



**AGENDA**  
**Special Session**  
**THE PLANNING AND ZONING COMMISSION**  
**TOWN OF CAMP VERDE 473 S. MAIN STREET**  
**CAMP VERDE, AZ. 86322**  
**COUNCIL CHAMBERS STE. 106**  
**THURSDAY MARCH 10, 2016**  
**6:30 PM**

***Because All Commission meetings will end at 9 PM, any remaining agenda items will be heard at the next Commission meeting.***

1. **Call To Order**
2. **Roll Call**
3. **Pledge Of Allegiance**
4. **Consent Agenda** - All those items listed below may be enacted upon by one motion and approved as Consent Agenda Items. Any item may be removed from the Consent Agenda and considered as a separate item if a member of Commission so requests.
  - a. **Approval of Minutes:**
  - b. **Set Next Meeting, Date and Time:**  
MARCH 17, 2016 – SPECIAL SESSION, 6:30PM (GENERAL PLAN)
5. **Call To The Public For Items Not On The Agenda**  
*(Residents are encouraged to comment about any matter not included on the agenda. State law prevents the Commission from taking any action on items not on the agenda, except to set them for consideration at a future date.)*
6. **Public Hearing, Discussion and recommendation to Council for (approval/or denial) of an (exception/waiver) requested by the applicant and owner, John Bassous (Tierra Verde Holdings, LLC), to the Town of Camp Verde Engineering Standard 512D requirements (Road Development Standards) for the proposed Castle Heights subdivision as located on assessor parcel number 404-18-181E and is adjacent to Arena Del Loma. (This is part of the Preliminary Plat approval process as outlined in the Town of Camp Verde's Planning & Zoning Ordinance, Section 505) – Resource: Community Development Director Michael Jenkins**
  1. **STAFF PRESENTATION**
  2. **Declare PUBLIC HEARING OPEN**  
Call for APPLICANT'S STATEMENT  
Call for COMMENT FROM OTHER PERSONS (either in favor or against)  
Call for APPLICANT'S REBUTTAL (if appropriate)
  3. **Declare PUBLIC HEARING CLOSED**  
Call for Commission DISCUSSION (may ask questions of applicant)  
Call for STAFF COMMENTS  
Call for MOTION  
Call for DISCUSSION OF MOTION  
Call for QUESTION  
ANNOUNCE ACTION TAKEN with Findings of Fact
7. **Public Hearing, Discussion and recommendation to Council for (approval/or denial) of an (exception/waiver) request by the applicant and owner, John Bassous (Tierra Verde Holdings, LLC), to the adequate fire flow requirements for the proposed Castle Heights subdivision as located on assessor parcel number 404-18-181E and is adjacent to Arena Del Loma. (This is part of the Preliminary Plat approval process as outlined in the Town of Camp Verde's Planning & Zoning Ordinance, Section 505) – Resource: Community Development Director Michael Jenkins**

1. **STAFF PRESENTATION**
  2. Declare **PUBLIC HEARING OPEN**  
Call for APPLICANT'S STATEMENT  
Call for COMMENT FROM OTHER PERSONS (either in favor or against)  
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  3. Declare **PUBLIC HEARING CLOSED**  
Call for Commission DISCUSSION (may ask questions of applicant)  
Call for STAFF COMMENTS  
Call for MOTION  
Call for DISCUSSION OF MOTION  
Call for QUESTION  
ANNOUNCE ACTION TAKEN with Findings of Fact
8. **Public Hearing, Discussion and possible Recommendation for approval (or denial) to Council on Preliminary Plat 20150392, submitted by John Bassous of Tierra Verde Holdings LLC, owner of parcel 404-18-181E, which consists of approximately 20.92 acres, for the Castle Heights Subdivision consisting of twelve (12) residential lots on Arena Del Loma, near the intersection of Montezuma Castle Highway. – Resource: Community Development Director Michael Jenkins**

1. **STAFF PRESENTATION**
2. Declare **PUBLIC HEARING OPEN**  
Call for APPLICANT'S STATEMENT  
Call for COMMENT FROM OTHER PERSONS (either in favor or against)  
Call for APPLICANT'S REBUTTAL (if appropriate)
3. Declare **PUBLIC HEARING CLOSED**  
Call for Commission DISCUSSION (may ask questions of applicant)  
Call for STAFF COMMENTS  
Call for MOTION  
Call for DISCUSSION OF MOTION  
Call for QUESTION  
ANNOUNCE ACTION TAKEN with Findings of Fact

**There Will Be No Public Input On The Following Items:**

9. **Current Events**  
*(Individual members of the Commission may provide brief summaries of current events and activities. These summaries are strictly for the purpose of informing the public of such events and activities. The Commission will take no discussion, consideration, or action on any such item, except that an individual Commission member may request an item be placed on a future agenda.)*
10. **Staff Comments**
11. **Adjournment**

**Please note:** The Planning and Zoning Staff makes every attempt to provide a complete agenda packet for public review. However, it is not always possible to include all information in the packet. You are encouraged to check with The Community Development Department prior to a meeting for copies of supporting documentation, if any that were unavailable at the time agenda packets were prepared.

Posted by:  Date/Time: 3/7/16 3:00pm

Note: Pursuant to A.R.S. §38-431.03A.2 and A.3, the Planning & Zoning Commission may vote to go into Executive Session for purposes of consultation for legal advice with the Town Attorney on any matter listed on the Agenda, or discussion of records exempt by law from public inspection associated with an agenda item.

The Town of Camp Verde Council Chambers is accessible to the handicapped. Those with special accessibility or accommodation needs, such as large typeface print, may request these at the Office of the Town Clerk.



**Agenda Item Submission Form – Section I**

**Meeting Date:** Wednesday, March 10, 2016, 6:30 p.m.      **Planning & Zoning Commission – Special Session**

*Consent Agenda*       **Formal Commission Recommendation to Council**       *Executive Session Requested*

*Presentation Only*       *Action/Presentation*

**Requesting Department:** Community Development

**Staff Resource/Contact Person:** Michael Jenkins, Community Development Director

**Agenda Title (be exact):** Public Hearing, discussion and recommendation to Council for (approval / or denial) of an (exception / waiver) request by the applicant and owner, John Bassous (Tierra Verde Holdings, LLC), to the Town of Camp Verde Engineering Standard 512D requirements (Road Development Standards) for the proposed Castle Heights subdivision as located on assessor parcel number 404-18-181E and is adjacent to Arena Del Loma. (This is part of the Preliminary Plat approval process as outlined in the Town of Camp Verde's Planning & Zoning Ordinance, Section 505)

**List Attached Documents:**

Exhibit "A": Applicant – owner (John Bassous) letter requesting an exception / waiver of curb and gutter to the road section design for the proposed Castle Heights Subdivision.

Exhibit "B": Letter from the Town's Deputy Public Works Director (Troy Odell), on behalf of the Public Works Director (Ron Long) supporting the street – road section as shown on the submitted Preliminary Plat for the proposed Castle Heights Subdivision.

**Estimated Presentation Time:** 10 minutes

**Estimated Discussion Time:** 20 minutes

**Reviews Completed by:** Town Staff.

**Department Head:**       **Town Attorney Comments:**

**Background Information:** (General Overview)

Over the last 8 years and during the recession, the Town of Camp Verde has seen very little or no new subdivision submittals. Subdivision development applications are now slowly increasing and staff has completed its review for the Preliminary Plat for the proposed Castle Heights Subdivision.

Town Staff and other entities are responsible to provide reviews and requirement comments for Preliminary Plat submittals based on Section 505 (Preliminary Subdivision Plat), Item A.3.a of the Town's Planning & Zoning Ordinance.

As part of the Preliminary Plat process, an applicant can apply for an exception/waiver to the adopted codes and ordinances of the Town. Should the applicant ask for an exception/waiver to the Engineering Standards (Road Section Design) , the applicant must submit the request for exception/waiver in writing to the Community Development Department. All Preliminary Plats along with any requested exception/waiver must go first to the Planning & Zoning Commission for their recommendation and then to the Town Council for approval or denial. If the applicant has not requested an exception/waiver and has not addressed the requirement to the satisfaction of staff, the Community Development Director is required by the Planning and Zoning Ordinance not to schedule any hearings before the Commission and the Council until all requirements and issues are addressed. Additionally, the Planning and Zoning Ordinance, Section 505, Item C.12, states that "The Commission may recommend that the Council authorize exceptions to any of the requirements in these regulations, if the Commission finds the following facts with respect thereto:

- a. There are special circumstances or conditions affecting said property; and
- b. That the granting of the exception will not be detrimental to the public safety, health and welfare or injurious to other property in the area in which said property is situated; and
- c. That it will not have the effect of nullifying the intent and purpose of the Town's General Plan or these regulations".

**Intent and Purposes of the currently adopted General Plan:**

The Town's current General Plan, under the GROWTH AREA element, Goal E, Implementation Strategy E.2 states the following: "Require developers to provide financial assurance that all curbs, gutters, pathways, fire hydrants, and streets are installed to Town specifications.

**Staff's Recommendation:**

Please see Exhibit "B" for the Town's Public Works Department comments.

**Recommended Motion:** Motion to (approve / or deny) an (exception / waiver) request by the applicant and owner, John Bassous (Tierra Verde Holdings, LLC), to the Town's Engineering Standard 512D (Road Development Standards) for the proposed Castle Heights subdivision as located on assessor parcel number 404-18-181E and is adjacent to Arena Del Loma with the following conditions of approval:

- That if this exemption / waiver to the Town's adopted "Engineering Standard 512D (Road Development Standards)" requirement, per the Town's Engineering Standards, is approved (in its original or any modified form) by the Town Council then, the applicant is to place a statement on the Preliminary & Final Plats for the Castle Heights Subdivision that gives the date of Council approval and the exception / waiver granted and a Road Cross Section Detail showing all road improvements as approved by the Town's Public Works Director.

EXHIBIT "A"

John Bassous  
Tierra Verde Holdings  
PO Box 2898  
Camp Verde, AZ 86322

December 15, 2015

Town of Camp Verde  
Planning and Zoning Department

RE.: Letter of Waiver

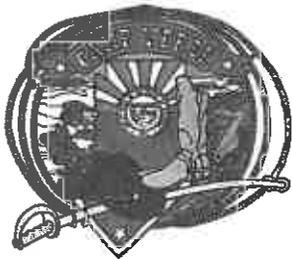
As the Owner of the proposed Castle Heights sub-division, I am pleased to submit this application for Preliminary Approval. I have spent two (2) years talking with many community leaders and individual citizens seeking their input as to what would be the best use of this pristine property. After much discussion and many revisions, you have before you what should be one of Camp Verde's finest locations to live...breathtaking views, large lots, easy access to Forest Service and a rural atmosphere. I am confident that this sub-division **will attract the attention of those wanting to call Camp Verde home!**

In keeping with the rural theme, I am requesting a waiver for curbing and gutters. The intent is to create a low density subdivision which lends itself to rural living and will not look like a "city" lot. We want the natural vegetation and land contours to be the focus, not sterile concrete. In addition, each lot being almost 1.7 acres and only 12 lots total, the drainage issues are significantly less than higher density subdivisions. We have addressed the drainage plan elsewhere demonstrating that curbing and gutters are not necessary. Finally, this would allow for a consistency within the Town of other sub-divisions which retain the rural atmosphere.

Thank you for your consideration,



John Bassous



**Town of Camp Verde**  
Public Works Department  
395 S. Main St.  
Camp Verde, AZ 86322  
Tel: (928) 554-0826  
Fax: (928) 567-1540  
Email:  
Troy.Odell@campverde.az.gov  
Web: www.cvaz.az.gov

**EXHIBIT "B"**

**TO: Town Council & Planning and  
Zoning Commission**

**FROM: Troy Odell  
Deputy Public Works Director  
March 7, 2016**

**Cc. Russ Martin – Town Manager**

**Re: Request for exception / waiver to allow for a rural road section for the Castle Heights  
Subdivision.**

**DESCRIPTION**

Dear Council & Commission:

I Troy Odell, (Deputy Public Works Director) on behalf of the Town Engineer (Ron Long) am hereby providing this letter of recommendation which supports the road section for the proposed Castle Heights subdivision. Mr. Long completed a review of the Preliminary Plat for the Castle Heights subdivision and found all revisions to be acceptable. The Preliminary Plat includes the standard subdivision roadway cross – sections which includes (2) 12 foot wide asphalt travel lanes together with a 4 foot shoulder on each side of the proposed road. The pavement sections is shown as 3 inches of asphaltic concrete over 9 inches of aggregate base course per Town of Camp Verde Engineering Standards 512D. The asphalt road includes a thickened edge, each side, per MAG Standard Detail 201 type A. The 4 foot wide shoulder on each side shall require a minimum thickness of 9 inches of compacted aggregate base course. The 6 foot wide and 2 foot deep drainage ditches at each road side are acceptable unless the final drainage report designates that a larger cross – section is required.

This typical road section shown on the Preliminary Plat reflects what is commonly found throughout the Camp Verde area within this type of rural subdivision.

This letter is in response to a request for exception / waiver to the Town road standards as submitted by the owner / applicant John Bassous per Section 505, Item C.12 of the Town of Camp Verde-Planning & Zoning Ordinance.

Troy Odell, P.E.  
Deputy Public Works Director



**Agenda Item Submission Form – Section I**

**Meeting Date:** Wednesday, March 10, 2016, 6:30 p.m.      **Planning & Zoning Commission – Special Session**

*Consent Agenda*       **Formal Commission Recommendation to Council**       *Executive Session Requested*

*Presentation Only*       *Action/Presentation*

**Requesting Department:** Community Development

**Staff Resource/Contact Person:** Michael Jenkins, Community Development Director

**Agenda Title (be exact):** Public Hearing, discussion and recommendation to Council for (approval / or denial) of an (exception / waiver) request by the applicant and owner, John Bassous (Tierra Verde Holdings, LLC), to the adequate fire flow requirements for the proposed Castle Heights subdivision as located on assessor parcel number 404-18-181E and is adjacent to Arena Del Loma. (This is part of the Preliminary Plat approval process as outlined in the Town of Camp Verde's Planning & Zoning Ordinance, Section 505)

**List Attached Documents:**

Exhibit "A": Copy of Arizona Revised Statute 9-807 (Mandated fire sprinklers in certain residences prohibited; exception; permit application format.

Exhibit "B": Applicant's submitted letter requesting an Exemption / Waiver from the Adequate Fire Flow requirement as provided for in the 2012 International Fire Code.

Exhibit "C": Fire District's letter of recommendation of denial to the Commission / Council on applicant's exemption / waiver request for adequate fire flow requirements.

Exhibit "D": Town's Building – Fire Code Official letter of recommendation of denial to the Commission / Council on applicant's exemption / waiver request for adequate fire flow requirements.

**Estimated Presentation Time:** 20 minutes

**Estimated Discussion Time:** 30 minutes

**Reviews Completed by:** Town and Fire District Staff.

**Department Head:**                       **Town Attorney Comments:**

**Invited guests / staff for technical input:** Camp Verde Fire District Fire Chief (Terry Keller) & Fire Marshall (Kristi Gagnon). Robert Foreman, Town of Camp Verde, Building and Fire Code Official & Emily Diver, Town of Camp Verde Building Inspector & Plans Examiner.

**Background Information:** (General Overview)

Over the last 8 years and during the recession, the Town of Camp Verde has seen very little or no new subdivision submittals. Subdivision development applications are now slowly increasing and staff has completed its review for the Preliminary Plat for the proposed Castle Heights Subdivision.

Town Staff and other entities are responsible to provide reviews and requirement comments for Preliminary Plat submittals based on Section 505 (Preliminary Subdivision Plat), Item A.3.a of the Town's Planning & Zoning Ordinance. One of the other reviewing entities, as listed in the Town's Planning & Zoning Ordinance, is the Camp Verde Fire District.

The Town of Camp Verde adopted the 2012 International Code Council Codes on August 6, 2014 which became effective on September 16, 2014. Included in the adoption was the 2012 Fire Code along with the additional technical codes as referenced in Article 7-4 of the Town Code. Under Section 7-1-100 (Town of Camp Verde Technical Code Amendments) it states that "All references to Fire Code Official in the adopted International Fire Code will be deemed to mean the appointed Building Official of the Town of Camp Verde or his designee, which from time to time, in accordance with the Intergovernmental Agreements with the Camp Verde Fire District, a separate entity from the Town, will be the Camp Verde Fire District appointed Fire Marshal". Also, the Camp Verde Fire District Board adopted the 2012 International Fire Code on August 21, 2014.

It has been the intent of the Town of Camp Verde and the Camp Verde Fire District, due to their combined responsibilities, to have the same fire codes and interpretations in effect to create consistent requirements.

As the Commission may know, per the Planning & Zoning Ordinance, the Community Development Department is initially the single point of contact when applying for development permits within the Town of Camp Verde. This includes submittals and reviews for subdivisions, building permits, zoning amendments, use permits and variances. The department, once receiving the application submittal, distributes the submittal documents to all reviewing agencies for requirement comments.

Focusing on Preliminary Plat Subdivision applications, the International Fire Code requires adequate fire flow for any new structure. This requirement comes from the Town's, as well as the Fire District's, adopted International Fire Code and is applied to new subdivisions requesting plat approval (Preliminary & Final Plats).

As part of the Preliminary Plat process, an applicant can apply for an exception/waiver to the adopted codes and ordinances of the Town. Should the applicant ask for an exception/waiver to the adequate fire flow requirement, the applicant must submit the request for exception/waiver in writing to the Community Development Department. All Preliminary Plats along with any requested exception/waiver must go first to the Planning & Zoning Commission for their recommendation and then to the Town Council for approval or denial. If the applicant has not requested an exception/waiver and has not addressed the requirement to the satisfaction of staff, the Community Development Director is required by the Planning and Zoning Ordinance not to schedule any hearings before the Commission and the Council until all requirements and issues are addressed. Additionally, the Planning and Zoning Ordinance, Section 505, Item C.12, states that "The Commission may recommend that the Council authorize exceptions to any of the requirements in these regulations, if the Commission finds the following facts with respect thereto:

- a. There are special circumstances or conditions affecting said property; and
- b. That the granting of the exception will not be detrimental to the public safety, health and welfare or injurious to other property in the area in which said property is situated; and
- c. That it will not have the effect of nullifying the intent and purpose of the Town's General Plan or these regulations".

**Intent and Purposes of the currently adopted General Plan:**

The Town's current General Plan, under the GROWTH AREA element, Goal E, Implementation Strategy E.2 states the following: "Require developers to provide financial assurance that all curbs, gutters, pathways, fire hydrants, and streets are installed to Town specifications.

**Staff's Recommendation:**

It is staff's recommendation to remain and hold to all currently adopted Codes, Ordinances and interpretations for adequate fire flow requirements for proposed new subdivisions. As discussed above, the Fire Code Official (Building Official or his designee) for the Town of Camp Verde makes all interpretations of the International Fire Code for the Town. Likewise, the Fire Chief (or his/her designee) of the Camp Verde Fire District makes all interpretations of the International Fire Code for the Fire District.

Based on the intent of the Town and the Fire District to follow the same codes and interpretations, both entities have worked together to accept the same interpretations of the fire code thus creating consistent requirements. It must be pointed out that several identical alternatives to achieving adequate fire flow have been determined by the Town and the Fire District to include but not limited to the following:

- Water line and fire hydrant or hydrants to meet the adequate fire flow requirements as determined by the Fire Code Official.

- Permanent on site water storage in tanks, ponds or ditches to meet adequate fire flow requirements as determined by the Fire Code Official.
- Sprinkler fire suppression systems with proper on site water storage and a pump as determined by the Fire Code Official.

**Additional advisory and technical input by the Camp Verde Fire District:**

As mentioned above, the Town's Building – Fire Code Official (Robert Foreman) and the Fire District's Fire Chief and Fire Marshal will be at the Commission hearing to provide input and answer technical questions. Additionally, the Town's Building – Fire Code Official & Fire District's Fire Marshal (Kristi Gagnon), each, have submitted a recommendation of denial to the Commission / Council for the applicant's adequate fire flow exemption / waiver request as attached (Exhibit "C") in this staff report.

**Previously adopted 2003 International Fire Code:** The previously adopted International Fire Code, used by the Town prior to its adoption of the 2012 International Fire Code, contains the same adequate fire flow requirements.

**Recommended Motion:** Motion to (approve / or deny) an (exception / waiver) request by the applicant and owner, John Bassous (Tierra Verde Holdings, LLC), to the adequate fire flow requirements for the proposed Castle Heights subdivision as located on assessor parcel number 404-18-181E and is adjacent to Arena Del Loma with the following conditions of approval:

- That if this exemption / waiver to the Town's adopted "Adequate Fire Flow" requirement, per the 2012 NFPA (Fire Code), is approved (in its original or any modified form) by the Town Council then, the applicant is to place a statement on the Preliminary & Final Plats for the Castle Heights Subdivision that gives the date of Council approval and the exception / waiver granted.

**EXHIBIT "A"**

**EXHIBIT "A"**

9-807. Mandated fire sprinklers in certain residences prohibited; exception; permit application format

A. A municipality shall not adopt a code or ordinance or part of a uniform code or ordinance that prohibits a person or entity from choosing to install or equip or not install or equip fire sprinklers in a single family detached residence or any residential building that contains not more than two dwelling units. A municipality shall not impose any fine, penalty or other requirement on any person or entity for choosing to install or equip or not install or equip fire sprinklers in such a residence. This section does not apply to any code or ordinance that requires fire sprinklers in a residence and that was adopted before December 31, 2009.

B. A fire sprinkler permit application may be in either print or electronic format.

C. A municipality shall include the provisions of subsection A of this section on fire sprinkler permit applications that are for a single family detached residence or any residential building that contains not more than two dwelling units.

**EXHIBIT "B"**

**EXHIBIT "B"**



**RESIDENTIAL AND COMMERCIAL CONTRACTOR**  
PO BOX 2898 CAMP VERDE, AZ 86322 (928) 567-2477  
ROC 261021

3.2.2016

**To:** Town of Camp Verde

**RE.:** Letter of Exemption for Fire Sprinklers/Adequate water supply for the proposed Castle Heights Subdivision

As the Owner of the property on which the proposed Castle Heights Subdivision is to be located, I am requesting that an exemption be granted by the Town of Camp Verde for fire sprinklers/adequate water supply for the following reasons:

**OPTIONS & FINANCIAL BURDEN**

**EXTEND WATER MAIN-** This property is in the Camp Verde Water service area but without a water supply. The closest water main is 8000 feet away. The cost would exceed \$500,000 to get water to the proposed 12 lot subdivision. This would cost approximately \$41, 600 per lot to provide water to the lot line and another \$8,000 to install the actual system.

**SUBDIVISION STORAGE TANK-** This would require the installation of a large well (in addition to each lot well), a 120,000 gallon storage tank with a pump, and distribution of water to several hydrants. The cost would range from \$350,000 - \$500,000.

**INDIVIDUAL STORAGE TANKS-** Each lot would have its own storage tank, pump and overhead system. The cost would range from \$10,000 - \$15,000 per house. This requires annual inspections and other maintenance costs which adds additional burden to the home owner.

While all these are options, the cost would be so great that the project would be cancelled due to financial impracticality.

**CODE FLEXIBILITY**

Our current code allows for flexibility. Section B103.1 clearly states that "the Fire Chief is authorized to reduce the fire flow requirements for isolated buildings or a group of buildings in a rural area or small communities where the development of full fire flow requirements is impractical" It is within our own adopted codes to reduce the requirements where deemed impractical.

**COMMUNITY PERCEPTION**

Our Town has made it clear through abundant public meetings and the General Plan that it wants to preserve its rural nature and where possible and encourage low density development. Castle Heights wants to do exactly that with 12 lots spread out over 20 acres. Subdivisions with rural design and intent are usually located

away from traditional utility sources. It only is logical that you cannot always have rural design features and provide all the luxuries of urban America.

**CURRENT BUILDING CODES**

Under our current building code, construction methods which minimize fire hazards are already in place. There are many current and innovative materials and methods that are ignition resistant and minimize fire hazard. These features along with defensible space planning create safe buildings. Statistics are clear that today's buildings are extremely safe. We know that Fire Departments receives significantly fewer fire calls today than twenty years ago. I am not aware of any individual that frets over not having a fire sprinkler system in their home or refuses to purchase a home because it does not have a sprinkler! I believe that there is sufficient amount of fire protection built into our adopted building code.

**ADEQUATE WATER SUPPLY**

There are multiple fire hydrants within 3 minutes of this subdivision and the Camp Verde Fire District does have a pumper truck to utilize in similar situation around Camp Verde. Castle Heights subdivision would have the same level of fire protection as every other house in Camp Verde that does not have a fire sprinkler and is not located within 600 feet of a fire hydrant!

The current ISO rating for the Camp Verde Fire District is 10. (Those areas beyond a five mile distance of a fire station) This means that it is common practice and understood that a fire district located in a rural area with the ISO rating of 10 will have to haul water. (Versus Phoenix which is rated at 1 due to its extensive water line distribution.)Our current Fire District employs a large capacity water tender vehicle as well as a new engine company. In addition, they receive mutual aid from Rimrock, Lake Montezuma, Sedona and Verde Valley Fire

**GOOD BUSINESS PRACTICE**

What is proposed before you today is an upper scale subdivision which will attract buyers who desire the rural atmosphere. Construction of Castle Heights subdivision will provide jobs for over 300 individuals who are primarily based in Camp Verde. It will generate over \$8,000,000 new dollars to this community. In turn, this subdivision will encourage businesses to locate to the adjacent property, resulting in an increase of sales tax revenue to the Town which you as a Council voted to convert to C-2.

Choosing to impose unnecessary restrictions chokes out development. Land owners often seek the path of least resistance, legally splitting a large parcel into lesser parcels, creating dirt roads and unplanned development, resulting in lesser property taxes which decrease the potential revenue for the variety of different districts, including the Camp Verde Fire District, who would still be required to service this area.

I am asking you to carefully consider your decision as it can and will have a profound impact on Camp Verde.

Respectfully,



John Bassous

March 2, 2016

Town of Camp Verde  
473 South Main Street, Suite 102  
Camp Verde, Arizona 86322

***Re: Castle Heights Subdivision***

We have prepared this letter in response to comments from the Camp Verde Fire District (CVFD) at the Project Review Meeting on February 1, 2016. We understand that the Camp Verde Fire District has adopted the 2012 version of the International Fire Code (IFC) and that water supply for fire protection is a principal concern for the Castle Heights Subdivision. We appreciate the concern for fire safety and just want to emphasize that Section B103.1 of the IFC allows for decreases in fire-flow requirements under appropriate circumstances. Given the rural nature of the project and the Camp Verde community in general, *"...the fire chief is authorized to reduce the fire-flow requirement [in rural areas] where the development of full fire-flow requirements is impractical."*

Additionally, Section B103.3 cites *NFPA 1142* and the International Wildland-Urban Interface Code for areas without water supply systems. *NFPA 1142* lists *occupancy hazard, construction type, structure dimensions and exposures* as principal requirements for estimating minimum water supplies. Single family residences are not listed in the *occupancy hazard* classification system; the most similar occupancy would be apartments which are considered light hazard. In regard to *construction type* the current building code integrates fire safety, regardless of *structure dimension*, with building requirements such as fire blocking, type x drywall (fire rated gypsum), elevated water heaters, smoke detectors, arc fault breakers and minimum clearances for flues and chimneys. These construction features along with defensible space planning and passive fire safety measures result in low fire potential. Furthermore, given the size of the lots (minimum 1.61 acres) *exposures* are minimal and can be completely discounted with a 50-ft minimum separation between structures.

The *International Wildland-Urban Interface Code* lists *access* and *water supply* as primary objectives. The standard also recommends *ignition resistant building materials* and *defensible space* as primary measures to prevent the spreading of fires. *Access* to the subdivision is from two (2) paved cul-de-sacs less than 500-ft in length. The streets will have a paved width of 24-ft with 28-ft turn radii and 96-ft diameter cul-de-sacs to facilitate fire truck access. A centralized water distribution system is not attainable for the Castle Heights Subdivision although sufficient *water supply* and firefighting resources are available from CVFD. The current building code already requires *ignition resistant building materials* and additional requirements will be integrated with the Final Plat to ensure each lot owner maintains *defensible space* around residential building structures.

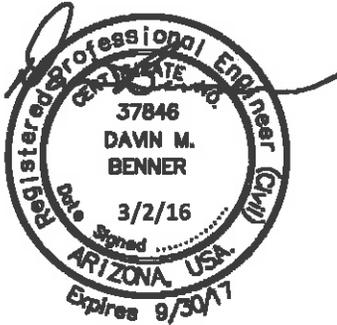
The nearest *water supply* is about 1-1/2 mile from Castle Heights and the development cost to extend the water distribution system is not financially viable for a 12-lot residential subdivision. Residential fire sprinkler systems are an accepted alternative to a centralized water distribution system but these types of systems are considerably expensive to install, especially on private well systems, and require perpetual ongoing maintenance and regular inspections to ensure proper operation. We believe *passive fire safety measures* are a more practical and effective solution given the circumstances, and we believe this is a more suitable approach.

Given the rural nature of the project and surrounding community, and considering the fact that a centralized water distribution system is not attainable, the developer is willing to impose additional requirements on the 12 single family lots to enhance fire safety. Specifically, the developer would revise the Preliminary Plat submittal to include the following items.

- *Increase side setbacks on all lots from 7-ft to 25-ft*
- *Incorporate the following supplementary building conditions on all lots*
  - *Minimum 50-ft separation between all structures*
  - *Defensible space requirements*

Please let us know if you would be agreeable to these concessions as a condition of approval.

Sincerely,



Davin Benner, P.E.  
**Granite Basin Engineering, Inc.**



KAREN L. REINHOLD, LUTCF, Agent  
Auto – Life – Health – Home and Business

400 Finnie Flat Road, Suite 2  
Camp Verde, Arizona 86322  
Phone: (928) 567-3374  
Fax (928) 567-6538

February 29, 2016

Town of Camp Verde  
RE: Subdivision to be built by Tierra Verde Builders  
John Bassous, President

To Whom it May Concern:

I have been a State Farm Agent for over 30 years, and in Arizona since 1997. I was asked to give my professional opinion on the economic value versus cost of interior sprinkler protection for homes built in Camp Verde.

Sprinklers, like alarm systems, can bring peace of mind to the homeowner. However, I have never seen either justify their expense. On a home, if sprinklers are in every room of the home, including bathrooms, closets, attics and attached structures, the savings is 7% of the annual premium. For example, if a homeowner's premium is \$1000 per year, he would save \$70 per year. If sprinklers are only in the main rooms (not attics, closets, etc.), the savings is only 2%, so that same homeowner would only save \$20 per year having the sprinklers. Given that the cost to install these devices is \$10,000 to \$15,000 per home, a resident could not possibly live long enough to recoup that expense. In addition, having this expense built into the cost of the home would be a disadvantage to the builder, the buyer, and eventually the seller. The discount is quite small, which reflects the small benefit the sprinklers provide in terms of fire protection.

Please feel free to contact me should you have further questions.

Sincerely,

A handwritten signature in cursive script that reads "Karen L. Reinhold".

Karen L. Reinhold, Agent  
State Farm Insurance

**EXHIBIT "C"**



# Camp Verde Fire District

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26B Salt Mine Road, Camp Verde, AZ 86322  
Phone (928) 567-9401 Fax (928) 567-3919

March 3, 2016

Re: Castle Heights Subdivision  
Water Supply Exemption Request

The Camp Verde Fire District does not support an "exemption" of the water supply requirement for the Castle Heights Subdivision.

Section 507.1 of the 2012 International Fire Code states (IFC), "An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction."

Section 507.2 of the 2012 IFC states, "A water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow."

Section 507.3 of the 2012 IFC states, "Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an approved method. The approved method of determining fire flow is appendix B of the 2012 IFC, which was adopted in conjunction with the main body of the IFC.

Appendix B, section B105.1 of the 2012 IFC states, "The minimum fire-flow and flow duration requirements for one- and two-family dwellings having a fire-flow calculation area that does not exceed 3,600 square feet shall be 1,000 gallons per minute for 1 hour."

Therefore, if the most optimal situation were to be achieved, the development would connect to water mains and provide fire hydrants that would supply a minimum of 1,000 gallons per minute, for at least 1 hour. If the most optimal situation is not achievable, a storage of water for the fire-flow is also acceptable. 1,000 gallons per minute for a duration of one hour would require a storage of 60,000 gallons.

If the 60,000 gallon water storage is also not achievable we look to section B103.1 of the 2012 IFC, which states, "The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the developments of full fire-flow requirements is impractical."

\*This section clearly states that a REDUCTION of the fire-flow is allowed, not an ELIMINATION of the fire-flow.

To determine what reduction is acceptable that still meets the intent of the code, we look two paragraphs lower at section B103.3, which states, "For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the fire code official is authorized to utilize NFPA 1142 or the *International Wildland Urban Interface Code*."

To determine which document to refer to, we must look at the objective of each document. NFPA 1142 is the "Standard on Water Supplies for Suburban and Rural Fire Fighting" and states in Section 1.2, "The purpose of this standard is to assist the AHJ to establish the minimum water supply necessary for structural fire-fighting purposes in those areas where it has been determined that there is no water or inadequate water for fire fighting."

The International Wildland Urban Interface Code (IWUIC) states in section 101.3, "Regulations in this code are intended to mitigate the risk to life and structures from intrusion of fire from wildland fire exposures and fire exposures from adjacent structures and to mitigate structure fires from spreading to wildland fuels."

The purpose of NFPA 1142 is aligned with the intent of the International Fire Code requirement for water supply; to provide water to suppress a fire that originates within the newly constructed building. The IWUIC is more intended for protection against wildland fires.

In NFPA 1142 a formula is used to determine the minimum water supply required. The factors in this formula include volume of structure, occupancy hazard classification, and construction classification. The total water supply

required will be different based on the different characteristics of each building. However, we can give an example of what the minimum water supply would be for a 2,500 square foot building, 14 feet in height, with a VB construction classification, and no other structure within 50'. Our equation would look like this:

$$WS(\min) = (35,000/7) \times 1.5$$

This would result in a minimum water supply of 7,500 gallons. This water supply would be required to be delivered at a rate of 500 gallons per minute and have a connection, such as a dry hydrant, which could be utilized by fire personnel for firefighting purposes.

NFPA 1142 also states in section 4.4.1, "The AHJ shall be permitted to reduce the water supply required by this standard for manual fire-fighting purposes when a structure is protected by an automatic sprinkler system that fully meets the requirements of NFPA 13."

This brings us to the subject of fire sprinklers in the residences. Neither the Camp Verde Fire District nor the Town of Camp Verde is requiring the developer to install fire sprinklers in the proposed homes. The requirement is for a water supply for firefighting purposes. As you can see in the paragraphs above, there are many options for providing the required water supply. The IFC and NFPA standards give us, as authorities having jurisdiction, the flexibility to accept fire sprinklers as an adequate water source for fire-flow should the developer choose to install them when other means of providing fire-flow are not achievable.

Residential fire sprinkler systems are considered adequate because national research shows that automatic fire sprinklers can reduce fire damage by up to 97%, reduce water usage to fight a home fire by as much as 91%, and most importantly, sprinklers coupled with smoke alarms can increase one's chance of surviving a fire by more than 82%. State Farm Insurance Company, in their article "8 Great Reasons to Install a Home Fire Sprinkler," proclaims that stopping a fire in its earliest stages increases safety and reduces the amount of property damage. Also, ninety percent of fires are contained by the operation of just one sprinkler. Many sprinklers will activate within 30 to 60 seconds – faster than local firefighters can respond. In one study, sprinklers used an estimated 341 gallons of water to control the average fire while firefighters used an average of 2,935 gallons to extinguish a residential fire. Additionally, a national poll conducted by Harris Interactive showed that two-thirds (69%) of U.S. homeowners say having a fire sprinkler system increases a home's value.

This requirement is not about fire sprinklers, but the information regarding sprinklers is included to express the flexibility of options that still meet the intent of the codes. While connecting to the existing water mains may not be feasible for this project, there are options that are feasible, including installing a fire sprinkler system. Three different local fire sprinkler contractors were kind enough to give me estimates of cost to the homeowner for an automatic fire sprinkler system for a 2,500 square foot residence that would utilize a private well, tank and pump to provide the needed water flow and pressure. One company quoted the cost at \$6,400, another company gave a cost of \$7,500, while the third company gave a cost of \$9,550.

The requirement for a water supply for a new subdivision, as one can see from the previous paragraphs, is not a matter of opinion. It is a necessary code requirement, which as an authority having jurisdiction, I am obligated to enforce. However, there is flexibility in how that requirement is met by the developer. No water supply is not an option.

Respectfully,

Kristi Gagnon  
Fire Marshal

**EXHIBIT "D"**

EXHIBIT "D"

TOWN OF CAMP VERDE



Memorandum

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**To: Planning and Zoning Commission**

**Cc: Mike Jenkins, Community Development Director**

File

**From: Robert Foreman, Building Official**

**Date: 03/07/2016**

**Re: Waiver of Fire Protection Water Supplies, Section 507 IFC**

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Planning and Zoning Commissioners:

As the Building Official and Fire Code Official for the Town of Camp Verde I cannot in any way support the waiving of such a basic and elemental life safety issue as fire protection.

Camp Verde has numerous neighborhoods, metes & bounds properties, and older sub-divisions that were created long before the County was mature enough to adopt Building and Fire Codes, long before Camp Verde incorporated and before Camp Verde adopted Building and Fire Codes. To consciously create more of these would at the very best be gross negligence, and go counter to the presently adopted General Plan. Reference GROWTH AREA element, Goal E, Implementation Strategy E.2

"Fire departments across the U.S. have worked tirelessly to promote fire safety and prevention. There's some evidence that the number of fires has diminished; however, *new building materials and furnishing mean that fires today burn up to eight times faster, as well as hotter, and with more toxic smoke than ever before.*" Reference [campverde.azsafepersonnel.com/training/player](http://campverde.azsafepersonnel.com/training/player).

Appendix B, also adopted by the Town of Camp Verde, Sections 103.1 and 103.2 does give the Fire Chief the ability to modify the required fire flow upwards or downwards depending on individual conditions. It does not state that the Fire Chief can eliminate the requirement for adequate fire flow.

Under State ARS statute 9-807 the Town cannot require the installation of a fire sprinkler in a single family residence if it did not have such an ordinance in place prior to December 31<sup>st</sup> 2009. However both the Fire Marshal, Fire Chief and the Town Building Official have agreed that a sprinkler system is an acceptable substitute water flow requirement to fire hydrants for a single family residence. This would not at all be the case for Commercial structures. As well as other acceptable means of providing adequate water supply to meet fire flow requirements.

The installation of a sprinkler system in a 2,500 square foot residence costs in the neighborhood of \$8,000 dollars. This cost spread over a 30 year mortgage is not a significant financial burden. As well financial issues cannot and will not be considered when it comes to basic Life Safety requirements in the Technical Building and Fire Codes.

The Commission should also consider that a premise of law is that what you do for one you are obligated to do for others. If a waiver of this basic Life Safety is given to one developer than any and all future developers can rightfully expect the same consideration in waiving this for their projects, including Commercial developments.

As the Camp Verde Fire Marshal has often commented these codes have been written in blood. There is a reason they exist. I would urge you not to forget the lesson of Chicago 1871. I would also urge you to consider the impression that would be made to members of a jury and of the judiciary if such a fundamental Life Safety requirement were to be waived by the Town and there was a loss of life as a result. The potential liability for the Town would be catastrophic.

I am absolutely opposed to any waiver of proper means of fire protection for any new sub-divisions and any commercial development.

My plans examiner/building inspector Emily Diver as you may or may not know has an architectural degree from Clemson University. Prior to employment with the Town Emily worked for several professional architectural firms over a twelve (12) year span of time. She wanted to add a statement to the effect that in all her dealings with Developers that she never worked with one that wanted to waive a basic Life Safety requirement.

Camp Verde is not a completely planned community like Anthem and we have to deal with what exists as best we can. To add more would be counter to all rational thinking.

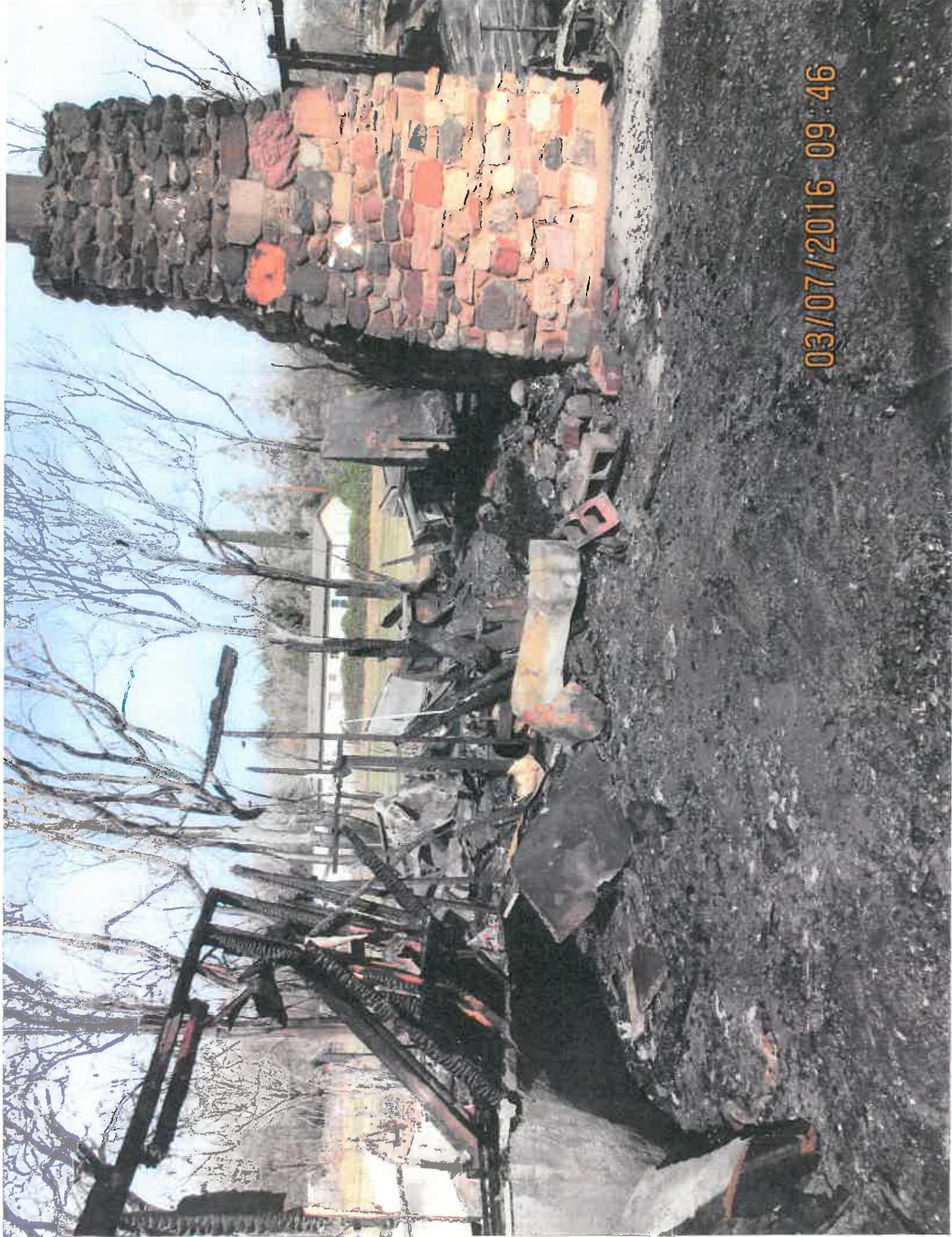
Thank you



Robert Foreman  
Building Official  
Town of Camp Verde  
473 S. Main St. Ste., 108  
928-554-0050  
[Robert.foreman@campverde.az.gov](mailto:Robert.foreman@campverde.az.gov)



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**Town of Camp Verde**

**Agenda Item Submission Form – Section I**

**Planning & Zoning Commission – Special Session**

**Meeting Date: March 10, 2016**

Consent Agenda       Decision Agenda       Executive Session Requested

Presentation Only       Action/Presentation

**Requesting Department:** Community Development

**Staff Resource/Contact Person:** Community Development Director, Michael Jenkins  
Assistant Planner, Kendall Welch

**Agenda Title (be exact):** Public Hearing, Discussion and possible Recommendation for approval (or denial) to Council on Preliminary Plat 20150392, submitted by John Bassous of Tierra Verde Holdings LLC, owner of parcel 404-18-181E, which consists of approximately 20.92 acres, for the Castle Heights Subdivision consisting of twelve (12) residential lots on Arena Del Loma, near the intersection of Montezuma Castle Highway.

**List Attached Documents:** Land Use Application Form, Directions to Property, Letter of Intent, Warranty Deed, Legal Description, Preliminary Title Report, Castle Heights Preliminary Deed Restrictions, APS Service Availability Letter, ADWR Service Availability Letter, CenturyLink Service Availability Letter, Yavapai County Development Services Site Investigation Report, Western Technologies Inc. Geotechnical Evaluation Report, Granite Basin Engineering Phase II Drainage Report, Granite Basin Engineering Traffic Memorandum Letter, Letter of Waiver for Curbing/Gutter, Letter of Waiver for Fire Flow Requirement With Attachments, Agency Review Comments, Vicinity Map, Zoning Map, Land Use Map, Castle Heights Subdivision Preliminary Plat, Castle Heights Subdivision Grading & Drainage Plans.

**Estimated Presentation Time:** 20 minutes

**Estimated Discussion Time:** 30 minutes

**Reviews Completed by:**

Department Head:       Town Attorney Comments:

**Background Information:** Preliminary Plat 20150392 was submitted on December 16, 2015 by John Bassous, owner of Tierra Verde Holdings LLC. The proposed Preliminary Plat is located on Parcel 404-18-181E on Arena Del Loma near the intersection of Montezuma Castle Highway in Camp Verde, AZ, and consists of approximately 20.92 acres. The Castle Heights Subdivision consists of twelve (12) residential lots, ranging in size from 1.61 acres to 1.80 acres. The subdivision is being proposed as “dry-lot”, with individual property owners being responsible for providing their own on-site septic system and well.

**Agency Comments:** Reviewing agencies were notified on December 23<sup>rd</sup>, 2015 and a summary of the responses received have been listed below. Please see the attached Agency Comments included in the agenda packet for additional information.

**APS (Kent Jones, Sr. Customer Project Manager)**

The proposed 12 lot subdivision is within our service territory and we have overhead facilities in the area to serve the project. The applicant will need to apply for service with APS when they are ready to be served.

**Camp Verde Building Division (Robert Foreman, Building Official)**

Building Division has no comments at this time. It is agreed that all new structures and utility infrastructure will be permitted through the Building Division.

**Camp Verde Fire District (Kristi Gagnon, Fire Marshal)**

1. All portions of the fire apparatus access roadway must meet the minimum standards of the IFC:
  - a. Fire apparatus access roads with a width less than 26 feet shall be marked with permanent "NO PARKING – FIRE LANE" signs on both sides. Signs shall measure 12 inches by 18 inches, have red letters on a white background, and shall comply with Federal Department of Transportation Standards for R8-31.
  - b. All weather access roadway for use of heavy firefighting apparatus shall be provided to the immediate job site at the start of construction.
  - c. The temporary fire access route shall be at least twenty (20) feet in width, shall have an unobstructed vertical clearance of at least thirteen feet, six inches (13'6"), and shall be capable of supporting the imposed load of fire apparatus weighing up to seventy-five thousand (75,000) pounds.
  - d. All temporary fire access routes, where required, shall be maintained until all construction is completed. Permanent fire apparatus access routes shall be completed prior to occupancy.
  - e. Arrangements shall be made to assure immediate Fire District access to the site at all times during construction. This may include signage as required by the Fire Code Official.
2. IFC 507.1 – An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings, or portions of buildings are hereafter constructed or moved into or within the jurisdiction. Per the adopted Fire Protection Development Standards based on the 2012 IFC:
  - A water source capable of supplying the required fire flow, either temporary or permanent, shall be made available prior to combustible materials being brought on to the construction site.
  - Temporary water supply arrangements shall have prior approval of the Fire Code Official. If a municipal or private water service is used, all connections shall have prior approval.
  - The minimum required fire flow for any newly developed area shall be as follows:
    - One-and two-family unit developments      1000 gpm\*  
\*Gallons per minute at twenty (20) psi for a two (2) hour duration.  
Exception: The Fire Code Official may allow fire flows in isolated residential developments to be met by requiring fire sprinklers in all buildings and residences when fire flows cannot be met by water storage and fire hydrants.
  - The delivery of the required fire flow by private water systems is permissible, provided that:
    - a. The design and installation are based on sound engineering principles and nationally recognized good practice. NFPA Standard 24, Current Edition, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances," shall be used. The system shall be designed and engineered to meet the required fire flows as established by the Fire Code Official. Engineering calculations to verify the anticipated flows shall be submitted at the time of plan review.
    - b. Provisions shall be made to keep reservoirs and tanks full and in a ready condition at all times utilizing a float system and back up generators.
    - c. The water supply shall be capable of delivering the required fire flow as required by the Table in Section 5.02-3.

Additional requirements may be forthcoming during the final plat review and once the building plans have been submitted. Plans are not approved. Failure to identify a code violation during this process of the plan review does not give the permit applicant the right nor authority to violate the code. The final installation and construction must be in accordance with the International Fire Code.

**Camp Verde Public Works Department (Ron Long, Town Engineer)**

The following comments are based upon review of the Preliminary Plat, Preliminary Grading and Drainage Plans, Soils Report, and Drainage Report for the Castle Heights Subdivision, submitted December 16, 2015. As such these preliminary documents are accepted for the Preliminary Plat and Plan approval process. The revisions can be submitted with the Final Plat.

**Summary:**

The Plat needs some minor revisions as noted. The Grading and Drainage plans, though adequate for a preliminary submittal, need to be revised to include the level of detail necessary for the bidding and construction of the Public and Private Improvements. The soils report is complete but the road structural section is to be determined by the Town of Camp Verde Engineering Standards. The Drainage Report is also adequate for a preliminary submittal but needs to be completed to the Yavapai County Drainage Manual Phase III level for the Final Plat and Plat submittal.

**Review Comments:**

Preliminary Plat

Sheets 1 and 2

1. Provide language for the dedication of the drainage easement to the HOA to maintain in perpetuity.
2. Add the revised Typical Roadway Section Detail to the Plat.

Grading and Drainage Plans

Sheet 1

1. Revise the Plan Set Title to include Street Improvements and Stormwater Pollution Prevention Plan (SWPPP).

Sheet 2

2. GENERAL NOTES: all notes must refer to the Town of Camp Verde as the governing body that will be responsible for, reviewing and approving plans and issuing permits for this project. Yavapai County is responsible for the wells, septic, and FEMA flood control issues only.
3. MATERIALS AND WORKMANSHIP: Revise this note to state "...shall comply with the current Town of Camp Verde Standards..." and MAG. Remove the reference to Yavapai County Standards and YC Resolution 10-36.
4. FINAL ACCEPTANCE: Remove the reference to Yavapai County.
5. STREET CLOSURES: Any street closure or work within the Town ROW requires a permit from the Town of Camp Verde Public Works Department. Any closure or work in the street will require the submittal of a Traffic Control Plan for approval prior to the start work.
6. PAVING NOTES: Remove the reference to YAG Section 345 and replace it with "...Per Town of Camp Verde Engineering Standards."
7. CHIP SEAL COAT: Remove references to YAG and replace with the appropriate MAG Standard Section 330.
8. Provide a "Estimated Quantities Section" for the Improvements.
9. Revise the "Typical Roadway Section" detail to reference the MAG Std. Dtl 201 Type A for the thickened edge section.

Also add a note to the detail for the roadway structural section to be 3" AC over 9" AB per the Town of Camp Verde Engineering Standards Section 512D.

*Note: the WTI soils report for this project provided the data used to determine the road structural section of 3"AC /9"AB based on Town of Camp Verde standard 512D.*

Sheets 3, 4, and 5

10. Add the size of the existing drainage pipe under Arena Del Loma. According to the drainage report it is a 27" diameter steel pipe.
11. More detail is required for the detention basin outlets as to outlet design size and location. Include a basin and outlet design for sub-basin 3.

12. Provide an SWPPP for this development, the notes/details can be included on sheets 3-5.
13. Provide construction notes and estimated quantities for the construction of the improvements.

#### Grading and Drainage Report

1. Complete the Phase III drainage report for this project and incorporate the basin and outlet structure design/requirements to the plans.

#### **Camp Verde Wastewater Division (Jan Grogan, Manager)**

No conflicts, this property is not located within the sewer collection system.

#### **Camp Verde Water System (Justin Bullard, Vice President)**

This area is in our Certificate of Convenience and Necessity (CC&N) issued by the Arizona Corporation Commission (ACC). We are regulated by the ACC and are required to follow their rules and regulations. We have an exclusive right to serve entities requesting service in our CC&N.

We do not currently serve this parcel and we do not have waterlines in this area. We could serve this parcel with an Advanced in Aid of Construction Agreement to extend a water main to the property.

The property owner can provide water to serve its interest as long as they do not charge for the water provided. To charge for water use is an illegal act. Further, if the developed area has more than 25 people per day being there, the water system is a Community Water System and must comply with all of the chemical analysis for providing water and have a Certified Operator maintain the water system. We comply with these requirements and are willing to provide water service to this area.

We have no objection for the approval of the requested use permit.

#### **CenturyLink (Armen McNerlin, Engineer II)**

If/when approved, please send a PDF file of the subdivision plat and a PDF copy of the APS plans for providing power as soon as possible. I have to submit both to a review group in Phoenix before I can design any facility placement.

#### **UniSource Energy Services (Irene Freeman, Planner)**

No conflicts, there is no natural gas.

#### **Yavapai County Development Services – Environmental Unit (Stacey Clark)**

The applicant will need to provide the following information to comply with the requirements of the Arizona Department of Environmental Quality delegated rules:

##### Onsite Wastewater -

- Request for registration of a site investigation is not complete; therefore, it is unclear if additional testing will be required.
- The applicant will be required to submit a Geological Report prepared by an Arizona Registered Engineer, Registered Geologist, or Registered Sanitarian. Reports of site investigations conducted in accordance with Arizona Administrative Code (AAC) R18-9-A310 and AAC R18-5-Article 4 must be included in the geological report. If it appears that a majority of the tested lots will require alternative systems the applicant will need to either test an additional 25% of the lots in order to make a better determination of the suitability for conventional systems or agree that a provision of the Approval of Sanitary Facilities for Subdivisions, which is included in the Arizona Department of Real Estate (ADRE) public report, will let buyers know that they can expect to need an alternate system in order to develop their property and the possible costs of such systems.

- No nitrogen management calculations were provided; however, I do not see this being a problem at this time according to AAC R18-9-A309.A.8. Calculations will, however, need to be provided in the required soils report.

Certificate of Sanitary Facilities for Subdivisions –

- Application and fees (\$752.50 plus \$3.00 per lot, not to exceed \$1,052.50) for Approval of Sanitary Facilities for Subdivisions.
- Completed Solid Waste Agreements – utility service agreement; 1 from the collector and 1 from the landfill.
- Plat that is ready for recordation and includes the necessary dedication and acknowledgment notes.

**Yavapai County Flood Control (Vickie Lewis, Hydrologist)**

Yavapai County does not have any input for this project as it is not located within a FEMA-Designated Special Flood Hazard Area. However, Public Works should definitely be requiring SWPPP and NOI as a part of any grading that occurs. This is a hillside area that the area of disturbance exceeds both 1 acre and 5 acres. It also is thought that detention would be required, but again, that would be something for Ron Long/Troy Odell.

**Staff Analysis/Review:**

Per Part Five, Section 505 – Preliminary Subdivision Plat, Item B – Preliminary Subdivision Plat Submittal Requirements of the current Planning & Zoning Ordinance:

1. Information Required: The Preliminary Subdivision Plat shall be prepared to contain the information required in Section 504 B. Conceptual Plan Submittal Requirements and the additional Preliminary Plat and supplementary requirements that follow in this Section. Engineering plans submitted in support of the Preliminary Plat shall be prepared under the direction of a Professional Engineer.  
This requirement has been addressed. Conceptual Plan submittal requirements include a vicinity map, title (name of development), location (section, township and range), reference (approximate distances to section and/or quarter corners), boundaries (of development clearly identified), north arrow, scales (both graphic and equivalent inch to feet), date, names (addresses, phone numbers and notation of relationship to development for landowners, subdividers/development agents, engineers, surveyors, land planners, landscape architects, architects, hydrologists or others responsible for design (including registration numbers), topography, proposed land uses (and densities by area as well as ownership patterns surrounding land uses and zoning within 300'), traffic/circulation concept plan, drainage concept plan, notes/chart, and requested waivers.
2. Title: The title shall include "Preliminary Plat" and the proposed name of subdivision.  
This requirement has been addressed.
3. Topography: A depiction of contours relating to USGS survey datum, or other datum approved in writing by the Town Engineer, shall be shown on the same map as the proposed subdivision layout. Location and elevation of the benchmark used should also be shown on the plat. Acceptable contour interval; grades up to 5%, two feet; 5% to 15% grades, five feet; grades over 15%, ten feet. Source and date of topography shall be noted on the Preliminary Plat. Datum basis shall be noted. Whenever practical, elevations should be based on N.G.S. datum. At least one permanent benchmark shall be included as part of the Preliminary Plat. Regular U.S.G.S. topographic maps, enlargements or similarities of same will not be acceptable as the source of topography.  
This requirement has been addressed.
4. Existing Drainage and Natural Features: Flood hazard and 100-year Floodplain areas, if any, shall be delineated on the Preliminary Plat, and building pads shall be identified within flood hazard areas; significant natural features such as washes, wetlands, major rock outcroppings and stands of trees, shall be identified.  
Per Yavapai County Flood Control this area is not located within a FEMA-Designated Special Flood Hazard Area. All lots will have a 10' PUE, Drainage and Slope Easement on the front of the lot. Additional Drainage Easements have been added to Lots 1 (25' on Rear, 60' on Exterior Side), 6 (10' on Exterior Side), 7 (10' on Exterior Side), and 12 (20' on Exterior Side, 40' on Rear). This requirement has been addressed.

5. Existing Streets, Easements and Improvements: Location, widths, ownership status and names of all existing streets and improvements therein; railroads, recorded utility or other easements or rights-of-way, including any existing facilities therein; public areas; all existing structures, with an indication of whether or not they are to remain, and Town corporation lines within or adjacent to the tract. Access road to the proposed subdivision shall be described to its intersection with a public road right-of-way.  
This requirement has been addressed.
6. Proposed Streets and Easements: Location, width and names of proposed streets, alleys, drainage ways, cross-walks, utility and access easements including all connections to adjoining platted or unplatted tracts. A typical cross-section shall be depicted on the plat where applicable describing the aforementioned improvements.  
This requirement has been addressed.
7. Adjacent Lands: Name, book and page numbers of any recorded subdivisions within or having a common boundary with the tract, or notation "unsubdivided" where appropriate.  
This requirement has been addressed.
8. Lot Layout: Including minimum building setback lines related to all streets; typical lot dimensions (scaled); dimensions of all corner lots and lots on curvilinear sections of street; each lot numbered individually and total number of lots shown.  
This requirement has been addressed. The current zoning of parcel 404-18-181E is R1L-70. R1L-70 indicates a minimum lot area of 70,000 square feet. The smallest lot indicated on the preliminary plat is 70,008 square feet. Per the current Planning & Zoning Ordinance Minimum Front Yard Setback is 20', Minimum Rear Yard Setback is 25', Minimum Side Yard Interior Setback is 7', and Minimum Side Yard Exterior Setback is 10'. The applicant should note that the "Site Data" listed on the Preliminary Plat indicates parcel "Portion of Assessor Parcel Number 404-18-181D" and should be revised to reflect the current parcel number "404-18-181E".
9. Public Land Use: Designation of all land to be dedicated or reserved for public or semi-public use, with use indicated.  
There are no public lands designated on this preliminary plat.
10. Zoning: The plat shall designate existing zoning classifications and land uses, present district boundary lines and status of any pending zoning change. If the plat includes land for which any multi-family, commercial or industrial use is proposed, such areas shall be clearly designated.  
This requirement has been addressed.
11. Utility Resources: Reference by note to all sources of proposed electricity, gas, telephone service, solid waste disposal, police and emergency service agencies.  
This requirement has been addressed. Per the preliminary plat, sewage disposal will be handled with on-site septic or alternate system, water supply will be handled with on-site well, electric will be supplied by APS, solid waste disposal will be supplied by Waste Management, and telephone/internet/cable tv has yet to be determined. Additionally the Castle Heights subdivision will be served by Camp Verde Fire District, Camp Verde Marshal's Office, and Camp Verde Unified School District. Applicant should note the "Fire District" is noted on the Preliminary plat as "Town of Camp Verde Fire District" and should be revised to read "Camp Verde Fire District", and "School District" noted on the Preliminary Plat is listed as "Town of Camp Verde School District" and should be revised to read "Camp Verde Unified School District".
12. Sewage Disposal: A statement as to the type of facilities proposed shall appear on the Preliminary Plat.
  - a. It shall be the responsibility of the subdivider to furnish the Yavapai County Environmental Services Department such evidence as that Department may require for its satisfaction as to the design and operation of sanitary sewage facilities proposed.
  - b. Where the proposed sewage disposal system will be by individual lot septic tanks, the result of the percolation tests and test boring logs as required by the County Environmental Services Department shall be submitted with the preliminary plat.
  - c. Where alternate systems are contemplated necessary supporting information to the county Environmental Services Departments' specifications shall be provided for review and approval in concert with Preliminary Plat evaluation.

- d. **Water Supply:** A statement as to the type of facilities proposed shall appear on the Preliminary Plat. It shall be the responsibility of the subdivider to furnish the Yavapai County Environmental Services Department such evidence as that Department may require for its satisfaction as to the facilities for supplying domestic water.

The applicant has been in contact with the Yavapai County Environmental Services Department on this requirement. A site investigation packet submitted by the applicant has been included in the agenda packet for review.

Per Part Five, Section 505 – Preliminary Subdivision Plat, Item C – Additional Preliminary Plat Submittal Requirements of the current Planning and Zoning Ordinance:

2. **Preliminary Title Report:** A policy of title insurance issued by a title insurance company within the preceding thirty (30) days to the owner of the land, covering the land within the proposed subdivision and showing all record owners, liens, and encumbrances shall be submitted. The preliminary title report shall contain Schedule "B" indicating the status of legal access to the proposed subdivision.

This requirement has been addressed. A copy of the preliminary title report with Schedule B has been included in this agenda packet for review.

3. **Preliminary Draft Deed Restrictions or Protective Covenants:** Restrictions or covenants shall be incorporated in the final plat submittal, including provisions for use and maintenance of commonly-owned facilities, if any. This requirement has been addressed. A copy of the Preliminary Deed Restrictions dated December 16, 2015 has been included in this agenda packet for review.

4. **Utility Service Letters:** A statement regarding availability of utilities and the direction and distance thereto and preliminary letters of serviceability shall be submitted in conjunction with the application.

This requirement has been addressed. A service availability letter dated September 29, 2015 was submitted by the applicant from APS and has been included in this agenda packet for review. Additionally, the applicant also submitted a letter dated September 18, 2015 from Arizona Department of Water Resources indicating:

"Castle Heights subdivision is being served groundwater by dry lot individual wells. The developer has chosen not to demonstrate a 100 year adequate water supply. The applicant has not demonstrated that the criteria for physical, legal and continuous availability, water quality, and financial capability have been met. Therefore the Department must find the water supply to be inadequate. For additional information please contact the Office of Assured and Adequate Water Supply at 602-771-8599." Pursuant to ARS §32-2181(F) a summary of the Department's report for those with an inadequate water supply shall be included in all promotional material and contracts for sale of lots in the subdivisions.

The applicant should also note that per ARS §9-463.01 "If the director of water resources has determined that there is inadequate water supply for the subdivision pursuant to section 45-108, the municipality shall note this on the face of the plat if the plat is approved."

5. **Street Names:** A list of the proposed street names.

This requirement has been addressed on the preliminary plat. Per the Addressing Official for Yavapai County, there are no conflicts with the proposed names of "Theo Court" and "Jessica Way".

6. **Preliminary Grading Plan:** A preliminary grading plan shall be required when cuts or fills will exceed 5' in height or will extend outside of the normal street right-of-way. The preliminary grading plan shall be in sufficient detail to convey the extent of grading activities such that their impact can be evaluated by the reviewing agencies.

- a. The Preliminary Grading Plan shall include existing and finish grade contours and limits of cut and fill areas.
- b. Driveway and building locations shall be shown when topographic or other constraints will require specific locations or site grading.
- c. A geotechnical report shall accompany the grading plan to support the slope stability assumptions of the grading plan.

- d. The Preliminary Grading Plan may be shown on the Preliminary Road Plans if all of the grading will be related directly to the roads and in compliance with the following requirements for Preliminary Road Plans.

This item has been addressed. The applicant should note the Town Engineer's comments as the project moves forward to Final Plat.

7. Preliminary Road Plans: Grades shall be given to the nearest whole percent grade. A profile sheet coinciding with the roads as shown on the Preliminary Plat or separate plan and profile sheets shall be prepared at a scale sufficient to allow evaluation of the proposed roads. Proposed drainage structures within the right-of-way shall be shown on the preliminary road plans. The reviewing agency's interests in these parts are:
  - a. Height, stability and slope of cut fills,
  - b. Affected drainage patterns,
  - c. Potential roadway geometric problems,
  - d. Impacts of the roads on adjacent lots, property and access,
  - e. Relationship of drainage to roadways; and,
  - f. Other items that may be specific to the roads in the specific subdivision.

This item has been addressed. The applicant should note the Town Engineer's comments as the project moves forward to Final Plat.

8. Preliminary Utility Plans: A Preliminary Utility Plan shall be prepared to illustrate the proposed location of utilities and verify that the necessary easements and right-of-way are proposed on the Preliminary Plat. It is recognized that final utility locations are decided by the individual utilities, but the objective of the Preliminary Utility Plan shall be to encourage cooperation in planning by the various utilities.

The Castle Heights subdivision is a dry lot subdivision, with proposed on-site wastewater systems and on-site wells being provided by individual lot owners. As such, no preliminary utility plans were submitted with the Preliminary Plat application.

9. Preliminary Drainage Plans: The Preliminary Drainage Plan shall be part of a Drainage Report in accordance with the requirements of the Yavapai County Flood Control District and Yavapai County Drainage Criteria Manual (refer to Camp Verde Engineering Design & Construction Standards).

This item has been addressed. The applicant should note the Town Engineer's comments as the project moves forward to Final Plat.

10. Traffic Impact Analysis: A traffic impact study shall be performed in accordance with the latest edition of the Town Engineering Design & Construction Standards or as required by the Town Engineer. In cases where the proposed subdivision streets intersect a State or County highway, the traffic impact analysis shall be performed in accordance with that agency's requirements.
  - a. Generally the following criteria are considered when determining if a traffic impact study is warranted:
    1. Significant changes in land uses are proposed or higher density zoning is sought.
    2. Town arterial highway access is requested or the existing location of access to the property is changed.
    3. The proposed increased activity or intensity of development will significantly impact vehicular or pedestrian traffic on County roads.
    4. A total of 100 or more vehicular trips during an A.M. or P.M. peak hour will be generated by the proposed development.
  - b. The traffic study shall be funded by the subdivider or property owner and upon submittal to the Planning and Zoning Department will be transmitted to and reviewed by the Town Engineer's office. Copies will be made available to other governmental agencies which may be affected by increased traffic.
  - c. The subdivider shall be required to provide financial assurances or complete the installation of any improvements determined necessary to maintain or improve traffic operations and traffic safety functions in direct proportion to the impact caused by the proposed development.

The applicant submitted a Traffic Memorandum letter dated October 14, 2015 from Granite Basin Engineering that has been included in the agenda packet for review. Per the Traffic Memorandum prepared by Granite Basin Engineering:

"The proposed development does not intersect a County or State Highway and no coordination is required with an outside agency. No significant changes in land use designations are proposed for this development. Higher density zoning is not being sought. No Town arterial highway access is requested. The proposed activity will not significantly impact vehicular traffic. Significantly less than 100 vehicular trips are generated during the AM or PM peak hours. Sight distance conditions are met for the design road speeds. No turn warrants have been identified for the proposed condition. Based on the limited impact of the proposed development and low threshold of traffic generation, we do not recommend a traffic impact analysis for the proposed development."

11. Development Schedule: The subdivider may submit a proposed development schedule for progressive phases of the subdivision's development to be approved with the Preliminary Plat.

N/A: The applicant did not submit a development schedule.

12. Application of Exception or Waiver: Any requested exception, waiver or variation from these regulations or approved construction standards such as roads, flood control, etc. shall be in the form of an Application of Exception specifying each requested waiver or variation and associated justification.

- a. The Application shall be a request for an exception to a circumstance actually delineated on the preliminary plat, subsequent final plat or other plans as submitted. Requests shall not be in the abstract but shall include the specific reason for each and every exception requested.
- b. The Community Development Department Staff shall accept the application for each and any exception, as herein described, and initiate or continue the processing of a subdivision plan as long as the plan complies with all other requirements.

The applicant submitted a Letter of Waiver on December 15, 2015 stating:

"In keeping with the rural theme, I am requesting a waiver for curbing and gutters. The intent is to create a low density subdivision which lends itself to rural living and will not look like a "city" lot. We want the natural vegetation and land contours to be the focus, not sterile concrete. In addition, each lot being almost 1.7 acres and only 12 lots total, the drainage issues are significantly less than higher density subdivisions. We have addressed the drainage plan elsewhere demonstrating that curbing and gutters are not necessary. Finally, this would allow for a consistency within the Town of other sub-divisions which retain the rural atmosphere."

Additionally, the applicant also submitted a Letter of Waiver on March 2, 2016 stating:

"As the owner of the property of which the proposed Castle Heights Subdivision is to be located, I am requesting that an exemption be granted by the Town of Camp Verde for fire sprinklers/adequate water supply for the following reasons: Options & Financial Burden, Code Flexibility, Community Perception, Current Building Codes, Adequate Water Supply, and Good Business Practice."

Per Part 5, Section 505 – Preliminary Subdivision Plat, Item D. Preliminary Subdivision Plat Review and Actions by Planning Commission, Line 2: "The Commission may review an application for exception simultaneously with the Preliminary Plat consideration, or, the Commission may hear the Application for Exception separately at the subdivider's request or as recommended by the Community Development Director." The Community Development Director Michael Jenkins has recommended the Applications of Exception be heard separately from the Preliminary Plat. If an Exception is approved, as a condition of approval, any and all exceptions must be delineated on the Preliminary and Final Plats along with dates and conditions of all approvals.

In regards to the Town of Camp Verde 2004 General Plan Ratified By Voters on March 8, 2005:

Per Chapter 3 – Land Use:

A. Goal Preserve and retain the rural atmosphere and character of the Town by promoting compatible land uses.

A.3. Update and consistently apply the Town's development regulations.

The proposed Castle Heights Subdivision will utilize the parcel's current (existing) zoning of R1L-70. The adjacent zoning is R1L-70 to the North, C2 and R1L-70 to the East, C2 and R1-70 to the South, and R1L-70 and R1-70 to the West.

Per Chapter 6 – Cost of Development:

Vision Statement: Development will be conveniently located to and compatible with existing infrastructure in order to protect taxpayers and existing businesses from having to assume financial responsibility for additional infrastructure required for new development. The Town government will equitably assess and manage the fiscal and capital impacts resulting from new development to maintain and improve the existing level of services and infrastructure.

D. Goal: Protect existing resources and infrastructure from becoming overburdened by new development:

D.1. Guide development to areas where public facilities and services exist or can be extended in the most efficient and cost-effective manner.

The proposed Castle Heights Subdivision is not located in an area that is served by either sewer or water facilities. At this time, extending sewer/water service to this area would not be cost effective, per the applicant's letter of exception dated March 2, 2016.

Per Chapter 7 – Housing:

A. Goal: Encourage a variety of housing types and densities to provide housing opportunities for all residents.

A. 3. Encourage development that is consistent with Camp Verde's predominant individualistic style.

Per the applicant's letter of intent, the proposed Castle Heights Subdivision is seeking to "attract the above median priced home buyer to Camp Verde, thus providing a greater tax base to this community." Additionally the applicant's letter of intent also states: "Currently there is very little property available in Camp Verde for larger lots zoned for site built homes. A vast majority of buyers wanting such properties are forced to go to other Verde Valley markets. The natural beauty of this property will remain intact as its natural contours and native vegetation will be preserved. Extensive engineering has been provided to comply with Town Codes in regards to drainage and traffic concerns. The engineered roadways were placed so as to have minimum visual impact, yet allow for easy ingress/egress. We have placed self-imposed deed restrictions to preserve the natural beauty and create a distinct neighborhood."

**While the majority of the Preliminary Subdivision Plat requirements have been met, at this time Community Development Department Staff is recommending for denial of the Castle Heights Preliminary Plat due to the Camp Verde Fire District/Town of Camp Verde requirements for adequate fire flow not being addressed by the applicant. It is staff's opinion that adequate fire flow is a basic public safety, health and welfare requirement that cannot and should not be waived.**

Per Part Five, Section 505 – Preliminary Subdivision Plat, Item D – Preliminary Subdivision Plat Review and Actions by Planning Commission of the current Planning and Zoning Ordinance:

2. "...The Commission may recommend that the Town Council authorize exceptions to any of the requirements in these regulations, if the Commission finds the following facts with respect thereto:

- a. There are special circumstances or conditions affecting said property; and
- b. **That the granting of the exception will not be detrimental to the public safety, health and welfare or injurious to other property in the area in which said property is situated; and**
- c. That it will not have the effect of nullifying the intent and purpose of the Town's General Plan or these regulations.

Per Part Five, Section 505 – Preliminary Subdivision Plat, Item D – Preliminary Subdivision Plat Review and Actions by Planning Commission of the current Planning and Zoning Ordinance:

4. The Commission may move to continue the plat pending its revision or resubmittal process if the Commission finds that the proposed plat lots are determined to be not suitable due to such features or conditions as flooding or poor drainage, steep slopes, rock problems, sanitary deficiencies, improper access to public roadway, or other conditions likely to effect public health, safety, convenience and general welfare.
  - a. Such continuance shall be set to a specific date coordinated by the subdivider and Commission for a future Commission hearing of the revised plat.
  - b. If the plat revision remains unsatisfactory to the Commission for a recommendation of approval, the Commission may recommend denial and forward their recommendation to Council.
  - c. A Preliminary Plat may not be continued for more than sixty (60) days after the Commission's first hearing on the Plat.
5. The Commission may recommend denial if it finds that the plat does not comply with these regulations, the intent and purpose of the General Plan, zoning or other applicable codes.
6. Recommendations for approval or denial by the Commission shall be forwarded to the Town Council for action at the next available regular meeting. A copy of the project report and draft or approved minutes setting out action of the commission shall be filed with the Town Clerk and be transmitted to the Council, to the subdivider and/or owner and to departments or agencies as necessary.

***Recommended Motion:***

**Recommendation for approval (or denial) to Council on Preliminary Plat 20150392, submitted by John Bassous of Tierra Verde Holdings LLC, owner of parcel 404-18-181E, which consists of approximately 20.92 acres, for the Castle Heights Subdivision consisting of twelve (12) residential lots on Arena Del Loma, near the intersection of Montezuma Castle Highway.**

With the following stipulations:

1. The Site Data on the Preliminary Plat be amended to reflect the current parcel number 404-18-181E.
2. The Fire District on the Preliminary Plat be amended to reflect Camp Verde Fire District.
3. The School District on the Preliminary Plat be amended to reflect Camp Verde Unified School District.

**Optional Motion:**

**Recommendation to continue Preliminary Plat 20150392, submitted by John Bassous of Tierra Verde Holdings LLC, owner of parcel 404-18-181E, which consists of approximately 20.92 acres, for the Castle Heights Subdivision consisting of twelve (12) residential lots on Arena Del Loma, near the intersection of Montezuma Castle Highway.**

# 20150392



# Land Use Application Form

**1. Application is made for:**

- |   |                                    |                        |
|---|------------------------------------|------------------------|
| Zoning Map Change                           | Use Permit                         | General Plan Amendment |
| Conceptual Plan Review                      | Preliminary Plat                   | Final Plat             |
| PUD Zoning                                  | Variance                           | Sign                   |
| Street Abandonment                          | Minor Land Division                | Wireless Tower         |
| Appeal                                      | Verification of Non-Conforming Use | Utility Exemption      |
| Site Plan Compatibility Review (Commercial) |                                    |                        |
| Other: _____                                |                                    |                        |

**2. Project Name:** Castle Heights

*Please print or type legibly*

**3. Contact information: (a list of additional contacts may be attached)**

Owner Name: John Bassous      Applicant Name: SAME

Address: PO Box 2898, Camp Verde      Address: \_\_\_\_\_

Phone: 928.567.2477      Phone: \_\_\_\_\_

E-mail: tvbuilders@q.com      E-Mail: \_\_\_\_\_

**4. Property Description:**

Address or Location: Arena Del Loma off of Montezuma Castle Highway

Existing Zoning: R1L-70      Existing Use: Bare Land

Proposed Zoning: R1L-70      Proposed Use: SFR Lots

**5. Purpose: (describe intent of this application in 1-2 sentences)**

Establish a 12 lot, 20 Acre single family residence sub-division

**6. Certification:**

*I certify that I am the lawful owner of the parcel(s) of land affected by this application and hereby consent to this action.*

Owner: John Bassous      Date: 12.15.2015      AND

*I certify that the information and attachments I have submitted are true and correct to the best of my knowledge. In filing this application, I am acting with the knowledge and consent of the property owner(s). I understand that all materials and fees required by the Town of Camp Verde must be submitted prior to having this application processed.*

Applicant: John Bassous      Date: 12.15.2015

12.16.2015



Town of Camp Verde  
473 South Main Street  
Suites 108 & 109  
Camp Verde, AZ 86322

December 17, 2015  
RE: Letter of Intent  
Castle Heights Sub-Division

**Tierra Verde Holdings** is pleased to present to you Camp Verde's newest proposed subdivision! After two years of planning and extensive community input, we are ready to move forward to Preliminary approval.

This 20 acre, 12 lot subdivision is located on Arena Del Loma off of Montezuma Castle Highway. The current zoning (R1L-70) will be maintained. Each lot being in excess of 1.6 acres will allow for low density build out in this subdivision as well as unobstructed views for each lot owner. Each lot will be serviced by their own well and septic system.

The property itself has stunning views and backs to Forest Service property. It is rural in feel, yet in close proximity to schools, I-17, Cliff Castle Casino, Jackson Flats, Montezuma Castle monument, and the downtown business district. In preserving the rural nature of this project, we are requesting a waiver to curbing and gutters. Currently there is very little property available in Camp Verde for larger lots zoned for site built homes. A vast majority of buyers wanting such properties are forced to go to other Verde Valley markets.

The natural beauty of this property will remain intact as its natural contours and native vegetation will be preserved. Extensive engineering has been provided to comply with Town Codes in regards to drainage and traffic concerns. The engineered roadways were placed so as to have minimum visual impact, yet allow for easy ingress/egress. We have placed self-imposed deed restrictions to preserve the natural beauty and create a distinct neighborhood.

Castle Heights subdivision will have a positive economic impact on Camp Verde and attract the above median priced home buyer to Camp Verde, thus providing a greater tax base to this community. In addition, this project will provide more than 100 jobs through the local construction and Real Estate trades, and circulate over six million dollars back into the local economy.

John and Mary Bassous, Owners of Tierra Verde Holdings have been Camp Verde residents for over 25 years. They have raised their two children here and have no plans to move. In addition, they own Tierra Verde Builders; a Camp Verde based General Contracting Company currently working from Chandler to the South Rim of the Grand Canyon, employing over 20 individuals.

John and Mary Bassous  
Tierra Verde Holdings

Recording Requested By:  
Empire West Title Agency

And When Recorded Mail To:  
Tierra Verde Holdings, LLC  
P.O. Box 2898  
Camp Verde, AZ 86322

Recorded Electronically
ID <u>2015-0056948</u>
County <u>Yavapai</u>
Date <u>12-12-15</u> Time <u>2:27PM</u>
Simplifile.com 800.460.5657

Escrow No.51872EW -PN 1001

Exempt B-5

This area reserved for County Recorder

Exempt per ARS11-1134B-5

### SPECIAL WARRANTY DEED

For the consideration of Ten Dollars, and other valuable considerations, I,  
**Tierra Verde Holdings, LLC, an Arizona limited liability company**  
do hereby convey to  
**Tierra Verde Holdings, LLC, an Arizona limited liability company**  
the following described property situated in the County of **Yavapai**, State of **Arizona**, together  
with all rights and privileges appurtenant thereto, to wit:

**See Exhibit "A" attached hereto and made a part hereof.**

SUBJECT TO: Existing taxes, assessments, covenants, conditions, restrictions, rights of way,  
easements, and all other matters of record.

And the Grantor hereby binds itself and its successors to warrant and defend the title, as against  
all acts of the Grantor herein and no other, subject to the matters above set forth.

Dated: November 30, 2015.

**Tierra Verde Holdings, LLC**

  
By **John Bassous, as Member**

**Tierra Verde Holdings, LLC**

  
By **Mary Bassous, as Member**

Dated November 30, 2015

Special Warranty Deed

Escrow No. 51872EW

STATE OF Arizona )  
 )SS.

County of Yavapai )

On November 30, 2015, before me, the undersigned Notary Public, personally appeared John Bassous and Mary Bassous, as Members of Tierra Verde Holdings, LLC, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) and that his/her/their signature(s) on the instrument the person(s) or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal

Chelsey Tucker  
Notary Public

My Commission Expires:

9/30/2019



**Exhibit "A"**

Description for parcel of land being a portion of that certain parcel as recorded in Book 4494 of Official Records, Page 484 and Section 19, Township 14 North, Range 5 East, G" & S. R. M., Yavapai County, Arizona being more particularly described as follows;

To find the place of beginning, begin at the North quarter Comer of said Section 19, being a found 3 inch BLM Brass cap, from which the West East 1/64 Comer of said Section 19, being a found BLM brass capped pipe, bears North 89 degrees 38 minutes 48 seconds East (R&M and basis of bearings for this description), a distance of 663.11 ft. (M);

THENCE from said North quarter Comer of said Section 19, South 00 degrees 13 minutes 20 Seconds East, a distance of 661.21 ft.(M) along the North/South mid-section line of said Section 19, to a found ½ inch rebar with tag stamped "L.S. 29263" added, being the Northwest comer of said parcel recorded in Book 4494 Official Records, Page 484 and the TRUE POINT OF BEGINNING;

THENCE continuing along the locally accepted said North/South mid-Section line, South 00 degrees 12 minutes 07 seconds East (M), a distance of 329.38 ft. (M) to a found ½ inch rebar with tag stamped "LS 29263" added;

THENCE continuing along the locally accepted said North/South mid-Section line, South 00 degrees 18 minutes 19 seconds East (M), distance of 298.88 ft. (M) to a set ½ inch rebar with plastic cap stamped L.S. 29263", being a point on the northerly right-of-way the of Arena Del Loma as recorded in Book 198, L.S. Page 52 of the Yavapai County records;

THENCE South 89 degrees 49 minutes 32 seconds East, a distance of 1435.21 ft. (M) along said right-of-way line of Arena Del Loma to a point;

THENCE North 00 degrees 05 minutes 28 seconds West, a distance of 640.58 ft. (M) to a point on

the North line of said parcel of land recorded in Book 4494 Of Official Records, Page 484;

THENCE South 89 degrees 40 minutes 57 seconds West (M), a distance of 1436.96 ft. along said

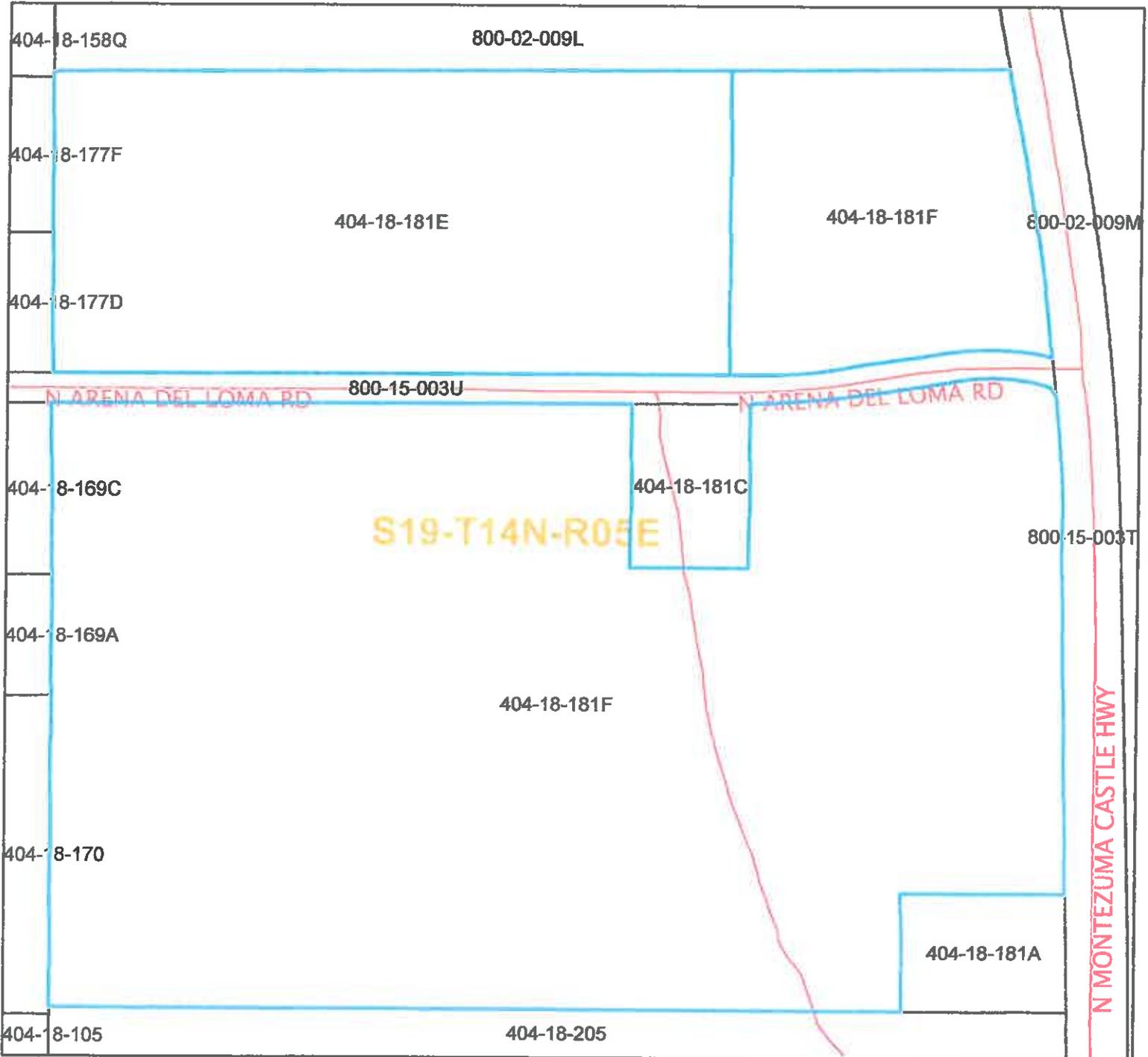
North line to the TRUE POINT OF BEGINNING.



1 inch = 300 feet

### Legend

— Asr Parcel Lines



YAVAPAI COUNTY ASSUMES NO RESPONSIBILITY FOR ANY ERRORS, OMISSIONS AND/OR INACCURACIES IN THIS MAPPING PRODUCT. THIS PRODUCT IS FOR INFORMATIONAL PURPOSES AND MAY NOT HAVE BEEN PREPARED FOR OR BE SUITABLE FOR LEGAL, ENGINEERING OR SURVEYING PURPOSES. USERS OF THIS INFORMATION SHOULD REVIEW OR CONSULT THE PRIMARY DATA AND INFORMATION SOURCES TO ASCERTAIN THE USABILITY OF THE INFORMATION.

Date: 12/3/2015

HAMMES SURVEYING LLC  
2100 VIA SILVERADO  
CAMP VERDE, ARIZONA 86322  
(928)-567-2833 (928) 282-5686

Parcel A: 20 acres

Description for parcel of land being a portion of that certain parcel as recorded in Book 4494 of Official Records, Page 484 and Section 19, Township 14 North, Range 5 East, G. & S. R. M., Yavapai County, Arizona being more particularly described as follows;

To find the place of beginning, begin at the North quarter Corner of said Section 19, being a found 3 inch BLM Brass cap, from which the West East 1/64 Corner of said Section 19, being a found BLM brass capped pipe, bears North 89 degrees 38 minutes 48 seconds East (R&M and basis of bearings for this description), a distance of 663.11 ft. (M);

thence from said North quarter Corner of said Section 19, South 00 degrees 13 minutes 20 seconds East, a distance of 661.21 ft. (M) along the North/South mid-section line of said Section 19, to a found 1/2 inch rebar with tag stamped "L.S. 29263" added, being the North West corner of said parcel recorded in Book 4494 of Official Records, Page 484 and the TRUE POINT OF BEGINNING;

thence continuing along the locally accepted said North/South mid-section line, South 00 degrees 12 minutes 07 seconds East (M), a distance of 329.38 ft. (M) to a found 1/2 inch rebar with tag stamped "L.S. 29263" added;

thence continuing along the locally accepted said North/South mid-section line, South 00 degrees 18 minutes 19 seconds East (M), distance of 298.88 ft. (M) to a set 1/2 inch rebar with plastic cap stamped "L.S. 29263", being a point on the northerly right-of-way line of Arena Del Loma as recorded in Book 198, L.S. Page 52 of the Yavapai County records;

thence South 89 degrees 49 minutes 32 seconds East, a distance of 1435.21 ft, (M) along said right-of-way line of Arena Del Loma to a point;

thence North 00 degrees 05 minutes 28 seconds West, a distance of 640.58 ft. (M) to a point on the North line of said parcel of land recorded in Book 4494 of Official Records, Page 484;

thence South 89 degrees 40 minutes 57 seconds West (M), a distance of 1436.96 ft. along said North line to the Place of Beginning.





**ALTA Commitment Form (6-17-06)  
COMMITMENT FOR TITLE  
INSURANCE**

**ISSUED BY  
WESTCOR LAND  
TITLE INSURANCE COMPANY**

Westcor Land Title Insurance Company, a California corporation ("Company"), for a valuable consideration, commits to issue its policy or policies of title insurance, as identified in Schedule A, in favor of the Proposed Insured named in Schedule A, as owner or mortgagee of the estate or interest in the land described or referred to in Schedule A, upon payment of the premiums and charges and compliance with the Requirements; all subject to the provisions of Schedules A and B and to the Conditions of this Commitment.

This Commitment shall be effective only when the identity of the Proposed Insured and the amount of the policy or policies committed for have been inserted in Schedule A by the Company.

All liability and obligation under this Commitment shall cease and terminate six (6) months after the Effective Date or when the policy or policies committed for shall issue, whichever first occurs, provided that the failure to issue the policy or policies is not the fault of the Company.

The Company will provide a sample of the policy form upon request.

IN WITNESS WHEREOF, WESTCOR LAND TITLE INSURANCE COMPANY has caused its corporate name and seal to be hereunto affixed and by these presents to be signed in facsimile under authority of its by-laws, effective as of the date of Commitment shown in Schedule A.

Issued By:

**Empire West Title Agency**  
600 W. Gurley Street, Suite 100  
Prescott, AZ 86305  
Phone: 928-778-5044

**WESTCOR LAND TITLE INSURANCE  
COMPANY**

HOME OFFICE  
201 N. New York Avenue, Suite 200  
Winter Park, Florida 32789  
Telephone: (407) 629-5842

  
Maria Chavira  
20  
Secretary

**SCHEDULE A**

Address Reference: **Arena Del Loma Road, Camp Verde, AZ 86322**

1. Effective Date: **October 21, 2015 at 7:30 am**
2. Policy or Policies to be issued:

A. ALTA Owners 2006 Standard Coverage

Proposed Insured: **future buyer**

- 3A. The estate or interest in the land described in this Commitment and covered herein is **Fee** and title thereto is at the effective date hereof vested in:  
**Tierra Verde Holdings, LLC, an Arizona limited liability company**
- 3B. Title to the estate herein described upon issuance of the Policy shall be vested in:  
**future buyer**
4. The land referred to in the Commitment is situate in the county of **Yavapai**, State of **Arizona** and is described in the attached Exhibit "A".

Please direct all inquiries and correspondence to:  
Empire West Title Agency  
Escrow Officer: Patti Nelsen  
Phone: 928-778-5044  
Commitment

Empire West Title Agency, issuing agent for  
Westcor Land Title Insurance Company  
By: Tim Muse  
Title Department

## EXHIBIT "A"

Description for parcel of land being a portion of that certain parcel as recorded in Book 4494 of Official Records, Page 484 and Section 19, Township 14 North, Range 5 East, G" & S. R. M., Yavapai County, Arizona being more particularly described as follows;

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THENCE from said North quarter Comer of said Section 19, South 00 degrees 13 minutes 20 Seconds East, a distance of 661.21 ft.(M) along the North/South mid-section line of said Section 19, to a found ½ inch rebar with tag stamped "L.S. 29263" added, being the Northwest comer of said parcel recorded in Book 4494 Official Records, Page 484 and the TRUE POINT OF BEGINNING;

THENCE continuing along the locally accepted said North/South mid-Section line, South 00 degrees 12 minutes 07 seconds East (M), a distance of 329.38 ft. (M) to a found ½ inch rebar with tag stamped "LS 29263" added;

THENCE continuing along the locally accepted said North/South mid-Section line, South 00 degrees 18 minutes 19 seconds East (M), distance of 298.88 ft. (M) to a set ½ inch rebar with plastic cap stamped L.S. 29263", being a point on the northerly right-of-way the of Arena Del Loma as recorded in Book 198, L.S. Page 52 of the Yavapai County records;

THENCE South 89 degrees 49 minutes 32 seconds East, a distance of 1435.21 ft. (M) along said right-of-way line of Arena Del Loma to a point;

THENCE North 00 degrees 05 minutes 28 seconds West, a distance of 640.58 ft. (M) to a point on the North line of said parcel of land recorded in Book 4494 Of Official Records, Page 484;

THENCE South 89 degrees 40 minutes 57 seconds West (M), a distance of 1436.96 ft. along said North line to the TRUE POINT OF BEGINNING.

**SCHEDULE B  
SECTION ONE - REQUIREMENTS**

Conditions to be met and instruments in insurable form which must be executed, delivered, and duly filed for record:

1. Payment of any and all assessments.
2. Obtain approval of subdivision plat and ccr's of Castle Heights Subdivision.
3. Record plat and ccr's of Castle Heights Subdivision.
4. Obtain approved Public Disclosure Report by State of Arizona Department of Real Estate.
5. Record Partial Reconveyance of Deed of Trust securing an original indebtedness in the amount of \$660,000.00 recorded November 27, 2013 as Book 4994, page 485 of Official Records:

Dated: November 25, 2013  
Trustor: Tierra Verde Holdings, LLC, an Arizona limited liability company  
Trustee: Empire West Title Agency, LLC, an Arizona limited liability company  
Beneficiary: Raj Na Capadu, LLC, an Arizona limited liability company

6. Record Deed from Tierra Verde Holdings, LLC, an Arizona limited liability company to future buyer.

NOTE: Operating Agreement on file in this office authorizes John Bassous and Mary Bassous, as Members to execute any necessary instruments on behalf of Tierra Verde Holdings, LLC.

NOTE: See attached tax sheet(s) for the following Parcel Number(s):404-18-181D.

24-month Chain of Title: The only conveyance(s) affecting said land recorded within the 24 months preceding the date of this commitment is (are) as follows:

Deed recorded November 27, 2013 in Book 4994, of Official Records, page 484.

NOTE: If no conveyances were found in that 24 month period, the last recorded conveyance is reported. If the subject land is a lot in a subdivision plat less than 24 months old, only the conveyances subsequent to the plat are reported.

DISCLOSURE NOTE: In the event any Affidavit required pursuant to A.R.S. 33-422 has been, or will be, recorded pertaining to the land, such Affidavit is not reflected in this Commitment nor will it be shown in any policy to be issued in connection with this Commitment. The statute applies only to unsubdivided land in an unincorporated area of a county.

The map attached, if any, may or may not be a survey of the land depicted hereon. Westcor Land Title Insurance Company expressly disclaims any liability for loss or damage which may result from reliance on this map except to the extent coverage for such loss or damage is expressly provided by the terms and provisions of the title insurance policy, if any, to which this map is attached.

**End of Schedule B - Requirements**

**SCHEDULE B  
SECTION TWO - EXCEPTIONS**

Schedule B of the policy or policies to be issued will contain exceptions to the following matters unless the same are disposed of to the satisfaction of the Company:

A. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the Effective Date but prior to the date the proposed Insured acquires for value of record the estate or interest or mortgage thereon covered by this Commitment.

1. Water rights, claims or title to water, whether or not shown by the public records.
2. Reservations or exceptions in Patents, or in Acts authorizing the issuance thereof.
3. Liabilities and Obligations imposed upon said land by reason of its inclusion within water, improvement, fire or other districts or associations, if any.
4. Any action by the County Assessor and/or Treasurer, altering the current or prior tax assessment, subsequent to the date of the Policy of Title Insurance.
5. An easement for communication facilities and incidental purposes, recorded in Book 825, pages 589 and 591 of Official Records.
6. An easement for electric lines and incidental purposes, recorded in Book 830, page 694 and corrected in Book 965, page 65 of Official Records.
7. Easements, restrictions, reservations, conditions and set-back lines as set forth on the plat recorded in Document No. 2015- \_\_\_\_\_, but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status or national origin to the extent such covenants, conditions or restrictions violate 42 USC 3604(c).
8. Covenants, conditions, restrictions, liabilities and obligations in the document recorded in Document No. 2015- \_\_\_\_\_, but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status, or national origin, to the extent such covenants, conditions or restrictions violate Title 42, Section 3604(c), of the United States Codes.

**End of Schedule B - Exceptions**

## CONDITIONS

1. The term mortgage, when used herein, shall include deed of trust, trust deed, or other security instrument.
  2. If the proposed Insured has or acquired actual knowledge of any defect, lien, encumbrance, adverse claim or other matter affecting the estate or interest or mortgage thereon covered by this Commitment other than those shown in Schedule B hereof, and shall fail to disclose such knowledge to the Company in writing, the Company shall be relieved from liability for any loss or damage resulting from any act of reliance hereon to the extent the Company is prejudiced by failure to so disclose such knowledge. If the proposed Insured shall disclose such knowledge to the Company, or if the Company otherwise acquires actual knowledge of any such defect, lien, encumbrance, adverse claim or other matter, the Company at its option may amend Schedule B of this Commitment accordingly, but such amendment shall not relieve the Company from liability previously incurred pursuant to paragraph 3 of these Conditions.
  3. Liability of the Company under this Commitment shall be only to the named proposed Insured and such parties included under the definition of Insured in the form of policy or policies committed for and only for actual loss incurred in reliance hereon in undertaking in good faith (a) to comply with the requirements hereof, or (b) to eliminate exceptions shown in Schedule B, or (c) to acquire or create the estate or interest or mortgage thereon covered by this Commitment. In no event shall such liability exceed the amount stated in Schedule A for the policy or policies committed for and such liability is subject to the insuring provisions and Conditions and the Exclusions from Coverage of the form of policy or policies committed for in favor of the proposed Insured which are hereby incorporated by reference and are made a part of this Commitment except as expressly modified herein.
  4. This Commitment is a contract to issue one or more title insurance policies and is not an abstract of title or a report of the condition of title. Any action or actions or rights of action that the proposed Insured may have or may bring against the Company arising out of the status of the title to the estate or interest or the status of the mortgage thereon covered by this Commitment must be based on and are subject to the provisions of this Commitment.
  5. *The policy to be issued contains an arbitration clause. All arbitrable matters when the Amount of Insurance is \$2,000,000 or less shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. You may review a copy of the arbitration rules at <<http://www.alta.org/>>.*
- 

Any policy we issue will have the following exceptions unless they are taken care of to our satisfaction:

1. (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.
2. 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 of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
5. (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.

The above exceptions will be eliminated from any ALTA Extended Coverage Policy, ALTA Plain Language Policy, ALTA Homeowner's Policy, ALTA Expanded Coverage Residential Loan policy and any short form

versions thereof. However, the same or similar exceptions may be made in Schedule B of those policies in conformity with Schedule B, Section Two, of this Commitment.

**CASTLE HEIGHTS SUBDIVISION**

**PRELIMINARY DEED RESTRICTIONS**

December 16, 2015

**1. ARCHITECTURAL**

All homes shall be a minimum of 1400 sq. ft. livable. All plans shall be approved by the Architectural committee comprised of John and Mary Bassous and Bob Simbric. Complete Plans shall include exterior elevations, floor plan, site plan, landscape plan and exterior lighting plan. No house shall exceed 26' in height from adjacent natural grade. All structures to comply with local building codes. Each lot to be served by their own well

**2. RESTRICTIONS**

No structure other than a single family residence, private garage, guest house or other approved outbuilding may be placed on the lot.

No clearing of site may take place until approval is granted by the Architectural Committee.

No commercial or business activity is allowed unless all of the following conditions are met:

- It is not detected by sight, sound or smell
- Conforms to applicable zoning ordinances
- Does not have an adverse impact on the subdivision
- Is contained in the interior portion of a structure
- Does not involve employees other than property owner
- Does not involve deliveries, additional foot or vehicular traffic
- Does not utilize flammable or hazardous materials in quantities not customary to residential use
- Does not utilize large vehicles such as semi-trucks

No semi-trucks or commercial equipment to be parked or stored on sub-division property at any time.

All structures to have a portion of decorative or native rock on the front of the structure facing the street.

No clear cutting of the lot is allowed. Native vegetation is encouraged.

No galvanized metal roofing or siding, T-111 siding (Masonite with vertical grooves) or shingle type siding.

All structures to be used by the owner on record and not for the purpose of rental.

No lot may be split. Anyone wishing to combine contiguous lots must first seek approval by the Architectural Committee and solely bear the cost should permission be granted.

Should you choose to fence your property, materials such as block, split face block, PVC, cedar pickets, rock and rusty metal are acceptable. Chain link, galvanized metal are not acceptable

All structures must be completed within nine (9) months after commencement of construction.

No temporary structures are allowed at any time.

Manufactured or mobile homes are not permitted at any time. Any recreational vehicles or projects (ie cars or equipment that are being restored) must be garaged or screened. There is to be no storage of non-running vehicles on setback boundaries.

All properties are to be maintained in a timely fashion. All nuisances, animate or inanimate such as overgrown grass, dead trees, weeds and overgrown shrubs are to be removed.

### **3. LIVESTOCK**

Livestock and poultry are allowed under the following conditions:

- Do not violate Town ordinances
- Personal use
- Maintained so as not to be a nuisance to others
- Confined area

No swine, guinea fowl, wild animals or pea fowl allowed. Those raising swine for 4-H may do so with approval from the Architectural Committee.



1250 E State Route 89A  
Cottonwood, AZ 86326

09/29/2015

John Bassous  
Tierra Verde Builders  
Tierra Verde  
Camp Verde, Az

Re: Tierra Verde

Dear Mr. Bassous,

The above referenced project is located in Arizona Public Service Company's electric service area. The Company extends its lines in accordance with the "Conditions Governing Extensions of Electric Distribution Lines and Services," Schedule 3, and the "Terms and Conditions for the Sale of Electric Service," Schedule 1, on file with the Arizona Corporation Commission at the time we begin installation of the electric facilities.

Application for the Company's electric service often involves construction of new facilities for various distances and costs depending upon customer's location, load size and load characteristics. With such variations, it is necessary to establish conditions under which Arizona Public Service will extend its facilities.

The enclosed policy governs the extension of overhead and underground electric facilities to customers whose requirements are deemed by Arizona Public Service to be usual and reasonable in nature.

Please give me a call at (928)821-4657 so that we may set up an appointment to discuss the details necessary for your project.

Sincerely,

Brandon Echols  
Customer Project Manager Associate  
Arizona Public Service

Enclosures: Schedule 1, Schedule 3



DOUGLAS A. DUCEY  
Governor

THOMAS BUSCHATZKE  
Director

**ARIZONA DEPARTMENT of WATER RESOURCES**  
3550 North Central Avenue, Second Floor  
Phoenix, Arizona 85012-2105  
602.771.8500  
[azwater.gov](http://azwater.gov)

*Via electronic mail*

September 18, 2015

John Bassous  
Tierra Verde Holdings, LLC  
PO Box 2898  
Camp Verde, AZ 86322

**Water Report #53-700864.0000**  
**Subdivision Name:** Castle Heights  
**Owner:** Tierra Verde Holdings, LLC,  
an Arizona limited liability company  
**Number of lots:** 12  
**County:** Yavapai  
**Township** 14 North, Range 5 East, Section 19

**Water provided by:** dry lot  
**Water Type:** Groundwater

**Current water depth:** No Information  
**Estimated 100-year depth:** No Information  
**Current decline rate:** No Information

**Basin:** Verde Valley

**Annual Water Demand:** 3.97 acre-feet/year

Dear Mr. Bassous:

Pursuant to A.R.S. § 45-108, the Department of Water Resources has reviewed the available information pertaining to the water supply for the above-referenced subdivision. This letter constitutes the Department's report on the subdivisions water supply as required by A.R.S. § 45-108(A).

Adequacy of the 100-year water supply was reviewed by the Department with regard to physical, legal and continuous availability, water quality, and financial capability. No information has been provided to the Department that indicates that the applicant has satisfied the adequate water supply requirements as set forth in A.A.C. R12-15-701 *et seq.* Therefore, the Department of Water Resources finds the water supply to be inadequate to meet the subdivision's projected needs.

Pursuant to A.R.S. §32-2181(F) a summary of the Department's report for those with an inadequate water supply shall be included in all promotional material and contracts for sale of lots in the subdivisions. We suggest the following synopsis:

**“Castle Heights subdivision is being served groundwater by dry lot-individual wells. The developer has chosen not to demonstrate a 100-year adequate water supply. The applicant has not demonstrated that the criteria for physical, legal and continuous availability, water quality, and financial capability have been met. Therefore the Department must find the water supply to be *inadequate*. For additional information please contact the Office of Assured and Adequate Water Supply at 602-771-8599”**

The developer, pursuant to A.R.S. §32-2181(F), may suggest a different summary of this report, but it must contain the above elements and/or the Department’s findings.

This letter is being forwarded to the Arizona Department of Real Estate as required by A.R.S. § 45-108. This law requires the developer to hold the recordation of the subdivision's plat until receipt of the Department's report on the subdivision's water supply. By copy of this report, the Yavapai County Recorder is also being officially notified of the developer's compliance with the law.

Pursuant to A.R.S. § 41-1092.03, the Department is notifying you that the Director’s determination and decision to issue this Water Report is an appealable agency action. You are entitled to appeal this action. If you wish to appeal this action, you must file a written appeal within thirty (30) days from receipt of this letter. I am providing you with a summary of the appeal process and an appeal form, should you elect to pursue this option.

Sincerely,



Richard B. Obenshain  
Program Manager  
Recharge, Assured & Adequate Water Supply

cc: *Via electronic mail:*  
Yavapai County Planning and Zoning  
Yavapai County Recorder  
Carla Randolph, Arizona Department of Real Estate  
Linda Taunt, Arizona Department of Environmental Quality  
Heide A. Kocsis, Az. State Land Department

DEC 16 '15 PM 1:36



CenturyLink™

CenturyLink Engineering  
500 S Calvary Way  
Cottonwood, AZ 86326

December 11, 2015

John Bassous  
Tierra Verde Builders  
PO Box 2898  
Camp Verde, AZ 86322

RE: Castle Heights Subdivision

John,

The above mentioned property is located in a parcel located in Section 19, Township 14N and Range 5E in Yavapai County.

In response to your "Service Availability" request for the above mentioned property, this letter is to acknowledge, the property is within the CenturyLink serving territory.

The tariff Rates and Regulations prescribed for service for this location are on file with your State Utilities Commission, and may be examined at your CenturyLink Business Office.

Sincerely,

A handwritten signature in cursive script that reads "Armen McNerlin".

Armen McNerlin  
CenturyLink Engineer  
500 S Calvary Way  
Cottonwood, AZ 86326  
office 928.634.2102  
cell 928.821.4609

# Yavapai County Development Services

**Prescott Office**  
1120 Commerce Dr, Prescott, AZ 86305  
(928) 771-3214 Fax: (928) 771-3432



**Cottonwood Office**  
10 S. 6<sup>th</sup> Street, Cottonwood, AZ 86326  
(928) 639-8151 Fax: (928) 639-8153

Addressing - Building Safety - Customer Service & Permitting - Environmental - Land Use - Planning

## REQUEST FOR REGISTRATION OF A SITE INVESTIGATION

(This is not a permit to construct. Submittal Fee \$67.50)

Date Submitted: \_\_\_\_\_

Receipt No.: \_\_\_\_\_

An individual site survey was performed by an Arizona Registered Engineer, Sanitarian or Geologist to determine if the property below will meet the requirements for an on-site wastewater disposal system.

Parcel No.: 404-18-181D

Water Source: Well X Public \_\_\_\_\_ Hauled \_\_\_\_\_ (individual wells to be drilled on each lot)

**PROPOSED SYSTEM DESIGN CRITERIA:**

Soil Absorption Rate (SAR): \_\_\_\_\_ Perc rate: \_\_\_\_\_ min. per inch Slope: \_\_\_\_\_

Conventional Disposal Trench\*: Total Depth: \_\_\_\_\_ ft. Effective Depth: \_\_\_\_\_ ft. Cover: \_\_\_\_\_ ft.

Summary of Surface and Subsurface Limitations: soil with > 50 percent rock fragments

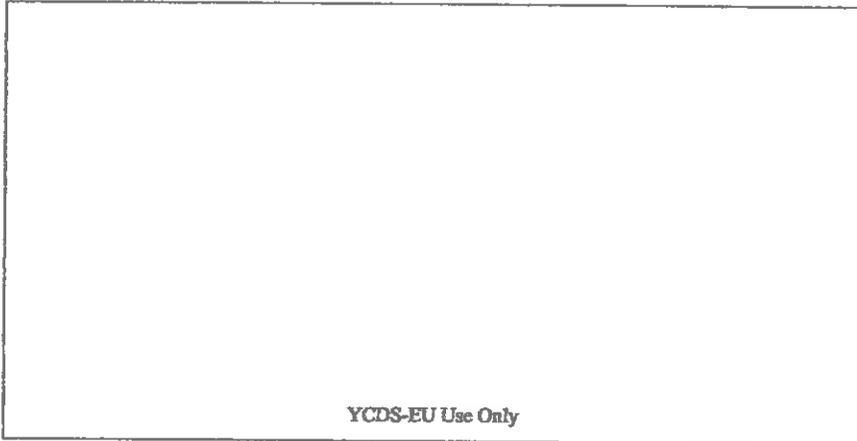
site specific SAR required for individual disposal locations

Professional



\* If an alternate system is appropriate indicate N/A

Comments: preliminary report only



YCDS-EU Use Only

**REGISTRANT SITE INVESTIGATION SUBMITTAL**  
**SECTIONS 1-10 AND APPLICABLE ATTACHMENTS ARE REQUIRED FOR REVIEW**

Arizona Administrative Code (A.A.C.) R18-9-A309(B)(1) requires submittal of a Site Investigation Report that summarizes the results of a site investigation conducted under R18-9-A310 including:

- A) Results from any soil evaluation, percolation test, or seepage pit performance test;
- B) Any surface limiting condition identified in R18-9-A310(C)(2); and
- C) Any subsurface limiting condition identified in R18-9-A310(D)(2).

**GENERAL INFORMATION**

**1 Project/Site Information**

Assessor's Parcel Number 404-18-181D

Project Address 1600 North Montezuma Castle Highway

Subdivision: Castle Heights

Lot Number: 1 - 12

Latitude: 34.592325 °

Longitude: 111.860081 °

**2 Registrant information**

Name Craig P. Wiedeman, P.E.

Phone 928-774-8700

Title Senior Geotechnical Engineer

Firm Name Western Technologies Inc.

Mailing Address 2400 E. Huntington Dr.

City Flagstaff

State AZ

Zip 86004

**SITE INVESTIGATION REPORT (ITEMS 3 THROUGH 9 AND APPLICABLE ATTACHMENTS ARE TO BE COMPLETED BY THE SITE INVESTIGATOR)**

**3 Surface Characterization Method [A.A.C. R18-9-A310(C)(1)]**

- A) ASTM D5879-95 used?  Yes  No
- B) Other method of equal or superior accuracy and reliability?  Yes  No (If Yes, please describe using Attachment 4.)

**4 Surface Limiting Conditions [A.A.C. R18-9-A310(C)(2)]**

The investigator shall determine whether, and if so, where any of the following surface limiting conditions exist:

- A) The surface slope is greater than 15 % at the intended location of the on-site wastewater facility  Yes  No
- B) Minimum setback distances are not within the limits specified in R18-9-A312(C);  Yes  No  Indeterminate\*  
 \* Note: Check Indeterminate when details of improvements and dwelling location and size NOT KNOWN.
- C) Surface drainage characteristics at the intended location of the on-site wastewater treatment facility could adversely affect the ability of the facility to function properly;  Yes  No
- D) A 100-year flood hazard zone, as indicated on the applicable flood insurance rate map, is located within the property on which the on-site wastewater treatment facility will be installed;  Yes  No
- E) An outcropping of rock that cannot be excavated exists in the intended location of the on-site wastewater treatment facility or could impair the function of soil receiving the discharge;  Yes  No
- F) Fill material deposits exist in the intended location of the on-site wastewater treatment facility  Yes  No.

**If the answer is Yes or Indeterminate to any of the above surface limiting conditions, please show location and note the associated limiting condition type on Site Investigation Map (Item 8).**

Parcel No.: 404-18-181D

**5 Subsurface Characterization Method [A.A.C. R18-9-A310(D)]**

Method used to perform subsurface characterization per A.A.C. R18-9-A310(D)(1) and (3)

- A) ASTM D5921 used?  Yes  No (if Yes, please enclose Attachment 1)
- B) Percolation test method used?  Yes  No (if Yes, please enclose Attachment 3)
- C) Seepage performance test method used?  Yes  No (if Yes, please enclose Attachment 2)
- D) Other ADEQ approved method?  Yes  No (if Yes, please describe method and enclose Attachment 4)

**6 Subsurface Limiting Conditions [A.A.C. R18-9-A310(D)(2)]**

The investigator shall determine whether any of the following limiting conditions exist in the primary and reserve areas of the on-site wastewater treatment facility to a depth of at least 12 feet below land surface or to an impervious soil or rock layer if encountered at a shallower depth:

- A) The soil absorption rate determined under A.A.C. R18-9-A312(D)(2) is:
  - 1. More than 1.20 gallons per day per square foot?  Yes  No
  - 2. Less than 0.20 gallons per day per square foot?  Yes  No
  - 3. A site-specific soil absorption rate (SAR) is required per A.A.C. R18-9-A312(D)(2)(b)?  Yes  No
- B) The vertical separation distance from the bottom of the lowest point of the disposal works to the seasonal high water table is less than the minimum vertical separation specified in A.A.C. R18-9-A312(E)(1)?  Yes  No
- C) Does seasonal saturation occur within surface soils that could affect the performance of the on-site wastewater treatment facility?  Yes  No
- D) Do any of the following subsurface limiting conditions that may cause or contribute to surfacing of wastewater occur within 12 feet of the land surface:
  - 1. An impervious soil or rock layer?  Yes  No
  - 2. A zone of saturation that substantially limits downward percolation from the disposal works?  Yes  No
  - 3. Soil with more than 50 percent rock fragments?  Yes  No
- E) Do any of the following subsurface limiting conditions that may promote accelerated downward movement of insufficiently treated wastewater occur within 12 feet of the land surface:
  - 1. Fractures or joints in rock that are open, continuous, or interconnected?  Yes  No
  - 2. Karst voids or channels?  Yes  No
  - 3. Highly permeable materials such as deposits of cobbles or boulders?  Yes  No
- F) Does a subsurface condition exist that may convey wastewater to a Water of the State and cause or contribute to an exceedance of a water quality standard established in 18 A.A.C. 11, Articles 1 and 4?  Yes  No
- G) Depth to groundwater below land surface 35 - 165 feet.

Please check below the method used.

- Trench or boring,
- Published groundwater data,
- Subdivision report,
- Relevant well data.

**If the answer is Yes to any of the above subsurface limiting conditions, please show location and note the associated limiting condition type on Site Investigation Map (Item 8).**

Parcel No.: 404-18-181D

**7 Site Investigation Map (Show locations of limiting conditions, features and improvements)**

Site Investigation Map below shall include:

- A) The property boundaries, a North arrow, soil test sites and the positions of limiting conditions noted in Items 5 and 7, and
- B) Any other site feature pertinent to the location and design of an on-site wastewater treatment facility observed at the time of the site investigation, including the topography delineated with appropriate contour intervals; any area where the native soil surface elevation is altered by cut or fill; the boundaries for locating the treatment works, primary disposal area and reserve disposal area; and any feature noted below that was observed during the site investigation and was within 200 horizontal feet from the location of the envisioned on-site system wastewater facility on both the investigated property and adjacent lands:
- C) Registrant's Professional Seal stamped and signed.

Well  Yes  No (to be drilled for each lot)

Pond or other water feature  Yes  No

Building or other structure  Yes  No

Driveway, vehicle path, parking area, equipment storage, or new or used construction materials  Yes  No

Retaining or other wall  Yes  No

Slope or cut bank  Yes  No

Other feature or condition identified in A.A.C. R18-9-A312(C)  Yes (If Yes, please attach a description)  No

See attached Plate 1

soil with > 50 percent rock fragments at all locations

Plate 1 – Test Pit Location Diagram  
 Tierra Verde Subdivision Roadways  
 North Arena Del Loma Road  
 Yavapai County, Arizona



*Tierra Verde Conceptual Plan*, from Granite Basin Engineering, Inc. Sheet 1, dated June 2015

LEGEND:

-  Approximate Test Pit Locations
-  Approximate Site Boundaries

 N ↑ Not to Scale	<b>Tierra Verde Builders</b>	
	<b>Geotechnical Evaluation</b>	
	<b>Western Technologies Inc.</b>	
	Job No. 2525JW327	Date: September 1, 2015

Parcel No.: 404-18-181D

**8 Investigator Qualification Information [A.A.C. R18090A310(H)] (Must check applicable boxes and provide related information)**

- A)  Arizona-registered professional engineer Certification Number: 11860 Expiration Date: 12/31/16  
 B)  Arizona-registered professional geologist Certification Number: Expiration Date:  
 C)  Arizona-registered sanitarian Registration Number: Expiration Date:

**9 Registrant Certification**

I have inspected the property identified in Item 1, Project/Site Information, for purposes of performing a site investigation. I have performed this site investigation in accordance with R18-9-A310 and have completed Items 3 through 7 to the best of my knowledge. This Site Investigation report is intended to be submitted in fulfillment of A.A.C.R18-9-A309(B)(1) and includes the following attachments.

#	Attachment Description	Attached?
1	Attachment 1	<input checked="" type="checkbox"/> Yes, total of 4 pages.
2		<input type="checkbox"/> Yes, total of _____ pages.
3		<input type="checkbox"/> Yes, total of _____ pages.
4		<input type="checkbox"/> Yes, total of _____ pages.

  
 Registrant Signature

12-3-15  
 Date Signed

**10 Site Investigation Affidavit**

I certify that I am the Person authorizing the work certified in Item 9 that has been performed in fulfillment of A.A.C. R18-9-A310 for Parcel Number \_\_\_\_\_

My interest in this Site Investigation as it relates to the installation of an on-site wastewater treatment facility is that (please check all applicable boxes and provide a description, if specified):

- I am the Owner of the property described above.  
 I am an Applicant pursuant A.A.C. R18-9-A309(B)  
 I am the Applicant's Representative, such as a licensed contractor, preparing a submittal pursuant A.A.C. R18-9-A309(B)  
 I am interested in the sale of the property for future installation of an on-site wastewater treatment facility under rules in effect at the time of submittal of a complete application.  
 Other. Please describe: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Signature

Date









**This page must be stamped with the registrant's professional seal and signed**

TEXTURE	STRUCTURE		
Loamy Sand – (LS) Sandy Loam – (SL) Silt Loam – (SiL) Loam – (L) Sandy Clay Loam – (SCL) Silty Clay Loam – (SiCL)	<b>GRADE</b> Structureless Weak Moderate Strong	(0) (1) (2) (3)	No aggregation Barely observable Distinct pedis Durable pedis
Clay Loam – (CL) Sandy Clay – (SC) Silty Clay – (SiC) Clay – (C)	<b>SIZE</b> Very Fine Fine Medium Coarse Very Coarse	(VF) (F) (M) (C) (VC)	<b>Angular, Subangular, Blocky</b> <5 mm 5-10 10-20 20-50 >50  <b>Prismatic, Columnar</b> <10 mm 10-20 20-50 50-100 >100
<b>SAND SIZES</b> Coarse – (Co) Medium – (M) Fine – (F) Very Fine – (VF)	<b>SHAPE</b> Platy Prismatic --Columnar Blocky --Angular -- Subangular Granular No Structure --Single Grain -- Massive	(PL) (PR) (CPR) (BK) (ABK) (SBK) (GR) (SG) (M)	Flat, plate-like Taller than wide Rounded tops Cubical Sharp edges Rounded edges Spherical  Sandy texture Finer textures
<b>ROCK FRAGMENTS</b>	<b>MOTTLES</b>	<b>BOUNDARY</b>	<b>CONSISTENCY</b> <b>DRY</b> <b>MOIST</b> <b>SAR</b>

Yavapai County – Development Services Department

<p><b>ROUNDED, SUBROUNDED, ANGULAR, IRREGULAR</b>                  Gravel – (GR) 2-75 mm                  Fine – (FGR) 2-5 mm                  Medium – (MGR) 5-20 mm                  Coarse – (CGR) 20-75 mm                  Pebbles – (PB) 2-75 mm                  Fine – (FPB) 2-5 mm                  Medium – (MPB) 5-20 mm                  Coarse – (CPB) 20-75 mm                  Cobbles – (CB) 75-250 mm                  Stones – (S) 250-600 mm                  Boulders – (B) ≥600 mm</p> <p><b>FLAT</b>                  Channers – (CH) 2-150 mm                  Flagstones – (FL) 150-380 mm                  Stones – (ST) 380-600 mm                  Boulders – (BO) ≥600 mm</p>	<p><b>TYPE OF ROCK</b>                  Basalt – (BAS)                  Chert – (CH)                  Sandstone – (SS)                  Limestone – (LST)</p> <p><b>TERMS OF SOIL/ROCK</b>                  Cemented – (CEM)                  Ice or Frozen – (ICE)                  Weathered – (WEA)                  Unweathered – (UNWEA)                  Fractured – (FRA)                  Decomposed – (DEC)                  Stratified – (ST)</p>	<p><b>QUANTITY</b>                  Few (F) – &lt;2%                  Common (C) – 2-20%                  Many (M) – &gt;20%</p> <p><b>SIZE</b>                  Fine (1) – &lt;5 mm                  Medium (2) – 5-15 mm                  Coarse (3) – &gt;15 mm</p> <p><b>CONTRAST</b>                  Faint – (F)                  Distinct – (D)                  Prominent – (P)</p>	<p><b>DISTINCTNESS</b>                  Abrupt (A) – Less than 2 cm                  Clear (C) – 2 to 5 cm                  Gradual (G) – 5 to 15 cm                  Diffuse (D) – More than 15 cm</p> <p><b>TOPOGRAPHY</b>                  Smooth (S) – A plane with few or no irregularities                  Wavy (W) – Waves wider than deep                  Irregular (I) – Waves deeper than wide                  Broken (B) – discontinuous and interrupted</p>	<p>L = Loose                  S = Soft                  SH = Slightly Hard                  MH = Moderately Hard                  VH = Very Hard                  H = Hard                  R = Rigid                  VR = Very Rigid</p>	<p>L = Loose                  VFR = Very Friable                  FR = Friable                  FI = Firm                  VFI = Very Firm                  EFI = Extremely Firm                  SR = Slightly Rigid                  R = Rigid                  VR = Very Rigid</p> <p>See Arizona Administrative Code(A.A.C.) R18-9-A312(D) for SAR determination.</p>
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# GEOTECHNICAL EVALUATION REPORT

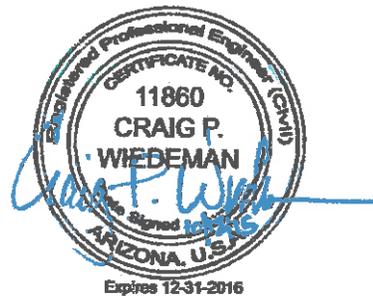
**TIERRA VERDE SUBDIVISION ROADWAYS**  
North Arena Del Loma Road W/O Montezuma Castle Highway  
Yavapai County, Arizona  
WT Reference No. 2525JW327

**PREPARED FOR:**  
Tierra Verde Builders  
400 Finnie Flat Road, Suite 1-C  
Camp Verde, Arizona 86322  
Attn: Mr. Dave Lochmann

October 12, 2015



Maximilian Kemnitz, P.E.  
Geotechnical Engineer



Reviewed By: Craig P. Wiedeman, P.E.  
Senior Geotechnical Engineer





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October 13, 2015

Tierra Verde Builders  
400 Finnie Flat Road, Suite 1-C  
Camp Verde, Arizona 86322  
Attn: Mr. Dave Lochmann

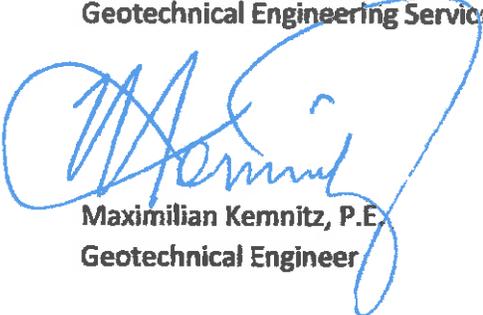
Re: Geotechnical Evaluation  
Tierra Verde Subdivision Roadways  
North Arena Del Loma Road W/O Montezuma Castle Highway  
Yavapai County, Arizona

Job No. 2525JW327

Western Technologies Inc. has completed the geotechnical evaluation for the proposed Tierra Verde Subdivision roadways on the north side of North Arena Del Loma Road and west of Montezuma Castle Highway in Yavapai County, Arizona. This study was performed in general accordance with our proposal number 2525PW091R4 dated August 20, 2015. The results of our study, including the test pit location diagram, laboratory test results, test pit logs, and the geotechnical recommendations are attached.

We have appreciated being of service to you in the geotechnical engineering phase of this project and are prepared to assist you during the construction phases as well. If design conditions change, or if you have any questions concerning this report or any of our testing, inspection, design and consulting services, please do not hesitate to contact me. I look forward to working with you on future projects.

Sincerely,  
WESTERN TECHNOLOGIES, INC.  
Geotechnical Engineering Services



Maximilian Kemnitz, P.E.  
Geotechnical Engineer

Copies to: Addressee (emailed)  
Granite Basin Engineering, Inc., Mr. Jim Binick, P.E. (emailed)

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**GEOTECHNICAL EVALUATION  
TIERRA VERDE SUBDIVISION ROADWAYS  
NORTH ARENA DEL LOMA ROAD W/O MONTEZUMA CASTLE HIGHWAY  
YAVAPAI COUNTY, ARIZONA  
JOB NO. 2525JW327**

**1.0 PURPOSE**

Western Technologies Inc. has completed this geotechnical evaluation report for the proposed Tierra Verde Subdivision roadways to be located on the north side of North Arena Del Loma Road and west of Montezuma Castle Highway in Yavapai County, Arizona. The purpose of these services is to provide earthwork and pavement design information and recommendations for the roadway and asphalt concrete pavement construction, and hydrologic soil characterization.

**2.0 PROJECT DESCRIPTION**

Based on information provided by Mr. Jim Binick, P.E., the proposed project will consist of two asphalt concrete paved residential roadways, each about 450 feet long and terminating in cul-de-sacs on the north side of Arena Del Loma Road (the Site). The roadways will be constructed within a planned 21-acre residential development. It is anticipated that maximum cut depths and fill heights will be about 5 feet along the two roadways. Should any of our information or assumptions not be correct, we request that the Client notify WT immediately.

**3.0 SCOPE OF SERVICES**

**3.1 Field Exploration**

Four test pits were excavated to depths of about 5 to 8 feet below the existing site grades using a John Deere 310 backhoe, at the approximate locations shown on the attached test pit location diagram, Plate 1. Excavation refusal on hard materials was encountered in Test Pit Nos. 1 and 2 at depths of 5 and 6.5 feet below the existing site grades. Logs of the test pits are presented in Appendix A. Subsoils encountered during drilling were examined visually and sampled at selected depth intervals.

A field log was prepared for each test pit. These logs contain visual classifications of the materials encountered during excavation. Final logs, included in Appendix A, represent our interpretation of the field logs and include modifications based on laboratory

observations and tests of the field samples. The final logs describe the materials encountered, their thicknesses, and the locations where samples were obtained.

The Unified Soil Classification System was used to classify soils. The soil classification symbols appear on the boring logs and are briefly described in Appendix A.

### **3.2 Laboratory Analyses**

Laboratory analyses were performed on representative soil samples to aid in material classification and to estimate pertinent engineering properties of the on-site soils for preparation of this report. Testing was performed in general accordance with applicable ASTM and Arizona methods. The following tests were performed and the results are presented in Appendix B.

- Water content
- Dry density
- Expansion
- Gradation
- Plasticity
- R-value
- Soluble salts and sulfates

Test results were utilized in the development of the recommendations contained in this report.

### **3.3 Analyses and Report**

This geotechnical evaluation report includes a description of the project, a discussion of the field and laboratory testing programs, a discussion of the subsurface conditions, and design recommendations as required to satisfy the purpose previously described.

This report is for the exclusive purpose of providing geotechnical engineering and/or testing information and recommendations. The scope of services for this project does not include, either specifically or by implication, any environmental assessment of the Site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken. We are available to discuss the scope of such studies with you.

## 4.0 SITE CONDITIONS

### 4.1 Surface

The Site consisted of native desert with sparse to moderate vegetation consisting of trees, cacti, and grass. The northwest corner of the Site was the high point of the planned subdivision, and the Site sloped from an elevation of about 3,300 feet in the northwest corner of the Site, to about 3,275 and 3,260 feet in the southeast and southwest corners of the Site, respectively. Surface drainage was generally to the south-southwest by sheet surface flow and a few north to south trending drainages. Coconino National Forest was located north of the Site and Arena Del Loma was located south of the Site.

### 4.2 Subsurface

As presented on the test pit logs, surface and subsurface soils extending to the full depth of exploration included GRAVELs with varying amounts of silt, clay, sand, cobbles and boulders. A thin layer of surficial Sandy CLAY was encountered in Test Pit No. 4. The soils below about 1 to 1.5 feet were slightly to moderately cemented. Excavation refusal on hard materials was encountered in Test Pit Nos. 1 and 2 at depths of about 5 and 6.5 feet below the existing site grades. Groundwater was not encountered in any test pit at the time of exploration. The logs in Appendix A show details of the subsurface conditions encountered during the field exploration.

## 5.0 GEOTECHNICAL PROPERTIES

Laboratory test results indicate that soils exhibit low to medium plasticity, and when water is added to compacted near-surface soils, low to moderate expansion occurs. A laboratory tested R-value of 28 was obtained on a representative sample of the native near-surface soils.

## 6.0 RECOMMENDATIONS

### 6.1 General

Recommendations contained in this report are based on our understanding of the project criteria described in Section 2.0, **PROJECT DESCRIPTION**, and the assumption

that the soil and subsurface conditions are those disclosed by the test pits. Others may change the plans and final elevations during design or construction. Substantially different subsurface conditions from those described herein may be encountered or become known. Any changes in the project criteria or subsurface conditions shall be brought to our attention in writing.

**6.2 Drainage**

The major potential cause of soil problems in this vicinity is moisture increase in soils below concrete slabs or pavements. It is extremely important that positive drainage be provided during construction and maintained throughout the life of the proposed improvements. Infiltration of water into utility or other excavations adjoining the roadways must be prevented during construction.

**6.3 Pavements**

Based on existing and anticipated subgrade conditions, the following pavement sections are recommended for the proposed residential roadways:

Traffic Area	Asphalt Concrete (in.)	Base Course (in.)
Residential Roadways	2.5	6
Residential Roadways Alternate	3	4

Bituminous surfacing should be constructed of dense-graded, central plant-mix, asphalt concrete. Base course and asphalt concrete should conform to Yavapai County specifications.

Material and compaction requirements should conform to recommendations presented under **EARTHWORK**. The gradient of paved surfaces should ensure positive drainage. Water should not pond in areas directly adjoining paved sections. The native subgrade soils will soften and lose stability if subjected to conditions which result in an increase in water content.

### 6.3.1 Pavement Analyses

The recommended pavement sections are based on the following conditions. This firm should be contacted if any of these conditions change so that revised recommendations can be provided, if necessary.

- a. A design R-value of 28 for the on-site granular soils, which corresponds to a resilient modulus of approximately 10,675 pounds per square inch. Any required fills should be constructed using on-site or imported materials with subgrade support characteristics equal to or greater than the subgrade soils in the area being filled. Where surficial CLAY soils are present at roadway subbase elevations, we recommend that the CLAY soils be removed and replaced with on-site or imported granular soils having a low expansion potential.
- b. Structural coefficients of 0.40 for asphalt concrete and 0.12 for aggregate base course material.
- c. A present serviceability index of 4.5, a terminal serviceability index of 2.5, an overall standard deviation of 0.35, a reliability factor of 85 percent, a drainage coefficient of 0.85, a seasonal variation factor of 2.4, and a design life of 20 years.
- d. A total 18-kip equivalent single axle load (ESAL) of 20,000 was assumed for the residential cul-de-sacs.

### 6.4 Corrosivity to Concrete

The chemical test results indicate that the site soils are negligibly corrosive to concrete. However, in order to be consistent with standard local practice and for reasons of material availability, we recommend that Type II Portland cement be used for all concrete on and below grade.

## 7.0 EARTHWORK

### 7.1 General

The conclusions contained in this report for the proposed construction are contingent upon compliance with recommendations presented in this section. Any excavating, trenching, or disturbance which occurs after completion of the earthwork must be backfilled, compacted and tested in accordance with the recommendations contained herein. It is not reasonable to rely upon our conclusions and recommendations if any future unobserved and untested trenching, grading or backfilling occurs.

### 7.2 Site Clearing

Strip and remove existing vegetation, organic topsoils, debris, and any other deleterious materials from pavement areas, including 3 feet beyond the perimeter of these areas in plan view. All exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

### 7.3 Excavation

We anticipate that excavations for the proposed roadway construction can be accomplished with conventional equipment. Additional excavation effort and/or heavy duty equipment will be required if excavations penetrate underlying cemented soils. The contractor should satisfy himself as to the hardness of subsurface materials and appropriate excavation equipment required.

Temporary cut slopes at this site in the lightly to moderately cemented soils may be sloped at 1:1 (horizontal:vertical). Permanent slopes cut in undisturbed native soils or constructed with engineered fill soil should be sloped at 2:1.

On-site fine-grained soils will pump or become unworkable at high water contents. Workability may be improved by scarifying and drying. Overexcavation of wet zones and replacement with dryer native or imported granular materials may be necessary.

### 7.4 Pavement Preparation

Prior to placement of fill and/or pavement materials, the exposed subgrade soils should be proof-rolled to verify that stable subgrade conditions exist. Any loose, soft, disturbed,

or otherwise unsuitable materials should be overexcavated and replaced with engineered fill. Compacted CLAY subgrade soils will expand when the moisture content is increased. Where encountered, we recommend that these CLAY soils be removed where they occur within 18 inches of final subbase elevation. The subgrade should then be scarified, moistened as required, and recompactd for a minimum depth of 8 inches prior to placement of fill and pavement materials.

**7.5 Materials**

- a. Clean on-site native soils with a maximum dimension of 6 inches or imported materials may be used as subbase fill and backfill material in pavement areas.
- b. Frozen soils should not be used as subbase fill or backfill.
- c. Imported soils should conform to the following:

- Gradation (ASTM C136):

	percent finer by weight
6" .....	100
4" .....	85-100
¾" .....	70-100
No. 4 Sieve .....	50-100
No. 200 Sieve .....	40 (max)

- Maximum expansive potential (%)\* ..... 1.5
- Maximum soluble sulfates (%)..... 0.10

\* Measured on a sample compacted to approximately 95 percent of the ASTM D698 maximum dry density at about 3 percent below optimum water content. The sample is confined under a 100 psf surcharge and submerged.

- d. Base course should conform to Yavapai County specifications.

**7.6 Placement and Compaction**

- a. Place and compact fill in horizontal lifts, using equipment and procedures that will produce recommended water contents and densities throughout the lift.
- b. Uncompacted fill lifts should not exceed 8 inches.
- c. No fill should be placed over frozen ground.
- d. Materials should be compacted to the following:

**Minimum Percent  
Material Compaction (ASTM D698)**

- On-site and imported soil, reworked and fill:  
Below pavement ..... 95
  - Aggregate base ..... 100
  - Nonstructural backfill..... 90
- e. On-site and imported soils with low expansive potential and aggregate base course materials should be compacted with a moisture content in the range of 3 percent below to 3 percent above optimum.

**7.7 Compliance**

Recommendations for pavement elements supported on compacted fills or prepared subgrade depend upon compliance with **EARTHWORK** recommendations. To assess compliance, observation and testing should be performed under the direction of a geotechnical engineer.

**8.0 LIMITATIONS**

This report has been prepared assuming the project criteria described in Section 2.0. If changes in the project criteria occur, or if different subsurface conditions are encountered or become known, the conclusions and recommendations presented herein shall become invalid. In any

such event, WT should be contacted in order to assess the effect that such variations may have on our conclusions and recommendations.

The recommendations presented are based entirely upon data derived from a limited number of samples obtained from widely spaced test pits. The attached logs are indicators of subsurface conditions only at the specific locations and times noted. This report assumes the uniformity of the geology and soil structure between test pits, however variations can and often do exist. Whenever any deviation, difference or change is encountered or becomes known, WT should be contacted.

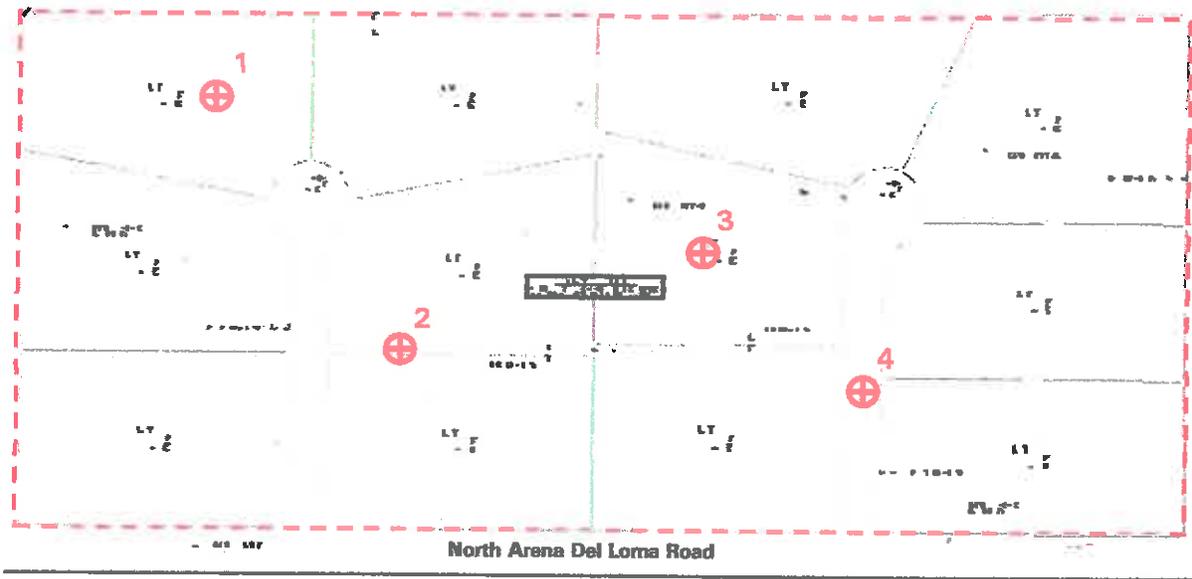
This report is for the exclusive benefit of our client alone. There are no intended third-party beneficiaries of our contract with the client or this report, and nothing contained in the contract or this report shall create any express or implied contractual or any other relationship with, or claim or cause of action for, any third party against WT.

This report is valid for the earlier of one year from the date of issuance, a change in circumstances, or discovered variations. After expiration, no person or entity shall rely on this report without the express written authorization of WT.

## 9.0 CLOSURE

We prepared this report as an aid to the designers of the proposed project. The comments, statements, recommendations and conclusions set forth in this report reflect the opinions of the authors. These opinions are based upon data obtained at the location of the Ts, and from laboratory tests. Work on your project was performed in accordance with generally accepted standards and practices utilized by professionals providing similar services in this locality. No other warranty, express or implied, is made.

Plate 1 – Test Pit Location Diagram  
 Tierra Verde Subdivision Roadways  
 North Arena Del Loma Road  
 Yavapai County, Arizona



*Tierra Verde Conceptual Plan*, from Granite Basin Engineering, Inc. Sheet 1, dated June 2015

LEGEND:

- ⊕ Approximate Test Pit Locations
- ⊞ Approximate Site Boundaries

 Not to Scale	<b>Tierra Verde Builders</b>	
	<b>Geotechnical Evaluation</b>	
	<b>Western Technologies Inc.</b>	
	Job No. 2525JW327	Date: September 1, 2015

<b>Allowable Soil Bearing Capacity</b>	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
<b>Backfill</b>	A specified material placed and compacted in a confined area.
<b>Base Course</b>	A layer of specified aggregate material placed on a subgrade or subbase.
<b>Base Course Grade</b>	Top of base course.
<b>Bench</b>	A horizontal surface in a sloped deposit.
<b>Caisson/Drilled Shaft</b>	A concrete foundation element cast in a circular excavation which may have an enlarged base (or belled caisson).
<b>Concrete Slabs-On-Grade</b>	A concrete surface layer cast directly upon base course, subbase or subgrade.
<b>Crushed Rock Base Course</b>	A base course composed of crushed rock of a specified gradation.
<b>Differential Settlement</b>	Unequal settlement between or within foundation elements of a structure.
<b>Engineered Fill</b>	Specified soil or aggregate material placed and compacted to specified density and/or moisture conditions under observations of a representative of a soil engineer.
<b>Existing Fill</b>	Materials deposited through the action of man prior to exploration of the site.
<b>Existing Grade</b>	The ground surface at the time of field exploration.
<b>Expansive Potential</b>	The potential of a soil to expand (increase in volume) due to absorption of moisture.
<b>Fill</b>	Materials deposited by the actions of man.
<b>Finished Grade</b>	The final grade created as a part of the project.
<b>Gravel Base Course</b>	A base course composed of naturally occurring gravel with a specified gradation.
<b>Heave</b>	Upward movement.
<b>Native Grade</b>	The naturally occurring ground surface.
<b>Native Soil</b>	Naturally occurring on-site soil.
<b>Rock</b>	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
<b>Sand and Gravel Base Course</b>	A base course of sand and gravel of a specified gradation.
<b>Sand Base Course</b>	A base course composed primarily of sand of a specified gradation.
<b>Scarify</b>	To mechanically loosen soil or break down existing soil structure.
<b>Settlement</b>	Downward movement.
<b>Soil</b>	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
<b>Strip</b>	To remove from present location.
<b>Subbase</b>	A layer of specified material placed to form a layer between the subgrade and base course.
<b>Subbase Grade</b>	Top of subbase.
<b>Subgrade</b>	Prepared native soil surface.

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## DEFINITION OF TERMINOLOGY

PLATE

A-1

**COARSE-GRAINED SOILS**  
LESS THAN 50% FINES

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
<b>GW</b>	WELL-GRADED GRAVEL OR WELL-GRADED GRAVEL WITH SAND, LESS THAN 5% FINES	<b>GRAVELS</b> MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE
<b>GP</b>	POORLY-GRADED GRAVEL OR POORLY-GRADED GRAVEL WITH SAND, LESS THAN 5% FINES	
<b>GM</b>	SILTY GRAVEL OR SILTY GRAVEL WITH SAND, MORE THAN 12% FINES	
<b>GC</b>	CLAYEY GRAVEL OR CLAYEY GRAVEL WITH SAND, MORE THAN 12% FINES	
<b>SW</b>	WELL-GRADED SAND OR WELL-GRADED SAND WITH GRAVEL, LESS THAN 5% FINES	<b>SANDS</b> MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE
<b>SP</b>	POORLY-GRADED SAND OR POORLY-GRADED SAND WITH GRAVEL, LESS THAN 5% FINES	
<b>SM</b>	SILTY SAND OR SILTY SAND WITH GRAVEL, MORE THAN 12% FINES	
<b>SC</b>	CLAYEY SAND OR CLAYEY SAND WITH GRAVEL, MORE THAN 12% FINES	

**NOTE:** Coarse-grained soils receive dual symbols if they contain 5% to 12% fines (e.g., SW-SM, GP-GC).

**FINE-GRAINED SOILS**  
MORE THAN 50% FINES

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
<b>ML</b>	SILT, SILT WITH SAND OR GRAVEL, SANDY SILT, OR GRAVELLY SILT	<b>SILTS AND CLAYS</b> LIQUID LIMIT LESS THAN 50
<b>CL</b>	LEAN CLAY OF LOW TO MEDIUM PLASTICITY, SANDY CLAY, OR GRAVELLY CLAY	
<b>OL</b>	ORGANIC SILT OR ORGANIC CLAY OF LOW TO MEDIUM PLASTICITY	
<b>MH</b>	ELASTIC SILT, SANDY ELASTIC SILT, OR GRAVELLY ELASTIC SILT	<b>SILTS AND CLAYS</b> LIQUID LIMIT MORE THAN 50
<b>CH</b>	FAT CLAY OF HIGH PLASTICITY, SANDY FAT CLAY, OR GRAVELLY FAT CLAY	
<b>OH</b>	ORGANIC SILT OR ORGANIC CLAY OF HIGH PLASTICITY	
<b>PT</b>	PEAT AND OTHER HIGHLY ORGANIC SOILS	<b>HIGHLY ORGANIC SOILS</b>

**NOTE:** Fine-grained soils may receive dual classification based upon plasticity characteristics (e.g. CL-ML).

**SOIL SIZES**

COMPONENT	SIZE RANGE
<b>BOULDERS</b>	Above 12 in.
<b>COBBLES</b>	3 in. - 12 in.
<b>GRAVEL</b>	No. 4 - 3 in.
Coarse	¾ in. - 3 in.
Fine	No. 4 - ¾ in.
<b>SAND</b>	No. 200 - No. 4
Coarse	No. 10 - No. 4
Medium	No. 40 - No. 10
Fine	No. 200 - No. 40
Fines (Silt or Clay)	Below No. 200

**NOTE:** Only sizes smaller than three inches are used to classify soils

**CONSISTENCY**

CLAYS & SILTS	BLOWS PER FOOT
<b>VERY SOFT</b>	0 - 2
<b>SOFT</b>	3 - 4
<b>FIRM</b>	5 - 8
<b>STIFF</b>	9 - 15
<b>VERY STIFF</b>	16 - 30
<b>HARD</b>	OVER 30

**RELATIVE DENSITY**

SANDS & GRAVELS	BLOWS PER FOOT
<b>VERY LOOSE</b>	0 - 4
<b>LOOSE</b>	5 - 10
<b>MEDIUM DENSE</b>	11 - 30
<b>DENSE</b>	31 - 50
<b>VERY DENSE</b>	OVER 50

**NOTE:** Number of blows using 140-pound hammer falling 30 inches to drive a 2-inch-OD (1½-inch ID) split-barrel sampler (ASTM D1586).

**PLASTICITY OF FINE GRAINED SOILS**

PLASTICITY INDEX	TERM
0	<b>NON-PLASTIC</b>
1 - 7	<b>LOW</b>
8 - 20	<b>MEDIUM</b>
Over 20	<b>HIGH</b>

**DEFINITION OF WATER CONTENT**

<b>DRY</b>
<b>SLIGHTLY DAMP</b>
<b>DAMP</b>
<b>MOIST</b>
<b>WET</b>
<b>SATURATED</b>

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**METHOD OF CLASSIFICATION**

**PLATE**

**A-2**

The number shown in "TEST PIT" refers to the approximate location of the same number indicated on the "Test Pit Location Diagram" as positioned in the field by pacing or measurement from property lines and/or existing features, or through the use of Global Positioning System (GPS) devices. The accuracy of GPS devices is variable.

"EQUIPMENT TYPE" refers to the equipment used in the excavation of the test pit, and may include the width of the bucket on the excavator and the use of "rock" teeth or attachments.

"SAMPLE TYPE" refers to the form of sample recovery, in which N = Split-barrel sample, R = Ring sample, G = Grab Sample, CS = California style split-barrel sample, B = Bucket sample.

"USCS" refers to the "Unified Soil Classification System" Group Symbol for the soil type as defined by ASTM D2487 and D2488. The soils were classified visually in the field, and where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

These notes and test pit logs are intended for use in conjunction with the purposes of our services defined in the text. Test pit log data should not be construed as part of the construction plans nor as defining construction conditions.

The Test Pit logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and characteristics may occur between test pits. Groundwater levels may fluctuate due to seasonal variations and other factors.

The stratification lines shown on the test pit logs represent our interpretation of the approximate boundary between soil or rock types based upon visual field classification at the test pit location. The transition between materials is approximate and may be more or less gradual than indicated.

Geotechnical  
Environmental  
Inspections  
Materials



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TEST PIT LOG NOTES

PLATE

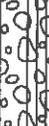
A-3

DATE EXCAVATED: 9-1-15  
 LOCATION: See Location Diagram  
 ELEVATION: Not Determined

**TEST PIT NO. 1**

EQUIPMENT: J Deere 310  
 EXCAVATION TYPE: 24" Bucket  
 FIELD ENGINEER: D. Curtis

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				GC-GM		Sandy, Silty GRAVEL; with clay, brown, moist
		G				GP-GM		Poorly Graded GRAVEL; with silt and sand, white, slightly damp
					5			slightly to moderately cemented, rounded cobbles up to 6 inches in diameter
					10			Excavation Refusal at 6.5 Feet

N- STANDARD PENETRATION TEST  
 R- RING SAMPLE  
 C- CORE: %RECOVERY/RQD  
 G- GRAB SAMPLE  
 B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



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PROJECT: TIERRA VERDE SUBDIVISION  
 PROJECT NO.: 2525JW327

**TEST PIT LOG**

PLATE  
**A-4**

DATE EXCAVATED: 9-1-15  
 LOCATION: See Location Diagram  
 ELEVATION: Not Determined

**TEST PIT NO. 2**

EQUIPMENT: J Deere 310  
 EXCAVATION TYPE: 24" Bucket  
 FIELD ENGINEER: D. Curtis

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				GM		Silty GRAVEL, with sand, brown, moist
		G				GP-GC		Poorly Graded GRAVEL; with sand and clay, white, slightly damp  slightly to moderately cemented, rounded cobbles and boulders up to 16 inches in diameter
					5			Excavation Refusal at 5 Feet
					10			

N- STANDARD PENETRATION TEST  
 R- RING SAMPLE  
 C- CORE: %RECOVERY/RQD  
 G- GRAB SAMPLE  
 B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



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 Flagstaff, AZ 86004-8934

PROJECT: TIERRA VERDE SUBDIVISION  
 PROJECT NO.: 2525JW327

PLATE  
**A-5**

**TEST PIT LOG**

DATE EXCAVATED: 9-1-15  
 LOCATION: See Location Diagram  
 ELEVATION: Not Determined

**TEST PIT NO. 3**

EQUIPMENT: J Deere 310  
 EXCAVATION TYPE: 24" Bucket  
 FIELD ENGINEER: D. Curtis

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				GP-GM		Poorly Graded GRAVEL; with silt and sand, brown, moist
		G						white, slightly damp
					5			slightly to moderately cemented, rounded cobbles and boulders up to 16 inches in diameter
					10			Excavation Stopped at 8 Feet

N- STANDARD PENETRATION TEST  
 R- RING SAMPLE  
 C- CORE: %RECOVERY/RQD  
 G- GRAB SAMPLE  
 B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



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 Flagstaff, AZ 86004-8934

PROJECT: TIERRA VERDE SUBDIVISION  
 PROJECT NO.: 2525JW327

**TEST PIT LOG**

PLATE  
**A-6**

DATE EXCAVATED: 9-1-15  
 LOCATION: See Location Diagram  
 ELEVATION: Not Determined

**TEST PIT NO. 4**

EQUIPMENT: J Deere 310  
 EXCAVATION TYPE: 24" Bucket  
 FIELD ENGINEER: D. Curtis

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOWS/FT.	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
		G				CL		Sandy Lean CLAY; trace gravel and occasional cobbles, brown, moist
		G			5	GW		Well-Graded GRAVEL; with sand, white, slightly damp  slightly to moderately cemented, rounded cobbles up to 12 inches in diameter
					10			Excavation Stopped at 8 Feet

N- STANDARD PENETRATION TEST  
 R- RING SAMPLE  
 C- CORE: %RECOVERY/RQD  
 G- GRAB SAMPLE  
 B- BUCKET SAMPLE

NOTES: Groundwater Not Encountered



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 PROJECT NO.: 2525JW327

**TEST PIT LOG**

PLATE  
**A-7**

Test Pit No.	Depth (ft)	USCS Class.	Particle Size Distribution (%) Passing by Weight							Atterberg Limits		Laboratory Compaction Characteristics			Remarks
			3"	¾"	#4	#10	#40	#200	2μ	LL	PI	Dry Density (pcf)	Optimum Moisture (%)	Method	
1	0-1	GC-GM	100	77	62	52	45	34.4	9.1	32	5				2
1	1-6.5	GM-GP	95	56	29	22	17	11.1		37	3				2
2	1-5	GP-GC	97	41	20	15	9	5.5	1.5	32	11				2
3	1.3-8	GP-GM	100	50	27	20	13	7.2	2.4	29	3				2
4	0-1.3	CL		100	94	92	89	61.2		29	13				2
4	1.3-8	GW	84	41	23	17	9	3.8	1.0	28	6				2

**NOTE:** NP = Non-plastic  
μ = microns (2μ = 0.002mm)

**REMARKS**  
Classification / Particle Size / Moisture-Density Relationship  
1. Visual  
2. Laboratory Tested  
3. Minus #200 Only  
4. Test Method ASTM D698/AASHTO T99  
5. Test Method ASTM D1557/AASHTO T180  
6. From the ADOT Family of Curves

 <b>Western Technologies Inc.</b> The Quality People Since 1955 wt-us.com	PROJECT: TIERRA VERDE SUBDIVISION JOB NO.: 2525JW327	<b>PLATE</b>  <b>B-1</b>
	<b>SOIL PROPERTIES</b>	

TEST PIT No.	Depth (ft.)	USCS Class.	Initial Dry Density (pcf)	Initial Water Content (%)	Compression Properties			Expansion Properties		Plasticity		Percent Passing #200	Soluble		Remarks
					Surcharge (ksf)	In-Situ	Total Compression (%) After Saturation	Surcharge (ksf)	Expansion (%)	LL	PI		Salts (ppm)	Sulfate (ppm)	
1	0-1	GC-GM	106.3	15.8				0.1	1.0			131	8	1,2	
4	0-1.3	CL	106.3	15.8				0.1	2.4			85	12	1,2	

**Notes:** Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.  
NP = Non-Plastic

**Remarks**

1. Compacted density (approx. 95% of ASTM D698 max. density at moisture content slightly below optimum.)
2. Submerged to approximate saturation.
3. Slight rebound after saturation.
4. Sample disturbance observed.
5. Sample is in place swell



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PROJECT: TIERRA VERDE SUBDIVISION  
JOB NO.: 2525JW327

PLATE

B-2

**SOIL PROPERTIES**

Test Pit No.	Depth (ft)	USCS Class.	Particle Size Distribution (%) Passing by Weight						Atterberg Limits		Laboratory Compaction Characteristics			R-Value	Remarks
			3"	3/8"	#4	#10	#40	#200	LL	PI	Dry Density (pcf)	Optimum Moisture (%)	Method		
1	0-1	GC-GM	100	77	62	52	45	34.4	32	5				28	2

NOTE: NP = Non-plastic

**REMARKS**

Classification / Particle Size / Moisture-Density Relationship

1. Visual
2. Laboratory Tested
3. Minus #200 Only
4. Test Method ASTM D698/AASHTO T99
5. Test Method ASTM D1557/AASHTO T180
6. From the ADOT Family of Curves

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	<p><b>SOIL PROPERTIES</b></p>	

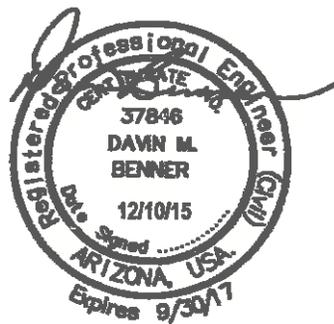
**GRANITE  
BASIN  
ENGINEERING, INC**

***PHASE II DRAINAGE REPORT  
FOR  
CASTLE HEIGHTS SUBDIVISION***

*Prepared for:  
Terra Verde Builders  
P.O. Box 2898  
Camp Verde, Arizona 86322*

*Prepared by:  
Granite Basin Engineering, Inc.  
1981 Commerce Center Circle, Suite B  
Prescott, Arizona 86301  
(928) 717-0171*

*December, 2015*



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## ***I. GENERAL LOCATION AND DESCRIPTION***

### ***A. Location***

***1. Owner/Developer Name.***

Tierra Verde Builders

***2. Assessor's Parcel Number(s).***

404-18-181E

***3. Township, range, section, 1/4 section.***

NE ¼ Section 19, T14N, R5E

***4. Local streets within and adjacent to the subdivision with ROW width shown.***

The site is bordered on the south by North Arena del Loma Road. The site is undeveloped and has no established streets.

***5. Major drainage ways, facilities and easements.***

The site is located on the side of small hill which overlooks Beaver Creek, a perennial tributary of the Verde River. Small, natural drainage ways exist on the site. The majority of the runoff from the area is comprised of sheet flow. No drainage facilities or easements exist.

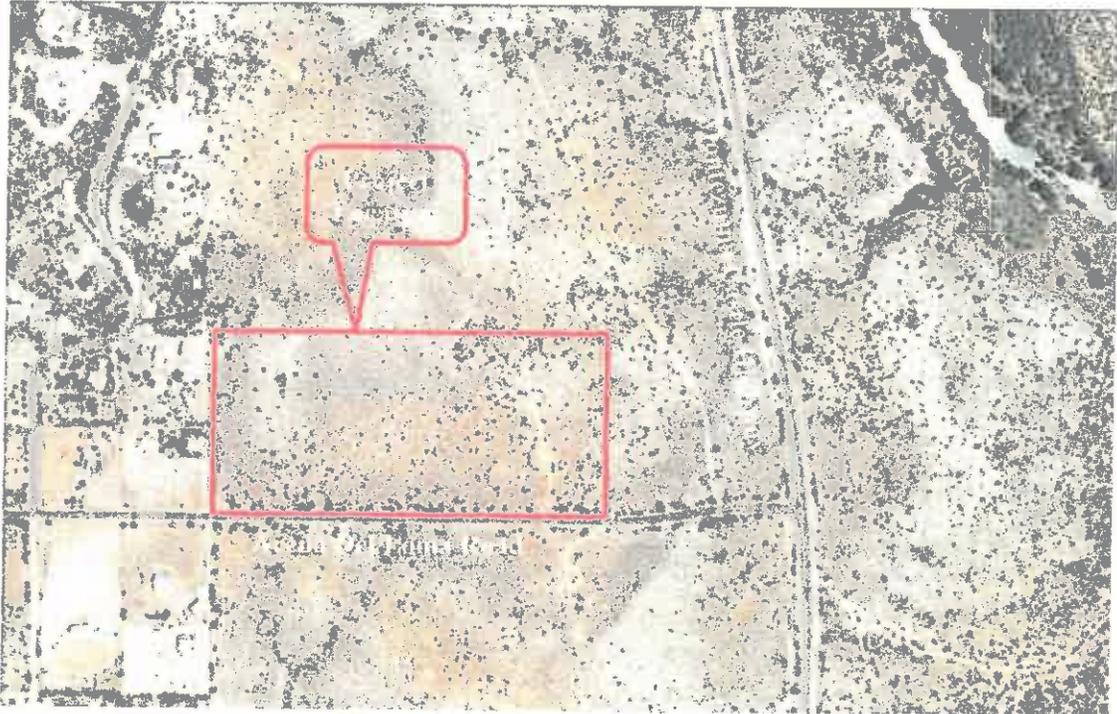
***6. Names of surrounding development, land uses, and identification of present zoning.***

Surrounding properties on the north east and south are undeveloped. Rural density single family residences on 2 acre lots are adjacent the west property line. Other development includes the Camp Verde High School located 1,750 feet south of the property. The property is zoned R1L-70 which allows for minimum 70,000 square feet lot. Adjacent properties located north of Arena del Loma Road are zoned R1L-70 except for one area east of the site which is zoned C2. Adjacent properties located south of Arena del Loma Road are zone R1-70.

### ***B. Description of Property***

***1. Area in acres.***

The total property acreage is 20.92±acres. The figure below shows the project location and surrounding area.



*Figure 1 – Project Location*

*2. Ground cover (type of trees, shrubs, vegetation, general soil conditions, topography, and slope).*

Native ground cover is generally comprised of acacia, shrubs and grasses. According to the USDA NRCS, soils in the contributing watersheds are classified as Bridge gravelly sandy loam (Bg) – Hydrologic Soil Group C; Guest clay (Gu) – Hydrologic Soil Group C; House Mountain stony loam (Hm) - Hydrologic Soil Group D; and Laveen gravelly sandy loam (La) – Hydrologic Soil Group B. The majority of the site is classified as the Laveen gravelly sandy loam. The bore logs from the soil report indicate onsite soils are gravels with varying amounts of silt, clay, sand, cobbles and boulders. Excavation refusal was encountered between 5 and eight feet.

Elevations on the site range from 3,258-ft above MSL along North Arena del Loma Road and 3,306-ft along north property line. Slopes along the west boundary vary from 5 percent near North Arena del Loma to 9 percent near the north property line. Slopes along the east boundary are milder with grades of 2 percent. Slopes on the site generally trend from north to south.

*3. All drainage ways and floodplains.*

Sheet flow and shallow concentrated flow drainage is present. The primary source of offsite sheet flow is from higher ground located north of the property. No floodplains are on the site. The nearest regulatory floodplain is a Zone A delineation for Beaver Creek approximately 600-ft southeast of the project boundary.

**4. Project description.**

The project consists of 12 low density, single family lots which will be accessed by two paved cul-de-sac roads. Six lots will be accessed by each road. The lots will be developed by custom home builders or the individual lot owners. The lots will be served by electric and telephone utilities. Each site will require development of a domestic well and individual on-site septic disposal system.

**5. Irrigation facilities.**

There are no existing irrigation facilities on the site.

**6. Proposed land use.**

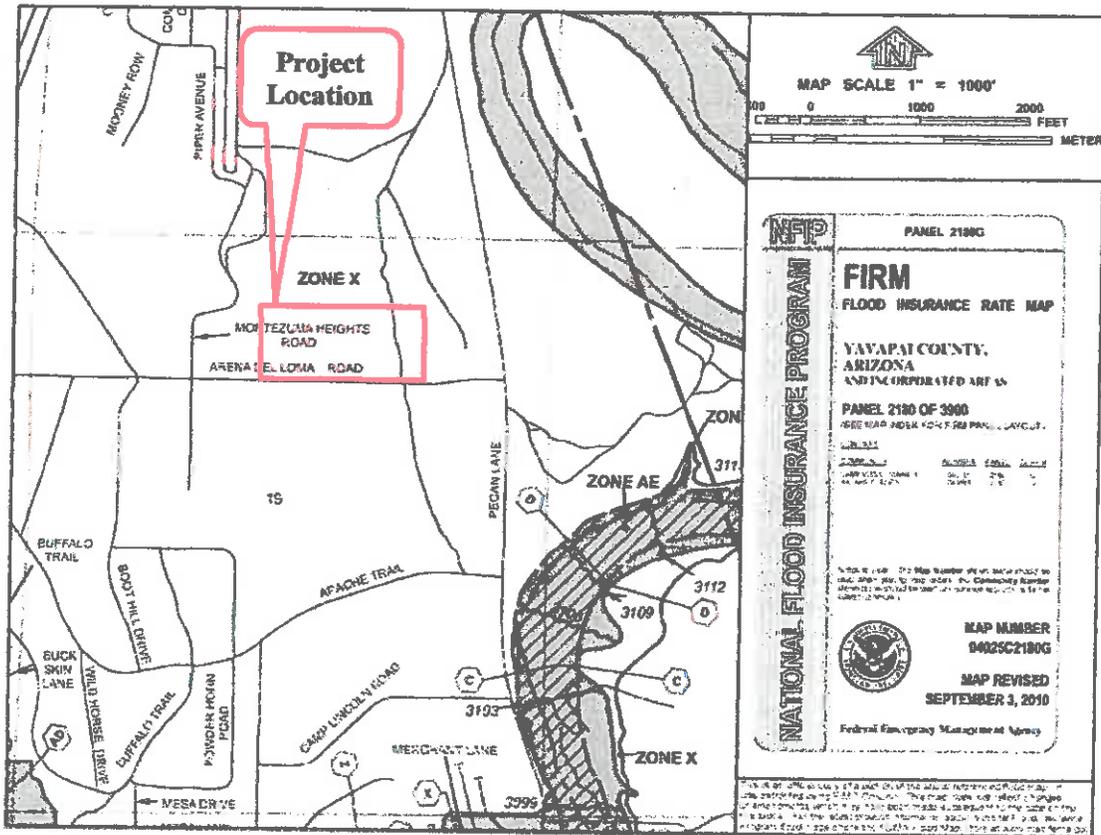
Proposed land use is for the construction and operation of a 12 lot, low density, single family residential subdivision.

**II. DRAINAGE BASINS AND SUB-BASINS**

**A. Major Basin Description**

**1. References to all drainage way planning studies, such as flood hazard delineation reports, drainage way planning reports, and flood insurance rate maps.**

Existing studies and reports specific to the site were not available. The site is located on revised FIRM panel 2180 of 3900 (map number 04025C2180G) revised September 3, 2010. Based on the FIRMETTE panel shown in Figure 2, the site lies within Shaded Zone 'X' and is subject to a 0.2% annual chance of flooding of the 500 year floodplain.



**Figure 2 – FEMA FIRMapette**

**2. Major basin drainage characteristics, existing and planned land uses.**

The site is located within the Verde River watershed and is generally classified as high desert range with moderate slopes and well established tributary flow channels. There are no well defined washes, however, small rills have formed in several concentration points. Existing land uses in the region are rural single family residences and undeveloped private and forest service lands. The majority of surrounding land use is R1L-70 and R1-70 except for one area east of the site which is zoned C2. The adjacent lands are undeveloped except for the low density single family dwellings west of the property. Planned land uses for the undeveloped private properties has not been determined. Forest service lands are not proposed for development.

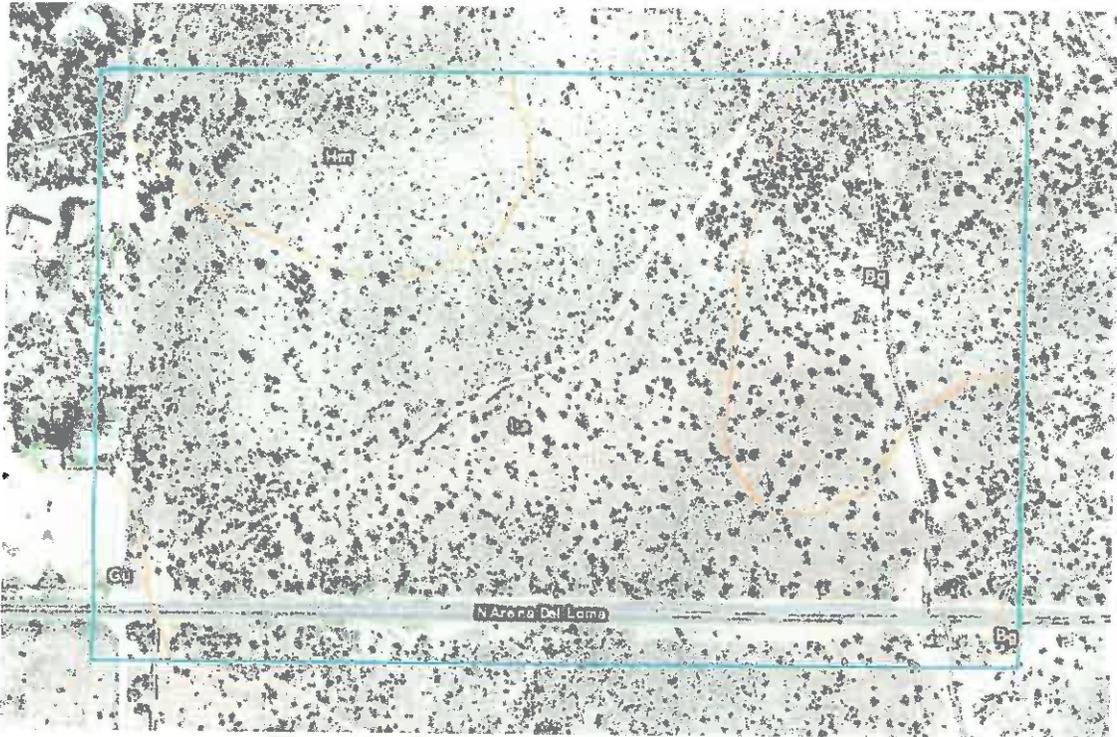
**3. Identification of all irrigation facilities within the basin, which will influence or be influenced by the local drainage.**

There are no existing irrigation facilities on the site.

**4. Soils Classification Map.**

The soils classification map from the USDA NRCS soil report can be seen below. The

full report can be seen in the Appendix.



*Figure 3 – Soil Classification Map*

*5. Identification of all detention facilities.*

There are no existing detention facilities on the site.

***B. Sub-Basin Description***

*1. Discussion of historic drainage patterns of the property in question.*

The majority of the drainage patterns of the site is sheet flow which trends north to south. Several rills have formed on the west portion of the property which direct flows to North Arena del Loma Road. Minor flows can be conveyed in the roadside swale to the west and east dependent upon the location to the road's high point. Major storm runoff events breach the road crest and sheet flow onto the neighboring undeveloped property to the south. Refer to the Appendix section for existing condition and proposed condition hydrology maps.

*2. Discussion of off-site drainage flow patterns and the impact on development under existing and fully developed basin conditions, as defined by the Planning Department.*

Offsite runoff enters the property from the north. Offsite flows enter the site as sheet flow from a nearby flat topped hill. Flows continue through the property as sheet flow and shallow concentrated flow to Arena del Loma Road where minor runoff flows are

intercepted by the existing roadside swale. Major runoff events will breach the road crest and continue as sheet flow onto the neighboring undeveloped property to the south.

No improvements are being proposed for the Coconino National Forest property immediately adjacent the north property line. No improvements are being proposed to Arena del Loma by the developer or the Town of Camp Verde and the current flow routing to the south is anticipated to stay the same. However, the existing roadside swale is proposed to be increased in size along with the development.

Flows which occur east of the roadway high point are eventually routed to culverts on North Montezuma Castle Highway and conveyed to Beaver Creek. Flows which occur on the west side of the roadway high point are routed onto Camp Verde School District athletic fields and Town of Camp Verde Butler Park. Flows which are routed to the fields are dissipated and eventually routed to agricultural areas north of the Verde River.

### **III. DRAINAGE DESIGN CRITERIA**

#### **A. Regulations**

*Drainage design conforms to the draft July 2015 version of the Drainage Design Manual for Yavapai County and per criteria set forth in the Uniform Standard Specifications, Town of Camp Verde, Arizona, Section CV701 "Storm Water Detention Requirements for Development of Property".*

#### **B. Development Criteria and Constraints**

- 1. Discussion of previous drainage studies (i.e. project master plans) for the site in question that influence or are influenced by the drainage design and how the plan will affect drainage design for the site.*

There are no previous drainage studies for the site.

- 2. Discussion of existing drainage studies prepared for adjacent projects.*

There are no previous drainage studies for adjacent projects that influence drainage design.

- 3. Discussion of the drainage impact of site constraints, such as streets, utilities, light rail rapid transit, existing structures and developments.*

The majority of the offsite drainage will be conveyed through the property in its current sheet and shallow flow configuration and routed to detention ponds along North Arena del Loma Road. Some concentration of flows currently exist near the southwest corner from existing rills. These concentrated flows will be collected and conveyed to the western detention pond.

Currently, flows which reach North Arena del Loma Road are directed in shallow

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roadside swales which generally direct flows toward the west. A road crest occurs approximately 250 feet from the east property line and flows which reach this portion of the road are directed east. The roadside swale is shallow and high intensity rainfall events result in flows breaching the road crown and continuing as sheet flow to the undeveloped parcel to the south. Proposed improvements are anticipated to reduce the frequency of flows breaching the road crown.

Only one drainage structure exists within the project area. This includes a 27-inch culvert under Arena del Loma Road. This structure will not be adversely affected as a result of the development.

**C. Hydrologic Criteria and Results**

*1. Identify design rainfall.*

Design rainfall was adopted from the current NOAA Atlas 14 precipitation frequency data server for the project location and is presented in the table below.

**Table 1 – Design Rainfall**

<i>Rainfall Data for Project Location (Camp Verde, AZ)</i>				
<i>Duration</i>	<i>Frequency, In Years</i>			
	<i>2</i>	<i>10</i>	<i>25</i>	<i>100</i>
<i>5-min</i>	<i>3.08</i>	<i>5.11</i>	<i>6.44</i>	<i>8.76</i>
<i>10-min</i>	<i>2.35</i>	<i>3.89</i>	<i>4.90</i>	<i>6.67</i>
<i>15-min</i>	<i>1.94</i>	<i>3.22</i>	<i>4.05</i>	<i>5.51</i>
<i>30-min</i>	<i>1.31</i>	<i>2.17</i>	<i>2.73</i>	<i>3.71</i>
<i>60-min</i>	<i>0.81</i>	<i>1.34</i>	<i>1.69</i>	<i>2.30</i>
<i>2-hr</i>	<i>0.48</i>	<i>0.77</i>	<i>0.96</i>	<i>1.29</i>
<i>3-hr</i>	<i>0.34</i>	<i>0.53</i>	<i>0.65</i>	<i>0.87</i>
<i>6-hr</i>	<i>0.21</i>	<i>0.31</i>	<i>0.37</i>	<i>0.48</i>
<i>12-hr</i>	<i>0.12</i>	<i>0.17</i>	<i>0.20</i>	<i>0.25</i>
<i>24-hr</i>	<i>0.08</i>	<i>0.11</i>	<i>0.13</i>	<i>0.16</i>

*2. Identify the runoff calculation method.*

Surface runoff was estimated using the SCS curve number method and TR-55 time of concentration calculation. Hydrograph formation was done using the SCS Method with a 24-hour storm of Type II rainfall distribution. The SCS method was chosen to generate runoff as the sub-basins are small and a hydrograph is required for detention pond routing. Hydrographs were generated using Autodesk’s Storm and Sanitary Analysis 2016 hydrologic and hydraulic modeling software. Refer to Appendix A.2 for weighted curve number and time of concentration calculations. Refer to Appendix A.3 for peak runoff calculations from Storm and Sanitary Analysis.

*3. Identify detention discharge/volumes and storage calculation method.*

Stormwater detention for the project is accomplished using two surface ponds located at the southwest and southeast corners of the subdivision. A summary table of the preliminary detention volume estimates can be seen below. Volume estimates were calculated by taking the volumetric difference between the 100-year hydrographs for the pre-developed and post-developed conditions at each concentration point. Results of the detention pond routing analysis will be conducted using Autodesk's Storm and Sanitary Analysis 2016 (SSA). Results of the routing analysis will be presented in the Phase III Drainage Report.

*Table 2 – Preliminary Detention Volume Estimates*

Preliminary Detention Volume Estimates			
Concentration Point	Pre Hydrograph (ft <sup>3</sup> )	Post Hydrograph (ft <sup>3</sup> )	Volume Estimate (ft <sup>3</sup> )
1	60,111	62,666	2,555
2	84,340	98,442	14,102
3	12,711	14,659	1,948
4	11,985	20,788	8,803
5	4,947	6,203	1,256

*4. Identify design storm recurrence intervals.*

Design storm recurrence intervals include the 2-, 10-, 25- and 100-year rainfall events.

*5. Discussion and justification of other criteria or calculation methods used that are not presented in or referenced by this manual.*

No other criteria or calculation methods were used for drainage design.

*6. Summary table of pre and post-development watershed areas and peak discharges for the 2, 10, 25 and 100-year return periods.*

A summary of pre-developed sub basin characteristics and peak flows can be seen in Table 3. A summary of post-developed sub-basin characteristics and un-attenuated peak flows can be seen in Table 4.

**Table 3 – Pre-Developed Condition Summary**

<i>Pre-Developed Condition Summary</i>							
<i>Sub-basin</i>	<i>Basin Area (ac)</i>	<i>Curve Number</i>	<i>TOC (min)</i>	<i>2-Year (cfs)</i>	<i>10-Year (cfs)</i>	<i>25-Year (cfs)</i>	<i>100-Year (cfs)</i>
1	9.08	79	18.5	4.44	9.38	13.06	18.95
2	19.09	70	14.8	3.06	10.69	17.13	28.14
3	2.74	71	14.1	0.55	1.72	2.70	4.35
4	2.72	70	20.4	0.36	1.28	2.08	3.45
5	1.02	72	18.8	0.20	0.61	0.94	1.51

**Table 4 – Post-Developed Condition Summary**

<i>Post-Developed Condition Summary</i>							
<i>Sub-basin</i>	<i>Basin Area (ac)</i>	<i>Curve Number</i>	<i>TOC (min)</i>	<i>2-Year (cfs)</i>	<i>10-Year (cfs)</i>	<i>25-Year (cfs)</i>	<i>100-Year (cfs)</i>
1	9.08	80	16.0	5.27	10.69	14.68	21.02
2	18.41	74	13.5	5.93	15.21	22.53	34.66
3	2.74	74	12.2	0.92	2.35	3.46	5.32
4	3.41	77	17.4	1.39	3.17	4.53	6.72
5	1.02	77	15.7	0.44	0.99	1.41	2.09

**D. Hydraulic Criteria**

1. *Identify references/methodologies used in performing hydraulic analysis.*

Hydraulic analysis of open channels and culvert structures was done with Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D®. Express uses manning’s equation to model conveyance capacities for open channels and culvert structures.

2. *Discussion of other drainage facility design criteria used that are not presented within this manual.*

Criteria set forth in the Uniform Standard Specifications, Town of Camp Verde, Arizona, Section CV701 “Storm Water Detention Requirements for Development of Property” was referenced as part of the drainage design.

**E. Variances from this manual**

1. *Identify provisions by section number for which a variance is requested.*

No variances are requested from the Drainage Design Manual for Yavapai County.

2. *Provide justification for each variance requested.*

No variances are requested from the Drainage Design Manual for Yavapai County.

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#### **IV. DRAINAGE FACILITY DESIGN**

##### **A. General Concept**

###### *1. Discussion of existing drainage patterns.*

The majority of the drainage patterns of the site is sheet flow with some areas of shallow concentrated flow which trends north to south. Several rills have formed on the west portion of the property which direct flows to North Arena del Loma Road. Minor flows can be conveyed in the road side swale to the west and east dependent upon the location to the roads high point. Major storm runoff events breach the road crest and sheet flow onto the neighboring undeveloped property to the south.

###### *2. Discussion of off-site runoff considerations and compliance with applicable criteria.*

Offsite runoff enters the subject property from the north. Offsite flows enter the site as sheet flow from a nearby flat topped hill. Flows continue through the property as sheet flow to Arena del Loma Road where minor runoff flows are routed east and west dependent upon the location to the high point on the road. Major runoff events will breach the road crest and continue as sheet flow onto the neighboring undeveloped property to the south. No improvements are being proposed to Arena del Loma by the developer or the Town of Camp Verde and the current flow routing to the south is anticipated to stay the same. Flows which occur east of the roadway high point are eventually routed to culverts on North Montezuma Castle Highway and conveyed to Beaver Creek. Flows which occur on the west side of the roadway high point are routed onto Camp Verde School District athletic fields and Town of Camp Verde Butler Park. Flows for the fields are dissipated and eventually routed to agricultural areas north of the Verde River.

The intent of the improvements will be to maintain the peak flow rate discharging from the property, reduce adverse impacts to surrounding properties, and provide collection and organization of stormwater runoff.

###### *3. Discussion of the content of tables, charts, figures, plates or drawings presented in the report.*

The tables presented within this report are provided to summarize important project data such as the design rainfall, preliminary volume estimates, peak flow rates and sub-basin characteristics. The hydrology maps presented in the Appendix section are included to help visualize current and proposed drainage conditions. For example, these hydrology maps show topography, surrounding developments, sub-basin lines, flow paths and patterns, and concentration points.

###### *4. Discussion of anticipated and proposed drainage patterns and/or Improvements.*

Proposed drainage patterns will generally follow the natural drainage trends in a

southerly direction. The proposed roadside swales of the new roads will direct flow toward North Arena del Loma Road. Some improvements are proposed on North Arena del Loma Road including deepening the north swale to accommodate a culvert at the intersection with the western cul-de-sac. The culvert will be able to convey the 25-year storm below the roadway. Higher intensity storms will result in the breach of the roadway centerline similar to the pre-development condition. Low flow velocity will be maintained in the roadside swale and peak discharges from the property will be maintained. Refer to the Appendix section for the proposed condition hydrology map.

No grading is proposed beyond the new cul-de-sac road prisms, detention ponds and swales. New detention ponds will be placed adjacent the north right-of-way line of North Arena del Loma Road. The western detention pond will use the existing culvert as the primary outlet structure and the eastern pond will use a long, shallow broad crested weir as its primary outlet structure. Should an emergency flooding situation occur, flood waters from the western pond will spill into the Arena del Loma R/W and travel across the street into the undeveloped parcel to the south. Flood waters from the eastern pond will spill into the Arena del Loma R/W and travel down to the Montezuma Castle Highway culvert crossing. No building structures are anticipated to be negatively impacted should a flooding situation occur. Please refer to the *Castle Heights Subdivision Grading & Drainage Plans* prepared by *Granite Basin Engineering, Inc.* for more details regarding proposed grading and improvements.

5. *Discussion of the stormwater runoff quality aspects of the drainage design including those activities necessary to control erosion and sedimentation during construction.*

Stormwater quality is addressed by providing first flush retention volume within both detention basins. The volume required is based off the amount of pavement area within the new cul-de-sacs. A summary of the first flush volume requirement can be seen in the table below.

**Table 5 – First Flush Volume**

First Flush Requirement			
Concentration Point	Precipitation Depth (in)	Impervious Area (ac)	V <sub>req</sub> (ft <sup>3</sup> )
2	0.5	0.86	1,560.9
4	0.5	0.30	544.5

Stormwater quality during construction will be addressed in the project Storm Water Pollution Prevention Plan (SWPPP) prepared by *Granite Basin Engineering, Inc.* The Erosion Control Plan (ECP) included with the SWPPP will contain both temporary and permanent Best Management Practices (BMPs) to maintain water quality including site planning and management, sequencing, hydro-seeding, rock outlet protection, check dams, sediment basins, and waddles, etc.

## ***B. Specific Details***

### *1. Discussion of drainage problems encountered and solutions at specific design points.*

No drainage problems were encountered in the drainage design.

### *2. Discussion of detention storage and outlet design.*

Stormwater detention for this project is accomplished using surface ponds. Proposed stage-storage relationships and outflow structures will be input into the Storm and Sanitary Analysis modeling software and hydrographs will be routed through the ponds. Stage-outflow relationships will be calculated with SSA based hydrograph inflow, outflow structure hydraulics and the stage-storage relationship. Results of the detention routing analysis will be presented in the Phase III Drainage Report.

### *3. Discussion of proposed drainage improvements.*

Improvements are proposed at the intersection of the new west cul-de-sac (Mountain Vista Lane) and North Arena del Loma Road including deepening the roadside swale to accommodate a culvert at the new road intersections. The culvert will be designed to convey the 25-year storm under the roadway. Enlargement of the swale cross section at the west side of the intersections will enable a detention basin to be placed at the inlet to the existing 27-inch diameter steel culvert crossing North Arena del Loma Road. Higher intensity storms may still result in breach of the roadway centerline in areas where the sheet flow patterns are maintained, similar to the pre-development conditions.

### *4. Discussion of maintenance access and aspects of the design.*

Maintenance is a key aspect of any drainage design. Routine maintenance of drainage structures is necessary to ensure proper performance. Sediment, brush, trash, and other debris can clog drainage openings hindering pond performance. Site grading design allows maintenance vehicles access to drainage facilities.

### *5. Discussion of easements and tracts for drainage purposes.*

Several drainage easements are proposed for this subdivision. The easements are required for runoff conveyance and stormwater detention. Easements for the proposed drainage facilities will be privately owned and maintained by a single entity. Please refer to the *Castle Heights Subdivision Preliminary Plat* prepared by *Granite Basin Engineering* for details of the proposed easements.

## **V. CONCLUSIONS**

### ***A. Compliance with Standards***

#### *1. Discussion of compliance with Yavapai County drainage criteria.*

The Drainage Design Manual for Yavapai County (July 2015) has been actively used to establish design criteria and constraints throughout the drainage design process.

## ***B. Drainage Plan***

### ***1. Discussion of influence of proposed development on existing drainage conditions.***

Drainage patterns will be maintained as they currently exist where runoff enters and exits the property. The proposed expansion of the roadside swale system combined with culverts at the new road intersection will accommodate the nominal increase in peak runoff generated by the roadways. Due to the increased roadside swale system and addition of detention ponds, the current sheet flow across North Arena del Loma Road is anticipated to be reduced.

Natural drainage patterns and peak flows will be maintained as much as practical as they currently exist where runoff enters and exits the property.

### ***2. Discussion of effectiveness of the drainage design to control damage from storm runoff.***

The proposed system will maintain the flow characteristics and discharge configuration of the pre-developed conditions. The drainage improvements are designed to capture and route runoff to the proposed detention basins. The detention basins are sized to reduce peak flows to original values. During periods of high intensity rainfall, runoff currently crests the crown of Arena del Loma Road and discharges as sheet flow into the neighboring property to the south. The proposed improvements are anticipated to reduce the frequency of this occurrence.

## ***VI. REFERENCES***

### ***A. Publications***

- 1. Drainage Design Manual for Yavapai County, July 2015.*
- 2. Soil Survey of Yavapai County, Western Part, U.S. Department of Agriculture, Soil Conservation Service.*

### ***B. Software***

- 1. Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D®, Version 10.*
- 2. Autodesk® Storm & Sanitary Analysis 2016, Version 10.1.53.1*

## **VII. REFERENCES**

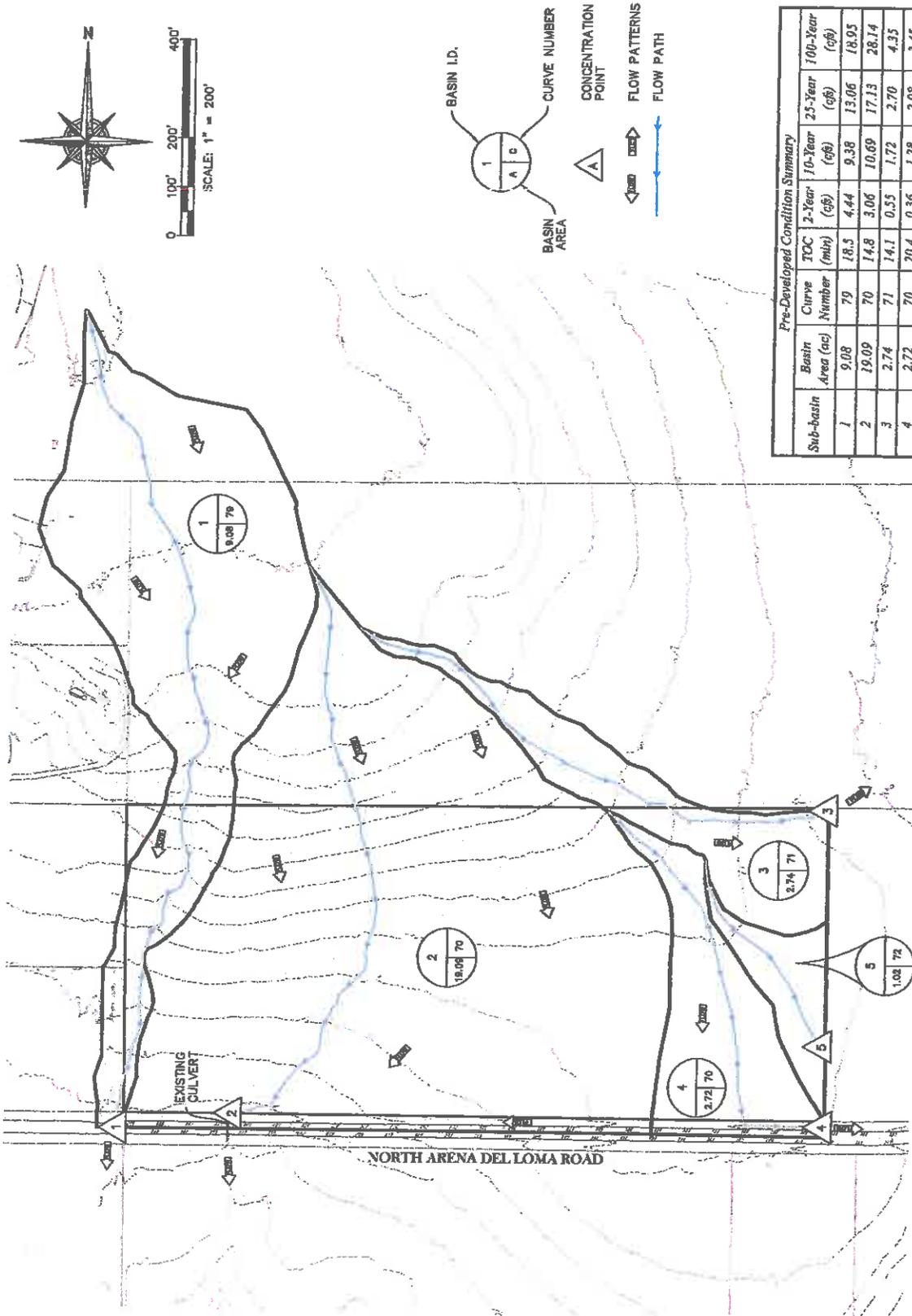
### **A. Publications**

- 1. Drainage Design Manual for Yavapai County, July 2015.*
- 2. Soil Resource Report Black Hills-Sedona Area, Arizona, Part of Coconino and Yavapai Counties, U.S. Department of Agriculture, NRCS.*

### **B. Software**

- 1. Autodesk® Storm & Sanitary Analysis 2016, Version 10.1.53.1*

*Appendix A.1 - Hydrologic Computations*  
*Hydrology Maps*



*Pre-Developed Condition Summary*

Sub-basin	Basin Area (ac)	Curve Number	TDC (min)	2-Year (cfs)	10-Year (cfs)	25-Year (cfs)	100-Year (cfs)
1	9.08	79	18.5	4.44	9.38	13.06	18.93
2	19.09	70	14.8	3.06	10.69	17.13	28.14
3	2.74	71	14.1	0.55	1.72	2.70	4.35
4	2.72	70	20.4	0.36	1.28	2.08	3.43
5	1.02	72	18.8	0.30	0.61	0.94	1.51

CASTLE HEIGHTS SUB-DIVISION  
POST-DEVELOPED HYDROLOGY MAP

DESIGN: TD  
CHECKED: DB

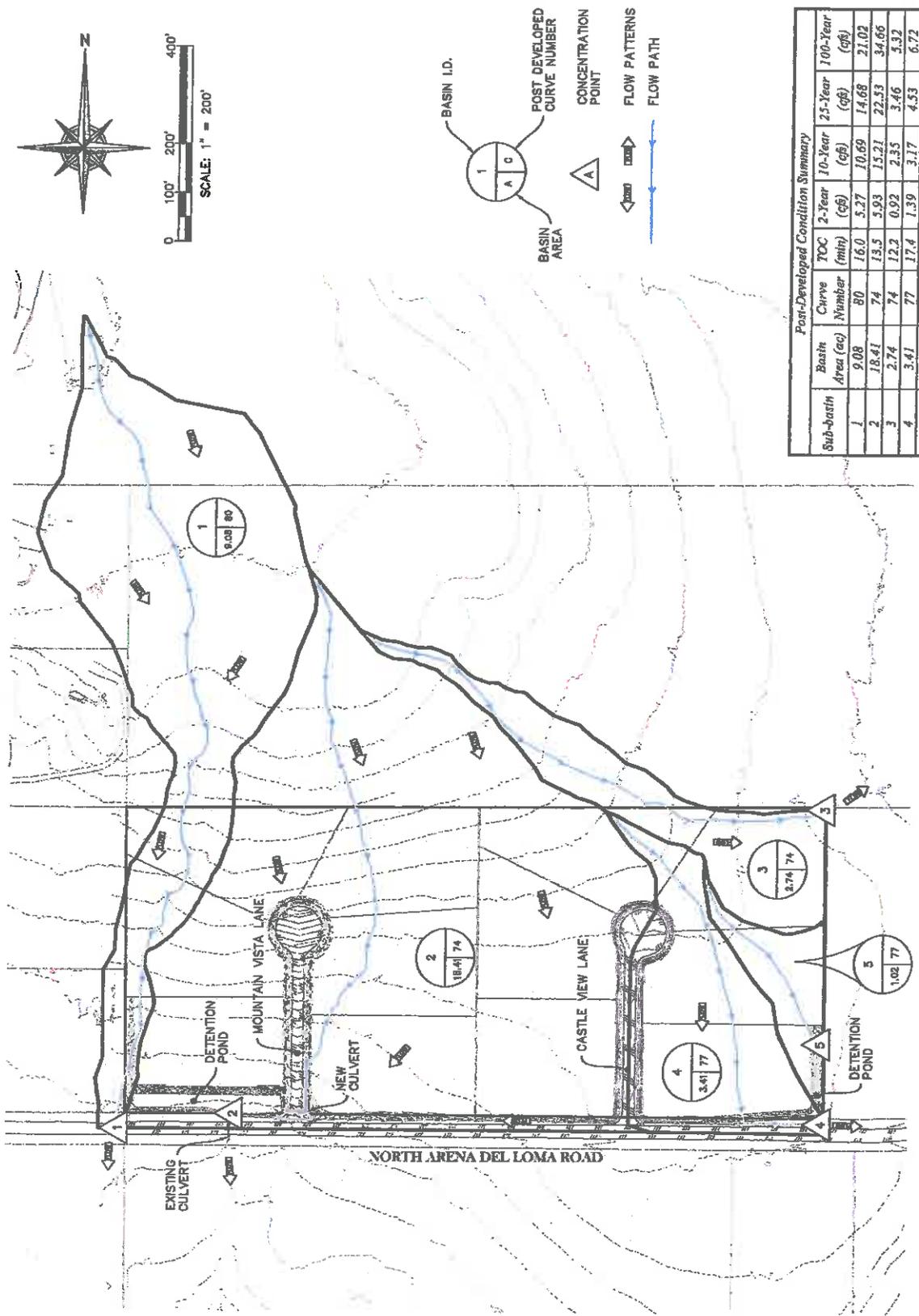
DATE: DECEMBER, 2015  
CRE: JOB #18065

PREPARED FOR:  
HERRA VERDE BORDERS

**GRANITE BASIN**  
ENGINEERING, INC.  
1981 Commerce Center Circle, Suite B  
Prescott, AZ 86301  
928.717.0171

FOR  
EXHIBIT  
PURPOSES  
ONLY

SHEET 1 OF 1



Post-Developed Condition Summary

Sub-basin	Basin Area (ac)	Curve Number	TOC (min)	2-Year (cfs)	10-Year (cfs)	25-Year (cfs)	100-Year (cfs)
1	9.08	80	16.0	5.27	10.69	14.68	21.02
2	18.41	74	13.5	5.93	15.21	22.53	34.66
3	2.74	74	12.2	0.92	2.35	3.46	5.32
4	3.41	77	17.4	1.39	3.17	4.53	6.72
5	1.02	77	15.7	0.44	0.99	1.41	2.09

*Appendix A.2 - Hydrologic Computations*  
*Land Use Assumptions & Time of Concentration Calculations*

## Area Weighting for Existing Condition Curve Number Calculation

Sub-Basin ID	Basin Area (acres)	Area Weighting for Soil Type												Weighted Curve Number			
		Hydrological Soil Group															
		B			C			D			RIL-70				Roadway		
		(acres)	(%)	(acres)	(%)	(acres)	(%)	(acres)	(%)	(acres)	(%)	(acres)	(%)		(acres)	(%)	
1	9.08	1.20	13.2%	0.27	3.0%	7.61	83.8%	6.82	75.1%	2.24	24.7%	0.02	0.2%	79			
2	19.09	13.33	69.8%	2.11	11.1%	3.65	19.1%	18.76	98.3%	0.00	0.0%	0.33	1.7%	70			
3	2.74	0.81	29.5%	1.85	67.6%	0.08	2.9%	2.74	100.0%	0.00	0.0%	0.00	0.0%	71			
4	2.72	1.65	60.8%	1.07	39.2%	0.00	0.0%	2.61	96.0%	0.00	0.0%	0.11	4.0%	70			
5	1.02	0.21	20.2%	0.81	79.8%	0.00	0.0%	1.02	100.0%	0.00	0.0%	0.00	0.0%	72			

## Area Weighting for Proposed Condition Curve Number Calculation

Sub-Basin ID	Basin Area (acres)	Area Weighting for Soil Type												Weighted Curve Number			
		Hydrological Soil Group															
		B			C			D			RIL-70				Roadway		
		(acres)	(%)	(acres)	(%)	(acres)	(%)	(acres)	(%)	(acres)	(%)	(acres)	(%)		(acres)	(%)	
1	9.08	1.20	13.2%	0.27	3.0%	7.61	83.8%	5.55	61.1%	3.51	38.7%	0.02	0.2%	80			
2	18.41	13.13	71.3%	1.63	8.8%	3.65	19.8%	3.86	21.0%	13.67	74.3%	0.88	4.8%	74			
3	2.74	0.81	29.5%	1.85	67.6%	0.08	2.9%	1.20	43.9%	1.54	56.1%	0.00	0.0%	74			
4	3.41	1.85	54.3%	1.55	45.7%	0.00	0.0%	0.00	0.0%	3.10	91.1%	0.30	8.9%	77			
5	1.02	0.21	20.2%	0.81	79.8%	0.00	0.0%	0.00	0.0%	1.02	100.0%	0.00	0.0%	77			

# Time of Concentration Calculations for Existing Condition

Table of Constants			Shallow Concentrated Flow Velocity			Hydraulic Radius						
Description	Variable	Value	$V = 16.1s^{0.5}$			$R = \frac{(B_w + zy)y}{B_w + 2y\sqrt{1+z^2}}$						
Roughness Coefficient Sheet Flow	n	0.13	Channel Flow Velocity			Sheet Flow Time						
Roughness Coefficient Channel Flow	n	0.032										
2-Year, 24-Hour Rainfall (in)	P <sub>2</sub>	1.92	$V = \frac{1.49}{n} R^{2/3} s^{1/2}$			$T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$						
Hydraulic Radius (ft)	R	0.55										
Slope (ft/ft)	s	varies	Shallow Concentrated/Channel Flow Time			Total Tc (min)						
Trapezoidal Channel Description												
Base Width (ft)	B <sub>w</sub>	1	$T_t = \frac{L}{3600 V}$			Channel Flow (ft)						
Side Slope Run (ft)	z	3										
Depth of Flow (ft)	y	1	Shallow Concentrated Flow (hr)			Channel Flow (hr)						
Trapezoidal Channel Description												
Sub Basin ID	Top Elev (ft)	Bottom Elev (ft)	Total Travel Length (ft)	Average Slope (ft/ft)	Sheet Flow Length (ft)	Sheet Flow Time (hr)	Shallow Concentrated Flow (ft)	Shallow Concentrated Flow (hr)	Channel Flow (ft)	Channel Flow (hr)	Total Tc (hr)	Total Tc (min)
1	3,352	3,259	1,782	0.052	200	0.22	647	0.05	935	0.04	0.31	18.5
2	3,340	3,257	1,293	0.064	180	0.19	580	0.04	533	0.02	0.25	14.8
3	3,338	3,273	1,091	0.060	150	0.17	941	0.07	0	0.00	0.23	14.1
4	3,290	3,275	896	0.016	140	0.27	306	0.04	450	0.03	0.34	20.4
5	3,283	3,276	473	0.014	130	0.26	322	0.05	21	0.00	0.31	18.8

# Time of Concentration Calculations for Proposed Condition

Table of Constants			Shallow Concentrated Flow Velocity			Hydraulic Radius						
Description	Variable	Value	$V = 16.1s^{0.5}$			$R = \frac{(B_w + zy)y}{B_w + 2y\sqrt{1+z^2}}$						
Roughness Coefficient Sheet Flow	n	0.1	Channel Flow Velocity			Sheet Flow Time						
Roughness Coefficient Channel Flow	n	0.032										
2-Year, 24-Hour Rainfall (in)	P <sub>2</sub>	1.92	$V = \frac{1.49}{n} R^{2/3} s^{1/2}$			$T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$						
Hydraulic Radius (ft)	R	0.55										
Slope (ft/ft)	s	varies	Shallow Concentrated/Channel Flow Time			Total Tc (min)						
Trapezoidal Channel Description												
Base Width (ft)	B <sub>w</sub>	1	$T_t = \frac{L}{3600 V}$			Channel Flow (ft)						
Side Slope Run (ft)	z	3										
Depth of Flow (ft)	y	1	Shallow Concentrated Flow (hr)			Channel Flow (hr)						
Trapezoidal Channel Description												
Sub Basin ID	Top Elev (ft)	Bottom Elev (ft)	Total Travel Length (ft)	Average Slope (ft/ft)	Sheet Flow Length (ft)	Sheet Flow Time (hr)	Shallow Concentrated Flow (ft)	Shallow Concentrated Flow (hr)	Channel Flow (ft)	Channel Flow (hr)	Total Tc (hr)	Total Tc (min)
1	3,352	3,259	1,782	0.05	200	0.18	647	0.05	935	0.04	0.27	16.0
2	3,340	3,257	1,393	0.06	180	0.16	680	0.05	533	0.02	0.23	13.5
3	3,338	3,273	1,091	0.06	150	0.14	941	0.07	0	0.00	0.20	12.2
4	3,290	3,275	896	0.02	140	0.22	306	0.04	450	0.03	0.29	17.4
5	3,283	3,276	473	0.01	130	0.21	322	0.05	21	0.00	0.26	15.7

*Appendix A.3 - Hydrologic Computations*  
*Peak Runoff Calculations*

### Project Description

File Name ..... 13065 SSA SCS-Pre-Development.SPF

### Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... SCS TR-55  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Hydrodynamic  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods ... NO

### Analysis Options

Start Analysis On ..... Sep 29, 2015 00:00:00  
 End Analysis On ..... Sep 30, 2015 00:00:00  
 Start Reporting On ..... Sep 29, 2015 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
 Routing Time Step ..... 30 seconds

### Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (Inches)	Rainfall Distribution
1		Time Series	SCS 2-Year	Cumulative	Inches	Arizona	Yavapai (North)	2	1.92	SCS Type II 24-hr

**Subbasin Summary**

SN	Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	1	9.08	79.00	1.92	0.48	4.32	4.44	0 00:18:30
2	2	19.09	70.00	1.92	0.21	4.03	3.06	0 00:14:48
3	3	2.74	71.00	1.92	0.24	0.64	0.55	0 00:14:06
4	4	2.72	70.00	1.92	0.21	0.57	0.36	0 00:20:24
5	5	1.02	72.00	1.92	0.26	0.28	0.20	0 00:18:48

**Node Summary**

SN ID	Element Type	Invert Elevation	Peak Inflow
		(ft)	(cfs)
1 CP 1	Outfall	3258.80	0.00
2 CP 2	Outfall	3257.00	0.00
3 CP 3	Outfall	3285.00	0.00
4 CP 4	Outfall	3282.00	0.00
5 CP 5	Outfall	3257.00	0.00

### Project Description

File Name ..... 13065 SSA SCS-Pre-Development.SPF

### Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... SCS TR-55  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Hydrodynamic  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods .... NO

### Analysis Options

Start Analysis On ..... Sep 29, 2015 00:00:00  
 End Analysis On ..... Sep 30, 2015 00:00:00  
 Start Reporting On ..... Sep 29, 2015 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
 Routing Time Step ..... 30 seconds

### Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (Inches)	Rainfall Distribution
1		Time Series	SCS 10-Year	Cumulative	inches	Arizona	Yavapai (North)	10	2.64	SCS Type II 24-hr

**Subbasin Summary**

SN	Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	1	9.08	79.00	2.64	0.93	8.47	9.38	0 00:18:30
2	2	19.09	70.00	2.64	0.52	10.00	10.69	0 00:14:48
3	3	2.74	71.00	2.64	0.58	1.54	1.72	0 00:14:06
4	4	2.72	70.00	2.64	0.52	1.43	1.28	0 00:20:24
5	5	1.02	72.00	2.64	0.60	0.62	0.61	0 00:18:48

**Node Summary**

SN ID	Element Type	Invert Elevation	Peak Inflow
		(ft)	(cfs)
1 CP 1	Outfall	3258.80	0.00
2 CP 2	Outfall	3257.00	0.00
3 CP 3	Outfall	3285.00	0.00
4 CP 4	Outfall	3262.00	0.00
5 CP 5	Outfall	3257.00	0.00

### Project Description

File Name ..... 13065 SSA SCS-Pre-Development.SPF

### Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... SCS TR-55  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Hydrodynamic  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods .... NO

### Analysis Options

Start Analysis On ..... Sep 29, 2015 00:00:00  
 End Analysis On ..... Sep 30, 2015 00:00:00  
 Start Reporting On ..... Sep 29, 2015 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
 Routing Time Step ..... 30 seconds

### Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1		Time Series	SCS 25-Year	Cumulative	Inches	Arizona	Yavapai (North)	25	3.12	SCS Type II 24-hr

**Subbasin Summary**

SN ID	Subbasin Area	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
	(ac)		(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
1	9.08	79.00	3.12	1.28	11.60	13.06	0 00:18:30
2	19.09	70.00	3.12	0.78	14.93	17.13	0 00:14:48
3	2.74	71.00	3.12	0.89	2.27	2.70	0 00:14:06
4	2.72	70.00	3.12	0.78	2.13	2.08	0 00:20:24
5	1.02	72.00	3.12	0.88	0.90	0.94	0 00:18:48

**Node Summary**

SN ID	Element Type	Element	Invert Elevation	Peak Inflow
			(ft)	(cfs)
1	CP 1	Outfall	3258.80	0.00
2	CP 2	Outfall	3257.00	0.00
3	CP 3	Outfall	3285.00	0.00
4	CP 4	Outfall	3262.00	0.00
5	CP 5	Outfall	3257.00	0.00

### Project Description

File Name ..... 13065 SSA SCS-Pre-Development.SPF

### Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... SCS TR-55  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Hydrodynamic  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods ..... NO

### Analysis Options

Start Analysis On ..... Sep 29, 2015 00:00:00  
 End Analysis On ..... Sep 30, 2015 00:00:00  
 Start Reporting On ..... Sep 29, 2015 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
 Routing Time Step ..... 30 seconds

### Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1		Time Series	SCS 100-Year	Cumulative	Inches	Arizona	Yavapai (North)	100	3.84	SCS Type II 24-hr

**Subbasin Summary**

SN Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1 1	9.08	79.00	3.84	1.83	16.65	18.95	0 00:18:30
2 2	19.09	70.00	3.84	1.22	23.37	28.14	0 00:14:48
3 3	2.74	71.00	3.84	1.29	3.52	4.35	0 00:14:06
4 4	2.72	70.00	3.84	1.22	3.33	3.45	0 00:20:24
5 5	1.02	72.00	3.84	1.35	1.38	1.51	0 00:18:48

**Node Summary**

SN ID	Element Type	Invert Elevation	Peak Inflow
		(ft)	(cfs)
1 CP 1	Outfall	3258.80	0.00
2 CP 2	Outfall	3257.00	0.00
3 CP 3	Outfall	3285.00	0.00
4 CP 4	Outfall	3282.00	0.00
5 CP 5	Outfall	3257.00	0.00

### Project Description

File Name ..... 13085 SSA SCS-Post-Development.SPF

### Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... SCS TR-55  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Hydrodynamic  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods ... NO

### Analysis Options

Start Analysis On ..... Sep 29, 2015 00:00:00  
 End Analysis On ..... Sep 30, 2015 00:00:00  
 Start Reporting On ..... Sep 29, 2015 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
 Routing Time Step ..... 30 seconds

### Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1		Time Series	SCS 2-Year	Cumulative	Inches	Arizona	Yavapai (North)	2	1.92	SCS Type II 24-hr

**Subbasin Summary**

SN ID	Subbasin Area	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)	
1	1	9.08	80.00	1.92	0.51	4.67	5.27	0 00:16:00
2	2	18.41	74.00	1.92	0.31	5.76	5.93	0 00:13:30
3	3	2.74	74.00	1.92	0.31	0.86	0.92	0 00:12:12
4	4	3.41	77.00	1.92	0.41	1.38	1.39	0 00:17:24
5	5	1.02	77.00	1.92	0.41	0.41	0.44	0 00:15:42

**Node Summary**

SN ID	Element Type	Invert Elevation	Peak Inflow
		(ft)	(cfs)
1 CP 1	Outfall	3258.80	0.00
2 CP 2	Outfall	3257.00	0.00
3 CP 3	Outfall	3285.00	0.00
4 CP 4	Outfall	3262.00	0.00
5 CP 5	Outfall	3257.00	0.00

### Project Description

File Name ..... 13065 SSA SCS-Post-Development.SPF

### Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... SCS TR-55  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Hydrodynamic  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods .... NO

### Analysis Options

Start Analysis On ..... Sep 29, 2015 00:00:00  
 End Analysis On ..... Sep 30, 2015 00:00:00  
 Start Reporting On ..... Sep 29, 2015 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
 Routing Time Step ..... 30 seconds

### Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1		Time Series	SCS 10-Year	Cumulative	inches	Arizona	Yavapai (North)	10	2.64	SCS Type II 24-hr

**Subbasin Summary**

SN	Subbasin ID	Area	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		(ac)		(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
1	1	9.08	80.00	2.64	0.99	8.96	10.89	0 00:18:00
2	2	18.41	74.00	2.64	0.69	12.68	15.21	0 00:13:30
3	3	2.74	74.00	2.64	0.69	1.69	2.35	0 00:12:12
4	4	3.41	77.00	2.64	0.83	2.83	3.17	0 00:17:24
5	5	1.02	77.00	2.64	0.83	0.85	0.99	0 00:15:42

## Node Summary

SN Element ID	Element Type	Invert Elevation	Peak Inflow
		(ft)	(cfs)
1 CP 1	Outfall	3256.80	0.00
2 CP 2	Outfall	3257.00	0.00
3 CP 3	Outfall	3285.00	0.00
4 CP 4	Outfall	3282.00	0.00
5 CP 5	Outfall	3257.00	0.00

### Project Description

File Name ..... 13065 SSA SCS-Post-Development.SPF

### Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... SCS TR-55  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Hydrodynamic  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods .... NO

### Analysis Options

Start Analysis On ..... Sep 29, 2015 00:00:00  
 End Analysis On ..... Sep 30, 2015 00:00:00  
 Start Reporting On ..... Sep 29, 2015 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
 Routing Time Step ..... 30 seconds

### Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1		Time Series	SCS 25-Year	Cumulative	Inches	Arizona	Yavapai (North)	25	3.12	SCS Type II 24-hr

**Subbasin Summary**

SN	Subbasin ID	Area (ac)	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	1	9.08	80.00	3.12	1.34	12.18	14.68	0 00:18:00
2	2	18.41	74.00	3.12	0.99	18.13	22.53	0 00:13:30
3	3	2.74	74.00	3.12	0.99	2.70	3.46	0 00:12:12
4	4	3.41	77.00	3.12	1.16	3.94	4.53	0 00:17:24
5	5	1.02	77.00	3.12	1.16	1.18	1.41	0 00:15:42

**Node Summary**

SN ID	Element Type	Invert Elevation	Peak Inflow
		(ft)	(cfs)
1 CP 1	Outfall	3258.80	0.00
2 CP 2	Outfall	3257.00	0.00
3 CP 3	Outfall	3265.00	0.00
4 CP 4	Outfall	3262.00	0.00
5 CP 5	Outfall	3257.00	0.00

### Project Description

File Name ..... 13065 SSA SCS-Post-Development.SPF

### Project Options

Flow Units ..... CFS  
 Elevation Type ..... Elevation  
 Hydrology Method ..... SCS TR-55  
 Time of Concentration (TOC) Method ..... User-Defined  
 Link Routing Method ..... Hydrodynamic  
 Enable Overflow Ponding at Nodes ..... YES  
 Skip Steady State Analysis Time Periods ..... NO

### Analysis Options

Start Analysis On ..... Sep 29, 2015 00:00:00  
 End Analysis On ..... Sep 30, 2015 00:00:00  
 Start Reporting On ..... Sep 29, 2015 00:00:00  
 Antecedent Dry Days ..... 0 days  
 Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss  
 Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss  
 Reporting Time Step ..... 0 00:05:00 days hh:mm:ss  
 Routing Time Step ..... 30 seconds

### Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (Inches)	Rainfall Distribution
1		Time Series	SCS 100-Year	Cumulative	Inches	Arizona	Yavapai (North)	100	3.84	SCS Type II 24-hr

**Subbasin Summary**

SN	Subbasin ID	Area	Weighted Curve Number	Total Rainfall	Total Runoff	Total Runoff Volume	Peak Runoff	Time of Concentration
		(ac)		(in)	(in)	(ac-in)	(cfs)	(days hh:mm:ss)
1	1	9.08	80.00	3.84	1.91	17.34	21.02	0 00:16:00
2	2	18.41	74.00	3.84	1.48	27.25	34.86	0 00:13:30
3	3	2.74	74.00	3.84	1.48	4.06	5.32	0 00:12:12
4	4	3.41	77.00	3.84	1.69	5.76	6.72	0 00:17:24
5	5	1.02	77.00	3.84	1.69	1.72	2.09	0 00:15:42

## Node Summary

SN	Element ID	Element Type	Invert Elevation	Peak Inflow
			(ft)	(cfs)
1	CP 1	Outfall	3256.80	0.00
2	CP 2	Outfall	3257.00	0.00
3	CP 3	Outfall	3285.00	0.00
4	CP 4	Outfall	3262.00	0.00
5	CP 5	Outfall	3257.00	0.00

*Appendix A.4 - Hydrologic Computations*  
*USDA NRCS Soil Report*



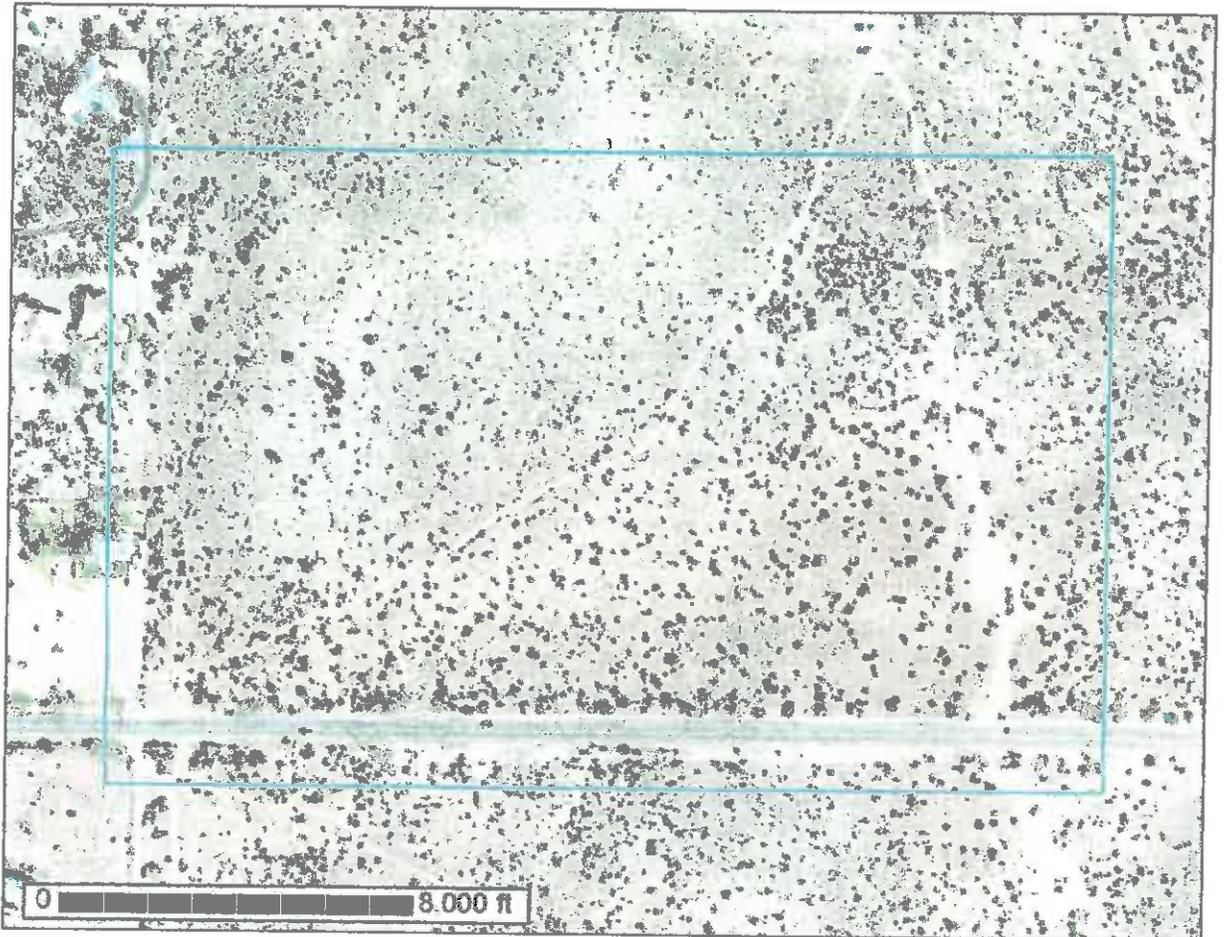
United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for Beaver Creek Area, Arizona



July 27, 2015

# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# Contents

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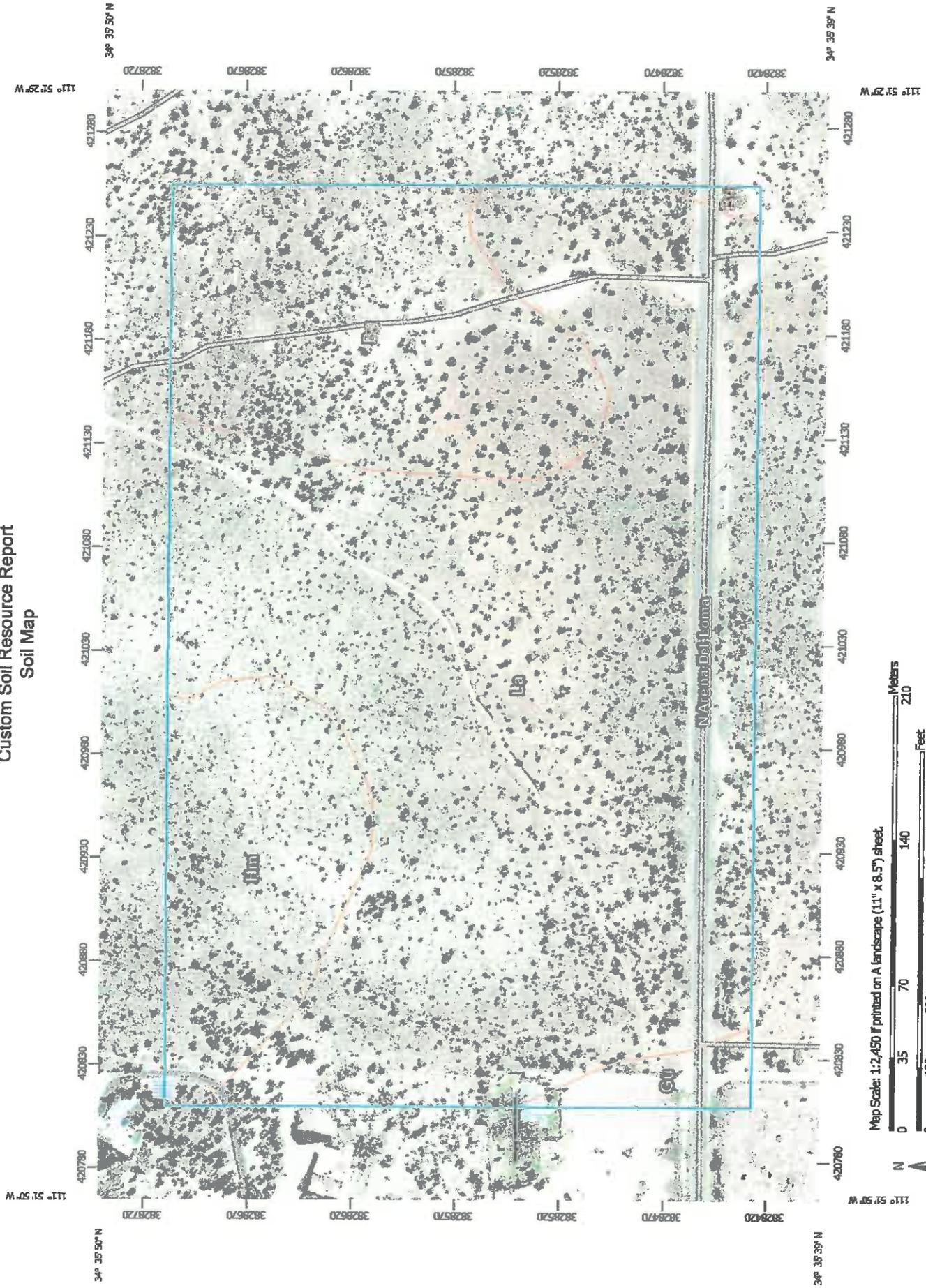
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# Soil Map

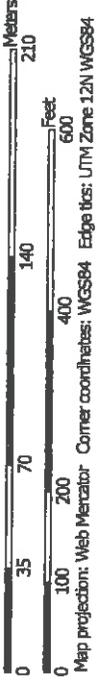
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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map



Map Scale: 1:2,450 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

## MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
 Soils	 Stony Spot
 Soil Map Unit Polygons	 Very Stony Spot
 Soil Map Unit Lines	 Wet Spot
 Soil Map Unit Points	 Other
<b>Special Point Features</b>	 Special Line Features
 Blowout	<b>Water Features</b>
 Borrow Pit	 Streams and Canals
 Clay Spot	<b>Transportation</b>
 Closed Depression	 Ralls
 Gravel Pit	 Interstate Highways
 Gravelly Spot	 US Routes
 Landfill	 Major Roads
 Lava Flow	 Local Roads
 Marsh or swamp	 Aerial Photography
 Mine or Quarry	<b>Background</b>
 Miscellaneous Water	 Background
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:31,700.

**Warning:** Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Beaver Creek Area, Arizona  
 Survey Area Data: Version 6, Sep 14, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 1, 2010—Nov 18, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map-unit boundaries may be evident.

## Map Unit Legend

Beaver Creek Area, Arizona (AZ041)			
Map Unit Symbol	Map Unit Name	Acres In AOI	Percent of AOI
Bg	Bridge gravelly sandy loam	6.0	19.2%
Gu	Guest clay	0.6	1.9%
Hm	House Mountain stony loam	3.8	12.1%
La	Laveen gravelly sandy loam	20.8	66.8%
<b>Totals for Area of Interest</b>		<b>31.2</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

## Custom Soil Resource Report

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Beaver Creek Area, Arizona

### Bg—Bridge gravelly sandy loam

#### Map Unit Setting

*National map unit symbol:* 1nvzm  
*Elevation:* 3,700 to 3,800 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Mean annual air temperature:* 57 to 63 degrees F  
*Frost-free period:* 180 to 240 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Bridge and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Bridge

##### Setting

*Landform:* Alluvial fans  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Alluvium derived from basalt and/or tuff and/or pyroclastic rock

##### Typical profile

*A - 0 to 3 inches:* gravelly sandy loam  
*Bw - 3 to 10 inches:* gravelly loam  
*Bk - 10 to 31 inches:* gravelly loam  
*Cr - 31 to 59 inches:* bedrock

##### Properties and qualities

*Slope:* 0 to 10 percent  
*Depth to restrictive feature:* 20 to 38 inches to paralithic bedrock  
*Natural drainage class:* Well drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to low (0.00 to 0.01 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 25 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 5.0  
*Available water storage in profile:* Low (about 3.8 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C

## Custom Soil Resource Report

### Gu—Guest clay

#### Map Unit Setting

*National map unit symbol:* vy1r  
*Elevation:* 3,500 to 3,900 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Mean annual air temperature:* 57 to 63 degrees F  
*Frost-free period:* 180 to 240 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Guest and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Guest

##### Setting

*Landform:* Alluvial fans  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Mixed alluvium

##### Typical profile

*C1 - 0 to 3 inches:* clay  
*C2 - 3 to 12 inches:* silty clay loam  
*C3 - 12 to 32 inches:* silty clay  
*C4 - 32 to 60 inches:* silty clay loam

##### Properties and qualities

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 10 percent  
*Gypsum, maximum in profile:* 1 percent  
*Salinity, maximum in profile:* Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 5.0  
*Available water storage in profile:* High (about 10.4 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C

## Custom Soil Resource Report

### Hm—House Mountain stony loam

#### Map Unit Setting

*National map unit symbol:* 1nw01  
*Elevation:* 3,600 to 3,800 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Mean annual air temperature:* 57 to 63 degrees F  
*Frost-free period:* 180 to 240 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*House mountain and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of House Mountain

##### Setting

*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Interfluve  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Residuum weathered from basalt

##### Typical profile

*A - 0 to 2 inches:* stony loam  
*C1 - 2 to 8 inches:* stony clay loam  
*C2 - 8 to 12 inches:* stony clay loam  
*R - 12 to 22 inches:* bedrock

##### Properties and qualities

*Slope:* 0 to 10 percent  
*Percent of area covered with surface fragments:* 25.0 percent  
*Depth to restrictive feature:* 5 to 20 inches to lithic bedrock  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Low to high (0.01 to 1.98 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 10 percent  
*Salinity, maximum in profile:* Nonsaline (0.0 to 0.5 mmhos/cm)  
*Available water storage in profile:* Very low (about 1.5 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* D

## La—Laveen gravelly sandy loam

### Map Unit Setting

*National map unit symbol:* 1nw5f  
*Elevation:* 3,800 to 4,000 feet  
*Mean annual precipitation:* 10 to 13 inches  
*Mean annual air temperature:* 57 to 63 degrees F  
*Frost-free period:* 180 to 240 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Laveen and similar soils:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Laveen

#### Setting

*Landform:* Terraces  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Alluvium derived from limestone and sandstone

#### Typical profile

*A - 0 to 3 inches:* gravelly sandy loam  
*Bk1 - 3 to 11 inches:* gravelly sandy loam  
*Bk2 - 11 to 24 inches:* gravelly sandy loam  
*Bk3 - 24 to 32 inches:* gravelly sandy loam  
*Crk - 32 to 33 inches:* bedrock

#### Properties and qualities

*Slope:* 5 to 20 percent  
*Depth to restrictive feature:* 30 to 60 inches to paralithic bedrock  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high  
(0.06 to 1.98 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 35 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 2.0  
*Available water storage in profile:* Low (about 3.2 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7e  
*Hydrologic Soil Group:* B

## Custom Soil Resource Report

# Soil Information for All Uses

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## Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

## Soil Physical Properties

This folder contains a collection of tabular reports that present soil physical properties. The reports (tables) include all selected map units and components for each map unit. Soil physical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

## Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

*Hydrologic soil group* is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>).

Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic

## Custom Soil Resource Report

soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

*Group A.* Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

*Group B.* Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

*Group C.* Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

*Group D.* Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

*Classification* of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number.

## Custom Soil Resource Report

Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

*Rock fragments* larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit and plasticity index (Atterberg limits)* indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

### References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Custom Soil Resource Report

Absence of an entry indicates that the data were not estimated. The asterisk \* denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007 (<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>).

Engineering Properties-Reaver Creek Area, Arizona																
Map unit symbol and soil name	Pct. of map unit	hydrologic group	Depth	USDA texture	Classification		Fragments				Percentage passing sieve number--			Liquid limit	Plasticity index	
					Unified	AASHTO	>18 inches	2-18 inches	4	10	40	200				
Bg--Bridge gravelly sandy loam			In													
Bridge	100	C	0-3	Gravelly sandy loam	SC, CL-ML	A-6, A-4	0-1-3	0-2-3	70-75-80	65-70-75	55-60-70	35-45-55	20-35-40	5-15-20		
			3-10	Gravelly sandy clay loam, gravelly loam, gravelly sandy loam	SC, CL-ML	A-4, A-6	0-1-3	0-2-3	75-80-85	70-75-80	60-65-75	40-50-60	20-35-40	5-15-20		
			10-31	Gravelly sandy clay loam, gravelly loam, gravelly sandy loam	SC, CL-ML	A-6, A-4	0-1-3	0-2-3	70-75-80	65-70-75	55-60-70	35-45-55	20-35-40	5-15-20		
Gu--Guest clay			31-59	Bedrock												
Guest	100	C	0-3	Clay	CH	A-7	0-0-0	0-0-0	100-100-100	100-100-100	95-98-100	85-90-95	50-55-60	25-28-30		
			3-12	Silty clay loam	CH	A-7	0-0-0	0-0-0	100-100-100	100-100-100	95-98-100	85-90-95	50-55-60	25-28-30		
			12-32	Silty clay	CH	A-7	0-0-0	0-0-0	100-100-100	100-100-100	95-98-100	85-90-95	50-55-60	25-28-30		
			32-60	Silty clay loam	CL	A-6	0-0-0	0-0-0	100-100-100	100-100-100	95-98-100	80-85-90	30-35-40	20-23-25		

Custom Soil Resource Report

Engineering Properties-Beaver Creek Area, Arizona														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
Hm—House Mountain stony loam			In				Pct	Pct					Pct	
House mountain	100	D	0-2	Stony loam	GM, ML	A-4, A-2	5-10-20	0-5-10	70-75-85	65-70-80	50-60-70	30-40-50	30-35-40	5-10-15
			2-8	Stony clay loam, stony loam, clay loam	GC, SC	A-2, A-4	5-10-20	0-5-10	60-85-90	50-60-80	40-45-50	30-35-40	30-35-40	5-10-15
			8-12	Stony clay loam, stony loam, clay loam	SC, GC	A-2, A-4	5-10-20	0-5-10	60-85-90	50-60-80	40-45-50	30-35-40	30-35-40	5-10-15
			12-22	Bedrock	—	—	—	—	—	—	—	—	—	—
La—Laveen gravelly sandy loam														
Laveen	100	B	0-3	Gravelly sandy loam	SC-SM, SC	A-4, A-2	0-0-0	0-0-0	75-88-100	70-75-100	40-45-70	25-30-60	20-25-30	5-7-10
			3-11	Gravelly sandy loam, fine sandy loam, loam	SC-SM, SC	A-4, A-2	0-0-0	0-0-0	75-88-100	70-75-100	40-45-70	25-30-60	20-25-30	5-7-10
			11-24	Gravelly sandy loam, fine sandy loam, loam	SC-SM, SC	A-4, A-2	0-0-0	0-0-0	75-88-100	70-75-100	40-45-70	25-30-60	20-25-30	5-7-10
			24-32	Gravelly sandy loam, fine sandy loam, loam	SC-SM, SC	A-4, A-2	0-0-0	0-0-0	75-88-100	70-75-100	40-45-70	25-30-60	20-25-30	5-7-10
			32-33	Bedrock	—	—	—	—	—	—	—	—	—	—





October 14, 2015

GBE Project: 13065.001

Mr. Ron Long, PE  
 Director of Public Works  
 Town of Camp Verde  
 395 South Main Street  
 Camp Verde, Arizona 86322

**Re: Traffic Memorandum  
 Castle Heights 12 Lot Subdivision, Portion of APN 408-18-181C**

Dear Mr. Long:

We are providing this Traffic Memorandum for your use in review of the proposed Castle Heights Subdivision.

**Background:**

The Castle Heights Subdivision is a small 12 lot subdivision proposed northeast of the intersection of North Arena Del Loma Road and North Montezuma Castle Road. The site is comprised of approximately 20 undeveloped acres. The zoning for the site is R1L-70 with minimum lot sizes of 70,000 square feet. The proposed land use is in conformance with the Town's existing Land Use Master Plan and zoning designation. The subdivision is proposed with two short cul-de-sac streets which will each serve six lots.

**Existing Traffic Conditions:**

Primary access to the site will be Arena Del Loma Road with the majority of traffic anticipated to use Montezuma Castle Road to travel north or south from the development. Both roads are two-lane roads. Traffic at the tee intersection of the two roads is controlled by a stop sign on Arena del Loma Road. Both roads are posted for 35 MPH. Project traffic volumes for the two roads were developed for the years 2015 and 2030 in the Verde Valley Multimodal Transportation Study (VVMTS).

Daily traffic volumes were forecasted as follows:

	2015 Forecast	2030 Forecast	Capacity Evaluation
N. Arena Del Loma	2318	3923	Under Capacity
N. Montezuma Castle Hwy.	7002	7377	Near Capacity

**Proposed Conditions:**

Traffic generation from the new subdivision is limited to 12 single family residences. The Institute of Traffic Engineers, Trip Generation Manual, 9<sup>th</sup> Edition, standard traffic generation rates for a single family detached housing (Code 210), were referenced to develop the following trip forecasts.

**ITE Standard Trip Rates**

Average Weekday = 9.52 trips per home (distribution 50% in/50% out)  
AM Peak Hour = 0.75 trips per home (distribution 25% in/75% out)  
PM Peak Hour = 1.00 trips per home (distribution 63% in/37% out)

**Forecasted Trip Generation**

Average Weekday = 12 Homes x 9.52 trips = 114.24 trips per day  
AM Peak Traffic = 12 Homes x 0.75 trips x 0.75 outbound = 6.75 movements per hour  
PM Peak Traffic = 12 Homes x 1.00 trips x 0.63 inbound = 7.56 movements per hour  
AM Peak Traffic per Cul-de-Sac = 6 Homes x 0.75 trips x 0.75 outbound = 3.375 movements per hour  
PM Peak Traffic per Cul-de-Sac = 6 Homes x 1.00 trips x 0.63 inbound = 3.78 movements per hour

**Other Conditions:**

A preliminary review of sight distance conditions was conducted using the guidelines set forth in the American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, Rural Streets Exhibit 3.1, Stopping Sight Distances. Based on a road design speed of 45 mph on North Arena del Loma Road, a preliminary design stopping distance of 360 feet was determined. The sight distance is available in both directions at the intersection of the proposed Cul-de-Sac streets.

A preliminary review of the turning movements was conducted using guidelines set forth in the Arizona Department of Transportation (ADOT) Traffic Engineering Policies, Guidelines and Procedures Section 200. The large majority of the movements is expected to be to and from North Montezuma Castle Highway due its direct access to the Camp Verde business district and Interstate 17. Few if any left turn movements are anticipated from the eastbound lane of North Arena del Loma and all peak hour movements were assumed to and from the east. Up to 4 right hand turning movements are forecasted from North Arena del Loma Road during the peak hour for each Cul-de-Sac. No warrant for a right hand turn is triggered due to the low number of movements.

**Conclusion:**

- 1) The proposed development does not intersect a County or State Highway and no coordination is required with an outside agency.
- 2) No significant changes in land use designations are proposed for the development. Higher density zoning is not being sought.
- 3) No Town arterial highway access is requested.
- 4) The proposed activity will not significantly impact vehicular traffic.
- 5) Significantly less than 100 vehicular trips are generated during the AM or PM peak hours.
- 6) Sight distance conditions are met for the design road speeds.
- 7) No turn warrants have been identified for the proposed condition.

Based on the limited impact of the proposed development and low threshold of traffic generation, we do not recommend a traffic impact analysis for the proposed development.

If you have any questions or comments regarding this memorandum, please feel free to contact our office directly.

Sincerely,



James Binick, P.E.  
Granite Basin Engineering, Inc.

John Bassous  
Tierra Verde Holdings  
PO Box 2898  
Camp Verde, AZ 86322

December 15, 2015

Town of Camp Verde  
Planning and Zoning Department

RE.: Letter of Waiver

As the Owner of the proposed Castle Heights sub-division, I am pleased to submit this application for Preliminary Approval. I have spent two (2) years talking with many community leaders and individual citizens seeking their input as to what would be the best use of this pristine property. After much discussion and many revisions, you have before you what should be one of Camp Verde's finest locations to live...breathtaking views, large lots, easy access to Forest Service and a rural atmosphere. I am confident that this sub-division will attract the *attention of those wanting to call Camp Verde home!*

In keeping with the rural theme, I am requesting a waiver for curbing and gutters. The intent is to create a low density subdivision which lends itself to rural living and will not look like a "city" lot. We want the natural vegetation and land contours to be the focus, not sterile concrete. In addition, each lot being almost 1.7 acres and only 12 lots total, the drainage issues are significantly less than higher density subdivisions. We have addressed the drainage plan elsewhere demonstrating that curbing and gutters are not necessary. Finally, this would allow for a consistency within the Town of other sub-divisions which retain the rural atmosphere.

Thank you for your consideration,

A handwritten signature in black ink, appearing to read 'JEB', with a long horizontal flourish extending to the right.

John Bassous



RESIDENTIAL AND COMMERCIAL CONTRACTOR  
PO BOX 2898 CAMP VERDE, AZ 86322 (928) 567-2477  
ROC 261021

3.2.2016

To: Town of Camp Verde

RE.: Letter of Exemption for Fire Sprinklers/Adequate water supply for the proposed Castle Heights Subdivision

As the Owner of the property on which the proposed Castle Heights Subdivision is to be located, I am requesting that an exemption be granted by the Town of Camp Verde for fire sprinklers/adequate water supply for the following reasons:

#### **OPTIONS & FINANCIAL BURDEN**

**EXTEND WATER MAIN-** This property is in the Camp Verde Water service area but without a water supply. The closest water main is 8000 feet away. The cost would exceed \$500,000 to get water to the proposed 12 lot subdivision. This would cost approximately \$41, 600 per lot to provide water to the lot line and another \$8,000 to install the actual system.

**SUBDIVISION STORAGE TANK-** This would require the installation of a large well (in addition to each lot well), a 120,000 gallon storage tank with a pump, and distribution of water to several hydrants. The cost would range from \$350,000 - \$500,000.

**INDIVIDUAL STORAGE TANKS-** Each lot would have its own storage tank, pump and overhead system. The cost would range from \$10,000 - \$15,000 per house. This requires annual inspections and other maintenance costs which adds additional burden to the home owner.

While all these are options, the cost would be so great that the project would be cancelled due to financial impracticality.

#### **CODE FLEXIBILITY**

Our current code allows for flexibility. Section B103.1 clearly states that "the Fire Chief is authorized to reduce the fire flow requirements for isolated buildings or a group of buildings in a rural area or small communities where the development of full fire flow requirements is impractical" It is within our own adopted codes to reduce the requirements where deemed impractical.

#### **COMMUNITY PERCEPTION**

Our Town has made it clear through abundant public meetings and the General Plan that it wants to preserve its rural nature and where possible and encourage low density development. Castle Heights wants to do exactly that with 12 lots spread out over 20 acres. Subdivisions with rural design and intent are usually located

away from traditional utility sources. It only is logical that you cannot always have rural design features and provide all the luxuries of urban America.

### **CURRENT BUILDING CODES**

Under our current building code, construction methods which minimize fire hazards are already in place. There are many current and innovative materials and methods that are ignition resistant and minimize fire hazard. These features along with defensible space planning create safe buildings. Statistics are clear that today's buildings are extremely safe. We know that Fire Departments receives significantly fewer fire calls today than twenty years ago. I am not aware of any individual that frets over not having a fire sprinkler system in their home or refuses to purchase a home because it does not have a sprinkler! I believe that there is sufficient amount of fire protection built into our adopted building code.

### **ADEQUATE WATER SUPPLY**

There are multiple fire hydrants within 3 minutes of this subdivision and the Camp Verde Fire District does have a pumper truck to utilize in similar situation around Camp Verde. Castle Heights subdivision would have the same level of fire protection as every other house in Camp Verde that does not have a fire sprinkler and is not located within 600 feet of a fire hydrant!

The current ISO rating for the Camp Verde Fire District is 10. (Those areas beyond a five mile distance of a fire station) This means that it is common practice and understood that a fire district located in a rural area with the ISO rating of 10 will have to haul water. (Versus Phoenix which is rated at 1 due to its extensive water line distribution.) Our current Fire District employs a large capacity water tender vehicle as well as a new engine company. In addition, they receive mutual aid from Rimrock, Lake Montezuma, Sedona and Verde Valley Fire

### **GOOD BUSINESS PRACTICE**

What is proposed before you today is an upper scale subdivision which will attract buyers who desire the rural atmosphere. Construction of Castle Heights subdivision will provide jobs for over 300 individuals who are primarily based in Camp Verde. It will generate over \$8,000,000 new dollars to this community. In turn, this subdivision will encourage businesses to locate to the adjacent property, resulting in an increase of sales tax revenue to the Town which you as a Council voted to convert to C-2.

Choosing to impose unnecessary restrictions chokes out development. Land owners often seek the path of least resistance, legally splitting a large parcel into lesser parcels, creating dirt roads and unplanned development, resulting in lesser property taxes which decrease the potential revenue for the variety of different districts, including the Camp Verde Fire District, who would still be required to service this area.

I am asking you to carefully consider your decision as it can and will have a profound impact on Camp Verde.

Respectfully,



John Bassous

March 2, 2016

Town of Camp Verde  
473 South Main Street, Suite 102  
Camp Verde, Arizona 86322

***Re: Castle Heights Subdivision***

We have prepared this letter in response to comments from the Camp Verde Fire District (CVFD) at the Project Review Meeting on February 1, 2016. We understand that the Camp Verde Fire District has adopted the 2012 version of the International Fire Code (IFC) and that water supply for fire protection is a principal concern for the Castle Heights Subdivision. We appreciate the concern for fire safety and just want to emphasize that Section B103.1 of the IFC allows for decreases in fire-flow requirements under appropriate circumstances. Given the rural nature of the project and the Camp Verde community in general, *"...the fire chief is authorized to reduce the fire-flow requirement [in rural areas] where the development of full fire-flow requirements is impractical."*

Additionally, Section B103.3 cites *NFPA 1142* and the International Wildland-Urban Interface Code for areas without water supply systems. NFPA 1142 lists *occupancy hazard, construction type, structure dimensions and exposures* as principal requirements for estimating minimum water supplies. Single family residences are not listed in the *occupancy hazard* classification system; the most similar occupancy would be apartments which are considered light hazard. In regard to *construction type* the current building code integrates fire safety, regardless of *structure dimension*, with building requirements such as fire blocking, type x drywall (fire rated gypsum), elevated water heaters, smoke detectors, arc fault breakers and minimum clearances for flues and chimneys. These construction features along with defensible space planning and passive fire safety measures result in low fire potential. Furthermore, given the size of the lots (minimum 1.61 acres) *exposures* are minimal and can be completely discounted with a 50-ft minimum separation between structures.

The *International Wildland-Urban Interface Code* lists *access* and *water supply* as primary objectives. The standard also recommends *ignition resistant building materials* and *defensible space* as primary measures to prevent the spreading of fires. *Access* to the subdivision is from two (2) paved cul-de-sacs less than 500-ft in length. The streets will have a paved width of 24-ft with 28-ft turn radii and 96-ft diameter cul-de-sacs to facilitate fire truck access. A centralized water distribution system is not attainable for the Castle Heights Subdivision although sufficient *water supply* and firefighting resources are available from CVFD. The current building code already requires *ignition resistant building materials* and additional requirements will be integrated with the Final Plat to ensure each lot owner maintains *defensible space* around residential building structures.

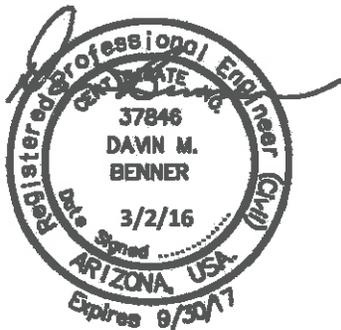
The nearest *water supply* is about 1-1/2 mile from Castle Heights and the development cost to extend the water distribution system is not financially viable for a 12-lot residential subdivision. Residential fire sprinkler systems are an accepted alternative to a centralized water distribution system but these types of systems are considerably expensive to install, especially on private well systems, and require perpetual ongoing maintenance and regular inspections to ensure proper operation. We believe *passive fire safety measures* are a more practical and effective solution given the circumstances, and we believe this is a more suitable approach.

Given the rural nature of the project and surrounding community, and considering the fact that a centralized water distribution system is not attainable, the developer is willing to impose additional requirements on the 12 single family lots to enhance fire safety. Specifically, the developer would revise the Preliminary Plat submittal to include the following items.

- *Increase side setbacks on all lots from 7-ft to 25-ft*
- *Incorporate the following supplementary building conditions on all lots*
  - *Minimum 50-ft separation between all structures*
  - *Defensible space requirements*

Please let us know if you would be agreeable to these concessions as a condition of approval.

Sincerely,



Davin Benner, P.E.  
Granite Basin Engineering, Inc.



KAREN L. REINHOLD, LUTCF, Agent  
Auto – Life – Health – Home and Business

400 Finnie Flat Road, Suite 2  
Camp Verde, Arizona 86322  
Phone: (928) 567-3374  
Fax (928) 567-6538

February 29, 2016

Town of Camp Verde  
RE: Subdivision to be built by Tierra Verde Builders  
John Bassous, President

To Whom it May Concern:

I have been a State Farm Agent for over 30 years, and in Arizona since 1997. I was asked to give my professional opinion on the economic value versus cost of interior sprinkler protection for homes built in Camp Verde.

Sprinklers, like alarm systems, can bring peace of mind to the homeowner. However, I have never seen either justify their expense. On a home, if sprinklers are in every room of the home, including bathrooms, closets, attics and attached structures, the savings is 7% of the annual premium. For example, if a homeowner's premium is \$1000 per year, he would save \$70 per year. If sprinklers are only in the main rooms (not attics, closets, etc.), the savings is only 2%, so that same homeowner would only save \$20 per year having the sprinklers. Given that the cost to install these devices is \$10,000 to \$15,000 per home, a resident could not possibly live long enough to recoup that expense. In addition, having this expense built into the cost of the home would be a disadvantage to the builder, the buyer, and eventually the seller. The discount is quite small, which reflects the small benefit the sprinklers provide in terms of fire protection.

Please feel free to contact me should you have further questions.

Sincerely,

Karen L. Reinhold, Agent  
State Farm Insurance



**Town of Camp Verde**  
**Michael Jenkins**  
Community Development Director  
473 S. Main St., Suite 108 & 109  
Camp Verde, AZ 86322  
Tel: (928) 554-0051  
Fax: (928) 567-7401  
Email: [mike.jenkins@campverde.az.gov](mailto:mike.jenkins@campverde.az.gov)

**MEETING TRANSMITTAL FORM**

**PROJECT REVIEW MEETING – CASTLE HEIGHTS PRELIMINARY PLAT**

**Meeting Date: Monday, February 1, 2016**

- **Note:** There are (2) forms of communication from the participants for this Project Review Meeting. The first form of comments comes as written statements from Town Staff and Agencies. These written comments are attached at the end of the cursory Agency verbal comments to follow. If you have any questions on these comments, please contact the Community Development Department directly at the information listed above.

**MEETING PARTICIPANTS VERBAL COMMENTS**

**ARIZONA PUBLIC SERVICE (APS)**

Representative: There was no representative present from Arizona Public Service (APS) at this meeting. Written comments received from APS indicate that there are no comments at this time. Please see attached written comments for contact information.

**TOWN OF CAMP VERDE COMMUNITY DEVELOPMENT, BUILDING DIVISION**

Representatives: Robert Foreman, Building Official  
Emily Diver, Residential Building Inspector/Permit Technician  
E-Mail: [robert.foreman@campverde.az.gov](mailto:robert.foreman@campverde.az.gov); [emily.diver@campverde.az.gov](mailto:emily.diver@campverde.az.gov)  
Phone: 928-554-0061; 928-554-0064

**Verbal Comments:** There were no additional verbal comments given to the applicant at this time. Please see attached written comments.

**TOWN OF CAMP VERDE COMMUNITY DEVELOPMENT DEPARTMENT**

Representatives: Michael Jenkins, Community Development Director  
Kendall Welch, Assistant Planner & Addressing Official  
E-Mail: [mike.jenkins@campverde.az.gov](mailto:mike.jenkins@campverde.az.gov); [kendall.welch@campverde.az.gov](mailto:kendall.welch@campverde.az.gov)  
Phone: 928-554-0051; 928-554-0053

**Verbal Comments:** Mr. Jenkins indicated that the applicant will need to add a cross section of the streets to the preliminary plat. Mrs. Welch indicated to the applicant that the proposed street names are in direct conflict with existing road names located within Yavapai County. The applicant will need to propose alternative street names. The applicant should reference the attached available and unavailable street names spreadsheet, as well as utilize the "Road Name" search function located on Yavapai County's website (<http://gis.yavapai.us>). The applicant should reference attached written comments for further information and contact information.

#### **TOWN OF CAMP VERDE PUBLIC WORKS DEPARTMENT**

**Representatives:** Ron Long, Town Engineer  
E-Mail: [ron.long@campverde.az.gov](mailto:ron.long@campverde.az.gov);  
Phone: 928-554-0823; 928-554-0826

**Verbal Comments:** Mr. Long stated that his formal written comments will be forthcoming, as he has not had a chance to complete his review. Per previous discussions with Mr. Bassous, Mr. Long stated that he will support the waiver for curb and gutter and will allow the rural street section/design. Mr. Long also stated that if drainage easements and streets are to be dedicated to the Town, the language will need to be included on the plat. Formal written comments were received from Mr. Long on February 10<sup>th</sup>, 2016 and have been attached for review.

#### **TOWN OF CAMP VERDE SEWER DIVISION**

**Representative:** There was no representative present from the Sewer Division at this meeting. Written comments received from Jan Grogan indicate that there are no conflicts at this time as this property is not located within the sewer collection system. Please see attached written comments for contact information.

#### **CAMP VERDE FIRE DISTRICT**

**Representative:** Kristi Gagnon, Fire Marshal  
E-Mail: [KGagnon@campverdefire.org](mailto:KGagnon@campverdefire.org)  
Phone: 928-567-9401 ext 105

**Verbal Comments:** Mrs. Gagnon indicated that her biggest concern is for an approved water supply that is capable of supplying the required fire flow for fire protection being supplied to the proposed subdivision. Mrs. Gagnon informed the applicant that fire sprinklers are an approved alternative to the hydrant requirement. Mr. Bassous questioned how previous subdivisions such as Millwood Estates, Preserves, etc. were able to meet this requirement. Community Development Staff will research these questions and will provide an answer at a later date in time. Mr. Bassous also requested there be additional discussions on alternative requirements if necessary in order to determine the best way to move forward.

#### **CAMP VERDE WATER SYSTEM, INC.**

**Representatives:** Justin Bullard & Rick Tackitt  
E-Mail: [cwvsinc@yahoo.com](mailto:cwvsinc@yahoo.com)  
Phone: 928-567-5281

**Verbal Comments:** Mr. Bullard and Mr. Tackitt indicated that Camp Verde Water System does not service the area where the proposed subdivision will be located. Additional written comments have been provided to the applicant and have been included for review.

### **CENTURYLINK**

Representative: There was no representative present from CenturyLink at this meeting. Written comments were received from Armen McNerlin, Engineer. Please see attached comments for further details and contact information.

### **UNISOURCE ENERGY SERVICES.**

Representative: There was no representative present from UniSource Energy Services. Written comments received indicate that there are no conflicts with the proposed project.

### **YAVAPAI COUNTY DEVELOPMENT SERVICES – ENVIRONMENTAL UNIT**

Representatives: Stacey Clark; Suzanne Ehrlich

E-Mail: [stacey.clark@yavapai.us](mailto:stacey.clark@yavapai.us); [suzanne.ehrlich@yavapai.us](mailto:suzanne.ehrlich@yavapai.us)

Phone: 928-649-6210; 928-442-5409

**Verbal Comments:** Ms. Ehrlich indicated to the applicant that she would be helping Ms. Clark in processing any applications pertaining to this project from an Environmental Services Unit perspective. Ms. Ehrlich gave a brief overview of the permitting process and requirements for obtaining a Certificate of Sanitary Facilities for the subdivision. Ms. Ehrlich indicated that there is a 100 foot setback to wells; and 50 foot setback to property lines, and that all applications need to be routed through Yavapai County Development Services – Environmental Unit. Official written comments have been attached for further information.

### **YAVAPAI COUNTY FLOOD CONTROL DISTRICT**

Representative: There was no representative from the Yavapai County Flood Control District present at this meeting. Written comments received from Vickie Lewis indicate that the proposed subdivision is not located within a FEMA Designated Special Flood Hazard Area. Please see attached comments for further information.

# Sign In Sheet

<u>Name:</u>	<u>Phone</u>	<u>E-mail:</u>
Kristi Gagnon	928-567-9401 ext. 105	kgagnon@campverdefire.org
Suzanne Ehrlich	928-442-5409	suzanne.ehrlich@yavapai.us
Justin Bullard	928-567-5281	cvwsinc@yahoo.com
Rick Tackill	11	11
Stacey Clark	928-649-6210	stacey.clark@yavapai.us
Bob Simbric	928-300-2823	bobsue1948@gmail.com
Ben Bassous	928-300-9443	bbassous@tierraverdebuilders.com
JOHN BASSOUS	928 300-8804	tvbuilders@q.com
Jim Binsick	928-489-8389	jim@granitebusinessengineering.com
EMILY DIVER	928-554-0064	EMILY.DIVER@CAMPVERDE.AZ.GOV
ROBERT FOREMAN	928-554-0050	
MIKE JENKINS	928-554-0051	MIKE.JENKINS@CAMPVERDE.AZ.GOV
Kendall Welch	928-554-0053	kendall.welch@campverde.az.gov

## Kendall Welch

---

**From:** Kent.Jones@aps.com  
**Sent:** Monday, January 25, 2016 8:11 AM  
**To:** Kendall Welch; Brandon.Echols@aps.com  
**Subject:** RE: Castle Heights Preliminary Plat Comments?

Hi Kendall,

We have no comments. The proposed 12 lot subdivision is within our service territory and we have overhead facilities in the area to serve the project. The applicant will need to apply for service with APS when they are ready to be served.

Please let me know if you have any questions.

Thanks,  
Kent

*Kent E. Jones*

Sr. Customer Project Manager



Arizona Public Service Company  
1250 E. Highway 89A  
Cottonwood, Arizona 86326

**(928) 646-8469 or 873-469 Office**  
**(928) 300-0458 Cell**  
kent.jones@aps.com  
M.S. 4718

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**From:** Kendall Welch [mailto:[Kendall.Welch@campverde.az.gov](mailto:Kendall.Welch@campverde.az.gov)]  
**Sent:** Monday, January 25, 2016 8:03 AM  
**To:** Jones, Kent E; Echols, Brandon  
**Subject:** Castle Heights Preliminary Plat Comments?  
**Importance:** High

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**USE CAUTION - EXTERNAL SENDER:** ([Kendall.Welch@campverde.az.gov](mailto:Kendall.Welch@campverde.az.gov))  
Do not click on links or open attachments that are not expected.

For questions or concerns, please email the APS Information Systems Security team at

# TOWN OF CAMP VERDE



## Memorandum

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**To: Kendall Welch, Assistant Planner**  
**Cc: Sandy, Permit Technician**  
**Emily Diver, Permit Technician/Inspector**  
**Kristi Gagnon, Camp Verde Fire Marshal**

**From: Robert Foreman, Building Official**

**Date: December 30<sup>th</sup>, 2015**

**Re: Castle Heights Preliminary Plat Project #20150392**

---

Building Department has the following comments on the development review application. These comments are preliminary in nature only, and are subject to change.

- Building Division has no comments or concerns at this time. It is agreed that all new structures and utility infrastructure will be permitted through the Building Division.

Robert L. Foreman  
Building Official  
Town of Camp Verde  
473 S. Main St. Ste 108  
928-554-0050  
[Robert.foreman@campverde.az.gov](mailto:Robert.foreman@campverde.az.gov)



**Town of Camp Verde**  
**Community Development Department – Planning Division**  
◆ 473 S. Main Street, Suite 109 ◆ Camp Verde, Arizona 86322 ◆  
◆ Telephone: 928.554.0050 ◆ Fax: 928.567.7401 ◆  
◆ [www.campverde.az.gov](http://www.campverde.az.gov) ◆

February 1, 2016

RE: Castle Heights Preliminary Plat  
Application: 20150392

Mr. Bassous,

Below are my review comments for the proposed Castle Heights Subdivision Preliminary Plat.

Per Part, Section 505, Item B – Preliminary Subdivision Plat submittal Requirements, Item 6 – Proposed Streets and Easements: “Location, width and names of proposed streets, alleys, drainage ways, cross-walks, utility and access easements including all connections to adjoining platted or unplatted tracts. A typical cross-section shall be depicted on the plat where applicable describing the aforementioned improvements.”

Please add cross-section of proposed streets to preliminary plat. If streets are going to be dedicated to the Town of Camp Verde as public, please add a notation to the preliminary plat.

On Sheet 2 of the Preliminary Plat, please add a notation to the setback diagram that states “Additional drainage setbacks may apply, please see diagram below.” or similar statement.

Additional comments may be forthcoming following the outcome of today’s meeting.

Sincerely,

A handwritten signature in cursive script that reads "Michael Jenkins".

Michael Jenkins  
Community Development Director  
[mike.jenkins@campverde.az.gov](mailto:mike.jenkins@campverde.az.gov)  
(928) 554-0051



Handicap Relay: 711 or Voice: 1-800-842-4681 TTD: 1-800-367-8939





**Town of Camp Verde**  
**Community Development Department – Planning Division**  
◆ 473 S. Main Street, Suite 108 & 109 ◆ Camp Verde, Arizona 86322 ◆  
◆ Telephone: 928.554.0050 ◆ Fax: 928.567.7401 ◆  
◆ [www.campverde.az.gov](http://www.campverde.az.gov) ◆

January 28, 2016

Tierra Verde Holdings LLC  
Attn: John Bassous  
PO Box 2898  
Camp Verde, AZ 86322

RE: Review Comments:  
Preliminary Plat – Castle Heights Subdivision  
Parcel 404-18-181E

Castle Heights Preliminary Plat – Sheet 1:

- Please update “Project Information” with current APN (404-18-181E)
- Please update “300 Foot Buffer Ownership List” to include Parcel 404-18-158K, Kish Norma L, 1902 N Montezuma Hts, Camp Verde, AZ 86322
- Per discussions with the Addressing Official for Yavapai County, there is an existing Mountain Vista Drive in Cornville, AZ, as well as an existing Castle View Drive in Prescott Valley, AZ, along with a recently approved Castle Vista Court in the Village of Oak Creek. Therefore, the proposed street names are considered duplicates and alternative street names are required. Per Part Seven – Section 705 Item 1 of the current Planning & Zoning Ordinance, “Names should be appropriate, easy to read so that children in particular, can pronounce the name in an emergency situation. New streets must be named from a pool of historical locations, pioneer family names, local brands and native vegetation that is approved and updated by the Town Council and is available at the Community Development Department. OR the applicant has the option of submitting a list of alternate street names along with the Preliminary Plat for possible approval by the Council.”

Respectfully,

Kendall Welch  
Assistant Planner/Addressing Official  
(928) 554-0053  
[kendall.welch@campverde.az.gov](mailto:kendall.welch@campverde.az.gov)



Handicap Relay: 711 or Voice: 1-800-842-4681 TTD: 1-800-367-8939



# TOWN OF CAMP VERDE



## Public Works Department Review Comments

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**To:** Kendall Welch, Assistant Planner

**From:** Ron Long, Public Works Director

**Date:** February 10, 2016

**Re:** Review Comments for the Castle Heights Subdivision; Preliminary Plat, Preliminary Grading & Drainage Plans, Soils Report and Drainage Report.

---

The following comments are based upon review of the Preliminary Plat, Preliminary Grading & Drainage Plans, Soils Report, and Drainage Report for the Castle Heights Subdivision, submitted December 16, 2015. As such these preliminary documents are accepted for the Preliminary Plat and Plan approval process. The revisions can be submitted with the Final Plat.

### Summary

The Plat needs some minor revisions as noted. The Grading and Drainage plans, though adequate for a preliminary submittal, need to be revised to include the level of detail necessary for the bidding and construction of the Public and Private Improvements. The soils report is complete but the road structural section is to be determined by the Town of Camp Verde Engineering Standards. The Drainage Report is also adequate for a preliminary submittal but needs to be completed to the Yavapai County Drainage Manual Phase III level for the Final Plat and Plat submittal.

### Review Comments

#### Preliminary Plat

#### Sheets 1 & 2

1. Provide language for the dedication of the drainage easements to the HOA to maintain in perpetuity.
2. Add the revised Typical Roadway Section Detail to the Plat.

## Grading & Drainage Plans

### **Sheet 1**

1. Revise the Plan Set Title to Include Street Improvements and Stormwater Pollution Prevention Plan (SWPPP).

### **Sheet 2**

2. **GENERAL NOTES**; all notes must refer to the Town of Camp Verde as the governing body that will be responsible for; reviewing & approving plans and issuing permits for this project. Yavapai County is responsible for the wells, septic, & FEMA flood control issues only.
3. **MATERIALS AND WORKMANSHIP**; Revise this note to state “. . . shall comply with the current Town of Camp Verde Standards . . .” & MAG. Remove the reference to Yavapai County Standards & YC Resolution 10-36.
4. **FINAL ACCEPTANCE**; Remove the reference to Yavapai County.
5. **STREET CLOSURES**; Any street closures or work within the Town ROW require a permit from the Town of Camp Verde Public Works Department. Any closure or work in the street will require the submittal of a Traffic Control Plan for approval prior to the start of work.
6. **PAVING NOTES**; Remove the reference to YAG Section 345 and replace it with “. . .Per Town of Camp Verde Engineering Standards”.
7. **CHIP SEAL COAT**; Remove references to YAG and replace with the appropriate MAG Standard section 330
8. Provide a "Estimated Quantities Section" for the Improvements.
9. Revise the "Typical Roadway Section" detail to reference the MAG Std. Dtl.201 Type A for the thickened edge section.  
Also add a note to the detail for the roadway structural section to be 3" AC over 9" AB per the Town of Camp Verde Engineering Standards Section 512D.  
*Note; the WTI soils report for this project provided the data used to determine the road structural section of 3"AC/9"AB based on Town of Camp Verde standard 512D.*

### **Sheets 3, 4, & 5**

10. Add the size of the existing drainage pipe under Arena Del Loma. *According to the drainage report it is a 27" diameter steel pipe.*
11. More detail is required for the detention basin outlets as to outlet design size and location. Include a basin & outlet design for sub-basin 3.
12. Provide an SWPPP for this development the notes/details can be included on sheets 3-5.
13. Provide construction notes and estimated quantities for the construction of the improvements.

## Grading & Drainage Report

1. Complete the Phase III drainage report for this project and incorporate the basin and outlet structure design/requirements to the plans.



## **Camp Verde Sanitary District**

P.O. Box 1205  
1000 E State Rte 260  
Camp Verde, AZ 86322-1205  
Phone (928) 567-6794 Fax (928) 567-8832  
Email [jan@campverdesewer.com](mailto:jan@campverdesewer.com)

1/5/2016

Town of Camp Verde  
Community Development Department

RE: Project Review Form  
Project Number 20150392  
Castle Heights Preliminary Plat  
404-18-181E

This property is not located within the sewer collection system.

I have no conflicts with this project.

*Jan Grogan*

Jan Grogan  
928-567-6794  
Manager  
Sewer Department  
Town of Camp Verde

## Camp Verde Fire District

26 B Salt Mine Road  
P.O. Box 886  
Camp Verde, Arizona 86322

Phone: 928.567.9401  
Fax: 928.567.2444  
www.campverdefire.org



January 6, 2016

### PRELIMINARY PLAT APPLICATION COMMENTS

*This review is based on: 2012 International Fire Code and 2012 International Building Code.*

#### PROJECT

CASTLE HEIGHTS SUBDIVISION  
PRELIMINARY PLAT  
404-18-181E  
CAMP VERDE, AZ 86322

#### CONTACT

JOHN BASSOUS  
928-567-2477

1. All portions of the fire apparatus access roadway must meet the minimum standards of the IFC:
  - a. Fire apparatus access roads with a width less than 26 feet shall be marked with permanent "NO PARKING – FIRE LANE" signs on both sides. Signs shall measure 12 inches by 18 inches, have red letters on a white background, and shall comply with Federal Department of Transportation Standards for R8-31.
  - b. All weather access roadway for use of heavy firefighting apparatus shall be provided to the immediate job site at the start of construction.
  - c. The temporary fire access route shall be at least twenty (20) feet in width, shall have an unobstructed vertical clearance of at least thirteen feet, six inches (13' 6"), and shall be capable of supporting the imposed load of fire apparatus weighing up to seventy-five thousand (75,000) pounds.
  - d. All temporary fire access routes, where required, shall be maintained until all construction is completed. Permanent fire apparatus access routes shall be completed prior to occupancy.
  - e. Arrangements shall be made to assure immediate Fire District access to the site at all times during construction. This may include signage as required by the Fire Code Official.
  
2. IFC 507.1 - An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings, or portions of buildings are hereafter constructed or moved into or within the jurisdiction.

Per the adopted Fire Protection Development Standards based on the 2012 IFC:

  - A water source capable of supplying the required fire flow, either temporary or permanent, shall be made available prior to combustible materials being brought on to the construction site.
  
  - Temporary water supply arrangements shall have prior approval of the Fire Code Official. If a municipal or private water service is used, all connections shall have prior approval.

## Camp Verde Fire District

26 B Salt Mine Road  
P.O. Box 386  
Camp Verde, Arizona 86322

Phone: 928.567.9401  
Fax: 928.567.2444  
www.campverdefire.org



- The minimum required fire flow for any newly developed area shall be as follows:

- o One-and two-family unit developments 1000 gpm\*  
\*Gallons per minute at twenty (20) psi for a two (2) hour duration.

**Exception:** The Fire Code Official may allow fire flows in isolated residential developments to be met by requiring fire sprinklers in all buildings and residences when fire flows cannot be met by water storage and fire hydrants.

- The delivery of the required fire flow by private water systems is permissible, provided that:
  - a. The design and installation are based on sound engineering principles and nationally recognized good practice. NFPA Standard 24, Current Edition, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances," shall be used. The system shall be designed and engineered to meet the required fire flows as established by the Fire Code Official. Engineering calculations to verify the anticipated flows shall be submitted at the time of plan review.
  - b. Provisions shall be made to keep reservoirs and tanks full and in a ready condition at all times utilizing a float system and back up generators.
  - c. The water supply shall be capable of delivering the required fire flow as required by the Table in Section 5.02-3.

Additional requirements may be forthcoming during the final plat review and once the building plans have been submitted.

**PLANS ARE NOT APPROVED.** Failure to identify a code violation during this process of the plan review **DOES NOT** give the permit applicant the right nor authority to violate the code. **The final installation and construction must be in accordance with the International Fire Code.**

Please feel free to contact me at (928) 567-9401 ext. 105, should you have any questions.

Sincerely,

Kristi Gagnon  
Fire Marshal

**CAMP VERDE WATER SYSTEM**

**499 S. 6<sup>th</sup> ST.**

**P.O. BOX 340**

**CAMP VERDE, AZ 86322**

**(928) 567-5281**

Date: January 6, 2016

Kendall Welch, Asst. Planner

Town of Camp Verde

473 S. Main Street

Camp Verde, AZ 86322

RE: Castle Heights Subdivision

Name: John Bassous

Parcel Number: 404-18-181E

Dear Mr. Welch:

This area is in our Certificate of Convenience and Necessity (CC&N) issued by the Arizona Corporation Commission (ACC). We are regulated by the ACC and are required to follow their Rules and Regulations. We have an exclusive right to serve entities requesting service in our CC&N.

We do not currently serve this parcel and we do not have waterlines in this area. We could serve this parcel with an Advanced in Aid of Construction Agreement to extend a water main to the property.

The property owner can provide water to serve its interest as long as they do not charge for the water provided. To charge for water use is an illegal act. Further, if the developed area has more than 25 people per day being there, the water system is a Community Water System and must comply with all of the chemical analysis for providing water and have a Certified Operator maintain the water system. We comply with these requirements and are willing to provide water service to this area.

We have no objection for the approval of the requested use permit. If you have any questions or need additional information, please call me at the number above.

Sincerely,



Justin R. Bullard

Vice President

Camp Verde Water System, Inc.

## Kendall Welch

---

**From:** Mcnerlin, Armen <Armen.Mcnerlin@centurylink.com>  
**Sent:** Monday, January 25, 2016 7:56 AM  
**To:** Kendall Welch  
**Subject:** RE: Project number 20150388

My only comment for Castle Heights would be, if approved, to send a PDF file of the subdivision plat and a PDF copy of the APS plans for providing power as soon as possible. I have to submit both to a review group in Phoenix before I can design any facility placement.

Thanks and have a great day,

Armen McNerlin  
Engineer II  
office 928-634-2102  
cell 928-821-4609  
armen.mcnerlin@centurylink.com



*The difference between the impossible and the possible lies in determination.*

---

**From:** Kendall Welch [mailto:Kendall.Welch@campverde.az.gov]  
**Sent:** Monday, January 25, 2016 7:46 AM  
**To:** Mcnerlin, Armen  
**Subject:** RE: Project number 20150388  
**Importance:** High

Thank you. Did you have any comments on the Castle Heights Preliminary Plat application that I mailed over on 12/23/15? Project 20150392?

*Kendall Welch*

Assistant Planner/Administrative Assistant  
Addressing Official  
Community Development Department  
E-Mail: [kendall.welch@campverde.az.gov](mailto:kendall.welch@campverde.az.gov)  
Phone: (928) 554-0053  
Fax: (928) 567-7401

Town of Camp Verde  
473 S. Main St. Ste. 108  
Camp Verde, AZ 86322  
Website: [www.campverde.az.gov](http://www.campverde.az.gov)  
Or Check Us Out On Facebook: Town of Camp Verde Community Development Department

## Kendall Welch

---

**From:** IFreeman@uesaz.com  
**Sent:** Wednesday, January 06, 2016 9:45 AM  
**To:** Kendall Welch  
**Cc:** RMartin@uesaz.com  
**Subject:** Project #20150392 Castle Heights Subdivision

Unisoure Energy Services has no conflicts with this project, there is no natural gas.

Irene Freeman  
Planner

---

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Please consider our environment before printing this email. 

# Yavapai County Development Services

## Prescott Office

1120 Commerce Dr., Prescott, AZ 86305  
(928) 771-3214 Fax: (928) 771-3432



## Cottonwood Office

10 S. 6<sup>th</sup> Street, Cottonwood, AZ 86326  
(928) 639-8151 Fax: (928) 639-8153

Addressing – Building Safety – Customer Service & Permitting – Environmental – Land Use – Planning

---

To: The Town of Camp Verde  
Community Development Department

From: Stacey Clark, RS  
Yavapai County Development Services- Environmental Unit  
(928) 649-6210

Date: January 21, 2016

RE: Castle Heights Subdivision Preliminary Plat 20150392- 404-18-181E

I will be attending the project review meeting for the Castle Heights Subdivision preliminary plat. Below are my comments:

The applicant will need to provide the following information to comply with the requirements of the Arizona Department of Environmental Quality delegated rules:

### Onsite wastewater-

- Request for registration of a site investigation is not complete; therefore, it is unclear if additional testing will be required.
- The applicant will be required to submit a Geological Report prepared by an Arizona Registered Engineer, Registered Geologist, or registered Sanitarian. Reports of site investigations conducted in accordance with Arizona Administrative Code (AAC) R18-9-A310 and AAC R18-5-Article 4 must be included in the geological report. If it appears that a majority of the tested lots will require alternative systems the applicant will need to either test an additional 25% of the lots in order to make a better determination of the suitability for conventional systems or agree that a provision of the Approval of Sanitary Facilities for Subdivisions, which is included in the Arizona Department of Real Estate (ADRE) public report, will let buyers know that they can expect to need an alternate system in order to develop their property and the possible costs of such systems.
- No nitrogen management calculations were provided; however, I do not see this being a problem at this time according to AAC R18-9-A309.A.8. Calculations will, however, need to be provided in the required soils report.

### Certificate of Sanitary Facilities for Subdivisions-

- Application and fees (\$752.50 plus \$3.00 per lot, not to exceed \$1,052.50) for Approval of Sanitary Facilities for Subdivisions.
- Completed Solid Waste Agreements- utility service agreement; 1 from the collector and 1 from the landfill.
- Plat that is ready for recordation and includes the necessary dedication and acknowledgment notes.

## Kendall Welch

---

**From:** Vickie Lewis <Vickie.Lewis@yavapai.us>  
**Sent:** Monday, January 25, 2016 9:15 AM  
**To:** Kendall Welch  
**Subject:** RE: Review Comments for Castle Heights Preliminary Plat (20150392)

Yavapai County does not have any input for this project as it is not located within a FEMA-Designated Special Flood Hazard Area. However, Public Works should definitely be requiring SWPPP and NOI as a part of any grading that occurs. This is a hillside area and the area of disturbance exceeds both 1 acre and 5 acres. It also thought that Detention would be required, but again, that would be something for Ron Long/Troy Odell.

*Vickie Lewis  
Hydrologist  
Yavapai County Flood Control  
(928) 649-6222*

---

**From:** Kendall Welch [mailto:Kendall.Welch@campverde.az.gov]  
**Sent:** Monday, January 25, 2016 7:41 AM  
**To:** Vickie Lewis  
**Subject:** Review Comments for Castle Heights Preliminary Plat (20150392)  
**Importance:** High

Good Morning Vickie,

It just occurred to me that I have not seen any review comments from you on the Castle Heights Preliminary Plat Application that I mailed on 12/23/15.  
Project 20150392 - Parcel 404-18-181E.

Can you double check and let me know when you get a chance?

Thank you!

*Kendall Welch*

Assistant Planner/Administrative Assistant  
Addressing Official  
Community Development Department  
E-Mail: [kendall.welch@campverde.az.gov](mailto:kendall.welch@campverde.az.gov)  
Phone: (928) 554-0053  
Fax: (928) 567-7401

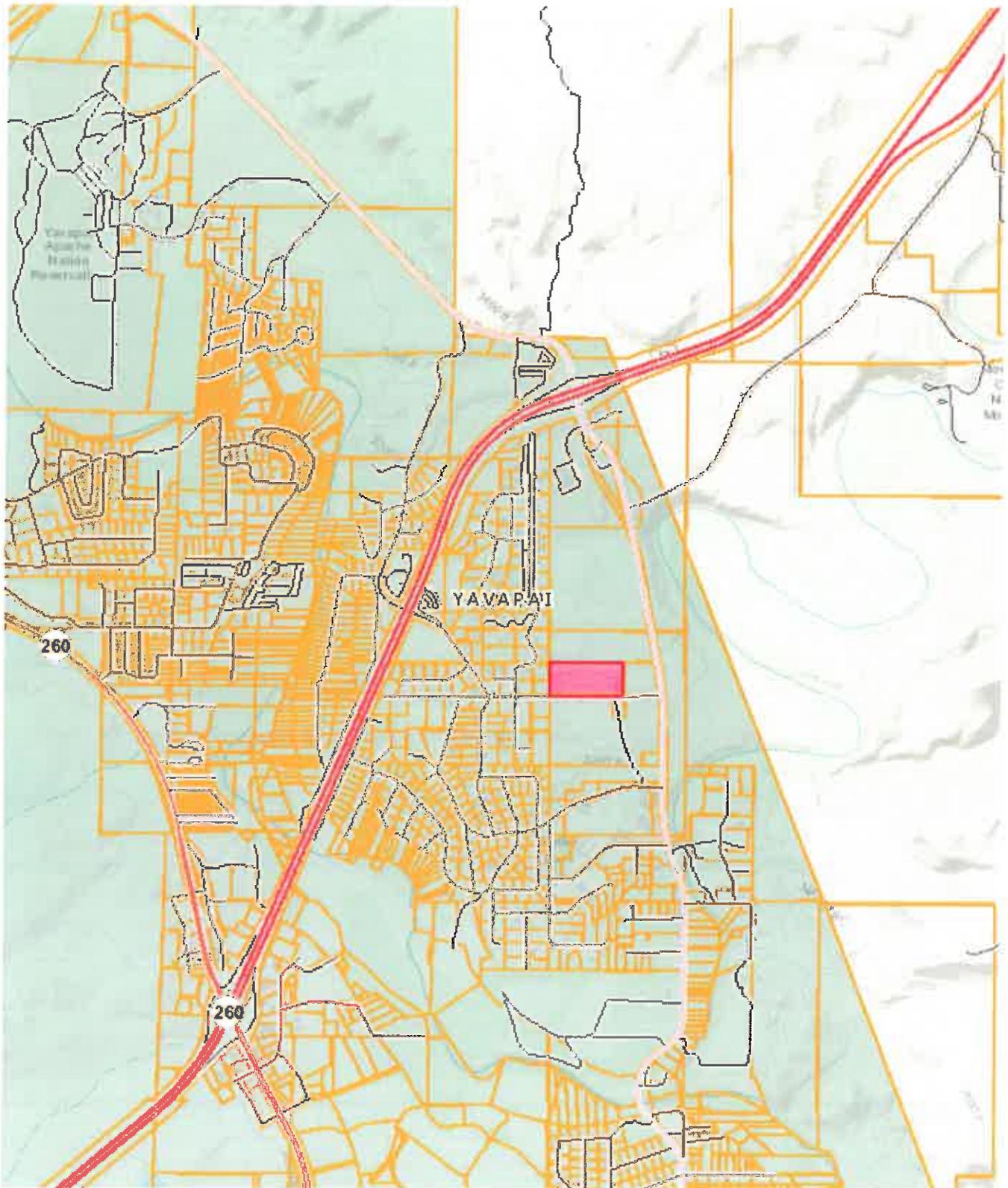
Town of Camp Verde  
473 S. Main St. Ste. 108  
Camp Verde, AZ 86322  
Website: [www.campverde.az.gov](http://www.campverde.az.gov)  
Or Check Us Out On Facebook: Town of Camp Verde Community Development Department

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*Hours of operations for all Town offices are Monday - Thursday 7 am to 5 pm and Friday 7 am to 11 am.*

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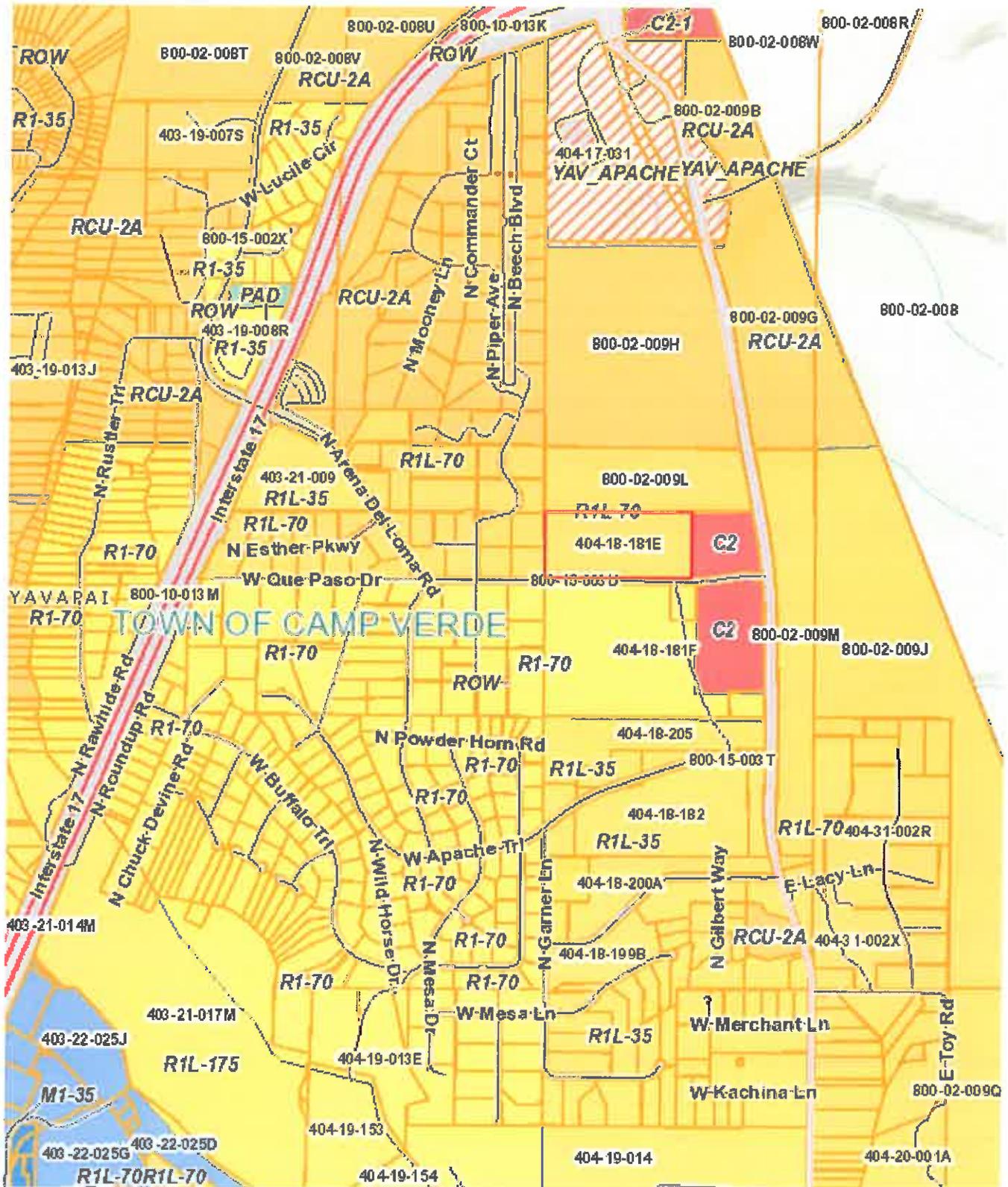
# Castle Heights Subdivision - Vicinity Map



*Disclaimer: Map and parcel information is believed to be accurate but accuracy is not guaranteed. No portion of the information should be considered to be, or used as, a legal document. The information is provided subject to the express condition that the user knowingly waives any and all claims for damages against Yavapai County that may arise from the use of this data.*

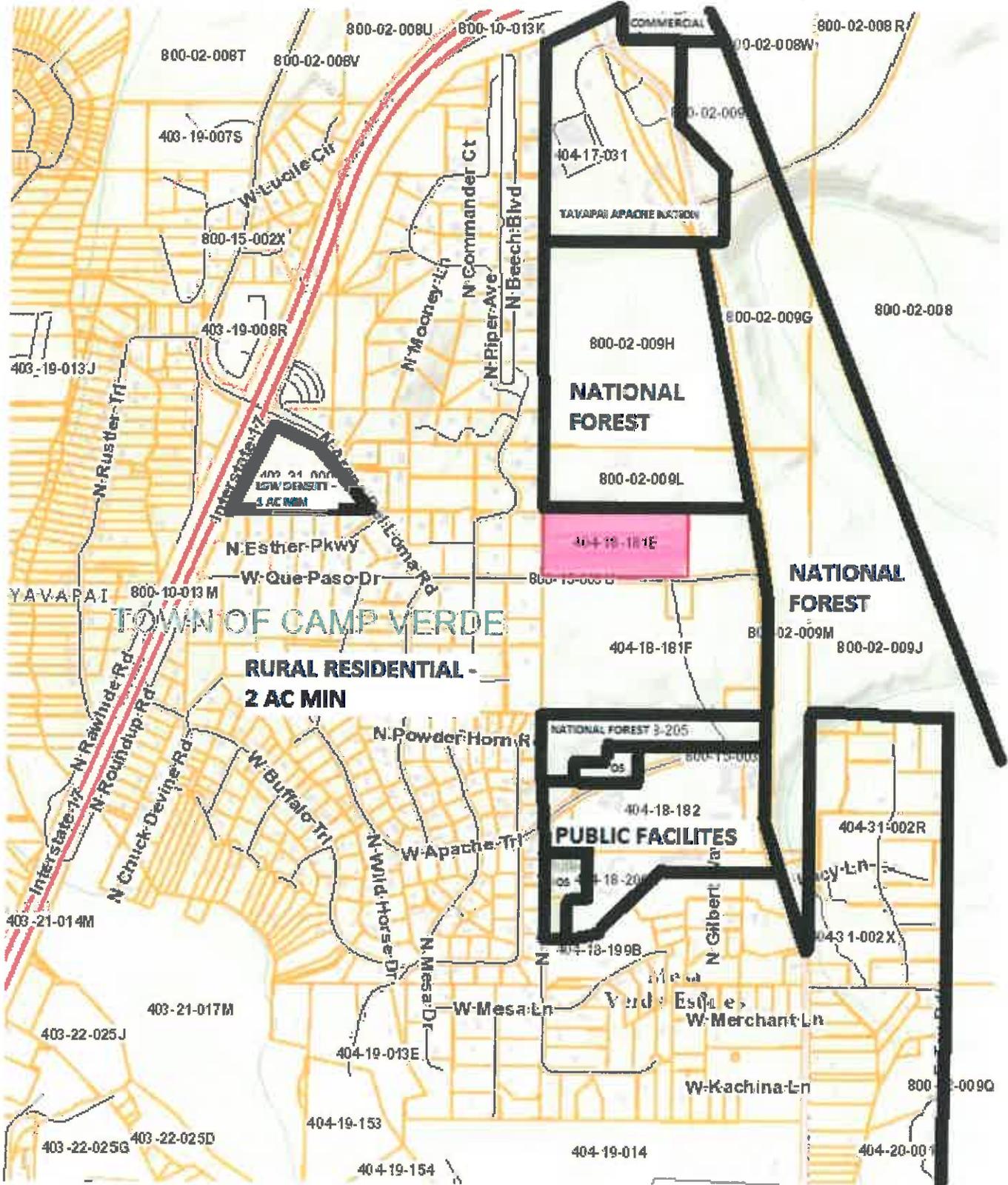
Map printed on: 12.21.2015

# Castle Heights Subdivision - Zoning Map



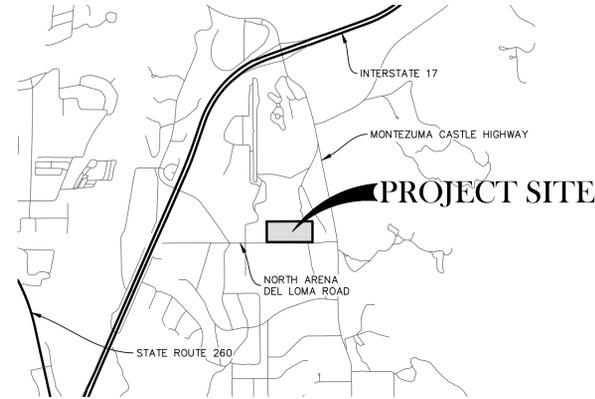
*Disclaimer: Map and parcel information is believed to be accurate but accuracy is not guaranteed. No portion of the information should be considered to be, or used as, a legal document. The information is provided subject to the express condition that the user knowingly waives any and all claims for damages against Yavapai County that may arise from the use of this data.*

# Castle Heights Subdivision - Land Use Map



*Disclaimer: Map and parcel information is believed to be accurate but accuracy is not guaranteed. No portion of the information should be considered to be, or used as, a legal document. The information is provided subject to the express condition that the user knowingly waives any and all claims for damages against Yavapai County that may arise from the use of this data.*

PLOTTED: Mar. 02, 2016 - 2:34pm  
 FILE: Z:\Projects\2013\13065\DWG\PRELIMINARY PLAT\PLAT\13065 PRE PLAT-01-COVER.dwg <c3d Imperial>



**PROJECT INFORMATION**

**CLIENT/OWNER:**  
 JOHN BASSOUS  
 TERRA VERDE BUILDERS  
 400 FINNIE FLAT ROAD,  
 CAMP VERDE, ARIZONA 86322  
 (928) 567-2477

**ENGINEER:**  
 GRANITE BASIN ENGINEERING, INC.  
 1981 COMMERCE CENTER CIRCLE, SUITE B  
 PRESCOTT, ARIZONA 86301  
 (928) 717-0171

**SITE DATA:**  
 PORTION OF ASSESSOR PARCEL NUMBER  
 404-18-181D

**ZONING NOTE:**  
 R1L-70 RESIDENTIAL  
 TOWN OF CAMP VERDE

**FLOODPLAIN NOTE:**  
 THIS PROJECT IS LOCATED ON FEMA FLOOD INSURANCE RATE  
 MAP (FIRM) 04025C2180G DATED SEPTEMBER 3, 2010.  
 THE PROJECT SITE IS DELINEATED ZONE X AND IS NOT  
 IMPACTED BY FEMA DELINEATED 100 YEAR FLOODPLAIN.

**SEWAGE DISPOSAL:**  
 ON-SITE SEPTIC OR ALTERNATE SYSTEM

**WATER SUPPLY:**  
 ON-SITE WELL

**FIRE DISTRICT:**  
 TOWN OF CAMP VERDE FIRE DISTRICT

**SCHOOL DISTRICT:**  
 TOWN OF CAMP VERDE SCHOOL DISTRICT

**POLICE:**  
 CAMP VERDE MARSHAL'S OFFICE

**BASIS OF BEARINGS & BENCHMARKS**

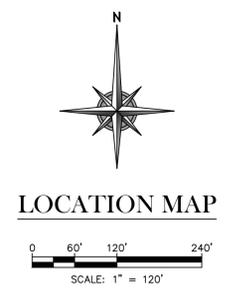
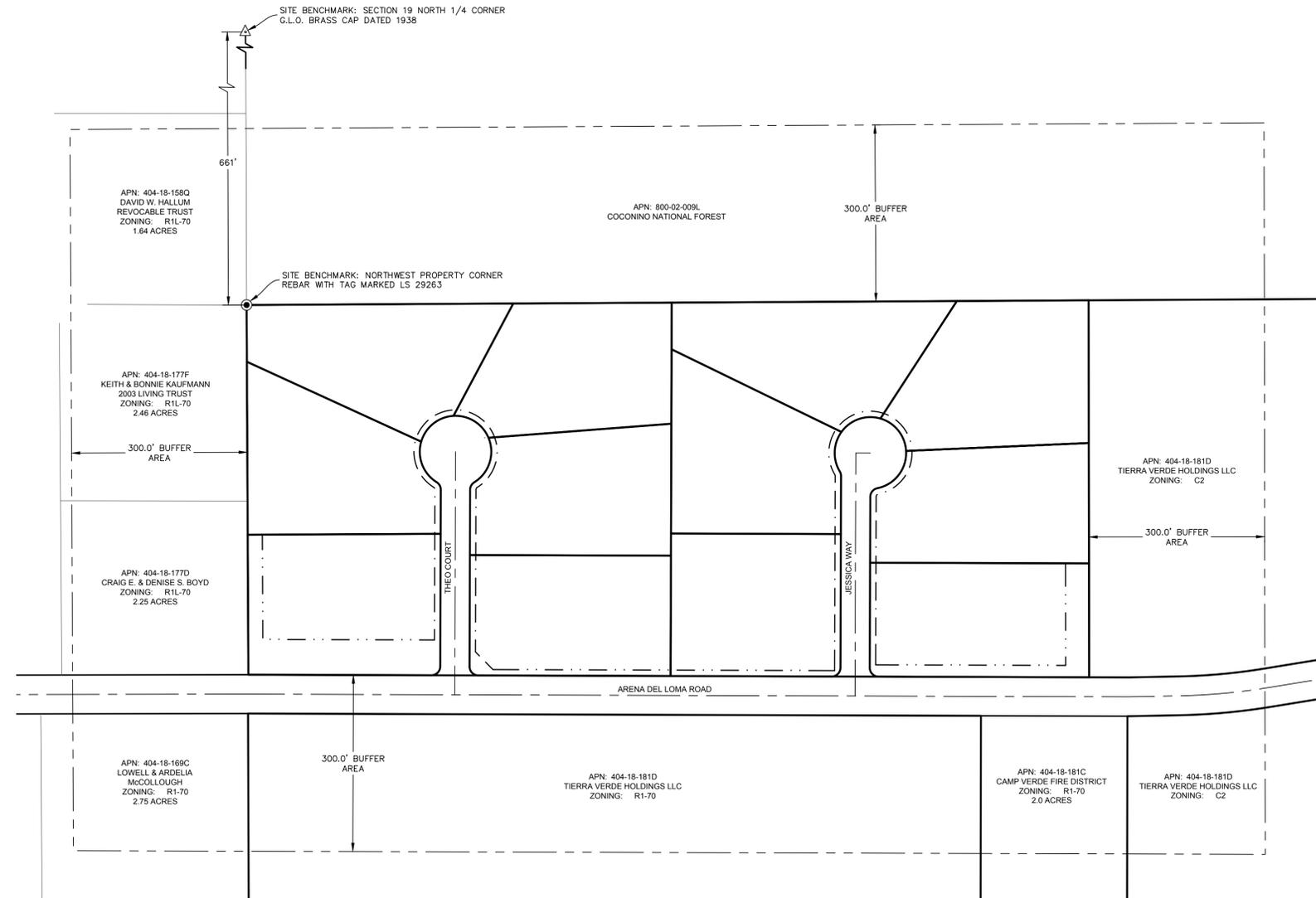
THE BASIS OF BEARING FOR THIS PROJECT IS N00°13'20.05"W, A DISTANCE OF 661.21 FEET ALONG A PORTION OF THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 19, BETWEEN THE NORTH 1/4 CORNER OF SECTION 19 AND THE NORTHWEST CORNER OF THE SUBJECT PROPERTY

BENCHMARK POINT	NORTHING	EASTING	ELEVATION
SECTION 19 NORTH 1/4 CORNER	4982.98	713716.90	3099.45
NORTHWEST PROPERTY CORNER	4321.78	711068.78	3141.11

VERTICAL DATUM IS NAVD 88      CONTOUR INTERVAL = 1'

# CASTLE HEIGHTS SUBDIVISION PRELIMINARY PLAT

A PROPOSED SUBDIVISION  
 SITUATED IN A PORTION OF SECTION 19, TOWNSHIP 14 NORTH, RANGE 5 EAST  
 OF THE GILA AND SALT RIVER MERIDIAN, TOWN OF CAMP VERDE, YAVAPAI COUNTY, ARIZONA



**SHEET INDEX**

SHEET	TITLE
1	COVER / 300' BUFFER AREA
2	LOT DEVELOPMENT PLAN

**SUBDIVISION INFORMATION**

TOTAL SUBDIVISION AREA: 20.92 ACRES  
 TOTAL LOTS: 12  
 AVERAGE LOT SIZE: 1.64 ACRES/71,261 SQ.FT.  
 RIGHT OF WAY AREA: 1.29 ACRES/56,011 SQ.FT.

**300 FOOT BUFFER OWNERSHIP LIST**

APN	OWNER	ADDRESS	CITY	STATE	ZIP
800-02-009L	COCONINO NATIONAL FOREST				
404-18-1580	HALLUM DAVID W REVOCABLE TRUST	PO BOX 1117	COTTONWOOD	ARIZONA	86320
404-18-177F	KAUFMANN KEITH & BONNIE 2003 LIVING TRUST	1861 MONTEZUMA HEIGHTS ROAD	CAMP VERDE	ARIZONA	86322
404-18-177D	BOYD CRAIG E & DENISE S	PO BOX 3000	CAMP VERDE	ARIZONA	86322
404-18-169C	MCCOLLOUGH LOWELL & ARDELIA	1734 ARENA DEL LOMA ROAD	CAMP VERDE	ARIZONA	86322
404-18-181C	CAMPE VERDE FIRE DISTRICT	PO BOX 386	CAMP VERDE	ARIZONA	86322
404-18-181D	TERRA VERDE HOLDINGS LLC	PO BOX 2898	CAMP VERDE	ARIZONA	86322

**UTILITIES AND SERVICES AVAILABLE**

ELECTRIC - APS  
 SOLID WASTE DISPOSAL - WASTE MANAGEMENT  
 TELEPHONE/INTERNET/CABLE T.V. - TBD

- NOTES**
- ACCESS & UTILITIES TO THE SITE WILL BE VIA NORTH ARENA DEL LOMA ROAD
  - TOPOGRAPHY FURNISHED BY HAMMES SURVEYING LLC. & IS HELD AS PUBLISHED ON THE NAVD 88 VERTICAL DATUM.

**LEGEND**

	FOUND REBAR & TAG LS 29263
	SECTION 19 NORTH 1/4 CORNER G.L.O. BRASS CAP DATED 1938
	1/2" REBAR WITH CAP RLS 33861 TO BE SET UPON COMPLETION OF CONSTRUCTION
	PROPERTY BOUNDARY
	RIGHT OF WAY
	ADJACENT PARCEL LINE
	BUILDING SETBACKS
	DRAINAGE EASEMENT
	PUBLIC UTILITY, DRAINAGE & SLOPE EASEMENT
	ROADWAY MONUMENT CENTERLINE
	300 FOOT OWNERSHIP BUFFER
	INDEX CONTOUR
	INTERMEDIATE CONTOUR
	EXISTING FLOW LINE
	EXISTING EDGE OF PAVEMENT
	PROPOSED EDGE OF PAVEMENT
	PROPOSED PAVEMENT

**SURVEYOR'S CERTIFICATE**

I, THOMAS A. LIUZZO, DO HEREBY CERTIFY THAT I AM A REGISTERED LAND SURVEYOR, AND THAT I HOLD LICENSE NUMBER 33861 AS PRESCRIBED UNDER THE LAWS OF THE STATE OF ARIZONA, I FURTHER CERTIFY THAT I HAVE PREPARED THIS PLAT FROM THE ORIGINAL FIELD NOTES MADE DURING A SURVEY OF THE TRACT OF LAND SHOWN ON THIS PLAT AND THAT THIS PLAT IS A TRUE AND ACCURATE MAP OF THE LAND SURVEYED AND WAS PERFORMED IN ACCORDANCE WITH THE ARIZONA MINIMUM STANDARDS FOR LAND SURVEY EFFECTIVE FEBRUARY 2002.

CALL BEFORE YOU DIG  
 1-800-STAKE-IT  
 1-800-782-5348  
 (OUTSIDE MARICOPA COUNTY)

REVISIONS	DATE	BY

FOR REVIEW ONLY	FOR BID ONLY	FOR APPROVAL ONLY	FOR RECORDING ONLY	FOR CONSTRUCTION ONLY	FOR AS-BUILT ONLY
<input checked="" type="checkbox"/>	<input type="checkbox"/>				

**GRANITE BASIN ENGINEERING, INC.**  
 1981 Commerce Center Circle, Suite B  
 Prescott, Arizona 86301  
 (928) 717-0171

TERRA VERDE BUILDERS  
 400 FINNIE FLAT ROAD  
 CAMP VERDE, ARIZONA 86322

CASTLE HEIGHTS SUBDIVISION  
 PRELIMINARY PLAT  
 COVER / 300' BUFFER AREA

**PRELIMINARY NOT FOR CONSTRUCTION**

JOB: 13065	DATE: 3/2/2016	SCALE: AS SHOWN	DRAWN: TD	DESIGN: TD	CHECKED: JB
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SHEET 1 OF 2

1:800-574-5448  
1:800-782-5348  
(OUTSIDE MARICOPA COUNTY)

APN: 404-18-1580  
DAVID W. HALLUM  
REVOCABLE TRUST  
ZONING: R1L-70  
1.64 ACRES

APN: 404-18-177F  
KEITH & JENNIFER  
REVOCABLE TRUST  
ZONING: R1L-70  
2.86 ACRES

APN: 404-18-177D  
ORANGE & DENISE S. BOYD  
ZONING: R1L-70  
2.86 ACRES

APN: 404-18-177C  
KEITH & JENNIFER  
REVOCABLE TRUST  
ZONING: R1L-70  
2.86 ACRES

APN: 404-18-177B  
KEITH & JENNIFER  
REVOCABLE TRUST  
ZONING: R1L-70  
2.86 ACRES

APN: 404-18-177A  
KEITH & JENNIFER  
REVOCABLE TRUST  
ZONING: R1L-70  
2.86 ACRES

APN: 404-18-177E  
KEITH & JENNIFER  
REVOCABLE TRUST  
ZONING: R1L-70  
2.86 ACRES

APN: 404-18-177G  
KEITH & JENNIFER  
REVOCABLE TRUST  
ZONING: R1L-70  
2.86 ACRES

APN: 404-18-177H  
KEITH & JENNIFER  
REVOCABLE TRUST  
ZONING: R1L-70  
2.86 ACRES

APN: 404-18-189C  
LOWELL & ARDELIA  
MCCOLLOUGH  
ZONING: R1-70  
2.75 ACRES

APN: 404-18-181D  
TIERRA VERDE HOLDINGS LLC  
ZONING: R1-70

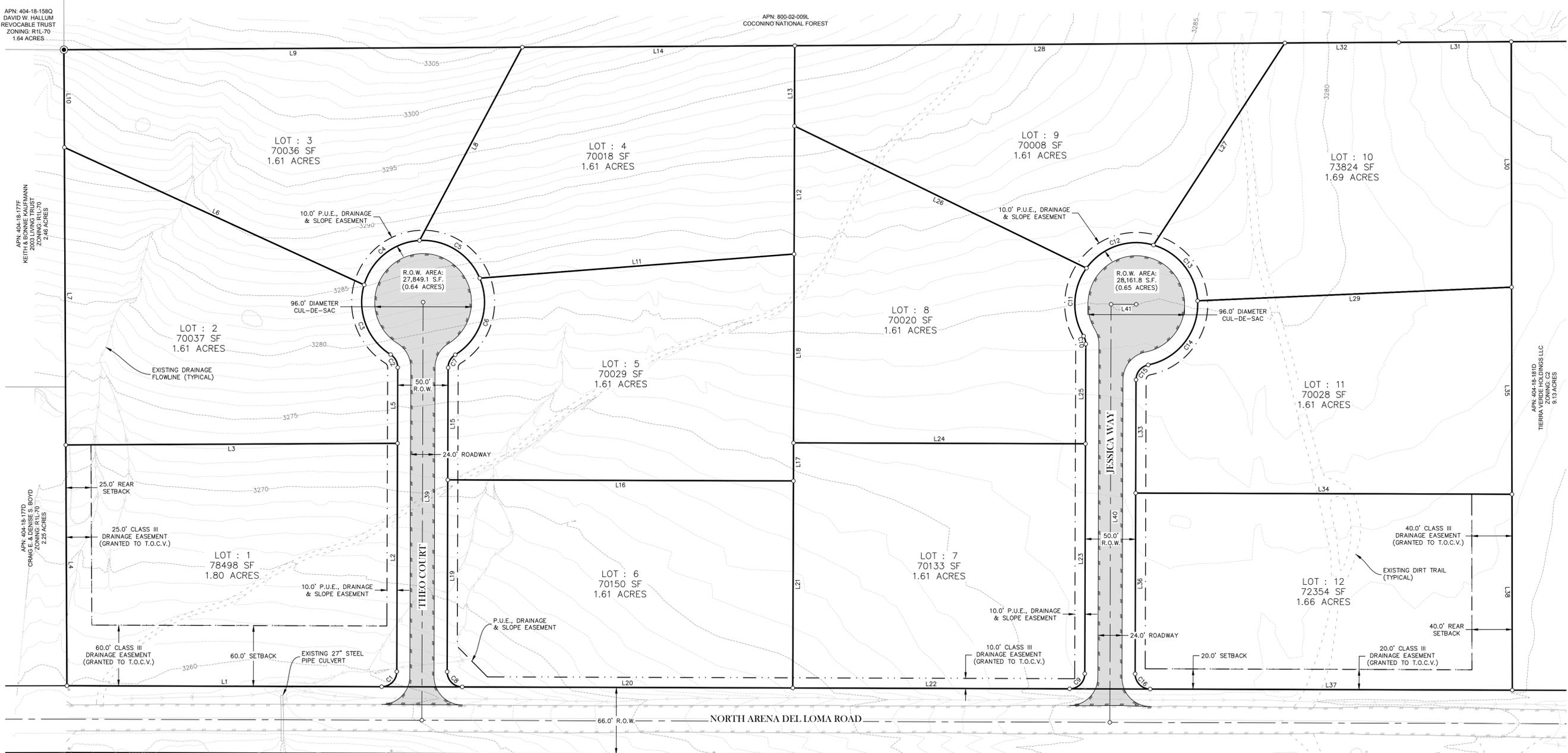
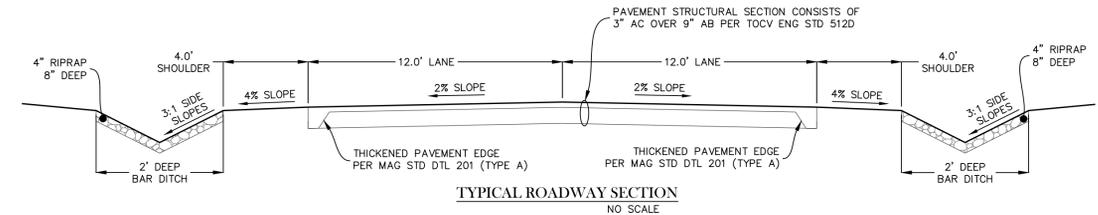
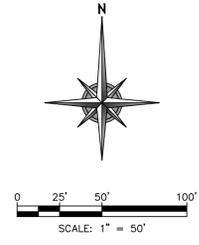
APN: 404-18-181C  
CAMP VERDE FIRE DISTRICT  
ZONING: R1-70  
2.0 ACRES

Parcel Line Table			Parcel Line Table			Curve Table					
Line #	Length	Direction	Line #	Length	Direction	Curve #	Length	Radius	Delta	Chord Direction	Chord Length
L1	312.50	S89° 49' 32.00"E	L22	274.89	S89° 49' 32.00"E	C1	23.56	15.00	90.00	N45° 10' 28"E	21.21
L2	225.44	N0° 10' 28.00"E	L23	227.10	N0° 10' 28.00"E	C2	15.25	15.00	58.24	N28° 56' 50"W	14.60
L3	329.37	S89° 43' 34.22"W	L24	289.89	S89° 49' 32.00"E	C3	79.13	61.00	74.33	N20° 54' 21"W	73.70
L4	237.87	S0° 16' 25.78"E	L25	98.52	N0° 10' 28.00"E	C4	75.00	61.00	70.45	N51° 28' 47"E	70.36
L5	74.94	N0° 10' 28.00"E	L26	322.13	N64° 09' 18.15"W	C5	75.00	61.00	70.45	S58° 04' 29"E	70.36
L6	327.15	S65° 28' 27.98"E	L27	238.48	S33° 09' 29.93"W	C6	86.52	61.00	81.27	S17° 46' 58"W	79.45
L7	293.94	S0° 16' 25.78"E	L28	486.67	S89° 40' 56.39"W	C7	15.25	15.00	58.24	S29° 17' 46"W	14.60
L8	216.47	S28° 06' 28.71"W	L29	312.16	S87° 31' 30.97"W	C8	23.56	15.00	90.00	S44° 49' 32"E	21.21
L9	455.14	S89° 40' 57.12"W	L30	242.49	N0° 05' 28.00"W	C9	23.56	15.00	90.00	N45° 10' 28"E	21.21
L10	96.44	S0° 16' 25.78"E	L31	111.68	S89° 40' 57.04"W	C10	8.17	15.00	31.21	N15° 25' 52"W	8.07
L11	313.11	N85° 37' 58.08"E	L32	113.15	S89° 40' 57.12"W	C11	71.21	61.00	66.88	N2° 24' 19"E	67.23
L12	111.48	S0° 10' 28.00"W	L33	111.96	S0° 10' 28.00"W	C12	75.00	61.00	70.45	N71° 04' 13"E	70.36
L13	79.35	N0° 10' 28.00"E	L34	373.66	S89° 49' 32.00"E	C13	75.00	61.00	70.45	S38° 29' 03"E	70.36
L14	270.57	S89° 40' 58.43"W	L35	204.55	N0° 05' 28.00"W	C14	87.36	61.00	82.05	S37° 45' 54"W	80.08
L15	110.88	S0° 10' 28.00"W	L36	178.53	S0° 10' 28.00"W	C15	20.58	15.00	78.62	S39° 28' 58"W	19.00
L16	343.27	N89° 49' 32.00"W	L37	359.56	S89° 49' 32.00"E	C16	23.56	15.00	90.00	S44° 49' 32"E	21.21
L17	37.60	S0° 10' 28.00"W	L38	193.53	N0° 05' 28.00"W						
L18	177.87	S0° 10' 28.00"W	L39	413.00	S0° 10' 28.00"W						
L19	189.50	S0° 10' 28.00"W	L40	413.00	S0° 10' 28.00"W						
L20	328.27	S89° 49' 32.00"E	L41	25.00	N89° 49' 32.00"E						
L21	204.50	S0° 10' 28.00"W									

# CASTLE HEIGHTS SUBDIVISION

## PRELIMINARY PLAT

A PROPOSED SUBDIVISION  
SITUATED IN A PORTION OF SECTION 19, TOWNSHIP 14 NORTH, RANGE 5 EAST  
OF THE GILA AND SALT RIVER MERIDIAN, TOWN OF CAMP VERDE, YAVAPAI COUNTY, ARIZONA



CALL FOR MORE DETAILS  
1-800-574-5448  
1-800-782-5348  
(OUTSIDE MARICOPA COUNTY)

REVISIONS	DATE	BY

DESCRIPTION

NUM.

FOR REVIEW ONLY

FOR BID ONLY

FOR APPROVAL ONLY

FOR RECORDING ONLY

FOR CONSTRUCTION ONLY

FOR AS-BUILT ONLY

**GRANITE BASIN**  
ENGINEERING, INC.  
1981 Commerce  
Center Drive, Suite B  
Phoenix, AZ 85001  
602.717.0171

TIERRA VERDE BUILDERS  
400 FINNIE FLAT ROAD  
CAMP VERDE, ARIZONA 86322

CASTLE HEIGHTS SUBDIVISION  
PRELIMINARY PLAT  
LOT DEVELOPMENT PLAN

**PRELIMINARY**  
NOT FOR  
CONSTRUCTION

JOB: 13065  
DATE: 3/2/2016  
SCALE: AS SHOWN  
DRAWN: TD  
DESIGN: TD  
CHECKED: JB

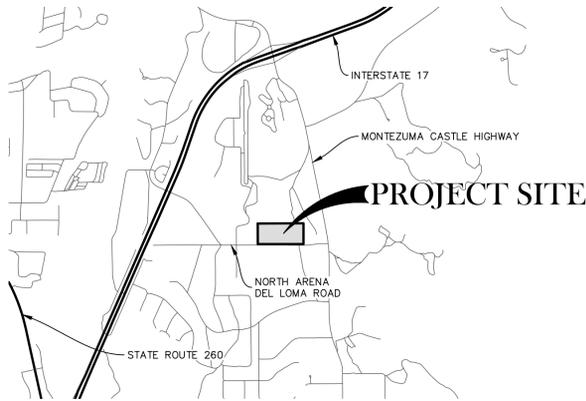
**2**

SHEET 2 OF 2

PLOTTED: Dec 10, 2015--4:46pm

# CASTLE HEIGHTS SUBDIVISION GRADING & DRAINAGE PLANS

A PROPOSED SUBDIVISION  
SITUATED IN A PORTION OF SECTION 19, TOWNSHIP 14 NORTH, RANGE 5 EAST  
OF THE GILA AND SALT RIVER MERIDIAN, TOWN OF CAMP VERDE, YAVAPAI COUNTY, ARIZONA



## PROJECT INFORMATION

### CLIENT/OWNER:

JOHN BASSOUS  
TIERRA VERDE BUILDERS  
400 FINNIE FLAT ROAD,  
CAMP VERDE, ARIZONA 86322  
(928) 567-2477

### ENGINEER:

GRANITE BASIN ENGINEERING, INC.  
1981 COMMERCE CENTER CIRCLE, SUITE B  
PRESCOTT, ARIZONA 86301  
(928) 717-0171

### SITE DATA:

PORTION OF ASSESSOR PARCEL NUMBER  
404-18-181D

### ZONING NOTE:

R1L-70 RESIDENTIAL  
TOWN OF CAMP VERDE

### FLOODPLAIN NOTE:

THIS PROJECT IS LOCATED ON FEMA FLOOD INSURANCE RATE  
MAP (FIRM) 04025C2180G DATED SEPTEMBER 3, 2010.  
THE PROJECT SITE IS DELINEATED ZONE X AND IS NOT  
IMPACTED BY FEMA DELINEATED 100 YEAR FLOODPLAIN.

### SEWAGE DISPOSAL:

ON-SITE SEPTIC

### WATER SUPPLY:

ON-SITE WELL

### FIRE DISTRICT:

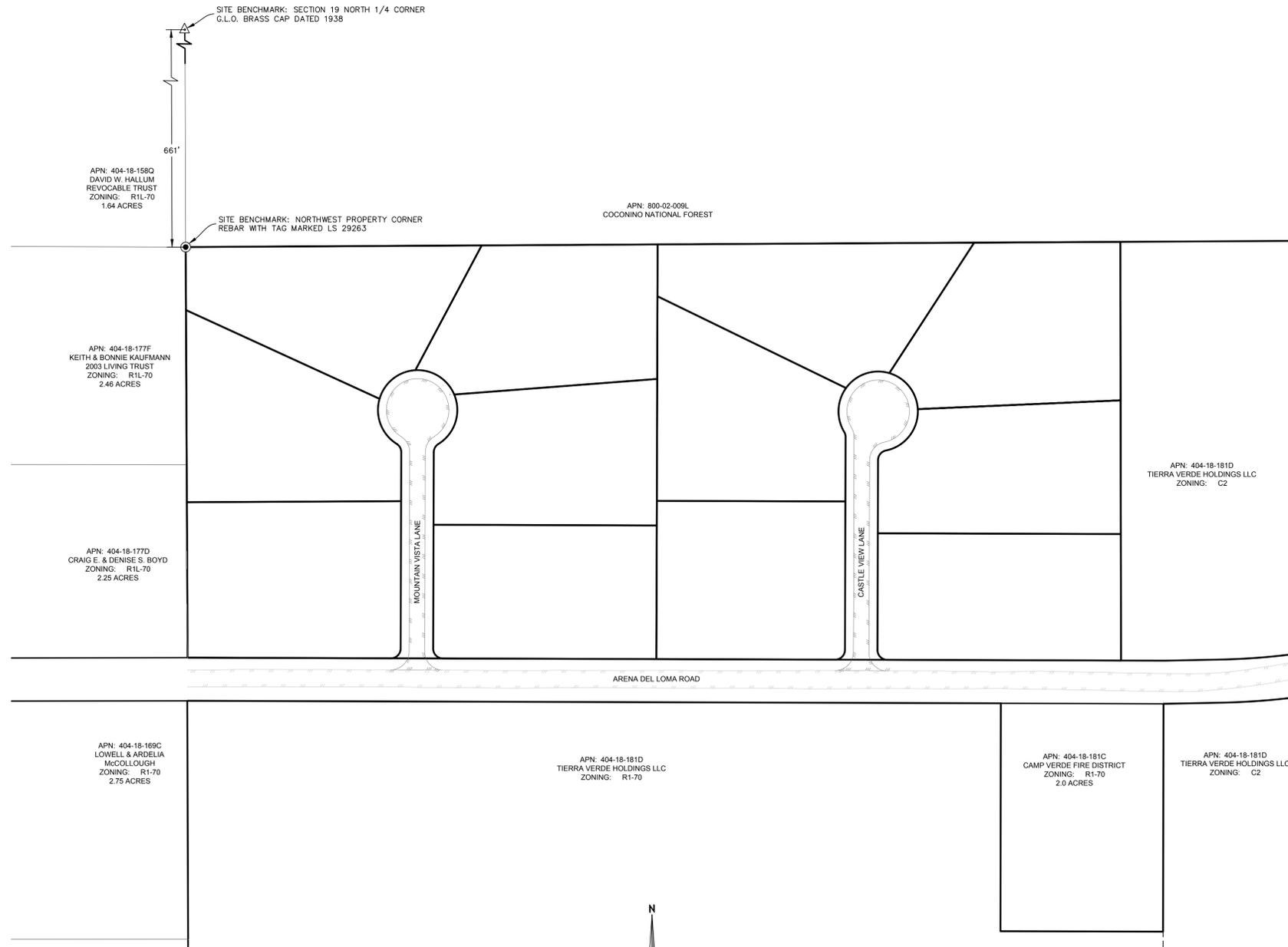
TOWN OF CAMP VERDE FIRE DISTRICT

### SCHOOL DISTRICT:

TOWN OF CAMP VERDE SCHOOL DISTRICT

### POLICE:

CAMP VERDE MARSHAL'S OFFICE



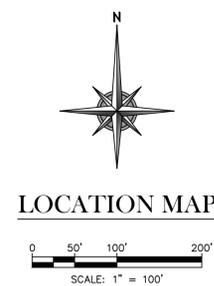
SHEET INDEX	
SHEET	TITLE
1	COVER SHEET
2	NOTES & DETAILS
3	PROJECT SUMMARY
4	MOUNTAIN VISTA PLAN & PROFILE
5	CASTLE VIEW PLAN & PROFILE

## NOTES

- ACCESS & UTILITIES TO THE SITE WILL BE VIA NORTH ARENA DEL LOMA ROAD
- TOPOGRAPHY FURNISHED BY HAMMES SURVEYING LLC. & IS HELD AS PUBLISHED ON THE NAVD 88 VERTICAL DATUM.

## LEGEND

- FOUND REBAR & TAG LS 29263 SECTION 19 NORTH 1/4 CORNER G.L.O. BRASS CAP DATED 1938
- PROPERTY BOUNDARY
- RIGHT OF WAY
- ADJACENT PARCEL LINE
- BUILDING SETBACKS
- DRAINAGE EASEMENT
- PUBLIC UTILITY, DRAINAGE & SLOPE EASEMENT
- ROADWAY MONUMENT CENTERLINE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- PROPOSED INDEX CONTOUR
- PROPOSED INTERMEDIATE CONTOUR
- EXISTING FLOW LINE
- EXISTING EDGE OF PAVEMENT
- PROPOSED EDGE OF PAVEMENT
- PROPOSED DRAINAGE PIPE
- PROPOSED PAVEMENT
- SAWCUT, REMOVE & REPLACE EXISTING PAVEMENT



BASIS OF BEARINGS & BENCHMARKS			
THE BASIS OF BEARING FOR THIS PROJECT IS N00°13'20.05"W, A DISTANCE OF 661.21 FEET ALONG A PORTION OF THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 19, BETWEEN THE NORTH 1/4 CORNER OF SECTION 19 AND THE NORTHWEST CORNER OF THE SUBJECT PROPERTY			
BENCHMARK POINT	NORTHING	EASTING	ELEVATION
SECTION 19 NORTH 1/4 CORNER	4982.98	713716.90	3099.45
NORTHWEST PROPERTY CORNER	4321.78	711068.78	3141.11
VERTICAL DATUM IS NAVD 88      CONTOUR INTERVAL = 1'			

CALL GRANITE BASIN ENGINEERING, INC. BEFORE YOU BUY  
1-800-574-6111  
1-800-782-5348  
(OUTSIDE MARICOPA COUNTY)

REVISIONS	DATE	BY

FOR REVIEW ONLY  FOR BID ONLY  FOR APPROVAL ONLY  FOR RECORDING ONLY  FOR CONSTRUCTION ONLY  FOR AS-BUILT ONLY

1981 Commerce Center Circle, Suite B  
Prescott, AZ 86301  
928.717.0171

PRELIMINARY  
NOT FOR  
CONSTRUCTION

JOB:	13065
DATE:	12/10/2015
SCALE:	AS SHOWN
DRAWN:	TD
DESIGN:	TD
CHECKED:	JB

FILE: Z:\Projects\2013\13065\DWG\PRELIMINARY\PLAT\GRADING\13065\_060-01-COVER.dwg <<C3D Imperial>>

GENERAL NOTES:

MATERIALS AND WORKMANSHIP

ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE CURRENT YAVAPAI COUNTY ENGINEERING STANDARDS AND SPECIFICATIONS, "MARICOPA ASSOCIATION OF GOVERNMENTS UNIFORM STANDARD" (MAG) SPECS, "MARICOPA ASSOCIATION OF GOVERNMENTS UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION" (MAG DETAILS), "YAVAPAI COUNTY ASSOCIATION OF GOVERNMENTS UNIFORM STANDARD AND DETAILS" (YAG SPECS & DETAILS), YAVAPAI COUNTY RESOLUTION 10-36, ADEQ BULLETIN 8 AND 10, AWA STANDARDS, THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES ANY SPECIAL PROVISIONS PREPARED FOR THE PROJECT, AND GENERALLY ACCEPTED GOOD CONSTRUCTION PRACTICES. THE TERM "CURRENT" MEANS THE MOST RECENT SPECIFICATION OR STANDARD IN EFFECT AS OF THE DATE OF THE ENGINEER'S SEAL ON THESE PLANS.

IF TWO OR MORE GIVEN SPECIFICATIONS DIFFER IN CONTENT, THE MORE RESTRICTIVE OR STRINGENT STANDARD OR SPECIFICATION, IN THE OPINION OF THE ENGINEER, WILL GOVERN.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN COPIES OF THE ABOVE STANDARDS, SPECIFICATIONS AND DETAILS, AS WELL AS ALL OTHER STANDARDS AND SPECIFICATIONS WHICH MAY BE NECESSARY TO COMPLETELY AND ACCURATELY INTERPRET THESE PLANS. THIS REQUIREMENT EXTENDS TO ANY STANDARDS, DETAILS OR SPECIFICATIONS REFERENCED BY THE CONSTRUCTION DOCUMENTS AND NOT INCLUDED IN THE LIST ABOVE.

THE ENGINEER MAY REQUIRE THE SUBMITTAL OF A "CERTIFICATE OF COMPLIANCE" AND/OR "MANUFACTURER'S GUIDELINES" FOR ANY MATERIALS USED IN THE WORK. MANUFACTURER'S GUIDELINES SHALL CONSIST OF WRITTEN INSTRUCTIONS FOR SHIPPING, HANDLING, UNLOADING, CUTTING, JOINING, INSTALLATION, STORAGE, AND/OR ANY OTHER FACETS OF WORKING.

SHOP DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR PER MAG SPECIFICATION 105.2.

THE ENGINEER MAY ORDER ANY OR ALL MATERIALS USED IN THE WORK TO BE TESTED ACCORDING TO THE STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) AND THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARDS. THE CONTRACTOR SHALL, AT HIS EXPENSE, SUPPLY ALL SAMPLES FOR THE TESTING AND CERTIFICATES OR RESULTS OF TESTING.

ALTERNATE MANUFACTURER AND MODEL

THE CONTRACTOR SHALL SUBMIT CAREFULLY DOCUMENTED AND CONSIDERED WRITTEN PROPOSALS FOR ALTERNATE MATERIALS AND CONSTRUCTION METHODS. THOSE PROPOSALS THAT ARE FOUND TO BE IN CONFORMITY WITH GOOD ENGINEERING DESIGN AND CAN BE EASILY MAINTAINED BY JURISDICTIONAL FORCES MAY BE GIVEN WRITTEN APPROVAL FOR INCORPORATION IN THE CONSTRUCTION PLANS IF THEY ARE FOUND TO BE IN THE BEST PUBLIC INTEREST.

UNAUTHORIZED WORK

ANY WORK PERFORMED WITHOUT THE KNOWLEDGE AND APPROVAL OF THE ENGINEER OR HIS AUTHORIZED REPRESENTATIVE IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

SUSPENSION OF WORK

THE ENGINEER OR HIS AUTHORIZED REPRESENTATIVE MAY SUSPEND THE WORK BY WRITTEN NOTICE WHEN, IN HIS JUDGMENT, PROGRESS IS UNSATISFACTORY, IMPROPER WORKMANSHIP IS BEING PERFORMED, WORK BEING DONE IS UNAUTHORIZED OR DEFECTIVE, WEATHER CONDITIONS ARE UNSUITABLE, OR THERE IS DANGER TO THE PUBLIC HEALTH OR SAFETY.

QUALIFICATIONS OF CONTRACTOR

ALL IMPROVEMENTS SHALL BE CONSTRUCTED BY CONTRACTORS LICENSED BY THE ARIZONA STATE REGISTRAR OF CONTRACTORS, WITH A CLASS OF LICENSE(S) FOR THE SPECIFIC WORK BEING PERFORMED.

CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION METHODS, SEQUENCING, AND SAFETY DURING CONSTRUCTION.

CONTRACTOR IS REQUIRED TO COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS APPLICABLE TO THE CONSTRUCTION OF THIS PROJECT.

WATER SUPPLY DURING CONSTRUCTION

ALL WEATHER ACCESS AND NECESSARY WATER SHALL BE IN PLACE, APPROVED AND OPERATIONAL AT ALL TIMES DURING CONSTRUCTION OF ON-SITE COMBUSTIBLE CONSTRUCTION. UTILITY OWNER APPROVAL IS REQUIRED FOR OBSTRUCTION OF ACCESS OR WATER SYSTEM SHUT DOWN.

THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR AND PROVIDE ALL NECESSARY WATER FOR HIS CONSTRUCTION OPERATION AT HIS OWN EXPENSE.

ESTIMATED QUANTITIES

ALL QUANTITIES SHOWN ARE APPROXIMATE AND ARE FURNISHED SOLELY FOR THE CONTRACTOR'S CONVENIENCE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACTUAL QUANTITIES OF WORK REQUIRED AND BASE HIS BID ON HIS OWN INDEPENDENT ESTIMATE OF THE WORK SCOPE AND QUANTITIES OF MATERIALS REQUIRED. HE DOES NOT NECESSARILY CORRESPOND TO BID SCHEDULE ITEMS. PAYMENT WILL BE BASED ON BID SCHEDULE ITEMS. THE CONTRACTOR SHALL NOT BE RELIEVED OF RESPONSIBILITY FOR INDEPENDENTLY ESTIMATING QUANTITIES PRIOR TO BIDDING. THE CONTRACTOR REPRESENTS THAT THE TOTAL CONTRACT SUM IS ADEQUATE COMPENSATION FOR COMPLETING THE ENTIRE PROJECT AS SHOWN ON THE PLANS.

THE LOCATION OF EXISTING FEATURES INDICATED ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL NOT BE RELIEVED OF RESPONSIBILITY FOR MAKING COMPLETE AND ACCURATE ON-SITE DETERMINATIONS OF THE LOCATIONS OF ALL UTILITIES, STRUCTURES AND FIELD CONDITIONS, WHICH MAY AFFECT THE PROGRESS OF THE WORK.

CONSTRUCTION OBSERVATIONS

AN OBSERVATION OF CONSTRUCTED IMPROVEMENTS WILL BE CONDUCTED BY THE ENGINEER. SPECIAL OBSERVATION AND TESTING SERVICES SHALL BE PROVIDED AT THE DEVELOPER'S EXPENSE, AS REQUIRED BY THE ENGINEER.

NO BASE COURSE CONSTRUCTION SHALL BE STARTED UNTIL ALL UTILITY LINES ARE COMPLETED AND TESTED UNDER PROPOSED AREAS AND THE SUBGRADE HAS BEEN INSPECTED AND APPROVED BY THE ENGINEER OR HIS AUTHORIZED REPRESENTATIVE.

NO PAVEMENT SHALL BE PLACED UNTIL BASE COURSE CONSTRUCTION IS INSPECTED AND APPROVED BY THE ENGINEER.

THE ENGINEER SHALL BE NOTIFIED 24 HOURS PRIOR TO BEGINNING DIFFERENT PHASES OF CONSTRUCTION SO THAT OBSERVATIONS MAY BE SCHEDULED.

MAINTENANCE OF FACILITIES AND WORK

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE STREETS AND OF PARTIALLY COMPLETED PORTIONS OF THE WORK UNTIL FINAL ACCEPTANCE OF THE WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE QUALITY OF EXISTING STREETS LEADING TO THE PROJECT SITE. EXISTING STREETS FOUND TO BE DAMAGED BY CONSTRUCTION TRAFFIC SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.

THE CONTRACTOR SHALL KEEP THE WORK AREA, ADJACENT PROPERTIES AND STREETS CLEAN AND FREE FROM RUBBISH, EXCESS MATERIALS, DUST AND DEBRIS GENERATED BY THE CONSTRUCTION ACTIVITY.

DAILY CLEANUP OF THE CONSTRUCTION SITE, INCLUDING SWEEPING STREETS, MAINTAINING TRENCHES, PROVIDING PROPER TRAFFIC CONTROL DEVICES, ETC., IS REQUIRED.

FINAL ACCEPTANCE

FINAL ACCEPTANCE OF THE CONSTRUCTION, BY THE ENGINEER, IS REQUIRED BEFORE RELEASING PERMITS AND/OR TRANSFERRING OWNERSHIP OF THE IMPROVEMENTS.

APPROVAL OF A PORTION OF THE WORK IN PROGRESS DOES NOT GUARANTEE ITS FINAL ACCEPTANCE. TESTING AND EVALUATION MAY CONTINUE UNTIL WRITTEN FINAL ACCEPTANCE OF A COMPLETE WORKABLE UNIT. ACCEPTANCE OF COMPLETED IMPROVEMENTS WILL NOT BE GIVEN UNTIL DEFECTIVE OR UNAUTHORIZED WORK IS REMOVED AND FINAL CLEANUP IS COMPLETE.

YAVAPAI COUNTY & THE TOWN OF CAMP VERDE RESERVES THE RIGHT TO REQUEST MODIFICATIONS TO THESE PLANS DURING CONSTRUCTION IF FIELD CONDITIONS WARRANT AND THE DESIGN ENGINEER CONCURS.

NO JOB WILL BE CONSIDERED COMPLETE UNTIL ALL CURB, PAVEMENT AND SIDEWALKS HAVE BEEN SWEEP CLEAN OF DIRT AND DEBRIS TO THE SATISFACTION OF THE OWNER AND ENGINEER AND ALL SURVEY MONUMENTS ARE INSTALLED.

WARRANTY

ANY DEFECTS WHICH APPEAR IN THE WORK WITHIN TWO YEARS FROM THE DATE OF FINAL ACCEPTANCE AND WHICH ARE DUE TO IMPROPER WORKMANSHIP OR INFERIOR MATERIALS SUPPLIED SHALL BE CORRECTED BY, AND AT THE EXPENSE OF, THE CONTRACTOR.

UTILITIES

THESE PLANS REPRESENT A REASONABLE EFFORT TO SHOW LOCATIONS OF EXISTING UNDERGROUND UTILITIES WITHIN THE PROJECT LIMITS. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO UTILITIES CAUSED DURING CONSTRUCTION. THE CONTRACTOR IS TO VERIFY THE LOCATION AND THE ELEVATIONS OF ALL EXISTING UTILITIES PRIOR TO ANY EXCAVATION OR CONSTRUCTION. WHERE PROPOSED UTILITIES ARE TO BE TIED INTO EXISTING STUBOUTS, MANHOLES, ETC., THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION BY POTHOLES, IF NECESSARY, TWO WEEKS PRIOR TO CONSTRUCTION. SHOULD ANY LOCATION OR ELEVATION DIFFER FROM THAT SHOWN ON PLANS, THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE PROPER UTILITY OWNER'S AGENT AND THE DESIGN ENGINEER.

UTILITIES MUST BE LOCATED TO MINIMIZE INTERFERENCE WITH ONE ANOTHER, TO PROVIDE REQUIRED HORIZONTAL AND VERTICAL SEPARATIONS, AND TO PROVIDE MAINTENANCE ACCESS WITHOUT VIOLATING EASEMENT BOUNDARIES.

UTILITY FACILITIES IN CONFLICT WITH THIS WORK WILL BE RELOCATED BY THE PERMITTEE OR THE UTILITY OWNER. THIS ACTIVITY SHALL BE COORDINATED WITH THE OWNER OF THE UTILITY TO PREVENT ANY UNNECESSARY INTERRUPTION OF SERVICE TO EXISTING CUSTOMERS.

IT IS NOT WITHIN THE SCOPE OF THE PLANS FOR THE ENGINEER TO LOCATE, IDENTIFY OR FORESEE EVERY UTILITY CONFLICT WHICH MAY ARISE DURING THE CONSTRUCTION PHASE OF THE PROJECT BUT IT IS THE INTENT OF THE OWNER TO REASONABLY COMPENSATE THE CONTRACTOR FOR THE WORK REQUIRED TO RELOCATE OR ADJUST UTILITIES CONFLICTING WITH THE CONSTRUCTION OF THE PROJECT. TO THAT END, UTILITIES (AS DEFINED IN MAG 101.2) WHICH ARE ENCOUNTERED WILL BE ADDRESSED AS FOLLOWS:

- 1) UTILITY RELOCATION'S OR ADJUSTMENTS NOTED ON THE PLANS SHALL BE PAID FOR PER THE BID SCHEDULE.
2) UTILITY RELOCATIONS OR ADJUSTMENTS NOT NOTED ON THE PLANS SHALL BE ADDRESSED ON A CASE BY CASE BASIS. THE ENGINEER SHALL DETERMINE WHAT WORK IS REQUIRED TO PRODUCE THE DESIRED FINAL PRODUCT. IF A UNIT BID PRICE DOES NOT EXIST THEN COMPENSATION MUTUALLY ACCEPTABLE TO THE OWNER, CONTRACTOR, AND ENGINEER SHALL BE MADE.
3) THE SEPARATION BETWEEN WATER AND ELECTRIC SHALL BE 4 FEET HORIZONTAL AND 2 FEET VERTICAL.

IN EITHER SITUATION, WORK ON THE SPECIFIC CASE SHALL NOT PROCEED UNTIL THE AMOUNT OF COMPENSATION IS AGREED UPON. COMPENSATION FOR UTILITY RELOCATIONS AND ADJUSTMENTS SHALL NOT INCLUDE COSTS FOR REPAIR TO THE UTILITY DAMAGED BY THE CONTRACTOR OR HIS SUBCONTRACTOR(S). THE CONTRACTOR IS NOT RELIEVED OF THE RESPONSIBILITY FOR DETERMINING THE LOCATION OF ALL UTILITIES AFFECTING THE WORK. THE APPROPRIATE UTILITY COMPANIES SHALL BE NOTIFIED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION. CERTAIN UTILITIES ARE TO REMAIN IN SERVICE DURING THE CONSTRUCTION OF THE FILL AND UPON COMPLETION OF THE CONTRACT. THESE UTILITIES SHALL BE PROTECTED DURING THE CONSTRUCTION AND CUT OR FILL PLACEMENT SHALL NOT PROHIBIT MAINTENANCE ACCESS TO THESE UTILITIES.

A UTILITY COORDINATION MEETING SHALL BE COORDINATED BY THE CONTRACTOR PRIOR TO THE START OF ANY WORK. ALL UTILITY ISSUES SHALL BE ADDRESSED IN ACCORDANCE WITH MAG SECTION 105.6.

BLUE STAKE

LOCATION OF UNDERGROUND UTILITIES SHALL BE ACCOMPLISHED IN ACCORDANCE WITH ARS 40-360.22 PRIOR TO ANY EXCAVATION. BLUE STAKE SHALL BE CALLED AT 1-800-STAKE-IT FOR ACCURATE LOCATION OF UTILITIES AS NECESSARY AND PRIOR TO ANY EXCAVATION.

STREET CLOSURES

STREETS CLOSED BECAUSE OF CONSTRUCTION, SHALL BE PROVIDED WITH BARRICADES AND/OR HAZARD SIGNS AS REQUIRED BY THE ENGINEER AND APPROVED BY THE COUNTY AND/OR TOWN ENGINEER.

AS-BUILT PLANS

THE CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF ALL APPROVED SHOP DRAWINGS AND AN ACCURATE, CURRENT, AS-BUILT SET OF PLANS ON SITE FOR REFERENCE AT ALL TIMES. THE AS-BUILT PLANS WILL BE FURNISHED BY THE CONTRACTOR TO THE OWNER AT THE COMPLETION OF THE PROJECT FOR RECORD. THE AS-BUILT PLANS MUST BE UPDATED DAILY BY THE CONTRACTOR AND INCLUDE, IN ADDITION TO THE PLANNED CONSTRUCTION, ANY CHANGES AUTHORIZED BY THE OWNER AND ANY UTILITIES DISCOVERED DURING THE TRENCHING OPERATIONS BY SIZE, LOCATION, AND TYPE REDLINED ONTO THE PLANS BY STATION/DISTANCE/DEPTH.

PRIOR TO APPROVAL OF AN IMPROVEMENT PROJECT, AN "AS-BUILT" PLAN MUST BE SUBMITTED TO THE ENGINEER. THE AS-BUILT PLAN SHALL INDICATE THE ACTUAL LOCATION OF WATER MAINS, SEWER MAINS, DRAINAGE STRUCTURES, ALL SEWER AND WATER SERVICES, ALL FITTINGS, VALVES AND MANHOLES RELATIVE TO RIGHT-OF-WAY BOUNDARIES, LOT LINE, OR OTHER POINTS OF SURVEY.

THE ENGINEER SHALL PLACE ALL INFORMATION ON REPRODUCIBLE CONSTRUCTION PLANS. THE AS-BUILT REPRODUCIBLE PLANS WILL THEN BE PLACED IN COUNTY AND/OR TOWN RECORDS. APPROPRIATE SUBMITTALS SHALL BE MADE AS REQUIRED TO ALL AGENCIES BY THE DEVELOPER.

CONSTRUCTION STAKING

THE ACCURACY OF ALL CONSTRUCTION WORK SHALL BE MAINTAINED AND VERIFIED BY THE DEVELOPER'S SURVEYOR AT THE DEVELOPER'S EXPENSE BY PROVIDING CONSTRUCTION STAKING SUITABLE TO THE ENGINEER. STAKES WILL BE SET ESTABLISHING LINES AND GRADES (FINISH OR FLOWLINE) FOR ALL CONSTRUCTION INCLUDING ROADS, CURB AND GUTTER, SIDEWALKS, UTILITIES, STRUCTURES, AND OTHER WORK AS CONSIDERED NECESSARY BY THE ENGINEER. ALL SURVEY CONTROL SHALL BE SET BY THE DEVELOPER'S SURVEYOR FROM MONUMENTS ACCEPTABLE TO THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR RESTAKING EXPENSES.

INTERPRETATION OF PLANS

THESE PLANS ARE SUBJECT TO THE INTERPRETATION OF INTENT BY THE ENGINEER. ALL QUESTIONS REGARDING THESE PLANS SHALL BE DIRECTED TO THE ENGINEER. ANY INTERPRETATION OF THE PLANS BY ANYONE OTHER THAN THE ENGINEER SHALL BE RESPONSIBLE FOR ANY CONSEQUENCES THEREOF.

COORDINATION WITH OTHER PROJECTS

CONTRACTOR SHALL COORDINATE WORK WITH ON-GOING AND PROPOSED WORK ADJACENT TO OR NEAR THE PROJECT SITE.

PERMITS AND APPROVALS

YAVAPAI COUNTY REQUIRES THE ISSUANCE OF A GRADING PERMIT FOR ANY EXCAVATION OR GRADING (INCLUDING PLACEMENT OF FILL). A RIGHT-OF-WAY PERMIT IS REQUIRED PRIOR TO COMMENCING ANY WORK WITHIN ANY YAVAPAI COUNTY RIGHT-OF-WAY.

THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS AND EASEMENTS FROM ALL APPLICABLE JURISDICTIONS PRIOR TO CONSTRUCTION.

STREET CONSTRUCTION

A SOIL INVESTIGATION REPORT PREPARED BY WESTERN TECHNOLOGIES, INC. ON OCTOBER 12, 2015 IS THE BASIS FOR EARTHWORK AND PAVEMENT DESIGN. COPIES OF THE REPORT ARE AVAILABLE AT THE OFFICE OF THE ENGINEER.

ALL ELEVATIONS SHOWN ON THE PLANS ARE FINISHED SURFACE ELEVATIONS (EXCEPT AS NOTED).

SUBGRADE PREPARATION

NATIVE SUBGRADE SOIL TO RECEIVE PAVING SHALL BE STRIPPED OF VEGETATION, DEBRIS, ORGANIC RICH SOILS, TREES AND OTHER DELETERIOUS MATERIALS. THE SUBGRADE SHALL BE SCARIFIED AND COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO TEST T99, METHOD A AND/OR METHOD T-191. CLAYEY SOILS SHALL BE COMPACTED AND MAINTAINED (UNTIL COVERED) AT A MOISTURE CONTENT IN THE RANGE OF OPTIMUM -4 TO +1% OF OPTIMUM. GRANULAR SOILS WILL BE ±2% OF OPTIMUM. EXISTING SLOPING AREAS STEEPER THAN 5:1 (HORIZONTAL TO VERTICAL) SHALL BE BENCHED TO REDUCE THE POTENTIAL FOR SLIPPAGE BETWEEN EXISTING SLOPES AND NEW FILLS. BENCHES SHALL BE LEVEL AND WIDE ENOUGH TO ACCOMMODATE COMPACTOR AND EARLY MOVING EQUIPMENT. ISOLATED CLAY POCKETS, IF ANY, SHALL BE OVER EXCAVATED BELOW SUBGRADE AND REPLACED WITH GRANULAR MATERIAL. WATER SHALL BE INTERCEPTED AND PREVENTED FROM FLOWING DOWN THE FACE OF THE CONSTRUCTED SLOPE.

FILL CONSTRUCTION

SUBBASE FILL SHALL CONSIST OF ON-SITE OR IMPORTED SOILS. IMPORTED SOILS, IF ANY, SHALL CONFORM TO THE FOLLOWING:

Table with 2 columns: GRADATION (ASTM C136) and % PASSING. Rows include 6", 4", 3", No. 4, No. 200, MAXIMUM EXPANSIVE POTENTIAL, and MAXIMUM SOLUBLE SULFATES.

FILL SHALL BE PLACED IN HORIZONTAL LIFTS AT THICKNESSES CONSISTENT WITH COMPACTOR EQUIPMENT USED TO ACHIEVE UNIFORM DENSITIES THROUGHOUT LIFT THICKNESS. FILLS LESS THAN 10 FEET HIGH SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99, METHOD A. THE CONTRACTOR SHALL CONTRACT WITH AN INDEPENDENT TESTING LABORATORY, WITH AN APPROVED ENGINEER, TO PROVIDE COMPACTION TESTING. TESTS SHALL BE PROVIDED AT MINIMUM INTERVALS OF ONE TEST PER 5000 SQUARE FEET OF FILL SURFACE FOR EACH LIFT OF FILL CONSTRUCTION. TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER DAILY.

FILL CONSTRUCTION SITE PREPARATION, EXCAVATION AND PLACEMENT SHALL BE IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL REPORT. IT IS THE INTENT OF THE OWNER THAT ALL OF THE MATERIAL NECESSARY TO CONSTRUCT THE FILL WILL BE AVAILABLE ON SITE. HOWEVER, THE BID SCHEDULE ITEM FOR FILL CONSTRUCTION IS INTENDED TO INCLUDE FULL CONSTRUCTION, WHERE PROPOSED UTILITIES ARE TO BE TIED INTO EXISTING STUBOUTS, MANHOLES, ETC., THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION BY POTHOLES, IF NECESSARY, TWO WEEKS PRIOR TO CONSTRUCTION. SHOULD ANY LOCATION OR ELEVATION DIFFER FROM THAT SHOWN ON PLANS, THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE PROPER UTILITY OWNER'S AGENT AND THE DESIGN ENGINEER.

AGGREGATE BASE COURSE

1. AGGREGATE BASE COURSE MATERIAL SHALL CONFORM TO MAG SECTIONS 310 AND 702 OF THE MAG SPECIFICATIONS AND SHOULD BE WELL GRADED WITHIN THE FOLLOWING LIMITS:

Table with 2 columns: SIEVE SIZE and PERCENT PASSING. Rows include 1-1/2", 1", No. 4, No. 8, No. 30, and No. 200.

THE MAXIMUM PLASTICITY INDEX SHALL NOT EXCEED 7, PER Y.A.G SPECIFICATIONS, AND THE PERCENTAGE OF WEAR SHALL NOT EXCEED 40 AFTER 500 REVOLUTIONS. CINDERS ARE NOT TO BE USED FOR AGGREGATE BASE COURSE MATERIAL.

PAVING NOTES

THE CONTRACTOR SHALL VERIFY THE LOCATION, ELEVATION AND GENERAL CONDITION OF ALL EXISTING THE-IN AND MATCHING POINTS OF PAVEMENT PRIOR TO ANY STREET CONSTRUCTION. SHOULD ANY LOCATIONS, ELEVATIONS, CROSS SLOPES, OR CONDITIONS DIFFER FROM WHAT IS SHOWN ON THE PLANS, THE CONTRACTOR SHALL CONTACT THE OWNER'S AGENT IMMEDIATELY FOR APPROPRIATE CORRECTIVE ACTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY COSTS INCURRED IF THIS PROCEDURE IS NOT FOLLOWED.

ALL VALVE BOXES, MANHOLE FRAMES AND COVERS, OR OTHER UTILITY APPURTENANCES WITHIN THE CONSTRUCTION LIMITS SHALL BE ADJUSTED TO FINAL FINISH GRADE, WHETHER SPECIFICALLY SHOWN ON THE PLANS OR NOT, PER YAG SECTION 345 AS NECESSARY FOR A COMPLETE JOB, OR AS DESIGNATED BY THE ENGINEER. WHERE NEW WATER METERS ARE INSTALLED IN THE SIDEWALKS, THE NEW BOXES AND COVERS SHALL BE SET FLUSH WITH THE SIDEWALK GRADE.

POSITIVE DRAINAGE SHALL BE PROVIDED DURING CONSTRUCTION OF THE PROPOSED PAVEMENT STRUCTURE. THE CONSTRUCTED GRADIENT OF PAVED SURFACES SHALL ENSURE POSITIVE DRAINAGE AND WATER IS NOT ALLOWED TO POND IN AREAS DIRECTLY ADJOINING PAVED SECTIONS.

IF QUESTIONS ARISE, EXACT POINT OF MATCHING TERMINATION AND PAVING, IF NECESSARY, SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER OR HIS AUTHORIZED REPRESENTATIVE.

EXISTING STREET AND TRAFFIC SIGNS WILL BE MAINTAINED DURING CONSTRUCTION AND RELOCATED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER OR HIS AUTHORIZED REPRESENTATIVE.

PRIOR TO THE PLACEMENT OF CURB OR CURB AND GUTTER, THE CONTRACTOR SHALL CONTACT THE ENGINEER AT LEAST 48 HOURS IN ADVANCE TO VERIFY CURB STRING LINE AND/OR FORMWORK. THE ENGINEER RESERVES THE RIGHT TO ADJUST CURB STRING LINES, GRADE STAKES, OR FORMWORK PRIOR TO THE PLACEMENT OF CURB AND GUTTER. ANY CUTS OR FILLS IN THE BASE COURSE LAYER AS A RESULT OF THE STRING LINE ADJUSTMENTS IS INCIDENTAL TO THE WORK PERFORMED. THE CONTRACTOR SHALL PROVIDE SUFFICIENT EQUIPMENT AND PERSONNEL TO PERFORM THE STRING LINE TEST IN THE PRESENCE OF THE ENGINEER.

AN ACCEPTABLE PAVEMENT SURFACE SHALL NOT VARY MORE THAN 1/8 INCH FROM THE LOWER EDGE OF A 2-FEET STRAIGHTEDGE WHEN THE STRAIGHTEDGE IS PLACED PARALLEL TO THE CENTER LINE OF THE ROADWAY. THE STRAIGHTEDGE SHALL BE FURNISHED BY THE CONTRACTOR AND BE ACCEPTABLE TO THE ENGINEER.

ASPHALT CONCRETE

THE WORK AND CONSTRUCTION REQUIREMENTS UNDER THIS SECTION SHALL BE IN ACCORDANCE WITH SECTION 409 OF ADOT STANDARD SPECIFICATIONS OR SECTION 321 AND 710 OF M.A.G. STANDARD SPECIFICATIONS. MIX DESIGN SHALL BE SUBMITTED TO THE COUNTY ENGINEER AT LEAST 28 DAYS PRIOR TO PAVING FOR REVIEW AND APPROVAL.

ASPHALTIC CONCRETE SHALL BE COMPACTED TO NOT LESS THAN 95.0 PERCENT OF LABORATORY DENSITY. THE LABORATORY DENSITY WILL BE DETERMINED BY THE CONTRACTOR'S ENGINEER BASED UPON FIELD SAMPLES IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO T-245 OR ASTM D1559-75, 75 BLOW MARSHALL DENSITY.

CORE SAMPLES SHALL BE TAKEN BY THE CONTRACTOR AT RANDOM LOCATIONS AS DIRECTED BY THE ENGINEER.

WHEN THE AVERAGE PERCENT OF COMPACTION IS LESS THAN 95.0%, OR IF THERE IS REASON TO BELIEVE THAT THE PAVEMENT THICKNESS IS DEFICIENT, THE CONTRACTOR MAY BE REQUIRED TO REMOVE AND REPLACE ANY PORTIONS, AT THE DISCRETION OF THE COUNTY ENGINEER, AT NO COST TO THE COUNTY.

CHIP SEAL COAT

A CHIP SEAL COAT IS REQUIRED ON ALL ASPHALTIC CONCRETE PROJECTS.

ALL NEW STREETS SHALL BE CHIP SEALED PER YAG STANDARD 330 AND THE FOLLOWING SPECIFICATION:

THE CHIP SEAL COAT SHALL CONSIST OF EMULSIFIED ASPHALT, TYPE CRS-2, (OR EQUIVALENT) APPLIED AT A RATE OF 0.30 TO 0.40 GALLONS PER SQUARE YARD. EMULSIFIED ASPHALT SHALL BE APPLIED TO THE SURFACE OF THE ROAD IN ACCORDANCE WITH YAG STANDARD 330. EMULSIFIED ASPHALT, TYPE CRS-2 OR EQUIVALENT SHALL CONFORM TO MAG SPECIFICATION 713.

CHIP SEAL COAT SHALL NOT BE APPLIED FOR 7 DAYS AFTER COMPLETION OF THE ASPHALTIC CONCRETE.

THE COVER MATERIAL SHALL CONFORM TO YAG SPECIFICATION 716 AND SHALL BE AN AGGREGATE MIX OF CLEAN SAND, GRAVEL OR CRUSHED ROCK AND SHALL BE FREE OF LUMPS OR BALLS OF CLAY. IT SHALL CONTAIN NO CALCAREOUS CLAY OR DUST COATINGS, GALCHE, SYNTHETIC MATERIALS, DECOMPOSED GRANITE, VOLCANIC CINDERS, ORGANIC MATTER, OR FOREIGN SUBSTANCES. IF A CLEAN COVER MATERIAL CANNOT BE ACHIEVED USING CONVENTIONAL CRUSHING AND EXTRA SCREENING METHODS, THEN THE COVER MATERIAL WILL HAVE TO BE WASHED IN WATER. THE COVER MATERIAL SHALL BE APPLIED AT A RATE OF 25 TO 30 POUNDS PER SQUARE YARD.

THE GRADING SHALL MEET THE FOLLOWING REQUIREMENTS WHEN TESTED IN ACCORDANCE WITH THE ASTM C-136 AND C-117.

Table with 2 columns: SIEVE SIZE and PERCENT BY WEIGHT PASSING SIEVES. Rows include 3/8", 1/4", No. 8, and No. 200.

THE CONTRACTOR IS RESPONSIBLE FOR ALL LABORATORY TESTS AND CERTIFICATIONS TO ASSURE THAT THE CHIP MATERIAL IS IN CONFORMANCE TO THE REQUIREMENTS SET FORTH IN THESE SPECIFICATIONS.

REPRESENTATIVE SAMPLES OF THE AGGREGATE COVER MATERIAL SHALL BE TAKEN DAILY, AND THE LABORATORY TEST RESULTS AND CERTIFICATES OF COMPLIANCE, CERTIFIED BY THE CONTRACTOR'S ENGINEER, SHALL BE SUBMITTED TO THE COUNTY ENGINEER. THE COUNTY ENGINEER MAY REJECT DELIVERED CHIP MATERIAL IF, IN HIS OPINION, THE DELIVERED MATERIAL DIFFERS SIGNIFICANTLY FROM THE REPRESENTATIVE SAMPLE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUCCESSFUL PLACEMENT OF THE CHIP SEAL COAT REGARDLESS OF TEMPERATURES OF MATERIAL COMPLIANCE, AND SHALL GUARANTEE THE SUCCESS OF THE CHIP SEAL COAT. THE CONTRACTOR SHALL COMPLY WITH ALL ADOT STANDARDS AND SPECIFICATIONS 404-314 AND YAG STANDARDS AND SPECIFICATIONS 330 FOR DATES AND ELEVATIONS OF PLACEMENT.

THE CONTRACTOR SHALL HAVE EACH INDIVIDUAL ROAD SWEEP WITHIN 24 HOURS, BUT NO SOONER THAN 6 HOURS, FOLLOWING THE COMPLETION OF THE CHIP SEAL. THE CONTRACTOR SHALL MAINTAIN TRAFFIC CONTROL AND LOOSE GRAVEL SIGNS UNTIL ALL SWEEPING HAS BEEN COMPLETED.

BLOTTING SHALL BE DONE WHEREVER AND WHENEVER NECESSARY, WITH A MATERIAL APPROVED BY THE COUNTY ENGINEER. ALL EXCESS BLOTTER MATERIAL SHALL BE SWEEP AWAY AND SURFACE OF THE BITUMINOUS ROADWAY SHALL BE REASONABLY CLEAN AND FREE OF ALL LOOSE MATERIAL BEFORE THE SEAL COAT MAY BE APPLIED.

RELOCATIONS AND REMOVALS

REMOVAL OF EXISTING IMPROVEMENTS SHALL BE PERFORMED IN ACCORDANCE WITH MAG SECTION 350.

SIGNS, TREES SHRUBS, MAILBOXES AND OTHER INCIDENTALS REQUIRING RELOCATION SHALL BE MOVED ONLY FAR ENOUGH TO ALLOW CONSTRUCTION OF THE PROJECT AND CAUSE THE LEAST DISRUPTION TO PRIVATE PROPERTIES AND LANDSCAPE. FINAL POSITIONS SHALL BE APPROVED BY THE ENGINEER PRIOR TO RELOCATION. ALL RELOCATED ITEMS SHALL CONTINUE TO WORK IN THEIR INTENDED CAPACITY AFTER THE RELOCATION HAS BEEN ACCOMPLISHED. NO SIGNS SHALL BE RELOCATED TO POSITIONS OUTSIDE DESIGNATED RIGHTS-OF-WAY. SAFETY SHALL BE A PRIMARY CONSIDERATION IN THE PLACEMENT OF SHRUBBERY AND SIGNS WHICH COULD POSSIBLY DISRUPT THE SIGHT DISTANCE OF MOTORISTS.

MISCELLANEOUS REMOVALS AND OTHER WORK NECESSITATED BY THE WORK AS IT PROGRESSES AND NOT SPECIFICALLY CALLED OUT ON THE PLANS WILL BE CONSIDERED INCIDENTAL WORK.

TRENCHING AND BACKFILLING

ROUGH GRADING SHALL BE COMPLETED PRIOR TO INSTALLATION OF UNDERGROUND UTILITIES.

TRENCH BOTTOM SHALL BE COMPACTED BY SUITABLE MEANS APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF BEDDING MATERIAL. BEDDING MATERIAL SHALL BE PLACED TO PROVIDE UNIFORM AND ADEQUATE LONGITUDINAL SUPPORT UNDER THE PIPE. THE CONTRACTOR SHALL ENSURE THAT ALL BEDDING MATERIAL SHALL BE COMPACTED TO A MINIMUM UNDERNEATH THE PIPE. BELL HOLES SHOULD BE PROVIDED AT EACH JOINT TO PERMIT PROPER ASSEMBLY WHILE MAINTAINING UNIFORM SUPPORT.

BEDDING MATERIAL SHALL BE ROUNDED GRAVEL WITH A MAXIMUM PARTICLE SIZE OF 3/4" AND SHALL BE NON-PLASTIC. WHERE DEPTH OF COVER IS 2-FT. OR LESS, BACKFILL MATERIAL SHALL BE ROUNDED GRAVEL WITH A MAXIMUM PARTICLE SIZE OF 3/4" AND WITH NO MORE THAN 20% PASSING THE #200 SIEVE.

BACKFILL SHALL BE PLACED IN LAYERS OF NOT MORE THAN 8" LOOSE DEPTH AND COMPACTED TO ACHIEVE COMPACTION OF 95% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99 AND T-191 OR ASTM D-2922 AND D-3017. THE CONTRACTOR SHALL CONTRACT WITH AN INDEPENDENT TESTING LABORATORY TO PROVIDE COMPACTION TESTING. TESTS SHALL BE PROVIDED AT MINIMUM INTERVALS OF ONE TEST PER 50 CUBIC YARDS OF TRENCH BACKFILL. TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER DAILY.

TRENCHING, PIPELAYING, BACKFILLING, AND ALL OTHER CONSTRUCTION SHALL BE PERFORMED UNDER THE INSPECTION, COORDINATION, AND SUPERVISION OF A REGISTERED PROFESSIONAL CIVIL ENGINEER.

NO TRENCH SHALL BE FILLED WITH BEDDING MATERIAL OR BACKFILL UNTIL THE EXCAVATION AND PIPE LAYING, RESPECTIVELY, HAVE BEEN APPROVED BY THE OWNER OR HIS AUTHORIZED REPRESENTATIVE.

THE EXCAVATION METHOD EMPLOYED SHALL BE THE CONTRACTOR'S OPTION. MATERIAL SHALL NOT BE STOCKPILED TO A DEPTH OF MORE THAN 5 FEET ABOVE FINISHED GRADE WITHIN 25 FEET OF ANY EXCAVATION OR STRUCTURE. EXCAVATION SHALL EXTEND SUFFICIENT DISTANCE FROM WALLS AND FOOTINGS TO ALLOW PLACING AND REMOVAL OF FORMS, INSTALLATION OF SERVICES AND INSPECTION BY THE ENGINEER. WITHIN 12" OF FINISHED GRADE SHOWN ON THE DRAWINGS, AND FOR THE MANHOLES, FILL AND BACKFILL SHALL BE NATIVE MATERIAL, FREE FROM BROKEN CONCRETE, ORGANIC MATERIAL, OR OTHER DEBRIS WITH SUFFICIENT FINES TO FILL ALL VOIDS AND TO INSURE A UNIFORMLY COMPACTED MASS OF THE REQUIRED DENSITY AND HAVING A MAXIMUM SIZE OF 2-3/4" INCHES WITH 0 TO 20% MINUS #200. ALL FILL AND BACKFILL SHALL BE PLACED IN LAYERS OF NOT MORE THAN 8" LOOSE AND COMPACTED TO 95% OF MAXIMUM DENSITY, DETERMINED BY AASHTO TEST METHOD T-99, PRIOR TO PLACEMENT OF THE NEXT LAYER.

DRAINAGE:

VERTICAL SEPARATION TO DRAINAGE PIPES

WHERE CULVERTS OR DRAINAGE PIPES CROSS GRAVITY SEWERS, PRESSURE SEWERS, OR WATER MAINS, A MINIMUM OF ONE FOOT OF VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN THE TWO PIPES.

DRAINAGE CHANNELS AND DITCHES

CHANNELS AND DITCHES SHOWN ON PLANS SHALL DAYLIGHT TO THE APPROPRIATE DESIGN LOCATIONS SO THAT POSITIVE DRAINAGE IS ACHIEVED.

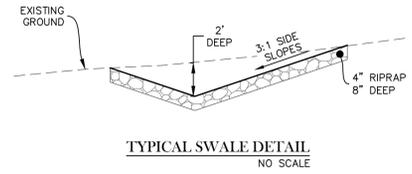
DRAINAGE MAINTENANCE DURING CONSTRUCTION

ADEQUATE DRAINAGE OF THE CONSTRUCTION AREA SHALL BE PROVIDED AT ALL TIMES. CONSTRUCTION DRAINS SHALL BE PROVIDED AS NEEDED TO ENABLE WATER TO DRAIN FROM THE CONSTRUCTION AREA RAPIDLY AND WITHOUT DAMAGING THE WORK IN PROGRESS. TO FURTHER PROMOTE GOOD DRAINAGE OF THE SITE, DRAINAGE CHANNELS, CULVERTS, AND STRUCTURES, SHALL BE CONSTRUCTED FROM DOWNSTREAM TO UPSTREAM IN SUCH A WAY THAT, DURING CONSTRUCTION, THEY DO NOT IMPEDE THE FLOW OF WATER FROM THE CONSTRUCTION AREA.

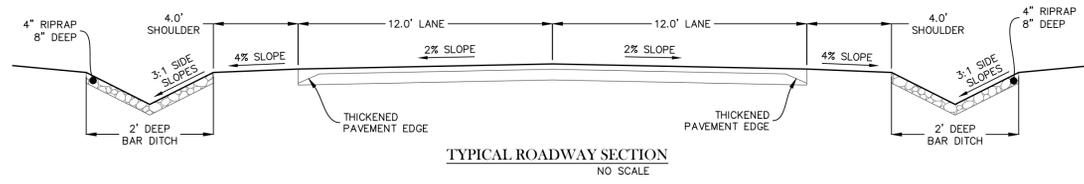
DAMAGE TO ADJACENT PROPERTIES OR TO ANY PORTION OF THE WORK CAUSED BY THE CONTRACTOR'S FAILURE TO PROVIDE ADEQUATE DRAINAGE OF THE CONSTRUCTION SITE OR TO ORDER THE WORK SO AS TO MINIMIZE THE POSSIBLE EXTENT OF SUCH DAMAGE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

ELECTRICAL

ELECTRICAL (APS) IF SHOWN ON THE PLANS IS FOR THE ESTIMATED MAIN TRENCH LOCATION. ALL ELECTRICAL MAIN LINE LOCATIONS, TRANSFORMER LOCATIONS, SERVICE LOCATIONS, AND ANY OTHER ELECTRICAL APPURTENANCES ARE TO BE INSTALLED PER APS PROVIDED PLANS.

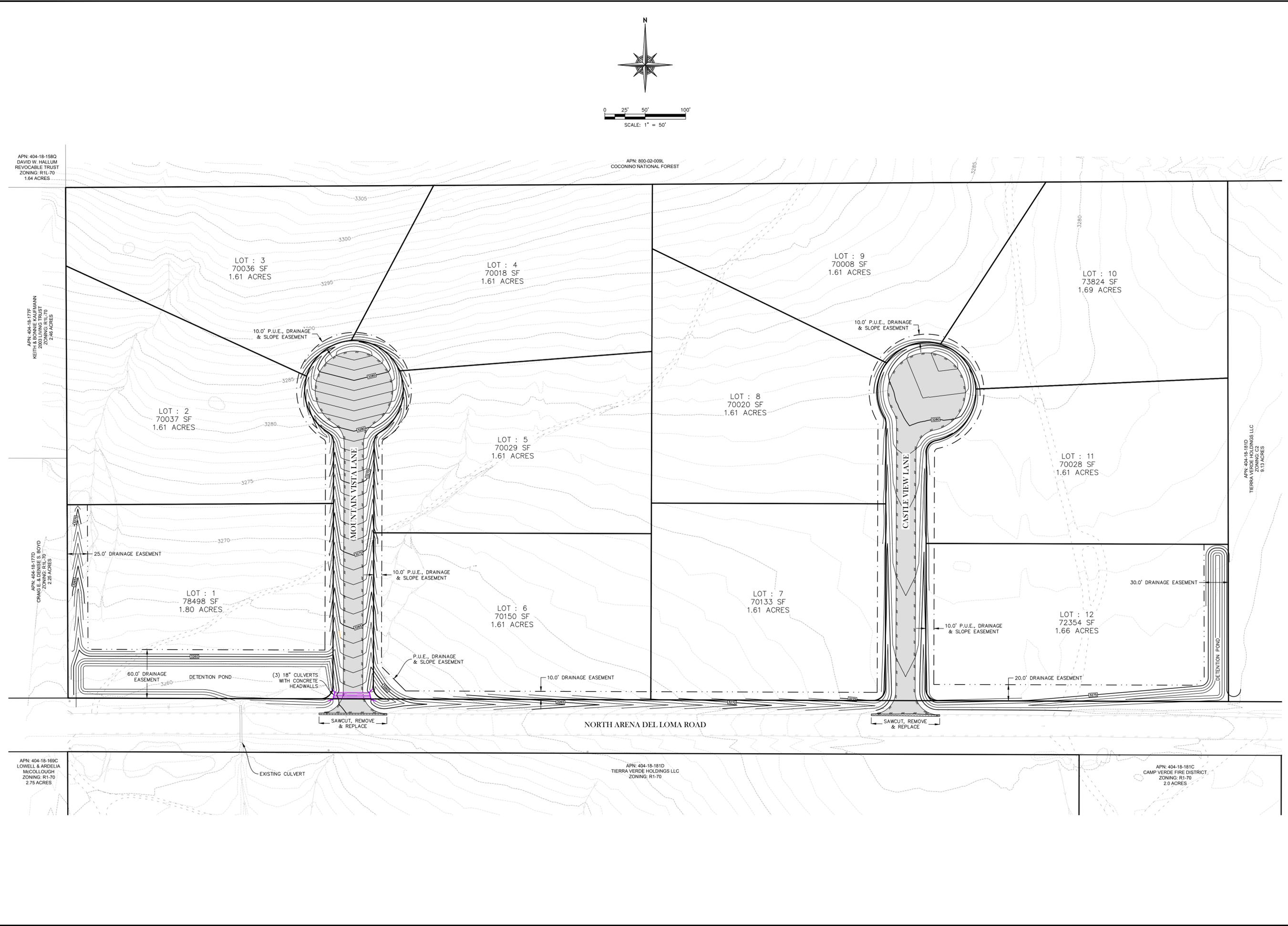


TYPICAL SWALE DETAIL NO SCALE



TYPICAL ROADWAY SECTION NO SCALE

Vertical sidebar containing project information: JOB: 13065, DATE: 12/10/2015, SCALE: AS SHOWN, DRAWN: TD, DESIGN: TD, CHECKED: JB. Includes the Granite Basin Engineering, Inc. logo and contact information, and a large '2' indicating page number.



APN: 404-18-1580  
DAVID W. HALLUM  
REVOCABLE TRUST  
ZONING: R1-70  
1.64 ACRES

APN: 404-18-1776  
KEITH & JENNIFER HANN  
2003 LIVING TRUST  
ZONING: R1-70  
2.46 ACRES

APN: 404-18-1770  
CRAIG E. & DENISE S. BOYD  
ZONING: R1-70  
2.29 ACRES

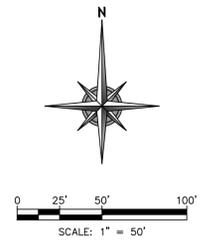
APN: 404-18-189C  
LOWELL & ARDELIA  
MCCOLLOUGH  
ZONING: R1-70  
2.79 ACRES

APN: 800-02-009L  
COCONINO NATIONAL FOREST

APN: 404-18-181D  
TIERRA VERDE HOLDINGS LLC  
ZONING: R1-70

APN: 404-18-181C  
CAMP VERDE FIRE DISTRICT  
ZONING: R1-70  
2.0 ACRES

APN: 404-18-181E  
TIERRA VERDE HOLDINGS LLC  
ZONING: C2  
9.13 ACRES



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REVISIONS	DATE	BY

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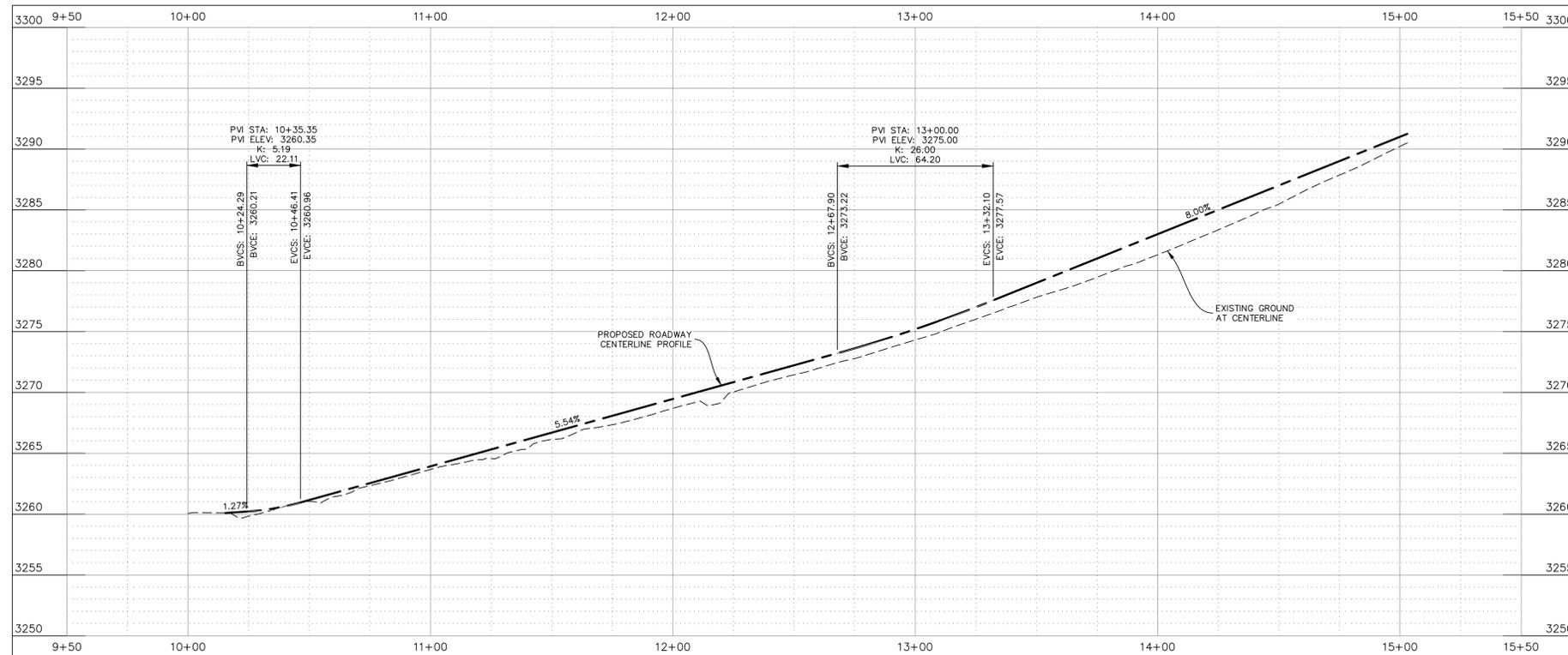
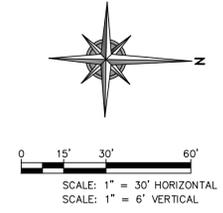
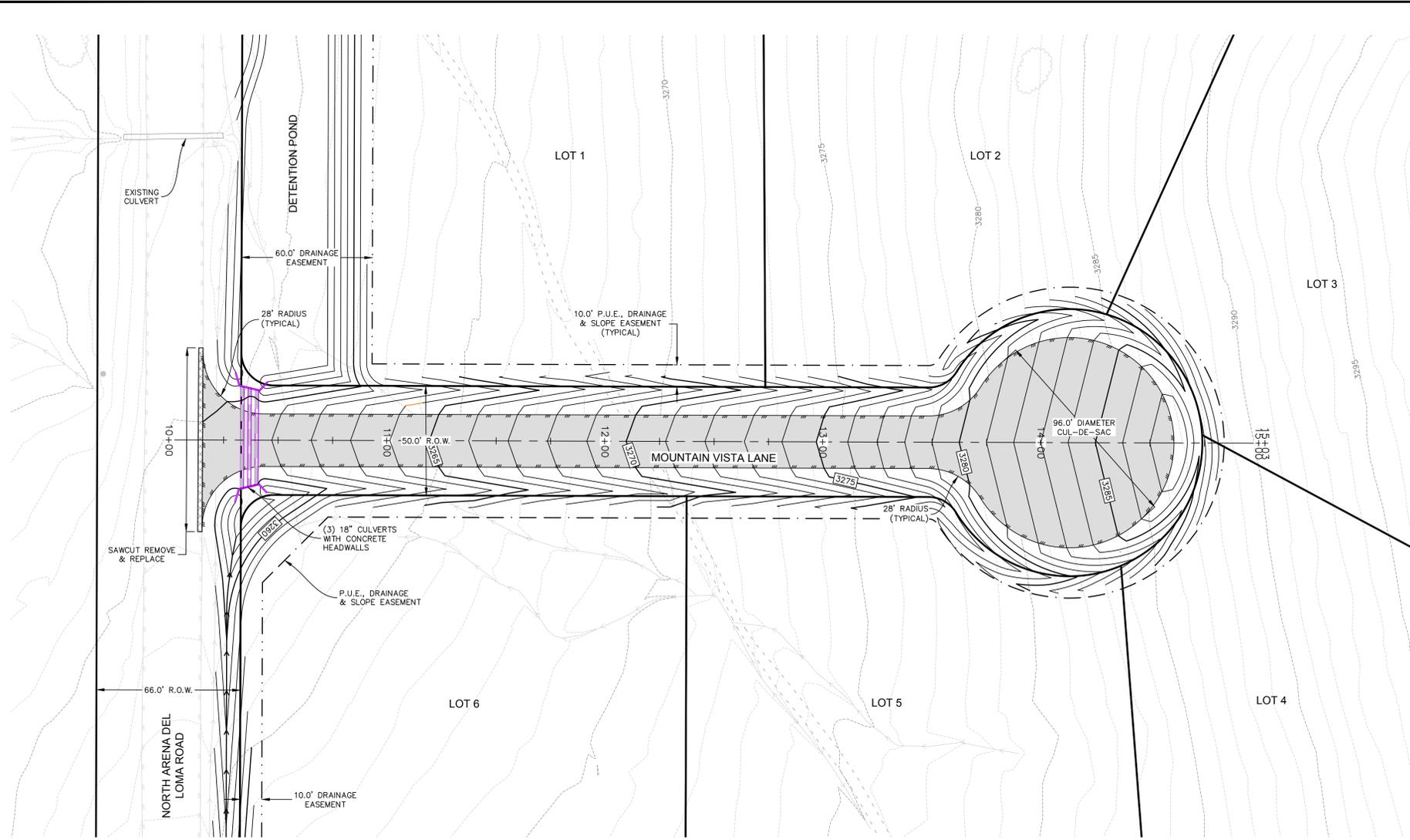
**GRANITE BASIN**  
ENGINEERING, INC.  
1981 Commerce  
Centre Drive, Suite 101  
Phoenix, AZ 85024  
928-717-0171

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CAMP VERDE, ARIZONA 86322

CASTLE HEIGHT'S SUBDIVISION  
GRADING & DRAINAGE PLANS  
PROJECT SUMMARY

**PRELIMINARY  
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CONSTRUCTION**

JOB:	13065
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SCALE:	AS SHOWN
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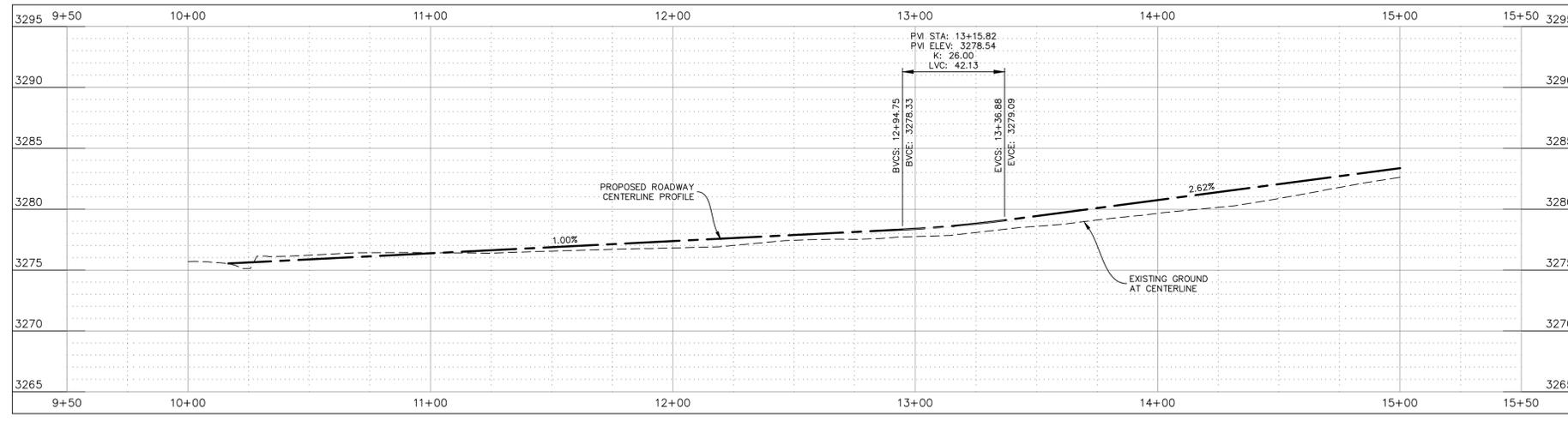
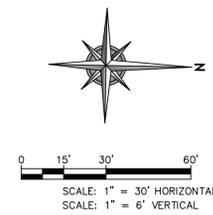
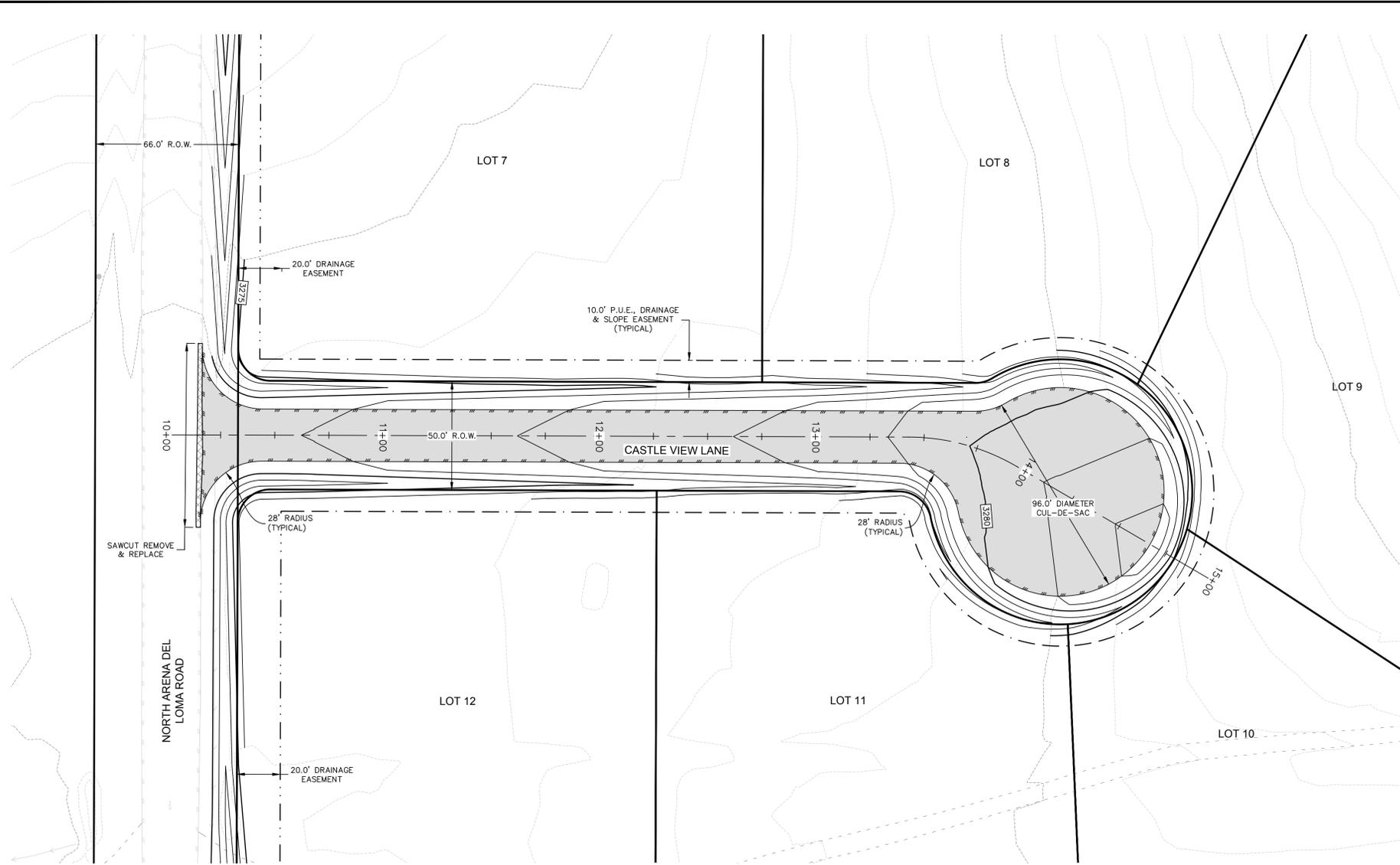
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CASTLE VIEW PLAN & PROFILE

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