



## **PLANNING COMMISSION - RESCHEDULED FROM 1/18/2023**

**Wednesday, January 25, 2023 at 5:00 PM**

Palmer Lake Town Hall – 28 Valley Crescent, Palmer Lake, Colorado

**\*Live Stream available at town website\***

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### **AGENDA**

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*This agenda is subject to revision 24 hours prior to commencement of the meeting.*

#### **Roll Call**

#### **Call to Order**

1. Nominate and Vote on Commission Chair
2. Nominate and Vote on Commission Vice Chair

#### **Approval of Minutes**

3. Minutes from 12/21/2022 Meeting

#### **Business Items**

4. **Pre-application Review** of Elephant Rock Villas Plan Submittal
5. Interview Planning Commission Member Candidates & Recommend Appointment(s) to Board of Trustees
6. Update on Master Plan Implementation Steps

#### **Next Meeting (2/15) and Future Items**

#### **Adjourn**

#### **Workshop: Continued Discussion/Review to Amend Sign Code**

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#### **Americans with Disabilities Act**

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Reasonable accommodations for persons with a disability will be made upon request. Please notify the Town of Palmer Lake (at 719-481-2953) at least 48 hours in advance. The Town of Palmer Lake will make every effort to accommodate the needs of the public.

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#### **Notice**

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Notice is hereby given that more than two members of the Board of Trustees may be present; however, there will be no action taken by the Board of Trustees at this meeting.



## PLANNING COMMISSION

Wednesday, December 21, 2022 at 5:00 PM

Palmer Lake Town Hall – 28 Valley Crescent, Palmer Lake, Colorado

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### MINUTES

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**Call to Order.** Chair Ihlenfeld called the meeting to order at 5:02 pm.

**Roll Call.** Present: Commissioners, Charlie Ihlenfeld, Bill Fisher, Mark Bruce, Amy Hutson, Susan Miner.

#### Approval of Minutes

1. Planning Commission Meeting Minutes 10/19. MOTION (Bruce, Hutson) to approve the minutes from the Oct 19 meeting. Motion PASSED (5-0).
2. Planning Commission Special Meeting Minutes 10/26. MOTION (Hutson, Fisher) to approve the minutes from the Oct 26 special meeting. Motion PASSED (5-0).

#### Public Hearing

3. Consider Application for Vacation and Replat - 113 Highland Road – Property owners, Larry and Nancy Stromer, 113 Highland Road, explained the vacation request for the replat. The adjacent property was formerly owned by Nancy Stromer’s family. The Stromers were unaware a portion of their property was now owned by Mr. Jess Eller. Both parties have agreed to the replat, with the stipulation that the Stromers will incur all costs and will comply with all legal requirements concerning the replat. There were no comments from the public. Staff had no concerns with this request. Commissioner Fisher would like to have pictures of the property. He wanted to be sure the property was a transfer between parties. Mr. Stromer stated that was the case. Commissioner Miner explained it as a gifting of land. MOTION (Miner, Fisher) to recommend the Board of Trustees approve the application as presented, with the understanding that all legal requirements are completed and filed with the appropriate entities. Motion PASSED (5-0).

#### Business Items

4. Review Applications for Appointment – Two applications were presented to the Commissioners. After review, they would like to interview the applicants at their next meeting on January 18. Staff will contact the applicants to set up the interviews.

Other Items – Chairman Ihlenfeld wanted the Commissioners to be aware of several developments now in preliminary discussions with Staff, and may be presented to the Planning Commission in the new year. Commissioner Miner encouraged the members to

read and become familiar with the newly adopted Master Plan before any development comes before them. Staff will research the evacuation plan question with the departments. Commissioner Hutson inquired if she could get a hard copy of the Master Plan, and was told the Master Plan is available online at the Town's website. However, Staff would check on a hard copy. A sign ordinance workshop was discussed. Commissioner Miner suggested they go look at all the signs in the Town before the workshop. The other members did not think it was necessary. Commissioner Hutson stated she had spoken with CMI concerning the possibility of using another municipality's ordinance as a template. CMI doesn't advise such an approach. The Town should produce its own sign ordinance. Dino Salvatori is seeking to put up a sign on his property at Highway 105, and was told to bring the request to the Planning Commission. He was asked about the kind of sign, its dimensions and how it would be lit. He was then instructed to submit an application to the Town office. He was also invited to attend the sign ordinance workshop, which would bring a business perspective to their discussion. The workshop is scheduled to be held after the January 18 meeting.

**Next Meeting (workshop and regular meeting on Jan 18) and Future Items**

**Adjourn** MOTION (Hutson, Bruce) to adjourn at 5:44 PM. Motion PASSED.

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Charlie Ihlendfeld, Chair

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ATTEST: Julia Stambaugh, Deputy Town Clerk

# ELEPHANT ROCK VILLAS

January 11, 2022

## 17.72.090 SKETCH PLAN SUBMITTAL

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### 17.72.090, B. – Sketch Plan

1. Contents of the Sketch Plan map to be reviewed at the preapplication conference are described in this section. This plan is to be an indication of the developer's intent, not necessarily to scale, and subject to change.

**An initial meeting with Town of Palmer Lake staff was held on August 16, 2022, to review a draft Sketch Plan of Elephant Rock Villas. Feedback received from that meeting and correspondence with the Town's Administrator, has been incorporated into this submittal. The applicant is submitting this application in conjunction with the attached Master Plan Application with the intention of attending a preapplication conference to review the Sketch Plan with the Town of Palmer Lake Planning Commission on January 18, 2023.**

2. The Sketch Plan map should be approximately scaled, include the entire PUD tract, and show in schematic detail the topography of the land, the location of proposed uses and major buildings, the proposed development density, housing types, layout of roads by functional classification, approximate rights-of-way, layout and configuration of common open space, and location of all entrances to the tract.

**Pursuant to the Town of Palmer Lake Land Development Code §17.72.090, included with this Application is a Sketch Plan for Elephant Rock Villas.**

3. The developer also submits a brief narrative text that describes the general design and architectural policies for the PUD, the treatment of environmentally sensitive land located in the project tract, the proposed time frame for the phased development, and the phases selected as concept plans in the preliminary plan for the PUD tract.

**Attached as Exhibit A to this Sketch Plan Submittal, please find PUD Design and Architectural Guidelines that address this requirement.**

4. If development is to be phased, a Master Plan must be filed pursuant to § 16.16.

**Pursuant to the Town of Palmer Lake Land Development Code §16.16, please consider the attached Master Plan Application and Site Plan.**

**1. Subdivision Design and Site Planning Intent:**

- 1.1.1. Intent – The overall intent of the site planning is to create a low-rise, small residential development integrated into the existing natural environment with open space views between buildings and from State Highway 105 that captures the surrounding rural charm and complies with characteristics consistent with the Town of Palmer’s Lake’s Comprehensive Plan and Master Plan.
- 1.1.2. Massing – Buildings are to be clustered in a mix of two or three residential dwelling units per building. No more than three units may be combined to keep the mass of each building at a residential scale.
- 1.1.3. Setbacks – The development shall have a minimum 100’ building setback from State Highway 105, with 25’ building setbacks from interior lot lines, and a 50’ building setback from rear property line. Building units shall have a minimum of 20’ of separation between each building.
- 1.1.4. Vegetation – Site planning shall consider existing vegetation and planned building locations that minimize removal of any existing trees or vegetation over 8" in diameter at the trunk. If larger vegetation requires removal, it may be replaced with transplanted (or similar) vegetation within 100’ of where the original vegetation was removed. Low water zone vegetation will be prioritized to comply with the xeriscape plant list included in the Town’s Comprehensive Plan.
- 1.1.5. Landscaping – Applicant will provide landscape/irrigations plan during the PUD review process. Preservation of the existing clusters of pine trees is a high priority. New native grasses and trees will be added in the highway setback area to provide a natural visual buffer to the highway. Care will be taken to ensure any plantings minimize fire risks to buildings or surrounding areas utilizing Firewise recommendations.
- 1.1.6. Open Space – Minimum open space of over 30% will be incorporated into the overall development and throughout the site to preserve views and vegetation.
- 1.1.7. Connectivity – A pedestrian/dog walking trail loop will be provided for both recreational opportunities and site connectivity, that connects to the interior pocket parks. Trails are to be crushed gravel or similar materials to maintain the rural aesthetic character of the area and to blend with the natural landscape.
- 1.1.8. Wildlife/Fencing – The development shall install fencing along the north boundary of the property, adjacent to Recovery Village as a buffer to separate the different land uses and maintain privacy for both parties. (Fencing materials for this buffer will be selected after conversations with the Town of Palmer Lake and Recovery Village.) In addition, residents may install peel and post rail fencing with welded wire in backyards to contain pets and children.
- 1.1.9. Roadways – Roadways and driveways within the development are proposed without curb and gutter to maintain a rural character. A built-up asphalt curb may be used where needed for drainage along roadways. Concrete may be used at high traffic areas, driveways, and walkways to the units. Asphalt roadways shall follow the Town of Palmer Lake Ordinance for construction.

- 1.1.10. Access – One, full-movement access to/from State Highway 105 is proposed with a two-lane entrance separated by a landscaped median into the proposed site. One access point is permitted for up to 29 units. Thirty or more units require two points of access. (In the alternative, each structure is required to have fire sprinklers with a minimum NFPA 13D system). No structure shall be located more than 150 feet from the access road. No dead-end access road shall be longer than 150 feet unless a turning area is provided for fire apparatus per the International Fire Code.
- 1.1.11. Lighting – Entry lights may be used for access, entry signage, and safety at the access road; however, lighting will be full cut-off / dark-sky compliant lights. To maintain the visibility of Elephant Rock from Hwy 105, no streetlights or additional development lighting is to be used other than what is allowed in the exterior building lighting at each building.
- 1.1.12. Fire Hydrants – Fire hydrants are proposed to accommodate each phase of construction that will meet Fire Department requirements.
- 1.1.13. Mail – A community mail receptacle will be installed near the entrance of the community for convenience.
- 1.1.14. Trash – Individual dwelling unit trash pick-up will be contracted through a commercial trash company. (Specific requirements for trash receptacles will be finalized during the PUD review process.)
- 1.1.15. Parking – Driveways and sixteen (16) guest parking spaces are available for residents and guests. Boat and recreational vehicle storage is not allowed.
- 1.1.16. Dogs Runs/Houses – Dog runs must be constructed with approved fencing materials and must be constructed adjacent to either the dwelling unit or separation wall between dwelling units. Dog houses no great than “X” will be allowed in fenced yards. (To be determined during PUD review process.)
- 1.1.17. Additional Structures/Storage – No exterior storage sheds or structures shall be allowed. Dog runs may be converted to outdoor storage for bicycles or other types of yard/household equipment to be determined during the PUD review process.

**2. Architectural Character and requirements:**

- 2.1. Building Scale – Buildings are to be a mix of 1 and 2 story elements. No building shall be more than two stories.
- 2.2. Building Height – The intent of the height restrictions for this development is to follow the stricter height restriction set forth by the Town of Palmer Lake Residential Zoning Ordinance. The allowable height shall be 26’-0” from the Lowest Grade Measurement to the Average Height Line between the building plate and the ridge of a gable, hipped, or gambrel roof, provided that no part of such roofs shall extend more than 5’ above the permitted height to the existing natural contour at the highest point on all sides.

- 2.2.1. Elevations of each side of the building shall be provided showing the following lines and labeled:
- 2.2.1.1. Existing Grade line – At a minimum, the two outside building corners on each end at the existing grade locations. Additional points along the elevation, particularly at corners, may be used.
  - 2.2.1.2. Proposed Grade line – At a minimum, the two outside building corners on each end at the proposed grade locations. Additional points along the elevation, particularly at corners, may be used.
  - 2.2.1.3. Lowest Grade Measurement Line – A line straight across from the lowest grade corner of each building elevation at 26' above the lowest grade building corner. Retaining walls and extensions beyond the enclosed building envelope are not required to be part of the lowest grade determination.
  - 2.2.1.4. Maximum Height Line – A line following the existing grade 32' up to establish the tallest allowable roof line as compared to the existing grade. Provide dimensions from the Maximum height line down to the actual roof ridge line.
  - 2.2.1.5. Average Height Line – The center line between the building plate and the roof ridge shall be shown on each elevation with dimensions to the Lowest Grade Measurement line.
- 2.3. Exterior Materials – Exterior materials are to be appropriate for Fire Resistive construction which can include a mix of stone, cultured stone, stucco, cementitious siding, cementitious trim, wood-look metal siding (non-reflective) and metal or composite railings. Vinyl siding, natural wood (other than IPE or Ironwood), and pressed board siding materials are not to be used. Decks and patios may be constructed of concrete or composite decking materials. Larger natural wood timbers, 6x or greater, may be used as supporting construction elements. Wood trim may be used sparingly as decorative elements only. Roofing to be Class A and non-reflective.
- 2.3.1. The exterior aesthetic desired is mountain rural. Natural looking materials in neutral colors is required to include grays, beiges, tans, browns, and blacks. The front door of each unit may have an accent color if desired.
  - 2.3.2. Windows are to be neutral-colored frames without added reflective coatings. Low-E coatings are approved and encouraged.
  - 2.3.3. Garage doors are to blend with the mountain style of the development and shall have a wood-look with a maximum of 1 full panel of glass lights.
  - 2.3.4. Roofs – Roof forms must be gable, hip, or gambrel roof forms. No flat roofs are allowed to maintain the mountain aesthetic of the development.
    - 2.3.4.1. Roofing is to be non-reflective and neutral in color in a medium to dark tone.

- 2.3.4.2. Class A roofing material can be asphalt shingles, composite shingles, stone coated metal, or concrete tile with the desired aesthetic being an Architectural dimensional shingle in a neutral gray color.
- 2.3.4.3. Roofs are not to be red, white, or other bright color that stands out against the natural landscape.
- 2.3.4.4. Each building elevation shall have at least one gable or gable dormer on each side to maintain a traditional mountain aesthetic on all sides.
- 2.3.4.5. Decorative elements like corbels, trusses, outriggers, and pergolas are encouraged.
- 2.4. Exterior Building Lighting – All exterior building lights are to be dark-sky rated, full cut-off fixtures. No lighting is allowed to spill over the property or lot lines. If a building is within 50 feet of a property or lot line, a photometric plan shall be provided to show a “0” footcandle level at all property and lot lines.
- 3. Phasing of Development:** Elephant Rock Villas will be constructed in five (5) phases. Timing of construction is estimated to be two to five years per phase, depending on availability of water taps from the Town of Palmer Lake and market conditions.
- 3.1. **Phase 1** – A total of fourteen (14) dwelling units along an entry road from Highway 105 to the northeast. Phase 1 will include five duplexes on the north side of the entry road and two duplexes on the south side of the entry road.
- 3.2. **Phase 2** – A total of eleven (11) dwelling units extending the entry road to the east to create a temporary hammerhead/fire access turnaround. Phase 2 will include one triplex to the north of the entry road, one triplex to the south of the entry road, one triplex on the northeast side of the temporary hammerhead and one duplex on the southeast side of the temporary hammerhead.
- 3.3. **Phase 3** – A total of sixteen (16) dwelling units which will extend the temporary hammerhead back to the west to join the entry road, creating a looped roadway and water system. Phase 2 will include three duplexes on the north side of the southern looped road and five duplexes on the south side of the looped road.
- 3.4. **Phase 4** – A total of twelve (12) units which will extend the northern side of the temporary hammerhead and create a permanent hammerhead/fire access turnaround in the northeast portion of the site. Phase 4 will include two, triplexes on the north side of the hammerhead, one triplex on the southwest side of the hammerhead and one triplex on the southeast side of the hammerhead.
- 3.5. **Phase 5** – A total of four (4) dwelling units will extend the entry road to a northwest hammerhead, pending evaluation of topography issues. If constructed, Phase 5 will include two, duplex units.

# ELEPHANT ROCK VILLAS

## PALMER LAKE, COLORADO

### SKETCH PLAN



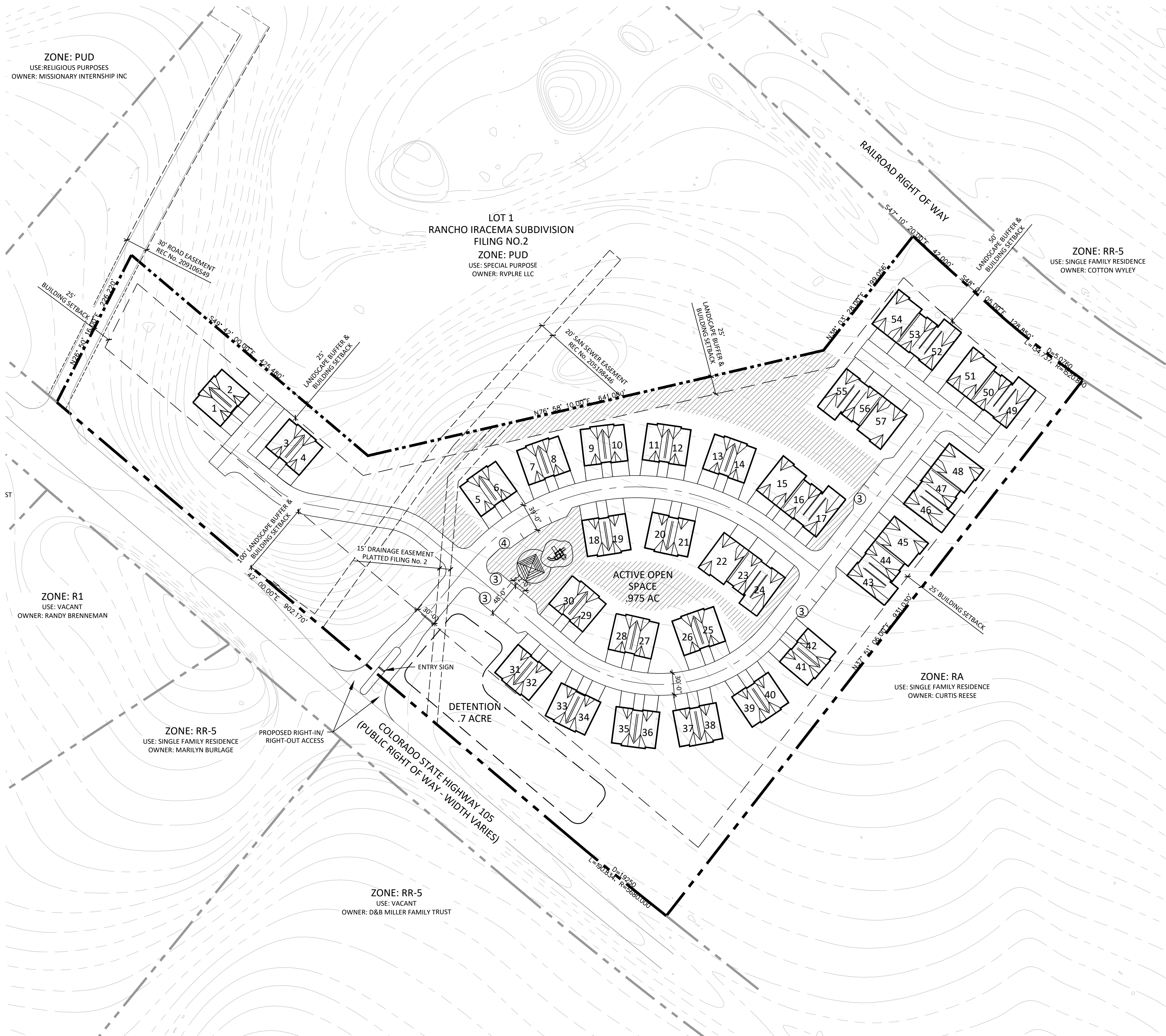
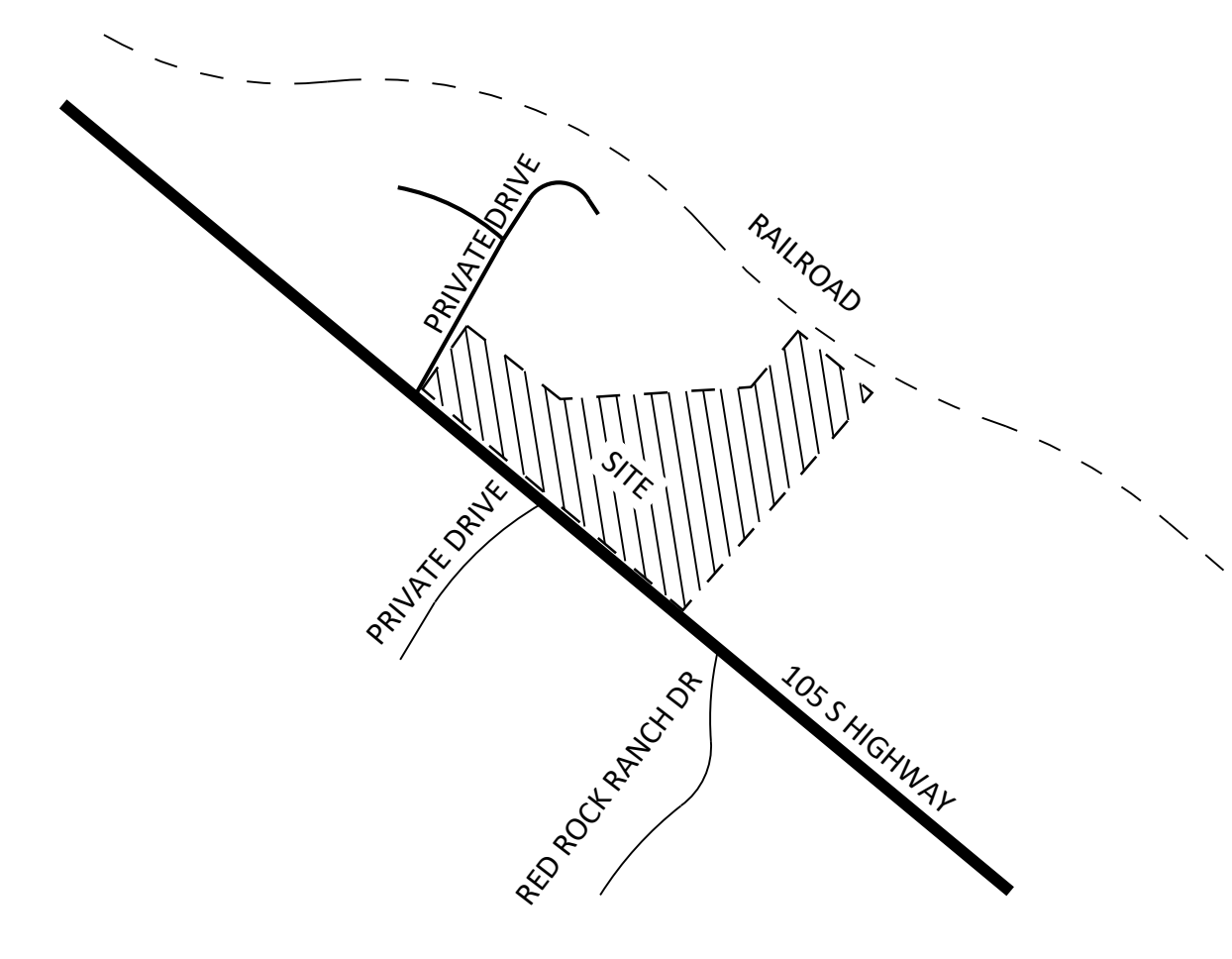
N.E.S. Inc.  
619 N. Cascade Avenue, Suite 200  
Colorado Springs, CO 80903

Tel. 719.471.0073  
Fax 719.471.0267

www.nescolorado.com

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#### VICINITY MAP



#### SITE DATA

Tax ID Number: 7109012011  
 Total Area: 13 Acres  
 Current Zoning: PUD  
 Current Use: Vacant  
 Proposed Use: Single Family Attached Residential  
 Number of Dwelling Units: 57  
 Maximum Building Height: 30'  
 Parking Formula: 2 Spaces/Dwelling Unit (17.60.0208)  
 Required: 2(57) = 114  
 Provided: 244  
 Garage Spaces: 114  
 Driveway Spaces: 114  
 On-Street Parking: 16  
 Building Setbacks  
 North (Railroad ROW): 50'  
 North (Adjacent to Lot 1): 25'  
 South (HIGHWAY 105): 100'  
 East: 25'  
 Landscape Setbacks/Buffers  
 North (Railroad ROW): 50'  
 North (Adjacent to Lot 1): 25'  
 South (Highway 105): 25'  
 Utility Providers  
 Proposed Sewage Treatment: Palmer Lake Sanitation District  
 Proposed Water Supply System: Town of Palmer Lake  
 Electric: Core Electric Cooperative  
 Gas: Black Hills Energy

#### Land Use Area Percentages

	AC	SF	%
Single Family Attached Residential	2.247	97,879	17.28%
Private ROW	1.662	72,397	12.78%
Private Driveways	0.594	25,875	4.57%
Guest Parking	0.086	3,746	0.66%
Deteration Pond	0.706	30,753	5.43%
Private Open Space	6.73	293,159	51.77%
Active Open Space	0.975	42,471	7.50%
Total Site Area	13.000	566,280	100.00%
Gross Density:	4.38 DU/AC		
*Net Density:	5.06 DU/AC		

\*Net density has been determined by subtracting private streets and guest parking areas (1.748 acres) resulting in a net density of 5.06 dwelling units per acre.

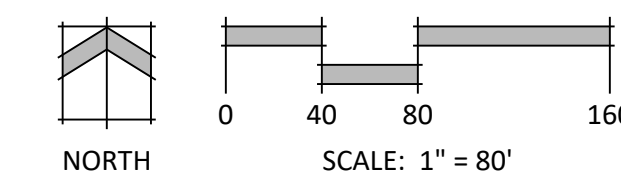
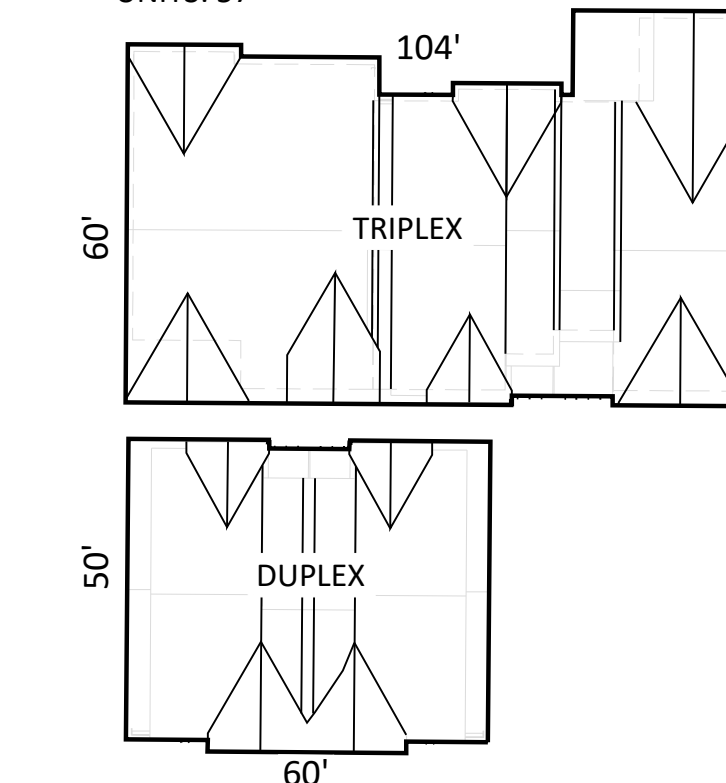
#### LEGAL DESCRIPTION

LOT 2 RANCHO IRACEMA SUBDIVISION FILING NO.2, IN THE TOWN OF PALMER LAKE, COUNTY OF EL PASO, STATE OF COLORADO.

#### GENERAL NOTES

- PRIVATE DRIVES ARE TO BE PAVED CONCRETE.
- FEDERAL EMERGENCY MANAGEMENT AGENCY, FLOOD INSURANCE RATE MAP NUMBER 08041C0257G, EFFECTIVE DATE, DECEMBER 7, 2018, INDICATES THE AREA IN THE VICINITY OF THIS PARCEL OF LAND TO BE A ZONE X (AREA DETERMINED TO BE OUT OF THE 500 YEAR FLOODPLAIN).
- CONTOURS SHOWN ON PLAN ARE AT 2' INTERVALS.

BUILDINGS: 25  
UNITS: 57



#### PROJECT TEAM

OWNER/APPLICANT: Dorman Properties LLC  
 2760 N Academy Blvd., STE 302  
 Colorado Springs, CO 80917  
 ARCHITECT: 308 LLC  
 815 S 25th Street  
 Colorado Springs, CO 80904  
 PLANNER/  
 LANDSCAPE ARCHITECT: N.E.S. Inc.  
 619 N. Cascade Ave., Suite 200  
 Colorado Springs, CO 80903  
 ENGINEER: RESPEC  
 121 S Tejon Street, STE 1110  
 Colorado Springs, CO 80903  
 TRAFFIC: LSC Transportation, Inc.  
 2404 E. Pikes Peak Ave, Suite 304  
 Colorado Springs, CO 80909  
 GEOTECH: RMG Engineers/Architects  
 2910 Austin Bluffs Pkwy, Suite 100  
 Colorado Springs, Colorado 80918  
 WATER COUNSEL: MONSON, CUMMINS, SHOHEET & FARR, LLC  
 13511 Northgate Estates Dr., Ste. 250  
 Colorado Springs, Colorado 80921  
 DEVELOPMENT CONSULTANT: Olive Real Estate Group, Inc.  
 102 N. Cascade Ave., Ste. 250  
 Colorado Springs, CO 80903

## ELEPHANT ROCK VILLAS

### SKETCH PLAN

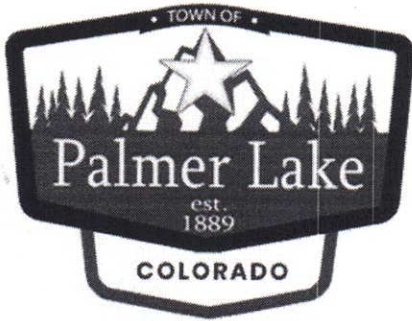
105 S HIGHWAY

DATE: 01.12.23  
 PROJECT MGR: C.LIEBER  
 PREPARED BY: C.HELMINGER

### SKETCH PLAN

# 1

1 OF 1



42 Valley Crescent  
PO Box 208  
Palmer Lake, CO 80133  
719-481-2953 - Office

Office Use Only	
Date:	_____
Fees:	\$1,000.00 + _____
Check #:	_____
Rec'd By:	_____
<i>Allow a minimum of 10 business days to review upon submittal.</i>	

## Planned Unit Development - PUD Application Form

Name of Applicant: Dorman Properties, LLC and Montebello 2205, LLC

Address: 2760 N Academy Blvd Ste 302, 80917 Phone #: (719) 213-9100


Name of Proposal: Elephant Rock Villas

Tax Schedule #: 71090-12-011

Legal Description: LOT 2 RANCHO IRACEMA SUB NO 2

This is a *Planned Unit Development* - A PUD district is intended to provide the means through which land may be developed through an overall unified approach that allows for flexibility and innovations in design, mixture of uses, and site design. *Ord. 17.52.010*

Current Zoning and Uses of Surrounding Property:	N: <u>PUD</u>	<u>Recovery Village</u>
	E: <u>RA</u>	<u>Residential</u>
	S: <u>RR-5</u>	<u>Vacant</u>
	W: <u>RR-5</u>	<u>Residential</u>

 11/10/23  
 Signature of Owner 11/10/23 Date

# ELEPHANT ROCK VILLAS

January 11, 2022

Item 4.

## 17.52.100 PLANNED UNIT DEVELOPMENT APPLICATION

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### 17.52.100 (1) a. 1. – Applicant & Project Team

#### APPLICANT/PROPERTY OWNER/DEVELOPER

**Todd Dorman, CCIM**  
**Dorman Properties, LLC**  
**Montebello 2205, LLC**  
2760 North Academy Blvd., Suite 302  
Colorado Springs, CO 80917  
Office: (719) 213-9100  
Email: [todd@dormanrealestate.com](mailto:todd@dormanrealestate.com)

#### DEVELOPMENT CONSULTANT

**Ingrid Richter**  
c/o Olive Real Estate Group, Inc.  
102 North Cascade Avenue, Suite 250  
Colorado Springs, CO 80903  
Office: (719) 598-3000  
Mobile: (719) 660-2001  
Email: [ingridrichter@oliverreg.com](mailto:ingridrichter@oliverreg.com)

#### TRANSPORTATION CONSULTANT

**Jeff C. Hodson, PE, Principal**  
**LSC Transportation Consultants, Inc.**  
2504 East Pikes Peak Avenue, Suite 304  
Colorado Springs, CO 80909  
Office: (719) 633-2868  
Email: [jeff@lsctrans.com](mailto:jeff@lsctrans.com)

#### ARCHITECT

**Christy Riggs, AIA, Owner/Architect**  
**308, LLC**  
815 S 25<sup>th</sup> Street, Suite #203  
Colorado Springs, CO 80906  
Office: (719) 505-6635  
Email: [christyriggs@308llc.com](mailto:christyriggs@308llc.com)

#### PLANNER/LANDSCAPE ARCHITECT

**Chris Lieber, Principal, PLA**  
**N.E.S., Inc.**  
649 North Cascade Ave., Suite 200  
Colorado Springs, CO 80903  
Office: (719) 471-0073  
Mobile: (719) 440-5102  
Email: [clieber@nescolorado.com](mailto:clieber@nescolorado.com)

#### CIVIL ENGINEER

**Rich Gallegos, PE, CFM, ENV SP**  
**RESPEC**  
121 South Tejon Street, Suite 1110  
Colorado Springs, CO 80903  
Office: (719) 266-5212  
Mobile: (719) 492-8296  
Email: [richard.gallegos@respec.com](mailto:richard.gallegos@respec.com)

#### GEOTECH CONSULTANT

**Kelli Zigler, Geologist**  
**RMG – Rocky Mountain Group**  
2910 Austin Bluffs Parkway, Suite 100  
Colorado Springs, CO 80918  
Office: (719) 548-0600  
Email: [kmzigler@rmg-engineers.com](mailto:kmzigler@rmg-engineers.com)

#### WATER ATTORNEY

**Chris D. Cummins, Esq.**  
**Monson, Cummins & Shohet, LLC**  
13511 Northgate Estates Dr., Ste. 250  
Colorado Springs, Colorado 80921  
Office: (719) 471-1212  
Email: [cdc@cowaterlaw.com](mailto:cdc@cowaterlaw.com)

### 17.52.100 (1) a. 2. – Type of unit, size, number of stories, approximate height

Elephant Rock Villas is a single-family attached, clustered townhome community with a mix of fifty-seven (57) non-owner-occupied duplexes and triplexes. Construction will be crawl space foundations with building heights of eighteen feet (18') for single story townhomes and twenty-eight feet (28') for two-story townhomes. (The allowable height shall be 26'-0" from the Lowest Grade Measurement to the Average Height Line between the building plate and the ridge of a gable, hipped, or gambrel roof, provided that no part of such roofs shall extend more than 5' above the permitted height to the existing natural contour at the highest point on all sides.)

# ELEPHANT ROCK VILLAS

January 11, 2022

Item 4.

## **17.52.100 (1) a. 3. – Number of dwelling units and gross and net density**

18 duplexes, totaling 36 single family townhomes are planned to include the following variations:

- One-story with ~1,200 SF to include 2 bedrooms, 2 bathrooms and a 2-car garage.
- Two-story units with ~2,200 SF to include 3 bedrooms, 2.5 bathrooms and a 2- car garage.
- One-story units with ~1,600 SF to include 3 bedrooms, 2.5 bathrooms and a 2-car garage.

7 triplexes, totaling 21 single family townhomes are planned to include the following variations:

- One-story with ~1,200 SF to include 2 bedrooms, 2 bathrooms and a 2-car garage.
- Two-story units with ~2,200 SF to include 3 bedrooms, 2.5 bathrooms and a 2- car garage.
- One-story units with ~1,600 SF to include 3 bedrooms, 2.5 bathrooms and a 2-car garage.

The proposed gross density of the 13-acre site is approximately 57 dwelling units per acre (4.38 DU/AC) consisting of approximately 18 duplex buildings (36 units) and 7 triplex buildings (21 units). Net Density has been determined by subtracting private streets (1.662 acres) and guest parking areas (.086 acres) resulting in a net density of 5.07 units per acres. The Land Development Code requires 12 dwelling units per net acre. A total of 8.411 acres of usable open space has been provided (3.9 acres are required by code). Code requires 25% of required open space (.975 acres) to be dedicated for active recreation, and .975 acres has been provided. A Land Use Area Density Table illustrating land use percentages is included on the Master Plan.

## **17.52.100 (1) a. 4. – Type of resident expected**

This Application is for consideration of 57 attached dwelling units on 13 acres of PUD zoned property. Elephant Rock Villas will be single family attached, non-owner occupied, long-term rental townhomes suitable for retirees, families, local workforce, and young professionals. The Elephant Rock Villas clustered townhome, 'for rent' approach offers a new and unique type of development in response to post-pandemic demographic, economic and market changes offering housing options for a variety of lifestyles and employment options. As population and employment growth along the Front Range increases, the rate of development in the unincorporated areas of El Paso continues to correlate with the current economic expansion of the Pikes Peak Region; specifically, those areas in northern El Paso County with a closer proximity to Denver. Monument, Colorado has seen exponential growth over the past five years resulting in increased demand for new residential housing options close to transportation corridors but in natural settings with recreational opportunities, beautiful landscapes, and nearby amenities. Elephant Rock Villas supports a rural neighborhood lifestyle for families, young professionals and/or retirees whose dream of home ownership is currently out of reach.

The townhomes are currently planned to rent at a market rate range of ~\$1,700 to ~\$2,300 per month depending on the size of the townhome and mix of bedroom/bathroom/garage amenities and final development and construction costs. Utilities will be paid by residents and common area community expenses (such as trash, snow removal and landscaping) will be paid for and managed by the Property Owner. Lease terms for approximately ninety percent (90%) of the dwelling units will be for a minimum of one year and approximately ten percent (10%) of the dwelling units will be used for short term rentals of no more than 30 days.

## **17.52.100 (1) a. 5. – Proposed ownership configuration**

Elephant Rock Villas will be non-owner occupied, long-term rental units managed by Dorman Real Estate, Inc., a subsidiary of the Property Owner. The development will be owned, developed, managed, and maintained by Dorman Properties, LLC and Montebello 2205, LLC who purchased the property on September 30, 2021. Todd Dorman serves as founder, principal and majority owner of these entities, as well as Dorman Real Estate, Inc., a real estate management company based in Colorado Springs, CO with

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a branch in Woodland Park, CO. Since 2009, Dorman Real Estate, Inc. has grown from 5 employees managing ~250 homes to 40± employees specializing in residential management of 800+ units, HOA management of over ~60 associations, commercial property management, short-term corporate and vacation rental management, along with a property maintenance division.

Mr. Dorman invested in Palmer Lake because he desires to be part of the Palmer Lake community and saw a need for high-quality rental homes in the Tri-Lakes region. With Dorman's resources and expertise in managing and maintaining similar projects and associations, the vision for Elephant Rock Villas is to become a legacy a crown jewel of success for the Palmer Lake community offering a sense of pride for its residents. The mission is to create an attainable, desirable living community befitting of a small mountain community that will be impeccably maintained for generations to come.

## **17.52.100 (1) a. 6. – Description of design parameters**

Draft **PUD Design and Architectural Policies** are included as **Exhibit A** of the Sketch Plan Application.

**Solar Orientation** – The proposed buildings have a southwest solar orientation.

**Building Materials** – WUI building standards with fire resistant materials will be used.

**Landscaping Materials** – Firewise landscaping standards will be referenced and used on the property.

**Natural Features** – The overall site is wooded with clusters of pine trees in a few generalized areas with the highest elevation on the northwest portion of the site, offering panoramic views. The site slopes approximately thirty feet (30') southeast to an existing drainage channel and cement culvert underneath Highway 105 located approximately two hundred feet (200') northwest of the bottom right angle of the triangle. The lower area of the site offers beautiful views of the Front Range to the south with Raspberry Mountain and Mount Herman in the foreground with Ben Lomond Mountain and Elephant Rock to the north.

The Property Owner proposes a one-hundred-foot (100') setback from Highway 105 creating open space, a natural drainage area, and a rural two-lane entrance separated by a landscaped median into the proposed site. The expanded setback from Highway 105 will decrease roadway noise and offer aesthetically pleasing south facing views for residents. Preservation of the existing clusters of pine trees is a high priority. The Property Owner will attempt to transplant existing trees that require clearing into the one-hundred-foot (100') setback area adjacent to Highway 105. In addition, new native grasses and trees will be added in the setback area to provide a natural visual buffer to the highway. Care will be taken to ensure any plantings minimize fire risks to buildings or surrounding areas utilizing Firewise recommendations.

Most of the proposed development area sits approximately thirty feet (30') lower in elevation than The Recovery Village, the nearest developed neighbor to the north, ensuring the north neighbors' south facing views are not compromised. Architecture of the units will ensure compatibility and consistency with the scale, blocking, style, and color palette of The Recovery Village. Amenities include natural open space areas, as well as a neighborhood pocket park. The site does not contain any wetlands, creeks or riparian areas, and the nearest creek is over 1,500' to the southwest, limiting the likelihood that Preble's meadow jumping mice are present on the site. A Soils and Geology Study was prepared by RMG Engineers and is included with this overall Application.

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**Surrounding Area** – The triangular-shaped site has with a jagged northern boundary (hypotenuse side of the triangle) situated directly adjacent to a 14± acre parcel operated as **The Recovery Village**. A small portion of the northern boundary is also adjacent to the Union Pacific Railroad. The southeastern side of the triangle of is adjacent to a 34± acre parcel owned by Curtis Reese currently zoned RA (Residential Agricultural) and the southwestern leg of the triangle is directly adjacent to Highway 105. Directly across Highway 105 to south, outside of the Town of Palmer Lake boundary, is an approximately 49-acre property owned by D&B Miller Family Trust currently zoned RR-5 (Residential Rural 5-acre lots). Also, across Highway 105 to the north, sits an approximately 7+ acre parcel owned by Randy Brenneman currently zoned R1 (Low Density Residential).

## **17.52.100 (1) a. 7. – Amount and function of proposed open space and active recreation areas**

The Applicant proposes that nearly sixty percent (60%) of the site will be utilized as private open space by the residents of Elephant Rock Villas. Approximately 7.486 acres will serve as open space, intended to create a vegetated neighborhood and rural environment for residents. It is anticipated a pedestrian trail loop and dog walking area will be designed within the perimeter setback areas that will provide recreational opportunities for residents and site connectivity. All trails will be constructed of crushed gravel or similar materials to maintain the rural aesthetic character of the area and to blend with the natural landscape. An additional 0.219-acre recreational area is proposed within the site and will serve as a ‘pocket park’.

## **17.52.100 (1) b. – Plan/Graphic Information**

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### **17.52.100 (1) b.1. – Scale, Vicinity Map, Date of Preparation and Proposed Project Name**

The proposed project name of the development is Elephant Rock Villas. PUD SKETCH Plan dated January 10, 2023 is attached as part of this submittal, which will be updated after feedback is received from the Tow of Palmer Lake staff and Planning Commission. The PUD Site Plan includes a general vicinity map (with north arrow). Reference scale of 1" = 50’.

### **17.52.100 (1) b.2. – Boundaries of subject parcel, legal description and total acreage**

The triangular-shaped site is a 13-acre vacant tract of land zoned PUD (Planned Unit Development), with a legal description of Lot 2 in Rancho Iracema Subdivision Filing No. 2, in the Town of Palmer Lake, County of El Paso County, State of Colorado (the “Property”). The Property has El Paso County Tax Schedule No. 71090-12-011 and is currently undeveloped. Details regarding the Property boundary and neighboring properties are referenced in 17.52.100, A.1.f.

### **17.52.100 (1) b.3. – Existing streets, rights of way widths, and driving surface widths within and immediately adjoining the site**

The proposed private loop road is thirty feet (30’) wide and is intended to create connectivity within the community and to allow a looped water system for both water pressure and fire suppression. Four parking areas are planned where right of way widths will increase to thirty-nine feet (39’) in three locations and forty-eight feet (48’) in one location to accommodate guest and/or on-street parallel parking on one-side or both sides of the road, respectively. The proposed private roadway will be designed as rural-residential with drainage swales instead of curb and gutter and hammerhead dead ends that allow vehicles to turn around while limiting the amount of paved impervious surface, resulting in additional infiltration of precipitation into the ground and enhance stormwater discharge quality. The internal private roadway will be maintained by the Property Owner, with proposed access to the development directly from State Highway 105.

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RESPEC civil engineers contemplated access to the site from the existing Recovery Village entrance from Highway 105. However, roadway profiles included with this Application show the elevation change to make this connection would require cutting down the top of the hill, resulting in a slope of eight percent (8%) on a north facing road. This profile would also require a retaining wall of approximately ten feet (10') on the northern property line, and approximately fifteen feet (15') to twenty feet (20') on a drive connection; making this alternative cost prohibitive.

## **17.52.100 (1) b.4. – Location, width, type and ownership of existing utility lines, right of way and easements**

**Easements** – Four easements currently exist on the property and are illustrated on the proposed PUD Sketch plan:

1. A fifteen-foot (15') drainage easement noted on the Rancho Iracema Subdivision Filing No. 2 replat for the benefit of Recovery Village runs north/northeast from Highway 105 to Recovery Village, terminating at a cement culvert located on the southern boundary carrying drainage underneath Highway 105. Recovery Village drainage will be accepted into the Elephant Rock Villas proposed drainage system and will flow through culverts under the proposed looped roadway system to the existing cement culvert underneath Highway 105.
2. A twenty-foot (20') sanitary sewer easement recorded at Reception No. 205198446 connecting to Palmer Lake Sanitation District for the benefit of Recovery Village runs northeast from Highway 105 to Recovery Village. The Applicant is working with Palmer Lake Sanitation District to determine capacity of the existing eight foot (8') sanitary sewer line, with the intention of the utilizing the line to carry Elephant Rock Villas effluent to existing Palmer Lake Sanitation District infrastructure.
3. A thirty-foot (30') road easement recorded at Reception No. 209106549 granting access from Highway 105 to Lot 2 is located on the northwest boundary line of the property is discussed above.
4. A ten-foot (10') water line easement recorded in Book 3500, Page 805, Reception No. 201062530 from the Clark Well for the benefit of Mission International and Recovery Village is located on the northeast boundary line of the property.

Overhead utility (OHU) lines are located on the southwest boundary of the property but are not recorded as exceptions to the title policy for the Property.

**Electric Service** – CORE Electric Cooperative will provide electrical service to the site pursuant to the will-serve letter dated August 19, 2022.

**Gas Service** – Black Hills Energy will provide gas service to the site pursuant to the will-serve letter dated June 19, 2022.

**Water Service** – Water service is being requested from Town of Palmer Lake as described in the Water Resources Report, dated January 9, 2023, written by Chris Cummins, Esq. The Applicant understands the Town is in the process of water system upgrades, which are required to provide sufficient flows and taps needed for this project. The Applicant and Town will need to work collaboratively to understand a realistic timeline of future water system upgrades and how those upgrades will coincide with future development plan approvals and installation of required infrastructure.

The Applicant intends to install a looped water system to serve the subdivision and provide sufficient fire flows, as illustrated on the Preliminary Utilities plan included with this Application. Sufficient fire hydrants are proposed to accommodate each phase of construction and meet Fire Department requirements. The looped system provides sufficient flow rates by allowing water to take more than one path to a given hydrant and provide adequate pressure and volume of water to fight a fire. A

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pressure-reducing valve will be installed prior to the construction of any dwelling units. The Applicant's goal is to develop a community that pays mill levy to the Town of Palmer Lake and administrative revenue for water service.

**Sanitary Sewer Service** – Wastewater service is being requested from Palmer Lake Sanitation District.

**Police and Fire** – The site is located within the boundaries of the Town of Palmer Lake Fire and Police.

## **17.52.100 (1) b. 5. – Identification of natural features**

**Natural Features** – The overall site is wooded with clusters of mature pine trees in a few generalized areas with the highest elevation on the northwest portion of the site, offering panoramic views. The site slopes approximately thirty feet (30') southeast to an existing drainage channel and cement culvert underneath Highway 105 located approximately two hundred feet (200') northwest of the southeastern corner of the site. The lower area of the site offers beautiful views of the Front Range to the south with Raspberry Mountain and Mount Herman in the foreground and Elephant Rock to the north.

The site does not contain any wetlands, creeks or riparian areas, and the nearest creek is over 1,500' to the southwest, limiting the likelihood that Preble's meadow jumping mice are present on the site. A Soils and Geology Study was prepared by RMG Engineers and is included with this overall Application. In addition, a Soils Map is included within the Engineering Profiles section of this Application.

## **17.52.100 (1) b.6. – Landforms and topographic character of the land**

Most of the proposed development area sits approximately thirty feet (30') lower in elevation than Recovery Village, the nearest developed neighbor to the north, ensuring the north neighbors' south facing views are not compromised. Architecture of the units will ensure compatibility and consistency with the scale, blocking, style, and color palette of The Recovery Village. The northwestern leg of the site contains two areas with slopes between 15% and 30%. These areas may be cost prohibitive to develop. A Slope Analysis Map is included in the Engineering Profiles section of this Application.

The undulating topography of the site lends itself to larger building footprints rather than smaller lots. Several larger areas of the site are level, and the proposed development of duplexes and triplexes will lessen the need for extensive grading and/or relocation of soil. Clustering of the units will also allow for preservation of existing trees.

## **17.52.100 (1) b.7. – Building footprints and percent coverage for attached residential units**

Building footprints, open space locations, active recreation areas are illustrated on the PUD (Sketch) Plan submittal. Land Use Area Percentages are also included on the PUD (Sketch) Plan.

## **17.52.100 (1) b.8. – Not Applicable (pertains to detached residential units)**

## **17.52.100 (1) b.9. – Not Applicable (pertains to non-residential uses)**

## **17.52.100 (1) b.10. – Traffic circulation and access plans**

**Internal Roadway** – The Applicant proposes construction of a two-lane entrance separated by a landscaped median. The interior rural roadways will loop through the community and will be designed to minimize disturbance. The road will be owned and maintained by the Applicant.

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**Access** – State Highway 105 is the primary and singular existing transportation corridor affecting the Property. LSC Transportation completed a Traffic Impact Study included with this Application and have initiated discussions with the Colorado Department of Transportation to include filing an Access Permit Request for the proposed access from Highway 105, which is required based on the **Colorado State Highway Access Code**. One, full-movement access to/from State Highway 105 is proposed with a two-lane entrance separated by a landscaped median into the proposed site. The proposed full-movement, single access point is approximately 550 feet southeast of The Recovery Village/Mission Training International access road and approximately 815 feet northwest of Red Rock Ranch Drive. Intersection sight distances are greater than 1,000 feet to both the east and west, which meet the prescribed distance in the **Colorado State Highway Access Code**. Based on projected traffic counts and trips generated by Elephant Rock Villas, the Traffic Impact Study notes acceptable Levels of Service and no requirement for auxiliary turn lanes at the proposed access point.

**Fire Evacuation/Emergency Access** – The Elephant Rock Villas Project Team was directed to refer to the International Fire Code for secondary access requirements. The Project Team has initiated conversations with both adjacent neighbors regarding future fire evacuation and emergency access issues, and both Recovery Village and Curtis Reese are amenable to continued discussions. The Applicant has been instructed to refer to International Fire Code, which allows for up to 30 dwelling units before a secondary access is required. In the alternative, the Applicant may consider fire suppression and/or sprinkling of units, in lieu of the secondary access requirement.

## **17.52.100 (1) b.11. – Parking**

To accommodate parking needs, each residential unit will have a 2-car garage and will be provided a 20' long driveway aprons, allowing space for two additional vehicles. To accommodate guest parking, sixteen (16) designated parallel parking spaces are proposed in four locations where the street will be widened to ensure adequate width for public safety access. Parking requirements are 2 spaces per dwelling unit or 114 space total, which are provided in garages. An additional 114 driveway spaces are planned, with an additional 16 guest spaces for a total of 244 spaces provided.

## **17.52.100 (1) b.12. – Landscape Design**

Landscaping will consist of a variety of indigenous vegetation that is consistent with surrounding vegetation in Palmer Lake and to provide a consistent, contextual natural landscape massing and screening along the Highway 105 corridor. To reduce water consumption, the selection of native and xeric plants will be utilized for their low water usage and drought-resistant properties as proposed in the Comprehensive Plan. Tree placement is proposed to be naturalistic to blend in with existing vegetation. Firewise landscaping principals will be applied to reduce ladder fuels around the proposed buildings. Proposed placement of dwelling units is intended to provide an open space, separation buffer between Highway 105 and adjacent properties to minimize contentious issues. A proposed gravel trail/dog walking area along the perimeter of the property will also be used as a land separation buffer.

## **17.52.100 (1) b.13. – Development Schedule**

The accompanying Master Plan proposes five (5) phases of development for Elephant Rock Villas, as follows:

- **Phase 1** – A total of fourteen (14) dwelling units along an entry road from Highway 105 to the northeast. Phase 1 will include five duplexes on the north side of the entry road and two duplexes on the south side of the entry road.
- **Phase 2** – A total of eleven (11) dwelling units extending the entry road to the east to create a temporary hammerhead/fire access turnaround. Phase 2 will include one triplex to the north of the

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entry road, one triplex to the south of the entry road, one triplex on the northeast side of the temporary hammerhead and one duplex on the southeast side of the temporary hammerhead.

- **Phase 3** – A total of sixteen (16) dwelling units which will extend the temporary hammerhead back to the west to join the entry road, creating a looped roadway and water system. Phase 2 will include three duplexes on the north side of the southern looped road and five duplexes on the south side of the looped road.
- **Phase 4** – A total of twelve (12) units which will extend the northern side of the temporary hammerhead and create a permanent hammerhead/fire access turnaround in the northeast portion of the site. Phase 4 will include two, triplexes on the north side of the hammerhead, one triplex on the southwest side of the hammerhead and one triplex on the southeast side of the hammerhead.
- **Phase 5** – A total of four (4) dwelling units will extend the entry road to a northwest hammerhead, pending evaluation of topography issues. If constructed, Phase 5 will include two, duplex units.

Timing of construction is estimated to be two to five years per phase, depending on availability of water taps from the Town of Palmer Lake and market conditions.

## **17.52.100 (1) b.14. – Drainage**

A full spectrum extended detention basin is proposed along the SH 105 right-of-way. The basin is designed utilizing the Mile High Flood District methodology and meets El Paso County criteria for detention and water quality. Peak proposed discharge rates from the site will be detained and released at levels below historical rates from the 0.73 ac-ft basin for the 5-year and 100-year storm events. Water quality is provided utilizing the County's four-step process, which includes constructing a forebay to reduce sediment loads and micro pool at the outlet. The Applicant intends to utilize the existing drainage channel and 2'x2' concrete box culvert underneath Highway 105, located approximately two hundred feet (200') northwest of the site's southeast corner. Detention and water quality features will be integrated into the system utilizing criteria established by the Town and supplemented by El Paso County regulations. A Drainage Report prepared by RESPEC is included with this Application.

## **17.52.100 (1) b.15. – Land Use Legend**

The land use legend is located on the cover sheet under site data. Proposed densities, utility easements, common open space, recreation areas, stormwater detention/water quality areas, adjacent land uses, setbacks, and buffers are labeled on the PUD Site Plan. The PUD also includes typical building footprints and elevations.

## **17.52.100 (1) b.16. – Signage**

An entry sign of approximately 5' by 10' is proposed to be located at the entry of the proposed right in/right out access for visibility from Hwy 105. The proposed entry sign location is shown and labeled on the PUD Site Plan. The entry sign will comply with Town of Palmer Lake Land Development Code.

## **17.52.100 (1) b.17. – Additional Information**

The Elephant Rock Villas 13-acre PUD Application encourages a unified approach to planning, design, and development of land that is (1) consistent with the goals and objectives and the Town of Palmer Lake Comprehensive Plan, (2) meets the criteria of §17.72 Planned Unit Development of the Town of Palmer Lake Land Development Code, and (3) complies with the Palmer Lake Community Master Plan.

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Elephant Rock Villas offers a carefully planned, clustered townhome development project that promotes efficient land use, conservation of open space and reduction of infrastructure costs by utilizing larger building footprints and expanded natural buffers with rural neighborhood amenities and dwelling units tucked into natural setting. The proposed development is contiguous and compatible with projects in the surrounding Tri-Lakes and Palmer Lake area and offers a logical transition of density between Recovery Village to the north and the undeveloped Reese property to the south. The proposed site is designed to minimize impacts to adjoining property owners while complimenting the unique environmental conditions and established land use character of the area. The project also financially supports and promotes expansion of the existing water and wastewater infrastructure of the Town of Palmer Lake and Palmer Lake Sanitation District, respectively.

Documents included with PUD Application include:

1. (Proposed) PUD Design and Architectural Guidelines
  - a. (Draft) Architectural Design Package
2. Engineering Profiles
  - a. Preliminary Utilities Plan
  - b. Road Profiles
  - c. Slope Analysis
  - d. Soils Map
  - e. ALTA Survey
  - f. Rancho Iracema Plat
3. Traffic Impact Study
  - a. Access Permit Request

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**1. Subdivision Design and Site Planning Intent:**

- 1.1.1. Intent – The overall intent of the site planning is to create a low-rise, small residential development integrated into the existing natural environment with open space views between buildings and from State Highway 105 that captures the surrounding rural charm and complies with characteristics consistent with the Town of Palmer’s Lake’s Comprehensive Plan and Master Plan.
- 1.1.2. Massing – Buildings are to be clustered in a mix of two or three residential dwelling units per building. No more than three units may be combined to keep the mass of each building at a residential scale.
- 1.1.3. Setbacks – The development shall have a minimum 100’ building setback from State Highway 105, with 25’ building setbacks from interior lot lines, and a 50’ building setback from rear property line. Building units shall have a minimum of 20’ of separation between each building.
- 1.1.4. Vegetation – Site planning shall consider existing vegetation and planned building locations that minimize removal of any existing trees or vegetation over 8" in diameter at the trunk. If larger vegetation requires removal, it may be replaced with transplanted (or similar) vegetation within 100’ of where the original vegetation was removed. Low water zone vegetation will be prioritized to comply with the xeriscape plant list included in the Town’s Comprehensive Plan.
- 1.1.5. Landscaping – Applicant will provide landscape/irrigations plan during the PUD review process. Preservation of the existing clusters of pine trees is a high priority. New native grasses and trees will be added in the highway setback area to provide a natural visual buffer to the highway. Care will be taken to ensure any plantings minimize fire risks to buildings or surrounding areas utilizing Firewise recommendations.
- 1.1.6. Open Space – Minimum open space of over 30% will be incorporated into the overall development and throughout the site to preserve views and vegetation.
- 1.1.7. Connectivity – A pedestrian/dog walking trail loop will be provided for both recreational opportunities and site connectivity, that connects to the interior pocket parks. Trails are to be crushed gravel or similar materials to maintain the rural aesthetic character of the area and to blend with the natural landscape.
- 1.1.8. Wildlife/Fencing – The development shall install fencing along the north boundary of the property, adjacent to Recovery Village as a buffer to separate the different land uses and maintain privacy for both parties. (Fencing materials for this buffer will be selected after conversations with the Town of Palmer Lake and Recovery Village.) In addition, residents may install peel and post rail fencing with welded wire in backyards to contain pets and children.
- 1.1.9. Roadways – Roadways and driveways within the development are proposed without curb and gutter to maintain a rural character. A built-up asphalt curb may be used where needed for drainage along roadways. Concrete may be used at high traffic areas, driveways, and walkways to the units. Asphalt roadways shall follow the Town of Palmer Lake Ordinance for construction.

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- 1.1.10. Access – One, full-movement access to/from State Highway 105 is proposed with a two-lane entrance separated by a landscaped median into the proposed site. One access point is permitted for up to 29 units. Thirty or more units require two points of access. (In the alternative, each structure is required to have fire sprinklers with a minimum NFPA 13D system). No structure shall be located more than 150 feet from the access road. No dead-end access road shall be longer than 150 feet unless a turning area is provided for fire apparatus per the International Fire Code.
- 1.1.11. Lighting – Entry lights may be used for access, entry signage, and safety at the access road; however, lighting will be full cut-off / dark-sky compliant lights. To maintain the visibility of Elephant Rock from Hwy 105, no streetlights or additional development lighting is to be used other than what is allowed in the exterior building lighting at each building.
- 1.1.12. Fire Hydrants – Fire hydrants are proposed to accommodate each phase of construction that will meet Fire Department requirements.
- 1.1.13. Mail – A community mail receptacle will be installed near the entrance of the community for convenience.
- 1.1.14. Trash – Individual dwelling unit trash pick-up will be contracted through a commercial trash company. (Specific requirements for trash receptacles will be finalized during the PUD review process.)
- 1.1.15. Parking – Driveways and sixteen (16) guest parking spaces are available for residents and guests. Boat and recreational vehicle storage is not allowed.
- 1.1.16. Dogs Runs/Houses – Dog runs must be constructed with approved fencing materials and must be constructed adjacent to either the dwelling unit or separation wall between dwelling units. Dog houses no great than “X” will be allowed in fenced yards. (To be determined during PUD review process.)
- 1.1.17. Additional Structures/Storage – No exterior storage sheds or structures shall be allowed. Dog runs may be converted to outdoor storage for bicycles or other types of yard/household equipment to be determined during the PUD review process.

**2. Architectural Character and requirements:**

- 2.1. Building Scale – Buildings are to be a mix of 1 and 2 story elements. No building shall be more than two stories.
- 2.2. Building Height – The intent of the height restrictions for this development is to follow the stricter height restriction set forth by the Town of Palmer Lake Residential Zoning Ordinance. The allowable height shall be 26’-0” from the Lowest Grade Measurement to the Average Height Line between the building plate and the ridge of a gable, hipped, or gambrel roof, provided that no part of such roofs shall extend more than 5’ above the permitted height to the existing natural contour at the highest point on all sides.

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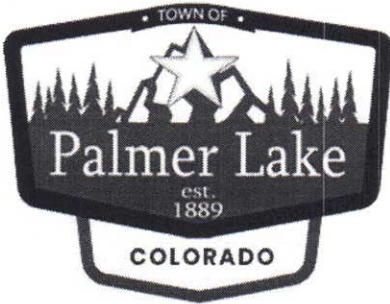
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- 2.2.1. Elevations of each side of the building shall be provided showing the following lines and labeled:
- 2.2.1.1. Existing Grade line – At a minimum, the two outside building corners on each end at the existing grade locations. Additional points along the elevation, particularly at corners, may be used.
  - 2.2.1.2. Proposed Grade line – At a minimum, the two outside building corners on each end at the proposed grade locations. Additional points along the elevation, particularly at corners, may be used.
  - 2.2.1.3. Lowest Grade Measurement Line – A line straight across from the lowest grade corner of each building elevation at 26' above the lowest grade building corner. Retaining walls and extensions beyond the enclosed building envelope are not required to be part of the lowest grade determination.
  - 2.2.1.4. Maximum Height Line – A line following the existing grade 32' up to establish the tallest allowable roof line as compared to the existing grade. Provide dimensions from the Maximum height line down to the actual roof ridge line.
  - 2.2.1.5. Average Height Line – The center line between the building plate and the roof ridge shall be shown on each elevation with dimensions to the Lowest Grade Measurement line.
- 2.3. Exterior Materials – Exterior materials are to be appropriate for Fire Resistive construction which can include a mix of stone, cultured stone, stucco, cementitious siding, cementitious trim, wood-look metal siding (non-reflective) and metal or composite railings. Vinyl siding, natural wood (other than IPE or Ironwood), and pressed board siding materials are not to be used. Decks and patios may be constructed of concrete or composite decking materials. Larger natural wood timbers, 6x or greater, may be used as supporting construction elements. Wood trim may be used sparingly as decorative elements only. Roofing to be Class A and non-reflective.
- 2.3.1. The exterior aesthetic desired is mountain rural. Natural looking materials in neutral colors is required to include grays, beiges, tans, browns, and blacks. The front door of each unit may have an accent color if desired.
  - 2.3.2. Windows are to be neutral-colored frames without added reflective coatings. Low-E coatings are approved and encouraged.
  - 2.3.3. Garage doors are to blend with the mountain style of the development and shall have a wood-look with a maximum of 1 full panel of glass lights.
  - 2.3.4. Roofs – Roof forms must be gable, hip, or gambrel roof forms. No flat roofs are allowed to maintain the mountain aesthetic of the development.
    - 2.3.4.1. Roofing is to be non-reflective and neutral in color in a medium to dark tone.

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- 2.3.4.2. Class A roofing material can be asphalt shingles, composite shingles, stone coated metal, or concrete tile with the desired aesthetic being an Architectural dimensional shingle in a neutral gray color.
- 2.3.4.3. Roofs are not to be red, white, or other bright color that stands out against the natural landscape.
- 2.3.4.4. Each building elevation shall have at least one gable or gable dormer on each side to maintain a traditional mountain aesthetic on all sides.
- 2.3.4.5. Decorative elements like corbels, trusses, outriggers, and pergolas are encouraged.
- 2.4. Exterior Building Lighting – All exterior building lights are to be dark-sky rated, full cut-off fixtures. No lighting is allowed to spill over the property or lot lines. If a building is within 50 feet of a property or lot line, a photometric plan shall be provided to show a “0” footcandle level at all property and lot lines.
- 3. **Phasing of Development:** Elephant Rock Villas will be constructed in five (5) phases. Timing of construction is estimated to be two to five years per phase, depending on availability of water taps from the Town of Palmer Lake and market conditions.
  - 3.1. **Phase 1** – A total of fourteen (14) dwelling units along an entry road from Highway 105 to the northeast. Phase 1 will include five duplexes on the north side of the entry road and two duplexes on the south side of the entry road.
  - 3.2. **Phase 2** – A total of eleven (11) dwelling units extending the entry road to the east to create a temporary hammerhead/fire access turnaround. Phase 2 will include one triplex to the north of the entry road, one triplex to the south of the entry road, one triplex on the northeast side of the temporary hammerhead and one duplex on the southeast side of the temporary hammerhead.
  - 3.3. **Phase 3** – A total of sixteen (16) dwelling units which will extend the temporary hammerhead back to the west to join the entry road, creating a looped roadway and water system. Phase 2 will include three duplexes on the north side of the southern looped road and five duplexes on the south side of the looped road.
  - 3.4. **Phase 4** – A total of twelve (12) units which will extend the northern side of the temporary hammerhead and create a permanent hammerhead/fire access turnaround in the northeast portion of the site. Phase 4 will include two, triplexes on the north side of the hammerhead, one triplex on the southwest side of the hammerhead and one triplex on the southeast side of the hammerhead.
  - 3.5. **Phase 5** – A total of four (4) dwelling units will extend the entry road to a northwest hammerhead, pending evaluation of topography issues. If constructed, Phase 5 will include two, duplex units.



42 Valley Crescent  
PO Box 208  
Palmer Lake, CO 80133  
719-481-2953 - Office

**Office Use Only**

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

Fees: \$1,000 + consulting fees \_\_\_\_\_

Check #: \_\_\_\_\_

Rec'd By: \_\_\_\_\_

*\*Allow up to 10 business days for review\**

## Master Plan Application Form

Name of Applicant: Dorman Properties, LLC and Montebello 2205, LLC

Address: 2760 N Academy Blvd Ste 302, C/S CO 80917 Phone#: (719) 213-9100

Name of Proposal Elephant Rock Villas

Tax Schedule #: 7109012011

Legal Description: LOT 2 RANCHO IRACEMA SUB NO 2

***This is a Master Plan – Section 16.16.010 - For subdivisions requiring multiple use and/or when development is phased or not subdivided at the same time.***

Please fill out the appropriate submission checklist to complete the application.

Current Zoning and Uses of Surrounding Property:

N: <u>PUD</u>	<u>Recovery Village</u>
E: <u>RA</u>	<u>Residential</u>
S: <u>RR-5</u>	<u>Vacant</u>
W: <u>RR-5</u>	<u>Residential</u>

  
Signature of Owner/Applicant *Mgr.*

11/10/23  
Date

# ELEPHANT ROCK VILLAS

January 11, 2022

## 16.16 MASTER PLAN APPLICATION

---

### 16.16.010 – Master Plan

A Master Plan Application is being submitted in conjunction with the Sketch Plan (pre-PUD Application), as Elephant Rock Villas is intended to be developed in phases.

### 16.16.020 – Master Plan Contents

- 1) Name of the proposed master plan: **Elephant Rock Villas**
- 2) A specific legal description: **Lot 2 in Rancho Iracema Subdivision Filing No. 2**
- 3) Name and address of owner or agent and of person preparing the plan:

**Owner:** Todd Dorman, CCIM  
Dorman Properties, LLC / Montebello 2205, LLC  
2760 North Academy Blvd., Suite 302  
Colorado Springs, CO 80917  
Office: (719) 213-9100  
Email: [todd@dormanrealestate.com](mailto:todd@dormanrealestate.com)

**Planner:** Chris Lieber, Principal, PLA  
N.E.S., Inc.  
649 North Cascade Ave., Suite 200  
Colorado Springs, CO 80903  
Office: (719) 471-0073  
Mobile: (719) 440-5102  
Email: [clieber@nescolorado.com](mailto:clieber@nescolorado.com)

- 4) Date of preparation, scale, and northpoint: **Date of Preparation: January 10, 2023; Scale: 1" = 50'**
- 5) A vicinity location map: **Included on Master Plan.**
- 6) Proposed land uses, together with densities: **Elephant Rock Villas is a single-family attached, clustered townhome community with a proposed mix of fifty-seven (57) non-owner-occupied duplexes and triplexes on 13 acres. Gross density is 4.38 Dwelling Units per Acre. Net Density has been determined by subtracting private streets (1.662 acres) and guest parking areas (.086 acres) resulting in a net density of 5.07 units per acres. The Land Development Code requires 12 dwelling units per net acre. A total of 8.411 acres of usable open space has been provided (3.9 acres are required by code). The Land Development Code requires 25% of required open space (.975 acres) to be dedicated for active recreation, and .975 acres has been provided. A Land Use Area Density Table illustrating land use percentages is included on the Master Plan.**
- 7) Topography, with a contour interval of no than 20 feet with all areas of slopes 30% or greater shaded: **The Master Plan includes 2' contour interval. Slopes areas thirty percent (30%) or greater are shaded to include the western boundary adjacent to State Highway 105, as well as small slope area in the far northwestern corner of the site.**

# ELEPHANT ROCK VILLAS

January 11, 2022

Item 4.

- 8) Proposed sewage treatment systems: **Sewerage service shall be provided by Palmer Lake Sanitation District pursuant to the attached will serve letter dated January 9, 2023. Palmer Lake Sanitation District utilizes the Tri-Lakes Wastewater Treatment Facility.**
- 9) Proposed water supply system with adequate evidence that sufficient water exists to supply the proposed development. Evidence shall include material on quality, quantity, and the reliability of supply; ownership of water rights; amenability of the supply to changes in land use; and certification that public or private water owners can and will supply adequate water to the proposed development, where applicable: **See attached Water Resources report, prepared by Chris Cummins, Esq., Monson, Cummins, Shohet & Farr, LLC, dated January 9, 2023.**
- 10) Any unusual or important manmade or natural features as identified in the town comprehensive plan: **Elephant Rock Villas (the "Property" or "Site") lies within the 'North Highway 105' Performance District as defined in §4.4 of the Town of Palmer Lake Comprehensive Plan (the "Comp Plan"). The Property is nestled approximately 400' below Ben Lomond Mountain and Elephant Rock to the south and offers sweeping views of Raspberry Mountain and Mount Herman.**
- 11) Summary statement of the characteristics of the proposed area, including, but not limited to, geology, soils, and vegetation: **Site vegetation consists of tall native grasses and prairie-type vegetation. Clusters of Ponderosa Pine trees and scrub oak are scattered throughout the site, and the Applicant intends to retain as much existing vegetation as possible. Soil borings from the Site identified two types of soil to include Pring coarse sandy loam and Tomah-Crawfoot which have moderate development stability. In general, bedrock exists beneath the Site which is considered to be part of the Dawson Formation. Detailed geologic, soil and vegetation information can be reviewed the Soils and Geology Study, prepared by RMG Engineers/Architects, as amended January 4, 2023.**
- 12) Any potential radiation hazard: **As in §8.3 of the Soils and Geology Study, "Elevated hazardous levels of radon from naturally occurring sources are not anticipated at this Site."**
- 13) Present land use, including proposed and existing borrow pits: **The Site is presently vacant, undeveloped land. No borrow pits currently exist and none are anticipated, as site grading is anticipated to be balanced, with no import or export required.**
- 14) Letter of commitment from the appropriate supplier of energy (natural gas, electricity, propane, etc.): **Will-serve letters are included with this Application from Black Hills Energy for natural gas and Core Electric Cooperative for electricity.**
- 15) Proposed location and type of permanent stormwater quality control facilities: **A 0.7-acre stormwater detention pond is illustrated on the site plan. Water quality for the site will be achieved through a private full spectrum detention extended detention basin (FSD/EBD) with a sedimentation forebay at the inlet into the basin and a micro pool at the outlet. Flows will discharge through a proposed private 'Type OS-2' Outlet Structure with a private 24" HDPE pipe outlet provided for the private FSD/EBD. The private FSD/EBD drains an area of 9.25 acres that is 46.96% impervious and will have a volume of 0.731 acre-ft. Portions of the property are not**

# ELEPHANT ROCK VILLAS

January 11, 2022

Item 4.

**detained because they are to remain undeveloped. Included with this Application is a Final Drainage Report prepared by RESPEC Engineering, dated January 2023.**

Documents included with Master Plan Application include:

1. Water Resources Report
2. Will Serve Letters
  - a. Palmer Lake Sanitation District
  - b. CORE Electrical Cooperative
  - c. Black Hills Energy
3. Soils Geology Study
4. Drainage Report

# ELEPHANT ROCK VILLAS

## PALMER LAKE, COLORADO

### MASTER PLAN

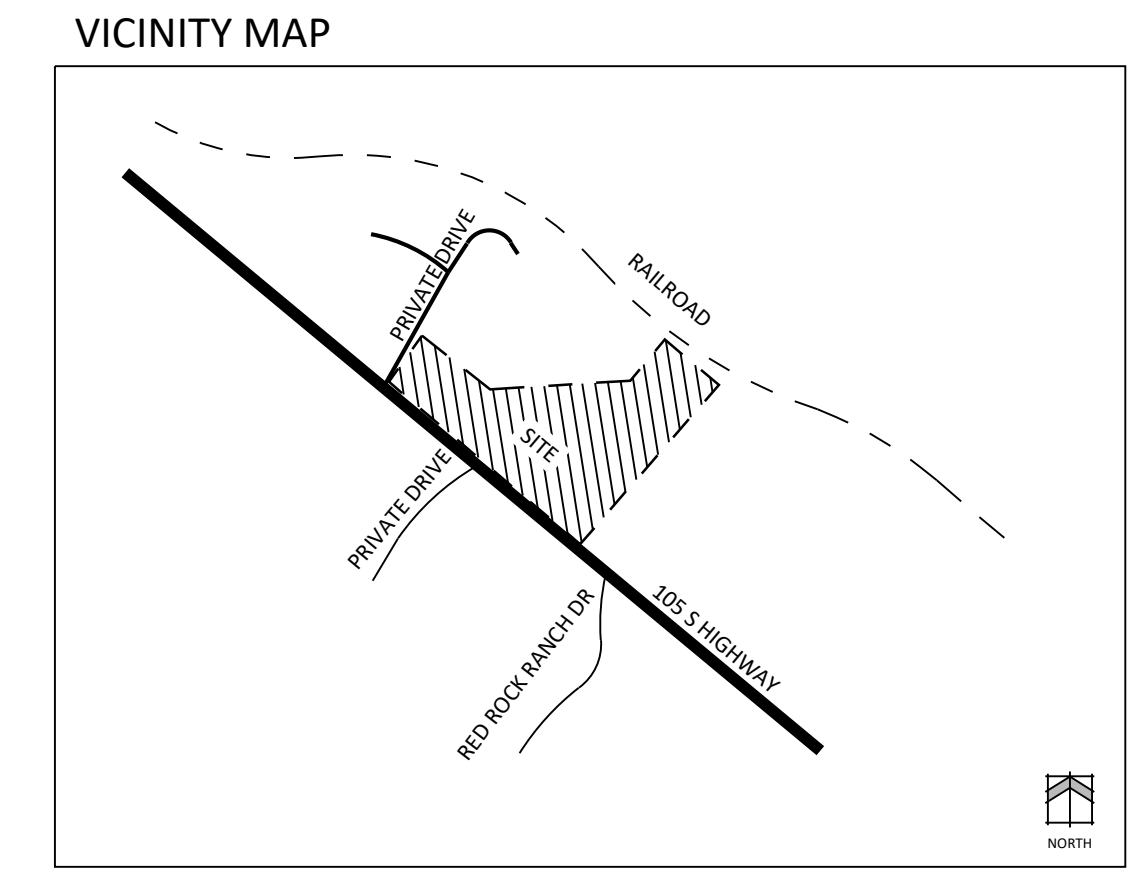
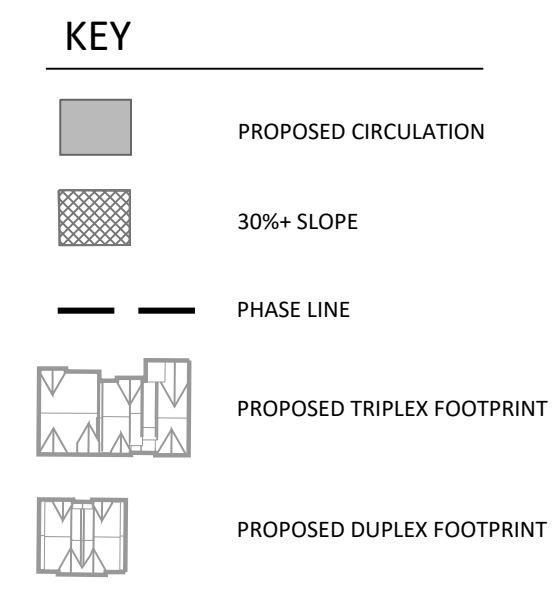
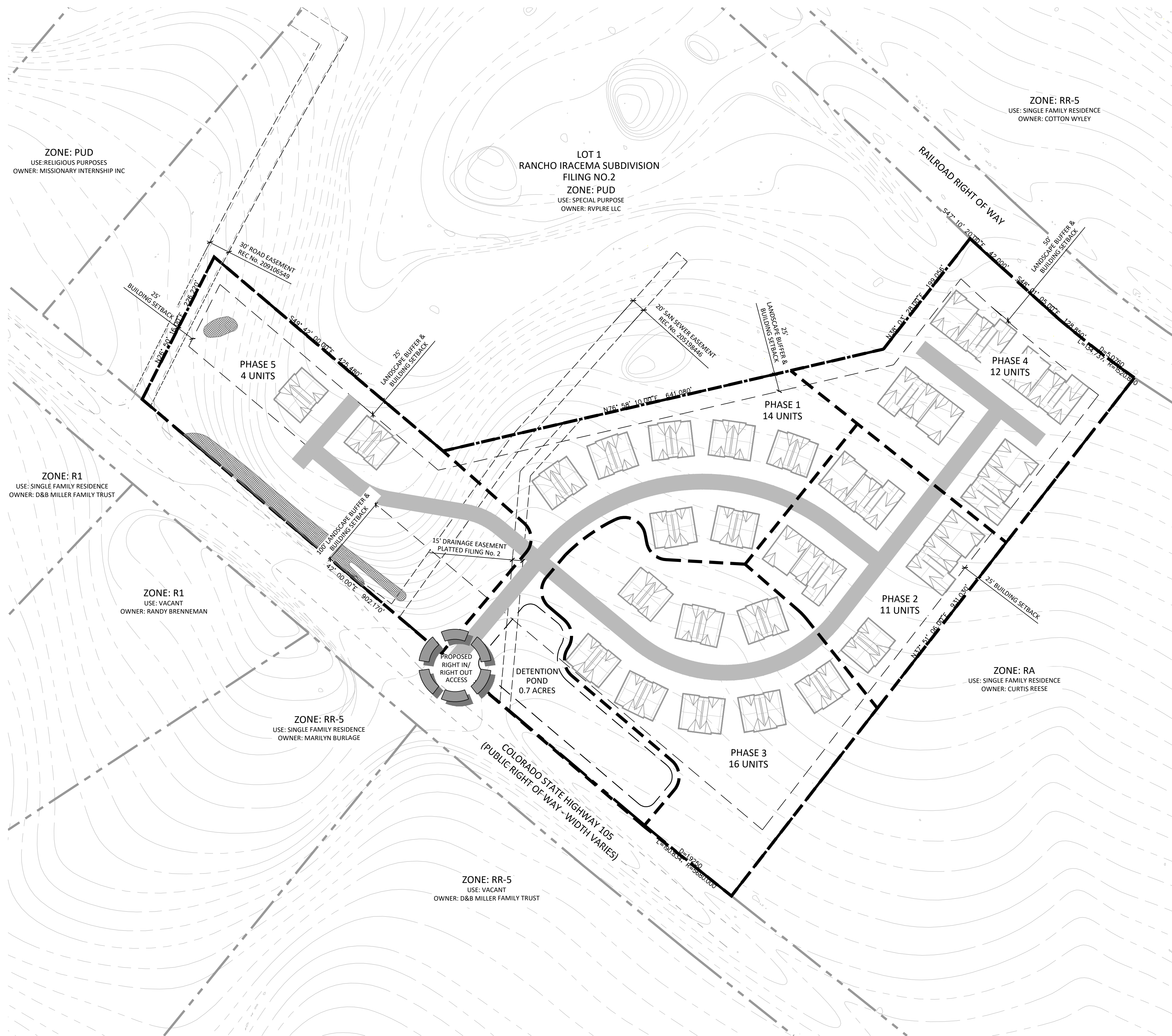


N.E.S. Inc.  
619 N. Cascade Avenue, Suite 200  
Colorado Springs, CO 80903

Tel. 719.471.0073  
Fax 719.471.0267

www.nescolorado.com

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#### SITE DATA

Tax ID Number: 7109012011  
Total Area: 13 Acres  
Current Zoning: PUD  
Current Use: Vacant  
Proposed Use: Single Family Attached Residential  
Number of Dwelling Units: 57  
Gross Density: 4.38 DU/AC  
\*Net Density: 5.06 DU/AC

#### PHASING DATA

Phase	Units	Buildings	Time Period
1	14	7	2024-2026
2	11	4	2026-2029
3	16	8	2029-2031
4	12	4	2031-2034
5	4	2	2034-2037
	57	25	

\*Net density has been determined by subtracting private streets and guest parking areas (1.748 acres) resulting in a net density of 5.06 dwelling units per acre.

Maximum Building Height: 30'  
Parking  
Formula: 2 Spaces/Dwelling Unit (17.60.0208)  
Required: 2(57) = 114  
Provided: 244  
Garage Spaces: 114  
Driveway Spaces: 114  
On-Street Parking: 16

Building Setbacks  
North (Railroad ROW): 50'  
North (Adjacent to Lot 1): 25'  
South (Highway 105): 100'  
East: 25'

Landscape Setbacks/Buffers  
North (Railroad ROW): 50'  
North (Adjacent to Lot 1): 25'  
South (HIGHWAY 105): 25'

Utility Providers  
Proposed Sewage Treatment: Palmer Lake Sanitation District  
Proposed Water Supply System: Town of Palmer Lake  
Electric: Core Electric Cooperative  
Gas: Black Hills Energy

#### LEGAL DESCRIPTION

LOT 2 RANCHO IRACEMA SUBDIVISION FILING NO.2, IN THE TOWN OF PALMER LAKE, COUNTY OF EL PASO, STATE OF COLORADO.

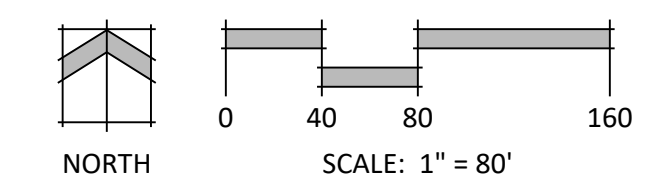
#### GENERAL NOTES

- PRIVATE DRIVES ARE TO BE PAVED CONCRETE.
- FEDERAL EMERGENCY MANAGEMENT AGENCY, FLOOD INSURANCE RATE MAP NUMBER 08041C0257G, EFFECTIVE DATE, DECEMBER 7, 2018, INDICATES THE AREA IN THE VICINITY OF THIS PARCEL OF LAND TO BE A ZONE X (AREA DETERMINED TO BE OUT OF THE 500 YEAR FLOODPLAIN).
- CONTOURS SHOWN ON PLAN ARE AT 2' INTERVALS, AND AREAS WITH SLOPE IN EXCESS OF 30% ARE HIGHLIGHTED.

#### PROJECT TEAM

OWNER/APPLICANT: Dorman Properties LLC  
2760 N Academy Blvd., STE 302  
Colorado Springs, CO 80917  
ARCHITECT: 308 LLC  
815 S 25th Street  
Colorado Springs, CO 80904  
PLANNER/  
LANDSCAPE ARCHITECT: N.E.S. Inc.  
619 N. Cascade Ave., Suite 200  
Colorado Springs, CO 80903  
ENGINEER: RESPEC  
121 S Tejon Street, STE 1110  
Colorado Springs, CO 80903  
TRAFFIC: LSC Transportation, Inc.  
2404 E. Pikes Peak Ave, Suite 304  
Colorado Springs, CO 80909  
GEOTECH: RMG Engineers/Architects  
2910 Austin Bluffs Pkwy, Suite 100  
Colorado Springs, CO 80918  
WATER COUNSEL: MONSON, CUMMINS, SHOHEET & FARR, LLC  
13511 Northgate Estates Dr., Ste. 250  
Colorado Springs, Colorado 80921  
DEVELOPMENT CONSULTANT: Olive Real Estate Group, Inc.  
102 N. Cascade Ave., Ste. 250  
Colorado Springs, CO 80903

MASTER PLAN PHASING DIAGRAM



P:\Dorman Properties, LLC\Palmer Lake\Tomahome\Project\Drawings\Planning\CP\Elephant Rock Villas\_MF.dwg (2/4/23) 1/12/2023 11:06:38 AM Brennan

PLANNER / LANDSCAPE ARCHITECT

IN ASSOCIATION WITH

PROJECT INFO

STAMP

ISSUE INFO

ISSUE / REVISION

SHEET TITLE

SHEET NUMBER

PLAN FILE #

# ELEPHANT ROCK VILLAS

## MASTER PLAN

105 S HIGHWAY

DATE: 01.12.23  
PROJECT MGR: C.LIEBER  
PREPARED BY: C.HELMINGER

### MASTER PLAN

1 OF 1

# **Elephant Rock Villas Subdivision**

Palmer Lake, Colorado

## **WATER RESOURCES REPORT**

**January 9, 2023**

**Prepared By:**



13511 Northgate Estates Dr., Ste. 250, Colorado Springs, Colorado 80921

## **Executive Summary:**

### **Water Resources Report – Elephant Rock Villas Subdivision**

Chris D. Cummins of Monson, Cummins, Shohet & Farr, LLC, on behalf of the Applicant, Dorman Properties, LLC, a Colorado limited liability company and Montebello 2205, LLC, a Colorado limited liability company (collectively “Owner”), provides the following Water Resources/Wastewater Report in support of the Elephant Rock Villas Subdivision in the Town of Palmer Lake, Colorado. The undersigned has been practicing law for over nineteen (19) years, and has substantial experience with water and water rights, specifically including Denver Basin groundwater resources, augmentation plans, designated basin replacement plans, subdivision proceedings, and water usage, and therefore should be considered a “qualified professional” as concerns water resources, as discussed at Section 8.4.7(B)(1)(c) of the El Paso County Land Development Code, or the corollary section of the Palmer Lake Land Development Code, if any. This Report, prepared in conjunction with other professionals, is intended to demonstrate for the Town of Palmer Lake Planning Commission and the Board of Trustees, water sufficiency in terms of quantity and dependability, including the water rights and resources proposed to be utilized by the proposed Elephant Rock Villas Subdivision (the “Subdivision”), within the boundary of the Town of Palmer Lake.

The Owner proposes PUD zoning and approval of a Master Plan by the Town of Palmer Lake for the Property that would allow the development of duplex and triplex buildings for a total of approximately 57 single family attached residential units. As described in further detail herein, Owner proposes each of the residential units within the Subdivision to be provided water through the Town of Palmer Lake’s central municipal water system<sup>1</sup>, and sewer services through the Palmer Lake Sanitation District’s central wastewater system.

The Subject Property upon which the Subdivision is proposed consists of approximately 13 acres located on the northeastern side of Colorado Highway 105, just to the east of the Recovery Village, in Palmer Lake, CO 80133. The Subdivision property is located in the portions of the NE<sup>1</sup>/<sub>4</sub> NW<sup>1</sup>/<sub>4</sub>, NW<sup>1</sup>/<sub>4</sub> NE<sup>1</sup>/<sub>4</sub> and SW<sup>1</sup>/<sub>4</sub> NE<sup>1</sup>/<sub>4</sub> of Section 9, Township 11 South, Range 67 West of the 6<sup>th</sup> P.M, as depicted on the attached **Exhibit A** location map. The Subject Property is Lot 2 of Filing 2 for the Rancho Iracema Subdivision, which was a re-plat of Lot 4 of the original Rancho Iracema Subdivision Filing 1. The remainder of the original Lot 4, now Lot 1 of Filing 2, constitutes the Recovery Village, which along with the adjacent Mission Training Center, shares a not-nontributary Denver aquifer well as contemplated in the original

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<sup>1</sup> The Subdivision Property, while previously annexed into the Town of Palmer Lake and subject to the Town’s taxation and land use planning, is currently outside of the area described in Emergency Ordinance 2018-16 as having central water service available. Owner asserts that this ordinance should be rescinded or amended in light of existing supplies and circumstances, as described in this report. In the alternative, Owner proposes a satellite nontributary Arapahoe aquifer well to be constructed in cooperation with the Town of Palmer Lake for eventual integration into the Town of Palmer Lake’s municipal water system.

subdivision approval (Colorado Division of Water Resources Permit No. 054533), subject to a water use agreement with the Town of Palmer Lake. However, said agreement with the Town limits the use of this Denver aquifer well (an “additional” well to the Town’s D2, D-3 and D-4, augmented by the decree in Case Nos. 86CW108 and 87CW68) to only “commercial” uses, which is inconsistent with the proposed residential development within the Subdivision. Further, said Denver aquifer well physically produces at rates insufficient for provision of water service to the proposed 57 single family attached dwellings within the Subdivision. As such, the originally anticipated source of water for this previously annexed and platted property is infeasible for the proposed Subdivision.

It is expected that each of the single-family attached residential units within the Subdivision will require a maximum of 0.25 annual acre-feet of water supply, for a total of 14.25 annual acre-feet of demand when all five (5) phases of development are completed. Such water supply demand is consistent with historical demand of similar attached residential dwelling units, as well as standard demand calculations for nearby municipalities and special districts. Owner proposes such supply to be provided through the Town of Palmer Lake’s municipal water system, with infrastructure to be constructed by Owner to facilitate such connection. In the alternative, Owner proposes a satellite well to the nontributary Arapahoe aquifer be constructed by Owner on the Subject Property, to eventually become an additional source of supply to the Town’s municipal system. The use of the Palmer Lake Sanitation District for wastewater treatment will, as with other similarly situated residential lots within the Town of Palmer Lake, result in re-usable effluent consistent with the terms and conditions of the Town of Palmer Lake’s decreed plans for augmentation in Case No(s). 86CW108, 87CW68, and 87CW069. Whether directly through the Town of Palmer Lake’s central system, or via a satellite system, there is a demonstrated sufficient quantity and reliability of water to support compliance with applicable Town of Palmer Lake ordinances, rules and policies, for subdivisions of this nature.

## I. INTRODUCTION

The purpose of this report is to provide a preliminary outline of the water resources, and associated wastewater requirements, necessary for approval of the Subdivision, as proposed by Owner.

1.1 New Development Description: The Subject Property for the proposed Subdivision consists of approximately 13 acres located on the northeastern side of Colorado Highway 105, just to the east of the Palmer Lake Recovery Village, in Palmer Lake, Colorado 80133, in the portions of the NE $\frac{1}{4}$  NW $\frac{1}{4}$ , NW $\frac{1}{4}$  NE $\frac{1}{4}$ , and SW $\frac{1}{4}$  NE $\frac{1}{4}$  of Section 9, Township 11 South, Range 67 West of the 6th P.M, as depicted on the attached **Exhibit A**. The Subject Property is Lot 2 of Filing 2 of the Rancho Iracema Subdivision, annexed into the Town of Palmer Lake and platted for commercial development by the predecessor to Recovery Village. If the proposed PUD and Master Plan are approved, the Property will be developed into 25 buildings with a total of 57 single family attached residential units, in a mixture of duplexes and triplexes. **Exhibit B**, attached hereto, is the draft Sketch/PUD plan for the Subdivision as proposed, prepared by NES.

## II. PROJECTION OF WATER NEEDS

2.1 Analysis of Water Demands: It is proposed that the 57 single family attached residential units in the Subdivision will utilize central water service provided by the Town of Palmer Lake, subject to amendment or rescission of Emergency Ordinance 2018-16, which excluded certain areas of the Town of Palmer Lake from receiving central water services, discussed in greater detail below. In the alternative, Owner proposes to drill a nontributary Arapahoe aquifer well of sufficient production capacity to, at a minimum, serve the 57 semi-attached residential units within the Subdivision, with said well to be owned and operated by the Town of Palmer Lake (avoiding private ownership/operation of a public water system). These alternatives are described in greater detail below. Uses of water within the Subdivision are anticipated to include in-house, limited landscape irrigation surrounding the dwellings, watering of domestic animals, and commercial/home office uses. It is anticipated that the residences on each lot will utilize up to 0.25 acre-feet annually, for a maximum total of 14.25 annual acre feet of water. Each residence will be presumed to utilize 0.20 acre-feet of water for in-house residential purposes, with the remaining 0.05 acre-feet available for other uses. These represent conservative estimates for demand, in light of (a) reduced consumption associated with attached/townhome types of construction (as opposed to a detached single-family dwelling); and (b) GMS analysis data calculates per-water tap demand within the Town, based upon metered deliveries, to be approximately 0.15 acre feet per tap annually, including detached single-family residences throughout the Town of Palmer Lake.

## III. PROPOSED WATER ALTERNATIVES

3.1 Preferred Alternative No. 1 – Town of Palmer Lake Central Service: The Subject Property was previously annexed into the Town of Palmer Lake, and it would be the Owner's preference to extend infrastructure as necessary to utilize water supplies delivered through the Town of Palmer Lake municipal water system for provision of water service to the 57 single family attached residential units within the Subdivision. All such infrastructure would be installed by Owner to the Town's specifications at Owner's expense, subject to the Town's inspection and approval, and Owner's warranty of the same consistent with applicable Town code.

3.1.1. Town Water Rights/Resources. As documented by the Town of Palmer Lake's engineering consultants at GMS, Inc. Consulting Engineers ("GMS"), the Town has a number of water resources available for provision of service to its customers, including senior surface water rights, augmented junior/return flow water rights, Denver Basin groundwater rights, and appropriative rights of exchange of re-usable components of each. The Town through an "implied consent" ordinance in 1985 claimed ownership of and appropriated all Denver Basin groundwater underlying land previously annexed into the Town, including the Subject Property. The Town in Case No. 86CW108, Water Division No. 2, subsequently obtained decreed rights to the use of the Denver, Arapahoe and Laramie-Fox Hills aquifers underlying such "implied consent" area, including the Subject Property.

To date, the Town has been unable to utilize the bulk of its significant Denver Basin

groundwater portfolio, having only a single Denver aquifer well, and a single Arapahoe aquifer well by which it may pump its entitlements. The Town's Denver aquifer well was recently redrilled, and a plan is being developed by GMS to allow the Town to meet its forecasted water demand at build out of approximately 3,670 residents (1,659 residential water taps), primarily through construction in the near term of an additional Arapahoe aquifer well. GMS estimates, based upon a 2020 Water Resources Study, that the Town has sufficient legal and physical water supplies at present to serve 1,145 taps, while the Town currently serves 1,015, leaving approximately 130 water taps currently unutilized and available for sale to developing properties. The undersigned has not, in the interests of consistency and efficiency, completed an independent analysis of the Town's available water supplies, but rather depends upon the findings and conclusions of GMS, which the undersigned finds to be reasonable.

3.1.2. Town Infrastructure/Improvements. As introduced above, GMS provided a plan for the Town to expand its physical and legal water supplies to ensure adequate ability to serve the entire Town of Palmer Lake at buildout. Much of this additional water/infrastructure is anticipated to be from development of the Town's substantial Denver Basin groundwater rights portfolio, which GMS calculates to have a potential yield of 3,539.3 annual acre feet, of which the Town is currently able to access approximately 743 acre feet annually. GMS has proposed three priorities of improvements, with the first priority being that the Town initially focus its system improvement efforts on an additional Arapahoe aquifer well, groundwater treatment improvements, and repair/improvement of the existing distribution system; the second priority being construction of a looped water system; and a final priority being conversion of properties on private wells to the Town's central system. It is important to note that these priorities concern not only timing of immediately necessary infrastructure, but also timing of improvements to allow for sources of funding to be developed by the Town, since such expenditures are anticipated to come from Town revenues. The infrastructure costs associated with the proposed Subdivision described herein are not anticipated to be completed with the Town's financing, but rather will be funded by the Owner, allowing acceleration of the infrastructure necessary for all of the Town's recommended improvement priorities. GMS estimates completion of the "priority one" projects in second quarter of 2024.

3.1.3. Subdivision Phasing. While GMS' opinion as to the availability of up to 130 water taps currently provides immediately available taps in excess of that required for the 57 single family attached residential units within the Subdivision, it is the Owner's intention to phase the development of the Subdivision over the course of several years, allowing the Town's water system improvement efforts to proceed and available water supplies to be expanded during the development of the Subdivision property, ensuring that only a small portion of the currently available taps would need to be allocated to Phase 1 and (possibly Phase 2) of the Subdivision. Owner proposes a Phase 1 development of approximately fourteen (14) units in seven (7) buildings to be completed between 2024 and 2026; Phase 2 development of approximately eleven (11) units in four (4) buildings to be completed between 2026 and 2029; Phase 3 development of approximately sixteen (16) units in eight (8) buildings to be completed between 2029 and 2031; Phase 4 comprised of approximately twelve (12) units in four (4) buildings to be completed between 2031 and 2034; and, if topography permits, development of Phase 5

consisting of 4 units in 2 buildings to be completed between 2034-2037. As such, Owner's current requirement for municipal water taps is limited to no less than 14 taps and no greater than 25 taps, and assuming GMS's "priority one" Town infrastructure improvements described above are completed on schedule in 2024, the Town will have additional water resources available for Phases 2, 3, 4 and possibly 5 in 2026 and beyond. Owner is willing to accept a plat note on Town planning documents conditioning Phases 2, 3, 4 and 5 upon availability of municipal water supply on this basis.

3.1.4. Ordinance 2018-16. In 2017, the Town retained a water resource consultant, TetraTech, to complete a study of available water supplies in light of ongoing drought and Denver Basin infrastructure issues. TetraTech provided an estimate of available taps based solely upon renewable/surface water supplies, and such renewable surface supplies remaining in priority. TetraTech's study conservatively opined that only 1,060 taps could be safely served by the Town of Palmer Lake's municipal system, less were the Town's senior water rights to be out of priority, as somewhat regularly occurs. In response, the Town enacted Emergency Ordinance 2018-16, a copy of which is attached as **Exhibit C**, which amongst other things purported to limit the availability of water taps, if any, to properties located within a specific "water supply system" area and prohibited expansion of infrastructure beyond such area. The Subdivision property is not currently located within said Water Supply System area. However, there have been material changes in the Town's understanding of its water resources, and the availability of those resources since Emergency Ordinance 2018-16 was enacted, and these changed circumstances justify rescission or amendment of said Ordinance.

Since the passage of Emergency Ordinance 2018-16, the Town engaged GMS to provide an extensive inventory of both infrastructure and water resources available to the Town, including as described in GMS' 2020 water supply summary and the most recent GMS report as discussed herein, and a plan to enhance such resources to support future growth. Further, the Town has re-drilled its Denver aquifer well, and is no longer nearly entirely dependent upon in-priority surface diversions as a reliable source of water supply, the assumption which formed the basis of the 2017 TetraTech Report and the subsequent 2018-16 Emergency Ordinance. Owner asserts that, with these changed circumstances and system improvements, the emergency no longer exists that was used as a basis for the passage of the 2018-16 Emergency Ordinance. GMS has opined that the Town has currently available 130 water taps, whereas Phase 1 of the proposed Subdivision would require only 14 such water taps, with subsequent phases being completed in parallel to Town system/supply improvements.

Owner asserts that application of Emergency Ordinance 2018-16, as written, results in equal protection issues, arbitrarily providing rights and entitlements to certain taxpayers and citizens of the Town, while denying such rights and entitlements to others. With Town water infrastructure currently located within approximately 750 feet of the Subject Property, there is no valid reason to allow landowners within the "Water Supply System" area to connect to Town infrastructure and purchase available taps, while denying this Owner the same entitlement.

Owner therefore requests, based upon changed circumstances, system improvements, and equity and fairness to all citizens of the Town of Palmer Lake, that

Ordinance 2018-16 be repealed or amended to allow for additional infrastructure, constructed at developer’s expense, to be installed outside of the current Water Supply System area as described in Ordinance 2018-16, and for water taps to be made available for purchase for the owners of such properties, specifically the Subject Property, subject to appropriate development approvals.

3.2 Alternative No. 2 – Satellite Central Well Water Service. Should the Town determine that, despite changed circumstances and potential equal protection issues, Owner should not be provided access to available taps or central service that is available to other annexed properties, Owner proposes construction of an Arapahoe aquifer well on the Subdivision property to access nontributary groundwater available to the Town, along with requisite treatment and distribution facilities, for provision of service to the 57 single family attached dwelling units within the Subdivision, which will eventually be integrated into the Town’s municipal water system. To the extent funded in whole or in part by the Owner, Owner desires to include cost recovery provisions for such satellite central service infrastructure if implemented, so that when the Subdivision is incorporated into the Town’s primary central water system, Owner may be compensated for additional users served thereby. Ownership of such Arapahoe Well, and treatment and distribution facilities, would be by the Town of Palmer Lake, and the Town would be responsible for the operation and maintenance of the Arapahoe Well and associated infrastructure once constructed and in service, with Owner responsible for all construction costs. The Town has the legal right to construct such a nontributary Arapahoe aquifer well pursuant to current court approvals, without additional legal action required.

**IV. WASTEWATER TREATMENT** – The Subdivision property is currently included within the Palmer Lake Sanitation District, and Owner will work with the District for the engineering and design of wastewater infrastructure for connection thereto, and the costs and expenses thereof.

Respectfully submitted this 9<sup>th</sup> day of January, 2023.

MONSON, CUMMINS, SHOHET & FARR, LLC

/s/ Chris D. Cummins  
Chris D. Cummins

- Exhibits:  
A – Area Map of Subject Property  
B – Proposed PUD Plat of Subject Property  
C – Emergency Ordinance 2018-16

Provisional Commitment to Serve Letter

January 9, 2023

Re: Elephant Rock Villas

To Whom It May Concern:

The real property having a general legal description of Lot 2 Rancho Iracema Subdivision Filing No. 2, in the Town of Palmer Lake, El Paso County, Colorado, referred to as Elephant Rock Villas in the attached PUD site plan (the "Subject Property") is located within the boundaries of Palmer Lake Sanitation District (the "District"). Because the Subject Property is located within the District's boundaries, the District is willing to submit this provisional commitment to serve letter. In providing this letter, the District understands that the owner/developer of the Subject Property will work with the District to accomplish all necessary items including, but not limited to, any written agreements and requested deposits to the District, prior to the District agreeing to grant any taps for use of the District's facilities.

We trust the foregoing is sufficient, but please direct any further inquiries to the undersigned District Manager, who can be reached at 719-481-2732.

Sincerely,



Becky Orcutt  
District Manager  
Palmer Lake Sanitation District

August 19, 2022

Todd Dorman  
Doorman Properties, LLC  
Montebello 2205, LLC  
2760 North Academy Blvd. Suite 302  
Colorado Springs, CO 80917

Re: Elephant Rock Villas – Lot Rancho Iracema Subdivision No. 2

We are an electric utility operating under the rules and regulations approved by our Board of Directors. The above-referenced parcels of land in Section 9, Township 11 South, and Range 67 West of the 6<sup>th</sup> P.M., Town of Palmer Lake, County of El Paso, State of Colorado, containing 57 attached units is located within our service area.

We are willing to extend our facilities to the proposed project in accordance with our extension policies. When you submit for an application for service, the designer assigned will be able to answer any questions concerning the location of electric facilities in relation to the project. Any attempt to identify facilities now may provide inaccurate information due to the phasing of your project and other developments in the vicinity, which may alter the location or type of facilities prior to your request for service.

If you have any further questions, please feel free to contact me.

Sincerely,



Brooks Kaufman  
Lands and Rights-of-Way Manager



**Bob Swatek**  
Utility Construction Planner  
Colorado Gas  
Bob.swatek@blackhillscorp.com

Black Hills Energy  
198 County Line RD  
Palmer Lake Co 80133

6-19-2022

Re: Elephant Rock Villas

To Whom It May Concern:

This letter will confirm that Black Hills Energy will provide Natural Gas Distribution service for the development of Elephant Rock Villas, in the town of Palmer Lake. Township 11 South, Range 67 West, in Section 9, County of El Paso, State of Colorado. Black Hills Energy will install a distribution system capable of serving the demand of the development that lies within the BHE certificated service territory.

This service will be subject to Black Hills Energy tariffs filed with the Colorado Public Utilities Commission and the Black Hills Energy Gas Network Main Extension Policy.

If you have any questions, please feel free to contact me.

Sincerely,

Bob Swatek  
Utility Construction Planner  
Colorado Gas  
bob.swatek@blackhillscorp.com  
Cell: 719-332-5856

**PALMER LAKE, COLORADO****EXHIBIT C****ORDINANCE NO. 16 OF 2018****AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF PALMER LAKE REPEALING AND REPLACING SECTION 16.48.010 OF THE TOWN OF PALMER LAKE MUNICIPAL CODE REGARDING THE WATER SUPPLY SYSTEM, RESTRICTING ANY FURTHER EXPANSION OF SUCH WATER SUPPLY SYSTEM, AND DECLARING AN EMERGENCY**

WHEREAS, THE TOWN OF PALMER LAKE IS A STATUTORY MUNICIPALITY EXISTING UNDER THE LAWS OF THE STATE OF COLORADO AND HAS THE AUTHORITY TO REGULATE LAND USE WITHIN ITS JURISDICTION; AND

WHEREAS, THE TOWN BOARD OF TRUSTEES HAS RECEIVED AND REVIEWED A REPORT DATED JUNE 14, 2017, REGARDING THE TOWN'S WATER SYSTEM TAP AND WATER RIGHTS INFORMATION WHICH PROVIDES THAT THE MAXIMUM NUMBER OF WATER TAPS THAT CAN BE SUPPLIED WITH THE TOWN'S EXISTING WATER SUPPLY SOURCES IS 1,060; AND

WHEREAS, THE TOWN BOARD OF TRUSTEES HAS RECEIVED INFORMATION THAT THE MAXIMUM TAP ESTIMATE OF 1,060 ASSUMES THAT THE TOWN'S SURFACE WATER DIVERSIONS ARE IN PRIORITY, UNDERSTANDING THAT IF LOW FLOW CYCLES OCCUR IN THE TOWN'S SURFACE WATER, THE WATER SUPPLY WILL HAVE TO BE AUGMENTED BY AQUIFER WELLS; AND

WHEREAS, THE TOWN BOARD OF TRUSTEES HAS RECEIVED INFORMATION THAT THE WATER SURFACE ELEVATION IN THE AQUIFER WELL AREAS HAS BEEN DROPPING APPROXIMATELY 35 FEET PER YEAR AND THAT THE WELLS ARE LOCATED IN A CONFINED AQUIFER, RESULTING IN A SLOW RECHARGE RATE SUCH THAT MORE WATER IS REMOVED FROM THE AQUIFER THAN CAN BE ADDED UNDER NORMAL CONDITIONS; AND

WHEREAS, THE TOWN BOARD OF TRUSTEES HAS RECEIVED INFORMATION FROM ITS WATER PLANT OPERATOR THAT THE TOWN IS NEARING THE THRESHOLD NUMBER OF TAPS THAT IT CAN SERVE WITH THE TOWN'S CURRENT WATER SUPPLY; AND

WHEREAS, THE TOWN BOARD OF TRUSTEES FINDS THAT THERE IS A DEMONSTRATED NEED TO PREVENT A SHORTAGE OF WATER FOR DOMESTIC AND FIRE FLOW USAGE FOR CURRENT AND FUTURE WATER CUSTOMERS OF THE TOWN; AND

WHEREAS, THE TOWN DESIRES TO REPEAL AND REPLACE SECTION 16.48.010 OF THE MUNICIPAL CODE WHICH ADDRESSES THE WATER SUPPLY SYSTEM TO PLACE A RESTRICTION ON ANY FURTHER EXPANSION OF THE WATER SUPPLY SYSTEM OR SERVICE OBLIGATIONS OUTSIDE THE EXISTING PERIMETER, IT BEING CONTEMPLATED THAT SUCH RESTRICTION SHALL REMAIN IN PLACE INDEFINITELY OR UNTIL SUCH TIME AS THE TOWN HAS STUDIED ITS WATER CAPACITIES, IDENTIFIED AND ACQUIRED NEW ALTERNATIVE AND ADDITIONAL WATER SOURCES, AND AMENDED ITS REGULATIONS AS NECESSARY TO ENSURE CONTINUED ADEQUATE WATER SUPPLY CAN BE PROVIDED; AND

WHEREAS, THE BOARD OF TRUSTEES FINDS THAT AN EMERGENCY EXISTS IN THAT THE PUBLIC HEALTH, SAFETY AND WELFARE REQUIRES THAT THE TOWN TAKE IMMEDIATE MEASURES TO ENSURE ADEQUATE WATER SUPPLY.

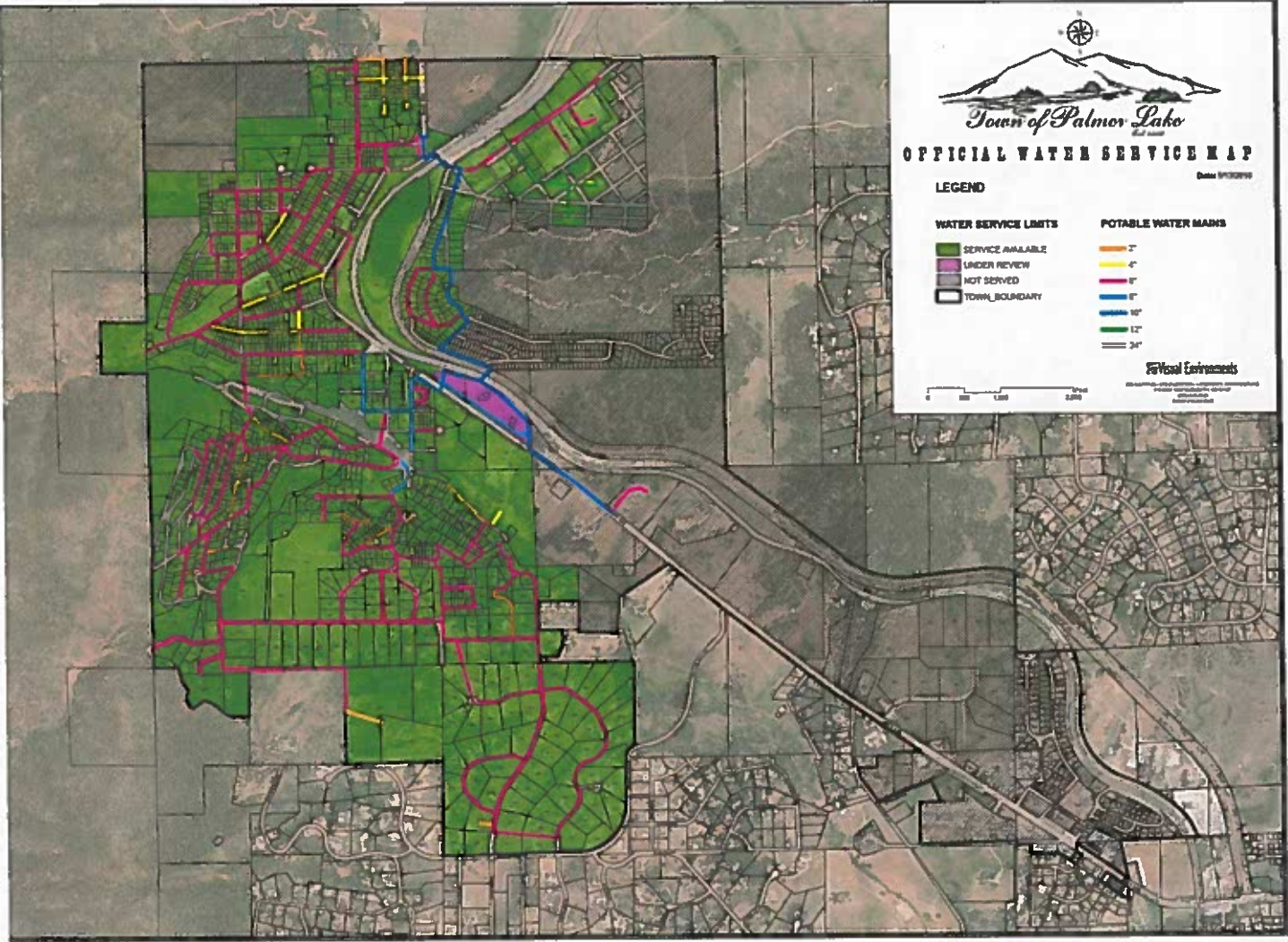
**NOW THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF PALMER LAKE, COLORADO:**

**Section 1.** The Board of Trustees adopts the above recitals as findings and incorporates them by reference in support of this ordinance.

**Section 2.** Section 16.48.010 of the Town of Palmer Lake Municipal Code is hereby repealed and replaced to read as follows in its entirety:

**16.48.010      Water Supply System.**

- A. Effective June 28, 2018, the Town's public water supply system shall not be enlarged or expanded to provide water service outside the existing perimeters of the Water Supply System as identified on the following map, which shall be part of this Section:



B. Service or main line connections to the Town’s water supply system not otherwise restricted in accordance with subsection A hereof shall at all times conform to the engineering standards of the Town. Fire plugs shall be installed at each intersection or every six hundred feet, whichever is less. Stand pipes are prohibited. Connections to water lines in alleys are prohibited.

**Section 3.** Section 16.48.030 is hereby amended as follows with deletions shown as strikethroughs and additions shown in all caps:

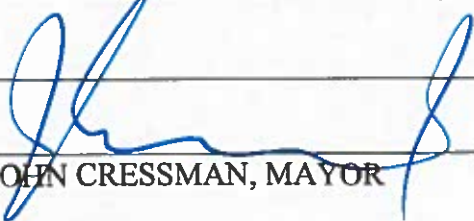

**16.48.030. Minimal Lot Sizes for Water and Sewer.** Municipal or other public provision of ~~both water and sewer~~ is required on lots less than two and one-half (2-1/2) acres in area. On lots of two and one-half (2-1/2) acres but less than five (5) acres, a central system of sewage treatment will be provided, designed, and built in a manner

approved by the State Health Department, provided, however, that the request for a central system for sewage treatment may be waived by the Board for good cause. ~~On lots of two and one half (2 1/2) acres but less than five (5) acres individual lot water sources may be used.~~ On lots of five (5) acres or more, OUTSIDE THE TOWN'S WATER SUPPLY SYSTEM PERIMETER AS DESCRIBED IN SECTION 16.48.010 individual water and sewer facilities may be installed ~~according to regulations herein and the appropriate state laws.~~ ON LOTS OF FIVE (5) ACRES OR MORE, INDIVIDUAL SEWER FACILITIES MAY BE INSTALLED ACCORDING TO REGULATIONS HEREIN AND THE APPROPRIATE STATE LAWS.

**Section 4.** The validity of any section, clause, sentence or provision of this ordinance shall not affect the validity of any other provision of this ordinance which can be given effect without reference to the invalid part or parts.

**Section 5. Emergency, Effective Date and Publication.** In accordance with the recitations above, the Board of Trustees finds that an emergency exists, this Ordinance is declared necessary for the immediate preservation of the public peace, health, welfare and safety, and this Ordinance shall take effect immediately upon its adoption, as provided by Section 31-16-105, C.R.S. This Ordinance shall be published by title only in a newspaper of general circulation within the Town and shall be published in full on the town web site upon adoption.

ORDINANCE PASSED, APPROVED AND ADOPTED BY AN AFFIRMATIVE VOTE OF THREE-FOURTHS OF THE MEMBERS OF THE BOARD OF TRUSTEES ON THIS 13th DAY OF SEPTEMBER, 2018, BY A VOTE OF 5 FOR AND 0 AGAINST.

 <hr/> JOHN CRESSMAN, MAYOR  ATTEST:  <hr/> VERLA BRUNER, TOWN CLERK	Approved as to Form:  <hr/> MAUREEN JURAN, TOWN ATTORNEY
---	--



NTS

**EXHIBIT A**

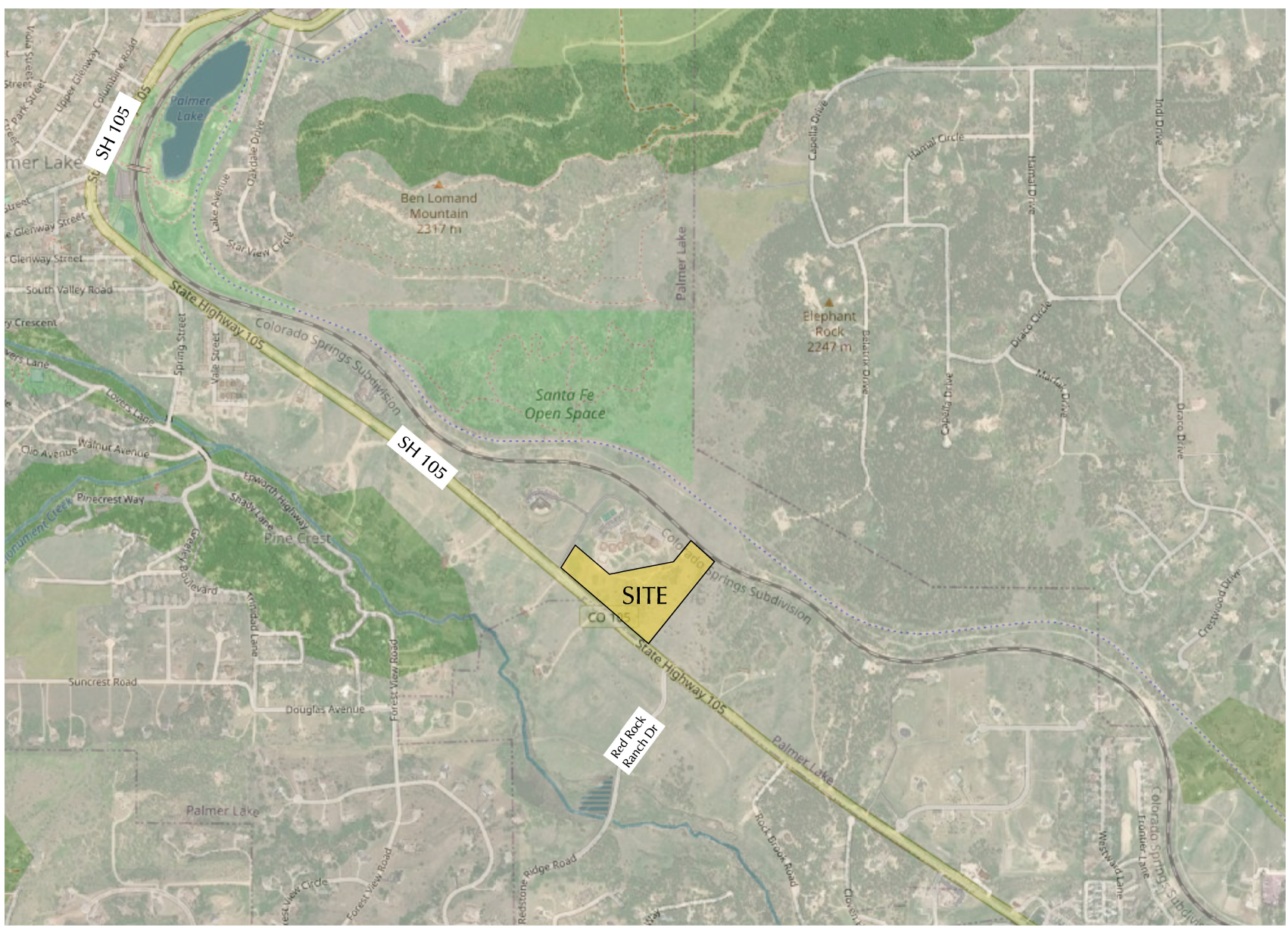
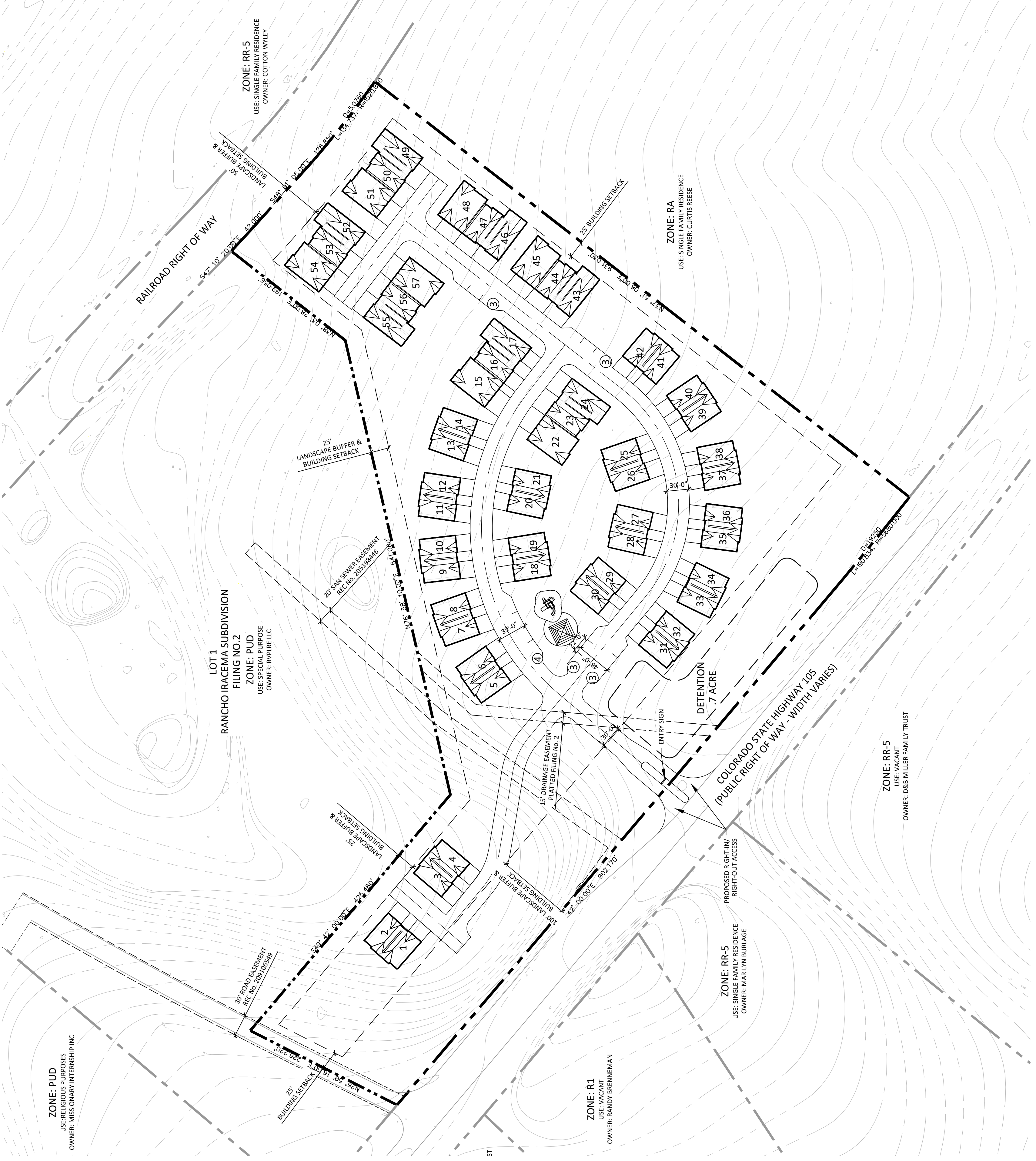


Figure 1  
**Vicinity Map**  
 Elephant Rock Villas (LSC # S22446)

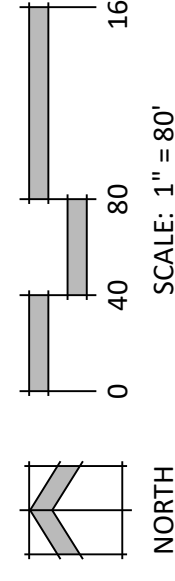
# ELEPHANT ROCK VILLAS

## PALMER LAKE, COLORADO

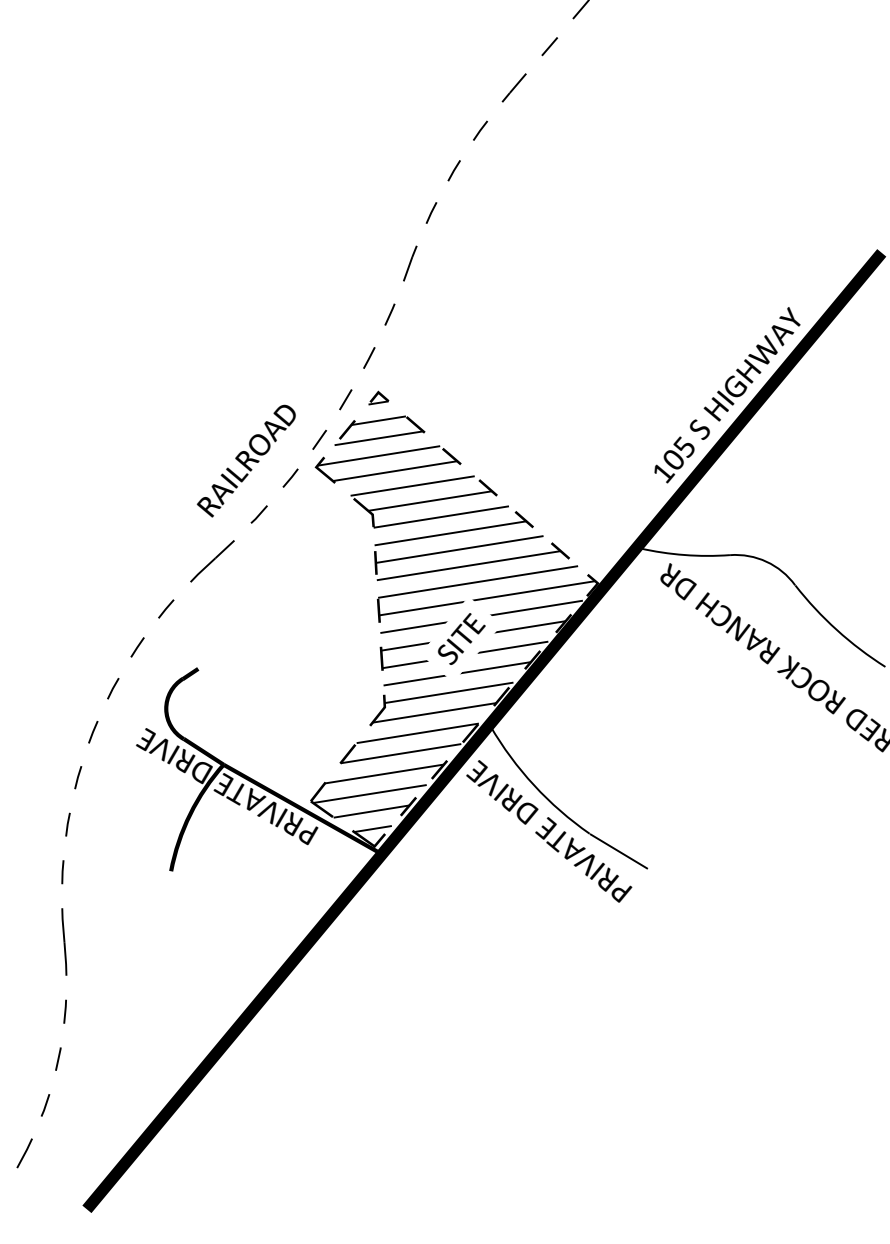
### SKETCH PLAN



PHASING DIAGRAM



VICINITY MAP



#### SITE DATA

Tax ID Number:	7109012011
Total Area:	13 Acres
Current Zoning:	VACANT
Proposed Use:	SINGLE FAMILY ATTACHED RESIDENTIAL
Number of Dwelling Units:	57
Gross Density:	4.38 DU/AC
Maximum Building Height:	30'
Parking Formula:	2 Spaces/Dwelling Unit (17-60.0208)
Formula:	(7) - 114
Garage Spaces:	114
Driveway Spaces:	14
On-Street Parking:	10
Building Setbacks:	
North (Railroad ROW):	50'
South (Highway 105):	25'
East:	25'
Landscape Setbacks/Buffer:	
North (Adjacent to Lot 1):	50'
South (Highway 105):	25'
Utility Providers:	Palmer Lake Sanitation District
Proposed Sewage Treatment:	Palmer Lake Sanitation District
Proposed Water Supply System:	Palmer Lake Sanitation District
Electric:	Core Electric Cooperative
Gas:	Black Hills Energy

#### PROJECT TEAM

OWNER/APPLICANT:	Dorman Properties, LLC, STE 202 Colorado Springs, CO 80917
ARCHITECT:	URS LLC 815 57th Street Colorado Springs, CO 80904
PLANNING/ LANDSCAPE ARCHITECT:	N.E.S., Inc. 619 N. Cascade Ave., Suite 200 Colorado Springs, CO 80903
ENGINEER:	RESPEC 121 S 7th Street, STE 1110 Colorado Springs, CO 80903
TRAFFIC:	LSC Transportation, Inc. 2404 E. Pikes Peak Ave, Suite 304 Colorado Springs, CO 80909
GEOTECH:	RMG Engineers/Architects 2910 Austin Bluffs Pkwy, Suite 100 Colorado Springs, CO 80918
WATER COUNSEL:	MONSON, CUMMINS, SHOHET & FARR, LLC 13511 Northgate Estates Dr., Ste. 250 Colorado Springs, Colorado 80921
DEVELOPMENT CONSULTANT:	ONE Real Estate Group, Inc. 1000 Northgate Estates Dr., Ste. 250 Colorado Springs, CO 80903

Land Use Area Percentages	AC	SF	%
Single Family Attached Residential	2.247	97,879	17.28%
Private ROW	1.627	72,397	12.78%
Private Driveways	0.594	25,875	4.57%
Guest Parking	0.086	3,746	0.66%
Detention Pond	0.706	30,753	5.43%
Private Usable Open Space	7.488	326,090	57.38%
Community Gather Space	0.219	8,540	1.58%
Total Area	13.000	506,330	100.00%

# EXHIBIT B

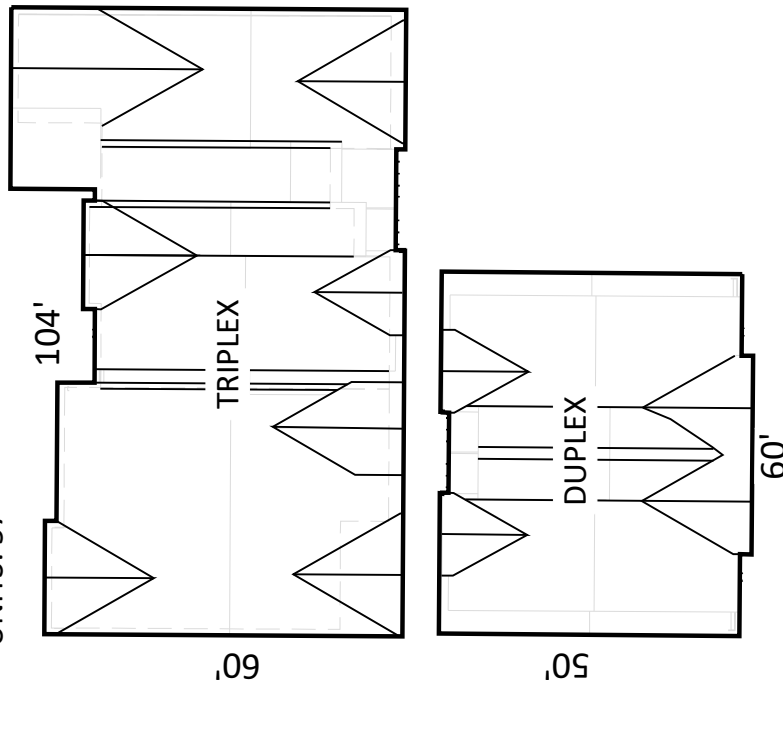
#### LEGAL DESCRIPTION

LOT 2 RANCHO IRACEMA SUBDIVISION FILING NO. 2, IN THE TOWN OF PALMER LAKE, COUNTY OF EL PASO, STATE OF COLORADO.

#### GENERAL NOTES

- PRIVATE DRIVES ARE TO BE PAVED CONCRETE.
- FLOOD INSURANCE RATE MAP NUMBER 08041C037G, EFFECTIVE DATE: DECEMBER 7, 2018, INDICATES THE AREA IN THE VICINITY OF THIS PARCEL OF LAND TO BE A ZONE X AREA DETERMINED TO BE OUT OF THE 500 YEAR FLOODPLAIN.
- CONTOURS SHOWN ON PLAN ARE AT 2' INTERVALS.

BUILDINGS: 25  
UNITS: 57



#### SKETCH PLAN

# 1

1 OF 1

N.E.S., Inc.  
619 N. Cascade Avenue, Suite 200  
Colorado Springs, CO 80903  
Tel. 719.471.0073  
Fax 719.471.0267  
www.nescolorado.com  
© 2012. All Rights Reserved.

## ELEPHANT ROCK VILLAS

### SKETCH PLAN

105 S HIGHWAY

DATE: 01.10.23  
PROJECT MGR: C. LIBBER  
PREPARED BY: C. HELMLINGER

## SOILS AND GEOLOGY STUDY

**Elephant Rock Villas  
Lot 2, Rancho Iraceme Sub, Filing No. 2  
Town of Palmer Lake, El Paso County, Colorado**

### PREPARED FOR:

**Dorman Real Estate  
2760 N. Academy Blvd., Suite 209  
Colorado Springs, CO 80917**

**JOB NO. 190736**

**October 21, 2022  
Amended January 4, 2023**

Respectfully Submitted,

RMG – Rocky Mountain Group

**Kelli Zigler  
Project Geologist**

Reviewed by,

RMG – Rocky Mountain Group

**Tony Munger, P.E.  
Sr. Geotechnical Project Manager**



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## 1.0 GENERAL SITE AND PROJECT DESCRIPTION

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### 1.1 Project Location

The project lies in the NE $\frac{1}{4}$  of the NW $\frac{1}{4}$  of Section 09, Township 11 South, Range 67 West of the 6<sup>th</sup> Principal Meridian in El Paso County, Colorado. The site is generally located north and west of the intersection of Highway 105 and Red Rock Ranch Road. The approximate location of the site is shown on the Site Vicinity Map, Figure 1.

### 1.2 Existing and Proposed Land Use

The site currently consists of one parcel (per the El Paso County Assessor's website) and is approximately 13 acres:

- Schedule No. 7109012011, current land use is classified as a vacant commercial lot

The proposed development site is a 13-acre vacant tract of land zoned PUD (Planned Unit Development) know as Lot 2 in Rancho Iracema Subdivision, Filing No. 2, in the Town of Palmer Lake, County of El Paso, State of Colorado (the "Property" or "Elephant Rock Villas"). The site is currently undeveloped.

### 1.3 Project Description

It is our understanding the property is to remain one parcel, and is to be developed with 25 multi-family structures for a total of 57 units. The structures are to be a clustered townhome community with non-owner-occupied duplexes and triplexes. Construction is to be slab-on-grade foundations with heights of eighteen feet for single-story townhomes and twenty-eight feet for two-story townhomes.

Elephant Rock Villas is to be developed, owned, managed, and maintained by Dorman Properties, LLC and Montebello 2205, LLC, who has purchased the property.

It is our understanding the site is to have access to water and sewer services from the Town of Palmer Lake and Palmer Lake Sanitation District, respectively. On-site wastewater treatment system (OWTS) are not proposed. The Proposed Building Layout Plan is presented in Figure 2.

### 1.4 Previous Investigations

Reports of previous geotechnical engineering/geologic investigations for this site were not available for our review.

## 2.0 QUALIFICATIONS OF PREPARERS

---

This Soils and Geology Study was prepared by a professional geologist as defined by Colorado Revised Statutes section 34-1-201(3) and by a qualified geotechnical engineer as defined by policy statement 15, "Engineering in Designated Natural Hazards Areas" of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors. (Ord. 96-74; Ord. 01-42)

The principle investigators for this study are Kelli Zigler P.G., and Tony Munger, P.E. Ms. Zigler is a Professional Geologist as defined by State Statute (C.R.S 34-1-201) with over 21 years of experience in

the geological and geotechnical engineering field. Ms. Kelli Zigler holds a B.S. in Geology from the University of Tulsa. Ms. Zigler has supervised and performed numerous geological and geotechnical field investigations throughout Colorado.

Tony Munger, P.E. is a licensed professional engineer with over 21 years of experience in the construction engineering (residential) field. Mr. Munger holds a B.S. in Architectural Engineering from the University of Wyoming

## 3.0 STUDY OVERVIEW

---

The purpose of this investigation is to characterize the general geotechnical, geologic site conditions and present our opinions of the potential effect of these conditions on the proposed development within the Town of Palmer Lake, El Paso County, Colorado. As such, our services exclude evaluation of the environmental and/or human, health related work products or recommendations previously prepared, by others, for this project.

Revisions to the conclusions presented in this report may be issued based upon submission of the Development Plan. This study has been prepared in accordance with the requirements outlined in the El Paso County Land Development Code (LDC) specifically Chapter 8, last updated August 27, 2019. Applicable sections include 8.4.8 and 8.4.9, and the El Paso County Engineering Criteria Manual (ECM), specifically Appendix C last updated July 9, 2019.

### 3.1 Scope and Objective

The scope of this study is to include a physical reconnaissance of the site and a review of pertinent, publically available documents including, but not limited to, previous geologic and geotechnical reports, overhead and remote sensing imagery, published geology and/or hazard maps, design documents, etc.

The objectives of our study are to:

- Identify geologic conditions present on the site
- Analyze potential negative impacts of these conditions on the proposed site development
- Analyze potential negative impacts to surrounding properties and/or public services resulting from the proposed site development as it relates to existing geologic conditions
- Provide our opinion of suitable techniques that may be utilized to mitigate any potential negative impacts identified herein

This report presents the findings of the study performed by RMG-Rocky Mountain Group relating to the geologic conditions of the above-referenced site. Revisions and modifications to this report may be issued subsequently by RMG, based upon:

- Additional observations made during grading and construction which may indicate conditions that require re-evaluation of some of the criteria presented in this report
- Review of pertinent documents (development plans, plat maps, drainage reports/plans, etc.) not available at the time of this study
- Comments received from the governing jurisdiction and/or their consultants subsequent to submission of this document

### 3.2 Site Evaluation Techniques

The information included in this report has been compiled from several sources, including:

- Field reconnaissance
- Geologic and topographic maps
- Review of selected publicly available, pertinent engineering reports
- Available aerial photographs
- Subsurface exploration
- Geologic research and analysis

Geophysical investigations were not considered necessary for characterization of the site geology. Monitoring programs, which typically include instrumentation and/or observations for changes in groundwater, surface water flows, slope stability, subsidence, and similar conditions, are not known to exist and were not considered applicable for the scope of this report.

### 3.3 Additional Documents

Additional documents reviewed during the performance of this study are included in Appendix A.

## 4.0 SITE CONDITIONS

---

### 4.1 Existing Site Conditions

The site is currently vacant undeveloped land. The site is generally located southeast of the intersection of Highway 105 and Red Rock Road in the Town of Palmer Lake, El Paso County, Colorado and comprises approximately 13 acres. The site is bound to the northeast by the Union Pacific railroad tracks, to the north by The Recovery Village (commercial development), to the east by Highway 105, and to the south by undeveloped land.

### 4.2 Topography

Based on our site reconnaissance on September 21, 2022 and USGS 2019 topographic map of the Palmer Lake Quadrangle, the site generally slopes down to the southeast to an existing drainage swale located along Highway 105 near the western property boundary. The site has an overall elevation change of approximately 25 to 30 feet. The majority of the elevation is along the western portion of the property; where the site is elevated approximately 23 feet above Highway 105. Minor erosional features were visible along the southern facing slope in the Highway 105 roadway cut. A natural drainage channel is visible near the northeast corner of the property and continues to run downslope to the south across the property to the east, as shown in Figure 11, Engineering Geology Map. At the time of the site reconnaissance the drainage was dry. The water level in the drainage channel is anticipated to vary, depending upon local precipitation events.

### 4.3 Vegetation

The site vegetation primarily consists of tall native grasses, weeds, and other prairie-type vegetation. Clusters of deciduous trees and scrub oak are scattered throughout the site.

#### 4.4 Aerial Photographs and Remote-Sensing Imagery

Personnel of RMG reviewed aerial photos available through Google Earth Pro dating back to 1999, Colorado Geological Survey (CGS) surficial geologic mapping, and historical photos by [historicaerials.com](http://historicaerials.com) dating back to 1947. Historically, the site has remained vacant, undeveloped land.

## 5.0 FIELD INVESTIGATION AND LABORATORY TESTING

---

The subsurface conditions within the property were explored by drilling four (4) exploratory borings on August 4, 2022, extending to depths of approximately 20 to 30 feet below the existing ground surface. The test borings were spaced to provide preliminary soil information across the site. The Proposed Building Layout with Test Boring Locations is presented in Figure 2.

The number of borings is in excess of the minimum one test boring per 10 acres of development up to 100 acres and one additional boring for every 25 acres of development above 100 acres as required by the ECM, Section C.3.3.

The test borings were drilled with a power-driven, continuous-flight auger drill rig. Samples were obtained during drilling of the test boring in general accordance with ASTM D-1586 and D-3550, utilizing a 2-inch O.D. Split Barrel Sampler and a 2½-inch O.D. California sampler, respectively. An Explanation of Test Boring Logs and the Test Boring Logs are presented in Figures 3 through 5.

### 5.1 Laboratory Testing

Soil laboratory testing was performed as part of this investigation. The laboratory tests included moisture content, grain-size analyses, and Atterberg Limit tests. A Summary of Laboratory Test Results is presented in Figure 6. Soils Classification Data is presented in Figures 7 and 8.

## 6.0 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

---

The site is located within the central portion of the Great Plains Physiographic Province. A major structural feature known as the Rampart Range Fault is located approximately 4 miles west of the site. The Rampart Range Fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southern portion of a large structural feature known as the Denver Basin. In general, the geology at the site consists of alluvium composed of sand, silt, clay, and gravel with loamy colluvium that overlies the Dawson Formation.

### 6.1 Subsurface Soil Conditions

The subsurface materials encountered in the test borings performed for this study were classified within the laboratory using the Unified Soil Classification System (USCS). The materials were visually identified and classified in the laboratory as silty to clayey sand and silty to clayey sandstone.

Additional descriptions and the interpreted distribution (approximate depths) of the subsurface materials are presented on the Test Boring Logs. The classifications shown on the logs are based upon the engineer's classification of the samples at the depths indicated. Stratification lines shown on the logs represent the approximate boundaries between material types and the actual transitions may be gradual and vary with location.

## 6.2 Bedrock Conditions

In general, the bedrock (as mapped by Colorado Geologic Survey - CGS) beneath the site is considered to be part of the Dawson Formation. The sandstone bedrock was encountered in our test borings. The Dawson sandstone is known to contain interbedded seams and/or layers of claystone. The claystone is considered expansive. The claystone or a representative sample of the claystone was not obtained for testing, however, the claystone is expected to classify as CL. Foundation stability within the Dawson sandstone generally is good and permeability is anticipated to be low. If claystone were encountered across the site, it is generally not suitable for foundations and the permeability is also considered low.

Depending on the final site grading and depth of foundations, bedrock is not anticipated in the proposed slab-on-grade foundation excavations. However, bedrock may be encountered in the utility trenches for the proposed development. Overall, the Dawson sandstone and claystone (if encountered) can readily be excavated with standard construction equipment such as a front-end loader or excavator.

## 6.3 U.S. Soil Conservation Service

The USDA/NRCS soil survey identifies the site soils as:

- 71 – Pring coarse sandy loam, 3 to 8 percent slopes. The Pring coarse sandy loam encompasses approximately of the property 1.8 percent of the property. Properties of the Pring coarse sandy loam include, well-drained soil, depth of the water table is anticipated to be more than 80 inches, runoff is anticipated to be low, frequency of flooding is none and ponding is none. Landforms include hills. The hydrologic soil group of the unit is B. The Pring coarse sandy loam comprised the majority of the site.
- 93 – Tomah-Crowfoot complex, 8 to 15 percent slopes. Properties of the complex include well drained soils, depth of the water table is anticipated to be greater than 80 inches, runoff is anticipated to be medium, frequency of flooding and ponding is none, and landforms include alluvial fans and hills. The Tomah-Crowfoot complex was mapped to comprise the southwestern quadrant of the site.

The USDA Soil Survey Map is presented in Figure 10.

## 6.4 General Geologic Conditions

Based on our field observations and review of relevant geologic maps, we identified the geologic conditions (listed below) affecting the development, as shown on the Engineering Geology Map, Figure 11.

The site generally consists of alluvium and colluvium deposits of the Pleistocene overlying the Dawson Formation of the Upper Cretaceous to Eocene age. Two geologic units were mapped at the site as:

- *Qas<sub>2</sub>* – Middle alluvium-slope deposits (middle Paleocene) – This unit consists of thin beds of poorly sorted sand with fine pebbles and gravel. The unit is comprised of sheetwash and stream-deposited alluvium that spans a broad range of time and includes deposits of more than one age. Some deposits are probably correlative with terrace deposits and older gravels along the larger streams of the area, but others owe their existence to non-synchronous channel avulsions and stream piracy. Estimated thickness is approximately 5 to 40 feet. The alluvium was encountered in our test borings to depths ranging between 7 and 12 feet.

- Tkda<sub>3</sub> - Facies unit three of the Dawson Formation (Paleocene) – The middle of the Dawson unit consists of sub-equal amounts of thick and very thick-bedded, massive and cross-bedded, white, tan, and light-gray arkose and pebbly arkose. Thin to thick beds of light-green to olive-gray clay-rich material may also be encountered. The unit is up to 500 to 600 feet thick in the southeast and thins towards the northwest of the quadrangle, in which the site is located.

## 6.5 Engineering Geology

One engineering geology unit was mapped at the site as:

- 3B – Expansive and potentially expansive soil and bedrock on flat to moderate slopes (0-12%)

The map unit description for this unit was provided by Charles Robinson and Associates (1977).

## 6.6 Structural Features

Structural features such as schistosity, folds, zones of contortion or crushing, joints, shear zones or faults were not observed by RMG on the site or in the surrounding area.

## 6.7 Surficial (Unconsolidated) Deposits

Lake and pond sediments, swamp accumulations, sand dunes, marine terrace deposits, talus accumulations, creep, or slope wash were not observed on the site. Slump and slide debris were also not observed on the site.

## 6.8 Features of Special Significance

Features of special significance such as accelerated erosion, (advancing gully head, badlands, or cliff reentrants) were not observed on the property. Features indicating settlement or subsidence such as fissures, scarplets, and offset reference features were not observed on the study site or surrounding areas.

Features indicating creep, slump, or slide masses in bedrock and surficial deposits were not observed on the property.

## 6.9 Groundwater and Drainage of Surface Water

The overall topography of the site slopes down from the north, northwest to the southeast, east.

Groundwater was not encountered at the time of drilling, nor were there indications of increased moisture observed in the samples obtained by RMG. Groundwater was also not observed in follow-up groundwater checks performed on October 7, 2022, approximately two months from the original drill date.

It should be noted that in granular soils and bedrock, some subsurface water conditions might be encountered due to the variability of the soil profile. Isolated sand and gravel layers within the soil, even those of limited thickness and width, can convey subsurface water. Subsurface water may also flow atop the interface between the upper soils and the underlying bedrock. While not indicative of a "groundwater" condition, these occurrences of subsurface water migration can (especially in times of heavy rainfall or snowmelt) result in water migration into the excavation or (once construction is complete) the building envelope. Builders and planners should be cognizant of the potential for the occurrence of subsurface

water conditions during on-site construction, and be prepared to evaluate and mitigate each individual occurrence as necessary.

Based on our knowledge of the area and engineering design and construction techniques commonly employed in the El Paso County area at this time, it is our opinion that there is insufficient reason to preclude full-depth basements on any of the lots in this subdivision at this time. Shallow groundwater conditions are not anticipated to be found at the time of the site-specific subsurface soil investigations.

Fluctuations in groundwater and subsurface moisture conditions may occur due to variations in rainfall and other factors not readily apparent at this time. Development of the property and adjacent properties may also affect groundwater levels.

### 6.10 Flooding and Surface Drainage

A natural drainage channel runs through the site in the northeast corner. The drainage channel was dry at the time of the site recon performed by RMG. The USGS Topo Map is presented in Figure 9.

Based on our review of the Federal Emergency Management Agency (FEMA) Community Panel No. 08041C0257G and the online ArcGIS El Paso County Risk Map, the site lies outside of a 100-year floodplain. The site is within the boundaries of Zone X. The FEMA Map is presented in Figure 12.

Zone X is defined by FEMA as an area of minimal flood hazard that is determined to be outside the Special Flood Hazard Area and higher than the elevation of the 0.2-percent-annual-chance (or 500-year) flood.

## 7.0 ECONOMIC MINERAL RESOURCES

---

Under the provision of House Bill 1529, it was made a policy by the State of Colorado to preserve for extraction commercial mineral resources located in a populous county. Review of the *El Paso Aggregate Resource Evaluation Map, Master Plan for Mineral Extraction, Map 1* indicates the site is identified as Upland Deposits. The deposits are composed of sand, gravel with silt and clay. These deposits are remnants of older streams deposited on topographic highs or bench like features. The tract is underlain primarily by the Dawson Arkose, a sedimentary formation of Tertiary age related to uplift and erosion of the Front Range.

According to the *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands*, the site is mapped within the Denver Basin Coal Region, the tract identifier is 41-02. However, the area of the site has been mapped "Poor" for coal resources. In this part of the Denver coal region, coal resources are locally present within the lower part of the Laramie Formation of Upper Cretaceous age. The area contains strata that may contain coal. This area is not prospective for metallic mineral resources. No oil and gas wells are drilled in the area, or within two miles of it. Alluvial deposits are commonly mined in the region for sand and gravel. There are no active or inactive gravel pits in the area, but there are several within a three-mile radius of it. Alluvial deposits containing gravel and/or sand cover approximately 112 acres of tract 41-02. Assuming a mineable thickness of 15 feet, this represents 4.1 million tons of potentially useable resource. The quality of the resource has not been determined. In the vicinity of this area, the coal-bearing beds of the Laramie Formation lie at a depth of approximately 1,500 feet (Kirkham and Ladwig, 1979). It is possible that the tract contains coal resources at this depth. The coal seams in the Laramie Formation tend to be lenticular and discontinuous in comparison to areas currently being mined in western Colorado.

## 8.0 IDENTIFICATION AND MITIGATION OF POTENTIAL GEOLOGIC CONDITIONS

---

The El Paso County Engineering Criteria Manual recognizes and delineates the difference between geologic hazards and constraints. A *geologic hazard* is one of several types of adverse geologic conditions capable of causing significant damage or loss of property and life. Geologic hazards are defined in Section C.2.2 Sub-section E.1 of the ECM. A *geologic constraint* is one of several types of adverse geologic conditions capable of limiting or restricting construction on a particular site. Geologic constraints are defined in Section C.2.2 Sub-section E.2 of the ECM (1.15 Definitions of Specific Terms and Phrases). The following geologic constraints were considered in the preparation of this report. They are not anticipated to pose a significant risk to the proposed development:

- Avalanches
- Compressible Soils
- Debris Flow-Fans/Mudslides
- Ground Subsidence and Abandoned Mining Activity
- Landslides
- Rockfall
- Flood Prone Area
- Groundwater Springs or Seeps
- Shallow Groundwater Tables
- Ponding water
- Steeply Dipping Bedrock
- Unstable or Potentially Unstable Slopes
- Scour, Erosion, Accelerated Erosion Along Creek Banks and Drainageways
- History of Landfill or Uncontrolled/Undocumented Fill Placement
- Valley Fill
- Downhill/Down-slope Creep
- Soil Slumps and Undercutting
- Corrosive Minerals

The following sections present the geologic conditions that have been identified on the property:

### 8.1 Expansive Soils

Based on our test borings and experience with similar materials in this area, the on-site soils generally possess low swell potential. However, the Dawson formation is known to have moderate to high swell potential in some locations. If these materials are encountered in the excavations for the proposed multi-family structures, they can readily be mitigated with typical construction practices common to this region of El Paso County, Colorado.

#### Mitigation

Foundation design and construction are typically adjusted for expansive soils. Mitigation of expansive soils may include overexcavation and replacement with non-expansive structural fill. Drilled piers are not anticipated. Floor slabs bearing directly on expansive soils are expected to experience movement.

Overexcavation and replacement with compacted non-expansive soils can be successful in reducing slab movement.

If expansive soils or bedrock are encountered during construction, mitigation of these expansive materials should follow the recommendations presented in a lot-specific subsurface soil investigation performed for each proposed structure.

## 8.2 Faults and Seismicity

Based on review of the Earthquake and Late Cenozoic Fault and Fold Map Server provided by CGS located at <http://dnrwebmapgdev.state.co.us/CGSOnline/> and the recorded information dating back to November of 1900, Colorado Springs has not experienced a recorded earthquake with a magnitude greater than 1.6 during that period. The nearest recorded earthquakes over 1.6 occurred in December of 1995 in Manitou Springs, which experienced magnitudes ranging between 2.8 to 3.5. Additional earthquakes over 1.6 occurred between 1926 and 2001 in Woodland Park, which experienced magnitudes ranging from 2.7 to 3.3. Both of these locations are located near the Ute Pass Fault, which is greater than 10 miles from the subject site. Earthquakes felt at this site will most likely result from minor shifting of the granite mass within the Pikes Peak Batholith, which includes pull from minor movements along faults found in the Denver basin. It is our opinion that ground motions resulting from minor earthquakes may affect structures (and the surrounding area) at this site if minor shifting were to occur.

### Mitigation

The Pikes Peak Regional Building Code, 2017 Edition, indicates maximum considered earthquake spectral response accelerations of 0.213g for a short period ( $S_s$ ) and 0.059g for a 1-second period ( $S_1$ ). Based on the results of our experience with similar subsurface conditions, we recommend the site be classified as Site Class B, with average shear wave velocities ranging from 2,500 to 5,000 feet per second for the materials in the upper 100 feet.

## 8.3 Radon

*"Radon Act 51 passed by Congress set the natural outdoor level of radon gas (0.4 pCi/L) as the target radon level for indoor radon levels".*

Northern El Paso County and the 80133 zip code in which the site is located, has an EPA assigned Radon Zone of 1. A radon Zone of 1 predicts an average indoor radon screening level greater than 0.4 pCi/L (picocuries per liter), which is above the recommended levels assigned by the EPA. *The EPA recommends [corrective measures](#) to reduce exposure to radon gas.*

All of the State of Colorado is considered EPA Zone 1 based on the information provided at [https://county-radon.info/CO/El\\_Paso.html](https://county-radon.info/CO/El_Paso.html). Elevated hazardous levels of radon from naturally occurring sources are not anticipated at this site.

### Mitigation

Radon hazards are best mitigated at the building design and construction phases. Providing increased ventilation of basements, crawlspaces, creating slightly positive pressures within structures, and sealing of joints and cracks in the foundations and below-grade walls can help mitigate radon hazards. Passive radon mitigation systems are also available.

Passive and active mitigation procedures are commonly employed in this region to effectively reduce the buildup of radon gas. Measures that can be taken after the residence is enclosed during construction include installing a blower connected to the foundation drain and sealing the joints and cracks in concrete floors and foundation walls. If the occurrence of radon is a concern, it is recommended that the residence be tested after they are enclosed and commonly utilized techniques are in place to minimize the risk.

## 9.0 BEARING OF GEOLOGIC CONDITIONS UPON PROPOSED DEVELOPMENT

---

Geologic hazards (as described in section 8 of this report) found to be present at this site include faults and seismicity and radon. Geologic conditions (as described in section 8 of this report) found to be present at this site include compressible soils and expansive soils. It is our opinion that the existing geologic and engineering conditions can be satisfactorily mitigated through proper engineering, design, and construction practices.

## 10.0 ADDITIONAL STUDIES

---

The findings, conclusions and recommendations presented in this report were provided to evaluate the suitability of the site for future development. Unless indicated otherwise, the test borings, laboratory test results, conclusions and recommendations presented in this report are not intended for use for design and construction. ***A site-specific subsurface soil investigation will be required for all proposed structures including (but not limited to) residences and any proposed retaining walls, etc.***

To develop recommendations for construction of the proposed roadways, a pavement design investigation should be performed. This investigation should consist of additional test borings, soil laboratory testing and specific recommendations for the design and construction of roadway pavement sections.

## 11.0 CONCLUSIONS

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Based upon our evaluation of the geologic conditions, it is our opinion that the proposed development is feasible. The geologic conditions identified are considered typical for the Front Range region of Colorado. Mitigation of geologic conditions is most effectively accomplished by avoidance. However, where avoidance is not a practical or acceptable alternative, geologic conditions should be mitigated by implementing appropriate planning, engineering, and suitable construction practices.

In addition to the previously identified mitigation alternatives, surface and subsurface drainage systems should be considered. Exterior, perimeter foundation drains should be installed around below-grade habitable or storage spaces. A typical perimeter drain detail is presented in Figure 13. Surface water should be efficiently removed from the building area to prevent ponding and infiltration into the subsurface soil.

We believe the silty to clayey sand and sandstone will classify as Type B material as defined by OSHA in 29 CFR Part 1926. OSHA requires that temporary excavations made in Type B materials be laid back at ratios no steeper than 1:1 (horizontal to vertical), unless the excavation is shored and braced. Excavations deeper than 20 feet, or when water is present, should always be braced or the slope designed by a professional engineer.

Long term cut slopes in the upper soil should be limited to no steeper than 3:1 (horizontal to vertical). Flatter slopes will likely be necessary should groundwater conditions occur. It is recommended that long term fill slopes be no steeper than 3:1 (horizontal to vertical).

Revisions and modifications to the conclusions and recommendations presented in this report may be issued subsequently by RMG based upon additional observations made during grading and construction, which may indicate conditions that require re-evaluation of some of the criteria presented in this report.

It is important for the Owner(s) of the property to read and understand this report, and to carefully familiarize themselves with the geologic hazards associated with construction in this area. This report only addresses the geologic constraints contained within the boundaries of the site referenced above.

## 12.0 CLOSING

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This report is for the exclusive purpose of providing geologic hazards information and preliminary geotechnical engineering recommendations. The scope of services did not include, either specifically or by implication, evaluation of wild fire hazards, environmental assessment of the site, or identification of contaminated or hazardous materials or conditions. Development of recommendations for the mitigation of environmentally related conditions, including but not limited to, biological or toxicological issues, are beyond the scope of this report. If the owner is concerned about the potential for such contamination or conditions, other studies should be undertaken.

This report has been prepared for **Dorman Real Estate** in accordance with generally accepted geotechnical engineering and engineering geology practices. The conclusions and recommendations in this report are based in part upon data obtained from review of available topographic and geologic maps, review of available reports of previous studies conducted in the site vicinity, a site reconnaissance, and research of available published information, soil test borings, soil laboratory testing, and engineering analyses. The nature and extent of variations may not become evident until construction activities begin. If variations then become evident, RMG should be retained to re-evaluate the recommendations of this report, if necessary.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers and engineering geologists practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No warranty, express or implied, is made by the preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

## FIGURES



NOT TO SCALE

Architecture  
Structural  
Geotechnical



**Engineers / Architects**

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Materials Testing  
Forensics  
Civil / Planning

SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

## SITE VICINITY MAP

ELEPHANT ROCK VILLAS  
EL PASO COUNTY, COLORADO  
DORMAN REAL ESTATE

JOB No. 190736

FIG No. 1

DATE 10-21-2022



APPROXIMATE PROPERTY BOUNDARIES

TB-4

PHASE 5  
4 UNITS

PHASE 1  
14 UNITS

TB-2

PHASE 3  
16 UNITS

TB-3

PHASE 2  
11 UNITS

PHASE 4  
2 UNITS

TB-1

HIGHWAY STATUS



NOT TO SCALE  
BASE MAP PROVIDED BY NES INC.

⊕ DENOTES APPROXIMATE  
LOCATION OF TEST BORINGS  
PERFORMED FOR THIS STUDY

Materials Testing  
Forensics  
Civil / Planning



Architecture  
Structural  
Geotechnical

Engineers / Architects





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ELEPHANT ROCK VILLAS  
EL PASO COUNTY, COLORADO  
DORMAN REAL ESTATE

ENGINEER:	TM
DRAWN BY:	KZ
CHECKED BY:	TM
ISSUED:	10-21-2022







PROPOSED BUILDING  
LAYOUT WITH TEST  
BORING LOCATIONS

# SOILS DESCRIPTION

-  CLAYEY SAND
-  SANDSTONE
-  SILTY SAND
-  SILTY TO CLAYEY SAND

UNLESS NOTED OTHERWISE, ALL LABORATORY TESTS PRESENTED HEREIN WERE PERFORMED BY:  
 RMG - ROCKY MOUNTAIN GROUP  
 2910 AUSTIN BLUFFS PARKWAY  
 COLORADO SPRINGS, COLORADO

# SYMBOLS AND NOTES

-  XX STANDARD PENETRATION TEST - MADE BY DRIVING A SPLIT-BARREL SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-1586. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).
-  XX UNDISTURBED CALIFORNIA SAMPLE - MADE BY DRIVING A RING-LINED SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-3550. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).
-  FREE WATER TABLE
-  DEPTH AT WHICH BORING CAVED
-  BULK DISTURBED BULK SAMPLE
-  AUG AUGER "CUTTINGS"
- 4.5 WATER CONTENT (%)

ROCKY MOUNTAIN GROUP

Architectural  
Structural  
Forensics



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Materials Testing  
Civil, Planning

## EXPLANATION OF TEST BORING LOGS

JOB No. 190736

FIGURE No. 3

DATE Oct/21/2022

Item 4.

TEST BORING: 1					TEST BORING: 2				
DATE DRILLED: 8/4/22 NO GROUNDWATER ON 8/4/22					DATE DRILLED: 8/4/22 NO GROUNDWATER ON 8/4/22				
DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
5			21	12.7	5			5	6.5
10			50/6"	5.1	10			29	10.3
15			50/5"	6.1	15			50/6"	14.0
20			50/4"	8.9	20			50/5"	7.8
					25			50/4"	8.4
					30			10/0"	9.1

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# TEST BORING LOG

JOB No. 190736

FIGURE No. 4

DATE Oct/21/2022

Item 4.

TEST BORING: 3  DATE DRILLED: 8/4/22 NO GROUNDWATER ON 8/4/22	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: 4  DATE DRILLED: 8/4/22 NO GROUNDWATER ON 8/4/22	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
SAND, SILTY TO CLAYEY, with gravel, light brown to brown, loose to medium dense, moist	5			7	4.5	SAND, SILTY, with gravel, light brown, loose to medium dense, moist	5			4	2.0
SANDSTONE, SILTY TO CLAYEY, with gravel, light brown, hard to very hard, moist	10			20	10.8	SANDSTONE, SILTY TO CLAYEY, with gravel, light brown, very hard, moist	10			12	2.1
	15			50	10.7		15			50/7"	6.2
	20			50/4"	9.5		20			50/5"	10.0
	25				6.4						
	30				8.7						

ROCKY MOUNTAIN GROUP

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## TEST BORING LOG

JOB No. 190736  
 FIGURE No. 5  
 DATE Oct/21/2022

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
1	4.0	12.7		32	15	3.7	25.2			SC
1	9.0	5.1								
1	14.0	6.1								
1	19.0	8.9								
2	2.0	6.5								
2	7.0	10.3		27	14	1.3	32.8			SC
2	14.0	14.0								
2	19.0	7.8								
2	24.0	8.4				4.8	24.1			
2	29.0	9.1								
3	4.0	4.5								
3	9.0	10.8		28	15	1.5	26.7			SC
3	14.0	10.7								
3	19.0	9.5								
3	24.0	6.4		31	21	1.3	29.7			SC
3	29.0	8.7								
4	2.0	2.0		NP	NP	5.0	6.8			SW-SM
4	7.0	2.1								
4	14.0	6.2								
4	19.0	10.0		30	14	0.0	47.8			SC

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Architectural  
Structural  
Forensics



Engineers / Architects

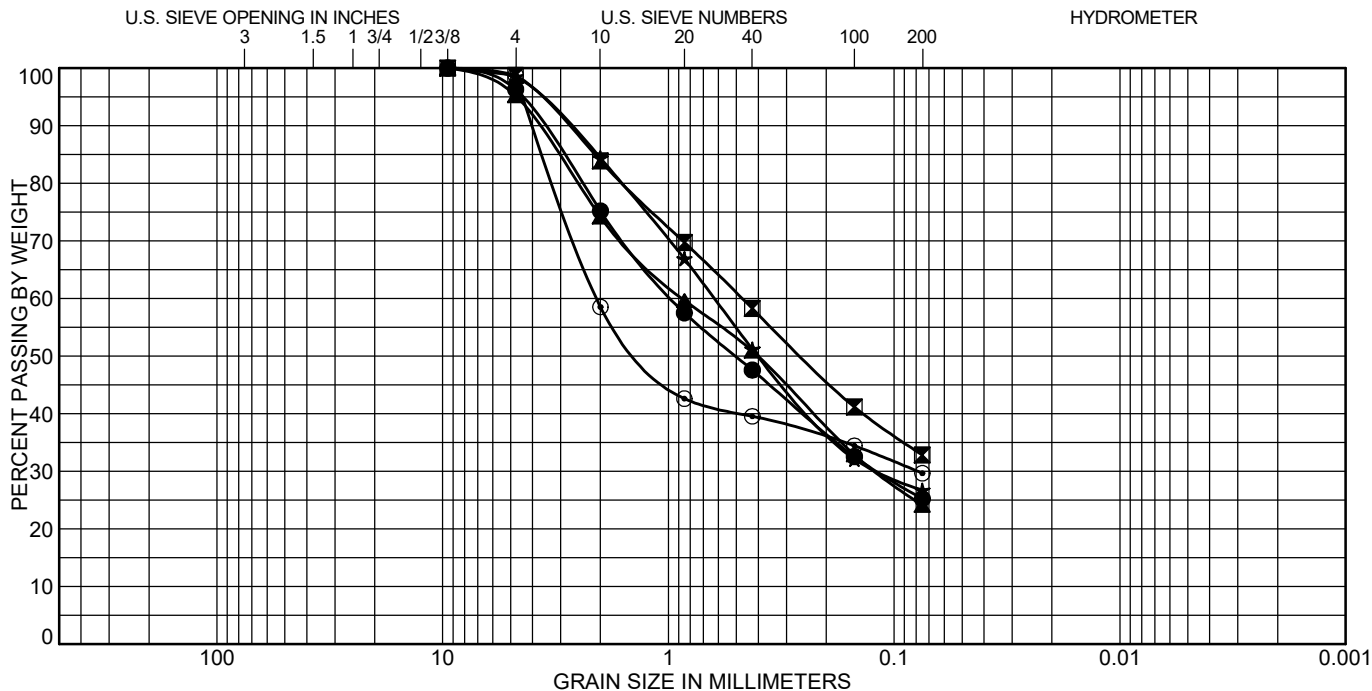
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## SUMMARY OF LABORATORY TEST RESULTS

JOB No. 190736  
FIGURE No. 6  
PAGE 1 OF 1  
DATE Oct/21/2022



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● 1	4.0	CLAYEY SAND(SC)	32	17	15
☒ 2	7.0	CLAYEY SAND(SC)	27	13	14
▲ 2	24.0				
★ 3	9.0	CLAYEY SAND(SC)	28	13	15
⊙ 3	24.0	CLAYEY SAND(SC)	31	10	21

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 1	4.0	3.7	71.1	25.2	
☒ 2	7.0	1.3	65.9	32.8	
▲ 2	24.0	4.8	71.1	24.1	
★ 3	9.0	1.5	71.8	26.7	
⊙ 3	24.0	1.3	69.1	29.7	

ROCKY MOUNTAIN GROUP

**RMG**  
Engineers / Architects

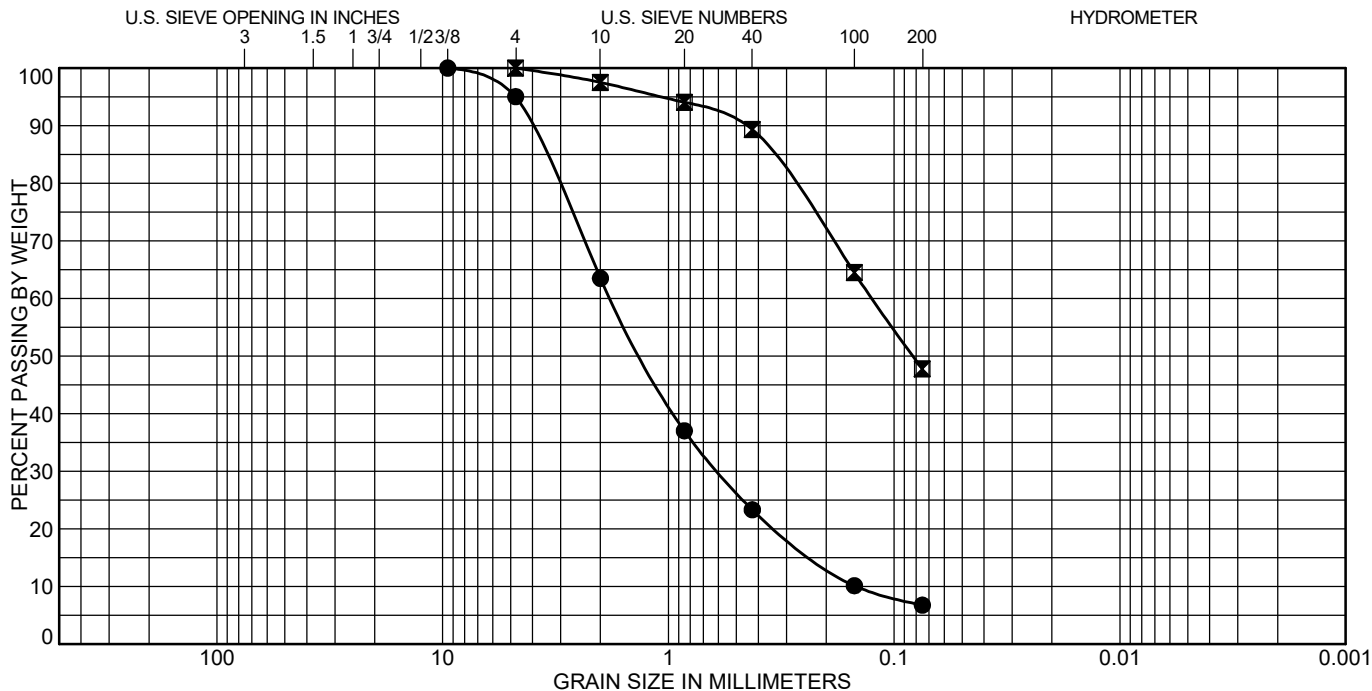
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Structural  
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# SOIL CLASSIFICATION DATA

JOB No. 190736  
FIGURE No. 7  
DATE Oct/21/2022



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● 4	2.0	WELL-GRADED SAND with SILT(SW-SM)	NP	NP	NP
☒ 4	19.0	CLAYEY SAND(SC)	30	16	14

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 4	2.0	5.0	88.3	6.8	
☒ 4	19.0	0.0	52.2	47.8	

ROCKY MOUNTAIN GROUP



**Engineers / Architects**

Colorado Springs: (Corporate Office)  
2910 Austin Bluffs Parkway  
Colorado Springs, CO 80918  
(719) 548-0600  
SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

Architectural  
Structural  
Forensics

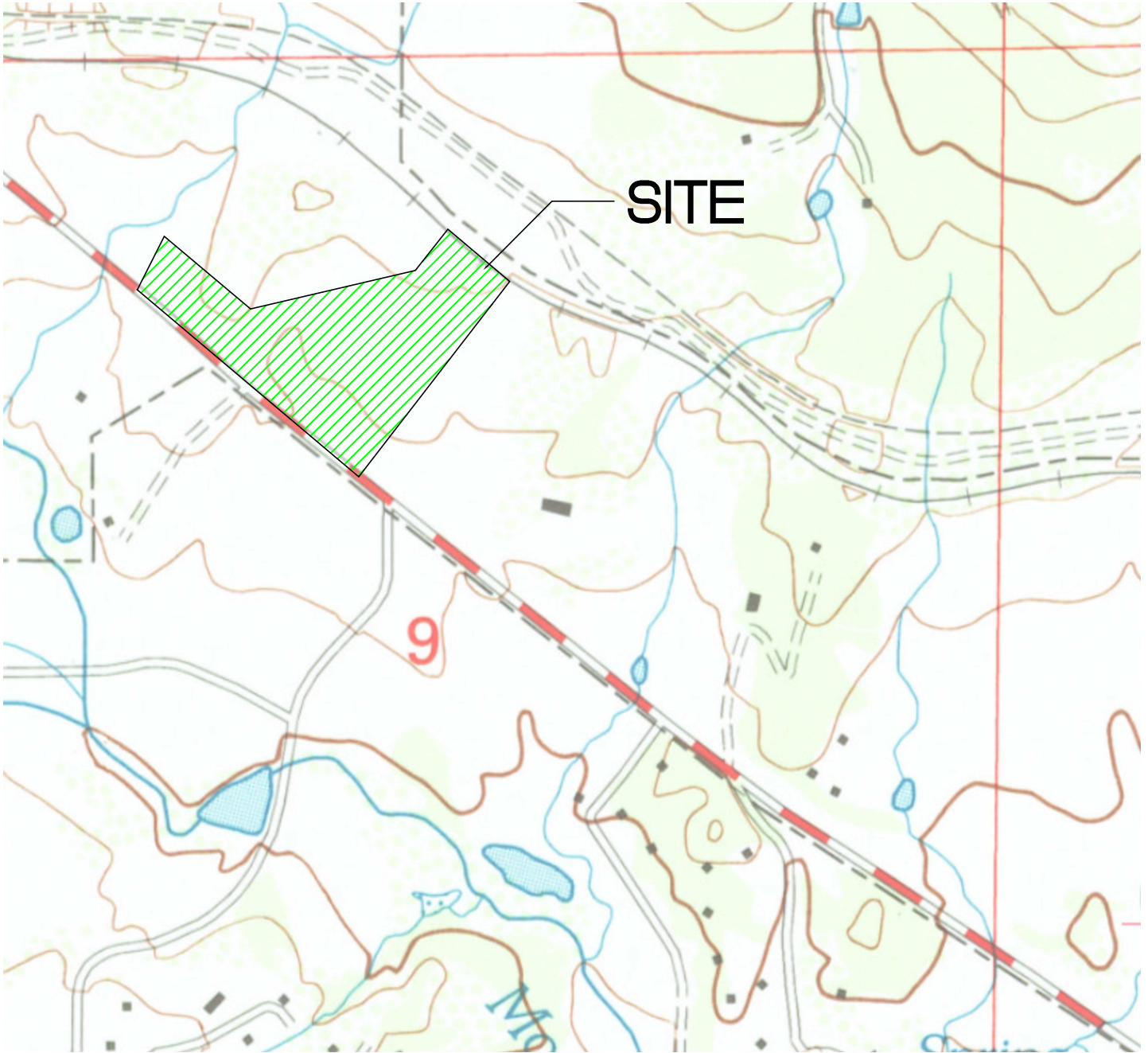
Geotechnical  
Materials Testing  
Civil, Planning

## SOIL CLASSIFICATION DATA

JOB No. 190736

FIGURE No. 8

DATE Oct/21/2022



NOT TO SCALE

Architecture  
Structural  
Geotechnical



Materials Testing  
Forensics  
Civil / Planning

**Engineers / Architects**

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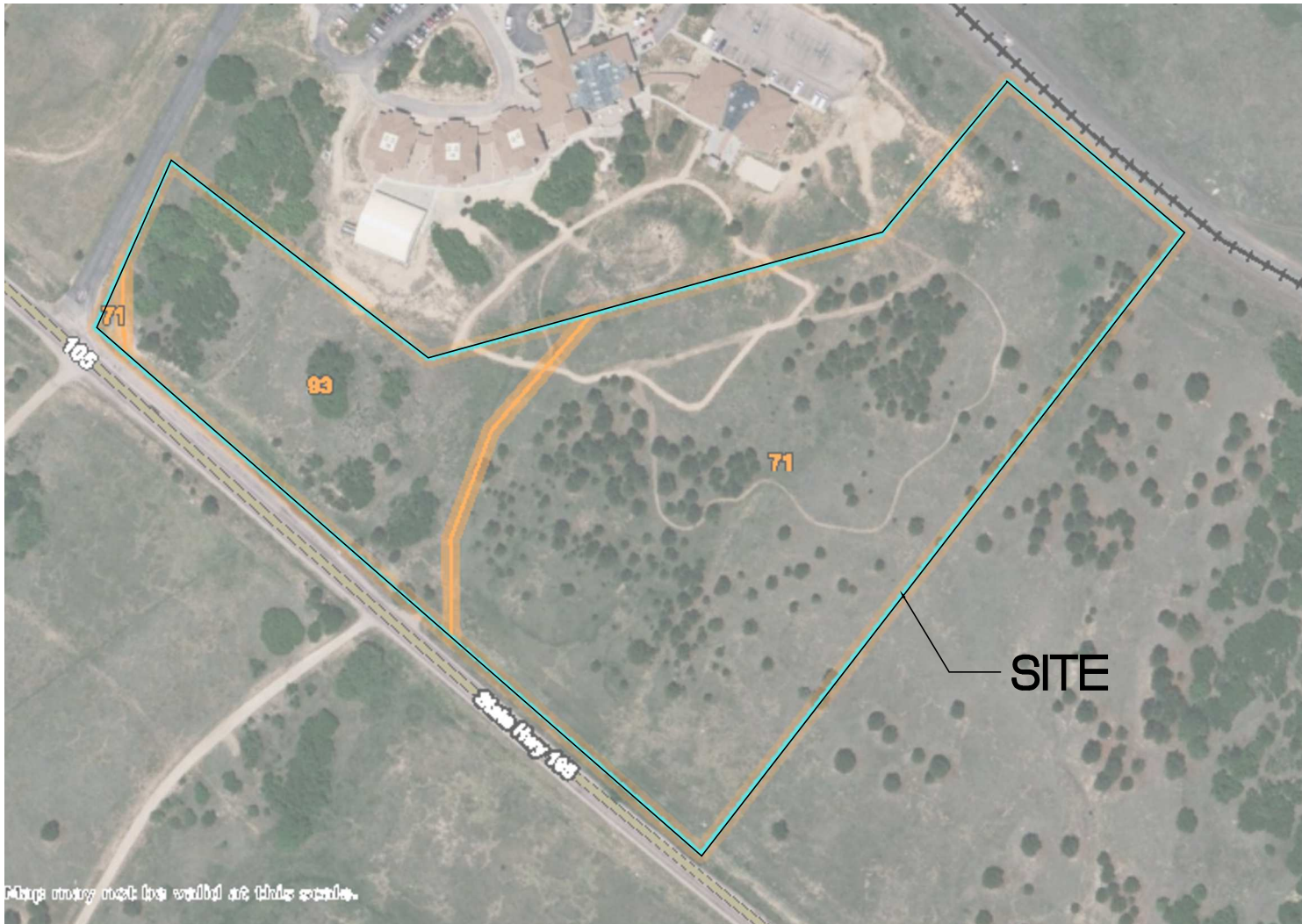
# USGS TOPO MAP

ELEPHANT ROCK VILLAS  
EL PASO COUNTY, COLORADO  
DORMAN REAL ESTATE

JOB No. 190736

FIG No. 9

DATE 10-21-2022



- 71 - Fine coarse sandy loam, 3 to 8 percent slopes
- 93 - Tomah-Crowfoot complex, 8 to 15 percent slopes



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Geotechnical



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## USDA SOIL SURVEY MAP

ELEPHANT ROCK VILLAS  
EL PASO COUNTY, COLORADO  
DORMAN REAL ESTATE

JOB No. 190736

FIG No. 10

DATE 10-21-2009



  
 NOT TO SCALE

 DENOTES APPROXIMATE LOCATION OF TEST BORINGS PERFORMED FOR THIS STUDY

**General Geology**

*Qas<sub>2</sub>* - Middle alluvium-slope deposits (middle Paleocene) - The unit is comprised of sheetwash and stream-deposited alluvium that spans a broad range of time and includes deposits of more than one age. Estimated thickness is approximately 5 to 40 feet. The alluvium was encountered in our test borings to depths ranging between 7 to 12 feet.

*Tkda<sub>3</sub>* - Facies unit three of the Dawson Formation (Paleocene) - The middle of the Dawson unit. The unit is up to 500 to 600 feet thick in the southeast and thins towards the northwest of the quadrangle, in which the site is located.

**Engineering Geology**

*3B* - Expansive and potentially expansive soil and bedrock on flat to moderate slopes (0-12%)

ELEPHANT ROCK VILLAS  
 EL PASO COUNTY, COLORADO  
 DORMAN REAL ESTATE

ENGINEER: TM  
 DRAWN BY: KZ  
 CHECKED BY: TM

ISSUED: 10-21-2022

ENGINEERING GEOLOGY MAP

SHEET No. FIG-1 70



NOT TO SCALE

Architecture  
Structural  
Geotechnical



Materials Testing  
Forensics  
Civil / Planning

**Engineers / Architects**

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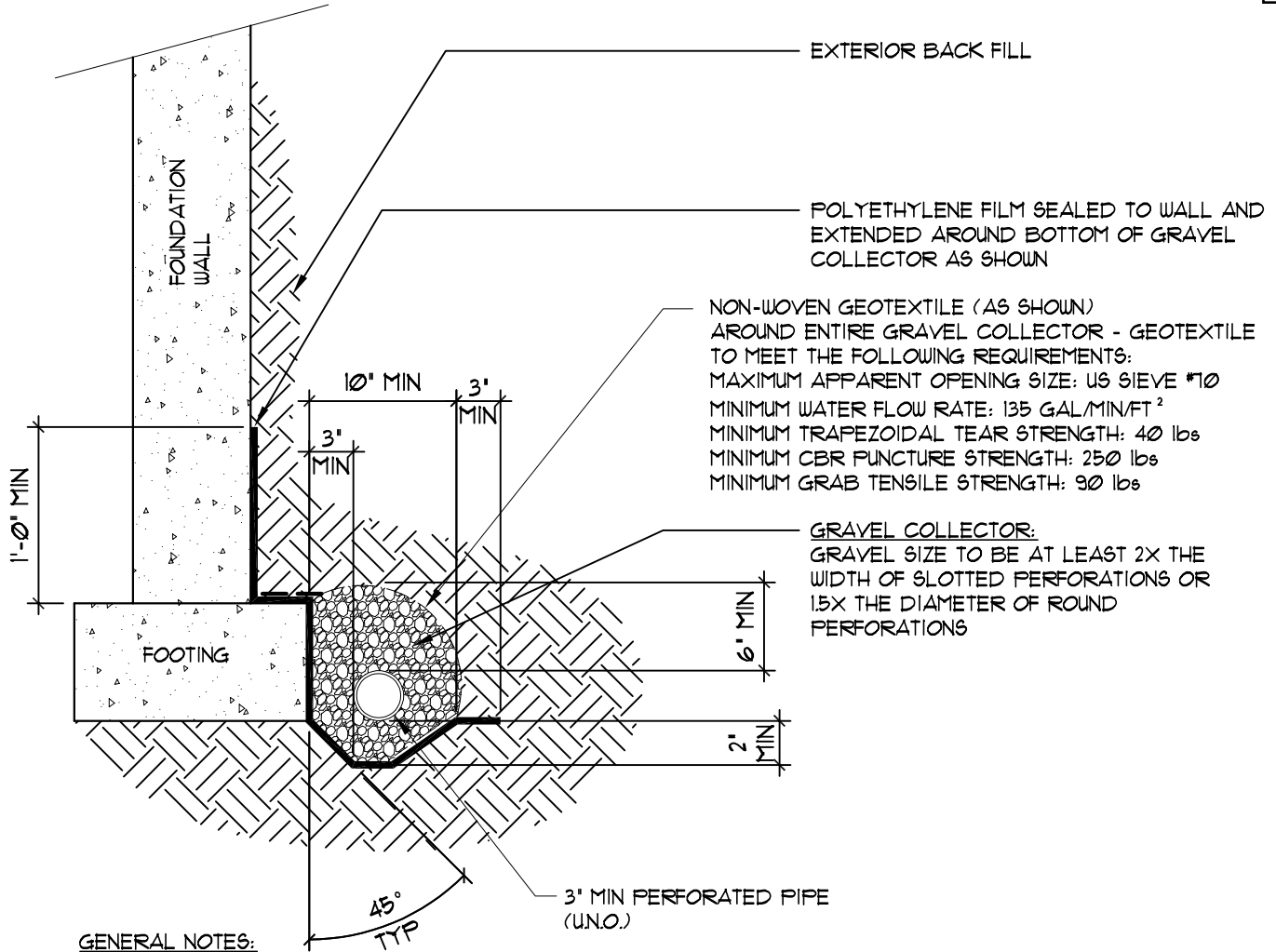
## FEMA MAP

ELEPHANT ROCK VILLAS  
EL PASO COUNTY, COLORADO  
DORMAN REAL ESTATE

JOB No. 190736

FIG No. 12

DATE 10-21-2019



**GENERAL NOTES:**

1. BOTTOM OF DRAIN PIPE SHALL BE AT OR BELOW BOTTOM OF FOOTING AT ALL LOCATIONS
2. ALL DRAIN PIPE SHALL BE PERFORATED PLASTIC, WITH THE EXCEPTION OF THE DISCHARGE PORTION WHICH SHALL BE SOLID, NON-PERFORATED PIPE.
3. DRAIN PIPE SHALL HAVE POSITIVE FALL THROUGHOUT.
4. DRAIN PIPE SHALL BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. IF A GRAVITY OUTFALL CANNOT BE ACHIEVED, THEN A SUMP PIT AND PUMP SHALL BE USED. THE OUTFALL SHOULD EXTEND PAST BACKFILL ZONES AND DISCHARGE TO A LOCATION THAT IS GRADED TO DIRECT WATER OFF-SITE.
5. ALL DRAIN COMPONENTS SHALL BE RATED/APPROVED BY THE MANUFACTURER FOR THE INSTALLED DEPTH AND APPLICATION
6. DRAIN SYSTEM, INCLUDING THE OUTFALL OF THE DRAIN, SHALL BE OBSERVED BY QUALIFIED PERSONNEL PRIOR TO BACKFILLING TO VERIFY INSTALLATION.
7. A VERTICAL SEGMENT OF PERFORATED DRAIN PIPE, CAPPED AT THE TOP, SHALL EXTEND TO FINISH GRADE WITHIN ALL WINDOW WELLS.

Architecture  
Structural  
Geotechnical



**Engineers / Architects**

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Materials Testing  
Forensics  
Civil / Planning

**PERIMETER DRAIN**

**FIG No. 13**

## Appendix A

### *Additional Reviewed Documentation*

1. *Site Plan, Elephant Rock Villas*, prepared by NES, dated August 15, 2022.
2. *Flood Insurance Rate Map, El Paso County, Colorado and Unincorporated Areas, Community Panel No. 081041C0257G*, Federal Emergency Management Agency (FEMA), effective December 7, 2018. FEMA Flood Map Service Center: <https://msc.fema.gov/portal/home>.
3. *Geologic Map of the Larkspur, Palmer Lake & Mt. Deception Quadrangles, Colorado-El Paso County & Douglas County, Colorado*, compiled by Dale M. Cochran, 1977.
4. *Environmental and Engineering Geologic Map for Land Use, Larkspur, Palmer Lake & Mt. Deception Quadrangles, Colorado-El Paso County & Douglas County, Colorado*, compiled by Dale M. Cochran, 1977.
5. *Map of Potential Geologic Hazards and Surficial Deposits*, compiled by Dale M. Cochran, Charles S. Robinson & Associates, Inc., Golden, Colorado, 1977.
6. *Geologic Map of the Palmer Lake Quadrangle, El Paso County, Colorado, Colorado Geologic Survey*, prepared by John W., Keller, Matthew L. Thorson, Jon P. Lindsey, Neil R., and Barkmann P.E., Open File Report OF-06-06, 2006.
7. *Reconnaissance Geologic Map of Colorado Springs and Vicinity, Colorado*, Department of the Interior United State Geologic Survey, prepared by Glenn R. Scott and Reinhold A. Wobus, Miscellaneous Field Studies, Map MF-482, Sheets 1 and 2, 1973.
8. *Colorado Springs Landslide Susceptibility, Colorado Geological Survey*: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/index.html?id=5e7484a637c4432e84f4f16d0af306d3>
9. *Colorado Landslide Inventory, Colorado Geological Survey*: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/index.html?id=9dd73db7fbc34139abe51599396e2648>.
10. *Pikes Peak Regional Building Department*: <https://www.pprbd.org/>.
11. *City of Colorado Springs, Subdivision Document Viewer*: <http://www.springsgov.com/SubDivView/default.asp?cmdGoBack=New+Search...>
12. *El Paso County Assessor, El Paso County, Colorado*: <https://property.spatalest.com/co/el Paso/#/property/7109012011>, Schedule No. 7109012011.
13. *Colorado Geological Survey, USGS Geologic Map Viewer*: <http://coloradogeologicalsurvey.org/geologic-mapping/6347-2/>.
14. *Historical Aerials*: <https://www.historicaerials.com/viewer>, Images dated 1952, 1953, 1955, 1960, 1969, 1984, 1999, 2004, 2005, 2009, 2011, 2013, 2015, 2017, and 2019..
15. *USGS Historical Topographic Map Explorer*: <http://historicalmaps.arcgis.com/usgs/> Images dated 1950, 1951, 1956, 1657, 1963, 1966, 1970, 1974, 1977, 1994, 2001, 2013 and 2013.
16. *Google Earth Pro*, Imagery dated 1999, 2003, 2004, 2005, 2006, 2011, 2015, 2017, 2018, 2019, and 2020.

# ELEPHANT ROCK VILLAS



SEAL

DATE  
01.10.2023

ISSUE  
DEVELOPMENT PLAN

REVISIONS

No.	Issuance	Date

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PROJECT NUMBER 21-136B

**ELEPHANT ROCK VILLAS**  
PALMER LAKE, CO

**308 LLC**  
308 N. CHESTNUT ST.  
COLORADO SPRINGS, CO 80905  
719.505.6635  
WWW.308LLC.COM

SHEET  
**DP 0 - COVER**  
COVER SHEET

**PROJECT TEAM:**

<b>CLIENT:</b> DOORMAN PROPERTIES TODD DOORMAN 2760 N. ACADEMY BLVD. #302 COLORADO SPRINGS, CO 80917 719-213-9100	<b>ARCHITECT:</b> 308 LLC CHRISTY RIGGS 815 S 25TH ST, SUITE 203 COLORADO SPRINGS, CO 80904 719.510.5993
<b>CIVIL ENGINEER:</b> RESPEC RICH GALLEGOS, P.E. 121 S. TEJON ST. #1110 COLORADO SPRINGS, CO 80903 719-266-5212	<b>LANDSCAPE ARCHITECT:</b> N.E.S. Christian Lieber 619 N. Cascade Ave. Colorado Springs, CO 80903 719-471-0073

**SITE & BUILDING DATA:**

OWNER NAME: DOORMAN PROPERTIES

APPLICANT NAME: DOORMAN PROPERTIES

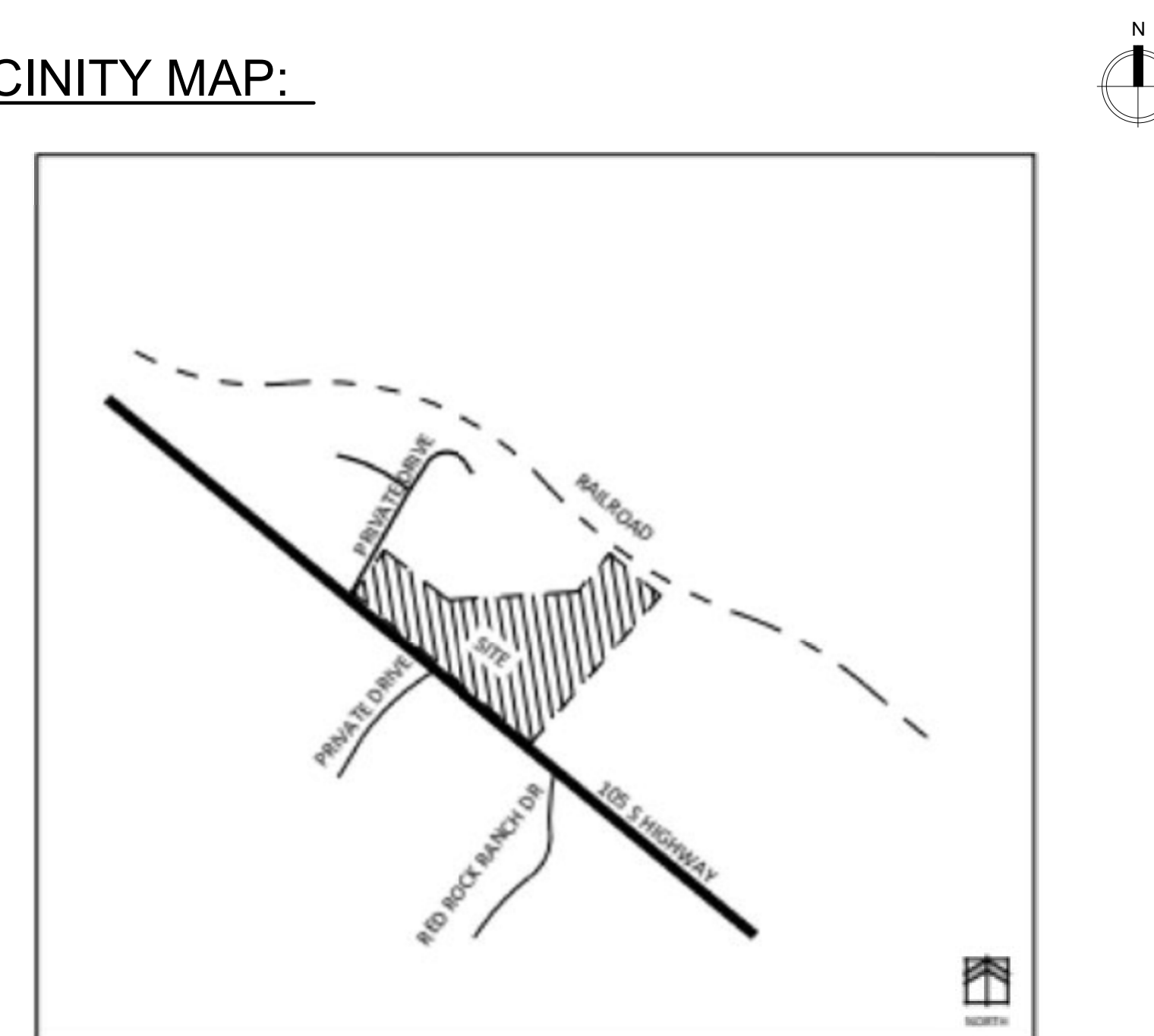
SITE ADDRESS: TBD

PROJECT TYPE: SINGLE FAMILY ATTACHED RESIDENTIAL

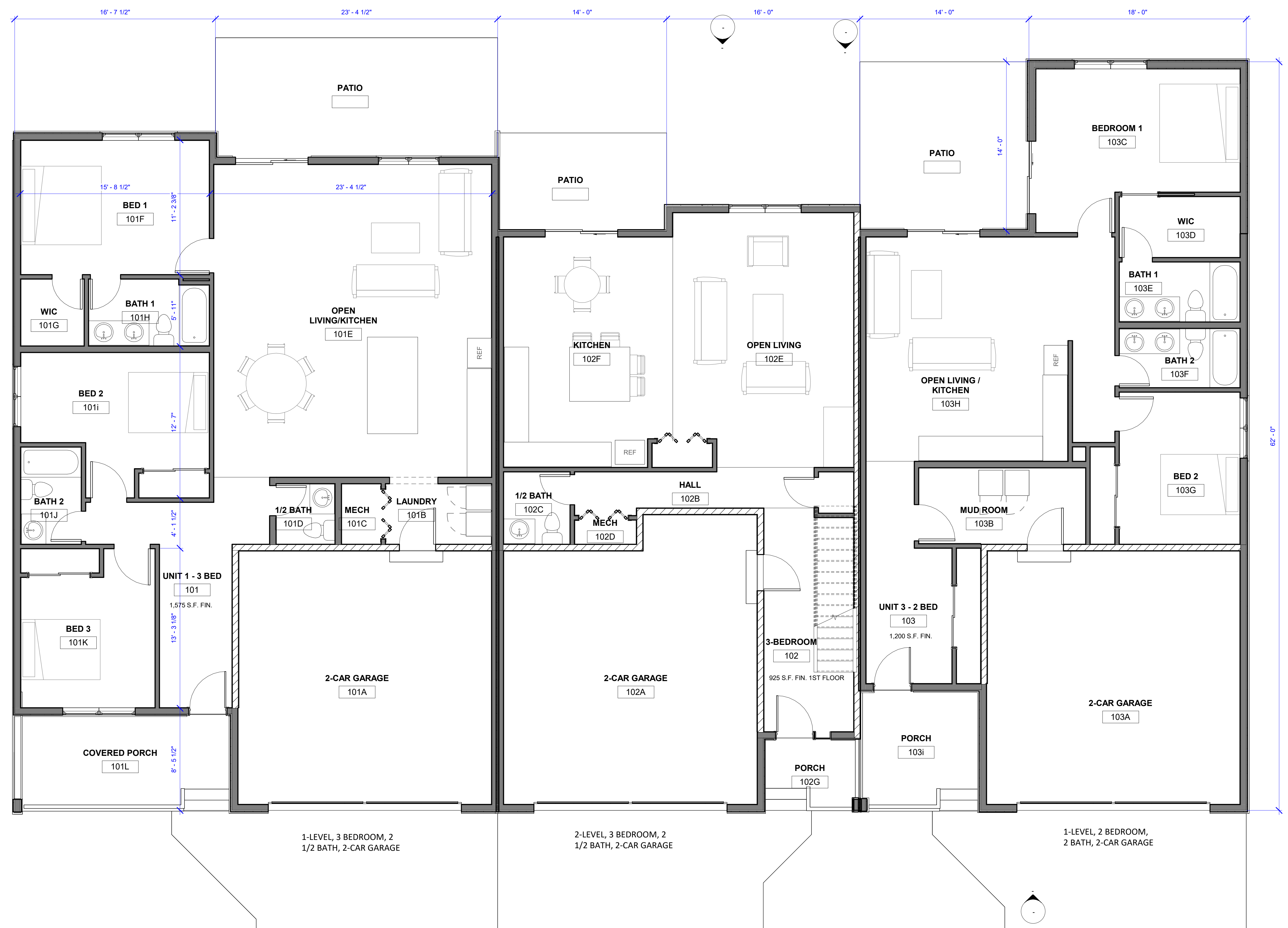
TAX SCHEDULE #: 7109012011

LAND USE CODE: PUD

**VICINITY MAP:**



PLANNING #



1 01 - MAIN LEVEL  
1/4" = 1'-0"

SEAL

DATE  
10-10-2022

ISSUE  
DEVELOPMENT PLAN

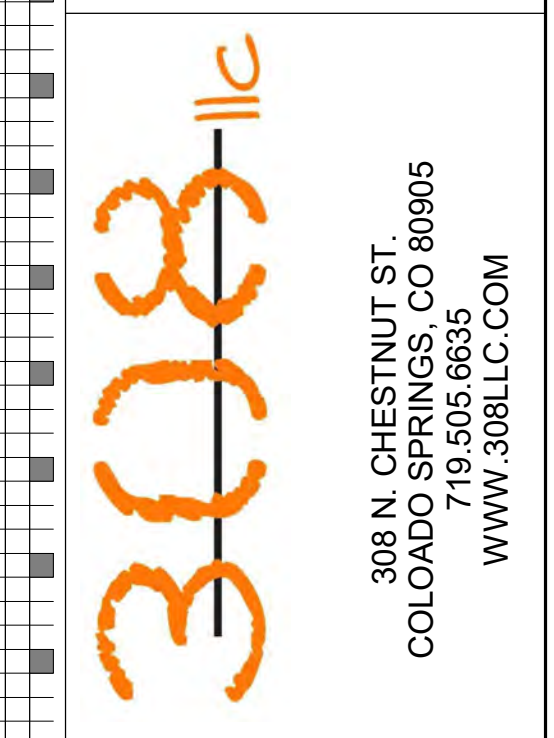
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PALMER LAKE, CO



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SHEET  
**DP 1**  
2 LEVEL FLOOR PLAN - MAIN FLOOR

PLANNING #



① 02 - 2ND FLOOR  
1/4" = 1'-0"

PLANNING #

SEAL

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10-10-2022

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SHEET

**DP 2**

2 LEVEL FLOOR PLAN -  
UPPER FLOOR



① EXTERIOR ELEVATION - SOUTH  
1/4" = 1'-0"

- STUCCO LIGHT BEIGE
- WOOD LOOK FIBER CEMENT
- MANUFACTURED STONE
- TRIM BOARD



② EXTERIOR ELEVATION - NORTH  
1/4" = 1'-0"

PLANNING #

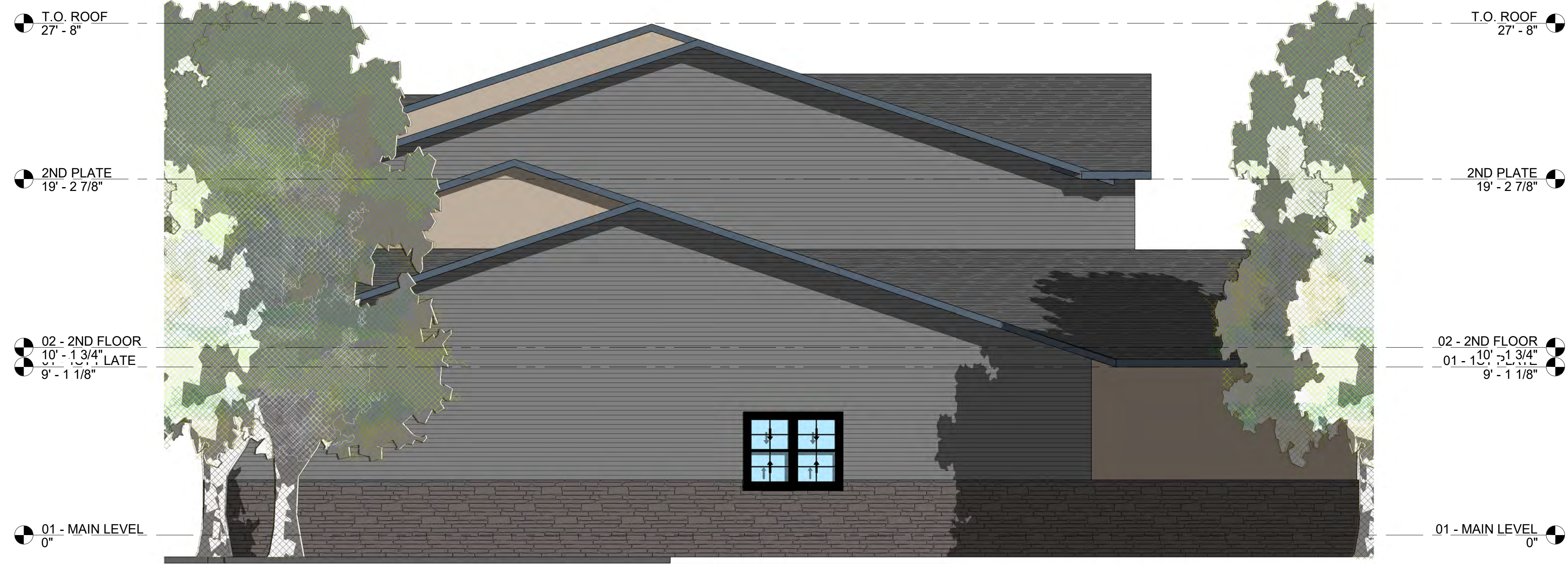
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DATE 10-10-2022		
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REVISIONS		
No.	Issuance	Date
OWNERSHIP OF INSTRUMENTS OF SERVICE		
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PROJECT NUMBER 21-136B		

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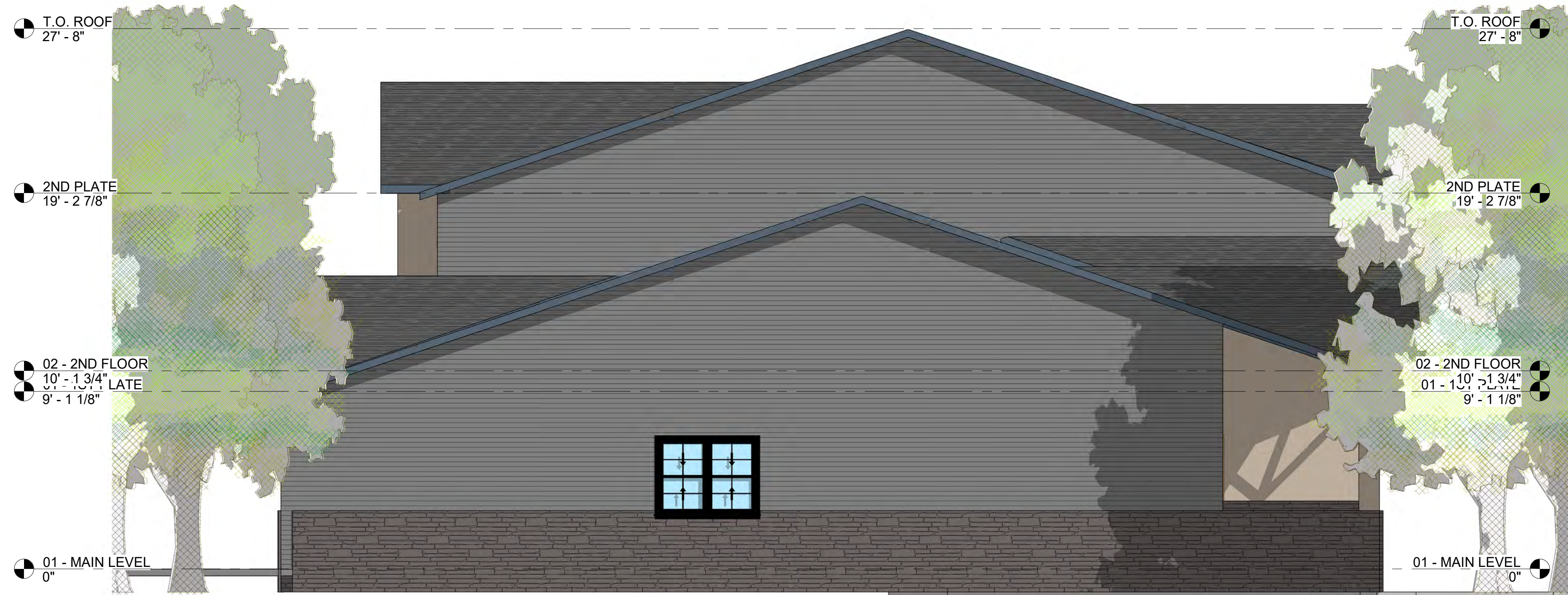
**3038** llc  
308 N. CHESTNUT ST.  
COLORADO SPRINGS, CO 80905  
719.505.6635  
WWW.308LLC.COM

SHEET  
**DP 3**  
EXTERIOR ELEVATIONS - NORTH/SOUTH

- STUCCO  
LIGHT BEIGE
- WOOD LOOK  
FIBER CEMENT
- MANUFACTURED  
STONE
- TRIM BOARD



① EXTERIOR ELEVATION - EAST  
1/4" = 1'-0"



② EXTERIOR ELEVATION - WEST  
1/4" = 1'-0"

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SHEET

**DP 4**

2 UNIT EXTERIOR  
ELEVATIONS - EAST/WEST



1 3D - FRONT



3 3D - OVERHEAD



2 3D - REAR

SEAL

DATE  
10-10-2022

ISSUE  
DEVELOPMENT PLAN

REVISIONS		
No.	Issuance	Date

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SHEET

**DP 5**

2 UNIT 3D SCHEMATIC VIEWS

PLANNING #



3 3D VIEW - 3 UNIT COLOR



1 3D View - 3 UNIT



2 3D View - 3 UNIT 2ND VIEW

PLANNING #

SEAL

DATE  
10-10-2022

ISSUE  
DEVELOPMENT PLAN

REVISIONS

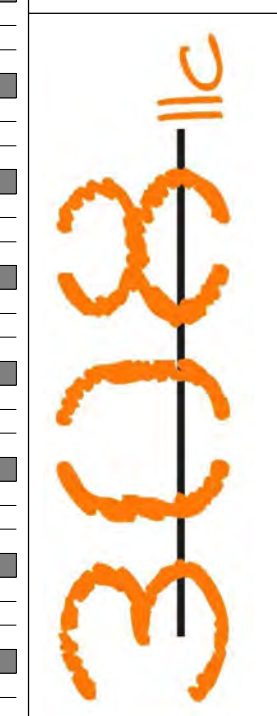
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PROJECT NUMBER 21-136B

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**VILLAS**  
 PALMER LAKE, CO



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SHEET

DP 6

3 UNIT 3D SCHEMATIC VIEWS

# FINAL DRAINAGE REPORT FOR RANCHO IRACEMA SUBDIVISION FILING NO. 2, LOT 2

(ELEPHANT ROCK TOWNHOMES DEVELOPMENT)

**PREPARED BY**

Rich Gallegos  
RESPEC  
102 S Tejon St., Suite 1110  
Colorado Springs, CO 80903

**PREPARED FOR**

Mr. Todd Dorman  
2760 N. Academy Blvd., Suite 302  
Colorado Springs, CO 809017  
719-213-9100

**JANUARY 2023**

Project Number W008.1





**TABLE OF CONTENTS**

PROJECT DESCRIPTION ..... 1

SOILS ..... 1

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HYDRAULIC ANALYSIS ..... 7

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WATER QUALITY ..... 7

CONSTRUCTION COST OPINION ..... 8

DRAINAGE BASIN FEES ..... 8

CONCLUSION ..... 8

REFERENCES ..... 9

**APPENDIX**

- APPENDIX A MAPS
- APPENDIX B CALCULATIONS
- APPENDIX C DESIGN CHARTS
- BACK POCKET



**ENGINEER’S STATEMENT:**

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by El Paso County and the Town of Palmer Lake for drainage reports, and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

\_\_\_\_\_  
Richard G. Gallegos, PE  
Registered Professional Engineer State of Colorado No. 36247

\_\_\_\_\_  
Date



**DEVELOPER’S STATEMENT:**

I, Todd Dorman, have read and will comply with all of the requirements specified in this drainage report and plan.

\_\_\_\_\_

Business Name:

By:

Title: Owner

Address: 2760 N. Academy Blvd., Suite 302  
Colorado Springs, CO 809017

**PALMER LAKE STATEMENT:**

Filed in accordance with the Palmer Lake Municipal Code as amended.

\_\_\_\_\_  
Director of Public Works

\_\_\_\_\_  
Date

Conditions:



## FINAL DRAINAGE REPORT RANCHO IRACEMA SUBDIVISION FILING 2, LOT 2

### PROJECT DESCRIPTION

This drainage report is for the development of the Rancho Iracema Subdivision Filing 2, Lot 2 as a townhome development. The currently vacant 13.00 acres site is located north of Colorado State Highway 105, approximately 300 feet west of Red Rocks Road. It is further described as the southern portion of Section 9, Township 11 South, Range 67 West of the 6<sup>th</sup> Principal Meridian in El Paso County, Colorado.

All of this subdivision is located in the Monument Creek drainage basin. Flows from the site drain directly into Monument Creek.

### SOILS

The soil on the site can be described as having a rapid permeability, medium-surface runoff, and moderate to high hazard of erosion. See the Soils Map within Appendix A for reference. The soils within the site are:

Map Unit Symbol	Map Unit Name	Hydrologic Soil Group	Percentage of Site
71	Pring Coarse Sandy Loam	B	75.0%
93	Tomah-Crowfoot Complex	B	25.0%

### FLOODPLAIN STATEMENT

No portion of the developed site is located within a designated FEMA 100-year floodplain according to the information published in the Federal Emergency Management Agency Flood Plain Map No. 08041C0257G, dated December 7, 2018.

### METHOD OF COMPUTATION

The methodology utilized for this report is in accordance with the *El Paso County Drainage Criteria Manual, Volumes 1*, dated May 2014. The Rational Method for computation of runoff was used for determining Sub-Basin flows.

$Q = cia$

Where

- Q = maximum rate of runoff in cubic feet per second
- c = runoff coefficient representing drainage area characteristics
- i = average rainfall intensity, in inches per hour, for the duration required for the runoff to become established
- a = drainage basin size in acres

The storm recurrence intervals used for this study were the 5-year storm and the 100-year storm. The detention discharge for the proposed 0.731-acre-foot Full Spectrum Extended Detention Basin is 1.3 cfs for the 5-year storm and 13.7 cfs for the 100-year storm. The Colorado Urban Hydrograph Procedure (CUHP) was used to route flows through the proposed private detention basin. This procedure is described in more detail in the *Mile High Flood District Urban Storm Drainage Criteria Manual Volume 1*, shown below in Appendix C – Colorado Urban Hydrograph Procedure Summary.



The Mile High Flood District – Detention Version 4.05 (January 2022) spreadsheet was used to determine the required detention basin storage volume and outlet structure design. ManningSolver Version 1.019, also, was used in this analysis to calculate the Manning’s normal depth within all proposed swales. MHFD Culvert Version 4.00 was used for hydraulic calculations for all culverts.

### **EXISTING DRAINAGE CONDITIONS**

The existing 13.00-acre site is currently undeveloped. No roadways exist into the site. Approximately 90% of the parcel is covered with rangeland grasses with slopes varying from 10% to 4%. The existing Rancho Iracema Subdivision Filing 2, Lot 1 development partially drains onto this site through four off-site basins, however an existing detention facility reduces the existing flow to historic levels. For this reason, it is assumed that the existing Rancho Iracema Subdivision Filing 2, Lot 1 is undeveloped. An existing 2’x2’ RCBC transports existing site flows across Colorado State Highway 105 and into Monument Creek which is located approximately 1000 feet south of the project.

The overall existing site is 0% impervious. All flows are tributary to the Monument Creek Drainage Basin.

Sub-Basin OS1 contains 5.64 acres and drains the western area of the existing Rancho Iracema Subdivision Filing 2, Lot 1. It produces flows of 1.4 cfs for the 5-year storm and 10.5 cfs for the 100-year storm. These ditch flows continue into Sub-Basin A1ex. Undeveloped flow rates are assumed because there is detention provided for this area.

Sub-Basin OS2 contains 5.63 acres and drains the central portion of Lot 1. It produces flows of 1.4 cfs for the 5-year storm and 10.7 cfs for the 100-year storm. These flows continue into Sub-Basin A2ex. Undeveloped flow rates are assumed because there is detention provided for this area.

Sub-Basin OS3 contains 2.06 acres and drains the northern portion of Lot 1. It produces flows of 0.6 cfs for the 5-year storm and 4.3 cfs for the 100-year storm. These flows continue into Sub-Basin A2ex.

Sub-Basin OS4 contains 0.36 acres and is located in the northeastern corner of the Lot 1 site. It will produce flows of 0.1 cfs for the 5-year storm and 0.9 cfs for the 100-year storm. These flows continue southeast into Sub-Basin Cex.

Sub-Basin A1ex contains 1.00 acres and drains the western area of the project. It produces flows of 0.3 cfs for the 5-year storm and 2.3 cfs for the 100-year storm. The combined ditch flows at Design Point 1 (DP1) are 1.4 cfs for the 5-year storm and 10.8 cfs for the 100-year storm. These flows continue east along Colorado State Highway 105 and into Sub-Basin A2ex.

Sub-Basin A2ex contains 9.18 acres and drains the central portion of the Lot 2 development. It produces flows of 2.1 cfs for the 5-year storm and 16.4 cfs for the 100-year storm. These flows combine with the flows from Sub-Basin OS2 and OS3 at Design Point 2 (DP2) to produce flows of 3.1 cfs for the 5-year storm and 24.0 cfs for the 100-year storm. These combined flows cross under SH 105 within an existing 2’x2’ RCBC.

Sub-Basin Bex contains 1.41 acres and drains southeastern area of the project. It produces flows of 0.3 cfs for the 5-year storm and 2.6 cfs for the 100-year storm. These flows travel to the existing



roadside ditch located along Colorado State Highway 105 and continue flowing eastward, away from the site.

Sub-Basin Cex contains 1.67 acres and drains the central area of the site. It produces flows of 0.5 cfs for the 5-year storm and 3.6 cfs for the 100-year storm. These flows will combine with the flows from Sub-Basin OS4 at Design Point 3 (DP3) to produce flows of 0.6 cfs for the 5-year storm and 4.4 cfs for the 100-year storm. These flows travel in a southeastern direction, away from the site.

Based on existing conditions of the site, the following storm flows will result:

Sub-basin	5-Year Flow (cfs)	100-Year Flow (cfs)	Area (Acre)
A1ex	0.3	2.3	1.00
A2ex	2.1	16.4	9.18
Bex	0.3	2.6	1.41
Cex	0.5	3.6	1.67
OS1	1.4	10.5	5.64
OS2	1.4	10.7	5.63
OS3	0.6	4.3	2.06
OS4	0.1	0.9	0.36
DP1(OS1+Aex)	1.4	10.8	6.64
DP2(OS2+OS3+A2ex)	3.1	24.0	16.87
DP3(OS4+Cex)	0.6	4.4	2.03

The Existing Conditions Drainage Plan is in the back folder of this report.

**DEVELOPED DRAINAGE CONDITIONS**

The proposed development will consist of fifty-seven (57) 1,500 sf townhome units on the 13.00 acre lot. It will contain a private asphalt road with roadside ditches. Overlot grading will be limited within the proposed project to protect as much vegetation as possible. A 0.731 acre-foot private full spectrum extended detention basin is proposed to meet current stormwater standards.

The overall proposed site is 34% impervious. All proposed flows are tributary to the Monument Creek Drainage Basin.

Flows from Sub-Basins OS1, with an area of 5.64 acres, will remain the same with flows of 1.4 cfs for the 5-year storm and 10.5 cfs for the 100-year storm. These ditch flows continue into Sub-Basin A. These flows combine with flows from Sub-basin A to produce total flows of 1.4 cfs for the 5-year storm and 10.6 cfs for the 100-year storm at Design Point 1 (DP1).

Sub-Basins OS2, with an area of 5.63 acres, will remain the same with flows of 1.4 cfs for the 5-year storm and 10.7 cfs for the 100-year storm. These ditch flows continue into an existing private detention basin. Flows are released from the existing private detention basin at historic rates.



Sub-Basin OS3 contains 2.06 acres and drains the northern portion of Lot 1. It produces flows of 0.6 cfs for the 5-year storm and 4.3 cfs for the 100-year storm. These flows sheetflow to the southeast.

Sub-Basin OS4 contains 0.36 acres and is located in the northeastern corner of the Lot 1 site. It will produce flows of 0.1 cfs for the 5-year storm and 0.9 cfs for the 100-year storm. These flows continue southeast into Sub-Basin Cex.

Sub-Basin A contains 0.90 acres and drains the western area of the property. It produces flows of 0.3 cfs for the 5-year storm and 2.1 cfs for the 100-year storm. These flows continue east along Colorado State Highway 105. This area is an undeveloped portion of the site that is to remain undeveloped. According to the El Paso County Engineering Criteria Manual (ECM) Section I.7.1.B.7., water quality is not required for Sub-basin A. For this reason, no water quality control measures are proposed for Sub-basin A.

Sub-Basin B contains 0.27 acres and drains due south. It produces flows of 0.6 cfs for the 5-year storm and 1.3 cfs for the 100-year storm. These flows continue along roadside ditches into Sub-basin D.

Sub-Basin C contains 0.97 acres and drains to the east. It produces flows of 1.1 cfs for the 5-year storm and 3.3 cfs for the 100-year storm. These flows will be intercepted by a proposed private 18" HDPE culvert and along a private roadside ditch which flows into Sub-Basin J.

Sub-Basin D, with an area of 0.20 acres and drains to the east. It produces flows of 0.8 cfs for the 5-year storm and 1.6 cfs for the 100-year storm. These flows continue along a private roadside ditch which flows into Sub-Basin J. These flows combine with flows from Sub-basin B, Sub-basin C, and Design Point 2 (DP2) to produce total flows of 5.0 cfs for the 5-year storm and 13.1 cfs for the 100-year storm at Design Point 3 (DP3).

Sub-Basin E contains 0.98 acres and drains to the southeast. It produces flows of 0.6 cfs for the 5-year storm and 2.9 cfs for the 100-year storm. These flows sheetflow to the southeast. This area is an undeveloped portion of the site that is to remain undeveloped. According to the El Paso County Engineering Criteria Manual (ECM) Section I.7.1.B.7., water quality is not required for Sub-basin E. For this reason, no water quality control measures are proposed for Sub-basin E.

Sub-Basin F contains 0.52 acres and is located in the northwestern area of Lot 1. It produces flows of 1.6 cfs for the 5-year storm and 0.3 cfs for the 100-year storm. These flows continue south and into Sub-Basin C. These flows combine with flows from Sub-basin K to produce total flows of 3.0 cfs for the 5-year storm and 7.9 cfs for the 100-year storm at Design Point 2 (DP2).

Sub-Basin G contains 0.18 acres and drains to the west. It produces flows of 0.8 cfs for the 5-year storm and 1.6 cfs for the 100-year storm. These flows continue along private roadside ditches towards Sub-basin J.

Sub-Basin H contains 0.57 acres and drains to the southwest. It produces flows of 1.2 cfs for the 5-year storm and 2.8 cfs for the 100-year storm. These flows sheetflow towards an 18" HDPE culvert that drains into Sub-basin J.

Sub-Basin I contains 0.35 acres and drains to the west. It produces flows of 1.6 cfs for the 5-year storm and 3.1 cfs for the 100-year storm. These flows are directed through proposed private 18" HDPE culverts that drain into Sub-basin J. These flows combine with flows from Design Point 3,



Sub-basin H, and Sub-basin G to produce total flows of 7.2 cfs for the 5-year storm and 18.0 cfs for the 100-year storm at Design Point (DP6). These flows continue into the proposed private extended detention basin.

Sub-Basin J, with an area of 1.15 acres and contains the proposed private extended detention basin. It produces flows of 0.7 cfs for the 5-year storm and 3.8 cfs for the 100-year storm. These flows continue into a proposed 2' wide concrete trickle channel that ties into a proposed private Type OS2 outlet structure. These flows combine with flows from Design Point 5 and Design Point 6 to produce total flows of 13.9 cfs for the 5-year storm and 33.5 cfs for the 100-year storm at Design Point 7 (DP7). These flows outlet through a proposed private 24" HDPE storm sewer pipe and into the public roadside ditch along Colorado State Highway 105. Post detention flows are 1.3 cfs for the 5-year storm and 13.7 cfs for the 100-year storm.

Sub-Basin K contains 1.54 acres and drains to the southwest. It produces flows of 2.3 cfs for the 5-year storm and 6.3 cfs for the 100-year storm. These flows continue in proposed private 24" HDPE culverts and towards Sub-basin F.

Sub-Basin L contains 0.50 acres and drains to the south. It produces flows of 2.3 cfs for the 5-year storm and 4.4 cfs for the 100-year storm. These flows continue into Sub-basin M.

Sub-Basin M contains 0.61 acres and drains to the south. It produces flows of 1.0 cfs for the 5-year storm and 2.7 cfs for the 100-year storm. These flows continue into Sub-basin O.

Sub-Basin N contains 0.95 acres and drains to the southwest. It produces flows of 0.3 cfs for the 5-year storm and 2.1 cfs for the 100-year storm. These flows combine with flows from Sub-basin P to produce total flows of 0.5 cfs for the 5-year storm and 4.1 cfs for the 100-year storm at Design Point 7 (DP7). According to the El Paso County Engineering Criteria Manual (ECM) Section I.7.1.B.7., water quality is not required for Sub-basin N. For this reason, no water quality control measures are proposed for Sub-basin N.

Sub-Basin O contains 0.53 acres and drains to the west. It produces flows of 2.5 cfs for the 5-year storm and 4.9 cfs for the 100-year storm. These flows continue into Sub-basin J. These flows combine with flows from Design Point 4, Sub-basin L, and Sub-basin M to produce total flows of 10.7 cfs for the 5-year storm and 22.9 cfs for the 100-year storm for the 100-year storm at Design Point 5 (DP5).

Sub-Basin P contains 0.82 acres and drains to the south. It produces flows of 0.3 cfs for the 5-year storm and 2.0 cfs for the 100-year storm. These flows sheetflow to the south. According to the El Paso County Engineering Criteria Manual (ECM) Section I.7.1.B.7., water quality is not required for Sub-basin P. For this reason, no water quality control measures are proposed for Sub-basin P.

Sub-Basin Q contains 0.63 acres and drains to the southwest. It produces flows of 2.5 cfs for the 5-year storm and 5.1 cfs for the 100-year storm. These flows continue under proposed private 18" HDPE culverts and into Sub-basin O. These flows combine with flows from Sub-basin R, Sub-basin S, and Sub-basin T to produce total flows 5.7 cfs for the 5-year storm and 12.6 cfs for the 100-year storm at Design Point 4 (DP4).

Sub-Basin R contains 0.16 acres and drains to the southeast. It produces flows of 0.6 cfs for the 5-year storm and 1.2 cfs for the 100-year storm. These flows sheetflow into a proposed private 24" HDPE culvert that drains into Sub-basin O.



Sub-Basin S contains 0.30 acres and drains to the southeast. It produces flows of 1.2 cfs for the 5-year storm and 2.5 cfs for the 100-year storm. These flows continue into a proposed private 18” HDPE culvert that continues to drain along a private roadside ditch.

Sub-Basin T contains 0.77 acres and drains to the south. It produces flows of 1.4 cfs for the 5-year storm and 3.7 cfs for the 100-year storm. These flows continue into a proposed private 18” HDPE culvert that drains into Sub-basin S.

Based on developed conditions of the site, the following storm flows will result:

Sub-basin	5-Yr Flow (cfs)	100-Yr Flow (cfs)	AREA (ACRE)
OS1	1.4	10.5	5.64
OS2	1.4	10.7	5.63
OS3	0.6	4.7	2.24
OS4	0.1	1.0	0.42
A	0.5	2.5	0.90
B	0.6	1.3	0.27
C	1.1	3.3	0.97
D	0.8	1.6	0.20
E	0.6	2.9	0.98
F	1.6	3.6	0.52
G	0.8	1.6	0.18
H	1.2	2.8	0.57
I	1.6	3.1	0.35
J	0.7	3.8	1.15
K	2.3	6.3	1.54
L	2.3	4.4	0.50
M	1.0	2.7	0.61
N	0.3	2.1	0.95
O	2.5	4.9	0.53
P	0.3	2.0	0.90
Q	2.5	5.1	0.63
R	0.6	1.2	0.16
S	1.2	2.5	0.30
T	1.4	3.7	0.77
DP1 (A+OS1)	1.4	10.6	6.54
DP2 (K+F)	3.0	7.9	2.06
DP3 (DP2+B+C+D)	5.0	13.1	3.50
DP4 (Q+R+S+T)	5.7	12.6	1.86
DP5 (DP4+L+M+O)	10.7	22.9	3.50
DP6 (DP3+H+I+G)	7.2	18.0	4.60
DP7 (DP5+DP6+J)	13.9	33.5	9.25
DP7 DET	1.3	13.7	9.25
DP8 (P+N)	0.5	4.1	1.85

Hydraulic calculations for the proposed improvements including pipe capacities and HGL, inlet capacities and swale capacities are included within the Drainage Calculation Sheet located in Appendix B.



## HYDRAULIC ANALYSIS

Proposed culvert capacities were calculated using a Manning's normal depth calculation in MHFD's Culvert Version 4.00. A percent slope of 0.5% was assumed for all culverts. An 80% full flow capacity was used in these calculations. It was determined that an 18-inch HDPE culvert has a capacity of 6.5 cfs at a 0.5% slope. It was also determined that a 24-inch HDPE culvert has a capacity of 13.9 cfs at a 0.5% slope. These capacities were used to determine the size of each proposed culvert shown on the Proposed Drainage Plan found in the Back Pocket. See Appendix B for all hydraulic calculations.

All proposed swales shown on the Proposed Drainage Plan are 2' deep triangular swales with 3:1 side slopes. A maximum 100-year flow of 22.9 cfs at Design Point 5 (DP5) was used to determine the capacity of the proposed swales. This flow produces 0.62 feet of freeboard and a velocity of 4.39 feet per second. Therefore, the proposed swales are adequate for all developed flows to be conveyed by the swales. See Appendix B for all reference calculations.

## FOUR STEP PROCESS

The proposed development and subsequent lot developments follow the "Four Step Process" as mandated by the Drainage Criteria Manual as follows:

### Step 1: Employ Runoff Reduction Practices

Runoff has been reduced by disconnecting impervious areas where possible, eliminating "unnecessary" impervious areas and encouraging infiltration into suitable soils.

### Step 2: Implement Control Measures (CMs) That Provide a Water Quality Capture Volume with Slow Release

- All new developed flows have been routed to the water quality basin with impervious area less than one acre.
- Drain time for the water quality basin is as follows: Full Spectrum Detention EDB is 40 hours.

### Step 3: Stabilize Drainageways

There are no drainageways adjacent to the project.

- Site flows from the project have been directed to roadside ditches along the roadways and transported to private drainage facilities which direct them into the water quality/detention facility.
- All new and re-developed projects are required to construct or participate in the funding of channel stabilization measures. Drainage basin fees paid at the time of platting go towards channel stabilization within the drainage basin.

### Step 4: Implement Site Specific and Other Source Control Measures (CM)

Erosion control measures will be in place during initial construction to provide source control of sediment with landscaping placed within the proposed development and permanent seeding of all disturbed areas provided per Permanent Control Measure (CM) requirements. No other potential pollutants are anticipated with this site post construction.

The development of this site will have no adverse impact on downstream properties.

## WATER QUALITY

Water quality for the site will be achieved through a private full spectrum detention extended detention basin (FSD/EBD) and tied into a proposed private "Type OS-2" Outlet Structure with a private 24" HDPE pipe outlet provided for the private FSD/EBD. The private FSD/EBD drains an area of 9.25 acres that is 46.96% impervious and will have a volume of 0.731 acre-ft. Portions of



the property are not detained because they are to remain undeveloped. According to the El Paso County Engineering Criteria Manual (ECM) Section I.7.1.B.7., water quality is not required for these regions. Total detained total area and detained percent impervious area calculations are shown in Appendix B of this report. The Water Quality capture volume will be 0.155 acre-ft. A private Emergency Spillway will be provided with a private 6" riprap lined weir which outfalls into the existing roadside ditch along Colorado State Highway 105. Calculations for the private FSD/EDB are included in Appendix B of this report.

**CONSTRUCTION COST OPINION**

The private, non-reimbursable drainage facility costs are as follows:

<b>Description</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Amount</b>
18" HDPE	800 LF	\$40	\$ 32,000
24" HDPE	685 LF	\$45	\$ 30,825
		Sub-Total	\$ 62,825
		Engineering & Contingencies 10%	\$ 6,283
		<b>TOTAL</b>	<b>\$ 69,108</b>

The private, non-reimbursable Control Measures (CM) Financial Assurances costs are as follows:

<b>Description</b>	<b>Quantity</b>	<b>Unit Cost</b>	<b>Amount</b>
24" HDPE	65 LF	\$45	\$ 2,925
Outlet Structure	1 EA	\$3,000	\$ 3,000
Riprap	2 CY	\$65	\$ 130
Concrete Forebay	1 LS	\$500	\$ 500
2' Conc. Pan	250 LF	\$25	\$ 6,250
FSD-EBD Grading	3315 CY	\$10	\$ 33,150
		Sub-Total	\$ 45,955
		Engineering & Contingencies 10%	\$ 4,596
		<b>TOTAL</b>	<b>\$50,551</b>

**DRAINAGE BASIN FEES**

Drainage fees for the previously platted lot within the Monument Creek Drainage Basin were paid at the time of platting; therefore, no fees are required at this time.

**CONCLUSION**

Site runoff, storm drains, and appurtenances associated with the development of the Rancho Iracema Subdivision Filing 2, Lot 2 will not adversely affect the downstream and surrounding developments. The overall drainage pattern and quantity will not be significantly changed from the existing conditions. The addition of a private full spectrum extended detention basin will reduce proposed flows to historic conditions.

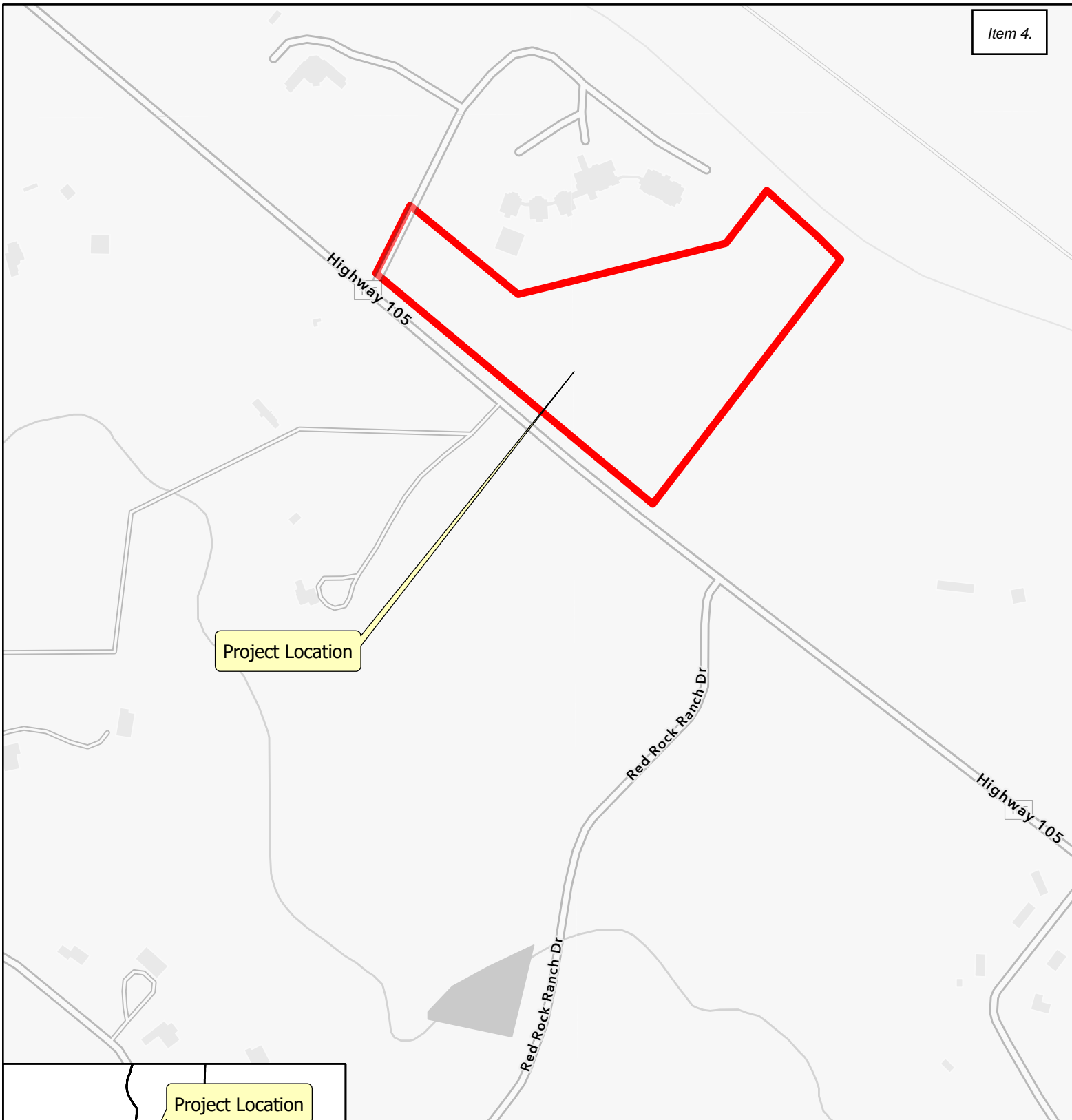


## REFERENCES

1. ***Palmer Lake Municipal Code (2022)*** by the Palmer Lake Board of Trustees.
2. Soil Survey of El Paso County Area, Colorado by USDA, NRCS.
3. ***El Paso County (December 2016) Engineering Criteria Manual.***
4. Urban Drainage and Flood Control District (June 2017). ***Urban Storm Drainage Criteria Manual, Volume 1-3.***



**APPENDIX A**  
**MAPS**

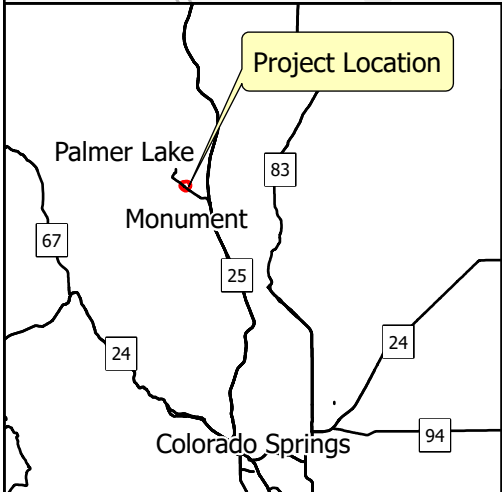


Project Location

Highway 105

Red Rock Ranch Dr

Highway 105

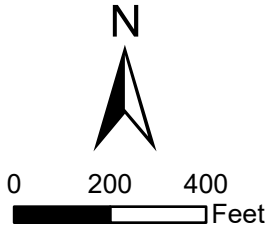


Project Location

Palmer Lake

Monument

Colorado Springs



Prepared by:



121 S. TEJON ST., SUITE 1110  
 COLORADO SPRINGS, CO 80903  
 WWW.RESPEC.COM (719) 266-5212

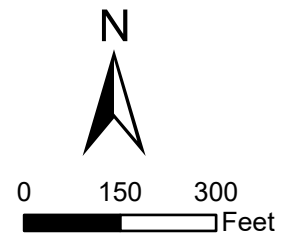
PALMER LAKE TOWNHOMES

**VICINITY MAP**

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Map Unit Symbol	Map Unit Name	Rating	Percentage of Site
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	B	0%
71	Pring corase sandy loam, 3 to 8 percent slopes	B	75%
93	Tomah-Crowfoot complex, 8 to 15 percent slopes	B	25%



Prepared by:



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 COLORADO SPRINGS, CO 80903  
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PALMER LAKE TOWNHOMES

**SOILS MAP**

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**

FLOOD INSURANCE RATE MAP  
EL PASO COUNTY,  
COLORADO  
AND INCORPORATED AREAS

PANEL 257 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY	080059	0257	G
MONUMENT, TOWN OF	080064	0257	G
PALMER LAKE, TOWN OF	080065	0257	G

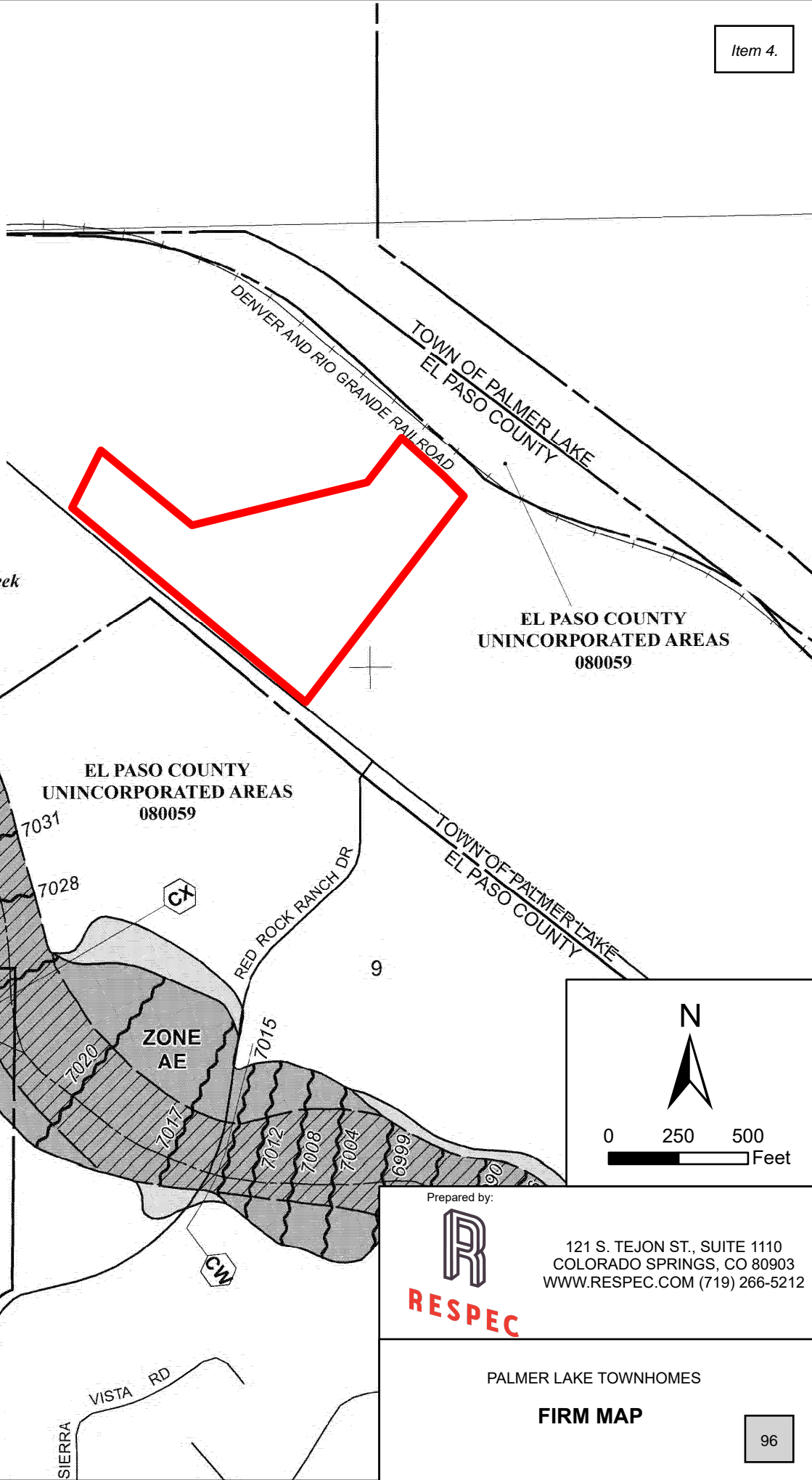
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER  
08041C0257G

MAP REVISED  
DECEMBER 7, 2018

Federal Emergency Management Agency



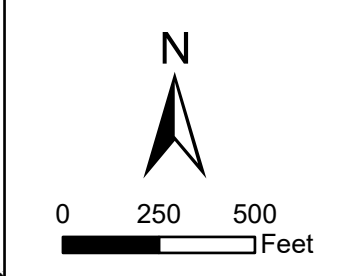
EL PASO COUNTY  
UNINCORPORATED AREAS  
080059

EL PASO COUNTY  
UNINCORPORATED AREAS  
080059

ZONE AE

Monument Creek

ZONE  
AE



Prepared by:



**RESPEC**

121 S. TEJON ST., SUITE 1110  
COLORADO SPRINGS, CO 80903  
WWW.RESPEC.COM (719) 266-5212

PALMER LAKE TOWNHOMES

**FIRM MAP**

TOWN OF PALMER LAKE  
080065

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# APPENDIX B

## CALCULATIONS

**EXISTING CONDITIONS  
RUNOFF COEFFICIENT  
TYPE A/B SOILS**

LAND USE	Imperv %	5 YR	100 YR
UNDEV	0	0.08	0.35
GRAVEL ROAD	80	0.59	0.7
ASPHALT ROAD	100	0.9	0.96
ROOFS	90	0.73	0.81

AREA DESIG.	TOTAL AREA (acre)	SURFACE CONDITION AREAS				CALCULATED C		
		UNDEV	GRAVEL ROAD	ASPHALT ROAD	ROOFS	5 YR	100 % IMPERVIOUS	100 % IMPERVIOUS
OS1	5.64	5.64	0.00	0.00	0.00	0.08	0.35	0.00
OS2	5.63	5.63	0.00	0.00	0.00	0.08	0.35	0.00
OS3	2.06	2.06	0.00	0.00	0.00	0.08	0.35	0.00
OS4	0.36	0.36	0.00	0.00	0.00	0.08	0.35	0.00
A1ex	1.00	1.00	0.00	0.00	0.00	0.08	0.35	0.00
A2ex	9.18	9.18	0.00	0.00	0.00	0.08	0.35	0.00
Bex	1.41	1.41	0.00	0.00	0.00	0.08	0.35	0.00
Cex	1.67	1.67	0.00	0.00	0.00	0.08	0.35	0.00
Total Site Percent Impervious								0.00

**DEVELOPED CONDITIONS  
RUNOFF COEFFICIENT  
TYPE A/B SOILS**

LAND USE	Imperv %	5 YR	100 YR
UNDEV	0	0.08	0.35
GRAVEL ROAD	80	0.59	0.7
ASPHALT ROAD	100	0.9	0.96
ROOFS	90	0.73	0.81

AREA DESIG.	TOTAL AREA (acre)	SURFACE CONDITION AREAS				CALCULATED C		
		UNDEV	GRAVEL ROAD	ASPH/ COM ROAD	ROOFS	5 YR	100 % IMPERVIOUS	100 % IMPERVIOUS
OS1	5.64	5.64	0.00	0.00	0.00	0.08	0.35	0.00
OS2	5.63	5.63	0.00	0.00	0.00	0.08	0.35	0.00
OS3	2.23	2.23	0.00	0.00	0.00	0.59	0.70	0.00
OS4	0.42	0.42	0.00	0.00	0.00	0.90	0.96	0.00
A	0.90	0.90	0.00	0.00	0.00	0.08	0.35	0.00
B	0.27	0.13	0.00	0.07	0.07	0.46	0.63	49.26
C	0.97	0.72	0.00	0.18	0.07	0.28	0.50	25.05
D	0.20	0.07	0.00	0.13	0.00	0.61	0.75	65.00
E	0.98	0.91	0.00	0.07	0.00	0.14	0.38	7.14
F	0.52	0.20	0.00	0.15	0.18	0.54	0.68	59.13
G	0.18	0.04	0.00	0.11	0.04	0.71	0.81	78.61
H	0.57	0.29	0.00	0.14	0.14	0.44	0.61	46.67
I	0.35	0.05	0.00	0.16	0.14	0.71	0.81	81.71
J	1.15	1.09	0.00	0.06	0.00	0.12	0.38	5.22
K	1.54	1.01	0.00	0.22	0.32	0.33	0.53	32.69
L	0.50	0.05	0.00	0.21	0.25	0.74	0.83	85.30
M	0.61	0.36	0.00	0.15	0.11	0.39	0.58	40.08
N	0.95	0.95	0.00	0.00	0.00	0.08	0.35	0.00
O	0.53	0.03	0.00	0.22	0.28	0.76	0.85	89.06
P	0.90	0.90	0.00	0.00	0.00	0.08	0.35	0.00
Q	0.63	0.11	0.00	0.24	0.28	0.68	0.79	78.10
R	0.16	0.05	0.00	0.11	0.00	0.62	0.75	66.25
S	0.30	0.04	0.00	0.12	0.14	0.71	0.81	82.00
T	0.77	0.47	0.00	0.16	0.14	0.37	0.56	37.14
Total Site Percent Impervious								34.00
Detained Total Area (B+C+D+F+G+H+I+J+K+L+M+O+Q+R+S+T)					9.25	Percent Impervious of Detained Area		46.96

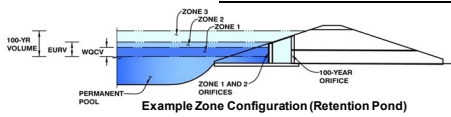


# DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.05 (January 2022)

Item 4.

Project: **Elephant Rock Villas**  
Basin ID: **A**



**Watershed Information**

Selected BMP Type =	<b>EDB</b>
Watershed Area =	9.25 acres
Watershed Length =	950 ft
Watershed Length to Centroid =	450 ft
Watershed Slope =	0.060 ft/ft
Watershed Imperviousness =	46.96% percent
Percentage Hydrologic Soil Group A =	0.0% percent
Percentage Hydrologic Soil Group B =	100.0% percent
Percentage Hydrologic Soil Groups C/D =	0.0% percent
Target WQCV Drain Time =	40.0 hours
Location for 1-hr Rainfall Depths =	Denver - Capitol Building

After providing required inputs above including 1-hour rainfall depths, click "Run CUHP" to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

Water Quality Capture Volume (WQCV) =	0.153 acre-feet
Excess Urban Runoff Volume (EURV) =	0.462 acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.424 acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.613 acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.780 acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	1.010 acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	1.193 acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	1.429 acre-feet
500-yr Runoff Volume (P1 = 3.01 in.) =	1.802 acre-feet
Approximate 2-yr Detention Volume =	0.346 acre-feet
Approximate 5-yr Detention Volume =	0.477 acre-feet
Approximate 10-yr Detention Volume =	0.639 acre-feet
Approximate 25-yr Detention Volume =	0.703 acre-feet
Approximate 50-yr Detention Volume =	0.735 acre-feet
Approximate 100-yr Detention Volume =	0.827 acre-feet

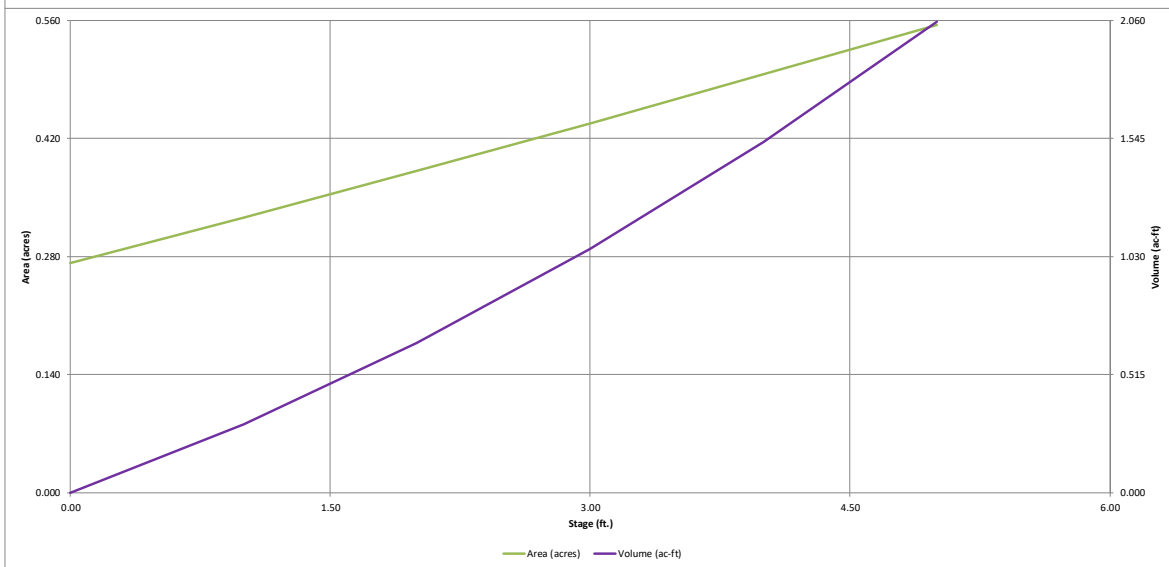
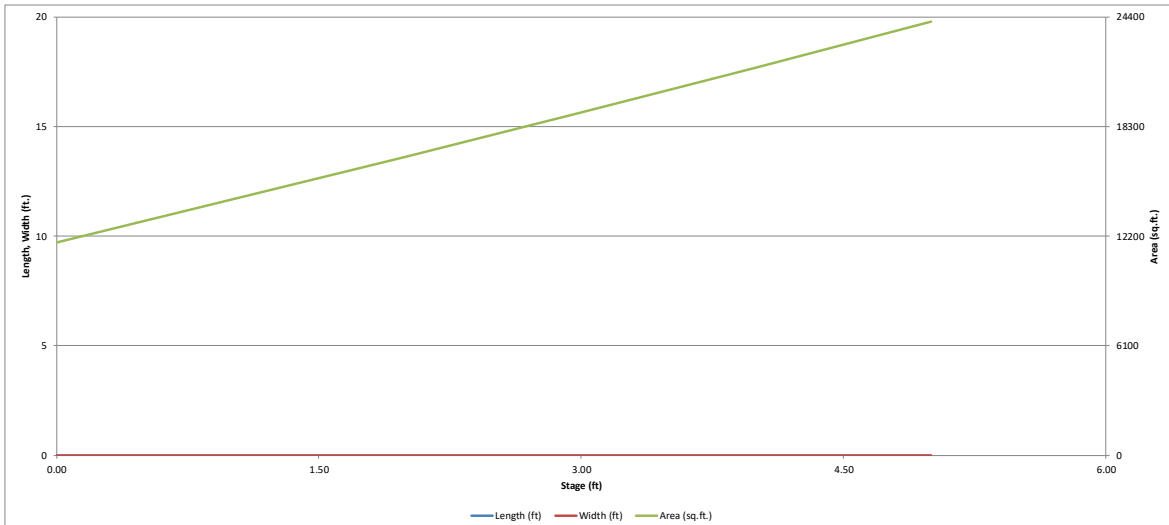
**Optional User Overrides**

	acre-feet
	acre-feet
1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
3.01	inches

**Define Zones and Basin Geometry**

Zone 1 Volume (WQCV) =	0.153 acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.309 acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.365 acre-feet
Total Detention Basin Volume =	0.827 acre-feet
Initial Surcharge Volume (ISV) =	user ft <sup>3</sup>
Initial Surcharge Depth (ISD) =	user ft
Total Available Detention Depth (H <sub>total</sub> ) =	user ft
Depth of Trickle Channel (H <sub>TC</sub> ) =	user ft
Slope of Trickle Channel (S <sub>TC</sub> ) =	user ft/ft
Slopes of Main Basin Sides (S <sub>main</sub> ) =	user H:V
Basin Length-to-Width Ratio (R <sub>L/W</sub> ) =	user
Initial Surcharge Area (A <sub>ISV</sub> ) =	user ft <sup>2</sup>
Surcharge Volume Length (L <sub>LSV</sub> ) =	user ft
Surcharge Volume Width (W <sub>LSV</sub> ) =	user ft
Depth of Basin Floor (H <sub>FLOOR</sub> ) =	user ft
Length of Basin Floor (L <sub>FLOOR</sub> ) =	user ft
Width of Basin Floor (W <sub>FLOOR</sub> ) =	user ft
Area of Basin Floor (A <sub>FLOOR</sub> ) =	user ft <sup>2</sup>
Volume of Basin Floor (V <sub>FLOOR</sub> ) =	user ft <sup>3</sup>
Depth of Main Basin (H <sub>MAN</sub> ) =	user ft
Length of Main Basin (L <sub>MAN</sub> ) =	user ft
Width of Main Basin (W <sub>MAN</sub> ) =	user ft
Area of Main Basin (A <sub>MAN</sub> ) =	user ft <sup>2</sup>
Volume of Main Basin (V <sub>MAN</sub> ) =	user ft <sup>3</sup>
Calculated Total Basin Volume (V <sub>total</sub> ) =	user acre-feet

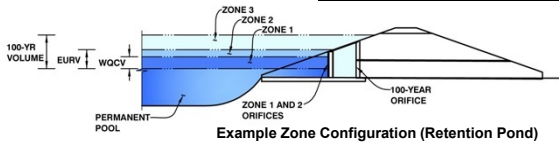
Depth Increment = 0.10 ft		Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft <sup>2</sup> )	Optional Override Area (ft <sup>2</sup> )	Area (acre)	Volume (ft <sup>3</sup> )	Volume (ac-ft)
Top of Micropool		--	0.00	--	--	--	11,869	0.272		
7083		--	1.00	--	--	--	14,221	0.326	13,045	0.299
7084		--	2.00	--	--	--	16,620	0.382	28,465	0.653
7085		--	3.00	--	--	--	19,077	0.438	46,314	1.063
7086		--	4.00	--	--	--	21,593	0.496	66,649	1.530
7087		--	5.00	--	--	--	24,167	0.555	89,529	2.055



## DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)

**Project:** Elephant Rock Villas  
**Basin ID:** A



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	0.54	0.153	Orifice Plate
Zone 2 (EURV)	1.48	0.309	Orifice Plate
Zone 3 (100-year)	2.45	0.365	Weir&Pipe (Rect.)
<b>Total (all zones)</b>		<b>0.827</b>	

**User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)**

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft <sup>2</sup>
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

**User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)**

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	2.222E-02	ft <sup>2</sup>
Depth at top of Zone using Orifice Plate =	1.50	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	6.00	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	3.20	sq. inches (diameter = 2 inches)	Elliptical Slot Area =	N/A	ft <sup>2</sup>

**User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)**

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.50	1.00					
Orifice Area (sq. inches)	3.20	3.20	3.20					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

**User Input: Vertical Orifice (Circular or Rectangular)**

Invert of Vertical Orifice =	Not Selected	Not Selected	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	Not Selected	Not Selected	ft <sup>2</sup>
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	N/A	N/A	feet
Vertical Orifice Diameter =	N/A	N/A	inches				

**User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)**

Overflow Weir Front Edge Height, Ho =	Zone 3 Weir	Not Selected	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H <sub>g</sub> =	Zone 3 Weir	Not Selected	feet
Overflow Weir Front Edge Length =	1.50	N/A	feet	Overflow Weir Slope Length =	1.50	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	4.00	N/A	feet
Horiz. Length of Weir Sides =	0.00	N/A	feet	Overflow Grate Open Area w/o Debris =	5.07	N/A	ft <sup>2</sup>
Overflow Grate Type =	4.00	N/A	feet	Overflow Grate Open Area w/ Debris =	11.14	N/A	ft <sup>2</sup>
Debris Clogging % =	Type C Grate	N/A	%		5.57	N/A	ft <sup>2</sup>
	50%	N/A	%				

**User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)**

Depth to Invert of Outlet Pipe =	Zone 3 Rectangular	Not Selected	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	Zone 3 Rectangular	Not Selected	ft <sup>2</sup>
Rectangular Orifice Width =	0.25	N/A	inches	Outlet Orifice Centroid =	0.78	N/A	feet
Rectangular Orifice Height =	16.90	N/A	inches	Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians
	18.70						

**User Input: Emergency Spillway (Rectangular or Trapezoidal)**

Spillway Invert Stage =	2.40	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth =	0.75	feet
Spillway Crest Length =	11.00	feet	Stage at Top of Freeboard =	4.15	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	0.50	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	1.61	acre-ft

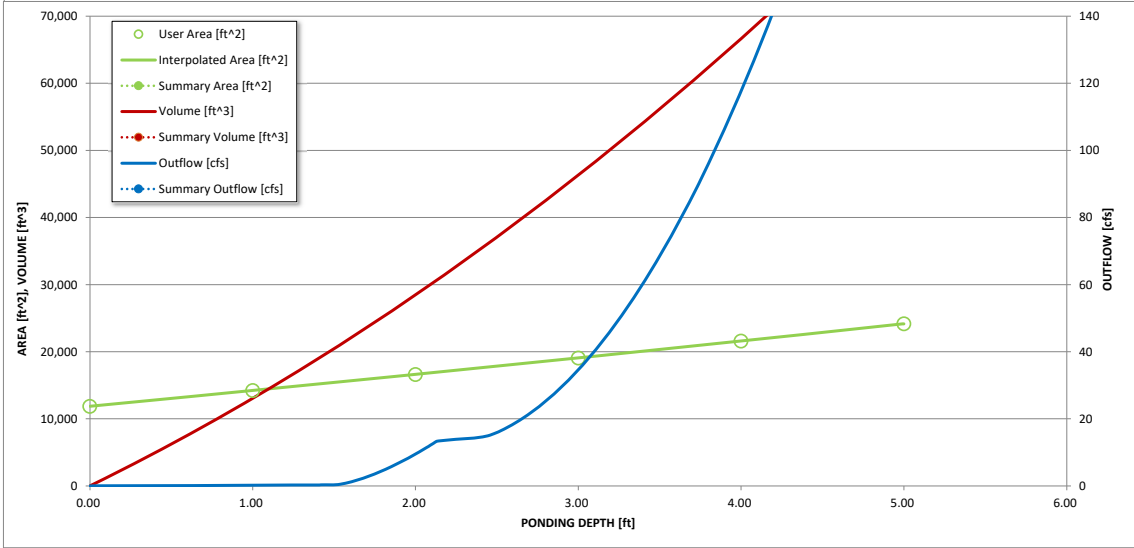
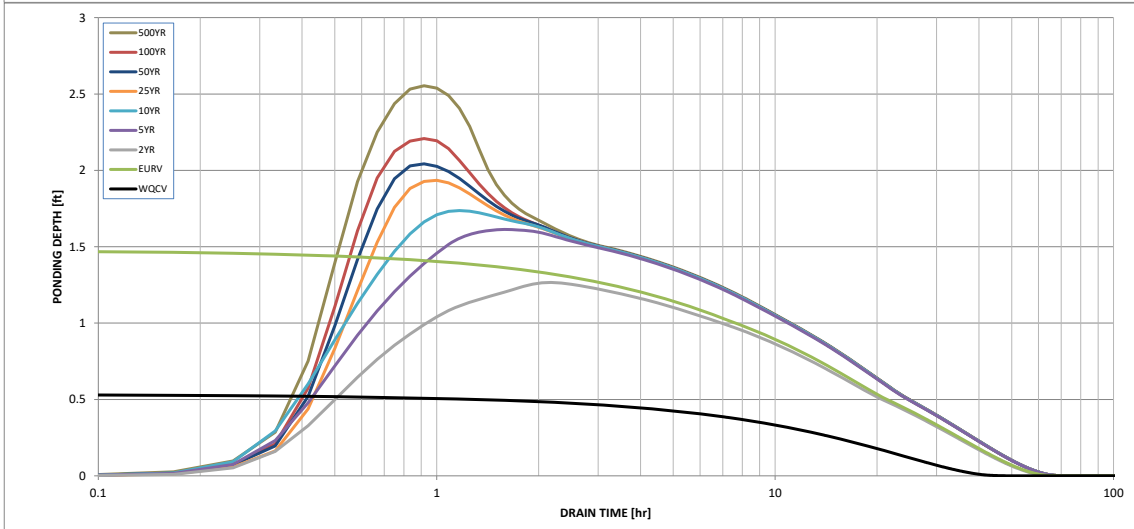
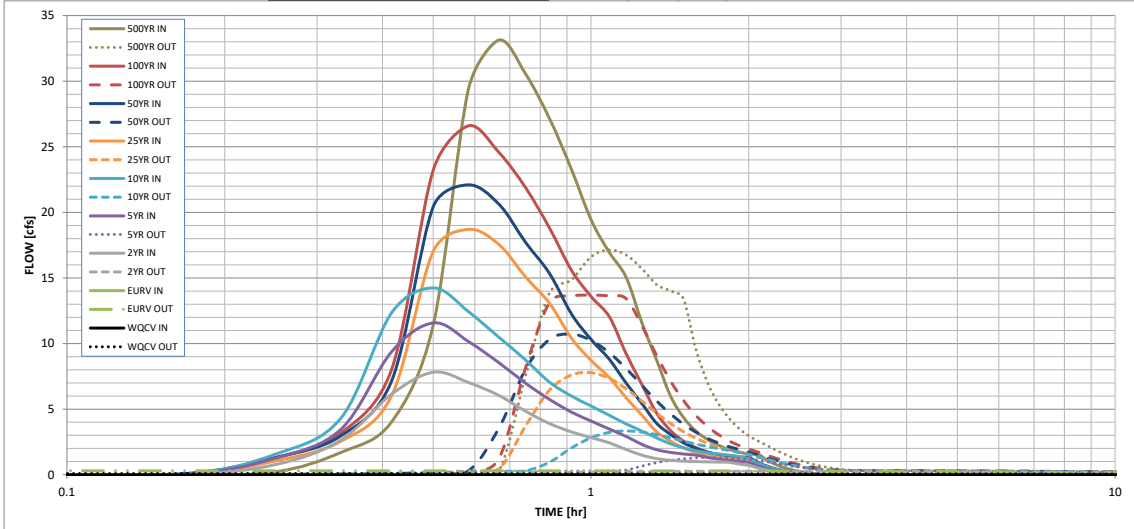
**Routed Hydrograph Results**

*The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).*

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =									
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.01
CUHP Runoff Volume (acre-ft) =	0.153	0.462	0.424	0.613	0.780	1.010	1.193	1.429	1.802
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.424	0.613	0.780	1.010	1.193	1.429	1.802
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	1.3	3.5	5.2	9.2	11.5	14.4	18.8
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.14	0.38	0.56	0.99	1.24	1.55	2.03
Peak Inflow Q (cfs) =	N/A	N/A	7.8	11.6	14.2	18.7	22.1	26.6	33.1
Peak Outflow Q (cfs) =	0.1	0.3	0.3	1.3	3.3	7.8	10.7	13.7	17.1
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.4	0.6	0.8	0.9	1.0	0.9
Structure Controlling Flow =	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	0.1	0.3	0.7	0.9	1.2	1.3
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	38	53	52	54	52	49	48	45	42
Time to Drain 99% of Inflow Volume (hours) =	42	58	58	61	59	58	57	56	54
Maximum Ponding Depth (ft) =	0.54	1.48	1.27	1.61	1.74	1.94	2.04	2.21	2.55
Area at Maximum Ponding Depth (acres) =	0.30	0.35	0.34	0.36	0.37	0.38	0.38	0.39	0.41
Maximum Volume Stored (acre-ft) =	0.155	0.463	0.386	0.509	0.552	0.627	0.669	0.731	0.872

## DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)



S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

## DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename: \_\_\_\_\_

**Inflow Hydrographs**

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

Time Interval	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.01	0.23
	0:15:00	0.00	0.00	0.78	1.27	1.58	1.06	1.31	1.29	1.71
	0:20:00	0.00	0.00	2.66	3.47	4.32	2.56	2.97	3.20	4.05
	0:25:00	0.00	0.00	6.16	9.39	12.37	6.05	7.19	8.06	11.45
	0:30:00	0.00	0.00	7.81	11.58	14.24	17.06	20.45	23.25	29.38
	0:35:00	0.00	0.00	7.03	10.16	12.43	18.71	22.10	26.59	33.14
	0:40:00	0.00	0.00	6.05	8.54	10.49	17.56	20.63	24.58	30.55
	0:45:00	0.00	0.00	4.84	6.98	8.75	15.07	17.71	21.88	27.15
	0:50:00	0.00	0.00	3.90	5.74	7.06	13.07	15.34	18.81	23.32
	0:55:00	0.00	0.00	3.27	4.78	6.01	10.43	12.28	15.61	19.44
	1:00:00	0.00	0.00	2.83	4.10	5.24	8.72	10.32	13.58	16.96
	1:05:00	0.00	0.00	2.44	3.48	4.53	7.41	8.80	12.04	15.05
	1:10:00	0.00	0.00	1.92	2.92	3.88	5.87	6.99	9.22	11.60
	1:15:00	0.00	0.00	1.50	2.32	3.33	4.54	5.43	6.89	8.75
	1:20:00	0.00	0.00	1.24	1.91	2.82	3.29	3.93	4.71	6.04
	1:25:00	0.00	0.00	1.11	1.71	2.36	2.58	3.09	3.39	4.37
	1:30:00	0.00	0.00	1.04	1.58	2.05	2.04	2.43	2.58	3.35
	1:35:00	0.00	0.00	1.01	1.50	1.84	1.71	2.02	2.08	2.69
	1:40:00	0.00	0.00	0.98	1.32	1.68	1.48	1.73	1.73	2.24
	1:45:00	0.00	0.00	0.96	1.19	1.58	1.34	1.56	1.49	1.94
	1:50:00	0.00	0.00	0.95	1.09	1.50	1.24	1.43	1.33	1.72
	1:55:00	0.00	0.00	0.82	1.02	1.39	1.18	1.35	1.24	1.60
	2:00:00	0.00	0.00	0.72	0.94	1.23	1.14	1.31	1.21	1.56
	2:05:00	0.00	0.00	0.52	0.67	0.87	0.81	0.93	0.86	1.11
	2:10:00	0.00	0.00	0.36	0.47	0.61	0.57	0.65	0.61	0.79
	2:15:00	0.00	0.00	0.25	0.33	0.43	0.40	0.45	0.43	0.55
	2:20:00	0.00	0.00	0.17	0.22	0.29	0.27	0.31	0.29	0.37
	2:25:00	0.00	0.00	0.11	0.14	0.19	0.18	0.20	0.19	0.25
	2:30:00	0.00	0.00	0.07	0.09	0.12	0.12	0.14	0.13	0.16
	2:35:00	0.00	0.00	0.04	0.06	0.07	0.07	0.08	0.08	0.10
	2:40:00	0.00	0.00	0.02	0.03	0.03	0.04	0.04	0.04	0.05
	2:45:00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.02
	2:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

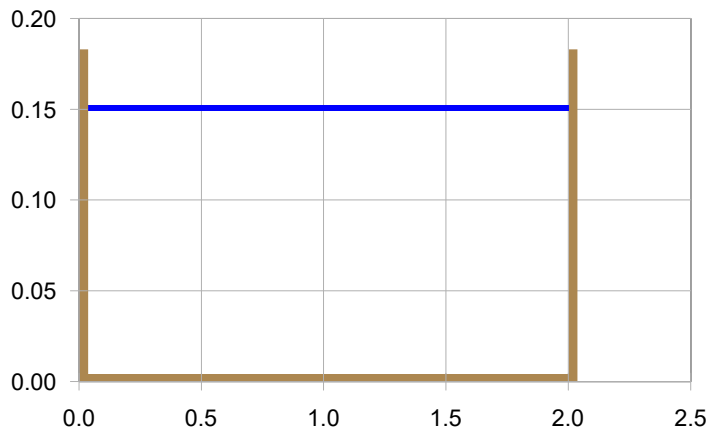


**Manning Formula:** Trickle Channel Calculations - 2% of 100 Year Flow**Rectangular Channel****Input**

Flow	0.67 cfs
Slope	0.005 ft/ft
Manning's n	0.012
Base Width	2 ft
Right Side Slope	0:1
Left Side Slope	0:1

**Output**

Depth	0.149 ft
Flow Area	0.298 sf
Velocity	2.25 fps
Velocity Head	0.0783 ft
Top Width	2.00 ft
Froude Number	1.02
Critical Depth	0.152 ft
Critical Slope	0.00475 ft/ft



Project: Elephant Rock Villas

## Water Quality Capture Volume (WQCV) Calculator

Drain Time (hrs)	40
Coefficient, a	1.0
Imperviousness, I	47.0%
WQCV (watershed inches)	0.20
WQCV (ft)	0.02
Watershed Area (ac)	9.25
WQCV (ac-ft)	0.15



## Forebay Calculator

WQCV (ac-ft)	0.15
2% of WQCV (ac-ft)	0.0031
2% of WQCV (cf)	133
Depth (ft)	1.0
Width (ft)	10
Length (ft)	16
Volume (cf)	160
Is Volume greater than 2% of WQCV?	YES



## Forebay Notch Calculator

Q <sub>100</sub> (cfs)	33.5
2% of Q <sub>100</sub> (cfs)	0.67
D (ft)	1
<b>W (ft)</b>	<b>0.22</b>

$$W = \frac{2\% \text{ of } Q}{D^{1.5} * C}$$



## Trickle Channel Calculator

Q <sub>100</sub> (cfs)	33.5
2% of Q <sub>100</sub> (cfs)	0.67
Slope (ft/ft)	0.005
<b>Bottom Width (ft)</b>	<b>2</b>
Side Slopes (Vertical)	0
<b>Depth of Trickle Channel (ft)</b>	<b>0.5</b>
Depth of 2% of 100-Year Flow (ft)	0.15
Velocity (ft/s)	2.25
Froude Number	1.02
Type of Flow (Subcritical/Supercritical)	Supercritical

**Project: Elephant Rock Villas**



**Proposed Detention Basin Spillway**

Slope (ft/ft)	0.2
Cf	2
Q <sub>100</sub> (cfs)	13.7
Width (ft)	11
q (cfs/ft)	1.25
Calculated D <sub>50</sub> (in)	5.2
D <sub>50</sub> used (in)	6.0



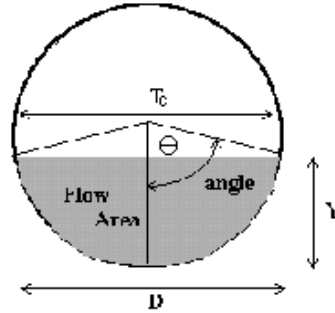
**Detention Basin Outlet**

100-Year Peak Outflow (cfs)	13.7
Y <sub>t</sub> (ft)	1.34
D <sub>c</sub> (ft)	2.0
D <sub>50</sub> (ft)	0.2
D <sub>50</sub> Used (ft)	6.0

# CIRCULAR CONDUIT FLOW (Normal & Critical Depth Computation)

MHFD-Culvert, Version 4.00 (May 2020)

**Project: Elephant Rock Villas**  
**Pipe ID: 18 Inch HDPE Culvert Capacity**

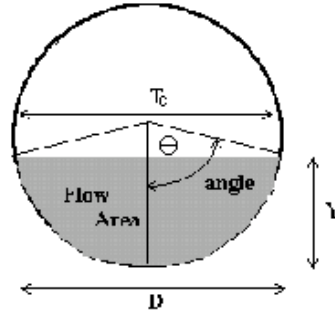


Design Information (Input)	
Pipe Invert Slope	So = 0.0050 ft/ft
Pipe Manning's n-value	n = 0.0120
Pipe Diameter	D = 18.00 inches
Design discharge	Q = 6.45 cfs
Full-Flow Capacity (Calculated)	
Full-flow area	Af = 1.77 sq ft
Full-flow wetted perimeter	Pf = 4.71 ft
Half Central Angle	Theta = 3.14 radians
Full-flow capacity	Qf = 8.07 cfs
Calculation of Normal Flow Condition	
Half Central Angle ( $0 < \theta < 3.14$ )	Theta = 1.93 radians
Flow area	An = 1.27 sq ft
Top width	Tn = 1.40 ft
Wetted perimeter	Pn = 2.90 ft
Flow depth	Yn = 1.01 ft
Flow velocity	Vn = 5.07 fps
Discharge	Qn = 6.45 cfs
Percent of Full Flow	Flow = 80.0% of full flow
Normal Depth Froude Number	Fr <sub>n</sub> = 0.94 subcritical
Calculation of Critical Flow Condition	
Half Central Angle ( $0 < \theta_c < 3.14$ )	Theta-c = 1.89 radians
Critical flow area	Ac = 1.23 sq ft
Critical top width	Tc = 1.43 ft
Critical flow depth	Yc = 0.98 ft
Critical flow velocity	Vc = 5.26 fps
Critical Depth Froude Number	Fr <sub>c</sub> = 1.00

# CIRCULAR CONDUIT FLOW (Normal & Critical Depth Computation)

MHFD-Culvert, Version 4.00 (May 2020)

**Project: Elephant Rock Villas**  
**Pipe ID: 24 Inch HDPE Culvert Capacity**



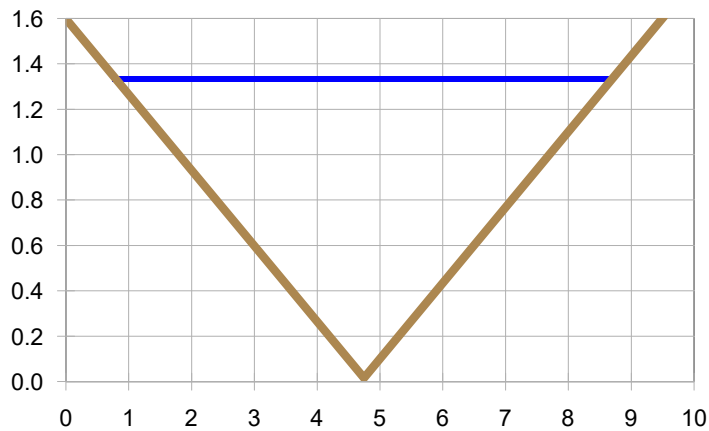
Design Information (Input)	
Pipe Invert Slope	So = 0.0050 ft/ft
Pipe Manning's n-value	n = 0.0120
Pipe Diameter	D = 24.00 inches
Design discharge	Q = 13.90 cfs
Full-Flow Capacity (Calculated)	
Full-flow area	Af = 3.14 sq ft
Full-flow wetted perimeter	Pf = 6.28 ft
Half Central Angle	Theta = 3.14 radians
Full-flow capacity	Qf = 17.38 cfs
Calculation of Normal Flow Condition	
Half Central Angle ( $0 < \theta < 3.14$ )	Theta = 1.93 radians
Flow area	An = 2.26 sq ft
Top width	Tn = 1.87 ft
Wetted perimeter	Pn = 3.86 ft
Flow depth	Yn = 1.35 ft
Flow velocity	Vn = 6.14 fps
Discharge	Qn = 13.90 cfs
Percent of Full Flow	Flow = 80.0% of full flow
Normal Depth Froude Number	Fr <sub>n</sub> = 0.98 subcritical
Calculation of Critical Flow Condition	
Half Central Angle ( $0 < \theta_c < 3.14$ )	Theta-c = 1.92 radians
Critical flow area	Ac = 2.24 sq ft
Critical top width	Tc = 1.88 ft
Critical flow depth	Yc = 1.34 ft
Critical flow velocity	Vc = 6.20 fps
Critical Depth Froude Number	Fr <sub>c</sub> = 1.00

**Manning Formula:** Proposed Swale - 100 Year Flow of Design Point 5**Triangular Channel****Input**

Flow	22.9 cfs
Slope	0.02 ft/ft
Manning's n	0.035
Base Width	0 ft
Right Side Slope	3:1
Left Side Slope	3:1

**Output**

Depth	1.318 ft
Flow Area	5.22 sf
Velocity	4.39 fps
Velocity Head	0.300 ft
Top Width	7.91 ft
Froude Number	0.953
Critical Depth	1.294 ft
Critical Slope	0.0221 ft/ft





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# APPENDIX C

## DESIGN CHARTS

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The runoff coefficient represents the integrated effects of infiltration, detention storage, evaporation, retention, flow routing, and interception, all of which affect the time distribution and peak rate of runoff. Runoff coefficients are based on the imperviousness of a particular land use and the hydrologic soil type of the area and are to be selected in accordance with Table 6-6.

The procedure for determining the runoff coefficient includes these steps:

1. Categorize the site area into one or more similar land uses, each with a representative imperviousness, according to the information in Table 6-6.
2. Based on the dominant hydrologic soil type in the area, use Table 6-6 to estimate the runoff coefficient for the particular land use category for the design storms of interest.
3. Calculate an area-weighted average runoff coefficient for the site based on the runoff coefficients from individual land use areas of the site.

When analyzing an area for design purposes, urbanization of the full watershed, including both on-site and off-site areas, shall be assumed.

Gravel parking areas, storage areas, and access drives proposed on Site Improvement Plans shall be analyzed based on an imperviousness of 80%. This is due to the potential for gravel areas being paved over time by property owners and the resulting adverse impacts on the stormwater management facilities and adjacent properties.

There are some circumstances where the selection of impervious percentage values may require additional investigation due to unique land characteristics (e.g., recent burn areas). When these circumstances arise, it is the designer's responsibility to verify that the correct land use assumptions are made.

When multiple sub-basins are delineated, the composite C value calculation is:

$$C_c = (C_1 A_1 + C_2 A_2 + C_3 A_3 + \dots C_i A_i) / A_t \quad (\text{Eq. 6-6})$$

Where:

$C_c$  = composite runoff coefficient for total area

$C_i$  = runoff coefficient for subarea corresponding to surface type or land use

$A_i$  = area of surface type corresponding to  $C_i$  (units must be the same as those used for total area)

$A_t$  = total area of all subareas for which composite runoff coefficient applies

$i$  = number of surface types in the drainage area

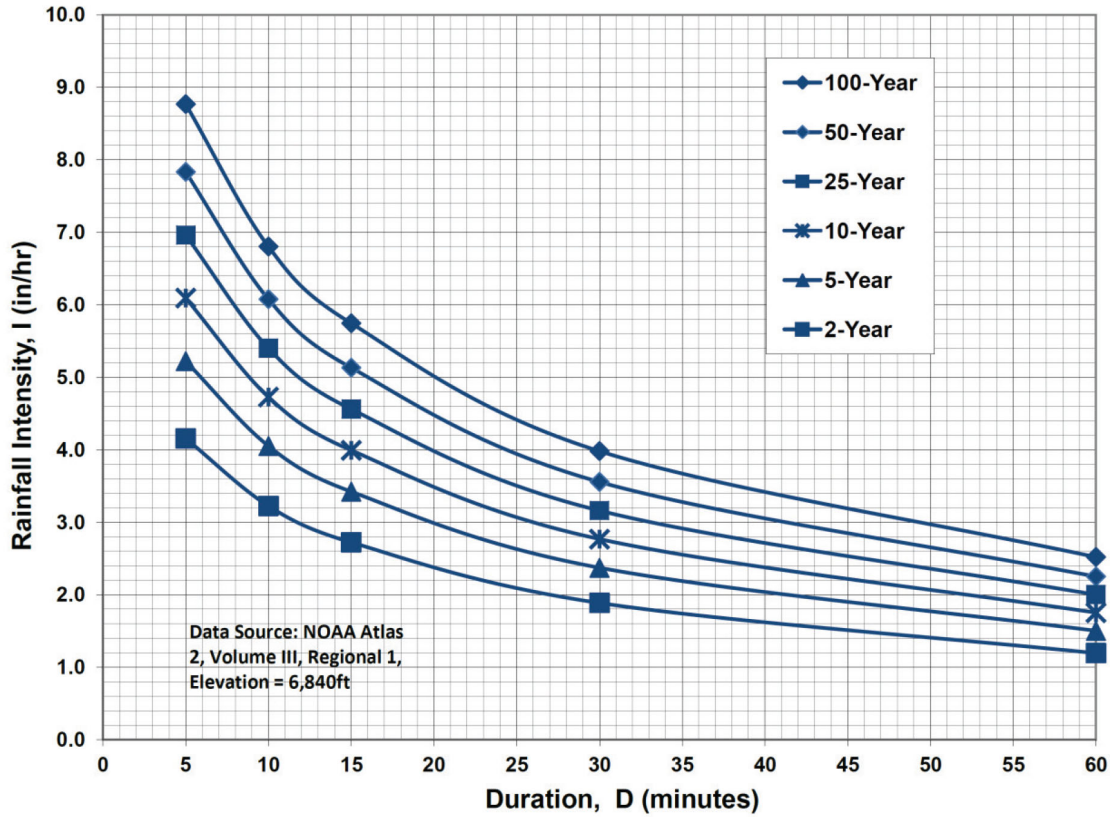
**Table 6-6. Runoff Coefficients for Rational Method**  
(Source: UDFCD 2001)

Land Use or Surface Characteristics	Percent Impervious	Runoff Coefficients					
		2-year	5-year	10-year	25-year	50-year	100-year

		HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	HSG A&B	HSG C&D	Item 4.	
Business															
Commercial Areas	95	0.79	0.80	0.81	0.82	0.83	0.84	0.85	0.87	0.87	0.88	0.88	0.89		
Neighborhood Areas	70	0.45	0.49	0.49	0.53	0.53	0.57	0.58	0.62	0.60	0.65	0.62	0.68		
Residential															
1/8 Acre or less	65	0.41	0.45	0.45	0.49	0.49	0.54	0.54	0.59	0.57	0.62	0.59	0.65		
1/4 Acre	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58		
1/3 Acre	30	0.18	0.22	0.25	0.30	0.32	0.38	0.39	0.47	0.43	0.52	0.47	0.57		
1/2 Acre	25	0.15	0.20	0.22	0.28	0.30	0.36	0.37	0.46	0.41	0.51	0.46	0.56		
1 Acre	20	0.12	0.17	0.20	0.26	0.27	0.34	0.35	0.44	0.40	0.50	0.44	0.55		
Industrial															
Light Areas	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74		
Heavy Areas	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83		
Parks and Cemeteries	7	0.05	0.09	0.12	0.19	0.20	0.29	0.30	0.40	0.34	0.46	0.39	0.52		
Playgrounds	13	0.07	0.13	0.16	0.23	0.24	0.31	0.32	0.42	0.37	0.48	0.41	0.54		
Railroad Yard Areas	40	0.23	0.28	0.30	0.35	0.36	0.42	0.42	0.50	0.46	0.54	0.50	0.58		
Undeveloped Areas															

Historic Flow Analysis—Greenbelts, Agriculture	2	0.03	0.05	0.09	0.16	0.17	0.26	0.26	0.38	0.31	0.45	0.36	Item 4.
Pasture/Meadow	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Forest	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50
Exposed Rock	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Offsite Flow Analysis (when landuse is undefined)	45	0.26	0.31	0.32	0.37	0.38	0.44	0.44	0.51	0.48	0.55	0.51	0.59
Streets													
Paved	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Gravel	80	0.57	0.60	0.59	0.63	0.63	0.66	0.66	0.70	0.68	0.72	0.70	0.74
Drive and Walks	100	0.89	0.89	0.90	0.90	0.92	0.92	0.94	0.94	0.95	0.95	0.96	0.96
Roofs	90	0.71	0.73	0.73	0.75	0.75	0.77	0.78	0.80	0.80	0.82	0.81	0.83
Lawns	0	0.02	0.04	0.08	0.15	0.15	0.25	0.25	0.37	0.30	0.44	0.35	0.50

Figure 6-5. Colorado Springs Rainfall Intensity Duration Frequency



**IDF Equations**

$$I_{100} = -2.52 \ln(D) + 12.735$$

$$I_{50} = -2.25 \ln(D) + 11.375$$

$$I_{25} = -2.00 \ln(D) + 10.111$$

$$I_{10} = -1.75 \ln(D) + 8.847$$

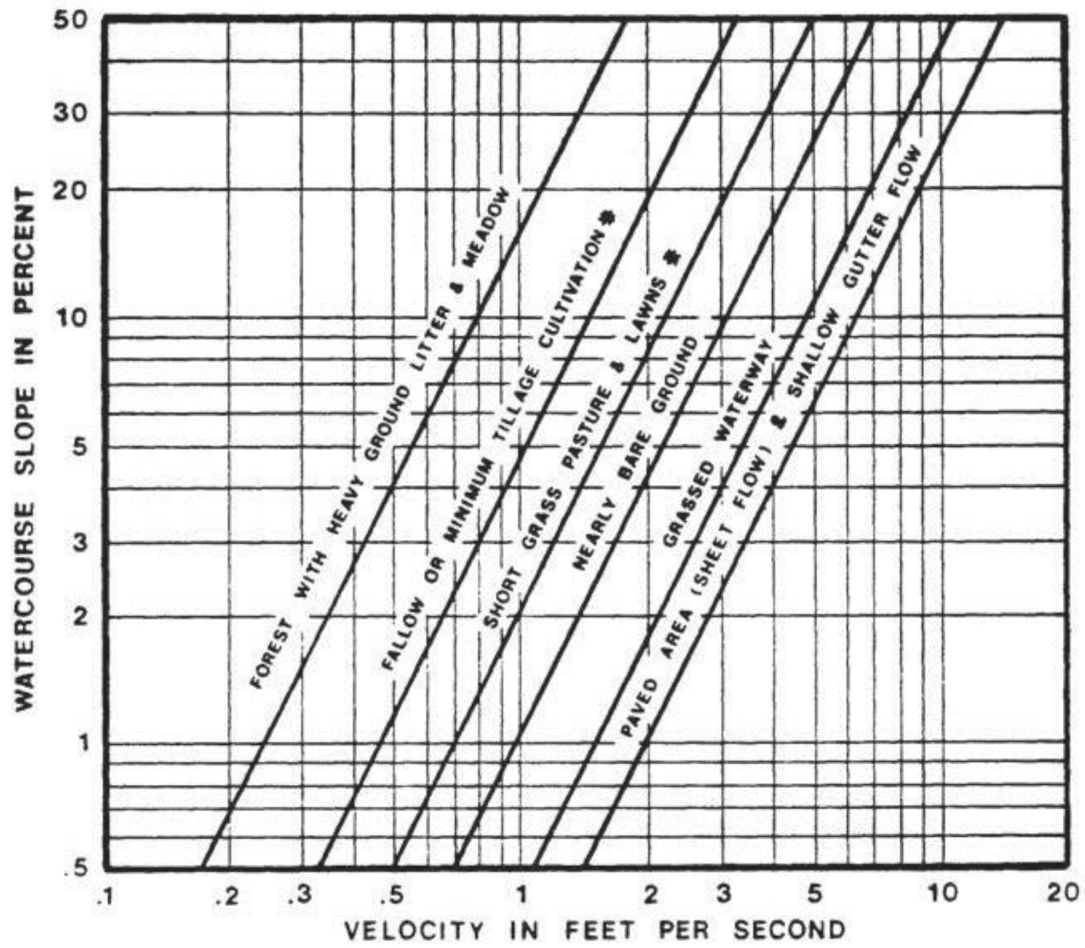
$$I_5 = -1.50 \ln(D) + 7.583$$

$$I_2 = -1.19 \ln(D) + 6.035$$

Note: Values calculated by equations may not precisely duplicate values read from figure.

Figure 6-25. Estimate of Average Concentrated Shallow Flow

Item 4.



## 3.0 Colorado Urban Hydrograph Procedure

### 3.1 Background

The Colorado Urban Hydrograph Procedure (CUHP) is a method of hydrologic analysis based upon the unit hydrograph principle. A unit hydrograph is defined as the hydrograph of one inch of direct runoff from the tributary area resulting from a storm of a given duration. The unit hydrograph thus represents the integrated effects of factors such as tributary area, shape, street pattern, channel capacities, and street and land slopes. The basic premise of the unit hydrograph is that individual hydrographs resulting from the successive increments of excess rainfall that occur throughout a storm period will be proportional in discharge throughout their runoff period. Thus, the hydrograph of total storm discharge is obtained by summing the ordinates of the individual sub-hydrographs.

CUHP has been developed and calibrated using rainfall-runoff data collected in Colorado (mostly in the Denver/Boulder metropolitan area). This section provides a general background in the use of the computer version of CUHP to perform stormwater runoff calculations. A detailed description of the CUHP method and the assumptions and equations used, including a hand calculation example, are provided in the CUHP User Manual. The latest version of the CUHP 2005 macro-enabled Excel workbook and User Manual are available for download from [www.udfed.org](http://www.udfed.org).

### 3.2 Effective Rainfall for CUHP

Effective rainfall is that portion of precipitation during a storm event that runs off the land to streams. Those portions of precipitation that do not reach a stream are called abstractions and include interception by vegetation, evaporation, infiltration, storage in all surface depressions, and extended duration surface retention. The total design rainfall depth for use with CUHP should be obtained from the *Rainfall* chapter of the USDCM. This chapter illustrates a method for estimating the amount of rainfall that actually becomes surface runoff whenever a design rainstorm is used.

#### 3.2.1 Pervious-Impervious Areas

As described in Section 2.5.1, the urban landscape is comprised of pervious and impervious surfaces. The degree of imperviousness is the primary variable that affects the volumes and rates of runoff calculated using CUHP. When analyzing a watershed for design purposes, the probable future percent of impervious area must first be estimated. A complete tabulation of recommended values of total percentage imperviousness is provided in Table 6-3 and Figures 6-1 through 6-3. References to impervious area and all calculations in this chapter are based on the input of total impervious areas. The pervious-impervious area relationship can be further refined for use in CUHP as follows:

- **DCIA:** Impervious area portion directly connected to the drainage system.
- **UIA:** Impervious area portion that drains onto or across pervious surfaces.
- **RPA:** The portion of pervious area receiving runoff from impervious portions.
- **SPA:** The separate pervious area portion not receiving runoff from impervious surfaces.

This further refinement is explained in more detail in the CUHP User Manual and in Chapter 3 of the USDCM Volume 3.



# BACK POCKET

NAME: N:\Projects\W0319-Palmer\_Lake\_Townhomes3\_DWG\5\_Sheets\Drainage\1\_Existing\_Conditions.dwg PLOT DATE: Jan 05, 2023 3:40pm



- DRAINAGE NOTES**
- ALL ELEVATIONS SHOWN ARE IN NAVD88.
  - EXISTING CONTOURS ARE SHOWN AT 2' AND 10' INTERVALS

**SYMBOL LEGEND**

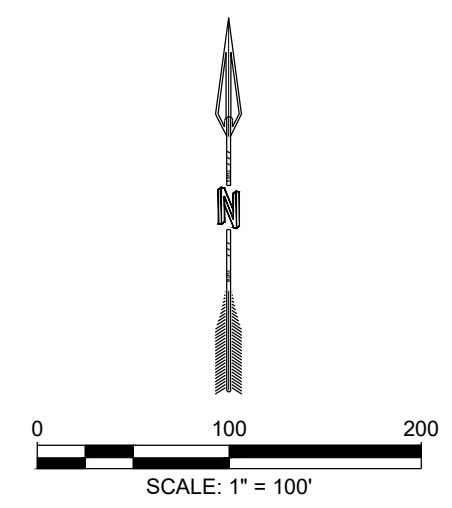
- A1A BASIN DESIGNATION
- XX BASIN AREA (ACRE)
- XX 5 YEAR STORM, CFS
- XX 100 YEAR STORM, CFS
- DP DESIGN POINT
- DIRECTION OF DRAINAGE FLOW
- EXISTING SUB-BASIN BOUNDARY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STORM SEWER
- EXISTING SWALE
- EXISTING TIME OF CONCENTRATION PATH

**EXISTING CONDITIONS**

AREA DESIGNATION	ACRES	Q5 (CFS)	Q100 (CFS)
A1ex	1.00	0.3	2.3
A2ex	9.18	2.1	16.4
Bex	1.41	0.3	2.6
Cex	1.67	0.5	3.6
OS1	5.64	1.4	10.5
OS2	5.63	1.4	10.7
OS3	2.06	0.6	4.3
OS4	0.36	0.1	0.9

**EXISTING DESIGN POINTS**

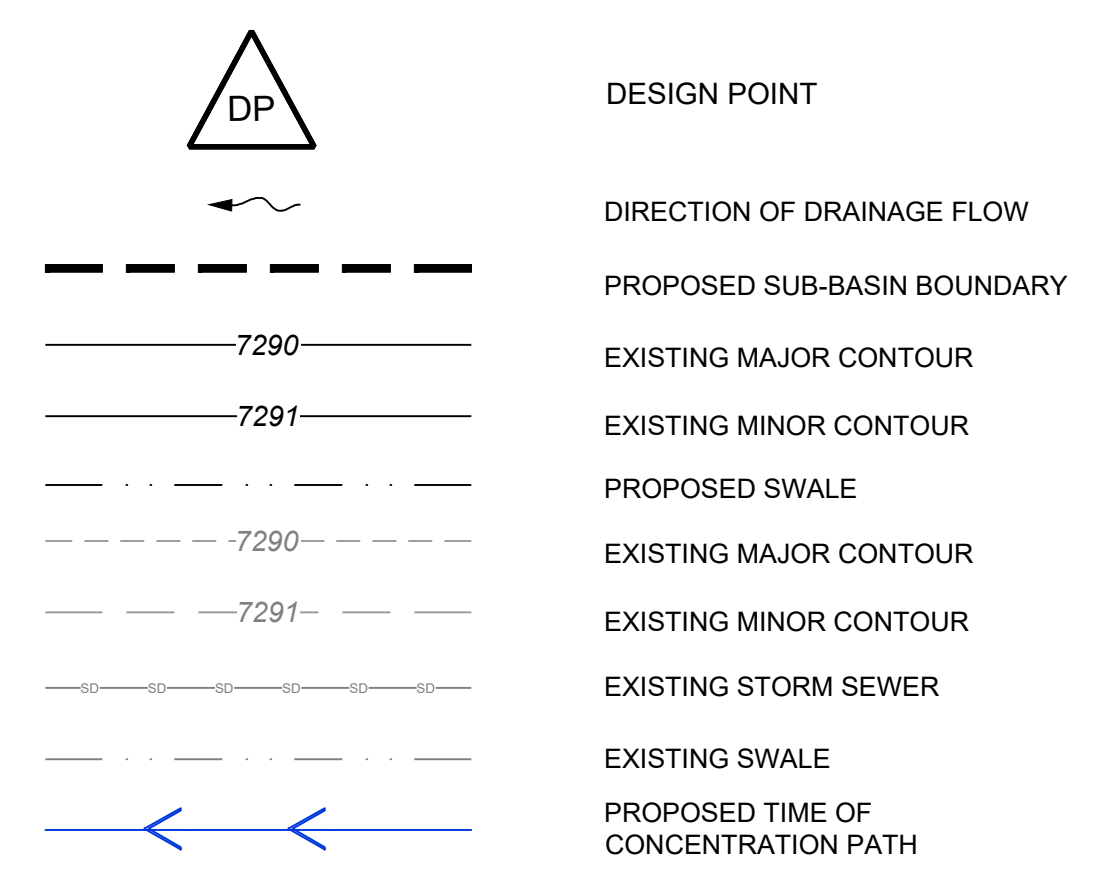
DESIGN POINT	ACRES	Q5 (CFS)	Q100 (CFS)
DP1 (OS1 + A1EX)	6.64	1.4	10.8
DP2 (OS2 + OS3 + A2EX)	16.87	3.1	24.0
DP3 (OS4 + CEX)	2.03	0.6	4.4



DESIGNED CTD: _____ DRAWN CTD: _____ CHECKED RGG: _____ DATE: 1.08.2023	REVISION _____ _____ _____
RESPEC COMMUNITY DESIGN SOLUTIONS 21 SOUTH TEJON STREET SUITE 1110 COSTA MESA, CA 92626 WWW.RESPEC.COM PHONE: (714) 985-7671	
STAMP <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>PRELIMINARY</b>                      NOT FOR CONSTRUCTION                      1/2023                      THIS DRAWING IS INCOMPLETE                      AND NOT TO BE USED FOR                      CONSTRUCTION UNLESS IT IS                      STAMPED, SIGNED AND DATED.                 </div>	
PROJECT NAME: ELEPHANT ROCK VILLAS	SHEET TITLE: EXISTING CONDITIONS
SUBMITTED FOR: DORMAN REAL ESTATE MANAGEMENT	SHEET NUMBER: SHEET 1 OF 2

- DRAINAGE NOTES**
- ALL ELEVATIONS ARE IN NAVD88.
  - EXISTING AND PROPOSED CONTOURS ARE SHOWN AT 2' AND 10' CONTOUR INTERVALS.
  - ALL PROPOSED SWALES SHOWN ARE 2' DEEP TRIANGULAR SWALES WITH 3:1 SIDE SLOPES.

- SYMBOL LEGEND**
- A1A BASIN DESIGNATION
  - XX BASIN AREA (ACRE)
  - XX 5 YEAR STORM, CFS
  - XX 100 YEAR STORM, CFS
  - DP DESIGN POINT
  - Direction of Drainage Flow
  - Proposed Sub-Basin Boundary
  - Existing Major Contour
  - Existing Minor Contour
  - Proposed Swale
  - Existing Major Contour
  - Existing Minor Contour
  - Existing Storm Sewer
  - Existing Swale
  - Proposed Time of Concentration Path



**DEVELOPED CONDITIONS**

AREA DESIGNATION	ACRES	Q5 (CFS)	Q100 (CFS)
OS1	5.64	1.4	10.5
OS2	5.63	1.4	10.7
OS3	2.23	0.6	4.6
OS4	0.42	0.1	1.0
A	0.90	0.3	2.1
B	0.27	0.6	1.3
C	0.97	1.1	3.3
D	0.20	0.8	1.6
E	0.98	0.6	2.9
F	0.52	1.6	3.6
G	0.18	0.8	1.6
H	0.57	1.2	2.8
I	0.35	1.6	3.1
J	1.15	0.7	3.8
K	1.54	2.3	6.3
L	0.50	2.3	4.4
M	0.61	1.0	2.7
N	0.95	0.3	2.1
O	0.53	2.5	4.9
P	0.90	0.3	2.0
Q	0.63	2.5	5.1
R	0.16	0.6	1.2
S	0.30	1.2	2.5
T	0.77	1.4	3.7

**DEVELOPED DESIGN POINTS**

DESIGN POINT NAME	ACRES	Q5 (CFS)	Q100 (CFS)
DP1 (OS1+A)	6.54	1.4	10.6
DP2 (K+F)	2.06	3.0	7.9
DP3 (DP2+B+C+D)	3.50	5.0	11.8
DP4 (Q+R+S+T)	1.86	6.0	15.5
DP5 (DP4+L+M+O)	3.50	5.0	22.9
DP6 (DP3+H+I+G)	4.60	7.2	18.0
DP7 (DP5+DP6+J)	9.25	13.9	33.5
DP7 DET	9.25	1.3	13.7
DP8 (P+N)	1.85	0.5	4.0



NAME: N:\Projects\W0319-Palmer Lake Townhomes3\_DWG\5\_Sheets\Drainage\2\_Developed Conditions.dwg PLOT DATE: Jan 06, 2023 3:45pm

DESIGNED RGG  
DRAWN RLM  
CHECKED RGG  
DATE 1.06.2023

RESPEC  
COMMUNITY DESIGN SOLUTIONS  
21 SOUTH TEJON STREET SUITE 1110  
COSTA MESA, CA 92626  
WWW.RESPEC.COM PHONE (714) 985-7671

STAMP

**PRELIMINARY**  
NOT FOR CONSTRUCTION  
1/2023

THIS DRAWING IS INCOMPLETE AND NOT TO BE USED FOR CONSTRUCTION UNLESS IT IS STAMPED, SIGNED AND DATED

**811**  
Know what's below.  
Call before you dig.

PROJECT NAME: ELEPHANT ROCK VILLAS

SHEET TITLE: DEVELOPED CONDITIONS

SUBMITTED FOR: DORMAN REAL ESTATE MANAGEMENT

SHEET NUMBER: SHEET 2 OF 2



# Community Matters Institute

Tel: ++303 730 0396

[barbcole@communitymattersinstitute.org](mailto:barbcole@communitymattersinstitute.org)

## MEMO

To: Dawn Collins, CMC, Town Administrator/Clerk  
From: Barb Cole, Executive Director, CMI  
CC: Julia Stambaugh, Deputy Town Clerk, and Mike Davenport, CMI  
Date: Tuesday, January 10, 2023  
RE: Next Steps

---

As discussed, Community Matters Institute (CMI) was contracted to undertake a few implementation items. We have agreed on the following services as the budget permits.

- (1) Update the Town's Zoning map to include the required signatures and be sized correctly to produce the required Official Map of the Town (by January 26, 2023).
- (2) Cost reimbursement agreement and options for staff and Board consideration (by January 26, 2023).
- (3) Complete a high-level diagnosis of the Land Use Regulations which can be used to seek further funding from DOLA. This will not include an entire code line-by-line review and comment. A line-by-line review is only appropriate when the larger and often global issues are reviewed and resolved by the Planning Commission. (Budgeted at 37 hours- Diagnosis completed no later than February 6, 2023, for Staff and Planning Commission)
  - a. Memo to staff and Planning Commission with Land Use Code Diagnosis (Chapters 16 and 17).
  - b. Worksheet for the Planning Commission to complete and our review and summary of code issues from the Planning Commission's perspective. This exercise will be used to inform the grant submission to DOLA and aid staff in preparing said grant application.
- (4) Prepare initial development review application forms and procedures for staff and applicants. These are intended to help staff and applicants move efficiently through the application process. We will focus on those forms that are unlikely to change with a new Land Use Code (by February 15, 2023).
- (5) As budget allows, assist the Planning Commission in their drafting of a new sign code (by March 31, 2023).
  - a. Review of new sign code sections prepared by the Planning Commission.
  - b. Graphics to illustrate types of signs and sign measurement.
  - c. Assistance to ensure sign code 'fits' Palmer Lake. Sign codes are not one size fits all. The speed at which signs are viewed and location impact size and type.

bc