down prices.

VII. Conformance with Comprehensive Plan Vision Components

A. Sense of Community

The Smith-Rothberg PAD provides a neighborhood park at the center of the subdivision. This park will be large enough to accommodate a variety of events, such as block parties, that help bring neighbors together and foster a connection to the community. A larger community park and community center is located near the center of the Red Rock Village PAD along Sasco Road, which can be used for large events for the entire Red Rock Community. It is anticipated that Smith-Rothberg PAD residents will have access to the Red Rock Community amenities.

B. Mobility and Connectivity

The Smith-Rothberg PAD provides the necessary infrastructure to ensure residents have multiple ways to move throughout the PAD safely. Several trails connect to sidewalk infrastructure, allowing residents to walk out their door to nearby parks. These trails will

extend to the boundary to offer connections to the Red Rock Village PAD and help create opportunities for a vast network encompassing nearly the entirety of Red Rock.

Because of Red Rock's location, public transportation options are limited but the existing and planned road network provides connections to all residential and commercial areas of the Red Rock Village PAD. These roadways also accommodate cyclists for non-vehicular travel. Lastly, the proximity to Interstate 10 allows residents to stay connected to the rest of the county and state.

C. Economic Sustainability

The Smith-Rothberg PAD helps locate housing near multiple future employment centers. The Pinal County Comprehensive Plan identifies a UPRR switching yard, Pinal Airpark, and economic development efforts by the Town of Marana as significant motivators for housing in the area because of the expected well-paying, long-term jobs each of those projects will generate.

D. Open Spaces and Places

The Smith-Rothberg PAD will provide its residents with over 18% of its acreage as developed open space. The ratio between open space and development will ensure that residents retain more than adequate open space near their homes. The Smith-Rothberg PAD will also offer the ability to connect to the Red Rock Village trail network that connects residents to multiple smaller parks and the large community park.

E. Environmental Stewardship

The Smith-Rothberg PAD will feature landscape borders, ample park space, and a wide greenbelt along the interstate. These areas will help reduce the urban heat island effect and allow for groundwater recharge and the harvesting of rainwater for landscaping. The goal is to plant healthy vegetation, maintained over time to ensure it grows to maturity and is an improvement over the existing distressed vegetation onsite.

F. Healthy, Happy Residents

As previously mentioned, the Smith-Rothberg PAD will offer numerous trails and sidewalks connecting residents to a proposed neighborhood park and multiple pocket parks. The community will be enhanced by native plants, helping to improve the aesthetics and providing people with shade and desert ambience. The availability and convenience of inviting recreational space will help residents lead an active and healthy lifestyle.

G. Quality Educational Opportunities

Red Rock Elementary School District was provided with a new school site in the Red Rock Village PAD. The old school site remains under the ownership of the Red Rock School District, and a second school site within the Red Rock Village PAD has been identified. As

the Red Rock community grows, the developer has ensured adequate space for new schools and their extracurriculars. The University of Arizona, Pima County Community College and Central Arizona Community College also provide quality post-secondary education to thousands of in- and out-of-state students every year.

VIII. Conformance with Comprehensive Plan's Key Concepts

A. Consistency with the Land Use Designation shown on the Graphics

The Pinal County Comprehensive Plan Land Use Designation for the project site is Moderate Low Density Residential. The project is proposing Medium Density Residential land use. This land use is consistent with the surrounding land uses in the Red Rock Village PAD, which is planned for primarily residential development west of Interstate 10.

B. Consistency with Mixed-Use Activity Center Concept

Not applicable. The project site is not shown within a Mixed-Use Activity Center.

C. Consistency with the Planning Guidelines Described in the Land Use Element

The proposed project complies with the General Planning Guidelines for Residential Categories and Suburban Residential.

The proposed project will create a new single-family residential subdivision that continues the existing single-family development pattern of the Red Rock Village PAD. This subdivision will be managed by a Homeowners Association to ensure the upkeep of common areas and homes within the subdivision. The subdivision will incorporate improved open space along the eastern boundary of the property to create a greenbelt that buffers the subdivision from the interstate.

The proposed project will be served by Global Water and ensure that all homes have access to water and wastewater services. The existing Red Rock Community Park may provide additional recreational amenities to the proposed subdivision apart from the planned neighborhood park and pocket parks within the PAD. The recreation areas will be connected through a series of paths and sidewalks that help move pedestrians throughout the neighborhood.

D. Quality Employment Opportunities County-wide

Housing quality and availability help attract new jobs because some employers want their workforce to live in quality neighborhoods near their workplaces. Employers are also attracted to the demographics of a region and what it offers as a potential employee pool. This project helps bring additional housing to southern Pinal County near many locations identified for their potential to expand employment. The housing that is offered

will help increase the number of professionals who can locate in the area and increase the attractiveness of southern Pinal County for potential employers.

E. Viable Agriculture, Equestrian and Rural Lifestyle

Not applicable. The site is not within an agricultural, equestrian, or rural area.

F. System of Connected Trails and Preservation of Open Space

The Smith-Rothberg PAD provides a trail system for residents of the subdivision to safely move through their community and connect to nearby parks. These trails will extend to the boundary of the PAD to offer opportunities to connect to the Red Rock Village PAD trails. The Red Rock Village PAD will connect to the county trail system via a planned multi-use corridor through the PAD along Sasco Road.

G. Natural and Cultural Resource Conservation

The Arizona Game and Fish Department's Environmental Review Tool indicates that the project is in "Important Connectivity Zones" and "Wildlife Connectivity" on the Important Areas map. These are both large general areas of connectivity. The design of the subdivision allows for wildlife crossing, specifically in the trail corridors along I-10 and the southern boundary of the site.

H. Water Resources, Public Facilities/Services, and Infrastructure Support

The Smith-Rothberg PAD is planned to develop after the final phases of the Red Rock Village PAD. The Red Rock Village PAD provides all the necessary infrastructure to support the subdivision.

IX. Minor Comprehensive Plan Amendment – Approval Criteria

I. The Identified Site is Appropriate for the Proposed Use

Currently, the subject property and surrounding land is vacant. This will change as the Red Rock Village PAD continues to develop additional single-family residential neighborhoods. Eventually, the proposed project will border a master planned community of single-family homes to the west and north.

J. The Amendment Must Constitute and Overall Improvement to the County

Developing the site as proposed will create a desirable community of market-rate single-family homes that provides access to the large job markets of the Tucson and Phoenix metro, as well as burgeoning industry in Pinal County.

K. The Amendment Will Not Adversely Impact a Portion of, or the Entire County, by:

1. **Significantly Altering Existing Land Use Patterns, Especially in Established Neighborhoods**

   The proposed project will not significantly alter the existing land use pattern of single-family residential homes. In fact, the project will continue the land use pattern of an existing and planned neighborhood by adding additional single-family homes at a comparable density.

2. **Significantly Reducing the Jobs Per Capita Balance in Pinal County**

   Approval of this amendment request will allow for the development of additional housing in Pinal County that can support planned employment centers like Pinal Airpark.

3. **Replacing Employment with Residential Uses**

   No employment uses are replaced by the requested amendment.

4. **Placing New Development Away from Existing or Approved Development if the New Development Overtaxes Infrastructure Systems and Public Services when Considering: Future Contributions to Infrastructure and Services through Construction and Dedication of Improvements, Payments of Development Fees, and Other Mitigation Measures**

   The project site will develop necessary infrastructure as indicated by further studies and plans later in the development process.

5. **Negatively Impacting the Existing Character (i.e., visual, physical, environmental, and functional) of the immediate area.**

   The existing suburban character of Red Rock will be upheld by the approval of this amendment request.

6. **Increasing the exposure of residential to aviation-generated noise, and /or flight operations**

   While Pinal Airpark is within the vicinity of the Red Rock Community, it is over 2 miles from the south boundary of the project site. Additionally, the runway is parallel to the site and offset to the west by approximately half a mile. It is not anticipated that Pinal Airpark will have a large impact on the proposed subdivision.

7. **Diminishing the Environmental Quality of the Air, Water, Land, or Cultural Resources**

   The proposed development will adhere to all environmental standards to ensure that the County's environmental quality is not negatively impacted by the site.

8. **Significantly Decreasing the Quality or Quantity of Recreational Amenities such as Open, Space, Parks, and Trails**

   Approval of this amendment request will add recreational amenities to the County and enhance planned county trail connections to Red Rock by creating a network of trails within the community.

Planned Area Development for

Smith-Rothberg

Pinal County, Arizona

PZ-PA-001-23

PZ-PD-009-23

PZ-037-23



The Planning Center
a division of TPC Group, Inc.

Planned Area Development for Smith-Rothberg
Red Rock, Arizona 85145

Submitted to:

Pinal County
Planning Division
31 North Pinal Street Building F
Florence, Arizona 85132

Prepared for:

RRV South, LP
6720 N Scottsdale Rd, Suite 250
Scottsdale, Arizona 85253

Prepared by:

The Planning Center
2 East Congress Street, Suite 600
Tucson, Arizona 85701
Telephone: (520) 623-6146

With assistance from:

Southwest Traffic Engineering
3838 N Central Ave, Suite 1810
Phoenix, AZ 85012
Telephone: (602) 266-7983

J.E. Fuller
40 E Helen St
Tucson, Arizona 85705
Telephone: (520) 623-3112

Table of Contents

I. INTRODUCTION 4

A. Purpose of Request 5
B. Description of Proposal 5

II. SITE ANALYSIS & PROPOSAL 8

A. Relationship to Adjacent and Surrounding Properties 9
B. Schools 13
C. Public Services 14
D. Location and Accessibility 15
E. Access Management 16
F. Utilities 16
G. Phasing 17
H. Ownership and Control 17
I. Conformance with Comprehensive Plan 18
J. Recreation 20
K. Screening 24
L. Maintenance of Streets and Common Areas 24
M. Preliminary Hydrologic Data 24

III. DEVELOPMENT REGULATIONS 30

A. Purpose And Intent 31
B. General Provisions 31
C. Definitions (As Per The Pinal County Development Services Code) 33
D. Residential Development Standards 38

IV. DESIGN GUIDELINES 41

A. Purpose 42
B. Circulation System 44
C. Landscape Development Guidelines 44
D. Architecture Design Guidelines 46
E. Signs 47
F. Lighting 47

V. IMPLEMENTATION 48

A. Purpose And Intent 49
B. Phasing Program 49
C. General Administration, Permit Processing and Amendments 50

VI. APPENDICES 52

A. Appendix A: Open Space and Recreation Plan 53
B. Appendix B: Landscape Plan 64
C. Appendix C: Comprehensive Plan Compliance Checklist 67
D. Appendix D: AZ Game and Fish Environmental Review Tool 77
E. Appendix E: Red Rock Village Community Association Design Guidelines 89
F. Preliminary Water Report for 129
G. Preliminary Sewer Report for 133

Introduction



A. Purpose of Request

On behalf of Sunbelt Holdings, The Planning Center requests a concurrent non-major comprehensive plan amendment, rezoning, and Planned Area Development overlay for parcel 410-12-001D in Red Rock, Pinal County. This request is a rezoning from GR (General Rural Zone) to R-7 (Single Residence Zoning District) to allow for the development of a single-family subdivision similar to those in the adjoining Red Rock Village (RRV) PAD. Sunbelt Holdings is the Master Developer of the Red Rock Village PAD and this parcel and requests a PAD to modify the R-7 standards to align with the Red Rock Village PAD's residential zoning standards.

A non-major amendment of the Pinal County Comprehensive Plan is required as part of this process because the property is designated as Moderate Low Density Residential (MLDR) despite its adjacency to a major interstate highway and the existing Red Rock community. Furthermore, the project proposes a density greater than what is allowed by the MLDR land use. The proposal does not constitute a major amendment based on *Chapter 10: Implementation* of the Pinal County Comprehensive Plan.

The Pinal County Comprehensive Plan recognizes the popularity of the Red Rock community and what makes it a desirable place to live. Its proximity to larger cities and local and state parks offers residents multiple entertainment and outdoor recreation options. To maintain affordability for new and existing residents of Red Rock, the community must maintain a healthy housing supply by continuing to develop and plan for additional residential land uses. Through this rezoning and PAD overlay, the developer will add 294 new homes to the Red Rock community to help increase housing options and availability and stabilize housing costs.

B. Description of Proposal

The Smith-Rothberg PAD proposes a non-major amendment to the Pinal County Comprehensive Plan Land Use map, a rezoning to R-7, and a PAD overlay with a single land use, Medium Density Residential (R-7 Zone). In addition to residences, the PAD will include trails, three pocket parks, and a large central park. Trails will provide residents with enjoyable, attractive corridors that encourage physical activity and connect residents to parks within the PAD, the larger Red Rock Community Park, and existing and future schools.

This PAD will follow many of the same development guidelines and regulations as the Red Rock Village PAD. The Red Rock Village Community Association will likely manage this PAD.

The following tables provide information about the proposed development, including the proposed zoning, comprehensive plan land use designation, number of lots, lot sizes, and density. After the tables, a preliminary development plan illustrates the information available in the tables and includes additional information regarding circulation, proposed amenities, and proposed phasing within the Smith-Rothberg PAD.

TABLE I.B.1: TOTAL SITE ACREAGE

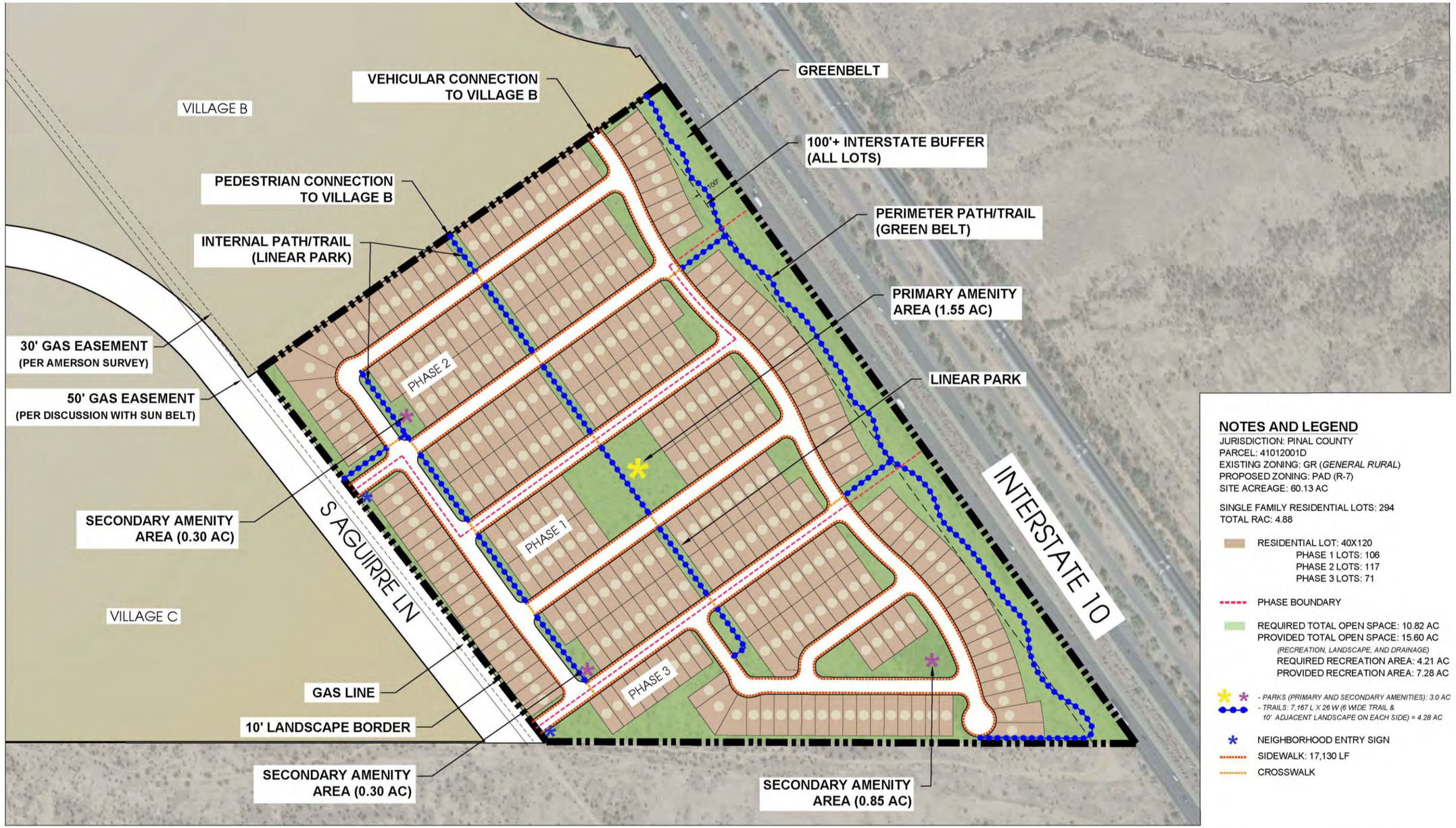
Smith-Rothberg PAD – Total Site Acreage		
Proposed Land Use Designation	**Proposed Zoning**	**Gross Acreage**
MDR - Medium Density Residential (3.5-8 du/ac)	R-7	60.13

TABLE I.B.2: PROPOSED LOTS

Smith-Rothberg PAD – Proposed Lots				
	Area	**Lots**		
		40 x 120		**Total**
Smith-Rothberg PAD	60.13 AC	294	100%	294

TABLE I.B.3: PROPOSED DENSITY

Smith-Rothberg PAD – Proposed Density	
Total Area of Residential Development	60.13 Acres
Total Number of Dwelling Units Proposed	294 Units
Maximum Overall Density	4.89 DU/AC



SMITH-ROTHBERG PAD

PROJECT: AGS-10 DATE: 06/15/22
FILE NAME: AGS-10 SITE PLANNING 061523.DWG

Site Analysis & Proposal



A. Relationship to Adjacent and Surrounding Properties

The property and adjacent properties are currently vacant. The Red Rock Village PAD designates the surrounding area as CR-3 (Single Residence) and CR-4 (Single Residence) zoning, which have smaller minimum lot size requirements per the PAD than those proposed in Smith-Rothberg.

This PAD will function as an extension of the existing RRV PAD and continue a similar development pattern. As such, there will be minimal impact on future residential property owners in the surrounding RRV PAD. The property to the south is unsubdivided state-owned land and Interstate 10 borders the PAD's eastern boundary.

1. Zoning

Properties to the north, east, and west are within the RRV PAD. The base zoning within the PAD for property to the west is CR-3, while the RRV PAD property to the north is zoned CR-4. East of I-10 is predominantly zoned CI-2 (Industrial) within the RRV PAD. South of the property is State Trust Land zoned GR (General Rural). See *Exhibit II.A.3: Existing Zoning.*

2. Land Use

The property is vacant and surrounded by vacant land on its northern, southern, and western boundary. The properties to north and west are designated as Moderate Low Density Residential (MLDR). These parcels are currently planned for residential development. The area south of the property is airport reserve. The airport reserve land use is meant to provide a buffer for surrounding land uses, expand the airport facilities, and allow airport-compatible employment. The eastern boundary is adjacent to I-10. Property east of I-10 is vacant, mainly within the industrial zone of the RRV PAD, and is designated MLDR. See *Exhibit II.A.1: Adjacent and Surrounding Properties* and *Exhibit II.A.2: Comprehensive Plan Land Use Designations*.

TABLE II.A: EXISTING ZONING AND LAND USE

Smith Rothberg PAD – Existing Zoning and Land Use			
Direction	**Existing Zoning**	**Comprehensive Plan Land Use**	**Existing Use**
North	CR-3, CR-4	Moderate Low Density Residential (1-3.5 du/ac)	Vacant (Planned Residential)
East	GR, CI-2	Moderate Low Density Residential (1-3.5 du/ac)	I-10, Vacant (Planned Industrial)
South	GR	Airport Reserve	Vacant
West	CR-3	Moderate Low Density Residential (1-3.5 ac/du)	Vacant (Planned Residential)

Exhibit II.A.1: Adjacent and Surrounding Properties



Exhibit II.A.2: Comprehensive Plan Land Use Designations

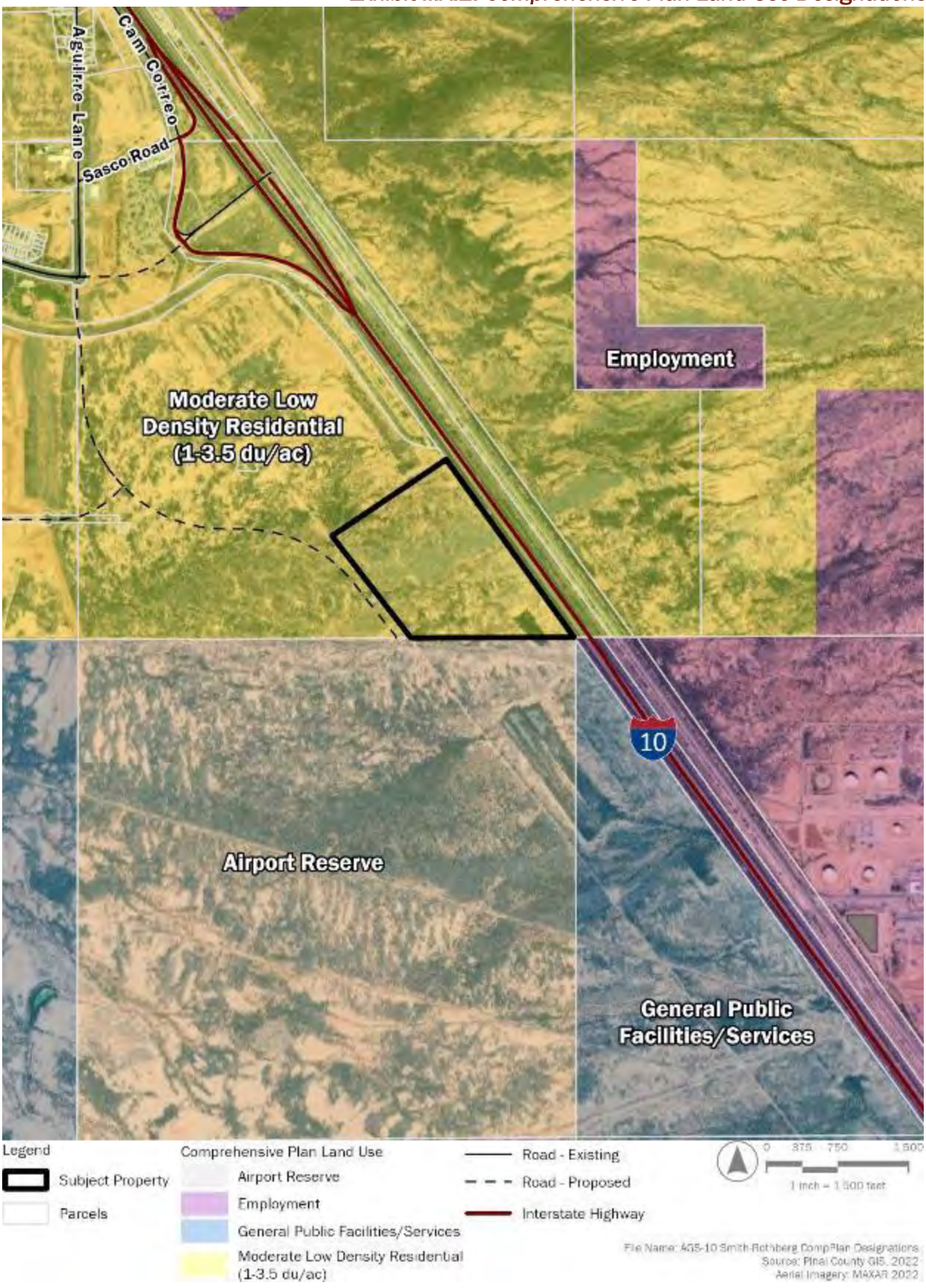
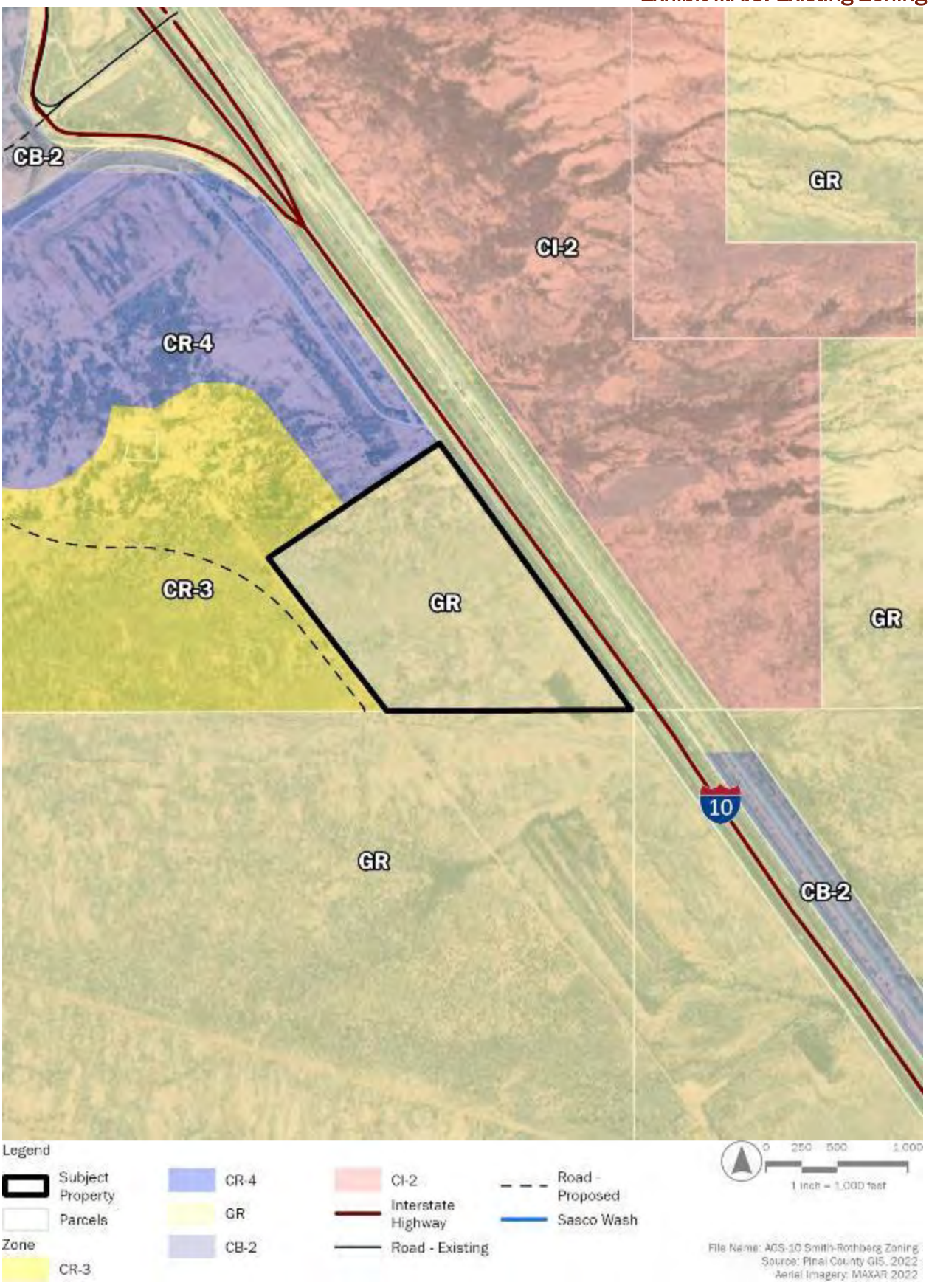


Exhibit II.A.3: Existing Zoning



B. Schools

The Red Rock Elementary School District is the only school district in the Red Rock community, and includes a single K-8 public school, Red Rock Elementary School. There are no high schools within the Red Rock community. The Red Rock community falls within the boundaries of the Santa Cruz Valley Union High School District and is served by Santa Cruz Valley Union High School in Eloy, Arizona.

MCAT High School and Marana High School are closer to the Red Rock community and are within the Marana Unified School District, approximately ten and fifteen miles south of the subject property. Mountain View High School is approximately twenty miles southeast and serves the eastern side of I-10 within the Marana Unified School District.

The neighboring Red Rock Village PAD provides two elementary school locations and allows schools to locate in the CR-3 and CR-4 zones. The original Red Rock Elementary School site at 33656 South Aguirre Lane was abandoned after the RRV PAD was entitled. Red Rock Elementary School relocated within the RRV PAD to 20854 East Homestead Drive, satisfying one of the offered school sites of the PAD. A second school site has been chosen south of Sasco Road along Red Rock Road. The RRV PAD has provided ample space for the Red Rock Elementary School District to expand as necessary to continue serving the children of Red Rock.

C. Public Services

1. Fire

Avra Valley Fire Station #194 is approximately one and a half miles west of the subject property at 21021 East Homestead Drive, Red Rock, Arizona. The Avra Valley Fire District service map does not cover the property but serves the Red Rock Village PAD. The master developer will support the Avra Valley Fire District with necessary contributions to ensure the district can adequately serve the subject property.

2. Public Safety

The Pinal County Sheriff's Office is the current public safety organization serving Red Rock. The nearest Pinal County Sheriff's station is the Arizona City Sheriff Substation, located approximately twenty miles northwest of the proposed PAD at 13970 Sunland Gin Road, Arizona City, Arizona.

3. Solid Waste Disposal

Waste Management, Inc. provides solid waste service for Red Rock Village.

4. Community Services

The Red Rock Village Community Association operates the Red Rock Community Park, including a swimming pool with a slide, a playground, picnic ramadas, ball fields, a basketball court, multiple pocket parks, and a skate park. Although they will have dedicated recreation amenities, residents of this PAD will likely be members of the Red Rock Village Community Association and have access to these services as well.

No libraries or museums exist in Red Rock. The nearest library is the Eloy Santa Cruz Library, located within Santa Cruz Valley Union High school. The Children's Museum of Oro Valley is approximately twenty-five miles southeast of the proposed PAD. The Arizona-Sonora Desert Museum is approximately twenty-five miles south of Red Rock. Residents also have convenient access via I-10 to several other museums and attractions throughout the Tucson metro region, like the Rooster Cogburn Ostrich Ranch.

D. Location and Accessibility

Currently, no streets or roads serve the property. The nearest major street is Sasco Road, approximately three-quarters of a mile to the northwest. According to the *Regionally Significant Routes Plan for Safety and Mobility, Final Report, December 2008* (RSRPSM), the nearest regionally significant route (RSR) is Baumgartner Road, classified as an RSR Parkway. The RSRPSM identifies a potential extension of Baumgartner Road to Interstate 10. Should a future study identify a need, Baumgartner Road would create an intersection with I-10 and connect to Park Link Drive on the east side of the interstate. This connection would be approximately two and a half miles northwest of the property.

This PAD is intended to develop after the final phases of the RRV PAD. As the RRV PAD approaches full build out, Smith-Rothberg's primary access will come through the Red Rock community via Aguirre Lane. Aguirre Lane will continue south from the planned Sasco Road/Aguirre Lane intersection, approximately 1,000 feet from its current location, to serve the new community.

The master developer or its successors or assigns of the Red Rock Village PAD will be responsible for the extension of Aguirre Lane to the project site boundary. The developer of the Smith-Rothberg PAD will be responsible for half-street improvements to Aguirre Lane adjacent to the PAD's western boundary. The newly extended Aguirre Lane will allow the Smith-Rothberg PAD to connect to the roadway network in two locations. This will ensure quick access to the centrally located Red Rock Community Park and future commercial areas of the RRV PAD and means residents will also have convenient access to Interstate 10. Most people living in Red Rock are employed outside the Red Rock Census Designated Place per the online Census OnTheMap Tool, which means they rely on I-10 as a significant commuter corridor. Having convenient access to I-10 will help reduce travel times for future residents who are likely to use the interstate to get to work and other activities outside Red Rock.

A third access point will connect with Village K of the Red Rock Village PAD to the north to promote connectivity with adjacent development. This connection provides an alternative to using Aguirre Lane for trips to the neighboring subdivision and will make it easier for residents to walk or bike to destinations in either PAD. Currently, the location of these connections is preliminary and further refinement will occur during the platting process, but generally, it is expected the roadway will connect with the adjacent northern parcel near the northeast corner of this PAD, and pedestrian connections will occur toward the center of the shared property line.

E. Access Management

The property is not adjacent to a projected regionally significant route and is not proposing any connections to a regionally significant route.

F. Utilities

1. Water Service

Global Water (GW) provides water service through its GW – Santa Cruz Water Company, Inc subsidiary. Global Water purchased Red Rock Utilities in 2018. It consolidated its services in Pinal County with GW-Santa Cruz and GW-Palo Verde.

2. Wastewater Service

GW – Palo Verde Utilities Company is the wastewater service provider in the Red Rock area. Red Rock Utilities was the wastewater service provider before Global Water's acquisition. The site will connect to the existing gravity sewer network once the later phases of the Red Rock Village PAD have located manhole connections nearby.

3. Electrical Service

Electric service is provided by Arizona Public Service (APS).

4. Natural Gas Service

Southwest Gas Corporation is the natural gas provider for the Red Rock area.

5. Cable/Internet/Phone Service

Century Link, Xfinity, and Viasat all offer the Red Rock area internet service. Xfinity is the only cable provider in Red Rock. DISH and DirecTV offer satellite service.

TABLE II.F: UTILITIES AND PUBLIC SERVICES

Smith-Rothberg PAD – Utilities and Public Services	
Utility/Service	**Provider**
Water	Global Water – Santa Cruz Water Company, Inc
Wastewater	GW – Palo Verde Utilities Company
Solid Waste	Waste Management, Inc
Electrical Service	Arizona Public Service
Natural Gas Service	Southwest Gas Corporation
Cable/Internet/Phone	CenturyLink, Xfinity, Viasat
Police	Pinal County Sheriff's Office
Fire	Avra Valley Fire District
Schools	Red Rock Elementary School District

G. Phasing

The Smith-Rothberg PAD is planned to develop in three phases. The developer will construct all trails and parks with each corresponding phase. The first phase will develop the two access points along Aguirre Lane, the central neighborhood park, a pocket park, and many of the residential lots in the center and along the western boundary of the PAD. Phase two develops the northern portion of the property that borders Village K of the Red Rock Village PAD. The final phase develops the remaining lots and a pocket park at the southern end of the property. These phases are delineated on the preliminary development plan and are subject to change at the time of platting. See *Exhibit I.B: Preliminary Development Plan*.

H. Ownership and Control

Lots within the Smith-Rothberg PAD will be sold to prospective homebuilders and to future homebuyers. Sunbelt Holdings, Inc will be the Declarant of the Smith-Rothberg PAD until the last lot is sold. As declarant, Sunbelt Holdings, Inc will retain the ability to amend the Covenants, Conditions, and Restrictions at their will. Additionally, Sunbelt retains the ability to amend the Smith-Rothberg PAD.

I. Conformance with Comprehensive Plan

In addition to the Comprehensive Plan Compliance Check List, the Smith-Rothberg PAD also complies with the following goals and policies of the Pinal County Comprehensive Plan:

Chapter 3

3.1 Goal: Carefully manage and guide growth in a manner that promotes economic development, integrates current and future multimodal transportation systems and is sensitive to the natural environment.

3.1.1 Objective: Promote diverse employment opportunities near population base.

Policy 3.1.1.6 Encourage a suitable balance between employment opportunities and available housing, taking into consideration the labor force and other demographic and economic characteristics of the County.

3.1.2 Objective: Provide for the coexistence of urban and rural land uses

Policy 3.1.2.5 Encourage new developments to locate where amenities and infrastructure already exist, are planned or will be provided

3.1.3 Objective: Promote mixed use activity centers, planned area developments, and cluster development that provide a mix of housing types and land uses.

Policy 3.1.3.4 Encourage future development to be located near existing developed areas minimizing sprawl and strip development in order to assure the provision of adequate services, preserve agriculture and open space, and maximize the utility of funds invested in public facilities and services.

The Smith-Rothberg PAD is intended to be developed during or after the later phases of the Red Rock Village PAD once planned infrastructure is in place. By locating adjacent to the RRV PAD, the Smith-Rothberg PAD limits sprawl by focusing new development near other planned development rather than it being proposed on incontiguous land further away. Additionally, this helps preserve agricultural areas to the west of Red Rock and protects the long-term viability of the Pinal Airpark by offering nearby housing. This housing will be important for the County because of the economic growth happening in the eastern part of the County in and around several municipalities like the City of Casa Grande. The industrial growth in the County is fueled by new large developments in the Phoenix metro, such as Taiwan Semiconductor Manufacturing's new plant, as companies look to provide services and products for their operations. While these companies continue to locate in eastern Pinal County, the municipalities in the area continue to experience a housing shortage. Town of Marana Mayor, Ed Honea, recently remarked at the 2023 State of the Town address that Marana has homes for the employees of all the major companies coming to Pinal County. However, Smith-Rothberg and the rest of Red Rock can provide housing closer to these economic centers and within Pinal County.

3.5 Goal: Concentrate development and encourage an appropriate range of land uses within Growth Areas in collaboration with and compatible to surrounding communities.

3.5.1 Objective: Encourage development within Growth Areas to occur in a coordinated and balanced fashion.

Policy 3.5.1.17 Support higher density residential development and land use intensity within Growth Areas where the physical infrastructure (water, sewer, etc.) and public facilities/services can be provided.

The Smith-Rothberg PAD has a maximum density of 4.89 du/ac and is located in the Red Rock Growth area, as identified by the Pinal County Comprehensive Plan. The density of the PAD places it in the Medium Density Residential (3.5-8 du/ac) land use classification of the Pinal County Comprehensive Plan which allows for higher density than the Moderate Low Density Residential designation. Additionally, all the necessary infrastructure has already been or will be developed as part of the RRV PAD.

Chapter 4

4.2 Goal: Create a comprehensive multimodal system

4.2.2 Objective: Promote an integrated land use and multimodal transportation system by linking land use planning guidelines.

Policies:

4.2.2.1 Encourage new developments to support a variety of transportation modes including transit, pedestrian, and bicycling.

4.2.2.3 Encourage new developments to provide connected open space that connects parks, schools, and neighborhoods.

The Smith-Rothberg PAD provides an extensive trail and path network in conjunction with the street sidewalk network. This network will be developed in open space corridors that facilitate connections to important destinations throughout the Smith-Rothberg PAD and the Red Rock Village PAD. These paths and trails will be bike-friendly, providing cyclists with an alternative to riding on the street next to vehicle traffic.

Chapter 6

6.4 Goal: Improve the quality, quantity and design of open space, park lands and trails in new residential development

6.4.1 Objective: Develop guidelines to meet the park land and facility demands for neighborhood and community parks created by new development

Policy 6.4.1.1 Encourage developers to meet the park land and facility demands for neighborhood and community parks created by new development

The developer is providing more recreation and open space than the County requires and additional amenities beyond what the *Pinal County Open Space and Recreation Area Guideline Manual, 2012* suggests.

J. Recreation

Currently, the RRV PAD contains a community park with two baseball fields, a basketball court, a pool, a skate park, multiple pocket parks, and a trail system that continues to be built as homes are developed. Residents of the Smith-Rothberg PAD also may be able to use existing recreation amenities within the Red Rock Village PAD. The current development of the RRV PAD is following its Conceptual Open Space Plan 'A', which illustrates a series of connected open space corridors that follow major roads within the PAD, such as Sasco Road, Aguirre Lane, and Red Rock Road. The type and extent of available amenities at the community park will expand as the remainder of the RRV PAD is developed.

The Smith-Rothberg PAD will align with the intent of the open space corridors concept established by the RRV PAD by allowing for multiple connections in the form of trails, paths, and sidewalks between the Red Rock Village PAD and the Smith-Rothberg PAD. This will provide opportunities for residents to travel between the neighboring villages of the RRV PAD to reach their destinations, such as future commercial development and schools, without using a vehicle.

The Smith-Rothberg PAD proposes one and a half miles of additional trails, a one- and one-half acre centralized park, and three pocket parks. The park in the center of the PAD may feature but is not limited to ramadas, play equipment, and recreational fields to provide residents with conveniently located open spaces that help promote physical activity. Three additional pocket parks will be located throughout the PAD to help provide convenient access to open space and recreation for all residents. The vignette provided on the following page is only conceptual and meant to showcase what the central neighborhood park could be. The final design of all park spaces will be determined during the development process.

The trail system of the Smith-Rothberg PAD helps link the recreation areas together to create an integrated open space and recreation system within the PAD. The trail system will begin at the northern access point and in the southeast corner of the property. These trails will connect with the extensive sidewalk infrastructure within the planned subdivision and provide a path along the eastern property line adjacent to Interstate 10, through the center of the PAD, and at the west end of the southwest-north east running blocks. The trails provide an aesthetically pleasing and convenient way for residents to reach the large park at the center of the PAD or visit with their neighbors without always needing to access the street network. The trails will so offer connections to Village K within the RRV PAD, which shares its southern boundary with the northern boundary of the Smith-Rothberg PAD. Landscaping in front yards of homes and in the common areas of the subdivision will help provide shade to

the planned sidewalks and trails within the PAD. See *Exhibit I.B: Preliminary Development Plan*.





Figure 1: Conceptual park vignette for the central neighborhood park within the Smith-Rothberg PAD.

1. Average Cross Slope

The average slope of the net acreage of the PAD determines the minimum ratio of conservation open space to developed open space required to meet the total open space requirement of 18%. The subject property is flat with an average cross slope of 1.22%. As the property has been disturbed, no minimum conservation open space is required.

Formula:

I x L x 0.000023/A
I=Contour Interval (Feet)
L=Length of all contour line segments (Feet)
A=Area of Parcel

Parcel Calculation

$$2 \times 15{,}937.8 \times \frac{.000023}{60.13} = 1.22\% \text{ Average Cross Slope}$$

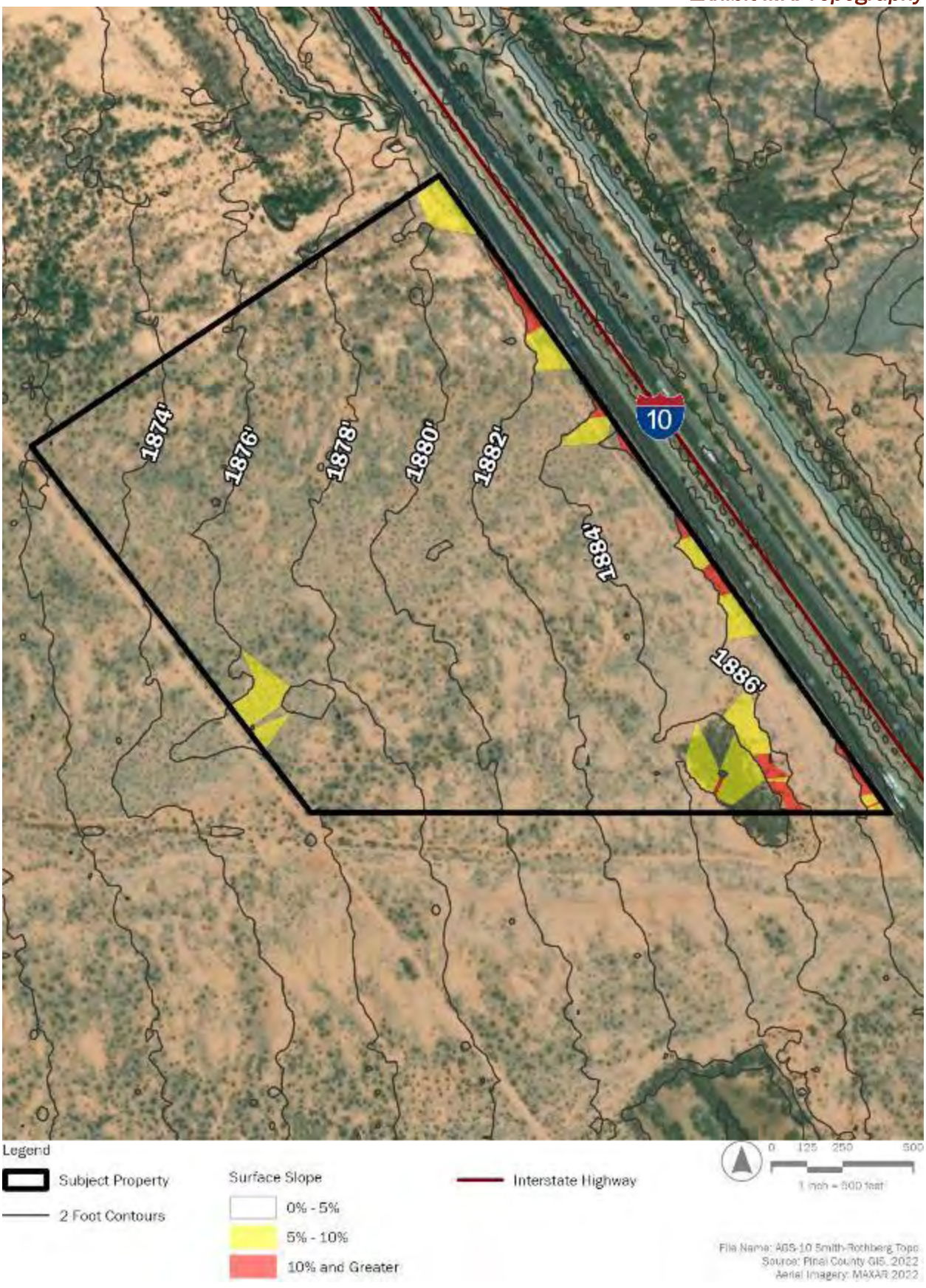
TABLE II.J: OPEN SPACE

Smith-Rothberg PAD – Open Space			
Site Acreage	**Required Acreage (based on 18% open space requirement)**	**Provided Acreage**	**As a Percent**
60	10.8 Open Space	15.6 OS	26% OS
60	4.21 Recreation Area	7.28 RA	12% RA

OS = Open Space
RA = Recreation Area

Note: Provided Acreage of Recreation Area is included in the total Open Space acreage

Exhibit II.K: Topography



K. Screening

Screening in the Smith-Rothberg PAD will follow the screening guidelines developed by the Red Rock Village Architectural Control Committee. Article 5.4 of the Red Rock Village Community Association Design Guidelines sets the following guideline regarding fences.

> *"Villages within the community shall be allowed two types of fencing being, 1) vinyl with the manufacturer, building specifications and color are all set forth on Exhibit B attached hereto and 2) a block wall made of cement block, not exceed 6ft in height and meeting the specifications set forth in Exhibit C attached hereto. The block wall shall be painted on both sides of the block wall with the color of RED ROCK BLOCK TAN, available at Sherman-Williams as MOR -10067."*

These standards are available in *Appendix E: Red Rock Village Community Association Design Guidelines*.

L. Maintenance of Streets and Common Areas

Streets will be constructed in accordance with Pinal County standards established in *Chapter 6 Street Design Requirements* of the *Pinal County Subdivision & Infrastructure Design Manual*. Upon acceptance by Pinal County, Pinal County will be responsible for maintaining public streets. However, the master developer maintains the right to provide gated access and have private streets throughout the community or a portion of it. The Red Rock Village Master HOA will maintain parks, open space, and common areas within the Smith-Rothberg PAD, as well as any private streets.

M. Preliminary Hydrologic Data

The project area lies within the northwest portion of the Upper Santa Cruz watershed where overland flow is generated from the Tortolita Mountain Ranges to the east. In general, the flow travels west/southwest at a mild and generally uniform slope of 0.8 percent through largely undeveloped desert rangeland, until it is intercepted by Interstate 10 (I-10). I-10 serves as an embankment, offering protection to the project site from the flood waters generated from the upstream watershed. During an initial site visit and review of Arizona Department of Transportation (ADOT) as-builts plans, two 3-cell 10-ft x 5-ft reinforced concrete box culverts (RCBCs) were found in the vicinity of the project site, site visit photos can be found below, and the culverts are graphically represented in Figure X. The northern culvert discharges on the western side of I-10 into an existing channel which immediately directs flow away from the proposed development to the northwest. The channel meanders through the existing Red Rock Village community and fans out to overland flow shortly thereafter. The southern culvert also discharges on the western side of I-10 into an existing natural channel. The channel appears to discharge flow into the remnants of a pit or basin and ultimately outfalls to the west/southwest, away from the

proposed development. From this assessment, it is evident that there are no flows greater than 500 cubic feet per second (cfs) impacting the project site.



Photo 1 – North Culvert (Looking West)

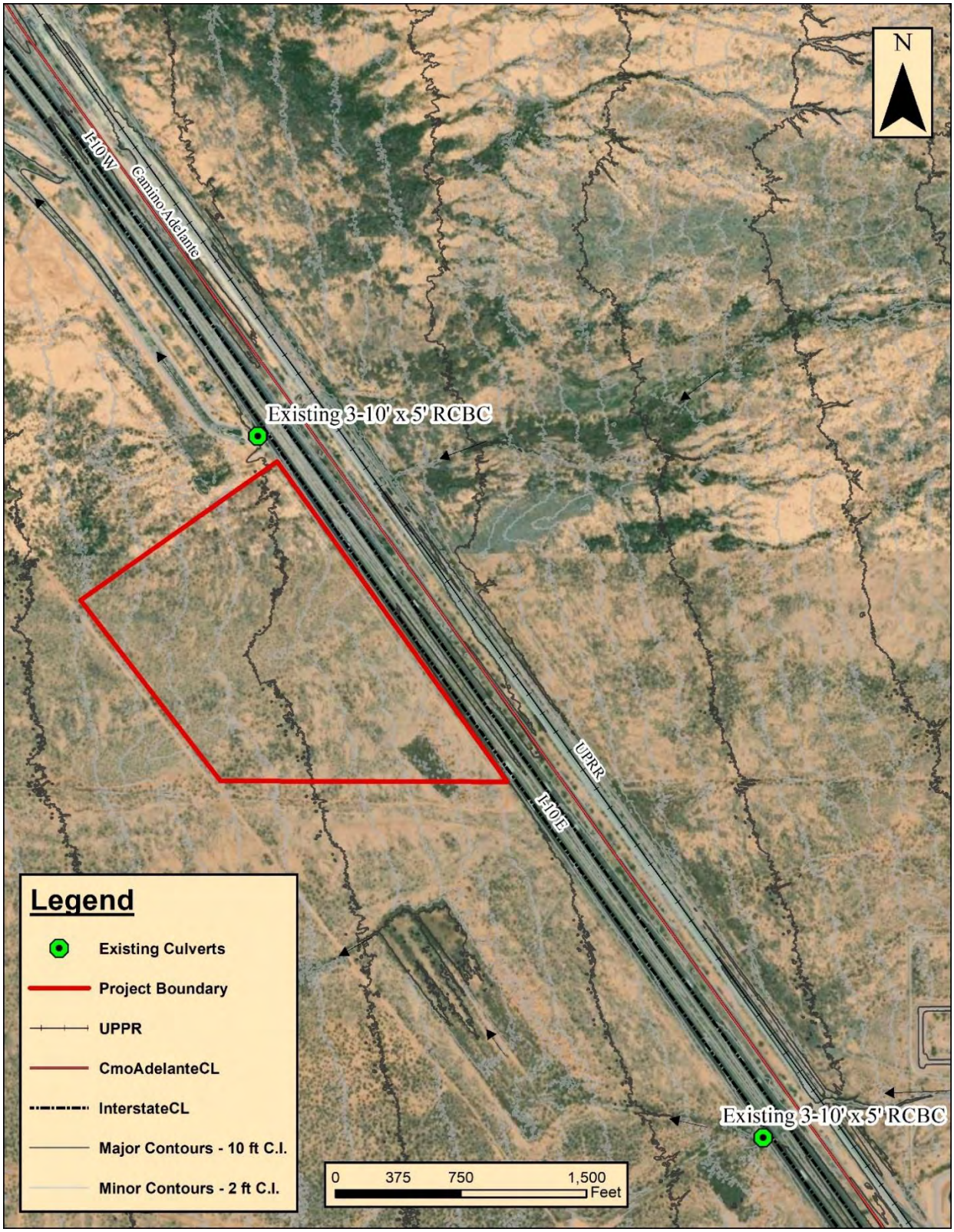


Photo 2 – Southern Culvert (Looking West)

TABLE II.M.1: ON SITE EXISTING PEAK DISCHARGES

Concentration Point	Contributing Off-Site Watersheds	Total Area (ac)	Lc (feet)	Slope (%)	Soil Type and Percentage	Weighted Runoff Coefficient	Peak Discharge (cfs)
ON-1	0	2.29	608	0.81	100% C	0.50	6.5
ON-2	0	19.66	1,710	0.79	100% C	0.50	41.0
ON-3	0	6.61	1,072	0.76	100% C	0.50	16.0
ON-4	0	2.62	805	0.83	100% C	0.50	7.0
ON-5	0	22.8	1,654	0.64	100% C	0.50	46.1
ON-6	0	4.31	639	0.85	100% C	0.50	12.2
ON-7	0	1.84	769	0.72	100% C	0.50	4.8

Exhibit II.M.1: On Site Existing Peak Discharges



From a review of the topography generated from the Pima Association of Governments (PAG) 2015 DEM LiDAR, aerial imagery, data collated from the preliminary site visit, and as-builts for existing ADOT hydraulic structures, it is evident that, in general, the on-site discharge flows from the border of the project domain and I-10, to the west/southwest, with the exception of the southeastern most sub-watershed, ON-6, which discharges to the south. As discussed above, there are no flows greater than 500-cfs impacting the project domain.

In compliance with Pinal County Drainage Manual (PCDM) Volumes I and II, the design storm used to calculate peak design discharges was a 100-year, 1-hr duration event. A precipitation depth of 2.09-in was used in these calculations and was determined using the centroid of the proposed development and NOAA Atlas 14.

As set forth by PCDM Volume I, the rational method was used to determine peak design discharges for pre and post-construction conditions:

$$Q=CiA \qquad \text{(eq. 1)}$$

Where:

C = runoff coefficient (dimensionless), determined from Table 2-1 in PCDM Volume II

i = rainfall intensity (in/hr), calculated using TC (time of concentration) and the design precipitation depth.

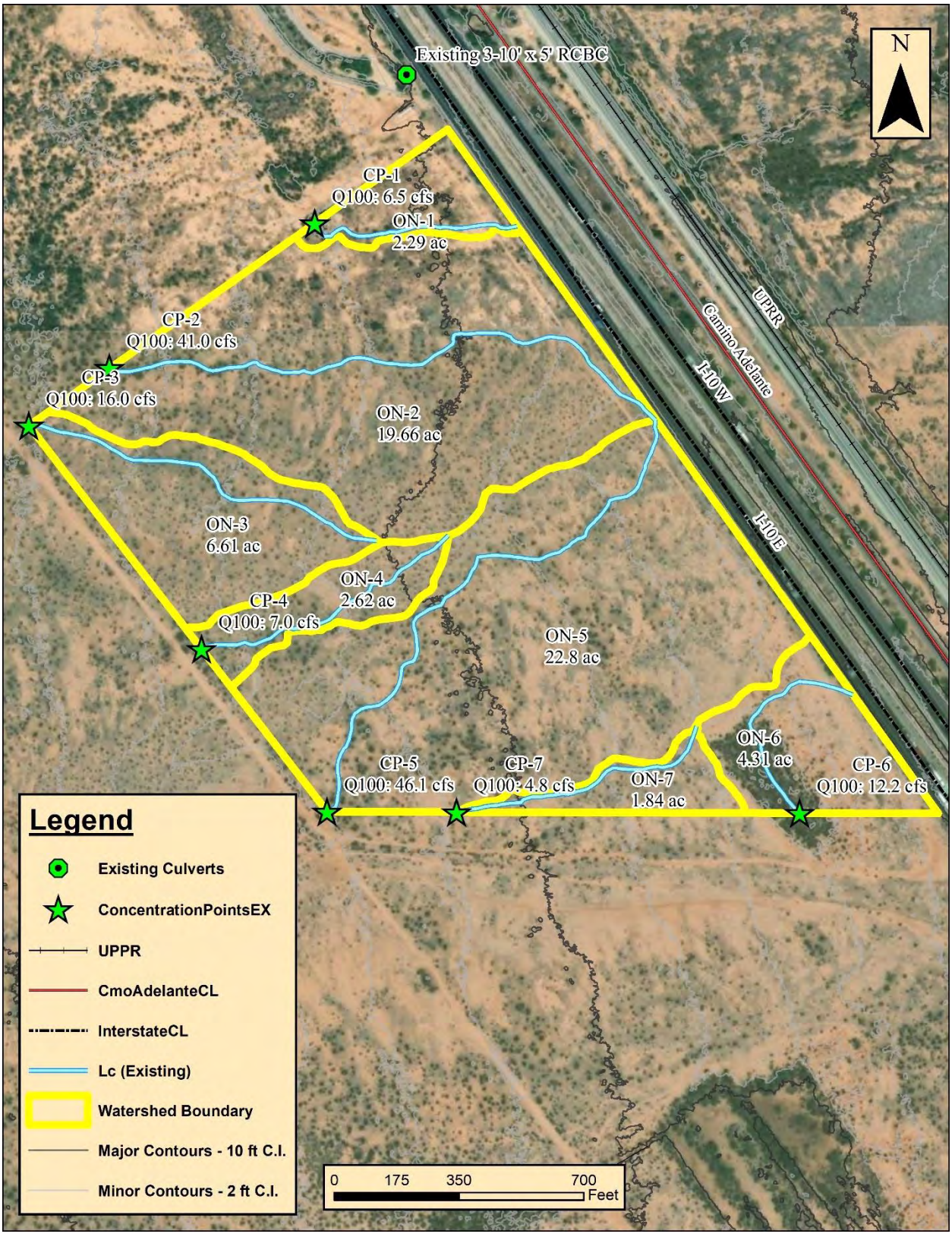
A = drainage area (acres)

A summary of the peak design discharges for on-site existing conditions is available in *Table II.M.1: On Site Existing Peak Discharges* and *Exhibit II.M.1: On Site Existing Peak Discharges* and a summary of the peak design discharges for on-site developed conditions is available in *Table II.M.2: On Site Proposed Peak Discharges and Exhibit II.M.2: On Site Proposed Peak Discharges*.

TABLE II.M.2: ON SITE PROPOSED PEAK DISCHARGES

Concentration Point	Contributing Off-Site Watersheds	Total Area (ac)	Lc (feet)	Slope (%)	Soil Type and Percentage	Weighted Runoff Coefficient	Peak Discharge (cfs)
CP-1	0	1.57	388	0.26	100% C	0.66	6.9
CP-2	0	3.81	767	0.65	100% C	0.64	15.8
CP-3	0	4.44	837	0.21	100% C	0.64	15.6
CP-4	0	3.04	596	0.21	100% C	0.62	10.9
CP-5	0	2.02	297	0.31	100% C	0.73	10.3
CP-6	0	5.5	1,088	0.58	100% C	0.74	26.6
CP-7A	0	4.54	936	0.47	100% C	0.75	20.1
CP-7B	0	3.47	831	0.44	100% C	0.81	17.0
CP-7C	0	4.51	665	0.68	100% C	0.73	22.0
CP-7D	0	3.48	946	0.27	100% C	0.81	15.3
CP-8	0	3.52	691	0.54	100% C	0.84	19.3
CP-9	0	1.92	623	0.56	100% C	0.83	10.4
CP-10	0	3.53	635	0.65	100% C	0.80	18.7
CP-11	0	3.08	423	0.33	100% C	0.82	16.7
CP-12	0	3.08	433	0.54	100% C	0.83	17.9
CP-13	0	2.29	299	0.55	100% C	0.83	15.3
CP-14	0	3.05	396	0.65	100% C	0.82	17.9
CP-15	0	3.28	1,157	0.36	100% C	0.81	16.1

Exhibit II.M.2: On Site Existing Peak Discharges



Development Regulations



A. Purpose And Intent

These development regulations serve as the primary mechanism for implementation of the Smith-Rothberg PAD. For the purpose of this PAD, the following types of land uses are hereby established:

- **Medium Density Residential (R-7)**

B. General Provisions

The following provisions are from the Red Rock Village PAD and have been modified for inclusion in this PAD to ensure compatibility between the two.

1. All construction and development within the PAD area shall comply with applicable provisions of the Pinal County Building Code and the various related mechanical, electrical, plumbing codes, fire code, grading and excavation code, and the subdivision codes, as adopted by Pinal County and the State of Arizona.

2. If specific development standards are not established or if an issue, condition or situation arises or occurs that is not clearly understandable in the PAD, then those regulations and standards of the Pinal County Development Services Code that are applicable for the most similar issue, condition, or situation shall apply, as determined by the Planning Director.

3. This PAD may be amended by the same procedure as it was adopted.

4. Any persons, firm or corporation, whether a principal, agent, employee or otherwise, violating any provisions of these regulations shall be made to comply with the Pinal County Development Services Code pertaining to zoning misdemeanors.

5. Whenever a use has not specifically been listed as being a permitted use in a particular zone classification within the PAD, it shall be the duty of the Planning Director to determine if said use is: 1) consistent with the intent of the zone; and 2) compatible with other listed permitted uses. Any person aggrieved by the determination may appeal that decision to the Board of Supervisors.

6. Exceptions to height limitations contained in the development apply only to antennas, chimneys, evaporative coolers or other architectural appurtenances required for the screening of rooftop equipment.

7. Automotive vehicles or trailers of any kind or type that have been abandoned shall not be parked or stored on any property within the PAD unless it is in a completely enclosed building.

8. Non-Conforming Uses of Land- Where, at the time of passage of this PAD, lawful use of land exists which would not be permitted by the regulations imposed by this PAD, such use may be continued so long as it remains otherwise lawful provided:
   a) No such non-conforming use shall be enlarged or increased nor extended to occupy a greater area of land than was occupied at the effective date of adoption or amendment of this PAD.
   b) No such non-conforming use shall be moved in whole or in part to any portion of the lot or parcel other than that occupied by such use at the effective date of adoption or amendment of this PAD.
   c) If any such non-conforming use of land ceases for any reason for a period of more than 180 days, any subsequent use of such land shall conform to the regulations specified by this PAD for the district in which such land is located.
   d) No additional structure not conforming to the requirements of this PAD shall be erected in connection with such non-conforming use of land.

9. At the time of site plan review, all developments shall submit a plan detailing fencing, walls, landscaping, building placement and other details which must be in conformance with the PAD design guidelines for residential structures.

10. Land Use Plan Provisions – A single land use designation, medium density residential (R-7), has been assigned to the entirety of the PAD.

    To ensure the orderly growth of the community and a harmonious connection with the neighboring villages in the Red Rock Village PAD, it is understood that modifications to the preliminary development plan lot-layout or adjustments because of final road alignments or grading/hydrology hazards specified by the County will occur during technical refinements in the tentative map process. These refinements shall not require an amendment to the PAD.

11. Special Use Permits – Special Use Permits shall be considered by the Planning and Zoning Commission and ultimately obtained from the Board of Supervisors.

12. Drill-sites – Drilling, mining or exploration for any minerals, oil, gas or other hydrocarbon substances shall be prohibited in the PAD area. Drilling/drill-sites for groundwater is allowed within the PAD area.

13. Agricultural uses shall be permitted on the property until such time that a specific parcel is platted, the plat is recorded, and improvements are constructed on a portion of the development land. Until then, that real estate and all parcels without improvements thereon, shall be and remain as an agricultural use.

C. Definitions (As Per The Pinal County Development Services Code)

For the purpose of this PAD, certain words and terms used herein are defined according to Pinal County Development Services Code *Chapter 2.10 – Definitions*.

When not inconsistent with the context, words used in the present tense include the future, words in the singular number include the plural and words in the plural number include the singular, the word "building" includes the word "structure" and the word "shall" is mandatory and not directory. "Supervisors" shall mean the Board of Supervisors of Pinal County, Arizona; "Commission" shall mean the County Planning and Zoning Commission of Pinal County; "Board" shall mean one of the Boards of Adjustment appointed under the authority of this Ordinance, and "County" shall mean Pinal County, Arizona.

"*" Identifies definitions which differ from those in the Pinal County Zoning Ordinance.

Accessory Building: A subordinate building or portion of the main building on the same lot or building site, the use of which is incidental to that of the main building and which is used exclusively by the occupants of the main buildings or their non-paying guests or employees.

Accessory Use: A use customarily incidental and subordinate to the principal use of a lot or building located upon the same lot or building site.

Agriculture: The tilling of the soil, the raising of crops, horticulture, animal husbandry, and uses of customarily incidental thereto, but not including commercial slaughter houses, stockyards, meat packing plants, fertilizer yards, or plants for the reduction of animal matter.

Buildable Area: The net portion of the lot remaining after deducting all required yards from the gross area of a lot or building site.

Building: For the purpose of this title, the terms “building” and “structure” shall be treated as though they are synonymous. (See *Structure*). A structure having a roof supported by columns and used exclusively for the shading of livestock shall not be considered a building and shall not need to conform to setback requirements that apply to buildings used to house livestock.

Building Height: The vertical distance from the average finished grade at the front of the building to the highest point of the building, exclusive of chimneys and screening of mechanical equipment.

Building Site: The ground area of a building or buildings together with all contiguous open spaces as required by this title.

Conventional Construction: A building constructed on a permanent site, conforming to the International Building Code (IBC), which includes but is not limited to factory-built

buildings (modular) as they are built according to the IBC. It does not include manufactured homes or mobile homes as they are not built according to the IBC.

Dwelling, One-Family: A building containing only a single dwelling unit.

Dwelling Group: A group of two or more detached or semi-detached one-family, duplex or multiple dwellings occupying a parcel of land in one ownership and having any yard or court in common, including house court and apartment court, but not including tourist court.

Dwelling Unit: A room or suite of two or more rooms that is designed for, or is occupied by one family doing its own cooking therein and having only one kitchen. (Amended 5-13-68.)

Factory-built Building (Modular):

A structure fabricated in a factory and delivered to the building site in one or more sections.

The structure shall be designed only for installation on a site-built permanent foundation and not designed to be moved once installed on the foundation. The unit shall include all the plumbing, heating, cooling and electrical systems of the building and shall bear the Arizona Insignia of Approval pursuant to A.R.S. Section 41-2195.

A factory-built building shall be considered the same as a building and/or a dwelling unit.

Building permits for these structures may be issued only in those residential zones that allow conventional construction of homes as a permitted use.

Family: Any number of individuals related by blood or marriage or not more than five unrelated persons customarily living together as a single housekeeping unit, and using common cooking facilities, as distinguished from a group occupying a hotel or club. A family shall be deemed to include domestic servants.

Garage, Private: An accessory building or portion of the main building designed or used for the shelter or storage of self-propelled vehicles owned or operated by the occupants of the main building.

Garage, Public: Premises, except those herein defined as a private or storage garage, used for the storage or care of self-propelled vehicles or where such vehicles are equipped for operation, or repaired, or kept for hire or sale.

Garage, Storage: Premises, except those herein defined as a private or public garage, used exclusively for the storage of self-propelled vehicles, and for no other purpose whatever.

Grazing: The feeding of domestic livestock on an open range or fenced pasture for commercial purposes and uses customarily incidental thereto, but not including

commercial slaughter houses, stockyards, fertilizer yards, bone yards or plants for the reduction of animal matter.

Guest House: An attached or detached accessory building with no cooking facilities, used to house guests of the occupants of the principal building, and which is never rented or offered for rent.

Home Occupation: An activity carried on by the occupant of a dwelling as a secondary use. See *PCDSC 2.150.260* for requirements.

Lot: An area or parcel of land under one ownership abutting upon at least one street at the time of adoption of the Ordinance, or area or parcel of land as shown with a separate and distinct number on a subdivision tract map or split-lot map recorded with the County Recorder of Pinal County, Arizona.

Lot, Corner: A lot located at the junction of two or more intersecting streets, having an interior angle of less than 135 degrees, with a boundary line thereof bordering on two of the streets. The point of intersection of the street lot lines is the comer.

Lot, Interior: A lot which is not a corner lot.

Lot, Key: A lot with a side lot line that abuts the rear lot line of one or more adjoining lots.

Lot, Through: An interior lot having frontage on two parallel or approximately parallel streets.

***Lot Coverage**: This is determined by the area contained within the foundation of the building.

Lot Depth: (1) If the front and rear lines are parallel, the shortest distance between such lines. (2)If the front and rear lines are not parallel, the shortest distance between the midpoint of the front lot line and the midpoint of the rear lot line. (3)If the lot is triangular, the shortest distance between the front lot line and the line parallel to the front lot line, not less than ten feet long lying wholly within the lot.

Lot Line: A property line bounding a lot.

Lot Line, Front: In the case of a lot abutting only one street, the line separating such lot form the street. In the case of a comer or through lot, the owner may elect any street lot line as the front lot line, provided such choice in the opinion of the Zoning Inspector will not be injurious to the existing or desirable future development of the adjacent properties.

Lot Line, Rear: The lot line which is opposite and most distant from the front lot line. The rear lot line of an irregular, triangular or gore lot shall, for the purpose of the Ordinance,

be a line entirely within the lot at least 10 feet long and parallel to and most distant from the front lot line.

Lot Line, Side: Any lot line not a front lot line or a rear lot line, a side lot line separating a lot from a street is a street side lot line. A side lot line separating from another is an interior side lot line.

Lot Line, Street or Alley: A lot line separating a lot from a street or alley.

Lot Width: The mean horizontal width of the lot measured at right angles to the depth.

Parcel: Real property with boundaries described by deed, subdivision plat or map of survey and recorded with the county recorder.

***Phase**: A development stage that includes, but is not limited to, the construction of the following elements: houses/buildings, infrastructure (roads, utilities, etc.), drainage structures and open space amenities.

Setback Lines: Setback lines are lines established generally, but not always parallel to the center line of a street between which no part of a building or structure or any part thereof may be erected or projected except as otherwise provided in this Ordinance.

***Site Plan** – A plat or development plan.

Story: The space in a building between the surface of any floor and the finished ceiling next above it, or the finished under surface of the roof directory above that particular floor.

Street: A way dedicated to the public that affords the principal means of access to abutting property.

Structure: Anything constructed or erected the use of which requires location on the ground or attachment to something having a location on the ground. This definition shall include, for the purpose of this title, a manufactured home, mobile home and accessories thereto. For the purpose of this title, the terms “building” and “structure” shall be treated as though they are synonymous, unless stated otherwise. (See Building.)

Structural Alterations: Any change in the supporting members of a building, such as bearing walls, columns, beams, girders, floor joists, or which expands the height, bulk or area thereof.

Subdivision: land subdivided or proposed to be subdivided for the purpose of sale or lease, whether immediate or future, into six or more lots or parcels.

Yard: An unoccupied space on a building site and, except as otherwise provided in this title, unobstructed from ground to sky.

Yard, Front: A yard extending the full width of the building site between the front lot line and the nearest line of the main building or the nearest line of any enclosed or covered porch.

Yard, Rear: A yard extending across the full width of the building site between the rear lot line and the nearest rear line of the main building or the nearest line of any enclosed or covered porch. Where a rear yard abuts a street, it shall meet the front yard requirements.

Yard, Side: A yard extending from the front yard to the rear yard between the side lot line and nearest line of the main building.

Yard, Street Side: A yard extending from the front yard to the rear yard between the street lot line and the nearest line of the main building. (Amended 2-25-85)

D. Residential Development Standards

Medium Density Residential (R-7)

Permitted Uses

- One dwelling, conventional construction
- Accessory building or use
- Home occupation
- Parks
- Solar Energy Device
- Other uses as permitted in the R-7 zone

Standards

Maximum building height: 30 feet

Minimum lot area: 4,000 square feet

Minimum lot width: 35 feet

Minimum front yard: 10 feet

Minimum side yards: 8 feet total (measured to the stem wall or foundation)

Minimum rear yard: 10 feet

Minimum distance between homes: 7 feet (measured from eave to eave)

Detached accessory buildings:

- Permitted coverage: one-third of the total area of the rear and side yards
- Maximum height: 20 feet
- Minimum distance to main buildings: 7 feet
- Minimum distance to front lot line: 60 feet
- Minimum distance to side and rear lot line: 4 feet
- Accessory buildings shall be detached from the main building except that they may be attached by means of an unenclosed structure
- Accessory buildings and their exterior materials shall match or coordinate with the main building

TABLE III.D.1: ZONING STANDARD COMPARISON

Smith-Rothberg PAD – Zoning Standard Comparison			
	Red Rock Village CR-4 Zone (for comparison only)	**R-7 Zone Standards**	**Modified R-7 PAD Standards**
	CR-4		
Minimum Lot Area	2,500 sq. feet	7,000 sq. feet	4,000 sq. feet
Minimum Lot Width	25 feet	50 feet	35 feet
Minimum Building Setback			
Front	10 feet	20 feet	10 feet
Sides	4 feet	10 feet	5 feet
Rear	10 feet	25 feet	10 feet
Maximum Building Height	30 feet	30 feet	30 feet
Minimum Distance between Main Building and Detached Accessory Building	7 feet	7 feet	7 feet
Buildable Area	N/A	N/A	N/A

TABLE III.D.2: PERMITTED USES COMPARISON

Smith-Rothberg PAD – Permitted Uses Comparison	
R-7 Zone Permitted and Special Uses	**R-7 Zone Modified Permitted Uses**
A. One dwelling, conventional construction. B. Child care (no more than five children for whom compensation is received). C. Church, subject to the requirements set forth in PCDSC 2.150.220. D. Government structures, fire district stations, sheriff's facilities and their accessory uses. E. Group home, subject to the requirements set forth in PCDSC 2.150.200. F. Guest house/casita, subject to the requirements set forth in PCDSC 2.150.240. G. Home occupation, subject to the requirements set forth in PCDSC 2.150.260. H. Parks. I. Public schools. J. Solar energy device, subject to the requirements set forth in chapter 2.210 PCDSC. K. Wireless communication facilities, subject to the requirements set forth in chapter 2.205 PCDSC. L. Some uses are allowed in all zoning districts based on statutory exemptions (see PCDSC 2.05.050) or because a governmental entity or governmental agency is performing a governmental function. ***Special Uses:*** A. Beauty salon or barbershop. B. Child care (more than five children for whom compensation is received). C. Clubs, lodges, and assembly halls. D. Golf course, subject to the requirements set forth in PCDSC 2.150.230. E. Group home of 11 or more residents or assisted living center. F. Private school. G. Wireless communication facility.	A. One dwelling, conventional construction. B. Child care (no more than five children for whom compensation is received). C. Church, subject to the requirements set forth in PCDSC 2.150.220. D. Government structures, fire district stations, sheriff's facilities and their accessory uses. E. Group home, subject to the requirements set forth in PCDSC 2.150.200. F. Guest house/casita, subject to the requirements set forth in PCDSC 2.150.240. G. Home occupation, subject to the requirements set forth in PCDSC 2.150.260. H. Parks. I. Public schools. J. Solar energy device, subject to the requirements set forth in chapter 2.210 PCDSC. K. Wireless communication facilities, subject to the requirements set forth in chapter 2.205 PCDSC. L. Some uses are allowed in all zoning districts based on statutory exemptions (see PCDSC 2.05.050) or because a governmental entity or governmental agency is performing a governmental function. ***Special Uses*** A. Beauty salon or barbershop B. Wireless communication facility

Design Guidelines



A. Purpose

The Smith-Rothberg PAD design guidelines are statements expressing the desired character of future development within the project area. The guidelines were originally created as part of the 2002 Red Rock Village PAD amendment and are being used in this PAD to continue the character of the Red Rock Village in the design of this subdivision. Under the authority of the CC&R's established for the Red Rock Village PAD, the Red Rock Village Architectural Control Committee crafted specific design guidelines in 2007 for the Red Rock Village PAD. These design guidelines were reviewed and adopted by Pinal County and have been included in this PAD in *Appendix E: Red Rock Village Community Association Design Guidelines*. Should a conflict between *Section IV. Design Guidelines* of this PAD and the Red Rock Village Community Association Design Guidelines arise, the Red Rock Village Community Association Design Guidelines shall take precedent. The Red Rock Village Community Association Design Guidelines are subject to their own amendment process and further amendments to the Red Rock Village Community Association Design Guidelines shall take precedence over *Section IV. Design Guidelines* and those contained in *Appendix E: Red Rock Village Community Association Design Guidelines*.

The guidelines are the design criteria to be used in the planning of each development proposal within the PAD. The criteria apply to four main topics: circulation, landscape, architecture, and signage. The developer and designers of each phase of the PAD will draw from and expand upon these concepts to maximize the success of the development. The development will be designed to be consistent with market needs, aesthetic satisfaction, and community goals.

The design guidelines are intended to be implemented at the time of development. This PAD establishes general design statements and guidelines that are applied project-wide to achieve consistent quality development. This includes design standards for community features, streetscapes, and parameters for architectural design. The final selection of project materials will be determined at PAD Site Plan Review based on the parameters set forth in the PAD.

The purposes of the Design Guidelines are as follows:

- To provide Pinal County with the necessary assurance that the PAD area will develop in accordance with the quality and character proposed herein;
- To provide guidance to County staff, Planning and Zoning Commission and the Board of Supervisors in the review of future development projects in the PAD area; and
- To include cost considerations and marketability effects to design guideline applications.

1. Areas Affected by Offsite Roadway Corridors

Treatment for the areas along major roadway corridors like Interstate 10 and Aguirre Lane will be different than the treatment within the residential subdivision blocks. To achieve an attractive streetscape where adjacent to Aguirre Lane, the area within and adjacent to its right-of-way will be uniformly established with regard to plant materials, earth berming and fencing treatments. As previously mentioned, a greenbelt at least one-hundred feet in width will be located along the eastern boundary adjacent to I-10.

2. Areas Affected by Project Entries

Entrances to the project site and subdivision blocks will be designed with accent plant material and groupings of plants to create major entry statements. To maintain the design integrity of the major entry features, the placement of structures at the community entrances should be carefully designed. This can be achieved by creative use of landscaping, walls, and fences to screen the side or back yards of homes from street view.

B. Circulation System

The layout of streets within the PAD is specifically designed to unite residential and recreational areas into a coherent system. Neighborhood streets provide access to all homes and recreation areas within the PAD. These streets are lined with sidewalks that facilitate pedestrian movement and connect with planned trails. Trail corridors provide an aesthetically pleasing environment for low-intensity recreation and connections to planned parks.

C. Landscape Development Guidelines

To achieve a distinctive quality within the project environment, landscape concept plans should strive to strengthen the overall community theme.

Landscape concept plans should focus on the following elements:

- Ensure that landscape design considerations include reclaimed water consumption and erosion control measures.
- Re-establish natural conditions where terrain is modified for circulation and development when possible.
- Enhance site improvements within view corridors on and offsite.
- Define specific plant materials in varying combinations to achieve a community identity.
- Utilize plant materials to visually identify each subdivision while blending them into the overall visual environment.

Landscape borders are necessary to ensure that proposed development within the Smith-Rothberg PAD is appropriately buffered from surrounding uses. The Smith-Rothberg PAD shall include the following landscape border requirements:

- North – Adjacent to Red Rock Village PAD: None (lot-to-lot with homes in the Red Rock Village PAD, which will be constructed by the same master developer)
- South – Adjacent to vacant State Trust Land: None
- East – Adjacent to Interstate 10: Minimum 100-foot Greenbelt (20-foot landscape border close to proposed lots, 80 feet of undisturbed open space immediately adjacent to I-10)
    - Required plants for the east landscape border – 4 canopy trees and 12 shrubs are required for every 100 linear feet of the landscape border area.
- West – Adjacent to Aguirre Lane: Minimum 10-foot landscape border
    - Required plants for the west landscape border – 4 canopy trees, 6 shrubs, 9 accents and/or vegetative groundcover plants are required for every 100 linear feet of the landscape border area.

The following is a list of general guidelines for landscape borders within the Smith-Rothberg PAD:

- Where a parcel abuts developed open space, there shall be no landscape border required.
- Landscape borders must consist of a combination of trees, shrubs, and groundcovers or accent plants.
- Minimum plant sizes shall be – trees: 15-gallon, shrubs & accents: 5-gallon, groundcovers: 1-gallon.
- Landscaping shall consist of approved plants from the Arizona Department of Water Resources (ADWR) plant list and viable salvage plants.
- Plants requiring irrigation shall be irrigated via an underground drip irrigation system.
- All walls and fences shall be painted, stained, or contain integral color. Uncolored gray block walls will not be permitted.
- Trees that produce large canopies and provide shade are especially encouraged in parks.
- Trees within landscape areas should be sited and spaced to avoid conflicts with overhead light fixtures.
- A minimum of one tree in the front yard of each residential lot will be required.
- Landscape borders may be used for passive recreation and may include recreational trails or walking paths as shown on *Exhibit I.B: Preliminary Development Plan*.
- Landscape plans shall be coordinated with above- and below-ground utilities to avoid conflicts at the time of installation.
- Viable vegetation identified in *Appendix B: Landscape Plan* shall be integrated into landscape borders.
- All common areas shall be maintained by the HOA and regulated by CC&R's.

D. Architecture Design Guidelines

The purpose of establishing Architectural Design Guidelines is to provide a reference for the planning and designing of residential, recreational, and facility structures within the PAD area. The intent of these guidelines is to guide the development of a specified architectural context and to help in the selection of materials and colors. More correctly, the guidelines are to be used to achieve project continuity and a standard of quality throughout the planned project and establish a greater visual identity.

1. Residential Design Guidelines

Layout

- A clear distinction shall be maintained between private, residential, educational, and recreational areas.
- An emphasis should be given to creating units with a strong indoor/outdoor relationship.
- All mechanical equipment shall be screened from view of major streets and pedestrian areas using walls similar in design to the project architecture or a planting space adequate in size for proper screening height and depth.
- Chimneys shall be compatible in materials to the accompanying structure.
- All antennas within residential areas shall be restricted to the attic or interior of the residence.
- All trash containers shall be screened from street view.

Design

- The architectural character of the PAD should be visually perceived from the street. The aim of the guidelines is to create interest through constancy in the use of architectural elements such as walls, windows, doors, balconies and roofs.
- Residential structures and community features shall be coordinated in architectural materials, details and quality. Community features include bus stops (school and mass transit), outdoor gathering places, recreation facilities and pedestrian access features.
- The pitch and form of roofs are a very visible community feature. A range of roof forms and roof pitch adds an appealing visual context to the community/streetscape.
- Enclosed roof overhangs are encouraged as a response to climatic conditions, especially when used in combination with porch enclosures, balconies and recesses to decrease summer sun angles and reduce interior temperature fluctuations.

- All parking structures, either free-standing or attached, shall incorporate the same design elements as the accompanying dwelling.

Materials

- The roofing materials used for all residential structures shall be of a fire-retardant material.
- Every single-family residence shall have a roof of a composition in compliance with the Fire Safety Section of the Uniform Building Code.

E. Signs

Signs shall comply with the *Pinal County Development Services Code, Chapter 2.145. Signs, Billboards, Name Plates and Other Outdoor Advertising*.

F. Lighting

Lights shall comply with the *Pinal County Development Services Code, Chapter 2.195. Outdoor Lighting*

Implementation



A. Purpose And Intent

Development of the Smith-Rothberg PAD will be implemented in conformance with the regulations and guidance contained within the PAD. This section outlines the procedures for administration of the provisions contained herein and the phasing plan for the development of the proposed planning area. Other information covered in this chapter pertain to general administration, subdivision, administration procedures and the linkage between these elements.

The Smith-Rothberg PAD shall be implemented through the subdivision process. The subdivision process will allow for the creation of lots as tentative parcel or tentative plats which will allow for implementation of the project phasing.

B. Phasing Program

The primary intention of the phasing program is to relate infrastructure requirements to site development and market demand. Currently, the PAD is planned to develop after necessary infrastructure is developed as part of the Red Rock Village PAD. This does not prohibit the PAD from developing prior to full buildout of the Red Rock Village PAD. Should the master developer or their successor(s) or assign(s) choose to develop the PAD or a portion of the PAD prior to the extension of the necessary infrastructure improvements, they will be required to pay the cost of such improvements.

Development of the PAD is expected to start at the center before developing the northern third of the PAD and finally the southern third. At minimum, 33% of the larger centralized recreation area amenities should be constructed and operational by the time 25% of the total allowable dwelling units have had a final inspection, 66% of the larger centralized recreation area amenities should be constructed and operational by the time 50% of the total allowable dwelling units have had a final inspection, and 100% of the larger centralized recreation area amenities should be constructed and operational by the time 75% of the total allowable dwelling units have had a final inspection. All other recreation area facilities should be constructed and operational by the time 75% of the dwelling units for the phase in which the facilities are located have had a final inspection.

The PAD allows for flexibility in project phasing because the actual sequence of development may be affected by numerous factors not currently predictable, including site plan modifications due to final engineering or changes in the economic market.

C. General Administration, Permit Processing and Amendments

The PAD shall be administered and enforced by Pinal County Planning and Development Services Department, in accordance with the provisions of the Pinal County Development Services Code.

Certain changes to explicit provisions in the PAD may be made subject to *Chapter 2.176.260* of the Pinal County Development Services Code. The following items are minor amendments in addition to those not listed under *Chapter 2.176.260(A)*:

- The addition of new information to the PAD maps or text that does not change the effect of any regulations or guidelines.
- Changes to the community infrastructure, such as roads, open space, park site, drainage, water, and sewer systems which do not have the effect of increasing or decreasing development capacity in the PAD area nor change the concepts of the plan.
- The determination that a use be allowed which is not specifically listed as permitted but which may be determined to be similar in nature to those uses explicitly listed as permitted.

The PAD shall be implemented through a method of tentative parcel and plat review by the engineering staff of the Pinal County Planning and Development Services Department. Tentative parcel and plats will be processed in accordance with the Pinal County Development Services Code.

All proposed projects within the PAD area shall be required to have an approved plat or Site Plan prior to issuance of building permits or concurrent with subdivision, special use permits or any other permits for the property. The Tentative parcel/plat or Site Plan review procedure is necessary for the following reasons:

- To ensure consistency with the PAD, the County Comprehensive Plan, and all implementing ordinances.
- To promote the highest contemporary standards of site design.
- To adapt to specific or special development conditions that occur from time to time while continuing to implement the PAD and conform development to the County Comprehensive Plan and implementing ordinances.
- To facilitate complete documentation of land use entitlements authorized and conditions pertinent thereto.
- To adapt to changes that may occur with respect to the circumstances under which the project is undertaken.

Exemptions

Following is a list of activities which are exempt from the Site Plan review process; however, a building permit may be required. This list is not all-inclusive. The Planning Director may exempt other special activities not covered by the example listing.

- All interior changes, alterations, construction.
- Repainting
- Re-glazing, new mullions
- Re-landscaping of existing structure.
- Re-roofing with similar-style roofing materials.
- Minor exterior repairs.
- Demolition.
- Exterior mechanical (heating, air conditioning, water heater, etc.)

Procedures

Site Plans which contain plans, drawings, illustrations, designs, reports and other detailed information, as required herein, shall be submitted to the County for review and comment. Applicants are encouraged to submit preliminary plans for review and comment by the Planning Department prior to the final preparation of a Site Plan. Comment from other County departments and service agencies shall be sought by the staff prior to preparing a recommendation on the finalized PAD Site Plan.

Applicants should ensure that they have obtained a copy of the design guidelines contained within the PAD. This will assist the developer in achieving consistency with the PAD and generally facilitate a quality project.

This plan may be amended as necessary in the same manner it was adopted; by ordinance. Said amendment or amendments shall not require a concurrent County Comprehensive Plan amendment unless it is determined by County staff that the proposed amendment would substantially affect the Comprehensive Plan goals, objectives, policies or programs.

Appendices



A. Appendix A: Open Space and Recreation Plan

1. Acreage

The parcel (APN: 410-12-001D) is approximately 60 acres and will be entirely developed.

2. Proximity to County and Neighborhood Infrastructure

The Pinal County Open Space and Trails Master Plan has a single proposed trail planned through the Red Rock community. This trail will be approximately three quarters of a mile north along Sasco Road and travel westward toward Ironwood Forest National Monument. It will connect to the Central Arizona Project trail corridor north of Red Rock at Park Link Drive.

The Red Rock Elementary School District is a Pinal County school district based in Red Rock. The Red Rock Elementary School District operates a single K-8 school in the Red Rock community.

Sasco Road, Red Rock Road, and Aguirre Lane provide dedicated bike lanes within the Red Rock Village PAD (RRV PAD). Trails, paths, and sidewalks within the Smith-Rothberg PAD will extend to the boundary to offer connections with the RRV PAD.

3. Slope Analysis

Much of the site is flat with a surface slope between 0% - 5%. Areas with a surface slope between 5% - 10% or greater than 10% are generally found along the eastern boundary with I-10, which is proposed to remain open space. These are man-made slopes that were formed with the construction of I-10 and other existing infrastructure/utilities. Runoff from the I-10 has created additional minor slopes onsite in an area near its southern boundary.

The average cross slope of the property is 1.22%. According to the Pinal County open space requirements, properties with slopes between 0% - 5% are not required to preserve conservation open space if the property has been disturbed. This property has been disturbed in the past as evidenced by the disturbance along the east boundary parallel with I-10 and some vehicle paths through the center of the property and along the western and southern boundary. Please see *Exhibit VI.A.1: Site Aerial* for a more detailed look at disturbances and *Exhibit II.K: Topography* for a more detailed view of on-site slopes.

Average Cross Slope

Formula: I x L x 0.000023/A
I=Contour Interval (Feet)
L=Length of all contour line segments (Feet)
A=Area of Parcel

Parcel Calculation

$$2 \times 15{,}937.8 \times \frac{.000023}{60.13} = 1.22\% \text{ Average Cross Slope}$$

4. Preliminary Hydrologic Information and Contributing Watershed

In accordance with PCDM Vol. II, the on-site discharge for Red Rock Village must be routed to a retention basin and drained within 36 hours. The necessary retention basin volume was calculated by the rational method (eq. 3):

$$V_R = C_W(\frac{P}{12})A \quad \text{(eq.3)}$$

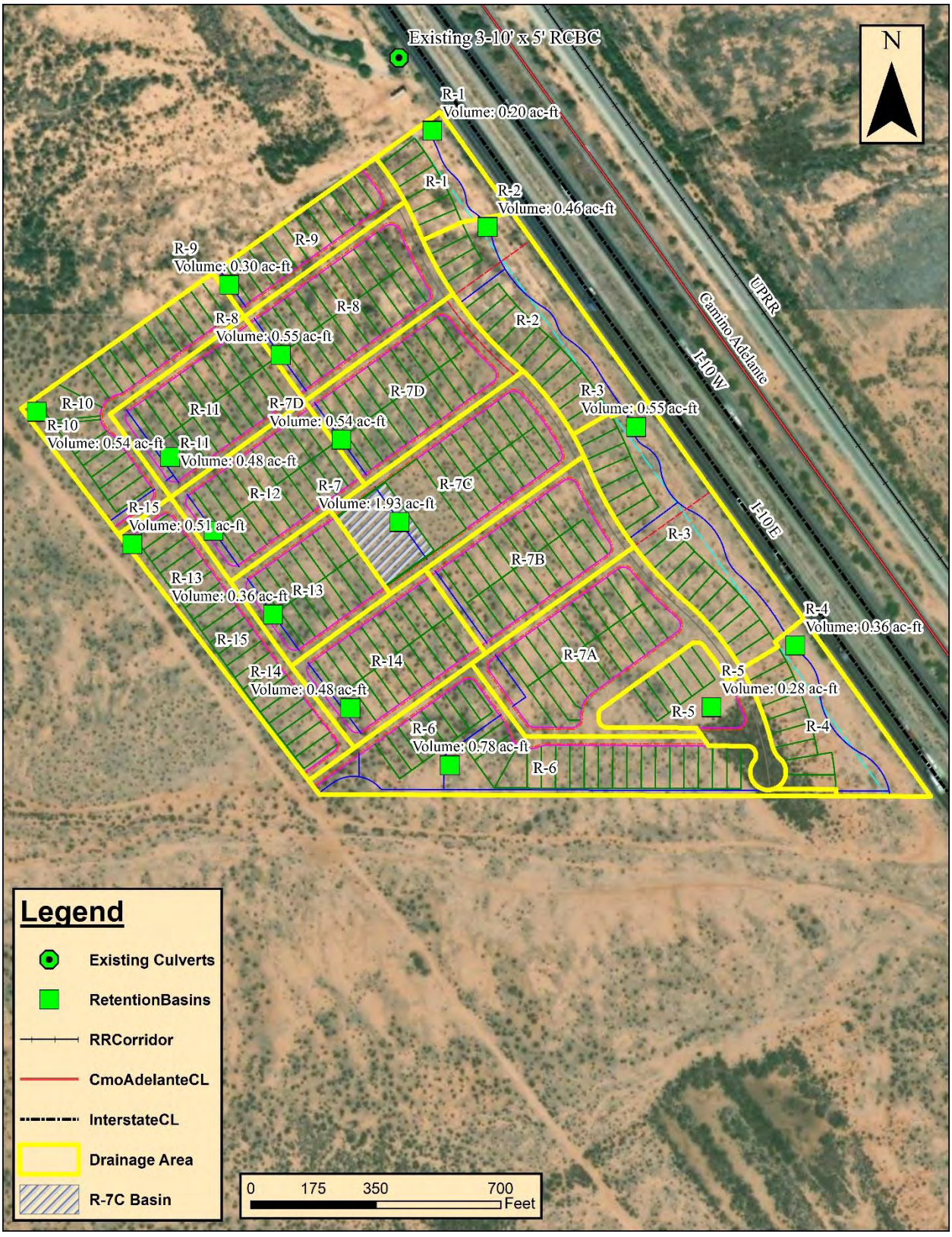
Where:
C_W = Weighted runoff coefficient, from Table 2-1 PCDM Vol. II. Calculated by spatially weighting the
curve number associated with lots, open spaces, and roads, dimensionless.
P = 100-year, 2-hour precipitation depth, taken from NOAA Atlas 14 using the centroid of the basin,
inches.
A = Drainage area, acres

As set forth by PCDM Vol. I, the retention basin ponding depth is not to exceed 3-ft and freeboard shall be no less than 1-ft. In lieu of a percolation test conducted by a registered geotechnical engineer, drywells are assumed to be used to drain all retention basins at a drain rate of 0.5-cfs per drywell within the prescribed 36-hours. A tabulated summary of the retention basins is available in *Table VI.A.4: Retention Volumes by Basin*, and the preliminary locations are shown in *Exhibit VI.A.4: Retention Volumes and Locations.*

TABLE VI.A.4: RETENTION VOLUMES BY BASIN

Basin ID	C_W	Precipitation Depth (in)	Drainage Area (ac)	Retention Volume (ac-ft)	# of Drywells
R-1	0.66	2.29	1.58	0.20	1
R-2	0.64	2.29	3.8	0.46	1
R-3	0.64	2.29	4.44	0.55	1
R-4	0.62	2.29	3.04	0.36	1
R-5	0.73	2.29	2.02	0.28	1
R-6	0.74	2.29	5.49	0.78	1
R-7C	0.79	2.29	12.8	1.93	2
R-7D	0.81	2.29	3.48	0.54	1
R-8	0.82	2.29	3.52	0.55	1
R-9	0.83	2.29	1.92	0.30	1
R-10	0.80	2.29	3.53	0.54	1
R-11	0.82	2.29	3.08	0.48	1
R-12	0.83	2.29	3.08	0.49	1
R-13	0.82	2.29	2.29	0.36	1
R-14	0.82	2.29	3.05	0.48	1
R-15	0.81	2.29	3.28	0.51	1

Exhibit VI.A.4: Retention Volumes and Location



5. Significant Vegetation

The Arizona Game and Fish Department Environmental Review Tool (AZGFD ERT) was used to determine the presence of riparian habitat onsite. The AZGFD ERT indicated that no "Pinal County Riparian" is found onsite. The nearest riparian habitat is north of the property within the existing Red Rock Village PAD. The entirety of the property is within an identified "Important Connectivity Zone" and "Wildlife Connectivity" area, although I-10 creates a significant barrier to wildlife crossings in this area.

Because no riparian habitat is found on-site, a field survey and an aerial (see *Exhibit VI.A: Site Aerial*) captured by MAXAR in May of 2021 was used to delineate vegetation density. Areas on-site were classified into three different densities of vegetation: high, medium, and low. There is a single area of high-density vegetation on-site that is caused by runoff from I-10 pooling along the southern boundary of the property. Medium density vegetation occurs in isolated areas along the western and northern boundary of the property. The remainder of the property is classified as low-density vegetation. The low-density vegetation areas have smaller, sparser plant material and evidence of recent ground disturbance from off-road vehicles. These classifications were used in conjunction with the field survey to determine what plants should be salvaged. The Landscape Plan provides an explanation of the methodology for determining salvageable plants.

6. View Corridors

The property has views of Picacho and Newman Peak to the north and Silver Bell Peak and Mountains to the southwest. Because many of the homes in the Smith-Rothberg PAD will be one or two-stories, views of these mountains will remain. The land immediately adjacent to the Smith-Rothberg PAD is vacant land but distant views of the mountains will persist after development of the Red Rock Village PAD. The street layout, large paths, and community park in the center of the subdivision will provide gaps that allow offsite vistas to be seen from the neighborhood.

7. Arizona State Museum Letter

There have been 32 archaeological surveys conducted on or within one mile of the project parcel between 1955 and 2011. These surveys have covered approximately 81% of the project site. No information is available for the other 19% of the site. Nineteen sites have been identified within one mile of the project site and none onsite. Seven of the sites are Native American sites and ten are Euro-American sites. The remaining site is newly recorded with no information available.

There are no National Register of Historic Places (NHRP) listed sites within one mile of the project site. The nearest NRHP-listed property is the Picacho Pass Skirmish Site-Overland Mail Company Stage Station at Picacho approximately 9.2 miles northwest of the project parcel. Because only two of the four surveys are considered satisfactory by SHPO

Guidance Point No.5 and they do not cover the entirety of the parcel, it is recommended that an archaeological contractor be consulted before any ground disturbances. For the full Arizona State Museum Equivalent Letter, see *Exhibit VI.A.4*.

8. Conservation and Developed Open Space

a) Conservation

Much of the site has been subject to past disturbances that have reduced the quality and amount of natural desert. Because of these existing conditions, there will be no preserved areas of conservation space.

b) Developed Open Space

All open space in the Smith-Rothberg PAD will be developed open space. The breakdown and percentage of open space and recreation is provided in the table below.

TABLE VI.A.8: PERCENT OF OPEN SPACE

Smith-Rothberg PAD – Open Space			
Site Acreage	**Required Acreage (based on 18% requirement)**	**Provided Acreage**	**As a Percent**
60	10.8 Open Space	15.6 OS	26% OS
60	4.21 Recreation Area	7.28 RA	12% RA

Note: Open Space = OS, Recreation Area = RA

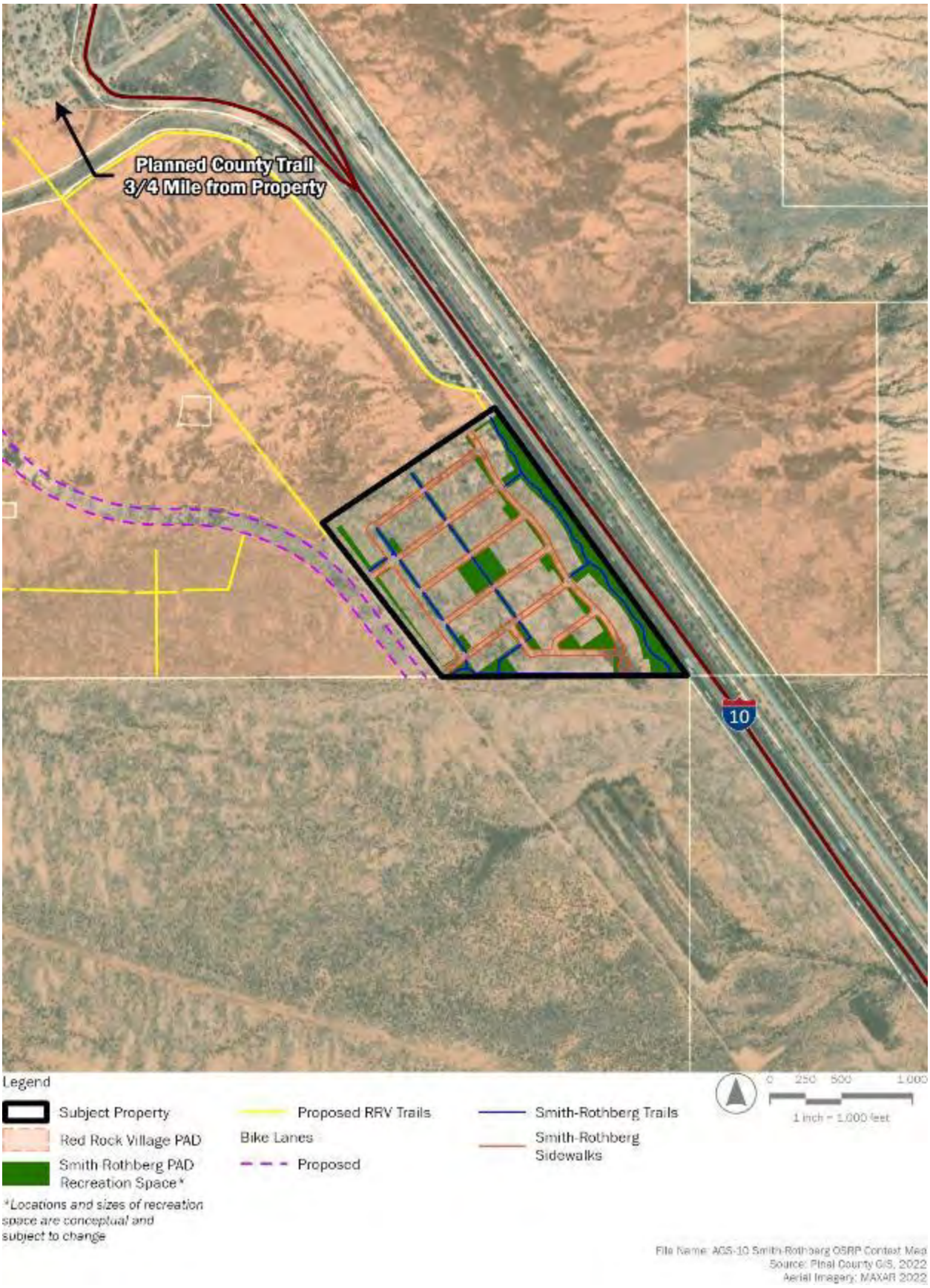
Exhibit VI.A.1: Site Aerial



Exhibit VI.A.2: Vegetation Density



Exhibit VI.A.3: Open Space and Recreation Plan Context Map



SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.

Tucson, Arizona 85701
Tel 520.325.9194 Fax 520.325.2033
www.swca.com

October 13, 2022

Garrett Aldrete
The Planning Center
2 East Congress Street, Suite 600
Tucson, Arizona 85701

Re: Archaeological Records Review of Parcel 410-12-001D near Red Rock, Pinal County, Arizona

Dear Mr. Aldrete:

SWCA Environmental Consultants (SWCA) has reviewed the archaeological project and site records for Pinal County Assessor's Parcel 410-12-001D in support of the environmental review requirements for rezoning privately owned land. The parcel is located on the west side of Interstate 10, east of the El Paso Natural Gas Pipeline 1007, and approximately 0.8 mile southeast of East Sasco Road in Section 9, Township 10 South, Range 10 East (Gila and Salt River Baseline and Meridian), on the U.S. Geological Survey Red Rock, Arizona, 7.5-minute quadrangle. Below are the results of the records search.

SEARCH RESULTS

According to a search of the archaeological site files and records contained with AZSITE, 32 archaeological survey projects have been conducted in or within 1.0 mile of the project parcels. These projects were conducted between 1955 and 2011 for residential and commercial development, road improvements and expansions, gas pipelines, power plants and transmission lines, fiber optic cables, mine expansions, transmission lines, and water infrastructure. Approximately 81 percent of the project parcel has been survey resulting from four surveys. In the early and middle 1990s, the University of Arizona conducted the Northern Tucson Basin Survey (NTBS) that partially overlapped with the parcel. The NTBS consisted of an 1,800 km^2 study area, which received varying degrees of survey coverage. Dames & Moore conducted an extensive linear survey for a fiber optic line in 1986 and 1987 which partially overlapped the project parcel. In 1997 and 1998, Pima Community College conducted a large block area of 817 acres of the La Osa Livestock Company land for proposed development. In 2001, Environmental Planning Group conducted a linear survey for a transmission line that overlapped the parcel.

Nineteen sites have been identified within 1.0 mile of the subject parcel, none of which are within the project parcel. Seven sites are Native American sites, consisting of two artifact scatters and five artifact scatters with associated rock features. Ten sites are Euro-American sites consisting of one historic artifact scatter, the Red Rock Station, the Red Rock Town Site, and the Arizona Southern Railroad Company railroad grade. The remaining six Euro-American sites consists of the in-use historic-era El Paso Natural Gas Line, State Route 84, Sasco Road, a dirt road, the Southern Pacific Railroad Mainline, and two transmission lines. The final site is newly recorded, and no information is currently available.

The National Park Service's National Register of Historic Places (NRHP) online database was also searched to identify properties listed in the NRHP that are located within or near the subject parcels. No NRHP-listed properties were identified in or within 1.0 mile. The NRHP-listed property nearest the subject parcel is the Picacho Pass Skirmish Site–Overland Mail Company Stage Station at Picacho Pass, which is approximately 9.2 miles northwest of the project parcel.

RECOMMENDATIONS

1. Approximately 81 percent of the subject parcel has been previously surveyed. However, the two surveys conducted in the 1980s were conducted over 30 years ago would not be considered satisfactory (adequate or accurate) when evaluated under SHPO Guidance Point No. 5: SHPO Position on Relaying on Old Archaeological Survey Data (Available at https://azstateparks.com/shpo-guidance-points), primarily because of changes that have since occurred in survey methodology and site definitions. The other two surveys would be considered satisfactory; however, they did not completely cover the subject parcel. Therefore, SWCA recommends, that a qualified archaeological contractor be consulted before any ground-disturbances. Therefore, SWCA recommends that a qualified archaeological contractor be consulted before any ground disturbances. A list of archaeological contractors is available on the Arizona State Museum (ASM) website at https://statemuseum.arizona.edu/crm.

2. Pursuant to Arizona Revised Statue §41-865, if any human remains of funerary objects are discovered during project work, all work must stop within the area of the remains and Cristin Lucas, ASM repatriation coordinator, will be contacted at 520-626-0320 or Stacy Ryan, ASM assistant repatriation coordinator, at 520-626-2950.

3. City, county, or municipal governments may have requirements; therefore, SWCA recommends that the relevant jurisdiction(s) be consulted.

If you have any questions about the results of this records search, please feel free to contact me at dbarr@swca.com or 520-325-9194.

Sincerely,

David M. R. Barr, M.A. RPA

Principal Investigator (Arizona Antiquities Act Permit No. 2022-033bl)

B. Appendix B: Landscape Plan

1. Vegetation Salvage Plan

Existing Conditions

A registered landscape architect surveyed the site to determine vegetation type, viability of existing vegetation, and transplantability. The site is predominately comprised of creosote flats and the occasional mesquite tree. There is a mesquite bosque near the southeast corner that appears to be manmade due to its trapezoidal shape and depressed topography in an otherwise flat site. The mesquite in this area show signs of old growth and poor viability to survive transplanting due to die-back in primary branching structure, rough and shaggy bark, and proximity to other plants. As a result, there is little to no regeneration of trees and these mesquites would likely not survive transplantation. No other mesquite on-site are young and healthy enough to survive transplantation.

Salvage Plants

While few and far between, there are barrel cacti onsite. Barrel cacti over a foot in height were inventoried but all barrel cacti on-site, no matter the size, shall be salvaged and incorporated into landscaping within Smith-Rothberg.

As shown on *Exhibit VI.B.1: Salvage Vegetation*, one peniocereus greggii, commonly known as night blooming cereus, was found onsite. This plant and all other peniocereus greggii found shall be salvaged and incorporated into the landscaping.

2. Proposed Treatment of Ground Surfaces

The streets of the proposed subdivision will be asphalt. Sidewalks will be made of concrete, and paths and trails will be made of concrete, asphalt, or another material suitable for trails. Areas surrounding paths and front yards will use rock mulch and rock landscaping. Parks will use grass or turf for recreation areas and appropriate ground materials for playgrounds, such as sand, woodchips, and rubber mats. Other areas of parks not used for recreation areas or play equipment will use natural or rock landscaping.

3. Extent and Location of All Plant Materials and Other Landscape Features

The extent and location of plant materials and landscape features will be determined during the platting process.

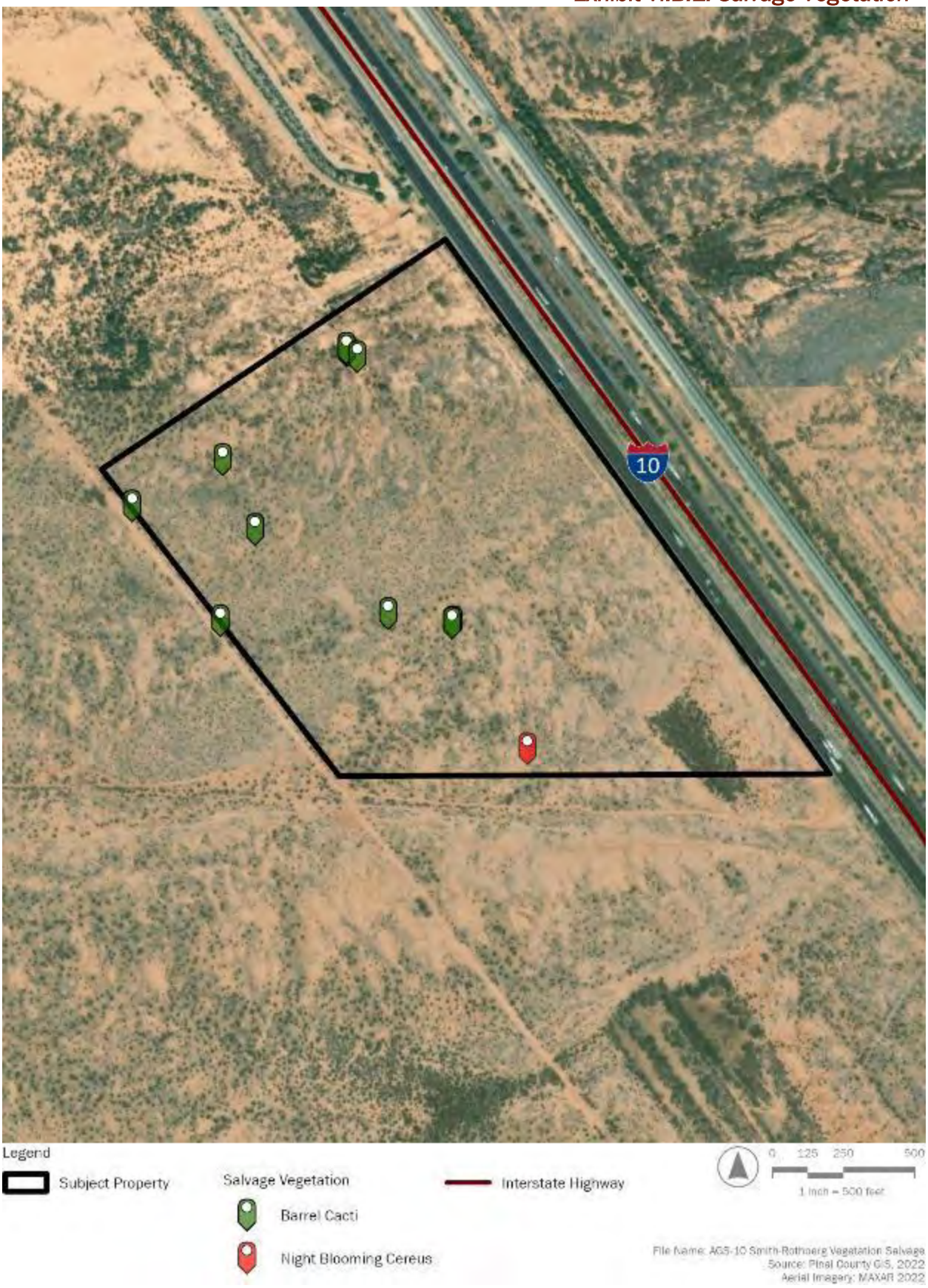
4. Extent of Decorative Design Elements

The proposed subdivision will have monumentation at both Aguirre Lane entry points. The extent and location of other decorative elements will be determined during the platting process.

5. Location of Water Outlets

The location of water outlets will be determined during the platting process.

Exhibit VI.B.1: Salvage Vegetation



C. Appendix C: Comprehensive Plan Compliance Checklist

Appendix A: Comprehensive Plan Compliance Checklist

Purpose:
Provide guidance to ensure conformity of development proposals with the Pinal County Comprehensive Plan.

Intent:
1. Explain how to determine if development proposals are compatible with the Comprehensive Plan.
2. Explain why unique conditions exist to deviate from the Plan.

The Pinal County Comprehensive Plan graphics, Land Use, Circulation (two graphics), and Economic Development, are not intended to be zoning maps that outlines specific locations and parcel-by-parcel determination for land uses and facilities. The Comprehensive Plan's intent is to provide policy direction and a framework for how the Pinal County "development form" or layout should occur over time. It is not the intent to predetermine specifically where land uses must occur. Guidelines within the Land Use element provide direction on development and how it relates to transportation corridors, surrounding land uses, public facilities, and natural environment.

Determination:
Comprehensive Plan Compliance is determined by the development's conformity with the Comprehensive Plan's land use designations (Land Use graphic and Land Use element text) and activity centers (Land Use and Economic Development graphics and Economic Development element text) as well as the goals, objectives, policies and guidelines outlined in the Pinal County Comprehensive Plan. Planning guidelines for each of the land use designations and Activity Centers are also included in the Land Use element. It is important to note that all components and concepts may not apply to every potential proposal.

Organization:
The Compliance Checklist focuses on two major components:

1. Consistency with Pinal County's Vision Components
2. Consistency with the Plan's Key Concepts illustrated on Land Use, Circulation, and Economic Development graphics.

How Is the Checklist Used?
Various concepts are discussed and a "YES" checkbox is provided to indicate if the proposal complies with the key concepts of the Plan.

- If a project complies, it receives a ✓ in the appropriate box.
- If it does not comply, the checkbox will remain blank, and additional information would need to be provided to explain the unique circumstance, if applicable.

We Create Our Future: Pinal County Comprehensive Plan Appendix A: Comprehensive Plan Compliance Check List A1

- If a project has no relation to a particular check list item, a "non applicable" response is acceptable with a brief explanation.

Who Should Use the Checklist?

Developers, staff, and decision-makers should use the Comprehensive Plan Compliance Checklist.

- ✓ Developers should use this checklist as a guide to the Plan's policies in the early stages of a development proposal and when submitting an application for review.
- ✓ Staff should use it to review development proposals and to make recommendations to decision-makers. The checklist can assist in developing the staff report.
- ✓ Decision-makers can use the checklist to better understand how well a proposal does or does not comply with the Pinal County Comprehensive Plan.

PART ONE

Consistency with Pinal County's Vision Components

The Pinal County Comprehensive Plan is a vision-based plan that provides the framework that all decisions related to growth and development are measured against. The following is intended to describe how the proposal meets the various vision components.

Pinal County Vision The County recognizes the importance of the region's strategic location between the Phoenix and Tucson Metropolitan Areas and its relationship to the overall well-being of the state of Arizona. What happens in Pinal County does not stay in Pinal County; the decisions made here will impact the entire state on many levels: business development, mobility, land management, air quality, water, and overall quality of life. People choose Pinal County for the diverse opportunities it offers; this diversity is what makes Pinal County unique but also represents a challenge as Pinal County continues to grow and change.

Pinal County is a place where history, culture and heritage are the foundation for its future. Pinal County will be seen as a leader in environmental stewardship and conservation practices by ensuring that the natural environment is preserved, yet still available to be discovered. Pinal County provides quality educational and training opportunities placing residents in cutting edge, environmentally-compatible jobs within the County. While communities within Pinal County retain and celebrate their unique qualities, governments and agencies share a collaborative spirit to ensure successes across Pinal County and remain responsive and accountable to their constituents.

Sense of Community—Pinal County is a collection of unique communities, each of which has something special to offer residents and visitors. Balancing emerging urban centers and Pinal County's rural character is important to residents; ensuring that the threads of Pinal County's history, heritage, and culture are woven into its future is what makes Pinal County unique from other regions. Ensuring places exist for people to gather and for communities to showcase the diversity of places, people, lifestyles, cultures, and opportunities will help to define Pinal County's identity.

The proposal:

☑ Is consistent with the **Sense of Community** vision component

Please explain:

The Smith-Rothberg PAD provides a neighborhood park at the center of the subdivision. This park will be large enough to accommodate a variety of events, such as block parties, that help bring neighbors together and foster a connection to the community. A larger community park and community center is located near the center of the Red Rock Village PAD along Sasco Road, which can be used for large events for the entire Red Rock Community. It is anticipated that Smith-Rothberg PAD residents will have access to the Red Rock Community amenities.

Mobility and Connectivity—Ensuring Pinal County has adequate transportation corridors and a variety of multimodal transportation options addressing all populations is essential for moving goods and people throughout the County and State with minimal affect on Pinal County's native wildlife. Offering multiple mobility and communication options, to effectively connect communities and activity centers throughout the County, will reduce congestion and improve air quality while enhancing the area's quality of life.

The proposal:

☑ Is consistent with the **Mobility and Connectivity** vision component

Please explain:
The Smith-Rothberg PAD provides the necessary infrastructure to ensure residents have multiple ways to move throughout the PAD safely. Several trails connect to sidewalk infrastructure, allowing residents to walk out their door to nearby parks. These trails will extend to the boundary to offer connections to the Red Rock Village PAD and help create opportunities for a vast network encompassing nearly the entirety of Red Rock.
Because of Red Rock's location, public transportation options are limited but the existing and planned road network provides connections to all residential and commercial areas of the Red Rock Village PAD. These roadways also accommodate cyclists for non-vehicular travel. Lastly, the proximity to Interstate 10 allows residents to stay connected to the rest of the county and state.

Economic Sustainability—Expanding opportunities for residents to live, work, learn, and play in close proximity promotes long-term economic viability. Pinal County desires activity centers that serve the current and future residents' needs offering services, businesses and employment opportunities, including high-tech and environmentally-friendly employers who champion Pinal County's conservation philosophy. The creation of the full range of quality jobs that allow residents to start their career, raise a family, and move up instead of out of Pinal County for career advancement is essential. (This may not apply to all projects)

The proposal:

☑ Is consistent with the **Economic Sustainability** vision component

Please explain:
The Smith-Rothberg PAD helps locate housing near multiple future employment centers. The Pinal County Comprehensive Plan identifies a UPRR switching yard in the Red Rock area, Pinal Airpark, and economic development efforts by the Town of Marana as significant motivators for housing in the area because of the expected well-paying, long-term jobs each of those projects will generate.

A 4 Appendix A: Comprehensive Plan Compliance Check List We Create Our Future: Pinal County Comprehensive Plan

Open Spaces and Places—Residents value the large connected open spaces and unique places of Pinal County, not only as part of their quality of life, but as an important resource to sustain the region's immense wildlife habitat and their corridors. From the majestic mountains rising from the desert floor in the west to the high desert and rugged mountain terrain to the east, enjoyment of and respect for the natural surroundings is a big part of why people choose Pinal County to live and visit.

The proposal:

☑ Is consistent with the **Open Spaces and Places** vision component

Please explain:
The Smith-Rothberg PAD will provide its residents with over 18% of its acreage as developed open space. The ratio between open space and development will ensure that residents retain more than adequate open space near their homes. The Smith-Rothberg PAD will also offer the ability to connect to the Red Rock Village trail network that connects residents to multiple smaller parks and the large community park.

Environmental Stewardship—People value the views of the mountains and open vistas during the day and the stars at night. These values have translated to a strong conservation ethic that stresses the importance of maintaining the quality of Pinal County's natural resources for future generations. Pinal County is the leader in environmental stewardship, and rewards and encourages sustainable practices such as innovative land use planning, sustainable agriculture, water conservation, green building development, and the use of renewable and alternative energy sources.

The proposal:

☑ Is consistent with the **Environmental Stewardship** vision component

Please explain:
The Smith-Rothberg PAD will feature landscape borders, ample park space, and a wide greenbelt along the interstate. These areas will help reduce the urban heat island effect and allow for groundwater recharge and the harvesting of rainwater for landscaping. The goal is to plant healthy vegetation, maintained over time to ensure it grows to maturity and is an improvement over the existing distressed vegetation onsite.

Healthy, Happy Residents—Access to quality healthcare and healthy lifestyle choices is a priority. Pinal County is a healthy, safe place where residents can walk or ride to activity centers and where interaction in Pinal County's clean, natural environment is encouraged. Ensuring residents are healthy, safe and happy in their community is a priority for Pinal County.

The proposal:

☑ Is consistent with the **Healthy, Happy Residents** vision component

Please explain:

As previously mentioned, the Smith-Rothberg PAD will offer numerous trails and sidewalks connecting residents to a proposed neighborhood park and multiple pocket parks. The community will be enhanced by native plants, helping to improve the aesthetics and providing people with shade and desert ambience. The availability and convenience of inviting recreational space will help residents lead an active and healthy lifestyle.

Quality Educational Opportunities—Quality, community-based Pre k-12 programs that provide youth with a competitive edge along with a wide variety of post-secondary educational opportunities and technical or specialized workforce training are necessities. Pinal County residents seek out life-long opportunities that help to expand their minds and diversify their experiences. (This may not apply to all projects)

The proposal:

☑ Is consistent with the **Quality Educational Opportunities** vision component

Please explain:

Red Rock Elementary School District was provided with a new school site in the Red Rock Village PAD. The old school site remains under the ownership of the Red Rock School District, and a second school site within the Red Rock Village PAD has been identified. As the Red Rock community grows, the developer has ensured adequate space for new schools and their extracurriculars. The University of Arizona, Pima County Community College, and Central Arizona Community College also provide quality post-secondary education to thousands of in- and out-of-state students every year.

PART TWO

Consistency with the Plan's Key Concepts illustrated on Land Use, Economic, and Circulation graphics

Consistency with the Land Use Designation shown on the graphics

The project land uses:

☐ Are shown as indicated on the Land Use and Economic Development graphic

☑ Are not shown as indicated on the Land Use and Economic Development graphic

The Pinal County Comprehensive Plan Land Use Designation for the project site is Moderate Low Density Residential. The project is proposing Medium Density Residential land use. This land use is consistent with the surrounding land uses in the Red Rock Village PAD, which is planned for primarily residential development west of Interstate 10 to Medium Density Residential (3.5-8 du/ac).

Consistency with the Mixed Use Activity Center Concept

The project land uses:

☐ Meet the Mixed Use Activity Center requirements

☑ Are not shown within a Mixed Use Activity Center

If shown within a Mixed Use Activity Center, explain how it meets the planning guidelines outlined in the Land Use element.

The land use proposal includes a Mixed Use project, not shown in a Mixed Use Activity Center; explain how it meets the planning guidelines and intent of the Plan.

Consistency with the Planning Guidelines described in the Land Use element

The project land uses:

☑ Are consistent with the applicable Planning Guidelines described in the Land Use element

See Minor Comprehensive plan narrative.

Quality Employment Opportunities County-wide

The Comprehensive Plan stresses the importance of increasing the number of opportunities to locate quality jobs County-wide in order to increase the jobs-to-population ratio.

The proposal:

☑ Is consistent with the Economic Development element

☐ Includes additional information about how the development addresses the Economic Development Vision embodied in the Comprehensive Plan.

are also attracted by the demographics of a region and what they offer as a potential pool of employees. The Red Rock

Please explain:

Housing quality and availability help attract new jobs because some employers want their workforce to live in quality neighborhoods near their workplaces. Employers are also attracted to the demographics of a region and what it offers as a potential employee pool. This project helps bring additional housing to southern Pinal County near many locations identified for their potential to expand employment. The housing that is offered will help increase the number of professionals who can locate in the area and increase the attractiveness of southern Pinal County for potential employers.

A-8 Appendix A: Comprehensive Plan Compliance Check List We Create Our Future: Pinal County Comprehensive Plan

Viable Agriculture, Equestrian and Rural Lifestyle

Historically, agriculture has played an important role in Pinal County's economy and lifestyle. Encouraging the continuation of viable agriculture and protecting it is an important component of the Plan. Additionally, supporting an equestrian and rural lifestyle has a place in Pinal County as it continues to urbanize.

The proposal:

☑ Clusters development to protect open space and agriculture

☐ Includes additional information about how the development addresses Viable Agriculture, Equestrian, and Rural Lifestyle.

Please explain:
The Smith-Rotherberg PAD uses a smaller lot size to create a more compact development pattern that allows for more open space and recreation area.

System of Connected Trails and Preservation of Open Space

Pinal County is committed to the preservation of large swaths of open space and the development of a connected system of trails. This applies to all projects/proposals/actions.

The proposal:

☑ Is consistent with *Pinal County Trails and Open Space Master Plan* and Comprehensive Plan Open Space and Places Chapter

☐ Includes additional information about how the development addresses the open space Vision and goals

Please explain:
The Smith-Rothberg PAD provides a trail system for residents of the subdivision to safely move through their community and connect to nearby parks. These trails will extend to the boundary of the PAD to offer opportunities to connect to the Red Rock Village PAD trails. The Red Rock Village PAD will connect to the county trail system via a planned multi-use corridor through the PAD along Sasco Road.

Natural and Cultural Resource Conservation

The Comprehensive Plan strives to protect natural/cultural resources, wildlife corridors and environmentally-sensitive areas such as mountains and foothills, major washes, and vistas. These areas are predominantly undeveloped and contain sensitive resources or natural hazard areas.

The proposal:

☐ Address environmentally sensitive areas it may impact.

☑ Includes additional information about how the development addresses the natural and cultural resource conservation.

Please explain:

Arizona Game and Fish Department's Environmental Review Tool indicates that project is in "Important Connectivity Zones" and "Wildlife Connectivity" on the Important Areas map. These are both large general areas of connectivity. The design of the subdivision allows for wildlife crossing, specifically in the trail corridors along I-10 and the southern boundary of the site.

Water Resources, Public Facilities/Services, and Infrastructure Support

All developments must bring adequate water resources and the necessary infrastructure to support the intensity of development in order to minimize the impact on the County's ability to provide public services. All development and growth, public and private, must acknowledge its impacts and pay its own way.

The proposal:

☑ Ensures that adequate public facilities are in place or planned for within a reasonable time of the start of the new development

Please explain:

The Smith-Rothberg PAD is planned to develop after the final phases of the Red Rock Village PAD. The Red Rock Village PAD provides all the necssary infrastructure to support the subdivision.

D. Appendix D: AZ Game and Fish Environmental Review Tool

Arizona Environmental Online Review Tool Report

Arizona Game and Fish Department Mission
To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.

Project Name:
Red Rock Village Addition PAD

Project Description:
AGS-10 Red Rock Village Addition

Project Type:
Development Outside Municipalities (Rural Development), Residential subdivision and associated infrastructure, New construction

Contact Person:
Garrett Aldrete

Organization:
The Planning Center

On Behalf Of:
CONSULTING

Project ID:
HGIS-17537

Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.

Page 1 of 12

Disclaimer:

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HabiMap Arizona data, specifically Species of Greatest Conservation Need (SGCN) under our State Wildlife Action Plan (SWAP) and Species of Economic and Recreational Importance (SERI), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

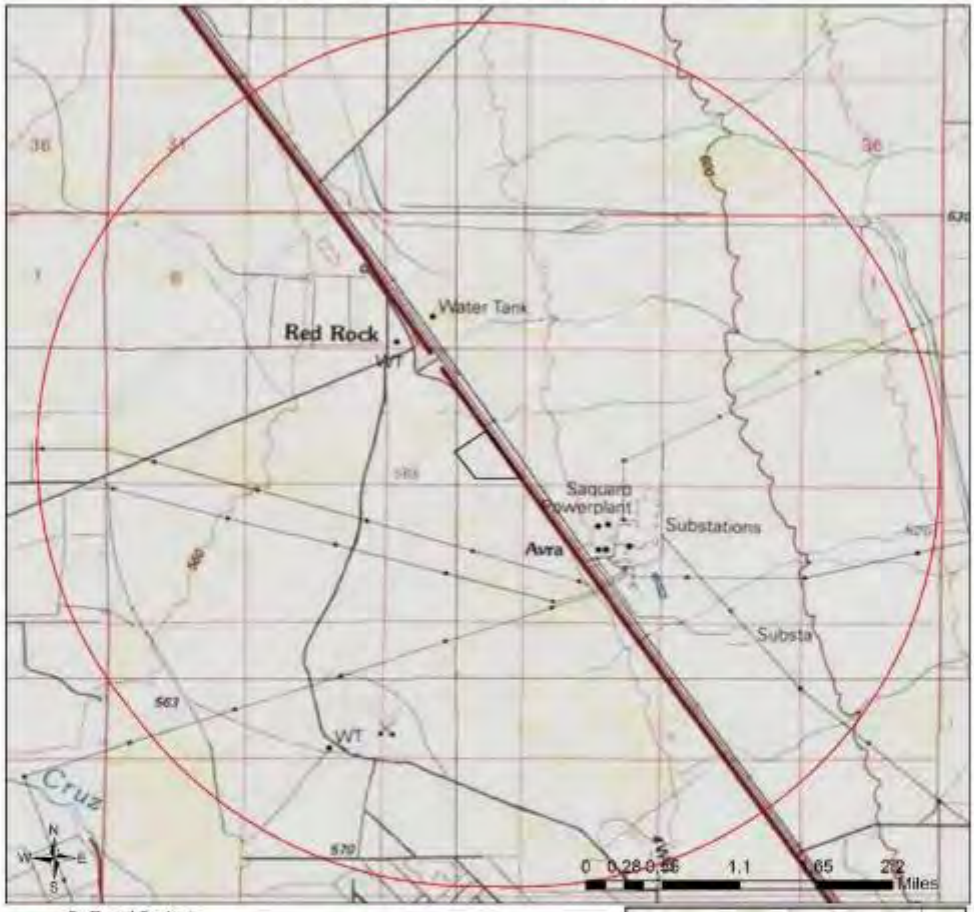
Locations Accuracy Disclaimer:
Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

Recommendations Disclaimer:

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Departments review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:
   Project Evaluation Program, Habitat Branch
   Arizona Game and Fish Department
   5000 West Carefree Highway
   Phoenix, Arizona 85086-5000
   Phone Number: (623) 236-7600
   Fax Number: (623) 236-7366
   Or
   PEP@azgfd.gov
6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.

Red Rock Village Addition PAD

USA Topo Basemap With Locator Map



Buffered Project Boundary

Project Boundary

Project Size (acres): 58.05

Lat/Long (DD): 32.5818 / -111.3183

County(s): Pinal

AGFD Region(s): Tucson

Township/Range(s): T10S, R10E

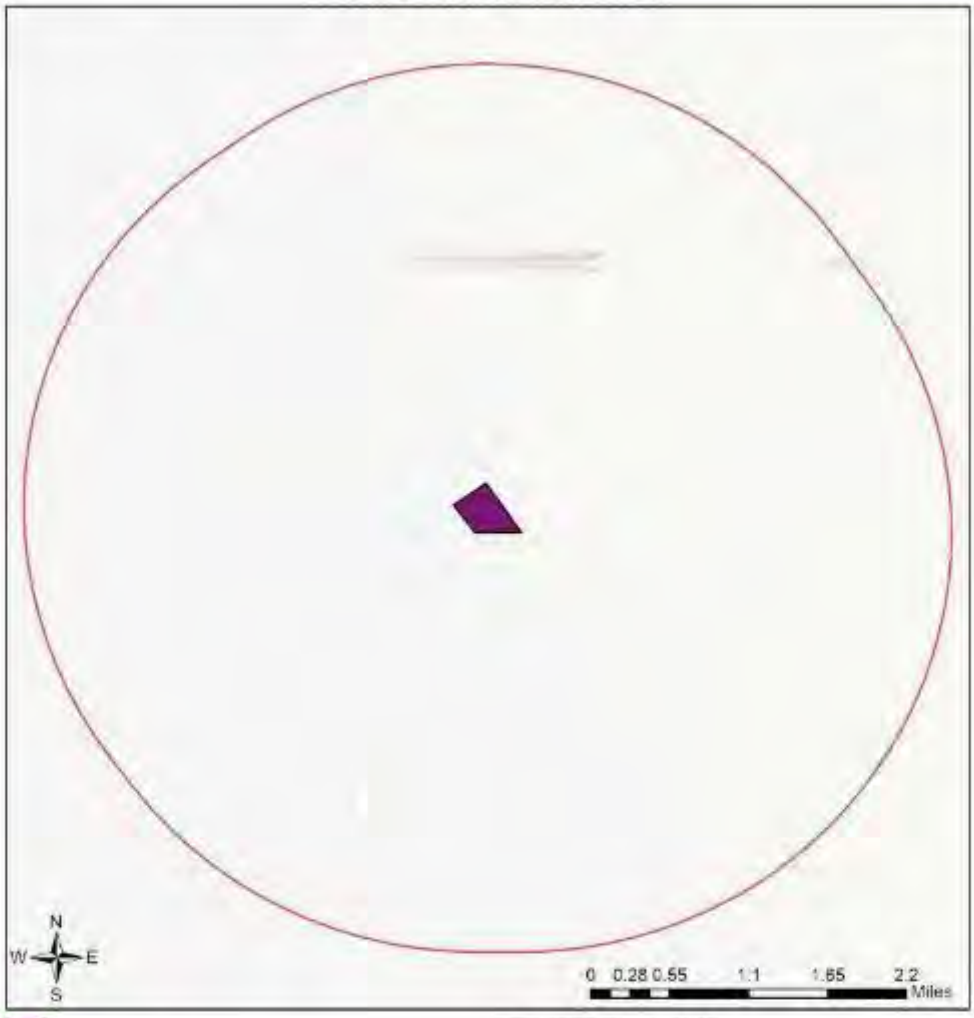
USGS Quad(s): RED ROCK

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS User community



Red Rock Village Addition PAD

Web Map As Submitted By User



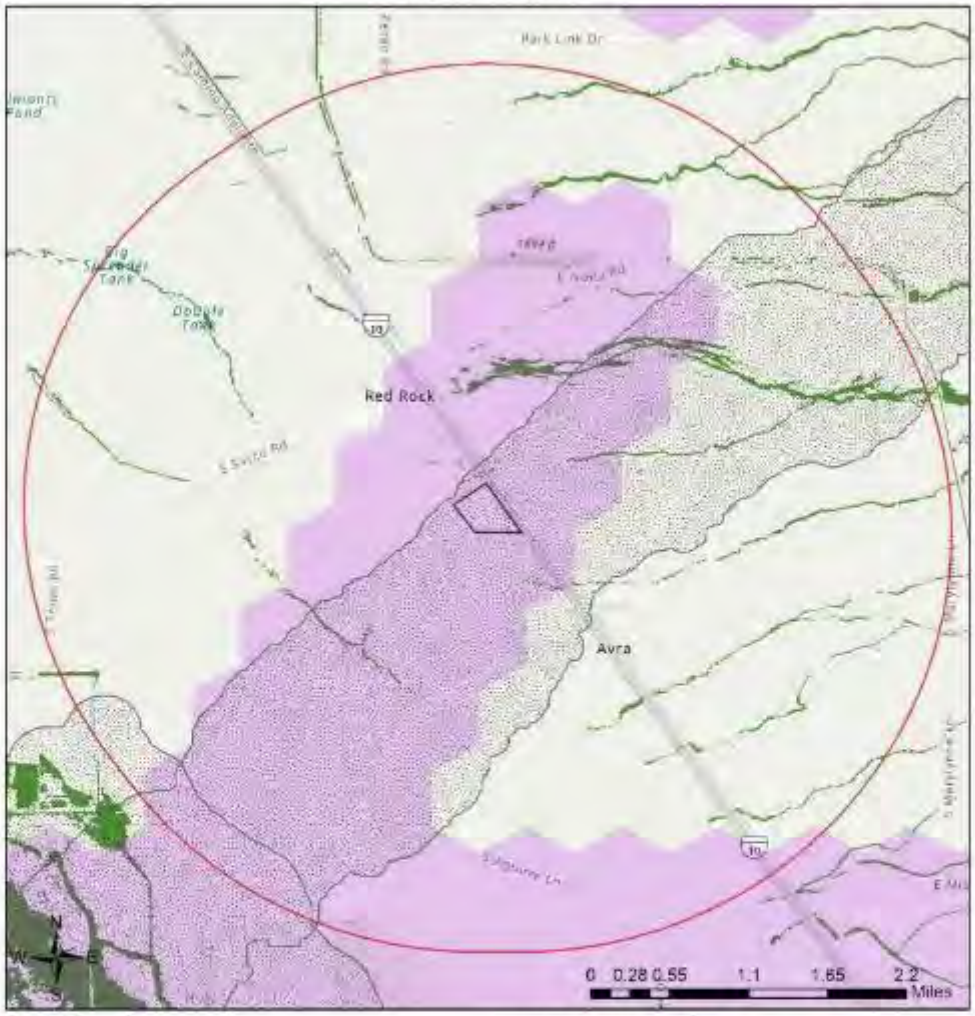
Buffered Project Boundary
Project Boundary

Project Size (acres): 58.05
Lat/Long (DD): 32.5618 / -111.3163
County(s): Pinal
AGFD Region(s): Tucson
Township/Range(s): T10S, R10E
USGS Quad(s): RED ROCK

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community

Red Rock Village Addition PAD

Important Areas



- Buffered Project Boundary
- Project Boundary
- Important Bird Areas
- Critical Habitat
- Pinal County Riparian
- Important Connectivity Zones
- Wildlife Connectivity

Project Size (acres): 58.05

Lat/Long (DD): 32.5618 / -111.3163

County(s): Pinal

AGFD Region(s): Tucson

Township/Range(s): T10S, R10E

USGS Quad(s): RED ROCK

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Red Rock Village Addition PAD

Township/Ranges and Land Ownership



- Buffered Project Boundary
- Project Boundary
- AZ Game & Fish Dept.
- BLM
- BOR
- Indian Res.
- Military
- Mixed/Other
- National Park/Mon.
- Private
- State & Regional Parks
- State Trust
- US Forest Service
- Wildlife Area/Refuge
- Township/Ranges

Project Size (acres): 58.05
Lat/Long (DD): 32.5618 / -111.3163
County(s): Pinal
AGFD Region(s): Tucson
Township/Range(s): T10S, R10E
USGS Quad(s): RED ROCK

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NGA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community
Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Special Status Species Documented within 3 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1A
Heloderma suspectum	Gila Monster					1A
Lepus alleni	Antelope Jackrabbit					1B

Note: Status code definitions can be found at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/
.

Special Areas Documented that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Important Connectivity Zone	Wildlife Connectivity					
Ironwood - Picacho Linkage Design	Wildlife Connectivity					

Note: Status code definitions can be found at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/
.

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Aix sponsa	Wood Duck					1B
Ammospermophilus harrisii	Harris' Antelope Squirrel					1B
Anaxyrus retiformis	Sonoran Green Toad			S		1B
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Botaurus lentiginosus	American Bittern					1B
Calypte costae	Costa's Hummingbird					1C
Chilomeniscus stramineus	Variable Sandsnake					1B
Chionactis annulata	Resplendent Shovel-nosed Snake	SC				1C
Colaptes chrysoides	Gilded Flicker			S		1B
Coluber bilineatus	Sonoran Whipsnake					1B
Corynorhinus townsendii pallescens	Pale Townsend's Big-eared Bat	SC	S	S		1B
Crotalus tigris	Tiger Rattlesnake					1B
Empidonax wrightii	Gray Flycatcher					1C
Euderma maculatum	Spotted Bat	SC	S	S		1B
Eumops perotis californicus	Greater Western Bonneted Bat	SC		S		1B
Glaucidium brasilianum cactorum	Cactus Ferruginous Pygmy-owl	PT	S	S		1B
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1A
Haliaeetus leucocephalus	Bald Eagle	SC, BGA	S	S		1A
Heloderma suspectum	Gila Monster					1A
Incilius alvarius	Sonoran Desert Toad					1B
Kinosternon sonoriense sonoriense	Desert Mud Turtle			S		1B
Lasiurus blossevillii	Western Red Bat		S			1B

Species of Greatest Conservation Need Predicted that Intersect with Project Footprint as Drawn, based on Predicted Range Models

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Lasiurus xanthinus	Western Yellow Bat		S			1B
Leptonycteris yerbabuenae	Lesser Long-nosed Bat	SC				1A
Lepus alleni	Antelope Jackrabbit					1B
Melanerpes uropygialis	Gila Woodpecker					1B
Melospiza lincolnii	Lincoln's Sparrow					1B
Melozone aberti	Abert's Towhee		S			1B
Micrathene whitneyi	Elf Owl					1C
Micruroides euryxanthus	Sonoran Coralsnake					1B
Myiarchus tyrannulus	Brown-crested Flycatcher					1C
Myotis velifer	Cave Myotis	SC		S		1B
Myotis yumanensis	Yuma Myotis	SC				1B
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					1B
Oreoscoptes montanus	Sage Thrasher					1C
Oreothlypis luciae	Lucy's Warbler					1C
Panthera onca	Jaguar	LE				1A
Perognathus longimembris	Little Pocket Mouse	No Status				1B
Phrynosoma goodei	Goode's Horned Lizard					1B
Phrynosoma solare	Regal Horned Lizard					1B
Phyllorhynchus browni	Saddled Leaf-nosed Snake					1B
Progne subis hesperia	Desert Purple Martin			S		1B
Setophaga petechia	Yellow Warbler					1B
Sphyrapicus nuchalis	Red-naped Sapsucker					1C
Spizella breweri	Brewer's Sparrow					1C
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Toxostoma lecontei	LeConte's Thrasher			S		1B
Troglodytes pacificus	Pacific Wren					1B
Vireo bellii arizonae	Arizona Bell's Vireo					1B
Vulpes macrotis	Kit Fox	No Status				1B

Species of Economic and Recreation Importance Predicted that Intersect with Project Footprint as Drawn

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Callipepla gambelii	Gambel's Quail					
Pecari tajacu	Javelina					
Puma concolor	Mountain Lion					
Zenaida asiatica	White-winged Dove					
Zenaida macroura	Mourning Dove					

Project Type: Development Outside Municipalities (Rural Development), Residential subdivision and associated infrastructure, Newconstruction

Project Type Recommendations:
Fence recommendations will be dependent upon the goals of the fence project and the wildlife species expected to be impacted by the project. General guidelines for ensuring wildlife-friendly fences include: barbless wire on the top and bottom with the maximum fence height 42", minimum height for bottom 16". Modifications to this design may be considered for fencing anticipated to be routinely encountered by elk, bighorn sheep or pronghorn (e.g., Pronghorn fencing would require 18" minimum height on the bottom). Please refer to the Department's Fencing Guidelines located on Wildlife Friendly Guidelines page, which is part of the Wildlife Planning button at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/.

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife. Guidelines for many of these can be found at: https://www.azgfd.com/wildlife/planning/wildlifeguidelines/.

Consider impacts of outdoor lighting on wildlife and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use. Use only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, canted, or cut to ensure that light reaches only areas needing illumination.

Minimize the potential introduction or spread of exotic invasive species, including aquatic and terrestrial plants, animals, insects and pathogens. Precautions should be taken to wash and/or decontaminate all equipment utilized in the project activities before entering and leaving the site. See the Arizona Department of Agriculture website for a list of prohibited and restricted noxious weeds at https://www.invasivespeciesinfo.gov/unitedstates/az.shtml and the Arizona Native Plant Society https://aznps.com/invas for recommendations on how to control. To view a list of documented invasive species or to report invasive species in or near your project area visit iMapInvasives - a national cloud-based application for tracking and managing invasive species at https://imap.natureserve.org/imap/services/page/map.html.

- To build a list: zoom to your area of interest, use the identify/measure tool to draw a polygon around your area of interest, and select "See What's Here" for a list of reported species. To export the list, you must have an account and be logged in. You can then use the export tool to draw a boundary and export the records in a csv file.

The construction or maintenance of water developments should include: incorporation of aspects of the natural environment and the visual resources, maintaining the water for a variety of species, water surface area (e.g., bats require a greater area due to in-flight drinking), accessibility, year-round availability, minimizing potential for water quality problems, frequency of flushing, shading of natural features, regular clean-up of debris, escape ramps, minimizing obstacles, and minimizing accumulation of silt and mud.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (include spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

Based on the project type entered, coordination with State Historic Preservation Office may be required (https://azstateparks.com/).

Trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herpetofauna (snakes, lizards, tortoise) from entering ditches.

Communities can actively support the sustainability and mobility of wildlife by incorporating wildlife planning into their regional/comprehensive plans, their regional transportation plans, and their open space/conservation land system programs. An effective approach to wildlife planning begins with the identification of the wildlife resources in need of protection, an assessment of important habitat blocks and connective corridors, and the incorporation of these critical wildlife components into the community plans and programs. Community planners should identify open spaces and habitat blocks that can be maintained in their area, and the necessary connections between those blocks to be preserved or protected. Community planners should also work with State and local transportation planning entities, and planners from other communities, to foster coordination and cooperation in developing compatible development plans to ensure wildlife habitat connectivity. The Department's guidelines for incorporating wildlife considerations into community planning and developments can be found on the Wildlife Friendly Guidelines portion of the Wildlife Planning page at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/.

Design culverts to minimize impacts to channel geometry, or design channel geometry (low flow, overbank, floodplains) and substrates to carry expected discharge using local drainages of appropriate size as templates. Reduce/minimize barriers to allow movement of amphibians or fish (e.g., eliminate falls). Also for terrestrial wildlife, washes and stream corridors often provide important corridors for movement. Overall culvert width, height, and length should be optimized for movement of the greatest number and diversity of species expected to utilize the passage. Culvert designs should consider moisture, light, and noise, while providing clear views at both ends to maximize utilization. For many species, fencing is an important design feature that can be utilized with culverts to funnel wildlife into these areas and minimize the potential for roadway collisions. Guidelines for culvert designs to facilitate wildlife passage can be found on the home page of this application at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/.

Based on the project type entered, coordination with Arizona Department of Environmental Quality may be required (http://www.azdeq.gov/).

Based on the project type entered, coordination with Arizona Department of Water Resources may be required (https://new.azwater.gov/).

Based on the project type entered, coordination with U.S. Army Corps of Engineers may be required (http://www.usace.army.mil/)

Based on the project type entered, coordination with County Flood Control district(s) may be required.

Development plans should provide for open natural space for wildlife movement, while also minimizing the potential for wildlife-human interactions through design features. Please contact Project Evaluation Program for more information on living with urban wildlife at PEP@azgfd.gov or at https://www.azgfd.com/wildlife/planning/wildlifeguidelines/ and https://www.azgfd.com/Wildlife/LivingWith.

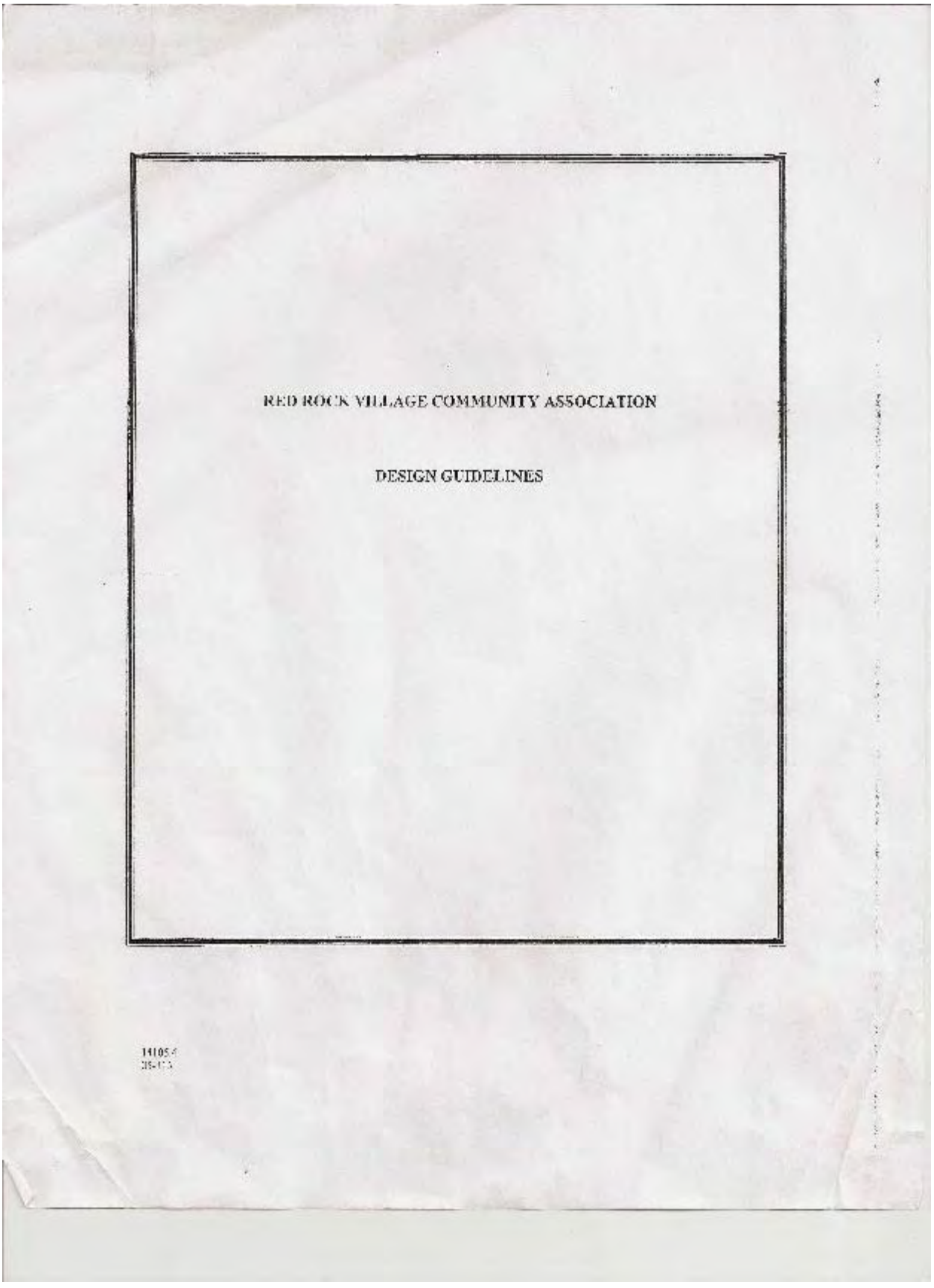
Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly at PEP@azgfd.gov.

Project Location and/or Species Recommendations:
Analysis indicates that your project is located in the vicinity of an identified *wildlife habitat linkage corridor*. The Arizona Missing Linkages represent ideal connections within or between intact blocks or core habitats. The blocks are currently disconnected or isolated and the linkages should be examined for improving permeability, or are currently intact and in need of preservation and/or enhancement. The reports provide recommendations for opportunities to preserve or enhance permeability. Project planning and implementation efforts should focus on maintaining and improving opportunities for wildlife permeability. For information pertaining to the linkage assessment and wildlife species that may be affected, please refer to: https://www.azgfd.com/wildlife/planning/habitatconnectivity/identifying-corridors/.
Please contact the Project Evaluation Program (pep@azgfd.gov) for specific project recommendations.

Analysis indicates that your project is located in the vicinity of an identified *wildlife habitat connectivity feature*.
The Statewide Wildlife Connectivity Assessment's Important Connectivity Zones (ICZs) represent general areas throughout the landscape which contribute the most to permeability of the whole landscape. ICZs may be used to help identify, in part, areas where more discrete corridor modeling ought to occur. The reports provide recommendations for opportunities to preserve or enhance permeability. Project planning and implementation efforts should focus on maintaining and improving opportunities for wildlife permeability. For information pertaining to the linkage assessment and wildlife species that may be affected, please refer to: https://s3.amazonaws.com/azgfd-portal-wordpress/azgfd.wp/wp-content/uploads/0001/01/23120719/ALIWCA_Final_Report_Perkl_2013_lowres.pdf.
Please contact the Project Evaluation Program (pep@azgfd.gov) for specific project recommendations.

E. Appendix E: Red Rock Village Community Association Design Guidelines


RED ROCK VILLAGE COMMUNITY ASSOCIATION
DESIGN GUIDELINES

RED ROCK VILLAGE COMMUNITY ASSOCIATION

DESIGN GUIDELINES

Table of Contents

Page

ARTICLE 1
ARCHITECTURAL REVIEW COMMITTEE; GENERAL PROVISIONS

1.1 Architectural Review Committee; Requirement for Approval 1
1.2 Establishment of Design Guidelines 1
1.3 Permitted Uses; Defined Terms 1
1.4 Use Restrictions 1
1.5 Modification; Conflict 1
1.6 Right of Waiver 1

ARTICLE 2
SUBMITTAL PROCESS

2.1 Required Materials 2
2.2 Process 2
2.3 Compliance with Requirements of Governmental Authorities 3
2.4 Warranty Disclaimer 3

ARTICLE 3
LANDSCAPING

3.1 Initial Installation 3
3.2 Landscape Concept 3
3.3 Plant Materials List 3
3.4 Prohibited Plants 4
3.5 Irrigation Systems 4
3.6 Ground Coverage 4
3.7 Concrete 4
3.8 Foundation Planting and Lawns 4
3.9 Plastic Sheeting 5
3.10 Landscape Structures and Ornamentation 5
3.11 Minimum Standards for Front Yard Landscape Installation 5
3.12 Removal of Debris 5

ARTICLE 4
ANTENNAS/SATELLITE DISHES

4.1 Communication Services 6
4.2 Approved Devices 6
4.3 Impairment of Ability to Receive Signals 6

14106.4
05-115

4.4 Restricted Devices 7

ARTICLE 5
OTHER IMPROVEMENTS AND ALTERATIONS

5.1 General Architectural and Design Character 7
5.2 Corner Lot Visibility Restrictions 7
5.3 Exterior Lighting 7
5.4 Fences and Gates 8
5.5 Fireplaces and Barbecues 8
5.6 Flags 8
5.7 Gutters and Downspouts 9
5.8 Holiday Decorations 9
5.9 Play Equipment 9
5.10 Pools, Spas and Jacuzzis 9
5.11 Security Doors 9
5.12 Solar Energy Devices 9
5.13 Storage Sheds 10
5.14 Tanks 10

Attachments:

Exhibit A – Arizona Department Of Water Resources Low Water Use Drought Tolerant Plant List
Exhibit B – Fence Specifications
Red Rock Village Architectural Review Form

RED ROCK VILLAGE COMMUNITY ASSOCIATION

DESIGN GUIDELINES
(Adopted _____, 2007)

ARTICLE I
ARCHITECTURAL REVIEW COMMITTEE; GENERAL PROVISIONS

1.1 Architectural Review Committee; Requirement for Approval. The Declaration of Covenants, Conditions and Restrictions for Red Rock Village, as it may be amended from time to time (the "Declaration"), provides for an Architectural Review Committee (the "ARC"). So long as Declarant owns any Property or Additional Property, the members of the ARC are to be appointed by Declarant; thereafter, the Board of Directors of the Red Rock Village Community Association will appoint the members of the ARC. The ARC shall review and approve or disapprove, prior to construction or installation, any landscaping, building, fence, wall or other structure or Improvement of whatever type unless review and approval of any such Improvement is not required according to the provisions of the Declaration or these Design Guidelines. Any additions or changes to existing Improvements or to the exterior of any Residential Unit also require the approval of the ARC prior to construction or installation.

1.2 Establishment of Design Guidelines. The ARC has established these Design Guidelines to provide for (i) architectural rules and guidelines for all Improvements and additions and changes to existing Improvements so that all Improvements within the Property may exist in harmony to surrounding structures and topography, and (ii) landscaping rules and guidelines that reflect the climate and regional character of Red Rock Village. The ARC will focus on minimizing environmental impact and maximizing water and energy conservation principles.

1.3 Permitted Uses; Defined Terms. Unless specifically excluded from the requirement to obtain the approval of the ARC, any provision in the Declaration or in these Design Guidelines that sets forth a permitted use shall be deemed to permit such use only after approved by the ARC. Capitalized words in this document not otherwise defined shall have the same meaning as described in Article 1 of the Declaration.

1.4 Use Restrictions. Prior to submitting a request to the ARC for approval of an Improvement or addition or change to an existing Improvement, an Owner should read these Design Guidelines and Article 3 of the Declaration, which contains the permitted uses and restrictions affecting each Lot.

1.5 Modification; Conflict. These Design Guidelines may be modified from time to time as may be deemed necessary in the sole discretion of the ARC. In the event of any conflict between these Design Guidelines and the Declaration, the Declaration shall control.

1.6 Right of Waiver. The ARC reserves the right at its sole discretion to waive or vary any of the procedures, guidelines or standards set forth herein.

741054
05-115

ARTICLE 2
SUBMITTAL PROCESS

2.1 Required Materials. An Owner shall submit the following, along with 2 completed copies of the Red Rock Village Architectural Review Form attached to these Design Guidelines (the "Review Form"), to the Association's managing agent. An Owner must receive written approval of the submittal from the ARC prior to construction or installation of any Improvement that requires the approval of the ARC.

2.1.1 For landscaping plan approval, or amendments to an approved landscaping plan, the Owner shall submit 2 copies of the landscaping plan for the Lot (no smaller than 8-1/2" x 11" or larger than 11" x 17"), including a description of all varieties and sizes of trees and shrubs, with the location of each tree and shrub clearly delineated on the plan. To the extent that the Owner can color code the trees and shrubs and provide a legend, it will facilitate review. If the Owner desires to install any hardscape, including but not limited to brick, masonry, concrete, rocks or other inert material, such items shall be clearly marked on the landscape plan and a legend shall be provided so that the ARC can easily determine the location and type of material. Lots have been designed and graded to provide positive drainage from the Lot and to protect environmental resources. In the event the Owner's plan proposes to alter the grade of the Lot, the location of all drainage structures and direction and slope of flow must be indicated on the plan. The ARC's approval of any plan shall not be deemed to constitute an assurance that the grading or drainage change is properly engineered to avoid any undesirable impact.

2.1.2 For changes or additions to the Residential Unit, the Owner shall submit 2 copies of the plot plan and 2 copies of the floor plan for the model and elevation. On such plans, the Owner shall draw the proposed changes or additions to the exterior elevation. If the Owner has a photograph of another house or picture out of a magazine that will assist the ARC, such photo should be submitted. The submittal should contain a description of the materials and colors the Owner plans to use in such changes or additions.

2.1.3 For all other Improvements requiring ARC approval, the Owner shall submit a description of the Improvement on the Review Form, samples, pictures and any other descriptive materials demonstrating the intent of the submittal.

2.1.4 No ARC review fee is payable at this time, however, the ARC reserves the right to establish a review fee at any time in the future, which amount shall be determined from time to time by the ARC. The ARC also reserves the right to request special fees at any time if the complexity of the request requires review by a licensed architect, engineer or other professional consultant.

2.2 Process. Owners may not rely on verbal approvals or indications from any person that Improvements will be approved by the ARC. The ARC shall either approve or disapprove in writing each request within 30 days after receipt of the request. If no notice is sent by the ARC within the 30 days, then the proposed Improvement is deemed disapproved. If a request is denied within such 30 day period, then written detail shall be forwarded to the Owner stating the reason for denial. If the ARC requests additional information, then the 30 day period will not commence until all required information has been submitted. It is an Owner's

[illegible]
[illegible]

2

responsibility to make sure that a request and all additional information required by the ARC is received by the ARC.

2.3 Compliance with Requirements of Governmental Authorities. The ARC approvals required pursuant to the Declaration and these Design Guidelines shall be in addition to, and not in lieu of, any approvals or permits which may be required under any federal, state or local law, statute, ordinance, rule or regulation, including, without limitation, all requirements of Pinal County. An approval by the ARC shall not be construed in any way to be an approval by any applicable federal, state or local governmental authority. In the event of conflict between these Design Guidelines and any governmental ordinance, building code or regulation, the more restrictive standard shall prevail.

2.4 Warranty Disclaimer. Owners are advised that the construction of or modifications to certain Improvements may void all or a portion of the warranty given to Owners by Declarant upon acquiring a Lot. Prior to commencing construction or modifying an Improvement, an Owner should investigate any effect such construction or modification will have on the warranty. The ARC will not be responsible for any warranty that is deemed void as a result of the ARC approving any such construction or modification.

ARTICLE 3
LANDSCAPING

3.1 Initial Installation. Front yard landscaping will be installed on each Lot by Declarant or a Builder. All such landscaping installed by Declarant or a Builder as a standard package (and including standard upgrades, if applicable) will be pre-approved by the ARC. Any additional landscaping installed by an Owner will require approval of the ARC prior to installation. In addition, Subsection 7.7.2 of the Declaration requires that the Owner of a Lot abutting a Common Area where the rear and/or side yards are enclosed with a view fence must landscape such rear and/or side yard areas no later than 180 days following the date on which the Lot is first conveyed to an Owner.

3.2 Landscape Concept. Landscaping should be designed with emphasis on specie variety for a blending of texture, color and flower mix. Plant massing with drifts of accents will create continuity throughout the Lots, the Project entryways, roadways, open space and parks. Careful consideration should be given to creating a landscape design that uses indigenous materials and is sensitive to the water conservation efforts used in the desert southwest.

3.3 Plant Materials List. The ARC recommends that all plant materials used be those named in the Low Water Use Drought Tolerant Plant List published by the Arizona Department of Water Resources for the Tucson Active Management Area (the "ADWR Plant List"). The ADWR Plant List as of the date these Design Guidelines were adopted is attached hereto as Exhibit A. Because it is difficult to name every acceptable plant material available, the ARC will consider requests for plant materials not listed, provided that such plant materials are not on the list of prohibited plant materials in Section 3.4 of these Design Guidelines. The ARC reserves the right to refuse any plant materials it believes will not be beneficial to the environment of Red Rock Village. Owners should review the use and placement of all plants with a knowledgeable professional or consult appropriate reference material.

3.4 Prohibited Plants. The following plants are prohibited from use within the Project because of their invasive characteristics and adverse effects on the native environment:

(i) Common Bermuda grass (some hybrid species may be permitted);

(ii) Mulberry species;

(iii) Common olive trees;

(iv) Desert broom; and

(v) Oleanders.

3.5 Irrigation Systems. All landscape plantings shall be maintained by a fully automatic underground irrigation system. Irrigation systems that use drip emitters instead of spray heads or bubblers are highly encouraged. When it is necessary to use sprinklers, care should be taken to avoid overspray on hardscape, structures, walls, fences and windows.

3.6 Ground Coverage. The ground surfaces of all yards shall be covered with approved inert or living materials or a combination of both. Approved inert materials shall include but not be limited to:

(i) River Rock (3" - 8" in diameter) - not to exceed 10% of yard

(ii) Decomposed granite (3/8" minus material or larger permitted) Apache Red and Desert Gold are approved colors; provided that the ARC will consider additional colors that are compatible with other colors in the Project. Only 1 color of decomposed granite is permitted in front yards.

(iii) Crushed granite

(iv) Boulders (must be buried at least 1/3 of their depth)

Additions or variances must be approved by the ARC. For the purpose of these Design Guidelines, top soil or decomposed granite smaller than 3/8" minus will not be considered inert material. No artificially colored rock will be permitted as ground cover. Ground cover, inert material and any other landscaping, softscape or hardscape, shall not be used to spell out or form names, nicknames, initials, names of states or cities, athletic teams, slogans, states, emblems, geometric patterns or any other word, image, symbol or communication.

3.7 Concrete. Excessive use of concrete (as determined by the ARC) in front and street side yards will not be allowed. Requests for concrete installation in addition to the concrete that was installed by Declarant or a Builder will be considered on a case-by-case basis.

3.8 Foundation Planting and Lawns. No shrubs or groundcovers shall be placed and no irrigation shall occur within the area that is 24 inches from the Residential Unit. No lawns will be permitted in the front yard of a Lot. Lawns and associated irrigation shall be

15-06-1
05-15

kept at least 3 feet from a building face, wall or fence, including any fence constructed in part or in whole as a view fence. Termites and other insects are attracted to moisture. Excessive watering and landscaping around the foundation of the Residential Unit may void the warranty on the Residential Unit and also may void any termite treatment warranty. All lawns that are visible from Common Area shall be over seeded and maintained with winter rye throughout the fall and winter seasons.

3.9 Plastic Sheeting. The use of solid plastic sheeting or polyethylene over ground areas will not be permitted. If landscape fabric is used, it must allow the free flow of water, air, and gases to and from the soil. Comparable materials may be used only with prior approval of the ARC.

3.10 Landscape Structures and Ornamentation.

3.10.1 Fountains shall be limited in height to 4 feet above the finished grade of the Lot. Any fountain shall be of natural material, color and design, each of which is compatible with the overall architectural theme of Red Rock Village, as determined by the ARC. Fountains installed in front yards will be set back a minimum of 20 feet from the front property line. Any water feature that is proposed must include plans and specifications for chlorination or similar treatment of the water to mitigate mosquito breeding.

3.10.2 No landscape feature shall be in excess of 4 feet in height. Statues, topiary and artifacts will not be allowed in the front or street side yard with the exception of temporary statues, artifacts and other holiday decorative landscaping items which may be allowed in accordance with Section 5.7 of these Design Guidelines. Statues, topiaries and artifacts will be allowed in rear yards if not Visible From Neighboring Property.

3.11 Minimum Standards for Front Yard Landscape Installation. The following minimum plant material sizes and plant quantities are strongly recommended by the ARC if an Owner desires to modify a standard front yard landscape installation by Declarant or a Builder, or if an Owner desires to perform a renovation of front yard landscaping. However, the ARC will consider variations of these requirements as long as the completed landscape plan results in an attractive front yard:

Trees	One 15 Gallon Tree
Shrubs	Five 5 Gallon Shrubs/Accents
Groundcover	Five 1 Gallon Groundcover/Accent

3.12 Removal of Debris. Upon completion of any landscaping Improvements, all landscape material debris must be removed from the Lot and any soil or other residue remaining on the street must be cleaned.

[illegible]
[illegible]

ARTICLE 4
ANTENNAS/SATELLITE DISHES

4.1 Communication Services. If an Owner desires to install an antenna for the purpose of receiving television or other communications services, the rules in this Article 4 apply.

4.2 Approved Devices. An antenna one meter or less in diameter or diagonal measurement which is designed to receive signals from direct broadcast satellites (DBS) or designed to receive video programming services from multi-channel multi-point distribution (wireless cable) providers (MMDS) or an antenna that is designed to receive television broadcast signals (TVBS) may be placed, installed, or kept on a Lot without approval by the ARC if the antenna and installation thereof complies with the following restrictions:

4.2.1 The antenna must be placed on the Lot in such a manner as to not be Visible From Neighboring Property unless it is impossible to do so without impairing the user's ability to receive signals from a provider of DBS, MMDS or TVBS.

4.2.2 If the antenna cannot be placed on the Lot in such a manner as to not be Visible From Neighboring Property without impairing the user's ability to receive signals from a provider of DBS, MMDS or TVBS, then the antenna must be screened by landscaping or by some other means so that it is not Visible From Neighboring Property, unless such screening would impair the user's ability to receive signals from a provider of DBS, MMDS or TVBS, in which event the antenna must be screened by landscaping or by some other means to reduce to the greatest extent possible its Visibility From Neighboring Property without impairing the user's ability to receive signals from a provider of DBS, MMDS or TVBS.

4.2.3 If the antenna is mounted on a residence or other structure and is Visible From Neighboring Property, the antenna must be painted a color that will blend into the background against which the antenna is mounted, unless the painting of the antenna would impair the user's ability to receive signals from a provider of DBS, MMDS or TVBS.

4.2.4 An antenna that is less than one meter in diameter and is designed to receive video program services from MMDS or an antenna designed to receive TVBS may be mounted on a mast which does not exceed 12 feet in height above the roof line. However, the mast shall be no higher than the height necessary to establish line of sight contact with the transmitter. If the mast or antenna is Visible From Neighboring Property, the mast or antenna must be painted a color that will blend into the background against which the antenna is mounted, so long as the painting of the antenna does not impair the user's ability to receive signals from the MMDS or TVBS provider.

4.3 Impairment of Ability to Receive Signals. A restriction contained in this section shall be deemed to impair the user's ability to receive signals from a provider of DBS, MMDS or TVBS if compliance with the restriction would unreasonably delay or prevent installation, maintenance or use of the antenna, unreasonably increase the cost of installation, maintenance or use of the antenna or preclude reception of an acceptable quality signal.

4.4 Restricted Devices. No antenna that exceeds one meter in diameter or diagonal measurement and no mast that exceeds 12 feet in height above the roof line may be placed, installed, constructed or kept on any Lot without the prior written approval of the ARC.

ARTICLE 5
OTHER IMPROVEMENTS AND ALTERATIONS

5.1 General Architectural and Design Character.

5.1.1 The architectural design of all additions, alterations, and renovations to the exterior of any Residential Unit shall conform to the design of the original home in style, detailing, materials, and color. The height of any addition to an existing Residential Unit shall not be higher than the original roof line.

5.1.2 All additions to Residential Units shall be built within the setback lines originally established for Red Rock Village or as changed by Declarant or Builder with the approval of Final County.

5.1.3 All materials used in the maintenance, repair, additions and alterations of any structure or Improvement subject to review hereunder shall match those used in the initial construction of the Improvement as to color, composition, type, and method of attachment. The ARC may allow substitute materials if it deems such materials to be compatible with the theme of the community.

5.2 Corner Lot Visibility Restrictions. Structures and landscaping installed adjacent to a street intersection may not exceed 3 feet in height within areas designated on the Plats as "Sight Visibility Easements."

5.3 Exterior Lighting.

5.3.1 Except as set forth in Subsection 5.3.2, exterior lighting on Lots shall be limited to fixtures installed by Declarant or a Builder, or otherwise approved by the ARC, and with light bulbs having no more than 100 watts each. All exterior lighting may be used without prohibition from dusk until 10:00 p.m., except for (i) lights installed by Declarant or Builder, which may be left on all night, (ii) security lighting that conforms to the specifications set forth in the next paragraph, (iii) lighting used for occasional parties or other special gatherings provided that such lighting is turned off by midnight, and (iv) lights that have been installed on the rear patio of a Residential Unit, which may be left on all night. All lights must be shielded, faced downward and otherwise comply with the Pinal County Light Pollution Code. Information regarding the code may be obtained at http://co.pinal.az.us/PlanDev/.

5.3.2 Exterior ground mounted lights (i.e., 12 inches in total height or less) used for driveways, walkways or landscaping will not require ARC approval if they are low voltage and indirect and do not have colored bulbs nor bulbs greater than 10 watts.

5.3.3 Security lighting on Lots that is attached to the exterior of a Residential Unit or other structure shall be limited to lighting that reasonably illuminates the area of a Lot

10.05.3
98 116

immediately surrounding the Residential Unit. Any security light intended to operate after 10:00 p.m. must be operated by a motion detector. The motion detector shall be programmed to shut off the light(s) no longer than 5 minutes after motion is detected and the light has been terminated.

5.3.4 The ARC shall reserve the right to require changes to or deletions of continuous or security lighting if the use of such lighting does not comply with the foregoing guidelines and/or results in a disturbance to surrounding Owners.

5.4 **Fences and Gates.** All fences and gates installed, maintained, repaired and replaced within the Project shall be vinyl. The manufacturer, building specifications and colors are all as set forth on Exhibit B attached hereto.

5.5 **Fireplaces and Barbecues.** Proposals for the installation of permanent outdoor fireplaces, barbecues and fire pits must include materials, colors and the location and distance from neighboring Lots. The style, color and materials of the proposed Improvement should complement the style, color and materials of the Residential Unit. Each Owner is responsible for assuring that the operation of the facility is in compliance with all applicable ordinances and laws.

5.6 **Flags.** No flag may be displayed on any Lot without the prior written approval of the ARC except for the following:

(i) American flag or an official or replica of a flag of the United States army, navy, air force, marine corps or coast guard;

(ii) POW/MIA flag;

(iii) Arizona state flag; and

(iv) An Arizona Indian nation's flag.

5.6.2 No flagpole may be installed without the prior written consent of the ARC. A request for approval of a flagpole must include the materials and color of the flagpole and the proposed location of installation.

5.6.3 Flagpoles installed on Lots shall be limited in height to 20 feet.

5.6.4 No flag(s) other than those listed in Section 5.5(i) through (iv) above may be displayed on a flagpole and such flag(s) shall be of a reasonable size as determined by the ARC.

5.6.5 Display of flags also shall be permitted by a bracket mounted on the Residential Unit or by other methods approved by the ARC. Brackets must be painted to match the color of the Residential Unit where the bracket is attached. All flags displayed on a bracket shall be of a reasonable size as determined by the ARC.

5.6-6 All displays of flags described in Section 5.3(i) above (and, if applicable, any other flag) or pins must be in a manner consistent with the Federal Flag Code (P.L. 94-344; 90 Stat. 810; 4 United States Code Sections 4 through 10). Copies of the Federal Flag Code are available at the Association offices.

5.7 Gutters and Downspouts. Gutters and Downspouts must be painted to match the color of the Residential Unit or trim adjacent to where the installation occurs. The ARC will not approve plastic finishing, without limitation, vinyl) gutters and downspouts. The termination point of the downspout must direct storm water away from the Residential Unit but cannot be directed to affect neighboring properties.

5.8 **Holiday Decorations.** Holiday decorations will not require approval if installed no earlier than 30 days before a holiday and removed no later than 30 days after a holiday. Any variation from these time periods will require approval of the ARC. The ARC reserves the right to request reasonable modifications to holiday decorations it deemed appropriate.

5.9 **Play Equipment.** Play structures and other play equipment shall be painted to match the color scheme of the Residential Unit or have a natural wood finish. Any canvas canopy shall be of a neutral color. No flags other than those described in Section 5.3 above are allowed. All play structures and play equipment shall be maintained so as to present a neat and clean appearance. Screening of play structures and other play equipment with landscaping may be required by the ARC.

5.10 **Pools, Spas and Jacuzzis.** All pools, spas and jacuzzis must be installed according to Pinal County ordinances and will require protective fencing and be subject to certain setbacks. In no instance shall any portion of a perimeter fence be temporarily removed or altered, including but not limited to removal in connection with the installation or construction of a swimming pool, WITHOUT THE PRIOR WRITTEN APPROVAL OF THE ARC. Notwithstanding the foregoing, no access to a rear yard will be allowed by removing a fence that is adjacent to a 3 foot no-access easement, as shown on the Plat. Any Owner in violation of this provision shall be subject to such monetary penalties and suspension of voting rights and Common Area use rights as may be established by the Board, subject to applicable law. Access to the rear yard may be gained by removing a portion of the front fence on the side of the home. Repairs to the fence must be completed in a timely fashion and include repairing the fence to its original condition. Lots that have view fencing must attractively screen all pool, spa and jacuzzi equipment so as to not be Visible From Neighboring Property. Any pumps and filters must be located a reasonable distance away from neighboring windows.

5.11 **Security Doors.** Security doors will be considered by the ARC provided that they are painted to match the front door or exterior base color of the home.

5.12 **Solar Energy Devices.** Solar roof panels will be considered for approval if made to look like an integrated part of the roof design and mounted directly to the roof plane. Solar roof panels installed by Owners or their contractors likely will void the roof warranty. Other solar collecting panels and devices may be placed, constructed and maintained upon a Lot so long as such solar collecting panels and devices are placed, constructed and maintained in such locations and with such means of screening or concealment as the ARC may reasonably deem

appropriate to limit, to the extent possible, the visual impact of such solar collecting panels and devices when viewed from any street or from any other portion of the Property.

5.13 Storage Sheds. Storage sheds will be permitted and need not be submitted for approval, provided that the maximum height of the shed does not exceed the height of the immediately surrounding fence.

5.14 Tanks. No tanks of any kind (including tanks for the storage of fuel) shall be erected, placed or maintained on any Lot except that nothing herein shall be deemed to prohibit use or storage upon any Lot of an above-ground propane or similar fuel tank with a capacity of ten (10) gallons or less used in connection with a normal residential gas barbecue, grill or fireplace or a spa or "hot tub," so long as such tank is not Visible From Neighboring Property.


Low Water Use
Drought Tolerant Plant List
Official Regulatory List for the Arizona Department of Water Resources, Prescott Active Management Area
2200 East Hillsdale Road
Prescott, AZ 86301
(928) 778-7202
www.azwater.gov
Photo - Jim Morgan

LOW WATER USE
DROUGHT TOLERANT PLANT LIST

OFFICIAL REGULATORY LIST FOR THE ARIZONA DEPARTMENT OF WATER RESOURCES PRESCOTT ACTIVE MANAGEMENT AREA

This is an official regulatory list that was developed to guide the regulated community in choosing low water use and drought tolerant landscaping plants. Within the Prescott AMA, all plants irrigated with groundwater within any publicly owned right-of-way of a highway, street, road, sidewalk, curb or shoulder which is used for travel in any ordinary mode, including pedestrian travel, may be used only if the plants are listed on the ADWR Low Water Use Plant List (or any subsequent modifications to the list) for the Prescott AMA. Per the Third Management Plan, the director may waive this requirement under special circumstances. This requirement does not apply to any portion of a residential lot that extends into a publicly owned right-of-way.

This list can also be used as a resource for residents and businesses that are interested in conserving water through low-water-use landscaping. These plants can be grown in the Prescott area with no-to-moderate supplemental irrigation once the plant is established. All plants listed can grow with less water than traditional high water use landscape plants and do not require more than the Prescott AMA criteria for low water use plants: a maximum of 12 inches of supplemental irrigation on an annual basis, not including rainfall.

Individuals wishing to add or delete plants from the list may submit an application for modification to the Prescott AMA office for consideration. The list will be amended as appropriate. The list and application may be downloaded from the ADWR website at www.azwater.gov.

An advisory committee reviews all applications for modification and submits recommendations to the AMA Director for final consideration.

The Prescott AMA extends its gratitude to the following members of the Plant List Advisory Committee for their generous contribution of time and expertise:

Dusty Elker, Mountain West Landscape Resources
Charlie Hildebrant, Mountain Path Landscaping
Steve Morgan, T. Barnabas Kane & Associates
Jeff Schalau, University of Arizona – Yavapai County Cooperative Extension
Nichole Trushell, Highlands Center for Natural History
Harold Watters, Watters Design & Garden Center

Cover Photo: Special thanks to Jim Morgan of Wings of Nature, Wildlife Photography and Recordings, for the use of his photo: Mexican cliff rose, *Cowania mexicana stansburiana*

November 2006

DEFINITIONS AND KEY TO SYMBOLS

Water Use
The amount of supplemental irrigation that may be needed on an annual basis under normal precipitation conditions once the plant is established. During an abnormally dry year, it may be necessary to increase irrigation to achieve average annual precipitation in addition to the suggested supplemental irrigation.
1 = 0 – 4 inches
2 = 5 – 8 inches
3 = 9 – 12 inches

Note: 0.62 gallons of water is equivalent to one inch of precipitation on one square foot of soil.

Botanical Name
International binomial system in which the first name represents genus, and the second, species. Additional words may be added to the name to describe further subdivisions.

Common Name
The non-scientific name by which a species of plant is known.

Local Zone
Area(s) within the Prescott AMA where the plant will usually succeed and where it should not require more water than the amount of supplemental irrigation indicated under Water Use:
G = Grassland – 4,400' – 5,000' (average annual rainfall 10 – 14 inches)
T = Transition – Pinyon Juniper/Chaparral/Oak Woodland – 4,400' – 6,000' (average annual rainfall 12 – 16 inches)
P = Ponderosa/Montane – 5,500' – 7,800' (average annual rainfall 16 – 20 inches)

Spreads in Cultivated Areas
Plant may aggressively spread by seed, sucker or other method in prepared, irrigated areas. Invasive species have been purposely left off this list.

Seasonal Color
The season(s) in which the plant shows color in the form of blooms or foliage. Details regarding bloom and foliage color are included in the Comments column.
W = Winter SP = Spring
SU = Summer F = Fall

Evergreen or Deciduous
E = Evergreen – has foliage that persists and remains green throughout the year
D = Deciduous – loses foliage at the end of the growing season
S = Semi-deciduous – partially loses foliage at the end of the growing season
SC = Succulent – has thick, fleshy, water-storing leaves or stems

Origin
Area or country to which the plant is native

N = North
W = West
CA = California
N Am = North America
Med = Mediterranean
S = South
C = Central
Mtn = Mountain
S Am = South America
E = East
MW = Midwest
U.S. = United States
Mex = Mexico

Comments
Includes notable information about the plant

November 2006

Water Use	Botanical Name	Common Name	Local Zone	Spreads in Cultivated Areas	Seasonal Color	Evergreen or Deciduous	Origin	Comments
TREES: Perennial woody plants having a main trunk and usually a distinct crown								
2	Acer palmatum	Japanese Maple	G,T	No	SP,SU,F	D	Asia	Red foliage in Fall
2	Cercidiphyllum japonicum	Katsura Tree	G,T,P	No		D	Japan	
2	Cercis canadensis	Eastern Redbud	G,T,P	No	SP	D	E.U.S.	Pink blooms in Spring
2	Cercis occidentalis	Western Redbud	G,T,P	No	SP	D	W.U.S.	Pink blooms in Spring
2	Chitalpa tashkentensis	Chitalpa	G,T	No	SP,SU	D	Hybrid	Pink blooms, Chilopsis/Catalpa cross
2	Cornus kousa	Kousa Dogwood	G,T,P	No	SU,F	D	Japan	White blooms in Spring, pink fruit in Fall
2	Cornus nuttallii	Pacific Dogwood	G,T,P	No	SP,F	D	W.U.S.	White blooms in Spring, red fruit in Fall
2	Crataegus laevigata	English Hawthorn	G,T,P	No	SP,F	D	Asia	White to pink blooms in Spring, yellow foliage in Fall
2	Crataegus phaenopyrum	Washington Hawthorn	G,T,P	No	SP,F	D	E.U.S.	White blooms in Spring, red fruit in Fall
2	Cupressus arizonica	Arizona Cypress	G,T	No		E	W.U.S.	
2	Fraxinus velutina	Arizona Ash	G,T	No	F	D	W.U.S.	Gold foliage in Fall, F.v. 'Modesto' is pest resistant
2	Gleditsia triacanthos 'inermis'	Thornless Honey Locust	G,T,P	No	F	D	E.U.S.	Yellow foliage in Fall, cultivar 'Imperial' is pest resistant
2	Juglans major	Arizona Walnut	G,T,P	No	F	D	W.U.S.	Yellow foliage in Fall
1	Juniperus deppeana	Alligator Juniper	G,T,P	No		E	W.U.S.	
1	Juniperus monosperma	One-seed Juniper	G,T,P	No		E	W.U.S.	
1	Juniperus osteosperma	Utah Juniper	G,T,P	No		E	W.U.S.	
1	Juniperus scopulorum	Rocky Mountain Juniper	G,T,P	No		E	W.U.S.	
2	Juniperus virginiana 'Cupressifolia'	Eastern Juniper	G,T,P	No		E	E.U.S.	

November 2008 4 of 5

Water Use	Botanical Name	Common Name	Local Zone	Spreads in Cultivated Areas	Seasonal Color	Evergreen or Deciduous	Origin	Comments
TREES (continued):								
3	Koelreuteria paniculata	Goldenrain Tree	G,T,P	No	SP,F	D	Asia	Bright yellow blooms in Spring, gold foliage and reddish seed pods in Fall
3	Malus spp.	Flowering Crabapple	G,T,P	No	SP,F	D	N.Hemisphere	Intense white to red blooms in Spring, colorful foliage in Fall
2	Pinus aristata	Bristlecone Pine	G,T,P	No		E	W.U.S.	
2	Pinus attenuata	Knobcone Pine	T,P	No		E	W.U.S.	
2	Pinus canariensis	Canary Island Pine	G,T,P	No		E	Canary Is.	
2	Pinus edulis	Pinyon Pine	G,T,P	No		E	SW U.S.	
2	Pinus halepensis	Aleppo Pine	G,T,P	No		E	Europe	
2	Pinus monophylla	Single-leaf Pinyon Pine	G,T,P	No		E	SW U.S.	
3	Pinus nigra	Austrian Pine	G,T,P	No		E	Europe	
2	Pinus ponderosa	Ponderosa Pine	T,P	No		E	W.U.S.	
2	Pinus sylvestris	Scotch or Scots Pine	G,T,P	No		E	Europe	
2	Pistacia chinensis	Chinese Pistache	G,T	No	F	D	China	Orange to red foliage
2	Prunus emarginata	Bitter Cherry	G,T,P	No	SP	D	W.U.S.	White blooms
3	Prunus pedunculata	Mayday Tree	G,T,P	No	SP	D	Europe	White blooms
3	Prunus serotina	Black Cherry	G,T,P	No	SP	D	N.W. E.U.S.	White blooms
2	Prunus virginiana melanocarpa	Western Chokecherry	G,T,P	No	SP	D	W.U.S.	White blooms
1	Quercus agrifolia	Arizona White Oak	T,P	No		D	SW U.S.	Leaves also May turn red/brown in early Summer
2	Quercus buckleyi	Texas Red Oak	G,T,P	No	F	D	S.U.S.	Red foliage
1	Quercus emoryi	Emory Oak	T,P	No		D	SW U.S.	Leaves also May turn red/brown in early Summer
1	Quercus gambelii	Gambel Oak		No		D	SW U.S.	
3	Quercus ilex	California Live Oak	G,T	No		D	CA	
3	Quercus macrocarpa	Bur Oak	T,P	No	F	D	N.A.	Yellow and brown foliage

November 2008 5 of 5

Water Use	Botanical Name	Common Name	Local Zone	Spreads in Cultivated Areas	Seasonal Color	Evergreen or Deciduous	Origin	Comments
TREES (continued):								
2	Quercus virginiana	Southern Live Oak	G,T,F	No		E	SE U.S.	Foliage is a good subher
2	Rhus typhina	Staghorn Sumac	G,T,F	Yes	F	D	N.A.	Red to orange foliage
2	Robinia x ambigua	Locust	G,T,F	No	SP	D	Hybrid	Fine to purple blooms, some cultivars subject to breakage
2	Robinia neomexicana	New Locust	G,T,F	No	SP	D	U.S.W.U.S.	White blooms
2	Sophora japonica	Japanese Pagoda Tree	G,T,F	No	SP	D	Asia	Yellow blooms, persistent seed pods
1	Ulmus parvifolia	Chinese Elm	G,T	No		D	Asia	Attractive mottled bark
SHRUBS: Woody plants of relatively low height, having several stems arising from the base and lacking a single trunk; a bush								
1	Acacia greggii	Catclaw	G,T	Yes	SP	D	W.U.S.	Yellow blooms
1	Agave parryi	Century Plant	G,T,F	No		ST	SW U.S.	Blooms after twenty years
2	Amelanchier alnifolia	Serviceberry	G,T,F	No	SP,F	D	E.U.S.	White to pink colored blooms in Spring, yellow to orange foliage in Fall
2	Amelanchier utahensis	Utah Serviceberry	G,T,F	No	SP	D	W.U.S.	White blooms
2	Amorpha fruticosa	False Indigo	G,T,F	No	SP,F	D	E.U.S.	Purplish blue blooms in Spring, yellow shrub age in Fall
1	Arctostaphylos spp.	Manzanita	T,F	No	EP,SU	E	W.U.S.	Pink blooms
1	Artemisia tridentata	Common Sage	G,T,F	Yes	SP		W.U.S.	Yellow blooms
1	Artemisia tridentata	Purple Sage	G,T,F	Yes	SP		W.U.S.	Yellow blooms
1	Artemisia 'Powis Castle'	Powis Castle	G,T,F	No		E	Hybrid	Silver foliage
1	Artemisia tridentata	Big Sagebrush	G,T,F	No	SP		W.U.S.	Yellow to green blooms, very branched shrub
1	Atriplex canescens	Fourwing Saltbush	G,T,F	No		E	W.U.S.	Feed stand seeds or harvest
2	Buddleia davidii	Butterfly Bush	G,T,F	No	SU,F	D	China	White to purple blooms June - October
1	Caesalpinia gilliesii	Bird of Paradise	G,T	Yes	EP,SU	D	S.A.	Yellow blooms with long red stamens

November 2005 3 of 8

Water Use	Botanical Name	Common Name	Local Zone	Spreads in Cultivated Areas	Seasonal Color	Evergreen or Deciduous	Origin	Comments
SHRUBS (continued):								
1	Caragana arborescens	Siberian Peashrub	G,T,F	No	EP,SU	D	Asia	Yellow blooms, pill bug grasshoppers
2	Ceanothus x 'Dark Star'	Blue Mist	G,T,F	Yes	SU	D	Hybrid	Blue blooms, attracts birds
1	Cercocarpus montanus	Hartweg's Buckthorn	T,F	No	SU		W.U.S.	White blooms, thorny
1	Ceanothus greggii	Desert Ceanothus Mojave Buckbrush	G,T,F	No	SU	E	W.U.S.	White blooms, thorny
1	Ceanothus integerrimus	Deer Brush	G,T,F	No	SU	E	W.U.S.	White blooms, attractive, growth form
1	Cercocarpus betuloides	Birch Leaf Mountain Mahogany	G,T,F	No	F	E	W.U.S.	Fall seeds with feathery tails
1	Cercocarpus ledifolius	Curl leaf Mountain Mahogany	G,T,F	No	F	E	W.U.S.	Fall seeds with feathery tails
1	Cercocarpus montanus	Mountain Mahogany	G,T,F	No	F	E	W.U.S.	Fall seeds with feathery tails
2	Chamaebatiaria millefolium	Fernbush	G,T,F	No	SP	D	Asia	White to red showy blooms
1	Chamaebatiaria millefolium	Fernbush	G,T,F	No	SU	E	W.U.S.	White blooms, needs excellent drainage, prefers alkaline soil
1	Chrysothamnus nauseosus (Chrysothamnus nauseosus)	Gray Rabbit Brush	G,T,F	Yes	SU	E	W.U.S.	Yellow blooms
2	Cotoneaster glaucophyllus	Gray Cotoneaster	G,T,F	No	SP,WI	E	Asia	White blooms in Spring, red berries in Winter
2	Cotoneaster horizontalis	Rock Cotoneaster	G,T,F	No	SP,WI	E	Asia	White blooms in Spring, red berries in Winter
2	Cotoneaster lucidus	Hedge Cotoneaster	G,T,F	No	SP,WI	E	Asia	White blooms in Spring, red berries in Winter
2	Cotoneaster racemiflorus	Little-leaf Cotoneaster (Redspray Cotoneaster	G,T,F	No	SP,WI		Asia	White blooms in Spring, red berries in Winter
1	Dasylirion wheeleri	Sotol, Desert Spoon	G,T	No	SU	EC	SW U.S.	White flower spike, long spiny foliage
1	Elaeagnus pungens	Silverberry	G,T	No	AU	E	Asia	Small white fragrant blooms, multicolored foliage
1	Ephedra viridis	Mormon Tea	G,T	No	SP	E	SW U.S.	Yellow blooms, green stemmy structure
1	Ericameria laricifolia	Turpentine Brush	G,T	No	SU,F	E	SW U.S.	Yellow blooms
1	Fallugia paradoxa	Apache Plume	G,T,F	Yes	SP	E	SW U.S.	White blooms, pink feathery seed head
1	Grayia spinosa (Atriplex spinosa)	Hopsage	G,T,F	No			W.U.S.	Spinelike woody white seed head

November 2005 4 of 8

Water Use	Botanical Name	Common Name	Local Zone	Spreads in Cultivated Areas	Seasonal Color	Evergreen or Deciduous	Origin	Comments
SHRUBS (continued):								
2	Encelia farinosa	Desert Olive	G,T,F	No	SP/F	D	SW U.S.	Yellow fragrant blooms in Spring, yellow foliage in Fall, attracts birds
2	Forsythia x intermedia	Forsythia	G,T,F	No	SP	D	Hybrid	Profuse yellow blooms
1	Garrya elliptica	Wavyleaf Silk Tassel	T,F	No		E	SW U.S.	Will grow in full shade
1	Hesperaloe parviflora	Red Yucca	G,T,F	No	SU	SD	N Mex.	Yellow to red blooms
2	Holodiscus dumosus	Mountain Spray	G,T,F	No	SP/F	D	Mtn U.S.	White blooms in Spring, orange to red foliage in Fall
2	Juniperus spp.	Juniper (Shrubs)	G,T,F	No		E	Various	Select suitable cultivar for application
3	Kolkwitzia amabilis	Beauty Bush	G,T,F	No	SP	D	China	Yellow center with pink bloom
3	Lonicera fragrantissima	Winter Honeysuckle	G,T,F	Yes	SP	S	Asia	White fragrant blooms
2	Lonicera tatarica	Tatarian Honeysuckle	G,T,F	No	SP	D	Asia	White to pink blooms
1	Mahonia aquifolium	Oregon Grape	G,T,F	Yes	P	E	B.C.-S	Compound holly-like foliage, bronze in fall, blooms resplendent shrub
2	Mahonia repens	Oregon Grape	G,T,F	Yes	SP/SM		NW U.S.	Yellow fragrant blooms in Spring, burgundy foliage in Winter
1	Mahonia x 'Golconda'	Patriot Barberry	G,T	No	SP	E	SW U.S.	Yellow blooms
1	Malvaviscus arboreus	Turk's cap	G,T,F	No	SU		SW U.S.	Intermittent white flower shrub
1	Opuntia spp.	Prickly Pear, Cholla - many species vary	G,T,F	No	SU	SD	SW U.S.	Showy cactus blooms, colors vary
2	Philadelphus microphyllus	Little Leaf Mock Orange	T,F	No	SU	D	SW U.S.	White fragrant blooms
2	Physocarpus monogynus	Mountain Ninebark	T,F	No	SP/F	D	W U.S.	White to pink blooms in Spring, red to orange foliage in Fall
2	Potentilla fruticosa	Shrubby Cinquefoil	G,T,F	No	SU	D	W U.S.	Showy yellow flowers all Summer or so
2	Prunus pumila v. besseyi (Prunus besseyi)	Western Sand Cherry	G,T,F	No	SP	D	W U.S.	White blooms
3	Prunus x cistena	Cistena Plum	G,T,F	No	SP/SU/F	D	Hybrid	Fine fragrant blooms in Spring, purple foliage in Summer to foliage in Fall
2	Prunus tomentosa	Nanking Cherry	G,T,F	No	SP	D	Asia	White fragrant blooms, edible cherry
1	Purshia mexicana (Cowania mexicana)	Cliffrose	G,T,F	No	SU	E	SW U.S.	White fragrant blooms

Water Use	Botanical Name	Common Name	Local Zone	Spreads in Cultivated Areas	Seasonal Color	Evergreen or Deciduous	Origin	Comments
SHRUBS (continued):								
2	Ribes spp.	Currant	G,T,F	No	SP/I		Mod.	White blooms in Spring, colorful fruit in Fall, thorny bar canes
1	Rhamnus frangula	Glossy Buckthorn	G,T,F	No		E	SW U.S.	Drought deciduous, adorns shrub middle
1	Rhamnus californica	California Buckthorn	G,T,F	No	SU	E	SW U.S.	Tolerates shade, colorful dark red berries
1	Rhamnus crocea	Redberry Buckthorn	G,T	No	SU	E	SW U.S.	Tolerates shade, colorful bright red berries
1	Rhus aromatica	Gro-low, Fragrant Sumac	G,T,F	Yes	SP/I	D	E. U.S.	Yellow blooms in Spring, red foliage in Fall
1	Rhus glabra	Smooth Sumac	G,T,F	Yes	SU/F	D	N.A.	Red fuzzy Summer red foliage in Fall
1	Rhus trilobata	Three-Leaf Sumac	G,T,F	No	SU/F	D	SW U.S.	Red fuzzy Summer red to orange foliage in Fall
1	Ribes malvaceum	New Mexico Locust	G,T,F	Yes	SP/F	D	SW U.S.	White to pink blooms in Spring, yellow foliage in Fall
2	Rosa rugosa	Rugosa Rose	G,T,F	No	SP	D	Asia	Colors vary, edible rose hips
2	Salvia greggii	Autumn Sage	G,T	Yes	SU/F	E	SW U.S.	Red to pink blooms, attracts hummingbirds, insects
2	Santolina chamaecyparissus	Gray Santolina, Lavender Cotton	G,T,F	No	SU		Med.	Yellow blooms, fall sun, can become leggy/ugly
1	Spartium junceum	Spanish Broom	G,T,F	Yes	SP	E	Med.	Yellow blooms, green stemmy structure
1	Yucca spp.	Yucca	G,T,F	No	SP/SU	SD	SW U.S.	Showy cream blooms on tall stalk, dried heads dispersal on ground
GROUNDCOVERS: Low-growing dense growth of plants **VINES: Weak-stemmed plants that derive support from climbing, twining, or creeping along a surface**								
2	Calonyction aculeatum	Common Moonvine	G,T,F	Yes	SM		China	White blooms in Spring, red berries in Fall
2	Jasminum officinale	Winter Jasmine	G,T,F	Yes	SP	E	China	Yellow blooms
2	Juniperus horizontalis 'Blue Chip'	Blue Chip Juniper	G,T,F	Yes			N.A.	Blue foliage turns violet in Winter
2	Juniperus sabina 'Buffalo'	Buffalo Juniper	G,T,F	Yes		E	Europe	
3	Lonicera japonica 'Halliana'	Hall's Honeysuckle	G,T,F	Yes	SP/SU	E	Asia	White to yellow fragrant blooms
1	Mahonia repens	Creeping Oregon Grape	T,F	Yes	SP/SU/F	E	W U.S.	Yellow blooms in Spring, purple fall in Summer, burgundy foliage in Winter

Water Use	Botanical Name	Common Name	Local Zone	Spreads in Cultivated Areas	Seasonal Color	Evergreen or Deciduous	Origin	Comments
GROUNDCOVERS & VINES (continued):								
3	Parthenocissus inserta	Woodbine	T,F	Yes	F	D	N.A.**	Early red foliage
3	Parthenocissus quinquefolia	Virginia Creeper	T,F	Yes	F	D	N.A.**	Early red foliage
3	Parthenocissus tricuspidata	Boston Ivy	T,F	Yes	F	D	Asia	For best results plant in the shade
2	[illegible]	Stonecrop	G,T,F	Yes	SU	E	Europe	Easy culture
2	Thymus praecox arcticus	Creeping Thyme	G,T,F	Yes	SU		Europe	White or rose blooms, water requirements by soil conditions
GRASSES: Characterized by slender leaves, called blades, which usually grow arching upwards from the ground								
Cool Season Grasses: Prefer supplemental irrigation January - March								
1	Arrhenatherum elatius	Tall Oatgrass, Bulbous Oatgrass	G,T,F	No	SU	E	W.N.U.S.	Purple seed heads
1	Festuca glauca	Blue Fescue	G,T,F	No		E	Europe	Blue foliage year round
1	Koeleria cristata	Junegrass	G,T,F	No		E	W.N.U.S.	
1	Stipa tenuissima	Mexican Feather Grass	G,T,F	No	SU	E	S.W.U.S.	Delicate wispy blades, pink flower spikes
1	Pennisetum orientale	Oriental Fountaingrass	G,T,F	No	SU	E	W.U.S.	Fine green foliage
Warm Season Grasses: Prefer supplemental irrigation June - August								
1	Bouteloua curtipendula	Side Oats Grama	G,T,F	No	F	E	S.W.U.S.	Cream seed heads
1	Bouteloua dactyloides	Buffalograss	G,T,F	No		E	S.W.U.S.	
1	Bouteloua gracilis	Blue Grama	G,T,F	No		E	S.W.U.S.	
1	Bouteloua gracilis	Blue Grama	G,T,F	No		E	S.W.U.S.	
1	Bouteloua hirsuta	Hairy Grama	G,T,F	No		E	S.W.U.S.	
1	Eragrostis elionurioides	Plains Lovegrass	G,T,F	No		E	S.W.U.S.	
1	Helictotrichon sempervirens	Blue Oat Grass	G,T,F	No		E	Europe	Blue foliage year round

November 2005

7 of 8

Water Use	Botanical Name	Common Name	Local Zone	Spreads in Cultivated Areas	Seasonal Color	Evergreen or Deciduous	Origin	Comments
GRASSES (warm season continued):								
1	Andropogon scoparius (Schizachyrium scoparium)	Little Bluestem	G,T,F	No		E	N.A.**	
1	Buchloe dactyloides	Buffalo	G,T,F	No		E	S.W.U.S.	
1	Muhlenbergia capillaris	Pink Muhly Deergrass	G,T,F	No	F	E	S.W.U.S.	Feathery flower spikes
1	Muhlenbergia emersleyi	Bull grass	G,T,F	No	F	E	S.W.U.S.	Cream feathery flower spikes
1	Muhlenbergia lindheimeri (Autumn Glow)	Autumn Glow Muhly	G,T,F	No	F	E	S.W.U.S.	Purple flower spikes
1	Muhlenbergia rigens	Deergrass	G,T,F	No	F	E	S.W.U.S.	Showy creamy yellow flower spikes
1	Sporobolus airoides	Alkali Dropseed, Alkali Sacaton	G,T,F	No		E	S.W.U.S.	Robust, requires deep soil
1	Sporobolus cryptandrus	Sand Dropseed	G,T,F	No		E	S.W.U.S.	
1	Sporobolus heterolepis	Prairie Dropseed	G,T,F	No		E	S.W.U.S.	
PERENNIALS: Flowering for several to many growing seasons								
2	Achillea millefolium	White Yarrow	G,T,F	No	SP-SU	WH	Europe	White blooms
2	Agastache cana	Texas Hummingbird Mint	G,T,F	No	SU	WH	S.W.U.S.	Varying reddish to pink, needs full sun
2	Asclepias tuberosa	Butterfly Weed	G,T,F	No	SU	WH	W.U.S.	Showy orange blooms attracts butterflies
2	Calylus maximiliana	Desert Marigold	G,T	No	SP-F	WH	S.W.U.S.	Showy yellow blooms, needs full sun
2	Berlandiera lyrata	Chocolate Flower	G	No	SP-F	WH	S.W.U.S.	Yellow rays with dark eye, needs full sun, frost tender above 5,000
2	Chrysopsis speciosa	Showy Golden Aster	G,T,F	No	SU	WH	U.S.A.**	White to pink blooms
2	Coreopsis grandiflora	Coreopsis, Tickseed	G,T,F	No	SU-F	WH	S.E.U.S.	Yellow to orange daisy-like blooms
2	Coreopsis tinctoria	Plains Coreopsis, Golden Coreopsis	G,T,F	No	SU-F	WH	N.A.**	Yellow to red daisy like blooms, sometimes planted as an annual
2	Dalea purpurea/multiflora	Prairie Clover, Purple Dalea	G,T,F	No	SU-F	WH	S.W.U.S.	Purple white blooms, spikes in clusters, high protein if ingested
2	Eriogonum spp.	Buckwheat	G,T,F	No	SU-F	WH	S.W.U.S.	White to pink blooms in clusters, full sun to partial shade

November 2005

8 of 8

Water Use	Botanical Name	Common Name	Local Zone	Specific to Cultivated Areas	Seasonal Color	Evergreen or Deciduous	Origin	Comments
PERENNIALS (continued):								
2	Eschscholzia californica	California Poppy	G,T,F	Yes	SU	NW	US	Yellow to orange blooms, often planted as an annual
2	Gaillardia grandiflora	Blanket Flower	G,T,F	Yes	SU - F	NW	SW U.S.	Yellow to red blooms with maroon bands
1	Gaura lindheimeri	Gaura	G,T,F	Yes	SU - F	NW	SW U.S.	Yellow blooms
2	Helianthemum nummularium	Sunrose	G,T,F	No	SP-SU	NW	Europe	Floral blooms
2	Heliomeris multiflora	Showy Goldeneye	G,T,F	No	SU	NW	SW U.S.	Large daisy-like yellow blooms all Summer
2	Iris germanica	Bearded Iris	G,T,F	No	SP	NW	Europe	Colors vary, best not to plant
2	Kniphofia uvaria	Red Hot Poker	G,T,F	No	SP-SU	NW	S Africa	Colors vary, attracts hummingbirds
1	Linum lewisii	Blue Flax	G,T,F	No	SU	NW	SW U.S.	Blue blooms, opens in morning
2	Melampodium leucanthum	Blackfoot Daisy	G,T,F	No	SU	NW	SW U.S.	White daisy like blooms with yellow eye
1	Mimulus cardinalis	Scarlet Monkey	G,T,F	No	SU	NW	SW U.S.	White to cardinal blooms, opens late afternoon, needs afternoon shade, does not tolerate clay soil
3	Monarda spp	Bee Balm	T,F	No	SU	NW	E U.S.	Fine toothed blooms
1	Oenothera caespitosa	White Tufted Evening Primrose	G,T,F	No	SU	NW	W U.S.	White blooms, opens in evening
1	Oenothera speciosa (Oenothera berlandieri)	Mexican Evening Primrose	G,T,F	Yes	SU	NW	SW U.S.	Pink to white, spreads by rhizomes
1	Penstemon spp	Penstemon	G,T,F	No	SU	NW	W U.S.	Colors vary, select species by zone
1	Perovskia atriplicifolia	Russian Sage	G,T,F	No	SU	NW	Asia	Profuse purple blooms
1-3	Rudbeckia spp	Coneflower	G,T,F	No	SU	NW	Various	Colors vary, select species by zone
1	Salvia greggii (Perovskia greggii)	Autumn Sage	G,T	No	SU	NW	W U.S.	Yellow blooms, water sparingly
2	Tanacetum cinerariifolia	Dalmatian	G,T,F	No	SU	E	Europe	Pink blooms
1	Verbena rigida	Verbena	G,T	No	SU	NW	SW U.S.	Blue blooms
1	Zinnia grandiflora	Desert Zinnia	G,T	No	SP-F	NW	SW U.S.	Yellow blooms with orange eye

November 2008

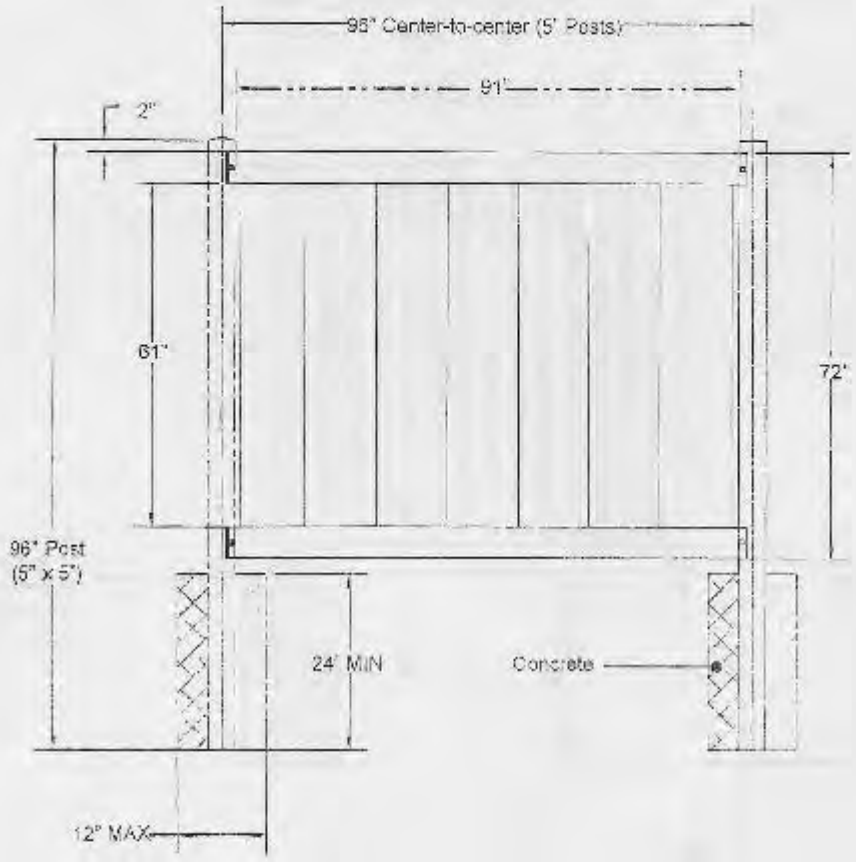
5 of 5

EXHIBIT B

FENCE SPECIFICATIONS

(see attached)

6' Tall Standard Privacy Fence



Parts List		
Qty	Item Description	Cut Length
2	U-Channel (1x1)	61"
1	1.75" x 5.5" Top Deco Rail	94"
1	1.75" x 5.5" Bottom Deco Rail (with aluminum insert)	94"
7	.0875" x 12.81" GlideLock Picket	64"

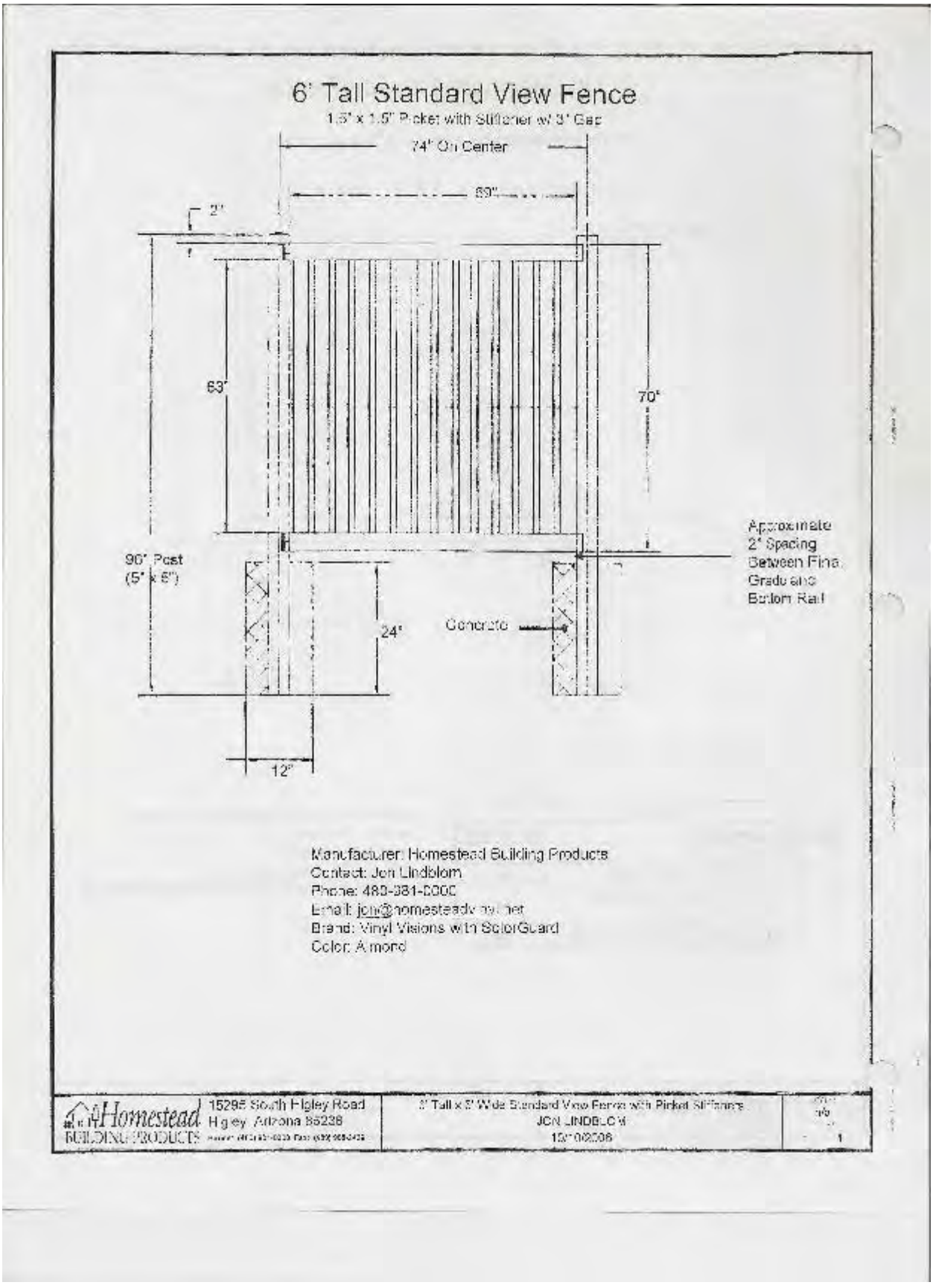
Manufacturer: Homestead Building Products
Contact: Jon Lindblom
Phone: 480-981-0000
Email: jon@homesteadvinyl.net
Brand: Vinyl Visions with SolarGuard and GlideLock
Color: Almond

Homestead BUILDING PRODUCTS 15295 South Higley Road Higley, Arizona 85236

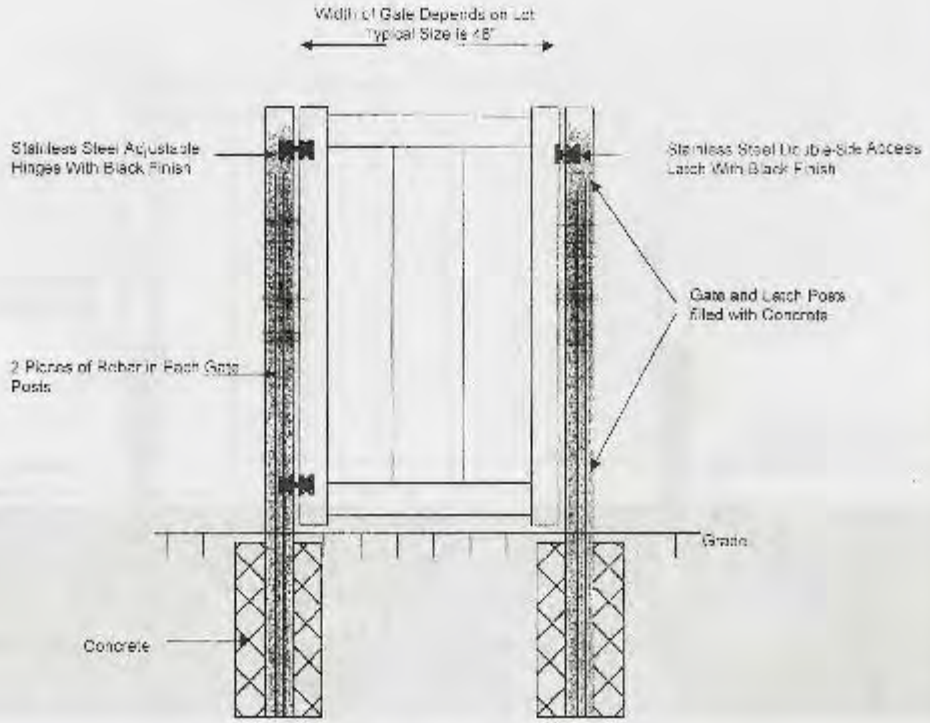
6' Tall x 8' Wide Classic Privacy 5.5 Deco Rail and GlideLock
JON LINDBLOM
10/2/2008

n/a

1


6' Tall Standard View Fence
1.5" x 1.5" Picket with Stiffener w/ 3" Gap
74" On Center
89"
2"
63"
70"
90" Post
(5" x 5")
24"
Concrete
Approximate
2" Spacing
Between Fins
Graduated
Bottom Rail
12"
Manufacturer: Homestead Building Products
Contact: Jon Lindblom
Phone: 480-381-0000
Email: jon@homesteadvinyl.net
Brand: Vinyl Visions with SolarGuard
Color: Almond
Homestead
BUILDING PRODUCTS
15295 South Higley Road
Higley, Arizona 85236
6' Tall x 8' Wide Standard View Fence with Picket Stiffeners
JON LINDBLOM
12/7/2006

6' Tall Standard Privacy Gate

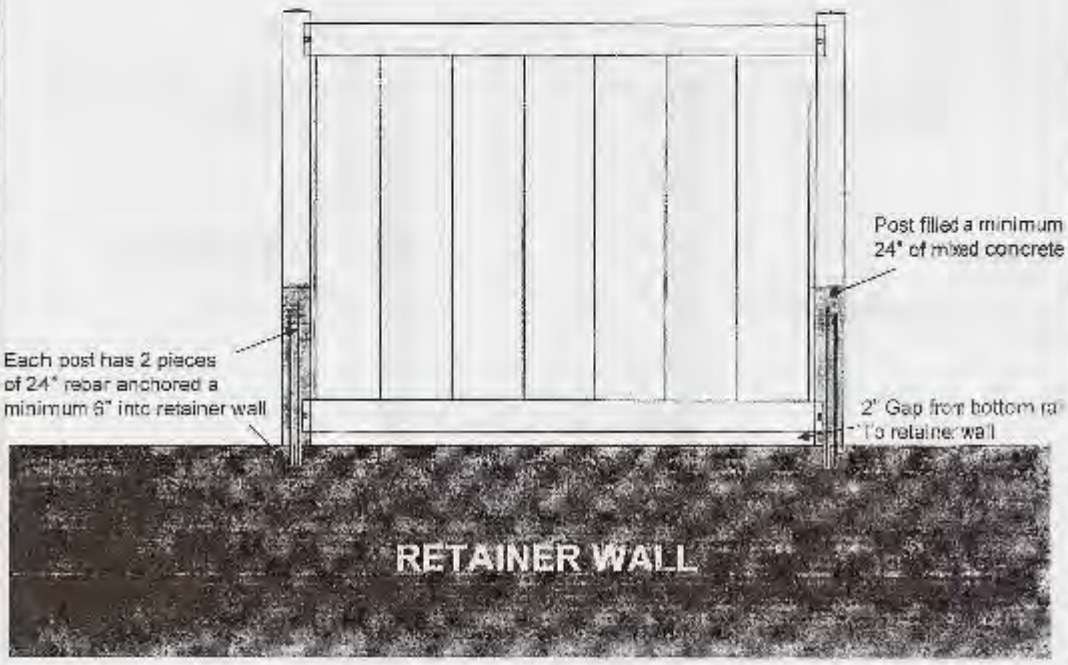


All Material Dimension are same as Privacy Fence

Manufacturer: Homestead Building Products
Contact: Jon Lindblom
Phone: 480-831-0000
Email: jon@homesteadvinyl.net
Brand: Vinyl Visions with SolorGuard and SlideLock
Color: Almond

Homestead BUILDING PRODUCTS 15295 South Higley Road Higley, Arizona 85236	6' Tall Standard Privacy Gate JON LINDBLOM 10/10/2006	n/a

6' Tall Standard Privacy Fence
WALL MOUNT SPECS
96" Center-to-center (6' Posts)

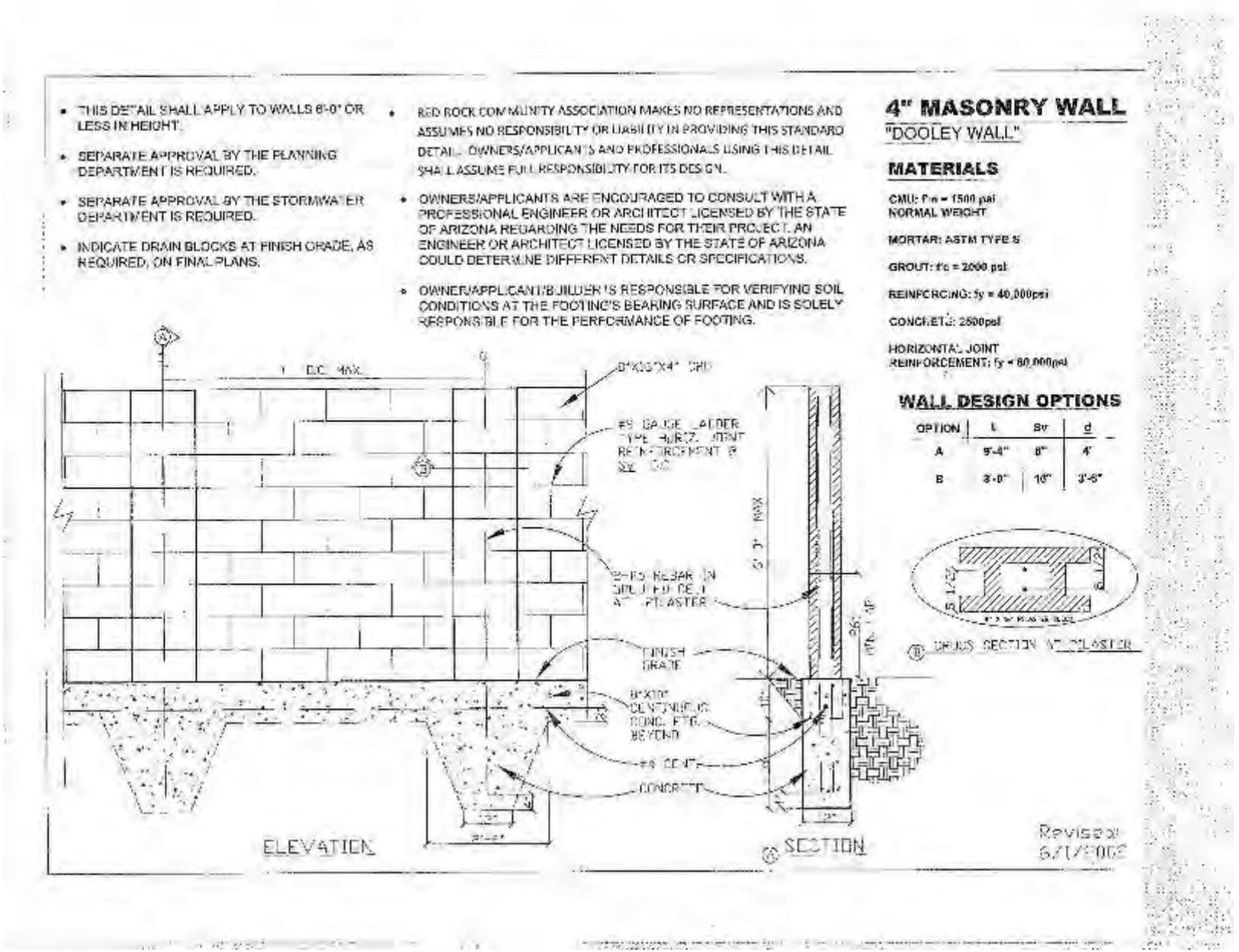


Parts List		
Qty	Item Description	Cut Length
2	U-Channel (1x1)	61"
1	1.75" x 5.5" Top Deco Rail	94"
1	1.75" x 5.5" Bottom Deco Rail (with aluminum insert)	94"
7	.0075" x 12.81" GlideLock Picket	94"

Manufacturer: Homestead Building Products
Contact: Jon Lindblom
Phone: 480-981-0000
Email: jon@homesteadvinyl.net
Brand: Vinyl Visions with SolorGuard and GlideLock
Color: Almond

Homestead BUILDING PRODUCTS 15295 South Higley Road Higley, Arizona 85236

6' Tall x 8' Wide Classic Privacy (Wall Mount)
JON LINDB.COM
10/13/2008


THIS DETAIL SHALL APPLY TO WALLS 6'-0" OR LESS IN HEIGHT.
SEPARATE APPROVAL BY THE PLANNING DEPARTMENT IS REQUIRED.
SEPARATE APPROVAL BY THE STORMWATER DEPARTMENT IS REQUIRED.
INDICATE DRAIN BLOCKS AT FINISH GRADE, AS REQUIRED, ON FINAL PLANS.
RED ROCK COMMUNITY ASSOCIATION MAKES NO REPRESENTATIONS AND ASSUMES NO RESPONSIBILITY OR LIABILITY IN PROVIDING THIS STANDARD DETAIL. OWNERS/APPLICANTS AND PROFESSIONALS USING THIS DETAIL SHALL ASSUME FULL RESPONSIBILITY FOR ITS DESIGN.
OWNERS/APPLICANTS ARE ENCOURAGED TO CONSULT WITH A PROFESSIONAL ENGINEER OR ARCHITECT LICENSED BY THE STATE OF ARIZONA REGARDING THE NEEDS FOR THEIR PROJECT. AN ENGINEER OR ARCHITECT LICENSED BY THE STATE OF ARIZONA COULD DETERMINE DIFFERENT DETAILS OR SPECIFICATIONS.
OWNER/APPLICANT/BUILDER IS RESPONSIBLE FOR VERIFYING SOIL CONDITIONS AT THE FOOTING'S BEARING SURFACE AND IS SOLELY RESPONSIBLE FOR THE PERFORMANCE OF FOOTING.
4" MASONRY WALL
"DOOLEY WALL"
MATERIALS
CMU: f'm = 1500 psi
NORMAL WEIGHT
MORTAR: ASTM TYPE S
GROUT: f'c = 2000 psi
REINFORCING: fy = 40,000psi
CONCRETE: 2500psi
HORIZONTAL JOINT
REINFORCEMENT: fy = 60,000psi
WALL DESIGN OPTIONS
OPTION | L | Sv | d
A | 9'-4" | 8" | 4"
B | 8'-0" | 16" | 3'-6"
#5 GAUGE LADDER TYPE HORIZ. JOINT REINFORCEMENT @ 8" OC
#5 VERT. REBAR IN GROUTED CELL
4" PLASTER
FINISH GRADE
CONCRETE
ELEVATION
SECTION
Revised 6/1/2006



SHERWIN-WILLIAMS 02/27/12
Shar-Color(tm) Order# 8539-00020D0

EXTERIOR ARCHITECTURAL
A-100 LATEX
FLAT NEW COLOR STANDALONE

MOR 13867 REDROCK WALLS
CUSTOM MANUAL MATCH

CCE+COLORANT	02	32	64	128
B1-Black	-	9	-	-
R2-Maroon	-	2	1	1
Y3-Deep Gold	-	40	-	-
G2-Raw Green	-	1	1	-

ONE GALLON EXTRA WHITE
08WA00151 6401B9181

Non Returnable Tinted Color

CAUTION: To ensure consistent color, always order enough paint to complete the job and intermix all containers of the same color before application. Mixed colors may vary slightly from color strip or color chip.

0000000-000

RED ROCK VILLAGE COMMUNITY ASSOCIATION

1870 W PRINCE RD, S-47; TUCSON, AZ 85705

DESIGN GUIDELINE AMENDMENTS

WHEREAS, the Articles of Incorporation of Red Rock Village intends the Association "to provide for the management, maintenance and care of the Areas of Responsibility and to exercise and perform such other powers and duties as are imposed on or granted to the Association by the Project Documents"; and,

WHEREAS, Article 5 of the Covenants, Conditions & Restrictions (CC&Rs) and Article 3 of the Bylaws authorizes the Board of Directors to conduct the affairs of the Association; and,

WHEREAS, Article 1 of the Design Guidelines 1.5 Modification:Conflict "these Design Guidelines may be modified from time to time as may be deemed necessary in the sole discretion of the ARC. In the event of any conflict between the Design Guidelines and the Declaration, the Declaration shall control."

NOW THEREFORE, the Association shall amend the following sections that shall be effective as of **May 1, 2012**:

ARTICLE 3 – LANDSCAPING

INITIAL INSTALLATION

This former section:

3.1 of the Design Guidelines- Initial Installation. Front yard landscaping will be installed on each Lot by Declarant or Builder. All such landscaping installed by Declarant or Builder as a standard package (and including upgrades, if applicable) will be pre-approved by the ARC. Any additional landscaping installed by an Owner will require approval of the ARC prior to installation. In addition, Subsection 7.7.2 of the Declaration requires that the Owner of a Lot abutting a Common Area where the rear and/or side yards are enclosed with a view fence must landscape such rear and/or side yard areas no later than 170 days following the date on which the Lot if first conveyed to an Owner.

Shall be replaced with:

3.1 of the Design Guidelines- Initial Installation. Front yard landscaping that is not purchased as an option from the Declarant or Builder will be installed by each Lot Owner within 90 days of closing:

(i) The revised section 3.11 of the Design Guidelines- Minimum Standards for Front Yard Landscape Installation.

(ii) Does not conflict with 5.2 of the Design Guidelines- Corner Lot Visibility Restrictions.

(iii) Utilizes foliage from the Approved Plant List by submitting an ARC of the landscape plan prior installation and post closing.

(iv) Meets or exceeds the 5 foot minimum set back requirement in relation to residence, fence lines, and utility easements designated on the Lot Plat Map.

GROUND COVERAGE

This former section:

3.6 of the Design Guidelines- Ground Cover. The ground surface of all yards shall be covered with approved inert or living materials or a combination of both. Approved inert materials shall include but not be limited to:

(i) River Rock (3" 6" in diameter) – not to exceed 10% of the yard.

(ii) Decomposed granite (3/8" minus material or larger permitted). Apache Red and Desert Gold are approved colors; provided that the ARC will consider different colors that are compatible with other colors in the Project. Only 1 color of decomposed granite is permitted in front yards.

(iii) Crushed granite.

(iv) Boulders (must be buried at least 1/3 of their depth).

Shall be replaced with:

3.6 of the Design Guidelines- Ground Cover. The ground surface of all yards shall be covered with approved inert or living materials or a combination of both. Approved inert materials shall include but not be limited to:

(i) River Rock (3" 6" in diameter) – not to exceed 10% of the yard.

(ii) Decomposed granite (3/8" minus material or larger permitted). Apache Red and Desert Gold are approved colors; provided that the ARC will consider different colors that are compatible with other colors in the Project. Only 1 color of decomposed granite is permitted in front yards.

(iii) Crushed granite.

(iv) Boulders (must be buried at least 1/3 of their size).

(V) New homes in the community closed post May 1, 2012- Rear yards shall have a ground cover ground application of the approved item within 180 days post closing of purchase and shall not require an ARC submittal so long as the color selection is of an approved color specified in (ii) or another neutral color option is selected by Owner. Association office shall be provided a written statement of installation upon completion by Owner via mail, email, fax or in person.

(vi) Existing homes in the Villages closed prior May 1, 2012- Rear yards shall have a minimal ground cover application of the approved item (ii) on or before December 31, 2012 and shall not require an ARC submittal so long as the color selection is of an approved color specified in (ii) or another neutral color option is selected by Owner. Association office shall be provided a written statement of installation upon completion by Owner

via mail, email, fax or in person.

CONCRETE

This former section:

3.7 of the Design Guidelines-Concrete. Excessive use of concrete (as determined by the ARC) in front and street side yards will not be allowed. Requests for concrete installation in addition to the concrete that was installed by Declarant or a Builder will be considered on a case-by-case basis.

Shall be replaced with:

CONCRETE, FLAGSTONE AND PAVERS

3.7 of the Design Guidelines-Concrete. Excessive use of concrete (as determined by the ARC) in front and street side yards will not be allowed. Requests for concrete installation in addition to the concrete that was installed by Declarant or a Builder will be considered on a case by case basis. Concrete installation requires an ARC submittal with complete plans showing intended placement, all surface measurements and depth with installation applications.

3.7.1 of the Design Guidelines- Flagstone. Flagstone may be installed in the front, side or rear of the lot with an ARC submittal if meeting the following criteria:

(i) Front Yard- Flagstones are placed in an aesthetic design for the purpose of landscaping enhancement and the color selection shall compliment the base or trim color of the home, not to exceed 6 foot (width) in any singular section and not exceed 15% of the yard.

(iii) Side Yard. Flagstones are placed in a pathway from the side gate to the sidewalk for allowing ease of entry to the side gate and/or the purpose of trash or recycle transport for service day and the color selection shall compliment the base or trim color of the home and shall not to exceed 4 feet in width.

(iv) Rear Yard- Flagstones are placed in the rear yard for the purpose of landscaping enhancement not to exceed 6 foot (width) in any singular section and/or for a patio floor expansion not to exceed the rear width of the house and 10 feet in depth in any singular section and either or both options shall compliment the base or trim color of the home. Neither option shall disrupt the existing positive drainage flow and shall not exceed 25% of the yard.

3.7.2 of the Design Guidelines- Pavers. Pavers may be installed in the front, side or rear of the lot without an ARC submittal if meeting the following criteria:

(i) Front Yard- Pavers are placed in an aesthetic design for the purpose of landscaping enhancement and the color selection shall compliment the base or trim color of the home, not to exceed 6 foot (width) in any singular section and not exceed 15% of the yard.

(ii) Driveway
A Pavers are placed on either or both sides of the existing driveway to expand the width of the driveway and the color selection shall compliment the base or trim color of the home, not to exceed the edge of the home on the non-entrance side and not to exceed 2.5 foot expansion on either side.
B- Pavers may be used for a new or replacement driveway so long as the color selection shall compliment the base or trim color of the home, and does not exceed the edge of the home on the non-entrance side by 2.5 feet and stop at the adjoining sidewalk and maintain a professional installation appearance.

(iii) Side Yard Pavers are placed in a pathway from the side gate to the sidewalk for allowing ease of entry to the side gate and/or the purpose of trash or recycle transport for service day and front yard and the color selection shall compliment the base or trim color of the home, not to exceed 4 feet in width.

(iv) Rear Yard- Pavers are placed in the rear yard for the purpose of landscaping enhancement not to exceed 6 foot (width) in any singular section and/or for a patio floor expansion not to exceed the rear width of the house and 10 feet in depth in any singular section and either or both options shall compliment the base or trim color of the home. Neither option shall disrupt the existing positive drainage flow and shall not exceed 25% of the yard.

This former section:
3.11 of the Design Guidelines- Minimum Standards for Front Yard Landscape Installation
The following minimum plant material sizes and plant quantities are strongly recommended by the ARC if an Owner desires to modify a standard front yard landscape installation by Declarant or a Builder, or if an Owner desires to perform a renovation of front yard landscaping. However, the ARC will consider variations of these requirements as long as the completed landscape plan results in an attractive front yard:

Trees	One 15 Gallon Tree
Shrubs	Five 5 Gallon Shrubs/Accents
Groundcover	Five 1 Gallon Groundcover/Accents

Shall be replaced with:
3.11 of the Design Guidelines- Minimum Standards for Front Yard Landscape Installation
The following minimum plant material sizes and plant quantities are required by the ARC for all Owners:

A. Owners post May 1, 2012 shall meet the requirement of the revised 3.1 Design Guideline- Initial Installation.

B. Owners prior March 15, 2012, shall not be required to submit an ARC submittal for modifications to an existing landscape installed by the Declarant or Builder so long as the modification meets:

(i) The minimum aesthetic appeal for the community with a variation of the following listed below.

(ii) The completed landscape plan results in an attractive front yard.

(iii) Meets or exceeds the 5 foot minimum set back requirement in relation to residence, fence lines, and utility easements designated on the Lot Plat Map.

(iv) Does not conflict with 5.2 of the Design Guidelines- Corner Lot Visibility Restrictions.

(v) The foliage selected is not on the Prohibited Plant definition found in the Design Guidelines section 3.4:

Front Yard has 1 Main Focal Point	Tree or Cacti that shall exceed 5 feet in height when mature
Shrubs	Five 5 Gallon Shrubs/Accents
Groundcover	Five 1 Gallon Groundcover/Accents

ARTICLE 5 – OTHER IMPROVEMENTS AND ALTERATIONS

FENCES AND GATES

This former section:
5.4 of the Design Guidelines- Fences and Gates. All fences and gates installed, maintained, repaired and replaced within the Project shall be vinyl. The manufacturer, building specifications and color are all set forth on Exhibit B attached hereto.

Shall be replaced with:
5.4 of the Design Guidelines-Fences and Gates. Villages within the community shall be allowed two types of fencing being, 1) vinyl with the manufacturer, building specifications and color are all set forth on Exhibit B attached hereto and 2) a block wall made of cement block, not exceed 6ft in height and meeting the specifications set forth in Exhibit C attached hereto. The block wall shall be painted on both sides of the block wall with the color of **RED ROCK BLOCK TAN, available at Sherman-Williams as MOR -10067 .**

5.4.1 Existing Vinyl Fence Changes. Homes with existing vinyl fencing may change the vinyl fence to block wall if Owner meets the specifications within 1) Exhibit C, 2) Section 5.4, and 3) by submittal of the required Architectural Request form providing all of the details relating to the modification and 4) by obtaining the adjacent neighbor's acknowledgement in regards to the party wall shared by Lots on the ARC form.

Modifications of vinyl to block from one lot neighboring another lot must be cohesive and secure where the two fence lines meet in the front of the Lots and visible from outside of the Lot.

5.4.2 Gates All gates shall require an ARC submittal and include a full description (and photo whenever possible) with measurements, materials, and latch closures when visible from outside of the Lot.

FIREPLACES and BARBECUES

This former section:
5.5 of the Design Guidelines-Fireplaces and Barbecues. Proposals for installation of permanent outdoor fireplaces, barbecues and fire pits must include materials, colors and the location and distance from neighboring Lots. The style, color and materials of the proposed Improvement should complement the style, color and materials of the Residential Unit. Each Owner is responsible for assuring that the operation of the facility is in compliance with all applicable ordinances and laws.

Shall be replaced with:
5.5 of the Design Guidelines-Fireplaces and Barbecues. ARC required and each proposal for installation of permanent outdoor fireplaces, barbecues and fire pits must include materials, colors and the location and distance from neighboring Lots and shall be considered on a case by case submittal. The style, color and materials of the proposed Improvement should complement the style, color and materials of the Residential Unit. Each Owner is responsible for assuring that the operation of the facility is in compliance with all applicable ordinances and laws.

(i) Portable barbecues and fire pits shall be permitted and shall be maintained and stored in the rear yards and not be visible from outside of the Lot.

(ii) Additions of internal fire places require a full ARC submittal to include the modifications that shall be required to all of the exterior portions of the home with a full schematic providing measurements, color, materials and all other related items necessary for the installation. Addition to the exterior of the home for chimney shall require the visible section outside of the Lot to be painted to match the base color of the home.

PLAY EQUIPMENT

This former section:
5.9 of the Design Guidelines- Play Equipment. Play structures and other play equipment shall be painted to match the color scheme of the Residential Unit or have a natural wood finish. Any canvas canopy shall be of a neutral color. No flags other than those described

in Section 5.5 above are allowed. All play structures and play equipment shall be maintained so as to present a neat and clean appearance. Screening of play structure and other play equipment with landscaping may be required by the ARC.

Shall be replaced with:
5.9 of the Design Guidelines- Play Equipment. Submittal shall be required and include specifications described within this section. Play structures and other play equipment shall be painted to match the color scheme of the Residential Unit or have a natural wood finish. Any canvas canopy shall be of a neutral color. No flags other than those described in Section 5.5 above are allowed. All play structures and play equipment shall be maintained so as to present a neat and clean appearance. Screening of play structure and other play equipment with landscaping may be required by the ARC. All play structures shall meet the following specifications:

(i) Play structures and play equipment are hereby identified as and not limited to- swing sets, combination play structures and trampolines.
(ii) All play structures and play equipment shall be used, stored and maintained in the rear yards only.
(iii) Play structures have a height cap of 13 feet.
(iv) Trampolines have a height cap of 14 feet.
(iv) Play structures and trampolines shall be placed no less than the minimum set back requirement of 5 feet from all fence lines and residence unless either unit exceeds 10 feet in height or width at any measurement point of the item (see (v)).
(v) Play structures and trampolines exceeding 10 feet in height or width at any measurement point that measurement shall be divided by 2 and thereby be set back requirement for all fence lines and residence.

Example A: play structure measurement 6x8x10- set back requirement is 5 ft.
Example B: play structure measurement 8x13x9- set back requirement is 6.5 ft.

SECURITY SCREEN DOORS

This former section:
5.11 of the Design Guidelines- Security Screen Doors. Security doors will be considered by the ARC provided that they are painted to match the front door or exterior base color of the home.

Shall be replaced with:
5.11of the Design Guidelines- Security Screen Doors. Security doors shall not require an ARC submittal so long as upon installation, the security screen door is painted to match the front door or exterior base color of the home or is a color that shall compliment the color pallet of the home. The design of the security screen door shall maintain a southwestern or neutral design to remain aesthetically appealing with the community.

The ARC reserves the right to require removal or modification to any installation that is not aesthetically appealing for the design of the community.

SOLAR DEVICES

This former section:
5.12 of the Design Guidelines- Solar Energy Devices. Solar roof panels will be considered for approval if made to look like an integrated part of the roof design and mounted directly to the roof plane. Solar roof panels installed by Owners and their contractors likely will void the roof warranty. Other solar collecting panels and devices may be placed, constructed and maintained in such locations and with such means of screening or concealment as the ARC may reasonably deem appropriate to limit, to the extent possible the visual impact of such solar collecting panels and devices when viewed from any street or from any other portion of the Property.

Shall be replaced with:
5.12 of the Design Guidelines- Solar Energy Devices. Solar roof panels will not require an ARC submittal so long as:

(i) Solar panels are made to look like an integrated part of the roof design and mounted directly to the roof plane.
(ii) Solar roof panels installed by Owners and their contractors could void the roof warranty.
(iii) The ARC has the right to require screening of the devices in the front of the fence line if deemed necessary any time in the future.
(iv) All exterior conduit lines must be painted to match the section of the home where it is attached.
(v) No advertisement signage may be posted anywhere on the Lot for the Solar company and be visible from outside of the Lot.

STORAGE SHEDS

This former section:
5.13 of the Design Guidelines- Storage Sheds. Storage sheds will be permitted and need not be submitted for approval, provided that the maximum height of the shed does not exceed the height of the immediately surrounding fence.

Shall be replaced with:
5.13 of the Design Guidelines- Storage Sheds. Storage sheds of a traditional nature that store contents of personal belongings and landscape tools and so forth shall not require a submittal so long as they meet the following criteria for installation:

(i) Shall only be placed in the rear yard.
(ii) The structure meets or exceeds the set back requirement of 5 feet from all fence lines and residence.

(ii) The height of the shed shall not exceed 12 for a flat roof or 13 feet for a peaked roof at the highest measuring point of the structure.

(iii) The materials of which the shed is constructed (metal, plastic, or wood) shall blend within a couple of shades of the base color of the house or be painted to match the house and the paint shall be routinely maintained so that it will retain an aesthetic appeal when visible from outside of the Lot from any neighboring Property.

(iv) Roofs of the sheds shall match the appropriate color for the material of which it is made- metal shall be painted to match the house and routinely maintained to avoid rust, plastic shall be purchased or painted to match the item or the house, and wood shall be a color pallet of the house roof or the house base color.

(v) Any flooring established shall not interrupt the existing, positive drainage flow.

5.13.1 of the Design Guidelines- <u>Storage Sheds.</u> Small storage sheds utilized to store the trash and recycle containers shall not require a submittal so long as they meet the following criteria for installation:

(i) May be placed in the side yard, alongside the house, closest to the side yard fence.

(ii) The height and width of the shed shall not exceed the height and width of the trash and/or recycle containers when jointly shared.

(vi) The materials of which the shed is constructed (plastic or wood) shall blend within a couple of shades of the base color of the house or be painted to match the house and the paint shall be routinely maintained so that it will retain an aesthetic appeal when visible from outside of the Lot from any neighboring Property.

(vii) Roofs of the sheds shall match the appropriate color for the material of which it is made- plastic shall be purchased or painted to match the item or the house, and wood shall be a color pallet of the house base color.

(viii) Any flooring established shall not interrupt the existing, positive drainage flow.

Adopted by the Board of Directors on March 30, 2011

RED ROCK VILLAGE COMMUNITY ASSOCIATION
c/o CCMC
1 S. Church Avenue, Suite 1200
Tucson, AZ 85741
Phone (520) 448-5300 / Fax (520) 488-5101

ARCHITECTURAL REQUEST FORM

Homeowner Name(s): _____ *Date:* _____
Property Address: _____ *Lot:* _____
Subdivision: _____
Phone Number: _____ *Mobile Number:* _____
Email: _____

Modification Request Will Affect: ☐ Front ☐ Side - __E __W __N __S ☐ Rear of Lot

☐ Photo(s) Attached ☐ Brochure Attached ☐ Sample Included

Select Type *- Give brief details (if brief details cannot be provided, full plans are required)*

☐ Fence Modification
Relocating _____ feet forward on the __E __W __N __S of the home with a 7 ft set back from the front edge of the home; utility boxes will not be blocked from service provider; same exact materials as existing fence is required.
* Requires neighbor(s) written acknowledgement *
Print Name(s): _____ Signature(s): _____ Lot: _____ Ph#: _____
Print Name(s): _____ Signature(s): _____ Lot: _____ Ph#: _____

☐ Flag ___ Mounted to Garage or House ___ Pole inset into ground
Requires drawing showing mount location and specifications of hardware. Brackets mounted to the house or garage must be painted to match paint where mounted

☐ Foliage ___ Replacing, existing location ___ Adding _____ Quantity Variety _____
Requires drawing showing plant(s) location; 5 ft set back requirement from all fence lines and residence.

☐ Ground Cover Type _____ Size _____ Color _____

☐ Irrigation - Attach drawing showing the details for change(s) including water flow.

☐ Landscape Features - Select type(s), enter quantity, give description, provide dimensions where applicable, and location on lot

	Qty	Description	Size	Location
___ Containers	____	_____	___x___	_____
___ Concrete Product	____	_____	___x___	_____
	____	_____	___x___	_____
___ Figurine	____	_____	___x___	_____
	____	_____	___x___	_____
	____	_____	___x___	_____
___ Free-standing Planter	____	_____	___x___	_____
___ Furniture	____	_____	___x___	_____
	____	_____	___x___	_____
	____	_____	___x___	_____
___ Lattice Work	____	_____	___x___	_____
___ Pedestal	____	_____	___x___	_____
___ Pots	____	_____	___x___	_____
___ Sculptures	____	_____	___x___	_____
___ Water Feature	____	_____	___x___	_____

3.10.1 Fountains installed in front yards will be set back a minimum of (12-20 ft) 20 ft from the front property line. Any water feature that is proposed must include plans and specifications for chlorination or similar treatment of the water to mitigate mosquito breeding.
The following treatment will be used in the water feature to mitigate mosquito breeding: _____

Page 1 3050 ARC Request - rev 12/21/2015

☐ Landscape ___Replacement ___Small area ___Large area ** ATTACH PLANS **
Proper drainage away from the house and to the street must be maintained within the lot; may not interfere with adjoining lots' drainage.

☐ Pavers Type _____ Color _____ ** ATTACH PLANS **

☐ Patio - requires full drawing, materials, measurements, color. Final County permit and photo upon completion to the Association.
** ATTACH PLANS ** ___Final County Permit Obtained

☐ Play Structure ___Wood ___Metal Color: _____ Center Height _____ Measurements ___x___x___
Attach drawing depicting location of installation; set back requirement 5 ft or 1/2 the highest point from all fence lines.

☐ Pool ___Above Ground ___In Ground Measurements x x
** ATTACH PLANS ** ___Final County Permit Obtained

☐ Satellite/Other Requires all hardware and wiring to be painted to match the surface where attached. Wiring/Cables must be secured to the surface where attached. Mounting Location:

☐ Shed ___Wood ___Metal Color: _____ Center Height _____ Measurements ___x___x___
Attach drawing depicting location of installation; set back requirement 5 ft the highest point from all fence lines.

☐ Security Screen Door ___Front ___Rear Design _____ Color _____
Color of Home _____ Color of Door _____ Color of Door Frame _____

☐ Trees(s) ___Replacing, existing location ___Adding _____Quantity Variety _____
Attach drawing depicting location of new additions; set back requirement: 5 ft from all fence lines.

☐ All Other Types: _____

If a Contractor has been hired for your project, please provide the following information.

Contractor Name: _____ Phone: _____

Contact Name: _____ Mobile: _____

Submittal must include a Plot Plan indicating the location of the requested improvement and include all applicable measurements, dimensions and description. Incomplete submittals will be denied.

Homeowner agrees to comply with all applicable City and State laws, and to obtain all necessary permits. Approval by the Architectural Review Committee shall not be deemed a warranty or representation as to the quality of such construction, installation, addition, alteration, repair, change or other work, or that work conforms to any applicable building codes or other Federal, State or local law, statute, ordinance, rule or regulation.

Architectural Review Committee requests will be reviewed within thirty (30) days. Requests will either be approved, denied or returned for additional information. If no response is received within thirty-five (35) days of submittal, consider the submittal denied and resubmit.

Architectural Requests can only be submitted by the homeowner of record. Please submit completed and signed request along with supporting documentation to the address or fax number listed above or via email to **RedRockVillageARC@ccmcnet.com**.

_____
Homeowner Signature

_____
Date

A. Preliminary Water Report for

Smith-Rothberg PAD

Pinal County, Arizona



The Planning Center
a division of TPC Group, Inc.

TABLE OF CONTENTS

I. INTRODUCTION 131

II. LOCATION 131

III. EXISTING WATER DISTRIBUTION SYSTEM 131

IV. PROPOSED WATER DISTRIBUTION SYSTEM 131

EXHIBITS

EXHIBIT 1: PROJECT LOCATION 5

I. Introduction

RRV South, LP is proposing a minor comprehensive plan amendment, rezoning, and PAD overlay for a single-family home subdivision in Red Rock, Arizona. Preparation of an improvement plan to develop the parcel is not anticipated until it is served by other infrastructure that would allow for its development.

The proposed subdivision will consist of 294 single-family homes on 60 acres of currently vacant land to be rezoned R-7 (Single-Residence Zoning District).

II. Location

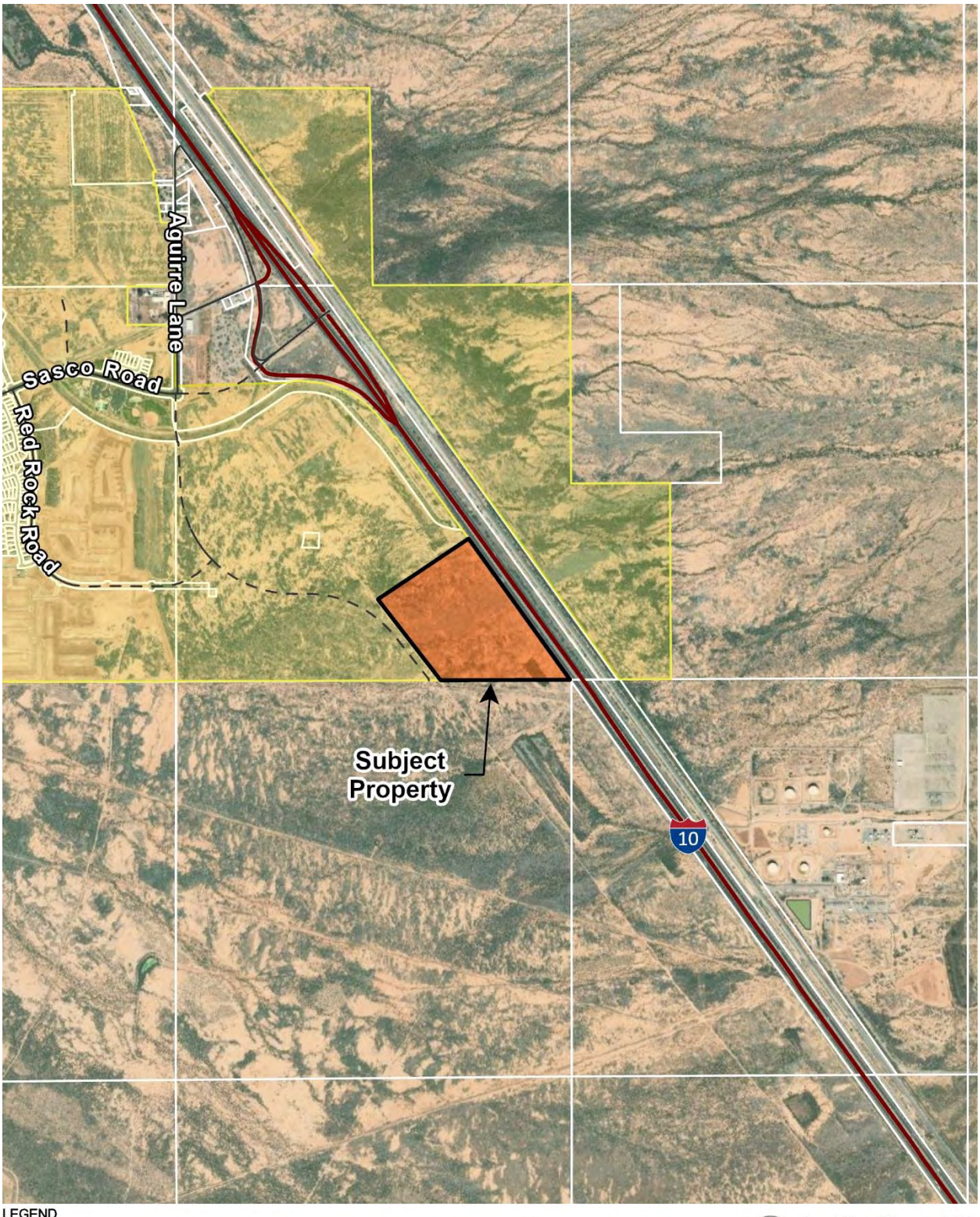
The proposed project site is in unincorporated Red Rock, Arizona bordered by Interstate 10 to the east, the Red Rock Village PAD to the north and west, and vacant land to the south. Land bordering the site within the Red Rock Village PAD is currently undeveloped. The parcel is in Section 9, Township 10 South, Range 10 East. See *Exhibit 1: Project Location*.

III. Existing Water Distribution System

The existing water distribution system near the project site is the Global Water Resources – Santa Cruz distribution system. No water mains are adjacent to the project site, but they will be extended from Sasco Road along Aguirre Lane with future infrastructure improvements within the Red Rock Village PAD. The location of tie-ins to the main along Aguirre Lane shall be determined during the development process.

IV. Proposed Water Distribution System

The water distribution system will be designed to conform to the standards of the Arizona Department of Water Resources (ADWR), Global Water, and Pinal County. Design parameters and exact piping shall be provided during the development process.


Aguirre Lane
Sasco Road
Red Rock Road
Subject Property
10
LEGEND
Subject Property
Red Rock Village
Interstate Highway
Road - Existing
Road - Proposed
0 500 1,000 2,000
1 inch = 2,000 feet
File Name: AGS-10 Smith-Rothberg PAD Location
Source: Pinal County GIS, 2022
Aerial Imagery: MAXAR 2022

B. Preliminary Sewer Report for

Smith-Rothberg PAD

Pinal County, Arizona



The Planning Center
a division of TPC Group, Inc.

TABLE OF CONTENTS

I. INTRODUCTION 135

II. LOCATION 135

III. EXISTING WASTEWATER COLLECTION 135

IV. PROPOSED WASTEWATER COLLECTION SYSTEM 135

V. DESIGN STANDARDS 135

EXHIBITS

EXHIBIT 1: PROJECT LOCATION..... 5

I. Introduction

RRV South, LP is proposing a minor comprehensive plan amendment, rezoning, and PAD overlay for a single-family home subdivision in Red Rock, Arizona. Preparation of improvement plans to develop the parcel is not anticipated until it is served by other infrastructure that would allow for its development.

The proposed subdivision will consist of 294 single-family homes on 60 acres of currently vacant land to be rezoned R-7 (Single-Residence Zoning District).

II. Location

The proposed project site is located in unincorporated Red Rock, Arizona, bordered by Interstate 10 to the east, the Red Rock Village PAD to the north and west, and vacant land to the south. Land bordering the site within the Red Rock Village PAD is currently undeveloped. The parcel is in Section 9, Township 10 South, Range 10 East. See *Exhibit 1: Project Location*.

III. Existing Wastewater Collection

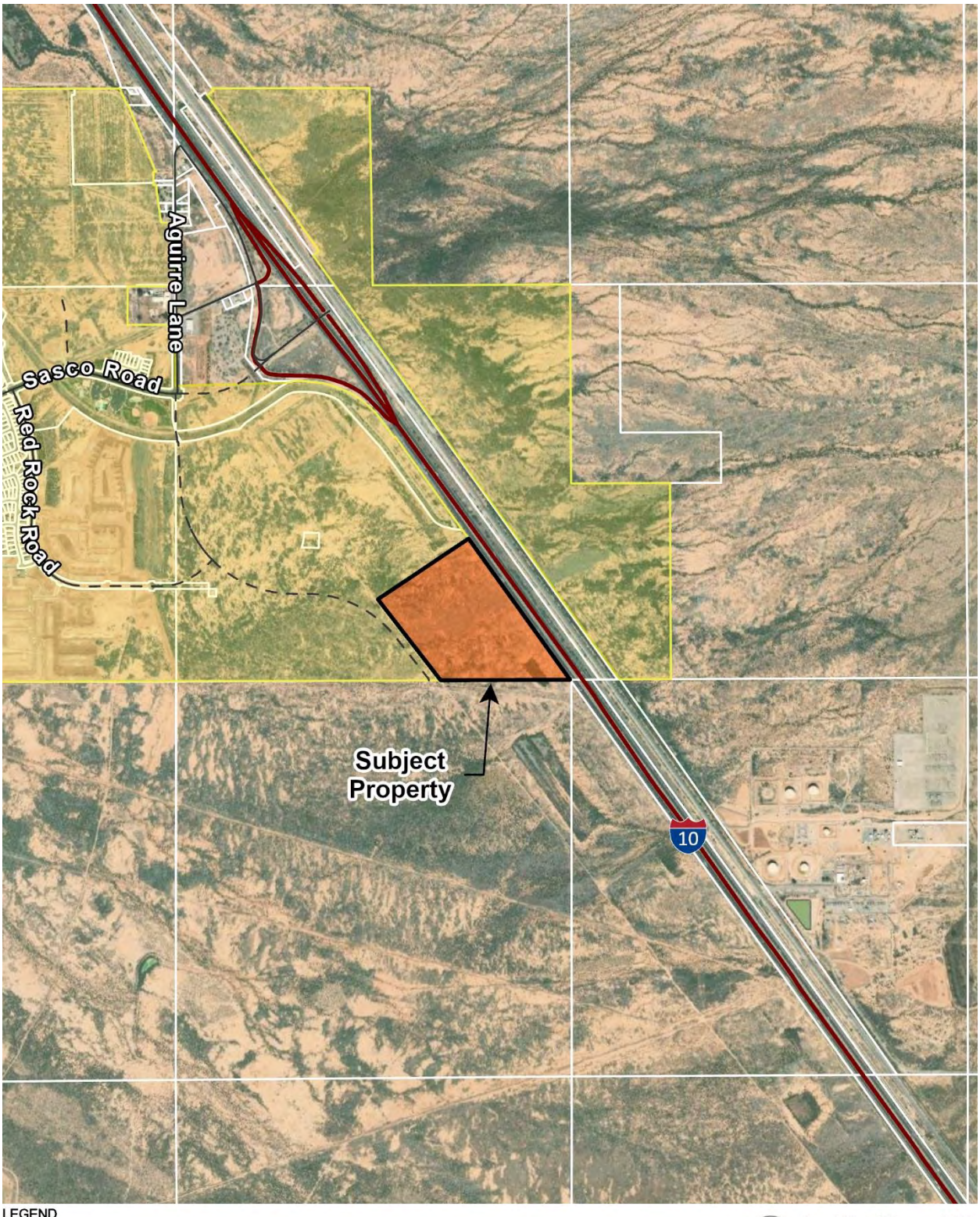
The existing wastewater collection system consists of a sewer main along Sasco Road. This main will be extended along Aguirre Lane in the future to tie into the proposed subdivision. Connection point locations shall be determined in the Final Sewer Report.

IV. Proposed Wastewater Collection System

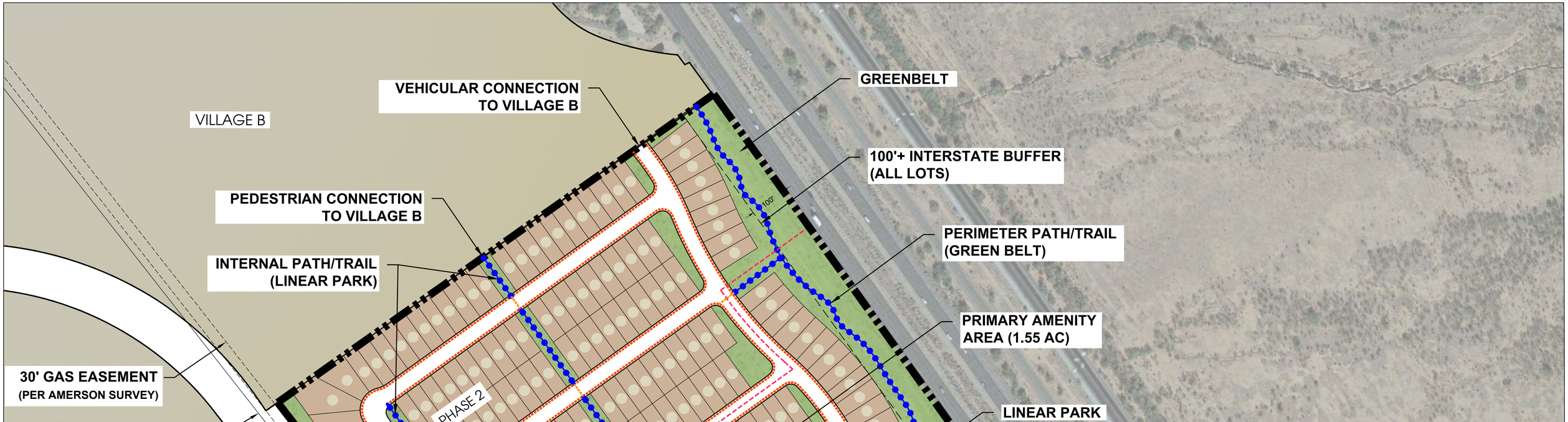
The project's wastewater system will be a gravity collection system consisting of 8-inch gravity sewer mains designed to Pinal County and Global Water standards. Further design of the wastewater collection system will be done at the time of development.

V. Design Standards

The sewage collection system will be designed to conform to ADEQ (Arizona Department of Environmental Quality) standards which are in the Arizona Administrative Code (R18-9-E301 4.01 General Permit: Sewage Collection Systems).


Aguirre Lane
Sasco Road
Red Rock Road
Subject Property
10
LEGEND
Subject Property
Red Rock Village
Interstate Highway
Road - Existing
Road - Proposed
0 500 1,000 2,000
1 inch = 2,000 feet
File Name: AGS-10 Smith-Rothberg PAD Location
Source: Pinal County GIS, 2022
Aerial Imagery: MAXAR 2022

SMITH ROTHBERG - PRELIMINARY SITE PLAN CONCEPT | 06.15.23



NOTES AND LEGEND

JURISDICTION: PINAL COUNTY
PARCEL: 41012001D
EXISTING ZONING: GR (*GENERAL RURAL*)
PROPOSED ZONING: PAD (R-7)
SITE ACREAGE: 60.13 AC

SINGLE FAMILY RESIDENTIAL LOTS: 294
TOTAL RAC: 4.88

RESIDENTIAL LOT: 40X120
PHASE 1 LOTS: 106
PHASE 2 LOTS: 117
PHASE 3 LOTS: 71

PHASE BOUNDARY

REQUIRED TOTAL OPEN SPACE: 10.82 AC
PROVIDED TOTAL OPEN SPACE: 15.60 AC
(RECREATION, LANDSCAPE, AND DRAINAGE)
REQUIRED RECREATION AREA: 4.21 AC
PROVIDED RECREATION AREA: 7.28 AC

- PARKS (PRIMARY AND SECONDARY AMENITIES): 3.0 AC
- TRAILS: 7,167 L X 26 W (6 WIDE TRAIL & 10' ADJACENT LANDSCAPE ON EACH SIDE) = 4.28 AC

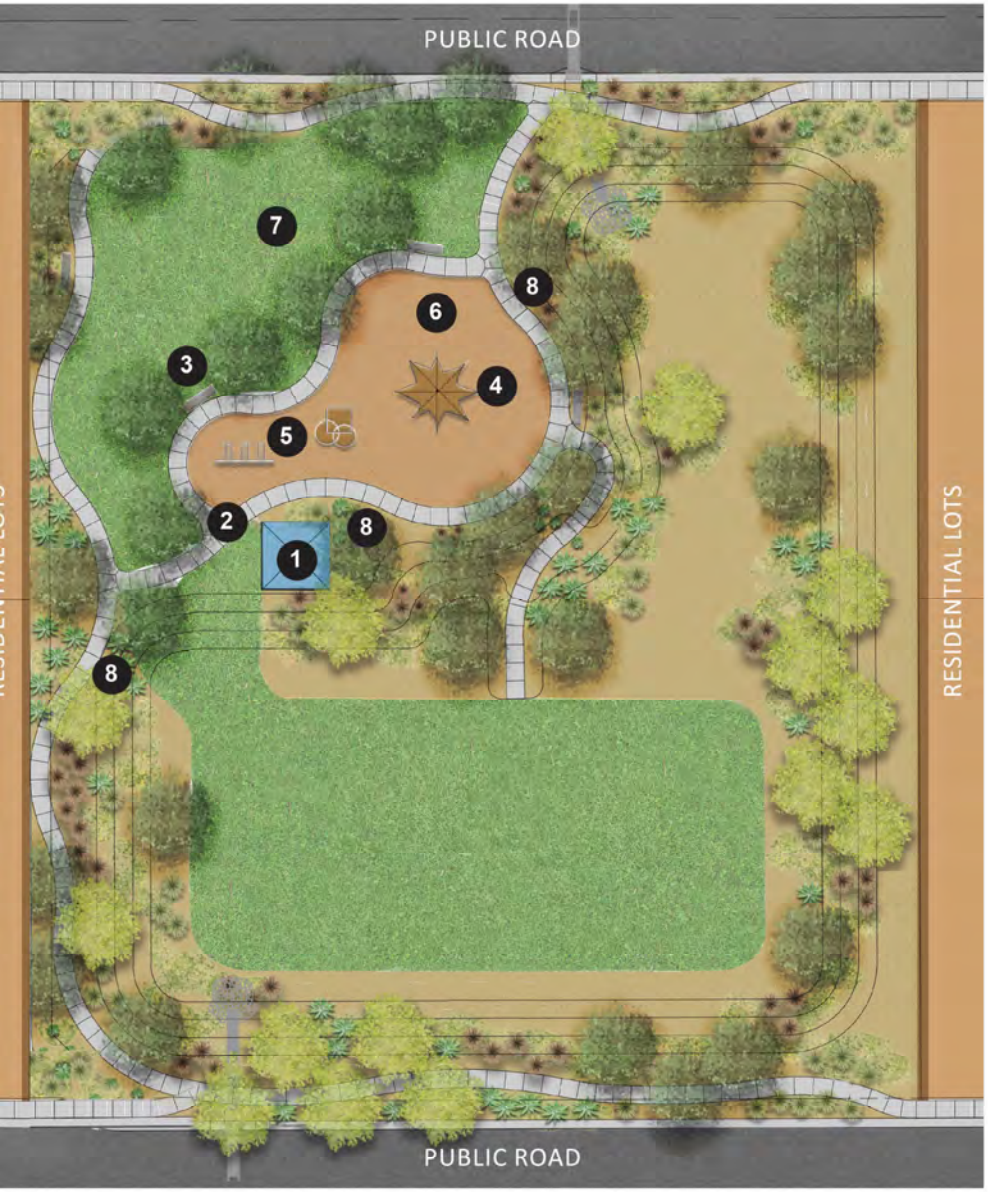
NEIGHBORHOOD ENTRY SIGN
SIDEWALK: 17,130 LF
CROSSWALK

SMITH-ROTHBERG PAD

PROJECT:AGS-10 DATE:06/15/22
FILE NAME: AGS-10 SITE PLANNING 061523.DWG

0' 120' 240' NORTH

THE PLANNING CENTER
a division of TPG group, inc.
2 e congress ste 600 tucson az 85701



LEGEND

1. RAMADA
2. CONCRETE SIDEWALK
3. BENCH
4. PLAYGROUND
5. SWINGS
6. FALL SAFE SURFACE
7. TURF AREA
8. BIKE RACKS









THE PLANNING CENTER
a division of TPC Group, Inc.

February 1, 2023

Dear Neighbor,

The Planning Center invites you to participate in a virtual neighborhood meeting to discuss a concurrent rezoning, Planned Area Development (PAD) overlay, and minor amendment to the Pinal County Comprehensive Plan.



The rezoning area is approximately three-quarters of a mile south of the Red Rock interchange on the west side of I-10. It shares a northern and western boundary with the Red Rock Village Planned Area Development and borders I-10 on its eastern boundary and Arizona State Land to the south. Please see the orange highlighted area on the map to the right.

The property is currently zoned GR (General Rural) and is designated as Moderate Low Density Residential by the Pinal County Comprehensive Plan. We are requesting a minor amendment to change the property's designation to Medium Density Residential and propose to rezone it to R-7 with a PAD overlay. The PAD overlay modifies the standards of the R-7 zone to align more closely with the Red Rock Village PAD's residential zoning standards.

This new Planned Area Development, called the Smith-Rothberg PAD, will be a single-family residential subdivision with approximately 300 single-family homes. The subdivision will have a large park in the center and smaller pocket parks throughout. The community will also feature an interconnected trail system with a linear park through the middle and a greenbelt along the interstate. The proposed trail system will extend to the Red Rock Village PAD boundary and Aguirre Lane to facilitate future trail connections and a larger overall trail network for the area.

Given that this community adjoins Red Rock Village and will be brought forth by the same Master Developer, Sunbelt Holdings, it may be subject to the Red Rock Village Community Association Guidelines and the same applicable Covenants, Conditions, and Restrictions (CC&Rs) governing homes within the Red Rock Village PAD.

See Back Page

a 2 e. congress ste 600 tucson az 85701
o 520.623.6146
f 520.622.1950
w azplanningcenter.com

As part of this process, we invite you to attend the Zoom meeting outlined below to discuss this proposal. Representatives from The Planning Center will present the proposed PAD, detail the minor comprehensive plan amendment and rezoning processes, and address any questions or concerns you may have.

Please join us:

Date: February 15, 2023
Time: 5:45 PM

Location: Zoom (see link below)
https://us06web.zoom.us/j/9844761151

Meeting ID: 984 476 1151
You may also join the meeting by dialing in via telephone. Please call: +1 (253) 215-8782

If you plan to attend, please email Garrett Aldrete (galdrete@azplanningcenter.com) and a live link will be emailed to you. This will save you from having to manually type the Zoom link into your browser.

Comments on this proposal may be submitted to the Pinal County Community Development Planning Division, P.O. Box 2973, Florence, AZ 85132, Phone (520) 509-3555.

If you cannot attend the meeting or have questions beforehand, please call or email me at bunderwood@azplanningcenter.com or (520) 623-6146.

Thank you.

Sincerely,

The Planning Center

Brian Underwood

Brian Underwood
Director of Planning

THE PLANNING CENTER
a division of TPC Group, Inc.

M E M O R A N D U M

Date:	February 15th, 2023	**Job No:**	AGS-10
To:	Brent Billingsley, Director of Community Development, Pinal County		
From:	Garrett Aldrete, Planner, The Planning Center		
Project:	Smith-Rothberg Planned Area Development – Neighborhood Meeting Summary		

This memorandum summarizes the neighborhood meeting held on Wednesday, February 15th, 2023, for the proposed rezoning, planned area development overlay, and minor comprehensive plan amendment request for the sixty-acre property (APN: 410-12-001D) located three-quarters of a mile south of East Sasco Road between the Aguirre Lane alignment and Interstate 10. The meeting was held virtually through Zoom and was noticed correctly utilizing mailing labels generated with Pinal County's mail buffer tool found on the Zoning Viewer of the Interactive Maps. Notices were sent to all property owners within 1,200 feet of the subject site.

The meeting began at 5:45 PM. Brian Underwood and I hosted the meeting and were joined by Geoff Bradmon, Ben Tighe, and Greg Mohl from Sunbelt Holdings. Greg Mohl is also the Red Rock Community Association President. No one from the public attended the meeting.

Should you have questions or would like additional information, please do not hesitate to contact me at galdrete@azplanningcenter.com.

Thank you.

a 2 e. congress ste 600 tucson az 85701
o 520.623.6146
f 520.622.1950
w azplanningcenter.com

PROPERTY OWNERSHIP LIST
(Required for filing all applications)

Instructions: Print Name, Address, City, State, Zip Code and Tax Parcel Number for each property owner within 600/ 1,200 (circle one) feet of the subject parcel boundary. Feel free to attach a separate list if generated digitally. Please see "How to use the Buffer Tool" on our FAQ's page if you are generating the list.

Parcel No.: 410-12-001E
Name: Global Water - Santa Cruz Water Co
Address: 21410 N 19th Ave Ste 220
City/ST/Zip: Phoenix, AZ 85027

Parcel No.: 410-08-003A
Name: Arizona Public Service Company
Address: PO Box 53999 MS 9505
City/ST/Zip: Phoenix, AZ 85072

Parcel No.: 410-12-001J
Name: RRV South LP
Address: 6720 N Scottsdale Rd Ste 250
City/ST/Zip: Phoenix, AZ 85072

Parcel No.: 410-12-001D
Name: Smith Robin B
Address: 12 Cedric Rd
City/ST/Zip: Summit, NJ 07901

Parcel No.: 410-12-001H
Name: Red Rock Village Community Association
Address: 8360 E Villa de Venturea Blvd Ste L100
City/ST/Zip: Scottsdale, AZ 85258

Parcel No.:
Name:
Address:
City/ST/Zip:

Parcel No.: 410-09-007A
Name: Walton International Group (USA) Inc, et al
Address: 13155 Noel Rd, Ste 100-LB 73
City/ST/Zip: Dallas, TX 75240

Parcel No.:
Name:
Address:
City/ST/Zip:

Parcel No.: 410-12-0020, 410-13-0030, 410-08-0010
Name: Union Pacific Railroad
Address: 1400 Douglas St Stop 1640
City/ST/Zip: Omaha, NE 68179

Parcel No.:
Name:
Address:
City/ST/Zip:

I hereby verify that the name list above was obtained on the 1st day of February, 2023, at the office of The Planning Center and is accurate and complete to the best of my knowledge.
(Source of Information)

On this 2nd day of February, 2023, before me personally appeared Garrett Aldrete
(Name of signor)

Signature Garrett Aldrete Date 2/2/2023

State of Arizona
)ss.
County of Pima

(SEAL)

My Commission Expires 02/01/2025

Signature of Notary Public

MONICA M. SNIEZEK
NOTARY PUBLIC - ARIZONA
Pima County
Commission # 597616
My Commission Expires
February 1, 2025

First American Title™	ALTA Commitment for Title Insurance ISSUED BY **First American Title Insurance Company**
Commitment	

COMMITMENT FOR TITLE INSURANCE

Issued By

FIRST AMERICAN TITLE INSURANCE COMPANY

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, *First American Title Insurance Company*, a NEBRASKA Corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Policy Amount and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within six months after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

First American Title Insurance Company

Kenneth D. DeGiorgio
President

Lisa W. Cornehl
Secretary

ISSUED BY

Landmark Title Assurance Agency of Arizona LLC
as agent for First American Title Insurance Company

If this jacket was created electronically, it constitutes an original document.

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

COMMITMENT CONDITIONS

1. DEFINITIONS
   (a) "Knowledge" or "Known": Actual or imputed knowledge, but not constructive notice imparted by the Public Records.
   (b) "Land": The land described in Schedule A and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.
   (c) "Mortgage": A mortgage, deed of trust, or other security instrument, including one evidenced by electronic means authorized by law.
   (d) "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.
   (e) "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.
   (f) "Proposed Policy Amount": Each dollar amount specified in Schedule A as the Proposed Policy Amount of each Policy to be issued pursuant to this Commitment.
   (g) "Public Records": Records established under state statutes at the Commitment Date for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge.
   (h) "Title": The estate or interest described in Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:
   (a) the Notice;
   (b) the Commitment to Issue Policy;
   (c) the Commitment Conditions;
   (d) Schedule A;
   (e) Schedule B, Part I—Requirements;
   (f) Schedule B, Part II—Exceptions; and
   (g) a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND
   The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company shall not be liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY
   (a) The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
      (i) comply with the Schedule B, Part I—Requirements;
      (ii) eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
      (iii) acquire the Title or create the Mortgage covered by this Commitment.
   (b) The Company shall not be liable under Commitment Condition 5(a) if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
   (c) The Company will only have liability under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
   (d) The Company's liability shall not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Conditions 5(a)(i) through 5(a)(iii) or the Proposed Policy Amount.
   (e) The Company shall not be liable for the content of the Transaction Identification Data, if any.
   (f) In no event shall the Company be obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
   (g) In any event, the Company's liability is limited by the terms and provisions of the Policy.

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT
   (a) Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.
   (b) Any claim must be based in contract and must be restricted solely to the terms and provisions of this Commitment.
   (c) Until the Policy is issued, this Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.
   (d) The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.
   (e) Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
   (f) When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT HAS BEEN ISSUED BY AN ISSUING AGENT
   The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for the purpose of providing closing or settlement services.

8. PRO-FORMA POLICY
   The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. ARBITRATION
   The Policy contains an arbitration clause. All arbitrable matters when the Proposed Policy Amount is $2,000,000 or less shall be arbitrated at the option of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at http://www.alta.org/arbitration.

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

First American Title™	ALTA Commitment for Title Insurance
	ISSUED BY **First American Title Insurance Company**
Schedule A	

Transaction Identification Data for reference only:
Issuing Agent: Landmark Title Assurance Agency of Arizona LLC
Escrow Officer: Chris Maddox
Title Officer: Mike Bishop
Property Address: Apprx. 60 acres - Red Rock, , AZ
Revision No.: Amended: May 8, 2023, Amendment No. 6

Issuing Office: 2555 E. Camelback Rd., Suite 275, Phoenix, AZ
Issuing Office File No.: 06199288-128-CM

SCHEDULE A

1. Commitment Date: April 28, 2023
2. Policy to be issued:
   (a) ALTA 2006 Extended Owner's Policy
   Proposed Insured: **RRV South LP, an Arizona limited partnership**
   Proposed Policy Amount: $1,500,000.00
   (b) None
   Proposed Insured:
   Proposed Policy Amount: $0.00
   (c) None
   Proposed Insured:
   Proposed Policy Amount: $0.00
3. The estate or interest in the Land described or referred to in this Commitment is **a Fee**
4. The Title is, at the Commitment Date, vested in:

   Robert Rothberg and Joan O. Rothberg, husband and wife as joint tenants with right of survivorship, as to an undivided 50% interest, and Robin B. Smith, an unmarried woman, as to an undivided 50% interest

5. The Land is described as follows:

   See Exhibit A attached hereto and made a part hereof.

By: _____
Authorized Countersignature

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

First American Title™	ALTA Commitment for Title Insurance
	ISSUED BY **First American Title Insurance Company**
Exhibit A	

The Land referred to herein below is situated in the County of Pinal, State of Arizona, and is described as follows:

A part of Section 9, Township 10 South, Range 10 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona, described as follows:

COMMENCING at the Southeast corner of the Southeast one-quarter of said section;

THENCE North 89' 56' 53" West along the South line of the said Southeast one-quarter, a distance of 50.87 (record) 45.37 (measured) feet to the POINT OF BEGINNING on the West right-of-way line of Interstate 10;

THENCE continue North 89° 56' 53"' West, along the said South line, a distance of 1,700.25 (record) 1713.85 (measured) feet to the East line of the El Paso Natural Gas easement;

THENCE North 37° 51' 09" West along the said East line, a distance of 1,365.93 (record) 1366.14 (measured) feet;

THENCE North 54° 37' 04" East 1,444.28 (record) 1437.69 (measured) feet to the said West right-of-way line;

THENCE South 35° 22' 56" East along the said West right-of-way line, a distance of 856.29 (record) 840.73 (measured) feet;

THENCE South 35° 22' 45" East, along the said West right-of-way line, a distance of 1,494.12 (record) 1518.11 (measured) feet to the POINT OF BEGINNING

EXCEPT for a period of (99) ninety-nine years from March 27, 1989, an undivided one-eighth of all minerals, including oil and gas that may be on, in, under, or produced from the property, as reserved in Deed recorded in Docket 1593, page 760, Records of Pinal County, Arizona..

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

First American Title™	ALTA Commitment for Title Insurance ISSUED BY **First American Title Insurance Company**
Schedule BI & BII	

Commitment No.: 06199288-128-CM

SCHEDULE B, PART I

Requirements

All of the following Requirements must be met:

1. The Proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.

2. Pay the agreed amount for the estate or interest to be insured.

3. Pay the premiums, fees, and charges for the Policy to the Company.

4. Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.

   TAX MAP

   TAX NOTE:

Year	2022
Parcel No.	410-12-001D
Total Tax	$7,640.36
First Half	$3,820.18 (paid)
Second Half	$3,820.18 (paid)

5. FURNISH the Company with Owner's Affidavit executed by Robert Rothberg and Joan O. Rothberg, husband and wife, and Robin B. Smith, an unmarried woman

6. (INTENTIONALLY OMITTED)

7. (INTENTIONALLY OMITTED)

8. FURNISH WRITTEN APPROVAL by all parties of the legal description used herein. (Parcel No. 2 Easement conveyed on vesting Deed was later terminated in Fee No. 2008-092623)

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

Schedule BI & BII (Cont.)

Commitment No.: 06199288-128-CM

SCHEDULE B

(Continued)

9. FURNISH name(s) and capacity(ies) of party(ies) who will be executing documents on behalf of the limited partnership named below, along with proper supporting documentation, including a fully executed copy of the partnership agreement (and all amendments) of the partnership:

   Partnership RRV South LP, an Arizona limited partnership

   NOTE:
   THIS COMPANY has on file a copy of documentation of the limited partnership named below, authorizing the General Partner listed below to execute and deliver all instruments required to consummate this transaction:

   RRV South LP, an Arizona limited partnership
   By AGS, LLC, an Arizona limited liability company, its General partner
   By Sean T. Walters, its Manager

10. RECORD Deed from Robert Rothberg and Joan O. Rothberg, husband and wife as joint tenants with right of survivorship, and Robin B. Smith, an unmarried woman, to RRV South LP, an Arizona limited partnership.

    NOTE: ARS 11:1133 may require the completion and filing of an Affidavit of Value.

11. (INTENTIONALLY OMITTED)

12. FURNISH Updated/Amended Survey to the Company prior to closing of Escrow to incorporate Amendments shown in Exceptions 9 (Fee No. 2022-098877) and 10 (2022-098876).

NOTE: Vesting Deed recorded in Docket 1593, page 760

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited.
Reprinted under license from the American Land Title Association.

SCHEDULE B

(Continued)

SCHEDULE B, PART II

Exceptions

THIS COMMITMENT DOES NOT REPUBLISH ANY COVENANT, CONDITION, RESTRICTION, OR LIMITATION CONTAINED IN ANY DOCUMENT REFERRED TO IN THIS COMMITMENT TO THE EXTENT THAT THE SPECIFIC COVENANT, CONDITION, RESTRICTION, OR LIMITATION VIOLATES STATE OR FEDERAL LAW BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, GENDER IDENTITY, HANDICAP, FAMILIAL STATUS, OR NATIONAL ORIGIN.

The Policy will not insure against loss or damage resulting from the terms and provisions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

I. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I—Requirements are met.

A. a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.

B. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession thereof.

C. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.

D. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the Public Records.

E. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.

F. Any lien or right to a lien for services, labor or material not shown by the Public Records.

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited.
Reprinted under license from the American Land Title Association.

Schedule BI & BII (Cont.)

Commitment No.: 06199288-128-CM

SCHEDULE B

(Continued)

1. RESERVATIONS contained in the Patent from the United States of America, recorded in Book 24 of Deeds, page 555, reading as follows:

   THERE IS RESERVED from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States of America.

2. WATER RIGHTS, claims or title to water, and agreements, covenants, conditions or rights incident thereto, whether or not shown by the public records.
   This exception is not limited by reason of the disclosure of any matter relating to Water Rights as may be set forth elsewhere in Schedule B.

3. TAXES AND ASSESSMENTS collectible by the County Treasurer, a lien not yet due and payable for the following:

   2023

4. EASEMENT and rights incident thereto, as set forth in instrument:

   Recorded in Book 24 of Miscellaneous
   Page 229
   Purpose communications facilities

5. EASEMENT and rights incident thereto, as set forth in instrument:

   Recorded in Book 24 of Miscellaneous
   Page 493
   Purpose communications facilities

6. EASEMENT and rights incident thereto, as set forth in instrument:

   Recorded in Docket 129
   Page 459
   Purpose pipeline and appurtenant facilities

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited.
Reprinted under license from the American Land Title Association.

Schedule BI & BII (Cont.)

Commitment No.: 06199288-128-CM

SCHEDULE B

(Continued)

7. THE RIGHT OF ENTRY to prospect for, mine and remove the minerals in said land, as implied by the reservation of same in instrument:

   Recorded in Docket 1593
   Page 760

8. UNRECORDED AGREEMENT according to the terms and conditions contained therein:

Purpose	Improvement and development
Dated	August 08, 2008
Disclosed by	Memorandum
Recorded	September 29, 2008
Fee No.	2008-092620

9. Obligations contained therein:

Purpose	Temporary easement
Dated	August 08, 2008
Recorded	September 29, 2008
Fee No.	2008-092621

First Amendment:

Recorded	October 23, 2018
Fee No.	2018-079500

Second Amendment:

Recorded	September 15, 2022
Fee No.	2022-098877

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited.
Reprinted under license from the American Land Title Association.

Schedule BI & BII (Cont.)

Commitment No.: 06199288-128-CM

SCHEDULE B

(Continued)

10. Obligations contained therein:

Purpose	Temporary easement
Dated	August 08, 2008
Recorded	September 29, 2008
Fee No.	2008-092622

First Amendment	
Recorded	September 15, 2022
Fee No.	2022-098876

11. Obligations contained therein:

Purpose	Temporary signage
Dated	August 08, 2008
Recorded	September 29, 2008
Fee No.	2008-092624

First Amendment:	
Recorded	October 23, 2018
Fee No.	2018-079499

12. RIGHTS OF PARTIES in possession.
NOTE: This exception will be amended or deleted upon the submission of the corresponding documents required in Schedule B, Part I.

13. INTENTIONALLY OMITTED.

14. INTENTIONALLY OMITTED.

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by First American Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited.
Reprinted under license from the American Land Title Association.

Schedule BI & BII (Cont.)

Commitment No.: 06199288-128-CM

SCHEDULE B

(Continued)

15. LIABILITIES AND OBLIGATIONS imposed upon said land by reason of its inclusion within the following named District:

Global Water – Palo Verde Utilities Company, Inc. (Recorded in Document No. 2023-006257)
Global Water – Santa Cruz Water Company, Inc. (Recorded in Document No. 2023-006258)

Copyright 2006-2016 American Land Title Association. All rights reserved.
The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited.
Reprinted under license from the American Land Title Association.

First American Title

Privacy Notice

Effective: October 1, 2019

Notice Last Updated: January 1, 2021

This Privacy Notice describes how First American Financial Corporation and its subsidiaries and affiliates (together referred to as "First American," "we," "us," or "our") collect, use, store, and share your information. This Privacy Notice applies to information we receive from you offline only, as well as from third parties, when you interact with us and/or use and access our services and products ("Products"). For more information about our privacy practices, including our online practices, please visit https://www.firstam.com/privacy-policy/. The practices described in this Privacy Notice are subject to applicable laws in the places in which we operate.

What Type Of Information Do We Collect About You? We collect a variety of categories of information about you. To learn more about the categories of information we collect, please visit https://www.firstam.com/privacy-policy/.

How Do We Collect Your Information? We collect your information: (1) directly from you; (2) automatically when you interact with us; and (3) from third parties, including business parties and affiliates.

How Do We Use Your Information? We may use your information in a variety of ways, including but not limited to providing the services you have requested, fulfilling your transactions, comply with relevant laws and our policies, and handling a claim. To learn more about how we may use your information, please visit https://www.firstam.com/privacy-policy/.

How Do We Share Your Information? We do not sell your information. We only share your information, including to subsidiaries, affiliates, and to unaffiliated third parties: (1) with your consent; (2) in a business transfer; (3) to service providers; and (4) for legal process and protection. To learn more about how we share your information, please visit https://www.firstam.com/privacy-policy/.

How Do We Store and Protect Your Information? The security of your information is important to us. That is why we take commercially reasonable steps to make sure your information is protected. We use our best efforts to maintain commercially reasonable technical, organizational, and physical safeguards, consistent with applicable law, to protect your information.

How Long Do We Keep Your Information? We keep your information for as long as necessary in accordance with the purpose for which it was collected, our business needs, and our legal and regulatory obligations.

Your Choices We provide you the ability to exercise certain controls and choices regarding our collection, use, storage, and sharing of your information. You can learn more about your choices by visiting https://www.firstam.com/privacy-policy/.

International Jurisdictions: Our Products are hosted and offered in the United States of America (US), and are subject to US federal, state, and local law. If you are accessing the Products from another country, please be advised that you may be transferring your information to us in the US, and you consent to that transfer and use of your information in accordance with this Privacy Notice. You also agree to abide by the applicable laws of applicable US federal, state, and local laws concerning your use of the Products, and your agreements with us.

We may change this Privacy Notice from time to time. Any and all changes to this Privacy Notice will be reflected on this page, and where appropriate provided in person or by another electronic method. **YOUR CONTINUED USE, ACCESS, OR INTERACTION WITH OUR PRODUCTS OR YOUR CONTINUED COMMUNICATIONS WITH US AFTER THIS NOTICE HAS BEEN PROVIDED TO YOU WILL REPRESENT THAT YOU HAVE READ AND UNDERSTOOD THIS PRIVACY NOTICE.**

Contact Us dataprivacy@firstam.com or toll free at 1-866-718-0097.

© 2019 First American Financial Corporation and/or its affiliates. All rights reserved. NYSE:FAF

For California Residents

If you are a California resident, you may have certain rights under California law, including but not limited to the California Consumer Privacy Act of 2018 ("CCPA"). All phrases used in this section shall have the same meaning as those phrases are used under California law, including the CCPA.

Right to Know. You have a right to request that we disclose the following information to you: (1) the categories of **personal information** we have collected about or from you; (2) the categories of sources from which the personal information was collected; (3) the business or commercial purpose for such collection and/or disclosure; (4) the categories of third parties with whom we have shared your **personal information**; and (5) the specific pieces of your personal information we have collected. To submit a verified request for this information, go to our online privacy policy at www.firstam.com/privacy-policy to submit your request or call toll-free at 1-866-718-0097. You may also designate an authorized agent to submit a request on your behalf by going to our online privacy policy at www.firstam.com/privacy-policy to submit your request or by calling toll-free at 1-866-718-0097.

Right of Deletion. You also have a right to request that we delete the **personal information** we have collected from and about you. This right is subject to certain exceptions available under the CCPA and other applicable law. To submit a verified request for deletion, go to our online privacy policy at www.firstam.com/privacy-policy to submit your request or call toll-free at 1-866-718-0097. You may also designate an authorized agent to submit a request on your behalf by going to our online privacy policy at www.firstam.com/privacy-policy to submit your request or by calling toll-free at 1-866-718-0097.

Verification Process. For either a request to know or delete, we will verify your identity before responding to your request. To verify your identity, we will generally match the identifying information provided in your request with the information we have on file about you. Depending on the sensitivity of the information requested, we may also utilize more stringent verification methods to verify your identity, including but not limited to requesting additional information from you and/or requiring you to sign a declaration under penalty of perjury.

Notice of Sale. We do not sell California resident information nor have we sold California resident information in the past 12 months. We have no actual knowledge of selling the information of minors under the age of 16..

Right of Non-Discrimination. You have a right to exercise your rights under California law, including under the CCPA, without suffering discrimination. Accordingly, First American will not discriminate against you in any way if you choose to exercise your rights under the CCPA.

Notice of Collection. To learn more about the categories of **personal information** we have collected about California residents over the last 12 months, please see "What Information Do We Collect About You" in https://www.firstam.com/privacy-policy. To learn about the sources from which we have collected that information, the business and commercial purpose for its collection, and the categories of third parties with whom we have shared that information, please see "How Do We Collect Your Information", "How Do We Use Your Information", and "How Do We Share Your Information" in https://www.firstam.com/privacy-policy.

Notice of Sale. We have not sold the **personal information** of California residents in the past 12 months.

Notice of Disclosure. To learn more about the categories of **personal information** we may have disclosed about California residents in the past 12 months, please see "How Do We Use Your Information" and "How Do We Share Your Information" in https://www.firstam.com/privacy-policy.

© 2019 First American Financial Corporation and/or its affiliates. All rights reserved. NYSE:FAF

NOTICE OF TITLE POLICY DISCOUNTS

Residential Resale and Refinance Transactions – Arizona

Escrow No.: **06199288**

Please note certain discounts sometimes apply to reduce title insurance premiums. You should review the possible discounts listed below and tell your escrow officer if you think any apply. For some of the discounts, you may be asked to provide additional information to allow us to verify that the discount is applicable. The discount will be subject to specific formulas filed by the Underwriter with the Arizona Department of Insurance and the location of the property.

SHORT/LONG TERM RESALE RATE:

There are certain discounts available if your purchase was within last 5 years and insured by us or another title company. The discount will vary depending on when you purchased your property and who insured it.

REFINANCE RATE:

There are certain discounts available if your current transaction is a refinance of a prior loan that was insured by us, or another title insurance company. This rate is subject to determination of loan balances in some instances, depending on the formula filed by the Underwriter being used to insure the current transaction.

Please acknowledge your understanding of the foregoing disclosure, even if no discount applies, by signing below.

Date: _____ Date: _____

_____ _____

Signature of Seller/Borrower Signature of Seller/Borrower

_____ _____

Print Name Print Name

AFFILIATED BUSINESS ARRANGEMENT DISCLOSURE

This is to give notice that Title Security Agency of Arizona (including Magnus Title Agency, a division thereof) ("Title Security") is an Arizona corporation which is affiliated with and has business relationships with Long Title Agency, LLC ("Long Title"), Catalina Title Agency, LLC ("Catalina Title"), Infinity Title Agency, LLC (Infinity Title/ITA), Millennium Title Agency, LLC (Millennium Title/MTA), Investors Title Agency, LLC (Investors Title), Professional Title Agency, LLC (Professional Title/PTA), Asset Title Agency, LLC (Asset Title) and CRE Title Agency, LLC (CRE Title) to provide title services. Title Security also has business relationships with First American Title Insurance Company, Old Republic National Title Insurance Company and Title Resources Guaranty Company, which underwrite the policies issued by Title Security. Because of these relationships, this referral may provide Title Security with a financial or other benefit.

You are not required to use Title Security, Long Title, Catalina Title, Infinity Title, Millennium Title, Investors Title, Professional Title, Asset Title, CRE Title, First American Title Insurance Company, Old Republic National Title Insurance Company or Title Resources Guaranty Company, as part of the real estate transaction for this subject property.

THERE ARE FREQUENTLY OTHER SETTLEMENT SERVICE PROVIDERS AVAILABLE WITH SIMILAR SERVICES. YOU ARE FREE TO SHOP AROUND TO DETERMINE THAT YOU ARE RECEIVING THE BEST SERVICES AND THE BEST RATE FOR THESE SERVICES.

The rates for escrow agencies that are also title insurers or title insurance agents are filed with the Arizona Department of Financial Institutions and the escrow agency may not deviate from those filed rates. Title insurance rates are filed with the Arizona Department of Insurance by each title insurer, and the rates are the same for all title insurance issuing agents for each particular insurer. The premium you are charged for your title insurance policy is based upon the purchase price for the property you are purchasing/selling. If you are refinancing, the premium you are charge for your title insurance policy is based upon the loan amount. You may request to review the title insurance rate card which establishes the premium amount from the escrow agent handling your transaction.

DISCLOSURE NOTICES

Good Funds Law
Arizona Revised Statutes Section 6-843 regulates the disbursement of escrow funds by an escrow agent. The law requires that funds be deposited in the escrow agent's escrow account and available for withdrawal prior to disbursement. Funds deposited with the Company by wire transfer may be disbursed upon receipt. Funds deposited with the Company in the form of cashier's checks, certified checks or teller's checks, or checks which are made by an affiliate of a state or federally regulated depository institution when the check is drawn on that institution, may be disbursed the same day as deposited. If funds are deposited with the Company by other methods, recording and/or disbursement may be delayed.

PURCHASER DWELLING ACTIONS NOTICE
Pursuant to Arizona Revised Statutes Section 12-1363.N, notice is hereby provided to the purchaser of a dwelling of the provisions of Arizona Revised Statutes Sections 12-1361, 1362 and 1363. These statutory sections set forth the requirements to be met by a purchaser prior to bringing an action against the seller of a dwelling arising out of or related to the design, construction, condition or sale of the dwelling. "Dwelling" means a single or multifamily unit designed for residential use and common areas and improvements owned or maintained by an association or its members. "Seller" means any person, firm, partnership, corporation, association or other organization engaged in the business of designing, constructing or selling dwellings. The complete statutory sections can be viewed on the Arizona State Legislature's web site: www.azleg.state.az.us/ars/ars.htm.

NOTICE:
Pursuant to Arizona Revised Statutes 11-480, effective January 1, 1991, the County Recorder may not accept documents for recording that do not comply with the following:

a Print must be ten-point type (pica) or larger.

b Margins of at least one-half inch along the left and right sides one-half inch across the bottom and at least two inches on top for recording and return address information.

c Each instrument shall be no larger than 8 ½ inches in width and 14 inches in length.

First American Title

NOTICE
OF
IMPORTANT CHANGE TO ARIZONA NOTARY LAWS

If your client is a foreign citizen, you will want to be aware of this change.

Arizona law currently provides that "satisfactory evidence of identity" for purposes of a notary's acknowledging signatures or performing jurats includes a "current form of identification issued by a federal, state or tribal government…." (A.R.S. 41-311.11.) Effective August 25, 2004, however, this provision has been amended to provided that the current form of identification must be issued by "the United States government or a state or tribal government…." This change means that a current form of identification issued by a foreign government, such as a foreign driver's license, will NOT meet the statutory identification requirements.

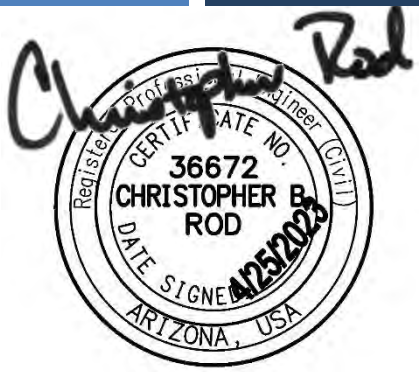
To avoid delays in closing transactions involving foreign citizens who may not have appropriate identification, you should determine as soon as possible what form(s) of identification your clients have. If they do not have appropriate identification, then you may wish to suggest, depending on their circumstances, that they apply for and obtain an appropriate form of U.S. or state identification.

Preliminary Drainage Report for
Red Rock Village
(Parcel 410-12-001D, Pinal County, Arizona)



April
2023

Prepared for | Sunbelt Holdings
6720 North Scottsdale Road, Suite 250
Scottsdale, Arizona 85253



JE FULLER
hydrology • geomorphology
40 E. Helen Street
Tucson, AZ 85715
www.jefuller.com
Chris@jefuller.com
520-623-3112

TABLE OF CONTENTS

1.0 General Location and Description 1
1.1 Project Summary Location 1
1.2 Contacts 1
1.3 Location 1
1.4 Property Description 1
2.0 Drainage Basins and Sub-Basins 4
2.1 Major Basins (Off-Site Watersheds) 4
2.2 Sub-basins (On-Site Watersheds) 6
2.3 Floodplains 8
2.3.1 FEMA 8
2.3.2 Local Floodplains 8
3.0 Drainage Design Criteria 10
3.1 Regulations 10
3.2 Development Criteria and Constraints 10
3.3 Hydrologic Criteria and Results 10
4.0 Drainage Facility Design 14
4.1 Roadway Capacity 14
4.2 Scupper Design 15
4.3 Channel Design 17
4.4 Retention Design 19
4.5 Scour Design 21
4.6 Culvert Design 24
4.7 Finished Floor Elevation 26
5.0 Conclusions 26
6.0 Engineer's Statement 27
7.0 References 27

LIST OF FIGURES

Figure 1 – Location Map 2
Figure 2 – Aerial Map 3
Figure 3 – Off Site Drainage Exhibit 5
Figure 4 – On Site Soils Classification Map 6
Figure 5 – On Site Drainage Exhibit 7
Figure 6 – FEMA FIRMette Map 9
Figure 7 – On Site Existing Conditions Peak Discharge Map 11
Figure 8 On-Site Proposed Conditions Peak Discharge Map 13
Figure 9 – Scupper Location Summary 16

Figure 10 – Proposed Channel Locations 18
Figure 11 – Retention Basin Locations 20
Figure 12 – Splash Pad Locations 23
Figure 13 – Culvert Locations 25

Tables

Table 1 – On-site Existing Peak Design Discharge Summary Table 10
Table 2 – On-Site Proposed Peak Design Discharges Summary Table 12
Table 3 – Roadway Capacities for Varying Longitudinal Slopes 14
Table 4 – Scupper Summary Table 15
Table 5 – Channel Summary Table 17
Table 6 – Retention Basin Summary 19
Table 7 – Splash Pad Summary Table 21
Table 8 – Culvert Summary Table 24
Table 9 – FFE by Basin Summary Table 26

Appendix

Appendix A: Supporting Calculations

Appendix B: Reference Documents (Appendix B - Download Link)

1.0 GENERAL LOCATION AND DESCRIPTION

1.1 PROJECT SUMMARY LOCATION

The following will serve as the Preliminary Drainage Report for Red Rock Village,a residential subdivision proposed for a undeveloped parcel located near the Red Rock Community within Pinal County, Arizona.

1.2 CONTACTS

Owner/Developer

Sunbelt Holdings, LLC
6720 North Scottsdale Road, Suite 250
Scottsdale, AZ 85253
Geoff Bradmon, PE – Owner Contact
Direct: 520.977.5280
Email: gbradmon@sunbeltholdings.com

Project Contact

The Planning Center
2 East Congress Street, Suite 600
Tucson Arizona 85701
Linda Morales - CEO
Direct: 520.209.2632
Email: lmorales@azplanningcenter.com

1.3 LOCATION

Parcel 410-12-001DC is located within Section 9 of Township 10 South, Range 10 East, Gila and Salt River Meridian, Pinal County, Arizona.

1.4 PROPERTY DESCRIPTION

The parcels are legally described as:

A PRT OF SE OF SEC 9-10S-10E BEG AT A PNT 50.87' W OF SE COR OF SAID SEC 9 TH CONT W-1700.25' TH N-37 DEG 51' W-1365.93' TH N-54 DEG 37' E-1444.28' TH S-35 DEG 22' E-2350.41' TO POB TOGETHER WITH 30' EASEMENT AS DESC IN DKT 1593/PG 760 59.92 AC

Parcel 410-12-001DC is currently undeveloped. The parcel is bound to the east by Interstate 10, while the land immediately north, south, and west of the project is undeveloped. The Community of Red Rock lies to the north of the site but does not form a boundary with the proposed project. A location map (Figure 1) has been provided as a visual representation of the project location. An aerial view (Figure 2) of the project site is also provided to further assist in the discussion.

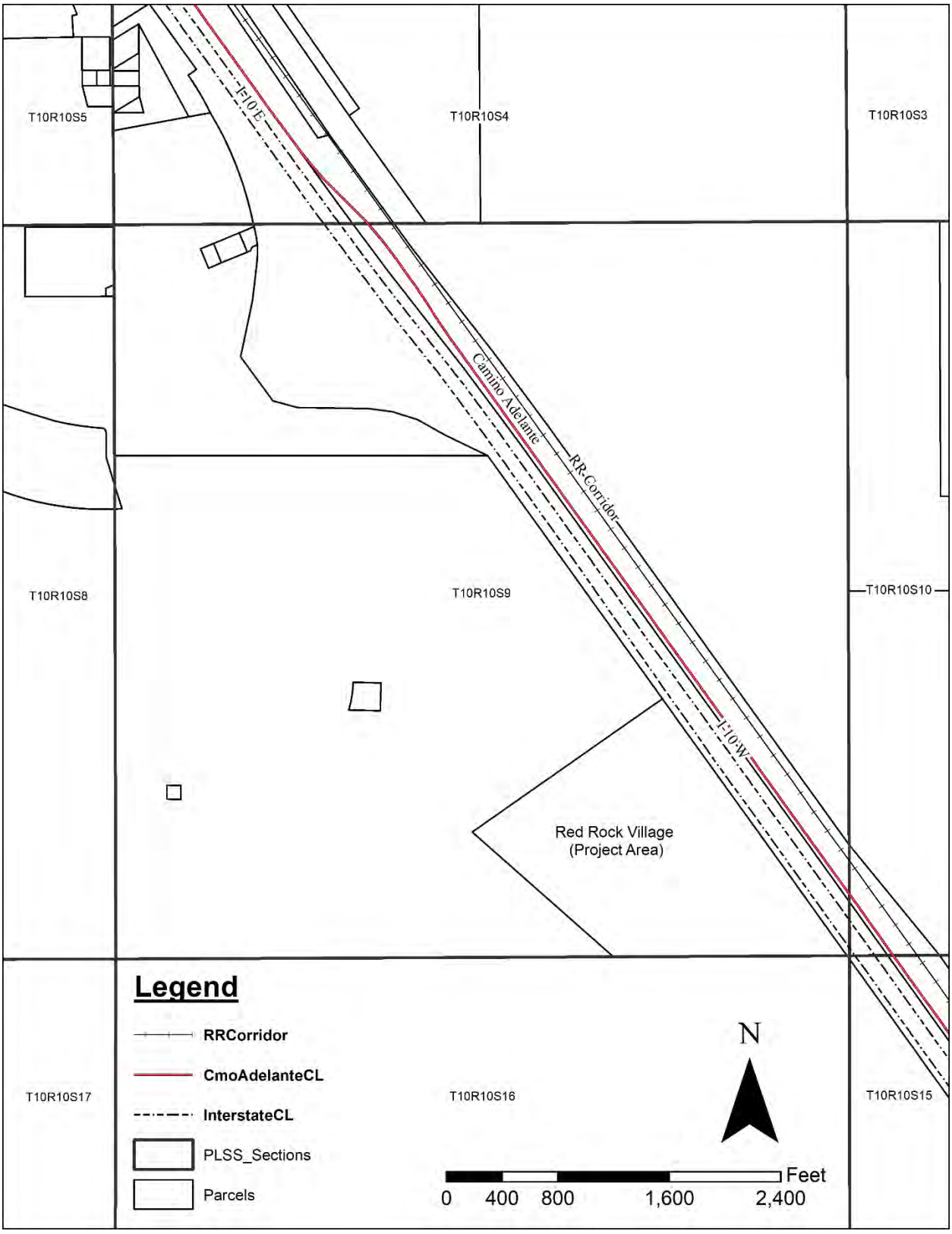


Figure 1 – Location Map



Figure 2 – Aerial Map

2.0 DRAINAGE BASINS AND SUB-BASINS

2.1 MAJOR BASINS (OFF-SITE WATERSHEDS)

The project area lies within the northwest portion of the Upper Santa Cruz watershed where overland flow is generated from the Tortolita Mountain Ranges to the east. In general, the flow travels west/southwest at a mild and generally uniform slope of 0.8 percent through largely undeveloped desert rangeland, until it is intercepted by Interstate 10 (I-10). I-10 serves as an embankment, offering protection to the project site from the flood waters generated from the upstream watershed. During an initial site visit and review of Arizona Department of Transportation (ADOT) as-builts plans, two 3-cell 10-ft x 5-ft reinforced concrete box culverts (RCBCs) were found in the vicinity of the project site, site visit photos can be found below, and the culverts are graphically represented in Figure 3. The northern culvert discharges on the western side of I-10 into an existing channel which immediately directs flow away from the proposed development to the northwest. The channel meanders through the existing Red Rock Village community and fans out to overland flow shortly thereafter. The southern culvert also discharges on the western side of I-10 into an existing natural channel. The channel appears to discharge flow into the remnants of a pit or basin and ultimately outfalls to the west/southwest, away from the proposed development.

	
Photo 1 – North Culvert **(Looking West)**	**Photo 2 – Southern Culvert** **(Looking West)**

From this review of the off-site watersheds, it is evident that there are no flows greater than 500-cfs impacting the project domain. Thus, off-site hydrology was not necessary for this project and a regional soils classification effort was not performed. On-site soils classification will be discussed in Section 2.2.

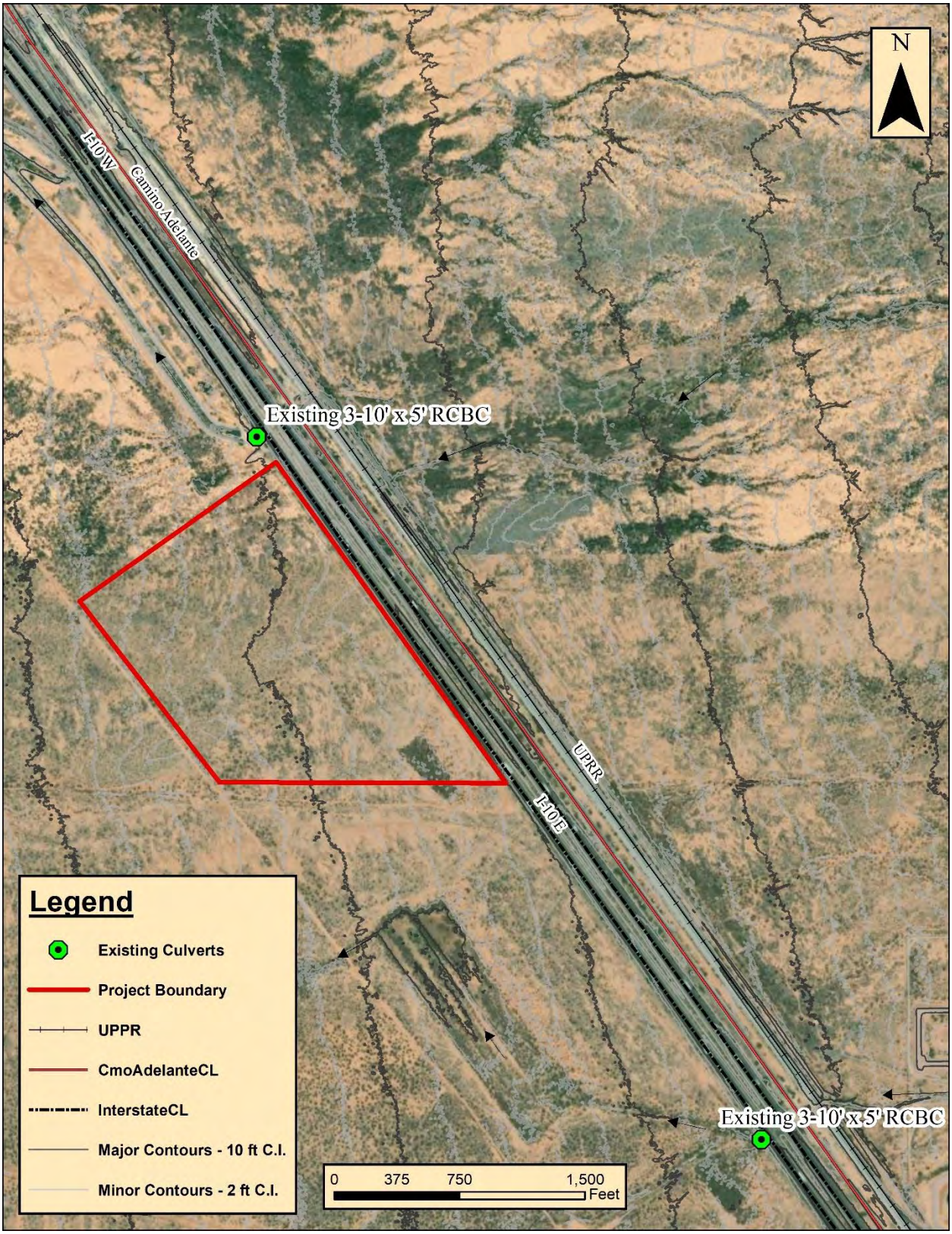


Figure 3 – Off Site Drainage Exhibit

2.2 Sub-basins (On-Site Watersheds)

From a review of the topography generated from the Pima Association of Governments (PAG) 2015 DEM LiDAR, aerial imagery, data collated from the preliminary site visit, and as-builts for existing ADOT hydraulic structures, it is evident that, in general, the on-site discharge flows from the border of the project domain and I-10, to the west/southwest, with the exception of the southeastern most sub-watershed, ON-6, which discharges to the south. As discussed in Section 2.1, there are no flows greater than 500-cfs impacting the project domain.

Supplementing JE Fuller's hydrologic calculations, discussed in greater detail in Section 3.3, a soils classification analysis was performed for the on-site basins. The data was collated from the United States Geologic Survey's (USGS) Web Soil Survey (WSS). As shown in Figure 4, the on-site soils classification can be broken down into Contine clay loam, Mohal loam MLRA 40, and Mohall clay loam. These soils all have a hydrologic soil rating of "C".

See Figure 5 for a comprehensive breakdown of the on-site watershed basins.



Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — Pinal County, Arizona, Western Part (AZ659)

Summary by Map Unit — Pinal County, Arizona, Western Part (AZ659)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
9	Contine clay loam	C	5.9	9.8%
31	Mohall loam MLRA 40	C	22.5	37.4%
32	Mohall clay loam	C	31.7	52.7%
Totals for Area of Interest			**60.1**	**100.0%**

Figure 4 – On Site Soils Classification Map

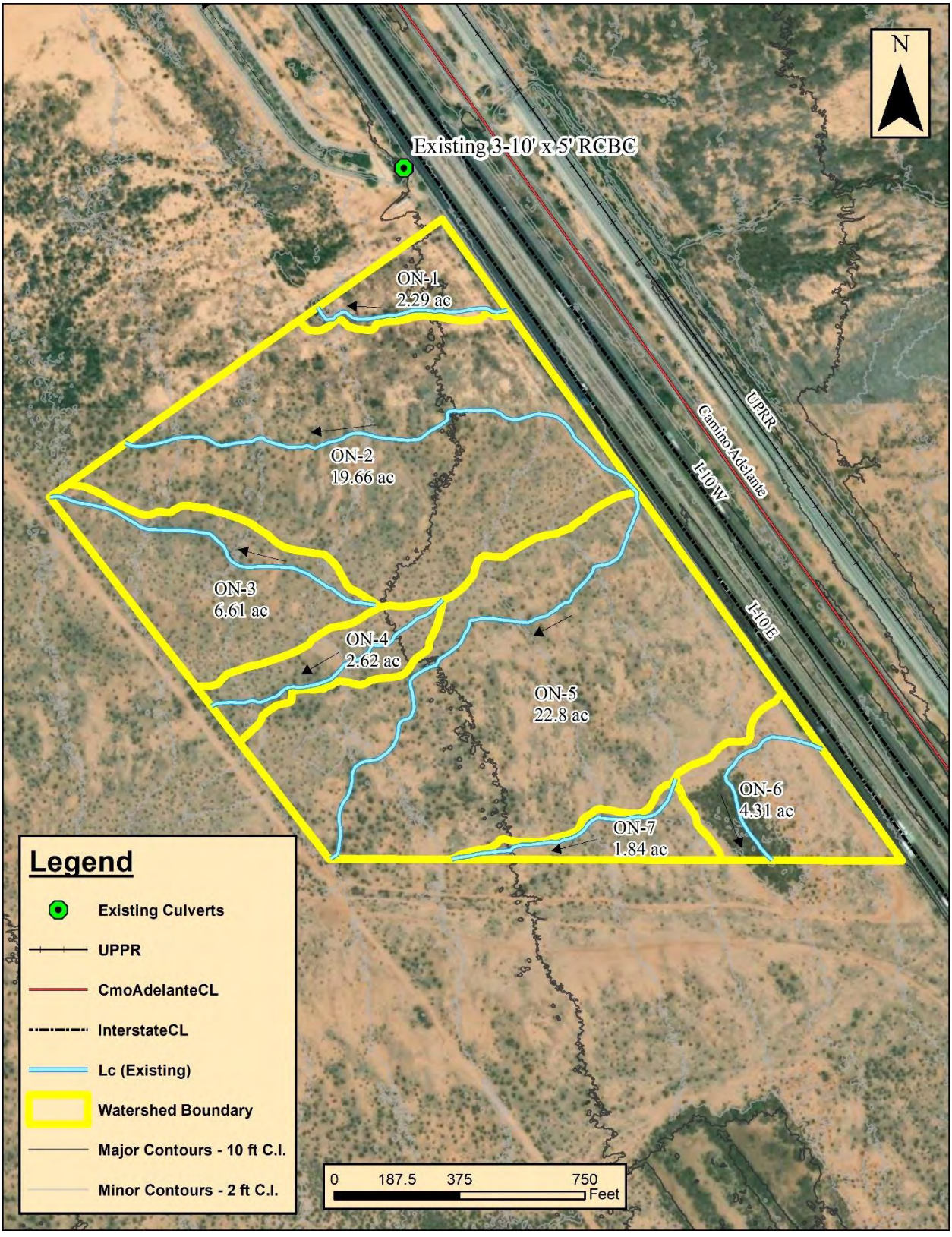


Figure 5 – On Site Drainage Exhibit

2.3 FLOODPLAINS

2.3.1 FEMA

Based on a review of FEMA FIRM Panel 04021C2400E, the site is located within Special Flood Hazard Zone X. A copy of the FEMA FIRMette is provided in Figure 6.

2.3.2 LOCAL FLOODPLAINS

Based on the evaluation of the off-site and on-site watersheds the runoff generated by the watersheds is not in excess of 500 cfs and as such the site is not subjected to any local floodplains.

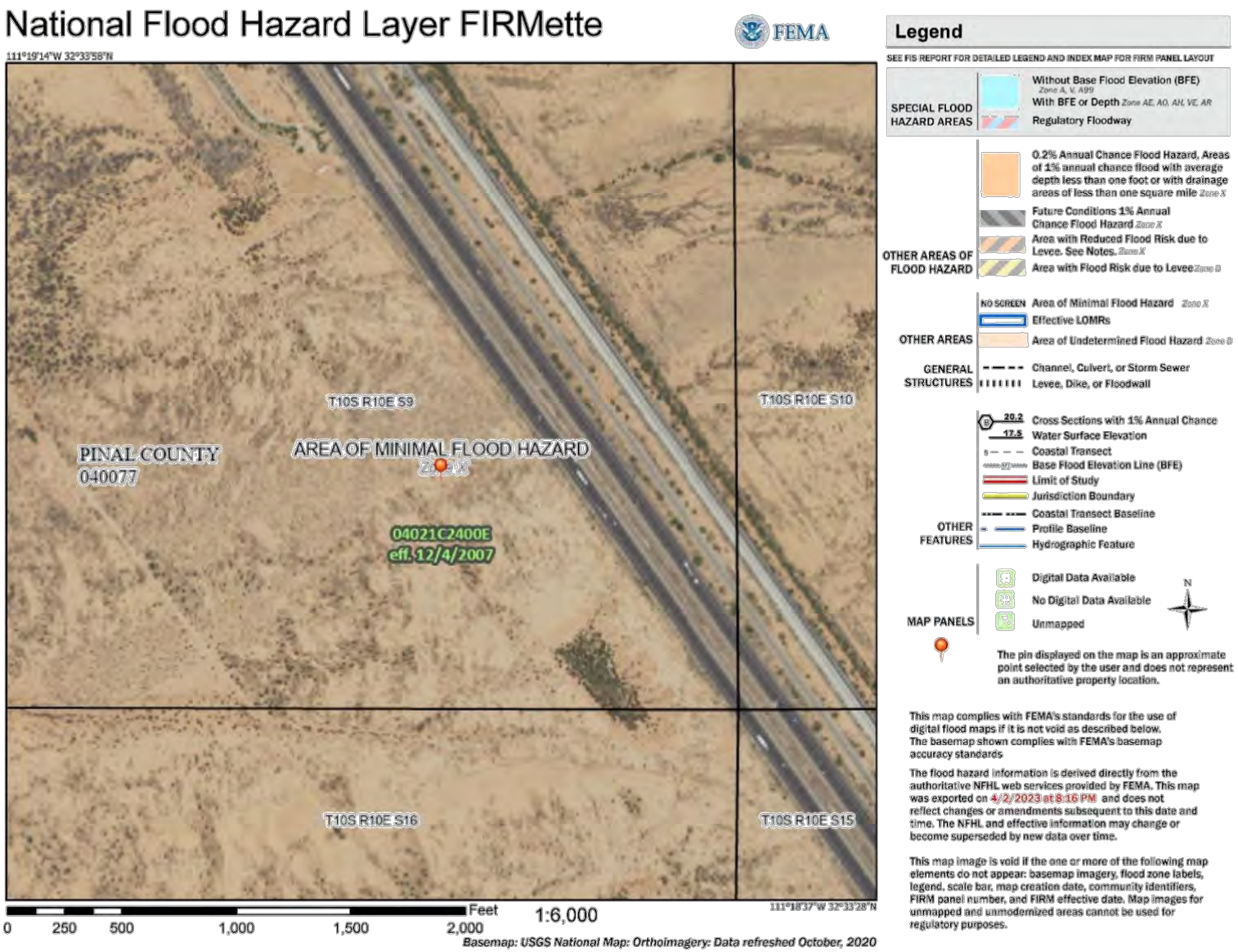


Figure 6 – FEMA FIRMette Map

3.0 DRAINAGE DESIGN CRITERIA

3.1 REGULATIONS

There are no optional provisions selected, or deviations from the manual for this project at this time.

3.2 DEVELOPMENT CRITERIA AND CONSTRAINTS

The design of this current project is based on the site plan provided to JE Fuller by The Planning Center. As discussed in previous sections, there are no regional off-site flows impacting the project domain. Thus, there is no upstream criteria for future development. This remains true while the two existing 3-cell 10-ft x 5-ft RCBCs under I-10 remain, and the topography of the land adjacent to the project site remains, more or less, in its current state such that flows are directed away from the site.

3.3 HYDROLOGIC CRITERIA AND RESULTS

In compliance with Pinal County Drainage Manual (PCDM) Volumes I and II, the design storm used to calculate peak design discharges was a 100-year, 1-hr duration event. A precipitation depth of 2.09-in was used in these calculations and was determined using the centroid of the proposed development and NOAA Atlas 14.

As set forth by PCDM Volume I, the rational method was used to determine peak design discharges for pre and post-construction conditions:

$$Q = CiA \qquad \text{(eq. 1)}$$

Where:

C = runoff coefficient (dimensionless), determined from Table 2-1 in PCDM Volume II

i = rainfall intensity (in/hr), calculated using T_C (time of concentration) and the design precipitation depth.

A = drainage area (acres)

A summary of the peak design discharges for on-site existing conditions is available in Table 1 and Figure 7 and a summary of the peak design discharges for on-site developed conditions is available in Table 2 and Figure 8.

TABLE 1 – ON-SITE EXISTING PEAK DESIGN DISCHARGE SUMMARY TABLE

Concentration Point	Contributing Off-Site Watersheds	Total Area (ac)	Lc (feet)	Slope (%)	Soil Type and Percentage	Weighted Runoff Coefficient	Peak Discharge (cfs)
ON-1	0	2.29	608	0.81	100% C	0.50	6.5
ON-2	0	19.66	1,710	0.79	100% C	0.50	41.0
ON-3	0	6.61	1,072	0.76	100% C	0.50	16.0
ON-4	0	2.62	805	0.83	100% C	0.50	7.0
ON-5	0	22.8	1,654	0.64	100% C	0.50	46.1
ON-6	0	4.31	639	0.85	100% C	0.50	12.2
ON-7	0	1.84	769	0.72	100% C	0.50	4.8

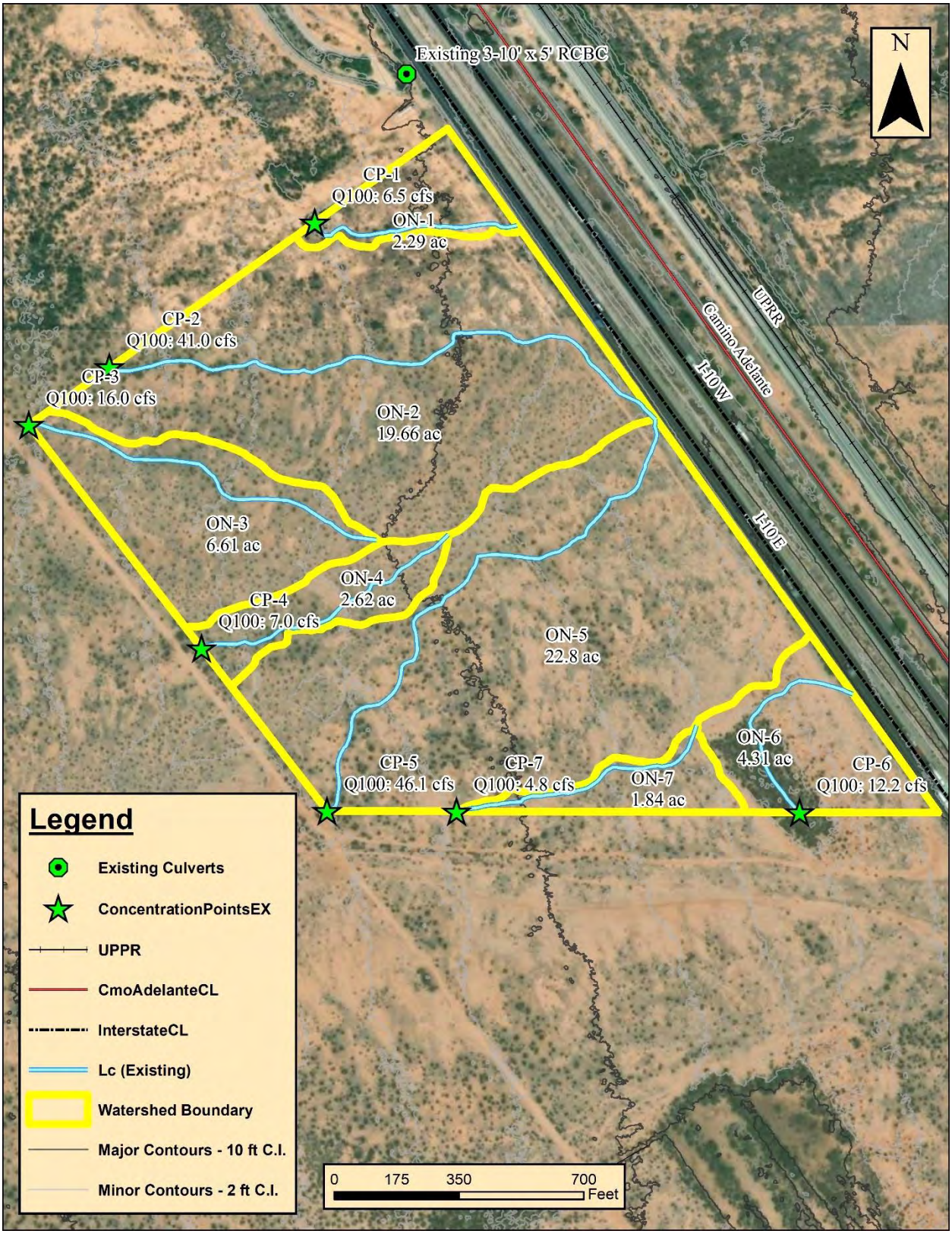


Figure 7 – On Site Existing Conditions Peak Discharge Map

TABLE 2 – ON-SITE PROPOSED PEAK DESIGN DISCHARGES SUMMARY TABLE

Concentration Point	Contributing Off-Site Watersheds	Total Area (ac)	Lc (feet)	Slope (%)	Soil Type and Percentage	Weighted Runoff Coefficient	Peak Discharge (cfs)
CP-1	0	1.57	388	0.26	100% C	0.66	6.9
CP-2	0	3.81	767	0.65	100% C	0.64	15.8
CP-3	0	4.44	837	0.21	100% C	0.64	15.6
CP-4	0	3.04	596	0.21	100% C	0.62	10.9
CP-5	0	2.02	297	0.31	100% C	0.73	10.3
CP-6	0	5.5	1,088	0.58	100% C	0.74	26.6
CP-7A	0	4.54	936	0.47	100% C	0.75	20.1
CP-7B	0	3.47	831	0.44	100% C	0.81	17.0
CP-7C	0	4.51	665	0.68	100% C	0.73	22.0
CP-7D	0	3.48	946	0.27	100% C	0.81	15.3
CP-8	0	3.52	691	0.54	100% C	0.84	19.3
CP-9	0	1.92	623	0.56	100% C	0.83	10.4
CP-10	0	3.53	635	0.65	100% C	0.80	18.7
CP-11	0	3.08	423	0.33	100% C	0.82	16.7
CP-12	0	3.08	433	0.54	100% C	0.83	17.9
CP-13	0	2.29	299	0.55	100% C	0.83	15.3
CP-14	0	3.05	396	0.65	100% C	0.82	17.9
CP-15	0	3.28	1,157	0.36	100% C	0.81	16.1



Figure 8 - On-Site Proposed Conditions Peak Discharge Map

4.0 DRAINAGE FACILITY DESIGN

4.1 ROADWAY CAPACITY

The design of the roadway will be provided as part of a separate document. At this time, it is anticipated that the roadways will serve as both major and residential collector streets. In accordance with PCDM Vol. II, curb to curb flow is accepted and will serve as the basis for computing the capacity of the streets. All streets in the proposed Red Rock Village are to have two, fourteen-foot travels lanes oriented in a normal (2%) crown, and bounded by six inch curbs on either side. In accordance with PCDM Volume II, Manning's equation was used for estimating the street capacity:

$$Q = A\left(\frac{1.49}{n}\right)R^{0.67}S^{0.5} \qquad \text{(eq. 2)}$$

Where:

Q = Total flow, cfs

n = Manning's roughness coefficient, dimensionless

A = Flow area, sq ft

R = Hydraulic Radius, ft

S = Slope of energy grade line, assumed equal to longitudinal slope of road, ft/ft

Table 3 details the resulting street capacity for varying longitudinal roadway slopes. NOTE: as set forth by PCDM Vol II, a Manning's roughness coefficient of 0.015 was used for the roughness of asphalt in the calculations.

TABLE 3 – ROADWAY CAPACITIES FOR VARYING LONGITUDINAL SLOPES

S_L (%)	n	Area Of Flow (sq ft)	R (ft)	Velocity (fps)	$Q_{Capacity}$ (cfs)
0.20	0.015	10.1	0.35	2.20	22.1
0.25	0.015	10.1	0.35	2.45	24.7
0.3	0.015	10.1	0.35	2.69	27.1
0.35	0.015	10.1	0.35	2.90	29.3
0.4	0.015	10.1	0.35	3.11	31.3
0.45	0.015	10.1	0.35	3.29	33.2
0.5	0.015	10.1	0.35	3.47	35.0
0.55	0.015	10.1	0.35	3.64	36.7
0.6	0.015	10.1	0.35	3.80	38.3
0.65	0.015	10.1	0.35	3.96	39.9
0.7	0.015	10.1	0.35	4.11	41.4

4.2 Scupper Design

Scuppers may be employed as a means of conveying roadway drainage off the paved surface and into a drainage easement. The scupper geometry will be determined using the Federal Highway Administration's (FHWA) Hydraulic Toolbox and the digital files will be provided in the Digital Appendix. The Hydraulic Toolbox calculates the length of the scupper based on the longitudinal slope and roadway geometry, and the design discharge. In some instances, the necessary length of the scupper is too long for the width of the drainage easement. In which case, the bypass flow was calculated and added to the downstream design discharge to be accepted in a downstream scupper. A graphical representation of the scupper locations is available in Figure 9, and a tabulated summary of the scupper geometries is available in Table 4.

Table 4 – Scupper Summary Table

Scupper ID	Longitudinal Roadway Slope (%)	Design Flow (cfs)	Inlet Length (ft)	Local Depression (in)	Intercepted Flow (cfs)	Bypass Flow (cfs)	Bypass to Scupper
SC-5A	0.5	4.7	28	6	4.7	0	-
SC-5B	0.5	4.7	28	6	4.7	0	-
SC-6A	0.6	2.9	25	6	2.9	0	-
SC-6B	0.6	3.0	25	6	3.0	0	-
SC-7A-1	0.7	15.4	35	6	12.0	3.4	R-7A-3
SC-7A-2	0.6	12.2	25	6	8.5	3.7	R-7A-3
SC-7A-3	0.2	8.6	35	6	8.6	0	-
SC-7B-1	0.6	10.8	40	6	10.4	0.4	SC-14-1
SC-7B-2	0.6	10.9	40	6	10.4	0.5	SC-14-2
SC-7C-1	0.8	9.5	50	6	9.5	0	-
SC-7C-2	0.7	10.6	50	6	10.6	0	-
SC-7D-1	0.4	9.7	40	6	9.7	0	-
SC-7D-2	0.5	11.6	40	6	11.1	0.5	SC-12-1
SC-8-1	0.6	10.7	40	6	10.3	0.4	SC-11-1
SC-8-2	0.6	11.2	40	6	10.6	0.6	SC-11-2
SC-9	0.5	12.4	40	6	11.7	0.7	SC-10-2
SC-10-1	0.6	1.4	15	6	1.4	0	-
SC-10-2	0.5	14	20	6	14.0	0	-
SC-11-1	0.3	9.0	40	6	9.0	0	-
SC-11-2	0.5	10.7	50	6	10.7	0	-
SC-12-1	0.4	10.5	45	6	10.5	0	-
SC-12-2	0.3	9.5	40	6	9.5	0	-
SC-13	0.5	15.8	60	6	15.8	0	-
SC-14-1	0.3	10.0	40	6	10.0	0	-
SC-14-2	0.6	11.0	45	6	10.9	0.1	SC-15-1
SC-15-1	0.5	1.8	20	6	1.8	0	-
SC-15-2	0.6	3.4	25	6	3.4	0	-

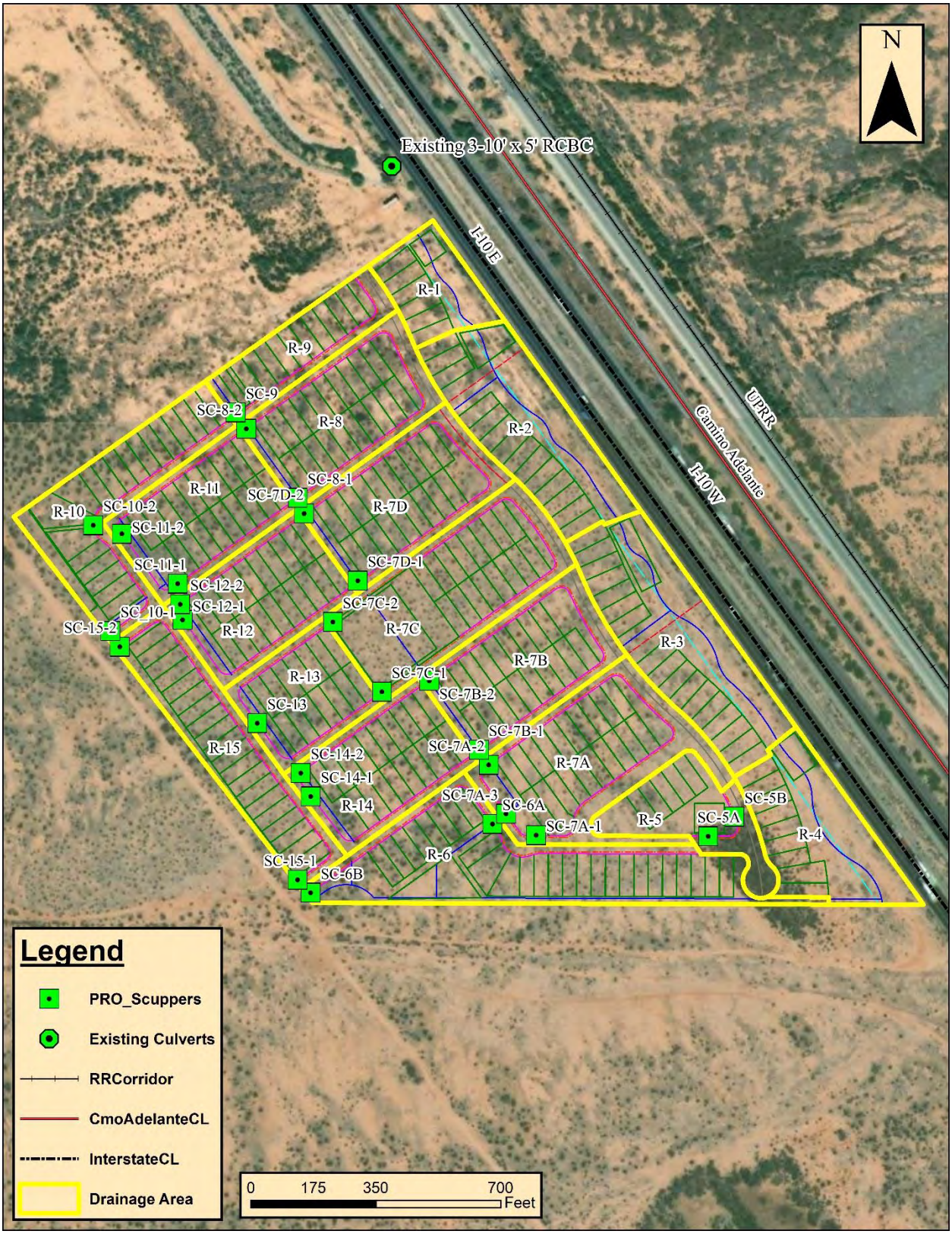


Figure 9 – Scupper Location Summary

4.3 Channel Design

In accordance with the Pinal County Subdivision and Infrastructure Design Manual, local drainage channels are to be constructed within dedicated drainage easements and will be used as a means of conveying on-site runoff to retention basins. The hydraulic analysis of the channels was performed using FHWA's Hydraulic Toolbox. As set forth by PCDM Volume II, the free board of the channel was determined using Equation 2:

$$FB = 0.25(y + \frac{V^2}{2g}) \quad \text{(eq. 2)}$$

Where:
y = Flow depth, ft
V = Flow velocity, fps
G = Gravitational acceleration constant, (32.2) ft/s^2

The channel geometry and hydraulic analysis results are available in Table 5 and the locations are presented in Figure 10.

Table 5 – Channel Summary Table

Channel ID	Q_{des} (cfs)	Length (ft)	S_L (%)	Channel Type	Manning's n	Side slope (H:V)	Velocity (fps)	Flow depth (ft)	Bottom Width (ft)	Depth + Freeboard (ft)	Top Width (ft)
CH-1	6.9	190	0.4	Triangular	0.032	4	1.8	1.0	-	1.28	10.0
CH-2	15.8	569	0.8	Triangular	0.032	4	2.9	1.2	-	1.6	12.8
CH-3	15.6	553	0.3	Triangular	0.032	4	2.0	1.4	-	1.8	14.4
CH-4	10.9	352	0.2	Triangular	0.032	4	1.6	1.3	-	1.64	13.1
CH-6A	17.6	989	0.6	Trapezoidal	0.032	3	2.7	1.1	3	1.43	11.6
CH-6B	3.0	228	0.4	Triangular	0.032	4	1.4	0.7	-	0.89	7.1
CH-7A	20.1	223	0.2	Trapezoidal	0.032	3	1.9	1.0	8	1.28	15.7
CH-7B	37.1	240	0.2	Trapezoidal	0.032	3	2.1	1.3	10	1.7	20.0
CH-10A	1.4	74	0.4	Triangular	0.032	4	1.2	0.5	-	0.64	5.2
CH-10B	14	130	0.7	Triangular	0.032	4	2.6	1.2	-	0.64	12.4
CH-15	12.3	545	0.3	Trapezoidal	0.032	3	1.9	VARIES	3	VARIES	VARIES

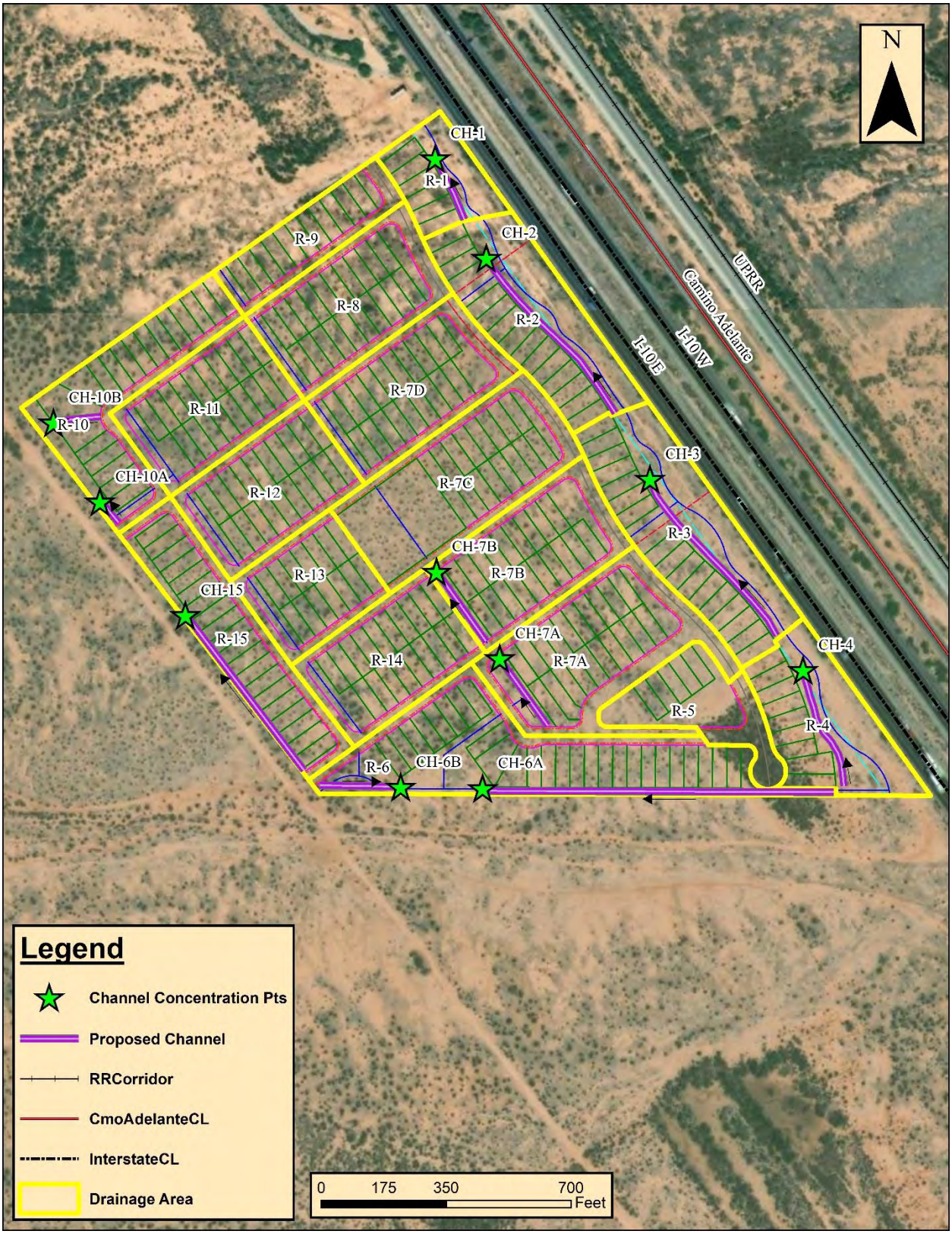


Figure 10 – Proposed Channel Locations

4.4 Retention Design

In accordance with PCDM Vol. II, the on-site discharge for Red Rock Village must be routed to a retention basin and drained within 36 hours. The necessary retention basin volume was calculated by the rational method (eq. 3):

$$V_R = C_W(\frac{P}{12})A \quad \text{(eq.3)}$$

Where:

C_W = Weighted runoff coefficient, from Table 2-1 PCDM Vol. II. Calculated by spatially weighting the curve number associated with lots, open spaces, and roads, dimensionless.

P = 100-year, 2-hour precipitation depth, taken from NOAA Atlas 14 using the centroid of the basin, inches.

A = Drainage area, acres

As set forth by PCDM Vol. I, the retention basin ponding depth is not to exceed 3-ft and freeboard shall be no less than 1-ft. In lieu of a percolation test conducted by a registered geotechnical engineer, drywells are assumed to be used to drain all retention basins at a drain rate of 0.5-cfs per drywell within the prescribed 36-hours. A tabulated summary of the retention basins is available in Table 6, and the preliminary locations are shown in Figure 11.

Table 6 – Retention Basin Summary

Basin ID	C_W	Precipitation Depth (in)	Drainage Area (ac)	Retention Volume (ac-ft)	# of Drywells
R-1	0.66	2.29	1.58	0.20	1
R-2	0.64	2.29	3.8	0.46	1
R-3	0.64	2.29	4.44	0.55	1
R-4	0.62	2.29	3.04	0.36	1
R-5	0.73	2.29	2.02	0.28	1
R-6	0.74	2.29	5.49	0.78	1
R-7C	0.79	2.29	12.8	1.93	2
R-7D	0.81	2.29	3.48	0.54	1
R-8	0.82	2.29	3.52	0.55	1
R-9	0.83	2.29	1.92	0.30	1
R-10	0.80	2.29	3.53	0.54	1
R-11	0.82	2.29	3.08	0.48	1
R-12	0.83	2.29	3.08	0.49	1
R-13	0.82	2.29	2.29	0.36	1
R-14	0.82	2.29	3.05	0.48	1
R-15	0.81	2.29	3.28	0.51	1

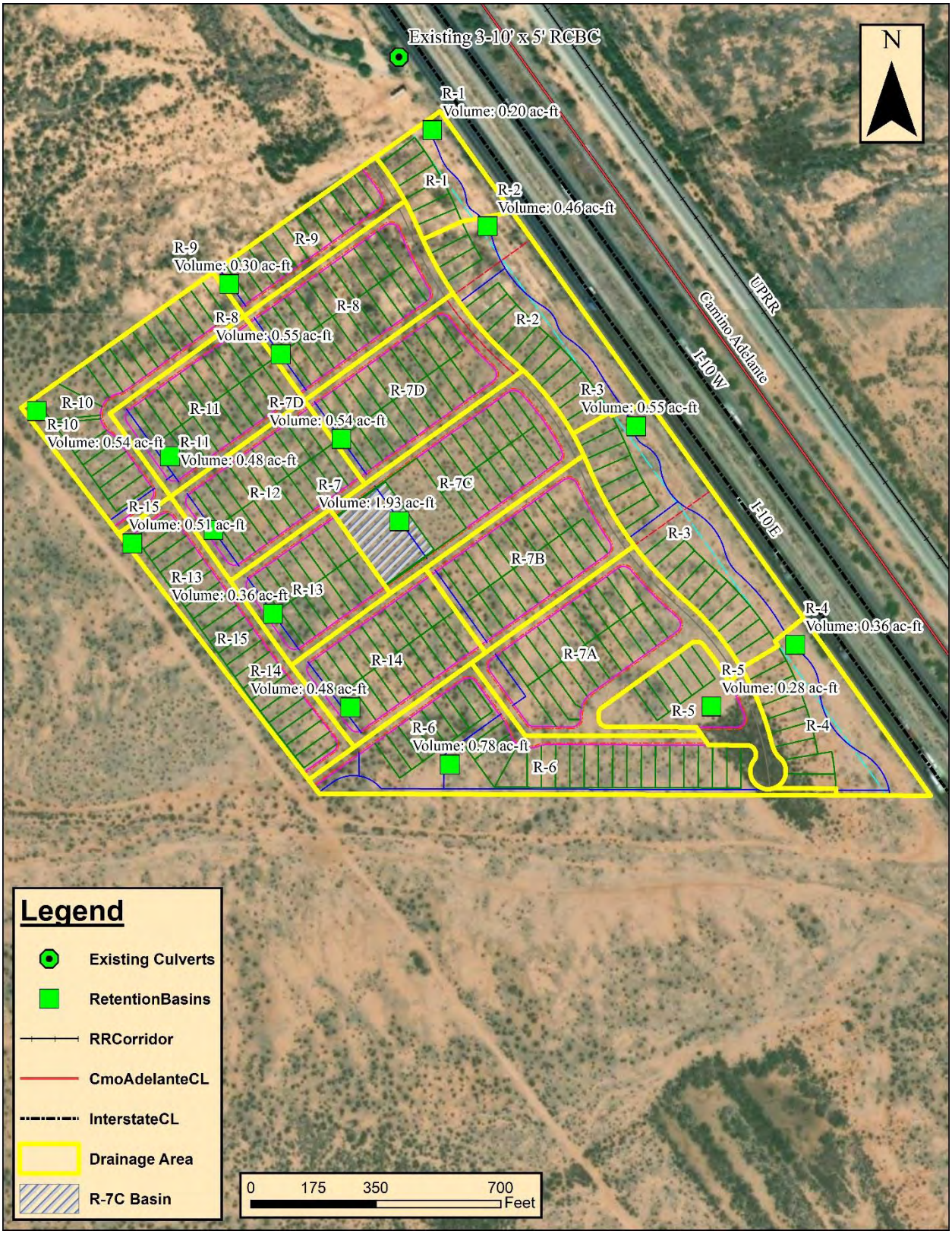


Figure 11 – Retention Basin Locations

4.5 Scour Design

Scour protection will be installed at the terminus of the proposed culverts, channels, and scupper outlets, or where concentrated flow has the potential of eroding the proposed surface. Riprap aprons will be employed to mitigate the scour risk and will be designed in accordance with HEC-11 and PCDM Vol. II. The rock layer will have a thickness equal to the mean diameter of the rock size. Aprons are to be underlined with a filter fabric (Mirafi 180N or equivalent). The riprap apron details can be found in Table 7, and the locations of the aprons can be found in Figure 12.

Table 7 – Splash Pad Summary Table

Splash Pad ID	Outfall Type	Q_{des} (cfs)	Design Splash Pad Width (ft)	Design Splash Pad Length (ft)	Design Rock Size D_{50} (in)
SP-1	Channel	6.9	8	6	6
SP-2	Channel	15.8	10	9	6
SP-3	Channel	15.6	11	11	6
SP-4	Channel	10.9	11	9	6
SP-5.1	Scupper	4.7	28	5	6
SP-5.2	Scupper	4.7	28	5	6
SP-6.1	Scupper	2.9	25	4	6
SP-6.2	Scupper	3	25	4	6
SP-6.3	Channel	3	5.8	4	6
SP-6.4	Channel	17.6	10	10	6
SP-7.1A	Scupper	12	35	9	9
SP-7.2A	Scupper/Culvert	11	8	9	6
SP-7.3A	Scupper	8.6	35	8	6
SP-7.1B	Scupper/Culvert	11	10	9	6
SP-7.2B	Scupper/Culvert	11	10	9	6
SP-7.1C	Scupper	9.52	50	9	6
SP-7.2C	Scupper	10.6	50	9	6
SP-7.3C	Scupper/Culvert	11	50	9	6
SP-7.1D	Scupper	9.65	40	8	6
SP-7.2D	Scupper	11.1	40	9	6
SP-8.1	Scupper	10.3	40	8	6
SP-8.2	Scupper	10.6	40	9	6
SP-9	Scupper	11.7	40	9	6
SP-10.1	Scupper	1.4	15	2	6
SP-10.2	Channel	14	9.2	9	6
SP-10.3	Scupper	14	20	10	6
SP-10.4	Channel	1.4	4.3	2	6

Splash Pad ID	Outfall Type	Q_{des} (cfs)	Design Splash Pad Width (ft)	Design Splash Pad Length (ft)	Design Rock Size D_{50} (in)
SP-11.1	Scupper	9	40	8	6
SP-11.2	Scupper	10.67	50	9	6
SP-12.1	Scupper	10.47	45	9	6
SP-12.2	Scupper	9.5	40	8	6
SP-13	Scupper	15.84	60	12	6
SP-14.1	Scupper	10	40	9	6
SP-14.2	Scupper	11	45	9	6
SP-15.1	Scupper	1.8	20	3	6
SP-15.2	Scupper	3.4	25	4	6



Figure 12 – Splash Pad Locations

4.6 Culvert Design

Reinforced concrete pipes (RCPs) are proposed in Red Rock Village to accept flow generated from basins R-7A and R-7B and discharge it under the roadways into the large retention basin, R-7C. This configuration leverages the large open space in the center of the proposed development, which allows the open spaces in R-7A and R-7B to be used for common place amenities. Hydraulic analysis of the culverts was performed using HWL software developed by *Dodson & Associates, Inc.* The results of the hydraulic analysis are available in Table 8, and the locations of the culverts can be found in Figure 13.

Table 8 – Culvert Summary Table

Culvert ID	Type/Size	Q_{des} (cfs)	$Q_{intercept}$ (cfs)	Slope (%)	Length (ft)	HW Inlet (ft)	Outlet Velocity (fps)
1.1	3-24" RCP	32.7	32.7	0.23	65	1.8	3.5
1.2	5-24" RCP	54.9	54.9	1.5	65	1.8	3.5

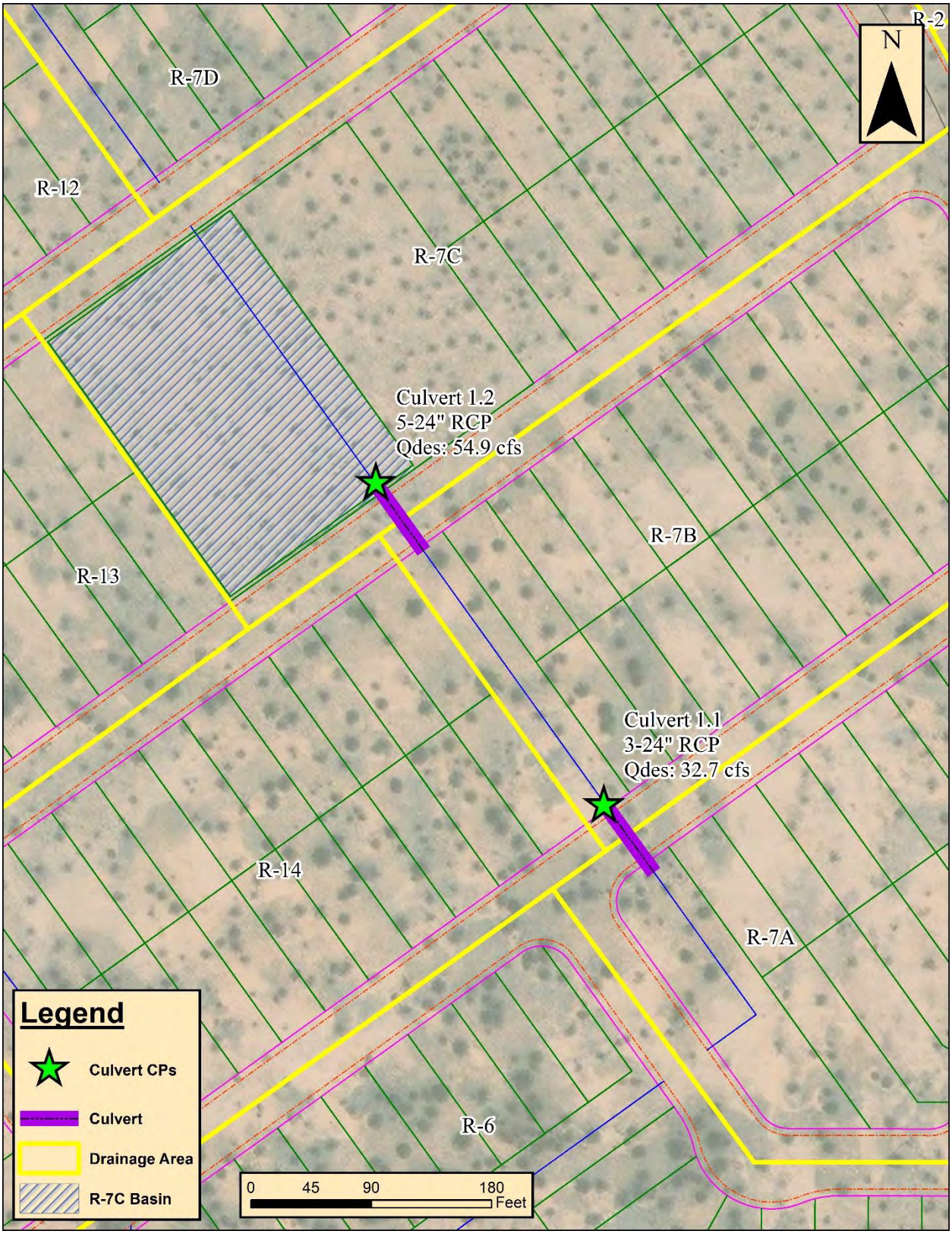


Figure 13 – Culvert Locations

4.7 Finished Floor Elevation

As set forth by Pinal County, finished floor elevations (FFEs) are to be 1-ft above the 100-yr, 2-hr water surface elevation of the adjacent retention basin. Discussed in section 4.4, the basin ponding depths are to be no more than 3-ft, with an additional foot for freeboard. Therefore, the preliminary finished floor elevations are to be no lower than the existing ground adjacent to the retention basins. Table 9 details the minimum FFE on a per basin basis.

Table 9 – FFE by Basin Summary Table

Basin ID	100-yr, 2-hr WSEL in Retention Basin	Minimum Finished Floor Elevations
R-1	1875.02	1876.02
R-2	1875.65	1876.65
R-3	1877.01	1878.01
R-4	1879.12	1880.12
R-5	1873.60	1874.60
R-6	1871.36	1872.36
R-7C	1873.73	1874.73
R-7D	1879.59	1880.59
R-8	1875.17	1876.17
R-9	1876.08	1877.08
R-10	1876.90	1877.90
R-11	1877.43	1878.43
R-12	1882.51	1883.51
R-13	1885.59	1886.59
R-14	1884.37	1885.37
R-15	1880.23	1881.23

5.0 CONCLUSIONS

Upon completion of the project, Red Rock Village will consist of single-family residences constructed on a 60-acre parcel of undeveloped land. The drainage design consists of conveying runoff in the roadway, to downstream scuppers where the flow will be discharged into retention/detention facilities that will fully retain the 100-yr, 2-hour storm. The parcel does not contain a mapped FEMA Special Flood Hazard Zone, nor is the parcel subjected to runoff crossing the site in excess of 500 cfs. As such, the finished floor elevations for the homes will be set a minimum of 1-foot above the water surface elevation within the basins. The drainage analyses and the drainage design are in accordance with Pinal County requirements and were completed using Pinal County Public Works Flood Control Section methodologies.

6.0 ENGINEER'S STATEMENT

The information presented in this drainage statement is specific to the development of Red Rock Village (Parcel 410-12-001D). While the analyses and design are in accordance with state and local regulations, the results are not intended to be used outside the scope of this project. If so used, the engineer does not assume any liability associated with that use. It will be up to the individual or the individual's professional to certify the results on their own and accept all liability therein.

7.0 REFERENCES

1. Arizona Department of Transportation "Highway Drainage Design Manual Volume 2 – Hydrology" January 2014
2. Arizona Department of Water Resources "State St2-96 Requirements for Floodplain and Floodway Modeling in Riverine Environments" July 1996
3. Pinal County, "Pinal County Drainage Design Manual – Volume 1 Design Criteria", August 2004
4. Pinal County, "Pinal County Drainage Design Manual – Volume 2 Design Methodology and Procedures Criteria", August 2004
5. RBF Consulting, "Master Drainage Report – Red Rock Village" April 18, 2007

Appendix A – Supporting Calculations

Hydrologic Calculations

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: On-1

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	2.29	2.29	2.29	2.29	2.29	2.29
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.40	0.40	0.40	0.44	0.48	0.50
L	mile	0.12	0.12	0.12	0.12	0.12	0.12
d1	feet	608	608	608	608	608	608
H1	feet	4.9	4.9	4.9	4.9	4.9	4.9
j1	feet	6762	6762	6762	6762	6762	6762
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	6762	6762	6762	6762	6762	6762
S	feet/mile	43	43	43	43	43	43
Kb	dimless	0.100	0.100	0.100	0.100	0.100	0.100
Tc (assum)	hours	0.29	0.25	0.23	0.21	0.20	0.19
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.83	2.65	3.28	4.19	4.92	5.68
Tc (calc)	hours	0.29	0.25	0.23	0.21	0.20	0.19
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	1.7	2.4	3.0	4.2	5.4	6.5

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By		Date	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: On-2

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	19.66	19.66	19.66	19.66	19.66	19.66
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.40	0.40	0.40	0.44	0.48	0.50
L	mile	0.32	0.32	0.32	0.32	0.32	0.32
d1	feet	1710	1710	1710	1710	1710	1710
H1	feet	13.5	13.5	13.5	13.5	13.5	13.5
j1	feet	19230	19230	19230	19230	19230	19230
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	19230	19230	19230	19230	19230	19230
S	feet/mile	42	42	42	42	42	42
Kb	dimless	0.100	0.100	0.100	0.100	0.100	0.100
Tc (assum)	hours	0.57	0.49	0.45	0.41	0.38	0.36
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.23	1.83	2.29	2.98	3.58	4.17
Tc (calc)	hours	0.57	0.49	0.45	0.41	0.38	0.36
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	9.7	14.4	18.0	25.8	33.8	41.0

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By		Date	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: On-3

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	6.61	6.61	6.61	6.61	6.61	6.61
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.40	0.40	0.40	0.44	0.48	0.50
L	mile	0.20	0.20	0.20	0.20	0.20	0.20
d1	feet	1072	1072	1072	1072	1072	1072
H1	feet	8.1	8.1	8.1	8.1	8.1	8.1
j1	feet	12331	12331	12331	12331	12331	12331
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	12331	12331	12331	12331	12331	12331
S	feet/mile	40	40	40	40	40	40
Kb	dimless	0.100	0.100	0.100	0.100	0.100	0.100
Tc (assum)	hours	0.42	0.37	0.34	0.31	0.29	0.27
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.49	2.16	2.70	3.49	4.15	4.85
Tc (calc)	hours	0.42	0.37	0.34	0.31	0.29	0.27
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	3.9	5.7	7.1	10.1	13.2	16.0

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By		Date	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: On-4

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	2.62	2.62	2.62	2.62	2.62	2.62
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.40	0.40	0.40	0.44	0.48	0.50
L	mile	0.15	0.15	0.15	0.15	0.15	0.15
d1	feet	805	805	805	805	805	805
H1	feet	6.7	6.7	6.7	6.7	6.7	6.7
j1	feet	8859	8859	8859	8859	8859	8859
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	8859	8859	8859	8859	8859	8859
S	feet/mile	44	44	44	44	44	44
Kb	dimless	0.100	0.100	0.100	0.100	0.100	0.100
Tc (assum)	hours	0.34	0.30	0.27	0.25	0.23	0.22
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.69	2.42	3.04	3.88	4.63	5.34
Tc (calc)	hours	0.34	0.30	0.27	0.25	0.23	0.22
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	1.8	2.5	3.2	4.5	5.8	7.0

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By		Date	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: On-5

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	22.80	22.80	22.80	22.80	22.80	22.80
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.40	0.40	0.40	0.44	0.48	0.50
L	mile	0.31	0.31	0.31	0.31	0.31	0.31
d1	feet	1654	1654	1654	1654	1654	1654
H1	feet	10.6	10.6	10.6	10.6	10.6	10.6
j1	feet	20686	20686	20686	20686	20686	20686
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	20686	20686	20686	20686	20686	20686
S	feet/mile	34	34	34	34	34	34
Kb	dimless	0.100	0.100	0.100	0.100	0.100	0.100
Tc (assum)	hours	0.61	0.52	0.48	0.43	0.40	0.38
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.18	1.76	2.20	2.90	3.48	4.05
Tc (calc)	hours	0.61	0.52	0.48	0.43	0.40	0.38
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	10.7	16.0	20.1	29.1	38.1	46.1

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By		Date	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: On-6

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	4.31	4.31	4.31	4.31	4.31	4.31
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.40	0.40	0.40	0.44	0.48	0.50
L	mile	0.12	0.12	0.12	0.12	0.12	0.12
d1	feet	639	639	639	639	639	639
H1	feet	5.4	5.4	5.4	5.4	5.4	5.4
j1	feet	6977	6977	6977	6977	6977	6977
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	6977	6977	6977	6977	6977	6977
S	feet/mile	44	44	44	44	44	44
Kb	dimless	0.100	0.100	0.100	0.100	0.100	0.100
Tc (assum)	hours	0.29	0.26	0.24	0.22	0.20	0.19
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.83	2.60	3.22	4.11	4.92	5.68
Tc (calc)	hours	0.29	0.26	0.24	0.22	0.20	0.19
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	3.2	4.5	5.5	7.8	10.2	12.2

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By		Date	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: On-7

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	1.84	1.84	1.84	1.84	1.84	1.84
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.40	0.40	0.40	0.44	0.48	0.50
L	mile	0.15	0.15	0.15	0.15	0.15	0.15
d1	feet	769	769	769	769	769	769
H1	feet	5.5	5.5	5.5	5.5	5.5	5.5
j1	feet	9118	9118	9118	9118	9118	9118
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	9118	9118	9118	9118	9118	9118
S	feet/mile	38	38	38	38	38	38
Kb	dimless	0.100	0.100	0.100	0.100	0.100	0.100
Tc (assum)	hours	0.35	0.31	0.28	0.26	0.24	0.23
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.66	2.38	2.99	3.81	4.54	5.23
Tc (calc)	hours	0.35	0.31	0.28	0.26	0.24	0.23
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	1.2	1.8	2.2	3.1	4.0	4.8

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-1 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
0.77	0.80	0.00	1.57	0.52	0.52	0.52	0.58	0.63

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	1.57	1.57	1.57	1.57	1.57	1.57
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.52	0.52	0.52	0.58	0.63	0.66
L	mile	0.07	0.07	0.07	0.07	0.07	0.07
d1	feet	388	388	388	388	388	388
H1	feet	1.02	1.02	1.02	1.02	1.02	1.02
j1	feet	7578	7578	7578	7578	7578	7578
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	7578	7578	7578	7578	7578	7578
S	feet/mile	14	14	14	14	14	14
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.19	0.17	0.15	0.14	0.13	0.12
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.22	3.12	3.89	4.89	5.76	6.66
Tc (calc)	hours	0.19	0.17	0.15	0.14	0.13	0.12
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	1.8	2.6	3.2	4.4	5.7	6.9

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg					
Project Number:	P4075.01	Made by	CDR	Date	4/25/23	
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-2 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
1.65	2.16	0.00	3.81	0.51	0.51	0.51	0.56	0.61

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.81	3.81	3.81	3.81	3.81	3.81
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.51	0.51	0.51	0.56	0.61	0.64
L	mile	0.15	0.15	0.15	0.15	0.15	0.15
d1	feet	767	767	767	767	767	767
H1	feet	5.01	5.01	5.01	5.01	5.01	5.01
j1	feet	9486	9486	9486	9486	9486	9486
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	9486	9486	9486	9486	9486	9486
S	feet/mile	34	34	34	34	34	34
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.20	0.18	0.16	0.15	0.14	0.13
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.18	3.05	3.80	4.78	5.62	6.50
Tc (calc)	hours	0.20	0.18	0.16	0.15	0.14	0.13
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	4.2	5.9	7.4	10.2	13.1	15.8

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-3 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.01	2.43	0.00	4.44	0.51	0.51	0.51	0.57	0.62

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	4.44	4.44	4.44	4.44	4.44	4.44
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.51	0.51	0.51	0.57	0.62	0.64
L	mile	0.16	0.16	0.16	0.16	0.16	0.16
d1	feet	837	837	837	837	837	837
H1	feet	1.78	1.78	1.78	1.78	1.78	1.78
j1	feet	18158	18158	18158	18158	18158	18158
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	18158	18158	18158	18158	18158	18158
S	feet/mile	11	11	11	11	11	11
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.33	0.29	0.26	0.24	0.22	0.21
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.71	2.47	3.10	3.95	4.72	5.45
Tc (calc)	hours	0.33	0.29	0.26	0.24	0.22	0.21
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	3.9	5.6	7.1	9.9	12.9	15.6

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-4 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
1.12	1.92	0.00	3.04	0.49	0.49	0.49	0.54	0.59

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.04	3.04	3.04	3.04	3.04	3.04
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.49	0.49	0.49	0.54	0.59	0.62
L	mile	0.11	0.11	0.11	0.11	0.11	0.11
d1	feet	596	596	596	596	596	596
H1	feet	1.23	1.23	1.23	1.23	1.23	1.23
j1	feet	13131	13131	13131	13131	13131	13131
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	13131	13131	13131	13131	13131	13131
S	feet/mile	11	11	11	11	11	11
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.27	0.23	0.21	0.20	0.19	0.18
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.90	2.75	3.41	4.28	5.02	5.80
Tc (calc)	hours	0.27	0.23	0.21	0.20	0.19	0.18
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	2.8	4.1	5.1	7.1	9.0	10.9

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-5 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
0.55	0.85	0.62	2.02	0.61	0.61	0.61	0.67	0.71

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	2.02	2.02	2.02	2.02	2.02	2.02
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.61	0.61	0.61	0.67	0.71	0.73
L	mile	0.06	0.06	0.06	0.06	0.06	0.06
d1	feet	297	297	297	297	297	297
H1	feet	0.93	0.93	0.93	0.93	0.93	0.93
j1	feet	5314	5314	5314	5314	5314	5314
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	5314	5314	5314	5314	5314	5314
S	feet/mile	17	17	17	17	17	17
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.15	0.13	0.12	0.11	0.11	0.10
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.43	3.42	4.18	5.26	6.05	7.01
Tc (calc)	hours	0.15	0.13	0.12	0.11	0.11	0.10
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	3.0	4.2	5.1	7.1	8.6	10.3

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-6 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
3.10	1.62	0.78	5.50	0.60	0.60	0.60	0.67	0.72

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	5.50	5.50	5.50	5.50	5.50	5.50
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.60	0.60	0.60	0.67	0.72	0.74
L	mile	0.21	0.21	0.21	0.21	0.21	0.21
d1	feet	1088	1088	1088	1088	1088	1088
H1	feet	6.26	6.26	6.26	6.26	6.26	6.26
j1	feet	14344	14344	14344	14344	14344	14344
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	14344	14344	14344	14344	14344	14344
S	feet/mile	30	30	30	30	30	30
Kb	dimless	0.025	0.025	0.025	0.025	0.025	0.025
Tc (assum)	hours	0.19	0.17	0.16	0.15	0.14	0.13
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.22	3.12	3.80	4.78	5.62	6.50
Tc (calc)	hours	0.19	0.17	0.16	0.15	0.14	0.13
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	7.4	10.4	12.6	17.6	22.1	26.6

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg					
Project Number:	P4075.01	Made by	CDR	Date	4/25/23	
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-7A (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.28	1.40	0.86	4.54	0.61	0.61	0.61	0.68	0.72

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	4.54	4.54	4.54	4.54	4.54	4.54
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.61	0.61	0.61	0.68	0.72	0.75
L	mile	0.18	0.18	0.18	0.18	0.18	0.18
d1	feet	936	936	936	936	936	936
H1	feet	4.42	4.42	4.42	4.42	4.42	4.42
j1	feet	13619	13619	13619	13619	13619	13619
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	13619	13619	13619	13619	13619	13619
S	feet/mile	25	25	25	25	25	25
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.26	0.22	0.21	0.19	0.18	0.17
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.93	2.81	3.41	4.37	5.13	5.93
Tc (calc)	hours	0.26	0.22	0.21	0.19	0.18	0.17
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	5.4	7.8	9.5	13.4	16.8	20.1

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-7B (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.09	0.50	0.88	3.47	0.66	0.66	0.66	0.74	0.78

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.47	3.47	3.47	3.47	3.47	3.47
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.66	0.66	0.66	0.74	0.78	0.81
L	mile	0.16	0.16	0.16	0.16	0.16	0.16
d1	feet	831	831	831	831	831	831
H1	feet	3.63	3.63	3.63	3.63	3.63	3.63
j1	feet	12568	12568	12568	12568	12568	12568
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	12568	12568	12568	12568	12568	12568
S	feet/mile	23	23	23	23	23	23
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.25	0.21	0.20	0.18	0.17	0.16
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.97	2.87	3.48	4.47	5.25	6.06
Tc (calc)	hours	0.25	0.21	0.20	0.18	0.17	0.16
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	4.5	6.6	8.0	11.4	14.2	17.0

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-7C (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
1.76	1.68	1.07	4.51	0.60	0.60	0.60	0.67	0.71

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	4.51	4.51	4.51	4.51	4.51	4.51
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.60	0.60	0.60	0.67	0.71	0.73
L	mile	0.13	0.13	0.13	0.13	0.13	0.13
d1	feet	665	665	665	665	665	665
H1	feet	4.50	4.50	4.50	4.50	4.50	4.50
j1	feet	8092	8092	8092	8092	8092	8092
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	8092	8092	8092	8092	8092	8092
S	feet/mile	36	36	36	36	36	36
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.18	0.16	0.15	0.14	0.13	0.12
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.27	3.19	3.89	4.89	5.76	6.66
Tc (calc)	hours	0.18	0.16	0.15	0.14	0.13	0.12
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	6.2	8.7	10.6	14.7	18.4	22.0

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-7D (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.09	0.50	0.89	3.48	0.67	0.67	0.67	0.74	0.78

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.48	3.48	3.48	3.48	3.48	3.48
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.67	0.67	0.67	0.74	0.78	0.81
L	mile	0.18	0.18	0.18	0.18	0.18	0.18
d1	feet	946	946	946	946	946	946
H1	feet	2.59	2.59	2.59	2.59	2.59	2.59
j1	feet	18087	18087	18087	18087	18087	18087
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	18087	18087	18087	18087	18087	18087
S	feet/mile	14	14	14	14	14	14
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.32	0.28	0.26	0.23	0.22	0.21
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	1.74	2.51	3.10	4.03	4.72	5.45
Tc (calc)	hours	0.32	0.28	0.26	0.23	0.22	0.21
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	4.0	5.8	7.2	10.3	12.8	15.3

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-8 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.20	0.20	1.12	3.52	0.70	0.70	0.70	0.77	0.82

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.52	3.52	3.52	3.52	3.52	3.52
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.70	0.70	0.70	0.77	0.82	0.84
L	mile	0.13	0.13	0.13	0.13	0.13	0.13
d1	feet	691	691	691	691	691	691
H1	feet	3.74	3.74	3.74	3.74	3.74	3.74
j1	feet	9393	9393	9393	9393	9393	9393
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	9393	9393	9393	9393	9393	9393
S	feet/mile	29	29	29	29	29	29
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.20	0.18	0.16	0.15	0.14	0.13
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.18	3.05	3.80	4.78	5.62	6.50
Tc (calc)	hours	0.20	0.18	0.16	0.15	0.14	0.13
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	5.4	7.5	9.4	13.0	16.2	19.3

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-9 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
1.33	0.12	0.47	1.92	0.68	0.68	0.68	0.76	0.80

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	1.92	1.92	1.92	1.92	1.92	1.92
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.68	0.68	0.68	0.76	0.80	0.83
L	mile	0.12	0.12	0.12	0.12	0.12	0.12
d1	feet	627	627	627	627	627	627
H1	feet	3.48	3.48	3.48	3.48	3.48	3.48
j1	feet	8407	8407	8407	8407	8407	8407
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	8407	8407	8407	8407	8407	8407
S	feet/mile	29	29	29	29	29	29
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.19	0.17	0.16	0.14	0.13	0.13
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.22	3.12	3.80	4.89	5.76	6.50
Tc (calc)	hours	0.19	0.17	0.16	0.14	0.13	0.13
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	2.9	4.1	5.0	7.1	8.9	10.4

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg					
Project Number:	P4075.01	Made by	CDR	Date	4/25/23	
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-10 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.46	0.50	0.57	3.53	0.65	0.65	0.65	0.72	0.76

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.53	3.53	3.53	3.53	3.53	3.53
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.65	0.65	0.65	0.72	0.76	0.80
L	mile	0.12	0.12	0.12	0.12	0.12	0.12
d1	feet	635	635	635	635	635	635
H1	feet	4.13	4.13	4.13	4.13	4.13	4.13
j1	feet	7871	7871	7871	7871	7871	7871
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	7871	7871	7871	7871	7871	7871
S	feet/mile	34	34	34	34	34	34
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.18	0.16	0.15	0.14	0.13	0.12
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.27	3.19	3.89	4.89	5.76	6.66
Tc (calc)	hours	0.18	0.16	0.15	0.14	0.13	0.12
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	5.2	7.3	8.9	12.4	15.5	18.7

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-11 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.09	0.32	0.67	3.08	0.67	0.67	0.67	0.74	0.79

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.08	3.08	3.08	3.08	3.08	3.08
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.67	0.67	0.67	0.74	0.79	0.82
L	mile	0.08	0.08	0.08	0.08	0.08	0.08
d1	feet	423	423	423	423	423	423
H1	feet	1.41	1.41	1.41	1.41	1.41	1.41
j1	feet	7315	7315	7315	7315	7315	7315
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	7315	7315	7315	7315	7315	7315
S	feet/mile	18	18	18	18	18	18
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.18	0.16	0.15	0.14	0.13	0.12
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.27	3.19	3.89	4.89	5.76	6.66
Tc (calc)	hours	0.18	0.16	0.15	0.14	0.13	0.12
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	4.7	6.6	8.0	11.1	13.9	16.7

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-12 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.20	0.21	0.67	3.08	0.68	0.68	0.68	0.75	0.80

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.08	3.08	3.08	3.08	3.08	3.08
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.68	0.68	0.68	0.75	0.80	0.83
L	mile	0.08	0.08	0.08	0.08	0.08	0.08
d1	feet	433	433	433	433	433	433
H1	feet	2.32	2.32	2.32	2.32	2.32	2.32
j1	feet	5915	5915	5915	5915	5915	5915
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	5915	5915	5915	5915	5915	5915
S	feet/mile	28	28	28	28	28	28
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.16	0.14	0.13	0.12	0.11	0.10
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.37	3.34	4.08	5.13	6.05	7.01
Tc (calc)	hours	0.16	0.14	0.13	0.12	0.11	0.10
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	4.9	7.0	8.5	11.8	14.8	17.9

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg					
Project Number:	P4075.01	Made by	CDR	Date	4/25/23	
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23	

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-13 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
1.54	0.21	0.75	2.50	0.69	0.69	0.69	0.76	0.81

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	2.50	2.50	2.50	2.50	2.50	2.50
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.69	0.69	0.69	0.76	0.81	0.83
L	mile	0.06	0.06	0.06	0.06	0.06	0.06
d1	feet	299	299	299	299	299	299
H1	feet	1.60	1.60	1.60	1.60	1.60	1.60
j1	feet	4095	4095	4095	4095	4095	4095
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	4095	4095	4095	4095	4095	4095
S	feet/mile	28	28	28	28	28	28
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.13	0.11	0.10	0.09	0.09	0.08
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.54	3.60	4.40	5.55	6.37	7.40
Tc (calc)	hours	0.13	0.11	0.10	0.09	0.09	0.08
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	4.4	6.2	7.6	10.6	12.8	15.3

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-14 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.09	0.30	0.66	3.05	0.67	0.67	0.67	0.74	0.79

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.05	3.05	3.05	3.05	3.05	3.05
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.67	0.67	0.67	0.74	0.79	0.82
L	mile	0.08	0.08	0.08	0.08	0.08	0.08
d1	feet	396	396	396	396	396	396
H1	feet	2.59	2.59	2.59	2.59	2.59	2.59
j1	feet	4906	4906	4906	4906	4906	4906
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	4906	4906	4906	4906	4906	4906
S	feet/mile	34	34	34	34	34	34
Kb	dimless	0.040	0.040	0.040	0.040	0.040	0.040
Tc (assum)	hours	0.14	0.12	0.11	0.10	0.10	0.09
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.48	3.51	4.28	5.40	6.21	7.20
Tc (calc)	hours	0.14	0.12	0.11	0.10	0.10	0.09
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	5.1	7.2	8.7	12.2	14.9	17.9

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/23
Reference:	PC Drainage Manual	Checked By	CBR	Date	4/25/23

All variables and solutions are as defined in the Pinal County Hydrology Manual (2004)
and ADOT Highway Drainage Design Manual Volume 2

Location/Concentration Point: CP-15 (Proposed)

Land Use Areas by Type (ac)				C_w by R.I. & LU				
Lots	Open Spaces	Roads	Total	2	5	10	25	50
2.20	0.38	0.70	3.28	0.66	0.66	0.66	0.73	0.78

Parameter	Units	Value/Results					
Event	Years	2	5	10	25	50	100
A	acres	3.28	3.28	3.28	3.28	3.28	3.28
P1	inches	0.82	1.10	1.31	1.61	1.85	2.09
C	dimless	0.66	0.66	0.66	0.73	0.78	0.81
L	mile	0.22	0.22	0.22	0.22	0.22	0.22
d1	feet	1157	1157	1157	1157	1157	1157
H1	feet	4.16	4.16	4.16	4.16	4.16	4.16
j1	feet	19306	19306	19306	19306	19306	19306
d2	feet		0	0	0	0	0
H2	feet		0.0	0.0	0.0	0.0	0.0
j2	feet	0	0	0	0	0	0
d3	feet		0	0	0	0	0
H3	feet		0.0	0.0	0.0	0.0	0.0
j3	feet	0	0	0	0	0	0
J	feet	19306	19306	19306	19306	19306	19306
S	feet/mile	19	19	19	19	19	19
Kb	dimless	0.025	0.025	0.025	0.025	0.025	0.025
Tc (assum)	hours	0.24	0.21	0.19	0.18	0.17	0.16
S-DRRZ	dimless	8	8	8	8	8	8
I (calc)	in/hr	2.01	2.87	3.56	4.47	5.25	6.06
Tc (calc)	hours	0.24	0.21	0.19	0.18	0.17	0.16
I (max)	in/hr	2.87	3.86	4.60	5.65	6.49	7.33
Q = CIA =	cfs	4.4	6.2	7.7	10.8	13.4	16.1

= Calculated from other spreadsheets'
= required input parameter for spreadsheet

I max is the maximum intensity possible based on a minimum value of Tc = 5 min.
discharge, Q, is based on the lesser of the calculated or maximum intensity

Table 2–1 Resistance Coefficient (K_b) For Use With The Rational Method T_c Equation

Description of Landform	K_b	
	Defined Drainage Network	Overland Flow Only
Mountain, with forest and dense ground cover (average slopes – 50% or greater)	0.15	0.30
Mountain, with rough rock and boulder cover (average slopes – 50% or greater)	0.12	0.25
Foothills (average slopes – 10% to 50%)	0.10	0.20
Alluvial fans, Pediments and Rangelands (average slopes – 10% or less)	0.05	0.10
Irrigation Pastures [a]	-	0.20
Tilled Agricultural Fields [a]	-	0.08
URBAN		
Residential, L is less than 1,000 ft [b]	0.04	
Residential, L is greater than 1,000 ft [b]	0.025	
Grass; parks, cemeteries, etc. [a]	-	0.20
Bare ground; playgrounds, etc. [a]	-	0.08
Paved; parking lots, etc. [a]	-	0.02

Notes: a – No defined drainage network.
b – L is length in T_c equation. Streets serve as drainage network.

Street Capacity Calculations

Project Name:	Red Rock Village - Smith Rothburg				
Project Number:	P4075.01	Made by	CDR	Date	4/25/2023
Reference:	-	Checked By	CBR	Date	4/25/2023

(1) $Q = VA$

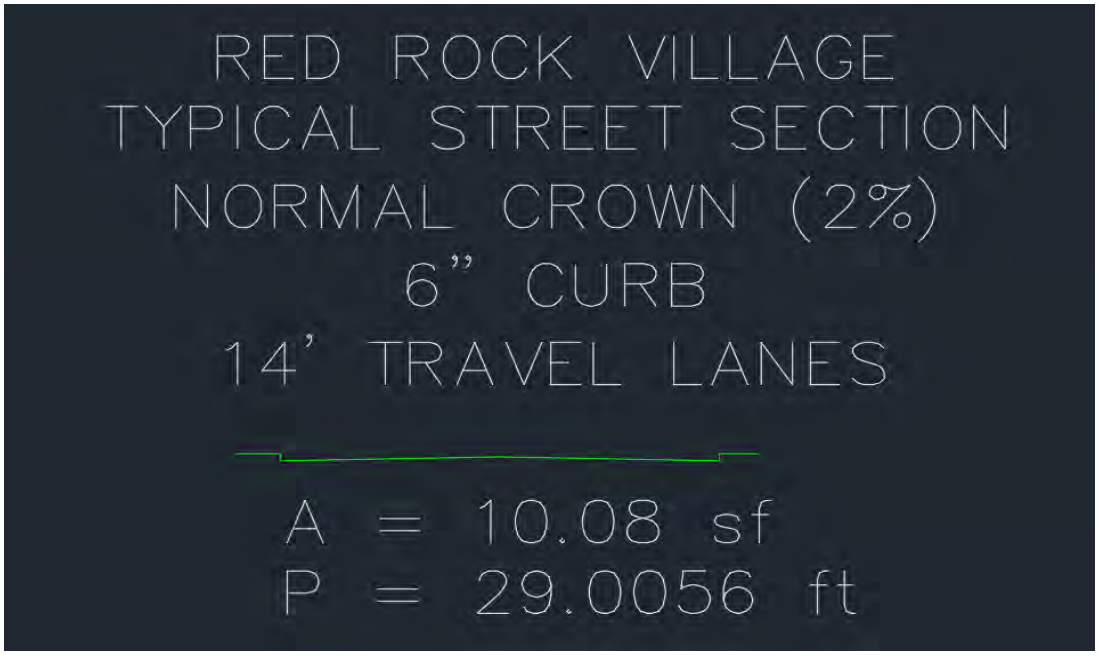
(2) $V = \frac{1.49}{n} R^{2/3} S^{1/2}$

(3) $R = \frac{A}{P}$

Where:			
	A =	10.1	sf
	P =	29.0	ft
	n =	0.015	dimless

Street Capacity at Varying S_L

S_L	V (fps)	$Q_{capacity}$ (cfs)
0.20%	2.20	22.1
0.25%	2.45	24.7
0.30%	2.69	27.1
0.35%	2.90	29.3
0.40%	3.11	31.3
0.45%	3.29	33.2
0.50%	3.47	35.0
0.55%	3.64	36.7
0.60%	3.80	38.3
0.65%	3.96	39.9
0.70%	4.11	41.4



Scupper Calculations

Curb and Gutter Analysis: SC-5A/B

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0050 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 60.3670 ft

Gutter Result Parameters

Design Flow: 4.7000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 3.6442 ft^2

Eo (Gutter Flow to Total Flow): 0.0860

Gutter Depth at Curb: 1.4488 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 28.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 4.7000 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-6A

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0064 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 48.0906 ft

Gutter Result Parameters

Design Flow: 2.9000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 2.3127 ft^2

Eo (Gutter Flow to Total Flow): 0.1072

Gutter Depth at Curb: 1.1542 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 25.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 2.9000 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-6B

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0060 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 49.2989 ft

Gutter Result Parameters

Design Flow: 3.0000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 2.4304 ft^2

Eo (Gutter Flow to Total Flow): 0.1047

Gutter Depth at Curb: 1.1832 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 25.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 3.0000 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-7A-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0070 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 88.4042 ft

Gutter Result Parameters

Design Flow: 15.3800 cfs

Gutter Depression: 0.0000 in

Area of Flow: 7.8153 ft^2

Eo (Gutter Flow to Total Flow): 0.0593

Gutter Depth at Curb: 2.1217 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 35.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 11.9967 cfs

Bypass Flow: 3.3833 cfs

Efficiency: 0.7800

Curb and Gutter Analysis: SC-7A-2

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0060 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 83.4260 ft

Gutter Result Parameters

Design Flow: 12.2000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 6.9599 ft^2

Eo (Gutter Flow to Total Flow): 0.0627

Gutter Depth at Curb: 2.0022 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 25.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 8.4838 cfs

Bypass Flow: 3.7162 cfs

Efficiency: 0.6954

Curb and Gutter Analysis: SC-7A-3

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0024 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 86.8895 ft

Gutter Result Parameters

Design Flow: 8.6000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 7.5498 ft^2

Eo (Gutter Flow to Total Flow): 0.0603

Gutter Depth at Curb: 2.0853 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 35.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 8.6000 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-7B-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0060 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 79.5600 ft

Gutter Result Parameters

Design Flow: 10.7500 cfs

Gutter Depression: 0.0000 in

Area of Flow: 6.3298 ft^2

Eo (Gutter Flow to Total Flow): 0.0657

Gutter Depth at Curb: 1.9094 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 10.3352 cfs

Bypass Flow: 0.4148 cfs

Efficiency: 0.9614

Curb and Gutter Analysis: SC-7B-2

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0060 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 79.9745 ft

Gutter Result Parameters

Design Flow: 10.9000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 6.3959 ft^2

Eo (Gutter Flow to Total Flow): 0.0654

Gutter Depth at Curb: 1.9194 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 10.4460 cfs

Bypass Flow: 0.4540 cfs

Efficiency: 0.9583

Curb and Gutter Analysis: SC-7C-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0080 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 72.0244 ft

Gutter Result Parameters

Design Flow: 9.5200 cfs

Gutter Depression: 0.0000 in

Area of Flow: 5.1875 ft^2

Eo (Gutter Flow to Total Flow): 0.0724

Gutter Depth at Curb: 1.7286 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 50.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 9.5200 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-7C-2

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0068 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 77.3062 ft

Gutter Result Parameters

Design Flow: 10.6000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 5.9762 ft^2

Eo (Gutter Flow to Total Flow): 0.0676

Gutter Depth at Curb: 1.8553 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 50.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 10.6000 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-7D-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0040 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 82.5028 ft

Gutter Result Parameters

Design Flow: 9.6700 cfs

Gutter Depression: 0.0000 in

Area of Flow: 6.8067 ft^2

Eo (Gutter Flow to Total Flow): 0.0634

Gutter Depth at Curb: 1.9801 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 9.6509 cfs

Bypass Flow: 0.0191 cfs

Efficiency: 0.9980

Curb and Gutter Analysis: SC-7D-2

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0050 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 84.5729 ft

Gutter Result Parameters

Design Flow: 11.5500 cfs

Gutter Depression: 0.0000 in

Area of Flow: 7.1526 ft^2

Eo (Gutter Flow to Total Flow): 0.0619

Gutter Depth at Curb: 2.0298 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 11.0739 cfs

Bypass Flow: 0.4761 cfs

Efficiency: 0.9588

Curb and Gutter Analysis: SC-8-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0057 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 80.1885 ft

Gutter Result Parameters

Design Flow: 10.7000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 6.4302 ft^2

Eo (Gutter Flow to Total Flow): 0.0652

Gutter Depth at Curb: 1.9245 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 10.3362 cfs

Bypass Flow: 0.3638 cfs

Efficiency: 0.9660

Curb and Gutter Analysis: SC-8-2

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0060 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 80.6575 ft

Gutter Result Parameters

Design Flow: 11.1500 cfs

Gutter Depression: 0.0000 in

Area of Flow: 6.5056 ft^2

Eo (Gutter Flow to Total Flow): 0.0648

Gutter Depth at Curb: 1.9358 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 10.6279 cfs

Bypass Flow: 0.5221 cfs

Efficiency: 0.9532

Curb and Gutter Analysis: SC-9

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0050 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 86.7501 ft

Gutter Result Parameters

Design Flow: 12.3600 cfs

Gutter Depression: 0.0000 in

Area of Flow: 7.5256 ft^2

Eo (Gutter Flow to Total Flow): 0.0604

Gutter Depth at Curb: 2.0820 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 11.6534 cfs

Bypass Flow: 0.7066 cfs

Efficiency: 0.9428

Curb and Gutter Analysis: SC-10-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0060 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 37.0437 ft

Gutter Result Parameters

Design Flow: 1.4000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 1.3722 ft^2

Eo (Gutter Flow to Total Flow): 0.1377

Gutter Depth at Curb: 0.8890 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 15.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 1.4000 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-11-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0030 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 84.7266 ft

Gutter Result Parameters

Design Flow: 8.9900 cfs

Gutter Depression: 0.0000 in

Area of Flow: 7.1786 ft^2

Eo (Gutter Flow to Total Flow): 0.0618

Gutter Depth at Curb: 2.0334 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 8.9900 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-11-2

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0050 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 82.0965 ft

Gutter Result Parameters

Design Flow: 10.6700 cfs

Gutter Depression: 0.0000 in

Area of Flow: 6.7398 ft^2

Eo (Gutter Flow to Total Flow): 0.0637

Gutter Depth at Curb: 1.9703 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 50.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 10.6700 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-12-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0040 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 84.9990 ft

Gutter Result Parameters

Design Flow: 10.4700 cfs

Gutter Depression: 0.0000 in

Area of Flow: 7.2248 ft^2

Eo (Gutter Flow to Total Flow): 0.0616

Gutter Depth at Curb: 2.0400 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 45.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 10.4700 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-12-2

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0030 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 86.6003 ft

Gutter Result Parameters

Design Flow: 9.5300 cfs

Gutter Depression: 0.0000 in

Area of Flow: 7.4996 ft^2

Eo (Gutter Flow to Total Flow): 0.0605

Gutter Depth at Curb: 2.0784 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 9.5300 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-13

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0050 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 95.2075 ft

Gutter Result Parameters

Design Flow: 15.8400 cfs

Gutter Depression: 0.0000 in

Area of Flow: 9.0645 ft^2

Eo (Gutter Flow to Total Flow): 0.0551

Gutter Depth at Curb: 2.2850 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 60.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 15.8400 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-14-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0030 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 88.2440 ft

Gutter Result Parameters

Design Flow: 10.0200 cfs

Gutter Depression: 0.0000 in

Area of Flow: 7.7870 ft^2

Eo (Gutter Flow to Total Flow): 0.0594

Gutter Depth at Curb: 2.1179 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 40.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 10.0200 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-14-2

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0060 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 80.1119 ft

Gutter Result Parameters

Design Flow: 10.9500 cfs

Gutter Depression: 0.0000 in

Area of Flow: 6.4179 ft^2

Eo (Gutter Flow to Total Flow): 0.0653

Gutter Depth at Curb: 1.9227 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 45.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 10.8585 cfs

Bypass Flow: 0.0915 cfs

Efficiency: 0.9916

Curb and Gutter Analysis: SC-15-1

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0050 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 42.1202 ft

Gutter Result Parameters

Design Flow: 1.8000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 1.7741 ft^2

Eo (Gutter Flow to Total Flow): 0.1218

Gutter Depth at Curb: 1.0109 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 20.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 1.8000 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Curb and Gutter Analysis: SC-15-2

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0060 ft/ft

Cross-Slope of Pavement: 0.0020 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Width of Spread: 51.6679 ft

Gutter Result Parameters

Design Flow: 3.4000 cfs

Gutter Depression: 0.0000 in

Area of Flow: 2.6696 ft^2

Eo (Gutter Flow to Total Flow): 0.1000

Gutter Depth at Curb: 1.2400 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Curb Opening

Length of Inlet: 25.0000 ft

Local Depression: 6.0000 in

Inlet Result Parameters

Intercepted Flow: 3.4000 cfs

Bypass Flow: 0.0000 cfs

Efficiency: 1.0000

Channel Calculations

Hydraulic Analysis Report

Project Data

Project Title:

Designer:

Project Date: Thursday, April 20, 2023

Project Units: U.S. Customary Units

Notes:

Channel Analysis: CH-1

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 4.0000 ft/ft

Side Slope 2 (Z2): 4.0000 ft/ft

Longitudinal Slope: 0.0040 ft/ft

Manning's n: 0.0320

Flow: 6.9000 cfs

Result Parameters

Depth: 0.9815 ft

Area of Flow: 3.8532 ft^2

Wetted Perimeter: 8.0935 ft

Hydraulic Radius: 0.4761 ft

Average Velocity: 1.7907 ft/s

Top Width: 7.8519 ft

Froude Number: 0.4505

Critical Depth: 0.7134 ft

Critical Velocity: 3.3891 ft/s

Critical Slope: 0.0219 ft/ft

Critical Top Width: 5.71 ft

Calculated Max Shear Stress: 0.2450 lb/ft^2

Calculated Avg Shear Stress: 0.1188 lb/ft^2

Channel Analysis: CH-2

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 4.0000 ft/ft

Side Slope 2 (Z2): 4.0000 ft/ft

Longitudinal Slope: 0.0080 ft/ft

Manning's n: 0.0320

Flow: 15.8000 cfs

Result Parameters

Depth: 1.1759 ft

Area of Flow: 5.5309 ft^2

Wetted Perimeter: 9.6967 ft

Hydraulic Radius: 0.5704 ft

Average Velocity: 2.8567 ft/s

Top Width: 9.4071 ft

Froude Number: 0.6565

Critical Depth: 0.9937 ft

Critical Velocity: 3.9999 ft/s

Critical Slope: 0.0196 ft/ft

Critical Top Width: 7.95 ft

Calculated Max Shear Stress: 0.5870 lb/ft^2

Calculated Avg Shear Stress: 0.2847 lb/ft^2

Channel Analysis: CH-3

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 4.0000 ft/ft

Side Slope 2 (Z2): 4.0000 ft/ft

Longitudinal Slope: 0.0033 ft/ft

Manning's n: 0.0320

Flow: 15.6000 cfs

Result Parameters

Depth: 1.3817 ft

Area of Flow: 7.6359 ft^2

Wetted Perimeter: 11.3934 ft

Hydraulic Radius: 0.6702 ft

Average Velocity: 2.0430 ft/s

Top Width: 11.0533 ft

Froude Number: 0.4332

Critical Depth: 0.9887 ft

Critical Velocity: 3.9897 ft/s

Critical Slope: 0.0197 ft/ft

Critical Top Width: 7.91 ft

Calculated Max Shear Stress: 0.2845 lb/ft^2

Calculated Avg Shear Stress: 0.1380 lb/ft^2

Channel Analysis: CH-4

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 4.0000 ft/ft

Side Slope 2 (Z2): 4.0000 ft/ft

Longitudinal Slope: 0.0022 ft/ft

Manning's n: 0.0320

Flow: 10.9000 cfs

Result Parameters

Depth: 1.3033 ft

Area of Flow: 6.7939 ft^2

Wetted Perimeter: 10.7470 ft

Hydraulic Radius: 0.6322 ft

Average Velocity: 1.6044 ft/s

Top Width: 10.4261 ft

Froude Number: 0.3502

Critical Depth: 0.8566 ft

Critical Velocity: 3.7137 ft/s

Critical Slope: 0.0206 ft/ft

Critical Top Width: 6.85 ft

Calculated Max Shear Stress: 0.1789 lb/ft^2

Calculated Avg Shear Stress: 0.0868 lb/ft^2

Channel Analysis: CH-6A

Notes:

Input Parameters

Channel Type: Trapezoidal

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Channel Width: 3.0000 ft

Longitudinal Slope: 0.0057 ft/ft

Manning's n: 0.0320

Flow: 17.6000 cfs

Result Parameters

Depth: 1.0581 ft

Area of Flow: 6.5326 ft^2

Wetted Perimeter: 9.6918 ft

Hydraulic Radius: 0.6740 ft

Average Velocity: 2.6942 ft/s

Top Width: 9.3484 ft

Froude Number: 0.5680

Critical Depth: 0.7850 ft

Critical Velocity: 4.1866 ft/s

Critical Slope: 0.0191 ft/ft

Critical Top Width: 7.71 ft

Calculated Max Shear Stress: 0.3763 lb/ft^2

Calculated Avg Shear Stress: 0.2397 lb/ft^2

Channel Analysis: CH-6B

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 4.0000 ft/ft

Side Slope 2 (Z2): 4.0000 ft/ft

Longitudinal Slope: 0.0039 ft/ft

Manning's n: 0.0320

Flow: 3.0000 cfs

Result Parameters

Depth: 0.7216 ft

Area of Flow: 2.0828 ft^2

Wetted Perimeter: 5.9505 ft

Hydraulic Radius: 0.3500 ft

Average Velocity: 1.4404 ft/s

Top Width: 5.7728 ft

Froude Number: 0.4226

Critical Depth: 0.5113 ft

Critical Velocity: 2.8691 ft/s

Critical Slope: 0.0245 ft/ft

Critical Top Width: 4.09 ft

Calculated Max Shear Stress: 0.1756 lb/ft^2

Calculated Avg Shear Stress: 0.0852 lb/ft^2

Channel Analysis: CH-7A

Notes:

Input Parameters

Channel Type: Trapezoidal

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Channel Width: 8.0000 ft

Longitudinal Slope: 0.0024 ft/ft

Manning's n: 0.0320

Flow: 20.1000 cfs

Result Parameters

Depth: 0.9766 ft

Area of Flow: 10.6746 ft^2

Wetted Perimeter: 14.1768 ft

Hydraulic Radius: 0.7530 ft

Average Velocity: 1.8830 ft/s

Top Width: 13.8599 ft

Froude Number: 0.3781

Critical Depth: 0.5412 ft

Critical Velocity: 3.8593 ft/s

Critical Slope: 0.0197 ft/ft

Critical Top Width: 11.25 ft

Calculated Max Shear Stress: 0.1463 lb/ft^2

Calculated Avg Shear Stress: 0.1128 lb/ft^2

Channel Analysis: CH-7B

Notes:

Input Parameters

Channel Type: Trapezoidal

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Channel Width: 10.0000 ft

Longitudinal Slope: 0.0022 ft/ft

Manning's n: 0.0320

Flow: 37.1000 cfs

Result Parameters

Depth: 1.2626 ft

Area of Flow: 17.4090 ft^2

Wetted Perimeter: 17.9856 ft

Hydraulic Radius: 0.9679 ft

Average Velocity: 2.1311 ft/s

Top Width: 17.5758 ft

Froude Number: 0.3773

Critical Depth: 0.6999 ft

Critical Velocity: 4.3811 ft/s

Critical Slope: 0.0181 ft/ft

Critical Top Width: 14.20 ft

Calculated Max Shear Stress: 0.1733 lb/ft^2

Calculated Avg Shear Stress: 0.1329 lb/ft^2

Channel Analysis: CH-10A

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 4.0000 ft/ft

Side Slope 2 (Z2): 4.0000 ft/ft

Longitudinal Slope: 0.0043 ft/ft

Manning's n: 0.0320

Flow: 1.4000 cfs

Result Parameters

Depth: 0.5324 ft

Area of Flow: 1.1337 ft^2

Wetted Perimeter: 4.3901 ft

Hydraulic Radius: 0.2582 ft

Average Velocity: 1.2349 ft/s

Top Width: 4.2591 ft

Froude Number: 0.4218

Critical Depth: 0.3769 ft

Critical Velocity: 2.4635 ft/s

Critical Slope: 0.0271 ft/ft

Critical Top Width: 3.02 ft

Calculated Max Shear Stress: 0.1428 lb/ft^2

Calculated Avg Shear Stress: 0.0693 lb/ft^2

Channel Analysis: CH-10B

Notes:

Input Parameters

Channel Type: Triangular

Side Slope 1 (Z1): 4.0000 ft/ft

Side Slope 2 (Z2): 4.0000 ft/ft

Longitudinal Slope: 0.0070 ft/ft

Manning's n: 0.0320

Flow: 14.0000 cfs

Result Parameters

Depth: 1.1522 ft

Area of Flow: 5.3106 ft^2

Wetted Perimeter: 9.5016 ft

Hydraulic Radius: 0.5589 ft

Average Velocity: 2.6362 ft/s

Top Width: 9.2179 ft

Froude Number: 0.6121

Critical Depth: 0.9468 ft

Critical Velocity: 3.9043 ft/s

Critical Slope: 0.0199 ft/ft

Critical Top Width: 7.57 ft

Calculated Max Shear Stress: 0.5033 lb/ft^2

Calculated Avg Shear Stress: 0.2441 lb/ft^2

Channel Analysis: CH-15

Notes:

Input Parameters

Channel Type: Trapezoidal

Side Slope 1 (Z1): 3.0000 ft/ft

Side Slope 2 (Z2): 3.0000 ft/ft

Channel Width: 3.0000 ft

Longitudinal Slope: 0.0028 ft/ft

Manning's n: 0.0320

Flow: 12.3000 cfs

Result Parameters

Depth: 1.0564 ft

Area of Flow: 6.5176 ft^2

Wetted Perimeter: 9.6816 ft

Hydraulic Radius: 0.6732 ft

Average Velocity: 1.8872 ft/s

Top Width: 9.3387 ft

Froude Number: 0.3981

Critical Depth: 0.6452 ft

Critical Velocity: 3.8623 ft/s

Critical Slope: 0.0201 ft/ft

Critical Top Width: 6.87 ft

Calculated Max Shear Stress: 0.1846 lb/ft^2

Calculated Avg Shear Stress: 0.1176 lb/ft^2

PROJ: Red Rock Village 60 ac
DETAIL: n-a

$$FB = 0.25\left(y + \frac{V^2}{2g}\right)$$

*From PCDM VOL II eq. 6.7

Channel ID	Flow Depth (ft)	Velocity (fps)	Freeboard (ft)	Total Depth
Ch-1	1	1.8	0.28	1.28
CH-2	1.2	2.9	0.37	1.57
CH-3	1.4	2	0.38	1.78
CH-4	1.3	1.6	0.34	1.64
CH-6A	1.1	2.7	0.33	1.43
Ch-6B	0.7	1.4	0.19	0.89
CH-7A	1	1.9	0.28	1.28
CH-7B	1.3	2.1	0.36	1.66
CH-10A	0.5	1.2	0.14	0.64
CH-10B	1.2	2.6	0.35	1.55

Retention Volume Calculations

PROJ:
DETAIL:

Red Rock Village-60 ac
Table 2-1 (Pinal County Hydrology Manual)

JE FULLER

Retention Basin ID: R-1

Drainage Area by LU	Lots	0.77	(ac)	
	Open Spaces	0.81	(ac)	
	Roads	0	(ac)	
	Total	1.58	(ac)	
Weighted Curve Number	C_W	0.66	dimless	
Required Retention Volume	A	1.58	(ac)	
	P	2.29	(in)	*100Y 2HR Precip. Depths
	C_W	0.66	dimless	
	V_R	0.20	(ac-ft)	*$V = C_W(P/12)A$

Required retention volume for: R-1	0.20	(ac-ft)	
Approx. Required "footprint" at 3-ft deep for: R-1	0.07	(ac)	

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	8615.3	cu-ft	=	0.20	ac-ft
	Required Side Slopes	4	H:1V			
D =	Depth of Pond	3	ft			
At =	Pond Surface Area	5,445.0	sq-ft	=	0.125	ac
Ab =	Calculated Bottom Area	2,479.1	sq-ft			
	Volume Provided	11,598.10	sq-ft	=	0.27	ac-ft
					check:	WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	8615.3	cu-ft	=	0.20	
	Required Side Slopes	4.0	H:1V			
D =	Depth of Pond	4.0	ft			
At =	Pond Surface Area	5445.0	sq-ft	=	0.125	
Ab =	Calculated Bottom Area	1746.4	sq-ft			
	Volume Provided at 3-ft	11598.1	sq-ft	=	0.20	ac-ft
	Volume Provided at 3-ft (WITH 1	13700.2	sq-ft	=	0.31	ac-ft
					CHECK:	WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	5,445	0.13	5,445	0.00	0.00	0.00
3.75	0.25	4.0	5,445	0.13	5,154	1324.69	49.06	0.03
3.50	0.25	4.0	5,154	0.12	4,871	1252.90	46.40	0.03
3.25	0.25	4.0	4,871	0.11	4,596	1183.11	43.82	0.03
3.00	0.25	4.0	4,596	0.11	4,328	1115.32	41.31	0.03
2.75	0.25	4.0	4,328	0.10	4,069	1049.53	38.87	0.02
2.50	0.25	4.0	4,069	0.09	3,818	985.74	36.51	0.02
2.25	0.25	4.0	3,818	0.09	3,575	923.95	34.22	0.02
2.00	0.25	4.0	3,575	0.08	3,340	864.16	32.01	0.02
1.75	0.25	4.0	3,340	0.08	3,113	806.37	29.87	0.02
1.50	0.25	4.0	3,113	0.07	2,893	750.58	27.80	0.02
1.25	0.25	4.0	2,893	0.07	2,682	696.79	25.81	0.02
1.00	0.25	4.0	2,682	0.06	2,479	645.00	23.89	0.01
0.75	0.25	4.0	2,479	0.06	2,284	595.21	22.04	0.01
0.50	0.25	4.0	2,284	0.05	2,097	547.42	20.27	0.01
0.25	0.25	4.0	2,097	0.05	1,918	501.62	18.58	0.01
0.00	0.25	4.0	1,918	0.04	1,746	457.83	16.96	0.01

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-2

Drainage Area by LU	Lots	1.65	(ac)	
	Open Spaces	2.15	(ac)	
	Roads	0	(ac)	
	Total	3.80	(ac)	
Weighted Curve Number	C_W	0.64	dimless	
Required Retention Volume	A	3.80	(ac)	
	P	2.29	(in)	*100Y 2HR Precip. Depths
	C_W	0.64	dimless	
	V_R	0.46	(ac-ft)	* $V = C_W(P/12)A$

Required retention volume for: R-2	0.46	(ac-ft)
Required "footprint" at 3-ft deep for: R-2	0.15	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	20183.2	cu-ft	=	0.46 ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	10,454.4	sq-ft	=	0.24 ac
Ab =	Calculated Bottom Area	6,122.6	sq-ft		
	Volume Provided	24,577.43	sq-ft	=	0.56 ac-ft
					check: WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	20183.2	cu-ft	=	0.46
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	10454.4	sq-ft	=	0.24
Ab =	Calculated Bottom Area	4934.6	sq-ft		
	Volume Provided at 3-ft	24577.4	sq-ft	=	0.47 ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	30095.3	sq-ft	=	0.69 ac-ft
					CHECK: WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	10,454	0.24	10,454	0.00	0.00	0.00
3.75	0.25	4.0	10,454	0.24	10,049	2562.81	94.92	0.06
3.50	0.25	4.0	10,049	0.23	9,652	2462.56	91.21	0.06
3.25	0.25	4.0	9,652	0.22	9,263	2364.32	87.57	0.05
3.00	0.25	4.0	9,263	0.21	8,882	2268.07	84.00	0.05
2.75	0.25	4.0	8,882	0.20	8,509	2173.82	80.51	0.05
2.50	0.25	4.0	8,509	0.20	8,144	2081.58	77.10	0.05
2.25	0.25	4.0	8,144	0.19	7,787	1991.33	73.75	0.05
2.00	0.25	4.0	7,787	0.18	7,439	1903.08	70.48	0.04
1.75	0.25	4.0	7,439	0.17	7,098	1816.84	67.29	0.04
1.50	0.25	4.0	7,098	0.16	6,765	1732.59	64.17	0.04
1.25	0.25	4.0	6,765	0.16	6,440	1650.34	61.12	0.04
1.00	0.25	4.0	6,440	0.15	6,123	1570.10	58.15	0.04
0.75	0.25	4.0	6,123	0.14	5,814	1491.85	55.25	0.03
0.50	0.25	4.0	5,814	0.13	5,513	1415.60	52.43	0.03
0.25	0.25	4.0	5,513	0.13	5,220	1341.36	49.68	0.03
0.00	0.25	4.0	5,220	0.12	4,935	1269.11	47.00	0.03

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-3

Drainage Area by LU		Lots	2.01	(ac)	
		Open Spaces	2.43	(ac)	
		Roads	0	(ac)	
		Total	4.44	(ac)	
Weighted Curve Number	C_W		0.64	dimless	
Required Retention Volume	A		4.44	(ac)	
	P		2.29	(in)	*100Y 2HR Precip. Depths
	C_W		0.64	dimless	
	V_R		0.55	(ac-ft)	* $V = C_W (P/12)A$

Required retention volume for: R-3	0.55	(ac-ft)
Required "footprint" at 3-ft deep for: R-3	0.18	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	23800.9	cu-ft	=	0.55	ac-ft
	Required Side Slopes	4	H:1V			
D =	Depth of Pond	3	ft			
At =	Pond Surface Area	12,196.8	sq-ft	=	0.28	ac
Ab =	Calculated Bottom Area	7,471.7	sq-ft			
	Volume Provided	29,214.78	sq-ft	=	0.67	ac-ft
					check:	WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	23800.9	cu-ft	=	0.55	ac-ft
	Required Side Slopes	4.0	H:1V			
D =	Depth of Pond	4.0	ft			
At =	Pond Surface Area	12196.8	sq-ft	=	0.28	ac
Ab =	Calculated Bottom Area	6152.7	sq-ft			
	Volume Provided at 3-ft	29214.8	sq-ft	=	0.57	ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	36016.3	sq-ft	=	0.83	ac-ft
					CHECK:	WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	12,197	0.28	12,197	0.00	0.00	0.00
3.75	0.25	4.0	12,197	0.28	11,759	2994.31	110.90	0.07
3.50	0.25	4.0	11,759	0.27	11,329	2885.87	106.88	0.07
3.25	0.25	4.0	11,329	0.26	10,908	2779.44	102.94	0.06
3.00	0.25	4.0	10,908	0.25	10,494	2675.00	99.07	0.06
2.75	0.25	4.0	10,494	0.24	10,088	2572.56	95.28	0.06
2.50	0.25	4.0	10,088	0.23	9,690	2472.12	91.56	0.06
2.25	0.25	4.0	9,690	0.22	9,301	2373.68	87.91	0.05
2.00	0.25	4.0	9,301	0.21	8,919	2277.24	84.34	0.05
1.75	0.25	4.0	8,919	0.20	8,545	2182.80	80.84	0.05
1.50	0.25	4.0	8,545	0.20	8,179	2090.36	77.42	0.05
1.25	0.25	4.0	8,179	0.19	7,821	1999.92	74.07	0.05
1.00	0.25	4.0	7,821	0.18	7,472	1911.48	70.80	0.04
0.75	0.25	4.0	7,472	0.17	7,130	1825.04	67.59	0.04
0.50	0.25	4.0	7,130	0.16	6,796	1740.61	64.47	0.04
0.25	0.25	4.0	6,796	0.16	6,470	1658.17	61.41	0.04
0.00	0.25	4.0	6,470	0.15	6,153	1577.73	58.43	0.04

PROJ:
DETAIL:

Red Rock Village-60 ac
Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-4

Drainage Area by LU		Lots	1.12	(ac)	
		Open Spaces	1.92	(ac)	
		Roads	0	(ac)	
		Total	3.04	(ac)	
Weighted Curve Number	C_W		0.62	dimless	
Required Retention Volume	A		3.04	(ac)	
	P		2.29	(in)	*100Y 2HR Precip. Depths
	C_W		0.62	dimless	
	V_R		0.36	(ac-ft)	* $V = C_W(P/12)A$

Required retention volume for: R-4	0.36	(ac-ft)
Required "footprint" at 3-ft deep for: R-4	0.12	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	15614.6	cu-ft	=	0.36	ac-ft
	Required Side Slopes	4	H:1V			
D =	Depth of Pond	3	ft			
At =	Pond Surface Area	8,712.0	sq-ft	=	0.2	ac
Ab =	Calculated Bottom Area	4,807.8	sq-ft			
	Volume Provided	19,991.66	sq-ft	=	0.46	ac-ft
					check:	WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	15614.6	cu-ft	=	0.36	ac-ft
	Required Side Slopes	4.0	H:1V			
D =	Depth of Pond	4.0	ft			
At =	Pond Surface Area	8712.0	sq-ft	=	0.2	ac
Ab =	Calculated Bottom Area	3762.4	sq-ft			
	Volume Provided at 3-ft	19991.7	sq-ft	=	0.37	ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	24266.1	sq-ft	=	0.56	ac-ft
					CHECK:	WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	8,712	0.20	8,712	0.00	0.00	0.00
3.75	0.25	4.0	8,712	0.20	8,343	2131.66	78.95	0.05
3.50	0.25	4.0	8,343	0.19	7,981	2040.33	75.57	0.05
3.25	0.25	4.0	7,981	0.18	7,628	1950.99	72.26	0.04
3.00	0.25	4.0	7,628	0.18	7,283	1863.65	69.02	0.04
2.75	0.25	4.0	7,283	0.17	6,945	1778.31	65.86	0.04
2.50	0.25	4.0	6,945	0.16	6,616	1694.97	62.78	0.04
2.25	0.25	4.0	6,616	0.15	6,295	1613.64	59.76	0.04
2.00	0.25	4.0	6,295	0.14	5,981	1534.30	56.83	0.04
1.75	0.25	4.0	5,981	0.14	5,676	1456.96	53.96	0.03
1.50	0.25	4.0	5,676	0.13	5,378	1381.62	51.17	0.03
1.25	0.25	4.0	5,378	0.12	5,089	1308.28	48.45	0.03
1.00	0.25	4.0	5,089	0.12	4,808	1236.95	45.81	0.03
0.75	0.25	4.0	4,808	0.11	4,534	1167.61	43.24	0.03
0.50	0.25	4.0	4,534	0.10	4,269	1100.27	40.75	0.03
0.25	0.25	4.0	4,269	0.10	4,012	1034.93	38.33	0.02
0.00	0.25	4.0	4,012	0.09	3,762	971.59	35.98	0.02

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

JE FULLER

Retention Basin ID: R-5

Drainage Area by LU	Lots	0.55	(ac)	
	Open Spaces	0.85	(ac)	
	Roads	0.62	(ac)	
	Total	2.02	(ac)	
Weighted Curve Number	C_W	0.73	dimless	
Required Retention Volume	A	2.02	(ac)	
	P	2.29	(in)	*100Y 2HR Precip. Depths
	C_W	0.73	dimless	
	V_R	0.28	(ac-ft)	* $V = C_W(P/12)A$

Required retention volume for: R-5	0.28	(ac-ft)
Required "footprint" at 3-ft deep for: R-5	0.09	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	12178.1 cu-ft	=	0.28	ac-ft
	Required Side Slopes	4 H:1V			
D =	Depth of Pond	3 ft			
At =	Pond Surface Area	6,969.6 sq-ft	=	0.16	ac
Ab =	Calculated Bottom Area	3,538.4 sq-ft			
	Volume Provided	15,473.94 sq-ft	=	0.36	ac-ft
				check:	WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	12178.1 cu-ft	=	0.28	ac-ft
	Required Side Slopes	4.0 H:1V			
D =	Depth of Pond	4.0 ft			
At =	Pond Surface Area	6969.6 sq-ft	=	0.16	ac
Ab =	Calculated Bottom Area	2650.6 sq-ft			
	Volume Provided at 3-ft	15473.9 sq-ft	=	0.28	ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	18557.8 sq-ft	=	0.43	ac-ft
				CHECK:	WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	6,970	0.16	6,970	0.00	0.00	0.00
3.75	0.25	4.0	6,970	0.16	6,640	1700.99	63.00	0.04
3.50	0.25	4.0	6,640	0.15	6,318	1619.51	59.98	0.04
3.25	0.25	4.0	6,318	0.15	6,004	1540.02	57.04	0.04
3.00	0.25	4.0	6,004	0.14	5,698	1462.54	54.17	0.03
2.75	0.25	4.0	5,698	0.13	5,400	1387.05	51.37	0.03
2.50	0.25	4.0	5,400	0.12	5,110	1313.57	48.65	0.03
2.25	0.25	4.0	5,110	0.12	4,828	1242.09	46.00	0.03
2.00	0.25	4.0	4,828	0.11	4,554	1172.60	43.43	0.03
1.75	0.25	4.0	4,554	0.10	4,288	1105.12	40.93	0.03
1.50	0.25	4.0	4,288	0.10	4,030	1039.63	38.50	0.02
1.25	0.25	4.0	4,030	0.09	3,780	976.15	36.15	0.02
1.00	0.25	4.0	3,780	0.09	3,538	914.67	33.88	0.02
0.75	0.25	4.0	3,538	0.08	3,304	855.18	31.67	0.02
0.50	0.25	4.0	3,304	0.08	3,078	797.70	29.54	0.02
0.25	0.25	4.0	3,078	0.07	2,861	742.21	27.49	0.02
0.00	0.25	4.0	2,861	0.07	2,651	688.73	25.51	0.02

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

JE FULLER

Retention Basin ID: R-6

Drainage Area by LU		Lots	3.1	(ac)
		Open Spaces	1.61	(ac)
		Roads	0.78	(ac)
		Total	5.49	(ac)
Weighted Curve Number	C_W		0.74	dimless
Required Retention Volume	A		5.49	(ac)
	P		2.29	(in)
	C_W		0.74	dimless
	V_R		0.78	(ac-ft)

*100Y 2HR Precip. Depths

* $V = C_W(P/12)A$

Required retention volume for: R-6	0.78	(ac-ft)
Required "footprint" at 3-ft deep for: R-6	0.26	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	33969.8	cu-ft	= 0.78	ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	16,117.2	sq-ft	= 0.37	ac
Ab =	Calculated Bottom Area	10,599.4	sq-ft		
	Volume Provided	39,786.95	sq-ft	= 0.91	ac-ft
				check:	WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	33969.8	cu-ft	= 0.78	ac-ft
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	16117.2	sq-ft	= 0.37	ac
Ab =	Calculated Bottom Area	9016.2	sq-ft		
	Volume Provided at 3-ft	39786.9	sq-ft	= 0.79	ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	49584.1	sq-ft	= 1.14	ac-ft
				CHECK:	WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	16,117	0.37	16,117	0.00	0.00	0.00
3.75	0.25	4.0	16,117	0.37	15,613	3966.16	146.89	0.09
3.50	0.25	4.0	15,613	0.36	15,118	3841.20	142.27	0.09
3.25	0.25	4.0	15,118	0.35	14,630	3718.25	137.71	0.09
3.00	0.25	4.0	14,630	0.34	14,150	3597.30	133.23	0.08
2.75	0.25	4.0	14,150	0.32	13,678	3478.34	128.83	0.08
2.50	0.25	4.0	13,678	0.31	13,214	3361.39	124.50	0.08
2.25	0.25	4.0	13,214	0.30	12,759	3246.44	120.24	0.07
2.00	0.25	4.0	12,759	0.29	12,311	3133.48	116.05	0.07
1.75	0.25	4.0	12,311	0.28	11,871	3022.53	111.95	0.07
1.50	0.25	4.0	11,871	0.27	11,439	2913.57	107.91	0.07
1.25	0.25	4.0	11,439	0.26	11,015	2806.62	103.95	0.06
1.00	0.25	4.0	11,015	0.25	10,599	2701.67	100.06	0.06
0.75	0.25	4.0	10,599	0.24	10,192	2598.71	96.25	0.06
0.50	0.25	4.0	10,192	0.23	9,792	2497.76	92.51	0.06
0.25	0.25	4.0	9,792	0.22	9,400	2398.81	88.84	0.06
0.00	0.25	4.0	9,400	0.22	9,016	2301.85	85.25	0.05

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-7A

Drainage Area by LU		Lots	2.25	(ac)
		Open Spaces	0.52	(ac)
		Roads	1.77	(ac)
		Total	4.54	(ac)
Weighted Curve Number	C_W		0.83	dimless
Required Retention Volume	A		4.54	(ac)
	P		2.29	(in)
	C_W		0.83	dimless
	V_R		0.72	(ac-ft)

*100Y 2HR Precip. Depths

* $V = C_W(P/12)A$

Required retention volume for: R-7A	0.72	(ac-ft)
Required "footprint" at 3-ft deep for: R-7A	0.24	(ac)

Input Required
Calc'd

PROJ: Red Rock Village-60 ac

DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-7B

Drainage Area by LU	Lots	2.09	(ac)	
	Open Spaces	0.5	(ac)	
	Roads	1.15	(ac)	
	Total	3.74	(ac)	
Weighted Curve Number	C_W	0.82	dimless	
Required Retention Volume	A	3.74	(ac)	
	P	2.29	(in)	*100Y 2HR Precip. Depths
	C_W	0.82	dimless	
	V_R	0.58	(ac-ft)	* $V = C_W(P/12)A$

Required retention volume for: R-7B	0.58	(ac-ft)
Required "footprint" at 3-ft deep for: R-7B	0.19	(ac)

Input Required

Calc'd

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-7C

Drainage Area by LU	Lots	1.76	(ac)	
	Open Spaces	1.69	(ac)	
	Roads	1.07	(ac)	
	Total	4.52	(ac)	
Weighted Curve Number	C_W	0.73	dimless	
Required Retention Volume	A	4.52	(ac)	
	P	2.29	(in)	*100Y 2HR Precip. Depths
	C_W	0.73	dimless	
	V_R	0.63	(ac-ft)	* $V = C_W(P/12)A$

Required retention volume for:	R-7C	0.63	(ac-ft)
Required "footprint" at 3-ft deep for:	R-7C	0.21	(ac)
	Total from R7A-D	1.93	ac-ft
			Input Required
			Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	84070.8	cu-ft	=	1.93 ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	39,204.0	sq-ft	=	0.9 ac
Ab =	Calculated Bottom Area	30,276.0	sq-ft		
	Volume Provided	103,932.00	sq-ft	=	2.39 ac-ft
					check: WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	84070.8	cu-ft	=	1.93 ac-ft
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	39204.0	sq-ft	=	0.9 ac
Ab =	Calculated Bottom Area	27556.0	sq-ft		
	Volume Provided at 3-ft	103932.0	sq-ft	=	2.19 ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	132837.3	sq-ft	=	3.05 ac-ft
					CHECK: WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	39,204	0.90	39,204	0.00	0.00	0.00
3.75	0.25	4.0	39,204	0.90	38,416	9702.33	359.35	0.22
3.50	0.25	4.0	38,416	0.88	37,636	9506.33	352.09	0.22
3.25	0.25	4.0	37,636	0.86	36,864	9312.33	344.90	0.21
3.00	0.25	4.0	36,864	0.85	36,100	9120.33	337.79	0.21
2.75	0.25	4.0	36,100	0.83	35,344	8930.33	330.75	0.21
2.50	0.25	4.0	35,344	0.81	34,596	8742.33	323.79	0.20
2.25	0.25	4.0	34,596	0.79	33,856	8556.33	316.90	0.20
2.00	0.25	4.0	33,856	0.78	33,124	8372.33	310.09	0.19
1.75	0.25	4.0	33,124	0.76	32,400	8190.33	303.35	0.19
1.50	0.25	4.0	32,400	0.74	31,684	8010.33	296.68	0.18
1.25	0.25	4.0	31,684	0.73	30,976	7832.33	290.09	0.18
1.00	0.25	4.0	30,976	0.71	30,276	7656.33	283.57	0.18
0.75	0.25	4.0	30,276	0.70	29,584	7482.33	277.12	0.17
0.50	0.25	4.0	29,584	0.68	28,900	7310.33	270.75	0.17
0.25	0.25	4.0	28,900	0.66	28,224	7140.33	264.46	0.16
0.00	0.25	4.0	28,224	0.65	27,556	6972.33	258.23	0.16

PROJ: Red Rock Village-60 ac

DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-7D

Drainage Area by LU	Lots	2.09	(ac)	
	Open Spaces	0.5	(ac)	
	Roads	0.89	(ac)	
	Total	3.48	(ac)	
Weighted Curve Number	C_W	0.81	dimless	
Required Retention Volume	A	3.48	(ac)	
	P	2.29	(in)	*100Y 2HR Precip. Depths
	C_W	0.81	dimless	
	V_R	0.54	(ac-ft)	* $V = C_W(P/12)A$

Required retention volume for: R-7D	0.54	(ac-ft)
Required "footprint" at 3-ft deep for: R-7D	0.18	(ac)

Input Required

Calc'd

PROJ:
DETAIL:

Red Rock Village-60 ac
Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-8

Drainage Area by LU	Lots	2.2	(ac)	
	Open Spaces	0.42	(ac)	
	Roads	0.9	(ac)	
	Total	3.52	(ac)	
Weighted Curve Number	C_W	0.82	dimless	
Required Retention Volume	A	3.52	(ac)	
	P	2.29	(in)	*100Y 2HR Precip. Depths
	C_W	0.82	dimless	
	V_R	0.55	(ac-ft)	* $V = C_W(P/12)A$

Required retention volume for: R-8	0.55	(ac-ft)
Required "footprint" at 3-ft deep for: R-8	0.18	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	23849.1	cu-ft	=	0.55 ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	12,196.8	sq-ft	=	0.28 ac
Ab =	Calculated Bottom Area	7,471.7	sq-ft		
	Volume Provided	29,214.78	sq-ft	=	0.67 ac-ft
					check: WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	23849.1	cu-ft	=	0.55
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	12196.8	sq-ft	=	0.28
Ab =	Calculated Bottom Area	6152.7	sq-ft		
	Volume Provided at 3-ft	29214.8	sq-ft	=	0.57 ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	36016.3	sq-ft	=	0.83 ac-ft
					CHECK: WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	12,197	0.28	12,197	0.00	0.00	0.00
3.75	0.25	4.0	12,197	0.28	11,759	2994.31	110.90	0.07
3.50	0.25	4.0	11,759	0.27	11,329	2885.87	106.88	0.07
3.25	0.25	4.0	11,329	0.26	10,908	2779.44	102.94	0.06
3.00	0.25	4.0	10,908	0.25	10,494	2675.00	99.07	0.06
2.75	0.25	4.0	10,494	0.24	10,088	2572.56	95.28	0.06
2.50	0.25	4.0	10,088	0.23	9,690	2472.12	91.56	0.06
2.25	0.25	4.0	9,690	0.22	9,301	2373.68	87.91	0.05
2.00	0.25	4.0	9,301	0.21	8,919	2277.24	84.34	0.05
1.75	0.25	4.0	8,919	0.20	8,545	2182.80	80.84	0.05
1.50	0.25	4.0	8,545	0.20	8,179	2090.36	77.42	0.05
1.25	0.25	4.0	8,179	0.19	7,821	1999.92	74.07	0.05
1.00	0.25	4.0	7,821	0.18	7,472	1911.48	70.80	0.04
0.75	0.25	4.0	7,472	0.17	7,130	1825.04	67.59	0.04
0.50	0.25	4.0	7,130	0.16	6,796	1740.61	64.47	0.04
0.25	0.25	4.0	6,796	0.16	6,470	1658.17	61.41	0.04
0.00	0.25	4.0	6,470	0.15	6,153	1577.73	58.43	0.04

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-9

Drainage Area by LU	Lots	1.33	(ac)	
	Open Spaces	0.12	(ac)	
	Roads	0.47	(ac)	
	Total	1.92	(ac)	
Weighted Curve Number	C_W	0.83	dimless	
Required Retention Volume	A	1.92	(ac)	
	P	2.29	(in)	*100Y 2HR Precip. Depths
	C_W	0.83	dimless	
	V_R	0.30	(ac-ft)	* $V = C_W(P/12)A$

Required retention volume for: R-9	0.30	(ac-ft)
Required "footprint" at 3-ft deep for: R-9	0.10	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	13276.2	cu-ft	=	0.30 ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	7,840.8	sq-ft	=	0.18 ac
Ab =	Calculated Bottom Area	4,166.5	sq-ft		
	Volume Provided	17,722.92	sq-ft	=	0.41 ac-ft
					check: WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	13276.2	cu-ft	=	0.30
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	7840.8	sq-ft	=	0.18
Ab =	Calculated Bottom Area	3197.7	sq-ft		
	Volume Provided at 3-ft	17722.9	sq-ft	=	0.33 ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	21394.4	sq-ft	=	0.49 ac-ft
					CHECK: WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	7,841	0.18	7,841	0.00	0.00	0.00
3.75	0.25	4.0	7,841	0.18	7,491	1916.26	70.97	0.04
3.50	0.25	4.0	7,491	0.17	7,148	1829.71	67.77	0.04
3.25	0.25	4.0	7,148	0.16	6,814	1745.16	64.64	0.04
3.00	0.25	4.0	6,814	0.16	6,488	1662.61	61.58	0.04
2.75	0.25	4.0	6,488	0.15	6,170	1582.07	58.60	0.04
2.50	0.25	4.0	6,170	0.14	5,860	1503.52	55.69	0.03
2.25	0.25	4.0	5,860	0.13	5,557	1426.97	52.85	0.03
2.00	0.25	4.0	5,557	0.13	5,263	1352.42	50.09	0.03
1.75	0.25	4.0	5,263	0.12	4,977	1279.87	47.40	0.03
1.50	0.25	4.0	4,977	0.11	4,699	1209.32	44.79	0.03
1.25	0.25	4.0	4,699	0.11	4,429	1140.78	42.25	0.03
1.00	0.25	4.0	4,429	0.10	4,166	1074.23	39.79	0.02
0.75	0.25	4.0	4,166	0.10	3,912	1009.68	37.40	0.02
0.50	0.25	4.0	3,912	0.09	3,666	947.13	35.08	0.02
0.25	0.25	4.0	3,666	0.08	3,428	886.58	32.84	0.02
0.00	0.25	4.0	3,428	0.08	3,198	828.03	30.67	0.02

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-10

Drainage Area by LU		Lots	2.46	(ac)
		Open Spaces	0.49	(ac)
		Roads	0.58	(ac)
		Total	3.53	(ac)
Weighted Curve Number	C_W		0.80	dimless
Required Retention Volume	A		3.53	(ac)
	P		2.29	(in)
	C_W		0.80	dimless
	V_R		0.54	(ac-ft)

*100Y 2HR Precip. Depths

* $V = C_W (P/12)A$

Required retention volume for: R-10	0.54	(ac-ft)
Required "footprint" at 3-ft deep for: R-10	0.18	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	23385.3	cu-ft	=	0.54 ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	11,761.2	sq-ft	=	0.27 ac
Ab =	Calculated Bottom Area	7,131.6	sq-ft		
	Volume Provided	28,051.27	sq-ft	=	0.64 ac-ft
					check: WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	23385.3	cu-ft	=	0.54
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	11761.2	sq-ft	=	0.27
Ab =	Calculated Bottom Area	5844.5	sq-ft		
	Volume Provided at 3-ft	28051.3	sq-ft	=	0.54 ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	34528.7	sq-ft	=	0.79 ac-ft
					CHECK: WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	11,761	0.27	11,761	0.00	0.00	0.00
3.75	0.25	4.0	11,761	0.27	11,331	2886.41	106.90	0.07
3.50	0.25	4.0	11,331	0.26	10,910	2779.96	102.96	0.06
3.25	0.25	4.0	10,910	0.25	10,496	2675.51	99.09	0.06
3.00	0.25	4.0	10,496	0.24	10,090	2573.06	95.30	0.06
2.75	0.25	4.0	10,090	0.23	9,692	2472.61	91.58	0.06
2.50	0.25	4.0	9,692	0.22	9,302	2374.16	87.93	0.05
2.25	0.25	4.0	9,302	0.21	8,921	2277.71	84.36	0.05
2.00	0.25	4.0	8,921	0.20	8,547	2183.27	80.86	0.05
1.75	0.25	4.0	8,547	0.20	8,181	2090.82	77.44	0.05
1.50	0.25	4.0	8,181	0.19	7,823	2000.37	74.09	0.05
1.25	0.25	4.0	7,823	0.18	7,473	1911.92	70.81	0.04
1.00	0.25	4.0	7,473	0.17	7,132	1825.47	67.61	0.04
0.75	0.25	4.0	7,132	0.16	6,798	1741.02	64.48	0.04
0.50	0.25	4.0	6,798	0.16	6,472	1658.57	61.43	0.04
0.25	0.25	4.0	6,472	0.15	6,154	1578.12	58.45	0.04
0.00	0.25	4.0	6,154	0.14	5,844	1499.67	55.54	0.03

PROJ:
DETAIL:

Red Rock Village-60 ac
Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-11

Drainage Area by LU		Lots	2.09	(ac)
		Open Spaces	0.32	(ac)
		Roads	0.67	(ac)
		Total	3.08	(ac)
Weighted Curve Number	C_W		0.82	dimless
Required Retention Volume	A		3.08	(ac)
	P		2.29	(in)
	C_W		0.82	dimless
	V_R		0.48	(ac-ft)

*100Y 2HR Precip. Depths

* $V = C_W (P/12)A$

Required retention volume for: R-11	0.48	(ac-ft)
Required "footprint" at 3-ft deep for: R-11	0.16	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	20867.4	cu-ft	=	0.48 ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	10,890.0	sq-ft	=	0.25 ac
Ab =	Calculated Bottom Area	6,457.0	sq-ft		
	Volume Provided	25,732.43	sq-ft	=	0.59 ac-ft
					check: WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	20867.4	cu-ft	=	0.48
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	10890.0	sq-ft	=	0.25
Ab =	Calculated Bottom Area	5235.3	sq-ft		
	Volume Provided at 3-ft	25732.4	sq-ft	=	0.49 ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	31567.9	sq-ft	=	0.72 ac-ft
					CHECK: WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	10,890	0.25	10,890	0.00	0.00	0.00
3.75	0.25	4.0	10,890	0.25	10,477	2670.66	98.91	0.06
3.50	0.25	4.0	10,477	0.24	10,071	2568.30	95.12	0.06
3.25	0.25	4.0	10,071	0.23	9,674	2467.95	91.41	0.06
3.00	0.25	4.0	9,674	0.22	9,284	2369.59	87.76	0.05
2.75	0.25	4.0	9,284	0.21	8,903	2273.24	84.19	0.05
2.50	0.25	4.0	8,903	0.20	8,529	2178.88	80.70	0.05
2.25	0.25	4.0	8,529	0.20	8,164	2086.52	77.28	0.05
2.00	0.25	4.0	8,164	0.19	7,807	1996.17	73.93	0.05
1.75	0.25	4.0	7,807	0.18	7,457	1907.81	70.66	0.04
1.50	0.25	4.0	7,457	0.17	7,116	1821.46	67.46	0.04
1.25	0.25	4.0	7,116	0.16	6,782	1737.10	64.34	0.04
1.00	0.25	4.0	6,782	0.16	6,457	1654.75	61.29	0.04
0.75	0.25	4.0	6,457	0.15	6,140	1574.39	58.31	0.04
0.50	0.25	4.0	6,140	0.14	5,830	1496.04	55.41	0.03
0.25	0.25	4.0	5,830	0.13	5,529	1419.68	52.58	0.03
0.00	0.25	4.0	5,529	0.13	5,235	1345.33	49.83	0.03

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-12

Drainage Area by LU		Lots	2.2	(ac)	
		Open Spaces	0.21	(ac)	
		Roads	0.67	(ac)	
		Total	3.08	(ac)	
Weighted Curve Number	C_W		0.83	dimless	
Required Retention Volume	A		3.08	(ac)	
	P		2.29	(in)	*100Y 2HR Precip. Depths
	C_W		0.83	dimless	
	V_R		0.49	(ac-ft)	* $V = C_w(P/12)A$

Required retention volume for: R-12	0.49	(ac-ft)
Required "footprint" at 3-ft deep for: R-12	0.16	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	21160.0	cu-ft	=	0.49 ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	10,890.0	sq-ft	=	0.25 ac
Ab =	Calculated Bottom Area	6,457.0	sq-ft		
	Volume Provided	25,732.43	sq-ft	=	0.59 ac-ft
					check: WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	21160.0	cu-ft	=	0.49
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	10890.0	sq-ft	=	0.25
Ab =	Calculated Bottom Area	5235.3	sq-ft		
	Volume Provided at 3-ft	25732.4	sq-ft	=	0.49 ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	31567.9	sq-ft	=	0.72 ac-ft
					CHECK: WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	10,890	0.25	10,890	0.00	0.00	0.00
3.75	0.25	4.0	10,890	0.25	10,477	2670.66	98.91	0.06
3.50	0.25	4.0	10,477	0.24	10,071	2568.30	95.12	0.06
3.25	0.25	4.0	10,071	0.23	9,674	2467.95	91.41	0.06
3.00	0.25	4.0	9,674	0.22	9,284	2369.59	87.76	0.05
2.75	0.25	4.0	9,284	0.21	8,903	2273.24	84.19	0.05
2.50	0.25	4.0	8,903	0.20	8,529	2178.88	80.70	0.05
2.25	0.25	4.0	8,529	0.20	8,164	2086.52	77.28	0.05
2.00	0.25	4.0	8,164	0.19	7,807	1996.17	73.93	0.05
1.75	0.25	4.0	7,807	0.18	7,457	1907.81	70.66	0.04
1.50	0.25	4.0	7,457	0.17	7,116	1821.46	67.46	0.04
1.25	0.25	4.0	7,116	0.16	6,782	1737.10	64.34	0.04
1.00	0.25	4.0	6,782	0.16	6,457	1654.75	61.29	0.04
0.75	0.25	4.0	6,457	0.15	6,140	1574.39	58.31	0.04
0.50	0.25	4.0	6,140	0.14	5,830	1496.04	55.41	0.03
0.25	0.25	4.0	5,830	0.13	5,529	1419.68	52.58	0.03
0.00	0.25	4.0	5,529	0.13	5,235	1345.33	49.83	0.03

PROJ:
DETAIL:

Red Rock Village-60 ac
Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-13

Drainage Area by LU		Lots	1.54	(ac)
		Open Spaces	0.21	(ac)
		Roads	0.54	(ac)
		Total	2.29	(ac)
Weighted Curve Number	C_W		0.82	dimless
Required Retention Volume	A		2.29	(ac)
	P		2.29	(in)
	C_W		0.82	dimless
	V_R		0.36	(ac-ft)

*100Y 2HR Precip. Depths

* $V = C_W (P/12)A$

Required retention volume for: R-13	0.36	(ac-ft)
Required "footprint" at 3-ft deep for: R-13	0.12	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	15634.5	cu-ft	=	0.36 ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	8,712.0	sq-ft	=	0.2 ac
Ab =	Calculated Bottom Area	4,807.8	sq-ft		
	Volume Provided	19,991.66	sq-ft	=	0.46 ac-ft
					check: WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	15634.5	cu-ft	=	0.36
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	8712.0	sq-ft	=	0.2
Ab =	Calculated Bottom Area	3762.4	sq-ft		
	Volume Provided at 3-ft	19991.7	sq-ft	=	0.37 ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	24266.1	sq-ft	=	0.56 ac-ft
					CHECK: WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	8,712	0.20	8,712	0.00	0.00	0.00
3.75	0.25	4.0	8,712	0.20	8,343	2131.66	78.95	0.05
3.50	0.25	4.0	8,343	0.19	7,981	2040.33	75.57	0.05
3.25	0.25	4.0	7,981	0.18	7,628	1950.99	72.26	0.04
3.00	0.25	4.0	7,628	0.18	7,283	1863.65	69.02	0.04
2.75	0.25	4.0	7,283	0.17	6,945	1778.31	65.86	0.04
2.50	0.25	4.0	6,945	0.16	6,616	1694.97	62.78	0.04
2.25	0.25	4.0	6,616	0.15	6,295	1613.64	59.76	0.04
2.00	0.25	4.0	6,295	0.14	5,981	1534.30	56.83	0.04
1.75	0.25	4.0	5,981	0.14	5,676	1456.96	53.96	0.03
1.50	0.25	4.0	5,676	0.13	5,378	1381.62	51.17	0.03
1.25	0.25	4.0	5,378	0.12	5,089	1308.28	48.45	0.03
1.00	0.25	4.0	5,089	0.12	4,808	1236.95	45.81	0.03
0.75	0.25	4.0	4,808	0.11	4,534	1167.61	43.24	0.03
0.50	0.25	4.0	4,534	0.10	4,269	1100.27	40.75	0.03
0.25	0.25	4.0	4,269	0.10	4,012	1034.93	38.33	0.02
0.00	0.25	4.0	4,012	0.09	3,762	971.59	35.98	0.02

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-14

Drainage Area by LU	Lots	2.09	(ac)	
	Open Spaces	0.3	(ac)	
	Roads	0.66	(ac)	
	Total	3.05	(ac)	
Weighted Curve Number	C_W	0.82	dimless	
Required Retention Volume	A	3.05	(ac)	
	P	2.29	(in)	*100Y 2HR Precip. Depths
	C_W	0.82	dimless	
	V_R	0.48	(ac-ft)	* $V = C_W(P/12)A$

Required retention volume for: R-14	0.48	(ac-ft)
Required "footprint" at 3-ft deep for: R-14	0.16	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Requir	20705.3	cu-ft	=	0.48	ac-ft
	Required Side S	4	H:1V			
D =	Depth of Pond	3	ft			
At =	Pond Surface A	10,890.0	sq-ft	=	0.25	ac
Ab =	Calculated Bott	6,457.0	sq-ft			
	Volume Provide	25,732.43	sq-ft	=	0.59	ac-ft
					check:	WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Requir	20705.3	cu-ft	=	0.48	
	Required Side S	4.0	H:1V			
D =	Depth of Pond	4.0	ft			
At =	Pond Surface A	10890.0	sq-ft	=	0.25	
Ab =	Calculated Bott	5235.3	sq-ft			
	Volume Provide	25732.4	sq-ft	=	0.49	ac-ft
	Volume Provide	31567.9	sq-ft	=	0.72	ac-ft
					CHECK:	WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	10,890	0.25	10,890	0.00	0.00	0.00
3.75	0.25	4.0	10,890	0.25	10,477	2670.66	98.91	0.06
3.50	0.25	4.0	10,477	0.24	10,071	2568.30	95.12	0.06
3.25	0.25	4.0	10,071	0.23	9,674	2467.95	91.41	0.06
3.00	0.25	4.0	9,674	0.22	9,284	2369.59	87.76	0.05
2.75	0.25	4.0	9,284	0.21	8,903	2273.24	84.19	0.05
2.50	0.25	4.0	8,903	0.20	8,529	2178.88	80.70	0.05
2.25	0.25	4.0	8,529	0.20	8,164	2086.52	77.28	0.05
2.00	0.25	4.0	8,164	0.19	7,807	1996.17	73.93	0.05
1.75	0.25	4.0	7,807	0.18	7,457	1907.81	70.66	0.04
1.50	0.25	4.0	7,457	0.17	7,116	1821.46	67.46	0.04
1.25	0.25	4.0	7,116	0.16	6,782	1737.10	64.34	0.04
1.00	0.25	4.0	6,782	0.16	6,457	1654.75	61.29	0.04
0.75	0.25	4.0	6,457	0.15	6,140	1574.39	58.31	0.04
0.50	0.25	4.0	6,140	0.14	5,830	1496.04	55.41	0.03
0.25	0.25	4.0	5,830	0.13	5,529	1419.68	52.58	0.03
0.00	0.25	4.0	5,529	0.13	5,235	1345.33	49.83	0.03

PROJ: Red Rock Village-60 ac
DETAIL: Table 2-1 (Pinal County Hydrology Manual)

Retention Basin ID: R-15

Drainage Area by LU		Lots	2.2	(ac)	
		Open Spaces	0.38	(ac)	
		Roads	0.7	(ac)	
		Total	3.28	(ac)	
Weighted Curve Number	C_W		0.81	dimless	
Required Retention Volume	A		3.28	(ac)	
	P		2.29	(in)	*100Y 2HR Precip. Depths
	C_W		0.81	dimless	
	V_R		0.51	(ac-ft)	* $V = C_w(P/12)A$

Required retention volume for: R-15	0.51	(ac-ft)
Required "footprint" at 3-ft deep for: R-15	0.17	(ac)

Input Required
Calc'd

Retention Basin Geometry Calcs (NO FREEBOARD)

	Volume Required	22103.5	cu-ft	=	0.51 ac-ft
	Required Side Slopes	4	H:1V		
D =	Depth of Pond	3	ft		
At =	Pond Surface Area	11,325.6	sq-ft	=	0.26 ac
Ab =	Calculated Bottom Area	6,793.4	sq-ft		
	Volume Provided	26,890.43	sq-ft	=	0.62 ac-ft
					check: WORKS

Retention Basin Geometry Calcs (WITH FREEBOARD)

	Volume Required	22103.5	cu-ft	=	0.51
	Required Side Slopes	4.0	H:1V		
D =	Depth of Pond	4.0	ft		
At =	Pond Surface Area	11325.6	sq-ft	=	0.26
Ab =	Calculated Bottom Area	5538.6	sq-ft		
	Volume Provided at 3-ft	26890.4	sq-ft	=	0.52 ac-ft
	Volume Provided at 3-ft (WITH 1-ft FREEBOARD)	33045.7	sq-ft	=	0.76 ac-ft
					CHECK: WORKS

Incremental Pond Volume Calculation Table

Depth of Pond	Icremental Depth	Side Slopes (_H:1V)	Pond Surface Area		Calculated Bottom Area	APPROX INCR. VOLUME		
			SQ FT	AC	SQ FT	CU FT	CU YD	AC-FT
4.00	0.00	4.0	11,326	0.26	11,326	0.00	0.00	0.00
3.75	0.25	4.0	11,326	0.26	10,904	2778.52	102.91	0.06
3.50	0.25	4.0	10,904	0.25	10,490	2674.10	99.04	0.06
3.25	0.25	4.0	10,490	0.24	10,085	2571.68	95.25	0.06
3.00	0.25	4.0	10,085	0.23	9,687	2471.26	91.53	0.06
2.75	0.25	4.0	9,687	0.22	9,297	2372.84	87.88	0.05
2.50	0.25	4.0	9,297	0.21	8,915	2276.41	84.31	0.05
2.25	0.25	4.0	8,915	0.20	8,542	2181.99	80.81	0.05
2.00	0.25	4.0	8,542	0.20	8,176	2089.57	77.39	0.05
1.75	0.25	4.0	8,176	0.19	7,818	1999.15	74.04	0.05
1.50	0.25	4.0	7,818	0.18	7,469	1910.73	70.77	0.04
1.25	0.25	4.0	7,469	0.17	7,127	1824.30	67.57	0.04
1.00	0.25	4.0	7,127	0.16	6,793	1739.88	64.44	0.04
0.75	0.25	4.0	6,793	0.16	6,468	1657.46	61.39	0.04
0.50	0.25	4.0	6,468	0.15	6,150	1577.04	58.41	0.04
0.25	0.25	4.0	6,150	0.14	5,840	1498.62	55.50	0.03
0.00	0.25	4.0	5,840	0.13	5,539	1422.20	52.67	0.03

Splash Pad Calculations

Client:	Sunbelt Holdings	Prepared by:	CDR
Project Name:	Red Rock Village 60 ac	Date:	4/21/2023
Concentration Point:	**Riprap Outlet Protection**	Job #:	-
	Sheet #: 1 of 1		

Splash Pad Computation Sheet

Design computations for splash pad dimensions using the COT methodology descibed in Section 6.7 of "Standards Manual for Drainage Design and Floodplain Management in Tucson, Arizona", (revised 1998)

Outlet Apron Sizing Equations:

Scour Hole Length (ft): $L_{sc} = D * DSG$

Dimensionless Scour Geometry: $DSG = a * (Qr / (g^{0.5} * D^{0.5}))^b * 0.09^b$ *Eqn. 6.17, COT Manual*

Representative Discharge (cfs): $Q_r = Q100/2 * (1 + ((Tr - 10) / Tr))$ *Eqn. 6.18, COT Manual*

Equivalent Depth (ft): $Y_e = (A/2)^{0.5}$ *Eqn. 6.19, COT Manual*

Where:

D = Culvert diameter (ft) *Substitute Y_e for D for non-circular outlets*

Q_{100} = 100-year peak discharge in cfs

A = area of flow at outlet in s.f.

g = 32.2 fps/s *acceleration of gravity*

a = 12.77 *Table 6.2C, COT Manual*

b = 0.41 *Table 6.2C, COT Manual*

T_r = 13.6 min. *for 5 min T_c, per PC/COT Stormwater Retention/Detention Manual*

Rock Riprap Sizing Equations:

Median Rock Diameter, D_{50} (ft): $D_{50} = 0.02 * (D_c^2/TW) * R^{1.33}$ *Eqn. 6-VI, PC Channel Design Manual*

$R = Q / D_c^{2.5}$ *for circular culverts*

$R = q / D_c^{1.5}$ *for other shapes*

Where:

D_c = Culvert Diameter or Flow Depth (ft)

TW = Tailwater Depth (ft) *Use 0.5 * D_c unless actual TW is known*

Q = Design discharge (cfs)

q = Q / flow width (cfs)

Computations:

Splash Pad Location:	Outfall Type	Q_{100} (cfs):	D_c (ft): or	Flow Width (ft)	A (sf):	Y_e (ft):	Q_r (cfs)	R	DSG:	Minimum L_{sc} (ft):	**Des. Splash Pad Length (ft):**	Min. Rock Size, D_{50} (in):	**Design Size D_{50} (in):**
SP-1	Channel	6.9	--	7.852	3.9	**1.3964**	**4.4**	**2.5**	**3.99**	**5.6**	6	**2.28**	6
SP-2	Channel	15.8	--	9.41	5.5	**1.6583**	**10.0**	**3.8**	**5.41**	**9.0**	9	**4.63**	6
SP-3	Channel	15.6	--	11.1	7.6	**1.9494**	**9.9**	**2.5**	**5.21**	**10.1**	11	**3.13**	6
SP-4	Channel	10.9	--	10.4	6.8	**1.8439**	**6.9**	**2.0**	**4.55**	**8.4**	9	**2.20**	6
SP-5.1	Scupper	4.7	--	28	3.4	**1.3038**	**3.0**	**4.0**	**3.46**	**4.5**	5	**3.91**	6
SP-5.2	Scupper	4.7	--	28	3.4	**1.3038**	**3.0**	**4.0**	**3.46**	**4.5**	5	**3.91**	6
SP-6.1	Scupper	2.9	--	25	2.4	**1.0954**	**1.8**	**3.9**	**2.94**	**3.2**	4	**3.21**	6
SP-6.2	Scupper	3	--	25	2.5	**1.118**	**1.9**	**3.8**	**2.97**	**3.3**	4	**3.16**	6
SP-6.3	Channel	3	--	5.8	2.1	**1.0247**	**1.9**	**2.4**	**3.02**	**3.1**	4	**1.55**	6
SP-6.4	Channel	17.6	--	9.3	6.5	**1.8028**	**11.1**	**3.2**	**5.56**	**10.0**	10	**4.13**	6
SP-7.1A	Scupper	12	--	35	6.2	**1.7607**	**7.6**	**4.6**	**4.77**	**8.4**	9	**6.43**	9
SP-7.2A	Scupper/Culvert	11	2	--	--	--	**7.0**	**1.9**	**4.49**	**9.0**	9	**2.32**	6
SP-7.3A	Scupper	8.6	--	35	6.1	**1.7464**	**5.4**	**3.4**	**4.17**	**7.3**	8	**4.23**	6
SP-7.1B	Scupper/Culvert	11	2	--	--	--	**7.0**	**1.9**	**4.49**	**9.0**	9	**2.32**	6
SP-7.2B	Scupper/Culvert	11	2	--	--	--	**7.0**	**1.9**	**4.49**	**9.0**	9	**2.32**	6
SP-7.1C	Scupper	9.52	--	50	7.2	**1.8974**	**6.0**	**3.5**	**4.27**	**8.1**	9	**4.79**	6
SP-7.2C	Scupper	10.6	--	50	7.7	**1.9621**	**6.7**	**3.5**	**4.44**	**8.7**	9	**5.00**	6
SP-7.3C	Scupper/Culvert	11	2	--	--	--	**7.0**	**1.9**	**4.49**	**9.0**	9	**2.32**	6
SP-7.1D	Scupper	9.65	--	40	6.6	**1.8166**	**6.1**	**3.6**	**4.34**	**7.9**	8	**4.79**	6
SP-7.2D	Scupper	11.1	--	40	6.8	**1.8439**	**7.0**	**4.0**	**4.58**	**8.4**	9	**5.52**	6
SP-8.1	Scupper	10.3	--	40	6.4	**1.7889**	**6.5**	**4.0**	**4.47**	**8.0**	8	**5.47**	6
SP-8.2	Scupper	10.6	--	40	6.5	**1.8028**	**6.7**	**4.0**	**4.51**	**8.1**	9	**5.55**	6
SP-9	Scupper	11.7	--	40	6.94	**1.8628**	**7.4**	**4.0**	**4.67**	**8.7**	9	**5.74**	6
SP-10.1	Scupper	1.4	--	15	1.1	**0.7416**	**0.9**	**4.7**	**2.36**	**1.8**	2	**2.79**	6
SP-10.2	Channel	14	--	9.2	5.3	**1.6279**	**8.9**	**3.5**	**5.17**	**8.4**	9	**4.10**	6
SP-10.3	Scupper	14	--	20	6.5	**1.8028**	**8.9**	**3.8**	**5.06**	**9.1**	10	**5.07**	6
SP-10.4	Channel	1.4	--	4.3	1.1	**0.7416**	**0.9**	**2.5**	**2.36**	**1.8**	2	**1.21**	6
SP-11.1	Scupper	9	--	40	6.8	**1.8439**	**5.7**	**3.2**	**4.20**	**7.7**	8	**4.17**	6
SP-11.2	Scupper	10.67	--	50	8.2	**2.0248**	**6.7**	**3.2**	**4.42**	**9.0**	9	**4.59**	6
SP-12.1	Scupper	10.47	--	45	7.65	**1.9558**	**6.6**	**3.3**	**4.42**	**8.6**	9	**4.63**	6
SP-12.2	Scupper	9.5	--	40	6.9	**1.8574**	**6.0**	**3.3**	**4.29**	**8.0**	8	**4.39**	6
SP-13	Scupper	15.84	--	60	11.4	**2.3875**	**10.0**	**3.2**	**5.02**	**12.0**	12	**5.36**	6
SP-14.1	Scupper	10	--	40	7.1	**1.8841**	**6.3**	**3.3**	**4.37**	**8.2**	9	**4.50**	6
SP-14.2	Scupper	11	--	45	7.2	**1.8974**	**7.0**	**3.8**	**4.54**	**8.6**	9	**5.41**	6
SP-15.1	Scupper	1.8	--	20	1.7	**0.922**	**1.1**	**3.6**	**2.50**	**2.3**	3	**2.46**	6
SP-15.2	Scupper	3.4	--	25	2.6	**1.1402**	**2.2**	**4.1**	**3.11**	**3.5**	4	**3.52**	6
SP-15.3	Channel	12.3	--	9.3	6.5	**1.8028**	**7.8**	**2.3**	**4.80**	**8.7**	9	**2.56**	6

Culvert Calculations

PIPE CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

April 20, 2023

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Culvert Diameter (ft)	2.0
FHWA Chart Number	1
FHWA Scale Number (Type of Culvert Entrance)	1
Manning's Roughness Coefficient (n-value)	0.014
Entrance Loss Coefficient of Culvert Opening	0.5
Culvert Length (ft)	65.0
Invert Elevation at Downstream end of Culvert (ft)	1,880.35
Invert Elevation at Upstream end of Culvert (ft)	1,880.5
Culvert Slope (ft/ft)	0.0023
Starting Flow Rate (cfs)	1.0
Incremental Flow Rate (cfs)	1.0
Ending Flow Rate (cfs)	11.0
Starting Tailwater Depth (ft)	0.0
Incremental Tailwater Depth (ft)	1.0
Ending Tailwater Depth (ft)	10.0

COMPUTATION RESULTS

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
1.0	0.0	0.46	0.52	0.43	0.34	0.34	2.77
2.0	1.0	0.67	0.92	0.6	0.49	1.0	1.27
3.0	2.0	0.83	1.88	0.75	0.6	2.0	0.95
4.0	3.0	0.97	2.91	0.87	0.7	2.0	1.27
5.0	4.0	1.1	3.95	0.99	0.79	2.0	1.59
6.0	5.0	1.23	4.99	1.11	0.87	2.0	1.91
7.0	6.0	1.35	6.04	1.22	0.94	2.0	2.23
8.0	7.0	1.46	7.1	1.34	1.01	2.0	2.55
9.0	8.0	1.58	8.16	1.47	1.07	2.0	2.86
10.0	9.0	1.69	9.23	1.62	1.13	2.0	3.18
11.0	10.0	1.8	10.31	2.0	1.19	2.0	3.5

HYDROCALC Hydraulics for Windows, Version 2.0.1, Copyright(c) 1996-2010
Dodson & Associates, Inc., 5629 FM 1960 West, Suite 314, Houston, TX 77069
Email:software@dodson-hydro.com, All Rights Reserved.

PIPE CULVERT ANALYSIS
COMPUTATION OF CULVERT PERFORMANCE CURVE

April 20, 2023

PROGRAM INPUT DATA

DESCRIPTION	VALUE
Culvert Diameter (ft)	2.0
FHWA Chart Number	1
FHWA Scale Number (Type of Culvert Entrance)	1
Manning's Roughness Coefficient (n-value)	0.014
Entrance Loss Coefficient of Culvert Opening	0.5
Culvert Length (ft)	65.0
Invert Elevation at Downstream end of Culvert (ft)	1,880.35
Invert Elevation at Upstream end of Culvert (ft)	1,880.5
Culvert Slope (ft/ft)	0.0023
Starting Flow Rate (cfs)	1.0
Incremental Flow Rate (cfs)	1.0
Ending Flow Rate (cfs)	14.0
Starting Tailwater Depth (ft)	0.0
Incremental Tailwater Depth (ft)	1.0
Ending Tailwater Depth (ft)	13.0

COMPUTATION RESULTS

Flow Rate (cfs)	Tailwater Depth (ft)	Headwater (ft) Inlet Control	Headwater (ft) Outlet Control	Normal Depth (ft)	Critical Depth (ft)	Depth at Outlet (ft)	Outlet Velocity (fps)
1.0	0.0	0.46	0.52	0.43	0.34	0.34	2.77
2.0	1.0	0.67	0.92	0.6	0.49	1.0	1.27
3.0	2.0	0.83	1.88	0.75	0.6	2.0	0.95
4.0	3.0	0.97	2.91	0.87	0.7	2.0	1.27
5.0	4.0	1.1	3.95	0.99	0.79	2.0	1.59
6.0	5.0	1.23	4.99	1.11	0.87	2.0	1.91
7.0	6.0	1.35	6.04	1.22	0.94	2.0	2.23
8.0	7.0	1.46	7.1	1.34	1.01	2.0	2.55
9.0	8.0	1.58	8.16	1.47	1.07	2.0	2.86
10.0	9.0	1.69	9.23	1.62	1.13	2.0	3.18
11.0	10.0	1.8	10.31	2.0	1.19	2.0	3.5
12.0	11.0	1.92	11.4	2.0	1.24	2.0	3.82
13.0	12.0	2.03	12.5	2.0	1.3	2.0	4.14
14.0	13.0	2.14	13.6	2.0	1.35	2.0	4.46

HYDROCALC Hydraulics for Windows, Version 2.0.1, Copyright(c) 1996-2010
Dodson & Associates, Inc., 5629 FM 1960 West, Suite 314, Houston, TX 77069
Email:software@dodson-hydro.com, All Rights Reserved.

SOUTHWEST TRAFFIC ENGINEERING, LLC

TRAFFIC IMPACT ANALYSIS

RED ROCK SMITH ROTHBERG

AGUIRRE LANE, SOUTH OF SASCO ROAD

22 MARCH 2023



APPROVED BY:

PINAL COUNTY ENGINEER — DATE
PINAL COUNTY, PUBLIC WORKS DEPARTMENT

PREPARED FOR
RRV SOUTH
6720 NORTH SCOTTSDALE ROAD, SUITE 250
SCOTTSDALE, ARIZONA 85253

SOUTHWEST TRAFFIC ENGINEERING, LLC
3838 NORTH CENTRAL AVENUE, SUITE 1810
PHOENIX, AZ 85012
T 602.266.SWTE (7983) F 602.266.1115

© 2023 SOUTHWEST TRAFFIC ENGINEERING, ALL RIGHTS RESERVED

Table of Contents

Executive Summary 6
Project Description 8
Study Methodology 8
Existing Conditions 11
Existing Traffic Data 11
Access 11
Trip Generation 13
Trip Distribution & Assignment 15
Future Traffic Operations Without Project 15
Future Traffic Operations With Project 21
Turn Lane Analysis 24
Traffic Signal Warrant Analysis 25
Mitigation 26
Conclusion 26

Table of Figures

Figure 1 – Vicinity Map 9
Figure 2 – Site Plan 10
Figure 3 – Existing Weekday Peak Hour Traffic Volumes 12
Figure 4 – Baseline Access Point and Intersection Configuration Assumptions 14
Figure 5 – Weekday Peak Hour Trip Assignment 16
Figure 6 – 2045 Weekday Peak Hour Traffic Volumes Without Project 17
Figure 7 – Adjacent Red Rock Development Trip Assignment 18
Figure 8 – 2045 Weekday Peak Hour Traffic Volumes Without Project With Red Rock 19
Figure 9 – 2045 Weekday Peak Hour Traffic Volumes With Project 22
Figure 10 – Proposed Lane Configurations and Traffic Control 28

List of Tables

Table 1 – Project Site Generated Trips 13
Table 2 - Level of Service Criteria – Signalized Intersections 20
Table 3 – Level of Service Criteria – Un-signalized Intersections 20
Table 4 – 2045 Weekday Peak Hour Levels of Service Without Project 21
Table 5 – 2045 Weekday Peak Hour Levels of Service With Project 23
Table 6 – Traffic Signal Warrant Analysis (Aguirre Lane/Sasco Road) 25
Table 7 – Mitigation Measures 26

Appendix
Traffic Counts
Trip Generation Calculations
Adjacent Site Assignment
Capacity Calculations
Turn Lane Calculations
Traffic Signal Warrant Calculations

Prepared By:
Andrew Smigielski, PE, PTOE, PTP
Amy Forsythe, EIT

RED ROCK SMITH ROTHBERG
AGUIRRE LANE, SOUTH OF SASCO ROAD
TRAFFIC IMPACT ANALYSIS

Executive Summary

The purpose of this traffic study is to evaluate the future transportation system within the project study area surrounding the site without and with the proposed project.

The Red Rock Village (Red Rock) development is planned to be constructed adjacent to the project site with full build out assumed to be completed by 2045. This adjacent project was originally analyzed in the Red Rock Village Development Transportation Impact Study (Original TIS) dated September 2017 and completed by EPS Group. Three traffic analysis addendums were also completed to address changes in the development plans:

- Red Rock Traffic Analysis Addendum #1 dated March 2020 and completed by **S**outh**w**est **T**raffic **E**ngineering, LLC (**SWTE**).
- Red Rock Traffic Analysis Addendum #2 dated July 2021 and completed by **SWTE**.
- Red Rock Loop North Traffic Analysis Addendum #3 (Red Rock Addendum #3) dated March 2023 and completed by **SWTE**.

Future Traffic Data Without and With Project

Northbound right turning vehicles at the intersection of Aguirre Lane/Sasco Road are expected to experience significant delays during the weekday AM peak hour in 2045 without and with the project, with the Red Rock development. Several movements are expected to experience inadequate delays during the weekday PM peak hour in 2045 without and with the project, with the Red Rock development.

The remaining study intersections are anticipated to operate at an adequate LOS during the weekday peak hours in 2045 with traffic from the project.

Turn Lane Analysis

Southbound left turn lanes are expected to be provided at North Access and South Access due to the planned raised median on Aguirre Lane. Northbound right turn lanes are not expected to be needed at the project driveways due to the end of road condition of Aguirre Lane at the southern border of the project site, which requires vehicles to access the site from the north. While in the future Aguirre Lane is planned to be extended to the south, vehicles are still expected to primarily travel to the site from the north.

The southbound left turn lanes at North Access/Aguirre Lane and South Access/Aguirre Lane are expected to require a minimum storage length of 75 feet.

Traffic Signal Warrant Analysis

Traffic signal warrants #1 and #2 are expected to be met at the intersection of Aguirre Lane/Sasco Road in 2045 without and with traffic from the project, with the Red Rock development.

Mitigation
Several movements are expected to experience inadequate delays during the weekday AM and PM peak hours in 2045 without and with the project, with the Red Rock development. The installation of dual northbound right turn lanes with northbound right turn overlap phasing would be expected to alleviate these delays.

Recommendations
Red Rock Addendum #3 highlighted that while highly directional traffic patterns are expected at the intersection of Aguirre Lane/Sasco Road, market conditions are expected to largely influence the traffic patterns of the area. For instance, if additional adjacent developments are constructed subsequently with the overall Red Rock development, the assumed traffic distribution may vary significantly than what was assumed in the analysis.

Right of way should be set aside for dual northbound right turn lanes at Aguirre Lane/Sasco Road, which can be installed in the future if needed. Additionally, right turn overlap signal phasing is recommended for the northbound approach to the intersection.

Southbound left turn lanes should be constructed at North Access and South Access with minimum storage lengths of 100 feet to adhere to Pinal County guidelines.

RED ROCK SMITH ROTHBERG
AGUIRRE LANE, SOUTH OF SASCO ROAD
TRAFFIC IMPACT ANALYSIS

Project Description

RRV South is proposing a new 294 unit single family development on the east side of Aguirre Lane, south of Sasco Road in Pinal County, Arizona. The vicinity of the project is shown in **Figure 1**. The site will be located as shown in **Figure 2**. The project site will be served by two proposed access points. This project is expected to be constructed adjacent to the planned Red Rock development, which has an assumed full buildout by the year 2045. While the project site is expected to be constructed prior to the year 2045, in order to account for the significant impact of the Red Rock development on the project area, only the horizon year of 2045 was evaluated in this analysis.

The purpose of this traffic impact analysis is to:

- Evaluate the future operational characteristics of the adjacent roadway network surrounding the project site.
- Estimate the traffic generation associated with the project and assign that traffic to the existing roadway system.
- Analyze future traffic operations at one existing intersection and two proposed access points serving the project site.
- Determine the need for auxiliary (left and right turn) lanes at the driveways that will serve the project site.
- Conduct traffic signal warrant analyses at the intersections of Aguirre Lane/Sasco Road.

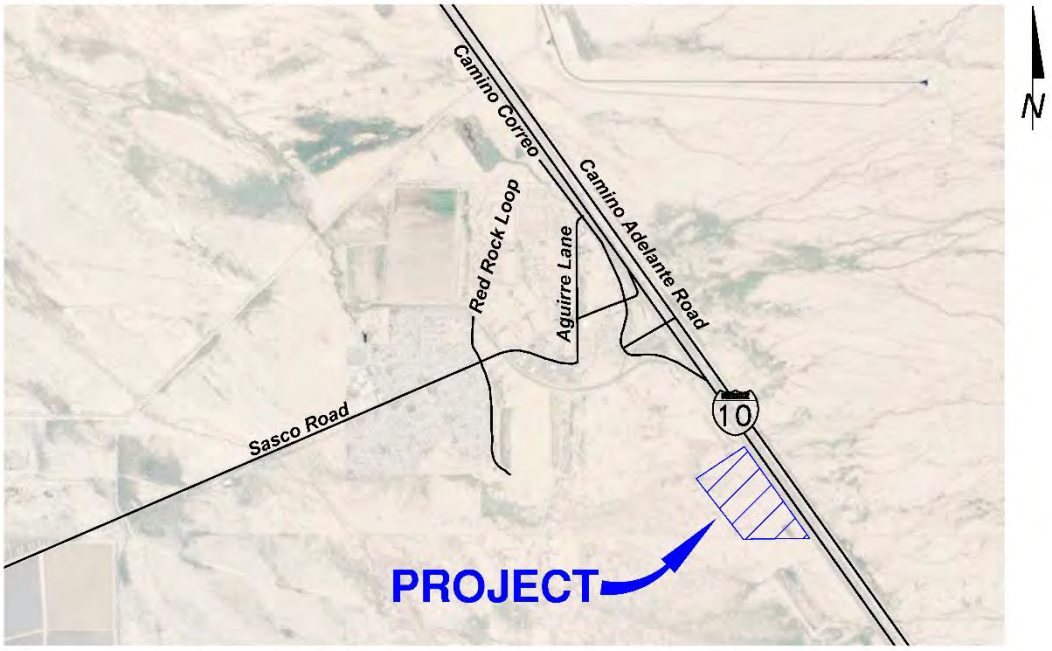
The author of this report is a registered professional engineer (civil) in the State of Arizona having specific expertise and experience in the preparation of traffic impact analyses.

Study Methodology

In order to analyze and evaluate the potential traffic impacts of the proposed development, the following tasks were undertaken:

- Field observation of the proposed site and surrounding area was conducted to evaluate the existing physical and operational characteristics of the adjacent roadway network.
- Site traffic volumes generated by the proposed site were calculated using the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition,* 2021.
- Calculated site traffic and adjacent development traffic was distributed based on the proposed nearby roadway network and developments and assigned to the primary roadways within the project study limits.
- Trips expected to be generated by the adjacent Red Rock development were assigned to the study intersection as background traffic.

Figure 1 – Vicinity Map

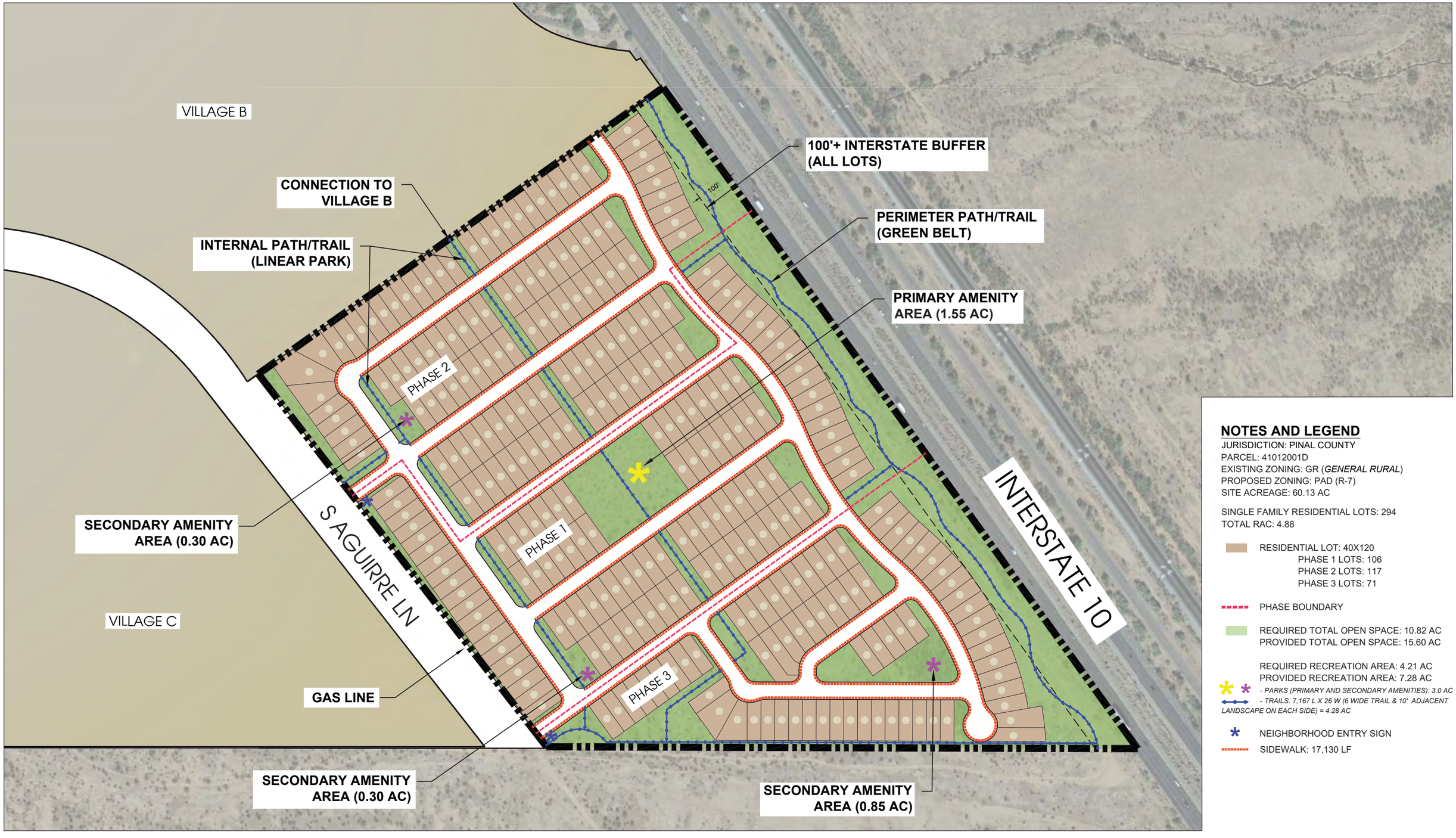


LEGEND:

= *Existing Road*

= *Project Site*

SMITH ROTHBERG - PRELIMINARY SITE PLAN CONCEPT | 09.30.22



NOTES AND LEGEND

JURISDICTION: PINAL COUNTY
PARCEL: 41012001D
EXISTING ZONING: GR (*GENERAL RURAL*)
PROPOSED ZONING: PAD (R-7)
SITE ACREAGE: 60.13 AC

SINGLE FAMILY RESIDENTIAL LOTS: 294
TOTAL RAC: 4.88

RESIDENTIAL LOT: 40X120
PHASE 1 LOTS: 106
PHASE 2 LOTS: 117
PHASE 3 LOTS: 71

PHASE BOUNDARY

REQUIRED TOTAL OPEN SPACE: 10.82 AC
PROVIDED TOTAL OPEN SPACE: 15.60 AC

REQUIRED RECREATION AREA: 4.21 AC
PROVIDED RECREATION AREA: 7.28 AC
- PARKS (PRIMARY AND SECONDARY AMENITIES): 3.0 AC
- TRAILS: 7,167 L X 26 W (6 WIDE TRAIL & 10' ADJACENT LANDSCAPE ON EACH SIDE) = 4.28 AC

NEIGHBORHOOD ENTRY SIGN
SIDEWALK: 17,130 LF

RED ROCK VILLAGE

PROJECT: AGS-10 DATE: 09/30/22
FILE NAME: AGS-10 SITE PLANNING 093022.DWG

0' 120' 240' NORTH

THE PLANNING CENTER
a division of TPC Group, Inc.
2 e congress ste 600 tucson az 85701

- Capacity analyses were performed for the future conditions without and with the project based on an opening year of 2045, using methodology presented in the *2016 Highway Capacity Manual (HCM 6)*.
- Turn lane queue storage requirements were estimated based on Pinal County guidelines.
- Traffic signal warrant analyses were completed at the intersection of Aguirre Lane/Sasco Road for the future conditions without and with the project based on an opening year of 2045.

Existing Conditions

Sasco Road extends west from Camino Correo as a two-lane roadway for approximately 1,090 feet and ends at Aguirre Lane. Its alignment then temporarily shifts approximately 960 feet to the south and continues to the west from Aguirre Lane. West of Aguirre Lane, Sasco Road offers two through lanes in each direction, separated by a raised median. There is a posted speed limit of 35 miles per hour (mph) on Sasco Road.

Aguirre Lane extends south from Camino Correo as a two-lane roadway for approximately 3,260 feet. South of North Sasco Road, Aguirre Lane widens to provide two through lanes in each direction separated by a raised median. There is a posted speed limit of 25 mph on the roadway.

Existing Traffic Data

In order to form a basis for analysis of the project impacts, weekday 24-hour bi-directional traffic counts were conducted at the intersection of Aguirre Lane/Sasco Road.

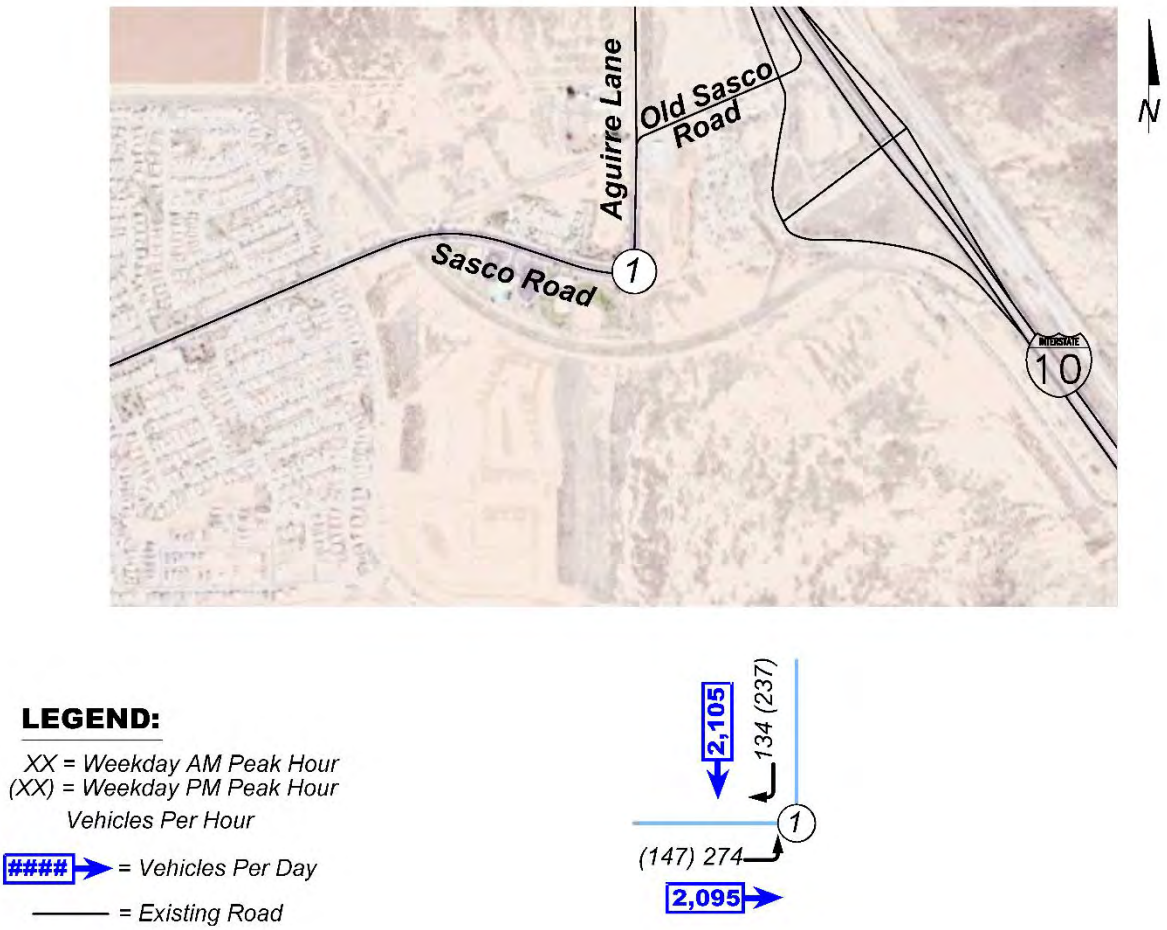
The weekday AM//PM peak hours were found to occur between 7:15 AM and 8:15 AM and 4:00 PM and 5:00 PM. The existing weekday AM/PM peak hour traffic volumes are shown in **Figure 3**. All traffic data was collected in January 2023 while school was in session. Complete traffic count data can be found in the Appendix.

Access

The project will be served by two proposed access points, North Access and South Access. Each of these driveways are expected to provide full access to/from the site.

As part of the project, Aguirre Lane is planned to be extended to the southern border of the project site. North of the project site, Aguirre Lane has a planned interim three-lane cross section, with one lane in each direction separated by a raised median. In the future, Aguirre Lane is expected to be widened to its ultimate seven-lane cross section.

Figure 3 – Existing Weekday Peak Hour Traffic Volumes



The Red Rock Village development is planned to be constructed adjacent to the project site with full build out assumed to be completed by 2045. This adjacent project was originally analyzed in the Red Rock Village Development Transportation Impact Study (Original TIS) dated September 2017 and completed by EPS Group. Three traffic analysis addendums were also completed to address changes in the development plans.

The Red Rock development is expected to complete significant roadway improvements to the nearby roadway network by 2045, including:

- Constructing the portion of the realigned Sasco Road between Aguirre Lane and Camino Correro to its ultimate five-lane cross section.
- Realigning the eastbound I-10 off-ramp to intersect with Sasco Road (new alignment) and the eastbound on-ramp to align with the new eastbound off-ramp.
- Signalizing the intersections of Eastbound I-10 Ramps/Sasco Road and Westbound I-10 Ramps/Sasco Road.
- Signalizing the intersection of Aguirre Lane/Sasco Road.

The baseline lane configuration and traffic control assumptions from the Red Rock Addendum #3 was also utilized in this analysis.

Figure 4 show the locations, geometry and spacing for the proposed intersections serving the project site that will serve as a baseline of analysis in the report.

Trip Generation

Trip generation was developed utilizing nationally agreed upon data contained in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 11th Edition,* 2021. The project trip generation was estimated for 294 single-family homes based on ITE Land Use Code 210 (LUC 210).

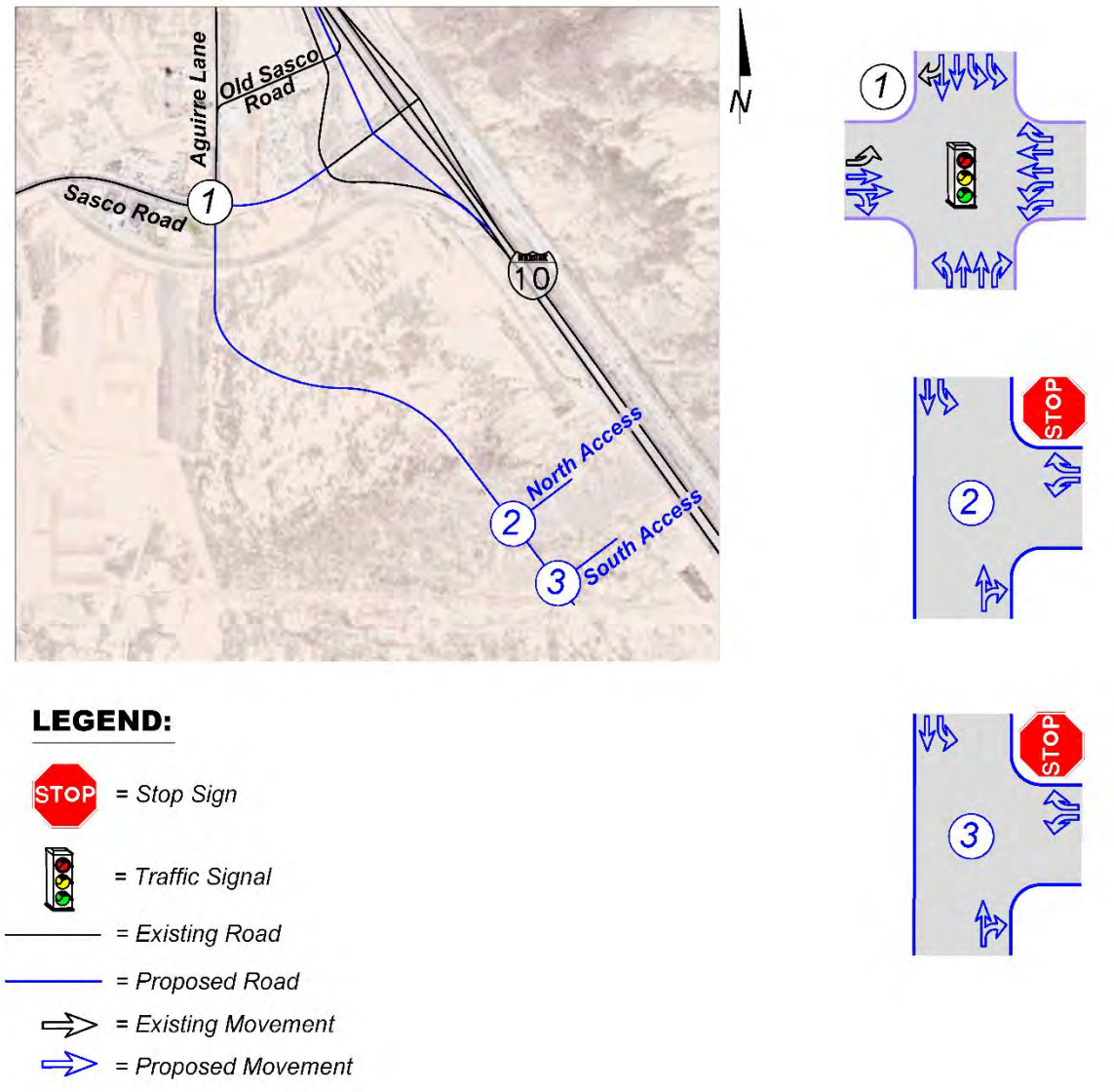
Tables 1 shows the results of the weekday trip generation for the project. The complete trip generation calculations can be found in the Appendix.

Table 1 – Project Site Generated Trips

Time Period	Single-Family Detached Housing (LUC 210)
Average Daily, Inbound (vtpd)	1,387
Average Daily, Outbound (vtpd)	1,387
Total Daily	**2,774**
AM Peak Hour, Inbound (vtph)	54
AM Peak Hour, Outbound (vtph)	152
Total AM Peak	**206**
PM Peak Hour, Inbound (vtph)	175
PM Peak Hour, Outbound (vtph)	102
Total PM Peak	**277**

vtpd - vehicle trips per day, vtph - vehicle trips per hour

Figure 4 – Baseline Access Point and Intersection Configuration Assumptions



Trip Distribution & Assignment

Trip distribution for the project was based on the proposed roadway network and developments near the project site. **Figure 5** shows the weekday trip distribution of the project as a percentage of net new primary trips and the assignment of the new site generated trips to the project intersections within the study area.

Future Traffic Operations Without Project

In order to assess the impacts of the project on future traffic operations, traffic projections were made for the year of 2045. A 1% annual traffic growth rate was used in the Original TIS, as traffic growth in the area would be primarily due to the Red Rock Village development. Weekday peak hour traffic volumes without the project were estimated using the 1% annual traffic growth rate for the year 2045.

However, in addition to growing the traffic volumes to the year 2045, due to the planned realignment of Sasco Road and the reconstruction of the Sasco Road/I-10 TI, traffic patterns in the area are expected to shift. Currently, traffic traveling from Interstate 10 (I-10) to the west of Aguirre Lane is required to take a circuitous route and travel through the free-flow 'L' intersection of Aguirre Lane/Sasco Road. After the improvements on Sasco Road and at Sasco Road/I-10 TI have been completed, the intersection of Aguirre Lane/Sasco Road will be a four-leg signalized intersection and traffic volumes are expected to shift to primarily travel along Sasco Road. Weekday peak hour traffic volumes without the project in 2045 are shown in **Figure 6**.

Based on the trip assignment provided in the Red Rock Addendum #3, weekday peak hour trips generated by the Red Rock development were assigned to the project study intersections, as shown in **Figure 7**. The weekday peak hour trip assignment provided in the Red Rock Addendum #3 can be found int the Appendix.

In order to account for the new traffic volumes associated with the adjacent development, the weekday peak hour trip assignment from the Red Rock development was combined with the 2045 traffic volumes without the project. The future weekday peak hour traffic volumes in 2045 without the project and with the Red Rock development are shown in **Figure 8**.

Analysis of future intersection operations was conducted for the weekday AM and PM peak hours using the nationally accepted methodology set forth in the *Highway Capacity Manual,* Transportation Research Board, 2016 (HCM 6). The computer software Synchro 11 was utilized to calculate the levels of service for individual movements and approaches.

LOS is a qualitative measure of the traffic operations at an intersection or on a roadway segment. Level of service is ranked from LOS A, which signifies little or no congestion and is the highest rank, to LOS F, which signifies congestion and jam conditions. LOS D is typically considered adequate operation at signalized and un-signalized intersections in developed areas.

Figure 5 – Weekday Peak Hour Trip Assignment

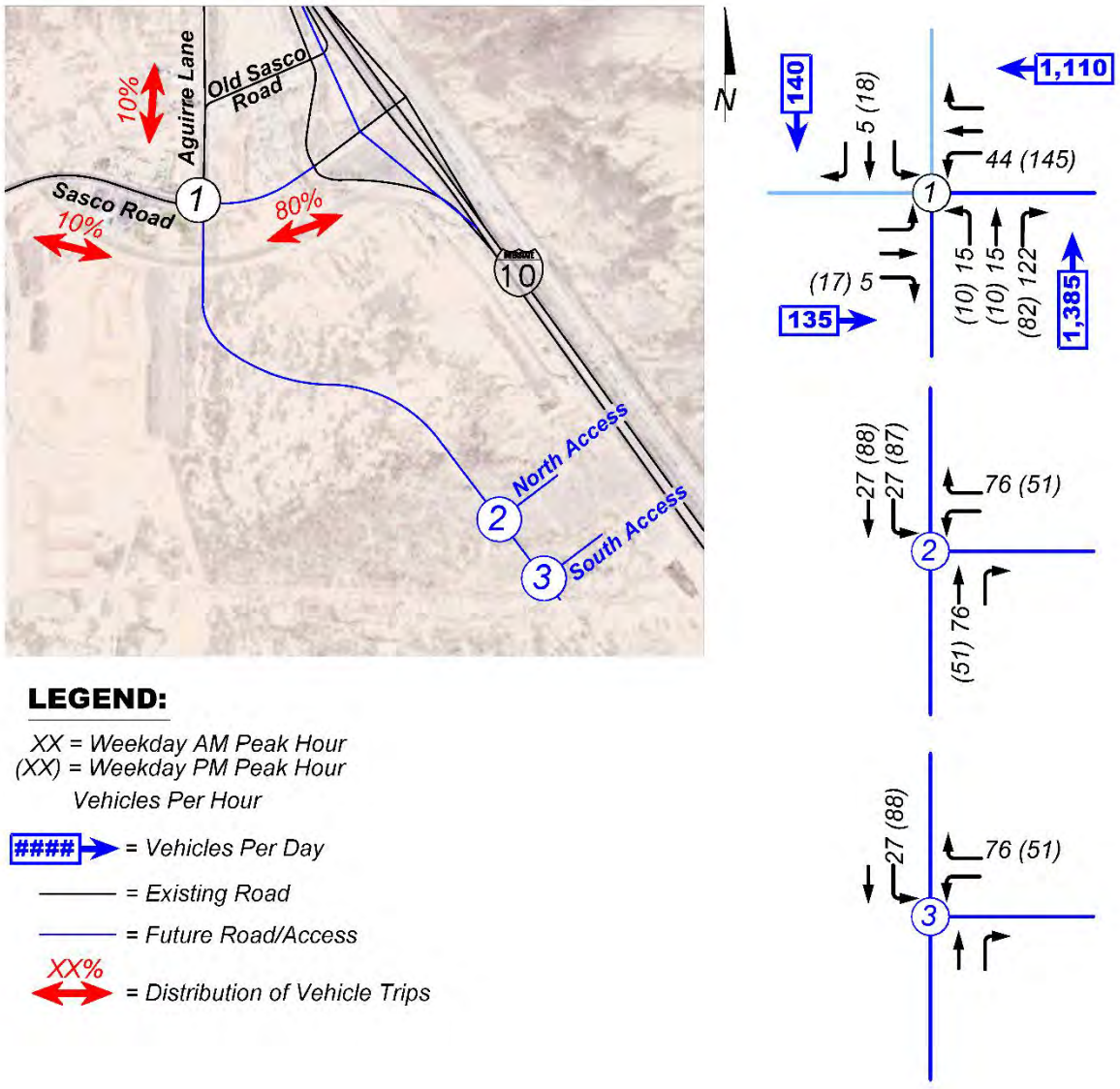


Figure 6 – 2045 Weekday Peak Hour Traffic Volumes Without Project

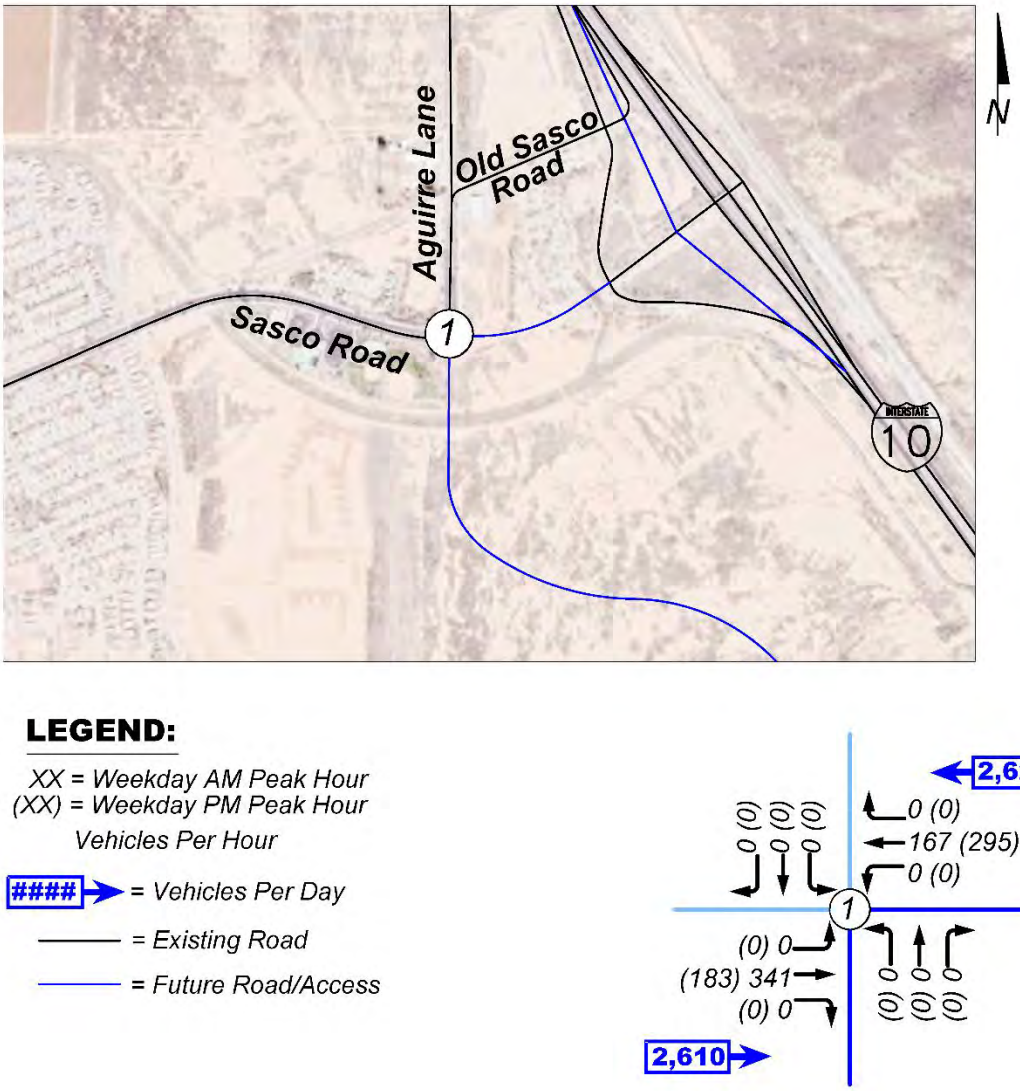


Figure 7 – Adjacent Red Rock Development Trip Assignment



LEGEND:

XX = Weekday AM Peak Hour
(XX) = Weekday PM Peak Hour
Vehicles Per Hour

= *Vehicles Per Day*

= *Existing Road*

= *Future Road/Access*

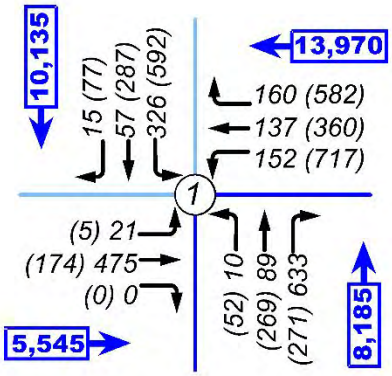


Figure 8 – 2045 Weekday Peak Hour Traffic Volumes Without Project With Red Rock



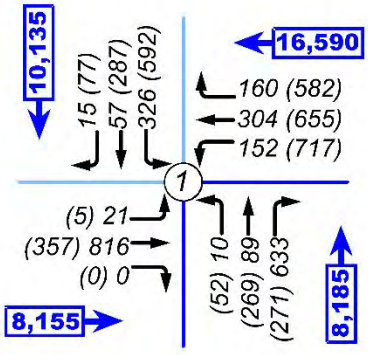
LEGEND:

XX = Weekday AM Peak Hour
(XX) = Weekday PM Peak Hour
Vehicles Per Hour

= Vehicles Per Day

= Existing Road

= Future Road/Access



At signalized intersections, level of service is calculated for each movement and then summed in a weighted fashion to yield the LOS for the approach and for the intersections as a whole. Criteria for level of service at signalized intersections are shown in **Table 2.**

Table 2 - Level of Service Criteria – Signalized Intersections

Level-of-Service	Average Total Delay
A	≤ 10.0 seconds per vehicle
B	> 10.0 and ≤ 20.0 seconds/vehicle
C	> 20.0 and ≤ 35.0 seconds/vehicle
D	> 35.0 and ≤ 55.0 seconds/vehicle
E	> 55.0 and ≤ 80.0 seconds/vehicle
F	> 80.0 seconds per vehicle

In calculating the levels of service, assumed signal phasing and timing data was used. Other assumptions included:

- Cycle length – 90 seconds
- Lane widths – 12 feet
- Approach grade – 0%
- Right turn on red allowed

At un-signalized intersections, level of service is predicted/calculated for those movements, which must either stop for or yield to oncoming traffic and is based on average control delay for the particular movement. Control delay is the portion of total delay attributed to traffic control measures such as stop signs and traffic signals. The criteria for level of service at un-signalized intersections are shown in **Table 3.**

Table 3 – Level of Service Criteria – Un-signalized Intersections

Level-of-Service	Delay
A	< 10 seconds/vehicle
B	> 10 and < 15 seconds/vehicle
C	> 15 and < 25 seconds/vehicle
D	> 25 and < 35 seconds/vehicle
E	> 35 and < 50 seconds/vehicle
F	> 50 seconds/vehicle

As with the current volumes, levels of service were calculated for each of the intersections in the study area for 2045 without the project and with the adjacent development. Intersection levels of service for 2045 without the project and with the adjacent development are shown in **Table 4**. Complete capacity calculations are included in the Appendix.

Table 4 – 2045 Weekday Peak Hour Levels of Service Without Project

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Signalized Intersections				
Aguirre Lane/Sasco Road				
Overall Intersection	F	112.2	D	54.6
Eastbound Left	B	19.8	C	30.3
Eastbound Through	D	38.4	D	38.7
Eastbound Through/Right	D	38.4	D	38.7
Westbound Left	D	39.8	D	45.2
Westbound Through	C	20.4	C	20.3
Westbound Right	C	21.0	F	69.2
Northbound Left	C	21.8	C	28.9
Northbound Through	C	23.6	D	38.4
Northbound Right	F	>120	F	>120
Southbound Left	D	40.7	E	57.1
Southbound Through	B	16.3	C	24.8
Southbound Through/Right	B	16.3	C	25.0

Delay - seconds per vehicle

As shown in **Table 4**, northbound right turning vehicles at the intersection of Aguirre Lane/Sasco Road are expected to experience significant delays during the weekday AM peak hour in 2045 without the project with the Red Rock development. The westbound right, northbound right, and southbound left turning movements at the intersection are expected to operate at inadequate LOS during the weekday PM peak hour in 2045 without traffic from the project and with the Red Rock development. These delays are due to relatively large number of left and right turning vehicles expected at the intersection.

Future Traffic Operations With Project

In order to assess the impacts of the project on future traffic operations, levels of service were calculated for each project intersection in 2045 with the project and with the adjacent development. Weekday peak hour traffic volumes for 2045 without the project with the adjacent development were combined with the estimated trips generated by the project to yield weekday peak hour traffic volumes with the project as shown in **Figure 9.** Weekday intersection levels of service for 2045 with the project, were then calculated as shown in **Table 5**. Complete capacity calculations are included in the Appendix.

Figure 9 – 2045 Weekday Peak Hour Traffic Volumes With Project

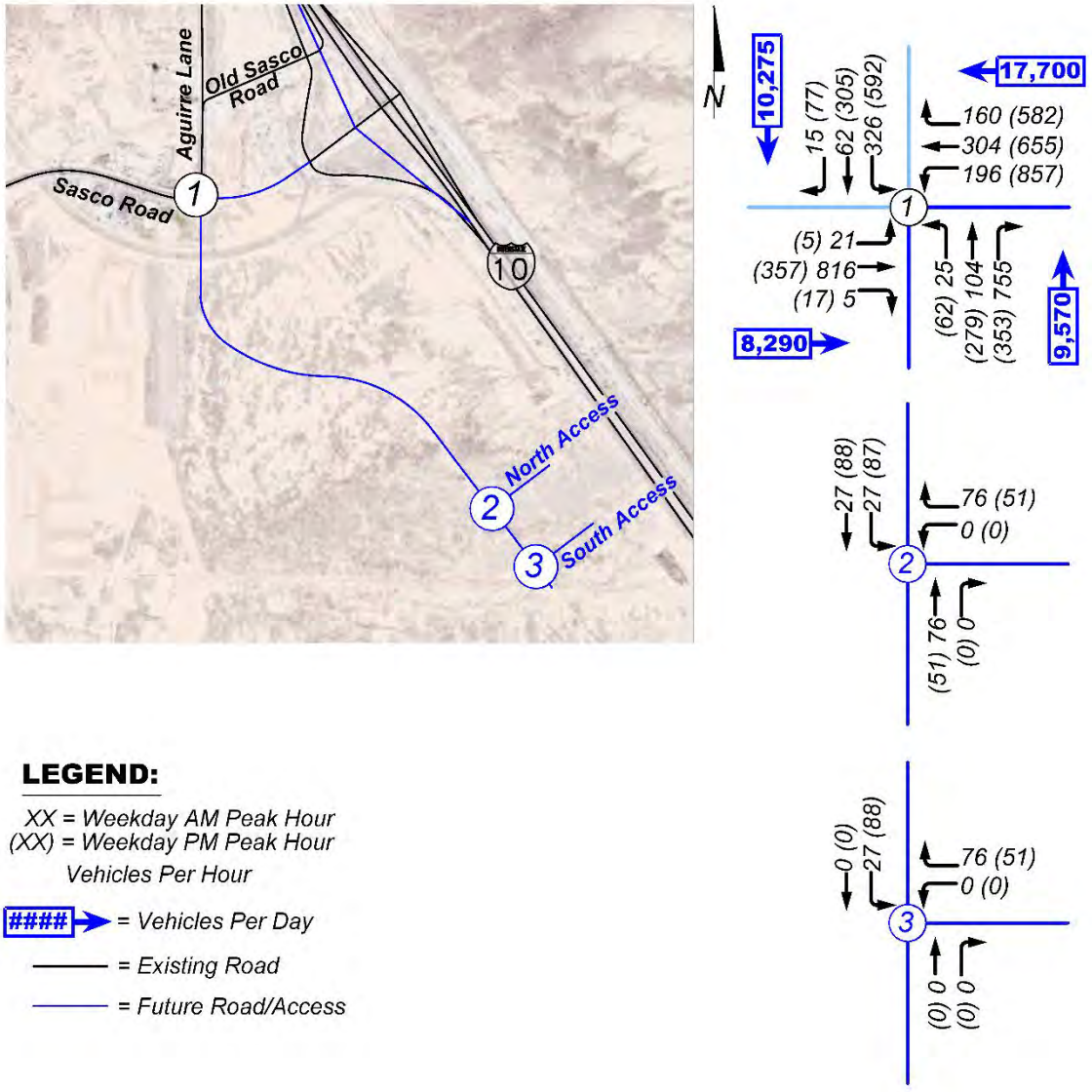


Table 5 – 2045 Weekday Peak Hour Levels of Service With Project

Intersection	2045 Without Project				2045 With Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Signalized Intersections								
Aguirre Lane/Sasco Road								
Overall Intersection	F	112.2	D	54.6	F	>120	F	81.6
Eastbound Left	B	19.8	C	30.3	C	20.5	C	30.5
Eastbound Through	D	38.4	D	38.7	D	47.7	D	44.1
Eastbound Through/Right	D	38.4	D	38.7	D	47.0	D	44.2
Westbound Left	D	39.8	D	45.2	D	40.2	F	86.4
Westbound Through	C	20.4	C	20.3	C	20.2	B	19.8
Westbound Right	C	21.0	F	69.2	C	20.8	F	66.2
Northbound Left	C	21.8	C	28.9	C	21.8	C	29.2
Northbound Through	C	23.6	D	38.4	C	24.5	D	39.4
Northbound Right	F	>120	F	>120	F	>120	F	>120
Southbound Left	D	40.7	E	57.1	D	42.0	E	58.9
Southbound Through	B	16.3	C	24.8	B	17.8	C	25.8
Southbound Through/Right	B	16.3	C	25.0	B	17.8	C	26.0
Un-Signalized Intersections								
North Access/Aguirre Lane								
Westbound Left	N/A		N/A		A	0.0	A	0.0
Westbound Right					A	9.1	A	8.8
Southbound Left					A	7.4	A	7.5
South Access/Aguirre Lane								
Westbound Left	N/A		N/A		A	0.0	A	0.0
Westbound Right					A	0.0	A	0.0
Southbound Left					A	0.0	A	0.0

Delay - seconds per vehicle

As shown in **Table 5**, northbound right turning vehicles at the intersection of Aguirre Lane/Sasco Road are expected to experience significant delays during the weekday AM peak hour in 2045 without and with the project, with the Red Rock development. Several movements are expected to experience inadequate delays during the weekday PM peak hour in 2045 without and with the project, with the Red Rock development. These delays are due to relatively large number of left and right turning vehicles expected at the intersection.

The remaining study intersections are anticipated to operate at an adequate LOS during the weekday peak hours in 2045 with traffic from the project.

Turn Lane Analysis

Southbound left turn lanes are expected to be provided at North Access and South Access due to the planned raised median on Aguirre Lane. Northbound right turn lanes are not expected to be need at the project driveways due to the end of road condition of Aguirre Lane at the southern border of the project site, which requires vehicles to access the site from the north. While in the future Aguirre Lane is planned to be extended to the south, vehicles are still expected to primarily travel to the site from the north.

Queue storage requirements for the proposed left turn lanes at North Access and South Access were estimated using the following methods as recommended in the *Pinal County Traffic Impact Assessment Guidelines and Procedures*, 2007. Typically, an average vehicle length of 25 feet is assumed.

For un-signalized intersections, storage for vehicles likely to arrive in an average two-minute period within the peak hour should be provided.

Vehicles per 2 min. period = (vehicles/hour) ÷ (30 periods/hour)
Storage length = vehicles per 2 min. period x 25 feet

Table 6 shows the calculated queue lengths based on 2045 weekday peak hour traffic volumes with traffic from the project and the Red Rock development. The computed values are typically rounded to the nearest 25 feet. Complete queue length calculations are available in the Appendix.

Table 6 – Calculated Queue Lengths

Intersection	Left Turn Storage			
	NB	SB	EB	WB
North Access/Aguirre Lane				
Turning Volume (vph)		87		
$S_{calculated}$ =		73		
$S_{rounded}$ =		75		
South Access/Aguirre Lane				
Turning Volume (vph)		88		
$S_{calculated}$ =		73		
$S_{rounded}$ =		75		

S - storage in feet, vph - vehicles per hour

As shown in **Table 6,** the southbound left turn lanes at North Access and South Access are expected to require a minimum storage length of 75 feet. In order to adhere to Pinal County guidelines, these turn lanes should provide a minimum storage length of 100 feet.

Traffic Signal Warrant Analysis

Traffic signal warrant analyses were performed determine if and/or when a traffic signal is needed based on future 2045 traffic volumes, without and with the site, at Aguirre Lane/Sasco Road.

The *Manual on Uniform Traffic Control Devices (MUTCD),* Federal Highway Administration, 2009, lists nine warrants that are used to determine if a traffic signal should be considered for installation at an intersection. A traffic signal may be warranted if one or more of the warrants are satisfied. Warrants #1 (Eight Hour Volume) and #2 (Four Hour Vehicular Volume) were used to evaluate the need to signalize the intersection. Based on existing conditions, availability of information, and applicability, the remaining warrants (#3, #4, #5, #6, #7, #8, and #9) do not apply to the given conditions.

Warrant #1 (Eight Hour Volume) is satisfied when for at least eight (8) hours of an average day, specific traffic volume levels are met for both the major and minor streets (Condition A – Minimum Vehicular Volume). The MUTCD states these volumes depend on the vehicles per hour (vph) combined for both approaches of the major street, and for the highest volume approach on the minor street. The values vary depending on the number of approach lanes and the 85th percentile speed of the roadways.

Warrant #1 also applies to operating conditions where the major street traffic levels are sufficiently high that traffic entering or crossing from a minor street suffers excessive delay (Condition B – Interruption of Continuous Traffic). Once again, the warrant is satisfied when for each of any of the same eight (8) hours of an average day, specific traffic volume levels are met for both the major and minor streets.

Warrant #2 (Four Hour Volume) is met when, for any four hours of the average day on both the major and minor streets, the hourly approach volumes are above the plotted curve contained in the MUTCD (see Appendix).

Daily traffic generated by the adjacent project as well as the proposed site was distributed throughout the 24 hours of a day based on existing daily traffic distributions and included in the future 2045 calculations. **Table 6** shows the results of the warrant analyses at the intersection. A complete set of the warrant analyses can be found in the Appendix.

Table 6 – Traffic Signal Warrant Analysis (Aguirre Lane/Sasco Road)

Aguirre Lane/Sasco Road	Warrant Number									
	1		2	3	4	5	6	7	8	9
	Condition A	Condition B								
2045 Without Project	Yes	Yes	Yes	*	*	*	*	*	*	*
Hours Met	16	10	17	*	*	*	*	*	*	*
2045 With Project	Yes	Yes	Yes	*	*	*	*	*	*	*
Hours Met	17	13	17	*	*	*	*	*	*	*

* Warrant Does Not Apply

As shown in **Table 6**, traffic signal warrants #1 and #2 are expected to be met at the intersection of Aguirre Lane/Sasco Road in 2045 without and with traffic from the project, with the Red Rock development.

Mitigation

Northbound right turning vehicles at the intersection of Aguirre Lane/Sasco Road are expected to experience significant delays during the weekday AM peak hour in 2045 without and with the project, with the Red Rock development. Several movements are expected to experience inadequate delays during the weekday PM peak hour in 2045 without and with the project, with the Red Rock development. The installation of dual northbound right turn lanes with northbound right turn overlap phasing would be expected to alleviate these delays.

Table 7 shows the LOS calculations for mitigation measure described above.

Table 7 – Mitigation Measures

Intersection	Mitigation Measures	2045 With Project Without Mitigation				2045 With Project With Mitigation			
		AM Peak		PM Peak		AM Peak		PM Peak	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Signalized Intersections									
Aguirre Lane/Sasco Road	Install dual northbound right turn lanes with right turn overlap phasing.								
Overall Intersection		F	>120	F	90.3	D	36.6	D	39.1
Eastbound Left		C	20.5	C	30.6	C	20.2	C	31.5
Eastbound Through		D	41.2	D	39.4	D	49.0	D	50.4
Eastbound Through/Right		D	41.2	D	39.4	D	48.3	D	50.4
Westbound Left		D	41.1	F	101.3	D	38.9	D	45.7
Westbound Through		B	20.0	B	19.8	B	19.8	B	17.9
Westbound Right		C	20.6	F	67.4	C	20.5	D	44.6
Northbound Left		C	22.9	C	29.1	C	21.6	C	32.5
Northbound Through		C	24.6	D	38.7	C	24.3	D	54.0
Northbound Right		F	>120	F	>120	D	36.7	B	19.0
Southbound Left		D	42.4	E	58.1	D	40.7	D	52.1
Southbound Through		B	17.1	C	25.0	B	17.7	C	29.2
Southbound Through/Right		B	17.2	C	25.2	B	17.7	C	29.4

Delay - seconds per vehicle

Conclusion

When fully completed, the proposed project is predicted to generate an additional 2,774 vehicle trips per day (vtpd) on weekdays to the adjacent street system from the new project site. Fifty percent of these new trips (1,387 vehicle trips) will be into the project and fifty percent will be out of the project.

Northbound right turning vehicles at the intersection of Aguirre Lane/Sasco Road are expected to experience significant delays during the weekday AM peak hour in 2045 without and with the project, with the Red Rock development. Several movements are expected to experience inadequate delays during the weekday PM peak hour in 2045 without and with the project, with the Red Rock development.

The remaining study intersections are anticipated to operate at an adequate LOS during the weekday peak hours in 2045 with traffic from the project.

Southbound left turn lanes are expected to be provided at North Access and South Access due to the planned raised median on Aguirre Lane. Northbound right turn lanes are not expected to be needed at the project driveways due to the end of road condition of Aguirre Lane at the southern border of the project site, which requires vehicles to access the site from the north. While in the future Aguirre Lane is planned to be extended to the south, vehicles are still expected to primarily travel to the site from the north.

The southbound left turn lanes at North Access/Aguirre Lane and South Access/Aguirre Lane are expected to require a minimum storage length of 75 feet.

Traffic signal warrants #1 and #2 are expected to be met at the intersection of Aguirre Lane/Sasco Road in 2045 without and with traffic from the project, with the Red Rock development.

Several movements are expected to experience inadequate delays during the weekday AM and PM peak hours in 2045 without and with the project, with the Red Rock development. The installation of dual northbound right turn lanes with northbound right turn overlap phasing would be expected to alleviate these delays.

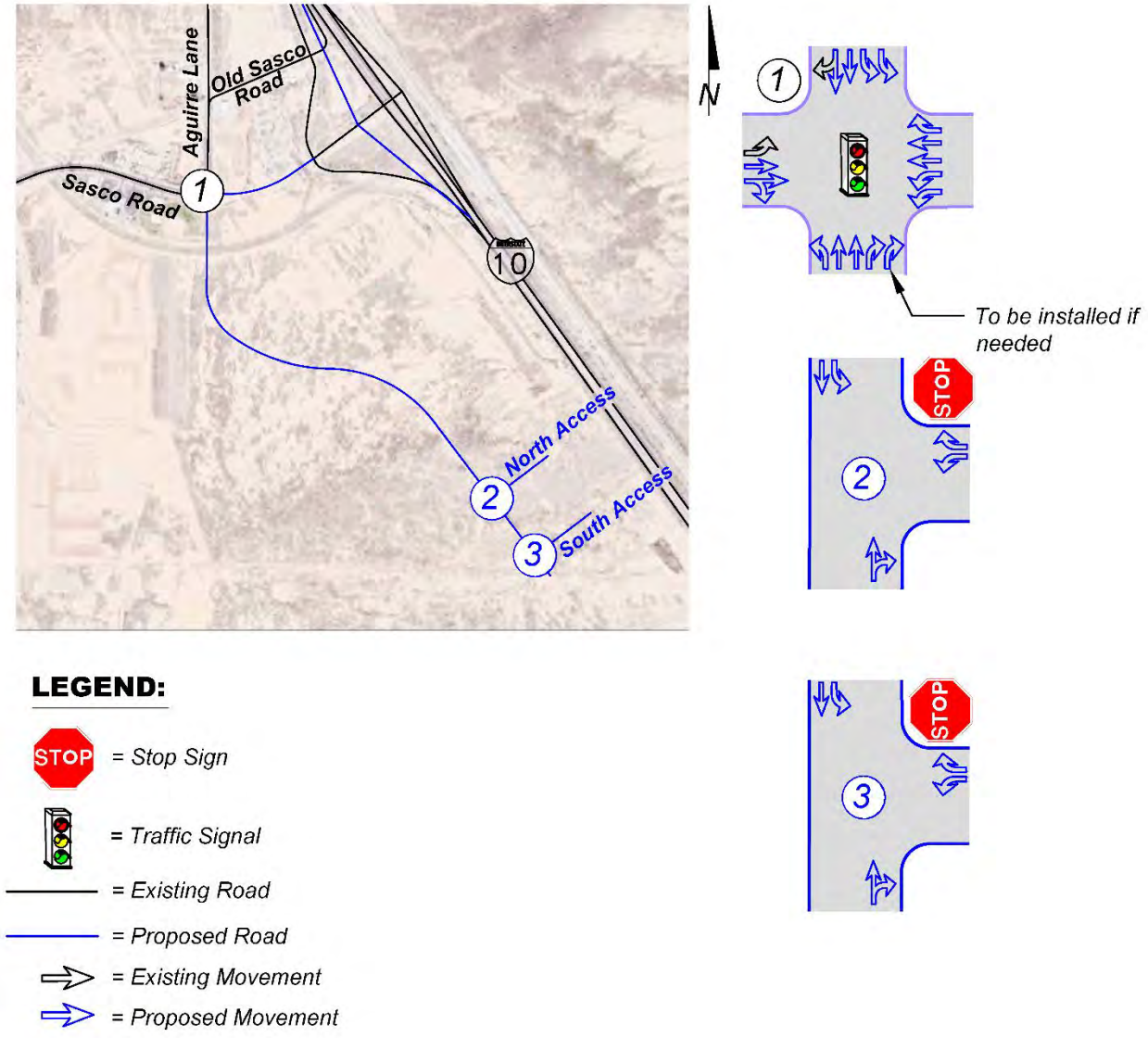
Red Rock Addendum #3 highlighted that while highly directional traffic patterns are expected at the intersection of Aguirre Lane/Sasco Road, market conditions are expected to largely influence the traffic patterns of the area. For instance, if additional adjacent developments are constructed subsequently with the overall Red Rock development, the assumed traffic distribution may vary significantly than what was assumed in the analysis.

Right of way should be set aside for dual northbound right turn lanes at Aguirre Lane/Sasco Road, which can be installed in the future if needed. Additionally, right turn overlap signal phasing is recommended for the northbound approach to the intersection.

Southbound left turn lanes should be constructed at North Access and South Access with minimum storage lengths of 100 feet to adhere to Pinal County guidelines.

Proposed lane configurations and traffic control are shown in **Figure 10**.

Figure 10 – Proposed Lane Configurations and Traffic Control



RED ROCK SMITH ROTHBERG
AGUIRRE LANE, SOUTH OF SASCO ROAD
TRAFFIC IMPACT ANALYSIS

APPENDIX

Traffic Counts

Trip Generation Calculations

Adjacent Site Assignment

Capacity Calculations

Turn Lane Calculations

Traffic Signal Warrant Analysis

RED ROCK SMITH ROTHBERG
AGUIRRE LANE, SOUTH OF SASCO ROAD
TRAFFIC IMPACT ANALYSIS

APPENDIX

Traffic Counts

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Tuesday, January 24, 2023 City: Red Rock Project #: 23-1076-001

Location: Sasco Rd just west of Aguirre Ln

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	1		1					12:00	24		30				
00:15	0		2					12:15	29		24				
00:30	0		2					12:30	30		21				
00:45	0	1	2	7			8	12:45	28	111	26	101			212
01:00	0		2					13:00	26		21				
01:15	2		0					13:15	27		31				
01:30	0		0					13:30	33		21				
01:45	1	3	1	3			6	13:45	24	110	16	89			199
02:00	2		0					14:00	26		33				
02:15	0		1					14:15	34		39				
02:30	2		1					14:30	40		34				
02:45	1	5	1	3			8	14:45	26	126	23	129			255
03:00	3		1					15:00	26		32				
03:15	4		1					15:15	37		39				
03:30	7		1					15:30	41		52				
03:45	6	20	1	4			24	15:45	45	149	43	166			315
04:00	15		2					16:00	34		56				
04:15	15		0					16:15	29		65				
04:30	16		0					16:30	38		70				
04:45	12	58	2	4			62	16:45	46	147	46	237			384
05:00	34		3					17:00	33		54				
05:15	21		3					17:15	32		53				
05:30	32		4					17:30	27		60				
05:45	41	128	5	15			143	17:45	18	110	57	224			334
06:00	41		6					18:00	22		83				
06:15	48		12					18:15	23		45				
06:30	61		16					18:30	8		50				
06:45	57	207	29	63			270	18:45	19	72	41	219			291
07:00	58		26					19:00	12		40				
07:15	74		41					19:15	13		33				
07:30	57		34					19:30	12		25				
07:45	76	265	31	132			397	19:45	9	46	36	134			180
08:00	67		28					20:00	5		25				
08:15	48		32					20:15	7		22				
08:30	31		22					20:30	7		22				
08:45	26	172	17	99			271	20:45	6	25	27	96			121
09:00	32		20					21:00	6		33				
09:15	23		19					21:15	6		15				
09:30	28		23					21:30	4		14				
09:45	27	110	19	81			191	21:45	1	17	9	71			88
10:00	20		15					22:00	2		13				
10:15	41		24					22:15	2		8				
10:30	26		30					22:30	1		8				
10:45	17	104	11	80			184	22:45	0	5	3	32			37
11:00	28		26					23:00	1		8				
11:15	21		30					23:15	1		6				
11:30	28		20					23:30	1		4				
11:45	20	97	20	96			193	23:45	2	5	2	20			25
Total Vol.		1170		587			**1757**			923		1518			**2441**

GPS Coordinates: 32.570393, -111.330272

Daily Totals

NB	SB	EB	WB	Combined
2093	2105			**4198**

	AM			PM		
Split %	66.6%	33.4%	**41.9%**	37.8%	62.2%	**58.1%**
Peak Hour	07:15	07:15	**07:15**	15:15	17:15	**16:00**
Volume	274	134	**408**	157	253	**384**
P.H.F.	0.90	0.82	**0.89**	0.87	0.76	**0.89**

RED ROCK SMITH ROTHBERG
AGUIRRE LANE, SOUTH OF SASCO ROAD
TRAFFIC IMPACT ANALYSIS

APPENDIX

Trip Generation Calculations

Single-Family Detached Housing

LAND USE: 294 Dwelling Units Single-Family Detached Housing

TRIP GENERATION CALCULATIONS ARE BASED ON THE INSTITUTE OF TRANSPORTATION ENGINEERS' TRIP GENERATION, 11TH EDITION. THE ITE LAND USE CODE IS Single-Family Detached Housing (210)

WEEKDAY

Average Rate = 9.43 Trips per Dwelling Unit (DU)

T = 9.43 Trips x 294 DU

T = 2,774 VTPD

ENTER: (0.5)*(2774) = **1,387 VTPD**

EXIT: (0.5)*(2774) = **1,387 VTPD**

AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)

Average Rate = 0.7 Trips per Dwelling Unit (DU)

T = 0.7 Trips x 294 DU

T = 206 VPH

ENTER: (0.26)*(206) = **54 VPH**

EXIT: (0.74)*(206) = **152 VPH**

PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)

Average Rate = 0.94 Trips per Dwelling Unit (DU)

T = 0.94 Trips x 294 DU

T = 277 VPH

ENTER: (0.63)*(277) = **175 VPH**

EXIT: (0.37)*(277) = **102 VPH**

*where, T = trip ends

TRIP GENERATION SUMMARY

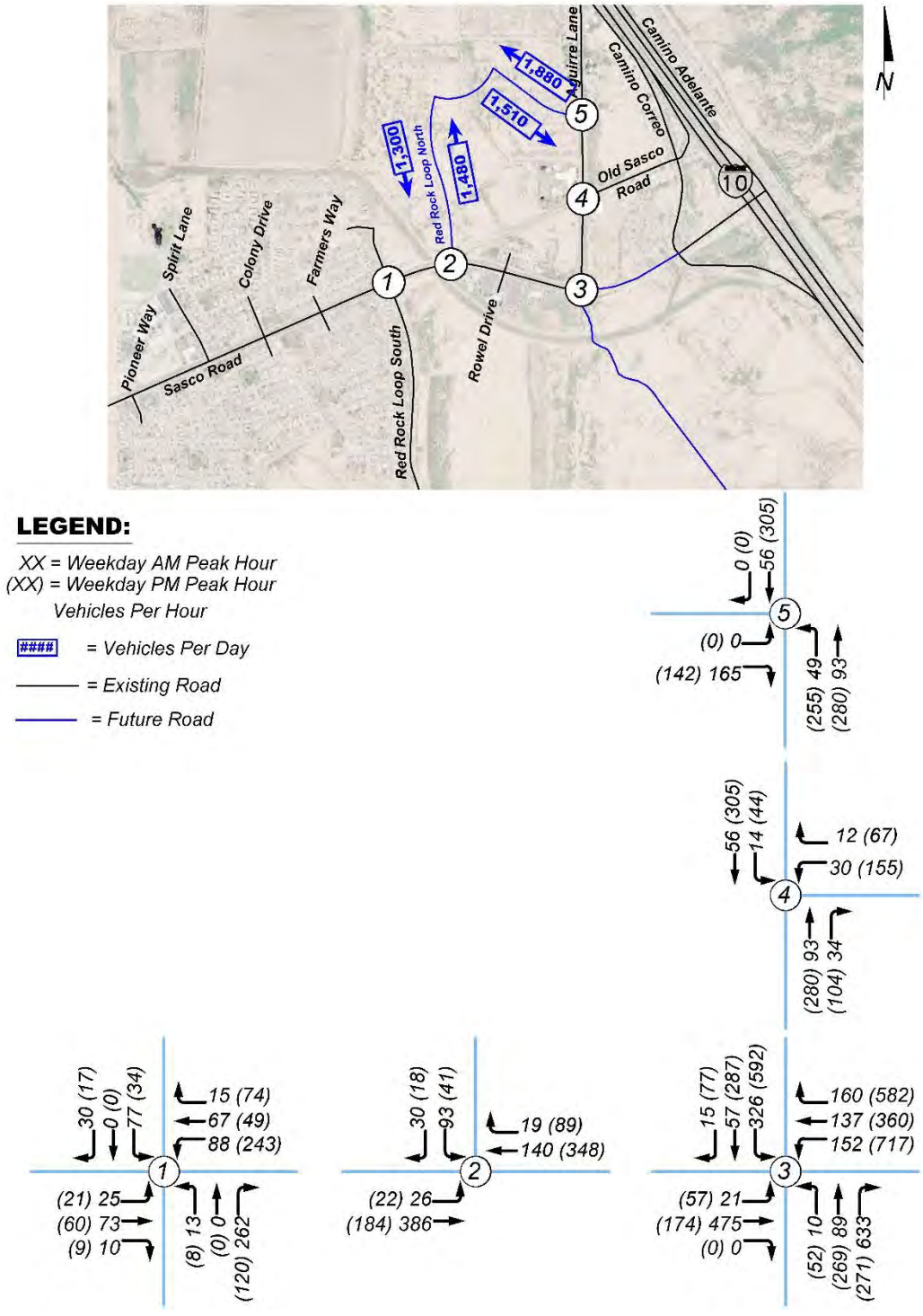
WEEKDAY	**2,774 VTPD**
AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)	**206 VPH**
PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)	**277 VPH**

RED ROCK SMITH ROTHBERG
AGUIRRE LANE, SOUTH OF SASCO ROAD
TRAFFIC IMPACT ANALYSIS

APPENDIX

Adjacent Site Assignment

Figure 4 – Redistributed 2045 Weekday Peak Hour Trip Assignment



RED ROCK SMITH ROTHBERG
AGUIRRE LANE, SOUTH OF SASCO ROAD
TRAFFIC IMPACT ANALYSIS

APPENDIX

Capacity Calculations

HCM 6th Signalized Intersection Summary
1: Sasco Road & Aguirre Lane

03/07/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	816	0	152	304	160	10	89	633	326	57	15
Future Volume (veh/h)	21	816	0	152	304	160	10	89	633	326	57	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	907	0	179	358	188	12	111	703	384	71	19
Peak Hour Factor	0.80	0.90	0.90	0.85	0.85	0.85	0.80	0.80	0.90	0.85	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	359	1009	0	264	1184	528	450	913	407	476	1063	274
Arrive On Green	0.03	0.28	0.00	0.08	0.33	0.33	0.01	0.26	0.26	0.14	0.38	0.38
Sat Flow, veh/h	1781	3647	0	3456	3554	1585	1781	3554	1585	3456	2796	721
Grp Volume(v), veh/h	26	907	0	179	358	188	12	111	703	384	44	46
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1728	1777	1585	1781	1777	1585	1728	1777	1741
Q Serve(g_s), s	0.8	20.1	0.0	4.1	6.1	7.3	0.4	2.0	21.0	8.8	1.3	1.4
Cycle Q Clear(g_c), s	0.8	20.1	0.0	4.1	6.1	7.3	0.4	2.0	21.0	8.8	1.3	1.4
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	359	1009	0	264	1184	528	450	913	407	476	676	662
V/C Ratio(X)	0.07	0.90	0.00	0.68	0.30	0.36	0.03	0.12	1.73	0.81	0.07	0.07
Avail Cap(c_a), veh/h	419	1044	0	465	1305	582	533	913	407	592	676	662
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.7	28.1	0.0	36.8	20.2	20.6	21.8	23.3	30.4	34.2	16.1	16.1
Incr Delay (d2), s/veh	0.1	10.3	0.0	3.0	0.1	0.4	0.0	0.3	336.7	6.6	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	9.6	0.0	1.8	2.5	2.7	0.2	0.8	45.8	4.0	0.5	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	38.4	0.0	39.8	20.4	21.0	21.8	23.6	367.1	40.7	16.3	16.3
LnGrp LOS	B	D	A	D	C	C	C	C	F	D	B	B
Approach Vol, veh/h		933			725			826			474	
Approach Delay, s/veh		37.9			25.3			315.9			36.1	
Approach LOS		D			C			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	26.0	11.2	28.2	6.2	36.1	7.2	32.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	14.0	21.0	11.0	24.0	5.0	30.0	5.0	30.0
Max Q Clear Time (g_c+I1), s	10.8	23.0	6.1	22.1	2.4	3.4	2.8	9.3
Green Ext Time (p_c), s	0.5	0.0	0.2	1.1	0.0	0.4	0.0	2.9

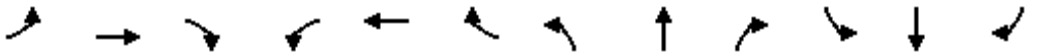
Intersection Summary	
HCM 6th Ctrl Delay	112.2
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
3: Sasco Road & Aguirre Lane

03/07/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	357	0	717	655	582	52	269	271	592	287	77
Future Volume (veh/h)	5	357	0	717	655	582	52	269	271	592	287	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	420	0	797	771	647	65	316	319	696	338	91
Peak Hour Factor	0.85	0.85	0.85	0.90	0.85	0.90	0.80	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	156	545	0	869	1410	629	311	539	241	726	877	233
Arrive On Green	0.01	0.15	0.00	0.25	0.40	0.40	0.05	0.15	0.15	0.21	0.32	0.32
Sat Flow, veh/h	1781	3647	0	3456	3554	1585	1781	3554	1585	3456	2777	737
Grp Volume(v), veh/h	6	420	0	797	771	647	65	316	319	696	214	215
Grp Sat Flow(s),veh/h/ln	1781	1777	0	1728	1777	1585	1781	1777	1585	1728	1777	1738
Q Serve(g_s), s	0.2	9.7	0.0	19.2	14.3	34.0	2.6	7.1	13.0	17.1	8.0	8.3
Cycle Q Clear(g_c), s	0.2	9.7	0.0	19.2	14.3	34.0	2.6	7.1	13.0	17.1	8.0	8.3
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	156	545	0	869	1410	629	311	539	241	726	561	549
V/C Ratio(X)	0.04	0.77	0.00	0.92	0.55	1.03	0.21	0.59	1.33	0.96	0.38	0.39
Avail Cap(c_a), veh/h	246	705	0	887	1410	629	334	539	241	726	561	549
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	34.8	0.0	31.2	19.9	25.8	28.6	33.8	36.3	33.5	22.8	22.9
Incr Delay (d2), s/veh	0.1	3.9	0.0	14.0	0.4	43.4	0.3	4.6	172.7	23.6	2.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	4.4	0.0	9.4	5.7	19.5	1.1	3.3	16.4	9.3	3.6	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	38.7	0.0	45.2	20.3	69.2	28.9	38.4	209.0	57.1	24.8	25.0
LnGrp LOS	C	D	A	D	C	F	C	D	F	E	C	C
Approach Vol, veh/h		426			2215			700			1125	
Approach Delay, s/veh		38.6			43.6			115.3			44.8	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.0	18.0	26.5	18.1	8.9	32.1	5.7	39.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	18.0	13.0	22.0	17.0	5.0	26.0	5.0	34.0
Max Q Clear Time (g_c+I1), s	19.1	15.0	21.2	11.7	4.6	10.3	2.2	36.0
Green Ext Time (p_c), s	0.0	0.0	0.3	1.2	0.0	2.3	0.0	0.0

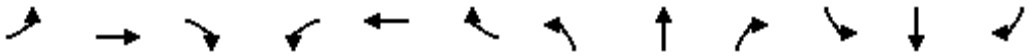
Intersection Summary	
HCM 6th Ctrl Delay	54.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
1: Aguirre Lane & Sasco Road

03/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	816	5	196	304	160	25	104	755	326	62	15
Future Volume (veh/h)	21	816	5	196	304	160	25	104	755	326	62	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	907	6	231	358	188	31	130	839	384	78	19
Peak Hour Factor	0.80	0.90	0.90	0.85	0.85	0.85	0.80	0.80	0.90	0.85	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	366	1006	7	317	1217	543	470	900	402	474	1027	242
Arrive On Green	0.03	0.28	0.28	0.09	0.34	0.34	0.03	0.25	0.25	0.14	0.36	0.36
Sat Flow, veh/h	1781	3619	24	3456	3554	1585	1781	3554	1585	3456	2854	672
Grp Volume(v), veh/h	26	445	468	231	358	188	31	130	839	384	48	49
Grp Sat Flow(s),veh/h/ln	1781	1777	1866	1728	1777	1585	1781	1777	1585	1728	1777	1749
Q Serve(g_s), s	0.9	20.1	20.1	5.4	6.1	7.4	1.1	2.4	21.1	9.0	1.5	1.6
Cycle Q Clear(g_c), s	0.9	20.1	20.1	5.4	6.1	7.4	1.1	2.4	21.1	9.0	1.5	1.6
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	366	494	519	317	1217	543	470	900	402	474	639	629
V/C Ratio(X)	0.07	0.90	0.90	0.73	0.29	0.35	0.07	0.14	2.09	0.81	0.07	0.08
Avail Cap(c_a), veh/h	425	511	537	456	1278	570	522	900	402	580	639	629
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.4	29.0	29.0	36.9	20.0	20.4	21.7	24.1	31.1	34.9	17.6	17.6
Incr Delay (d2), s/veh	0.1	18.7	18.0	3.4	0.1	0.4	0.1	0.3	498.6	7.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	10.8	11.2	2.4	2.5	2.7	0.4	1.0	63.4	4.2	0.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	47.7	47.0	40.2	20.2	20.8	21.8	24.5	529.7	42.0	17.8	17.8
LnGrp LOS	C	D	D	D	C	C	C	C	F	D	B	B
Approach Vol, veh/h		939			777			1000			481	
Approach Delay, s/veh		46.6			26.3			448.3			37.1	
Approach LOS		D			C			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	26.1	12.6	28.2	7.6	35.0	7.3	33.6
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	14.0	21.0	11.0	24.0	5.0	30.0	5.0	30.0
Max Q Clear Time (g_c+I1), s	11.0	23.1	7.4	22.1	3.1	3.6	2.9	9.4
Green Ext Time (p_c), s	0.4	0.0	0.3	1.1	0.0	0.5	0.0	2.9

Intersection Summary	
HCM 6th Ctrl Delay	165.9
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	76	76	0	27	27
Future Vol, veh/h	0	76	76	0	27	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	85	85	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	89	89	0	34	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	191	89	0	0	89	0
Stage 1	89	-	-	-	-	-
Stage 2	102	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	798	969	-	-	1506	-
Stage 1	934	-	-	-	-	-
Stage 2	922	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	780	969	-	-	1506	-
Mov Cap-2 Maneuver	780	-	-	-	-	-
Stage 1	934	-	-	-	-	-
Stage 2	901	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	3.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	969	1506	-
HCM Lane V/C Ratio	-	-	-	0.092	0.022	-
HCM Control Delay (s)	-	-	0	9.1	7.4	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	76	0	0	27	0
Future Vol, veh/h	0	76	0	0	27	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	85	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	89	0	0	34	0

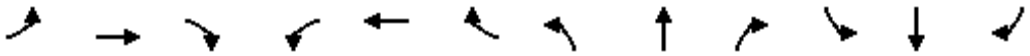
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	68	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	937	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	937	-	-	-	-	-
Mov Cap-2 Maneuver	937	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	955	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		0	
HCM LOS	-		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	-	-	0	-	-	-
HCM Lane LOS	-	-	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-	-

HCM 6th Signalized Intersection Summary
1: Aguirre Lane & Sasco Road

03/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	357	17	857	655	582	62	279	353	592	305	77
Future Volume (veh/h)	5	357	17	857	655	582	62	279	353	592	305	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	420	20	952	728	647	78	328	415	696	359	91
Peak Hour Factor	0.85	0.85	0.85	0.90	0.90	0.90	0.80	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	531	25	881	1425	635	315	536	239	721	870	218
Arrive On Green	0.01	0.15	0.15	0.26	0.40	0.40	0.05	0.15	0.15	0.21	0.31	0.31
Sat Flow, veh/h	1781	3454	164	3456	3554	1585	1781	3554	1585	3456	2815	705
Grp Volume(v), veh/h	6	216	224	952	728	647	78	328	415	696	225	225
Grp Sat Flow(s),veh/h/ln	1781	1777	1841	1728	1777	1585	1781	1777	1585	1728	1777	1743
Q Serve(g_s), s	0.2	10.1	10.1	22.0	13.3	34.6	3.2	7.4	13.0	17.2	8.6	8.8
Cycle Q Clear(g_c), s	0.2	10.1	10.1	22.0	13.3	34.6	3.2	7.4	13.0	17.2	8.6	8.8
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	158	273	283	881	1425	635	315	536	239	721	549	539
V/C Ratio(X)	0.04	0.79	0.79	1.08	0.51	1.02	0.25	0.61	1.74	0.97	0.41	0.42
Avail Cap(c_a), veh/h	247	350	363	881	1425	635	328	536	239	721	549	539
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	35.2	35.2	32.1	19.5	25.8	28.8	34.3	36.6	33.8	23.6	23.7
Incr Delay (d2), s/veh	0.1	9.0	9.0	54.3	0.3	40.3	0.4	5.2	348.6	25.1	2.3	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	4.9	5.1	15.5	5.3	19.3	1.4	3.5	28.0	9.5	3.9	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	44.1	44.2	86.4	19.8	66.2	29.2	39.4	385.2	58.9	25.8	26.0
LnGrp LOS	C	D	D	F	B	F	C	D	F	E	C	C
Approach Vol, veh/h		446			2327			821			1146	
Approach Delay, s/veh		44.0			59.9			213.2			46.0	
Approach LOS		D			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.0	18.0	27.0	18.2	9.4	31.6	5.7	39.6
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	18.0	13.0	22.0	17.0	5.0	26.0	5.0	34.0
Max Q Clear Time (g_c+I1), s	19.2	15.0	24.0	12.1	5.2	10.8	2.2	36.6
Green Ext Time (p_c), s	0.0	0.0	0.0	1.1	0.0	2.4	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	81.6
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	51	51	0	87	88
Future Vol, veh/h	0	51	51	0	87	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	80	80	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	64	64	0	102	104

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	372	64	0	0	64	0
Stage 1	64	-	-	-	-	-
Stage 2	308	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	629	1000	-	-	1538	-
Stage 1	959	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	587	1000	-	-	1538	-
Mov Cap-2 Maneuver	587	-	-	-	-	-
Stage 1	959	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	3.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	1000	1538	-
HCM Lane V/C Ratio	-	-	-	0.064	0.067	-
HCM Control Delay (s)	-	-	0	8.8	7.5	-
HCM Lane LOS	-	-	A	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0.2	0.2	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	51	0	0	88	0
Future Vol, veh/h	0	51	0	0	88	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	80	80	85	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	64	0	0	104	0

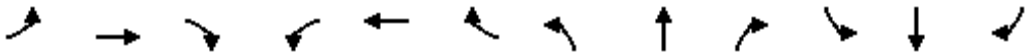
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	208	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	208	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	780	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	827	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	780	-	-	-	-	-
Mov Cap-2 Maneuver	780	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	827	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		0	
HCM LOS	-		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	-	-	0	-	-	-
HCM Lane LOS	-	-	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-	-

HCM 6th Signalized Intersection Summary
1: Aguirre Lane & Sasco Road

03/09/2023



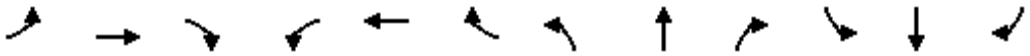
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	816	5	196	304	160	25	104	755	326	62	15
Future Volume (veh/h)	21	816	5	196	304	160	25	104	755	326	62	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	907	6	231	358	188	31	130	839	384	78	19
Peak Hour Factor	0.80	0.90	0.90	0.85	0.85	0.85	0.80	0.80	0.90	0.85	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	367	997	7	323	1214	541	466	882	953	477	1014	239
Arrive On Green	0.03	0.28	0.28	0.09	0.34	0.34	0.03	0.25	0.25	0.14	0.36	0.36
Sat Flow, veh/h	1781	3619	24	3456	3554	1585	1781	3554	2790	3456	2854	672
Grp Volume(v), veh/h	26	445	468	231	358	188	31	130	839	384	48	49
Grp Sat Flow(s),veh/h/ln	1781	1777	1866	1728	1777	1585	1781	1777	1395	1728	1777	1749
Q Serve(g_s), s	0.8	19.8	19.8	5.3	6.0	7.2	1.0	2.3	20.3	8.8	1.4	1.5
Cycle Q Clear(g_c), s	0.8	19.8	19.8	5.3	6.0	7.2	1.0	2.3	20.3	8.8	1.4	1.5
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	367	489	514	323	1214	541	466	882	953	477	631	621
V/C Ratio(X)	0.07	0.91	0.91	0.72	0.29	0.35	0.07	0.15	0.88	0.81	0.08	0.08
Avail Cap(c_a), veh/h	450	501	526	550	1306	582	520	882	953	593	631	621
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.1	28.6	28.6	36.0	19.7	20.1	21.6	23.9	25.3	34.1	17.4	17.5
Incr Delay (d2), s/veh	0.1	20.4	19.7	3.0	0.1	0.4	0.1	0.4	11.4	6.5	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	10.8	11.3	2.3	2.4	2.6	0.4	1.0	8.7	4.0	0.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	49.0	48.3	38.9	19.8	20.5	21.6	24.3	36.7	40.7	17.7	17.7
LnGrp LOS	C	D	D	D	B	C	C	C	D	D	B	B
Approach Vol, veh/h		939			777			1000			481	
Approach Delay, s/veh		47.9			25.6			34.7			36.0	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	25.3	12.6	27.5	7.5	34.0	7.2	32.9
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	14.0	20.0	13.0	23.0	5.0	29.0	6.0	30.0
Max Q Clear Time (g_c+I1), s	10.8	22.3	7.3	21.8	3.0	3.5	2.8	9.2
Green Ext Time (p_c), s	0.5	0.0	0.4	0.7	0.0	0.5	0.0	2.9

Intersection Summary	
HCM 6th Ctrl Delay	36.6
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
1: Aguirre Lane & Sasco Road

03/09/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	357	17	857	655	582	62	279	353	592	305	77
Future Volume (veh/h)	5	357	17	857	655	582	62	279	353	592	305	77
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	420	20	952	728	647	78	328	415	696	359	91
Peak Hour Factor	0.85	0.85	0.85	0.90	0.90	0.90	0.80	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	513	24	1015	1544	689	281	405	1137	747	783	196
Arrive On Green	0.01	0.15	0.15	0.29	0.43	0.43	0.05	0.11	0.11	0.22	0.28	0.28
Sat Flow, veh/h	1781	3454	164	3456	3554	1585	1781	3554	2790	3456	2815	705
Grp Volume(v), veh/h	6	216	224	952	728	647	78	328	415	696	225	225
Grp Sat Flow(s),veh/h/ln	1781	1777	1841	1728	1777	1585	1781	1777	1395	1728	1777	1743
Q Serve(g_s), s	0.3	10.3	10.4	23.6	12.8	34.3	3.4	7.9	9.1	17.4	9.2	9.4
Cycle Q Clear(g_c), s	0.3	10.3	10.4	23.6	12.8	34.3	3.4	7.9	9.1	17.4	9.2	9.4
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	154	264	273	1015	1544	689	281	405	1137	747	494	485
V/C Ratio(X)	0.04	0.82	0.82	0.94	0.47	0.94	0.28	0.81	0.37	0.93	0.45	0.46
Avail Cap(c_a), veh/h	283	303	314	1023	1544	689	290	405	1137	747	494	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.4	36.2	36.3	30.2	17.7	23.7	32.0	38.0	18.1	33.8	26.2	26.3
Incr Delay (d2), s/veh	0.1	14.2	14.1	15.4	0.2	20.8	0.5	16.0	0.9	18.3	3.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.4	5.6	11.6	5.0	15.9	1.5	4.3	3.0	9.0	4.2	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.5	50.4	50.4	45.7	17.9	44.6	32.5	54.0	19.0	52.1	29.2	29.4
LnGrp LOS	C	D	D	D	B	D	C	D	B	D	C	C
Approach Vol, veh/h		446			2327			821			1146	
Approach Delay, s/veh		50.1			36.7			34.3			43.1	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	15.0	30.8	18.0	9.6	29.4	5.7	43.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	19.0	10.0	26.0	15.0	5.0	24.0	7.0	34.0
Max Q Clear Time (g_c+I1), s	19.4	11.1	25.6	12.4	5.4	11.4	2.3	36.3
Green Ext Time (p_c), s	0.0	0.0	0.2	0.7	0.0	2.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	39.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

RED ROCK SMITH ROTHBERG
AGUIRRE LANE, SOUTH OF SASCO ROAD
TRAFFIC IMPACT ANALYSIS

APPENDIX

Turn Lane Calculations

Un-Signalized Intersection (Left Turn Lane)
Location: North Access/Aguirre Lane
Approach/Leg: Southbound **2045 With Project**

V = vehicles per hour

PM Peak Hour
V = 87 vph

S = Storage = (V *2 min* 25 ft/veh)/60 min/hr

$$S\ (ft) = \frac{87\ vph*(2\ min)*(25\ ft/veh)}{(60\ min/hr)} = 73\ feet$$

Minimum Recommended Storage: 75 feet

Un-Signalized Intersection (Left Turn Lane)
Location: South Access/Aguirre Lane
Approach/Leg: Southbound **2045 With Project**

V = vehicles per hour

PM Peak Hour
V = 88 vph

S = Storage = (V *2 min* 25 ft/veh)/60 min/hr

$$S\ (ft) = \frac{88\ vph*(2\ min)*(25\ ft/veh)}{(60\ min/hr)} = 73\ feet$$

Minimum Recommended Storage: 75 feet

RED ROCK SMITH ROTHBERG
AGUIRRE LANE, SOUTH OF SASCO ROAD
TRAFFIC IMPACT ANALYSIS

APPENDIX

Traffic Signal Warrant Analysis

General Description of Intersection

2045 Without With Adjacent Development

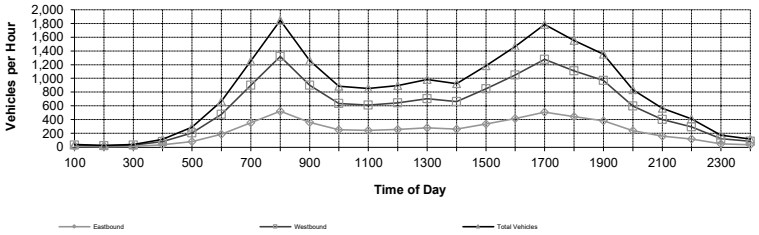
Project Number:	23010
Name of Major Roadway:	Sasco Road
Direction:	E/W
# of EB Lanes:	2
# of WB Lanes:	2
85th percentile speed:	35 mph
Control #:	
Section #:	
Route #:	
Name of Minor Roadway:	Aguirre Lane
Direction:	N/S
# of NB Lanes:	2
# of SB Lanes:	2
85th percentile speed:	35 mph
Control #:	
Section #:	
Route #:	
City:	Red Rock
Population:	5,000
County:	Maricopa
District:	
Data Source:	24-hour approach
Date of Survey:	1/24/2023 *(press Ctrl + ;)*
Day of Week:	Tuesday
Weather:	Sunny
Surface Conditions:	Dry / Smooth

Enter Traffic Volumes:

Automated Traffic Counts

Street: **Sasco Road**
Location: **Aguirre Lane**

City/State: **Red Rock, AZ**
Project #: **23010**
Date: **1/24/2023**
Day of Week: **Tuesday**
Data Source: **24-hour approach**



24-Hour Volume: **19,515**

Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	11		27	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	8		20	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	11		27	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	32		80	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	82		206	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	189		476	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	357		898	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	524		1321	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	358		902	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	252		636	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	243		612	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	255		642	

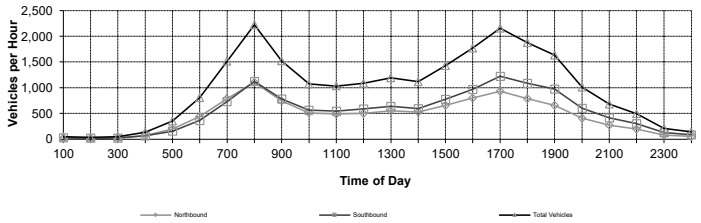
Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:15 PM				
12:30 PM				
12:45 PM				
1:00 PM	280		705	
1:15 PM				
1:30 PM				
1:45 PM				
2:00 PM	263		662	
2:15 PM				
2:30 PM				
2:45 PM				
3:00 PM	337		849	
3:15 PM				
3:30 PM				
3:45 PM				
4:00 PM	416		1048	
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM	507		1278	
5:15 PM				
5:30 PM				
5:45 PM				
6:00 PM	441		1111	
6:15 PM				
6:30 PM				
6:45 PM				
7:00 PM	384		968	
7:15 PM				
7:30 PM				
7:45 PM				
8:00 PM	238		599	
8:15 PM				
8:30 PM				
8:45 PM				
9:00 PM	160		403	
9:15 PM				
9:30 PM				
9:45 PM				
10:00 PM	116		293	
10:15 PM				
10:30 PM				
10:45 PM				
11:00 PM	49		123	
11:15 PM				
11:30 PM				
11:45 PM				
12:00 AM	33		83	
	5,545		13,970	
	24-Hour Volume		19,515	

Equipment ID#:

Automated Traffic Counts

Street: **Aguirre Lane**
Location: **Sasco Road**

City/State: **Red Rock, AZ**
Project #:
Date: **1/24/2023**
Day of Week: **Tuesday**
Data Source: **24-hour approach**



24-Hour Volume: **23,545**

Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	17		28	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	15		18	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	22		23	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	72		63	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	193		155	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	438		364	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	784		730	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	1104		1123	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	742		777	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	509		562	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	488		544	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	497		585	

Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:59 PM				
12:30 PM				
12:45 PM				
1:00 PM	552		638	
1:59 PM				
1:30 PM				
1:45 PM				
2:00 PM	525		591	
2:59 PM				
2:30 PM				
2:45 PM				
3:00 PM	654		776	
3:59 PM				
3:30 PM				
3:45 PM				
4:00 PM	800		967	
4:59 PM				
4:30 PM				
12:00 AM				
5:00 PM	932		1222	
5:59 PM				
5:30 PM				
5:45 PM				
6:00 PM	788		1085	
6:59 PM				
6:30 PM				
6:45 PM				
7:00 PM	657		975	
7:59 PM				
7:30 PM				
7:45 PM				
8:00 PM	408		601	
8:59 PM				
8:30 PM				
8:45 PM				
9:00 PM	267		412	
9:59 PM				
9:30 PM				
9:45 PM				
10:00 PM	193		301	
10:59 PM				
10:30 PM				
10:45 PM				
11:00 PM	78		129	
11:59 PM				
11:30 PM				
11:45 PM				
12:00 AM	55		85	
	10,790		12,755	
			24-Hour Volume	23,545

Equipment ID#:

TRAFFIC SURVEY - COUNT ANALYSIS
2009 MUTCD WARRANTS

	County:	Maricopa			**District No.:**	
	City:	Red Rock	**Population:**	5,000	**Survey Date:**	1/24/2023
	Route #	**Name**		**Control**	**Section**	**85% Speed**
Major		Sasco Road			-	35
Minor		Aguirre Lane			-	35

Warrant 1: Eight- Hour Volumes

Condition A

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural*
1		1	500	350	150	105
2 or more		1	600	420	150	105
2 or more		2 or more	600	**420**	200	**140**
1		2 or more	500	350	200	140

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 1

Time		Volume		Criteria		
				Major	Minor	
Begin	End	Major	Minor	>= 420	>= 140	Both Meet
12:00 AM	1:00 AM	37.18914	28.02697	N	N	N
1:00 AM	2:00 AM	27.89185	18.219617	N	N	N
2:00 AM	3:00 AM	37.18914	23.048107	N	N	N
3:00 AM	4:00 AM	111.5674	71.688028	N	N	N
4:00 AM	5:00 AM	288.2158	193.07727	N	Y	N
5:00 AM	6:00 AM	664.7558	438.13616	Y	Y	Y
6:00 AM	7:00 AM	1255.133	784.08543	Y	Y	Y
7:00 AM	8:00 AM	1845.511	1122.7577	Y	Y	Y
8:00 AM	9:00 AM	1259.782	777.48723	Y	Y	Y
9:00 AM	10:00 AM	887.8907	561.94276	Y	Y	Y
10:00 AM	11:00 AM	855.3502	543.79833	Y	Y	Y
11:00 AM	12:00 PM	897.1879	585.44198	Y	Y	Y
12:00 PM	1:00 PM	985.5121	637.53622	Y	Y	Y
1:00 PM	2:00 PM	925.0798	591.21444	Y	Y	Y
2:00 PM	3:00 PM	1185.404	776.20079	Y	Y	Y
3:00 PM	4:00 PM	1464.322	967.10997	Y	Y	Y
4:00 PM	5:00 PM	1785.079	1222.0677	Y	Y	Y
5:00 PM	6:00 PM	1552.646	1085.1741	Y	Y	Y
6:00 PM	7:00 PM	1352.755	975.13803	Y	Y	Y
7:00 PM	8:00 PM	836.7556	601.356	Y	Y	Y
8:00 PM	9:00 PM	562.4857	411.61635	Y	Y	Y
9:00 PM	10:00 PM	409.0805	300.82838	N	Y	N
10:00 PM	11:00 PM	171.9998	129.15797	N	N	N
11:00 PM	12:00 AM	116.2161	85.250439	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met: 16

Hours Required: 8

Condition A is satisfied

Warrant 1 satisfied.

Warrant 1: Eight- Hour Volumes

Condition B

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural*
1		1	750	525	75	53
2 or more		1	900	630	75	53
2 or more		2 or more	**900**	630	**100**	70
1		2 or more	750	525	100	70

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 2

Time		Volume		Criteria		
Begin	End	Major	Minor	Major >= 900	Minor >=100	Both Meet
12:00 AM	1:00 AM	37.18914	28.02697	N	N	N
1:00 AM	2:00 AM	27.89185	18.219617	N	N	N
2:00 AM	3:00 AM	37.18914	23.048107	N	N	N
3:00 AM	4:00 AM	111.5674	71.688028	N	N	N
4:00 AM	5:00 AM	288.2158	193.07727	N	Y	N
5:00 AM	6:00 AM	664.7558	438.13616	N	Y	N
6:00 AM	7:00 AM	1255.133	784.08543	Y	Y	Y
7:00 AM	8:00 AM	1845.511	1122.7577	Y	Y	Y
8:00 AM	9:00 AM	1259.782	777.48723	Y	Y	Y
9:00 AM	10:00 AM	887.8907	561.94276	N	Y	N
10:00 AM	11:00 AM	855.3502	543.79833	N	Y	N
11:00 AM	12:00 PM	897.1879	585.44198	N	Y	N
12:00 PM	1:00 PM	985.5121	637.53622	Y	Y	Y
1:00 PM	2:00 PM	925.0798	591.21444	Y	Y	Y
2:00 PM	3:00 PM	1185.404	776.20079	Y	Y	Y
3:00 PM	4:00 PM	1464.322	967.10997	Y	Y	Y
4:00 PM	5:00 PM	1785.079	1222.0677	Y	Y	Y
5:00 PM	6:00 PM	1552.646	1085.1741	Y	Y	Y
6:00 PM	7:00 PM	1352.755	975.13803	Y	Y	Y
7:00 PM	8:00 PM	836.7556	601.356	N	Y	N
8:00 PM	9:00 PM	562.4857	411.61635	N	Y	N
9:00 PM	10:00 PM	409.0805	300.82838	N	Y	N
10:00 PM	11:00 PM	171.9998	129.15797	N	Y	N
11:00 PM	12:00 AM	116.2161	85.250439	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met: 10

Hours Required: 8

Condition B is satisfied

Warrant 1 satisfied.

Warrant 2: Four Hour Vehicular Volumes

This warrant is similar to Warrant 1A, except that the required traffic volumes must be present for at least four hours of an average day. The traffic volumes required are based on curves (Figure 4C-1) shown in the MUTCD.

*** The required traffic is present for at least four hours.**

Warrant 2 is satisfied

Warrant 3, Condition A- Peak Hour Delay

This warrant is intended for application where traffic conditions will cause undue delay to traffic entering or crossing the major street. The peak hour delay warrant is satisfied when the following conditions exist for one hour (any four consecutive 15-minute periods) of an average weekday:

(1) The total delay by the traffic on a side street controlled by a stop sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach, **and**

(2) the volume on the side street (one direction) equals or exceeds 100 vph for one moving lane of traffic and 150 vph for two moving lanes, **and**

(3) the total traffic volume serviced during 1 hour equals or exceeds 800 vph for an intersection with four (or more) approaches or 650 vph for three approaches.

***Part 1 - N/A**
***Part 2 - N/A**
***Part 3 - N/A**

Warrant 3, Condition B - Peak Hour Volume

This warrant applies to traffic entering from the minor street which encounters undue delay crossing the main street. This w is satisfied when the main street and side street traffic volumes satisfy the curves shown in Figure 4C-4 of the TMUTCD.

Warrant 3 is N/A.

Warrant 4: Pedestrian Volume

Required*	Existing
100 or more for each of any four hours	_____
OR	
190 or more during any one hour	_____

* For predominant pedestrian crossing speeds less than 3.5 ft/sec, the pedestrian volume may be reduced as much as 50 percent.

Gap Requirements

YES	NO	Is the nearest signal located more than 300 feet away?
YES	NO	For traffic flow which is not platooned, are there less than 60 gaps per hour of adequate length for the pedestrians to cross the street?

Warrant 4 is N/A.

Warrant 5: School Crossing

YES NO Is the number of adequate gaps in traffic stream during the period when the children are using the crossing less than the number of minutes in the same period?

Warrant 5 is N/A.

Warrant 6: Coordinate Systems

YES NO Are the adjacent signals in a signal system?
YES NO Would the resultant spacing be 1000 feet or more?

Warrant 6 is N/A.

Warrant 7: Crash Experience

YES NO Is 80% or more of one of Warrants #1, #2, or #3 met?
YES NO Have there been more than five accidents susceptible to correction by a traffic signal in 12 months?

Warrant 7 is N/A.

Warrant 8: Roadway Network

YES NO Does the major street having an existing or immediately projected entering volume of > 1000 vehicles per hour of a typical weekday?

YES NO Do 5-year projected traffic volumes meet Warrants 1, 2, or 3?

YES NO Is there an entering traffic volume of at least 1000 vehicles per hour for each of any 5 hours on a Saturday or Sunday?

Warrant 8 is N/A.

Summary:

Warrants satisfied: 1, 2

Warrants not satisfied: none

Warrants not applicable: 3, 4, 5, 6, 7, 8

Warrants not included in study: none

Warrant 2 - Four Hour Vehicular Volumes

85th % speed: <= 40 mph
Population: < 10,000

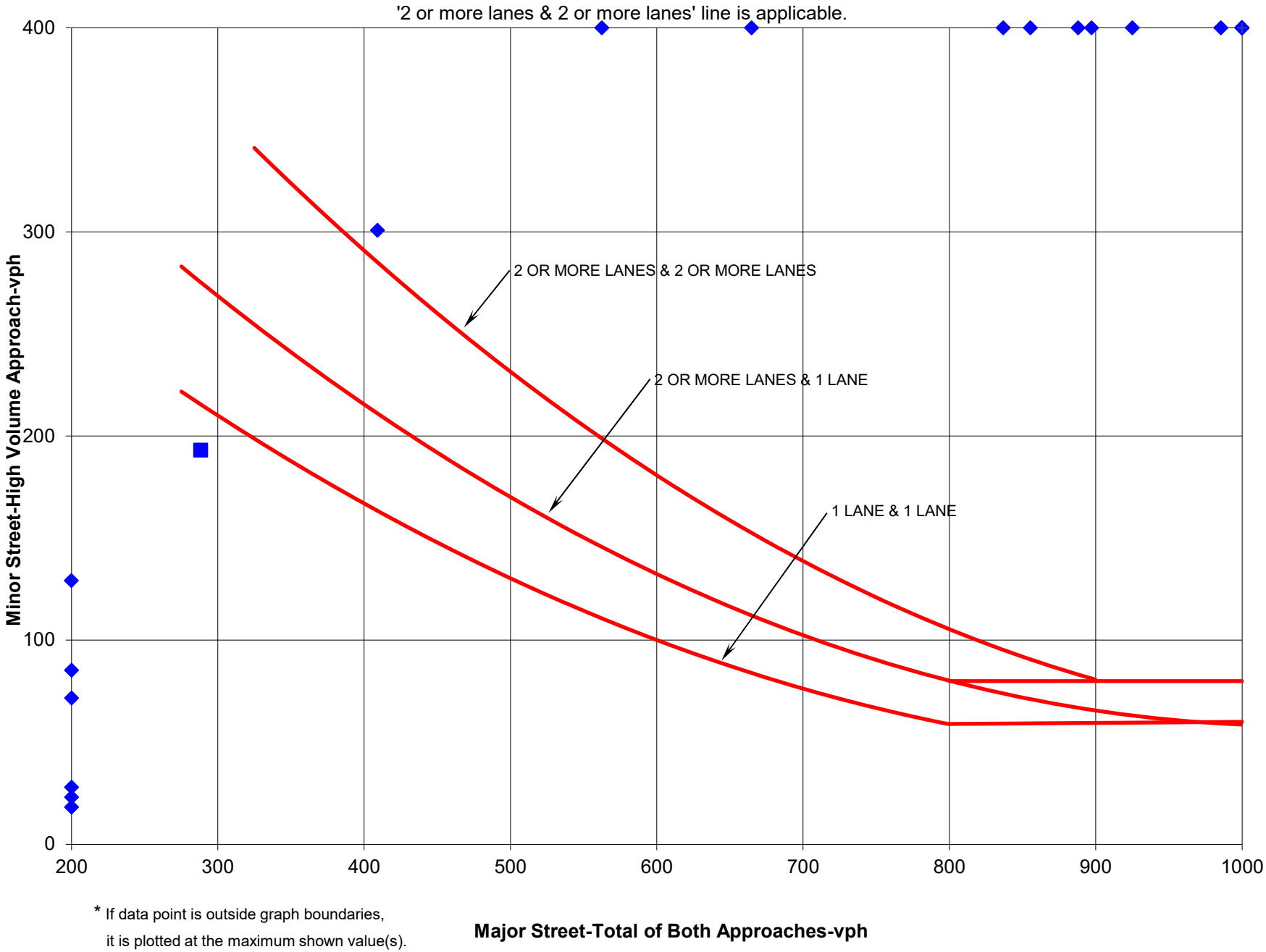
Major Street Lanes: 2
Minor Street Lanes: 2

Use Figure: 4C-2 2&2

Rank	Major Street Volume	Minor Street Volume	Figure 4C-1			Figure 4C-2		
			1&1	2&1	2&2	1&1	2&1	2&2
1	116.2160553	85.2504392	-	-	-	-	-	N
2	37.18913768	28.02697	-	-	-	-	-	N
3	27.89185326	18.2196169	-	-	-	-	-	N
4	37.18913768	23.0481066	-	-	-	-	-	N
5	111.5674131	71.6880285	-	-	-	-	-	N
6	288.2158171	193.077274	-	-	-	-	-	N
7	664.7558361	438.13616	-	-	-	-	-	Y
8	1255.133397	784.085435	-	-	-	-	-	Y
9	1845.510958	1122.75771	-	-	-	-	-	Y
10	1259.782039	777.487232	-	-	-	-	-	Y
11	887.8906622	561.942756	-	-	-	-	-	Y
12	855.3501667	543.798326	-	-	-	-	-	Y
13	897.1879466	585.441984	-	-	-	-	-	Y
14	985.5121486	637.536216	-	-	-	-	-	Y
15	925.0797999	591.214442	-	-	-	-	-	Y
16	1185.403764	776.20079	-	-	-	-	-	Y
17	1464.322296	967.109969	-	-	-	-	-	Y
18	1785.078609	1222.06769	-	-	-	-	-	Y
19	1552.646498	1085.17414	-	-	-	-	-	Y
20	1352.754883	975.138033	-	-	-	-	-	Y
21	836.7555979	601.356003	-	-	-	-	-	Y
22	562.4857075	411.616353	-	-	-	-	-	Y
23	409.0805145	300.828375	-	-	-	-	-	Y
24	171.9997618	129.157968	-	-	-	-	-	N
			0	0	0	0	0	17
Warrant 2 is satisfied.			N	N	N	N	N	Y

Warrant 2

Figure 4C-2 Four Hour Volume Warrant (population<10,000 or >40 mph on major street)



* If data point is outside graph boundaries, it is plotted at the maximum shown value(s).

General Description of Intersection

Project Number: 23010

2045 With

Name of Major Roadway: Sasco Road

Direction: E/W

# of EB Lanes: 2

# of WB Lanes: 2

85th percentile speed: 35 *mph*

Control #:

Section #:

Route #:

Name of Minor Roadway: Aguirre Lane

Direction: N/S

# of NB Lanes: 2

# of SB Lanes: 2

85th percentile speed: 35 *mph*

Control #:

Section #:

Route #:

City: Red Rock

Population: 5,000

County: Maricopa

District:

Data Source: 24-hour approach

Date of Survey: 1/24/2023 *(press Ctrl + ;)*

Day of Week: Tuesday

Weather: Sunny

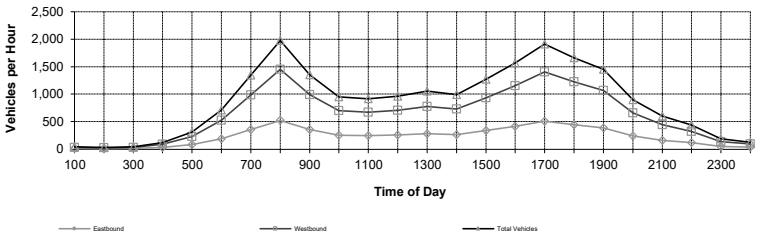
Surface Conditions: Dry, Smooth

Enter Traffic Volumes:

Automated Traffic Counts

Street: **Sasco Road**
Location: **Aguirre Lane**

City/State: **Red Rock, AZ**
Project #: **23010**
Date: **1/24/2023**
Day of Week: **Tuesday**
Data Source: **24-hour approach**



24-Hour Volume: **20,900**

Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	11		29	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	8		22	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	11		29	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	32		88	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	82		227	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	189		523	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	357		988	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	524		1452	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	358		991	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	252		699	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	243		673	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	255		706	

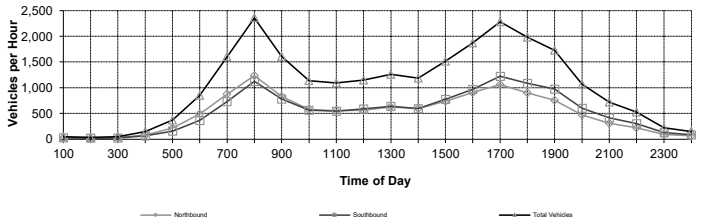
Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:15 PM				
12:30 PM				
12:45 PM				
1:00 PM	280		775	
1:15 PM				
1:30 PM				
1:45 PM				
2:00 PM	263		728	
2:15 PM				
2:30 PM				
2:45 PM				
3:00 PM	337		933	
3:15 PM				
3:30 PM				
3:45 PM				
4:00 PM	416		1152	
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM	507		1405	
5:15 PM				
5:30 PM				
5:45 PM				
6:00 PM	441		1222	
6:15 PM				
6:30 PM				
6:45 PM				
7:00 PM	384		1064	
7:15 PM				
7:30 PM				
7:45 PM				
8:00 PM	238		658	
8:15 PM				
8:30 PM				
8:45 PM				
9:00 PM	160		443	
9:15 PM				
9:30 PM				
9:45 PM				
10:00 PM	116		322	
10:15 PM				
10:30 PM				
10:45 PM				
11:00 PM	49		135	
11:15 PM				
11:30 PM				
11:45 PM				
12:00 AM	33		91	
	5,545		15,355	
	24-Hour Volume		20,900	

Equipment ID#:

Automated Traffic Counts

Street: **Aguirre Lane**
Location: **Sasco Road**

City/State: **Red Rock, AZ**
Project #:
Date: **1/24/2023**
Day of Week: **Tuesday**
Data Source: **24-hour approach**



24-Hour Volume: **24,930**

Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	19		28	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	17		18	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	24		23	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	80		63	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	214		155	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	485		364	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	873		730	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	1235		1123	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	832		777	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	572		562	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	549		544	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	561		585	

Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:59 PM				
12:30 PM				
12:45 PM				
1:00 PM	621		638	
1:59 PM				
1:30 PM				
1:45 PM				
2:00 PM	591		591	
2:59 PM				
2:30 PM				
2:45 PM				
3:00 PM	738		776	
3:59 PM				
3:30 PM				
3:45 PM				
4:00 PM	904		967	
4:59 PM				
4:30 PM				
12:00 AM				
5:00 PM	1058		1222	
5:59 PM				
5:30 PM				
5:45 PM				
6:00 PM	898		1085	
6:59 PM				
6:30 PM				
6:45 PM				
7:00 PM	753		975	
7:59 PM				
7:30 PM				
7:45 PM				
8:00 PM	468		601	
8:59 PM				
8:30 PM				
8:45 PM				
9:00 PM	307		412	
9:59 PM				
9:30 PM				
9:45 PM				
10:00 PM	222		301	
10:59 PM				
10:30 PM				
10:45 PM				
11:00 PM	91		129	
11:59 PM				
11:30 PM				
11:45 PM				
12:00 AM	63		85	
	12,175		12,755	
	24-Hour Volume		24,930	

Equipment ID#:

TRAFFIC SURVEY - COUNT ANALYSIS
2009 MUTCD WARRANTS

	County:	Maricopa			**District No.:**	
	City:	Red Rock	**Population:**	5,000	**Survey Date:**	1/24/2023
	Route #	**Name**		**Control**	**Section**	**85% Speed**
Major		Sasco Road			-	35
Minor		Aguirre Lane			-	35

Warrant 1: Eight- Hour Volumes

Condition A

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural*
1		1	500	350	150	105
2 or more		1	600	420	150	105
2 or more		2 or more	600	**420**	200	**140**
1		2 or more	500	350	200	140

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 1

Time		Volume		Criteria		
				Major	Minor	
Begin	End	Major	Minor	>= 420	>= 140	Both Meet
12:00 AM	1:00 AM	39.82849	28.02697	N	N	N
1:00 AM	2:00 AM	29.87137	18.219617	N	N	N
2:00 AM	3:00 AM	39.82849	24.460835	N	N	N
3:00 AM	4:00 AM	119.4855	79.606085	N	N	N
4:00 AM	5:00 AM	308.6708	213.53225	N	Y	N
5:00 AM	6:00 AM	711.9343	485.31458	Y	Y	Y
6:00 AM	7:00 AM	1344.212	873.16357	Y	Y	Y
7:00 AM	8:00 AM	1976.489	1234.8735	Y	Y	Y
8:00 AM	9:00 AM	1349.19	831.87817	Y	Y	Y
9:00 AM	10:00 AM	950.9052	572.33323	Y	Y	Y
10:00 AM	11:00 AM	916.0553	548.90733	Y	Y	Y
11:00 AM	12:00 PM	960.8623	585.44198	Y	Y	Y
12:00 PM	1:00 PM	1055.455	637.53622	Y	Y	Y
1:00 PM	2:00 PM	990.7337	591.21444	Y	Y	Y
2:00 PM	3:00 PM	1269.533	776.20079	Y	Y	Y
3:00 PM	4:00 PM	1568.247	967.10997	Y	Y	Y
4:00 PM	5:00 PM	1911.768	1222.0677	Y	Y	Y
5:00 PM	6:00 PM	1662.839	1085.1741	Y	Y	Y
6:00 PM	7:00 PM	1448.761	975.13803	Y	Y	Y
7:00 PM	8:00 PM	896.141	601.356	Y	Y	Y
8:00 PM	9:00 PM	602.4059	411.61635	Y	Y	Y
9:00 PM	10:00 PM	438.1134	300.82838	Y	Y	Y
10:00 PM	11:00 PM	184.2068	129.15797	N	N	N
11:00 PM	12:00 AM	124.464	85.250439	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met: 17

Hours Required: 8

Condition A is satisfied

Warrant 1 satisfied.

Warrant 1: Eight- Hour Volumes

Condition B

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural*
1		1	750	525	75	53
2 or more		1	900	630	75	53
2 or more		2 or more	**900**	630	**100**	70
1		2 or more	750	525	100	70

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 2

Time		Volume		Criteria		
Begin	End	Major	Minor	Major >= 900	Minor >=100	Both Meet
12:00 AM	1:00 AM	39.82849	28.02697	N	N	N
1:00 AM	2:00 AM	29.87137	18.219617	N	N	N
2:00 AM	3:00 AM	39.82849	24.460835	N	N	N
3:00 AM	4:00 AM	119.4855	79.606085	N	N	N
4:00 AM	5:00 AM	308.6708	213.53225	N	Y	N
5:00 AM	6:00 AM	711.9343	485.31458	N	Y	N
6:00 AM	7:00 AM	1344.212	873.16357	Y	Y	Y
7:00 AM	8:00 AM	1976.489	1234.8735	Y	Y	Y
8:00 AM	9:00 AM	1349.19	831.87817	Y	Y	Y
9:00 AM	10:00 AM	950.9052	572.33323	Y	Y	Y
10:00 AM	11:00 AM	916.0553	548.90733	Y	Y	Y
11:00 AM	12:00 PM	960.8623	585.44198	Y	Y	Y
12:00 PM	1:00 PM	1055.455	637.53622	Y	Y	Y
1:00 PM	2:00 PM	990.7337	591.21444	Y	Y	Y
2:00 PM	3:00 PM	1269.533	776.20079	Y	Y	Y
3:00 PM	4:00 PM	1568.247	967.10997	Y	Y	Y
4:00 PM	5:00 PM	1911.768	1222.0677	Y	Y	Y
5:00 PM	6:00 PM	1662.839	1085.1741	Y	Y	Y
6:00 PM	7:00 PM	1448.761	975.13803	Y	Y	Y
7:00 PM	8:00 PM	896.141	601.356	N	Y	N
8:00 PM	9:00 PM	602.4059	411.61635	N	Y	N
9:00 PM	10:00 PM	438.1134	300.82838	N	Y	N
10:00 PM	11:00 PM	184.2068	129.15797	N	Y	N
11:00 PM	12:00 AM	124.464	85.250439	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met:	13
Hours Required:	8

Condition B is satisfied

Warrant 1 satisfied.

Warrant 2: Four Hour Vehicular Volumes

This warrant is similar to Warrant 1A, except that the required traffic volumes must be present for at least four hours of an average day. The traffic volumes required are based on curves (Figure 4C-1) shown in the MUTCD.

*** The required traffic is present for at least four hours.**

Warrant 2 is satisfied

Warrant 3, Condition A- Peak Hour Delay

This warrant is intended for application where traffic conditions will cause undue delay to traffic entering or crossing the major street. The peak hour delay warrant is satisfied when the following conditions exist for one hour (any four consecutive 15-minute periods) of an average weekday:

(1) The total delay by the traffic on a side street controlled by a stop sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach, **and**

(2) the volume on the side street (one direction) equals or exceeds 100 vph for one moving lane of traffic and 150 vph for two moving lanes, **and**

(3) the total traffic volume serviced during 1 hour equals or exceeds 800 vph for an intersection with four (or more) approaches or 650 vph for three approaches.

***Part 1 - N/A**
***Part 2 - N/A**
***Part 3 - N/A**

Warrant 3, Condition B - Peak Hour Volume

This warrant applies to traffic entering from the minor street which encounters undue delay crossing the main street. This w is satisfied when the main street and side street traffic volumes satisfy the curves shown in Figure 4C-4 of the TMUTCD.

Warrant 3 is N/A.

Warrant 4: Pedestrian Volume

Required*	Existing
100 or more for each of any four hours	_____
OR	
190 or more during any one hour	_____

* For predominant pedestrian crossing speeds less than 3.5 ft/sec, the pedestrian volume may be reduced as much as 50 percent.

Gap Requirements

YES	NO	Is the nearest signal located more than 300 feet away?
YES	NO	For traffic flow which is not platooned, are there less than 60 gaps per hour of adequate length for the pedestrians to cross the street?

Warrant 4 is N/A.

Warrant 5: School Crossing

YES NO Is the number of adequate gaps in traffic stream during the period when the children are using the crossing less than the number of minutes in the same period?

Warrant 5 is N/A.

Warrant 6: Coordinate Systems

YES NO Are the adjacent signals in a signal system?
YES NO Would the resultant spacing be 1000 feet or more?

Warrant 6 is N/A.

Warrant 7: Crash Experience

YES NO Is 80% or more of one of Warrants #1, #2, or #3 met?
YES NO Have there been more than five accidents susceptible to correction by a traffic signal in 12 months?

Warrant 7 is N/A.

Warrant 8: Roadway Network

YES NO Does the major street having an existing or immediately projected entering volume of > 1000 vehicles per hour of a typical weekday?

YES NO Do 5-year projected traffic volumes meet Warrants 1, 2, or 3?

YES NO Is there an entering traffic volume of at least 1000 vehicles per hour for each of any 5 hours on a Saturday or Sunday?

Warrant 8 is N/A.

Summary:

Warrants satisfied: 1, 2

Warrants not satisfied: none

Warrants not applicable: 3, 4, 5, 6, 7, 8

Warrants not included in study: none

Warrant 2 - Four Hour Vehicular Volumes

85th % speed: <= 40 mph
Population: < 10,000

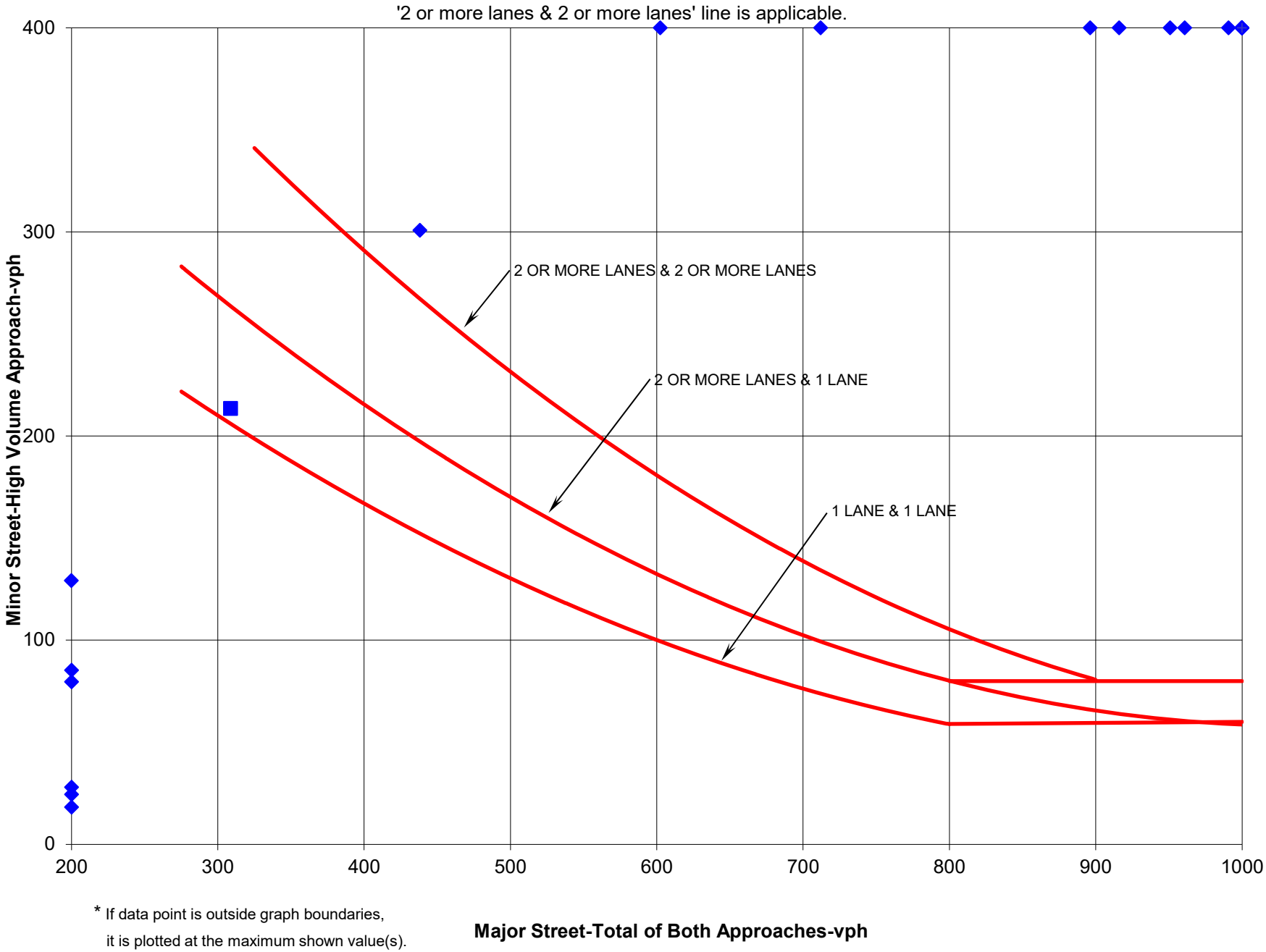
Major Street Lanes: 2
Minor Street Lanes: 2

Use Figure: 4C-2 2&2

Rank	Major Street Volume	Minor Street Volume	Figure 4C-1			Figure 4C-2		
			1&1	2&1	2&2	1&1	2&1	2&2
1	124.4640305	85.2504392	-	-	-	-	-	N
2	39.82848976	28.02697	-	-	-	-	-	N
3	29.87136732	18.2196169	-	-	-	-	-	N
4	39.82848976	24.4608351	-	-	-	-	-	N
5	119.4854693	79.6060847	-	-	-	-	-	N
6	308.6707956	213.532253	-	-	-	-	-	N
7	711.9342544	485.314578	-	-	-	-	-	Y
8	1344.211529	873.163567	-	-	-	-	-	Y
9	1976.488804	1234.87352	-	-	-	-	-	Y
10	1349.190091	831.878169	-	-	-	-	-	Y
11	950.9051929	572.333228	-	-	-	-	-	Y
12	916.0552644	548.907334	-	-	-	-	-	Y
13	960.8623154	585.441984	-	-	-	-	-	Y
14	1055.454979	637.536216	-	-	-	-	-	Y
15	990.7336827	591.214442	-	-	-	-	-	Y
16	1269.533111	776.20079	-	-	-	-	-	Y
17	1568.246784	967.109969	-	-	-	-	-	Y
18	1911.767508	1222.06769	-	-	-	-	-	Y
19	1662.839447	1085.17414	-	-	-	-	-	Y
20	1448.761315	975.138033	-	-	-	-	-	Y
21	896.1410195	601.356003	-	-	-	-	-	Y
22	602.4059076	411.616353	-	-	-	-	-	Y
23	438.1133873	300.828375	-	-	-	-	-	Y
24	184.2067651	129.157968	-	-	-	-	-	N
			0	0	0	0	0	17
Warrant 2 is satisfied.			N	N	N	N	N	Y

Warrant 2

Figure 4C-2 Four Hour Volume Warrant (population<10,000 or >40 mph on major street)



* If data point is outside graph boundaries, it is plotted at the maximum shown value(s).

LEGAL DESCRIPTION:

EXHIBIT A

The Land referred to herein below is situated in the County of Pinal, State of Arizona, and is described as follows:

A part of Section 9, Township 10 South, Range 10 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona, described as follows:

COMMENCING at the Southeast corner of the Southeast one-quarter of said section;

THENCE North 89° 56' 53" West along the South line of the said Southeast one-quarter, a distance of 50.87 feet to the POINT OF BEGINNING on the West right-of-way line of Interstate 10;

THENCE continue North 89° 56' 53" West, along the said South line, a distance of 1,700.25 feet to the East line of the El Paso Natural Gas easement;

THENCE North 37° 51' 09" West along the said East line, a distance of 1,365.93 feet;

THENCE North 54° 37' 04" East 1,444.28 feet to the said West right-of-way line;

THENCE South 35° 22' 56" East along the said West right-of-way line, a distance of 856.29 feet;

THENCE South 35° 22' 45" East, along the said West right-of-way line, a distance of 1,494.12 feet to the POINT OF BEGINNING

EXCEPT for a period of (99) ninety-nine years from March 27, 1989, an undivided one-eighth of all minerals, including oil and gas that may be on, in, under, or produced from the property, as reserved in Deed recorded in Docket 1593, page 760, Records of Pinal County, Arizona..

GENERAL NOTES:

1. THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH FIRST AMERICAN TITLE INSURANCE CO., FILE NO. 06199288-128-CM COMMITMENT DATE: JANUARY 28, 2022.
2. **BASIS OF BEARINGS:** IS THE NORTH LINE OF SECTION 8, TOWNSHIP 10 SOUTH, RANGE 10 EAST OF THE GILA AND SALT RIVER MERIDIAN, PINAL COUNTY, ARIZONA, BEARING BEING: **S 89°45'51" W** .
3. AREA OF THIS PARCEL=**60.128**± ACRES.
4. THIS IS AN ABOVE GROUND SURVEY. THE UNDERGROUND UTILITIES, IF SHOWN, ARE BASED ON INFORMATION PROVIDED BY THE VARIOUS UTILITY COMPANIES AND THESE LOCATIONS SHOULD BE CONSIDERED APPROXIMATE. THERE MAY BE ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN ON THIS DRAWING.
5. THE WORD "CERTIFY" OR "CERTIFICATE" IS AN EXPRESSION OF PROFESSIONAL OPINION REGARDING THE FACTS OF THE SURVEY AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED.
6. FLOOD ZONE DESIGNATION IS SHADED ZONE "X" PER FEDERAL EMERGENCY MANAGEMENT AGENCY MAP NUMBER 04021C2400E, PANEL NUMBER 2400 OF 2575, EFFECTIVE DATE: DECEMBER 4, 2007.
7. NO BUILDINGS OBSERVED.

TABLE "A" NOTES

8. NO SUBSTANTIAL FEATURES OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK (IN ADDITION TO THE IMPROVEMENTS AND FEATURES REQUIRED PURSUANT TO SECTION 5 ABOVE) (E.G., PARKING LOTS, BILLBOARDS, SIGNS, SWIMMING POOLS, LANDSCAPED AREAS, SUBSTANTIAL AREAS OF REFUSE).

11. NO EVIDENCE OF UNDERGROUND UTILITIES EXISTING ON OR SERVING THE SURVEYED PROPERTY (IN ADDITION TO THE OBSERVED EVIDENCE OF UTILITIES REQUIRED PURSUANT TO SECTION 5.E.IV.) AS DETERMINED BY:

(a) PLANS AND/OR REPORTS PROVIDED BY CLIENT (WITH REFERENCE AS TO THE SOURCES OF INFORMATION)

16. NO EVIDENCE OF RECENT EARTH MOVING WORK, BUILDING CONSTRUCTION, OR BUILDING ADDITIONS OBSERVED IN THE PROCESS OF CONDUCTING THE FIELDWORK.

4.4.22

AMERSON SURVEYING INC
4552 E. Camp Lowell Dr.
Tucson, Arizona 85712
Fax: 325-8703
520-325-5883

(#) SCHEDULE 'B' PART II

EXCEPTIONS

THIS COMMITMENT DOES NOT REPUBLISH ANY COVENANT, CONDITION, RESTRICTION, OR LIMITATION CONTAINED IN ANY DOCUMENT REFERRED TO IN THIS COMMITMENT TO THE EXTENT THAT THE SPECIFIC COVENANT, CONDITION, RESTRICTION, OR LIMITATION VIOLATES STATE OR FEDERAL LAW BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, GENDER IDENTITY, HANDICAP, FAMILIAL STATUS, OR NATIONAL ORIGIN.

The Policy will not insure against loss or damage resulting from the terms and provisions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

I. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I- Requirements are met.

A. a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.

B. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession thereof.

C. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.

D. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the Public Records.

E. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.

F. Any lien or right to a lien for services, labor or material not shown by the Public Records.

1. RESERVATIONS contained in the Patent from the United States of America, recorded in Book 24 of Deeds, page 555, reading as follows: THERE IS RESERVED from the lands hereby granted, a right of way thereon for ditches or canals constructed by the authority of the United States of America.

2. WATER RIGHTS, claims or title to water, and agreements, covenants, conditions or rights incident thereto, whether or not shown by the public records.
This exception is not limited by reason of the disclosure of any matter relating to Water Rights as may be set forth elsewhere in Schedule B.

3. TAXES AND ASSESSMENTS collectible by the County Treasurer, a lien not yet due and payable for the following year: 2021

4. EASEMENT and rights incident thereto, as set forth in instrument:

Recorded in Book 24 of Miscellaneous Page 229
Purpose communications facilities *BLANKET ESMT IN THE E 1/2 SEC 9*

5. EASEMENT and rights incident thereto, as set forth in instrument:

Recorded in Book 24 of Miscellaneous Page 493
Purpose communications facilities *BLANKET ESMT IN THE SE 1/4 SEC 9*

6. EASEMENT and rights incident thereto, as set forth in instrument:
Recorded in Docket 129
Page 459 *ALL OF SECTION 9 TO BE SELECTED BY*
Purpose pipeline and appurtenant facilities *GRANTEE FOR SOUTH PACIFIC PIPE LINE*

7. THE RIGHT OF ENTRY to prospect for, mine and remove the minerals in said land, as implied by the reservation of same in instrument:

Recorded in Docket 1593 Page 760 *PLOTTED AND NOT ON PROPERTY*

8. UNRECORDED AGREEMENT according to the terms and conditions contained therein:

Purpose Improvement and development
Dated August 08, 2008
Disclosed by Memorandum *LEGAL OF ALL OF RED ROCK LESS*
Recorded September 29, 2008 *COMMERCIAL & EXCEPTED PARCEL*
Fee No. 2008-092620

9. AGREEMENT according to the terms and conditions contained therein: *PLOTTED AND NOT ON PROPERTY*

Purpose Temporary easement
Dated August 08, 2008
Recorded September 29, 2008
Fee No. 2008-092621

First Amendment:
Recorded October 23, 2018
Fee No. 2018-079500

10. AGREEMENT according to the terms and conditions contained therein: *NOT ON PROPERTY*

Purpose Temporary easement
Dated August 08, 2008
Recorded September 29, 2008
Fee No. 2008-092622

11. AGREEMENT according to the terms and conditions contained therein: *NOT ON PROPERTY*

Purpose Temporary signage
Dated August 08, 2008
Recorded September 29, 2008
Fee No. 2008-092624

First Amendment:
Recorded October 23, 2018
Fee No. 2018-079499

12. RIGHTS OF PARTIES in possession.
NOTE: This exception will be amended or deleted upon the submission of the corresponding documents required in Schedule B, Part I.

13. ADVERSE MATTERS that may be revealed by an inspection of the land.
NOTE: This exception will be amended or deleted upon the submission of the corresponding documents required in Schedule B, Part I.

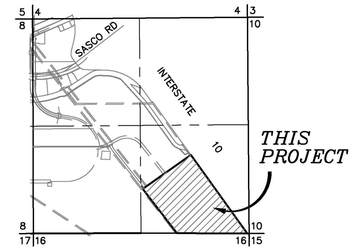
14. LOCATION OF IMPROVEMENTS, easements, discrepancies, conflicts in boundary lines, shortage in area, encroachments or any other facts which a correct survey would disclose.
NOTE: This exception will be amended or deleted upon the submission of the corresponding documents required in Schedule B, Part I.

LEGEND:

●	FOUND AS NOTED AND ATTACHED TAG PLS 22245
O	FOUND AS NOTED
×	CALCULATED POINT
(#)	SCHEDULE B ITEMS
-×-×-×-	FENCE LINE AS NOTED
(NSR)	NOT SURVEY RELATED

REFERENCES:

- TITLE REPORT FROM FIRST AMERICAN FILE# 06199288-128-CM (R)
- ALTA HILGART/WILSON PROJECT# 2023 DATED 7-20-2018 (R-1)
- R OF S 2005-066223 DATED 06-03-2005 STANTEC (R-2)



LOCATION PLAN

A PORTION OF SECTION 9
TOWNSHIP 10 SOUTH, RANGE 10 EAST,
GILA & SALT RIVER MERIDIAN,
PINAL CO., ARIZONA
SCALE: 3"= 1 MILE

NO. SHEET INDEX

1. COVER SHEET AND NOTES
2. SURVEY

CERTIFICATION:

TO: RRV SOUTH LP, AN ARIZONA LIMITED PARTNERSHIP, ROBERT ROTHBERG, A MARRIED MAN, JOAN D. ROTHBERG A MARRIED WOMAN, ROBIN B. SMITH, AN UNMARRIED WOMAN AND LANDMARK TITLE ASSURANCE AGENCY OF ARIZONA LLC.

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1,3,4,8,11a & 16 OF TABLE THEREOF. THE FIELD WORK WAS COMPLETED ON MARCH 14, 2022.

DATE OF PLAT OR MAP: MARCH 31, 2022

MICHAEL K. AMERSON
REGISTERED LAND SURVEYOR #22245

AMERSON SURVEYING, INC.
4552 E. Camp Lowell Drive
Tucson, Arizona 85712-1213
520-325-5883

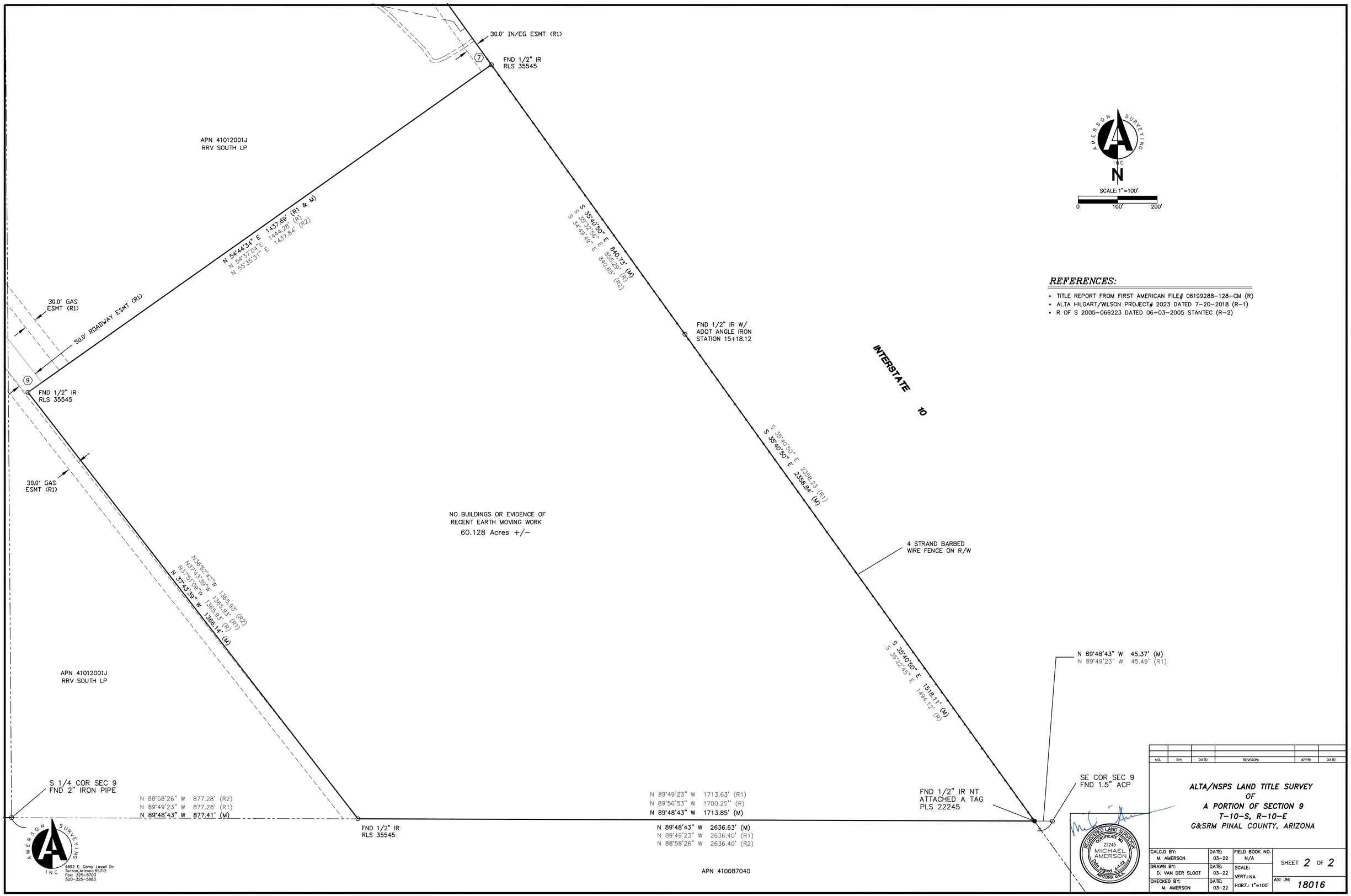
NO.	BY:	DATE:	REVISION:	APPR:	DATE:

ALTA/NSPS LAND TITLE SURVEY OF A PORTION OF SECTION 9 T-10-S, R-10-E G&SRM PINAL COUNTY, ARIZONA

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
22245
MICHAEL
AMERSON
Date signed
ARIZONA U.S.A.

CALC.D BY: M. AMERSON	DATE: 03-22	FIELD BOOK NO. N/A	SHEET 1 OF 2
DRAWN BY: D. VAN DER SLOOT	DATE: 03-22	SCALE: VERT.: NA HORZ.: 1"=50'	
CHECKED BY: M. AMERSON	DATE: 03-22		ASI JN: 18016

S:\SURVEY\18016\WORK ALTA FOR ZB PARCELS\18016 ALTA SHEET 1 AND 2 ZB PARCEL rev 4-4-22.dwg, 4/4/2022 2:03:37 PM, Robert PDF



REFERENCES:

- TITLE REPORT FROM FIRST AMERICAN FILE# 06199288-128-CM (R)
- ALTA HILGART/WILSON PROJECT# 2023 DATED 7-20-2018 (R-1)
- R OF S 2005-066223 DATED 06-03-2005 STANTEC (R-2)

NO.	BY:	DATE:	REVISON:	APPR:	DATE:

ALTA/NSPS LAND TITLE SURVEY
OF
A PORTION OF SECTION 9
T-10-S, R-10-E
G&SRM PINAL COUNTY, ARIZONA

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
22245
MICHAEL
AMERSON
Date Signed 3-29
ARIZONA U.S.A.

CALC.D BY: M. AMERSON	DATE: 03-22	FIELD BOOK NO. N/A	SHEET 2 OF 2
DRAWN BY: D. VAN DER SLOOT	DATE: 03-22	SCALE: VERT.: NA HORZ.: 1"=100'	
CHECKED BY: M. AMERSON	DATE: 03-22		ASI JN: 18016

S:\SUV\2018\18016\WORK\ALTA FOR ELEVEN\ELEVEN ALTA SHEET 1 AND 2 SHEETS.dwg, 6/4/2022 2:01:06 PM, Bluebeam PDF

NOTICE OF PUBLIC HEARING BY THE PINAL COUNTY PLANNING AND ZONING COMMISSION AT 9:00 A.M. ON THE **21ST** DAY OF **DECEMBER, 2023**, AT THE PINAL COUNTY ADMINISTRATIVE COMPLEX, IN THE BOARD OF SUPERVISORS HEARING ROOM, 135 N. PINAL STREET, FLORENCE, ARIZONA, TO CONSIDER THE APPLICATION FOR **NON-MAJOR COMPREHENSIVE PLAN AMENDMENT, REZONE & A PLANNED AREA DEVELOPMENT (PAD) OVERLAY DISTRICT** IN AN UNINCORPORATED AREA OF PINAL COUNTY, ARIZONA.

PZ-PA-001-23 – PUBLIC HEARING/ACTION: Robin Smith, Robert and Joan Rothberg, owners, Brian Underwood, The Planning Center, agent/applicant requesting a Non-Major Comprehensive Plan Amendment to designate 60± acres from **Moderate Low density Residential (MLDR)** to **Medium Density Residential (MDR),** situated in portion of Sections 9, T10S, R10E G&SRB&M;, Tax parcel 410-12-001D (legal on file), located three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane in Red Rock area, in Pinal County.

PZ-037-23 – PUBLIC HEARING/ACTION: Robin Smith, Robert and Joan Rothberg, owners, Brian Underwood, The Planning Center, agent/applicant requesting an approval of a **rezone** of 60± acres from **GR (General Rural Zone)** to **R-7 (Rural Zoning District)**, to allow for 294 single family dwelling units; situated in portion of Sections 9, T10S, R10E G&SRB&M; Tax parcel 410-12-001D (legal on file), located three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane in Red Rock area, in Pinal County.

PZ-PD-009-23 – PUBLIC HEARING/ACTION: Robin Smith, Robert and Joan Rothberg, owners, Brian Underwood, The Planning Center, agent/applicant requesting approval of **Smith-Rothberg (PAD) Overlay Zoning District** of 60± acres to allow for 294 single family dwelling units; situated in portion of Sections 9, T10S, R10E G&SRB&M; (legal on file), Tax parcels 410-12-001D (legal on file), located three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane in Red Rock area, in Pinal County.

At least 24 hours prior to the public hearing, documents pertaining to these requests are available for public inspection at the Pinal County Planning and Development Department, Pinal County Complex, 85 N. Florence Street, Florence, Arizona, Monday through Friday between the hours of 8:30 a.m. and 4:30 p.m. and on the internet at:

https://www.pinal.gov/236/Notice-of-Hearings

ALL PERSONS INTERESTED IN THESE MATTERS MAY APPEAR AT THE PUBLIC HEARING AT THE DATE, TIME AND PLACE DESIGNATED ABOVE AND STATE THEIR APPROVAL OR OBJECTION TO THE PROPOSED AMENDMENT.PROTESTS TO THE REZONING AND/OR PAD OVERLAY ZONE BY 20% OF THE PROPERTY OWNERS BY AREA AND NUMBER WITHIN 300 FEET OF THE PROPERTY PROPOSED FOR REZONING WILL REQUIRE AN AFFIRMATIVE VOTE OF THREE-FOURTHS OF ALL MEMBERS OF THE BOARD OF SUPERVISORS FOR APPROVAL.

DATED ON THIS **25th** DAY OF **SEPTEMBER, 2023** by Pinal County Planning & Development Dept.

A WRITTEN STATEMENT OF APPROVAL OR PROTEST MAY BE FILED WITH THE PINAL COUNTY PLANNING & DEVELOPMENT DEPARTMENT, P.O. BOX 749, FLORENCE AZ 85132 STATEMENT MUST CONTAIN THE FOLLOWING INFORMATION:

1) The Planning Case Number(s) See above
2) Your name, address, telephone number and property tax parcel number (print or type)
3) Whether you support or oppose the request
4) A brief statement of reasons for supporting or opposing the request
5) Whether or not you wish to appear and be heard at the hearing.

NO LATER THAN 5:00 PM ON December 11, 2023
Contact for this matter: Sangeeta Deokar
E-mail Address: Sangeeta.deokar@pinal.gov
Phone # (520) 866-6641 Fax # (520) 866-6530

Publish once:

Pinal Central Dispatch
Arizona Republic

Affidavit of Public Hearing Notice Mailing

Case No.: PZ-PA-001-23/PZ-037-23/PZ-PD-009-23

Applicant Name: Garrett Aldrete , The Planning Center

Location: Red Rock, Pinal County

I, the undersigned, confirm that a Notice of Public Hearing was mailed to property owners within 600 feet as required by the Pinal County Development Services Code for the case(s) noted above.

Applicant/Representative Signature — Date: 12/02/23

This instrument was acknowledged before me on this 01 day of December, 2023, by Garrett Aldrete. In witness whereof I hereunto set my hand and official seal.

Notary Public

My commission expires Dec. 06, 2026

JACLYN MARTINEZ
Notary Public - Arizona
Pima County
Commission # 640020
My Comm. Expires Dec 6, 2026

SMITH ROBIN B
12 Cedric Rd
Summit, NJ 07901

UNION PACIFIC RAILROAD
1400 Douglas St Stop 1640
Omaha, NE 68179

RRV SOUTH LP
6720 N Scottsdale Rd STE 250
Scottsdale, AZ 85253

RED ROCK VILLAGE COMMUNITY ASSOCIATION
8360 E Via De Ventura Blvd STE L100
Scottsdale, AZ 85258

Arizona State Land Department - Planning and Engineering Section
ATTN: Rhonda Buss
1110 W Washington St
Phoenix, AZ 85007

WALTON INTERNATIONAL GROUP (USA) INC ETAL
13155 Noel Rd
Dallas, TX 75240

The Planning Center
2 E Congress St
Tucson, AZ 85701

PINAL COUNTY
PO BOX 749
Florence, AZ 85132

CASA GRANDE VALLEY NEWSPAPERS INC
200 W. 2ND ST.
CASA GRANDE AZ 85122

(520) 836-7461
Fax (520) 836-2944

Advertising Memo Bill

1| Memo Bill Period	2| Advertiser/Client Name
11/2023	THE PLANNING CENTER

23| Total Amount Due	*Unapplied Amount	3| Terms of Payment
90.89		

21| Current Net Amount Due	22| 30 Days	60 Days	Over 90 Days
.00	.00	.00	.00

4| Page Number	5| Memo Bill Date	6| Billed Account Number	7| Advertiser/Client Number
1	11/27/23	15022 CHRIS.	**15022**

8\| Billed Account Name and Address

THE PLANNING CENTER
2 E CONGRESS, STE. 600
TUCSON AZ 85701

Amount Paid: _____

Comments:

Ad #: 186120

Please Return Upper Portion With Payment

10| Date	11| Newspaper Reference	12|13|14| Description-Other Comments/Charges	15| SAU Size 16| Billed Units	17| Times Run 18| Rate	19| Gross Amount	20| Net Amount
11/30/23	186120	PZ-PA-001-23	1.0X15.38	1		
	PWEEK	NOTICE OF PUBLIC HEARI	15.50	89.28	89.28	90.89
		11/30				
		CGIT CGPC				
	AZTPT	AZ TPT TAX		1.61		

PAID
11-27-23

Statement of Account - Aging of Past Due Amounts

21| Current Net Amount Due	22| 30 Days	60 Days	Over 90 Days	*Unapplied Amount	23| Total Amount Due
0.00	0.00	0.00	0.00		**90.89**

CASA GRANDE VALLEY NEWSPAPERS INC.
(520) 836-7461

* UNAPPLIED AMOUNTS ARE INCLUDED IN TOTAL AMOUNT DUE

24| Invoice	25| Advertiser Information			
	1| Billing Period	6| Billed Account Number	7| Advertiser/Client Number	2| Advertiser/Client Name
186120	11/2023	15022	15022	THE PLANNING CENTER

STATE OF ARIZONA

COUNTY OF PINAL } ss.

NOTICE OF PUBLIC HEARING BY THE PINAL COUNTY PLANNING AND ZONING COMMISSION AT 9:00 A.M. ON THE 21ST DAY OF DECEMBER, 2023, AT THE PINAL COUNTY ADMINISTRATIVE COMPLEX, IN THE BOARD OF SUPERVISORS HEARING ROOM, 135 N. PINAL STREET, FLORENCE, ARIZONA, TO CONSIDER THE APPLICATION FOR NON-MAJOR COMPREHENSIVE PLAN AMENDMENT, REZONE & A PLANNED AREA DEVELOPMENT (PAD) OVERLAY DISTRICT IN AN UNINCORPORATED AREA OF PINAL COUNTY, ARIZONA.

PZ-PA-001-23 – PUBLIC HEARING/ACTION: Robin Smith, Robert and Joan Rothberg, owners, Brian Underwood, The Planning Center, agent/applicant requesting a Non-Major Comprehensive Plan Amendment to designate 60± acres from Moderate Low density Residential (MLDR) to Medium Density Residential (MDR), situated in portion of Sections 9, T10S, R10E G&SRB&M;, Tax parcel 410-12-001D (legal on file), located three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane in Red Rock area, in Pinal County.

PZ-037-23 – PUBLIC HEARING/ACTION: Robin Smith, Robert and Joan Rothberg, owners, Brian Underwood, The Planning Center, agent/applicant requesting an approval of a rezone of 60± acres from GR (General Rural Zone) to R-7 (Rural Zoning District), to allow for 294 single family dwelling units; situated in portion of Sections 9, T10S, R10E G&SRB&M; Tax parcel 410-12-001D (legal on file), located three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane in Red Rock area, in Pinal County.

PZ-PD-009-23 – PUBLIC HEARING/ACTION: Robin Smith, Robert and Joan Rothberg, owners, Brian Underwood, The Planning Center, agent/applicant requesting approval of Smith-Rothberg (PAD) Overlay Zoning District of 60± acres to allow for 294 single family dwelling units; situated in portion of Sections 9, T10S, R10E G&SRB&M; (legal on file), Tax parcels 410-12-001D (legal on file), located three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane in Red Rock area, in Pinal County.

At least 24 hours prior to the public hearing, documents pertaining to these requests are available for public inspection at the Pinal County Planning and Development Department, Pinal County Complex, 85 N. Florence Street, Florence, Arizona, Monday through Friday between the hours of 8:30 a.m. and 4:30 p.m. and on the internet at: https://www.pinal.gov/236/Notice-of-Hearings

ALL PERSONS INTERESTED IN THESE MATTERS MAY APPEAR AT THE PUBLIC HEARING AT THE DATE, TIME AND PLACE STATE THEIR APPROVAL OR OBJECTION TO THE PROPOSED AMENDMENT.PROTESTS TO THE REZONING AND/OR PAD OVERLAY ZONE BY 20% OF THE PROPERTY OWNERS BY AREA AND NUMBER WITHIN 300 FEET OF THE PROPERTY PROPOSED FOR REZONING WILL REQUIRE AN AFFIRMATIVE VOTE OF THREE-FOURTHS OF ALL MEMBERS OF THE BOARD OF SUPERVISORS FOR APPROVAL.

DATED ON THIS 25th DAY OF SEPTEMBER, 2023 by Pinal County Planning & Development Dept.

A WRITTEN STATEMENT OF APPROVAL OR PROTEST MAY BE FILED WITH THE PINAL COUNTY PLANNING & DEVELOPMENT DEPARTMENT, P.O. BOX 749, FLORENCE AZ 85132 STATEMENT MUST CONTAIN THE FOLLOWING INFORMATION:

1) The Planning Case Number(s) See above
2) Your name, address, telephone number and property tax parcel number (print or type)
3) Whether you support or oppose the request
4) A brief statement of reasons for supporting or opposing the request
5) Whether or not you wish to appear and be heard at the hearing.

NO LATER THAN 5:00 PM ON December 11, 2023

Contact for this matter: Sangeeta Deokar

E-mail Address: Sangeeta.deokar@pinal.gov

Phone # (520) 866-6641 Fax # (520) 866-6530

No. of publications: 1; date of publication: Nov. 30, 2023.

Affidavit of Publication

Kara K. Cooper, first being duly sworn deposes and says: That he/she is a native born citizen of the United States of America, over 21 years of age, that I am an agent and/or publisher of the Pinal Central Dispatch, a newspaper section published at Casa Grande, Pinal County, Arizona, Thursday of each week; that a notice, a full, true and complete printed copy of which is hereunto attached, was printed in the regular edition of said newspaper, and not in a supplement thereto, for ONE issue. The publications thereof having been on the following date:

11/30/2023

PINAL CENTRAL DISPATCH

By _____
agent and/or publisher of the Pinal Central Dispatch

Sworn to before me this 4th

day of Dec. A.D., 2023

Vicki Morris

Notary Public in and for the County
Of Pinal, State of Arizona

Vicki Morris
Notary Public
Pinal County, Arizona
My Comm. Expires 09-20-24
Commission No. 597545

THE ARIZONA REPUBLIC

PO Box 194, Phoenix, Arizona 85001-0194

Phone 1-602-444-7315 Fax 1-877-943-0443

PNI-Arizona Republic

AZ PLANNING CENTER
2 E CONGRESS ST # 600
TUCSON, AZ 85701-1783

Order # 0005862157 **# of Affidavits**

P.O #

Published Date(s):

11/30/23

STATE OF WISCONSIN
COUNTY OF BROWN } **SS.**

I, being first duly sworn, upon oath deposes and says: That I am the legal clerk of the Arizona Republic, a newspaper of general circulation in the counties of Maricopa, Coconino, Pima and Pinal, in the State of Arizona, published weekly at Phoenix, Arizona, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates indicated.

Sworn to before me this

14 TH day of
DECEMBER 2023

Notary Public

My Commission expires: 4-6-27

DENISE ROBERTS
Notary Public
State of Wisconsin

AFFIDAVIT OF PUBLICATION

NOTICE OF PUBLIC HEARING BY THE PINAL COUNTY PLANNING AND ZONING COMMISSION AT 9:00 A.M. ON THE 21ST DAY OF DECEMBER, 2023, AT THE PINAL COUNTY ADMINISTRATIVE COMPLEX, IN THE BOARD OF SUPERVISORS HEARING ROOM, 135 N. PINAL STREET, FLORENCE, ARIZONA, TO CONSIDER THE APPLICATION FOR NON-MAJOR COMPREHENSIVE PLAN AMENDMENT, REZONE & A PLANNED AREA DEVELOPMENT (PAD) OVERLAY DISTRICT IN AN UNINCORPORATED AREA OF PINAL COUNTY, ARIZONA.

PZ-PA-001-23 – PUBLIC HEARING/ACTION: Robin Smith, Robert and Joan Rothberg, owners, Brian Underwood, The Planning Center, agent/applicant requesting a Non-Maior Comprehensive Plan Amendment to designate 60± acres from Moderate Low density Residential (MLDR) to Medium Density Residential (MDR), situated in portion of Sections 9, T10S, R10E G&SRB&M;, Tax parcel 410-12-001D (legal on file), located three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane in Red Rock area, in Pinal County.

PZ-037-23 – PUBLIC HEARING/ACTION: Robin Smith, Robert and Joan Rothberg, owners, Brian Underwood, The Planning Center, agent/applicant requesting an approval of a rezone of 60± acres from GR (General Rural Zone) to R-7 (Rural Zoning District), to allow for 294 single family dwelling units; situated in portion of Sections 9, T10S, R10E G&SRB&M; Tax parcel 410-12-001D (legal on file), located three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane in Red Rock area, in Pinal County.

PZ-PD-009-23 – PUBLIC HEARING/ACTION: Robin Smith, Robert and Joan Rothberg, owners, Brian Underwood, The Planning Center, agent/applicant requesting approval of Smith-Rothberg (PAD) Overlay Zoning District of 60± acres to allow for 294 single family dwelling units; situated in portion of Sections 9, T10S, R10E G&SRB&M; (legal on file), Tax parcels 410-12-001D (legal on file), located three-quarters of a mile south of the intersection of Sasco Road and Aguirre Lane in Red Rock area, in Pinal County.

At least 24 hours prior to the public hearing, documents pertaining to these requests are available for public inspection at the Pinal County Planning and Development Department, Pinal County Complex, 85 N. Florence Street, Florence, Arizona, Monday through Friday between the hours of 8:30 a.m. and 4:30 p.m. and on the internet at: https://www.pinal.gov/236/Notice-of-Hearings

ALL PERSONS INTERESTED IN THESE MATTERS MAY APPEAR AT THE PUBLIC HEARING AT THE DATE, TIME AND PLACE DESIGNATED ABOVE AND STATE THEIR APPROVAL OR OBJECTION TO THE PROPOSED AMENDMENT.PROTESTS TO THE REZONING AND/OR PAD OVERLAY ZONE BY 20% OF THE PROPERTY OWNERS BY AREA AND NUMBER WITHIN 300 FEET OF

AND NUMBER WITHIN 300 FEET OF THE PROPERTY PROPOSED FOR REZONING WILL REQUIRE AN AFFIRMATIVE VOTE OF THREE--FOURTHS OF ALL MEMBERS OF THE BOARD OF SUPERVISORS FOR APPROVAL.

DATED ON THIS 25th DAY OF SEPTEMBER, 2023 by Pinal County Planning & Development Dept.

A WRITTEN STATEMENT OF APPROVAL OR PROTEST MAY BE FILED WITH THE PINAL COUNTY PLANNING & DEVELOPMENT DEPARTMENT, P.O. BOX 749, FLORENCE AZ 85132 STATEMENT MUST CONTAIN THE FOLLOWING INFORMATION:

1) The Planning Case Number(s) See above
2) Your name, address, telephone number and property tax parcel number (print or type)
3) Whether you support or oppose the request
4) A brief statement of reasons for supporting or opposing the request
5) Whether or not you wish to appear and be heard at the hearing.

NO LATER THAN 5:00 PM ON December 11, 2023

Contact for this matter: Sangeeta Deokar
E-mail Address:
Sangeeta.deokar@pinal.gov
Phone # (520) 866-6641
Fax # (520) 866-6530
Pub: Nov 30, 2023

Affidavit of Broadcast Sign Installation

Case No.: PZ-PA-001-23/PZ-037-23/PZ-PD-009-23

Applicant Name: Garrett Aldrete , The Planning Center

Location: Red Rock, Pinal County

I, the undersigned, confirm that broadcast signs for the Pinal County Public Hearing were installed as required for the case(s) noted above.

Garrett Aldrete 11/29/23

Applicant/Representative Signature Date

This instrument was acknowledged before me on this 29 day of November, 2023, by Garrett Aldrete. In witness whereof I hereunto set my hand and official seal.

Jaclyn Martinez

Notary Public

My commission expires Dec. 06, 2026

JACLYN MARTINEZ
Notary Public - Arizona
Pima County
Commission # 640020
My Comm. Expires Dec 6, 2026

PINAL COUNTY
Public Hearings

NOTICE

PLANNING & ZONING
PINAL COUNTY
PUBLIC HEARING

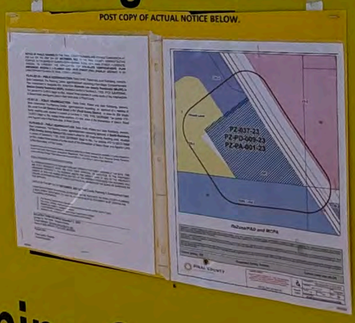
Any person who is interested may file written comments, in favor or in opposition, with Community Development Department in Pinal County or appear in person at the hearing.

Date Posted: 11/29/23

Public Hearing Information

Case Number: PZ-PA-001-23
Existing Comprehensive Plan Designation:
Moderate Low Density Residential
Proposed Comprehensive Plan Designation:
Medium Density Residential
Acreage: 60.13

POST COPY OF ACTUAL NOTICE BELOW.



Applicant Name: Brian Underwood, The Planning Center
Applicant Phone Number: 520-623-6146
Case Information Available at Pinal County Planning and Development Services
(520) 866-6442


Air Park Rd 5
35
NOTICE
PLANNING & ZONING
PINAL COUNTY
PUBLIC HEARING
Any person who is interested may file written comments, in favor or in opposition, with Community Development Department in Pinal County or appear in person at the hearing.
Date Posted: 11/24/23
POST COPY OF ACTUAL NOTICE BELOW.

PINAL COUNTY
Public Hearings

NOTICE

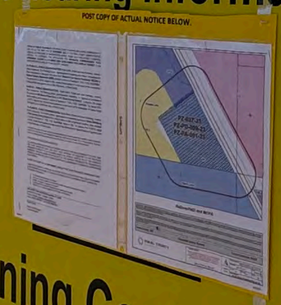
PLANNING & ZONING
PINAL COUNTY
PUBLIC HEARING

Any person who is interested may file written comments, in favor or in opposition, with Community Development Department in Pinal County or appear in person at the hearing.

Date Posted: 11/29/23

Public Hearing Information

POST COPY OF ACTUAL NOTICE BELOW.



Case Number: PZ-037-23, PZ-PD-009-23
Existing Zoning: GR (General Rural)

Proposed Zoning: R-7 (PAD)
Acreage: 60.13

Applicant Name: Brian Underwood, The Planning Center
Applicant Phone Number: 520-623-6146

Case Information Available at Pinal County Planning and Development Services
(520) 866-6442