DOUGLAS COUNTY
COLORADO

Preliminary Plan Staff Report

Date:	February 25, 2026
To:	Douglas County Board of County Commissioners
Through:	Douglas J. DeBord, County Manager
From:	Kati Carter, AICP, Director of Community Development SK for KCC
CC:	Trevor Bedford, AICP, Senior Planner Jeanette Bare, AICP, Current Planning Manager Steve Koster, AICP, Deputy Director of Community Development
Subject:	**Ramblewood Preliminary Plan**
Project File:	**SB2025-040**

Planning Commission Hearing:	**February 23, 2026 @ 6:00 p.m.**
Board of County Commissioners Hearing:	**March 10, 2026 @ 2:30 p.m.**

I. EXECUTIVE SUMMARY

The request is for approval of a preliminary plan for 68 single-family detached residential lots, two agricultural lots, eight tracts, and associated public roads on approximately 176.79 acres in the Ramblewood Planned Development (PD). The site is located on the south side of Hilltop Road, across from its intersection with Merryvale Trail.

Access will occur via Hilltop Road with a secondary access to the south via Alpine Drive. Water and sewer service will be provided through inclusion into the Parker Water and Sanitation District (PWSD).

This property is within the Northeast Subarea as identified by the 2040 Comprehensive Master Plan.

The Planning Commission heard the request at its February 23, 2026 public hearing. The Planning Commission recommended approval with a vote of 5 to 2.

II. APPLICATION INFORMATION

A. Applicants

Hilltop Jam, LLC
2554 Aspen Drive
Park City, UT 84060

Bradley A Whittlesey & Joan V Whittlesey
4700 E Princeton Ave
Englewood, CO 80113

B. Applicant's Representative

Dan Sheldon
6900 E Bellview Avenue, Suite 300
Greenwood Village, CO 80111

C. Request

The request is for approval of a preliminary plan consisting of 68 single-family detached lots, two agricultural lots, eight tracts, and associated roads on approximately 176.79 acres.

D. Process

A preliminary plan application is processed pursuant to Article 4 of the Douglas County Subdivision Resolution (DCSR). Article 4 states the intent of the process is "An in-depth analysis of the proposed subdivision, including a review of the design considering the ability to obtain water and sanitation, identified geologic hazards, environmentally sensitive areas, wildlife habitat areas, source of required services, vehicular and pedestrian circulation, storm drainage and water quality, relationship to surrounding land uses, and conformance with the Master Plan."

Per Section 405.08 of the DCSR. "The Board shall evaluate the preliminary plan, staff report, referral agency comments, applicant responses, Planning Commission recommendations, public comment and testimony, and shall either approve, approve with conditions, continue, table for further study, remand to the Planning Commission, or deny the preliminary plan. The Board's decision shall be based on the evidence presented; compliance with adopted County standards, regulations and policies; and other guidelines."

E. Location

The project is located on the south side of Hilltop Road, across from its intersection with Merryvale Trail.

F. Project Description

This application is to subdivide approximately 177 acres into 68 single-family residential lots, two agricultural lots, and eight tracts within the Ramblewood PD. Tract A will be privately owned and maintained and will allow for utilities, drainage, open space, and uses accessory to the agricultural lots. Tract C will be privately owned and will be maintained by the Ramblewood Metro District as a directors' parcel and open space. The remaining six tracts will be owned and maintained by the Ramblewood Metro District for open space, drainage, and utilities. Access to the subdivision is proposed off of Hilltop Road with a secondary access off of Alpine Drive. All lots will be accessed via internal public roads. Central water services are proposed

to all 70 lots by PWSD. PWSD will enter into a separate intergovernmental agreement (IGA) with Pinery Water and Wastewater District (PWWD) to provide sewer service for the 68 single-family lots. The two agricultural lots allow for residential and agricultural uses and will be served by individual onsite wastewater treatment systems (OWTS) with the option to connect to central sewer services if desired.

The Ramblewood PD allows a maximum of 70 dwelling units over the project site. 68 single family lots are proposed within Planning Area A over 77 acres. These lots range from 13,500 to 26,817 square feet. Planning Area A allows for a minimum lot size of 10,000 square feet. The two agricultural lots are proposed within Planning Area B. These lots will be 26.29 acres and 53.38 acres. Planning Area B allows for a minimum lot size of 20 acres. In addition to the residential lots, the project proposes approximately 60 acres of open space to provide a buffer between neighboring properties and the single-family lots. A 1.5-acre public park and trail system is proposed within the open space tracts.

Project Details

Zoning	Ramblewood PD
Gross Site Acreage	176.79 Acres
Residential Lots	68 Single-Family and 2 Large Lot Residential and Agricultural
Tracts	8 Tracts
Public Roadways	4
Gross Density	1 dwelling per 2.52 acres

Section 406.07 of the DCSR requires submittal of evidence that the property has been included into the water district that has committed to serving the subdivision at the time of application for a preliminary plan. Section 406.07 also includes a provision for submittal of this documentation to be deferred by the Community Development Director for reason of good cause shown. In this case, the applicant requested to defer submitting documentation showing that the property has been included within the PWSD to avoid delays in the development process. The Director approved the applicant's request to defer the submittal requirement for evidence of inclusion of the property into the PWSD, on the condition that such evidence must be submitted prior to consideration of the first final plat associated with the Ramblewood Preliminary Plan by the Board of County Commissioners.

III. CONTEXT

A. Background

The property has been historically zoned and used for agriculture. The surrounding properties to the west, south, and east are part of the Hidden Village subdivision, which was rezoned from agricultural to residential in 1970. These properties are now

zoned Rural Residential (RR) to the south and west and Estate Residential (ER) to the east.

The subject property was rezoned from Agricultural One (A-1) and Rural Residential (RR) to the Ramblewood PD in August 2025.

B. Adjacent Land Uses and Zoning

The property is primarily surrounded by residential and agricultural properties.

Zoning and Land Use

	Zoning	Land Use
North	Rural Residential and Open Space	Single-Family Residential and Open Space Tracts
South	Estate Residential	Single-Family Residential
East	Estate Residential and Rural Residential	Single-Family Residential
West	Rural Residential and Agricultural One	Single-Family Residential and Agricultural

IV. PHYSICAL SITE CHARACTERISTICS

A. Site Characteristics and Constraints

The northern portion of the site generally slopes to the north towards Hilltop Road. The southern portion of the site has varying topography, generally sloping to the south towards Alpine Drive.

B. Access

The subdivision will be primarily accessed via Hilltop Road with a secondary access from Alpine Drive to the south. Hilltop Road is a major arterial roadway that will be widened by Douglas County in the future. Alpine Drive is currently an unpaved road with plans for the County to pave it in the future. Internal public roadways will be constructed to access individual lots.

The applicant submitted a traffic impact study that was accepted by Douglas County. Based on commitments during the Planned Development rezoning, the applicant will be required to dedicate right-of-way for Alpine Drive and Hilltop Road. The applicant will additionally be required to construct access improvements from Hilltop Road and contribute towards the paving of Alpine Drive.

C. Soils and Geology

The CMP Class 3 Hazards and Environmental Constraints map indicated no constraints on the site. Colorado Geologic Survey (CGS) responded to the referral request with no objection noting that there were no unusual geologic conditions or constraints within the proposed subdivision area that would preclude residential use and density.

D. Drainage and Erosion

The applicant submitted a Phase II Drainage Report, which was accepted by Douglas County Public Works Engineering. A Phase III Drainage report will be required at final plat.

E. Floodplain

A portion of the agricultural planning areas contain floodplain. There is sufficient space to construct residences outside of the floodplain on the agricultural lots. The project will continue to be evaluated for impacts to the floodplain at final plat.

F. Wildlife

The CMP Wildlife resources map identifies the site as having low habitat value. The applicant provided and ecological resources survey of the site that concluded no threatened or endangered species, or their obvious habitat were seen on the property. The project includes open space buffers on the east and west sides of the single-family residential lots and wildlife friendly fencing adjacent to open space.

G. Historic Preservation

Douglas County Historic Preservation responded to the referral request with no recommendations at this time, but requested a Class II cultural resources survey prior to any ground disturbance. This will be completed prior to approval of the final plat.

V. PROVISION OF SERVICES

A. Schools

The Douglas County School District indicated in its referral comments that the project generates a land dedication requirement of 1.579 acres. Since this is smaller than DCSD's minimum school site size, DCSD requests cash-in-lieu of land dedication. Cash-in-lieu of land dedication shall be determined at final plat, with payment due prior to recordation.

B. Fire Protection

The proposed central water services will support fire protection services. South Metro Fire Rescue (SMFR) responded to the referral request with comments regarding a proposed turn around and a requirement for all 70 proposed lots to be served by central water. The applicant revised the plans and will provide central water services to all 70 lots. SMFR confirmed no further concerns with the project at this time.

C. Sheriff Services

The Douglas County Sheriff's Office (DCSO) provides emergency services to the site. The Office of Emergency Management responded to the referral request noting that the secondary access via Alpine Drive is a critical element for potential evacuation routes. DCSO responded with no concerns, and DCSO E911 did not respond to the referral request.

D. Water

All lots are proposed to be served by central water by PWSD. The applicant has provided a will-serve letter from PWSD indicating that the district is committed to serving the lots. Section 406.07 of the DCSR requires submittal of evidence that the property has been included into the water district that has committed to serving the subdivision at the time of application for a preliminary plan, but includes a provision for this to be deferred by the director with good cause. In this case, the applicant requested and was granted a deferral of this until consideration of the final plat.

E. Sanitation

The applicant proposes to serve the 68 single-family residential lots with central sewer services through an IGA between PWSD and PWWD. The two agricultural lots are proposed to be served by septic, but will have the option to connect to PWWD services if desired. The Douglas County Health Department (DCHD) responded to the referral request with a favorable recommendation for water service and sewage disposal.

F. Utilities

Utility service is provided by CORE Electric and Xcel Energy. CORE noted that electric facilities will need to be extended to the property and that the developer will be responsible for all costs associated with offsite electric utility extension. CORE also provided information regarding grading within easements and requirements for notes on the final plat exhibit. Xcel responded to the referral request with information regarding easements and natural gas service.

G. Dedications

The following dedications are anticipated at the time of final plat.

Roads	The internal roads will be dedicated to Douglas County as public roadways. 80 feet of right of way will be dedicated for Alpine Drive to Douglas County.
Tracts	Open Space Tracts and Tract B will be dedicated to the Ramblewood Metro District for ownership and maintenance. Tracts A and C will be privately owned with Tract C being maintained by the Ramblewood Metro District
Drainage and Blanket Access Easements	Drainage and blanket access easements will be dedicated to Douglas County and to the Ramblewood Metro District
Utilities	General purpose utility easements will be dedicated to Douglas County.

H. Parks, Trails, and Open Space

The applicant proposes approximately 60 acres of open space that will provide trails for the development and buffers to adjacent properties. The applicant is also proposing a 1.5-acre public park to be owned and maintained by the Ramblewood Metropolitan District. Additional contributions, including cash-in-lieu of land dedication will be determined at final plat.

VI. PUBLIC NOTICE AND INPUT

In accordance with Section 408 of the DCSR, public notice is required to be published in the Douglas County News-Press and posted on the site by the applicant. In addition to the notice requirements, adjacent landowners were mailed courtesy notices at the beginning of the referral period. At the writing of this staff report, residents provided comments noting concerns generally regarding the project's compatibility with the area, traffic concerns, and concerns regarding an off-site sewer line. All comments are attached to this report. All referral agency comments are outlined in the Referral Agency Response Report, as well as the referral response letters, attached to this staff report.

VII. PLANNING COMMISSION HEARING

At a public hearing on February 23, 2026, the Planning Commission considered the applicant's request for approval of the preliminary plan. After presentations by staff and the applicant, members of the public spoke in opposition and in favor of the application. Speakers in opposition generally discussed compatibility with the rural character of the area. The speaker in favor generally discussed the applicant's community outreach and the design of the project. Planning Commissioners asked questions regarding clustering, rural character, and plans for sewer. The Planning Commission recommended approval of the application by a vote of 5 to 2.

VIII. STAFF ANALYSIS

A preliminary plan may be approved upon the finding by the Board of County Commissioners that the preliminary plan:

403.01: Conforms with the goals, objectives, and policies of the Master Plan.
Staff Comment: The property is located within the Northeast Subarea as identified in Section 3 of the 2040 CMP. The CMP states that while approval criteria for land use applications require a finding of compliance with the CMP, "…the competing values of the plan must be balanced through the public review process to achieve the larger vision of the community." As such, the CMP acknowledges its own competing values and that implementation can only be achieved through the balancing of community values during the review process. The Ramblewood PD attempts to balance the competing values of the CMP.

Goals, objectives, and policies within Section 3 often discuss open space and wildlife (Policy 3-1E.1, Policy 3-2A.2, Policy 3-2D.1, Policy 3-3E.6), compatibility with the natural and rural characteristics of the area (Objective 3-2A, Objective 3-2B, Policy 3-2B.1, Policy 3-3E.1, Policy 3-3E.2, Policy 3-3E.3, Policy 3-3E.7) and availability of services including central water and sewer services (Policy 3-3E.2 and Policy 3-3E.3).

The applicant has identified open space buffers and trails and will require wildlife fencing on properties adjacent to open space. The single-family residential lots have been clustered on the northern portion of the property to preserve open space buffers and natural features to limit land disturbance while providing large enough lots to take existing vegetation into account when siting homes. Additionally, the project will be served by central water for all lots and central sewer services for the 68 single-family lots while the two agricultural lots will have the option to connect to central sewer services if desired.

Policy 3-3E.1 states that "A maximum gross density of one dwelling unit per 2.5 acres is supported in the Northeast Subarea where it is logical infill, where approximately 50 percent of the property boundary is adjacent to zoned lands or parcel sizes consistent with the proposed development, and where site characteristics generally support it." This project has a gross density of one dwelling unit per 2.5 acres. In their narrative, the applicant states that they believe the project's overall density and layout of lots and opens space tracts are consistent with adjacent land use patterns.

403.02: Addresses the design elements established in Article 4, Section 404.
Staff Comment: The proposed subdivision is in conformance with the design elements. Proposed lot sizes allow for setbacks that conform to the requirements of the Ramblewood PD. The site has no Class 3 geologic hazards. Subdivision wide drainage and grading concepts have been reviewed and accepted by Douglas County Overengineer on a preliminary basis. The applicant will take care to protect archaeological and historical resources if uncovered during construction and will complete a Phase II Cultural Resource Survey at the time of final plat. Vehicular, pedestrian, and bicycle access is provided through the inclusion of internal streets and trails.

403.03: Conforms with Section 18A, Water Supply Overlay District, of the Zoning Resolution.
Staff Comment: DCZR Section 1803A establishes approval standards to be used in the evaluation of land use applications reviewed under Section 18A. The CDWR has reviewed the preliminary plan request and has determined that the supply is adequate. The applicant will be required to provide evidence of inclusion into PWSD prior to consideration of the first Ramblewood final plat.

1803A.01 The applicant has demonstrated that the water rights can be used for the proposed uses.
Staff Comment: The will-serve letter and other documentation from PWSD demonstrates that the water rights owned by PWSD can be used for the proposed uses within the subdivision.

1803A.02 The reliability of a renewable right has been analyzed and is deemed sufficient by the County based on its priority dates within the Colorado System of Water Rights Administration.
Staff Comment: No renewable water rights are proposed to serve the development.

1803A.03 The Water Plan is deemed adequate and feasible by the County to ensure that water supply shortage will not occur due to variations in the hydrologic cycle.
Staff Comment: A Water Plan is not required for review of proposed water service by a District.

1803A.04 The Water Plan is sufficient to meet the demand applicable to the project based on the minimum water demand standards in Section 1805A herein.
Staff Comment: A Water Plan is not required for review of proposed water service by a District.

403.04 Provides for a public wastewater collection and treatment system and, if other methods of wastewater collection and treatment are proposed, such systems comply with State and local laws and regulations.
Staff Comment: Sanitation Services will be provided by the Pinery Water and Wastewater District (PWWD) through an IGA with PWSD and the Ramblewood Metro District. The evidence of inclusion into PWSD will be provided prior to consideration of the first final plat within the Ramblewood PD. In addition, the construction of an off-site sewer line is necessary to extend sewer services to the subdivision. A Location and Extent (L & E) application will be required for this public improvement as noted in proposed condition number 3.

403.05 Identifies all areas of the proposed subdivision, which may involve soil or topographical conditions presenting hazards or requiring special precautions and the proposed uses of these areas are compatible with such conditions.
Staff Comment: A geotechnical study was provided by the applicant and reviewed by Colorado Geologic Survey (CGS). CGS responded to the referral request with no objection noting that there were no unusual geologic conditions or constraints within the proposed subdivision area that would preclude residential use and density.

403.06 Provides adequate drainage improvements.
Staff Comment: A Phase II Drainage Report has been reviewed by Engineering and found to be acceptable. A Phase III Drainage Report will be reviewed through the final plat process and formal easements established in conjunction with construction plans.

403.07 Provides adequate transportation improvements.
Staff Comment: Engineering has reviewed and accepted the traffic impact study provided with the preliminary plan.

403.08 Protects significant cultural, archaeological, natural, and historical resources and unique landforms.
Staff Comment: No unique landforms are located within the subject property. During construction activity within the development, the applicant, its successors and assigns shall take all reasonable care to watch for historic resources, paleontological resources and other cultural history resources and shall immediately notify Douglas County in the event of such a discovery. The applicant will provide a Class II cultural resources survey at the time of final plat for further evaluation prior to ground disturbance.

403.09 Has available all necessary services, including fire and police protection, recreation facilities, utility services, streets, and open space to serve the proposed subdivision.
Staff Comment: The proposed subdivision will be served by South Metro Fire, the Douglas County Sheriff's Office, the Douglas County School District, CORE Electric Cooperative, Xcel Energy, Comcast and Centurylink. Public streets are proposed within the project. An approximately 1.5-acre public park is proposed along with approximately 60 acres of open space and a trail system. Any cash-in-lieu fees for school and park land dedication will be identified with the final plat and provided prior to plat recordation.

403.10 Does not interfere with the extraction of any known commercial mining deposit.
Staff Comment: There are no known significant mineral deposits on site per the Douglas County Minerals Extraction Master Plan.

IX. STAFF ASSESSMENT

Staff has evaluated the preliminary plan request in accordance with Article 4 of the DCSR. Should the Board find that the approval standards for the preliminary plan are met, the following proposed conditions should be considered for inclusion in the motion:

1. Prior to the Board's consideration of the first final plat, the applicant shall provide evidence of inclusion of the property in the Parker Water and Sanitation District.

2. Prior to the Board's consideration of the final plat, the applicant shall provide a Class II cultural resources survey for the property.

3. Prior to the Board's consideration of the final plat, a Location and Extent for the required off-site sewer improvements shall be submitted and approved.

4. During construction activity within the development, the applicant, its successors and assigns shall take all reasonable care to watch for historic

resources, paleontological resources, and other cultural history resources and shall immediately notify Douglas County and complete appropriate Colorado Office of Archaeology and Historic Preservation data management forms in the event of such discovery.

5. Technical corrections to the record copy of the preliminary plan exhibit shall be made to the satisfaction of Douglas County.

6. All commitments and promises made by the applicant or the applicant's representative during the public hearing and/or agreed to in writing and included in the public record have been relied upon by the Board of County Commissioners in approving the application, therefore such approval is conditioned upon the applicant's full satisfaction of all such commitments and promises.

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DOUGLAS COUNTY
COLORADO

Land Use Application

Please complete, sign, and date this application. Return it with the required items on the Submittal Checklist to planningsubmittals@douglas.co.us. Submittals may also be mailed or submitted in person to Planning Resources.

PROJECT INFORMATION

Project Type: Subdivision - Preliminary Plan

Marketing Name: Ramblewood

Presubmittal Review Project Number: PS2025-208

PROJECT SITE

Address: Two parcels south of Hilltop Road, directly south of the intersection of Hilltop Road and Merryvale Trail.

State Parcel Number(s): 2347-061-00-001 and 2347-063-00-001

Subdivision/Block#/Lot# *(if platted)*:

PROPERTY OWNER(S)

Name(s):	Hilltop Jam, LLC	Bradley A Whittlesey & Joan V Whittlesey
Address:	2554 Aspen Spring Drive, Park City, UT 84060	4700 E Princeton Ave, Englewood, CO 80113
Phone:	435-649-6686	720-205-6441
Email:	[redacted]	[redacted]

AUTHORIZED REPRESENTATIVE

Name: Dan Sheldon

Company: Miller United Real Estate

Address: 6900 E. Belleview Avenue, Suite 300, Greenwood Village, CO 80111

Phone: 303-886-2838

Email: [redacted]

A notarized Letter of Authorization is required from the property owner, unless the owner is acting as the representative.

ACKNOWLEDGMENT

To the best of my knowledge, the information contained on this application is true and correct. I have received the County's information sheet regarding the *Preble's Meadow Jumping Mouse*.

Daniel R. Sheldon — Applicant's Signature

10/8/25 — Date

NOTICE: Douglas County Planning does not charge "Approval" fees. Douglas County communicates through our official email accounts ending in @douglas.co.us; beware of phishing scams using similar addresses. If you have questions or concerns about the validity of an email or invoice, please call our public outreach and assistance team at 303-660-7460 or email planning@douglas.co.us.

Project Number (Office Use Only): SB2025-040

PREBLE'S MEADOW JUMPING MOUSE

What is the Preble's Meadow Jumping Mouse?

The Preble's Meadow Jumping Mouse is a rare mouse designated by the United States Fish and Wildlife Service as a "threatened species" under the Endangered Species Act. The federal threatened species designation prohibits the unlawful "take" of the Preble's Meadow Jumping Mouse or its habitat.

Where does the mouse live?

The Preble's Meadow Jumping Mouse lives primarily in heavily vegetated riparian habitats. In Douglas County, the mouse has been located in or near many drainages, including tributaries and the mainstream reaches of East and West Plum Creek. However, any stream reach or potential habitat within Douglas County may be subject to the requirements of the Endangered Species Act. The mouse has also been found in Boulder, Elbert, El Paso, Jefferson, and Larimer counties and in parts of Wyoming.

What activities may be considered a violation of the Endangered Species Act?

In its listing decision, the United States Fish and Wildlife Service identified activities that may result in violation of the Endangered Species Act to include:

- Unauthorized or unpermitted collection, handling, harassing, or taking of the species;
- Activities that directly or indirectly result in the actual death or injury death of the mouse, or that modify the known habitat of the species, thereby significantly modifying essential behavioral patterns (e.g., plowing, mowing, or cutting; conversion of wet meadow or riparian habitats to residential, commercial, industrial, recreational areas, or cropland; overgrazing; road and trail construction; water development or impoundment; mineral extraction or processing; off-highway vehicle use; and, hazardous material cleanup or bioremediation); and;
- The application or discharge of agrichemicals or other pollutants and pesticides onto plants, soil, ground water, or other surfaces in violation of label directions or any use following Service notification that such use, application or discharge is likely to harm the species; would be evidence of unauthorized use, application or discharge.

How to determine if a proposed activity would violate the Endangered Species Act.

Any questions regarding whether an activity will impact the Preble's Meadow Jumping Mouse or its habitat should be directed to:

Field Office Supervisor
USFWS Colorado ES Field Office (MS 65412)
Denver Federal Center
PO Box 25486
Denver, CO 80225-0486
303-236-4773
ColoradoES@fws.gov

Where to find more information on the Preble's Meadow Jumping Mouse.

More information from the US Fish and Wildlife Service can be found at: https://ecos.fws.gov/ecp/species/4090

Any approval given by Douglas County does not obviate the need to comply with applicable federal, state, or local laws and/or regulations.

NORRIS DESIGN
PEOPLE + PLACEMAKING
1101 Bannock Street
Denver, Colorado 80204
303.892.1166

January 29, 2026

Douglas County, Department of Community Development
100 Third Street, #220
Castle Rock, CO 80104

RE: APPLICATION FOR RAMBLEWOOD PRELIMINARY PLAN

Dear Douglas County Department of Community Development,

On behalf of Miller United, Norris Design is pleased to present the following proposal to plat 68 single-family residential lots and 2 agricultural lots on the subject property known as Ramblewood. The subject site is composed of two separate parcels of land: the 16.9-acre Hilltop JAM LLC Parcel (County Parcel #: 2347-061-00-001) and the 159.2-acre Whittlesey Parcel (County Parcel #: 2347-063-00-001) (collectively the "Site"). The two parcels were recently rezoned as the Ramblewood Planned Development (Reception #2025045524) on September 26, 2025. The site is bordered by Hilltop Road to the north, Alpine Drive to the southwest, and residential homes to the west, east, and southeast.

PROJECT TEAM

Owner:
Hilltop JAM LLC
2554 Aspen Springs Drive
Park City, UT 84060
435.649.6686
Contact: James Helfand
jahapc@yahoo.com

Applicant:
Miller United Real Estate, LLC
6900 E. Belleview Avenue, Suite 300
Greenwood Village, CO 80111
303.886.2838
Contact: Dan Sheldon
dsheldon@miller-united.com

Civil Engineer/Surveyor:
LJA Engineering
1765 West 121st Avenue, Suite 300
Westminster, CO 80234
303.421.4224
Contact: Kevin Lovelace, PE
klovelace@lja.com

Owner:
Bradley A. Whittlesey & Joan V. Whittlesey
4700 E Princeton Ave
Englewood, CO 80113
720.205.6441
Contact: Brad Whittlesey
Brad.whittlesey@gmail.com

Planner and Landscape Architect:
Norris Design
1101 Bannock Street
Denver, Colorado 80204
303.892.1166
Contact: Sarah Tengen
stengen@norris-design.com

Traffic Engineer:
SM Rocha, LLC
8700 Turnpike Drive, Suite 240
Westminster, Colorado 80031
303.458.9798 Ext. 106
Contact: Stephen Simon
stephen@smrocha.com

BACKGROUND

The Hilltop JAM LLC Parcel, located in the east half of Section 6, Township 7 South, Range 65 West of the 6th principal meridian, County of Douglas, State of Colorado, lies vacant of structures and paved roads. Directly adjacent to the south lies the Whittlesey Parcel, located in the southwest quarter and the southeast quarter of Section 6, Township 7 South, Range 65 West of the 6th principal meridian, County of Douglas, State of Colorado, and is additionally vacant of any structures and paved roads.

The intent of the proposed Preliminary Plan is to plat the Hilltop JAM LLC Parcel and Whittlesey Parcel as one property with 68 clustered single-family residential lots and 2 agricultural, or ranch lots, resulting in an overall site density of 0.39 dwelling units per acre. Both parcels were recently rezoned under the Ramblewood PD (Reception #2025045524) which requires a maximum site density of 0.39 dwelling units per acre. The Hilltop JAM LLC Parcel lies within Planning Area A and is zoned single-family residential with a maximum density of 0.88 dwelling units per acre. The Whittlesey Parcel lies within Planning Areas A, B, and C. The majority of the Whittlesey Parcel lies within Planning Area B and is zoned agricultural with a maximum density of 0.02 dwelling units per acre.

The focus of this application is establishing single-family residential cluster lots within Planning Area A, establishing the two ranch lots of Planning Area B, and the provision of related infrastructure in one phase.

PROJECT DESCRIPTION

The Preliminary Plan proposes primary access (Street A) to be achieved from Hilltop Road to the north with secondary access from Alpine Drive to the south. While Hilltop Road improvements are to be wholly completed by Douglas County as part of its Hilltop Road Improvements Project, the improvements to the intersection of Street A and Hilltop Road shall be the responsibility of the property owners and their assigns. All right-of-way for the County's Hilltop Road Improvements Project has already been provided by the Owner. The Site will be connected by a network of streets with a detached walk on one side providing pedestrian circulation. A proposed trail network provides recreational opportunities and additional connectivity to site amenities including the mail kiosk, ponds, parks, open space, and view corridors. Streets B and C intersect Street A and provide access to the single-family lots proposed on the northern half of the site. Street D intersects Street A by following the natural ridgeline and existing dirt road where possible, to support secondary access. Cul-de-sacs are proposed to allow the street network to work with the natural grade and minimize disturbance of the land while providing safe and effective circulation. Fire hydrants shall be provided along Streets A, B, and C to serve the Site and surrounding neighborhoods. Although not required, a fire vehicle turnaround and fire hydrant will be provided along Street D which will support fire life safety measures both on Site and in the surrounding area. All proposed roadways will be owned and maintained by Douglas County.

As the Site abuts Hilltop Road, which is a Major Arterial, a Sound Study has been included with this application. A Traffic Impact Study is also included with this application. At the time of the recordation of the Final Plat, the owners and their assigns shall be responsible for their fair share contribution towards the paving of Alpine Drive pursuant to the agreed upon amount contained in the recorded Ramblewood Planned Development. The owners and their assigns shall also dedicate 80 feet of public right-of-way for Alpine Drive.

The proposed single-family residential lots have been designed to minimize development impact to the site and its adjacent communities. The 68 lots are clustered to the northern half of the Site with large open space buffers. These lots comply with the density (0.88 du/ac), boundary, use, and standards of Planning Area A as stated in the Ramblewood PD. The 2 ranch lots comply with the density (0.02 du/ac), boundary, use and standards of Planning Area B as stated in the Ramblewood

PD. The overall site density (0.39 du/ac) is consistent with both the Ramblewood PD and CMP Northeast Subarea.

The proposed Preliminary Plan includes park space, trails, and roughly 60 acres of open space; more than a third of the Site. The park is an approximately 1.5-acre public park to be owned and maintained by the previously approved Ramblewood Metropolitan District. Local and Regional Park and Trail dedication requirements shall meet the criteria provided in Article 10, Section 1003.11.1, 1003.11.2,1003.11.3, and 1003.11.4 of the Douglas County Subdivision Resolution, as amended. All trails will be owned and maintained by the Ramblewood Metropolitan District.

Utilities including water, storm sewer, and sanitary sewer shall be provided to the lots via underground lines and routes designed in compliance with Douglas County Engineering Standards. Two detention ponds shall be provided on site – one south of Hilltop Road, north of Street B and one south of Street B, north of the ranch lots.

PROVISION OF SERVICES

Metro District

The Ramblewood Metropolitan District was approved with the PD and shall be responsible for the provision of many of the Site services.

Schools

The Douglas County School District has provided a Will Serve Letter for the development. As the land dedication requirement anticipated from the Student Generation is smaller than the District's minimum school site requirement, the School District has requested cash-in-lieu of land dedication to be paid pursuant to a separate agreement with the Douglas County School District. The Applicant has engaged an appraisal of the Property and will negotiate directly with the School District the amount of the cash-in-lieu of land dedication which shall be paid at the time of recordation of the final plat.

Fire Protection Service

As the Site is located within the jurisdictional boundaries of South Metro Fire Rescue, the Fire District will provide fire prevention, fire suppression, emergency medical, and special team response services to the property. The applicant has provided a Will Serve Letter from South Metro Rescue and a Wildfire Mitigation Plan with this application.

Water and Sanitation

Parker Water and Sanitation District (PWSD) has provided a Will Serve Letter describing its willingness and ability to serve the development. Central Water will be provided to all lots through an Inclusion Agreement with Parker Water and Sanitation District. Additionally, through the Inclusion Agreement, Central Sewer will be provided to the 68 clustered lots, while the owner of the 2 ranch lots will have the option to connect to PWSD or handle sewer by Onsite Wastewater Treatment Systems (OWTS). The project team is currently working on achieving agreements for a gravity sewer outfall to the Pinery Water & Wastewater District (via an agreement with PWSD) whereby Pinery Water & Wastewater District (PWWD) would be the wholesale provider of sanitary sewer, and Parker Water & Sanitation District would be the retail provider. By making these agreements with PWWD and PWSD, we are able to eliminate the need for a lift station facility. This

approach has been discussed at length with both PWSD and PWWD, with both entities in full support.

The project team is currently in the process of finalizing the Inclusion Agreement with PWSD. Pursuant to Section 406.07 of the Douglas County Subdivision Resolution, the Director of Community Development granted a deferral of the submittal of evidence of inclusion at the time of Preliminary Plan on the condition that such evidence be submitted prior to consideration of the Final Plat application by the Board of County Commissioners. The execution of the Inclusion Agreement and associated Intergovernmental Agreement between the Ramblewood Metropolitan District, PWSD, and PWWD are currently underway and will be completed prior to Final Plat approval.

PHYSICAL SITE CONSIDERATIONS

Site Characteristics and Constraints

The northernmost portion of the Site is generally sloped to the north, towards Hilltop Road. The rest of the Site has varying topography, but it is generally sloped to the south, towards Alpine Drive.

Soils and Geology

A Soil Study and Geological Hazard Report has been included with this application.

Floodplain and Drainage

Although a small portion of the southern half of the Site is located within a floodplain, it is intended that the floodplain be left undisturbed. A Phase II Drainage Report is included with the Preliminary Plan application. Detention ponds are proposed with this application.

Wildlife

The CMP Wildlife Resources Map identifies the Site as having a low habitat value. No environmentally hazardous, sensitive, or natural resource areas are found on the Site. An Ecological Resources Survey of the Site was performed at the time of the rezoning and concluded that no threatened or endangered species or their obvious habitat were seen on the property.

A Cultural Resources Survey is included with this application and identifies no findings on-site, therefore no mitigation is required.

It is worth reiterating that the Preliminary Plan proposes a design aligned with the standards and buffers of the Ramblewood PD, limiting the development disturbance on the Site, retaining significant open space, and allowing much of the natural environment to remain undisturbed.

COMPLIANCE WITH THE DOUGLAS COUNTY COMPREHENSIVE MASTER PLAN (CMP)

Under the Douglas County Comprehensive Master Plan, the Site is identified within the Northeast Subarea and classified under Section 3 – Nonurban Land Use. The proposed development complies with several objectives and policies of the Comprehensive Master Plan, notably:

- Policy 3-1E.1: *Identify and set aside, through the land use and development review processes, important open spaces in tracts or easements, where appropriate.*

- The Preliminary Plan proposes a layout of clustered lots which allows significant open space buffers along the project's edge. The Ramblewood PD established the open space buffers of Planning Area D and Planning Area E. The Preliminary Plan adds additional open space buffer by proposing additional open space between the single-family lots and these Planning Areas. Planning Area D established an open space buffer of 300 ft along the site's western edge. The proposed plan adds over 100 ft of additional open space buffer between Planning Area D and the nearest single-family lot line. Planning Area E established an open space buffer of 200 ft along the site's eastern edge. The proposed plan adds over 50 ft of additional open space buffer between Planning Area E and the nearest single-family lot line. The result is a plan which provides even more open space buffer from adjacent residential properties than is required by the zoning to ensure that the site is developed in thoughtful, context sensitive manner.

- Objective 3-2A: *Ensure the character and intensity of development is appropriate for the Nonurban Area.*
  - The Preliminary Plan proposes residential development with a gross density of one dwelling unit per 2.5 acres complying with the maximum allowable density of the Northeast Subarea, one dwelling unit per 2.5 acres. The proposed density is also consistent with adjacent parcels zoned Estate Residential directly to the east and south of the property. Open space is incorporated throughout the plan to conserve the natural character of the Site. The plan provides open space buffers along the Site's boundaries, which surpass the requirements of the PD for buffers from Hilltop Road and neighboring property lines.

- Policy 3-2A.2: *Where possible, fencing should be wildlife friendly, in accordance with standards recommended by the Colorado Division of Wildlife.*
  - Per a commitment of the approved PD, wildlife friendly fencing shall be provided adjacent to open spaces in Planning Area A at the time of construction.

- Objective 3-2B: *Design development to conserve and showcase important natural and rural features.*
  - The proposed Preliminary Plan conserves natural Site features by clustering 68 of the proposed 70 lots to the northern half of the Site. The clustered lots ensure preservation of important natural features along the Site's edge and accommodation of significant open space to reinforce the area's rural character. Clustering lots ensures minimal natural land is disturbed. The proposed 2 ranch lots in the southern half of the Site support rural features commonly found in Douglas County.

- Policy 3-2B.1: *Use building envelopes, clustering, and other site design techniques, where appropriate, to direct building away from environmentally and visually sensitive lands.*
  - The proposed Preliminary Plan proposes clustering lots with significant open space buffers along the site's edges to direct building away from environmentally and visually sensitive lands.

- Policy 3-2D.1: *Require the provision of open space and trail corridors within residential development to promote recreation and exercise opportunities.*
    - The proposed Preliminary Plan provides roughly 60 acres of open space and trail corridors to provide future residents with recreation and exercise opportunities.

- Objective 3-2D: *Encourage Rural development that supports healthy communities.*
    - The proposed Preliminary Plan includes approximately 60 acres of open space and a trail network to encourage human interaction with nature. A public park is provided central to the clustered lots.

- Policy 3-2D.3: *Develop local trail systems and a regional, interconnected system of multi-use trails that link communities, recreation areas, open space, neighborhood trails, and trail systems, including those outside of Douglas County.*
    - The proposed Preliminary Plan includes public trails linking the community to recreation areas, open space, and programmed park area.

- Policy 3-3E.1: *A maximum gross density of one dwelling unit per 2.5 acres is supported in the Northeast Subarea where it is logical infill, where approximately 50 percent of the property boundary is adjacent to zoned lands or parcel sizes consistent with the proposed development, and where site characteristics can generally support it.*
    - The proposed Preliminary Plan meets the maximum gross density of one dwelling unit per 2.5 acres as supported in the Northeast Subarea. The Preliminary Plan establishes single-family residential and agricultural lots which are consistent with the existing uses of all properties adjacent to the Site.
    -
- Policy 3-3E.2: *A maximum gross density of one dwelling unit per 2.5 acres is supported in the Northeast Subarea where there is adequate public infrastructure to support the proposed development and where the other goals, objectives, and policies of the Plan have been met.*
    - Adequate public infrastructure is available to support the proposed Preliminary Plan. A Traffic Impact Study, as well as Will Serve letters from the Douglas County School District, South Metro Fire and Rescue, and Parker Water and Sanitation are included with this application. The Preliminary Plan outlines the commitment to Public Land Dedication that will be assessed pursuant to agreements with the providers.

- Policy 3-3E.3: *Encourage connections to central water and sewer district systems, when possible.*
    - Central Water will be provided to all lots per an Inclusion Agreement with Parker Water and Sanitation District. Additionally, Central Sewer will be provided to the 68 clustered lots, while the owner of the 2 ranch lots will have the option to connect to PWSD or handle sewer by Onsite Wastewater Treatment Systems (OWTS).

- Policy 3-3E.5: *New development within the Northeast Subarea should be designed to minimize the removal of vegetation and to use trees and landforms to screen development, where possible. Additional trees and vegetation should be planted, where necessary and appropriate, to screen development.*

- To minimize removal of vegetation, the Preliminary Plan proposes majority of the lots to be clustered in the northern half of the site with ample open space buffers to Hilltop Road and the adjacent communities.

- Policy 3-3E.6: *Maintain natural drainages for wildlife movement, where possible, and provide open space linkages within and between large-lot developments.*
  - Recognizing the sensitivity of adjacent properties, the proposed Preliminary Plan builds from the commitments to open space buffers along the Site's edges adjacent to large-lot developments, as written in the Ramblewood PD, and will provide wildlife friendly fencing where applicable at construction.

- Policy 3-3E.7: *Development along existing roads in the Northeast Subarea should be carefully sited and designed to minimize visual impacts, particularly of distant Front Range Mountain views and open meadows.*
  - While primary access to the Site is proposed from Hilltop Road, the proposed Plan does not include lots within 200' of Hilltop Road to ensure a visually appealing front door, respecting the views of homes located across Hilltop Road to the north. It should also be noted that the lots closest to Hilltop Road are oriented so that future homes will be front facing Hilltop Road, providing a more visually pleasing view from the north.

COMPLIANCE WITH THE DOUGLAS COUNTY SUBDIVISION RESOLUTION (DCSR)

Douglas County Subdivision Resolution – Section 403

A Preliminary Plan application is processed pursuant to Article 4 of the Douglas County Subdivision Resolution (DCSR). Per DCSR Section 403, *A preliminary plan may be approved upon the finding by the Board that the preliminary plan:*

- *403.01 Conforms with the goals, objectives, and policies of the Master Plan.*
  - As evidenced in the section above, the Ramblewood Preliminary Plan conforms with the goals, objectives, and policies of the Douglas County Comprehensive Master Plan.

- *403.02 Addresses the design elements established in Article 4, Section 404.*
  - *404.01 Lots are of an appropriate size and configuration for the site's characteristics and intended uses, and otherwise capable of meeting minimum zone district standards such as lot size, setbacks, and off-street parking.*
    - The proposed lots are of an appropriate size and configuration for the site's characteristics and intended uses and are in compliance with the standards of the Ramblewood PD

  - *404.02 Geologic hazards, floodplains, wildfire, or other hazardous conditions are mitigated and avoided.*
    - No geologic hazards or other hazardous conditions are identified. Although a small portion of the southern half of the Site is located within a floodplain, it is intended that the floodplain be left undisturbed. A Wildfire Mitigation Plan is included with this application.

- *404.03 Conflicts between proposed and surrounding land uses are minimized through lot and tract orientation, setbacks, landscaping, or other buffering techniques.*
  - Ramblewood lot sizes were designed with open space buffers and respect to the natural environment in mind. Clustering lots mitigates disturbance of existing vegetation and provides greater buffers to adjacent lots. The plan exceeds the open space commitments and setback requirements of the Ramblewood PD. The proposed Preliminary Plan provides roughly 60 acres of open space and trail corridors to provide future residents with recreation and exercise opportunities. The proposed Preliminary Plan meets the maximum gross density of one dwelling unit per 2.5 acres as supported in the Northeast Subarea. The Preliminary Plan establishes single-family residential and agricultural lots which are consistent with the existing uses of all properties adjacent to the Site.

- *404.04 Streets and stormwater facilities are laid out with the ability to meet the Douglas County Roadway Design and Construction Standards, Storm Drainage Design and Technical Criteria Manual, and other applicable County regulations.*
  - Streets and stormwater facilities are laid out in compliance with the applicable County regulations.

- *404.05 Elements of the site's natural terrain, drainageways, riparian areas, and vegetation are preserved or integrated into the subdivision layout.*
  - The subdivision is laid out in a manner which respects the natural features of the site and preserves the site's natural terrain, existing drainageways, riparian areas, and vegetation as much as possible.

- *404.06 Archeological and historical resources of special significance are protected.*
  - A Cultural Resources Survey is included with this application and identifies no findings on-site, therefore no mitigation is required.

- *404.07 Opportunities for safe and convenient vehicular, pedestrian, and other connections within the subdivision and adjacent neighborhoods, shopping, employment, and recreational areas are provided.*
  - The proposed streets and trail network offer future residents safe and convenient vehicular and pedestrian connections within the subdivision including connections to the centrally located public park. The subdivision's location along Hilltop Road offers future residents vehicular connections to the range of shopping, employment, and recreational areas in the nearby Town of Parker and the other surrounding areas.

- *404.08 Specific recommendations of other required development reports or technical studies are implemented.*
  - The Preliminary Plan application includes the following required development reports:
    - Soil Suitability and Geological Hazard Report
    - Phase II Drainage Report

- Traffic Impact Study
- Cultural, Historic, and Archeological Resources Report
- Wildfire Mitigation Plan
- Sound Study

- *403.03 Conforms with Section 18A, Water Supply - Overlay District, of the Zoning Resolution.*
    - A Will Serve letter from Parker Water and Sanitation District (PWSD) is included with this application. The project team is currently in the process of finalizing the Inclusion Agreement with PWSD. Pursuant to Section 406.07 of the Douglas County Subdivision Resolution, the Director of Community Development granted a deferral of the submittal of evidence of inclusion at the time of Preliminary Plan on the condition that such evidence be submitted prior to consideration of the Final Plat application by the Board of County Commissioners. The execution of the Inclusion Agreement is currently underway and will be completed prior to Final Plat approval.

- *403.04 Provides for a public wastewater collection and treatment system and, if other methods of wastewater collection and treatment are proposed, such systems comply with State and local laws and regulations.*
    - Public wastewater collection and treatment for the 68 single-family detached lots shall be provided by Parker Water and Sanitation District (through the Pinery Water & Wastewater District as the wholesale provider), following inclusion into the district. Additionally, through the Inclusion Agreement, Central Sewer will be provided to the 68 clustered lots, while the owner of the 2 ranch lots will have the option to connect to PWSD or handle sewer by Onsite Wastewater Treatment Systems (OWTS).

- *403.05 Identifies all areas of the proposed subdivision, which may involve soil or topographical conditions presenting hazards or requiring special precautions and the proposed uses of these areas are compatible with such conditions.*
    - A Soil Suitability and Geological Hazard Report has been included with this application in compliance with Sections 408.02 and 408.03.

- *403.06 Provides adequate drainage improvements.*
    - Detention is provided in accordance with current stormwater management practices as required by Douglas County Storm Drainage and Technical Criteria Manual. A Phase II Drainage Report is included with this application.

- *403.07 Provides adequate transportation improvements.*
    - The necessary road improvements are provided to access the neighborhood, provide circulation, and provide secondary, emergency access to Ramblewood as well as the surrounding community.

- *403.08 Protects significant cultural, archaeological, natural, and historical resources and unique landforms.*
    - No cultural, archaeological, natural or historical resources and unique landforms were identified on the project site, as documented in the Ecological Resources Survey

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1101 Bannock Street
Denver, Colorado 80204
303.892.1166

conducted with the rezoning application and the Cultural Resources Survey conducted with this application.

- *<u>403.09</u> Has available all necessary services, including fire and police protection, recreation facilities, utility services, streets, and open space to serve the proposed subdivision.*
    - The proposed application has all available services, including fire and police protection, utility services, street maintenance, recreation facilities, and open spaces needed to serve future residents. Applicable will serve letters are included in this submittal.
        - Although not required for this Preliminary Plan, a fire truck turnaround shall be provided to serve Ramblewood and provide fire mitigation infrastructure to the benefit of the surrounding area. Fire hydrants located throughout the development will serve the Site and also support fire life safety measures for the surrounding communities.
        - A Public Park shall be programmed and designed in accordance with the neighborhood character and needs of future residents.
        - Trails will connect open space to the proposed public park and vice versa.
        - Streets have been designed with minimal impact to the natural grade of the Site and provided only where necessary for safety and circulation.

- *<u>403.10</u> Does not interfere with the extraction of any known commercial mining deposit.*
    - No known mining deposits have been identified. As such, this project does not interfere with any mining extractions.

We believe the proposed Preliminary Plan advances the County's goals and objectives for this particular property through an appropriate infill of homes designed to fit in, not stand out, in respect to the established neighborhoods the Site lies between. The proposed Preliminary Plan complies with the Ramblewood PD, proposing single-family residential in the northern half of the Site with large open space buffers and agricultural uses in the southern half of the Site.

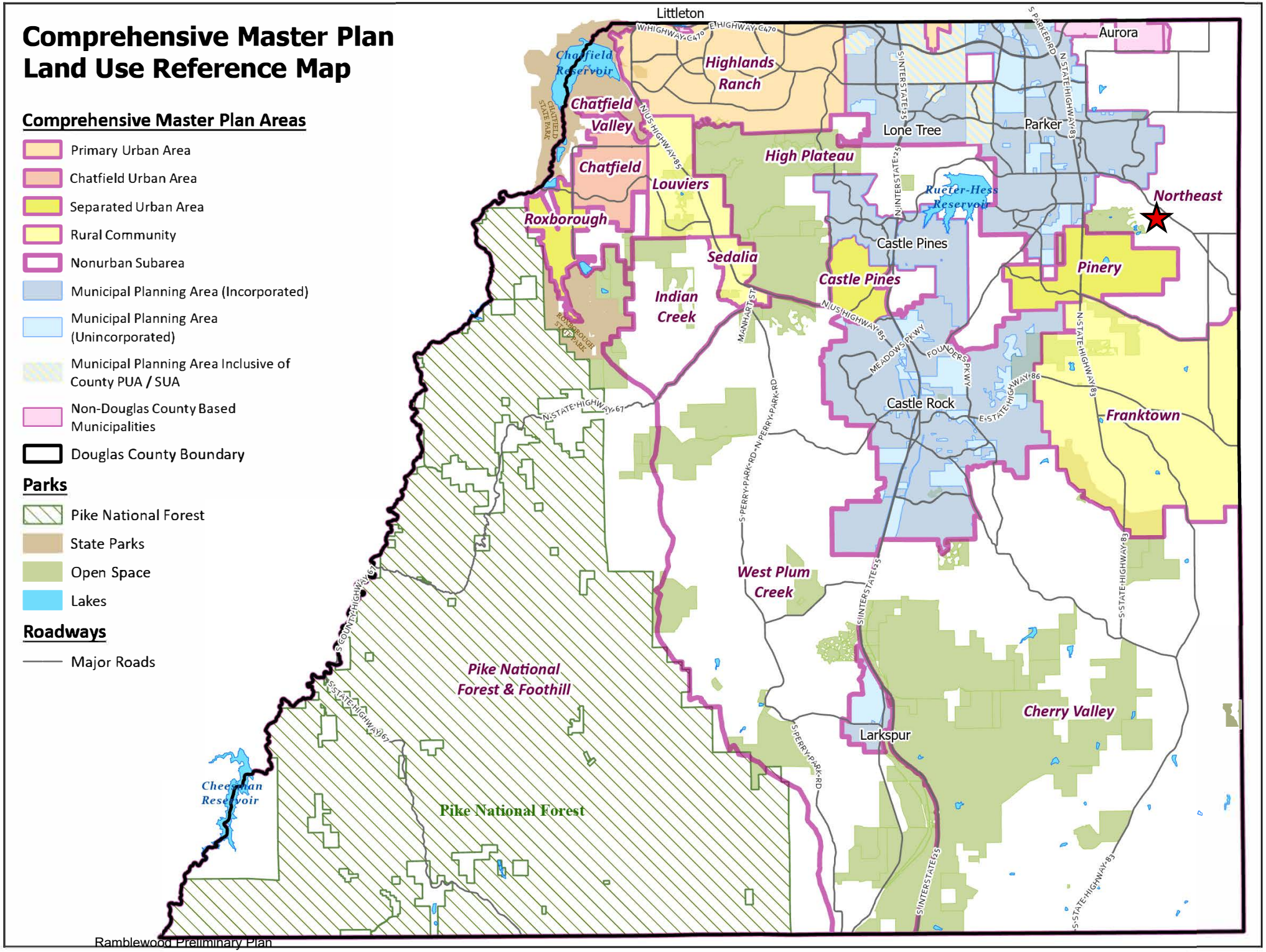
Our team looks forward to continuing our work with Douglas County throughout the review process for this Preliminary Plan. Please contact me at stengen@norris-design.com or 303.892.1166 should you have any questions or concerns.

Thank you,

Sarah Tengen

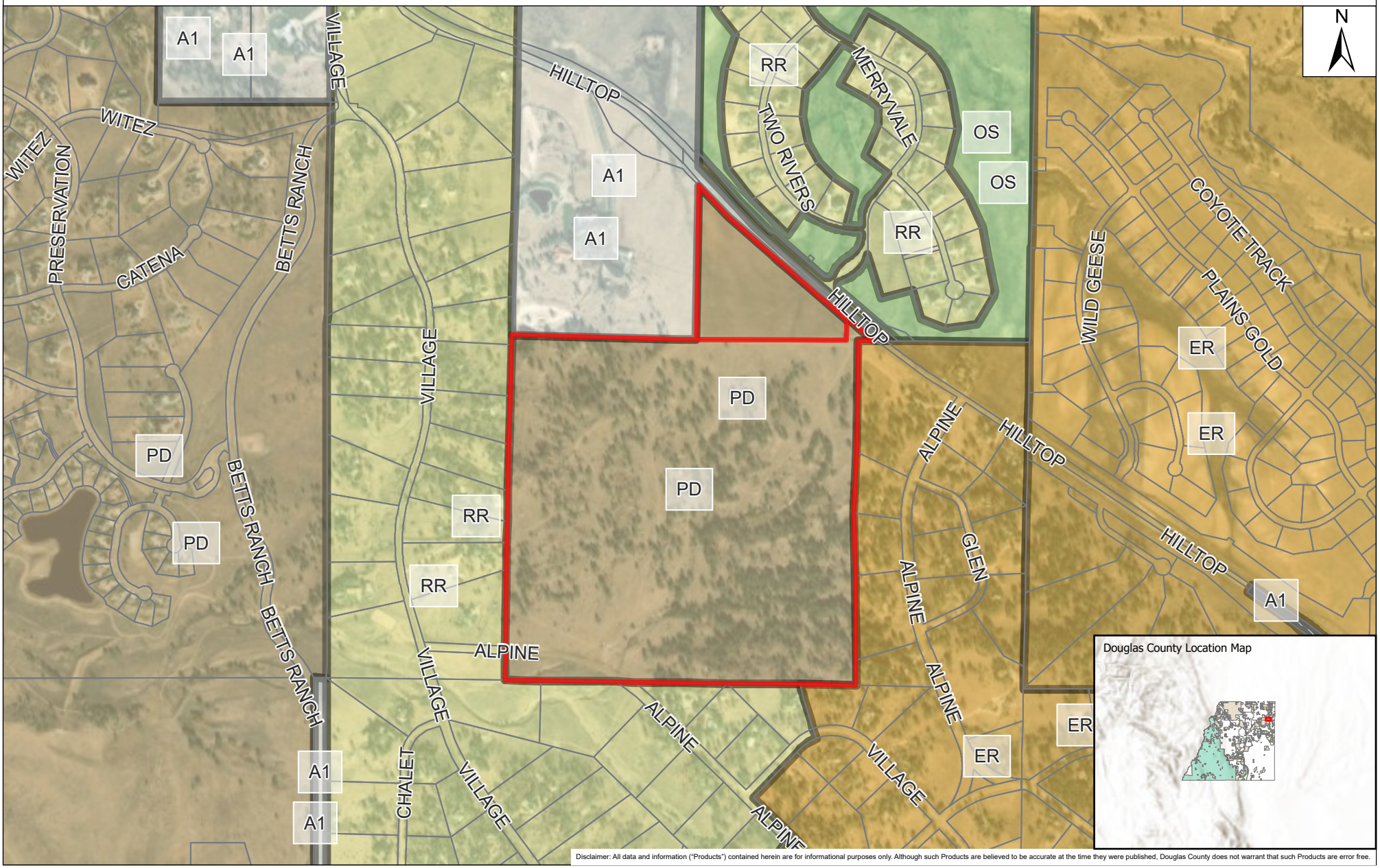
Sarah Tengen
Planner

Comprehensive Master Plan Land Use Reference Map



SB2025-040 Ramblewood Preliminary Plan

DOUGLAS COUNTY
COLORADO



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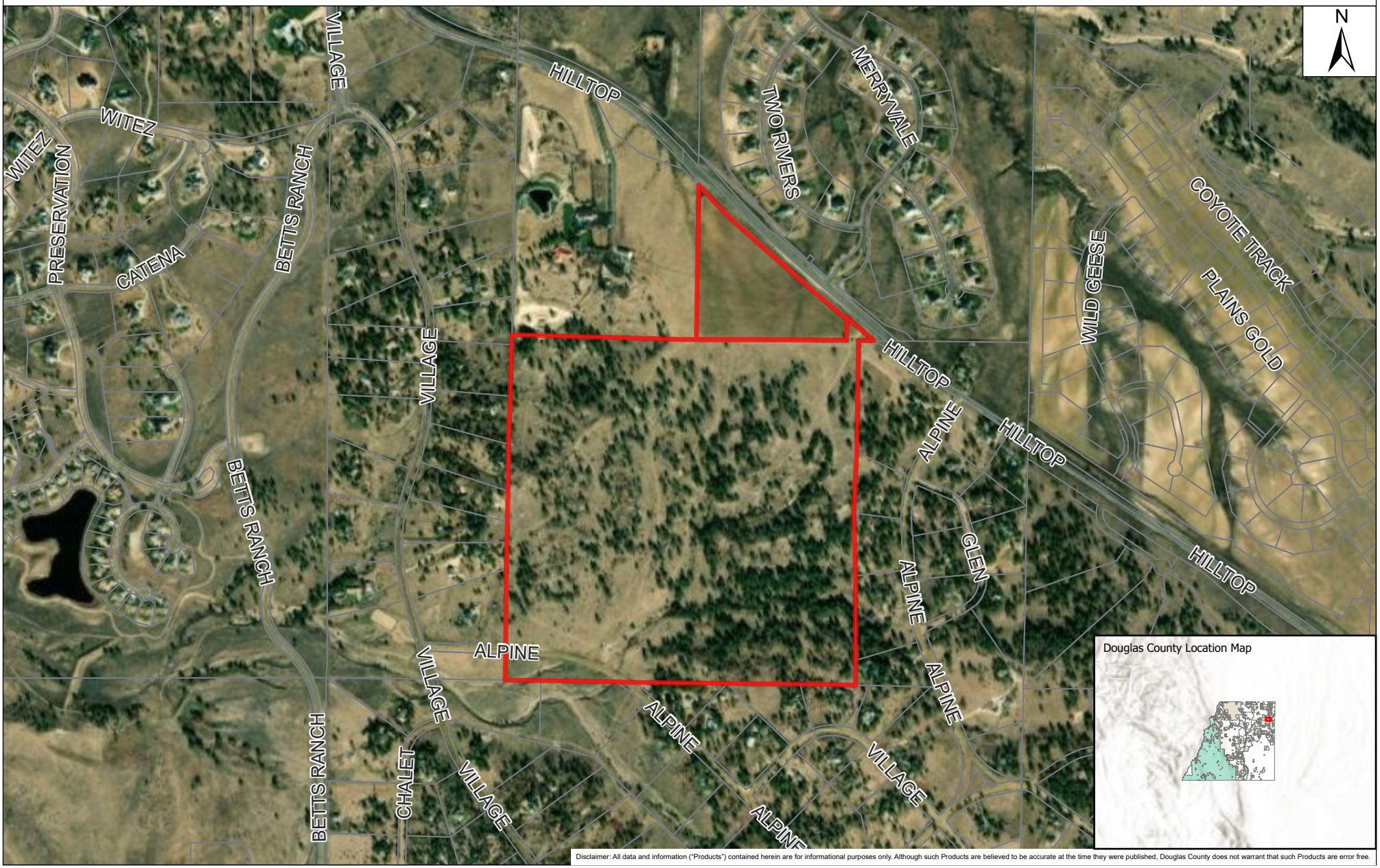
PD - PLANNED DEVELOPMENT
OS - OPEN SPACE CONSERVATION
PARCELS
A1 - AGRICULTURAL ONE
RR - RURAL RESIDENTIAL
ER - ESTATE RESIDENTIAL

SB2025-040 Ramblewood Preliminary Plan

DOUGLAS COUNTY
COLORADO



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PD - PLANNED DEVELOPMENT
OS - OPEN SPACE CONSERVATION
PARCELS
A1 - AGRICULTURAL ONE
RR - RURAL RESIDENTIAL
ER - ESTATE RESIDENTIAL

Project Name: Ramblewood Preliminary Plan
Project File #: SB2025-040
Date Sent: 11/14/2025 **Date Due:** 12/09/2025

Agency	Date Received	Agency Response	Response Resolution
Addressing Analyst	11/14/2025	Received: Please propose street names to be placed on the final plat. Douglas County will evaluate and confirm approval or denial of proposed street names. Contact DCAddressing@douglas.co.us or 303.660.7411 with questions.	Applicant proposed preliminary street names that have been accepted by addressing.
AT&T Long Distance - ROW	11/21/2025	Received: Excerpt of referral comments: No conflicts	No response necessary
Building Services	11/20/2025	No Comment:	No response necessary
CenturyLink		No Response Received:	No response necessary
Cherry Creek Basin Water Quality Authority	11/19/2025	Received: The Cherry Creek Basin Water Quality Authority (Authority) acknowledges notification from Douglas County that the proposed development plans for SB2025-040, Ramblewood Preliminary Plan have been or will be reviewed by Douglas County for compliance with the applicable Regulation 72 construction and post-construction requirements. Based on the Authority's current policy, the Authority will no longer routinely conduct a technical review and instead the Authority will defer to Douglas County's review and ultimate determination that the proposed development plans comply with Regulation 72. If a technical review of the proposed development plan is needed, please contact LandUseReferral@ccbwqa.org. The review may include consultation with the Authority's Technical Manager to address specific questions or to conduct a more detailed Land Use Review, if warranted.	No response necessary. CCBWQA defers to Douglas County Public Works determines compliance with applicable State water quality regulations.

Project Name: Ramblewood Preliminary Plan
Project File #: SB2025-040
Date Sent: 11/14/2025 **Date Due:** 12/09/2025

Agency	Date Received	Agency Response	Response Resolution
Colorado Division of Water Resources	12/05/2025	Received: Based on our review, there have been no changes to the demands or proposed water supply source for the Ramblewood Subdivision. Attached are letters dated April 8, 2025 and May 12, 2025 that were previously sent by our office during the review of ZR2024-031. The May 12, 2025 letter provided an opinion that the water supply for the subdivision is adequate and can be provided without causing injury to decreed water rights, so long as the District is committed to serving the 68 lots.	No response necessary
Colorado Geological Survey	12/08/2025	Received: No unusual geologic conditions or geotechnical constraints are present within the proposed Ramblewood subdivision area (approximate location 39.4674, -104.7087) that would preclude the proposed residential use and density. CGS therefore has no objection to approval of SB2025-040. AGW's Geotechnical Due Diligence Study, Hilltop 177, Douglas County, Colorado (AGW Project No. 245004, October 9, 2024) contains a valid preliminary characterization of subsurface conditions and makes appropriate preliminary recommendations for mitigating, through overexcavation and replacement as a properly placed and compacted structural fill, the site's expansive soils and shallow, expansive claystone bedrock. CGS agrees (page 4) that "overexcavation depths between 10 and 12 feet below lowest foundation elevation should be expected." Jill Carlson, Engineering geologist, Colorado Geological Survey, carlson@mines.edu	No response necessary

Project Name: Ramblewood Preliminary Plan
Project File #: SB2025-040
Date Sent: 11/14/2025 **Date Due:** 12/09/2025

Agency	Date Received	Agency Response	Response Resolution
Colorado Parks and Wildlife (East DC - Dist 549)		No Response Received:	No response necessary
Comcast		No Response Received:	No response necessary

CORE Electric Cooperative	12/09/2025	Received: Comments and Requirements Grading Within Utility Easements 1. The grade within CORE's 15-foot utility easement must not exceed 15% slope. 2. Drainage grading along Hilltop Road must be revised to ensure no drainage swale or channel is created within the 15-foot utility easement, as this would limit CORE's ability to access and maintain underground electric facilities. Electric Service Extension CORE Electric Cooperative will need to extend electric facilities to the development to provide service. The developer will be responsible for all costs associated with the extension of offsite electric facilities. The developer must coordinate with CORE for trenching, conduit installation, and equipment placement in accordance with CORE's construction standards. Please ensure these requirements are incorporated into the final design and construction plans. Failure to comply may result in delays in providing electric service to the development UPDATE 01/16/2026: CORE Electric Cooperative approves the Preliminary Plan, and our comments have been addressed by the applicant. Please be aware of CORE will require the following language be added to the plat notes. No improvements that conflict with or interfere with construction, maintenance or access to utilities shall be placed within the utility	Applicant addressed CORE's concerns and acknowledged requested notes for final plat. Applicant will be responsible for all costs associated with the extension of offsite electric facilities.

Agency	Date Received	Agency Response	Response Resolution
		easements. Prohibited improvements include, but are not limited to, permanent structures, buildings, counter-forts, decks, attached porches, attached stairs, window wells, air conditioning units, retaining walls/components and other objects that may interfere with the utility facilities or access, use and maintenance thereof. . The utility easements as shown hereon are hereby dedicated for public utilities, cable communication systems fiber and other purposes as shown hereon. The entities responsible for providing the utility services for which the easements are established are hereby granted the perpetual right of ingress and egress from and to adjacent properties for installation, maintenance and replacement of utility lines and related facilities.	
Crest View Estates HOA		No Response Received:	No response necessary
Douglas County Conservation District	12/09/2025	Received: Please see attached comments.	
Douglas County Health Department	12/08/2025	Received: A will-serve letter has been provided by Parker Water & Sanitation District. Based on this letter, DCHD is providing a favorable recommendation regarding the proposed method of water service and sewage disposal.	No response necessary
Douglas County Historic Preservation	12/05/2025	Received: Please see attached comments. Summary: No further recommendations at this time. A Class II survey is needed prior to ground disturbance.	Applicant acknowledged future requirements. A Class II survey will be provided and reviewed at final plat.
Douglas County Parks and Trails	12/03/2025	Received: This applicant would be responsible for park dedication requirements outlined in Article 10 of the Douglas County Subdivision Resolution.	Applicant acknowledged requirements and will provide required cash-in-lieu prior to recordation of final plat.

Project Name: Ramblewood Preliminary Plan
Project File #: SB2025-040
Date Sent: 11/14/2025 **Date Due:** 12/09/2025

Agency	Date Received	Agency Response	Response Resolution
Douglas County School District RE 1	12/09/2025	Received: See attached letter Summary: DCSD requested cash-in-lieu of 1.579 acres of land dedication	Applicant acknowledged requirements and will provide required cash-in-lieu prior to recordation of final plat.
Engineering Services	12/08/2025	Received: See attached comments Summary: Provided comments regarding roadway standards and plan notes. UPDATE 01/20/2026: Our comments have been addressed.	All comments have been addressed.
Hidden Village POA		No Response Received:	
Mile High Flood District	12/09/2025	Received: This letter is in response to the request for our comments concerning the referenced project. We have reviewed this referral only as it relates to an MHFD drainageway and for maintenance eligibility of storm drainage features, in this case: - Pond B Outfall to Kinney Creek Tributary MHFD comments 1. We would like to review the stream corridor and design with future submittals We have no objections to the referenced project at this time. We appreciate the opportunity to review this application and look forward to reviewing future submittals.	The final plat application will be referred to MHFD as requested.
Office of Emergency Management	11/17/2025	Received: Inclusion of the secondary access/egress road connecting to Alpine Dr is a critical component of this project. This will provide residents with primary and secondary evacuation routes, helping this community be well-prepared for disasters.	No response necessary
Open Space and Natural Resources		No Response Received:	No response necessary

Project Name: Ramblewood Preliminary Plan
Project File #: SB2025-040
Date Sent: 11/14/2025 **Date Due:** 12/09/2025

Agency	Date Received	Agency Response	Response Resolution
Parker Water & Sanitation District	11/17/2025	Received: Please note PWSD has not received the formal inclusion application letter from Ramblewood. PWSD will not be able to comment on this project until application is completed and sent to PWSD.	Applicant has initiated the inclusion process and will submit the executed agreement prior to consideration of final plat.
Pinery Water and Wastewater District		No Response Received:	No response necessary
Rural Water Authority of Douglas County		No Response Received:	No response necessary
Sheriff's Office	12/04/2025	Received: No concern from DCSO traffic.	No response necessary
Sheriff's Office E911		No Response Received:	No response necessary
South Metro Fire Rescue	12/02/2025	Received: South Metro Fire Rescue (SMFR) has reviewed the provided documents. Revisions are required prior to approval of the preliminary plan. See attached letter for comments to be addressed.Summary: All 70 lots should be served by central water. Comments regarding fire turnaround standards and grading. UPDATE 01/23/2026: South Metro Fire Rescue (SMFR) has reviewed the provided revised response documents addressing the original SMFR comments. SMFR has no objection to the proposed preliminary plan based upon these updated documents and responses provided. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project.	All lots will be served by central water. Turnaround revised. All comments addressed.

Project Name: Ramblewood Preliminary Plan
Project File #: SB2025-040
Date Sent: 11/14/2025 **Date Due:** 12/09/2025

Agency	Date Received	Agency Response	Response Resolution
The Pinery HOA	12/08/2025	Received: The Pinery Homeowners' Association does not have any objection to the Ramblewood Preliminary Plan consisting of 68 single-family residential lots, 2 agricultural lots, and 8 tracts. Our primary concern pertains to the impact on traffic at the intersection of Hilltop Road and Village Drive. We recognize that improvements are currently underway in this area to help mitigate these traffic concerns, however. We appreciate the opportunity to review and comment on this referral.	No response necessary
Town of Parker Development Review		No Response Received:	No response necessary
Town of Parker Public Works		No Response Received:	No response necessary
Wildfire Mitigation	12/10/2025	Received: The wildfire mitigation plan provided meets the required standards. It is approved with the condition that all proposed actions are fully implemented before development proceeds.	No response necessary

Project Name: Ramblewood Preliminary Plan
Project File #: SB2025-040
Date Sent: 11/14/2025 **Date Due:** 12/09/2025

Agency	Date Received	Agency Response	Response Resolution
Xcel Energy-Right of Way & Permits	12/03/2025	Received: Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the Ramblewood Preliminary Plan and currently has no apparent conflict. The property owner/developer/contractor must complete the application process for any new natural gas service via xcelenergy.com/InstallAndConnect. It is then the responsibility of the developer to contact the Xcel Designer assigned to the project for approval of design details. If additional easements need to be acquired by separate PSCo document, a Right-of-Way Agent will need to be contacted by the Designer. As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 for utility locates prior to construction.	Applicant acknowledged information

From: Trevor Bedford
Sent: Friday, December 5, 2025 4:15 PM
To: Matt Jakubowski
Subject: FW: Referral SB2025-040 (Ramblewood Subdivision Preliminary Plan)
Attachments: Ramblewood Subdivision - (Douglas).pdf; Ramblewood Subdivision 2nd Letter - (Douglas).pdf

---

From: Matz - DNR, Michael <michael.matz@state.co.us>
Sent: Friday, December 5, 2025 4:14:30 PM (UTC-07:00) Mountain Time (US & Canada)
To: Trevor Bedford <tbedford@douglas.co.us>
Cc: Comaniciu - DNR, Ioana <ioana.comaniciu@state.co.us>
Subject: Referral SB2025-040 (Ramblewood Subdivision Preliminary Plan)

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Good afternoon,

We have reviewed the documentation from Referral SB2025-040 relating to the Preliminary Plan for Ramblewood Subdivision.

Based on our review, there have been no changes to the demands or proposed water supply source for the Ramblewood Subdivision.

Attached are letters dated April 8, 2025 and May 12, 2025 that were previously sent by our office during the review of ZR2024-031.

The May 12, 2025 letter provided an opinion that the water supply for the subdivision is adequate and can be provided without causing injury to decreed water rights, so long as the District is committed to serving the 68 lots.

Thank you for the opportunity to review.

Best,

Mike Matz, P.E.
Water Resources Engineer

COLORADO
Division of Water Resources
Department of Natural Resources

P 303.866.3581 x 8241
1313 Sherman Street, Room 821, Denver, CO 80203
michael.matz@state.co.us | www.colorado.gov/water

April 8, 2025

Trevor Bedford
Douglas County Planning Services
Transmission via email: tbedford@douglas.co.us

Re: Ramblewood Subdivision – Planned Development Rezone
Case Number: ZR2024-031
Applicants: Hilltop Jam, LLC and Bradley & Joan Whittlesey
Part of Sec. 6, Twp. 7S, Rng. 65W, 6th P.M., Douglas County
Water Division 1, Water District 8

Dear Trevor Bedford,

We have received your March 18, 2025 proposal to rezone and subdivide 176.794 +/- acres located in Sec. 6, Twp. 7S, Rng. 65W, 6th P.M., Douglas County (Parcel ID No. 234706100001 and 234706300001). This application proposes rezoning from Agricultural-1 to Planned Development and subdividing the 176.794 +/- acres into seventy lots of varying size, with the remaining 60 +/- acres being open space. Two of the lots will be primarily agricultural in use, with Ranch Lot 1 being 25 acres in size and Ranch Lot 2 being 58 acres in size.

Water Supply Demand

68 Lots in area PA-A

The annual water demand per single family equivalent (SFE) for the 68 lots located in area PA-A of the proposed subdivision is 92.4 acre-feet/year as shown in the table below:

Use	Demand (af/yr/sfe)	No. Units	Total Demand (af/yr)
Indoor/Outdoor residential	1.1	68	74.8
Outdoor non-residential (irrigation of 6.86 acres)	-	-	17.6
-	-	**Total**	**92.4**

2 Lots in area PA-B

Water demands for the two lots (Ranch Lot 1 and Ranch Lot 2) located in area PA-B of the proposed subdivision are unknown. The application documents indicate these two lots will be mainly used for agricultural purposes, with an allowance for up to two residential dwelling units in area PA-B.

Source of Water Supply

68 Lots in area PA-A

The proposed water supplier for the 68 single-family lots located in area PA-A of the proposed subdivision is service provided by the Parker Water and Sanitation District (District). A conditional "will-serve" letter dated January 17, 2025 indicates that the District is willing to serve the proposed subdivision, conditioned upon compliance with all the District Rules and Regulations, Standard and Specifications, and/or conditions specific to the property; including payment of the appropriate fees and any charges related to water and/or sanitation service, as established from time to time by the District Directors. Service from the District is also conditional upon successful completion of the property inclusion into the District service area.

According to the "will-serve" letter, the District has a combination of decreed Denver Basin supplies, junior and senior tributary water rights, and storage rights in Rueter-Hess Reservoir totaling 71,920 af/yr. The anticipated yield of these rights in an average or dry year is 41,134 af/yr, which exceeds the estimated buildout demand of 23,500 af/yr.

The majority of the District's supply is water from Denver Basin bedrock aquifers. The State Engineer's Office does not have evidence regarding the length of time for which this source will be a physically and economically viable source of water. According to section 37-90-137(4)(b)(I), C.R.S., "Permits issued pursuant to this subsection (4) shall allow withdrawals on the basis of an aquifer life of one hundred years." Based on this **allocation** approach, the annual amounts of water in the District's decrees are equal to one percent of the total amount, as determined by rules 8.A and 8.B of the Statewide Nontributary Ground Water Rules, 2 CCR 402-7. Therefore, the water may be withdrawn in those annual amounts for a maximum of 100 years.

The Applicant has indicated that a portion of the Denver Basin groundwater underlying the Southern 160 acres that was decreed in case no. 07CW0107 by the Division 1 Water Court will be conveyed to the District in return for providing water service. Similarly, a portion of the Denver Basin groundwater (which has not yet been decreed or claimed) underlying the 17 acres to the North will also be conveyed to the District. The Applicant intends to convey an estimated total 92.4 af/year of Denver Basin groundwater from the Lower Dawson, Denver, Arapahoe, and Laramie-Fox Hills aquifers to the District in order to offset the anticipated demand from the subdivision.

The groundwater underlying the 160 acre property was adjudicated in case no. 07CW0107 for domestic, industrial, commercial, irrigation, stock watering,

recreational, fire protection, and augmentation purposes, both on and off the subject property. Table 1 summarizes the amounts quantified in each aquifer in case no. 07CW0107, the amount estimated underlying the undecreed 17 acres, and the amounts estimated to be conveyed to the District:

Aquifer	Annual amount from 07CW0107 underlying 160 acres (100 year aquifer allocation)	Annual amount available estimated by Applicant underlying 17 acres (100 year aquifer allocation)	Annual amount estimated to be conveyed to the District from 07CW01007[1] and the undecreed 17 acres[2]	Type
Lower Dawson	32.0	3.6	- 1.8[2]	NT*
Denver	70.7	8.5	35.4[1] 4.3[2]	NT*
Arapahoe	68.0	7.2	51.0[1] 5.4[2]	NT*
Laramie Fox-Hills	46.8	5.0	- 2.5[2]	NT*
Total	**217.5**	**24.3**	**86.4[1]** **14.0[2]**	-

*Nontributary

2 Lots in area PA-B

The proposed water supply for the 2 lots located in area PA-B are on-lot domestic wells. It is unclear what specific aquifer source will supply these 2 lots.

A review of our records does not show any permitted wells located on the subject property. However, well permit no. 31958 (located on an adjacent property) was decreed in case no. W-5628 by the Division 1 Water Court as Bowman Well No. 31958

for domestic, stock watering, and agricultural irrigation uses on approximately 80 acres in the E ½ of the NW ¼ of Sec. 6, Twp. 7S, Rng. 65W. Well no. 31958 has an appropriation based on the law as it existed before the enactment of Senate Bill 73-213 and is known as a "Pre-213 Well" and the well currently claims all Upper Dawson groundwater underlying the subject property.

State Engineer's Office Opinion

Based upon the above and pursuant to section 30-28-136(1)(h)(I), this office has not received information sufficient to render an opinion regarding whether the proposed water supply is adequate and can be provided without causing injury to decreed water rights. Prior to further review of the subdivision water supply plan, the following information is required:

1. Clarify the proposed uses and aquifer source for Ranch Lots 1 and 2.

Additional Comments

The applicant should be aware that any proposed detention pond for this development, must meet the requirements of a "storm water detention and infiltration facility" as defined in section 37-92-602(8), Colorado Revised Statutes, otherwise the structure may be subject to administration by this office. The applicant should review DWR's Administrative Statement Regarding the Management of Storm Water Detention Facilities and Post-Wildland Fire Facilities in Colorado to ensure that the notification, construction and operation of the proposed structure meets statutory and administrative requirements. The applicant is encouraged to use Colorado Stormwater Detention and Infiltration Facility Notification Portal, located at https://maperture.digitaldataservices.com/gvh/?viewer=cswdif, to meet the notification requirements.

Please contact Mike Matz at 303-866-3581 x8241 or at michael.matz@state.co.us with any questions.

Sincerely,

Ioana Comaniciu, P.E.

Water Resources Engineer

Ec: Referral no. 33884

COLORADO
Division of Water Resources
Department of Natural Resources

May 12, 2025

Trevor Bedford
Douglas County Planning Services
Transmission via email: tbedford@douglas.co.us

Re: Ramblewood Subdivision – Planned Development Rezone (2nd Letter)
Case Number: ZR2024-031
Applicants: Hilltop Jam, LLC and Bradley & Joan Whittlesey
Part of Sec. 6, Twp. 7S, Rng. 65W, 6th P.M., Douglas County
Water Division 1, Water District 8

Dear Trevor Bedford,

We have received your March 18, 2025 proposal and additional information provided on May 1, 2025 to rezone and subdivide 176.794 +/- acres located in Sec. 6, Twp. 7S, Rng. 65W, 6th P.M., Douglas County (Parcel ID No. 234706100001 and 234706300001). This application proposes rezoning from Agricultural-1 to Planned Development and subdividing the 176.794 +/- acres into seventy lots of varying size, with the remaining 60 +/- acres being open space. Two of the lots will be primarily agricultural in use, with Ranch Lot 1 being 25 acres in size and Ranch Lot 2 being 58 acres in size.

Our office previously provided comments in a letter dated April 8, 2025. The comments contained in this 2nd letter supersede those that were previously provided.

Water Supply Demand

68 Lots in area PA-A

The annual water demand per single family equivalent (SFE) for the 68 lots located in area PA-A of the proposed subdivision is 92.4 acre-feet/year as shown in the table below:

Use	Demand (af/yr/sfe)	No. Units	Total Demand (af/yr)
Indoor/Outdoor residential	1.1	68	74.8
Outdoor non-residential (irrigation of 6.86 acres)	-	-	17.6
-	-	**Total**	**92.4**

2 Lots in area PA-B

The application documents indicate that Ranch Lot 1 and Ranch Lot 2 will be mainly used for agricultural purposes, with an allowance for up to two residential dwelling units in area PA-B. The annual water demand for Ranch Lot 1 and Ranch Lot 2 located in area PA-B of the proposed subdivision is estimated to be 3.5 acre-feet/year as shown in the table below:

Use	Demand (af/yr/lot)	No. Lots	Total Demand (af/yr)
Indoor residential	0.2	2	0.4
Residential irrigation (30,000 SF)	1.5	2	3.0
Domestic animal watering (4 animals)	0.05	2	0.1
-	-	**Total**	**3.5**

Source of Water Supply

68 Lots in area PA-A

The proposed water supplier for the 68 single-family lots located in area PA-A of the proposed subdivision is service provided by the Parker Water and Sanitation District (District). A conditional "will-serve" letter dated January 17, 2025 indicates that the District is willing to serve the proposed subdivision, conditioned upon compliance with all the District Rules and Regulations, Standard and Specifications, and/or conditions specific to the property; including payment of the appropriate fees and any charges related to water and/or sanitation service, as established from time to time by the District Directors. Service from the District is also conditional upon successful completion of the property inclusion into the District service area.

According to the "will-serve" letter, the District has a combination of decreed Denver Basin supplies, junior and senior tributary water rights, and storage rights in Rueter-Hess Reservoir totaling 71,920 af/yr. The anticipated yield of these rights in an average or dry year is 41,134 af/yr, which exceeds the estimated buildout demand of 23,500 af/yr.

The majority of the District's supply is water from Denver Basin bedrock aquifers. The State Engineer's Office does not have evidence regarding the length of time for which this source will be a physically and economically viable source of water. According to section 37-90-137(4)(b)(I), C.R.S., "Permits issued pursuant to this subsection (4) shall allow withdrawals on the basis of an aquifer life of one hundred years." Based on this **allocation** approach, the annual amounts of water in the District's decrees are equal to one percent of the total amount, as determined by rules 8.A and 8.B of the Statewide Nontributary Ground Water Rules, 2 CCR 402-7. Therefore, the water may be withdrawn in those annual amounts for a maximum of 100 years.

The Applicant has indicated that a portion of the Denver Basin groundwater underlying the Southern 160 acres that was decreed in case no. 07CW0107 by the Division 1 Water Court will be conveyed to the District in return for providing water service. Similarly, a portion of the Denver Basin groundwater (which has not yet been decreed or claimed) underlying the 17 acres to the North will also be conveyed to the District. The Applicant intends to convey an estimated total 92.4 af/year of Denver Basin groundwater from the Lower Dawson, Denver, Arapahoe, and Laramie-Fox Hills aquifers to the District in order to offset the anticipated demand from the subdivision.

The groundwater underlying the 160 acre property was adjudicated in case no. 07CW0107 for domestic, industrial, commercial, irrigation, stock watering, recreational, fire protection, and augmentation purposes, both on and off the subject property. Table 1 summarizes the amounts quantified in each aquifer in case no. 07CW0107, the amount estimated underlying the undecreed 17 acres, and the amounts estimated to be conveyed to the District:

Aquifer	**Annual amount from 07CW0107 underlying 160 acres (100 year aquifer allocation)**	**Annual amount available estimated by Applicant underlying 17 acres (100 year aquifer allocation)**	**Annual amount estimated to be conveyed to the District from 07CW01007[1] and the undecreed 17 acres[2]**	**Type**
Lower Dawson	32.0	3.6	- 1.8[2]	NT*
Denver	70.7	8.5	35.4[1] 4.3[2]	NT*
Arapahoe	68.0	7.2	51.0[1] 5.4[2]	NT*
Laramie Fox-Hills	46.8	5.0	-	NT*

			2.5[2]	
Total	**217.5**	**24.3**	**86.4[1]** **14.0[2]**	-

*Nontributary

2 Lots in area PA-B

The proposed water supply for the 2 lots located in area PA-B are on-lot domestic wells. According to the additional information provided by the Applicant on May 1, 2025, 2 acre-feet per year of Lower Dawson ground water decreed under Water Court Division 1 case no. 07CW0107 will be conveyed to each lot (Ranch Lot 1 and Ranch Lot 2). The Lower Dawson aquifer under the subject property is considered to be non-tributary.

Applications for on lot well permits, submitted by an entity other than the original decree holder must include evidence that the applicant has acquired the right to the portion of water being requested on the application.

State Engineer's Office Opinion

Based upon the above and pursuant to section 30-28-136(1)(h)(I) and section 30-28-136(1)(h)(II), C.R.S., it is our opinion that the proposed water supply is adequate and can be provided without causing injury to decreed water rights, **so long as the District is committed to serving the 68 lots**.

Our opinion that the water supply is **adequate** is based on our determination that the amount of water required annually to serve the subdivision is currently physically available, based on current estimated aquifer conditions.

Our opinion that the water supply can be **provided without causing injury** is based on

our determination that the amount of water that is legally available on an annual basis, according to the statutory **allocation** approach, for the proposed uses is greater than the annual amount of water required to supply existing water commitments and the demands of the proposed subdivision.

Our opinion is qualified by the following:

The Division 1 Water Court has retained jurisdiction over the final amount of water available pursuant to the above-referenced water rights, pending actual geophysical data from the aquifer.

The amounts of water in the Denver Basin aquifer, and identified in this letter, are calculated based on estimated current aquifer conditions. The source of water is from a non-renewable aquifer, the allocations of which are based on a 100-year aquifer life. The county should be aware that the economic life of a water supply based on wells in a given Denver Basin aquifer may be less than the 100 years used for allocation due to anticipated water level declines. We recommend that the county determine whether it is appropriate to require development of renewable water resources for this subdivision to provide for a long-term water supply.

Additional Comments

The applicant should be aware that any proposed detention pond for this development, must meet the requirements of a "storm water detention and infiltration facility" as defined in section 37-92-602(8), Colorado Revised Statutes, otherwise the structure may be subject to administration by this office. The applicant should review DWR's Administrative Statement Regarding the Management of Storm Water Detention Facilities and Post-Wildland Fire Facilities in Colorado to ensure that the notification, construction and operation of the proposed structure

meets statutory and administrative requirements. The applicant is encouraged to use Colorado Stormwater Detention and Infiltration Facility Notification Portal, located at https://maperture.digitaldataservices.com/gvh/?viewer=cswdif, to meet the notification requirements.

Please contact Mike Matz at 303-866-3581 x8241 or at michael.matz@state.co.us with any questions.

Sincerely,

Ioana Comaniciu, P.E.
Water Resources Engineer

Ec: Referral no. 33884

MHFD
MILE HIGH FLOOD DISTRICT

2480 W. 26th Ave Suite 156-B | Denver, CO 80211
TEL 303 455 6277 | FAX 303 455 7880

www.mhfd.org

For MHFD staff use only.	
Project ID:	106664
Submittal ID:	10013888

December 9, 2025

To: Douglas County

Via email

Subject: MHFD Review Comments

Re: Ramdblewood Preliminary Plan : (Sb2025-040))

This letter is in response to the request for our comments concerning the referenced project. We have reviewed this referral only as it relates to an MHFD drainageway and for maintenance eligibility of storm drainage features, in this case:

- Pond B Outfall to Kinney Creek Tributary

MHFD comments

1. We would like to review the stream corridor and design with future submittals

We have no objections to the referenced project at this time. We appreciate the opportunity to review this application and look forward to reviewing future submittals.

Please feel free to contact me with any questions.

Sincerely,

Laura Hinds, P.E.
Senior Project Manager, Mile High Flood District
lhinds@mhfd.org

Right of Way & Permits

1123 West 3rd Avenue
Denver, Colorado 80223
Telephone: 303.285.6612
violeta.ciocanu@xcelenergy.com

December 3, 2025

Douglas County Planning Services
100 Third Street
Castle Rock, CO 80104

Attn: Trevor Bedford

Re: Ramblewood Preliminary Plan, Case # SB2025-040

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the **Ramblewood Preliminary Plan** and currently has **no apparent conflict**.

The property owner/developer/contractor must complete the application process for any new natural gas service via xcelenergy.com/InstallAndConnect. It is then the responsibility of the developer to contact the Xcel Designer assigned to the project for approval of design details.

If additional easements need to be acquired by separate PSCo document, a Right-of-Way Agent will need to be contacted by the Designer.

As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 for utility locates prior to construction.

Violeta Ciocanu (Chokanu)
Right of Way and Permits
Public Service Company of Colorado dba Xcel Energy
Office: 303-285-6612 – Email: violeta.ciocanu@xcelenergy.com

RAMBLEWOOD PRELIMINARY PLAN

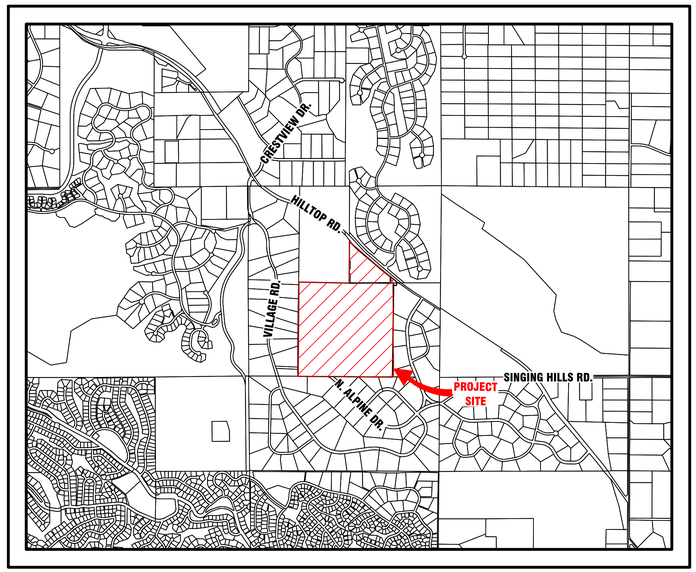
LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

220.455 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040

GENERAL NOTES:

1. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OR LAND BOUNDARY MONUMENT OR ACCESSORY COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, COLORADO REVISED STATUTE.
2. PER C.R.S. 38-51-106, "ALL LINEAL UNITS DEPICTED ON THIS LAND SURVEY PLAT ARE U.S. SURVEY FEET. ONE METER EQUALS 39.37/12 U.S. SURVEY FEET, EXACTLY ACCORDING TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY."
3. LAND TITLE GUARANTEE COMPANY'S COMMITMENT NO. ABD70737260, EFFECTIVE AUGUST 20TH, 2021 WAS RELIED UPON FOR RECORD INFORMATION REGARDING RIGHTS-OF-WAY, EASEMENTS AND ENCUMBRANCES. THIS SURVEY DOES NOT REPRESENT A TITLE SEARCH BY AZTEC CONSULTANTS OR REDLAND TO DETERMINE OWNERSHIP, RIGHTS-OF-WAY, EASEMENTS OR OTHER MATTERS OF PUBLIC RECORD.
4. BASED ON A GRAPHICAL REPRESENTATION OF FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) NO. 08035C0132F, WITH AN EFFECTIVE DATE OF SEPTEMBER 30, 2005, THE SUBJECT PROPERTY LIES WITHIN ZONE "A" AND "X" WITH ZONE "A" BEING DEFINED AS "SPECIAL FLOOD HAZARD AREA SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD": "NO BASE FLOOD ELEVATIONS DETERMINED." ZONE "X" IS DEFINED AS "AREAS OF 0.2% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE." THE APPROXIMATE LIMITS OF ZONE "A" HAVE BEEN DEPICTED HEREON AND ZONE "X" BEING EVERYTHING OUTSIDE OF ZONE "A".
5. DRAINAGE EASEMENTS ARE TO BE GRANTED TO DOUGLAS COUNTY ACROSS OS-1, OS-2, OS-3, OS-5, TRACT A, TRACT C FOR THE PURPOSE OF ACCESSING, MAINTAINING, AND REPAIRING STORM WATER MANAGEMENT IMPROVEMENTS, INCLUDING, BUT NOT LIMITED TO, INLETS, PIPES, CULVERTS, CHANNELS, DITCHES, HYDRAULIC STRUCTURES, RIPRAP, DETENTION BASINS, FOREBAYS, MICRO-POOLS, AND WATER QUALITY FACILITIES (COLLECTIVELY, THE "FACILITIES") IN THE EVENT THE METRO DISTRICT, ITS SUCCESSORS AND ASSIGNS ("SYSTEM OWNER") FAILS TO SATISFACTORILY MAINTAIN OR REPAIR SAID FACILITIES. A BLANKET ACCESS EASEMENT OVER THE SUBDIVISION WILL BE GRANTED TO DOUGLAS COUNTY, BUT ONLY FOR THE PURPOSE OF ACCESSING THE FACILITIES IN THE EVENT THAT THE DRAINAGE EASEMENTS DO NOT PROVIDE ADEQUATE ACCESS. THE MAINTENANCE AND REPAIR OF THE FACILITIES LOCATED IN THE SUBDIVISION, AS WILL BE SHOWN ON THE CONSTRUCTION PLANS OR ON THE PLAT FOR THE SUBDIVISION, SHALL BE THE RESPONSIBILITY OF THE SYSTEM OWNER. IN THE EVENT SUCH MAINTENANCE AND REPAIR ARE NOT PERFORMED BY THE SYSTEM OWNER TO THE SATISFACTION OF DOUGLAS COUNTY, THEN DOUGLAS COUNTY SHALL HAVE THE RIGHT, BUT NOT THE OBLIGATION, TO ENTER SAID SUBDIVISION, AFTER TEN (10) DAYS PRIOR WRITTEN NOTICE TO THE SYSTEM OWNER, UNLESS THERE IS AN EMERGENCY, IN WHICH CASE DOUGLAS COUNTY WILL GIVE NOTICE AS SOON AS PRACTICABLE, TO PERFORM ALL NECESSARY WORK, THE COST OF WHICH SHALL BE PAID BY THE SYSTEM OWNER UPON BILLING. IN THE EVENT THE SYSTEM OWNER FAILS TO REIMBURSE DOUGLAS COUNTY WITHIN THIRTY (30) DAYS AFTER SUBMISSION OF THE BILL FOR THE COSTS INCURRED, DOUGLAS COUNTY WILL HAVE THE RIGHT TO ENFORCE SUCH OBLIGATIONS BY APPROPRIATE LEGAL ACTION. IT IS THE SYSTEM OWNER'S RESPONSIBILITY TO CONSTRUCT, MAINTAIN, AND REPAIR THE FACILITIES IN A MANNER CONSISTENT WITH ALL APPLICABLE PLANS APPROVED OR ACCEPTED BY DOUGLAS COUNTY SUBSEQUENT TO THIS PRELIMINARY PLAN.
6. DWELLING UNITS ARE TO BE CONSTRUCTED IN A MANNER WHICH WILL ACCOMMODATE CONNECTION TO A UTILITY MONITORING AND TELECOMMUNICATION SYSTEM FOR CENTRAL SERVICE UNDER A MASTER SERVICE CONTRACTOR OR CENTRAL COMPUTER-CONTROLLED MONITORING PROGRAM. THE OWNERS OF EACH LOT SHALL FULLY PARTICIPATE IN AND BE PART OF THE UTILITY MONITORING AND TELECOMMUNICATIONS SYSTEM OR SYSTEMS.
7. STREETS A THROUGH D WILL BE OWNED AND MAINTAINED BY DOUGLAS COUNTY.
8. PROPOSED TRAILS WITHIN THE SITE BOUNDARY WILL BE OWNED AND MAINTAINED BY THE RAMBLEWOOD METROPOLITAN DISTRICT.

remove this note - will be addressed with the final plat



VICINITY MAP
1" = 2000'

Sheet List Table

Sheet Number	Sheet Title
1	Cover Sheet
2	Typical Street Section Plan
3	Overall Plan
4	Site Plan
5	Site Plan
6	Site Plan
7	Site Plan
8	Grading Plan
9	Grading Plan
10	Grading Plan
11	Grading Plan
12	Sight Distance Plan
13	Sight Distance Plan
14	Existing Features Plan
15	Offsite Sanitary Sewer Plan
16	Trails Plan

DEVELOPER
MILLER UNITED
6900 E. BELLVIEW AVE,
GREENWOOD VILLAGE, CO 80111
PHONE: (303) 799-6300
CONTACT: DAN SHELDON

CIVIL ENGINEER
LJA ENGINEERING, INC.
1765 WEST 121ST AVE, SUITE 300
WESTMINSTER, CO 80234
PHONE: (303) 421-4224
CONTACT: KEVIN LOVELACE

SURVEYOR
LJA SURVEYING, INC
1765 WEST 121ST AVE, SUITE 300
WESTMINSTER, CO 80234
PHONE: (303) 358-7002
CONTACT: DEREK BROWN

PLANNER/LANDSCAPE
NORRIS DESIGN
1101 BANNOCK STREET,
DENVER, CO 80204
PHONE: (303) 892-1166
CONTACT: DANIEL JENNINGS

GEOTECHNICAL ENGINEER
CTL THOMPSON
1971 WEST 12TH AVE.
DENVER, CO 80204
PHONE: (303) 825-0777
CONTACT: ALAN J. LISOWY, P.E.

AGENCY LIST

DOUGLAS COUNTY
100 THIRD STREET
CASTLE ROCK, CO 80104
PHONE: (303) 660-7460
CONTACT: CHUCK SMITH

PARKER WATER & SANITATION DISTRICT
19801 E. MAIN STREET
PARKER, CO 80138
PHONE: (303) 841-4627
CONTACT: JAROD BAYLIE

CORE ELECTRIC COOPERATIVE
5496 US-85
SEDALIA, CO 80135
PHONE: (800) 332-9540

Engineering doesn't have any comments on the Traffic Study

PROJECT BENCHMARK:

I:\JOB FOLDERS\1084\1084-0006\CIVIL\PROD\PRELIM PLAN\COVER PRINTED ON: 11/6/2025 2:52 PM

LJA
1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

Revision Type:

No.	Rev. Date:
1	
2	
3	
4	
5	
6	

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: N/A
Scale Vert: N/A

Sheet: 1 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Cover Sheet

NOT FOR CONSTRUCTION

Developer:
Miller United Real Estate, LLC
6900 Bellview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 1

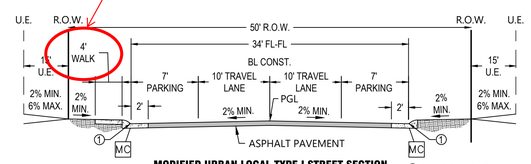
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

GENERAL ABBREVIATIONS

A.E.	ACCESS EASEMENT
BKL	BIKE LANE
BL CONST	BASELINE OF CONSTRUCTION
BS	BOTTOM ELEVATION OF RISE
B.S.I.	BY SEPARATE INSTRUMENT
CDS	CUL-DE-SAC
CE	CURB EXTENSION
CL	CENTERLINE
CT	CURB TRANSITION
CWN	CROWN
DBO	DESIGN BY OTHERS
DC	MEDIAN CURB & GUTTER
D.E.	DRAINAGE EASEMENT
DIST.	DISTANCE
D.U.E.	DRAINAGE & UTILITY EASEMENT
EOA	EDGE OF ASPHALT
EOP	EDGE OF PAVEMENT
E.A.E.	EMERGENCY ACCESS EASEMENT
E.ATT.E.	EXISTING AT&T EASEMENT
E.P.E.	EXISTING PIPELINE EASEMENT
ESMT.	EASEMENT
FES	FLARED END SECTION
FGB	FINISHED GROUND AT BOTTOM WALL ELEVATION
FGT	FINISHED GROUND AT TOP WALL ELEVATION
FH	FIRE HYDRANT
FL	FLOWLINE
FV	FIELD VERIFY
G	FINISHED GROUND
G.E.	GAS EASEMENT
G.O.E.	GAS & OIL EASEMENT
GV	GATE VALVE
HP	HIGH POINT
I.E.	IRRIGATION EASEMENT
LL	LOT LINE
LP	LOW POINT
LS	LANDSCAPING
LTWD	LITTLE THOMPSON WATER DISTRICT
MC	MOUNTABLE CURB & GUTTER
MH	MANHOLE
MSE	MECHANICALLY STABILIZED EARTH
P	PAVEMENT
P&P	PLAN & PROFILE
P.A.E.	PUBLIC ACCESS EASEMENT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCR	POINT OF CURB RETURN
PERF.	PERFORATED
PGL	PROFILE GRADE LINE
PI	POINT OF INFLECTION
PRC	POINT OF REVERSE CURVATURE
PSWD	PARKER SANITATION & WATER DISTRICT
PT	POINT OF TANGENCY
RELOC	TO BE RELOCATED
R.O.W.	RIGHT OF WAY
RN	RECORDING NUMBER
S.E.	SANITARY EASEMENT
SD.E.	SIGHT DISTANCE EASEMENT
SEC	SECTION LINE
SL	SANITARY LINE
SS	SANITARY SERVICE
SW	SIDEWALK
SW.E.	SIDEWALK EASEMENT
TB	THRUST BLOCK
TC	TOP OF CURB
TEMP.	TEMPORARY
TRANS.	TRANSITION
TR.E.	TRANSPORTATION EASEMENT
TS	TOP ELEVATION OF RISER
UD	UNDERDRAIN
U.E.	UTILITY EASEMENT
U.G.E	UTILITY & GAS EASEMENT
VC	VERTICAL CURB & GUTTER
W.E.	WATER EASEMENT
WL	WATER LINE
WS	WATER SERVICE
W.S.W.	WATER SURFACE ELEVATION
WV	WATER VALVE

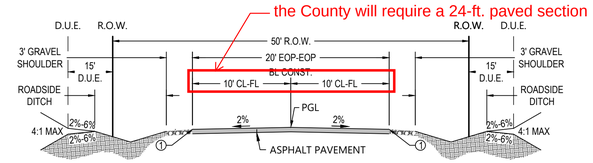
revise to a 5-ft. walk



MODIFIED URBAN LOCAL TYPE I STREET SECTION
N.T.S.
(STREET B, STREET C, STREET D)

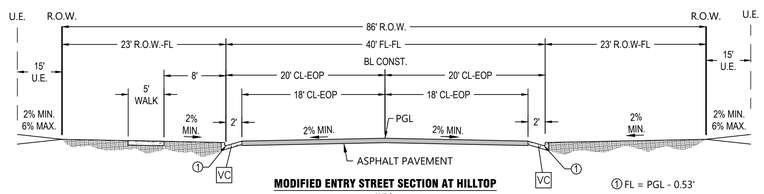
1 FL = PGL - 0.47'

the County will require a 24-ft. paved section



RURAL LOCAL TYPE III STREET SECTION
N.T.S.
(STREET D)

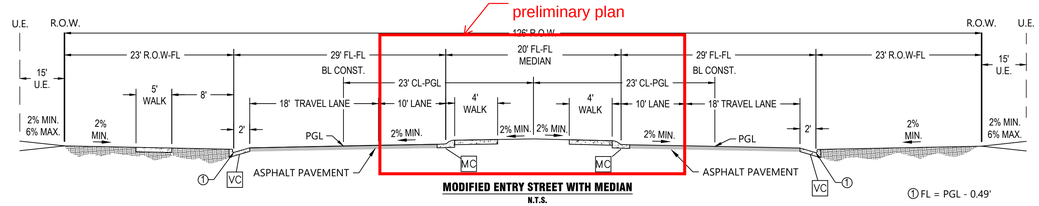
1 FL = PGL - 0.20'



MODIFIED ENTRY STREET SECTION AT HILLTOP
N.T.S.
(STREET A)

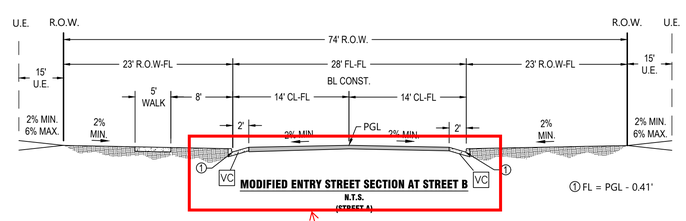
1 FL = PGL - 0.53'

refer to the comments on the preliminary plan



MODIFIED ENTRY STREET WITH MEDIAN
N.T.S.
(STREET A)

1 FL = PGL - 0.49'



MODIFIED ENTRY STREET SECTION AT STREET B
N.T.S.
(STREET A)

1 FL = PGL - 0.41'

not sure where this cross section is proposed - 14-ft. half section probably not acceptable as an entry street

PROJECT BENCHMARK:

1765 W. 121st Avenue
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No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: N/A
Scale Vert: N/A

Sheet: 2 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Typical Street Section Plan

NOT FOR CONSTRUCTION

Developer:
Kimley-Horn and Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 2

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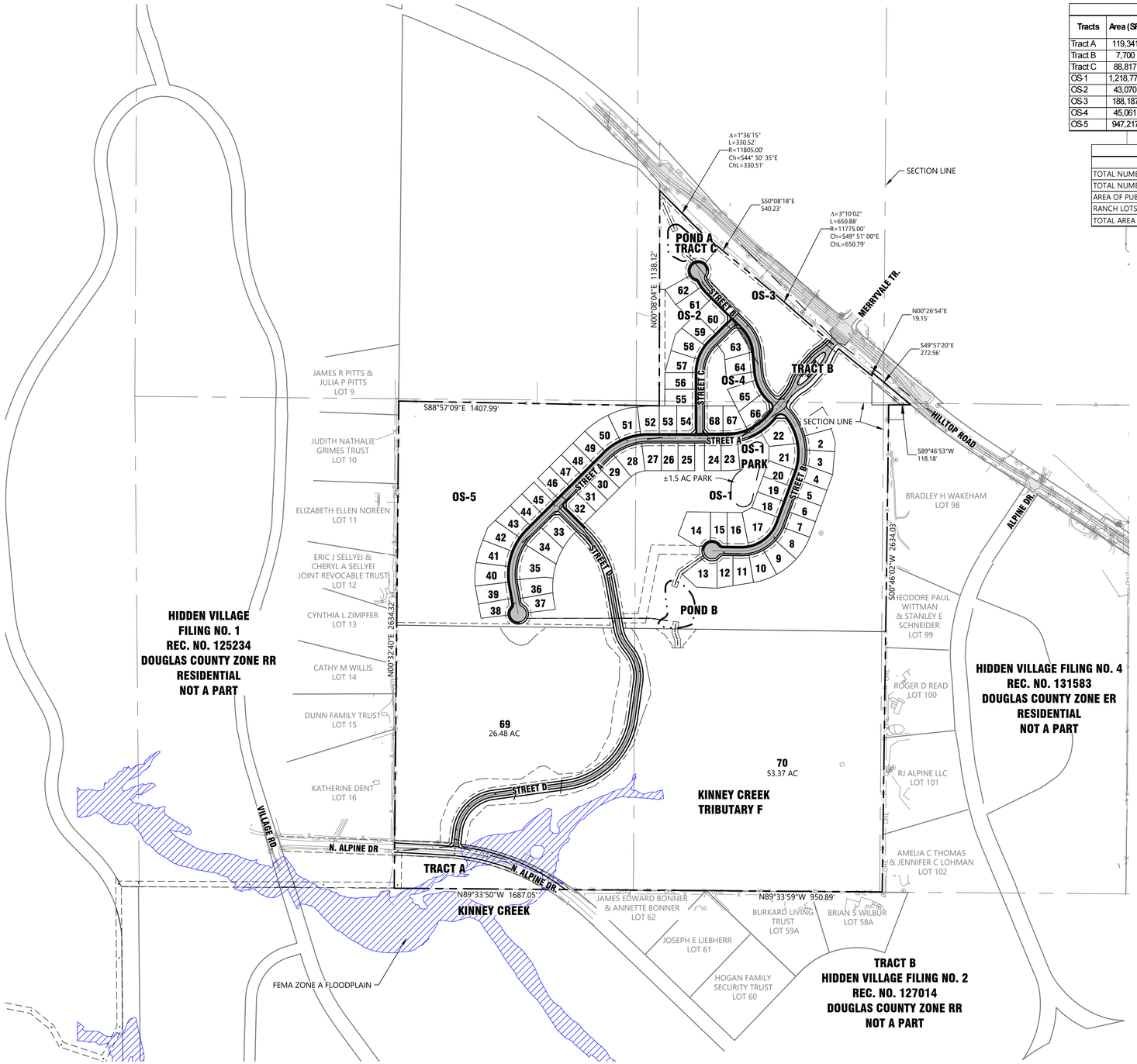
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO



TRACT USE, OWNERSHIP & MAINTENANCE CHART

Tracts	Area (SF)	Area (Ac)	Ownership/ Maitenance	Access	Utilities	Drainage	Landscape	Open Space	Trails	Park
Tract A	119,341	2.740	OWNER		X	X		X		
Tract B	7,700	0.177	METRO DISTRICT	X	X	X	X			
Tract C	88,817	2.039	METRO DISTRICT	X	X	X	X	X		
OS-1	1,218,770	27.979	METRO DISTRICT	X	X	X	X	X	X	X
OS-2	43,070	0.989	METRO DISTRICT	X	X	X	X	X		
OS-3	188,187	4.320	METRO DISTRICT	X	X	X	X	X	X	
OS-4	45,061	1.034	METRO DISTRICT	X	X		X	X		
OS-5	947,217	21.745	METRO DISTRICT	X	X	X	X	X		

LAND USE TABLE

TYPE	AREA (SF)	AREA (AC)	% OF TOTAL AREA
TOTAL NUMBER OF RESIDENTIAL LOTS (68)	1,092,149	25.0723	14.18%
TOTAL NUMBER OF TRACTS (8)	2,658,163	61.0230	34.52%
AREA OF PUBLIC STREET DEDICATION (ROW, ONSITE)	472,419	10.8452	6.13%
RANCH LOTS (2)	3,478,422	79.8536	45.17%
TOTAL AREA	7,701,153	176.7941	100.00%

PROJECT BENCHMARK:

SCALE
1 inch = 300 ft.
300 0 150 300

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Revision Type:

No.	Rev. Date:
1	
2	
3	
4	
5	
6	

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 300'
Scale Vert: N/A

Sheet: 3 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Overall Plan

NOT FOR CONSTRUCTION

Developer:
Village Allied Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 3

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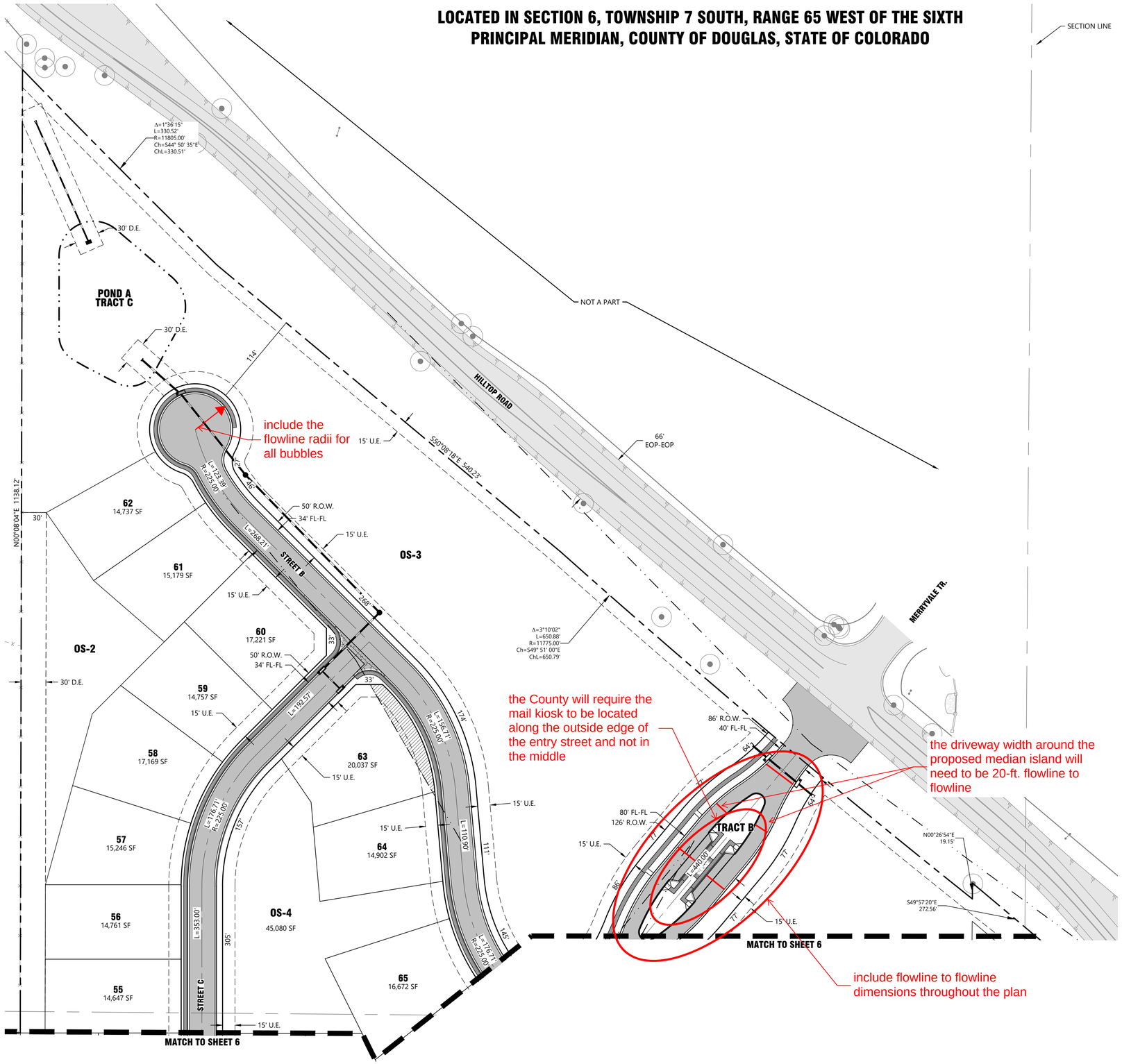
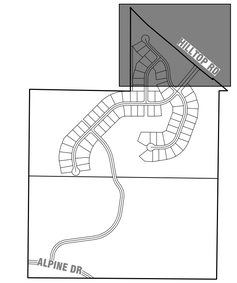
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.
60 0 30 60

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No.	Rev. Date:	Revision Type:
1		
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 80'
Scale Vert: N/A

Sheet: 4 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Nuvo Unified Real Estate, LLC
6900 Wallace Ave.
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 4

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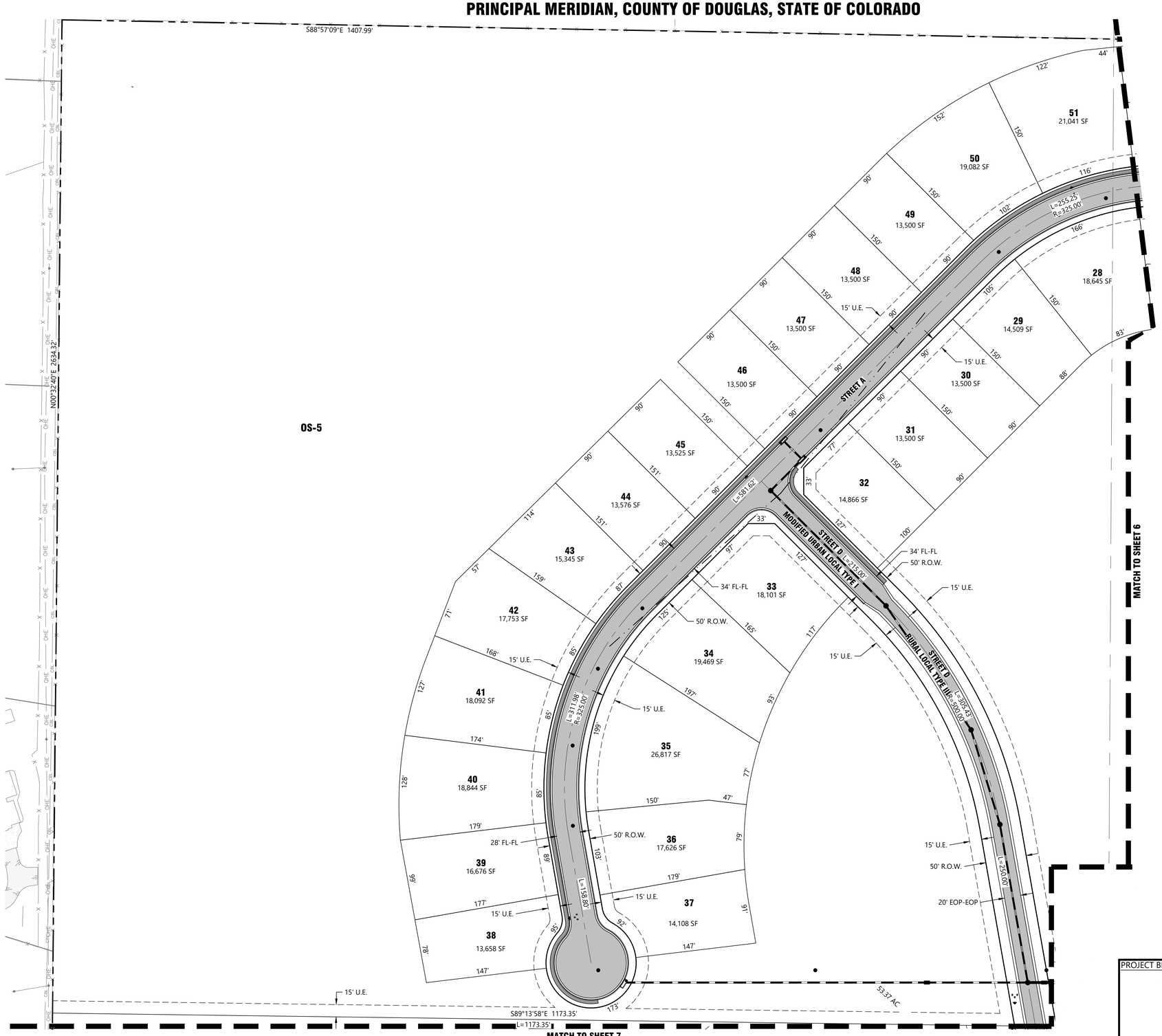
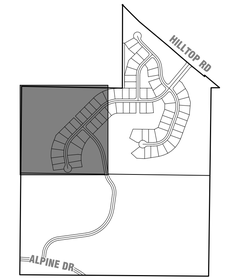
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 80'
Scale Vert: N/A

Sheet: 5 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Mill Street Land Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
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No. 5

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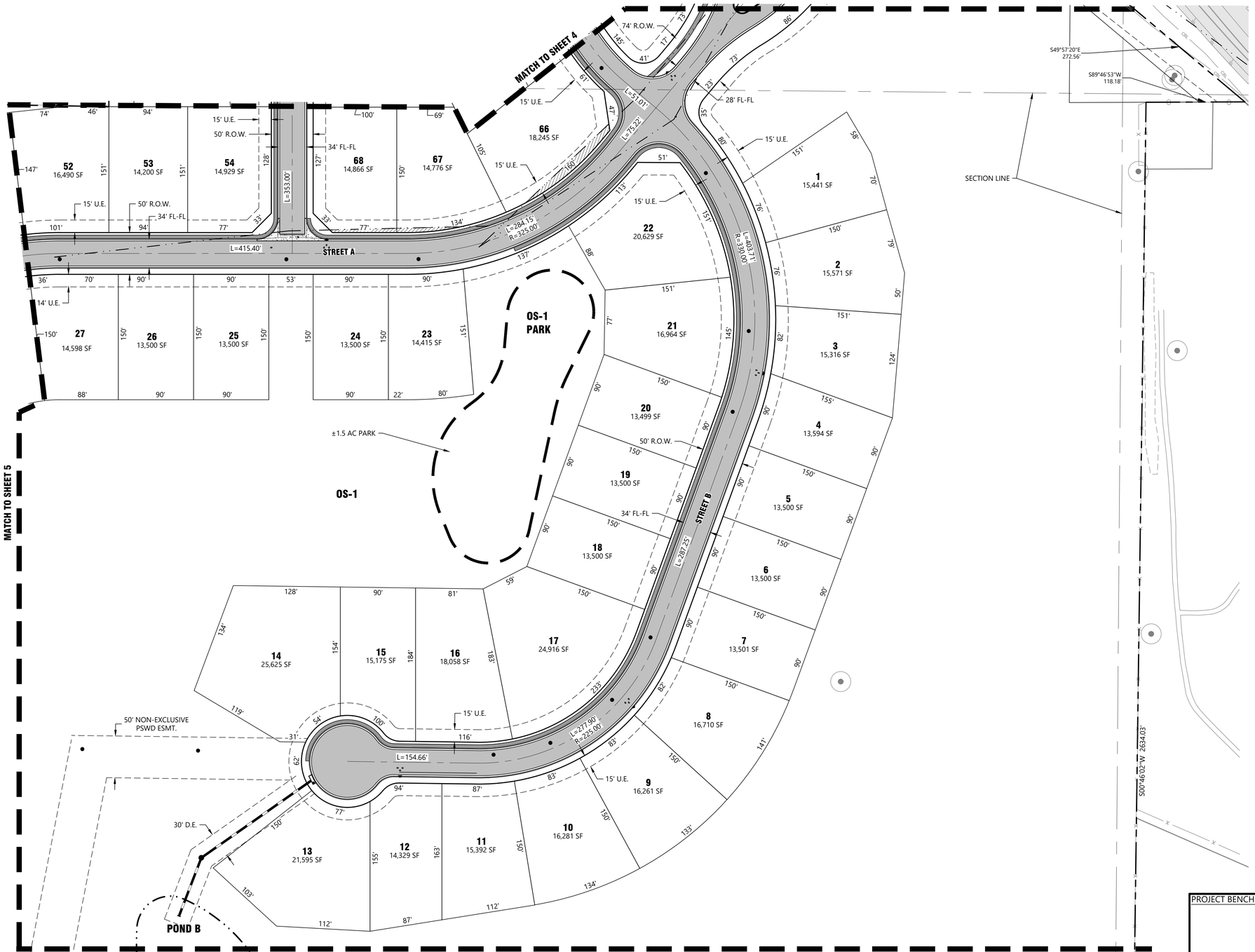
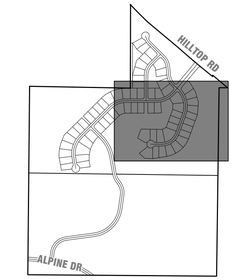
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 80'
Scale Vert: N/A

Sheet: 6 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Wilkinson Real Estate, LLC
6900 Bellview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
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No. 6

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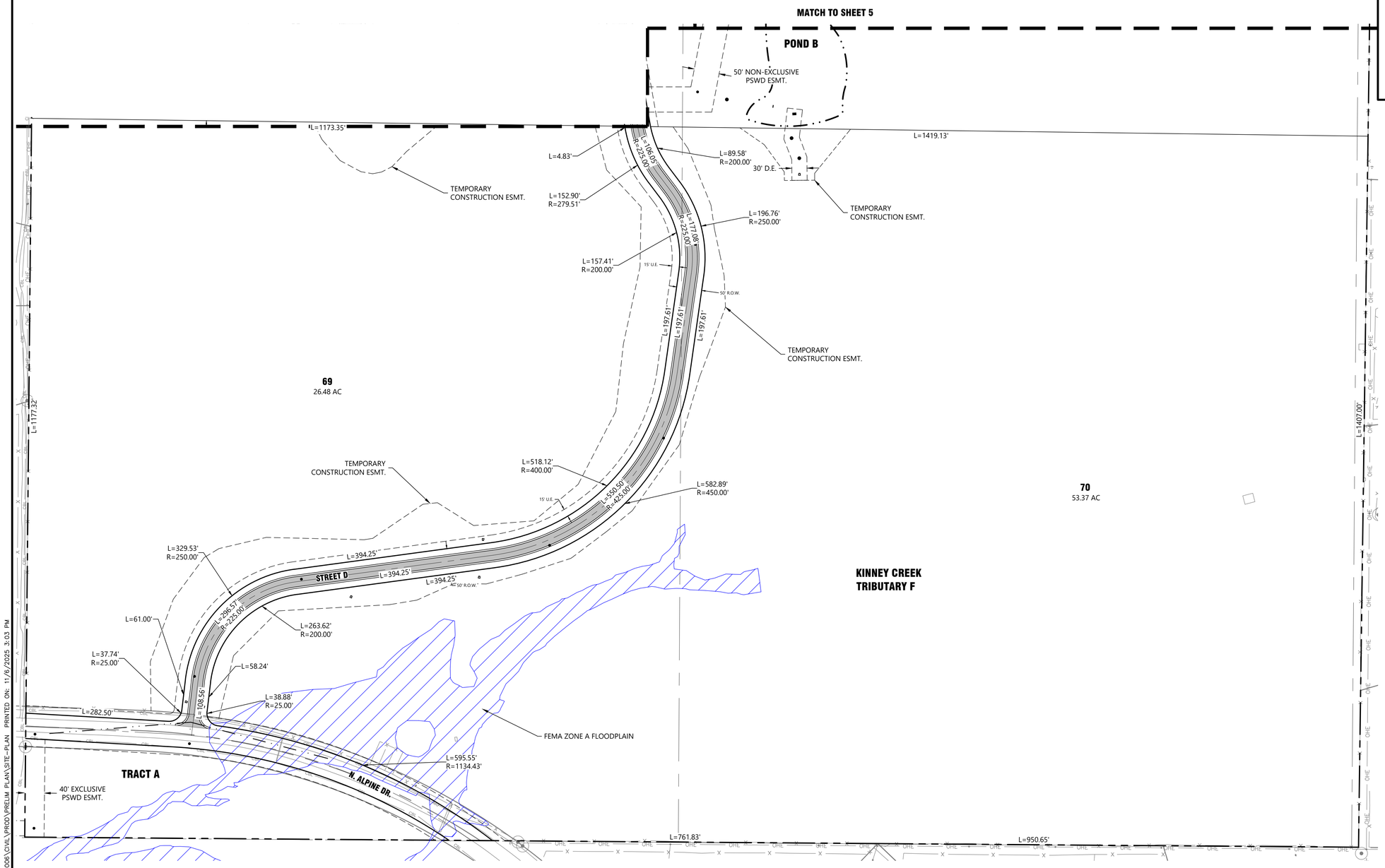
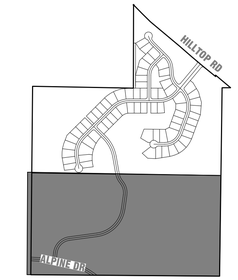
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

PROJECT BENCHMARK:

SCALE
1 inch = 100 ft.

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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/A

Sheet: 7 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Ridgeline Real Estate, LLC
6900 Belleview Ave.
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 7

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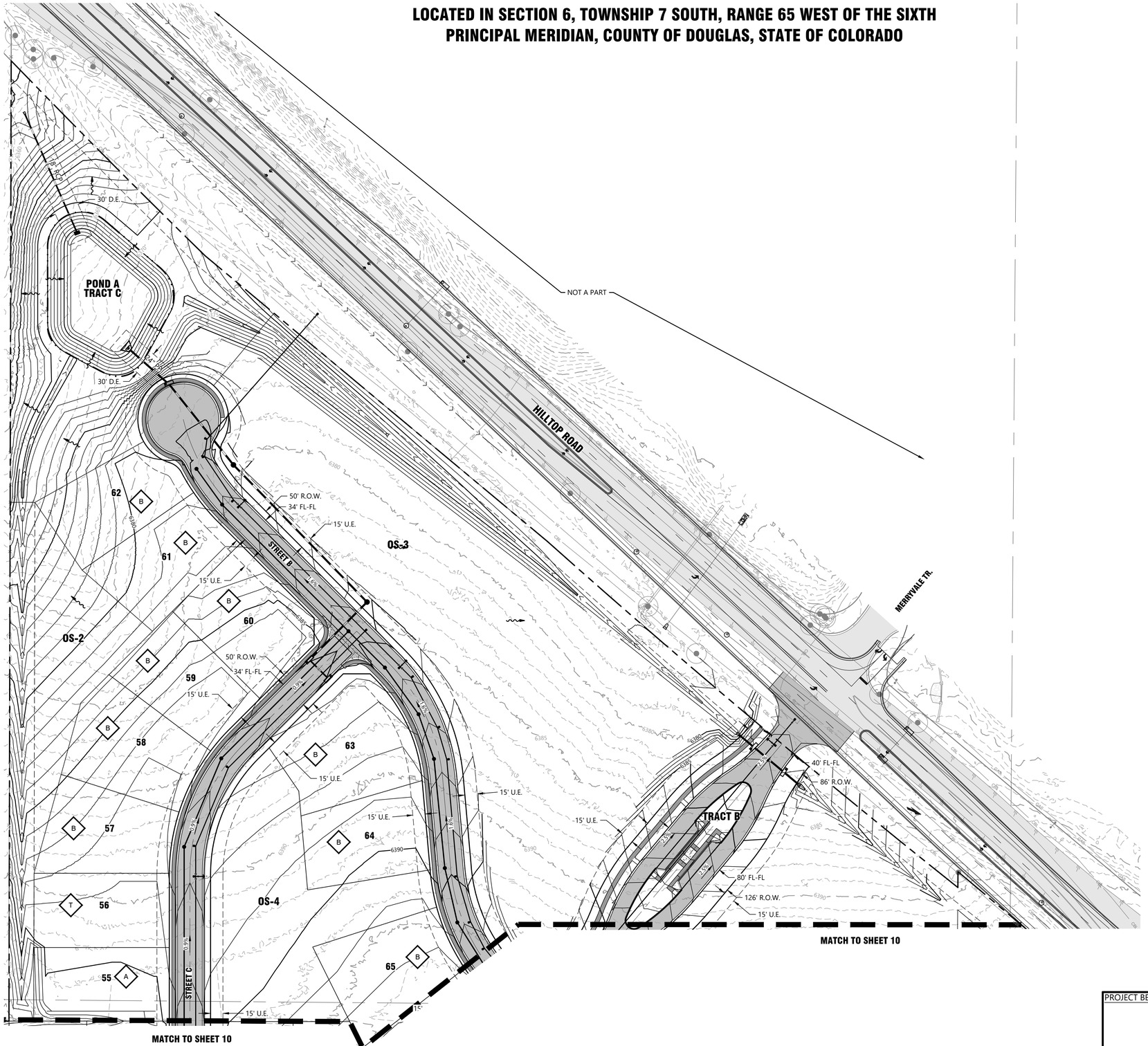
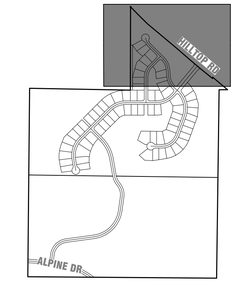
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

LOT TYPE

A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 8 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
MVC Hilltop Real Estate, LLC
6900 Dallas Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 8

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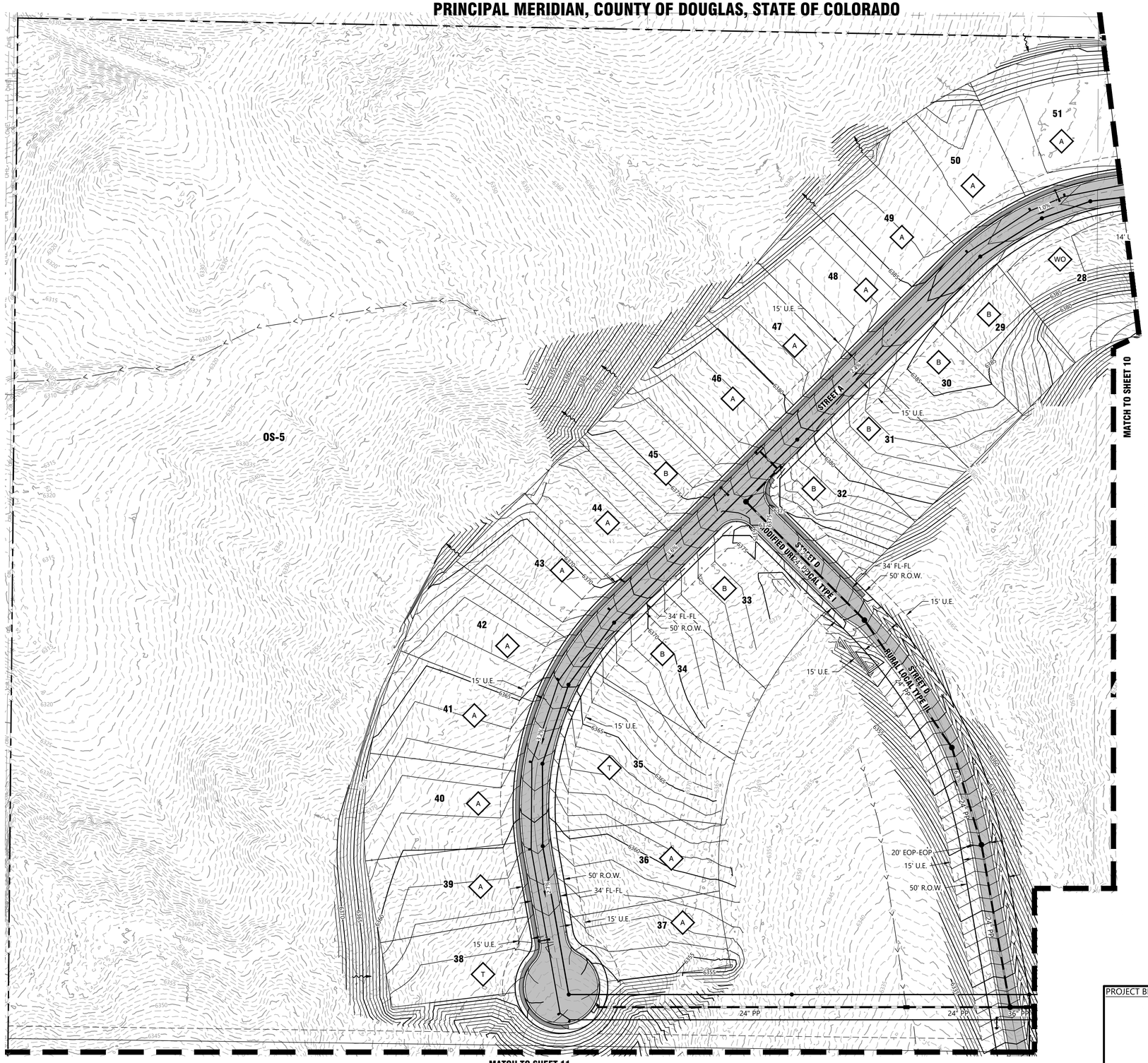
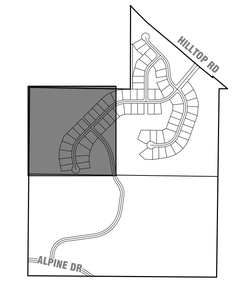
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

LOT TYPE	
A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.
60 0 30 60

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No.	Rev. Date:	Revision Type:
1		
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6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 80'
Scale Vert: N/A

Sheet: 9 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Miller Investment Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 9

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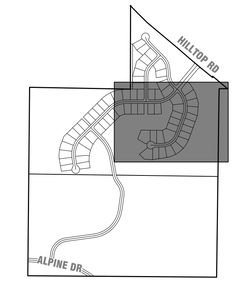
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO



KEY MAP
1"=1000'

LOT TYPE	
A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

LJA
1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 10 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Mill Creek Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

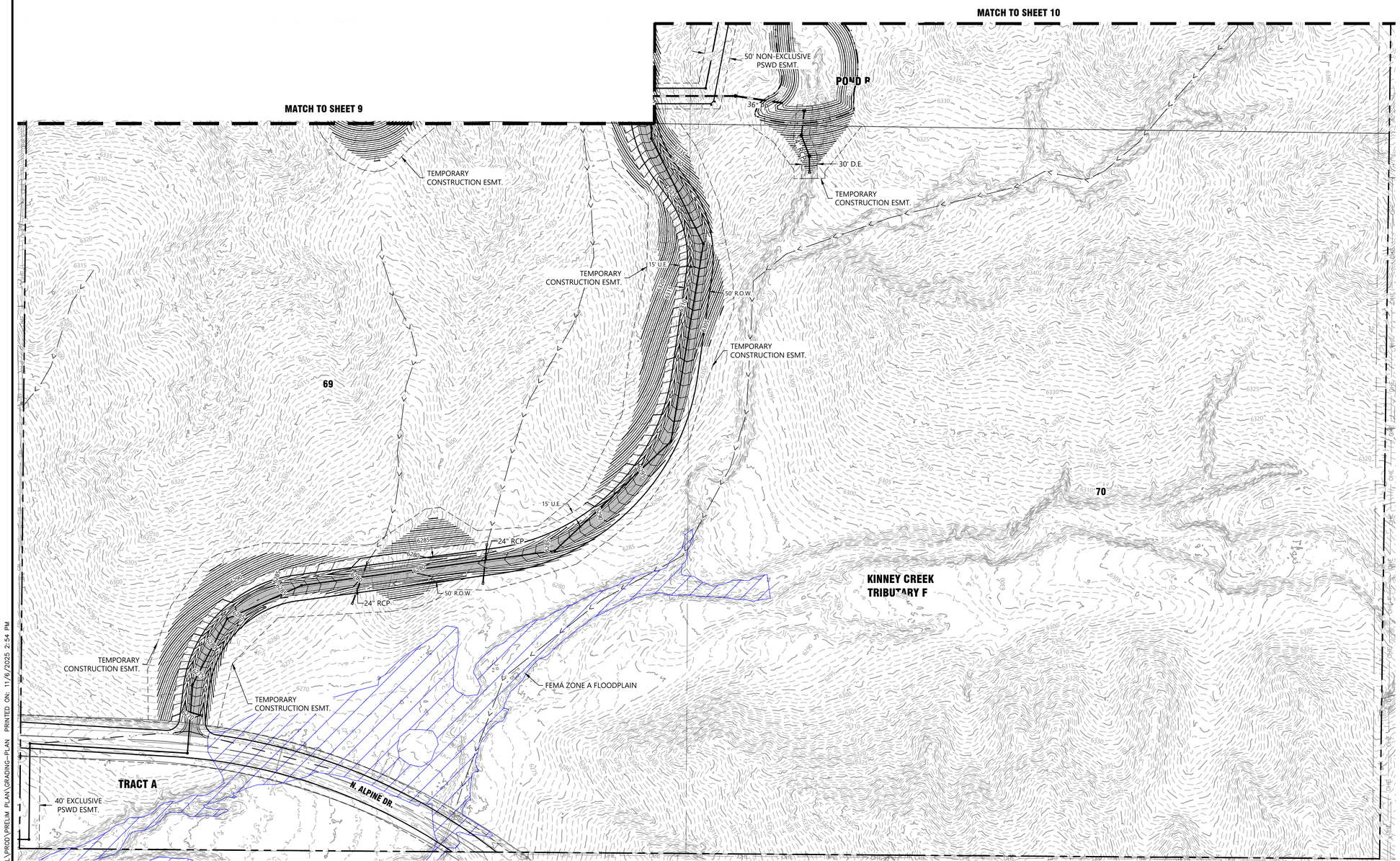
Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

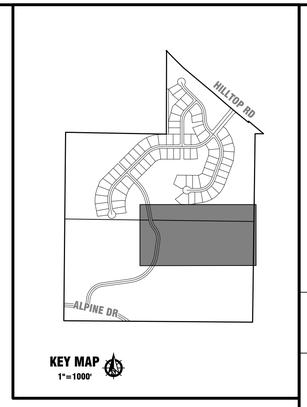
No. 10

I:_08 FOLDERS\1084\1084-0006\CIVIL\PROD\PRELIM PLAN\GRADING-PLAN PRINTED ON: 11/6/2025 2:54 PM

RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





LOT TYPE

A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

SCALE
60 0 30 60
1 inch = 60 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 11 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Kiwi Invest Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 11

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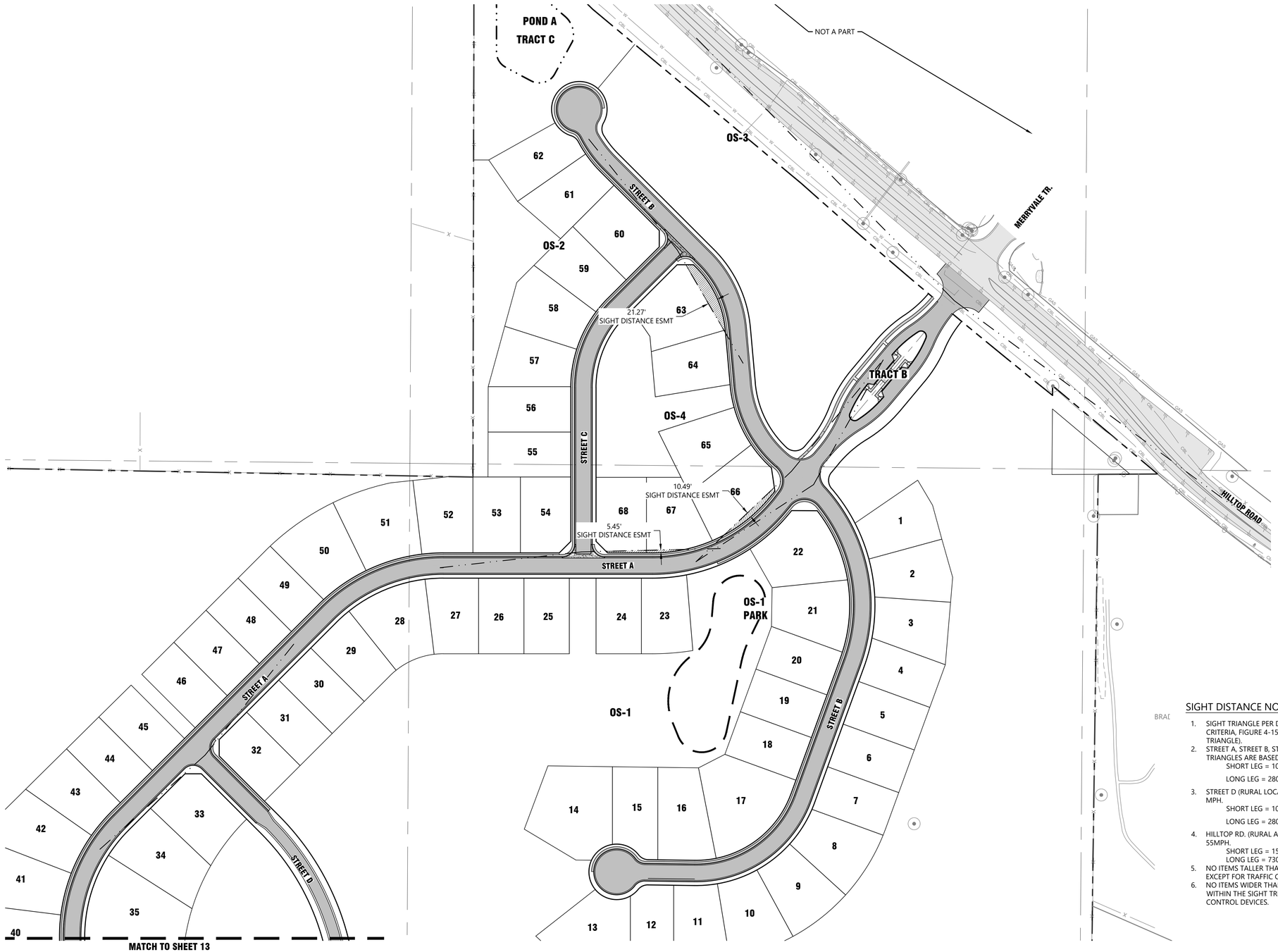
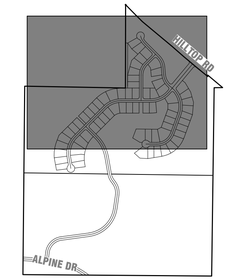
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

SIGHT DISTANCE NOTES:

1. SIGHT TRIANGLE PER DOUGLAS COUNTY ROADWAY DESIGN AND TECHNICAL CRITERIA, FIGURE 4-15 INTERSECTION AND DRIVEWAY SIGHT DISTANCE (LINE OF SIGHT TRIANGLE).
2. STREET A, STREET B, STREET C, AND ALPINE DR. (URBAN LOCAL TYPE I) SIGHT TRIANGLES ARE BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
3. STREET D (RURAL LOCAL TYPE III) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM THE FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
4. HILLTOP RD. (RURAL ARTERIAL) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 55MPH.
   SHORT LEG = 15' FROM THE FLOW LINE.
   LONG LEG = 730' LINE OF SIGHT.
5. NO ITEMS TALLER THAN 30" ARE ALLOWED WITHIN THE STOPPING SIGHT TRIANGLES EXCEPT FOR TRAFFIC CONTROL DEVICES.
6. NO ITEMS WIDER THAN 18" CAN BE TALLER THAN 30" OR GREATER ARE ALLOWED WITHIN THE SIGHT TRIANGLES EXCEPT FOR STREET TREE TRUNKS AND TRAFFIC CONTROL DEVICES.

PROJECT BENCHMARK:

100 0 50 100
SCALE
1 inch = 100 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JT
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/a

Sheet: 12 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Sight Distance Plan

NOT FOR CONSTRUCTION

Developer:
Alfa Ventures Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

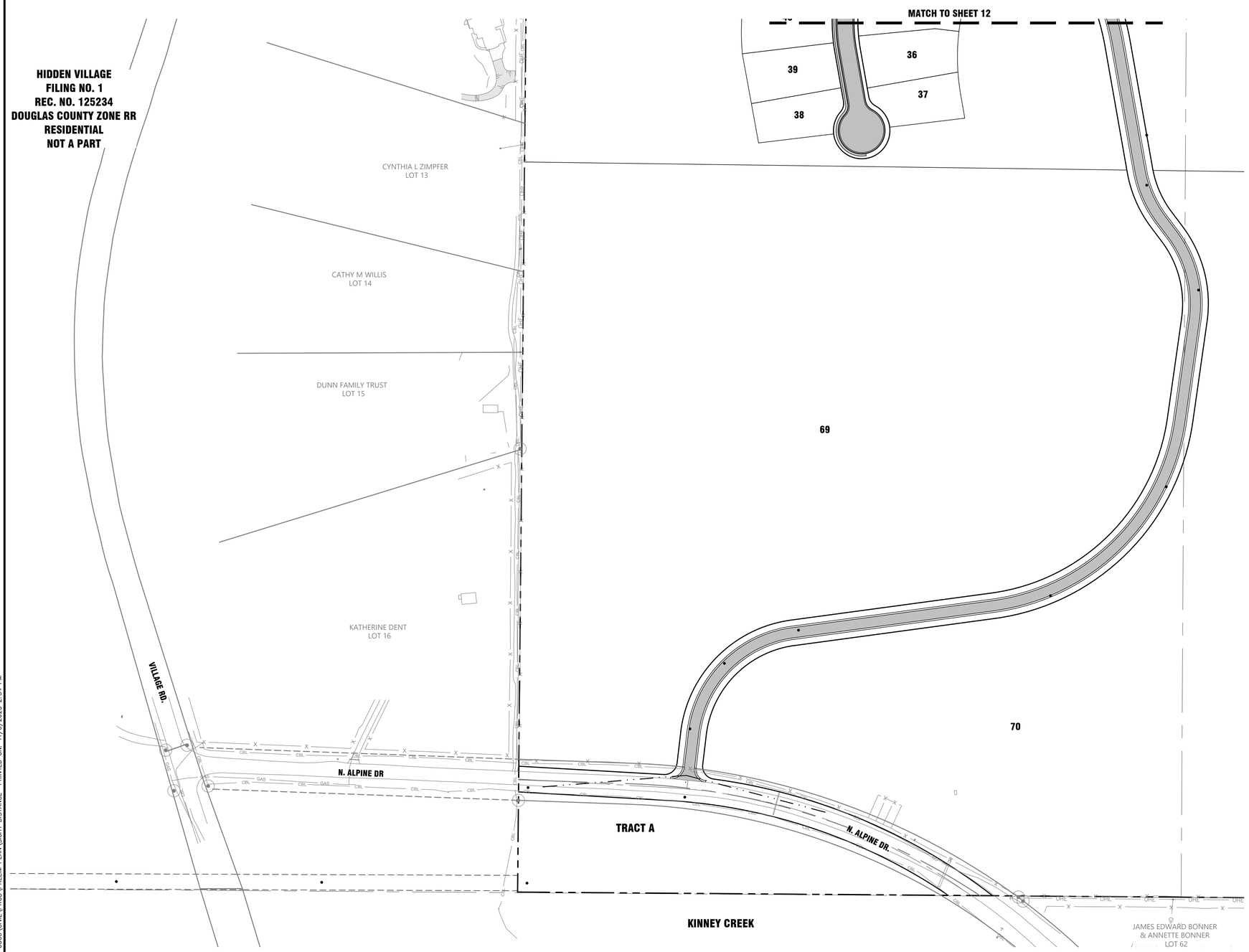
Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

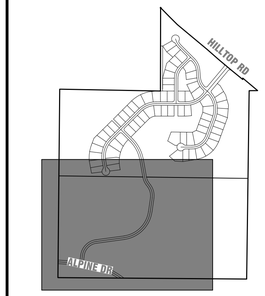
No. 12

I:\JOB FOLDERS\1084\1084-0006\CIVIL\PROD\PRELIM PLAN\SIGHT DISTANCE PRINTED ON: 11/6/2025 2:54 PM

RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

SIGHT DISTANCE NOTES:

1. SIGHT TRIANGLE PER DOUGLAS COUNTY ROADWAY DESIGN AND TECHNICAL CRITERIA, FIGURE 4-15 INTERSECTION AND DRIVEWAY SIGHT DISTANCE (LINE OF SIGHT TRIANGLE).
2. STREET A, STREET B, STREET C, AND ALPINE DR. (URBAN LOCAL TYPE I) SIGHT TRIANGLES ARE BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
3. STREET D (RURAL LOCAL TYPE III) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM THE FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
4. HILLTOP RD. (RURAL ARTERIAL) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 55MPH.
   SHORT LEG = 15' FROM THE FLOW LINE.
   LONG LEG = 730' LINE OF SIGHT.
5. NO ITEMS TALLER THAN 30" ARE ALLOWED WITHIN THE STOPPING SIGHT TRIANGLES EXCEPT FOR TRAFFIC CONTROL DEVICES.
6. NO ITEMS WIDER THAN 18" CAN BE TALLER THAN 30" OR GREATER ARE ALLOWED WITHIN THE SIGHT TRIANGLES EXCEPT FOR STREET TREE TRUNKS AND TRAFFIC CONTROL DEVICES.

PROJECT BENCHMARK:

100 0 50 100
SCALE
1 inch = 100 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JT
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/a

Sheet: 13 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Sight Distance Plan

NOT FOR CONSTRUCTION

Developer:
Kimley-Horn Real Estate, LLC
6900 Dallas Pkwy Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 13

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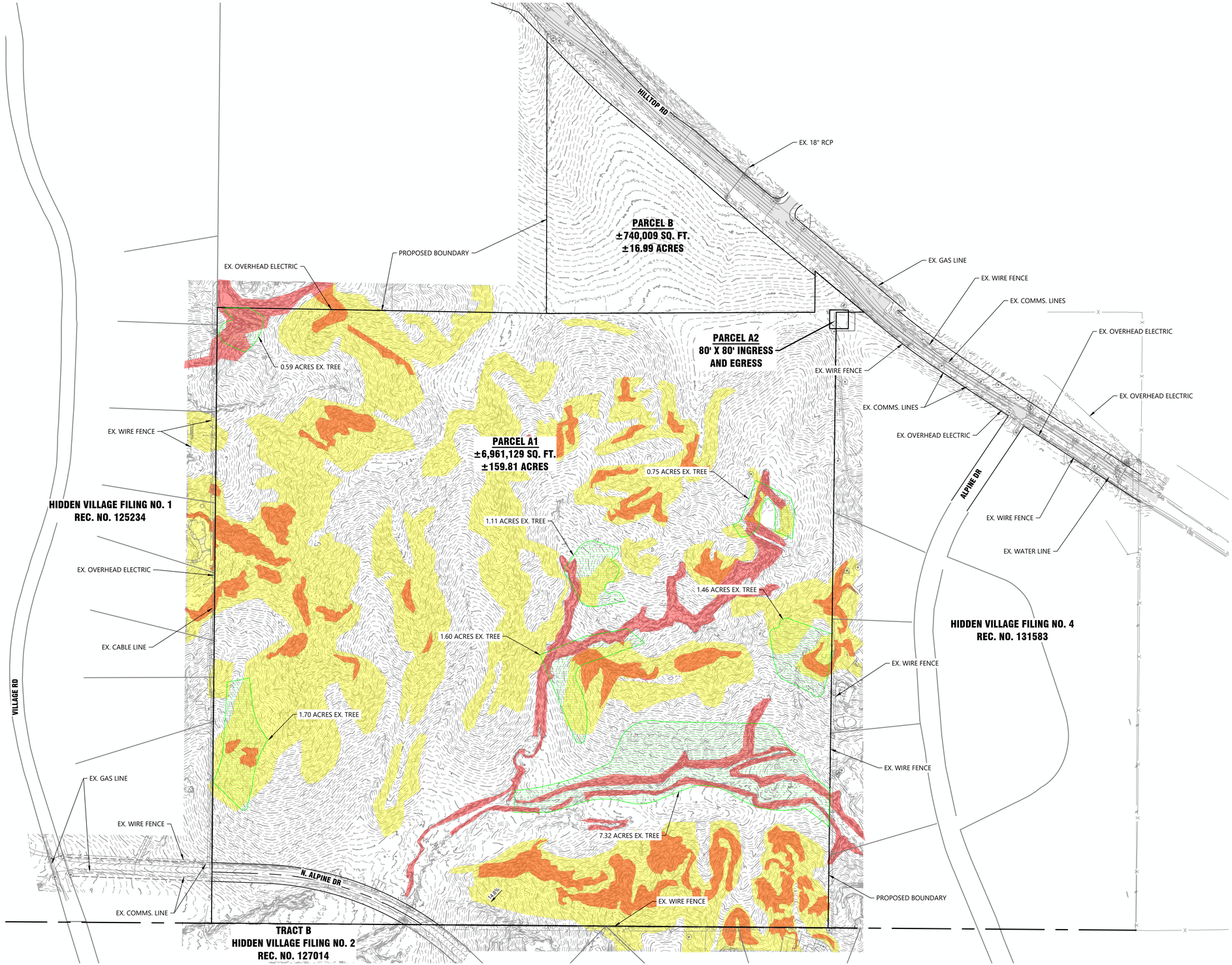
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO



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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 200'
Scale Vert: N/a

Sheet: 14 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Preliminary Plan
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Existing Features Plan

NOT FOR CONSTRUCTION

Developer:
Alta Vista Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

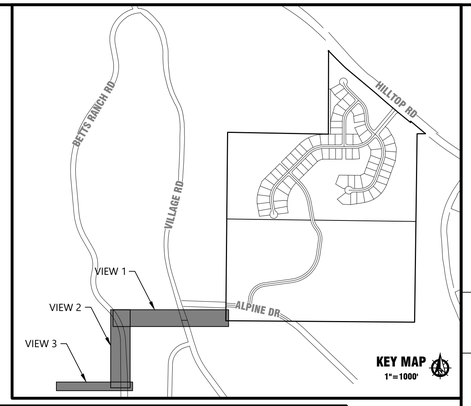
Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

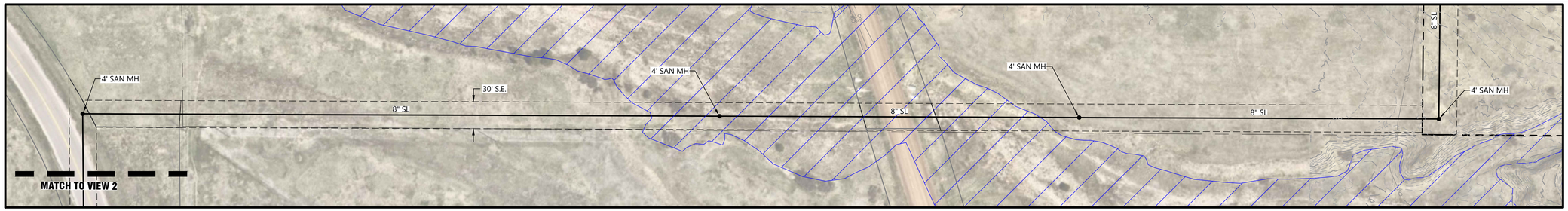
Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 14

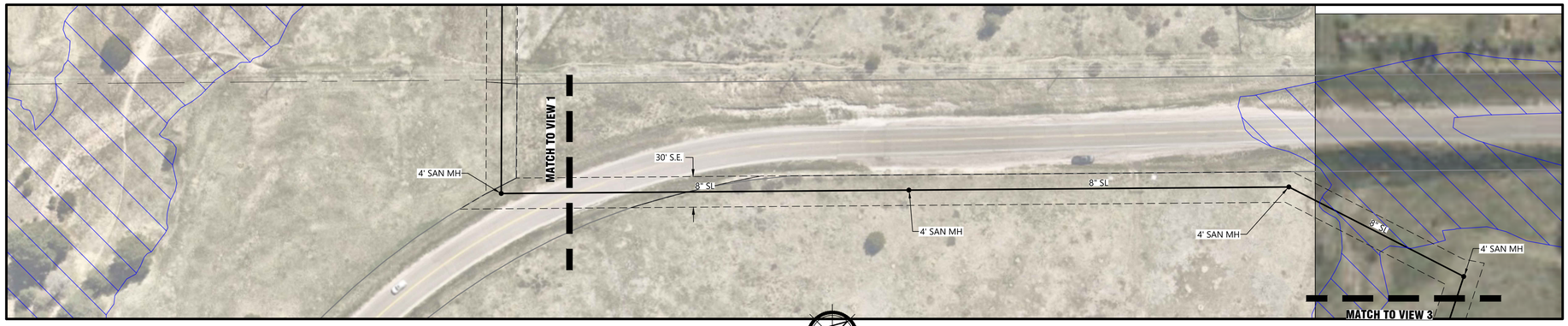
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

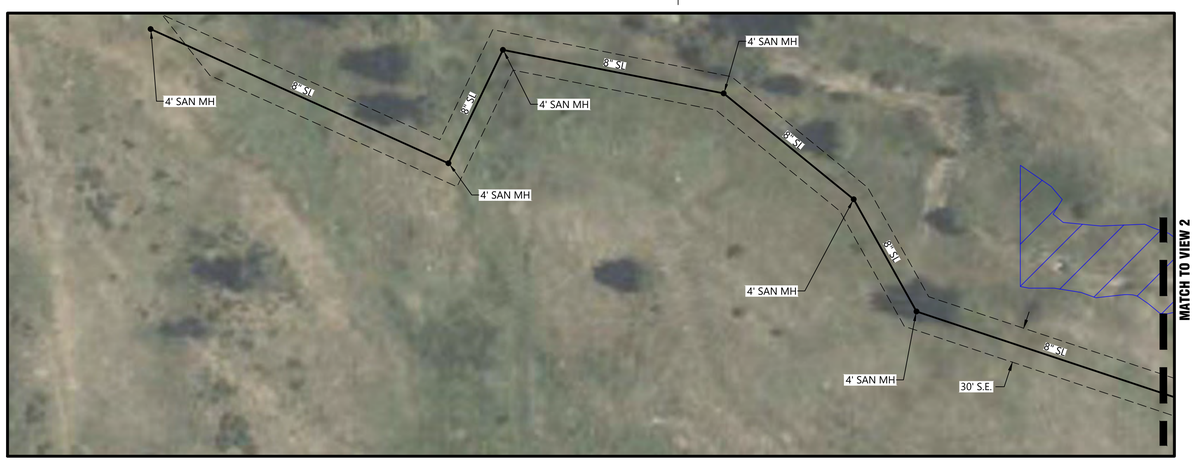




VIEW 1



VIEW 2



VIEW 3

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 15 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Offsite Sanitary Sewer Plan

NOT FOR CONSTRUCTION

Developer:
Wilkinson Real Estate, LLC
6900 Building Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 15

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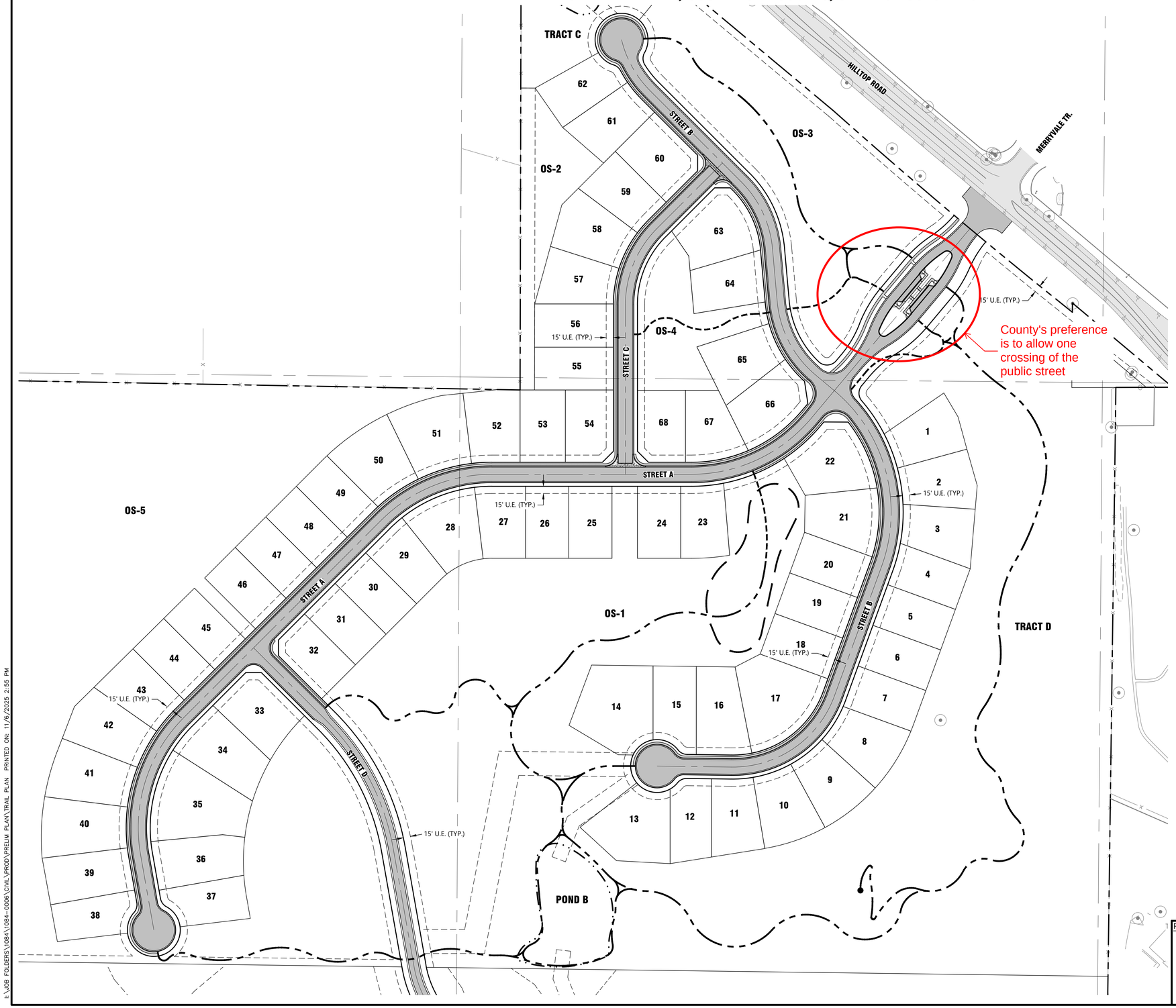
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO



LEGEND

- 5' CONCRETE TRAIL (1,050 LF, 0.31 AC @ 13' WIDE CORRIDOR)
- SOFT SURFACE TRAIL (7,125 LF, 1.31 AC @ 8' WIDE CORRIDOR)

PROJECT BENCHMARK:

SCALE
1 inch = 100 ft.

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Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JT
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/A

Sheet: 16 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Trails Plan

NOT FOR CONSTRUCTION

Developer:
Mattamy Homes Real Estate, LLC
6600 Bellview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 16

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Phase II Drainage Report
for
Ramblewood Filing No. 1
Douglas County, Colorado

Prepared for:

Miller United Real Estate, LLC
6900 E. Belleview Ave, Suite 300
Greenwood Village, CO 80111
Contact: Dan Sheldon
Contact Email: dsheldon@miller-united.com

By:

LJA ENGINEERING

1765 West 121st Avenue, Suite 300
Westminster, CO 80234
Contact: Kevin Lovelace
Contact Email: klovelace@lja.com

Date: October 15, 2025

detailed drainage comments will be provided with the final plat submittal

Trevor Bedford

From: Chuck Smith
Sent: Tuesday, January 20, 2026 8:50 AM
To: Sarah Tengen
Cc: Trevor Bedford; Dan Sheldon; Kevin Lovelace; Hardy Dylan; Daniel Jennings; Mark Kieffer
Subject: RE: Ramblewood Preliminary Plan | SB2025-040 January 2026

Good Morning All – I have reviewed the latest submittal and our comments have been addressed - thanks

Chuck Smith, CFM | Engineer III – Douglas County Engineering
Douglas County Department of Public Works Engineering
Engineering Services
Address | 100 Third St., Castle Rock, CO 80104
Main | 303-660-7490
Email | CSmith@douglas.co.us

From: Sarah Tengen <stengen@norris-design.com>
Sent: Friday, January 16, 2026 11:14 AM
To: Chuck Smith <CSmith@douglas.co.us>
Cc: Trevor Bedford <tbedford@douglas.co.us>; Dan Sheldon <dsheldon@miller-united.com>; Kevin Lovelace <klovelace@lja.com>; Hardy Dylan <dyhardy@lja.com>; Daniel Jennings <djennings@norris-design.com>; Mark Kieffer <MKieffer@Norris-Design.com>
Subject: Ramblewood Preliminary Plan | SB2025-040 January 2026

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Good morning Chuck,

Thank you again for working with us to resolve the Ramblewood Preliminary Plan comments. Please see the attached PDF for the revised Preliminary Plan. If you could please confirm you have received this and all comments are resolved, that would be greatly appreciated.

Thank you, and have a great weekend!

NORRIS DESIGN
PEOPLE + PLACEMAKING

Sarah Tengen (she/her/hers)
Planner
+ 1101 Bannock Street | Denver, CO 80204
+ P 303.892.1166 | D 720.379.2986

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Douglas County School District
Learn Today. Lead Tomorrow
620 Wilcox Street
Castle Rock, Colorado 80104

December 15, 2025

Trevor Bedford, AICP | Senior Planner
Douglas County Department of Community Development
Planning Services Division
Address | 100 Third St., Castle Rock, CO 80104
Direct | 303.814.4372 Main | 303.660.7460
Email tbedford@douglas.co.us

RE: Ramblewood Preliminary Plan (SB2025-040)

Dear Mr. Bedford,

Thank you for the opportunity to respond to the above referenced application. It is our understanding that the applicant is requesting to subdivide approximately 177 acres into 70 residential lots, eight tracts, and approximately 11 acres of public right-of-way. The property is generally located south of the Hilltop Road and Village Road intersection.

DCSD has calculated the amount of school site land requirement for students generated by the proposed planned development. A total of 67 students are expected from the development (as proposed) generating a land dedication requirement of 1.579-acres. Since this is smaller than DCSD's minimum school site size and since the applicant has stated in their project summary that cash-in-lieu of land dedication will be paid at final plat, DCSD requests cash-in-lieu of land dedication.

CASH-IN-LIEU CALCULATION
STUDENT GENERATION

PROJECT NAME: RAMBLEWOOD PRELIMINARY PLAN (SB2025-040)				
DU/	ACRES		DENSITY	
70	115.7711		0.60	
			Generation	Number
STUDENT GENERATION RATES	No. of DU's		Rate	of Students
ELEMENTARY	70	X	0.52	36
MIDDLE SCHOOL	70	X	0.15	11
HIGH SCHOOL	70	X	0.29	20
			TOTAL	67
				Required
			School	Land
	Number		Acreage	Dedication
SCHOOL LAND DEDICATION	of Students		Per Student	Acreage
ELEMENTARY	36	X	0.018	0.655
MIDDLE SCHOOL	11	X	0.030	0.315
HIGH SCHOOL	20	X	0.030	0.609
			TOTAL	1.579

As per Article 1004.05.3 of the Douglas County Subdivision Regulations, “The cash-in-lieu fee shall be equivalent to the full market value of the acreage required for school land dedication. Value shall be based on anticipated market value after completion of platting. The applicant shall submit a proposal for the cash-in-lieu fee and supply the information necessary for the Board to evaluate the adequacy of the proposal. This information shall include at least one appraisal of the property by a qualified appraiser.” And as per Article 1004.06, “The conveyance of land or payment of fees obtained through the County's dedication requirement shall be required prior to the recordation of the first final plat for the subdivision….”

Assuming neither the applicant nor Douglas County object to these fees DCSD has no objection to the proposed project. DCSD looks forward to future collaboration with the applicant and Douglas County on this proposal.

Shavon Caldwell, Planning Manager
DCSD Planning & Construction
scaldwell2l@dcsdk12.org
303.387.0417

REFERRAL RESPONSE REQUEST

Date sent: November 14, 2025 Comments due by: **December 9, 2025**

Project Name:	Ramblewood Preliminary Plan
Project File #:	SB2025-040
Project Summary:	Request for a preliminary plan consisting of 68 single-family residential lots, 2 agricultural lots, and 8 tracts.

Information on the identified development proposal located in Douglas County is enclosed. Please review and comment in the space provided.

☐	No Comment
☐	Please be advised of the following concerns:
☒	See letter attached for detail.
Agency: Pinery Homeowners Association	**Phone #:** 303-841-8572
Your Name: Sonia Eyre	**Your Signature:** Sonia Eyre
(please print)	**Date:** December 8, 2025

Agencies should be advised that failure to submit written comments prior to the due date, or to obtain the applicant's written approval of an extension, may result in written comments being accepted for informational purposes only.

Sincerely,

Trevor Bedford, AICP, Senior Planner
tbedford@douglas.co.us

Homeowners Association, Inc.
A COLORADO NON-PROFIT CORPORATION
8170 Hillcrest Way
Parker, CO 80134
303-841-8572

December 8, 2025

Trevor Bedford, AICP
Planning Services

RE: Project SB2025-040

Dear Mr. Bedford,

Please see below the following comments regarding Project SB2025-040:

The Pinery Homeowners' Association does not have any objection to the Ramblewood Preliminary Plan consisting of 68 single-family residential lots, 2 agricultural lots, and 8 tracts.

Our primary concern pertains to the impact on traffic at the intersection of Hilltop Road and Village Drive. We recognize that improvements are currently underway in this area to help mitigate these traffic concerns, however.

We appreciate the opportunity to review and comment on this referral.

Respectfully,

Sonia Eyre
Board President
Pinery Homeowners' Association

From: Trevor Bedford
Sent: Friday, November 21, 2025 9:03 AM
To: Matt Jakubowski
Subject: FW: Douglas County eReferral (Project Number SB2025-040) Is Ready For Review
Attachments: RAMBLEWOOD.jpg

From: James Peabody <jamesp@cwc64.com>
Sent: Friday, November 21, 2025 9:02:20 AM (UTC-07:00) Mountain Time (US & Canada)
To: Trevor Bedford <tbedford@douglas.co.us>; duanew cwc64.com <duanew@cwc64.com>; jt cwc64.com <jt@cwc64.com>; Lana S. <ls1762@att.com>; LENNY V. <lv2121@att.com>
Subject: Re: Douglas County eReferral (Project Number SB2025-040) Is Ready For Review

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Trevor,

This is in response to your eReferral with a utility map showing any buried AT&T Long Line/Core Fiber Optics near ***Ramblewood, Parker, CO 80134 (Project # SB2025-040).*** The Earth map shows the project area in red. Based on the address and/or map you provided, there should be NO conflicts with the AT&T Long Lines, as we do not have facilities in that area.

Please feel free to contact us with any questions or concerns.

***** Map disclaimer: The attached google earth maps are intended to show approximate locations of the buried AT&T long line fiber optic cable. The maps are provided for informational purposes only. In no way should the maps be used for anything other than general guidelines as to where the fiber is or is not and any other use of these maps is strictly prohibited. *****

Thank you,

James Peabody
Clearwater Consulting Group, Inc.
120 9th Ave. South, Suite #140
Nampa, ID 83651
C: (951) 201-1279
E: jamesp@cwc64.com

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From: annb cwc64.com <annb@cwc64.com>
Sent: Thursday, November 20, 2025 12:51 PM
To: James Peabody <jamesp@cwc64.com>
Subject: FW: Douglas County eReferral (Project Number SB2025-040) Is Ready For Review

Ann

-----Original Message-----
From: tbedford@douglas.co.us <tbedford@douglas.co.us>
Sent: Friday, November 14, 2025 2:27 PM
To: annb cwc64.com <annb@cwc64.com>
Subject: Douglas County eReferral (Project Number SB2025-040) Is Ready For Review

There is an eReferral for your review. Please use the following link to log on to your account:
https://apps.douglas.co.us/planning/projects/Login.aspx

Project number SB2025-040, Ramblewood Preliminary Plan.

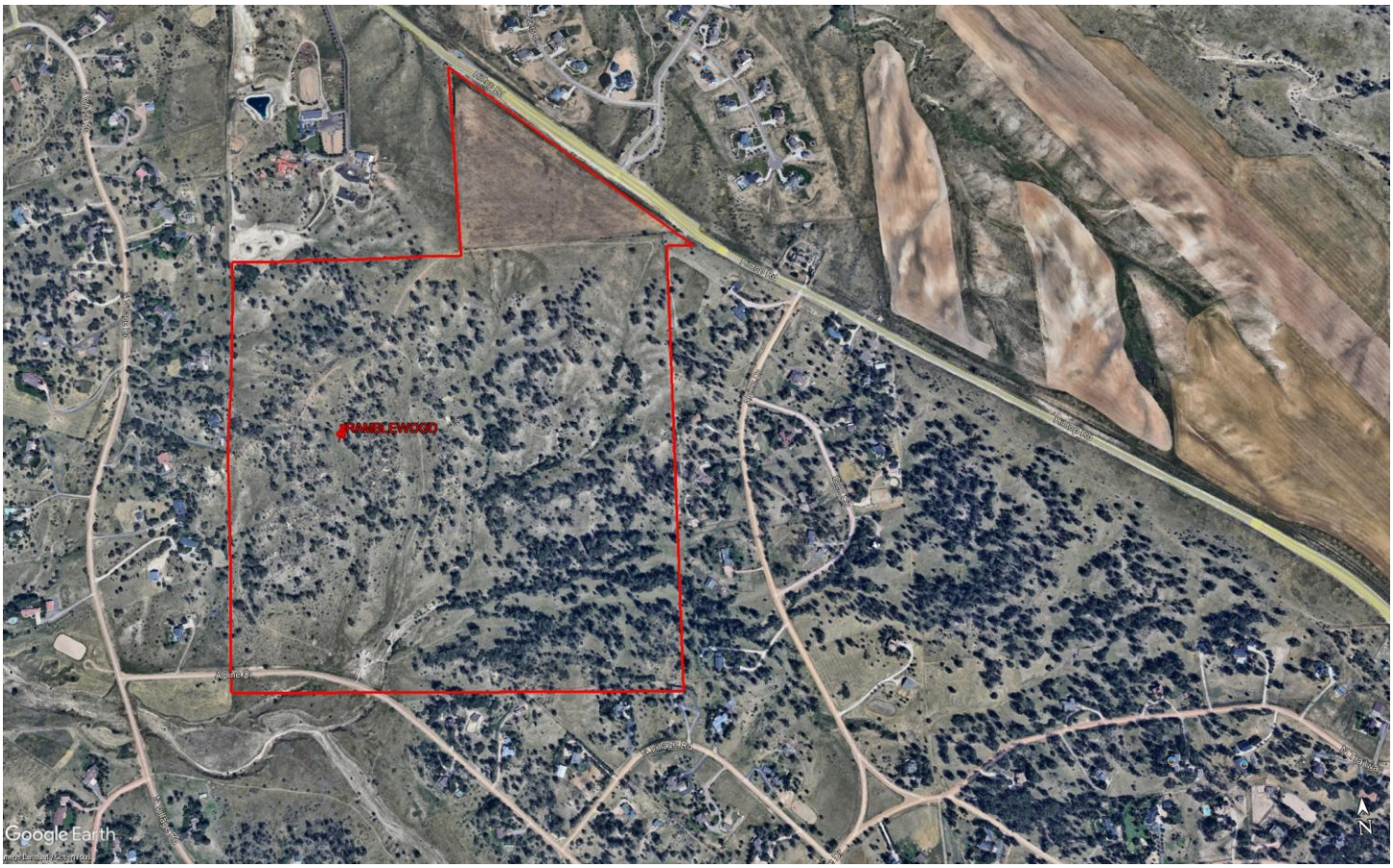
Request for a preliminary plan consisting of 68 single-family residential lots, 2 agricultural lots, and 8 tracts.

This referral will close on Tuesday, December 9, 2025.

If you have any questions, please contact me.

Sincerely,

Trevor Bedford, AICP
Planning Services
100 Third Street
Castle Rock, CO 80104
303-660-7460 (main)


RAMBLEWOOD
Google Earth
N

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

Trevor Bedford, AICP, Senior Planner
Douglas County Department of Community Development, Planning Services
100 Third St
Castle Rock Co 80104
303.660.7460
303.660.9550 Fax

Project Name:	Ramblewood Preliminary Plan
Project File #:	**SB2025-040**
S Metro Review #	REFPDP25-00290
Review date:	December 2, 2025
Plan reviewer:	Aaron Miller 720.989.2246 aaron.miller@southmetro.org
Project Summary:	Request for a preliminary plan consisting of 68 single-family residential lots, 2 agricultural lots, and 8 tracts.
Code Reference:	Douglas County Fire Code, 2018 International Fire Code, and 2021 International Building Code with amendments as adopted by Douglas County.

South Metro Fire Rescue (SMFR) has reviewed the provided documents. Revisions are required prior to approval of the preliminary plan.

COMMENTS:

1. As indicated in the narrative "The intent of the proposed Preliminary Plan is to plat the Hilltop JAM LLC Parcel and the Whittlesey Parcel as one property…" As such the ranch lots must be included in the water district and must provide municipal water including for fire protection water supplies to meet the adopted Douglas County requirements. Hydrants must be provided for fire protection of future structures on these ranch lots and the allowable building envelope for any structures shall meet the requirements of Section 507 of the Douglas County Fire Code. None of the exceptions to 507.1 are applicable to these newly created lots which are part of this project in order to meet the density requirements. These lots are not eligible for any rural water supply allowances and shall be treated the same as all cluster lots with regards to water supplies.
2. The narrative incorrectly indicates "Although not required, a fire vehicle turnaround and fire hydrant will be provided along street D…" There is no such turnaround appearing on the plans and a turnaround does not "provide fire mitigation infrastructure to benefit surrounding areas" remove all such misleading inferences from narratives and plans. Hydrants may be required along street D dependent upon water line routing and requirements to provide municipal water to the ranch lots. Further coordination with SMFR and Parker Water will be required to resolve water supply prior to preliminary plan approval.
3. Grading plan did not label all roadway grades for verification the grades of roadways meet standards. Revise to label all roadway grades in the direction of travel.
4. Note that the Wildfire Mitigation Plan is not part of Fire Protection Service. Wildfire Mitigation Standards are part of the Building Code requirements.

SOUTH METRO FIRE RESCUE
FIRE MARSHAL'S OFFICE

Trevor Bedford, AICP, Senior Planner
Douglas County Department of Community Development, Planning Services
100 Third St
Castle Rock Co 80104
303.660.7460
303.660.9550 Fax

Project Name:	Ramblewood Preliminary Plan
Project File #:	**SB2025-040**
S Metro Review #	REFPDP25-00290
Review date:	REVISED - January 23, 2025
Plan reviewer:	Aaron Miller 720.989.2246 aaron.miller@southmetro.org
Project Summary:	Request for a preliminary plan consisting of 68 single-family residential lots, 2 agricultural lots, and 8 tracts.
Code Reference:	Douglas County Fire Code, 2018 International Fire Code, and 2021 International Building Code with amendments as adopted by Douglas County.

South Metro Fire Rescue (SMFR) has reviewed the provided revised response documents addressing the original SMFR comments. SMFR has no objection to the proposed preliminary plan based upon these updated documents and responses provided. Applicants and Contractors are encouraged to contact SMFR regarding the applicable permit requirements for the proposed project.

December 5, 2025

Trevor Bedford
Douglas County Department of Community Development
Planning Services Division
100 Third St., Castle Rock, CO 80104

Re: SB2025-040, Ramblewood Preliminary Plan

Dear Mr. Bedford,

This letter provides comments regarding the request for a preliminary plan consisting of 68 single-family residential lots, 2 agricultural lots, and 8 tracts.

At this time the Curator has no further recommendations. If there are future development plans that involve any ground disturbance a Class II survey will need to be conducted to evaluate for cultural resources before any disturbance occurs. A Class I file search does not fulfill a cultural survey. A walking pedestrian survey would be recommend before any ground disturbance.

There is potential for buried archaeological resources related to prehistoric activities in the project area and potential for the discovery of subsurface cultural deposits during ground moving activities. Should buried artifacts and features be discovered, we recommend completion of the appropriate Colorado Office of Archaeology and Historic Preservation (OAHP) Data Management and Historic and/or Prehistoric Component forms, following OAHP guidelines, with accompanying sketch maps and photographs. Completed forms are submitted to OAHP to ensure that Douglas County's historic or prehistoric data is included in the Colorado OAHP state-wide database of cultural resources.

Thank you in advance for your attention to the preservation and protection of Douglas County's cultural resources for future generations.

Sincerely,

Brittany Cassell

Brittany Cassell, Curator

Trevor Bedford

From: Brooks Kaufman <BKaufman@core.coop>
Sent: Friday, January 16, 2026 11:39 AM
To: Sarah Tengen
Cc: Trevor Bedford; Dan Sheldon; Kevin Lovelace; Hardy Dylan; Daniel Jennings; Mark Kieffer
Subject: RE: Ramblewood Preliminary Plan | SB2025-040 January 2026
Attachments: 260116-Ramblewood-PP-Plan Exhibit-4.pdf

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Good morning, Sarah

CORE Electric Cooperative approves the Preliminary Plan, and our comments have been addressed by the applicant.

Please be aware of CORE will require the following language be added to the plat notes.

No improvements that conflict with or interfere with construction, maintenance or access to utilities shall be placed within the utility easements. Prohibited improvements include, but are not limited to, permanent structures, buildings, counter-forts, decks, attached porches, attached stairs, window wells, air conditioning units, retaining walls/components and other objects that may interfere with the utility facilities or access, use and maintenance thereof. .

The utility easements as shown hereon are hereby dedicated for public utilities, cable communication systems fiber and other purposes as shown hereon. The entities responsible for providing the utility services for which the easements are established are hereby granted the perpetual right of ingress and egress from and to adjacent properties for installation, maintenance and replacement of utility lines and related facilities.

Respectfully

Brooks Kaufman
Lands and Rights of Way Manager

800.332.9540 MAIN
720.733.5493 DIRECT
303.912.0765 MOBILE

www.core.coop.

Book time to meet with me

From: Sarah Tengen <stengen@norris-design.com>
Sent: Friday, January 16, 2026 11:16 AM
To: Brooks Kaufman <BKaufman@core.coop>
Cc: Trevor Bedford <tbedford@douglas.co.us>; Dan Sheldon <dsheldon@miller-united.com>; Kevin Lovelace <klovelace@lja.com>; Hardy Dylan <dyhardy@lja.com>; Daniel Jennings <djennings@norris-design.com>; Mark Kieffer <MKieffer@Norris-Design.com>
Subject: Ramblewood Preliminary Plan | SB2025-040 January 2026

> You don't often get email from stengen@norris-design.com. Learn why this is important

[CAUTION:] This email is from an external source. Avoid clicking links or opening attachments unless you trust the sender and verify the content's safety.

Good morning Brooks,

Thank you for taking the time to review the Ramblewood Preliminary Plan. Please see the attached PDF for the revised Preliminary Plan incorporating CORE comments. If you could please confirm you have received this and all comments are resolved, that would be greatly appreciated.

Thank you, and have a great weekend!

Sarah Tengen (she/her/hers)
Planner
+ 1101 Bannock Street | Denver, CO 80204
+ P 303.892.1166 | D 720.379.2986

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1101 Bannock Street
Denver, Colorado 80204
303.892.1166

December 17, 2025

Trevor Bedford
Department of Community Development
100 Third Street
Castle Rock, CO 80104

Re: Review of Ramblewood Preliminary Plan (PS2025-208)

Dear Mr. Bedford,

Thank you for your comments for the 2nd Submittal review of a Preliminary Plan application for the property known as Ramblewood. We are pleased to make our third submittal for a Preliminary Plan, addressing the comments provided by the County prior to the Referral process. Please see below for the responses provided to all written County comments.

We look forward to continuing to work with the County during the review and approval process for this application. Please contact us if you have any questions or if you need additional information.

Sincerely,
Norris Design

Sarah Tengen

Sarah Tengen
Planner

DOUGLAS COUNTY: ADDRESSING ANALYST

- Please propose street names to be placed on the final plat. Douglas County will evaluate and confirm approval or denial of proposed street names.
  At https://dougco.maps.arcgis.com/apps/instant/sidebar/index.html?appid=268d3ed4c6be4988907e388272c23d11 you can search a list of street names in the Douglas County database. These names have already been considered and should not be proposed again.
  Response: The applicant will work to coordinate with Douglas County Addressing on street names for approval at Final Plat.

- Proposed street names should be easy to read or pronounce. Street names that are the same as, or similar to, other street names are considered to be duplications and will be denied. Street names that are the same as, or similar to, subdivision names may not be used. Street names existing in areas to which we dispatch emergency services outside of Douglas County may not be used. North, east, south and west should not be part of the name. Special characters may not be used. Abbreviations, acronyms and initials may not be used. Street names must contain no more than 12 letters or character spaces (including the space between words). Please review all guidelines in the Douglas County Addressing and Street Naming Manual online at: https://www.douglas.co.us/documents/addressing-and-street-naming-manual-full.pdf/. Contact DCAddressing@douglas.co.us or 303.660.7411 with questions.
  Response: Acknowledged, thank you.

UTILITIES: AT&T LONG DISTANCE – ROW

- Based on the address and/or map you provided, there should be NO conflicts with the AT&T Long Lines, as we do not have facilities in that area. Please feel free to contact us with any questions or concerns.
  Response: No conflicts noted. Thank you.

CENTURYLINK

- No response received.
  Response: Understood, thank you.

CHERRY CREEK BASIN WATER QUALITY

- The Cherry Creek Basin Water Quality Authority (Authority) acknowledges notification from Douglas County that the proposed development plans for SB2025-040, Ramblewood Preliminary Plan have been or will be reviewed by Douglas County for compliance with the applicable Regulation 72 construction and post-construction requirements. Based on the Authority's current policy, the Authority will no longer routinely conduct a technical review and instead the Authority will defer to Douglas County's review and ultimate determination that the proposed development plans comply with Regulation 72.
  Response: Understood, thank you for your review.

- If a technical review of the proposed development plan is needed, please contact LandUseReferral@ccbwqa.org. The review may include consultation with the Authority's Technical Manager to address specific questions or to conduct a more detailed Land Use Review, if warranted.
  Response: Understood, thank you.

COLORADO DIVISION OF WATER RESOURCES

- Based on our review, there have been no changes to the demands or proposed water supply source for the Ramblewood Subdivision. Attached are letters dated April 8, 2025 and May 12, 2025 that were previously sent by our office during the review of ZR2024-031. The May 12, 2025 letter provided an opinion that the water supply for the subdivision is adequate and can be provided without causing injury to decreed water rights, so long as the District is committed to serving the 68 lots.
  Response: Understood, thank you for your review.

COLORADO GEOLOGICAL SURVEY

- No unusual geologic conditions or geotechnical constraints are present within the proposed Ramblewood subdivision area (approximate location 39.4674, -104.7087) that would preclude the proposed residential use and density. CGS therefore has no objection to approval of SB2025-040. AGW's Geotechnical Due Diligence Study, Hilltop 177, Douglas County, Colorado (AGW Project No. 245004, October 9, 2024) contains a valid preliminary characterization of subsurface conditions and makes appropriate preliminary recommendations for mitigating, through overexcavation and replacement as a properly placed and compacted structural fill, the site's expansive soils and shallow, expansive claystone bedrock. CGS agrees (page 4) that "overexcavation depths between 10 and 12 feet below lowest foundation elevation should be expected." Jill Carlson, Engineering geologist, Colorado Geological Survey, carlson@mines.edu
  Response: No objection noted. Thank you.

COLORADO PARKS AND WILDLIFE (EAST DC – DIST 549)

- No response received.
  Response: Understood, thank you.

COMCAST

- No response received.
  Response: Understood, thank you.

CORE

- The grade within CORE's 15-foot utility easement must not exceed 15% slope.
  Response: Grading within the easements has been revised to not exceed 15%.

- Drainage grading along Hilltop Road must be revised to ensure no drainage swale or channel is created within the 15-foot utility easement, as this would limit CORE's ability to access and maintain underground electric facilities.
  Response: The swales along Hilltop Road have been revised to ensure no drainage conveyance occurs within the the 15' utility easement. The final drainage design will ensure no swales or channels are proposed within the easement.

- CORE Electric Cooperative will need to extend electric facilities to the development to provide service. The developer will be responsible for all costs associated with the extension of offsite

electric facilities. The developer must coordinate with CORE for trenching, conduit installation, and equipment placement in accordance with CORE's construction standards.
Response: Comment noted. Developer to coordinate with CORE as needed.

- Please ensure these requirements are incorporated into the final design and construction plans. Failure to comply may result in delays in providing electric service to the development.
Response: Comment noted. The above items will be incorporated into the final design and Construction Plans of the proposed development.

CRESTVIEW ESTATES HOA

- No response received.
Response: Understood, thank you.

DOUGLAS COUNTY CONSERVATION DISTRICT:

- The Douglas County Conservation District provides development responses for Douglas County in accordance with Senate Bill 35. District comments are made on the suitability of soils for the proposed land uses, floodwater management, and watershed protection. In addition, the District submits advisory comments regarding rural water supply issues, agricultural land use conversion, and endangered species protection if the development plan affects those issues. According to U.S.D.A. Natural Resources Conservation Service (NRCS) soils survey (enclosed soil report Pages 27-29), the Fondis Clay loam, Newlin-Satana complex, Stapleton-Bresser association, and the Kutch sandy loam are somewhat to very limited for dwellings with and without basements, and small commercial buildings due to flooding, and roads due to shrinkswell soil properties, slope, and depth to hard bedrock. Due to the limitations on the above soils on the site, alternatives to mitigate the limitations of the soil will be required in your engineering design or construction techniques. Topsoil should be stripped to a depth of 6 inches and all stockpiles should have side slopes no steeper than 3:1 and seeded. All disturbed areas should be seeded and mulched with weed free hay mulch at 4,000 lbs. /acre. Recommended seeding dates for Colorado are November 1 to May 1, when the soil is not frozen. Grasses should be seeded when soil moisture and temperature are optimum for germination, unless a dormant planting is desired. Grass seed should be drilled at a depth of ¼ to ½ inch deep and if broadcasted, double the seeding rate. For more information on grass seed selections and seeding rates please contact the Douglas County Conservation District. The District recommends disturbed land be mulched or revegetated within 45 days of disturbance
The District recommends disturbed land be mulched or revegetated within 45 days of Disturbance.
The District recommends using a phased grading approach. By limiting the area being graded to 15 acres or less and seeding with native grasses the land area disturbed is minimized. The development site is 176.22 acres.
There is no Integrated Noxious Weed Control Plan and it is recommended that an integrated weed management program be reviewed and approved by the Douglas County Weed Inspector and/or Weed Advisory board, the County Extension Agent, NRCS, or a qualified weed management professional prior to the land use authority approval.
Vehicle tracking control stations need to be installed at all entrance and exit points on the site. The station should consist of a pad of 3 to 6-inch rock or a vehicle control pad/mat to strip mud from tires prior to vehicles leaving the construction site to prevent spreading of noxious weeds.
The channels of many of the major streams are not stable and undergo substantial shifts in

alignment during flood events. Upstream development increases the magnitude and frequency of local flooding. Floods that exceed the computed 100-year storm do regularly occur. The District does not support development proposals that are located in or near drainages or development that disturbs wetlands.
Silt fences or other forms of erosion barriers need to be planned and installed as a temporary sediment control device used on construction sites to protect water quality.
The District strongly recommends that Low Impact Development (LID) techniques be implemented for economic and conservation benefits.
The Douglas County Comprehensive Master Plan, Section 9 Wildlife designates this area as Low Habitat Value. "Wildlife is one of the most valuable community assets." (enclosed Section 9).
Thank you for the opportunity to review this project. Direct any questions to Heather Kelly, District Manager, at Admin@DouglasConserves.org or (303) 218 – 2622
Response: Comments noted. Additional responses provided with the attached letter.

DOUGLAS COUNTY HEALTH DEPARTMENT

- A will-serve letter has been provided by Parker Water & Sanitation District. Based on this letter, DCHD is providing a favorable recommendation regarding the proposed method of water service and sewage disposal.
  Response: Understood, thank you for your review.

DOUGLAS COUNTY: HISTORIC PRESERVATION

- At this time the Curator has no further recommendations. If there are future development plans that involve any ground disturbance a Class II survey will need to be conducted to evaluate for cultural resources before any disturbance occurs. A Class I file search does not fulfill a cultural survey. A walking pedestrian survey would be recommended before any ground disturbance.
  Response: Understood, thank you for your review.

  There is potential for buried archaeological resources related to prehistoric activities in the project area and potential for the discovery of subsurface cultural deposits during ground moving activities. Should buried artifacts and features be discovered, we recommend completion of the appropriate Colorado Office of Archaeology and Historic Preservation (OAHP) Data Management and Historic and/or Prehistoric Component forms, following OAHP guidelines, with accompanying sketch maps and photographs. Completed forms are submitted to OAHP to ensure that Douglas County's historic or prehistoric data is included in the Colorado OAHP state-wide database of cultural resources
  Response: Understood, thank you for your review.

DOUGLAS COUNTY: BUILDING SERVICES

- No comment.
  Response: Thank you for your review.

DOUGLAS COUNTY: DOUGLAS COUNTY PARKS AND TRAILS

- This applicant would be responsible for park dedication requirements outlined in Article 10 of the Douglas County Subdivision Resolution.
  Response: The applicant is providing a public park and trail network on site and intends to receive credit for these improvements per Section 10 PLD requirements.

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303.892.1166

DOUGLAS COUNTY: SCHOOL DISTRICT

- DCSD has calculated the amount of school site land requirement for students generated by the proposed planned development. A total of 67 students are expected from the development (as proposed) generating a land dedication requirement of 1.579-acres. Since this is smaller than DCSD's minimum school site size and since the applicant has stated in their project summary that cash-in-lieu of land dedication will be paid at final plat, DCSD requests cash-in-lieu of land dedication.
  Response: Thank you for your review. The applicant acknowledges the cash-in-lieu amount and looks forward to continuing to work with Douglas County School district.

CASH-IN-LIEU CALCULATION
STUDENT GENERATION

PROJECT NAME: RAMBLEWOOD PRELIMINARY PLAN (SB2025-040)				
DU/	ACRES		DENSITY	
70	115.7911		0.60	
			Generation	Number
STUDENT GENERATION RATES	No. of DU's		Rate	of Students
ELEMENTARY	70	X	0.52	36
MIDDLE SCHOOL	70	X	0.15	11
HIGH SCHOOL	70	X	0.29	20
			TOTAL	67
				Required
			School	Land
	Number		Acreage	Dedication
SCHOOL LAND DEDICATION	of Students		Per Student	Acreage
ELEMENTARY	36	X	0.018	0.655
MIDDLE SCHOOL	11	X	0.030	0.315
HIGH SCHOOL	20	X	0.030	0.609
			TOTAL	1.579

- As per Article 1004.05.3 of the Douglas County Subdivision Regulations, "The cash-in-lieu fee shall be equivalent to the full market value of the acreage required for school land dedication. Value shall be based on anticipated market value after completion of platting. The applicant shall submit a proposal for the cash-in-lieu fee and supply the information necessary for the Board to evaluate the adequacy of the proposal. This information shall include at least one appraisal of the property by a qualified appraiser." And as per Article 1004.06, "The conveyance of land or payment of fees obtained through the County's dedication requirement shall be required prior to the recordation of the first final plat for the subdivision...."
  Assuming neither the applicant nor Douglas County object to these fees DCSD has no objection to the proposed project. DCSD looks forward to future collaboration with the applicant and Douglas County on this proposal.
  Response: While the applicant team acknowledges the requirement, there was an error in the subdivision acreage provided within the referral letter. The applicant is in progress of resolving this error with Shavon at DCSD and shall continue coordination to meet this requirement.

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ENGINEERING SERVICES

- Detailed drainage comments will be provided with the Final Plat Submittal.
  Response: Comment noted.

MILE HIGH FLOOD DISTRICT

- We would like to review the stream corridor and design with future submittals. We have no objections to the referenced project at this time. We appreciate the opportunity to review this application and look forward to reviewing future submittals.
  Response: No objections noted. Future submittals of the Construction Plans will be provided to MHFD for review.

DOUGLAS COUNTY: OFFICE OF EMERGENCY MANAGEMENT

- Inclusion of the secondary access/egress road connecting to Alpine Dr is a critical component of this project. This will provide residents with primary and secondary evacuation routes, helping this community be well-prepared for disasters.
  Response: Comment noted. Secondary access road connecting to Alpine Dr. is provided and shown on the Preliminary Plan.

OPEN SPACE AND NATURAL RESOURCES

- No response received.
  Response: Understood, thank you.

PARKER WATER & SANITATION DISTRICT

- Please note PWSD has not received the formal inclusion application letter from Ramblewood. PWSD will not be able to comment on this project until application is completed and sent to PWSD.
  Response: The applicant team has been in conversation with Parker Water & Sanitation District regarding the Inclusion Agreement as detailed in the email communication included with this submittal. The Inclusion Agreement will be executed prior to the Planning Commission Hearing for Preliminary Plan.

PINERY WATER & WASTEWATER DISTRICT

- No response received.
  Response: Understood, thank you.

RURAL WATER AUTHORITY OF DOUGLAS COUNTY

- No response received.
  Response: Understood, thank you.

DOUGLAS COUNTY: SHERIFF'S OFFICE

- No concern from DCSO traffic.
  Response: Understood, thank you.

SHERIFF'S OFFICE E911

- No response received.
  Response: Understood, thank you.

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SOUTH METRO FIRE RESCUE

- As indicated in the narrative "The intent of the proposed Preliminary Plan is to plat the Hilltop JAM LLC Parcel and the Whittlesey Parcel as one property…" As such the ranch lots must be included in the water district and must provide municipal water including for fire protection water supplies to meet the adopted Douglas County requirements. Hydrants must be provided for fire protection of future structures on these ranch lots and the allowable building envelope for any structures shall meet the requirements of Section 507 of the Douglas County Fire Code. None of the exceptions to 507.1 are applicable to these newly created lots which are part of this project in order to meet the density requirements. These lots are not eligible for any rural water supply allowances and shall be treated the same as all cluster lots with regards to water supplies.
  Response: The applicant is committed to providing hydrants and mitigating concerns around fire protection and is in the process of working with South Metro Fire to provide an acceptable Alternative Method.

- The narrative incorrectly indicates "Although not required, a fire vehicle turnaround and fire hydrant will be provided along street D…" There is no such turnaround appearing on the plans and a turnaround does not "provide fire mitigation infrastructure to benefit surrounding areas" remove all such misleading inferences from narratives and plans. Hydrants may be required along street D dependent upon water line routing and requirements to provide municipal water to the ranch lots. Further coordination with SMFR and Parker Water will be required to resolve water supply prior to preliminary plan approval.
  Response: While we understand that a vehicle turnaround is not required, provision of this infrastructure is a commitment we have made to the surrounding neighborhood. The referenced turnaround has been added to the plans.

- Grading plan did not label all roadway grades for verification the grades of roadways meet standards. Revise to label all roadway grades in the direction of travel.
  Response: Grading plan has been updated to include roadway grades along the street centerlines for review and verification of street grades.

- Note that the Wildfire Mitigation Plan is not part of Fire Protection Service. Wildfire Mitigation Standards are part of the Building Code requirements.
  Response: Noted, thank you.

PINERY HOA

- The Pinery Homeowners' Association does not have any objection to the Ramblewood Preliminary Plan consisting of 68 single-family residential lots, 2 agricultural lots, and 8 tracts. Our primary concern pertains to the impact on traffic at the intersection of Hilltop Road and Village Drive. We recognize that improvements are currently underway in this area to help mitigate these traffic concerns, however. We appreciate the opportunity to review and comment on this referral.
  Response: Understood, thank you for your review.

TOWN OF PARKER DEVELOPMENT REVIEW

- No response received.
  Response: Understood, thank you.

TOWN OF PARKER PUBLIC WORKS

- No response received.
  Response: Understood, thank you.

WILDFIRE MITGATION

- The wildfire mitigation plan provided meets the required standards. It is approved with the condition that all proposed actions are fully implemented before development proceeds.
  Response: Thank you for your review.

XCEL ENERGY RIGHT-OF-WAY & PERMITS

- Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the Ramblewood Preliminary Plan and currently has no apparent conflict. The property owner/developer/contractor must complete the application process for any new natural gas service via xcelenergy.com/InstallAndConnect. It is then the responsibility of the developer to contact the Xcel Designer assigned to the project for approval of design details. If additional easements need to be acquired by separate PSCo document, a Right-of-Way Agent will need to be contacted by the Designer. As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 for utility locates prior to construction. No response received.
  Response: No conflicts noted.

End of response to comments

Docusign Envelope ID: C9DFF0F9-F68C-4072-91A5-104A7A70F783

LJA ENGINEERING
LJA Responses

DOUGLAS CONSERVES
DOUGLAS COUNTY CONSERVATION DISTRICT
PO Box 688 / 7519A E. Hwy 86 Franktown, CO 80116 / Phone 303-218-2622

DATE: December 9, 2025

RE: SB2025-040

The Douglas County Conservation District provides development responses for Douglas County in accordance with Senate Bill 35. District comments are made on the suitability of soils for the proposed land uses, floodwater management, and watershed protection. In addition, the District submits advisory comments regarding rural water supply issues, agricultural land use conversion, and endangered species protection if the development plan affects those issues.

According to U.S.D.A. Natural Resources Conservation Service (NRCS) soils survey (enclosed soil report Pages 27-29), the Fondis Clay loam, Newlin-Satana complex, Stapleton-Bresser association, and the Kutch sandy loam are somewhat to very limited for dwellings with and without basements, and small commercial buildings due to flooding, and roads due to shrink-swell soil properties, slope, and depth to hard bedrock. Due to the limitations on the above soils on the site, alternatives to mitigate the limitations of the soil will be required in your engineering design or construction techniques.

Topsoil should be stripped to a depth of 6 inches and all stockpiles should have side slopes no steeper than 3:1 and seeded. All disturbed areas should be seeded and mulched with weed free hay mulch at 4,000 lbs. /acre. Recommended seeding dates for Colorado are November 1 to May 1, when the soil is not frozen. Grasses should be seeded when soil moisture and temperature are optimum for germination, unless a dormant planting is desired. Grass seed should be drilled at a depth of ¼ to ½ inch deep and if broadcasted, double the seeding rate. For more information on grass seed selections and seeding rates please contact the Douglas County Conservation District.

Comment noted. Topsoil stripping, grading slopes, and seeding type/schedule will be evaluated during preparation of Construction Documents and Grading, Erosion, & Sediment Control (GESC) Plan.

The District recommends disturbed land be mulched or revegetated within 45 days of disturbance.

Comment noted. The Grading, Erosion, & Sediment Control (GESC) Plan & Report will specify that disturbed land is properly and timely seeded and mulched following grading activities.

DOUGLAS
—CONSERVES—
DOUGLAS COUNTY CONSERVATION DISTRICT
PO Box 688 / 7519A E. Hwy 86 Franktown, CO 80116 / Phone 303-218-2622

The District recommends using a phased grading approach. By limiting the area being graded to 15 acres or less and seeding with native grasses the land area disturbed is minimized. The development site is 176.22 acres.

Comment noted. Construction activities will most likely follow some form of a phased approach; however, actual construction phasing will be determined during the Final Design/Construction Document phase.

There is no Integrated Noxious Weed Control Plan and it is recommended that an integrated weed management program be reviewed and approved by the Douglas County Weed Inspector and/or Weed Advisory board, the County Extension Agent, NRCS, or a qualified weed management professional prior to the land use authority approval.

A Noxious Weed Control Plan can be submitted at the time of Construction Document Submittal and GESC Plan Submittal.

Vehicle tracking control stations need to be installed at all entrance and exit points on the site. The station should consist of a pad of 3 to 6-inch rock or a vehicle control pad/mat to strip mud from tires prior to vehicles leaving the construction site to prevent spreading of noxious weeds.

Comment noted. Vehicle Tracking will be designed and shown with the GESC Plan.

The channels of many of the major streams are not stable and undergo substantial shifts in alignment during flood events. Upstream development increases the magnitude and frequency of local flooding. Floods that exceed the computed 100-year storm do regularly occur. The District does not support development proposals that are located in or near drainages or development that disturbs wetlands. **Comment noted. The design of this development will include two onsite detention ponds to maintain historic flows to adjacent outfalls. There are no wetlands within the site.**

Silt fences or other forms of erosion barriers need to be planned and installed as a temporary sediment control device used on construction sites to protect water quality.

Comment noted. Silt fences and erosion control barriers will be designed and shown with the GESC Plan.

The District strongly recommends that Low Impact Development (LID) techniques be implemented for economic and conservation benefits.

Comment noted. We will look to incorporate LID techniques where possible and as allowed by Douglas County Engineering.

The Douglas County Comprehensive Master Plan, Section 9 Wildlife designates this area as Low Habitat Value. "Wildlife is one of the most valuable community assets." (enclosed Section 9).

Comment noted.

Thank you for the opportunity to review this project. Direct any questions to Heather Kelly, District Manager, at Admin@DouglasConserves.org or (303) 218 – 2622.

RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

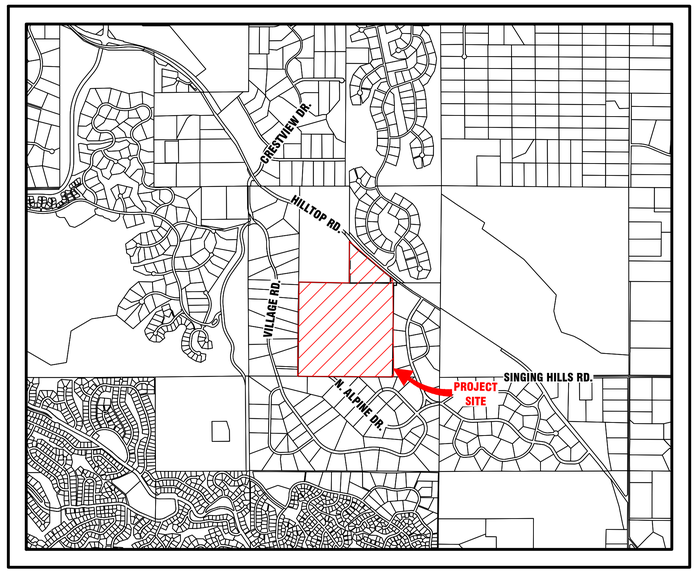
220.455 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040

GENERAL NOTES:

1. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OR LAND BOUNDARY MONUMENT OR ACCESSORY COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, COLORADO REVISED STATUTE.
2. PER C.R.S. 38-51-106, "ALL LINEAL UNITS DEPICTED ON THIS LAND SURVEY PLAT ARE U.S. SURVEY FEET. ONE METER EQUALS 39.37/12 U.S. SURVEY FEET, EXACTLY ACCORDING TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY."
3. LAND TITLE GUARANTEE COMPANY'S COMMITMENT NO. ABD70737260, EFFECTIVE AUGUST 20TH, 2021 WAS RELIED UPON FOR RECORD INFORMATION REGARDING RIGHTS-OF-WAY, EASEMENTS AND ENCUMBRANCES. THIS SURVEY DOES NOT REPRESENT A TITLE SEARCH BY AZTEC CONSULTANTS OR REDLAND TO DETERMINE OWNERSHIP, RIGHTS-OF-WAY, EASEMENTS OR OTHER MATTERS OF PUBLIC RECORD.
4. BASED ON A GRAPHICAL REPRESENTATION OF FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) NO. 08035C0132F, WITH AN EFFECTIVE DATE OF SEPTEMBER 30, 2005, THE SUBJECT PROPERTY LIES WITHIN ZONE "A" AND "X" WITH ZONE "A" BEING DEFINED AS "SPECIAL FLOOD HAZARD AREA SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD": "NO BASE FLOOD ELEVATIONS DETERMINED." ZONE "X" IS DEFINED AS "AREAS OF 0.2% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE." THE APPROXIMATE LIMITS OF ZONE "A" HAVE BEEN DEPICTED HEREON AND ZONE "X" BEING EVERYTHING OUTSIDE OF ZONE "A".
5. DRAINAGE EASEMENTS ARE TO BE GRANTED TO DOUGLAS COUNTY ACROSS OS-1, OS-2, OS-3, OS-5, TRACT A, TRACT C FOR THE PURPOSE OF ACCESSING, MAINTAINING, AND REPAIRING STORM WATER MANAGEMENT IMPROVEMENTS, INCLUDING, BUT NOT LIMITED TO, INLETS, PIPES, CULVERTS, CHANNELS, DITCHES, HYDRAULIC STRUCTURES, RIPRAP, DETENTION BASINS, FOREBAYS, MICRO-POOLS, AND WATER QUALITY FACILITIES (COLLECTIVELY, THE "FACILITIES") IN THE EVENT THE METRO DISTRICT, ITS SUCCESSORS AND ASSIGNS ("SYSTEM OWNER") FAILS TO SATISFACTORILY MAINTAIN OR REPAIR SAID FACILITIES. A BLANKET ACCESS EASEMENT OVER THE SUBDIVISION WILL BE GRANTED TO DOUGLAS COUNTY, BUT ONLY FOR THE PURPOSE OF ACCESSING THE FACILITIES IN THE EVENT THAT THE DRAINAGE EASEMENTS DO NOT PROVIDE ADEQUATE ACCESS. THE MAINTENANCE AND REPAIR OF THE FACILITIES LOCATED IN THE SUBDIVISION, AS WILL BE SHOWN ON THE CONSTRUCTION PLANS OR ON THE PLAT FOR THE SUBDIVISION, SHALL BE THE RESPONSIBILITY OF THE SYSTEM OWNER. IN THE EVENT SUCH MAINTENANCE AND REPAIR ARE NOT PERFORMED BY THE SYSTEM OWNER TO THE SATISFACTION OF DOUGLAS COUNTY, THEN DOUGLAS COUNTY SHALL HAVE THE RIGHT, BUT NOT THE OBLIGATION, TO ENTER SAID SUBDIVISION, AFTER TEN (10) DAYS PRIOR WRITTEN NOTICE TO THE SYSTEM OWNER, UNLESS THERE IS AN EMERGENCY, IN WHICH CASE DOUGLAS COUNTY WILL GIVE NOTICE AS SOON AS PRACTICABLE, TO PERFORM ALL NECESSARY WORK, THE COST OF WHICH SHALL BE PAID BY THE SYSTEM OWNER UPON BILLING. IN THE EVENT THE SYSTEM OWNER FAILS TO REIMBURSE DOUGLAS COUNTY WITHIN THIRTY (30) DAYS AFTER SUBMISSION OF THE BILL FOR THE COSTS INCURRED, DOUGLAS COUNTY WILL HAVE THE RIGHT TO ENFORCE SUCH OBLIGATIONS BY APPROPRIATE LEGAL ACTION. IT IS THE SYSTEM OWNER'S RESPONSIBILITY TO CONSTRUCT, MAINTAIN, AND REPAIR THE FACILITIES IN A MANNER CONSISTENT WITH ALL APPLICABLE PLANS APPROVED OR ACCEPTED BY DOUGLAS COUNTY SUBSEQUENT TO THIS PRELIMINARY PLAN.
6. DWELLING UNITS ARE TO BE CONSTRUCTED IN A MANNER WHICH WILL ACCOMMODATE CONNECTION TO A UTILITY MONITORING AND TELECOMMUNICATION SYSTEM FOR CENTRAL SERVICE UNDER A MASTER SERVICE CONTRACTOR OR CENTRAL COMPUTER-CONTROLLED MONITORING PROGRAM. THE OWNERS OF EACH LOT SHALL FULLY PARTICIPATE IN AND BE PART OF THE UTILITY MONITORING AND TELECOMMUNICATIONS SYSTEM OR SYSTEMS.
7. STREETS A THROUGH D WILL BE OWNED AND MAINTAINED BY DOUGLAS COUNTY.
8. PROPOSED TRAILS WITHIN THE SITE BOUNDARY WILL BE OWNED AND MAINTAINED BY THE RAMBLEWOOD METROPOLITAN DISTRICT.

remove this note - will be addressed with the final plat

This note has been removed, to be addressed with final plat.



VICINITY MAP
1" = 2000'

Sheet List Table

Sheet Number	Sheet Title
1	Cover Sheet
2	Typical Street Section Plan
3	Overall Plan
4	Site Plan
5	Site Plan
6	Site Plan
7	Site Plan
8	Grading Plan
9	Grading Plan
10	Grading Plan
11	Grading Plan
12	Sight Distance Plan
13	Sight Distance Plan
14	Existing Features Plan
15	Offsite Sanitary Sewer Plan
16	Trails Plan

DEVELOPER

MILLER UNITED
6900 E. BELLVIEW AVE,
GREENWOOD VILLAGE, CO 80111
PHONE: (303) 799-6300
CONTACT: DAN SHELDON

CIVIL ENGINEER

LJA ENGINEERING, INC.
1765 WEST 121ST AVE, SUITE 300
WESTMINSTER, CO 80234
PHONE: (303) 421-4224
CONTACT: KEVIN LOVELACE

SURVEYOR

LJA SURVEYING, INC
1765 WEST 121ST AVE, SUITE 300
WESTMINSTER, CO 80234
PHONE: (303) 358-7002
CONTACT: DEREK BROWN

PLANNER/LANDSCAPE

NORRIS DESIGN
1101 BANNOCK STREET,
DENVER, CO 80204
PHONE: (303) 892-1166
CONTACT: DANIEL JENNINGS

GEOTECHNICAL ENGINEER

CTL THOMPSON
1971 WEST 12TH AVE.
DENVER, CO 80204
PHONE: (303) 825-0777
CONTACT: ALAN J. LISOWY, P.E.

AGENCY LIST

DOUGLAS COUNTY
100 THIRD STREET
CASTLE ROCK, CO 80104
PHONE: (303) 660-7460
CONTACT: CHUCK SMITH

PARKER WATER & SANITATION DISTRICT
19801 E. MAIN STREET
PARKER, CO 80138
PHONE: (303) 841-4627
CONTACT: JAROD BAYLIE

CORE ELECTRIC COOPERATIVE
5496 US-85
SEDALIA, CO 80135
PHONE: (800) 332-9540

No comments on Traffic Study noted.

Engineering doesn't have any comments on the Traffic Study

PROJECT BENCHMARK:

LJA

1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: N/A
Scale Vert: N/A

Sheet: 1 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Cover Sheet

NOT FOR CONSTRUCTION

Developer:
Miller United Real Estate, LLC
6900 Bellview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 1

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RAMBLEWOOD PRELIMINARY PLAN

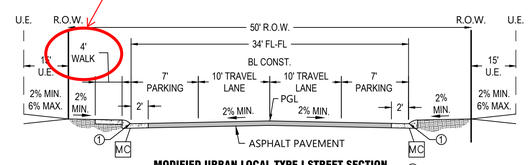
LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

GENERAL ABBREVIATIONS

A.E.	ACCESS EASEMENT
BKL	BIKE LANE
BL CONST	BASELINE OF CONSTRUCTION
BS	BOTTOM ELEVATION OF RISE
B.S.I.	BY SEPARATE INSTRUMENT
CDS	CUL-DE-SAC
CE	CURB EXTENSION
CL	CENTERLINE
CT	CURB TRANSITION
CWN	CROWN
DBO	DESIGN BY OTHERS
DC	MEDIAN CURB & GUTTER
D.E.	DRAINAGE EASEMENT
DIST.	DISTANCE
D.U.E.	DRAINAGE & UTILITY EASEMENT
EOA	EDGE OF ASPHALT
EOP	EDGE OF PAVEMENT
E.A.E.	EMERGENCY ACCESS EASEMENT
E.ATT.E.	EXISTING AT&T EASEMENT
E.P.E.	EXISTING PIPELINE EASEMENT
ESMT.	EASEMENT
FES	FLARED END SECTION
FGB	FINISHED GROUND AT BOTTOM WALL ELEVATION
FGT	FINISHED GROUND AT TOP WALL ELEVATION
FH	FIRE HYDRANT
FL	FLOWLINE
FV	FIELD VERIFY
G	FINISHED GROUND
G.E.	GAS EASEMENT
G.O.E.	GAS & OIL EASEMENT
GV	GATE VALVE
HP	HIGH POINT
I.E.	IRRIGATION EASEMENT
LL	LOT LINE
LP	LOW POINT
LS	LANDSCAPING
LTWD	LITTLE THOMPSON WATER DISTRICT
MC	MOUNTABLE CURB & GUTTER
MH	MANHOLE
MSE	MECHANICALLY STABILIZED EARTH
P	PAVEMENT
P&P	PLAN & PROFILE
P.A.E.	PUBLIC ACCESS EASEMENT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCR	POINT OF CURB RETURN
PERF.	PERFORATED
PGL	PROFILE GRADE LINE
PI	POINT OF INFLECTION
PRC	POINT OF REVERSE CURVATURE
PSWD	PARKER SANITATION & WATER DISTRICT
PT	POINT OF TANGENCY
RELOC	TO BE RELOCATED
R.O.W.	RIGHT OF WAY
RN	RECORDING NUMBER
S.E.	SANITARY EASEMENT
SD.E.	SIGHT DISTANCE EASEMENT
SEC	SECTION LINE
SL	SANITARY LINE
SS	SANITARY SERVICE
SW	SIDEWALK
SW.E.	SIDEWALK EASEMENT
TB	THRUST BLOCK
TC	TOP OF CURB
TEMP.	TEMPORARY
TRANS.	TRANSITION
TR.E.	TRANSPORTATION EASEMENT
TS	TOP ELEVATION OF RISER
UD	UNDERDRAIN
U.E.	UTILITY EASEMENT
U.G.E	UTILITY & GAS EASEMENT
VC	VERTICAL CURB & GUTTER
W.E.	WATER EASEMENT
WL	WATER LINE
WS	WATER SERVICE
W.S.W.	WATER SURFACE ELEVATION
WV	WATER VALVE

revise to a 5-ft. walk

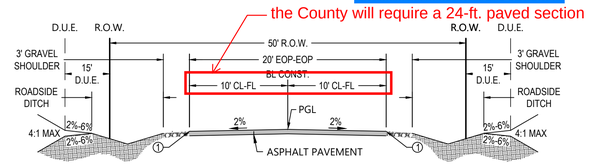
Sidewalk revised to 5-ft. wide.



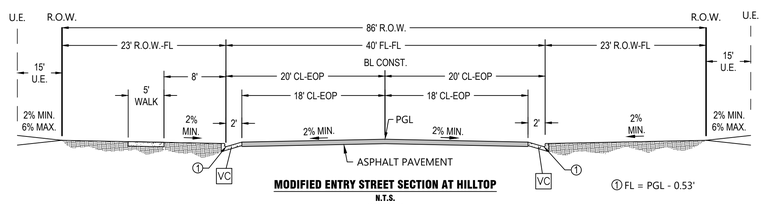
MODIFIED URBAN LOCAL TYPE I STREET SECTION
N.T.S.
(STREET B, STREET C, STREET D)

Pavement section revised to 24-ft. wide.

the County will require a 24-ft. paved section



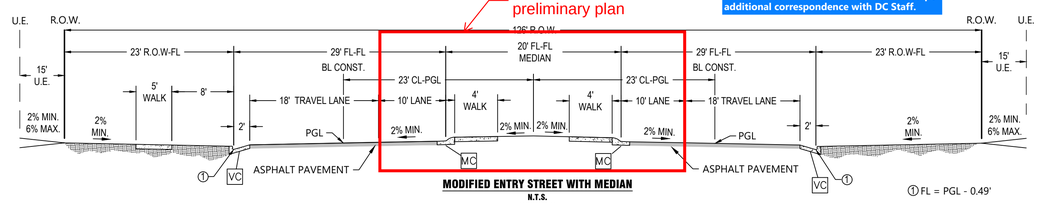
RURAL LOCAL TYPE III STREET SECTION
N.T.S.
(STREET D)



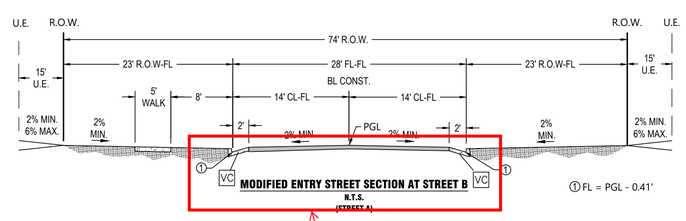
MODIFIED ENTRY STREET SECTION AT HILLTOP
N.T.S.
(STREET A)

refer to the comments on the preliminary plan

Plan-view comments have been addressed per additional correspondence with DC Staff.



MODIFIED ENTRY STREET WITH MEDIAN
N.T.S.
(STREET A)



MODIFIED ENTRY STREET SECTION AT STREET B
N.T.S.
(STREET A)

not sure where this cross section is proposed - 14-ft. half section probably not acceptable as an entry street

This section was included erroneously and is not needed. Detail has been removed from the plan.

PROJECT BENCHMARK:

LJA
1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: N/A
Scale Vert: N/A

Sheet: 2 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Typical Street Section Plan

NOT FOR CONSTRUCTION

Developer:
Kimley-Horn and Associates
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 2

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RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

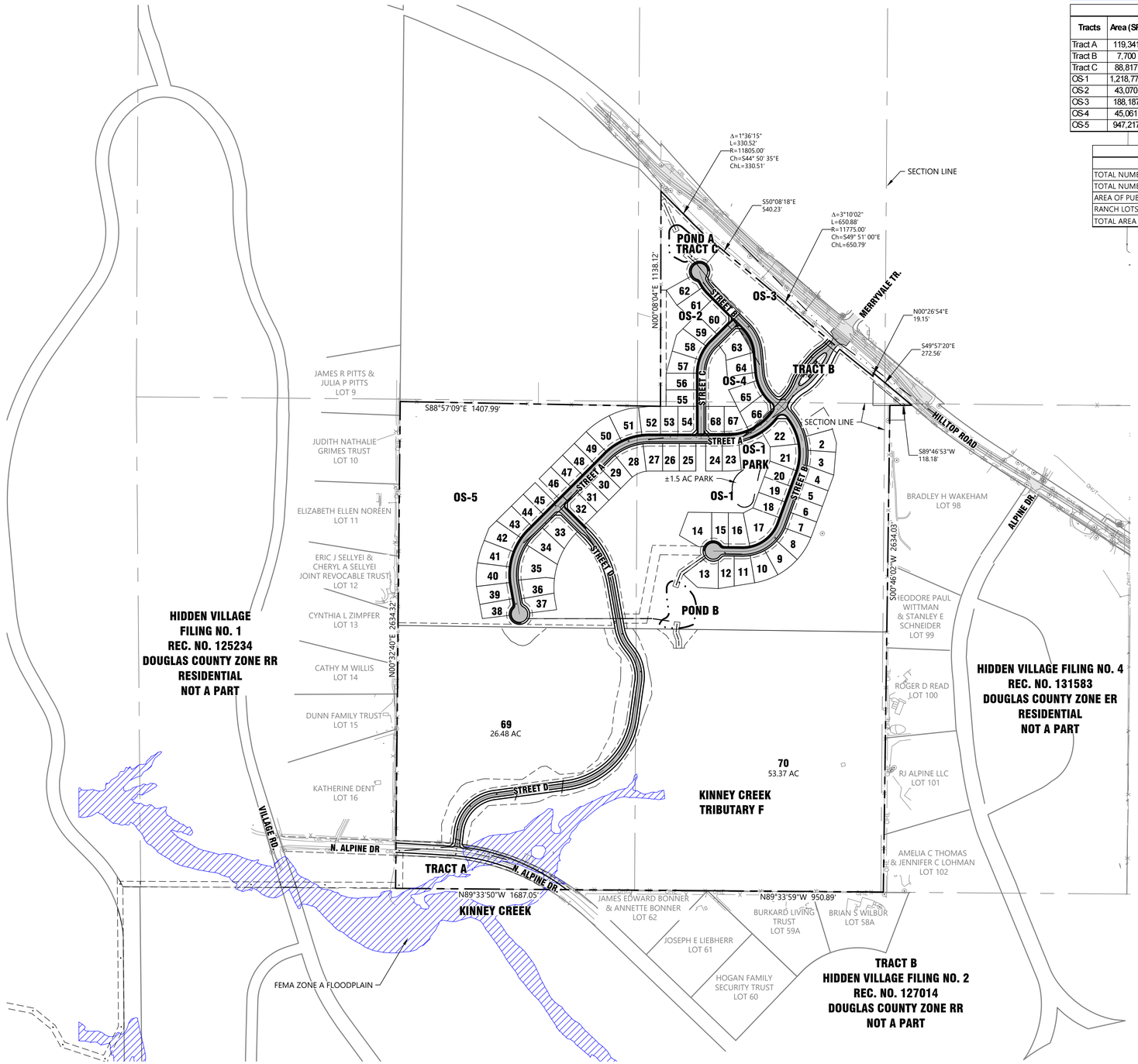
Tract table has been updated to eliminate Tract B from the median island as discussed, locations and acreages of tracts has been updated accordingly.

TRACT USE, OWNERSHIP & MAINTENANCE CHART

Tracts	Area (SF)	Area (Ac)	Ownership/ Maitenance	Access	Utilities	Drainage	Landscape	Open Space	Trails	Park
Tract A	119,341	2.740	OWNER		X	X		X		
Tract B	7,700	0.177	METRO DISTRICT	X	X	X	X			
Tract C	88,817	2.039	METRO DISTRICT	X	X	X	X	X		
OS-1	1,218,770	27.979	METRO DISTRICT	X	X	X	X	X	X	X
OS-2	43,070	0.989	METRO DISTRICT	X	X	X	X	X		
OS-3	188,187	4.320	METRO DISTRICT	X	X	X	X	X	X	
OS-4	45,061	1.034	METRO DISTRICT	X	X		X	X		
OS-5	947,217	21.745	METRO DISTRICT	X	X	X	X	X		

LAND USE TABLE

TYPE	AREA (SF)	AREA (AC)	% OF TOTAL AREA
TOTAL NUMBER OF RESIDENTIAL LOTS (68)	1,092,149	25.0723	14.18%
TOTAL NUMBER OF TRACTS (8)	2,658,163	61.0230	34.52%
AREA OF PUBLIC STREET DEDICATION (ROW, ONSITE)	472,419	10.8452	6.13%
RANCH LOTS (2)	3,478,422	79.8536	45.17%
TOTAL AREA	7,701,153	176.7941	100.00%



PROJECT BENCHMARK:

SCALE
1 inch = 300 ft.

300 0 150 300

LJA
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Westminster, CO 80234
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No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
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6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 300'
Scale Vert: N/A

Sheet: 3 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Overall Plan

NOT FOR CONSTRUCTION

Developer:
Watermark Real Estate, LLC
6900 Building Ave.
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 3

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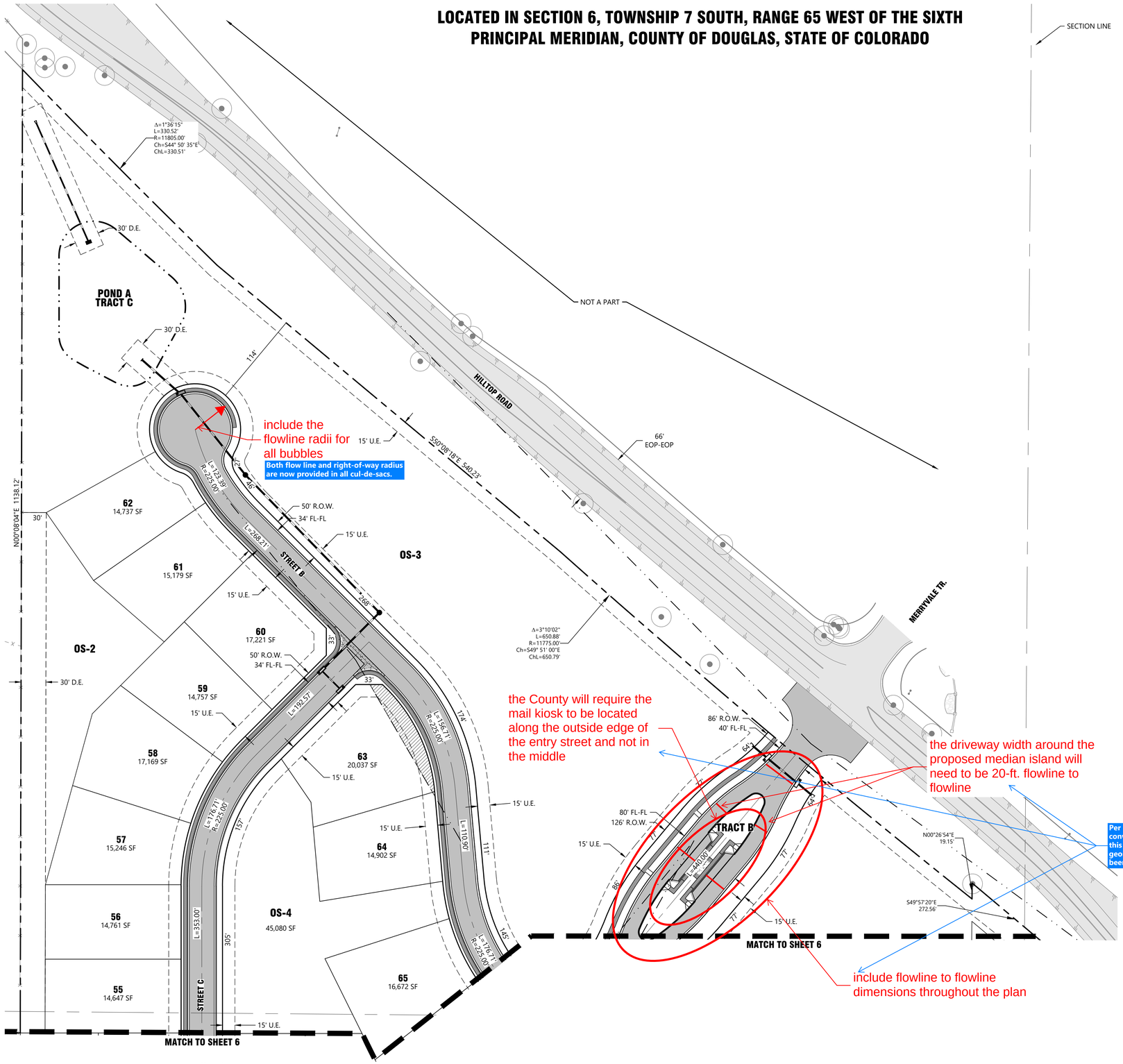
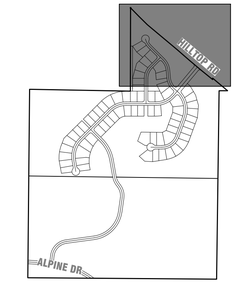
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO



Per additional correspondence with Chuck Smith and other DC Staff conversations, the median island with Mail Kiosk remains included with this Submittal. A detail view of the island has been added to this sheet for geometry confirmation. All additional markups provided by Staff have been addressed with the resubmitted plan.



KEY MAP
1"=1000'

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.
60 0 30 60

LJA
1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 80'
Scale Vert: N/A

Sheet: 4 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Nuvo Unified Real Estate, LLC
6900 Wallace Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 4

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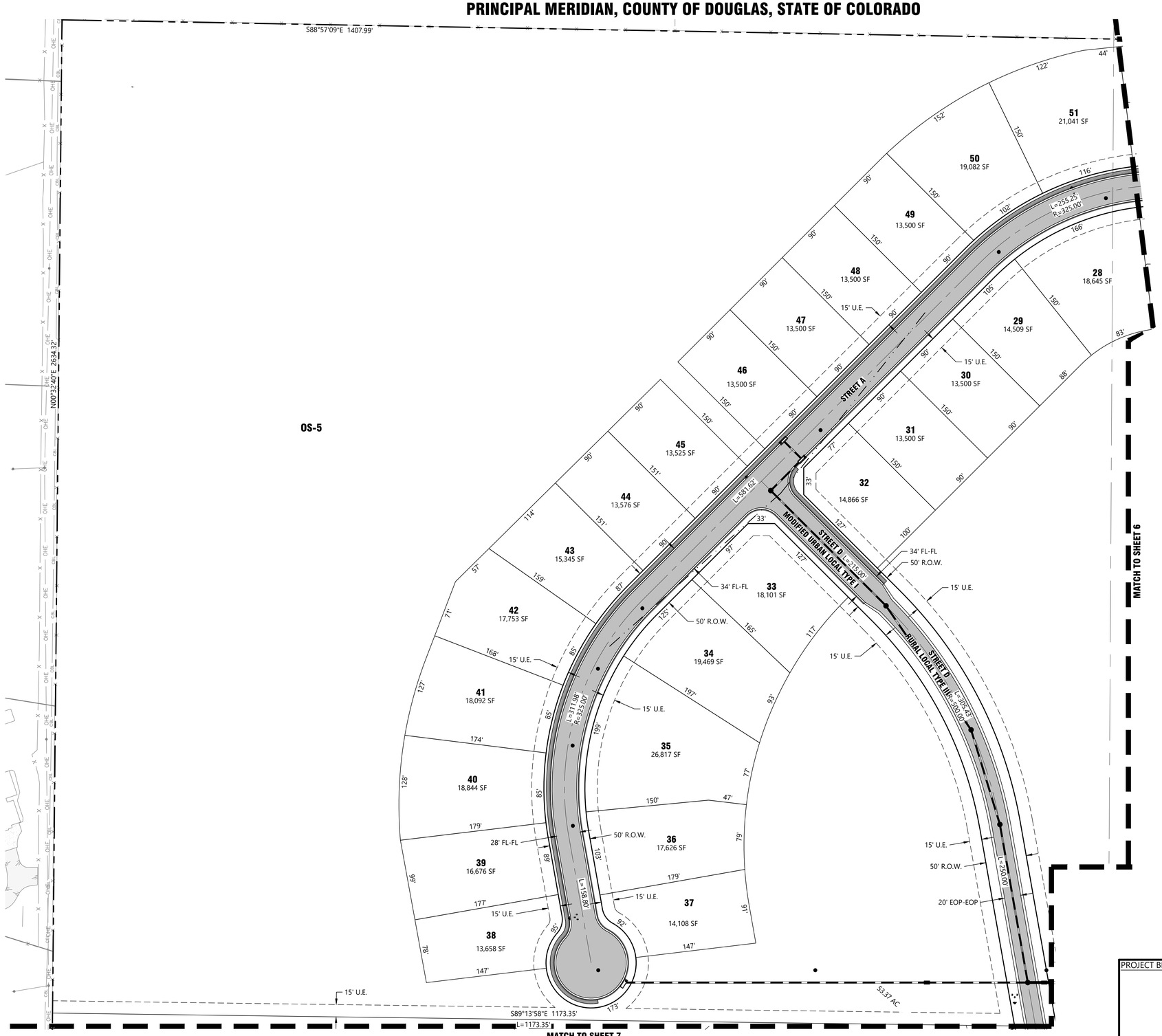
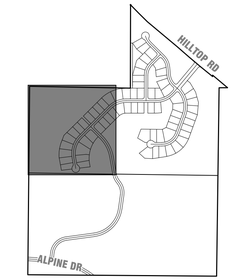
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

LJA
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Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 80'
Scale Vert: N/A

Sheet: 5 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Miller Investment Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 5

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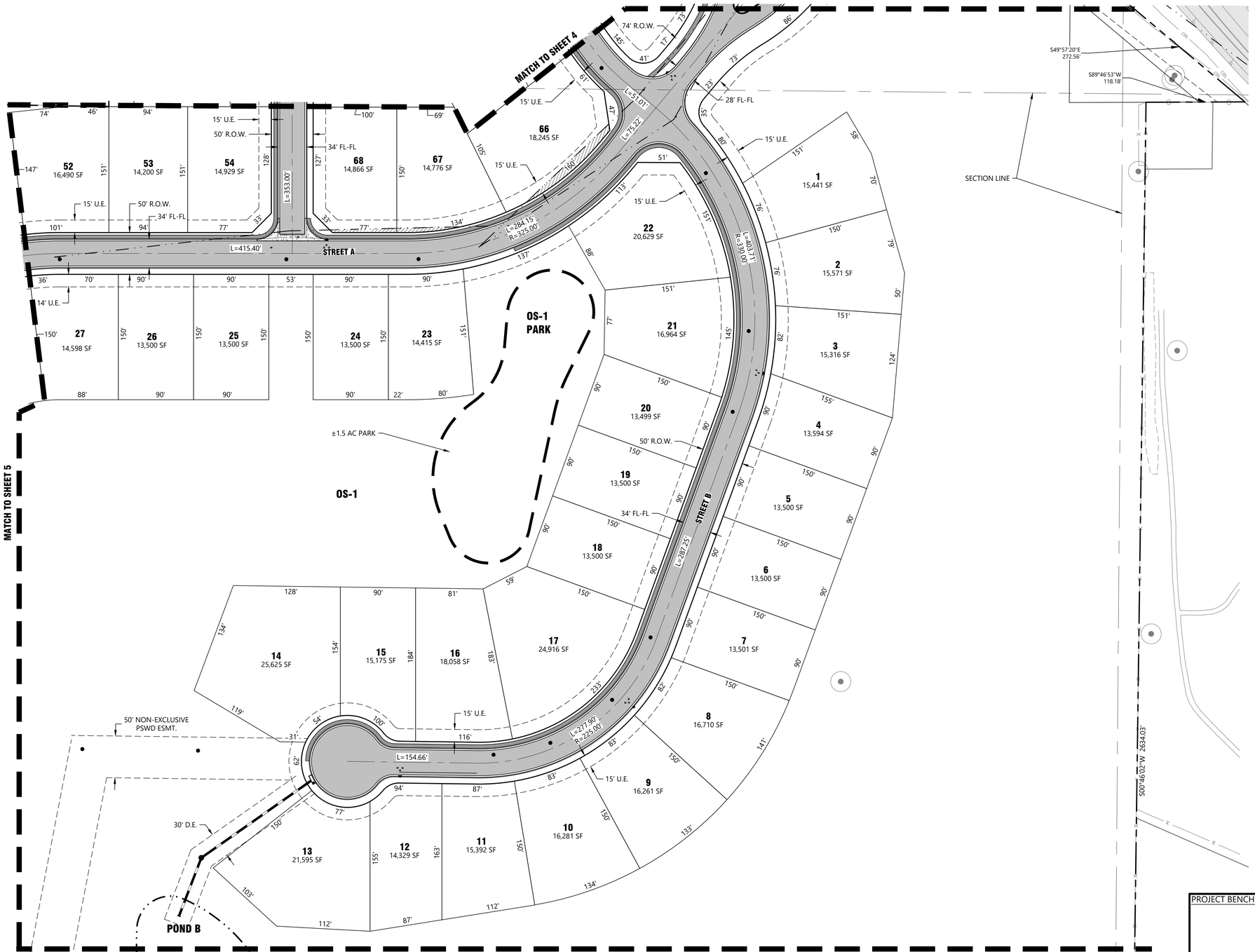
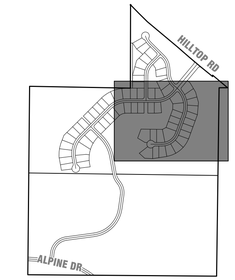
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO



PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.



KEY MAP
1"=1000'

LJA
1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
1		
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 80'
Scale Vert: N/A

Sheet: 6 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Wilkinson Real Estate, LLC
6900 Wilkinson Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 6

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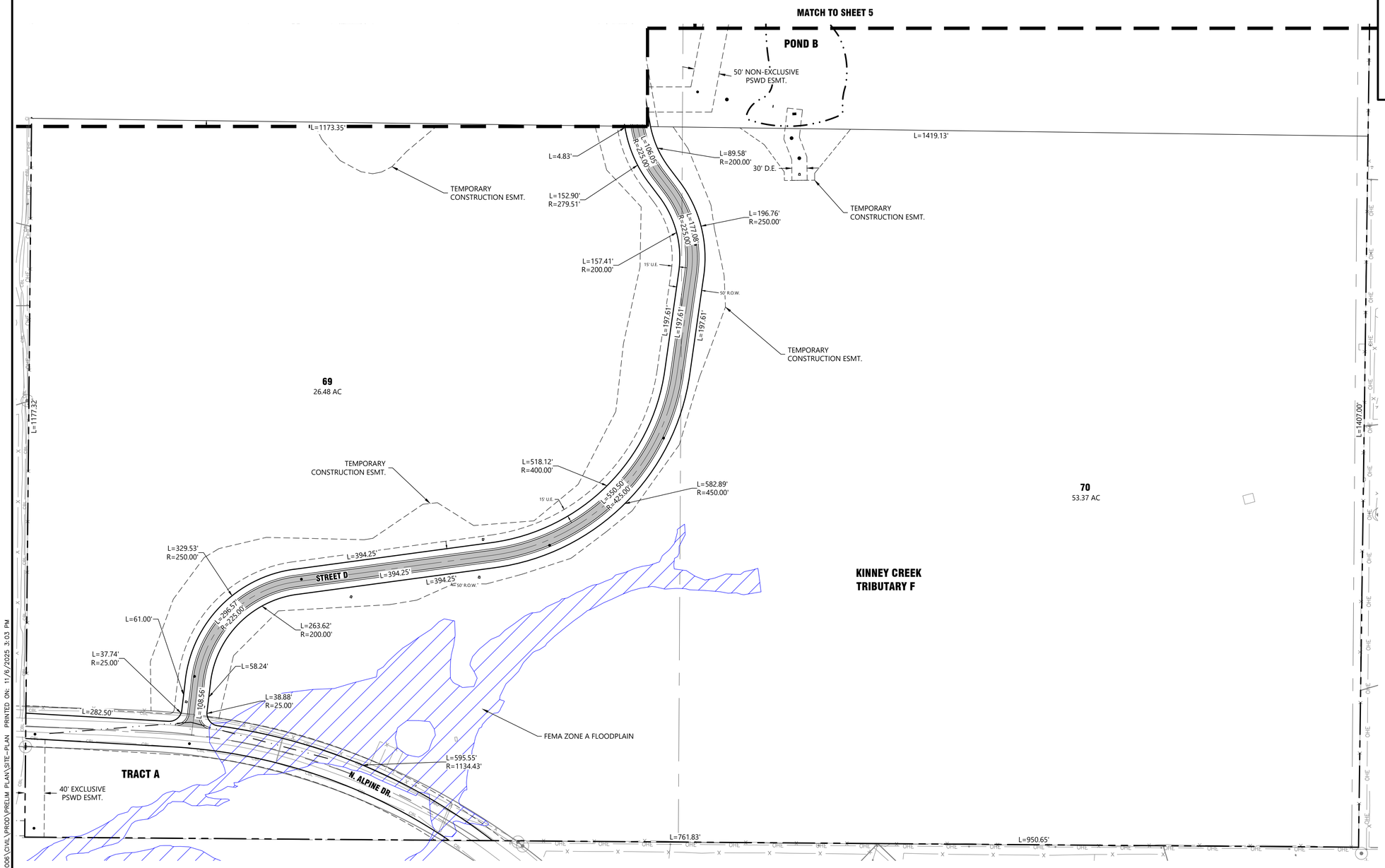
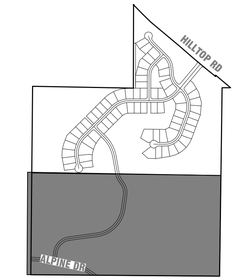
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

PROJECT BENCHMARK:

SCALE
1 inch = 100 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/A

Sheet: 7 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Ridgeline Real Estate, LLC
6900 Belleview Ave.
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 7

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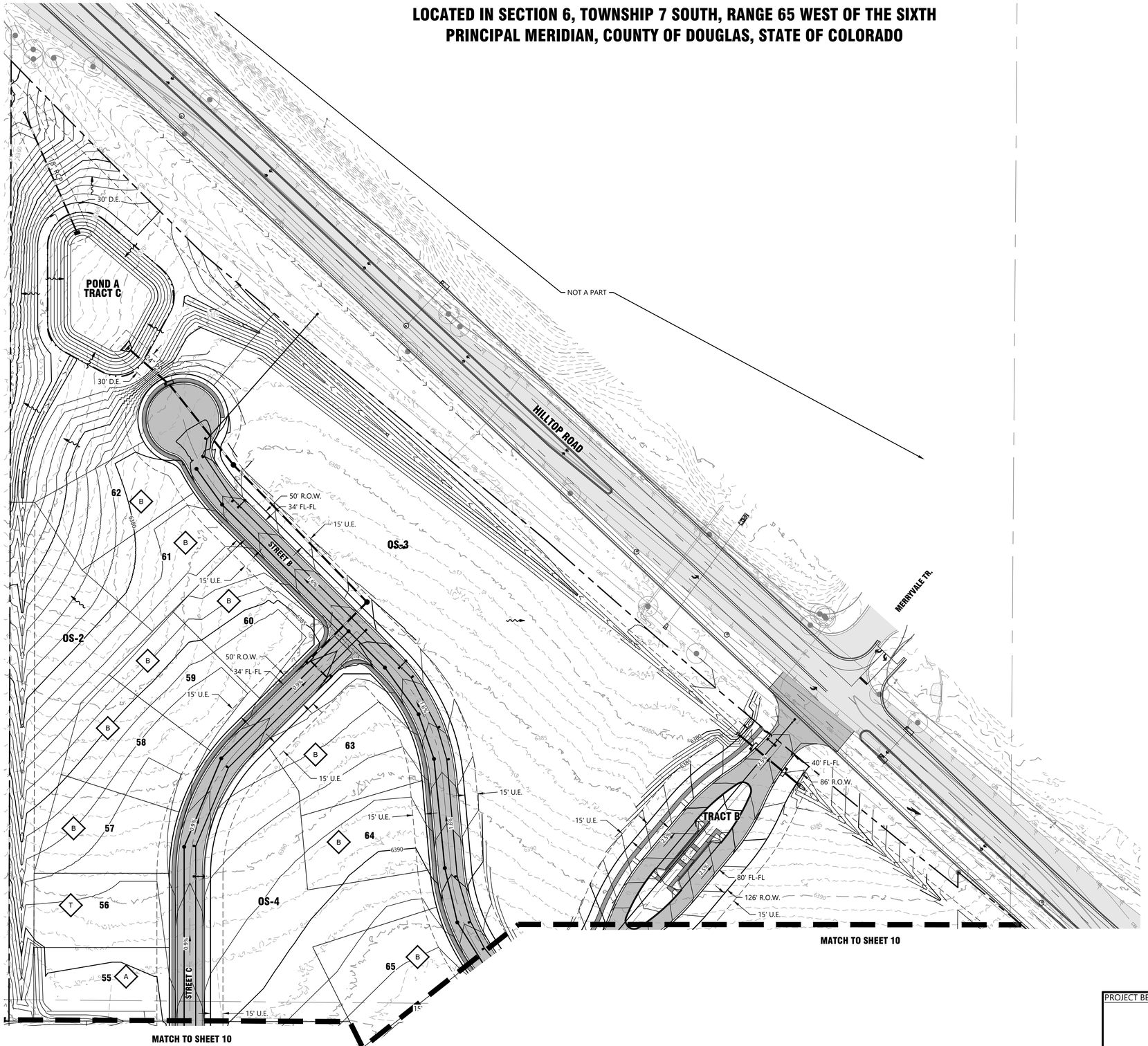
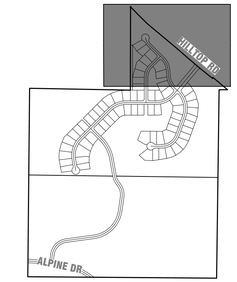
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

LOT TYPE	
A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 8 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
MVC Three Real Estate, LLC
6900 Dallas Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 8

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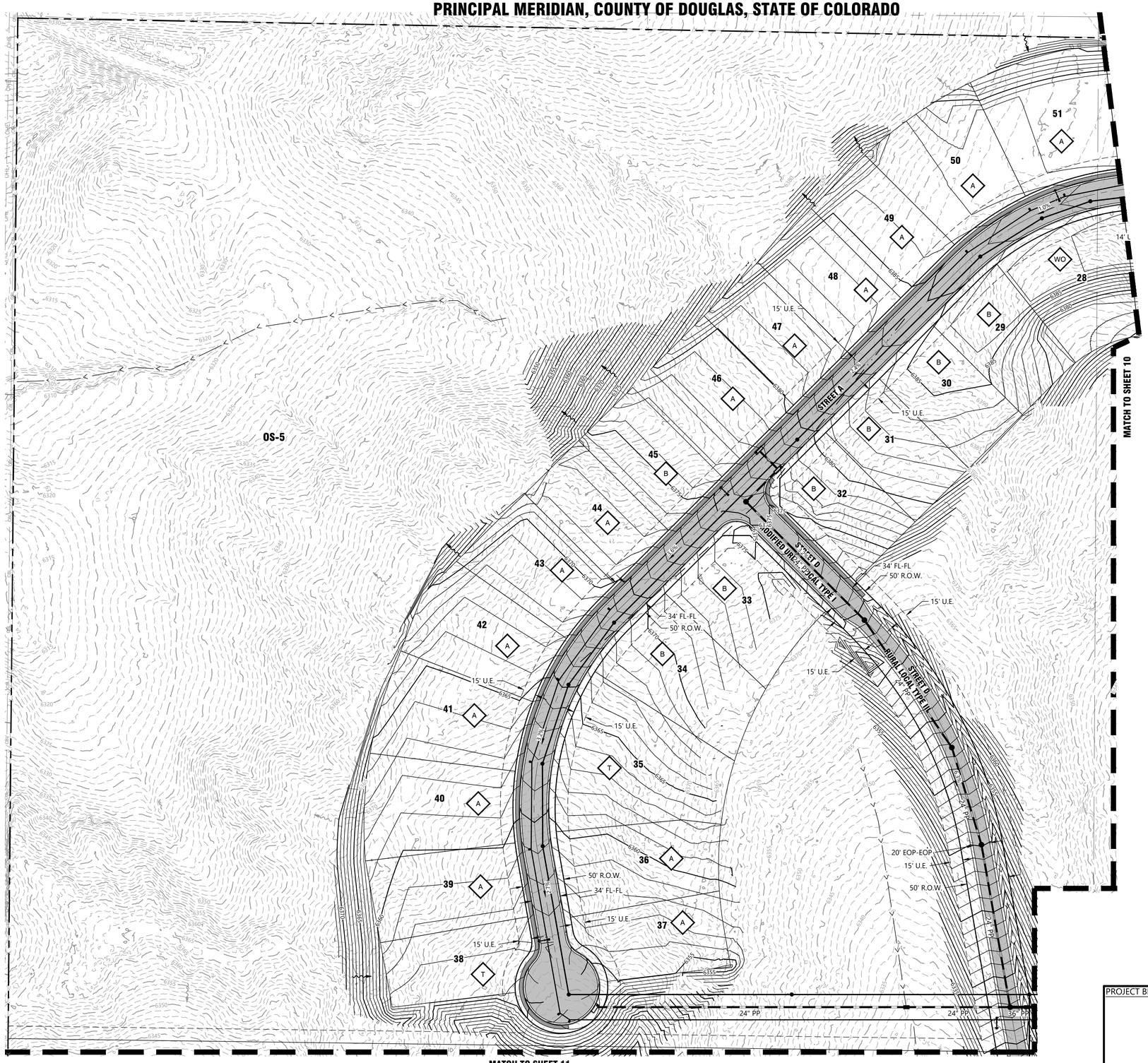
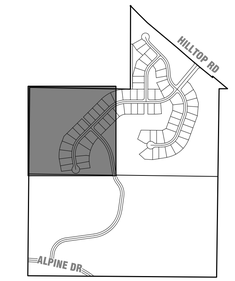
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

LOT TYPE

A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 80'
Scale Vert: N/A

Sheet: 9 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Miller Investment Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 9

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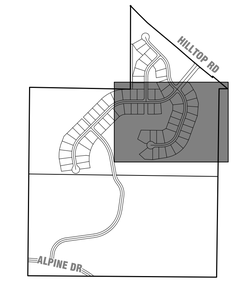
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO



KEY MAP
1"=1000'

LOT TYPE	
A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 10 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Mill Creek Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 10

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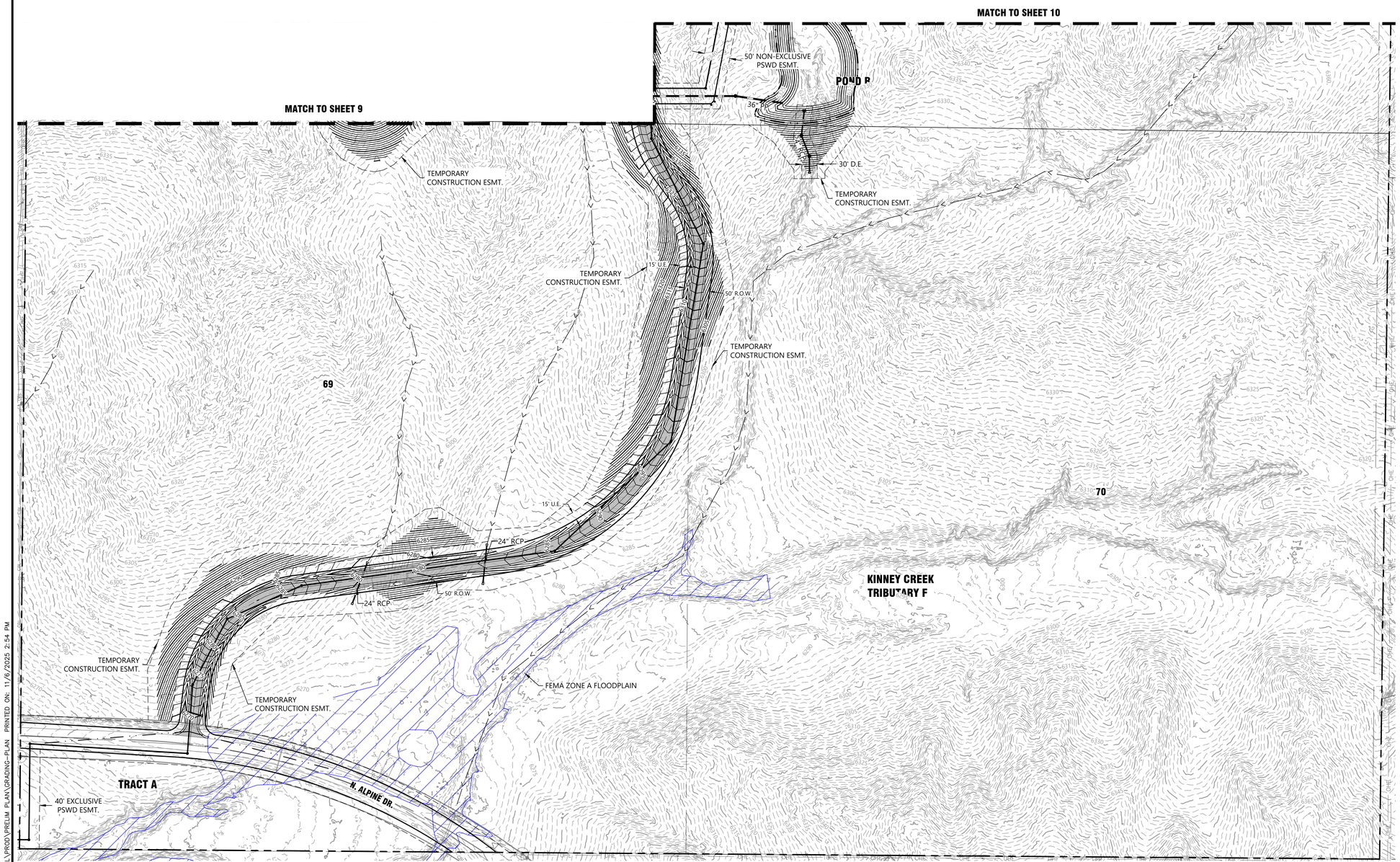
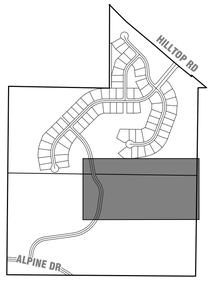
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

LOT TYPE

A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

60 0 30 60
SCALE
1 inch = 60 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 11 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Alvista Hilltop Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 11

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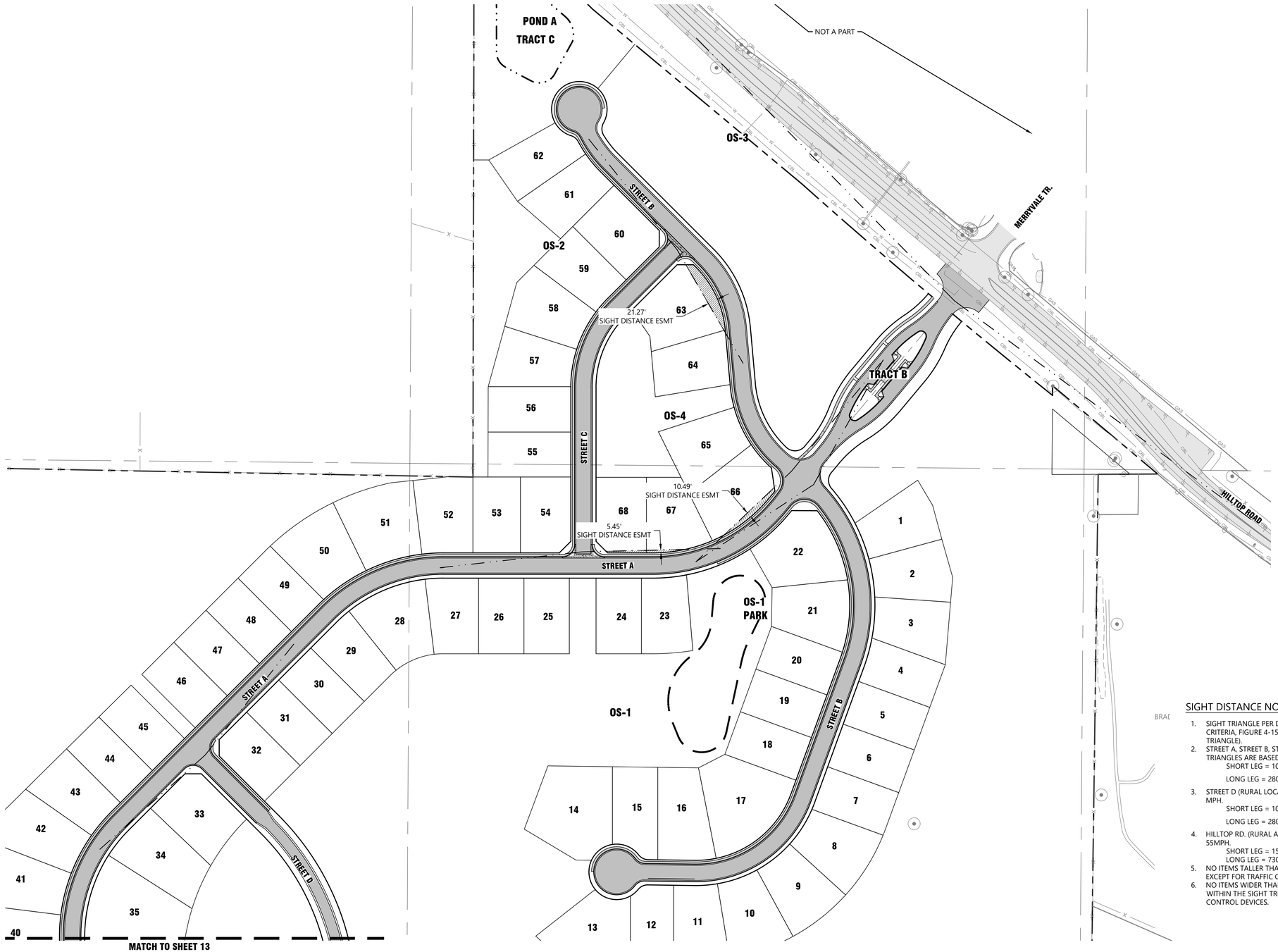
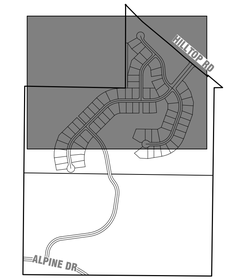
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

SIGHT DISTANCE NOTES:

1. SIGHT TRIANGLE PER DOUGLAS COUNTY ROADWAY DESIGN AND TECHNICAL CRITERIA, FIGURE 4-15 INTERSECTION AND DRIVEWAY SIGHT DISTANCE (LINE OF SIGHT TRIANGLE).
2. STREET A, STREET B, STREET C, AND ALPINE DR. (URBAN LOCAL TYPE I) SIGHT TRIANGLES ARE BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
3. STREET D (RURAL LOCAL TYPE III) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM THE FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
4. HILLTOP RD. (RURAL ARTERIAL) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 55MPH.
   SHORT LEG = 15' FROM THE FLOW LINE.
   LONG LEG = 730' LINE OF SIGHT.
5. NO ITEMS TALLER THAN 30" ARE ALLOWED WITHIN THE STOPPING SIGHT TRIANGLES EXCEPT FOR TRAFFIC CONTROL DEVICES.
6. NO ITEMS WIDER THAN 18" CAN BE TALLER THAN 30" OR GREATER ARE ALLOWED WITHIN THE SIGHT TRIANGLES EXCEPT FOR STREET TREE TRUNKS AND TRAFFIC CONTROL DEVICES.

PROJECT BENCHMARK:

100 0 50 100
SCALE
1 inch = 100 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JT
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/a

Sheet: 12 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Sight Distance Plan

NOT FOR CONSTRUCTION

Developer:
Alfa Ventures Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

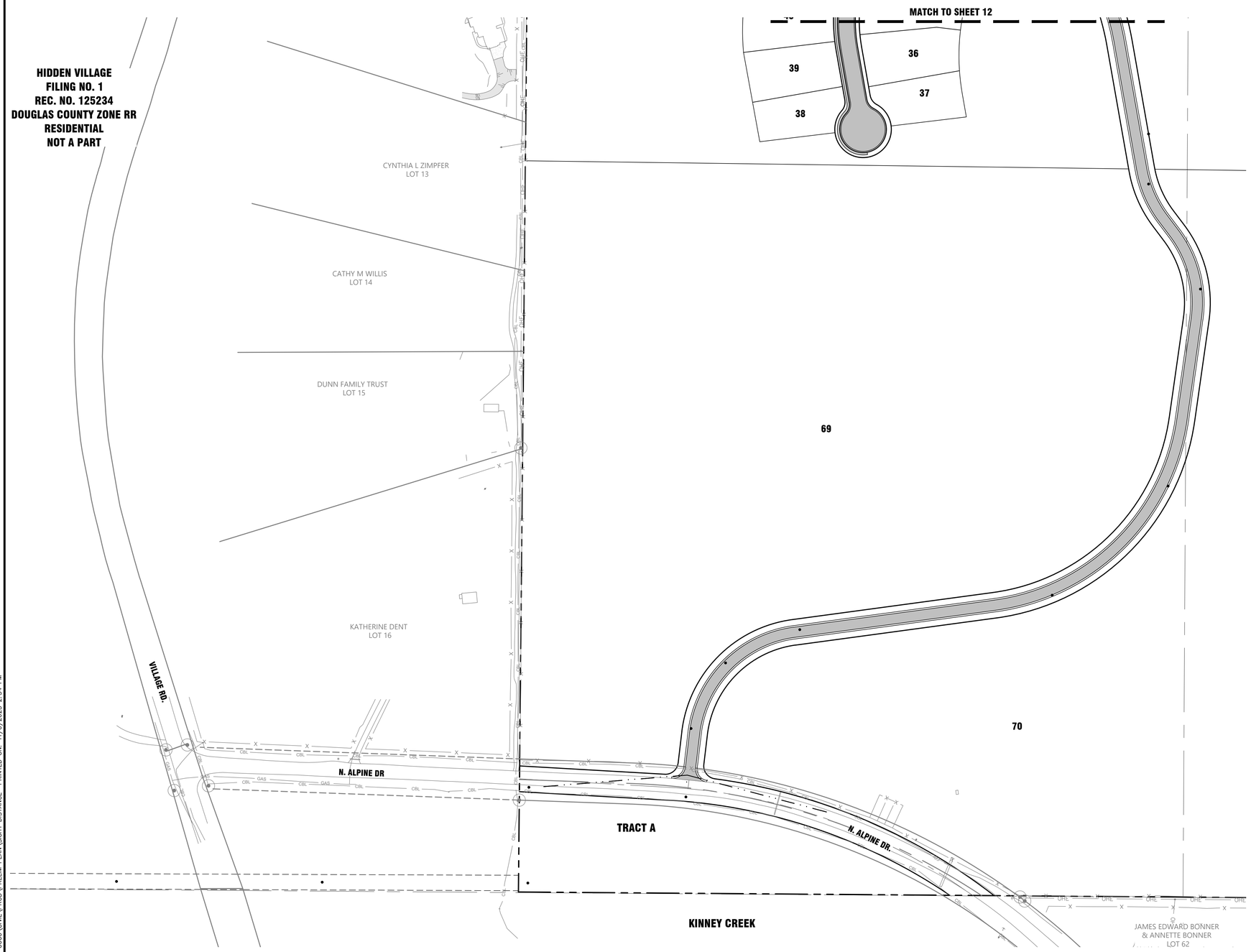
Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

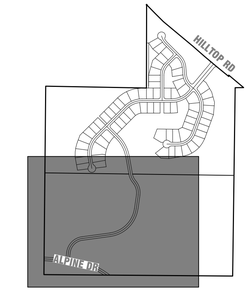
No. 12

I:\JOB FOLDERS\1084\1084-0006\CIVIL\PROD\PRELIM PLAN\SIGHT DISTANCE PRINTED ON: 11/6/2025 2:54 PM

RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO





KEY MAP
1"=1000'

SIGHT DISTANCE NOTES:

1. SIGHT TRIANGLE PER DOUGLAS COUNTY ROADWAY DESIGN AND TECHNICAL CRITERIA, FIGURE 4-15 INTERSECTION AND DRIVEWAY SIGHT DISTANCE (LINE OF SIGHT TRIANGLE).
2. STREET A, STREET B, STREET C, AND ALPINE DR. (URBAN LOCAL TYPE I) SIGHT TRIANGLES ARE BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
3. STREET D (RURAL LOCAL TYPE III) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM THE FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
4. HILLTOP RD. (RURAL ARTERIAL) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 55MPH.
   SHORT LEG = 15' FROM THE FLOW LINE.
   LONG LEG = 730' LINE OF SIGHT.
5. NO ITEMS TALLER THAN 30" ARE ALLOWED WITHIN THE STOPPING SIGHT TRIANGLES EXCEPT FOR TRAFFIC CONTROL DEVICES.
6. NO ITEMS WIDER THAN 18" CAN BE TALLER THAN 30" OR GREATER ARE ALLOWED WITHIN THE SIGHT TRIANGLES EXCEPT FOR STREET TREE TRUNKS AND TRAFFIC CONTROL DEVICES.

PROJECT BENCHMARK:

100 0 50 100
SCALE
1 inch = 100 ft.

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Designed: CIV
Prepared: JT
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/a

Sheet: 13 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Sight Distance Plan

NOT FOR CONSTRUCTION

Developer:
Kimley-Horn Real Estate, LLC
6900 Dallas Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 13

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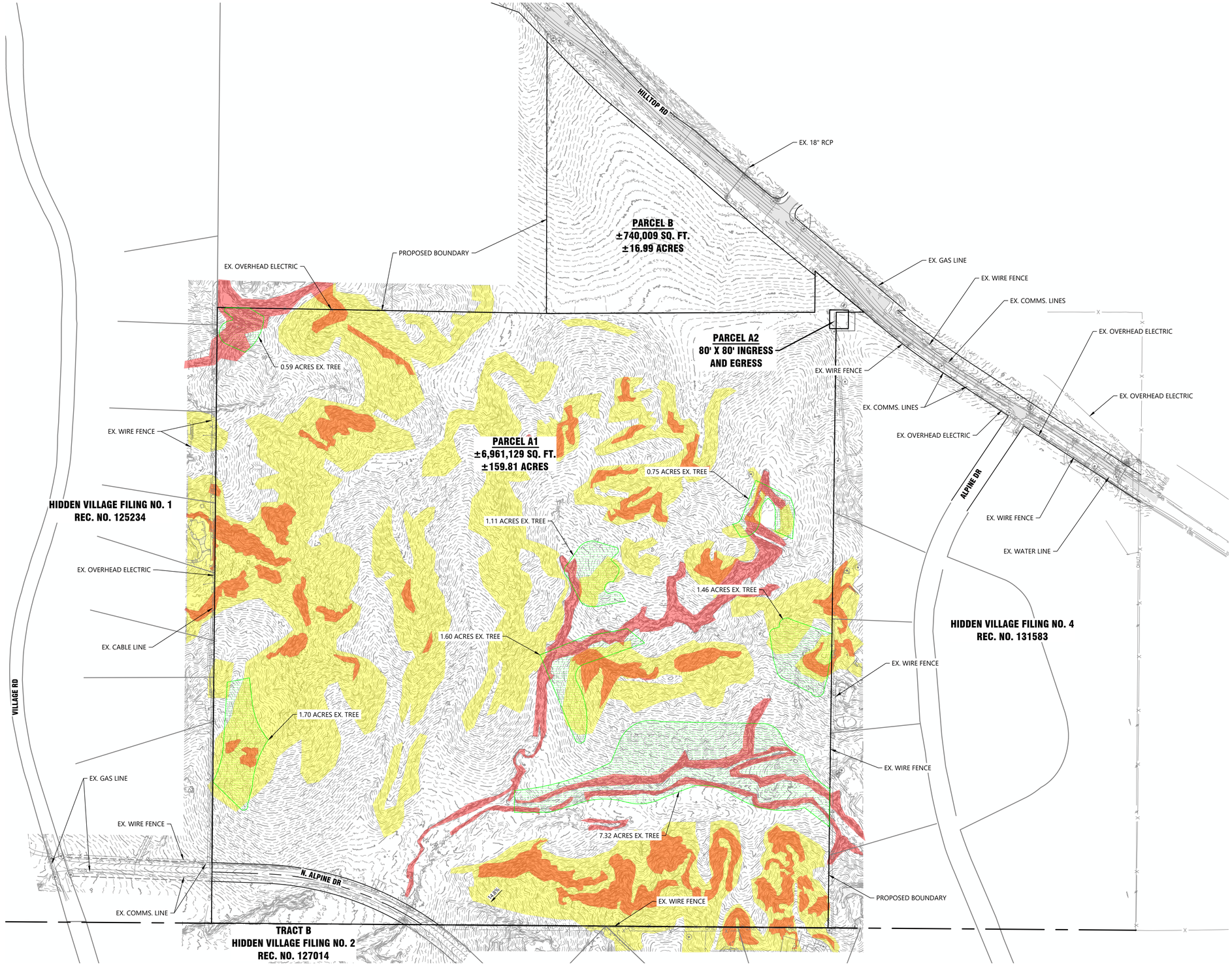
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO



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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 200'
Scale Vert: N/a

Sheet: 14 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Preliminary Plan
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Existing Features Plan

NOT FOR CONSTRUCTION

Developer:
Mill Creek Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

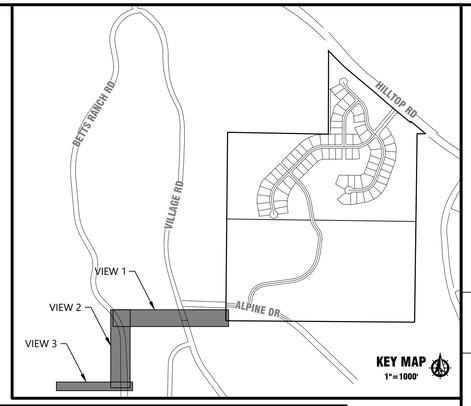
Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

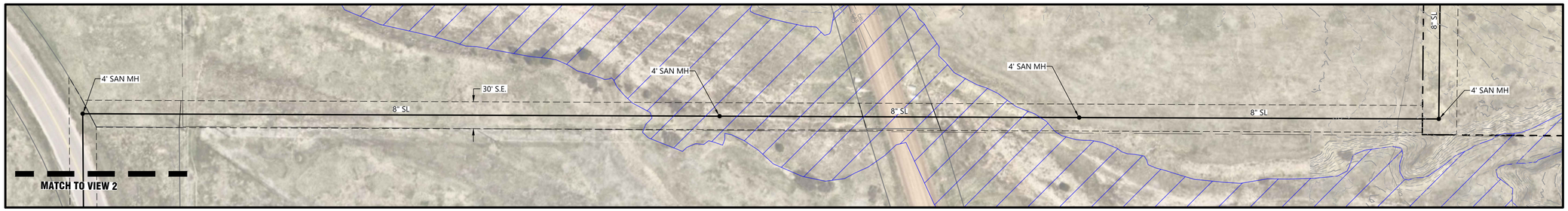
Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 14

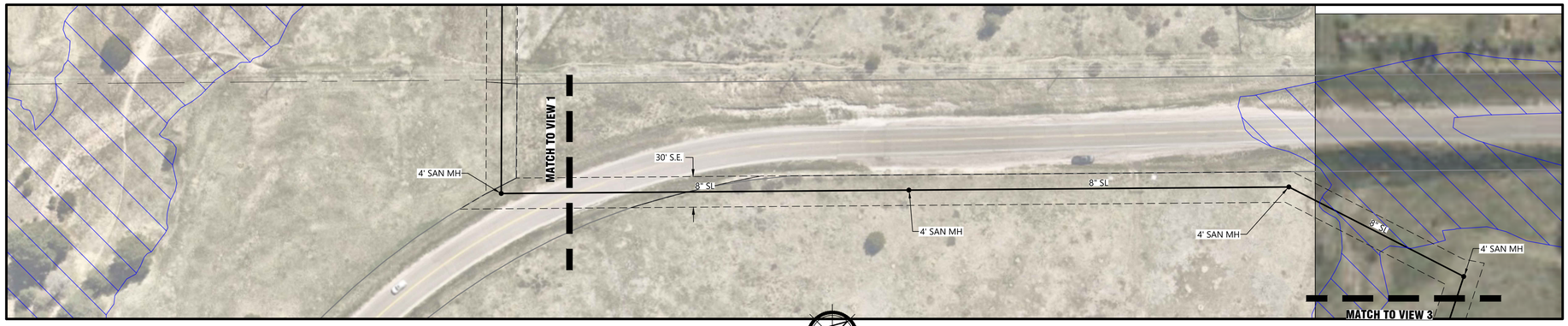
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

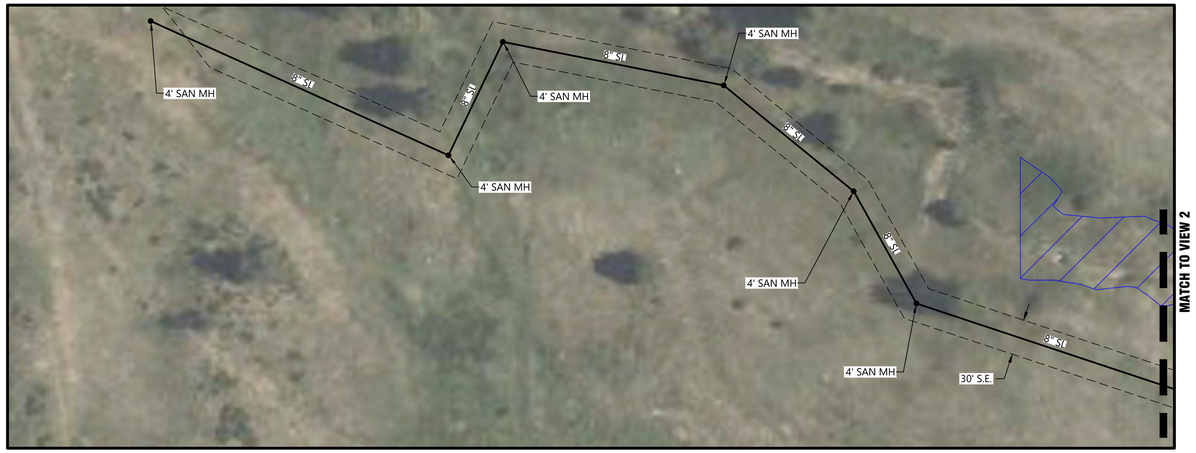




VIEW 1



VIEW 2



VIEW 3

PROJECT BENCHMARK:

SCALE
1 inch = 60 ft.

LJA
1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 15 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Offsite Sanitary Sewer Plan

NOT FOR CONSTRUCTION

Developer:
Wilkinson Real Estate, LLC
6900 Building Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

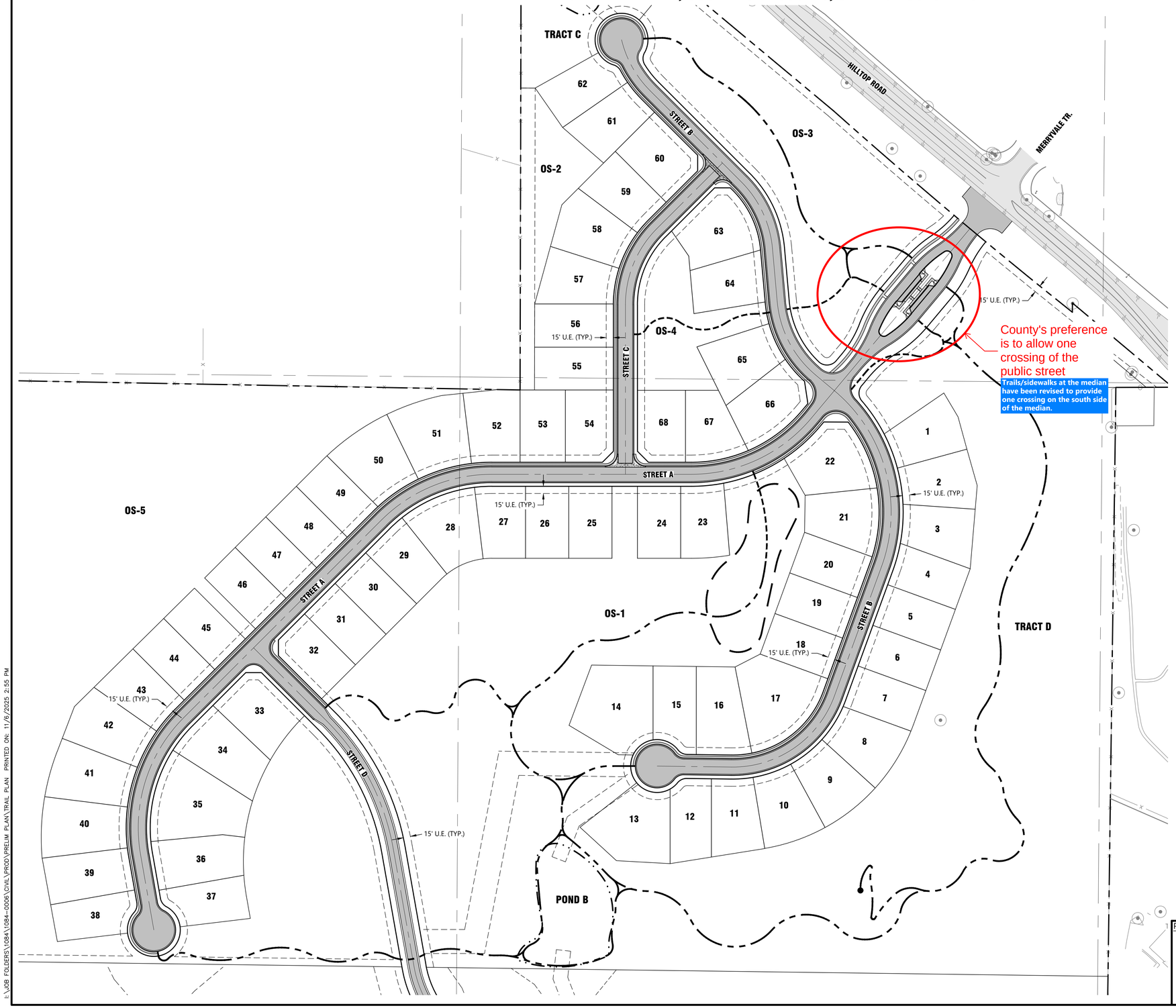
Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 15

I:\JOB FOLDERS\1084\1084-0006\CIVIL\PROD\PRELIM PLAN\UTILITY-PLAN PRINTED ON: 11/6/2025 2:55 PM

RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO



LEGEND

- 5' CONCRETE TRAIL (1,050 LF, 0.31 AC @ 13' WIDE CORRIDOR)
- SOFT SURFACE TRAIL (7,125 LF, 1.31 AC @ 8' WIDE CORRIDOR)

PROJECT BENCHMARK:

SCALE
1 inch = 100 ft.

LJA
1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: CIV
Prepared: JT
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/A

Sheet: 16 of 16
Date: November 6, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Trails Plan

NOT FOR CONSTRUCTION

Developer:
Mattio Lindstrand Real Estate, LLC
6600 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 16

I:\JOB FOLDERS\1084\1084-0006\CIVIL\PROJ\PRELIM PLAN\TRAIL PLAN PRINTED ON: 11/6/2025 2:55 PM

Trevor Bedford

From: Dan Sheldon <dsheldon@miller-united.com>
Sent: Wednesday, February 4, 2026 11:10 AM
To: Trevor Bedford; tkberringer@aol.com
Cc: Sarah Tengen; Daniel Jennings <djennings@norris-design.com>
Subject: RE: SB2025-040 Ramblewood - Hidden Village Property Owner Concern

Follow Up Flag: Follow up
Flag Status: Flagged

Caution: This email originated outside the organization. Be cautious with links and attachments.

Trevor & Terry:

Good afternoon. The survey work being done within the Hidden Village Property Owners Association ("HVPOA") tracts is being completed by the Ramblewood Metropolitan District (the "RMD") surveyors. Written legal notice of this survey work was provided to the HVPOA on January 14, 2026. Further, the RMD has spoken with the HVPOA President about this work as well as RMD's legal counsel has spoken with the HVPOA legal counsel.

Terry, you are correct. Our original plan was to build a lift station to serve our project and lift the sewer from our site up to Hilltop Road where it could go into another lift station that would be built at The Fields (on the north side of Hilltop Road just east of our project). We pivoted to a gravity sewer solution for a number of reasons. We will be hosting a neighborhood zoom webinar meeting on Tuesday, February 17th at 6pm in which we will detail out the pivot from lift station to gravity sewer amongst other updates. Invite was sent to the HVPOA on Monday this week requesting that they distribute it to the residents of Hidden Village. I'd urge you to attend if concerned about the sewer alignment or would like any other updates pertaining to the Ramblewood project.

I can tell you that there should be zero impact to your property at 6935 Chalet as the easement that the RMD is seeking from the HVPOA is wholly contained in Tract A of the HVPOA. You are just about spot on with your statement about the line going approximately 14' from your property line. We are seeking a 30' easement with the sewer line going down the middle of it. Further, all access and construction requirements to construct the sewer line in Tract A will be accomplished via a temporary construction and access easement to the NORTH of the sewer line alignment.

If you have further questions, please feel free to contact me directly at 303-886-2838.

MILLER UNITED
REAL ESTATE
Daniel R. Sheldon
Principal
Miller United Real Estate
Email: dsheldon@miller-united.com

From: Trevor Bedford <tbedford@douglas.co.us>
Sent: Monday, February 2, 2026 11:06 AM
To: Dan Sheldon <dsheldon@miller-united.com>
Cc: Sarah Tengen <stengen@norris-design.com>; Daniel Jennings <djennings@norris-design.com> <djennings@norris-design.com>
Subject: SB2025-040 Ramblewood - Hidden Village Property Owner Concern

Dan,

I just received this email from a property owner in Hidden Village with some concerns about surveyors near their property line.

Thank you,

Trevor Bedford, AICP | Senior Planner
Douglas County Department of Community Development
Planning Services Division
Address | 100 Third St., Castle Rock, CO 80104
Direct | 303.814.4372 **Main** | 303.660.7460
Email tbedford@douglas.co.us
NOTICE: Douglas County Planning does not charge "Approval" fees. Douglas County communicates through our official email accounts ending in @douglas.co.us; beware of phishing scams using similar addresses. If you have questions or concerns about the validity of an email or invoice, please call our Public Outreach and Assistance team at 303-660-7460 or email planning@douglas.co.us

From: tkberringer@aol.com <tkberringer@aol.com>
Sent: Monday, February 2, 2026 10:28 AM
To: Trevor Bedford <tbedford@douglas.co.us>
Subject: Someone staking sanitary sewer line through private property

Caution: This email originated outside the organization. Be cautious with links and attachments.

Good morning Trevor, this e-mail is a follow up to our conversation this morning regarding some unknown entity staking a sanitary sewer line through private property here in the Hidden Village subdivision. We assume this is in relation to the Ramblewood development that is currently under consideration along Hilltop Road. In meetings with Hidden Village property owners the developer showed homes clustered near Hilltop, with several larger parcels proposed as ranch estates. The developer said they would be installing lift stations for the sanitary sewer to tie into Parker Water and Sanitation facilities. We would like to know if the developer has decided that option is too costly, and will try to force Hidden Village to accept a revised routing of a sanitary line. The line as staked would be going through private property that is collectively owned by all Hidden Village homeowners. My own property would be directly impacted, the staking shows the line approximately 14' off my north property line, which is over 700' long. We would like to know if the developer has applied for any utility easements through Hidden Village, and if so,why weren't we notified. We would appreciate any follow up you can provide and look forward to hearing back from you.

Terry Berringer
6935 Chalet Circle
303-841-7810

Trevor Bedford

From: Bill Landrigan <bblandrigan@gmail.com>
Sent: Saturday, February 21, 2026 10:25 AM
To: Trevor Bedford
Subject: Ramblewood

Caution: This email originated outside the organization. Be cautious with links and attachments.

Trevor:

I do not support or approve of this new development. This high density development is not consistent with surrounding development with larger lots and open area. Property values will go down, traffic will increase on hilltop, and the overall appearance of this area will deteriorate.
We must have consistent development and not allow high density units in this urban area.

Thanks
Bill Landrigan
Merryvale Trail

Trevor Bedford

From: Colleen Currie <colleen@ccgrad.net>
Sent: Sunday, February 22, 2026 6:36 PM
To: Trevor Bedford
Subject: Re: SB2-25-040 - strong opposition

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Hi, Trevor.

As homeowners in the Tallman HOA, we are strongly opposed to this development. Fractional acre lots/cluster developments are not part of the Dougco master plan. We already have a safety issue with a high-volume of traffic and speeds on Hilltop. Even with the in-process widening, we fear that a development of this size will outstrip this new capacity quickly. In addition, the Dougco Sheriff's Dept recognizes the severe safety issue in our neighborhood and is working with us to add speed humps. In our area, Merryvale Trail and Canyon Wind streets have become a main cut through between Hilltop and Canterbury/Legend HS and this will only intensify if this new development is allowed. Property values may be negatively impacted as well.

Finally, as a blind person, it is already nearly impossible for me to safely cross Canyon Wind with the current volume (with no sidewalks or crosswalks). Adding high density neighborhoods, will present signifcantly more danger for me personally, in addtion to the many small children who ride bikes on our streets.

Thank you,
Colleen Currie
(303) 725-9430
8575 Carneros Court
80138

Colleen Currie
Please excuse any typos - emails are voice dictated.

Trevor Bedford

From: Cynthia Zimpfer <czimpfer@earthlink.net>
Sent: Sunday, February 22, 2026 7:26 PM
To: Trevor Bedford
Subject: Re: Ramblewood Planned Development, Project File # ZR2024-031

Importance: High

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Dear Mr. Bedford,

I am writing again to voice my strong opposition to the Ramblewood Planned Development.

My Home Owner's Association of Hidden Village, has advised its members that the developers are now investigating the feasibility of installing a sewer line in the Hidden Village Common Grounds for their planned development.
Has there been an Environmental Impact Statement written for this proposed sewer line? If so, I would like to review this with attorneys.
This is another example of how the land and water resources for this planned development are scarce in our area and the developers are looking to infringe on the Hidden Village Community's resources. The only explanation for such a development is money for the developers and perhaps, additional tax revenue for Douglas County.
The danger is that yet another development will severely impact the quality of life for the present homeowners and will impact greatly the natural resources. And it will lower the value of current property owner's properties including the Colorado Golf Club.

I also do not understand why the developers can not have two access points onto Hilltop Road instead of the planned access road onto Alpine Road which is a rock road. It seems to me that the issue is an aesthetic/design issue rather than a safety issue.

And the 70+ homes in this development will exasperate further the traffic onto Hill top Road—perhaps, an additional 200 cars? Does Douglas County want to become a Los Angeles suburb?

As per my previous emails, copies follow below, written in opposition of this development, I am even more convinced that this proposed development will contribute nothing to our community and will in fact, destroy the natural resources, the value and the sense of community.

I am hopeful that the Douglas County Planning/Zoning board will see that this development will add ZERO to our community and will await your updates.

Thank you.
Cynthia Zimpfer, Homeowner, Hidden Village Parker
7292 Village Road
Tel (862) 250 0159

On Jul 21, 2025, at 12:02 PM, Trevor Bedford <tbedford@douglas.co.us> wrote:

Thank you for the additional comments. I have provided them to the Planning Commission. I do want to let you know that tonight's Planning Commission Hearing has been cancelled and the Ramblewood PD hearing will be rescheduled to August 4th at 6PM in front of the Planning Commission. The Board hearing on August 26th has not changed.

Thank you,

Trevor Bedford, AICP | Senior Planner
Douglas County Department of Community Development
Planning Services Division
Address | 100 Third St., Castle Rock, CO 80104
Direct | 303.814.4372 **Main** | 303.660.7460
Email tbedford@douglas.co.us

From: Cynthia Zimpfer <czimpfer@earthlink.net>
Sent: Wednesday, July 16, 2025 11:38 AM
To: Trevor Bedford <tbedford@douglas.co.us>
Subject: Fwd: Ramblewood Planned Development, Project File # ZR2024-031

Hello Mr. Bedford,

I am contacting you again, in advance of the announced Public Hearings before the Douglas County Planning Commission and Douglas County Commissioners on July 21 and August 26, 2025, where the developer of Ramblewood Development is requesting a Change in Zoning from Agriculture One and Rural Residential to PD-Planned Development.

I am adamantly against this project and believe that it will cause harm to the Hidden Village neighborhood and the surrounding areas.
It does not make sense to add another 70 homes (up to 300+ people) in such a small area, other than for the financial benefits that the owner of the property and the developers will reap.

The developers have made their case by saying that if their project is not approved, then another developer will submit plans for an even larger development—basically, a veiled threat.
They have defended the development's proposed use of water by digging even further into the water table, and when asked about increased traffic on HillTop Road, they said that we, the community, have to talk to Douglas County about traffic mitigation plans.
My property immediately abuts their planned development, and there appears to be no plans for fencing between my property and the development.

I also do not understand why there would need to be a road built that extends from the end of their proposed development through the two 20 acre lots abutting Alpine Road and

which would exit out onto Alpine Road. The developer says that this proposed road out of their development onto Alpine Road is required for Fire and Emergency vehicles as they need two exits out of the development.Then why did the developer not plan for a second exit out to Hill top Road?—Most likely, because they would have had to reduce the number of homes planned, meaning less profit. This proposed 'exit' road onto Alpine Road will completely change the Hidden Village community, and in effect extend their development into Hidden Village.

It seems to be that Douglas County ought to be creating more public green spaces and parks, instead of being lured by developer's dollars and influence.

Regards,

Cynthia Zimpfer

Begin forwarded message:

From: Cynthia Zimpfer <czimpfer@earthlink.net>
Subject: Ramblewood Planned Development, Project File # ZR2024-031
Date: April 18, 2025 at 10:34:54 AM MDT
To: tbedford@douglas.co.us

Dear Mr. Bedford,

I am sorry I am late in replying to your email dated March 18 concerning an application for a development of 70 houses under the name of the Ramblewood Planned Development as I was out of the US on business.

I am a resident of Hidden Village and own Lot 13 directly behind the proposed development.
I moved from New Jersey and spent 5 years building my house on this property which was completed in December 2020.
I wanted to be in a location that had low density...and a rural quality of life.
This development will significantly lower the value of my 5.9 acre property and change the quality of life in Hidden Village.

Here are my specific concerns:

1. WATER.
How will the water be accessed for these homes? Will each home have its own well? And if so, I am concerned that they will be connecting into the Hidden Village aquifer.
We, in Hidden Village, each have our own well.

2. FENCING AROUND PROPOSED DEVELOPMENT.

What kind of fence is proposed which would abut to my property and how would it be maintained? There is a private bridal trail for Hidden Village residents directly behind this proposed development and I can imagine that the residents of this new development would be very enticed to trespass onto these trails which are maintained by Hidden Village residents!!

3. INCREASED TRAFFIC

I understand that the Ramblewood proposal would have the main access onto HillTop road, but that the fire department requires that there also be an exit onto Alpine Road in Hidden Village.
A development of 70 homes may add up to 300-400 people who would have access to our community which add lots of traffic and noise.

4. LIGHT AND NOISE POLLUTION.

Part of the attraction of Hidden Village has been the low light and low noise. With an addition of 70 homes abutting to Hidden Village, there will be a significant increase in light and noise pollution.

5. CURBS & SIDEWALKS in the Proposed development.

As you may know, the roads in Hidden Village are dirt roads and are maintained as such for the equestrian asset in our community.
The paved surfaces in this development would cause run off onto the impervious rooftops, roads and other surfaces causing damage..

6. WILDLIFE

There is abundant wildlife in and around Hidden Village and the property under consideration of development.
There is worry about where the animals and birds will be displaced given this extensive development.

I understand that there is always a push and pull with developers who wish to maximize their investments and the homeowners who surround developments, but I just do not understand how Douglas County would allow 70 homes to be built in under 100 acres.
A way to maintain the value of property in and around Hidden Village is to limit the development to 5 or 10 acre lot homesteads.

I will await your comments.

Respectfully yours,

Cynthia Zimpfer
7292 Village Road
Parker, CO 80134
Tel: (862) 250 0159

Trevor Bedford

From: Carrick & Laurie Boshart <arqitek@comcast.net>
Sent: Saturday, February 21, 2026 10:34 AM
To: Trevor Bedford
Subject: Opposition to Ramblewood Planned Development

Caution: This email originated outside the organization. Be cautious with links and attachments.

Hello Trevor,

I am a resident of the Tallman Gulch community, and also a registered architect in the state of Colorado, California and Idaho. My wife and I are writing to register our opposition to the Ramblewood Planned community just outside our neighborhood. The project violates all of section 3 of the County Master Plan. This density and lot configuration is inconsistent with the surrounding subdivisions (including ours), where properties range from 1-2.0 acres to the north with larger acreages surrounding this property in Hidden Village to the south.

- Visually and in overall planning, this development differs significantly from the established character of the area, regardless of the layout and use of open space.
- It does not align with Douglas County's "like-for-like" development standards as outlined in the County Master Plan.
- This is a suburban subdivision layout in a non-urban community
- There are no other subdivisions in this area with this lot density for several miles. It does not belong here!
- Master Plan introduction, where it states that "In the State of Colorado, it is the duty of the county planning commission to draft and adopt a comprehensive plan for the unincorporated territory of the county, pursuant to C.R.S. §30-28-106(1)." Per Figure 1.2, this masterplan document reigns over implementation documents for zoning resolution and planned developments, therefore the Masterplan must be upheld:

https://www.douglas.co.us/documents/cmp-section-1.pdf/

Thank you for your attention to our concerns,

Carrick R. Boshart, AIA, NCARB, LEED AP
Laurie Lauletta-Boshart

Trevor Bedford

From: Eric Jessen <eric.jessen@me.com>
Sent: Friday, February 20, 2026 5:15 PM
To: Trevor Bedford
Cc: Jessen Lori
Subject: SB2025-040 Opposition to Ramblewood Development

Importance: High

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Trevor Bedford, Douglas County Planning,

As residents of Tallman / Vivant, my wife, Lori, and I want to formally express our opposition to the proposed Ramblewood Development.

This proposed Ramblewood plan includes 63 homes on lots ranging from 0.3 to 0.45 acres.

- This density and lot configuration is inconsistent with the surrounding subdivisions (including ours), where properties range from 1-1.5 acres to the north with larger acreages surrounding this property in Hidden Village to the south.
- Visually and in overall planning, this development differs significantly from the established character of the area regardless of the layout and use of open space.
- It does not align with Douglas County's "like-for-like" development standards as outlined in the County Master Plan.
- This is a suburban subdivision layout in a non-urban community
- There are no other subdivisions in this area with this lot density for several miles. It does not belong here!

This project violates all of section three of the masterplan.

Eric Jessen
727.504.5014

Trevor Bedford

From: FongFamily FongFamily <dsakfongco@msn.com>
Sent: Sunday, February 22, 2026 8:49 AM
To: Trevor Bedford
Subject: File Number SB2025-040

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

David and Suzanne Fong

6945 N Trailway Circle

Parker, CO 80134

dsakfongco@msn.com

February 22, 2026

Douglas County Planning Services Attn: Trevor Bedford 100 Third Street Castle Rock, CO 80104

Re: Formal Objection to Proposed Development "Ramblewood" – File No. SB2025-040

Dear Mr. Bedford,

I am writing to formally object to the proposed Ramblewood subdivision (File No. SB2025-040). After reviewing the applicant's materials and comparing them with the Douglas County Master Plan and the established character of the surrounding area, it is clear that this proposal is incompatible with the Northeast Non-Urban Area and should not be approved in its current form.

1. Density and Lot Configuration Are Inconsistent With Surrounding Development

The proposal includes **63 homes on lots ranging from 0.3 to 0.45 acres**. As demonstrated during the review of the Fields project's original plan, this level of density is **not consistent** with the surrounding subdivisions. Properties to the north range from **1–1.5 acres**, and parcels in Hidden Village to the south are even larger.

The Douglas County Master Plan emphasizes that development in Non-Urban Areas must maintain rural character and low density. Specifically:

- **"Non-Urban Areas are intended to remain rural in nature, with low-density residential development and large lots."** (Master Plan, p. 18)
- **"New development should be compatible with the established character of the surrounding area."** (Master Plan, p. 22)

Ramblewood's suburban-style density is fundamentally incompatible with these standards.

2. The Proposal Conflicts With the Douglas County Master Plan

The Master Plan map clearly identifies this region as part of the **Northeast Non-Urban Area**, which is intended to maintain a low-density, rural character. The Master Plan states:

> "In the State of Colorado, it is the duty of the county planning commission to draft and adopt a comprehensive plan for the unincorporated territory of the county, pursuant to CRS 30-28-106(1)." (Master Plan, p. 4)

Additionally, **Figure 1.2** (Master Plan, p. 6) establishes that the Master Plan **supersedes implementation documents**, including zoning resolutions and planned development standards. Therefore, the Master Plan must guide the evaluation of this proposal.

Relevant Master Plan language supporting this objection includes:

- **"Like-for-like development patterns should be maintained to preserve community character."** (Master Plan, p. 23)
- **"Subdivision design should respect existing land use patterns and avoid introducing suburban densities into rural areas."** (Master Plan, p. 24)
- **"The County will ensure that development intensity is compatible with surrounding land uses."** (Master Plan, p. 21)

Ramblewood violates **all three governing sections** of the Master Plan for the Northeast Non-Urban Area:

- It is **not like-for-like** in density
- It is **not compatible** with surrounding development
- It **does not preserve** the rural character the Master Plan requires

3. Impacts to Community Property, Threatened Eminent Domain, and Available Alternatives

The developer has indicated a willingness to pursue **eminent domain** to take community-owned property. This land is used daily by residents and includes a **bridle trail, community meeting space, and established native grass areas**.

The proposed **30-foot utility easement** would run through these community amenities, rendering the bridle trail **unusable for equestrians** and potentially taking **years** to re-establish native grasses. This represents a significant and unnecessary disruption to existing community resources.

Importantly, **a viable alternative exists**: The developer can **tie into The Fields subdivision sewer system**, which would avoid any impact to our community property entirely. This option eliminates the need for eminent domain, avoids damage to community trails, our use and enjoyment of our community property and aligns with responsible planning practices.

The Master Plan explicitly supports minimizing impacts to existing communities:

- **"Infrastructure extensions should avoid disruption to existing neighborhoods and community amenities whenever feasible."** (Master Plan, p. 31)

- **“Development should not require the taking of private or community property when reasonable alternatives exist.”** (Master Plan, p. 32)

Given that a feasible alternative sewer connection exists, the proposed easement-and the threat of eminent domain-are unjustified and inconsistent with County policy.

4. The Proposal Does Not Belong in This Location

The cumulative effect of the density, the suburban subdivision design, the disregard for the Master Plan, and the impacts to community property make it clear that this proposal is **not appropriate for this site**. The Northeast Non-Urban Area is intended to maintain its rural character, and Ramblewood is fundamentally inconsistent with that vision.

Request

For these reasons, I respectfully request that Douglas County **deny** the Ramblewood subdivision application (SB2025-040) or require the applicant to redesign the project to conform to the Master Plan and the established character of the surrounding area.

Thank you for your consideration and for your continued commitment to upholding the County’s planning standards and community values.

Sincerely,

David and Suzanne Fong

Trevor Bedford

From: juanjose@infocore.com.pe
Sent: Friday, February 20, 2026 7:09 PM
To: Trevor Bedford
Subject: SB2025-040

Caution: This email originated outside the organization. Be cautious with links and attachments.

We are against the changes to the city's zoning plan. Changes were authorized a few months ago for the area behind our house, which is jeopardizing our investments. Please reconsider and do not grant them the building permit.

Juan Jose Iraola
CEO
8537 Carneros Ct
Parker, CO 80138
USA
Celular 9999-88420
Whatsapp+1 720-4134457
www.infocore.com.pe

INFOCORE

Trevor Bedford

From: JD Liggett <jdliggett3@gmail.com>
Sent: Saturday, February 21, 2026 1:00 PM
To: Trevor Bedford
Subject: Opposition to SB2025-040 Ramblewood Subdivision Preliminary Plan

Caution: This email originated outside the organization. Be cautious with links and attachments.

Dear Mr. Bedford,

I am submitting formal opposition to the Ramblewood Subdivision Preliminary Plan (SB2025-040).

The proposal includes 63 homes on 0.3–0.45 acre lots within an area designated Non-Urban in the Douglas County Comprehensive Master Plan.

This density is materially incompatible with adjacent and nearby subdivisions. Hidden Village lot sizes range from approximately 2.6 to over 10 acres, with typical parcels around 5 acres. Lots in the Tallman subdivision across Hilltop Road are approximately 1–1.5 acres. The proposed Ramblewood lots are therefore approximately 3 to 30 times smaller than surrounding properties.

In addition, Hidden Village is served by unpaved dirt roads designed for low-density rural traffic. Adding traffic from 63 additional homes will materially increase vehicle volume, resulting in accelerated road degradation, increased dust, higher maintenance requirements, and reduced safety. These roads were not designed to support suburban-density traffic levels.

The Comprehensive Master Plan requires compatibility with existing land use patterns and infrastructure. This proposal introduces suburban density into a rural area with infrastructure designed for low-density use.

Approval of SB2025-040 would conflict with the County's adopted Comprehensive Master Plan and established land use framework.

I request denial of SB2025-040 as currently proposed.

Sincerely,
Jayme Liggett
6989 N Trailway Cir
Parker, CO
Hidden Village Resident

Trevor Bedford

From: Keegan Tekulve <tekulvebk@gmail.com>
Sent: Friday, February 20, 2026 7:49 PM
To: Trevor Bedford
Subject: SB2025-040 Ramblewood Preliminary Plan Objection

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

To our Douglas County Commissioners,

I am would like to express my objections for the current preliminary plans for SB2025-040 Ramblewood. As a Douglas County native and resident of a neighboring community to Ramblewood, I know development is going to happen; I just ask for you to uphold the intentions of the Master Plan for this area when reviewing these plans. Specifically, I would like you to deny these plans because they do not align with Douglas County's "like-for-like" development standards and the guidelines for the Non-Urban Developments as outlined in the County Master Plan.

The current proposed plan includes 63 homes on lots on lot sizes ranging from 0.3 to 0.45 acres. This density and lot configuration is inconsistent with the surrounding subdivisions. The adjacent northern neighborhood, Tallman, is a subdivision made up of 1-1.5 acres lots and the remaining surrounding neighborhoods, such as Hidden Village to the south, are substantial larger lots! Including the neighbor on the West, whose parcel is a 56 acre lot with cows and other large animals. Not a property that should have 63 small lot homes butting up against their fence.

The overall planning and visual design of the Ramblewood Development differs drastically from the established character of the area! The proposed plans are essentially putting a suburban subdivision in a non-urban area. The density and layout do not meet the "like-for-like" standards of our County's Master Plan.

Please deny the proposed plans for this development! Please require the developers to read and implement the requirements of the County's Non-Urban Areas Master Plan when redrafting their plans for Ramblewood. I have provided links below to the guidelines I would like their development plans to follow before they are ready to be approved.

Thank you for your time and sincere consideration,

Brittany Keegan Tekulve
Tekulvebk@gmail.com
303-902-6838

Attached links for you to review and require Ramblewood developers to follow:

- Douglas County Masterplan Map - Ramblewood area is considered a non-urban area: https://www.douglas.co.us/documents/map-1-1-comprehensive-master-plan-land-use-map.pdf/
- The Ramblewood parcel is part of the Northeast Non-urban area, here is the map: https://www.douglas.co.us/documents/cmp-map-3-1-nonurban-subareas.pdf/
- Subarea subdivision map: https://www.douglas.co.us/documents/cmp-map-3-6-northeast-subarea.pdf/
- Per Figure 1.2, this masterplan document reigns over implementation documents for zoning resolution and planned developments; the Masterplan must be upheld: https://www.douglas.co.us/documents/cmp-section-1.pdf/

Trevor Bedford

From: lee schuessler <leeschuessler@gmail.com>
Sent: Sunday, February 22, 2026 3:21 PM
To: Trevor Bedford
Subject: Public Comment: Ramblewood Preliminary Plan (File No. SB2025-040)

Caution: This email originated outside the organization. Be cautious with links and attachments.

Dear Mr. Bedford,

I am writing to formally submit my comments regarding the proposed Ramblewood development (File No. SB2025-040). As a resident of the affected Hilltop area, I have significant concerns regarding the density and configuration of the 63 proposed homes on lots ranging from 0.3 to 0.45 acres.

I believe this project should be denied or significantly revised for the following reasons:

The proposed 0.3-acre lots are inconsistent with the established character of our non-urban community, where existing properties range from 1 to 1.5 acres to the north and even larger acreages to the south.

This suburban subdivision layout does not align with Douglas County's "like-for-like" development standards. Specifically, I believe this project violates Section 3 of the Master Plan, which governs implementation for zoning resolutions in unincorporated territory.

The Northeast area is considered a non-urban region. Introducing a high-density suburban layout here ignores the rural character and the County Master Plan's intent to maintain distinct community boundaries.

The current proposal differs significantly from the established use of open space and the layout of the surrounding subdivisions. I urge the Planning Commission and the Board of County Commissioners to uphold the Master Plan and require a development density that is compatible with the existing neighborhood.

Thank you for your time and for considering these concerns Trevor.

Sincerely,

Lee Schuessler

8331 Blossom Hl Ln, Parker, CO 80138

720-831-2125

Trevor Bedford

From: Peter West <petermwb@yahoo.com>
Sent: Friday, February 20, 2026 5:19 PM
To: Trevor Bedford
Subject: ramble wood

Caution: This email originated outside the organization. Be cautious with links and attachments.

hello, peter west here from 7799 two rivers circle, parker (tallman gulch) having looked at the small lot sizes, i am not i favor of this new neighborhood, however i do not think i get a vote, since it appears that ramblewood is already approved. we already have too much congestion in this area. when i bought my house i thought i was buying a house out in the country on acreage. when i moved in, i discovered what i really bought was a house in los angeles, or a close proximity thereof.

regards, peter west parker

Trevor Bedford

From: Steve Pieper <stevepieper@ymail.com>
Sent: Sunday, February 22, 2026 3:43 PM
To: Trevor Bedford
Subject: Comments relating to SB2025-040, Ramblewood

Caution: This email originated outside the organization. Be cautious with links and attachments.

Mr. Bedford,

Thank you for receiving comments relating to the Ramblewood residential subdivision proposal, SB2025-040.

The developer seeks to construct approximately 63 homes on lots of suburban sizing, ranging from 0.3 to 0.45 acres, in the Northeast Nonurban subarea (https://www.douglas.co.us/documents/cmp-map-3-1-nonurban-subareas.pdf/).

The surrounding residential areas are zoned and developed for Estate Residential and Rural Residential use, which require minimum lot sizes approximately four times larger than the Ramblewood developer proposes. It seems clear that if allowed to proceed, the Ramblewood development would represent a significant departure from both letter and intent of Section 3 of the Douglas County 2040 CMP, Nonurban Land Use (https://www.douglas.co.us/documents/cmp-section-3.pdf/).

The proposed subdivision would be drastically different in character, density, appearance, and property value from the surrounding communities of Tallman Gulch, Parker East, Hidden Village, and Crestview (https://www.douglas.co.us/documents/cmp-map-3-6-northeast-subarea.pdf/), and would represent a deeply unwelcome encroachment of urban development into the nonurban areas in which the current property owners have invested heavily to enjoy and preserve. The surrounding areas comply with the 2040 County Master Plan's "large lot residential" nonurban land use guidance, while the Ramblewood proposal clearly does not.

Allowing the Ramblewood development to continue as planned would also set a significant precedent that undermines the integrity of Douglas County's land use regulatory enforcement.

A proposal similar to the Ramblewood plan, which sought to place a similar suburban-style, high density development in the Fields subdivision (across Hilltop Road to the north, and just east of Tallman Gulch), was recently struck down by the planning committee. The Committee required the developer to adjust the development plan to comply with the letter and spirit of the 2040 CMP and Estate Residential zoning guidance.

This decision was a welcome affirmation that the Douglas County Planning Commission takes seriously its own planning guidance, and surrounding residents are appreciative and grateful for the Commission's integrity in that prior decision.

We respectfully request that the Commission require the Ramblewood developer to submit a proposal that complies with the letter and spirit of the 2040 CMP; that respects and protects the investment of the Douglas County taxpayers who live in the surrounding nonurban areas; and that preserves the

quiet, uncrowded, tranquil, and rural feeling that surrounding residents have paid dearly to enjoy with our families and friends.

We hope the Committee affirms that suburban developments do not belong in Douglas County's nonurban areas. We would also like to make clear that we welcome any development for the area that upholds the technical guidelines -- as well as the spirit and intent -- of Douglas County's nonurban land use requirements and zoning regulations, and that matches the openness, quality, connection to nature, and overall experience of the surrounding residences.

Thank you very much for your consideration,

Steve Pieper
Vivant / Tallman Gulch resident
(702) 336-6224
8215 Blossom Hill Lane
Parker 80138
stevepieper@ymail.com

Trevor Bedford

From: Scott Rehner <scott_rehner@hotmail.com>
Sent: Monday, February 23, 2026 9:51 AM
To: Trevor Bedford
Subject: SB2025-040- Ramblewood Please Reject as Proposed
Attachments: Proposed Ramblewood Subdivision SB2025-040v1.pdf

Importance: High

Follow Up Flag: Follow up
Flag Status: Flagged

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Hello Trevor,

Please find attached letter requesting rejection of SB225-040 as proposed.

Regards,

Scott Rehner
President, Tallman HOA
720.837.9084 cell

Date: February 23, 2026

To: Trevor Bedford

Subject: SB2025-040, Proposed Ramblewood Development

Dear Trevor,

I am the current Tallman HOA President, and writing you about the proposed Ramblewood development, SB2025-040. While I have no issue with the landowner selling their property and making a fair and reasonable profit, on behalf of the HOA, I do have an issue with the development as currently proposed, and ask that it be **rejected**.

In principle, it does not appear that the proposed project conforms extensively to the Comprehensive Master Plan:

- Visually and in overall planning, this development differs significantly from the established character of the area regardless of the layout and use of open space.
- It does not align with Douglas County's "like-for-like" development standards as outlined in the County Master Plan.
- This is a suburban subdivision layout in a non-urban community
- There are no other subdivisions in this area with the proposed lot density for several miles.
    - Tallman to the west is **1.5 acre lots** with a density of one dwelling per 3.75 acres if open space is included.
    - Hidden Village to the south is **2.3 to 5 acres lots**.
    - Windy Hills is typically **5 acres lots**.
    - To the east lots are zone Agricultural One ranging from **10 to 35 acres**.

In reviewing the documents, it appears that the current proposed primary entrance/exit from the development lines up with Merryvale Trail on the other side of Hilltop. This is a concern as Hilltop is already very busy during prime commute hours, and it could mean that getting in/out of the proposed community and Tallman will be negatively impacted. The Tallman HOA recently paid for a traffic study by Stolfus, which the County is in possession of, and there is a significant amount of traffic through Tallman entering/exiting onto Hilltop which is not necessary just Tallman resident traffic.

Regards,

Scott Rehner

President, Tallman HOA

Trevor Bedford

From: Virginia Hepworth <vdhepworth@gmail.com>
Sent: Monday, February 23, 2026 9:54 AM
To: Trevor Bedford
Subject: Proposed Ramblewood Developement SB2025-040
Attachments: Attn vdh ramblewood.docx

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Please review and thank you for your consideration.

Attn: Trevor Bedford

Email: tbedford@douglas.co.us

Subject: Proposed Ramblewood Development

I am writing to inform your of my opposition to the approval of the Ramblewood Preliminary Plan, File Number: SB2025-040. The proposed plan includes 63 homes on lot ranging from 0.3 to 0.45 acres, this high density, although its is designed to be in the upper half the the subdivision, is not consistent with the zoning and lot sizes in Hidden Village and the surrounding zoning subdivision, which range between 3.0 to 10.0 acrea sites. I can see the hand writing on the wall, in about 10-15 years, a developer will request high density zoning for the lower half the site, which is proposed as two large sites and a buffer zone between Hidden Village and the proposed high density abutting Hilltop Road.

I have lived in Hidden Village for 50 years, Sun Valley Road used to connect the Village with the Pinery, the traffic going through the Village from the Pinery was continuous, eventually Betts Ranch Road was completed, and Sun Valley Road was vacated. I can assure you, that once this development is completed, during rush hours, their traffic would end up going though the Village to get out on the Round-about on Hilltop Road, to go west bound, otherwise, they would be sitting forever, as we do now, which will then be two lanes of traffic to cross going west bound.

Our subdivision was built and approved as a horse community, with dedicated bridle trails throughout, which are on private property, when you get a large number of children in a subdivision, they seem to have a problem understanding private trails and open space limits. Fror example, last week, I was in my area, the dogs started barking, and two kids on electric bikes come over the hill on the bridle trail within my property, when they heard the dogs, they spun a 180 and headed up the trail out of site, if they had come over the hill with a horse on the trail, the riders, more than likely would have been thrown.

I understand and I am not opposed to development, as that was my livelihood for over 60 years, from construction management to construction materials testing, but there is a place for everything, and this high density is not contiguous with this neighborhood, nor the master development plan.

Thank You for your consideration.

Virginia Anderson Hepworth

6859 Village Road, Parker, CO 80134

Email: vdhepworth@gmail.com

Trevor Bedford

From: Denise Convento <deconvento@live.com>
Sent: Monday, February 23, 2026 11:09 AM
To: Trevor Bedford
Subject: Ramblewood Subdivision Opposition

Follow Up Flag: Follow up
Flag Status: Flagged

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Douglas County Planning Commission
100 Third Street
Castle Rock, CO 80104

Dear Members of the Douglas County Planning Commission,

I am writing to express my strong opposition to the proposed Ramblewood subdivision. After reviewing the details of the plan, it is clear that this development is incompatible with the existing character, density, and planning standards of our surrounding community. I urge the Commission to reject this proposal for the following reasons:

• The proposed development includes **63 homes on lots ranging from only 0.3 to 0.45 acres**, which is significantly denser than the established neighborhoods surrounding the site. Nearby subdivisions, including ours, consist of **1–1.5-acre properties**, with even larger parcels in Hidden Village to the south.

• From both a visual and planning perspective, the proposed layout stands in stark contrast to the established rural-residential character of the region. Even with proposed open space, the overall design does not complement the existing community aesthetic or land-use patterns.

• The proposal does **not align with Douglas County's "like-for-like" development standards** outlined in the County Master Plan.

• The project reflects a **suburban subdivision design** placed within what is clearly a **non-urban, rural-residential community**.

• There are **no other subdivisions within several miles** with comparable density or lot size. Quite simply, **it does not belong here**.

Additional Community Impacts

• **Traffic Concerns:**
The existing roadways in this area were not designed to support the level of traffic that 63 additional homes would generate. Increased congestion, more turning movements on rural roads, and higher daily trip counts would materially affect safety for current residents, pedestrians, cyclists, and equestrian use. Road improvements needed to support this level of density would further disrupt the rural character of the area.

• **School Capacity Issues:**
Local schools are already experiencing enrollment pressure, and adding a subdivision of this scale would place unnecessary strain on the district. This creates long-term challenges for class sizes, staffing, and resource allocation — issues that will ultimately impact educational quality.

For all these reasons, I respectfully request that the Planning Commission deny the Ramblewood subdivision proposal. Preserving the character, safety, and infrastructure stability of our community is essential, and allowing such an incongruent and overly dense development would irreversibly alter the area we value.

Thank you for your consideration and for your continued commitment to responsible planning in Douglas County.

Sincerely,
Eric and Denise Convento

Trevor Bedford

From: Morgan Frahm <dwell_studio@outlook.com>
Sent: Monday, February 23, 2026 11:21 AM
To: Trevor Bedford
Subject: Public Comment for the Douglas County Planning Meeting 2.23.26 regarding the Ramblewood Development SB2025-040
Attachments: Ramblewood Developement Public Comment SB2025-040.pdf

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Hi Trevor,

I hope your day is going well. Please see my attached public comment for the Planning Meeting tonight regarding submittal SB2025-040 for the Ramblewood Development Plan.

If you could please send it to the planning commissioners, that would be appreciated!

Lisa Frahm

Lisa Frahm, R.A.
Prairie Hill Design Co.
303.596.1144

Douglas County Planning Commission

100 Third Street
Castle Rock, CO 80104

February 23, 2026

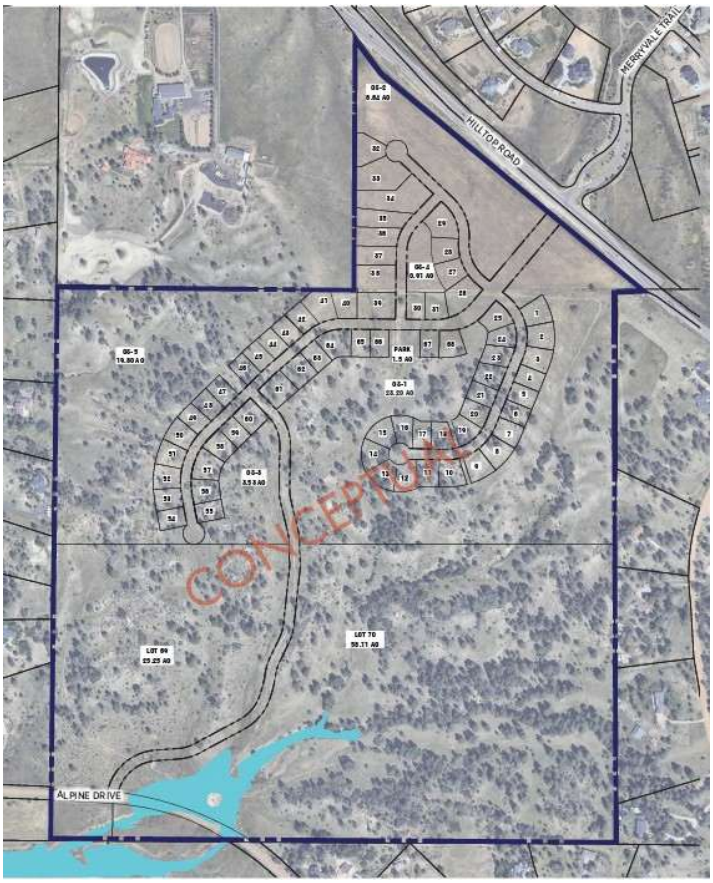
Dear Members of the Douglas County Planning Commission,

I am writing to respectfully ask that you to vote '**no**' on the preliminary plan for the Ramblewood development in Douglas County. While the proposal may appear to check the required development boxes on paper, the overall layout and density clearly conflict with the intent and design guidance outlined in the county's Master Plan. The purpose of the Master Plan is not simply technical compliance, but to ensure new development fits the character and pattern of the surrounding community. As currently proposed, the Ramblewood plan does not accomplish that.

During the neighborhood presentation on 10/09/24, Dan Sheldon presented four conceptual plans for the proposed Ramblewood development. Plans 1 and 2 showed housing density that exceeded what is allowed under the Douglas County Master Plan, while Plans 3 and 4 were scaled back to approximately 70 lots to better align with those requirements. While Plan 3 would have appeared to be the most consistent with Section 3 of the Master Plan, which calls for development that fits within the context of surrounding neighborhoods, the developer chose to pursue Plan 4, repeatedly stating it was more viable for them and the builder.

Conceptual Plan 3 from the Presentation

Conceptual Plan 4



The plan ultimately selected, Plan 4, consists of 68 clustered homes on approximately .3 to .45 acre lots concentrated toward the front of the site and clearly visible from Hilltop Road. While this layout may technically fit within certain development parameters, it does not reflect the intent or design standards of the Non-Urban designation within the Douglas County Master Plan.

The purpose of this section of the Master Plan is to retain and preserve the character of the surrounding area and guide responsible growth consistent with the standards for smart development established by the State of Colorado. During the meeting, at timestamp 45:50, Dan Sheldon acknowledged this directly, stating that developments should "fit in with the surrounding community, not stand out from the surrounding community." However, the proposal presented does the opposite.

The surrounding neighborhoods to the proposed Ramblewood Development clearly establish a consistent development pattern; Tallman Gulch to the north contains lots generally ranging from 1 to 1.5 acres. Hidden Village to the east, south, and west consists of 5 acre parcels, and there is also large A-1 zoned acreage to the northwest. In contrast, the Ramblewood proposal introduces 68 homes on .3 to .45 acre lots in the middle of this area. That level of density does not visually or conceptually align with the established pattern of development. Instead, it creates a concentrated pocket of smaller lots that stands apart from the surrounding communities the Douglas County Master Plan is intended to protect. While the inclusion of two larger lots on the southern edge of the property may be intended to soften that contrast, they are not visible from Hilltop Road and therefore do little to address the overall impact or visual compatibility of the actual development itself.

This is not simply a matter of preference. The purpose of the Master Plan is to guide development so that growth respects existing land use patterns and community character. When a proposal so clearly diverges from those patterns, it raises legitimate concerns about whether the spirit and intent of the plan are actually being followed.

For that reason, we respectfully ask that you vote' **no'** on this preliminary plan and require the developer to return with a plan more consistent with the surrounding area—something they have already demonstrated is possible with Plan 3.

Concerns Regarding Conduct During the Community Meeting

As a Licensed Architect and being in this industry myself, I would also like to raise serious concerns about the conduct and information presented during the community meeting. I strongly encourage the Commission to review the recording of the Ramblewood Neighborhood Meeting on Zoom. During that discussion, Dan Sheldon repeatedly presented statements that were misleading or incomplete while encouraging residents to support Plan 4. When information shared with the public is inaccurate, it prevents residents from being able to evaluate a proposal honestly and undermines trust in the public process. I have attended several planning and community meetings in the past and I feel that Mr. Sheldon's was misleading the community on several occasions.

For example, residents were told that if this proposal was not supported, another developer could come in and build something far more intense on the property. That statement is misleading because any developer would still be required to follow the same county regulations and the Douglas County Master Plan. Suggesting otherwise created unnecessary fear among residents who were simply trying to understand the proposal.

Similarly, it was stated that Plan 3 would require more wells than Plan 4, despite the fact that the Plan 4 proposal involves the Parker Water & Sanitation District obtaining the water rights for the site. Statements like this left the impression that the alternative plan would create greater strain on resources, when the facts do not support that conclusion.

There were also claims that Plan 3 would significantly increase traffic and that the entire site would need to be scraped and cleared using heavy equipment. In reality, the difference between the plans is approximately 14 homes using a secondary connection to Alpine Drive, a relatively minor change in actual daily traffic. Likewise, development of any plan would involve building roads and utilities, but it does not require clearing or grading the entire property. Presenting these outcomes as unavoidable consequences of Plan 3 exaggerates the impacts and misrepresents how development typically occurs.

Perhaps most concerning was the mixed message given to residents throughout the meeting. Mr. Sheldon repeatedly stated that he did not need the community's approval, while at the same time saying that he wanted feedback and wanted to work with the neighborhood. At one point he told a participant directly that approval from the community was not necessary and that their focus was on doing what was best for them and the builder. If that is truly the position, it calls into question the purpose of holding a community meeting in the first place.

Public meetings are meant to inform residents and allow for genuine dialogue. When information presented to the community is misleading or framed in a way that pressures people into supporting a specific outcome, it becomes more than a disagreement about development. It becomes an issue of fairness, transparency, and respect for the public process.

For these reasons, I respectfully ask the Commission to carefully review both the proposal and the manner in which it was presented to the surrounding community, and to vote no, as Plan 3 appeared to be significantly more consistent with the character and intent for this area than the proposal currently being advanced.

Thank you for your time and consideration.

Lisa Frahm

Stagecaoch Acres Resident

Parker, Colorado 80138

Trevor Bedford

From: Brian Stanley <brian.stanley77@gmail.com>
Sent: Monday, February 23, 2026 1:17 PM
To: Trevor Bedford
Subject: Ramblewood Subdivision

Follow Up Flag: Follow up
Flag Status: Flagged

> **Caution:** This email originated outside the organization. Be cautious with links and attachments.

Trevor,

As a resident of the Talman Gulch community, I am concerned about a new planned Ramblewood development for the following reasons.

This proposed plan includes 63 homes on lots ranging from 0.3 to 0.45 acres. o This density and lot configuration is inconsistent with the surrounding subdivisions (including ours), where properties range from 1-1.5 acres to the north with larger acreages surrounding this property in Hidden Village to the south. o Visually and in overall planning, this development differs significantly from the established character of the area regardless of the layout and use of open space. o It does not align with Douglas County's "like-for-like" development standards as outlined in the County Master Plan. o This is a suburban subdivision layout in a non-urban community o There are no other subdivisions in this area with this lot density for several miles. It does not belong here!

Sincerely
Brian Stanley

Phase II Drainage Report
for
Ramblewood Filing No. 1
Douglas County, Colorado

Prepared for:

Miller United Real Estate, LLC
6900 E. Belleview Ave, Suite 300
Greenwood Village, CO 80111
Contact: Dan Sheldon
Contact Email: dsheldon@miller-united.com

By:

LJA ENGINEERING

1765 West 121st Avenue, Suite 300
Westminster, CO 80234
Contact: Kevin Lovelace
Contact Email: klovelace@lja.com

Date: October 15, 2025

Ramblewood Filing No. 1

Project No.:	CO1084-0006
Document Title:	Phase 2 Drainage Report - Ramblewood
Document No.:	1
Revision:	1
Date:	2025/10/15
Client name:	Miller United Real Estate, LLC
Client No:	1084
Project manager:	Kevin Lovelace, PE
Author:	Ryan Walker, PE
QAQC manager:	Xylina Warren-Laird, PE
File name:	I:\Job Folders\1084\1084-0006\Civil\Documents\Drainage\Final\Report\Ramblewood Ph2 Drng.docx

Limitation: This report has been prepared on behalf of, and for the exclusive use of LJA's Client, and is subject to, and issued in accordance with, the provisions of the contract between LJA and the Client. LJA accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

Document history and status

Revision	Date	Description	By	Review	Approved
1	2025/10/15	1st Submittal	RMW	XWL	

CERTIFICATION OF ENGINEER

"This report and plan for the Phase II drainage design of Ramblewood Filing No. 1 was prepared by me (or under my direct supervision) in accordance with the provisions of Douglas County Drainage Design and Technical Criteria for the owners thereof. I understand that Douglas County does not and will not assume liability for drainage facilities designed by others."

_____ _____

Ryan Walker, PE Date
Registered Professional Engineer
State of Colorado No. 66493

CERTIFICATION OF DEVELOPER

Miller United Real Estate, LLC hereby certifies that the drainage facilities for Ramblewood Filing No. 1 shall be constructed according to the design presented in this report. I understand that Douglas County does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that Douglas County reviews drainage plans pursuant to Colorado Revised Statutes, Title 30, Article 28; but cannot, on behalf of Miller United Real Estate, LLC, guarantee that final drainage design review will absolve Miller United Real Estate, LLC and/or their successors and/or assigns of future liability for improper design. I further understand that approval of the final plat does not imply approval of my engineer's drainage design."

_____

Miller United Real Estate, LLC

_____ _____

Dan Sheldon Date

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Appendix B. Hydraulic Calculations

B1 Detention Ponds

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Appendix C. Referenced Information

C1 Soil Map

C2 FEMA FIRM

C3 Sulphur Gulch FHAD

C4 Kinney Creek FHAD

Appendix D. Drainage Maps

1. General Location & Description

1.1 Site Location

Ramblewood Filing No. 1 is a proposed single-family residential subdivision located in Douglas County, Colorado. The site is situated within Section 6, Township 7 South, Rage 65 West of the 6th Principal Meridian, Douglas County Colorado. See the Vicinity Map below for project location reference.

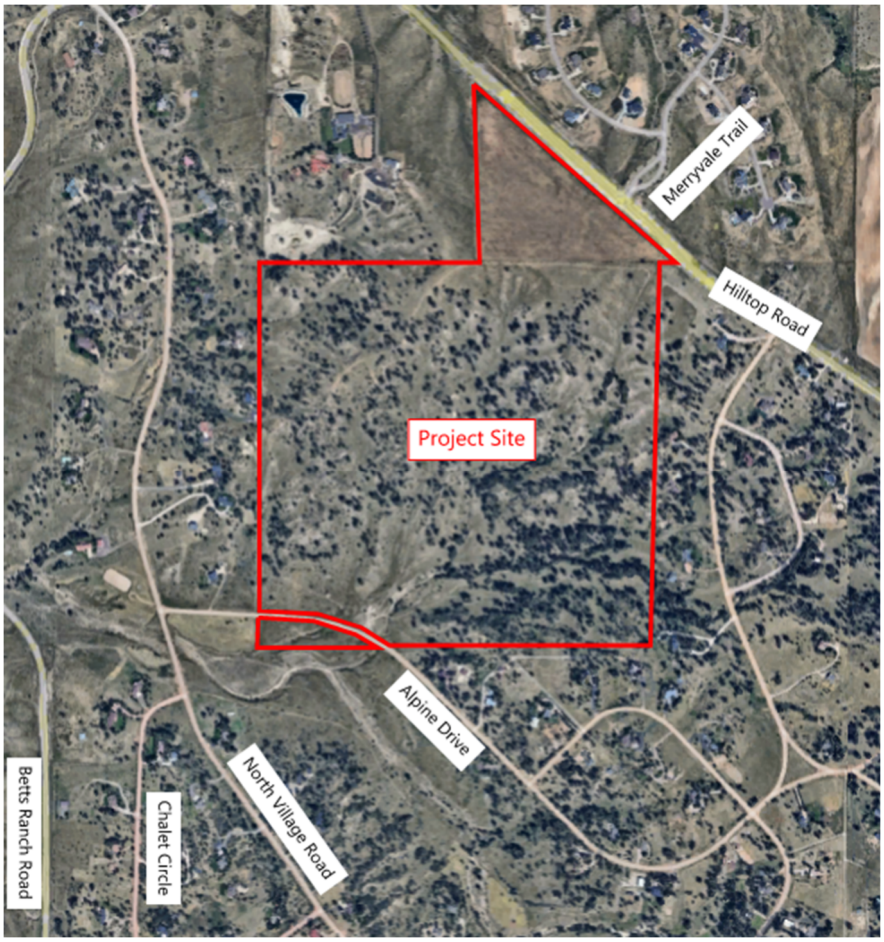

Figure 1 – Vicinity Map

Ramblewood Filing No. 1 is situated southwest of the intersection of Hilltop Road and Merryvale Trail and north of Alpine Drive. The surrounding vicinity land use is primarily residential, with the Tallman residential neighborhood being located northeast across Hilltop Road.

1.2 Description of Property

The project site is a 176.8 acre proposed single family residential development which consists of 68 lots, ranging in size from 0.25 acres to 0.65 acres. The site is currently undeveloped, with the ground cover being either native prairie grasses or sparsely vegetated forest. The existing topography of the Site

consists of slopes around 2%-45% with the north portion of the site draining to Tallman Gulch, and the remainder of the site draining to Kinney Creek.

Per the NRCS Soils Survey Map, provided in Appendix C, the site consists of approximately 50% of Type A Hydrologic Soil Group, 14% of Type B Hydrologic Soil Group, and 36% of Type C/D Hydrologic Soil Groups. For the developed areas of the project, the Type C soil type was used to provide the most conservative peak flow rates within the proposed neighborhood. Outside of the proposed construction activity, in undisturbed open space and landscape areas, land use by soil type was provided to get more precise runoff coefficient values. Additionally, individual soil maps for each water quality and detention facility were pulled to have precise soil types draining to each facility.

The two major drainageways in the project vicinity, Tallman Gulch and Kinney Creek, were identified with FEMA floodplain areas in the vicinity of the Site. FEMA Flood Insurance Rate Map (FIRM) panels for each location have been provided in the Appendix. There are no project impacts to any floodplains being proposed.

No existing local irrigation ditches or canals were identified in the Site vicinity.

The final proposed land use for the site will be a residential neighborhood.

2. Drainage Basins & Sub-Basins

2.1 Major Drainage Basins

Kinney Creek and Tributary F to Kinney Creek are situated on the southern boundary of the site. Kinney Creek serves as the main drainageway for the proposed development. Kinney Creek is tributary to Cherry Creek. The northern portion of the site is tributary to Tallman Gulch, which is located to the north of the site. Tallman Gulch is tributary to Sulphur Gulch and ultimately to Cherry Creek.

Kinney Creek was most recently studied in the *Flood Hazard Area Delineation – Kinney Creek, Fonder Draw and Tributaries*, prepared by WRC Engineering, Inc., dated April 7, 2004. The project is located within the far upstream portion of Kinney Creek. This FHAD includes existing and future hydrology for Kinney Creek watersheds. Excerpts from this FHAD can be found in Appendix C.

Tallman Gulch was most recently studied in the *Flood Hazard Area Delineation – Sulphur Gulch,* prepared by Merrick, dated February 2021. The project site is located within the far upstream portion of Tallman Gulch which is tributary to Sulphur Gulch. This FHAD includes existing and future hydrology for Sulphur Gulch and Tallman Gulch watersheds. Excerpts from the FHAD can be found in Appendix C.

The majority of the project site is not located within a regulatory 1% probability (100-year) floodplain. It is situated within unshaded Zone X. The southern portion of the site is located with floodplain Zone A. No structures are being proposed within this floodplain. The project site is within the FEMA Firm Map panels 08035C0202F and 08035C0204F, dated September 30, 2005. The FEMA Firm Maps can be found in Appendix C.

The Site has been divided into 3 major drainage basins which will drain to one of these two drainageways in existing conditions:

Major Basin HA
Basin HA is located in the northern portion of the site, with runoff historically draining to the north-northwest. Basin HA is **20.24** acres that currently contains an undeveloped lot with prairie grasses. In the current condition, runoff drains northwest where an existing culvert crosses under Hilltop Road to the north before draining into Tallman Gulch, which ultimately drains to Sulphur Gulch.

Major Basin HB
Basin HB is located along the southern and eastern boundaries of the project Site, and contains a majority of the Site's area. Basin HB is **128.68** acres that currently contains undeveloped sparsely vegetated forest area with existing drainage swales leading to Kinney Creek Tributary F. In the current condition, runoff generally drains from northeast to southwest, where there are two culvert crossings under N. Alpine Drive to convey flows from the Kinney Creek Tributary F under the roadway. Flows from Basin HB exit the basin at the culvert crossing and drain into the main channel of Kinney Creek.

Major Basin HC
Basin HC is located along the western boundary of the project, with runoff historically draining west out of the Site. Basin HC is **29.83** acres that currently contains undeveloped sparely vegetated forest area. In the current condition, runoff will drain west out of the project Site before being routed south and draining into the main Kinney Creek channel.

Table 1. Calculated Existing Peak Flows

Calculated Existing Runoff Rates				
Basin	Total Area	Composite	Peak Flow (cfs)	
ID	(Ac.)	Imperv. %	Q_5	Q_{100}
HA	20.24	5%	3.46	43.97
HB	128.68	5%	12.06	170.41
HC	29.83	5%	1.80	29.94

Table 1. provides the calculated peak runoff rates for the existing basins on the project Site. HA flows out of the site to the northwest, HB flows out of the site to the southwest, and HC flows out of the site to the west, as shown on the drainage maps provided in Appendix D. Proposed flows being released from the developed site will be restricted to less than the existing runoff peak flows provided in each of the major drainage basins.

The proposed Site has been divided into 6 major drainage basins which will drain to one of these two drainageways:

Major Basin A
Basin A is located in the northern portion of the site and is serviced by the proposed Pond A. Basin A is **19.60** acres that is proposed to consist of single-family residential units, local roadways, open space, and a full spectrum detention pond. A storm system is proposed to extend from Pond A to collect the minor storm flows from Basin A. The major storm flows will be directed to the pond by means of the proposed storm system in combination with overland flows through the street Right-of-Ways (R.O.W.) where

applicable. Refer to Appendix B for preliminary detention pond calculations. The pond is proposed to outfall to Tallman Gulch, located north of the pond. Tallman Gulch ultimately flows to Sulphur Gulch. Basin A will maintain existing drainage patterns.

Major Basin B

Basin B is located in the northern half of the site and is serviced by the proposed Pond B. Basin B is **37.56** acres that is proposed to consist of single-family residential units, local roadways, open space, and a full spectrum detention pond. A storm system is proposed to extend from Pond B to collect the minor storm flows from Basin B. The major storm flows will be directed to the pond by means of the proposed storm system in combination with overland lows through the street Right-of-Ways (R.O.W.) where applicable. Refer to Appendix B for preliminary detention pond calculations. The pond is proposed to outfall to Kinney Creek Tributary F, located south of the pond. Kinney Creek Tributary F ultimately flows to Cherry Creek. Basin B will maintain existing drainage patterns.

Major Basin C

Basin C is located in the northwestern corner of the site. Basin C is **0.72** acres that is proposed to be landscaped/open space on the northwestern side of Pond A. This basin cannot be reasonably routed to Pond A and thus, water quality cannot be provided for these flows. However, the basin land use is remaining open space and no additional imperviousness is being added. Flows from this basin will drain across native grasses into Tallman gulch similar to the outfall for Major Basin A, before ultimately flowing to Sulphur Gulch and Cherry Creek. Basin C will maintain existing drainage patterns.

Major Basin D

Basin D is located in the southeastern half of the Site, along the eastern and southern project Site Boundary. Basin D is **90.21** acres that is proposed to contain a rural roadway, open space, swales, small portions of single-family housing lots, and Kinney Creek Tributary F. Several swales are proposed to convey flows from the rural roadway to proposed culvert crossings under proposed Street D. Water quality is proposed to be provided by utilizing runoff reduction methods allowing runoff to flow over native vegetation (receiving pervious areas). Swale design and runoff reduction method calculations will be provided with the Phase III report. Generally, runoff drains south-southwest towards two existing culvert crossings under N. Alpine Drive located at the southern boundary of the Site. Flows passed through these existing culverts will drain into the Kinney Creek main channel. Basin D will maintain existing drainage patterns.

Major Basin E

Basin E is located on the western boundary of the site and is not anticipated to be serviced by an onsite pond. Basin E is approximately **26.57** acres that contains undeveloped open space. Basin E is not anticipated to be developed with this project. Runoff from the minor and major storm events will sheet flow to an Unnamed Tributary to Kinney Creek and will be conveyed west and south to Kinney Creek. Kinney Creek ultimately flows to Cherry Creek. Basin E will maintain existing drainage patterns.

Major Basin F

Basin F is located on the southern boundary of the site, south of North Alpine Drive, and is not anticipated to be serviced by an onsite pond. Basin F is approximately **2.78** acres that contains undeveloped open space, and a portion of Kinney Creek Tributary F. Basin F is not anticipated to be developed with this project. Runoff from the minor and major storm events will sheet flow to Kinney Creek Tributary F and will

be conveyed southwest to Kinney Creek. Kinney Creek ultimately flows to Cherry Creek. Basin F will maintain existing drainage patterns.

2.2 Minor Drainage Basins

The Site has been divided into 32 subbasins:

Minor Basin A1
Basin A1 is located along the site boundary in the northwestern corner of the Site and is comprised of the proposed extended detention facility Pond A. Runoff generally flows inward towards the pond bottom and then towards the outlet structure at DP A1. The outlet structure will provide controlled release for flows below historical release rates and will outlet into Tallman Gulch to the northwest of the basin, following existing drainage patterns.

Minor Basin A2
Basin A2 is located along the southern half of Street B, west of the intersection with Street A, and is comprised of the typical roadway section, single family housing, and open space. Runoff generally flows north towards the Street B before being routed in curb and gutter towards the Type R Inlet SA1-2, which is a sump location. Flows captured at SA1-2 are routed into Pond A for water quality and detention before being released into Tallman Gulch.

Minor Basin A3
Basin A3 is located along the western half of Street C, south of Basin A2, and is comprised of the typical roadway section, single family housing, and open space. Runoff generally flows east into the Street C before being routed north in curb and gutter towards the Type R Inlet SA1-5, which is an on-grade inlet. Flows captured at SA1-5 are routed to Pond A for water quality and detention before being released into Tallman Gulch.

Minor Basin A4
Basin A4 is located along the eastern half of Street C, west of Basin A2, and is comprised of the typical roadway section, single family housing, and open space. Runoff generally flows west, northwest into Street C before being routed north in curb and gutter towards the Type R Inlet SA1-6, which is an on-grade inlet. Flows captured at SA1-6 are routed to Pond A for water quality and detention before being released into Tallman Gulch.

Minor Basin A5
Basin A5 is located along the northern half of Street B, west of the intersection with Street A, and is comprised of the typical roadway section and open space. Runoff generally drains southwest into the Street B before being routed northeast in curb and gutter towards the Type R Inlet SA1-2, which is a sump location. This type R Inlet will capture both Basins A2 and A5. Flows captured at SA1-2 are routed to Pond A for water quality and detention before being released into Tallman Gulch.

Minor Basin A6
Basin A6 is located along the northwestern boundary of the Site, west of Basins A2 and A3, and is comprised of single-family housing, open space, and a drainage swale. Runoff generally drains west towards the Swale A6 where it is routed north into the Pond A at DP A6. Flows at DP A6 drain into Pond A for water quality and detention before being released into Tallman Gulch.

Minor Basin A7
Basin A7 is located along the northern boundary of the Site, north of Basin A5, and is comprised of open space and a drainage swale. Runoff generally drains northeast towards Swale A7 where it is routed northwest into the Pond A at DP A7. Basin A7 receives flows from Basin A8, A9, and A10 via a culvert crossing under Street A. Flows at DP A7 drain into Pond A for water quality and detention before being released into Tallman Gulch.

Minor Basin A8
Basin A8 is located along the northwestern half of Street A, north of the intersection with Street B, and is comprised of the typical roadway section associated with Street A. Runoff generally drains east into the Street A then is routed north where flows are captured by a Type R Inlet SA1-8, located in a sump. Flows captured at SA1-8 are routed into Basin A7 where Swale A7 will convey flows into Pond A for water quality and detention before being released into Tallman Gulch.

Minor Basin A9
Basin A9 is located along the southeastern half of Street A, north of the intersection with Street B, and is comprised of the typical roadway section associated with Street A and open space draining into the roadway. Runoff generally drains north into Street A before being routed northeast towards the a Type R Inlet SA1-9, located in a sump. Flows captured at SA1-9 are routed under Street A via a proposed culvert into Basin A7. Flows are then conveyed by Swale A7 into Pond A for water quality and detention before being released into Tallman Gulch.

Minor Basin A10
Basin A10 is located along the northeastern boundary of the Site, east of Basin A9, and is comprised of primarily open space with a drainage swale. Runoff generally drains north into Swale A10 where it is routed northwest towards a proposed culvert SA1-10, which runs under Street A. Flows passed through the culvert under Street A are conveyed via Swale A7 to Pond A for water quality and detention before being released into Tallman Gulch.

Minor Basin B1
Basin B1 is located in the center of the site, between Streets A, B and D, and is comprised of single-family housing, open space, and a proposed extended detention Pond B. Runoff generally drains towards Pond B located at the low point of the basin. A natural channel is present in existing conditions to convey flows from the north into the Pond B at DP B1. Flows captured by Pond B are detained and released to the south into an existing natural channel at rates below historic conditions, matching historic drainage patterns. This natural channel drains south into Kinney Creek Tributary F within Basin F1.

Minor Basin B2
Basin B2 is located along the western half of Street B, southeast of the intersection with Street A, and is comprised of the typical roadway section associated with Street B, single-family housing, and open space. Runoff generally drains towards Street B before being routed southwest in the curb and gutter towards the inlet SA1-3, which is located in a sump. Flows captured by SA1-3 are conveyed into Pond B for water quality and detention before being released to the south, where it will flow into Kinney Creek Tributary F.

Minor Basin B3
Basin B3 is located along the eastern half of Street B, southeast of the intersection with Street A, and is comprised of the typical roadway section associated with Street B, single-family housing, and open space.

Runoff generally drains towards Street B before being routed southwest in curb and gutter towards the inlet SA1-3, which is located in a sump. The inlet at this location will capture flows from both Basins B2 and B3. Flows captured by SA1-3 are conveyed into Pond B for water quality and detention before being released to the south, where it will flow into Kinney Creek Tributary F.

Minor Basin B4

Basin B4 is located along the western half of Street A, south of the intersection with Street D, and is comprised of the typical roadway section associated with Street A, single-family housing, and open space. Runoff generally drains towards Street A before being routed southwest in curb and gutter towards the inlet SB2-6, which is located in a sump. Flows captured by SB2-6 are conveyed via a storm line into Pond B for water quality and detention before being released south, where it will flow into Kinney Creek Tributary F.

Minor Basin B5

Basin B5 is located along the eastern half of Street A, south of the intersection with Street D, and is comprised of the typical roadway section associated with Street A, single-family housing, and open space. Runoff generally drains towards Street A before being routed southwest in curb and gutter towards the inlet aSB2-6, which is located in a sump. The inlet at this location will capture flows from both Basins B4 and B5. Flows captured by SB2-6 are conveyed via a storm line into Pond B for water quality and detention before being released south, where it will flow into Kinney Creek Tributary F.

Minor Basin B6

Basin B6 is located along the north/western half of Street A, located between the intersections with Street B and Street D, and is comprised of the typical roadway section associated with Street A, single-family housing, and open space. Runoff generally drains towards Street A before being routed west/southwest in curb and gutter towards the Type R Inlet SB2-12, which is an on-grade inlet. Flows captured by SB2-12 are conveyed via a storm line under Street D into Pond B for water quality and detention before being released south, where it will flow into Kinney Creek Tributary F.

Minor Basin B7

Basin B7 is located along the south/southeastern half of Street A, located between the intersections with Street B and Street D, and is comprised of the typical roadway section associated with Street A, single-family housing, and open space. Runoff generally drains towards Street A before being routed west/southwest in curb and gutter towards the Type R Inlet SB2-11, which is an on-grade inlet. Flows captured by SB2-11 are conveyed via a storm line under Street D into Pond B for water quality and detention before being released south, where it will flow into Kinney Creek Tributary F.

Minor Basin B8

Basin B8 is located along the eastern half of the upper portion of Street D, west of Basin B1, and is comprised of the rural roadway, single-family housing, roadside swales, and open space. Runoff generally drains towards the center of the basin where the roadside swale is located; the eastern half of the Street D roadway will drain east into Swale B8 and the open space will drain west into Swale B8. Swale B8 will convey flows south towards a Type D inlet SB2-3, which will be located in a local sump. Flows captured by SB2-3 are conveyed via a storm line east into Pond B for water quality and detention before being released south, where it will flow into Kinney Creek Tributary F.

Minor Basin B9

Basin B9 is located along the western half of the upper portion of Street D, west of Basin B8, and is comprised of the rural roadway, single-family housing, roadside swales, and open space. Runoff generally drains towards the center of the basin where an existing swale is located. Swale B9 will convey flows towards a Type D Inlet SB2-5, which will be located in a local sump. Flows captured by SB2-5 are conveyed via a storm line east into Pond B for water quality and detention before being released south, where it will flow into Kinney Creek Tributary F.

Minor Basin C1

Basin C1 is located along the northeastern corner of the project, just northwest of Pond A, and is comprised of open space. Runoff generally drains to the northwest where it leaves the site and enters a channel draining to Tallman Gulch at DP C1. No additional water quality is being proposed for this basin, potential for the runoff reduction method to apply if required. The outfall for Pond A will flow into Basin C1.

Minor Basin D1

Basin D1 is located along the eastern and southern boundaries of the site, southeast of the major drainage basin B. Basin D1 is comprised of primarily open space with multiple natural channels associated with Kinney Creek Tributary F, small portions of Street D, and some back of lot areas for the single-family housing. Runoff generally drains from northeast to southwest through one of the multiple existing channels to a low point at DP D1. An existing 54-in culvert crossing under N. Alpine Drive is located at DP D1 which conveys Kinney Creek Tributary F flows. Water quality treatment will be provided utilizing the runoff reduction method prior to the outfall through the culvert. Flows passed through the culvert will drain into the Kinney Creek main channel.

Minor Basin D2

Basin D2 is located along the southern boundary of the site, between Street D and N. Alpine Drive. Basin D2 is comprised of open space containing Kinney Creek Tributary F. Runoff generally drains towards DP D2 at the low point along N. Alpine Road. No additional impervious area is being added in this basin, no water quality treatment is being proposed for this basin. Flows from Basin D3 are routed through this Basin D2. An existing culvert crossing is located at DP D2 which routes flows under N. Alpine Road before ultimately draining to the Kinney Creek main channel.

Minor Basin D3

Basin D3 is located along the southern half of Street D, south of Basin D6. Basin D3 is comprised of portions of Street D, a roadside swale, and open space. Runoff generally drains south into a roadside swale which routes flows to the southwest to DP D3. Water quality treatment will be provided utilizing the runoff reduction method prior to leaving the basin. Flows at DP D3 will route into Basin D2 and ultimately drain into Kinney Creek.

Minor Basin D4

Basin D4 is located along the eastern half of Street D, just north of the intersection with N. Alpine Drive. Basin D4 is comprised of portions of Street D and a roadside swale. Runoff generally drains east into the roadside swale where it is routed south to DP D4. Water quality treatment will be provided utilizing the runoff reduction method prior to leaving the basin. Flows at DP D4 will route east into Basin D2 and ultimately drain into Kinney Creek.

Minor Basin D5

Basin D5 is located along the western half of Street D, just north of the intersection with N. Alpine Drive. Basin D5 is comprised of portions of Street D, a roadside swale, and open space. Runoff generally drains into the swale where it is routed south to culvert SD1-6. A culvert is proposed to drain flows under Street D into Basin D4. Water quality treatment will be provided utilizing the runoff reduction method prior to leaving the basin. Flows entering Basin D4 will route into Basin D2 and ultimately drain into Kinney Creek.

Minor Basin D6

Basin D6 is located south of the Steet A cul-de-sac, west of Basin D7, and is comprised of primarily open space with a natural channel, a portion of Street D, a roadside swale, and a small section of single-family housing lots. Runoff generally drains towards the natural channel, identified as Swale D6-A, located in the center of the basin. Flows enter Swale D6-A and are routed south to a culvert crossing at DP D6. Runoff from Street D will drain north into the roadside swale D6-B which will route those flows to the culvert crossing at DP D6. Water quality treatment will be provided utilizing the runoff reduction method prior to the outfall through the culvert. Flows passed through the culvert will enter Basin D2 and drain into Kinney Creek Tributary F.

Minor Basin D7

Basin D7 is located along the western side of Street D, along the central half where there is no roadside swale proposed along the western side of Street D, south of Basin B9. Basin D1 is comprised of portions of Street D and open space. Runoff generally drains to a natural channel which exists in the center of the basin, identified as Swale D7. Flows from the western side of the basin drain east into Swale D7 and flows from Street D on the eastern side of the basin drain west into Swale D7. Flows in Swale D7 will drain south towards a culvert crossing under Street D at DP D7. Water quality treatment will be provided utilizing the runoff reduction method prior to the outfall through the culvert. Flows passed through the culvert will enter Basin D1 and drain into Kinney Creek Tributary F.

Minor Basin D8

Basin D8 is located along the western side of Street D, along the southern half of the road where a roadside swale, Swale D8, is proposed to capture runoff. Basin D8 is comprised of portions of Street D, a roadside swale, and open space. Runoff generally drain towards the Swale D8 before being routed south where the swale ends at DP D8. At DP D8, the swale flows will enter Basin D7 and route to the culvert crossing under Street D at DP D7. Water quality treatment will be provided utilizing the runoff reduction method prior to the outfall through the culvert. Flows passed through the culvert will enter Basin D1 and drain into Kinney Creek Tributary F.

Minor Basin D9

Basin D9 is located along the eastern half of Street D, just south of Basin B8. Basin D9 is comprised of portions of Street D, a roadside swale D9, and open space. Runoff generally drains into the Swale D9 before being routed south to DP D9, where the swale ends and flow will enter Basin D1. Water quality treatment will be provided utilizing the runoff reduction method prior to the outfall through the culvert. Flows at DP D9 will route into Basin D1 and ultimately drain into Kinney Creek.

Minor Basin E1

Basin E1 is located along the western boundary of the site and is comprised of exclusively open space. The runoff in this basin generally sheet flows to the west where it leaves the project Site. A peak dividing the northern minor basin E1 and southern minor basin E2 is located west of the Street A cul-de-sac. No

proposed impervious areas are being added to this basin, no water quality treatment is being proposed for this basin. Runoff from E1 will ultimately drain into Kinney Creek.

Minor Basin E2

Basin E2 is located along the western boundary of the site, south of Basin E1, and is comprised of exclusively open space. The runoff in this basin generally sheet flows to the west where it leaves the project Site. No proposed impervious areas are being added to this basin, no water quality treatment is being proposed for this basin. Runoff from E1 will ultimately drain into Kinney Creek.

Minor Basin F1

Basin F1 is located in the southwestern corner of the project site, on the southern side of N. Alpine Drive. The basin is comprised of exclusively open space. Runoff generally drains to the Kinney Creek Tributary F channel in the center of the basin. No proposed construction activities are proposed within the basin, no water quality treatment is being proposed for this basin. Runoff from F1 will ultimately drain into Kinney Creek.

Table 1. Calculated Proposed Runoff Rates

Calculated Proposed Runoff Rates				
Basin	Total Area	Composite	Peak Flow (cfs)	
ID	(Ac.)	Imperv. %	Q_5	Q_{100}
A1	0.75	59%	1.84	4.72
A2	2.04	50%	2.77	7.83
A3	1.67	45%	2.02	6.08
A4	2.31	36%	2.11	7.37
A5	0.66	71%	1.60	3.67
A6	4.49	18%	2.27	12.86
A7	4.47	20%	2.27	11.80
A8	0.54	80%	1.76	3.79
A9	1.11	48%	1.78	5.12
A10	1.57	20%	0.96	4.98
B1	13.28	15%	4.15	22.32
B2	4.16	44%	4.72	14.52
B3	2.85	44%	3.21	9.89
B4	3.78	40%	4.03	13.02
B5	2.11	45%	3.02	9.08
B6	4.19	43%	4.52	14.10
B7	2.07	48%	2.87	8.31
B8	1.96	26%	1.38	5.88
B9	3.17	17%	1.28	6.04
D1	67.08	6%	8.43	89.51
D2	1.97	5%	0.42	5.09
D3	0.30	47%	0.58	1.72
D4	0.22	46%	0.44	1.29
D5	1.50	11%	0.58	4.24
D6	10.53	6%	1.05	10.19
D7	6.80	8%	1.36	11.87
D8	1.43	22%	1.19	5.90
D9	0.38	29%	0.47	1.88
E1	16.66	5%	0.99	15.64
E2	9.91	5%	0.86	12.50

3. Drainage Design Criteria

3.1 Development Criteria References

The drainage design for this project was prepared using the Douglas County Storm Drainage Design and Technical Criteria (SDDTC) Manual, dated July 8, 2008 (amended January 2013) and the Mile High Flood District's (MHFD) *Urban Storm Drainage Criteria Manual* (USDCM) *Vol 1, 2, & 3*, latest online version.

3.2 Drainage Studies, Outfall Systems Plans, and Site Constraints

The most recent studies were obtained and reviewed for the two drainageways in vicinity of the project Site:

1. *Flood Hazard Area Delineation – Kinney Creek, Fonder Draw and Tributaries*, prepared by WRC Engineering, Inc., dated April 7, 2004.

2. *Flood Hazard Area Delineation – Sulphur Gulch,* prepared by Merrick, dated February 2021

The studies confirmed the historic drainage patterns and provided overview information on the Tallman Gulch (a tributary of Sulphur Gulch) and Kinney Creek drainageways. This site will provide water quality and detention to match historic drainage patterns and below historic flow rates to avoid causing any potential drainage issues downstream from the project.

3.3 Hydrology

The rational method as outlined by Section 6.3 in the Douglas County SDDTC was utilized to calculate the peak runoff values for the drainage basins, as no basin is larger than the 160-acre maximum. Per Douglas County SDDTC, the 5-year storm was selected as the minor storm event and the 100-yr storm was selected as the major storm event.

Rainfall data for the minor and major storm events was obtained directly from the Douglas County SDDTC Table 6-1. The project site is located in the Douglas County Zone 1 for rainfall depths. The minor storm (5-year) 1-hour rainfall depth is 1.43 in and the major storm (100-year) 1-hour rainfall depth is 2.60 in.

Imperviousness by land use was determined using Tables 6-2 and 6-3 in MHFD's USDCM Vol 1. Composite impervious percentages were calculated for each individual basin utilizing the different land uses and soil type. The composite impervious percentages were then used to calculate the runoff coefficient for each storm event based on the information provided in Table 6-5 in MHFD's USDCM Vol 1.

Time of concentration was calculated by combining the initial time (overland flow) with the concentrated travel time (channelized flow) as outlined in Section 6.3.2 of the Douglas County SDDTC. The 1-hour rainfall depth and the time of concentration were used to calculated the rainfall intensity utilized for the calculation of peak runoff.

Detention storage calculations and detention storage release rate calculations were completed using Mile High Flood District's Detention software, MHFD-Detention_v4.07.

3.4 Hydraulics

As part of this Phase II Drainage Report, street capacities for the roadways were preliminarily calculated to determine the max flow that can be conveyed on one half of the street using the MHFD Inlet software and the Douglas County allowable flow depth criteria provided in Chapter 7 of the SDDTC; calculations are provided in Appendix B. Additionally, using the same MHFD Inlet software, capacities for the proposed inlet locations were calculated and confirmed to have adequate capacity for the proposed drainage areas, provided in Appendix B. Additionally, as part of this Phase II process, the storm pipes were initially sized based on summed peak flows; it would be anticipated that flows will decrease when routed and the size of pipe require may be reduced. FlowMaster calculations determining the max flow capacity at different sizes of pipe are provided in Appendix B and were used to estimate required pipe sizes.

For the future Phase III Drainage Report, the SF-3 routing spreadsheet will be setup to calculate precise flows being captured/bypassed at each inlet location using MHFD Inlet software and will confirm street capacity is still adequate with any design modifications. Once the inlets have been confirmed to be functioning properly and the street conveyance is not exceeding criteria outlined in the Douglas County SDDTC, a computer model will be developed for the storm sewer system using Bentley StormCAD Connect Edition. Using the StormCAD program, capacities for all conveyance elements will be confirmed in conjunction with the Douglas County SDDTC criteria for designing sizing storm sewers in Section 9.1. StormCAD will calculate and provide hydraulic grade lines, water surface profiles, and flow variables.

Additionally, as part of the Phase III Drainage Report, swale capacity calculations and potential erosion control elements will be designed utilizing the Bentley FlowMaster Connect Edition software in conjunction with the criteria provided in Douglas County's SDDTC and Mile High Flood Districts USDCMs. Swale stability charts obtained from Mile High Flood District USDCM Vol 1 are provided in Appendix B that will be a basis for the future swale design.

3.5 Water Quality Enhancement

Water quality for the Ramblewood Filing No. 1 Site is being provided in two separate designed extended detention pond facilities, Pond A and Pond B. These ponds are conceptually designed in accordance with Douglas County SDDTC and MHFD USDCM Vol 1-3; the Ponds will be full-spectrum detention facilities which are designed to detain the Excess Urban Runoff Value (EURV) and the 100-year Detention Volume. These ponds are designed to receive all flows from their respective major basins. The ponds and the respective basins are discussed in further detail in the Storm Management Facility Design section of this report.

Street D, which extends south to a connection with N. Alpine Drive is primarily down-gradient from both proposed pond locations. Nine (9) Minor basins have been identified as receiving runoff from Street D and will require water quality treatment prior to leaving the project site, Basins B8, B9, D3, D4, D5, D6, D7, D8, AND D9. In order to provide water quality treatment, the runoff reduction method outlined MHFD USDCM Vol 3 will be utilized to send runoff across pervious receiving areas to provide adequate water quality treatment. The calculations for this runoff reduction method will be prepared as part of the Phase III Drainage report.

Three Basins, E1, E2 and F1 will not be impacted by proposed activities so no additional water quality treatment will be proposed at this time for these basins.

One Basin, C1, is located down-gradient of Pond A at the corner of the Site, will either provide runoff reduction or will allow this basin to free release, to be determined with the Phase III Drainage Report. Basin C1 is primarily open space and any increase in imperviousness would come from spillway related infrastructure for the pond.

4. Existing Stormwater Conveyance or Storage Facilities

4.1 Existing Stormwater Conveyance Facilities

The site is currently undeveloped. There are existing stormwater conveyance facilities to remain. Kinney Creek Tributary F flows through the south and eastern half of the site. Kinney Creek Tributary F flows southwest and crosses North Alpine Drive via existing 54-in CMP and 15-in CMP culverts. Kinney Creek Tributary F flows to Kinney Creek and ultimately to Cherry Creek. There is roughly a roadside swale located along Hilltop Road that flows to the northwest. This roadside swale flows to an existing culvert, located offsite northwest of the project site, and is conveyed north to Tallman Gulch. No improvements are proposed for these existing drainageways.

4.2 Existing Stormwater Storage Facilities

There are no existing stormwater storage facilities located on site.

5. Proposed Stormwater Conveyance or Storage Facilities

5.1 Stormwater Conveyance Facilities

Ramblewood Filing No. 1 will be designed per Douglas County Standards. Onsite runoff will be conveyed through streets, swales, and grass-lined channels to Type R Inlets and area inlet design points throughout the site. The proposed storm systems are anticipated to be sized to convey the minor storm event without surcharging. Runoff in the 100-year storm event will be conveyed by a combination of street, swale, channel, and storm sewer for each basin to the full-spectrum detention ponds. As previously noted, street capacity calculations are provided in Appendix B.

A series of grass-lined roadside swales are proposed along the proposed road Street D that connects to North Alpine Drive. These swales will work in conjunction with existing swales in the project site to route flows from Street D to the culvert crossing at N. Alpine Drive.

Detailed design of all proposed swales conforming to Douglas County and Mile High Flood District criteria will be prepared as part of the Phase III Drainage Report. Guidance on swale stability to be utilized for design from Mile High Flood District is provided in Appendix B.

Four culverts which will route flow under proposed roadways are also proposed, to be fully designed as part of the Phase III Drainage Report. Three of the four culverts have been preliminarily designed based on the peak runoff flows, calculations provided in Appendix B. One culvert near the intersection of N. Alpine Drive and Street D will require grading modification to allow a culvert crossing, to be designed with the Phase III Drainage Report. Per Douglas County SDDTC, the minimum culvert size is 24-in diameter per Section 11.3.2.

5.2 Stormwater Storage Facilities

Water quality and detention for the site is proposed to be provided in two full-spectrum detention ponds, Pond A and Pond B. The proposed ponds are to be designed as Extended Detention Basins (EDBs). The detention ponds are designed using the MHFD-Detention v4.07 spreadsheet and will be in accordance with Douglas County criteria. Preliminary detention pond calculations have been provided in Appendix B. A summary of each facility is provided below:

Pond A

Pond A is designed to receive flows from the entire Major Basin A area, minor basins A1-A10. The drainage area is **19.60** acres and the composite imperviousness is 33%. The estimated required 100-year volume is 1.397 ac-ft per the MHFD-Detention calculations. Preliminary calculations for the outlet structure and release rate are provided in Appendix B. The outfall for the pond is to the northwest of the facility, directly into a swale which leads to Tallman Gulch. Energy dissipation and erosion control will be investigated as part of the Phase III Drainage Report. Pond A will be located in a drainage tract; a drainage easement may be proposed for the outfall. This facility will be owned and maintained by the Metro District.

Pond B

Pond B is designed the receive flows from the entire Major Basin B area, minor basins B1-B9. The drainage area is **37.56** acres and the composite imperviousness is 30%. The estimated required 100-year volume is 2.337 ac-ft per the MHFD-Detention calculations. Preliminary calculations for the outlet structure and release rate are provided in Appendix B. The outfall for the pond is to the south into an existing swale which drains to Kinney Creek Tributary F. Energy dissipation and erosion control will be investigated as part of the Phase III Drainage report. Pond B will be located in a drainage tract; a drainage easement may be proposed for the outfall. This facility will be owned and maintained by the Metro District.

5.3 Water Quality Enhancement Best Management Practices

The ponds discussed in Section 5.2 are designed in accordance with the Douglas County *Storm Drainage Design and Technical Criteria Manual* and the MHFD *Storm Drainage Criteria Manual Volumes 1, 2, and 3*. The Detention Ponds will be designed to detain the Water Quality Control Volume, Excess Urban Runoff Volume, and the 100-year Detention Volume. Basins not captured and routed to the full-spectrum detention ponds will sheet flow over native vegetation providing water quality enhancement.

A series of roadside swales are proposed along the Street D that connects to North Alpine Drive. A detention facility is not proposed to provide water quality treatment or detention for this area. The roadside swale is proposed to provide water quality treatment for the impervious area from the roadway surface.

5.4 Floodplain Modification

No floodplain modifications are proposed with this development. All proposed activities will avoid impacting Kinney Creek floodplains located on the southern boundary of the Site.

5.5 Additional Permitting Requirements

Not applicable.

6. Conclusions

6.1 Compliance with Standards

The drainage design for Ramblewood Filing No. 1 conforms to the Douglas County *Storm Drainage Design and Technical Criteria Manual* and the MHFD *Urban Storm Drainage Criteria Manuals,* and relevant nearby drainage reports.

6.2 Variances

Variance 1 – Douglas County Storm Drainage Design and Technical Criteria Manual Section 9.2.1 Storm Sewer Pipe Material

County criteria requires that storm sewer pipes located within public R.O.W. must be reinforced concrete pipe (RCP). Douglas County has allowed the use of polypropylene pipe (PP) within public R.O.W. during a trial period. Due to the limited width of the road, it is requested that the use of polypropylene be allowed within public R.O.W. and for the use of curvilinear pipe. The allowance of curvilinear pipe within public R.O.W. could potentially eliminate manholes, which would reduce future maintenance requirements for the County.

6.3 Drainage Concept

This drainage report has analyzed the storm runoff patterns for the proposed Ramblewood Filing No. 1 Site and mitigation measures for the increased runoff associated with the development have been proposed.

This has been prepared in accordance with the Douglas County SDDTC and the Mile High Flood District's USDCMs.

7. References

- Douglas County Stormwater Drainage Design and Technical Criteria Manual
- Mile High Flood District Drainage Criteria Manual Volumes 1, 2, & 3, current version
- Natural Resources Conservation Service Web Soil Survey, United States Department of Agriculture
- Federal Emergency Management Agency Flood Insurance Rate Map, Community Panel Number 08035C0204F and 08035C0202F
- *Flood Hazard Area Delineation – Kinney Creek, Fonder Draw and Tributaries*, prepared by WRC Engineering, Inc., and dated April 7, 2004

- *Sulphur Gulch Flood Hazard Area Delineation*, prepared by Merrick & Company, and dated February 2021

Appendix A. Hydrologic Calculations

Local Type II Right-Of-Way Impervious Calculation

1084-0006
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Total ROW Width (ft) 50

Surface	Width (sf)	C_5	C_{100}	Impervious (%)
Lawn	10.16	0.20	0.57	20%
Curb, Gutter, and Walk	9.84	0.81	0.87	95%
Paved Street	30.00	0.69	0.81	95%
Composite Site Values:		0.69	0.81	80%
Composite % Impervious Used:		0.69	0.81	80%

Ramblewood

Basin Weighted Runoff Coefficient Calculations

Land Use Is Comprised of 3 Surface Characteristics:						
NRCS Soil Group	C*	Imperviousness	C_2	C_5	C_{10}	C_{100}
A	Single-Family	35%	0.26	0.32	0.39	0.63
B	Pavement, Concrete	95%	0.79	0.81	0.83	0.87
C	Urban Local Type II ROW	80%	0.65	0.69	0.72	0.81
D	Pond WSE	100%	0.83	0.85	0.87	0.89
E	Type C/D Landscaping/Open Space	20%	0.14	0.20	0.28	0.57
F	Type C/D Undisturbed Open Space	5%	0.03	0.08	0.17	0.50
G	Type A Landscaping/Open Space*	20%	0.10	0.11	0.12	0.27
H	Type A Undisturbed Open Space*	5%	0.02	0.02	0.02	0.15
I	Type B Landscaping/Open Space*	20%	0.13	0.15	0.22	0.52
J	Type B Undisturbed Open Space*	5%	0.03	0.03	0.10	0.45

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Basin ID	Total Area (Ac.)	A Area (Ac.)	B Area (Ac.)	C Area (Ac.)	D Area (Ac.)	E Area (Ac.)	F Area (Ac.)	G Area (Ac.)	H Area (Ac.)	I Area (Ac.)	J Area (Ac.)	Weighted Imp. I (%)	Weighted Runoff Coefficients C_2	C_5	C_{10}	C_{100}
Developed																
A1	0.75				0.37	0.17				0.21		59%	0.48	0.51	0.55	0.71
A2	2.04	1.34		0.69		0.01						50%	0.39	0.44	0.50	0.69
A3	1.67	1.29		0.38		0.00						45%	0.35	0.40	0.46	0.67
A4	2.31	1.00		0.37		0.95						36%	0.27	0.33	0.40	0.63
A5	0.66			0.56		0.10						71%	0.57	0.61	0.65	0.77
A6	4.49	1.28				0.83	1.76		0.14	0.47	0.02	18%	0.12	0.17	0.25	0.54
A7	4.47					4.47						20%	0.14	0.20	0.28	0.57
A8	0.54			0.54								80%	0.65	0.69	0.72	0.81
A9	1.11			0.53		0.58						48%	0.38	0.43	0.49	0.68
A10	1.57					1.57						20%	0.14	0.20	0.28	0.57
B1	13.28	2.79			0.43	0.36			6.45	0.56	2.69	15%	0.10	0.12	0.16	0.36
B2	4.16	3.34		0.82				0.00				44%	0.33	0.39	0.45	0.66
B3	2.85	1.85		0.67		0.33						44%	0.33	0.39	0.45	0.66
B4	3.78	2.88		0.53				0.21		0.15		40%	0.30	0.35	0.41	0.63
B5	2.11	1.57		0.49				0.04		0.01		45%	0.34	0.40	0.46	0.66
B6	4.19	3.41		0.73				0.04		0.01		43%	0.32	0.38	0.44	0.66
B7	2.07	1.10		0.71		0.21				0.06		48%	0.38	0.43	0.49	0.68
B8	1.96	0.54	0.22				0.02	0.14	0.21	0.22	0.60	26%	0.19	0.22	0.27	0.51
B9	3.17	0.56	0.19					0.11	1.66	0.19	0.45	17%	0.12	0.13	0.16	0.35
C1	0.72					0.06				0.66		20%	0.13	0.15	0.22	0.52
D1	67.08	1.94	0.27			0.25	25.22		37.03		2.37	6%	0.03	0.05	0.09	0.31
D2	1.97						1.97					5%	0.03	0.08	0.17	0.50
D3	0.30		0.12			0.11	0.07					47%	0.37	0.42	0.48	0.68
D4	0.22		0.09			0.08	0.05					46%	0.37	0.41	0.47	0.67
D5	1.50		0.09			0.09	1.08		0.25			11%	0.08	0.12	0.19	0.47
D6	10.53	0.23	0.08			0.11	0.92		9.12		0.09	6%	0.03	0.04	0.05	0.20
D7	6.80		0.19			0.09	2.92	0.04	3.55			8%	0.05	0.07	0.11	0.33
D8	1.43		0.23			0.21	1.00					22%	0.17	0.21	0.29	0.57
D9	0.38		0.09			0.07	0.20	0.02				29%	0.23	0.27	0.34	0.59
E1	16.66								15.24		1.42	5%	0.02	0.02	0.03	0.17
E2	9.91						1.98		6.86		1.06	5%	0.02	0.03	0.06	0.25
F1	2.78						1.65		0.75		0.38	5%	0.03	0.05	0.12	0.40
Developed Imp.	**177.45**	**25.12**	**1.57**	**7.01**	**0.80**	**10.63**	**38.83**	**0.61**	**81.25**	**2.54**	**9.09**	15%	0.10	0.12	0.17	0.38
Ponds																
Pond A	19.60	4.91	0.00	3.06	0.37	8.68	1.76	0.00	0.14	0.68	0.02	33%	0.25	0.30	0.37	0.62
Pond B	37.56	18.05	0.41	3.95	0.43	0.90	0.02	0.54	8.32	1.20	3.74	30%	0.22	0.26	0.31	0.52
Existing/Historic																
HA	20.24						18.05		0.16		2.03	5%	0.03	0.07	0.16	0.50
HB	128.68						43.59		67.07		18.02	5%	0.02	0.04	0.08	0.31
HC	29.83						0.96		23.87		5.00	5%	0.02	0.02	0.04	0.21
Existing Imp.	**178.75**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**62.60**	**0.00**	**91.10**	**0.00**	**25.05**	5%	0.02	0.04	0.08	0.32

Time of Concentration

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Basin ID	C_5	Initial Flow Time T_i			Travel Time T_t							Tc Check				Final T_c
		Length L_i (ft)	Slope S_i (%)	T_i (min)	Length L_t (ft)	Slope S_t (%)	Convey. Element	Convey. Coeff. K	Vel. (fps)	T_t (min)	Total T_c (min)	Imp. (dec)	Length L_t (ft)	Slope S_t (%)	$T_c = 26 - 17i + [Lt/\{60*(14i+9)*(S^{0.5})\}]$ (min)	(min)
Developed																
A1	0.51						POND									5.0
A2	0.44	145	2.00	11.3	845	1.60	Street	20	2.5	5.6	16.9	0.5	845	1.6	18.2	16.9
A3	0.40	175	2.00	13.2	495	0.85	Street	20	1.8	4.5	17.7	0.5	495	0.9	18.9	17.7
A4	0.33	285	2.00	18.7	475	0.85	Street	20	1.8	4.3	23.0	0.4	475	0.9	20.5	20.5
A5	0.61	25	2.00	3.5	880	1.50	Street	20	2.4	6.0	9.5	0.7	880	1.5	14.6	9.5
A6	0.17	200	5.00	13.9	750	3.00	GRASS	15	2.6	4.8	18.7	0.2	750	3.0	23.6	18.7
A7	0.20	375	5.00	18.5	790	1.00	GRASS	15	1.5	8.8	27.3	0.2	790	1.0	23.7	23.7
A8	0.69	25	2.00	3.0	385	2.00	Street	20	2.8	2.3	5.2	0.8	385	2.0	12.6	5.2
A9	0.43	205	5.50	9.9	185	2.00	Street	20	2.8	1.1	11.0	0.5	185	2.0	17.9	11.0
A10	0.20	235	4.20	15.5	220	4.70	GRASS	15	3.3	1.1	16.7	0.2	220	4.7	22.7	16.7
B1	0.12	310	1.60	26.6	740	6.20	BARE	10	2.5	5.0	31.6	0.2	740	6.2	23.8	23.8
B2	0.39	215	2.00	14.9	960	4.00	Street	20	4.0	4.0	18.9	0.4	960	4.0	19.1	18.9
B3	0.39	225	2.00	15.3	1075	3.70	Street	20	3.8	4.7	19.9	0.4	1075	3.7	19.2	19.2
B4	0.35	160	2.00	13.6	800	2.90	Street	20	3.4	3.9	17.5	0.4	800	2.9	19.8	17.5
B5	0.40	70	2.00	8.4	775	3.00	Street	20	3.5	3.7	12.1	0.5	775	3.0	18.8	12.1
B6	0.38	145	2.00	12.4	1120	1.30	Street	20	2.3	8.2	20.6	0.4	1120	1.3	19.8	19.8
B7	0.43	50	2.00	6.8	1175	1.40	Street	20	2.4	8.3	15.1	0.5	1175	1.4	18.8	15.1
B8	0.22	215	6.60	12.5	555	6.00	GRASS	15	3.7	2.5	15.0	0.3	555	6.0	21.8	15.0
B9	0.13	275	6.60	15.5	310	7.30	BARE	10	2.7	1.9	17.4	0.2	310	7.3	23.2	17.4
C1	0.15	185	8.50	11.5	1	1.00	LAWN	7	0.7	0.0	11.5	0.2	1	1.0	22.6	11.5
D1	0.05	450	6.20	22.0	3000	3.60	BARE	10	1.9	26.4	48.3	0.1	3000	3.6	27.6	27.6
D2	0.08	375	6.00	19.8	1	1.00	BARE	10	1.0	0.0	19.8	0.1	1	1.0	25.2	19.8
D3	0.42	25	4.00	3.9	210	1.30	GRASS	15	1.7	2.0	6.0	0.5	210	1.3	18.3	6.0
D4	0.41	20	5.70	3.1	260	6.20	GRASS	15	3.7	1.2	4.3	0.5	260	6.2	18.3	5.0
D5	0.12	325	13.80	13.4	245	6.10	GRASS	15	3.7	1.1	14.6	0.1	245	6.1	24.2	14.6
D6	0.04	375	8.50	18.3	660	6.40	BARE	10	2.5	4.3	22.7	0.1	660	6.4	25.3	22.7
D7	0.07	230	12.70	12.2	890	5.50	BARE	10	2.3	6.3	18.5	0.1	890	5.5	25.3	18.5
D8	0.21	55	8.50	5.9	715	5.20	GRASS	15	3.4	3.5	9.4	0.2	715	5.2	22.8	9.4
D9	0.27	65	18.50	4.6	280	6.00	GRASS	15	3.7	1.3	5.9	0.3	280	6.0	21.2	5.9
E1	0.02	300	13.50	14.3	605	6.90	BARE	10	2.6	3.8	18.1	0.1	605	6.9	25.5	18.1
E2	0.03	500	11.70	19.2	295	8.10	BARE	10	2.8	1.7	20.9	0.1	295	8.1	25.3	20.9
F1	0.05	500	3.20	28.8	225	3.20	BARE	10	1.8	2.1	30.8	0.1	225	3.2	25.4	25.4
Existing																
HA	0.07	500	4.00	26.3	1235	2.30	BARE	10	1.5	13.6	39.9	0.1	1235	2.3	26.5	26.5
HB	0.04	445	6.20	22.1	3085	3.60	BARE	11	2.1	24.6	46.7	0.1	3085	3.6	27.9	27.9
HC	0.02	445	10.00	19.2	695	7.00	BARE	12	3.2	3.6	22.8	0.1	695	7.0	25.6	22.8

Basin Runoff Calculations - Direct Runoff

Project No.: 1084-0006

10/09/25

Basin ID	Inlet/Design Point	Total Area (Ac.)	Imp (%)	Tc (min)	Runoff Coeff. C_2	C_5	C_{100}	I_2	I_5	I_{100}	Q_5	Q_{100}
Developed												
A1	SO1-2	0.75	59%	5.0	0.48	0.51	0.71	3.60	4.85	8.82	1.84	4.72
A2	SA1-2	2.04	50%	16.9	0.39	0.44	0.69	2.27	3.06	5.57	2.77	7.83
A3	SA1-5	1.67	45%	17.7	0.35	0.40	0.67	2.22	2.99	5.44	2.02	6.08
A4	SA1-6	2.31	36%	20.5	0.27	0.33	0.63	2.06	2.78	5.05	2.11	7.37
A5	SA1-2	0.66	71%	9.5	0.57	0.61	0.77	2.93	3.95	7.18	1.60	3.67
A6	A6	4.49	18%	18.7	0.12	0.17	0.54	2.16	2.91	5.29	2.27	12.86
A7	A7	4.47	20%	23.7	0.14	0.20	0.57	1.90	2.57	4.67	2.27	11.80
A8	SA1-8	0.54	80%	5.2	0.65	0.69	0.81	3.55	4.79	8.71	1.76	3.79
A9	SA1-9	1.11	48%	11.0	0.38	0.43	0.68	2.76	3.73	6.78	1.78	5.12
A10	A10	1.57	20%	16.7	0.14	0.20	0.57	2.29	3.09	5.61	0.96	4.98
B1	B1	13.28	15%	23.8	0.10	0.12	0.36	1.90	2.56	4.65	4.15	22.32
B2	SB1-3	4.16	44%	18.9	0.33	0.39	0.66	2.15	2.90	5.27	4.72	14.52
B3	SB1-3	2.85	44%	19.2	0.33	0.39	0.66	2.13	2.88	5.23	3.21	9.89
B4	SB2-6	3.78	40%	17.5	0.30	0.35	0.63	2.23	3.01	5.48	4.03	13.02
B5	SB2-6	2.11	45%	12.1	0.34	0.40	0.66	2.65	3.57	6.50	3.02	9.08
B6	SB2-12	4.19	43%	19.8	0.32	0.38	0.66	2.09	2.83	5.14	4.52	14.10
B7	SB2-11	2.07	48%	15.1	0.38	0.43	0.68	2.40	3.24	5.88	2.87	8.31
B8	SB2-3	1.96	26%	15.0	0.19	0.22	0.51	2.40	3.24	5.89	1.38	5.88
B9	SB2-5	3.17	17%	17.4	0.12	0.13	0.35	2.24	3.02	5.49	1.28	6.04
C1	C1	0.72	20%	11.5	0.13	0.15	0.52	2.71	3.65	6.64	0.40	2.51
D1	D1	67.08	6%	27.6	0.03	0.05	0.31	1.75	2.36	4.28	8.43	89.51
D2	D2	1.97	5%	19.8	0.03	0.08	0.50	2.09	2.82	5.14	0.42	5.09
D3	D3	0.30	47%	6.0	0.37	0.42	0.68	3.42	4.62	8.40	0.58	1.72
D4	D4	0.22	46%	5.0	0.37	0.41	0.67	3.60	4.85	8.82	0.44	1.29
D5	SG1-2	1.50	11%	14.6	0.08	0.12	0.47	2.44	3.29	5.99	0.58	4.24
D6	D6	10.53	6%	22.7	0.03	0.04	0.20	1.95	2.63	4.78	1.05	10.19
D7	D7	6.80	8%	18.5	0.05	0.07	0.33	2.17	2.93	5.32	1.36	11.87
D8	D8	1.43	22%	9.4	0.17	0.21	0.57	2.94	3.97	7.22	1.19	5.90
D9	D9	0.38	29%	5.9	0.23	0.27	0.59	3.44	4.64	8.43	0.47	1.88
E1	E1	16.66	5%	18.1	0.02	0.02	0.17	2.19	2.96	5.38	0.99	15.64
E2	E2	9.91	5%	20.9	0.02	0.03	0.25	2.04	2.75	5.00	0.86	12.50
F1	F1	2.78	5%	25.4	0.03	0.05	0.40	1.83	2.47	4.49	0.38	5.01
Existing												
HA	HA	20.24	5%	26.5	0.03	0.07	0.50	1.79	2.41	4.38	3.46	43.97
HB	HB	128.68	5%	27.9	0.02	0.04	0.31	1.73	2.34	4.25	12.06	170.41
HC	HC	29.83	5%	22.8	0.02	0.02	0.21	1.94	2.62	4.76	1.80	29.94

Intensity = $\frac{28.5 * P_1}{(10 + T_c)^{0.786}}$

2 Year P_1 =	1.06
5 Year P_1 =	1.43
100 Year P_1 =	2.60

Appendix B. Hydraulic Calculations

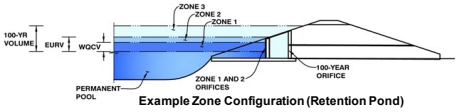
B1 Detention Ponds

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.07 (June 2025)

Project: **Ramblewood 1084-0006**

Basin ID: **Pond A**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected SCM Type =	**EDB**	
Watershed Area =	19.60	acres
Watershed Length =	1,410	ft
Watershed Length to Centroid =	750	ft
Watershed Slope =	0.021	ft/ft
Watershed Imperviousness =	33.00%	percent
Percentage Hydrologic Soil Group A =	5.0%	percent
Percentage Hydrologic Soil Group B =	25.0%	percent
Percentage Hydrologic Soil Groups C/D =	70.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Parker - Town Hall	

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

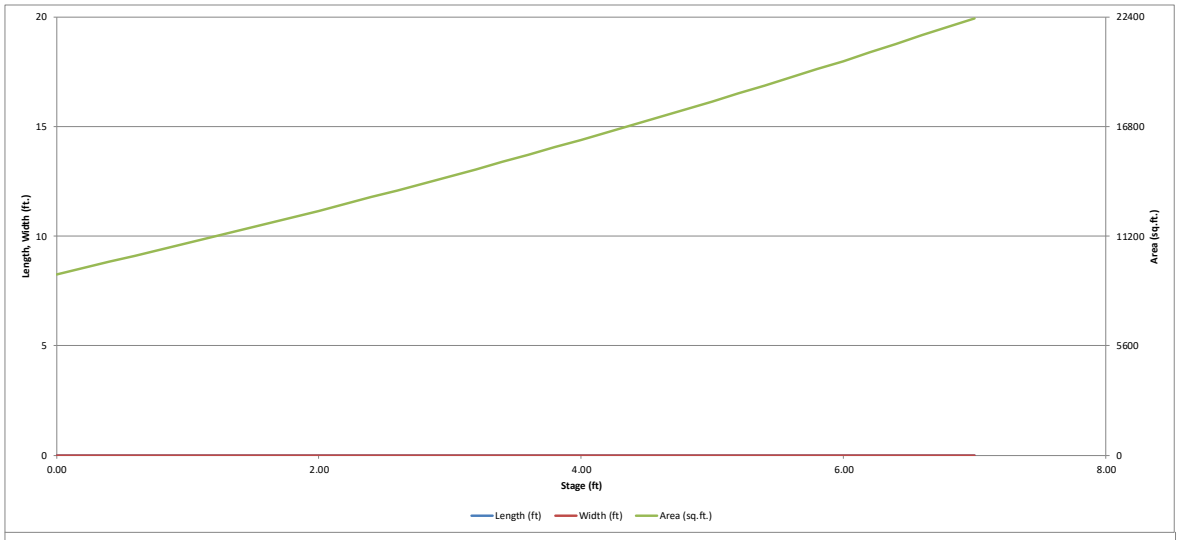
			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.262	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	0.615	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.06 in.) =	0.552	acre-feet	1.06	inches
5-yr Runoff Volume (P1 = 1.43 in.) =	1.034	acre-feet	1.43	inches
10-yr Runoff Volume (P1 = 1.66 in.) =	1.373	acre-feet	1.66	inches
25-yr Runoff Volume (P1 = 1.69 in.) =	1.525	acre-feet		inches
50-yr Runoff Volume (P1 = 2.26 in.) =	2.439	acre-feet	2.26	inches
100-yr Runoff Volume (P1 = 2.6 in.) =	3.091	acre-feet	2.60	inches
500-yr Runoff Volume (P1 = 3.08 in.) =	3.907	acre-feet		inches
Approximate 2-yr Detention Volume =	0.445	acre-feet		
Approximate 5-yr Detention Volume =	0.747	acre-feet		
Approximate 10-yr Detention Volume =	0.905	acre-feet		
Approximate 25-yr Detention Volume =	0.909	acre-feet		
Approximate 50-yr Detention Volume =	1.135	acre-feet		
Approximate 100-yr Detention Volume =	1.397	acre-feet		

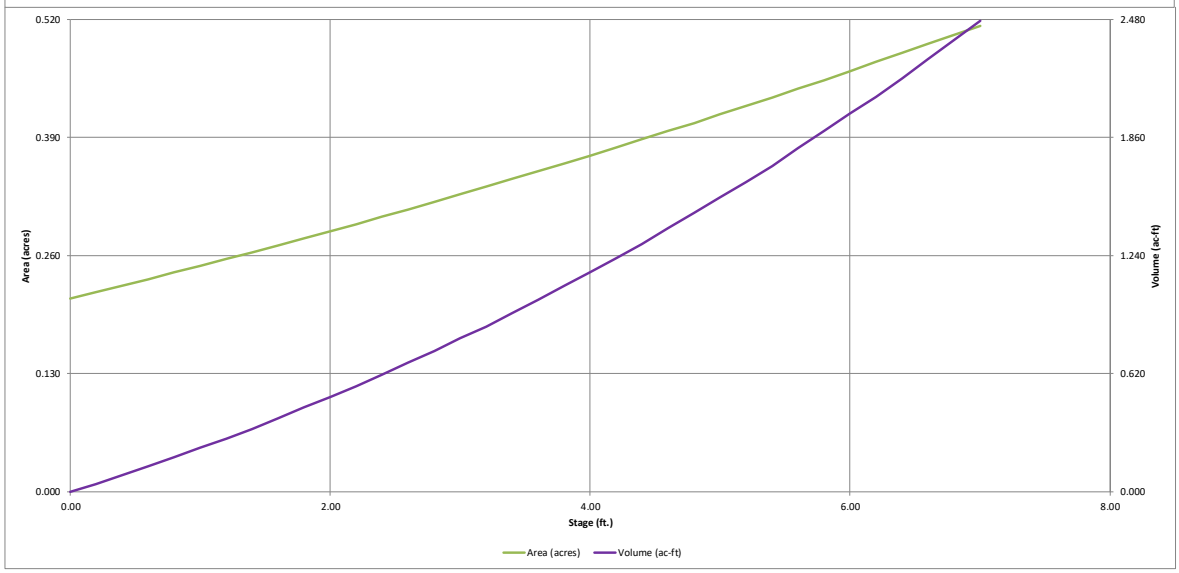
Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.262	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.353	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.782	acre-feet
Total Detention Basin Volume =	1.397	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	9,267	0.213		
6363.2	--	0.20	--	--	--	9,572	0.220	1,788	0.041
6363.4	--	0.40	--	--	--	9,881	0.227	3,730	0.086
6363.6	--	0.60	--	--	--	10,193	0.234	5,837	0.134
6363.8	--	0.80	--	--	--	10,510	0.241	7,907	0.182
6364	--	1.00	--	--	--	10,830	0.249	10,041	0.231
6364.2	--	1.20	--	--	--	11,155	0.256	12,128	0.278
6364.4	--	1.40	--	--	--	11,484	0.264	14,388	0.330
6364.6	--	1.60	--	--	--	11,816	0.271	16,833	0.386
6364.8	--	1.80	--	--	--	12,153	0.279	19,230	0.441
6365	--	2.00	--	--	--	12,493	0.287	21,695	0.498
6365.2	--	2.20	--	--	--	12,838	0.295	24,100	0.553
6365.4	--	2.40	--	--	--	13,187	0.303	26,699	0.613
6365.6	--	2.60	--	--	--	13,540	0.311	29,503	0.677
6365.8	--	2.80	--	--	--	13,896	0.319	32,247	0.740
6366	--	3.00	--	--	--	14,257	0.327	35,062	0.805
6366.2	--	3.20	--	--	--	14,622	0.336	37,804	0.868
6366.4	--	3.40	--	--	--	14,991	0.344	40,761	0.936
6366.6	--	3.60	--	--	--	15,364	0.353	43,947	1.009
6366.8	--	3.80	--	--	--	15,741	0.361	47,057	1.080
6367	--	4.00	--	--	--	16,121	0.370	50,243	1.153
6367.2	--	4.20	--	--	--	16,506	0.379	53,341	1.225
6367.4	--	4.40	--	--	--	16,896	0.388	56,677	1.301
6367.6	--	4.60	--	--	--	17,288	0.397	60,265	1.383
6367.8	--	4.80	--	--	--	17,685	0.406	63,762	1.464
6368	--	5.00	--	--	--	18,086	0.415	67,339	1.546
6368.2	--	5.20	--	--	--	18,491	0.425	70,812	1.626
6368.4	--	5.40	--	--	--	18,901	0.434	74,547	1.711
6368.6	--	5.60	--	--	--	19,314	0.443	78,558	1.803
6368.8	--	5.80	--	--	--	19,731	0.453	82,462	1.893
6369	--	6.00	--	--	--	20,151	0.463	86,450	1.985
6369.2	--	6.20	--	--	--	20,603	0.473	90,320	2.073
6369.4	--	6.40	--	--	--	21,036	0.483	94,479	2.169
6369.6	--	6.60	--	--	--	21,475	0.493	98,941	2.271
6369.8	--	6.80	--	--	--	21,918	0.503	103,280	2.371
6370	--	7.00	--	--	--	22,338	0.513	107,705	2.473


20
15
10
5
0
Length, Width (ft.)
22400
16800
11200
5600
0
Area (sq.ft.)
0.00
2.00
4.00
6.00
8.00
Stage (ft)
Length (ft)
Width (ft)
Area (sq.ft.)

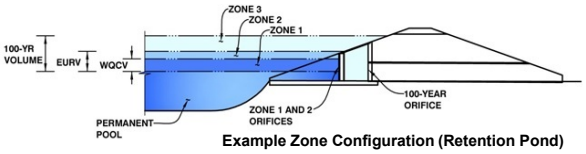

0.520
0.390
0.260
0.130
0.000
Area (acres)
2.480
1.860
1.240
0.620
0.000
Volume (ac-ft)
0.00
2.00
4.00
6.00
8.00
Stage (ft.)
Area (acres)
Volume (ac-ft)

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)

Project: **Ramblewood 1084-0006**

Basin ID: **Pond A**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.13	0.262	Orifice Plate
Zone 2 (EURV)	2.40	0.353	Orifice Plate
Zone 3 (100-year)	4.64	0.782	Weir&Pipe (Restrict)
Total (all zones)		1.397	

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

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft^2
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 SCM)

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	2.50	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	N/A	inches
Orifice Plate: Orifice Area per Row =	N/A	sq. inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

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	2.00						
Orifice Area (sq. inches)	3.75	2.00						

	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)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

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

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.50	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	5.67	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V
Horiz. Length of Weir Sides =	2.92	N/A	feet
Overflow Grate Type =	Close Mesh Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	3.23	N/A	feet
Overflow Weir Slope Length =	3.01	N/A	feet
Grate Open Area / 100-yr Orifice Area =	10.79	N/A	
Overflow Grate Open Area w/o Debris =	13.50	N/A	ft^2
Overflow Grate Open Area w/ Debris =	6.75	N/A	ft^2

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

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	1.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	18.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	12.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	1.25	N/A	ft^2
Outlet Orifice Centroid =	0.56	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	1.91	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	5.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	40.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=	0.42	feet
Stage at Top of Freeboard =	6.92	feet
Basin Area at Top of Freeboard =	0.51	acres
Basin Volume at Top of Freeboard =	2.43	acre-ft

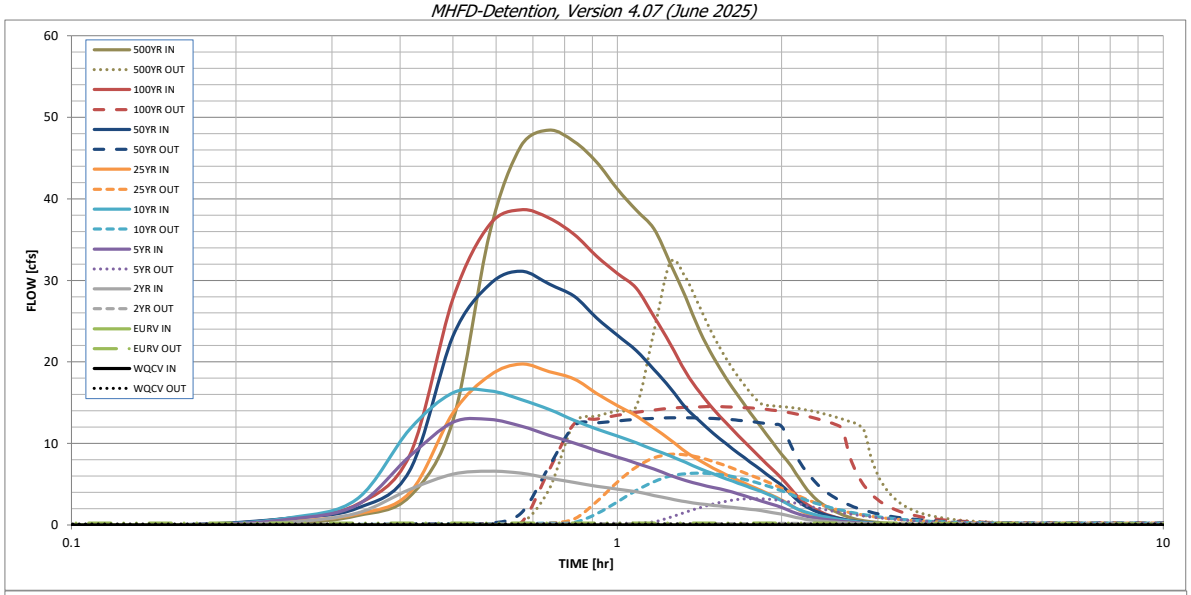
Routed Hydrograph Results

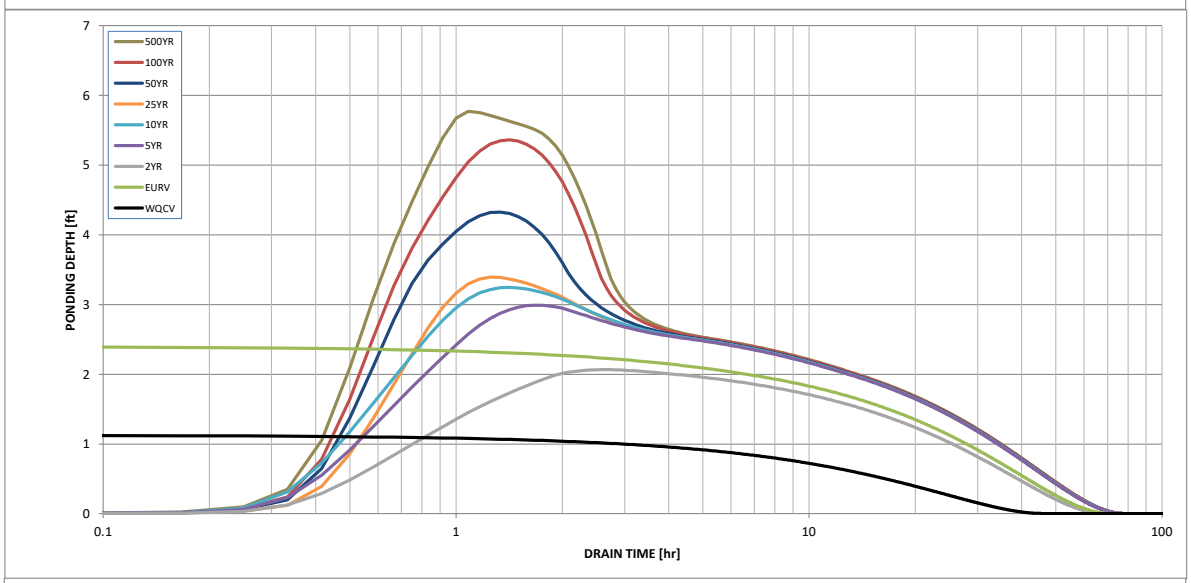
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

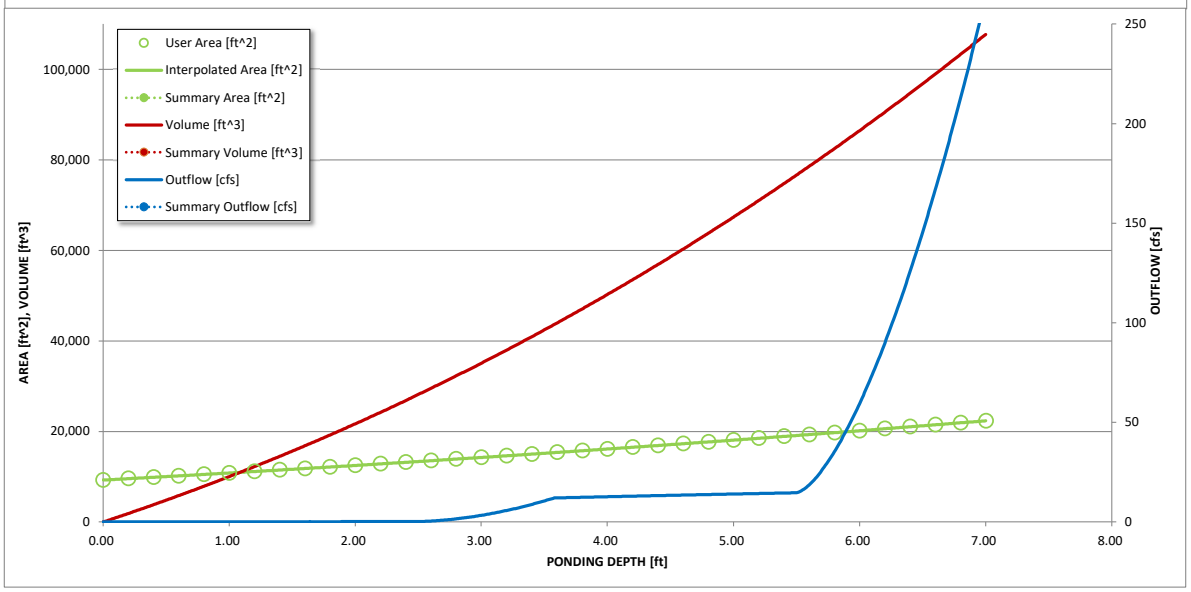
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.06	1.43	1.66	1.69	2.26	2.60	3.08
CUHP Runoff Volume (acre-ft) =	0.262	0.615	0.552	1.034	1.373	1.525	2.439	3.091	3.907
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.552	1.034	1.373	1.525	2.439	3.091	3.907
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	1.4	6.1	8.7	11.6	20.2	26.6	34.2
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.07	0.31	0.45	0.59	1.03	1.36	1.75
Peak Inflow Q (cfs) =	N/A	N/A	6.6	12.9	16.5	19.7	31.1	38.7	48.4
Peak Outflow Q (cfs) =	0.1	0.2	0.2	3.2	6.4	8.7	13.2	14.5	32.2
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.5	0.7	0.7	0.6	0.5	0.9
Structure Controlling Flow =	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	0.2	0.4	0.6	0.9	1.0	1.1
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	59	57	62	60	59	54	51	48
Time to Drain 99% of Inflow Volume (hours) =	**42**	64	62	69	67	67	64	63	61
Maximum Ponding Depth (ft) =	1.13	2.40	2.06	2.99	3.24	3.39	4.32	5.36	5.77
Area at Maximum Ponding Depth (acres) =	0.25	0.30	0.29	0.33	0.34	0.34	0.38	0.43	0.45
Maximum Volume Stored (acre-ft) =	0.263	0.616	0.515	0.798	0.885	0.932	1.274	1.694	1.875

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)







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

DETENTION BASIN OUTLET STRUCTURE DESIGN

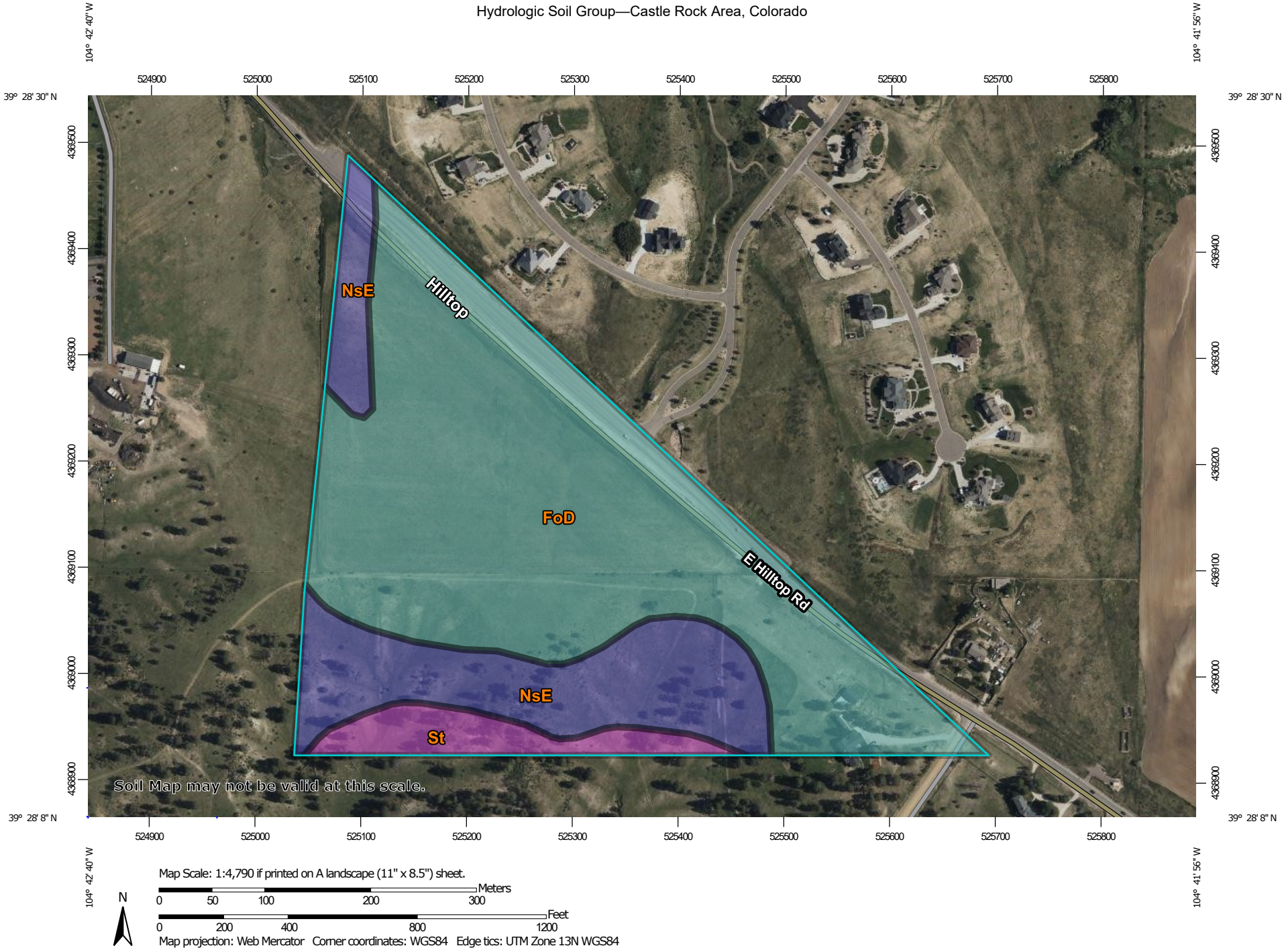
Outflow Hydrograph Workbook Filename: _____

Inflow Hydrographs

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

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0	0.00	0.00	0.00	0.00	0.00	0.06	0.03	0.16
	0:15:00	0	0.00	0.34	0.70	0.87	0.44	0.82	0.84	1.12
	0:20:00	0	0.00	1.43	2.45	3.18	1.33	2.04	2.50	3.49
	0:25:00	0	0.00	4.36	8.43	11.74	3.95	6.68	8.56	12.80
	0:30:00	0	0.00	6.23	12.59	16.21	13.74	23.14	27.76	35.81
	0:35:00	0	0.00	6.60	12.93	16.45	18.33	29.51	36.85	46.49
	0:40:00	0	0.00	6.34	12.12	15.38	19.73	31.12	38.67	48.42
	0:45:00	0	0.00	5.75	11.00	14.18	18.81	29.53	37.63	47.03
	0:50:00	0	0.00	5.20	10.05	12.83	17.91	28.05	35.64	44.49
	0:55:00	0	0.00	4.76	9.11	11.78	16.12	25.38	32.95	41.20
	1:00:00	0	0.00	4.40	8.33	10.91	14.66	23.28	30.86	38.61
	1:05:00	0	0.00	4.07	7.59	10.07	13.37	21.39	29.03	36.32
	1:10:00	0	0.00	3.63	6.87	9.24	11.89	19.07	25.60	32.11
	1:15:00	0	0.00	3.20	6.10	8.47	10.44	16.80	22.21	27.97
	1:20:00	0	0.00	2.85	5.45	7.67	8.98	14.41	18.78	23.75
	1:25:00	0	0.00	2.61	4.98	6.92	7.89	12.72	16.25	20.57
	1:30:00	0	0.00	2.41	4.60	6.26	6.96	11.22	14.22	17.99
	1:35:00	0	0.00	2.24	4.25	5.67	6.17	9.95	12.50	15.80
	1:40:00	0	0.00	2.08	3.80	5.12	5.47	8.79	10.95	13.82
	1:45:00	0	0.00	1.92	3.37	4.60	4.83	7.74	9.52	12.00
	1:50:00	0	0.00	1.77	2.95	4.10	4.22	6.73	8.17	10.29
	1:55:00	0	0.00	1.54	2.55	3.57	3.64	5.77	6.91	8.68
	2:00:00	0	0.00	1.32	2.15	2.98	3.07	4.86	5.74	7.18
	2:05:00	0	0.00	1.05	1.67	2.31	2.38	3.72	4.35	5.44
	2:10:00	0	0.00	0.81	1.27	1.80	1.74	2.69	3.13	3.96
	2:15:00	0	0.00	0.63	1.00	1.45	1.27	2.02	2.32	2.96
	2:20:00	0	0.00	0.51	0.81	1.18	0.96	1.55	1.75	2.24
	2:25:00	0	0.00	0.42	0.66	0.96	0.73	1.21	1.31	1.69
	2:30:00	0	0.00	0.35	0.53	0.78	0.57	0.93	0.98	1.27
	2:35:00	0	0.00	0.28	0.43	0.62	0.44	0.72	0.72	0.94
	2:40:00	0	0.00	0.23	0.34	0.49	0.34	0.55	0.52	0.68
	2:45:00	0	0.00	0.18	0.27	0.38	0.26	0.42	0.38	0.50
	2:50:00	0	0.00	0.15	0.21	0.30	0.20	0.32	0.30	0.39
	2:55:00	0	0.00	0.12	0.17	0.23	0.16	0.26	0.24	0.31
	3:00:00	0	0.00	0.10	0.13	0.18	0.13	0.20	0.19	0.25
	3:05:00	0	0.00	0.07	0.10	0.14	0.10	0.15	0.15	0.19
	3:10:00	0	0.00	0.06	0.07	0.10	0.07	0.12	0.11	0.14
	3:15:00	0	0.00	0.04	0.05	0.07	0.05	0.08	0.08	0.10
	3:20:00	0	0.00	0.03	0.03	0.05	0.04	0.06	0.05	0.07
	3:25:00	0	0.00	0.02	0.02	0.03	0.02	0.03	0.03	0.04
	3:30:00	0	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02
	3:35:00	0	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	3:40:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hydrologic Soil Group—Castle Rock Area, Colorado



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Castle Rock Area, Colorado
Survey Area Data: Version 17, Aug 29, 2024

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
FoD	Fondis clay loam, 3 to 9 percent slopes	C	32.1	69.4%
NsE	Newlin-Satanta complex, 5 to 20 percent slopes	B	11.2	24.2%
St	Stapleton-Bresser association	A	3.0	6.4%
Totals for Area of Interest			**46.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

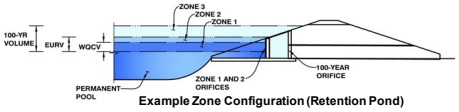
Tie-break Rule: Higher

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.07 (June 2025)

Project: 1084-0006

Basin ID: Pond B



Example Zone Configuration (Retention Pond)

Watershed Information

Selected SCM Type =	**EDB**	
Watershed Area =	37.56	acres
Watershed Length =	2,070	ft
Watershed Length to Centroid =	600	ft
Watershed Slope =	0.050	ft/ft
Watershed Imperviousness =	30.00%	percent
Percentage Hydrologic Soil Group A =	57.0%	percent
Percentage Hydrologic Soil Group B =	31.0%	percent
Percentage Hydrologic Soil Groups C/D =	12.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	Parker - Town Hall	

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

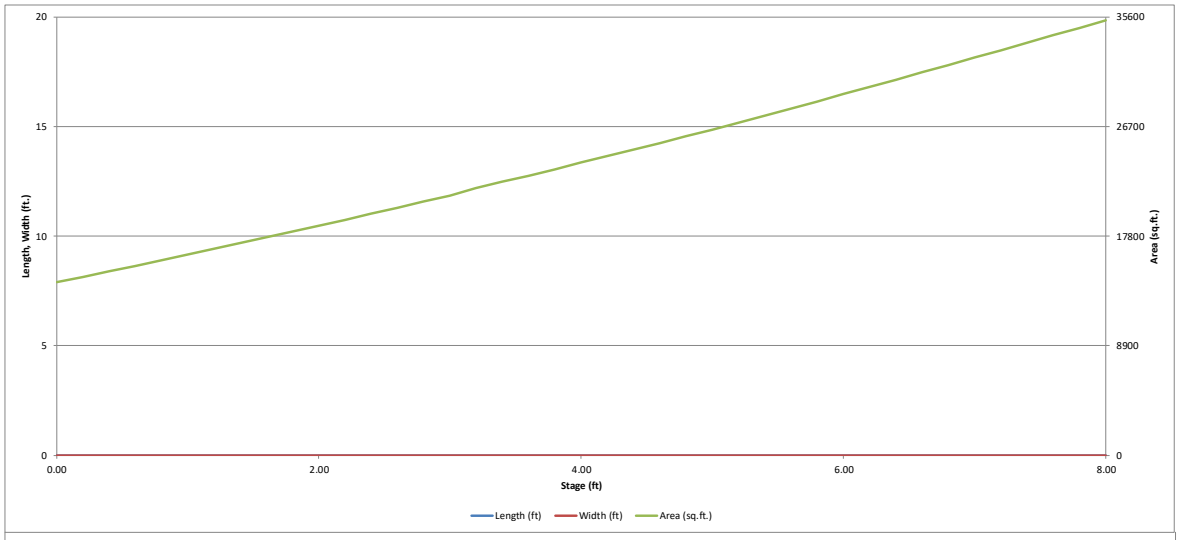
			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.474	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	1.123	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.06 in.) =	0.753	acre-feet	1.06	inches
5-yr Runoff Volume (P1 = 1.43 in.) =	1.172	acre-feet	1.43	inches
10-yr Runoff Volume (P1 = 1.66 in.) =	1.650	acre-feet	1.66	inches
25-yr Runoff Volume (P1 = 1.69 in.) =	1.979	acre-feet		inches
50-yr Runoff Volume (P1 = 2.26 in.) =	3.475	acre-feet	2.26	inches
100-yr Runoff Volume (P1 = 2.6 in.) =	4.719	acre-feet	2.60	inches
500-yr Runoff Volume (P1 = 3.08 in.) =	6.166	acre-feet		inches
Approximate 2-yr Detention Volume =	0.682	acre-feet		
Approximate 5-yr Detention Volume =	1.031	acre-feet		
Approximate 10-yr Detention Volume =	1.340	acre-feet		
Approximate 25-yr Detention Volume =	1.437	acre-feet		
Approximate 50-yr Detention Volume =	1.886	acre-feet		
Approximate 100-yr Detention Volume =	2.337	acre-feet		

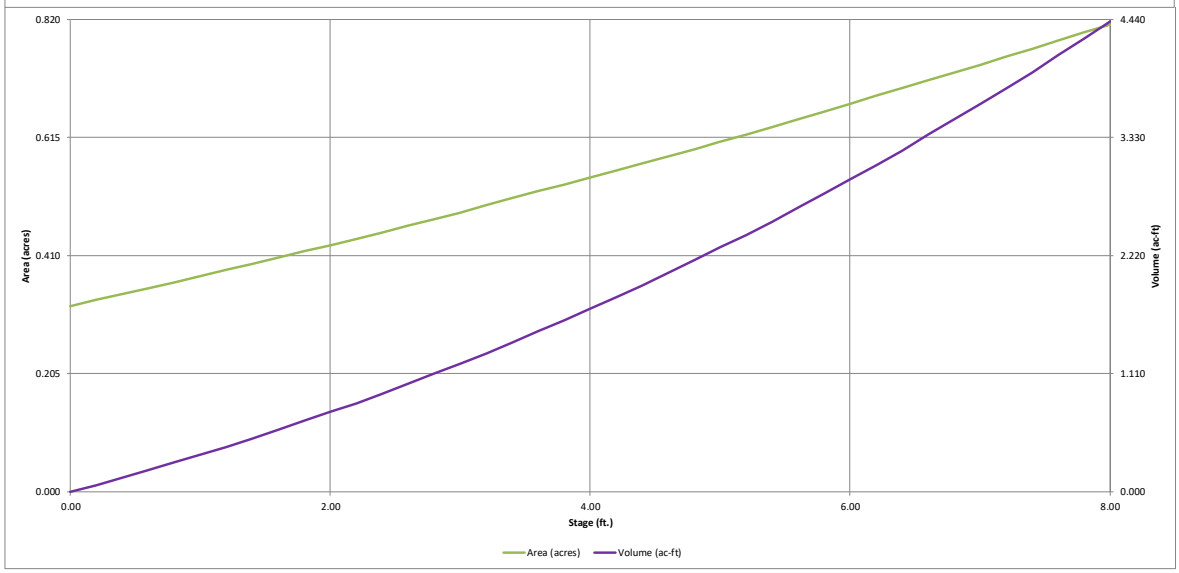
Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.474	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.649	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	1.214	acre-feet
Total Detention Basin Volume =	2.337	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	**user**	acre-feet

Depth Increment = ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	14,062	0.323		
6318.2	--	0.20	--	--	--	14,497	0.333	2,711	0.062
6318.4	--	0.40	--	--	--	14,937	0.343	5,650	0.130
6318.6	--	0.60	--	--	--	15,381	0.353	8,831	0.203
6318.8	--	0.80	--	--	--	15,830	0.363	11,952	0.274
6319	--	1.00	--	--	--	16,284	0.374	15,164	0.348
6319.2	--	1.20	--	--	--	16,764	0.385	18,301	0.420
6319.4	--	1.40	--	--	--	17,228	0.396	21,696	0.498
6319.6	--	1.60	--	--	--	17,697	0.406	25,360	0.582
6319.8	--	1.80	--	--	--	18,169	0.417	28,947	0.665
6320	--	2.00	--	--	--	18,647	0.428	32,629	0.749
6320.2	--	2.20	--	--	--	19,128	0.439	36,215	0.831
6320.4	--	2.40	--	--	--	19,614	0.450	40,084	0.920
6320.6	--	2.60	--	--	--	20,104	0.462	44,252	1.016
6320.8	--	2.80	--	--	--	20,599	0.473	48,322	1.109
6321	--	3.00	--	--	--	21,098	0.484	52,492	1.205
6321.2	--	3.20	--	--	--	21,689	0.498	56,554	1.298
6321.4	--	3.40	--	--	--	22,201	0.510	60,938	1.399
6321.6	--	3.60	--	--	--	22,716	0.521	65,651	1.507
6321.8	--	3.80	--	--	--	23,236	0.533	70,247	1.613
6322	--	4.00	--	--	--	23,760	0.545	74,946	1.721
6322.2	--	4.20	--	--	--	24,291	0.558	79,509	1.825
6322.4	--	4.40	--	--	--	24,824	0.570	84,415	1.938
6322.6	--	4.60	--	--	--	25,362	0.582	89,682	2.059
6322.8	--	4.80	--	--	--	25,903	0.595	94,808	2.176
6323	--	5.00	--	--	--	26,449	0.607	100,043	2.297
6323.2	--	5.20	--	--	--	27,012	0.620	105,119	2.413
6323.4	--	5.40	--	--	--	27,582	0.633	110,573	2.538
6323.6	--	5.60	--	--	--	28,159	0.646	116,423	2.673
6323.8	--	5.80	--	--	--	28,744	0.660	122,113	2.803
6324	--	6.00	--	--	--	29,338	0.673	127,921	2.937
6324.2	--	6.20	--	--	--	29,937	0.687	133,549	3.066
6324.4	--	6.40	--	--	--	30,520	0.701	139,589	3.205
6324.6	--	6.60	--	--	--	31,107	0.714	146,057	3.353
6324.8	--	6.80	--	--	--	31,697	0.728	152,337	3.497
6325	--	7.00	--	--	--	32,292	0.741	158,736	3.644
6325.2	--	7.20	--	--	--	32,897	0.755	164,926	3.786
6325.4	--	7.40	--	--	--	33,504	0.769	171,560	3.938
6325.6	--	7.60	--	--	--	34,117	0.783	178,657	4.101
6325.8	--	7.80	--	--	--	34,734	0.797	185,542	4.259
6326	--	8.00	--	--	--	35,356	0.812	192,551	4.420


20
15
10
5
0
Length, Width (ft.)
35600
26700
17800
8900
0
Area (sq.ft.)
0.00
2.00
4.00
6.00
8.00
Stage (ft)
Length (ft)
Width (ft)
Area (sq.ft.)

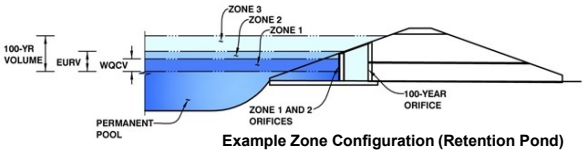

0.820
0.615
0.410
0.205
0.000
Area (acres)
4.440
3.330
2.220
1.110
0.000
Volume (ac-ft)
0.00
2.00
4.00
6.00
8.00
Stage (ft.)
Area (acres)
Volume (ac-ft)

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)

Project: 1084-0006

Basin ID: Pond B



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.33	0.474	Orifice Plate
Zone 2 (EURV)	2.83	0.649	Orifice Plate
Zone 3 (100-year)	5.07	1.214	Weir&Pipe (Restrict)
Total (all zones)		2.337	

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

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft^2
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 SCM)

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	3.00	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	N/A	inches
Orifice Plate: Orifice Area per Row =	N/A	sq. inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

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	2.00						
Orifice Area (sq. inches)	6.20	6.20						

	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)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

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

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	3.00	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	5.67	N/A	feet
Overflow Weir Grate Slope =	4.00	N/A	H:V
Horiz. Length of Weir Sides =	2.92	N/A	feet
Overflow Grate Type =	Close Mesh Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	3.73	N/A	feet
Overflow Weir Slope Length =	3.01	N/A	feet
Grate Open Area / 100-yr Orifice Area =	6.07	N/A	
Overflow Grate Open Area w/o Debris =	13.50	N/A	ft^2
Overflow Grate Open Area w/ Debris =	6.75	N/A	ft^2

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

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	1.00	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	24.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	16.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	2.22	N/A	ft^2
Outlet Orifice Centroid =	0.75	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	1.91	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	6.00	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	80.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=	0.44	feet
Stage at Top of Freeboard =	7.44	feet
Basin Area at Top of Freeboard =	0.77	acres
Basin Volume at Top of Freeboard =	3.98	acre-ft

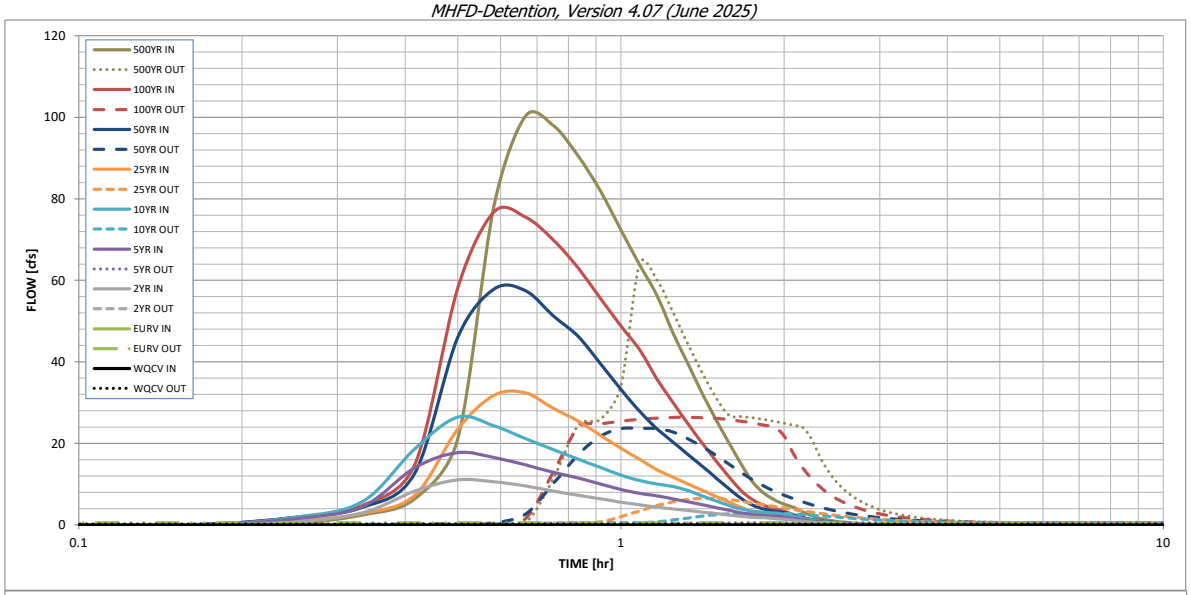
Routed Hydrograph Results

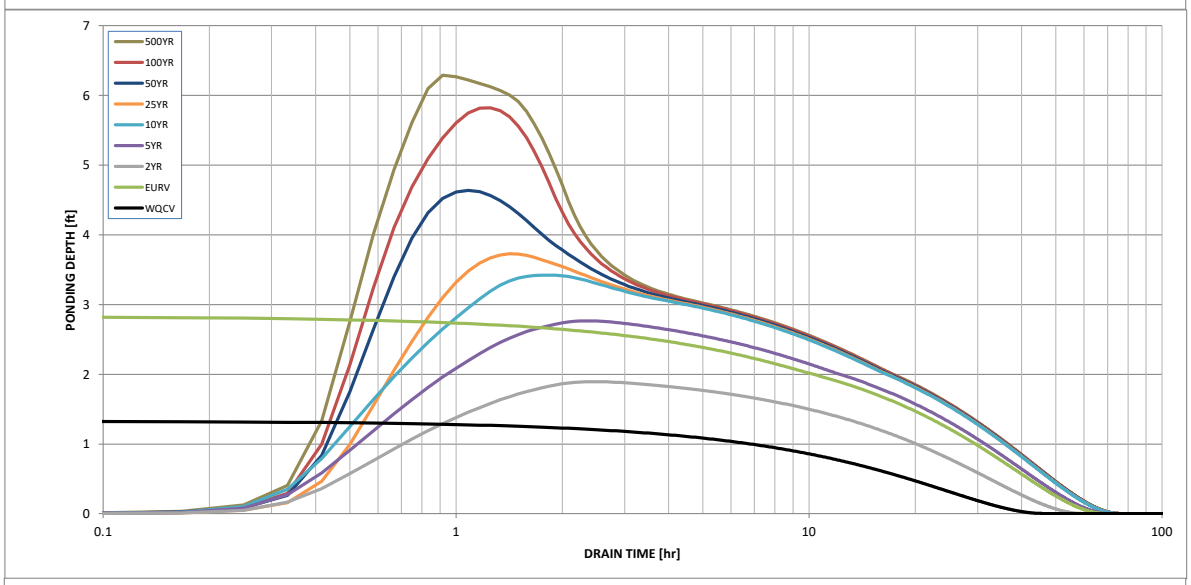
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

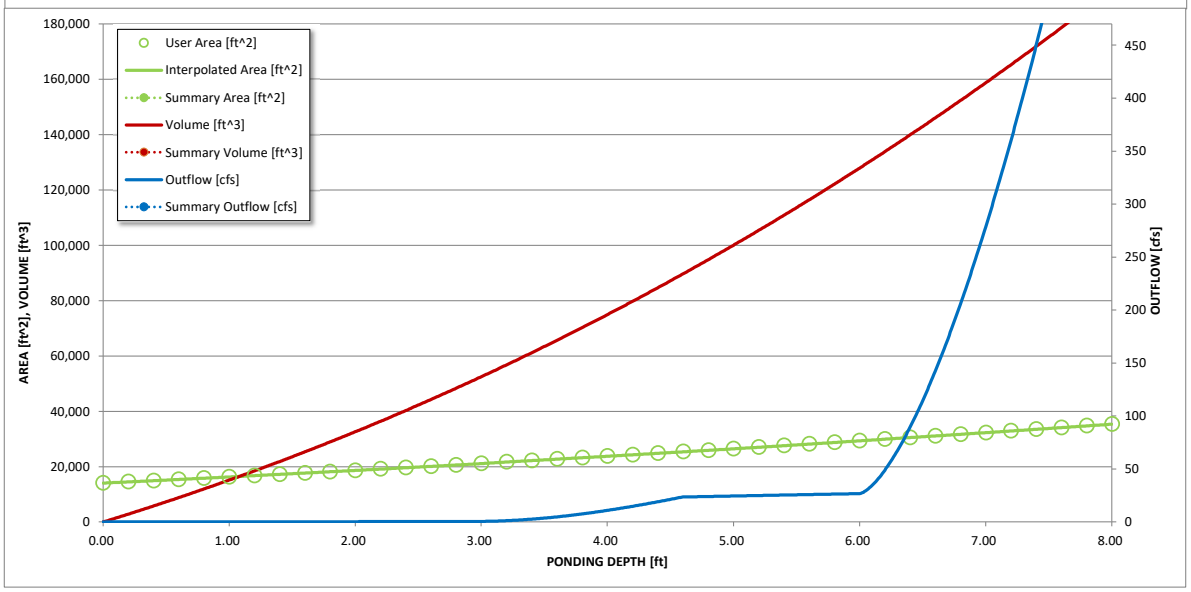
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.06	1.43	1.66	1.69	2.26	2.60	3.08
CUHP Runoff Volume (acre-ft) =	0.474	1.123	0.753	1.172	1.650	1.979	3.475	4.719	6.166
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.753	1.172	1.650	1.979	3.475	4.719	6.166
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	1.3	2.6	9.2	16.5	38.1	53.9	73.4
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.03	0.07	0.25	0.44	1.02	1.43	1.95
Peak Inflow Q (cfs) =	N/A	N/A	11.1	17.8	26.4	32.4	57.9	76.7	100.3
Peak Outflow Q (cfs) =	0.2	0.5	0.3	0.5	2.9	6.5	23.7	26.4	64.3
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.2	0.3	0.4	0.6	0.5	0.9
Structure Controlling Flow =	Plate	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	N/A	0.2	0.4	1.7	1.9	2.0
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) =	39	57	50	59	61	60	54	51	48
Time to Drain 99% of Inflow Volume (hours) =	**42**	62	54	64	67	66	64	62	60
Maximum Ponding Depth (ft) =	1.33	2.83	1.89	2.76	3.42	3.73	4.64	5.82	6.28
Area at Maximum Ponding Depth (acres) =	0.39	0.47	0.42	0.47	0.51	0.53	0.58	0.66	0.69
Maximum Volume Stored (acre-ft) =	0.474	1.124	0.702	1.090	1.409	1.570	2.076	2.817	3.128

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.07 (June 2025)







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

DETENTION BASIN OUTLET STRUCTURE DESIGN

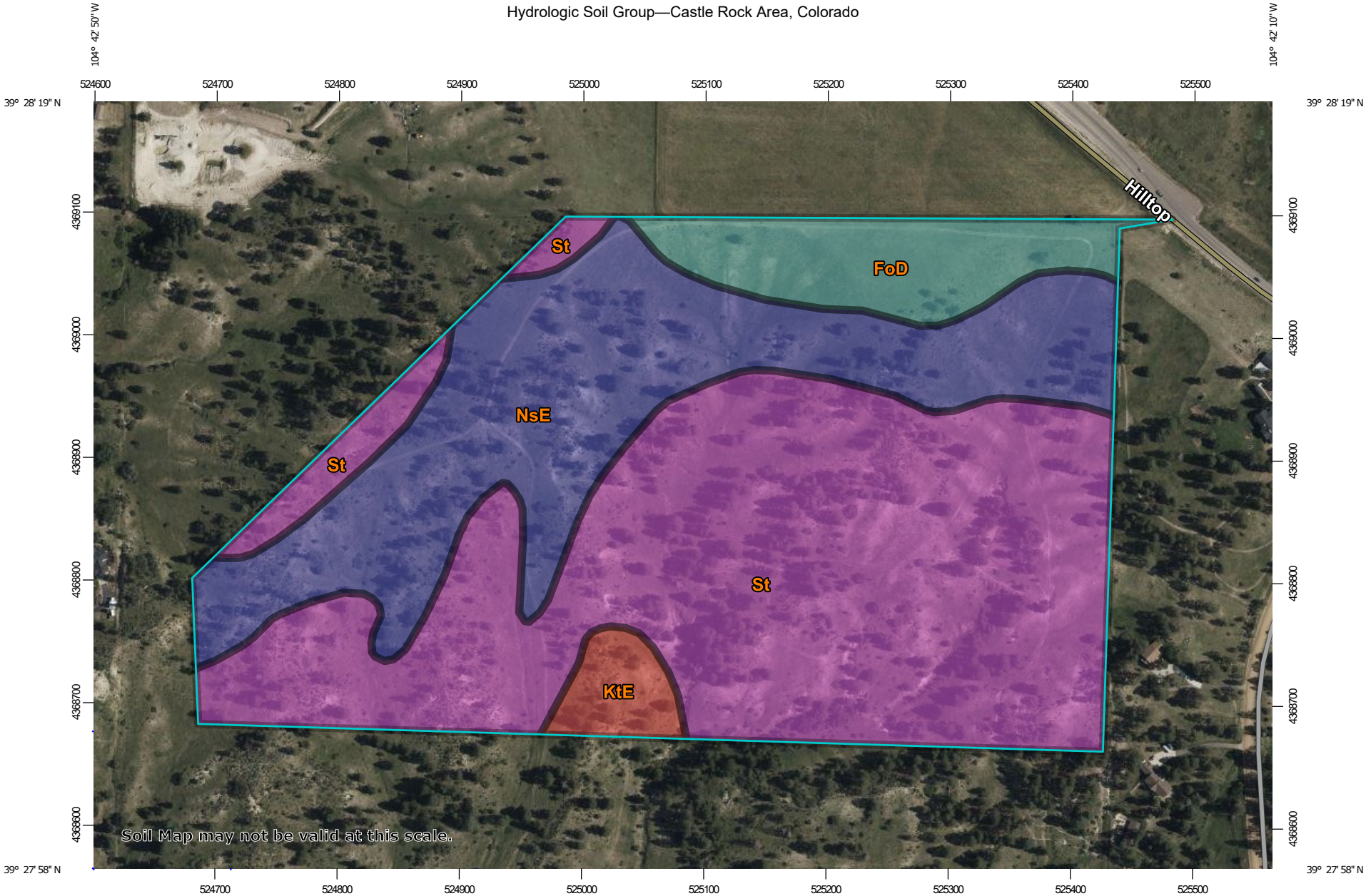
Outflow Hydrograph Workbook Filename: _____

Inflow Hydrographs

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

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0	0.00	0.00	0.00	0.00	0.00	0.12	0.06	0.35
	0:15:00	0	0.00	0.72	1.50	1.88	0.94	1.78	1.83	2.45
	0:20:00	0	0.00	2.99	4.50	5.69	2.82	4.29	4.77	6.39
	0:25:00	0	0.00	8.27	14.05	18.69	7.30	12.74	14.81	21.09
	0:30:00	0	0.00	11.09	17.76	26.43	23.46	46.00	58.04	78.13
	0:35:00	0	0.00	10.57	16.54	24.32	31.80	57.88	76.72	100.33
	0:40:00	0	0.00	9.54	14.71	21.16	32.39	57.43	75.54	98.00
	0:45:00	0	0.00	8.29	12.90	18.51	28.63	51.33	69.93	90.59
	0:50:00	0	0.00	7.27	11.51	16.13	25.51	46.31	63.09	81.90
	0:55:00	0	0.00	6.40	10.05	14.08	21.97	39.54	55.55	72.37
	1:00:00	0	0.00	5.59	8.70	12.22	18.80	33.25	48.83	63.74
	1:05:00	0	0.00	4.93	7.72	10.87	16.04	27.83	42.91	56.17
	1:10:00	0	0.00	4.35	7.10	10.05	13.51	23.51	35.70	46.84
	1:15:00	0	0.00	3.91	6.38	9.39	11.66	20.26	29.90	39.16
	1:20:00	0	0.00	3.51	5.62	8.35	9.97	17.12	24.53	31.97
	1:25:00	0	0.00	3.14	4.91	7.05	8.44	14.26	19.82	25.67
	1:30:00	0	0.00	2.78	4.23	5.83	6.95	11.45	15.64	20.07
	1:35:00	0	0.00	2.42	3.62	4.75	5.56	8.82	11.78	14.93
	1:40:00	0	0.00	2.10	2.94	3.87	4.29	6.46	8.38	10.49
	1:45:00	0	0.00	1.87	2.53	3.37	3.26	4.83	6.16	7.83
	1:50:00	0	0.00	1.75	2.30	3.12	2.67	3.91	4.83	6.19
	1:55:00	0	0.00	1.56	2.14	2.89	2.35	3.38	3.97	5.10
	2:00:00	0	0.00	1.40	1.98	2.62	2.17	3.03	3.38	4.32
	2:05:00	0	0.00	1.13	1.58	2.09	1.70	2.35	2.50	3.18
	2:10:00	0	0.00	0.89	1.23	1.61	1.30	1.78	1.79	2.24
	2:15:00	0	0.00	0.70	0.95	1.24	1.00	1.35	1.27	1.59
	2:20:00	0	0.00	0.55	0.73	0.94	0.76	1.01	0.94	1.18
	2:25:00	0	0.00	0.43	0.56	0.70	0.58	0.76	0.71	0.88
	2:30:00	0	0.00	0.33	0.42	0.52	0.43	0.56	0.53	0.66
	2:35:00	0	0.00	0.25	0.31	0.39	0.32	0.41	0.39	0.49
	2:40:00	0	0.00	0.19	0.23	0.29	0.24	0.31	0.30	0.37
	2:45:00	0	0.00	0.14	0.17	0.21	0.18	0.23	0.22	0.27
	2:50:00	0	0.00	0.10	0.12	0.15	0.13	0.16	0.15	0.18
	2:55:00	0	0.00	0.07	0.08	0.09	0.08	0.10	0.09	0.11
	3:00:00	0	0.00	0.04	0.05	0.05	0.05	0.06	0.05	0.06
	3:05:00	0	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	3:10:00	0	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00
	3:15:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:40:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:45:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hydrologic Soil Group—Castle Rock Area, Colorado



Map Scale: 1:4,410 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Castle Rock Area, Colorado
Survey Area Data: Version 17, Aug 29, 2024

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
FoD	Fondis clay loam, 3 to 9 percent slopes	C	6.1	8.9%
KtE	Kutch sandy loam, 5 to 20 percent slopes	D	1.8	2.7%
NsE	Newlin-Satanta complex, 5 to 20 percent slopes	B	21.3	31.3%
St	Stapleton-Bresser association	A	38.8	57.1%
Totals for Area of Interest			**68.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

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

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

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

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

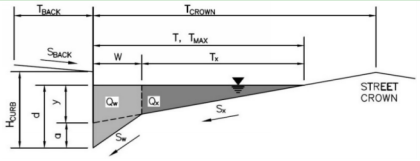
B2 Street Capacity Calculations

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **1084-0006**

Inlet ID: **Urban Local Min Slope**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.010		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**3.4**	**24.2**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 1.00 cfs on sheet 'Inlet Management'

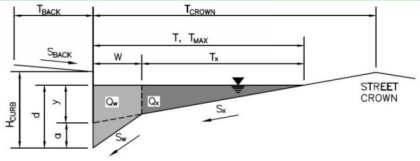
Major storm max. allowable capacity GOOD - greater than the design peak flow of 2.00 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **1084-0006**

Inlet ID: **Urban Local Max Slope**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.060		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**8.3**	**20.6**	**cfs**

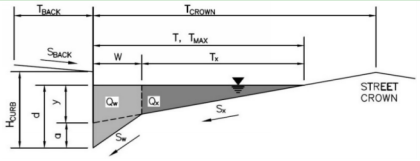
Minor storm max. allowable capacity GOOD - greater than the design peak flow of 1.00 cfs on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design peak flow of 2.00 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **1084-0006**
Inlet ID: **Cul-De-Sac Sump**



Gutter Geometry:

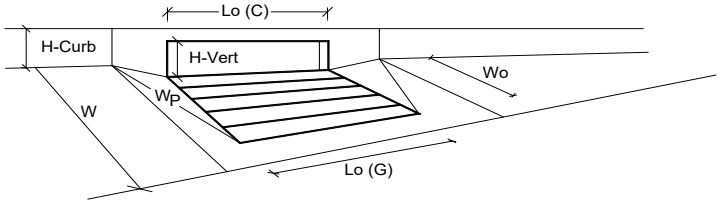
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	45.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	45.0	45.0	ft
Warning 02 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.2	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	5.00	5.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.2	12.0	inches
Grate Information			MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	15.00	15.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.35	0.83	ft
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.80	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**10.6**	**42.1**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)		$Q_{PEAK\ REQUIRED}$ =	6.0	19.0	cfs

B3 MHFD Inlet Calculations for Preliminary Capacity Check

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: Ramblewood - 1084-0006
Minor:
Major:

Worksheet Protected

INLET NAME	A2	SA1-5
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	On Grade	On Grade
Inlet Type		
Number of Inlet Units		

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	2.77	2.02
Major Peak Flow, Q (cfs)	7.83	6.08

Bypass (Carry-Over) Flow from Upstream Inlets must be organized from upstream (left) to downstream (right) in order for

Receive Bypass Flow from:		
Bypass Flow Description (Optional):		
Minor Bypass Flow Received, Q_b (cfs)		
Major Bypass Flow Received, Q_b (cfs)		

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	2.77	2.02
Major Total Design Peak Flow, Q (cfs)	7.83	6.08
Minor Inlet Interception Capacity, Q_a (cfs)		
Major Inlet Interception Capacity, Q_a (cfs)		
Minor Flow Bypassed Downstream, Qb (cfs)		
Major Flow Bypassed Downstream, Qb (cfs)		
Minor Flow Capture Percentage, C%		
Major Flow Capture Percentage, C%		

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: Ramblewood - 1084-0006
Minor:
Major:

Worksheet Protected

INLET NAME	SA1-6	A5
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	On Grade	On Grade
Inlet Type		
Number of Inlet Units		

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	2.11	1.60
Major Peak Flow, Q (cfs)	7.37	3.67

Bypass (Carry-Over) Flow from Upstream bypass flows to be linked.

Receive Bypass Flow from:		
Bypass Flow Description (Optional):		
Minor Bypass Flow Received, Q_b (cfs)		
Major Bypass Flow Received, Q_b (cfs)		

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	2.11	1.60
Major Total Design Peak Flow, Q (cfs)	7.37	3.67
Minor Inlet Interception Capacity, Q_a (cfs)		
Major Inlet Interception Capacity, Q_a (cfs)		
Minor Flow Bypassed Downstream, Qb (cfs)		
Major Flow Bypassed Downstream, Qb (cfs)		
Minor Flow Capture Percentage, C%		
Major Flow Capture Percentage, C%		

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: Ramblewood - 1084-0006
Minor:
Major:

Worksheet Protected

INLET NAME	SA1-2	B2
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	In Sump	On Grade
Inlet Type	CDOT Type R Curb Opening	
Number of Inlet Units	1	

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	4.37	4.72
Major Peak Flow, Q (cfs)	11.50	14.52

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:		
Bypass Flow Description (Optional):		
Minor Bypass Flow Received, Q_b (cfs)		
Major Bypass Flow Received, Q_b (cfs)		

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	4.37	4.72
Major Total Design Peak Flow, Q (cfs)	11.50	14.52
Minor Inlet Interception Capacity, Q_a (cfs)	5.78	
Major Inlet Interception Capacity, Q_a (cfs)	42.12	
Minor Flow Bypassed Downstream, Qb (cfs)	N/A	
Major Flow Bypassed Downstream, Qb (cfs)	N/A	
Minor Flow Capture Percentage, C%	100%	
Major Flow Capture Percentage, C%	100%	

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: Ramblewood - 1084-0006
Minor:
Major:

Worksheet Protected

INLET NAME	B3	SB1-3
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	On Grade	In Sump
Inlet Type		CDOT Type R Curb Opening
Number of Inlet Units		1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	3.21	7.94
Major Peak Flow, Q (cfs)	9.89	24.41

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:		
Bypass Flow Description (Optional):		
Minor Bypass Flow Received, Q_b (cfs)		
Major Bypass Flow Received, Q_b (cfs)		

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	3.21	7.94
Major Total Design Peak Flow, Q (cfs)	9.89	24.41
Minor Inlet Interception Capacity, Q_a (cfs)		11.10
Major Inlet Interception Capacity, Q_a (cfs)		42.12
Minor Flow Bypassed Downstream, Qb (cfs)		N/A
Major Flow Bypassed Downstream, Qb (cfs)		N/A
Minor Flow Capture Percentage, C%		100%
Major Flow Capture Percentage, C%		100%

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: Ramblewood - 1084-0006
Minor:
Major:

Worksheet Protected

INLET NAME	B4	B5
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	On Grade	On Grade
Inlet Type		
Number of Inlet Units		

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	4.03	3.02
Major Peak Flow, Q (cfs)	13.02	9.08

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:		
Bypass Flow Description (Optional):		
Minor Bypass Flow Received, Q_b (cfs)		
Major Bypass Flow Received, Q_b (cfs)		

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	4.03	3.02
Major Total Design Peak Flow, Q (cfs)	13.02	9.08
Minor Inlet Interception Capacity, Q_a (cfs)		
Major Inlet Interception Capacity, Q_a (cfs)		
Minor Flow Bypassed Downstream, Qb (cfs)		
Major Flow Bypassed Downstream, Qb (cfs)		
Minor Flow Capture Percentage, C%		
Major Flow Capture Percentage, C%		

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: Ramblewood - 1084-0006
Minor:
Major:

Worksheet Protected

INLET NAME	SB2-6	B6
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	In Sump	On Grade
Inlet Type	CDOT Type R Curb Opening	
Number of Inlet Units	1	

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	7.05	4.52
Major Peak Flow, Q (cfs)	22.09	14.10

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:		
Bypass Flow Description (Optional):		
Minor Bypass Flow Received, Q_b (cfs)		
Major Bypass Flow Received, Q_b (cfs)		

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	7.05	4.52
Major Total Design Peak Flow, Q (cfs)	22.09	14.10
Minor Inlet Interception Capacity, Q_a (cfs)	8.04	
Major Inlet Interception Capacity, Q_a (cfs)	42.12	
Minor Flow Bypassed Downstream, Qb (cfs)	N/A	
Major Flow Bypassed Downstream, Qb (cfs)	N/A	
Minor Flow Capture Percentage, C%	100%	
Major Flow Capture Percentage, C%	100%	

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: Ramblewood - 1084-0006
Minor:
Major:

Worksheet Protected

INLET NAME	B7	SA1-8
Inlet Application (Street or Area)	STREET	STREET
Hydraulic Condition	On Grade	In Sump
Inlet Type		CDOT Type R Curb Opening
Number of Inlet Units		1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	2.87	1.76
Major Peak Flow, Q (cfs)	8.31	3.79

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:		
Bypass Flow Description (Optional):		
Minor Bypass Flow Received, Q_b (cfs)		
Major Bypass Flow Received, Q_b (cfs)		

CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	2.87	1.76
Major Total Design Peak Flow, Q (cfs)	8.31	3.79
Minor Inlet Interception Capacity, Q_a (cfs)		1.91
Major Inlet Interception Capacity, Q_a (cfs)		7.05
Minor Flow Bypassed Downstream, Qb (cfs)		N/A
Major Flow Bypassed Downstream, Qb (cfs)		N/A
Minor Flow Capture Percentage, C%		100%
Major Flow Capture Percentage, C%		100%

MHFD-Inlet, Version 6.00 (August 2025)

INLET MANAGEMENT

Project: Ramblewood - 1084-0006
Minor:
Major:

Worksheet Protected

INLET NAME	SA1-9
Inlet Application (Street or Area)	STREET
Hydraulic Condition	In Sump
Inlet Type	CDOT Type R Curb Opening
Number of Inlet Units	1

USER-DEFINED INPUT

User-Defined Peak Flows

Minor Peak Flow, Q (cfs)	1.78
Major Peak Flow, Q (cfs)	5.12

Bypass (Carry-Over) Flow from Upstream

Receive Bypass Flow from:	
Bypass Flow Description (Optional):	
Minor Bypass Flow Received, Q_b (cfs)	
Major Bypass Flow Received, Q_b (cfs)	

CALCULATED OUTPUT

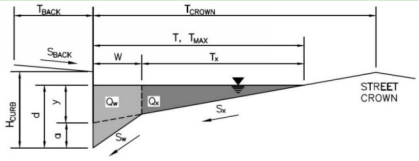
Minor Total Design Peak Flow, Q (cfs)	1.78
Major Total Design Peak Flow, Q (cfs)	5.12
Minor Inlet Interception Capacity, Q_a (cfs)	2.47
Major Inlet Interception Capacity, Q_a (cfs)	11.35
Minor Flow Bypassed Downstream, Qb (cfs)	N/A
Major Flow Bypassed Downstream, Qb (cfs)	N/A
Minor Flow Capture Percentage, C%	100%
Major Flow Capture Percentage, C%	100%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **A2**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.016		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**4.3**	**30.6**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.77 cfs on sheet 'Inlet Management'

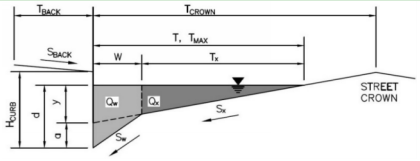
Major storm max. allowable capacity GOOD - greater than the design peak flow of 7.83 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **SA1-5**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.009		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**3.2**	**23.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.02 cfs on sheet 'Inlet Management'

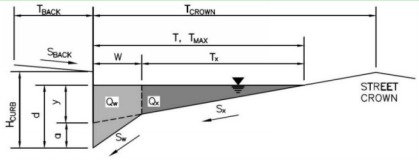
Major storm max. allowable capacity GOOD - greater than the design peak flow of 6.08 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **SA1-6**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.009		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**3.2**	**23.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.11 cfs on sheet 'Inlet Management'

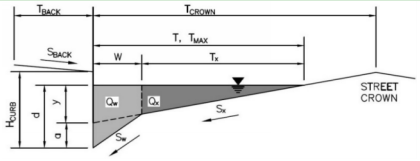
Major storm max. allowable capacity GOOD - greater than the design peak flow of 7.37 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **A5**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.016		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**4.3**	**30.5**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 1.60 cfs on sheet 'Inlet Management'

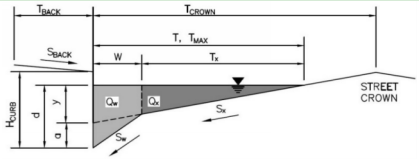
Major storm max. allowable capacity GOOD - greater than the design peak flow of 3.67 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **SA1-2**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	45.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	45.0	45.0	ft
Warning 02 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.0	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

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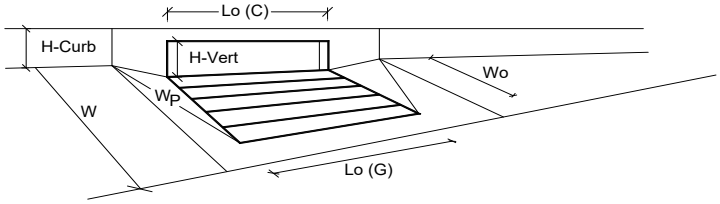


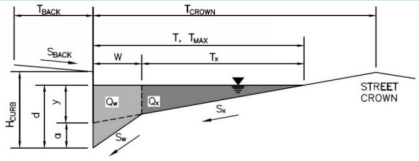
Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	5.00	5.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	5.0	12.0	inches
Grate Information			MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	15.00	15.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.25	0.83	ft
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.72	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**5.8**	**42.1**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)		$Q_{PEAK\ REQUIRED}$ =	4.4	11.5	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **B2**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.050		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**7.6**	**21.7**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 4.72 cfs on sheet 'Inlet Management'

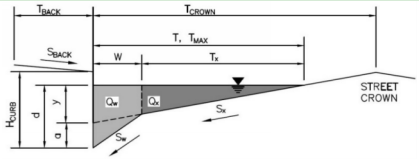
Major storm max. allowable capacity GOOD - greater than the design peak flow of 14.52 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **B3**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.050		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**7.6**	**21.7**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 3.21 cfs on sheet 'Inlet Management'

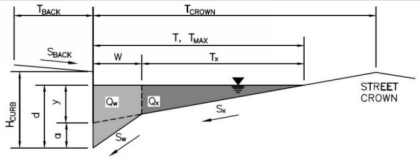
Major storm max. allowable capacity GOOD - greater than the design peak flow of 9.89 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **SB1-3**



Gutter Geometry:

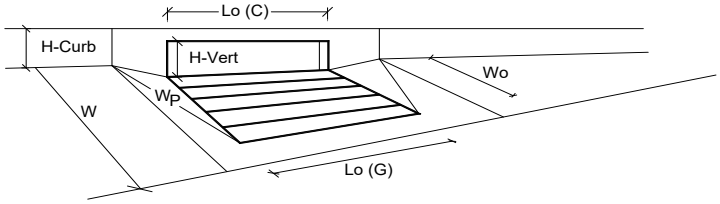
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	45.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	45.0	45.0	ft
Warning 02 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.3	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



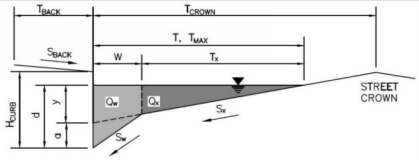
Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	5.00	5.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.3	12.0	inches
Grate Information			MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	15.00	15.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.36	0.83	ft
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.81	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**11.1**	**42.1**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)		$Q_{PEAK\ REQUIRED}$ =	7.9	24.4	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **B4**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.027		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**5.6**	**26.1**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 4.03 cfs on sheet 'Inlet Management'

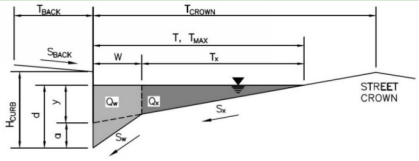
Major storm max. allowable capacity GOOD - greater than the design peak flow of 13.02 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **B5**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.027		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**5.6**	**26.1**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 3.02 cfs on sheet 'Inlet Management'

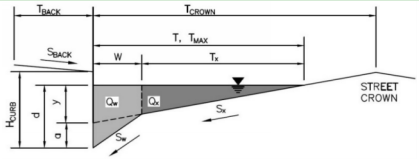
Major storm max. allowable capacity GOOD - greater than the design peak flow of 9.08 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **SB2-6**



Gutter Geometry:

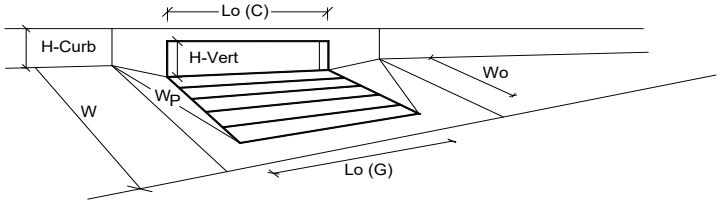
Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	10.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	45.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	45.0	45.0	ft
Warning 02 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	5.6	12.0	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is not applicable to Sump Condition				
MAJOR STORM Allowable Capacity is not applicable to Sump Condition	**Q_{allow} =**	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



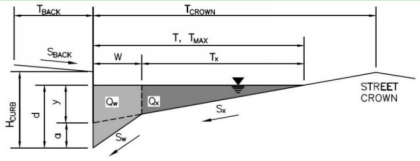
Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	5.00	5.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	5.6	12.0	inches
Grate Information			MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	15.00	15.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.30	0.83	ft
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.76	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**8.0**	**42.1**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)		$Q_{PEAK\ REQUIRED}$ =	7.1	22.1	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **B6**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.036		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	
		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**6.4**	**24.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 4.52 cfs on sheet 'Inlet Management'

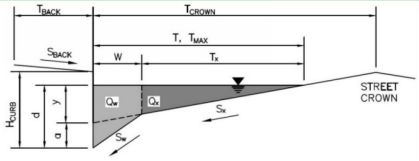
Major storm max. allowable capacity GOOD - greater than the design peak flow of 14.10 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **B7**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	11.0		ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.025		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020		
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00		inches
Distance from Curb Face to Street Crown	T_{CROWN} =	14.0		ft
Gutter Width	W =	2.00		ft
Street Transverse Slope	S_X =	0.020		ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083		ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.036		ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016		
		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	14.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.0	inches
Allow Flow Depth at Street Crown (check box for yes, leave blank for no)		☐	☑	

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**6.4**	**24.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design peak flow of 2.87 cfs on sheet 'Inlet Management'

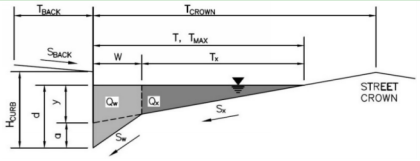
Major storm max. allowable capacity GOOD - greater than the design peak flow of 8.31 cfs on sheet 'Inlet Management'

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **SA1-8**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	23.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	22.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	22.0	22.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	9.5	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

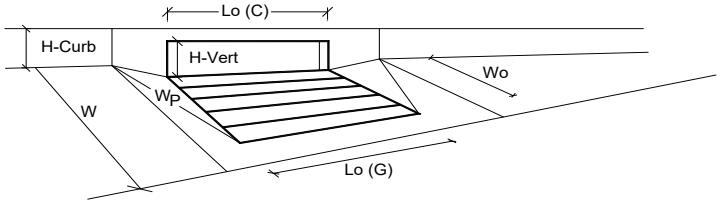
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



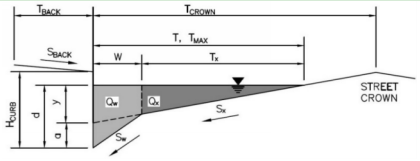
Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	5.00	5.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	4.0	6.8	inches
Grate Information			MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.17	0.40	ft
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	1.00	1.00	
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**1.9**	**7.0**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)		$Q_{PEAK\ REQUIRED}$ =	1.8	3.8	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: **Ramblewood - 1084-0006**

Inlet ID: **SA1-9**



Gutter Geometry:

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	23.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	22.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.000	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.016	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	22.0	22.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	9.5	inches
Check boxes are not applicable in SUMP conditions		☐	☐	

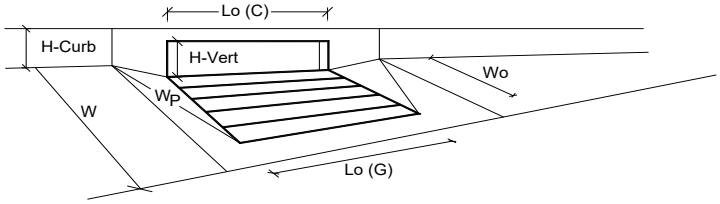
MINOR STORM Allowable Capacity is not applicable to Sump Condition

MAJOR STORM Allowable Capacity is not applicable to Sump Condition

	Minor Storm	Major Storm	
Q_{allow} =	**SUMP**	**SUMP**	**cfs**

INLET IN A SUMP OR SAG LOCATION

MHFD-Inlet, Version 6.00 (August 2025)



Design Information (Input)	CDOT Type R Curb Opening		MINOR	MAJOR	
Type of Inlet		Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a_{local} =	5.00	5.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	4.0	6.8	inches
Grate Information			MINOR	MAJOR	☐ Override Depths
Length of a Unit Grate		L_o (G) =	N/A	N/A	feet
Width of a Unit Grate		W_o =	N/A	N/A	feet
Open Area Ratio for a Grate (typical values 0.15-0.90)		A_{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C_f (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C_w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C_o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L_o (C) =	10.00	10.00	feet
Height of Vertical Curb Opening in Inches		H_{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H_{throat} =	6.00	6.00	inches
Angle of Throat		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W_p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C_f (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C_w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C_o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d_{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d_{Curb} =	0.17	0.40	ft
Grated Inlet Performance Reduction Factor for Long Inlets		RF_{Grate} =	N/A	N/A	
Curb Opening Performance Reduction Factor for Long Inlets		RF_{Curb} =	0.79	0.98	
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination}$ =	N/A	N/A	
			MINOR	MAJOR	
Total Inlet Interception Capacity (assumes clogged condition)		**Q_a =**	**2.5**	**11.3**	**cfs**
Inlet Capacity IS GOOD for Minor and Major Storms (>Q Peak)		$Q_{PEAK\ REQUIRED}$ =	1.8	5.1	cfs

B4 Swale Stability Charts

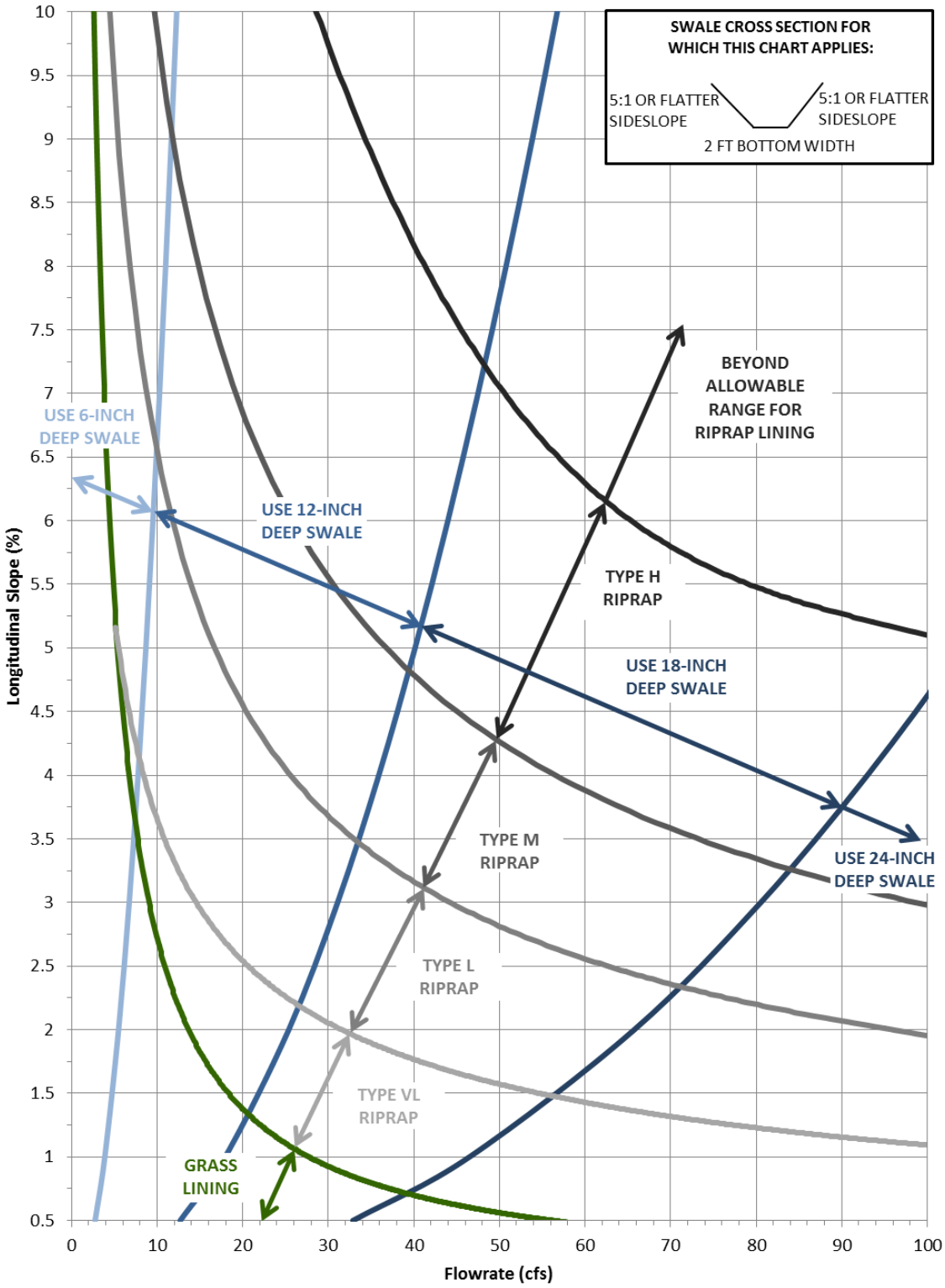


Figure 8-22. Swale stability chart; 2- to 4-foot bottom width and side slopes between 5:1 and 10:1 (Note: Riprap classifications refer to gradation for riprap used in soil riprap or void-filled riprap. See Figure 8-34 for gradations.) (Source: Muller Engineering Company)

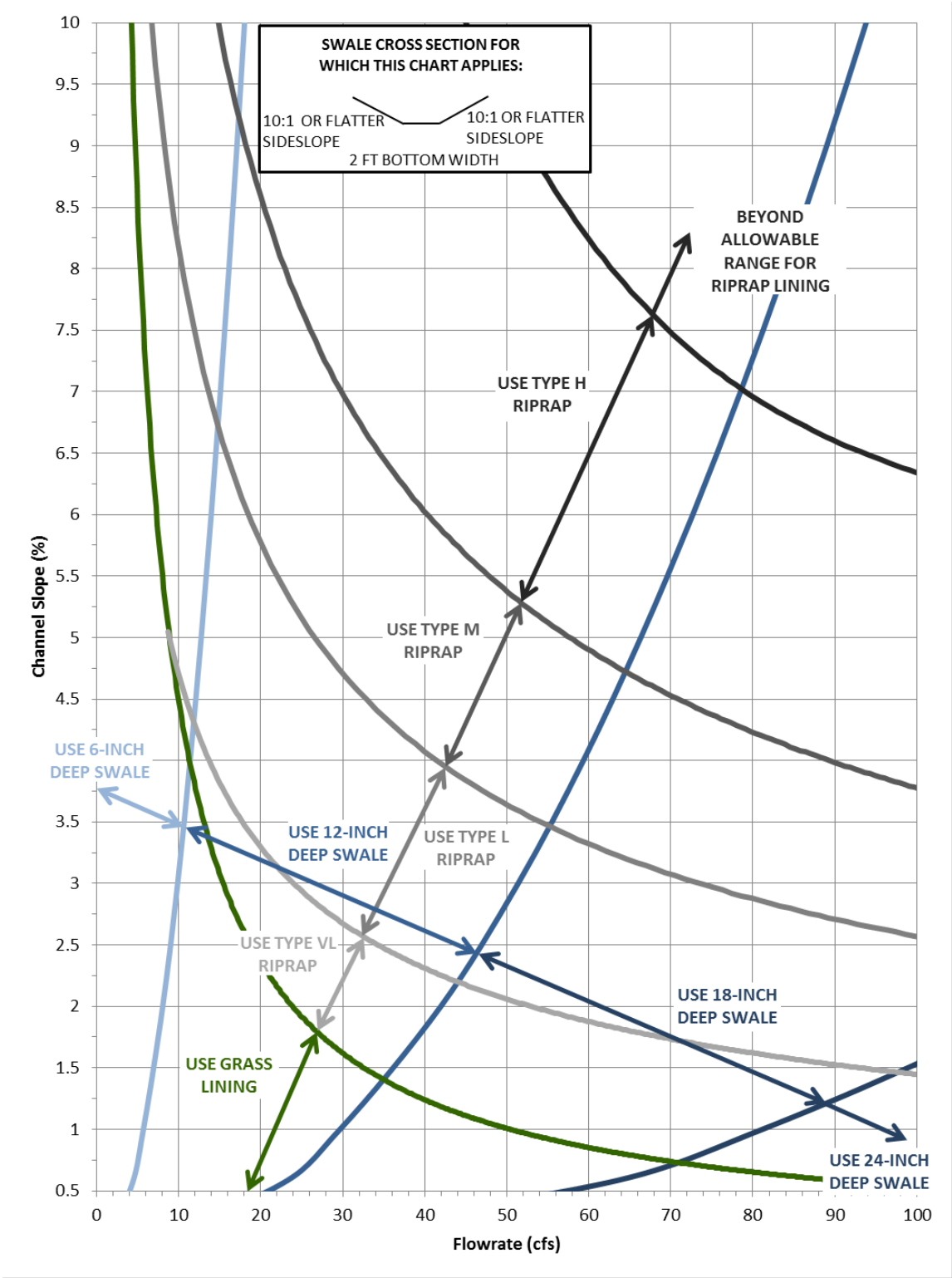


Figure 8-23. Swale stability chart: 2- to 4-foot bottom width and 10:1 (or flatter) side slopes
(Note: Riprap classifications refer to gradation for riprap used in soil riprap or void-filled riprap. See Figure 8-34 for gradations.) (Source: Muller Engineering Company)

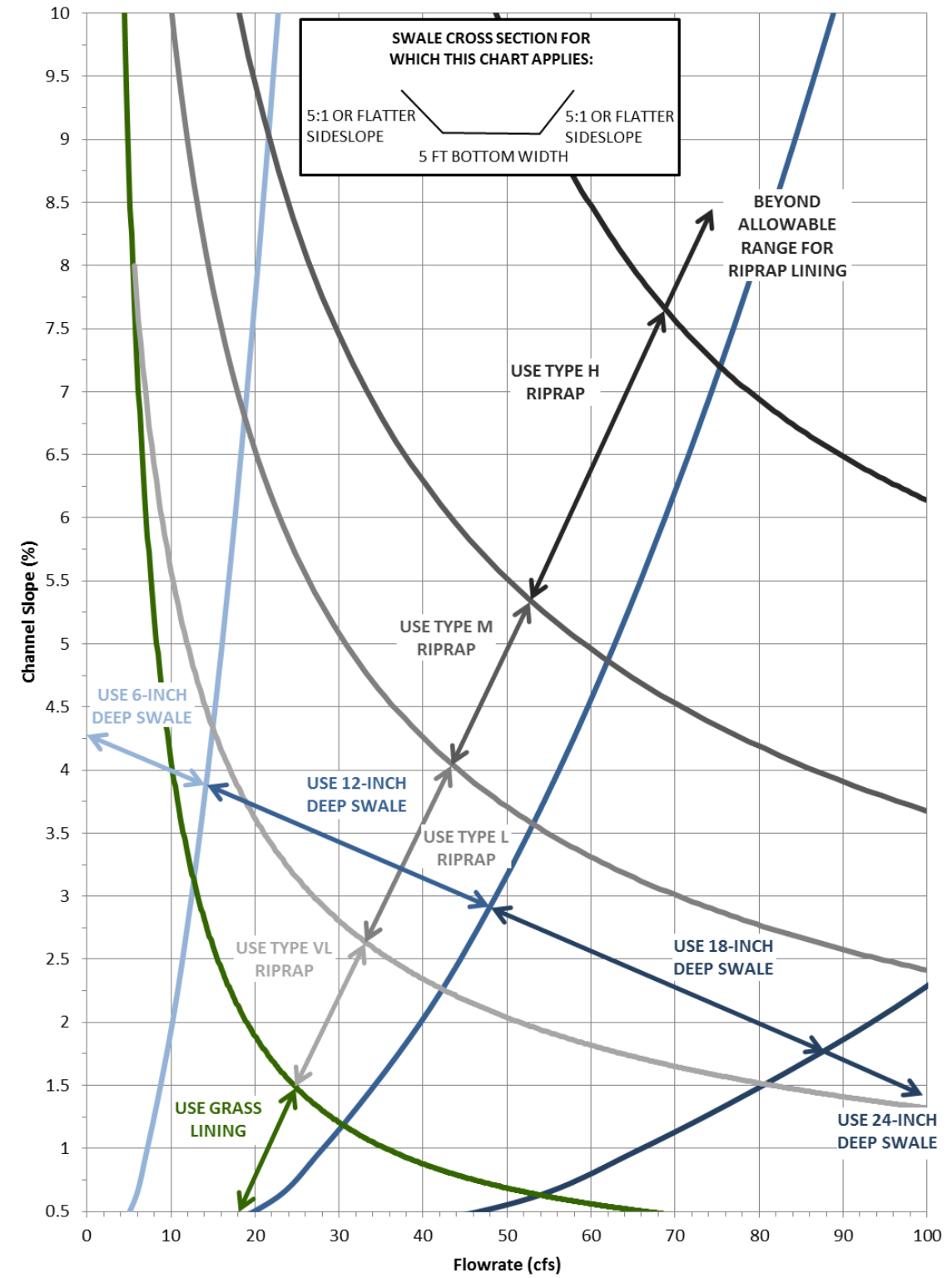


Figure 8-24. Swale stability chart: greater than 4-foot bottom width and side slopes between 5:1 and 10:1

(Note: Riprap classifications refer to gradation for riprap used in soil riprap or void-filled riprap. See Figure 8-34 for gradations.) (Source: Muller Engineering Company)

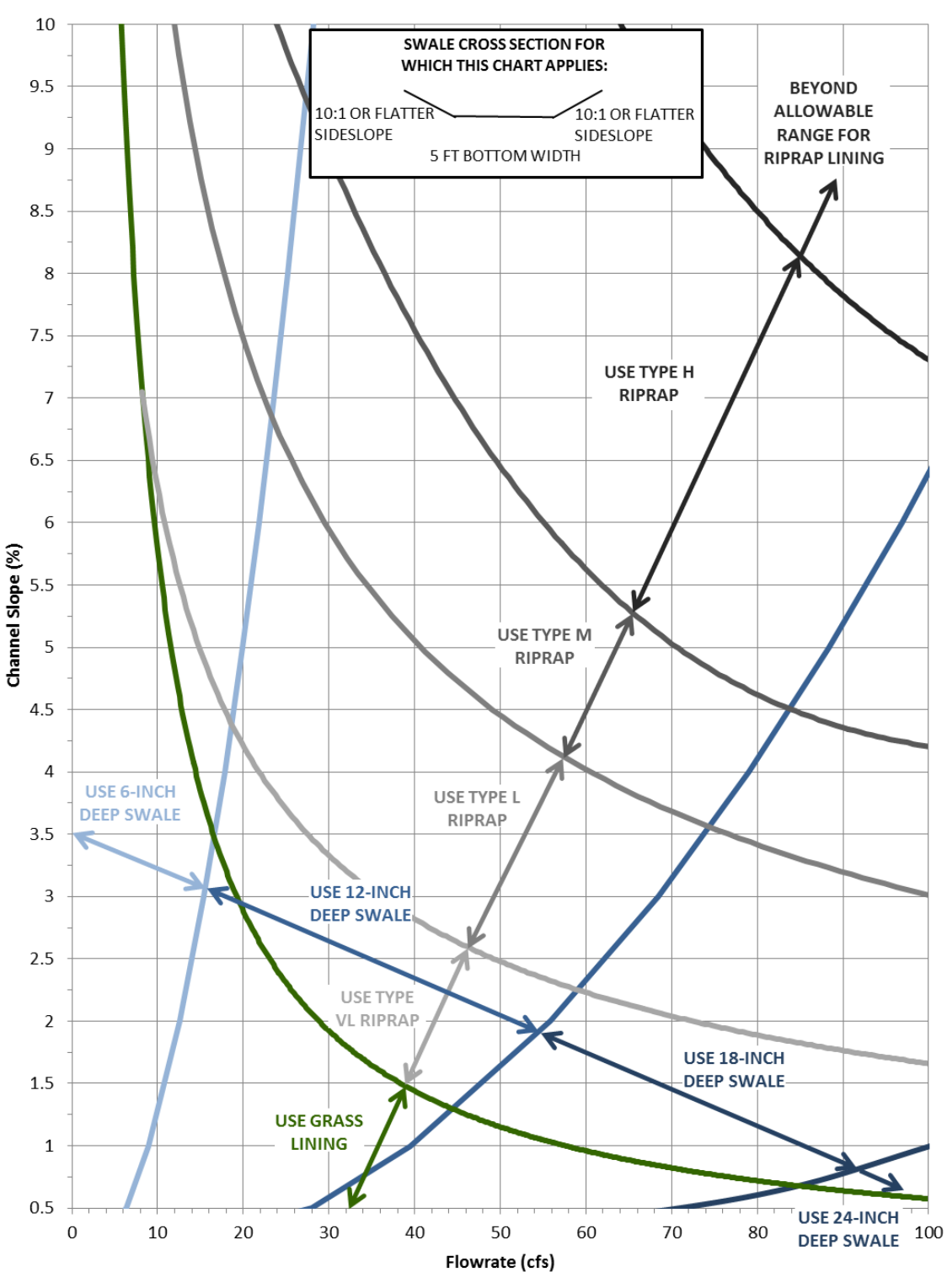


Figure 8-25. Swale stability chart: greater than 4-foot bottom width and 10:1 (or flatter) side slopes (Note: Riprap classifications refer to gradation for riprap used in soil riprap or void-filled riprap. See Figure 8-34 for gradations.) (Source: Muller Engineering Company)

Ramblewood Preliminary Plan
Project File: SB2025-040
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B5 Preliminary Culvert Calculations

Culvert Report

CULVERT SA1-10 TO SA1-7, BASIN A10

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 9 2025

Circular Culvert

Invert Elev Dn (ft)	=	6377.61
Pipe Length (ft)	=	65.00
Slope (%)	=	1.00
Invert Elev Up (ft)	=	6378.26
Rise (in)	=	24.0
Shape	=	Circular
Span (in)	=	24.0
No. Barrels	=	1
n-Value	=	0.013
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Square edge w/headwall (C)
Coeff. K,M,c,Y,k	=	0.0098, 2, 0.0398, 0.67, 0.5

Embankment

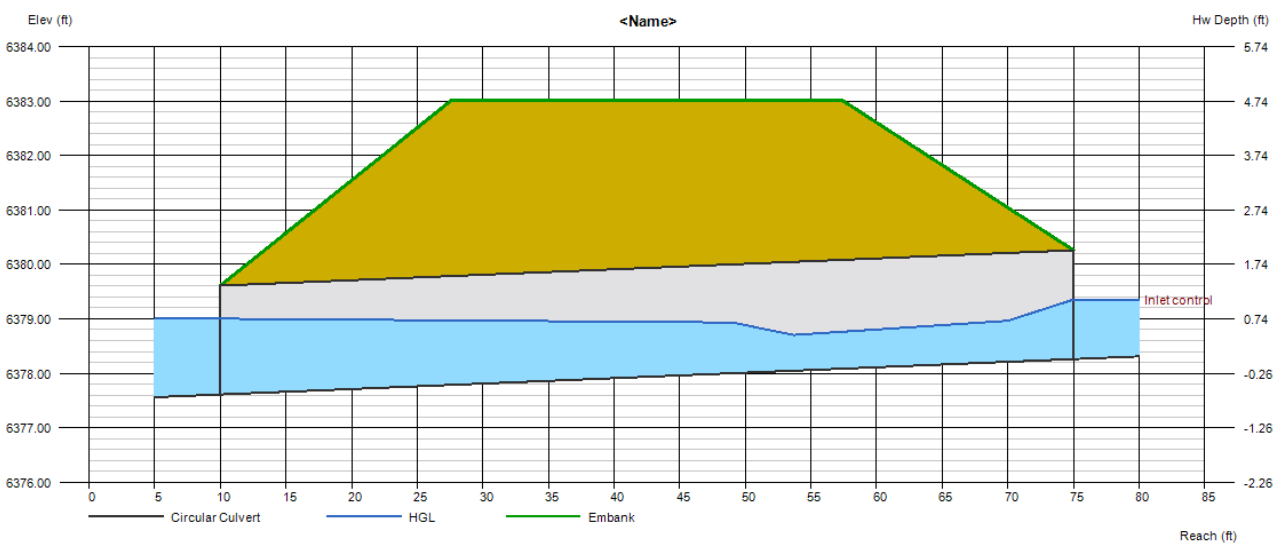
Top Elevation (ft)	=	6383.01
Top Width (ft)	=	29.84
Crest Width (ft)	=	20.00

Calculations

Qmin (cfs)	=	4.98
Qmax (cfs)	=	4.98
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	4.98
Qpipe (cfs)	=	4.98
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	2.13
Veloc Up (ft/s)	=	4.35
HGL Dn (ft)	=	6379.00
HGL Up (ft)	=	6379.05
Hw Elev (ft)	=	6379.35
Hw/D (ft)	=	0.55
Flow Regime	=	Inlet Control



Culvert Report

CULVERT SD1-2 TO SD1-1, BASINS D7+D8

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 9 2025

Circular Culvert

Invert Elev Dn (ft)	=	6276.99
Pipe Length (ft)	=	79.00
Slope (%)	=	1.00
Invert Elev Up (ft)	=	6277.78
Rise (in)	=	24.0
Shape	=	Circular
Span (in)	=	24.0
No. Barrels	=	1
n-Value	=	0.013
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Square edge w/headwall (C)
Coeff. K,M,c,Y,k	=	0.0098, 2, 0.0398, 0.67, 0.5

Embankment

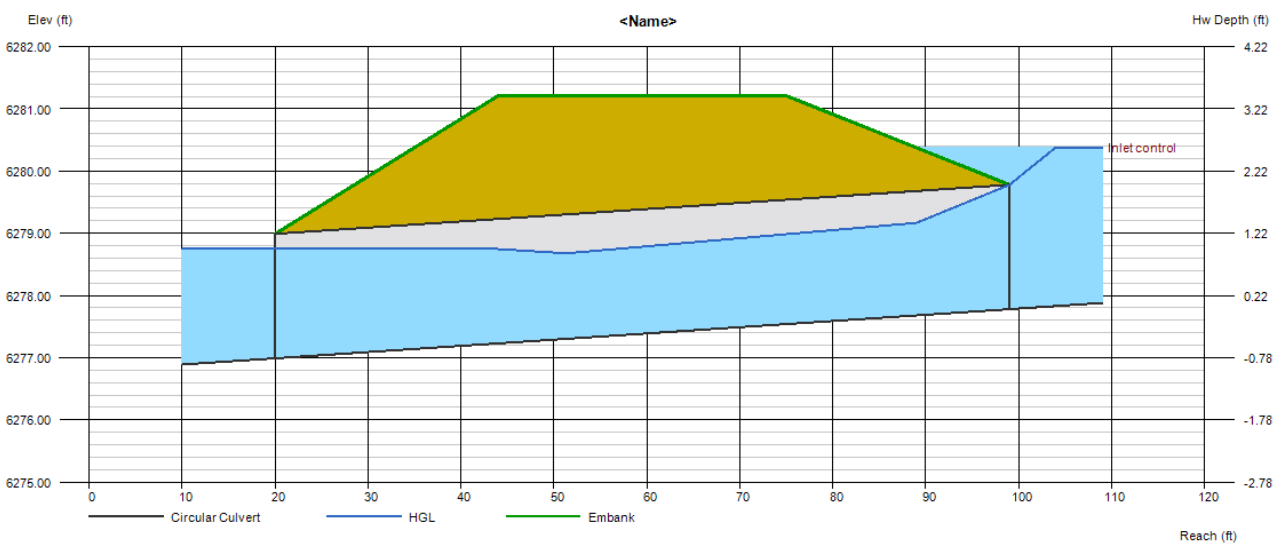
Top Elevation (ft)	=	6281.21
Top Width (ft)	=	31.00
Crest Width (ft)	=	20.00

Calculations

Qmin (cfs)	=	17.77
Qmax (cfs)	=	17.77
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	17.77
Qpipe (cfs)	=	17.77
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	6.07
Veloc Up (ft/s)	=	6.95
HGL Dn (ft)	=	6278.75
HGL Up (ft)	=	6279.30
Hw Elev (ft)	=	6280.38
Hw/D (ft)	=	1.30
Flow Regime	=	Inlet Control



Culvert Report

CULVERT SD1-4 TO SD1-3, BASINS D6

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Oct 9 2025

Circular Culvert

Invert Elev Dn (ft)	=	6275.94
Pipe Length (ft)	=	88.00
Slope (%)	=	1.00
Invert Elev Up (ft)	=	6276.82
Rise (in)	=	24.0
Shape	=	Circular
Span (in)	=	24.0
No. Barrels	=	1
n-Value	=	0.013
Culvert Type	=	Circular Concrete
Culvert Entrance	=	Square edge w/headwall (C)
Coeff. K,M,c,Y,k	=	0.0098, 2, 0.0398, 0.67, 0.5

Embankment

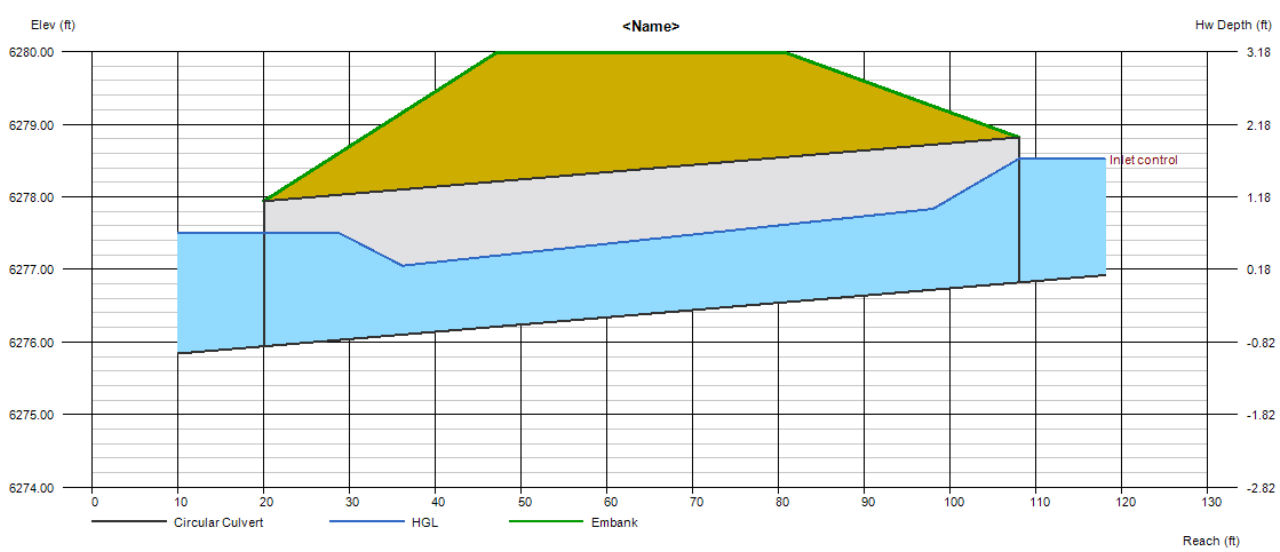
Top Elevation (ft)	=	6279.98
Top Width (ft)	=	33.94
Crest Width (ft)	=	20.00

Calculations

Qmin (cfs)	=	10.19
Qmax (cfs)	=	10.19
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	10.19
Qpipe (cfs)	=	10.19
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	3.85
Veloc Up (ft/s)	=	5.50
HGL Dn (ft)	=	6277.51
HGL Up (ft)	=	6277.96
Hw Elev (ft)	=	6278.53
Hw/D (ft)	=	0.85
Flow Regime	=	Inlet Control



B6 FlowMaster Max Pipe Flow

Worksheet for 18" PP

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Normal Depth	16.0 in
Diameter	18.0 in

Results	
Discharge	11.13 cfs
Flow Area	1.7 ft²
Wetted Perimeter	3.7 ft
Hydraulic Radius	5.4 in
Top Width	0.94 ft
Critical Depth	15.3 in
Percent Full	88.9 %
Critical Slope	0.011 ft/ft
Velocity	6.71 ft/s
Velocity Head	0.70 ft
Specific Energy	2.03 ft
Froude Number	0.891
Maximum Discharge	11.30 cfs
Discharge Full	10.50 cfs
Slope Full	0.011 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	88.9 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	16.0 in
Critical Depth	15.3 in
Channel Slope	0.010 ft/ft
Critical Slope	0.011 ft/ft

Worksheet for 24" PP

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Normal Depth	21.0 in
Diameter	24.0 in

Results	
Discharge	23.77 cfs
Flow Area	2.9 ft²
Wetted Perimeter	4.8 ft
Hydraulic Radius	7.2 in
Top Width	1.32 ft
Critical Depth	20.7 in
Percent Full	87.5 %
Critical Slope	0.010 ft/ft
Velocity	8.15 ft/s
Velocity Head	1.03 ft
Specific Energy	2.78 ft
Froude Number	0.968
Maximum Discharge	24.33 cfs
Discharge Full	22.62 cfs
Slope Full	0.011 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	87.5 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	21.0 in
Critical Depth	20.7 in
Channel Slope	0.010 ft/ft
Critical Slope	0.010 ft/ft

Worksheet for 30" PP

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Normal Depth	28.0 in
Diameter	30.0 in

Results	
Discharge	44.11 cfs
Flow Area	4.8 ft²
Wetted Perimeter	6.5 ft
Hydraulic Radius	8.7 in
Top Width	1.25 ft
Critical Depth	26.5 in
Percent Full	93.3 %
Critical Slope	0.010 ft/ft
Velocity	9.25 ft/s
Velocity Head	1.33 ft
Specific Energy	3.66 ft
Froude Number	0.834
Maximum Discharge	44.12 cfs
Discharge Full	41.01 cfs
Slope Full	0.012 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	96.7 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	28.0 in
Critical Depth	26.5 in
Channel Slope	0.010 ft/ft
Critical Slope	0.010 ft/ft

Worksheet for 36" PP

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	0.010 ft/ft
Normal Depth	34.0 in
Diameter	36.0 in

Results	
Discharge	71.72 cfs
Flow Area	6.9 ft²
Wetted Perimeter	8.0 ft
Hydraulic Radius	10.4 in
Top Width	1.37 ft
Critical Depth	32.2 in
Percent Full	94.4 %
Critical Slope	0.010 ft/ft
Velocity	10.37 ft/s
Velocity Head	1.67 ft
Specific Energy	4.51 ft
Froude Number	0.815
Maximum Discharge	71.74 cfs
Discharge Full	66.69 cfs
Slope Full	0.012 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	88.9 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	34.0 in
Critical Depth	32.2 in
Channel Slope	0.010 ft/ft
Critical Slope	0.010 ft/ft

Appendix C. Referenced Information

C1 Soil Map

United States Department of Agriculture

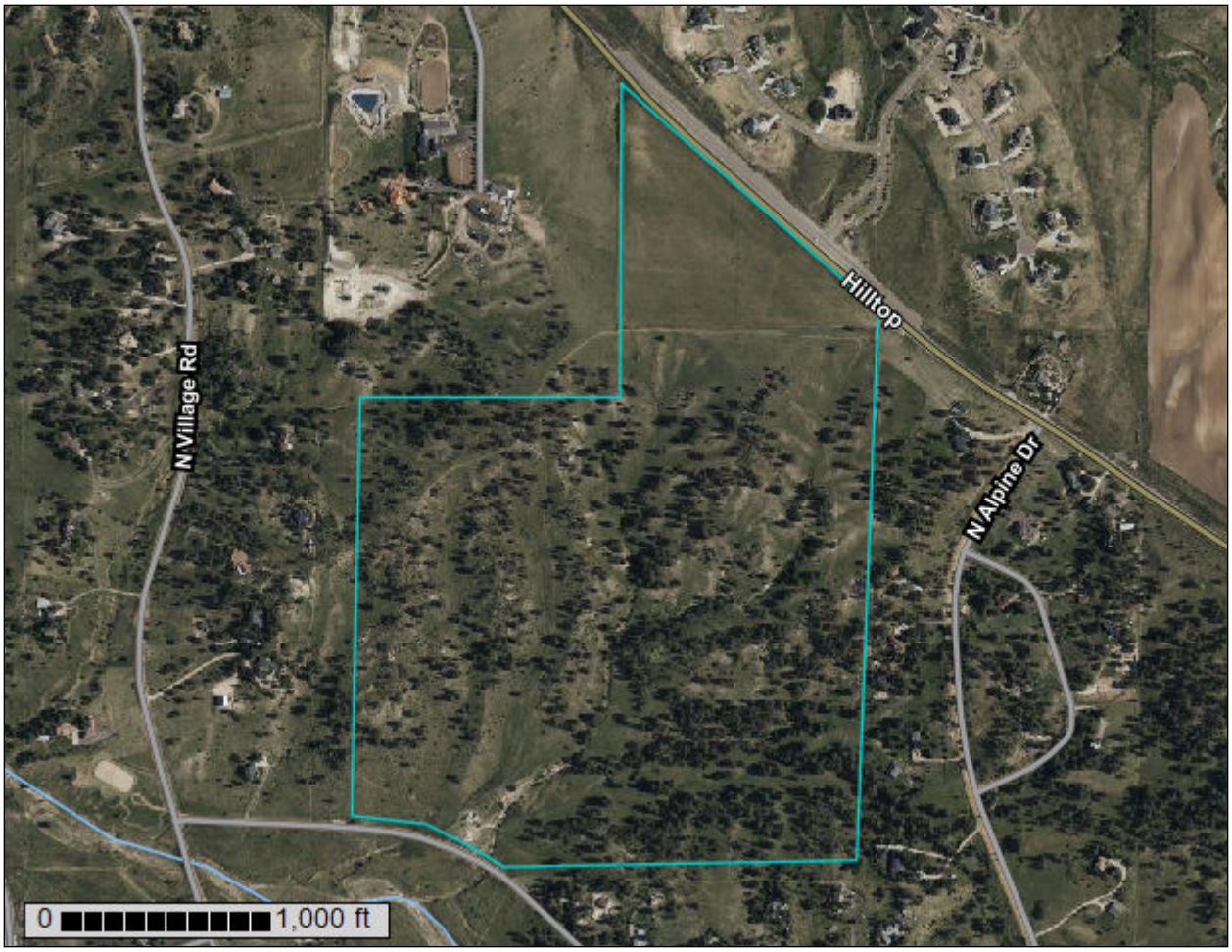
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for

Castle Rock Area, Colorado



October 25, 2024

Preface

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

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

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

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

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

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

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

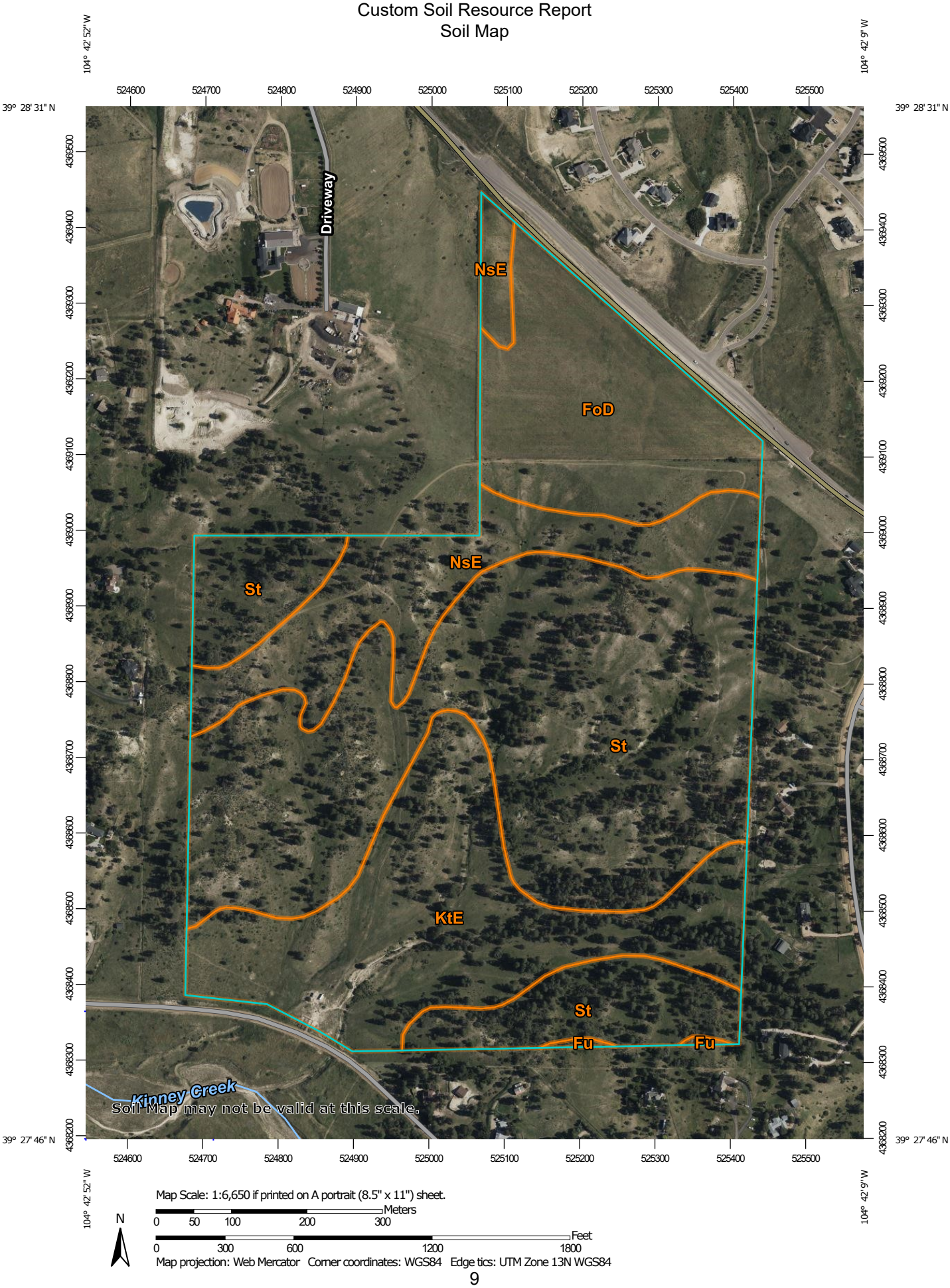
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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


104° 42' 52" W
104° 42' 9" W
39° 28' 31" N
39° 27' 46" N
524600
524700
524800
524900
525000
525100
525200
525300
525400
525500
4369500
4369400
4369300
4369200
4369100
4369000
4368900
4368800
4368700
4368600
4368500
4368400
4368300
4368200
Driveway
NsE
FoD
NsE
St
St
KtE
St
Fu
Fu
Kinney Creek
Soil Map may not be valid at this scale.
Map Scale: 1:6,650 if printed on A portrait (8.5" x 11") sheet.
Meters
0 50 100 200 300
Feet
0 300 600 1200 1800
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Castle Rock Area, Colorado
Survey Area Data: Version 17, Aug 29, 2024

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

Date(s) aerial images were photographed: Mar 1, 2023—Sep 1, 2023

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI	
FoD	Fondis clay loam, 3 to 9 percent slopes	21.4	14.4%	Type C
Fu	Fondis-Kutch association	0.3	0.2%	Type C
KtE	Kutch sandy loam, 5 to 20 percent slopes	32.5	21.8%	Type D
NsE	Newlin-Satanta complex, 5 to 20 percent slopes	20.4	13.7%	Type B
St	Stapleton-Bresser association	74.4	49.9%	Type A
Totals for Area of Interest		**149.0**	**100.0%**	

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Castle Rock Area, Colorado

FoD—Fondis clay loam, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: jqyp
Elevation: 5,500 to 6,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Fondis and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fondis

Setting

Landform: Ridges, buttes, mesas
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits over coarse-silty outwash derived from arkose

Typical profile

H1 - 0 to 7 inches: clay loam
H2 - 7 to 24 inches: clay
H3 - 24 to 60 inches: sandy clay loam

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Minor Components

Kutch

Percent of map unit: 5 percent
Hydric soil rating: No

Englewood
Percent of map unit: 5 percent
Hydric soil rating: No

Denver
Percent of map unit: 4 percent
Hydric soil rating: No

Aquic haplustolls
Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Fu—Fondis-Kutch association

Map Unit Setting
National map unit symbol: jqyq
Elevation: 5,500 to 6,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition
Fondis and similar soils: 50 percent
Kutch and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fondis

Setting
Landform: Draws, valley sides
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits over coarse-silty outwash derived from arkose

Typical profile
H1 - 0 to 7 inches: loam
H2 - 7 to 24 inches: clay
H3 - 24 to 60 inches: sandy clay loam

Properties and qualities
Slope: 5 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Description of Kutch

Setting

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-textured residuum weathered from calcareous shale

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 32 inches: clay
H3 - 32 to 36 inches: weathered bedrock

Properties and qualities

Slope: 5 to 40 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R049XB208CO - Clayey Foothill
Hydric soil rating: No

Minor Components

Bresser

Percent of map unit: 5 percent
Hydric soil rating: No

Newlin

Percent of map unit: 5 percent
Hydric soil rating: No

Hilly gravelly land

Percent of map unit: 4 percent

Hydric soil rating: No

Aquic haplustolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

KtE—Kutch sandy loam, 5 to 20 percent slopes

Map Unit Setting

National map unit symbol: jqz5
Elevation: 5,500 to 6,800 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Kutch and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kutch

Setting

Landform: Drainageways, alluvial fans, valley sides
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous fine-loamy clayey shale

Typical profile

H1 - 0 to 6 inches: sandy loam
H2 - 6 to 32 inches: clay
H3 - 32 to 36 inches: weathered bedrock

Properties and qualities

Slope: 5 to 20 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

Bresser

Percent of map unit: 7 percent
Hydric soil rating: No

Newlin

Percent of map unit: 7 percent
Hydric soil rating: No

Aquic haplustolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

NsE—Newlin-Satanta complex, 5 to 20 percent slopes

Map Unit Setting

National map unit symbol: jqzh
Elevation: 5,500 to 6,600 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 49 to 51 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition

Newlin and similar soils: 50 percent
Satanta and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Newlin

Setting

Landform: Knobs, drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Unconformable sandy and gravelly and/or mixed source alluvium

Typical profile

H1 - 0 to 8 inches: gravelly sandy loam
H2 - 8 to 17 inches: gravelly sandy clay loam
H3 - 17 to 22 inches: gravelly sandy loam
H4 - 22 to 60 inches: very gravelly sand

Properties and qualities

Slope: 5 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R049XC202CO - Loamy Foothill Palmer Divide
Hydric soil rating: No

Description of Satanta

Setting

Landform: Knobs, drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits derived from mixed

Typical profile

H1 - 0 to 9 inches: loam
H2 - 9 to 30 inches: clay loam
H3 - 30 to 60 inches: loam

Properties and qualities

Slope: 5 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Bresser

Percent of map unit: 6 percent
Hydric soil rating: No

Buick
Percent of map unit: 6 percent
Hydric soil rating: No

Truckton
Percent of map unit: 6 percent
Hydric soil rating: No

Aquic haplustolls
Percent of map unit: 2 percent
Landform: Swales
Hydric soil rating: Yes

St—Stapleton-Bresser association

Map Unit Setting
National map unit symbol: jr09
Elevation: 5,500 to 6,600 feet
Mean annual precipitation: 15 to 19 inches
Mean annual air temperature: 49 to 51 degrees F
Frost-free period: 120 to 135 days
Farmland classification: Not prime farmland

Map Unit Composition
Stapleton and similar soils: 60 percent
Bresser and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stapleton

Setting
Landform: Valley sides, knobs, ridges
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Weathered alluvium derived from arkose

Typical profile
H1 - 0 to 7 inches: sandy loam
H2 - 7 to 16 inches: sandy loam
H3 - 16 to 60 inches: gravelly sandy loam

Properties and qualities
Slope: 8 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Description of Bresser

Setting

Landform: Valley sides
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium and/or sandy eolian deposits

Typical profile

H1 - 0 to 8 inches: sandy loam
H2 - 8 to 30 inches: sandy clay loam
H3 - 30 to 60 inches: loamy sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

Loamy alluvial land

Percent of map unit: 14 percent
Hydric soil rating: No

Aquic haplustolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

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C2 FEMA FIRM

NOTES TO USERS

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Silver Spring, Maryland 20910
(301) 713-3191

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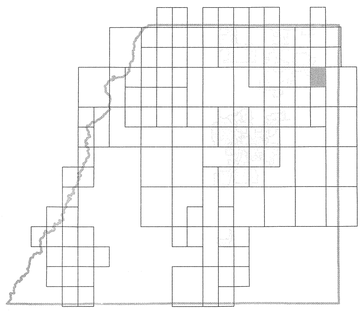
Carpenter Creek	3.93	Sellers Gulch	3.43
Cherry Creek, Cross Section BZ to CU	3.23	Sellers Gulch, Unnamed Tributary	3.39
East Plum Creek, Cross Section W to AY	3.26	Sulphur Gulch	3.13
East Plum Creek, Cross Section AZ to CZ	3.49	Tallman Gulch	3.16
East Plum Creek, Cross Section DA to EM	3.71	West Plum Creek, Cross Section W to AM	3.68
Glade Gulch	3.65		
Happy Canyon Creek	3.12		

Example: To convert Baldwin Gulch elevations to NAVD 88, 3.10 feet were added to the NGVD 29 elevations.

Panel Location Map



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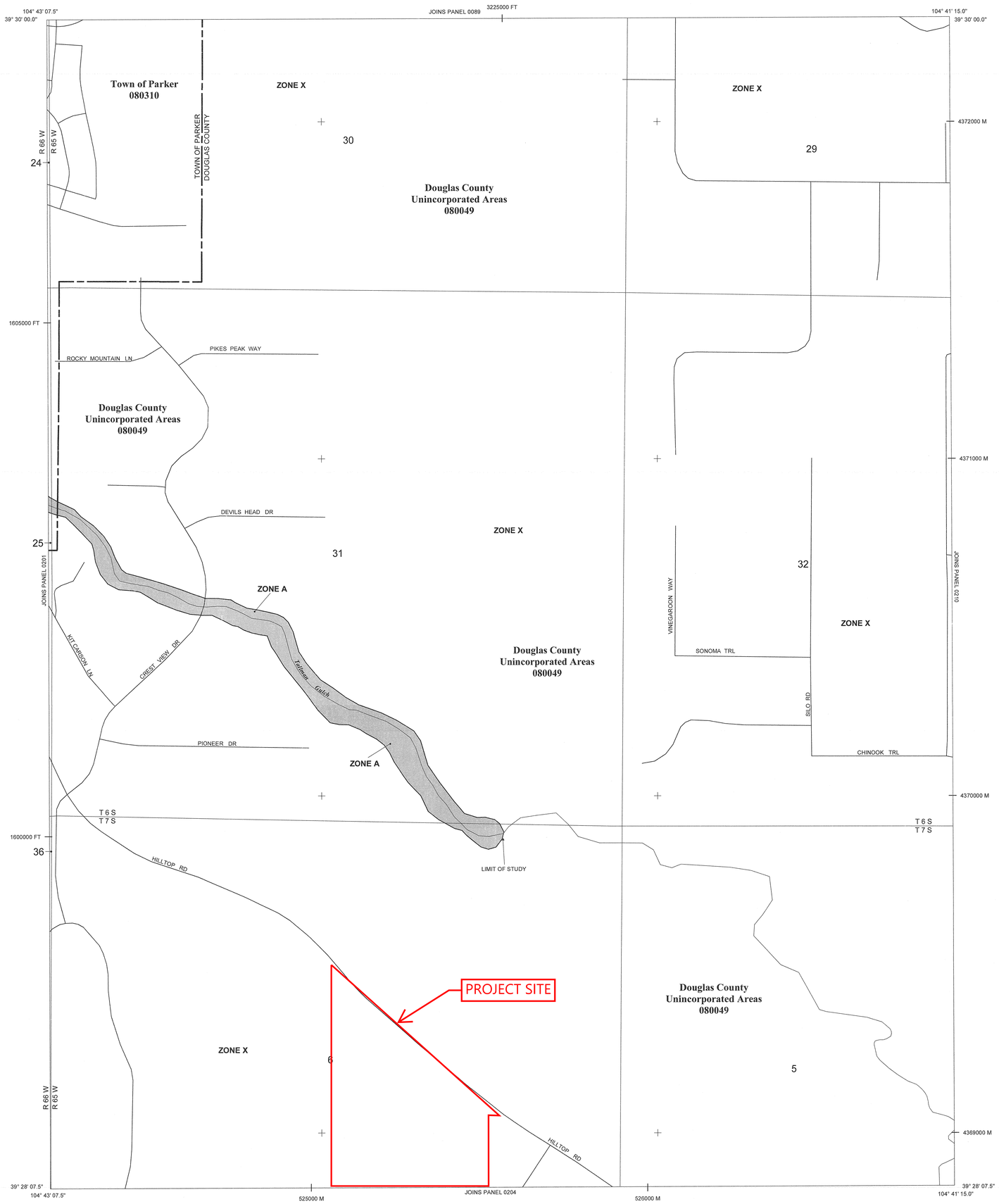

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
104° 50' 37.5" , 39° 30' 00"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
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3180000 FT	5000-foot ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 502), Lambert Conformal Conic projection
× KK6400	National Geodetic Survey bench mark (see explanation in Notes to Users section of this FIRM panel

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
SEPTEMBER 30, 2005

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0202F

FIRM
FLOOD INSURANCE RATE MAP
DOUGLAS COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 202 OF 495
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
DOUGLAS COUNTY	080049	0202	F
PARKER, TOWN OF	080310	0202	F

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
08035C0202F

EFFECTIVE DATE:
SEPTEMBER 30, 2005

Federal Emergency Management Agency

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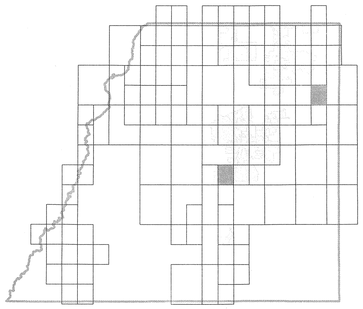

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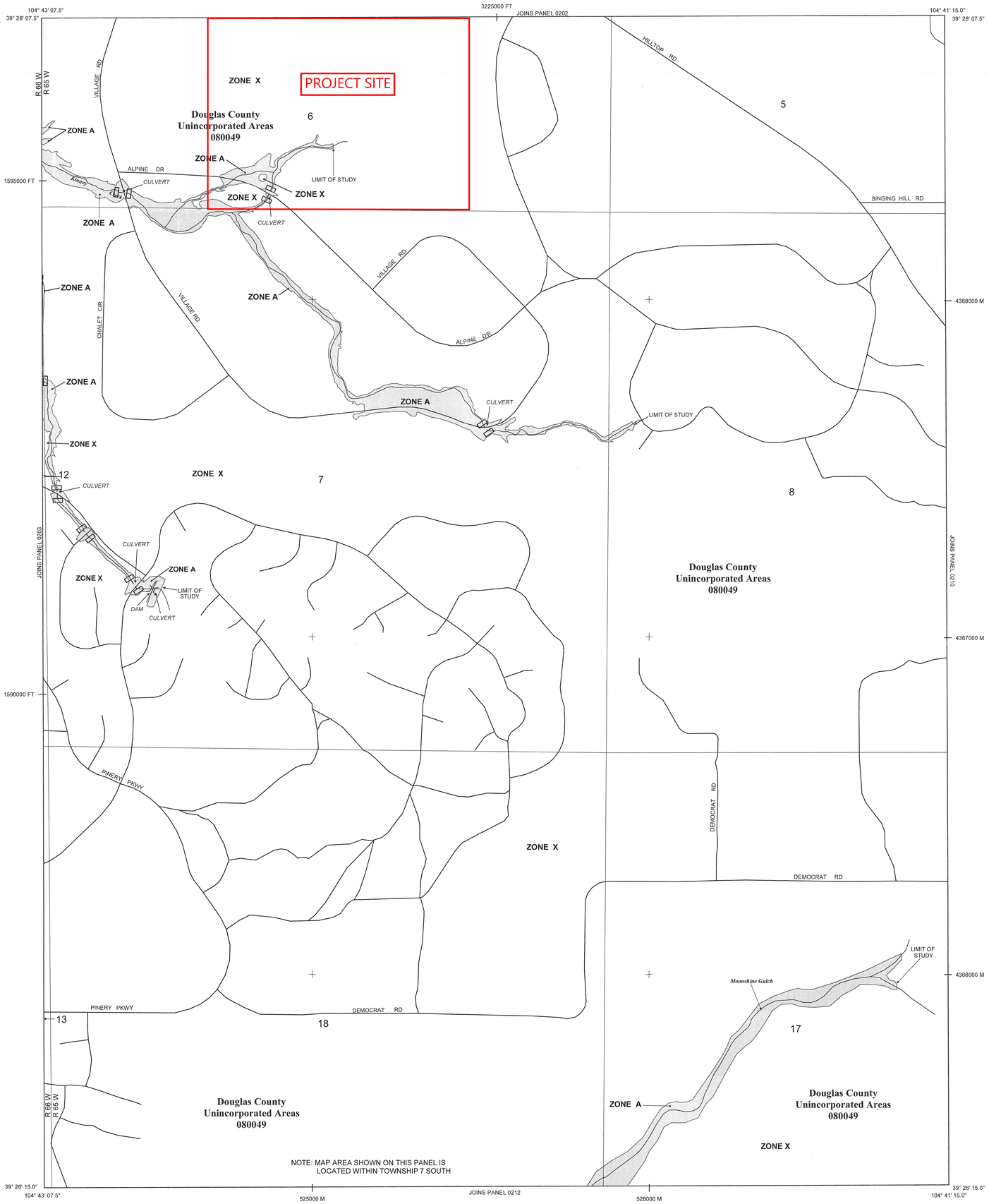

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SEPTEMBER 30, 2005

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NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0204F

FIRM

FLOOD INSURANCE RATE MAP

DOUGLAS COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 204 OF 495

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
DOUGLAS COUNTY	080049	0204	F

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MAP NUMBER
08035C0204F

EFFECTIVE DATE:
SEPTEMBER 30, 2005

Federal Emergency Management Agency

C3 Sulphur Gulch FHAD

FLOOD HAZARD AREA DELINEATION

SULPHUR GULCH

February 2021

Prepared for:

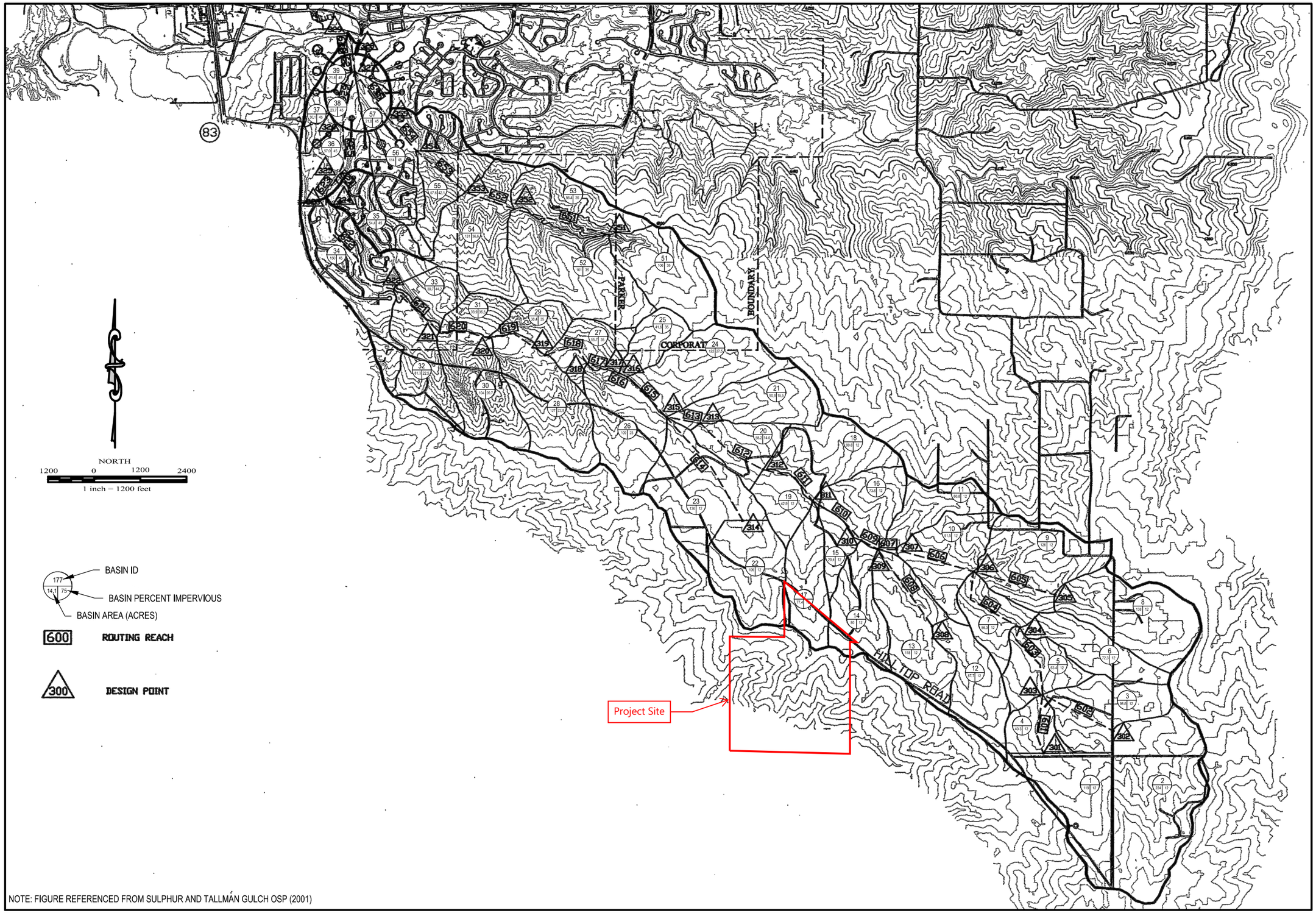
MHFD
MILE HIGH FLOOD DISTRICT

PARKER
COLORADO

Prepared by:

MERRICK®

2480 W. 26th Avenue, Unit B225
Denver, Colorado 80211
Phone: 303-964-3333
Fax: 303-964-3355



NOTE: FIGURE REFERENCED FROM SULPHUR AND TALLMAN GULCH OSP (2001)

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REVISIONS:

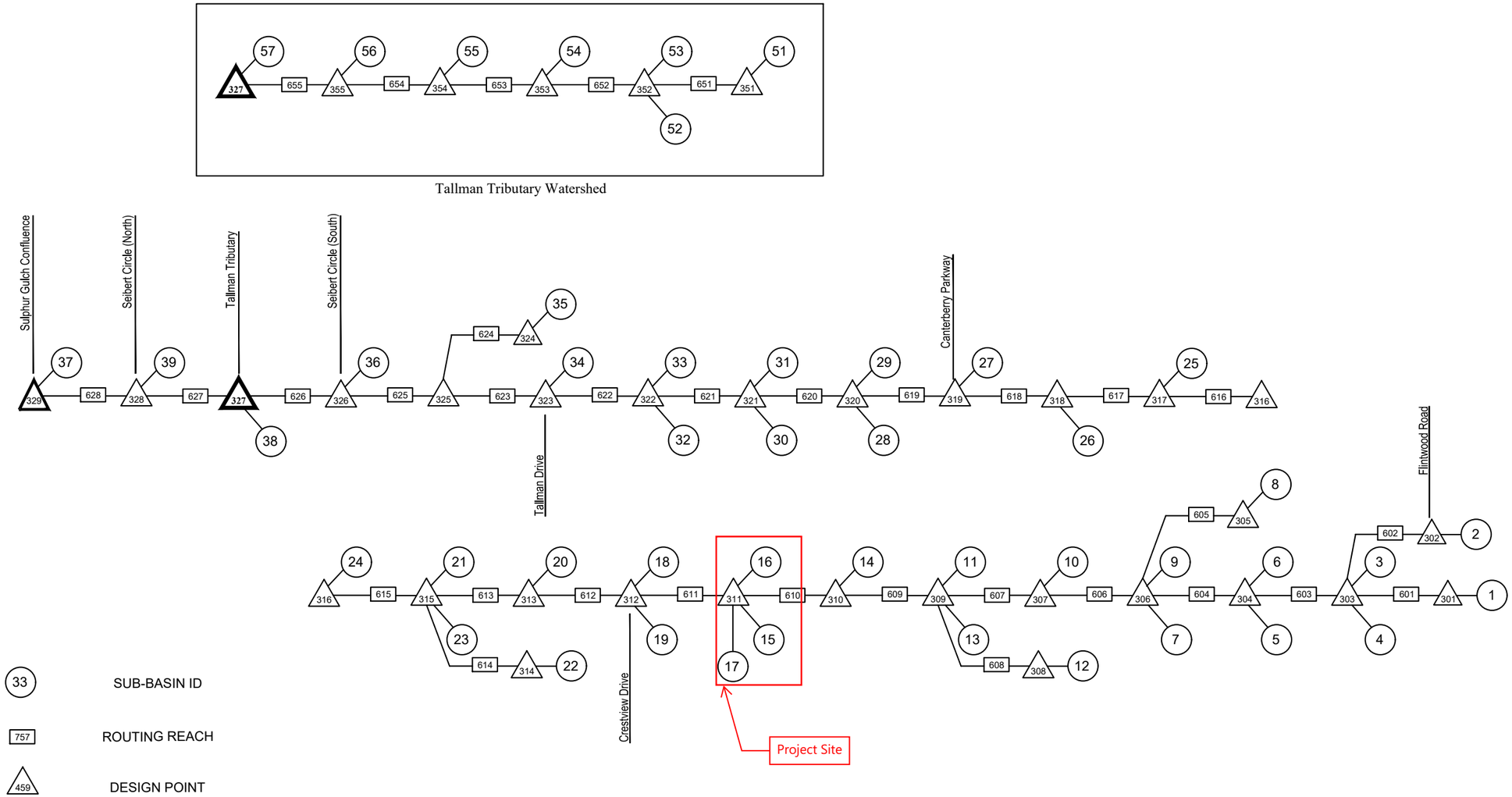
REV	REVISION DESCRIPTION	DATE	CHECKED BY:	APPROVED BY:

DESIGN BY: JAG
DRAWN BY:
CHECKED BY: BC
APPROVED BY:

SULPHUR - TALLMAN GULCH WATERSHEDS FHAD

SUBWATERSHED BOUNDARIES / SWMM ROUTING MAP

JOB NO: 65419417
DATE: May 2017
SHEET: B-3 (2 OF 2)



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REV	REVISION DESCRIPTION	DATE	CHANGED BY	CHECKED BY	APPROVED BY

DESIGN BY:
DRAWN BY: JAG
CHECKED BY:
APPROVED BY: BC

SULPHUR - TALLMAN GULCH WATERSHEDS FHAD

SWMM SCHEMATIC

JOB NO: 65419417
DATE: May 2017
SHEET: B-4 (2 OF 2)

400	JUNCTION	0.00	0.00	308.94	0	00:00	0.00
445	JUNCTION	0.07	1.24	474.98	0	00:40	1.24
438	JUNCTION	0.06	0.93	311.90	0	00:40	0.93
439	JUNCTION	0.10	1.31	229.29	0	00:57	1.31
442	JUNCTION	0.05	1.08	221.09	0	00:35	1.03
441	JUNCTION	0.00	0.00	215.96	0	00:00	0.00
454	JUNCTION	0.05	0.98	148.90	0	00:35	0.92
460	JUNCTION	0.92	1.69	172.62	0	01:14	1.69
451	JUNCTION	0.44	3.89	266.96	0	01:05	3.86
450	JUNCTION	0.22	2.53	339.54	0	00:50	2.48
457	JUNCTION	0.08	1.65	148.63	0	00:35	1.53
462	JUNCTION	1.11	1.24	217.93	0	03:26	1.24
37	JUNCTION	0.93	1.69	189.88	0	01:13	1.68
428	DIVIDER	0.19	2.00	282.36	0	00:28	2.00
434	DIVIDER	0.19	3.50	259.59	0	00:30	3.50
447	DIVIDER	0.19	2.50	185.36	0	00:24	2.50
435	DIVIDER	0.09	2.09	257.22	0	00:35	1.90
PineGulchDam	STORAGE	9.25	12.86	239.55	0	03:26	12.86
PineGulchPond	STORAGE	3.22	4.09	192.28	0	01:13	4.09
PaperFlowerPond	STORAGE	1.81	14.46	364.35	0	02:04	14.45

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min		Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	Flow Balance Error Percent
301	JUNCTION	132.19	132.19	0	00:45	3.97	3.97	0.000
302	JUNCTION	251.31	251.31	0	00:50	7.46	7.46	0.000
303	JUNCTION	158.49	527.41	0	00:53	4.65	16.2	0.000
304	JUNCTION	133.23	633.89	0	01:02	4.61	20.9	0.000
305	JUNCTION	145.69	145.69	0	00:50	4.58	4.58	0.000
306	JUNCTION	237.07	933.98	0	01:06	6.13	31.7	0.000
307	JUNCTION	110.48	1006.14	0	01:11	3.07	34.8	0.000
308	JUNCTION	89.01	89.01	0	00:50	3.07	3.07	0.000
309	JUNCTION	165.69	1232.86	0	01:11	6.04	44	0.000
310	JUNCTION	84.84	1300.95	0	01:12	2.81	46.9	0.000
311	JUNCTION	191.02	1440.85	0	01:15	6.36	53.4	0.000
312	JUNCTION	153.34	1546.38	0	01:18	5.09	58.5	0.000
313	JUNCTION	64.55	1578.81	0	01:23	2.09	60.7	0.000
314	JUNCTION	147.54	147.54	0	00:45	3.93	3.93	0.000
315	JUNCTION	240.50	1848.12	0	01:23	8.29	73.1	-0.000
316	JUNCTION	152.54	1940.69	0	01:26	5.1	78.3	0.000
317	JUNCTION	74.37	1969.28	0	01:26	1.84	80.1	0.000
318	JUNCTION	139.30	2042.52	0	01:28	4.32	84.5	0.000
319	JUNCTION	91.40	2072.93	0	01:31	2.36	86.8	-0.000
320	JUNCTION	170.65	2144.52	0	01:37	6.52	93.8	0.000
321	JUNCTION	192.09	2172.60	0	01:46	5.33	99.1	0.000
322	JUNCTION	167.04	2216.28	0	01:49	5.01	104	0.000
325	JUNCTION	0.00	2209.34	0	02:03	0	114	0.000
323	JUNCTION	227.42	2202.71	0	02:02	6.57	111	0.000
324	JUNCTION	115.72	115.72	0	00:40	2.49	2.49	0.000
326	JUNCTION	123.08	2202.87	0	02:08	2.48	116	0.000
327	JUNCTION	79.80	2455.79	0	02:09	1.98	148	0.000
328	JUNCTION	58.06	2456.36	0	02:10	0.862	149	0.000
329	JUNCTION	35.18	2467.29	0	02:11	1.35	150	0.000
351	JUNCTION	177.28	177.28	0	00:40	4.67	4.67	0.000
352	JUNCTION	390.71	520.92	0	00:50	10.8	15.6	0.000
353	JUNCTION	262.36	716.67	0	00:54	5.66	21.3	0.000
354	JUNCTION	119.31	789.94	0	01:00	2.66	24.1	0.000
355	JUNCTION	263.73	941.27	0	01:02	5.32	29.5	0.000
401	JUNCTION	68.23	68.23	0	00:50	2.34	2.34	0.000
402	JUNCTION	166.57	166.57	0	00:45	4.53	4.53	0.000
403	JUNCTION	256.88	446.52	0	00:59	8.16	15.3	0.000
404	JUNCTION	480.82	480.82	0	00:55	17.7	17.7	0.000
405	JUNCTION	197.25	1084.19	0	01:09	8.4	41.6	0.000
406	JUNCTION	244.05	244.05	0	00:50	7.86	7.86	0.000
407	JUNCTION	192.75	432.71	0	00:55	7.33	15.2	0.000
408	JUNCTION	194.66	608.02	0	01:07	7.68	22.9	0.000
409	JUNCTION	161.62	748.12	0	01:10	5.73	28.7	0.000
410	JUNCTION	80.57	814.44	0	01:16	3.67	32.5	0.000
411	JUNCTION	0.00	1885.33	0	01:12	0	74.1	0.000
412	JUNCTION	228.07	2112.94	0	01:16	8.38	84.2	0.000
413	JUNCTION	252.54	2234.80	0	01:19	6.32	90.7	0.000
414	JUNCTION	87.53	87.53	0	00:45	2.34	2.34	0.000
415	JUNCTION	198.08	263.35	0	00:50	4.68	7.1	0.000
416	JUNCTION	112.52	112.52	0	00:45	3.13	3.13	0.000
417	JUNCTION	271.07	603.65	0	01:00	9.48	20	0.000
418	JUNCTION	211.24	783.63	0	01:08	7.6	27.8	-0.000
419	JUNCTION	0.00	554.00	0	02:04	0	40.5	0.000
420	JUNCTION	309.36	2937.10	0	01:23	9.86	143	0.000
421	JUNCTION	253.04	3040.05	0	01:26	6.56	150	-0.000
422	JUNCTION	35.71	35.71	0	00:45	0.972	0.972	0.000
423	JUNCTION	183.93	183.93	0	00:40	3.76	3.76	0.000
424	JUNCTION	329.11	524.82	0	00:55	11.8	16.7	0.000
425	JUNCTION	275.91	784.65	0	00:58	9.8	26.6	0.000
426	JUNCTION	158.56	921.01	0	01:02	4.82	31.5	0.000
234	JUNCTION	0.00	209.56	0	00:47	0	4.78	0.000
427	JUNCTION	151.25	1033.25	0	01:06	4.08	35.6	0.000
429	JUNCTION	109.51	4079.62	0	01:28	3.78	193	0.000
430	JUNCTION	104.51	104.51	0	00:35	1.93	1.93	0.000
431	JUNCTION	76.95	159.58	0	00:46	1.65	3.63	0.000
432	JUNCTION	70.99	70.99	0	00:40	1.91	1.91	0.000
433	JUNCTION	34.96	4184.68	0	01:32	0.874	199	0.000
436	JUNCTION	106.72	4283.35	0	01:34	3.2	208	0.000
440	JUNCTION	53.74	4370.02	0	01:37	1.25	215	0.000
443	JUNCTION	37.31	4384.49	0	01:40	0.792	217	0.000
444	JUNCTION	138.88	4396.63	0	01:43	3.13	220	0.000
448	JUNCTION	0.00	6309.61	0	01:54	0	374	0.000
452	JUNCTION	72.03	6377.85	0	01:56	1.38	393	0.000
453	JUNCTION	274.48	6394.29	0	01:59	5.75	398	0.000
456	JUNCTION	92.20	6404.58	0	02:00	1.56	401	0.000
458	JUNCTION	0.00	6408.75	0	02:00	0	401	0.000
459	JUNCTION	204.29	6427.16	0	02:05	5.51	407	0.000
400	JUNCTION	62.93	62.93	0	00:45	1.98	1.98	0.000
445	JUNCTION	64.48	64.48	0	00:40	1.61	1.61	0.000
438	JUNCTION	62.85	62.85	0	00:40	1.71	1.71	-0.000
439	JUNCTION	52.36	95.41	0	00:57	1.29	3.1	0.000
442	JUNCTION	68.10	68.10	0	00:35	1.41	1.41	0.000
441	JUNCTION	113.53	113.53	0	00:40	2.8	2.8	0.000
454	JUNCTION	38.42	38.42	0	00:35	0.778	0.778	0.000
460	JUNCTION	71.34	114.26	0	01:03	1.44	17.4	0.000
451	JUNCTION	179.94	319.65	0	01:05	5.19	11.9	0.000
450	JUNCTION	189.44	189.44	0	00:50	6.43	6.43	0.000
457	JUNCTION	39.54	39.54	0	00:35	0.786	0.786	0.000
462	JUNCTION	0.00	25.96	0	03:26	0	13.3	0.000
37	JUNCTION	0.00	80.65	0	01:13	0	16	0.000
428	DIVIDER	81.94	81.94	0	00:45	2.61	2.61	0.000
434	DIVIDER	181.81	181.81	0	00:40	4.13	4.13	0.000
447	DIVIDER	153.59	153.59	0	00:40	3.32	3.32	0.000
435	DIVIDER	62.74	62.74	0	00:35	1.2	1.2	0.000
PineGulchDam	STORAGE	130.51	409.86	0	01:07	3.29	15.2	0.006
PineGulchPond	STORAGE	266.29	266.31	0	00:35	4.26	17.4	0.031
PaperFlowerPond	STORAGE	326.30	984.42	0	01:22	12.2	40.5	0.018

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

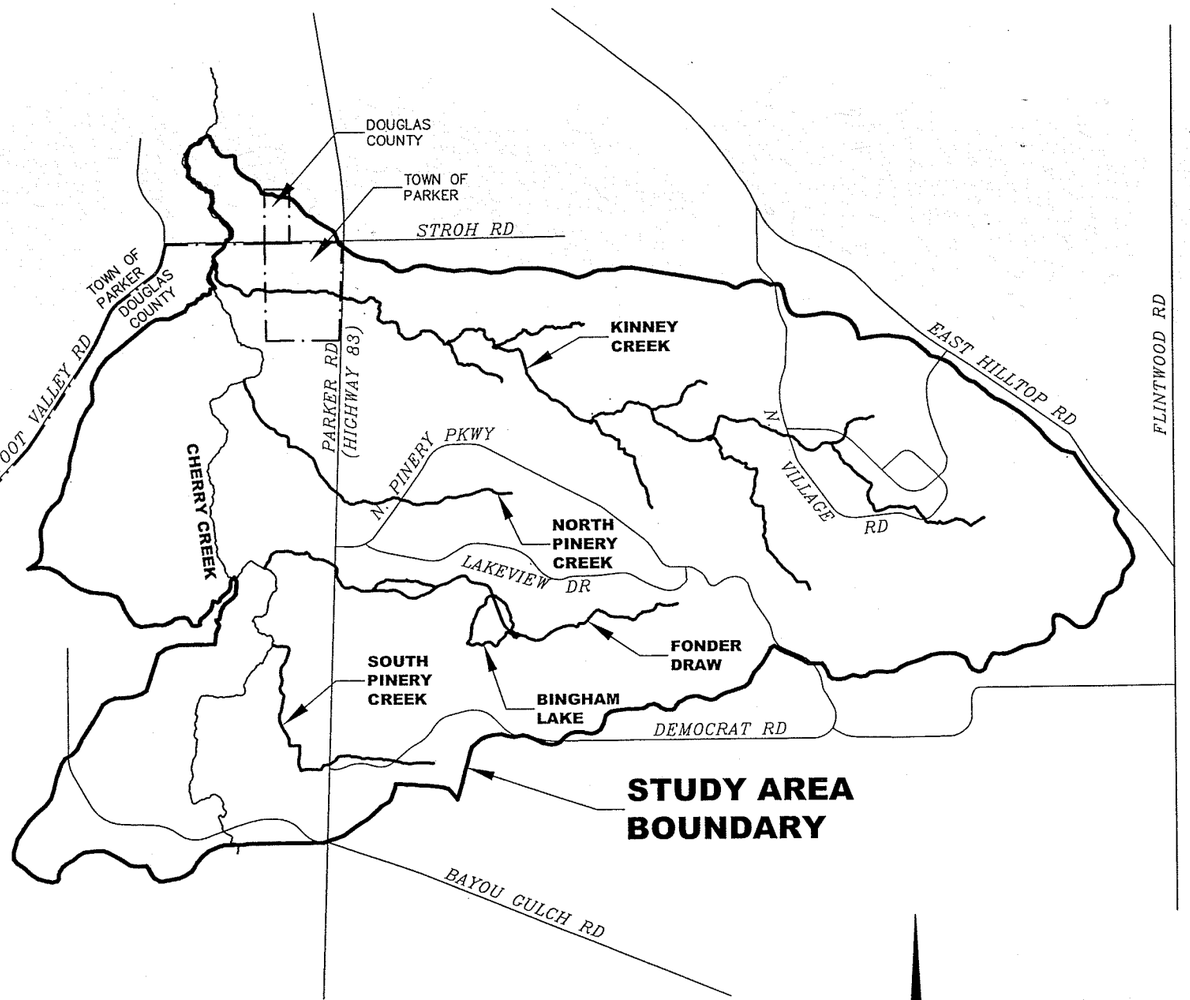
****
Storage Volume Summary
****

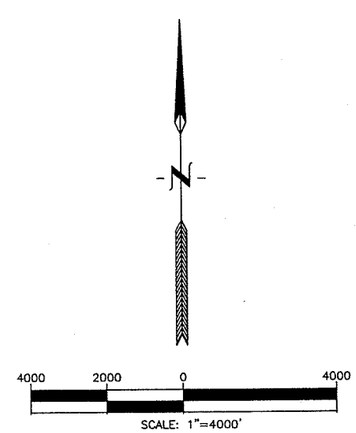
Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min		Maximum Outflow CFS
PineGulchDam	986.930	18	0	0	1754.916	31	0	03:26	25.96
PineGulchPond	215.924	10	0	0	383.307	18	0	01:12	80.65
PaperFlowerPond	133.654	8	0	0	1609.308	95	0	02:04	554.00

****
Link Flow Summary
****

C4 Kinney Creek FHAD

FLOOD HAZARD AREA DELINEATION KINNEY CREEK, FONDER DRAW AND TRIBUTARIES





URBAN DRAINAGE & FLOOD CONTROL DISTRICT
DOUGLAS COUNTY

APRIL 2004

LEGEND

- MAJOR ROADWAY
- STREAM
- STUDY BOUNDARY
- JURISDICTIONAL BOUNDARIES

WRC ENGINEERING, INC.
950 SOUTH CHERRY STREET SUITE 404
DENVER, COLORADO 80246
PHONE NO: (303) 757-8513
FAX NO: (303) 758-3208

M:\2122\DWG\2122KNC.DWG, COVER - 4/7/04 - MAS

FLOOD HAZARD AREA DELINEATION
KINNEY CREEK, FONDER DRAW
AND TRIBUTARIES

Prepared For:

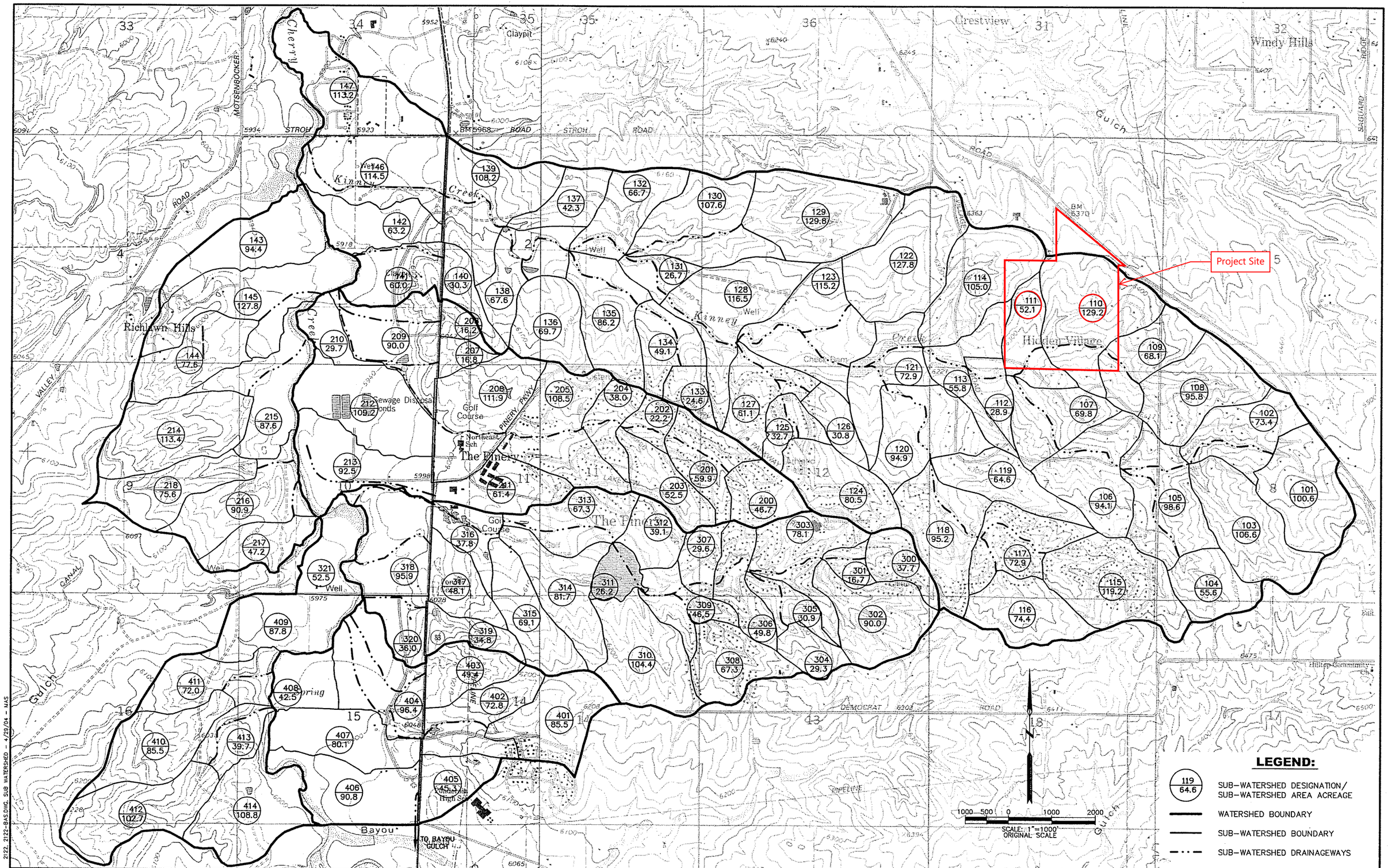
Urban Drainage & Flood Control District
Douglas County

Prepared By:

WRC Engineering, Inc.
950 South Cherry Street, Suite 404
Denver, Colorado 80246
(303) 757-8513
(303) 758-3208 FAX

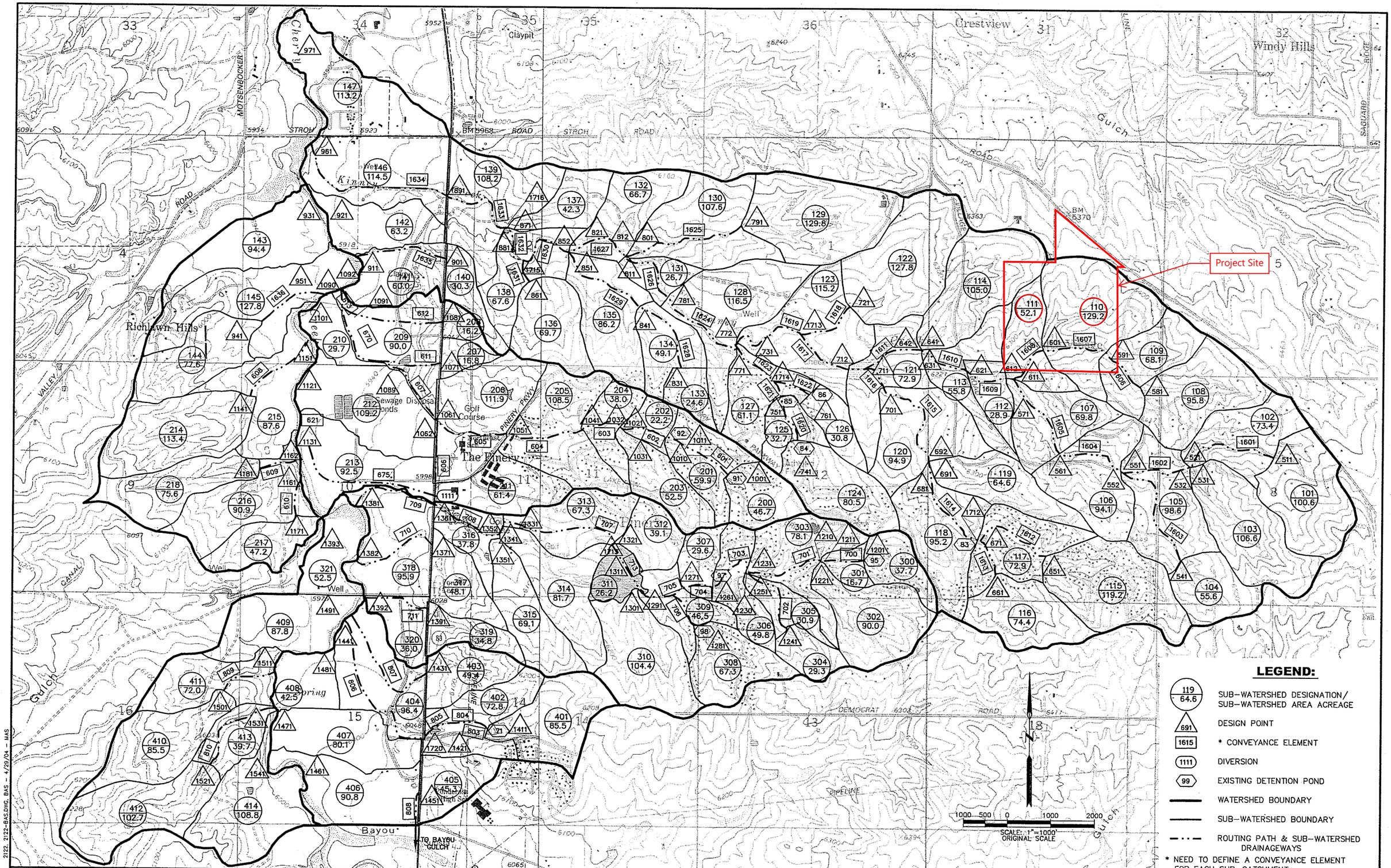
April 2004

WRC File: 2122/12

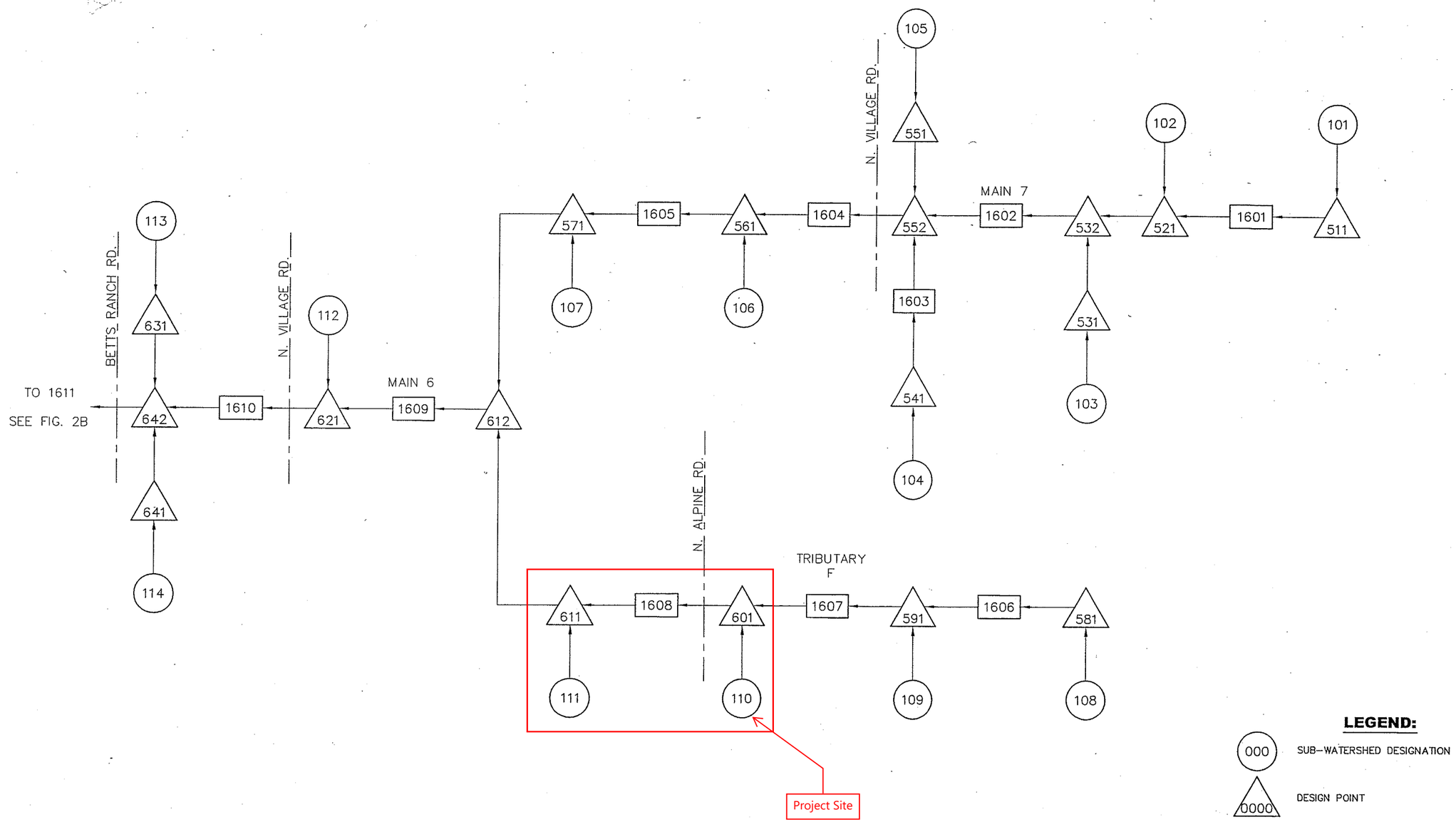


2122, 2122-BAS.DWG, SUB WATERSHED - 4/29/04 - NAS

Ramblewood Preliminary Plan Project File: SB2025-040	WRC ENGINEERING, INC. 950 SOUTH CHERRY STREET, SUITE 404 DENVER, COLORADO 80246 PHONE NO: (303) 757-8513 FAX NO: (303) 758-3208	DESIGNED RLM DATE 5/7/03 DRAWN MAS DATE 5/7/03 CHECKED DATE REVISED DATE AS-BUILT DATE	DOUGLAS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	KINNEY CREEK AND FONDER DRAW WATERSHEDS OUTFALL SYSTEMS PLANNING	SUB-WATERSHED BOUNDARY	FIGURE III-1



WRC ENGINEERING, INC. 950 SOUTH CHERRY STREET, SUITE 404 DENVER, COLORADO 80246 PHONE NO: (303) 757-8513 FAX NO: (303) 758-3208	DESIGNED RLM DRAWN MAS CHECKED REVISED AS-BUILT	DATE 5/7/03 DATE 5/7/03 DATE DATE DATE	DOUGLAS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	KINNEY CREEK AND FONDER DRAW WATERSHEDS OUTFALL SYSTEMS PLANNING	WATERSHED MAP & SWMM ROUTING ELEMENTS	FIGURE III-5



LEGEND:

- 000 — SUB–WATERSHED DESIGNATION
- 0000 — DESIGN POINT
- 0000 — * CONVEYANCE ELEMENT
- 0000 — EXISTING DETENTION POND
- 0000 — DIVERSION

* NEED TO DEFINE A CONVEYANCE ELEMENT FOR EACH SUB–CATCHMENT

KINNEY CREEK

2122, 2122SCH.DWG, SCH-1 - 8/4/03 - PAH

WRC ENGINEERING, INC. 950 SOUTH CHERRY STREET, SUITE 404 DENVER, COLORADO 80246 PHONE NO: (303) 757-8513 FAX NO: (303) 758-3208	DESIGNED STS/JDG DATE 6/26/03 DRAWN PAH DATE 6/26/03 CHECKED ___ DATE ___ REVISED ___ DATE ___ AS-BUILT ___ DATE ___	DOUGLAS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	KINNEY CREEK AND FONDER DRAW WATERSHEDS OUTFALL SYSTEMS PLANNING	SWMM ROUTING SCHEMATIC	FIGURE III-6

TABLE 2
CUHP SUB-WATERSHED INPUT PARAMETERS

WATERSHED DESIGNATION	AREA AC.	AREA SQ. MI.	LENGTH FT.	LENGTH MI.	CENTROID LENGTH FT.	CENTROID LENGTH MI.	EXISTING IMPERV. %	PROJECTED IMPERV. %	SLOPE %	PERVIOUS DETENTION IN.	IMPERVIOUS DETENTION IN.	INITIAL RATE IN./HR.	DECAY COEFF. 1/SEC.	FINAL RATE IN./HR.	Existing MDCIA	Projected MDCIA
Kinney Creek																
101	100.6	0.157	3000	0.568	1000	0.189	7.9	15.0	4.4	0.35	0.1	4.5	0.0018	0.6	2	1
102	73.4	0.115	2600	0.492	1525	0.289	2.0	15.0	3.9	0.35	0.1	4.5	0.0018	0.6	2	2
103	106.6	0.167	4000	0.758	1900	0.360	4.6	15.0	4.1	0.35	0.1	4.5	0.0018	0.6	2	
104	55.6	0.087	2600	0.492	1100	0.208	11.1	15.0	4.7	0.35	0.1	4.5	0.0018	0.6		
105	98.6	0.154	3600	0.682	1400	0.265	12.4	16.3	4.2	0.35	0.1	4.4	0.0018	0.6	2	1
106	94.1	0.147	2850	0.540	1100	0.208	15.0	15.0	5.0	0.35	0.1	3.8	0.0018	0.6	2	1
107	69.8	0.109	3250	0.616	1400	0.265	15.0	15.0	3.9	0.35	0.1	3.9	0.0018	0.6	2	2
108	95.8	0.150	3300	0.625	1250	0.237	9.8	15.0	4.6	0.35	0.1	4.1	0.0018	0.6	2	1
109	68.1	0.106	1800	0.341	1050	0.199	11.8	15.0	4.4	0.35	0.1	3.8	0.0018	0.6	2	1
110	129.2	0.202	3350	0.634	1350	0.256	5.3	15.0	4.0	0.35	0.1	3.9	0.0018	0.6	2	1
111	52.1	0.081	3100	0.587	1400	0.265	3.3	15.0	4.0	0.35	0.1	3.8	0.0018	0.6	2	
112	28.9	0.045	2200	0.417	400	0.076	14.4	15.0	5.3	0.35	0.1	4.4	0.0018	0.6	2	2
113	55.8	0.087	3450	0.653	950	0.180	13.1	14.4	4.3	0.35	0.1	4.3	0.0018	0.6	2	2
114	105	0.164	4000	0.758	2300	0.436	9.8	14.4	4.1	0.35	0.1	4.3	0.0018	0.6	2	1
115	119.2	0.186	4500	0.852	2000	0.379	28.7	35.5	3.5	0.35	0.1	4.4	0.0018	0.6	2	2
116	74.4	0.116	3150	0.597	1250	0.237	9.6	35.8	4.3	0.35	0.1	4.4	0.0018	0.6	2	
117	72.9	0.114	3550	0.672	1400	0.265	38.8	38.8	3.2	0.35	0.1	4.3	0.0018	0.6	2	2
118	95.2	0.149	4000	0.758	1450	0.275	27.4	36.9	4.1	0.35	0.1	4.2	0.0018	0.6	2	2
119	64.6	0.101	4500	0.852	1750	0.331	14.4	16.3	4.0	0.35	0.1	4.1	0.0018	0.6	2	2
120	94.9	0.148	3500	0.663	1600	0.303	9.1	25.6	3.0	0.35	0.1	4.2	0.0018	0.6	2	1
121	72.9	0.114	2550	0.483	450	0.085	2.7	8.6	5.2	0.35	0.1	3.9	0.0018	0.6		
122	127.8	0.200	4000	0.758	1900	0.360	5.3	15.4	3.8	0.35	0.1	4.5	0.0018	0.6	2	1
123	115.2	0.180	4300	0.814	2450	0.464	3.9	10.5	2.7	0.35	0.1	3.9	0.0018	0.6		
124	80.5	0.126	3350	0.634	1450	0.275	26.9	26.9	4.2	0.35	0.1	4.4	0.0018	0.6	2	2
125	32.7	0.051	1900	0.360	950	0.180	31.3	31.3	4.4	0.35	0.1	4.2	0.0018	0.6	2	2
126	30.8	0.048	2300	0.436	900	0.170	9.6	13.2	5.2	0.35	0.1	4.1	0.0018	0.6	2	1
127	61.1	0.095	2900	0.549	1450	0.275	29.0	29.6	4.4	0.35	0.1	4.2	0.0018	0.6		
128	116.5	0.182	4800	0.909	2500	0.473	5.8	14.3	2.9	0.35	0.1	4.2	0.0018	0.6		
129	129.8	0.203	4250	0.805	1900	0.360	2.0	12.0	4.5	0.35	0.1	4.5	0.0018	0.6		
130	107.6	0.168	4050	0.767	1350	0.256	2.0	10.7	3.6	0.35	0.1	4.5	0.0018	0.6		
131	26.7	0.042	2250	0.426	900	0.170	2.0	5.8	2.1	0.35	0.1	4.4	0.0018	0.6	2	2
132	66.7	0.104	3550	0.672	2000	0.379	2.0	4.9	3.2	0.35	0.1	4.4	0.0018	0.6		
133	24.6	0.038	1650	0.313	550	0.104	34.3	34.3	5.2	0.35	0.1	4.4	0.0018	0.6		
134	49.1	0.077	2400	0.455	1050	0.199	7.7	9.4	4.5	0.35	0.1	4.2	0.0018	0.6		
135	86.2	0.135	4000	0.758	2250	0.426	3.9	4.2	3.5	0.35	0.1	4.1	0.0018	0.6		
136	69.7	0.109	2650	0.502	1150	0.218	2.0	2.0	4.5	0.35	0.1	4.4	0.0018	0.6		
137	42.3	0.066	3100	0.587	1450	0.275	2.0	2.0	4.3	0.35	0.1	4.3	0.0018	0.6		
138	67.6	0.106	2700	0.511	1000	0.189	2.0	2.0	4.4	0.35	0.1	4.2	0.0018	0.6		
139	108.2	0.169	3350	0.634	1200	0.227	2.0	2.0	3.7	0.35	0.1	4.4	0.0018	0.6		
140	30.3	0.047	2600	0.492	550	0.104	2.0	2.0	4.2	0.35	0.1	4.1	0.0018	0.6		
141	60	0.094	2200	0.417	1000	0.189	5.9	66.4	4.6	0.35	0.1	4.2	0.0018	0.6		
142	63.2	0.099	4400	0.833	2700	0.511	2.0	7.9	1.7	0.35	0.1	4.4	0.0016	0.6		
143	94.4	0.148	5800	1.098	2800	0.530	2.7	13.7	1.6	0.35	0.1	4.1	0.0018	0.6		
144	77.6	0.121	3550	0.672	1650	0.313	5.9	6.6	3.7	0.35	0.1	4.1	0.0018	0.6		
145	127.8	0.200	7550	1.430	3900	0.739	5.3	13.8	1.5	0.35	0.1	4.1	0.0018	0.6		
146	114.5	0.179	4600	0.871	2900	0.549	5.9	81.2	1.7	0.35	0.1	3.9	0.0017	0.6		
147	113.2	0.177	6850	1.297	3550	0.672	34.8	39.6	1.1	0.35	0.1	4.2	0.0015	0.7		

TABLE 3
SWMM Routing Element Parameters

Gutter Number	Gutter Connection	NDP	NP	Type	Width or Diameter	Length (feet)	Invert Slope	Side Slopes (H:V) Left	Side Slopes (H:V) Right	Manning's N	Overbank/ Surcharge	JK
Kinney Creek												
511	1601	0	3		12	1	0.001	3	3	0.06	20	0
1601	521	0	1	CHANNEL	50	1850	0.041	7	7	0.06	10	0
521	532	0	3		12	1	0.001	3	3	0.06	20	0
531	532	0	3		12	1	0.001	3	3	0.06	20	0
532	1602	0	3		12	1	0.001	3	3	0.06	20	0
1602	552	0	1	CHANNEL	35	1700	0.04	5	7	0.06	3.5	0
541	1603	0	3		12	1	0.001	3	3	0.06	20	0
1603	552	0	1	CHANNEL	35	2750	0.037	10	9	0.06	12	0
551	552	0	3		12	1	0.001	3	3	0.06	20	0
552	1604	0	3		12	1	0.001	3	3	0.06	20	0
1604	561	0	1	CHANNEL	55	1650	0.014	3	3	0.06	9	0
561	1605	0	3		12	1	0.001	3	3	0.06	20	0
1605	571	0	1	CHANNEL	65	2100	0.02	3	3	0.06	11	0
571	612	0	3		12	1	0.001	3	3	0.06	20	0
581	1606	0	3		12	1	0.001	3	3	0.06	20	0
1606	591	0	4	CHANNEL	5	1275	0.024	2	20	0.06	1	0
				OVERFLOW	30	1275	0.024	5	4	0.06	20	
591	1607	0	3		12	1	0.001	3	3	0.06	20	0
1607	601	0	4	CHANNEL	5	1550	0.019	2	4	0.06	10	0
				OVERFLOW	160	1550	0.019	18	8	0.06	10	
601	1608	0	3		12	1	0.001	3	3	0.06	20	0
1608	611	0	4	CHANNEL	20	1250	0.024	4	4	0.06	5	0
				OVERFLOW	175	1250	0.024	10	8	0.06	20	
611	612	0	3		12	1	0.001	3	3	0.06	20	0
612	1609	0	3		12	1	0.001	3	3	0.06	20	0
1609	621	0	4	CHANNEL	20	1150	0.015	2	16	0.06	1.5	0
				OVERFLOW	268	1150	0.015	2	4	0.06	20	
621	1610	0	3		12	1	0.001	3	3	0.06	20	0
1610	642	0	4	CHANNEL	20	1150	0.024	3	6	0.06	1	0
				OVERFLOW	200	1150	0.024	3	10	0.06	20	
631	642	0	3		12	1	0.001	3	3	0.06	20	0
641	642	0	3		12	1	0.001	3	3	0.06	20	0
642	1611	0	3		12	1	0.001	3	3	0.06	20	0
1611	712	0	1	CHANNEL	210	1850	0.016	3	2	0.06	11	0

Project Site

TABLE D

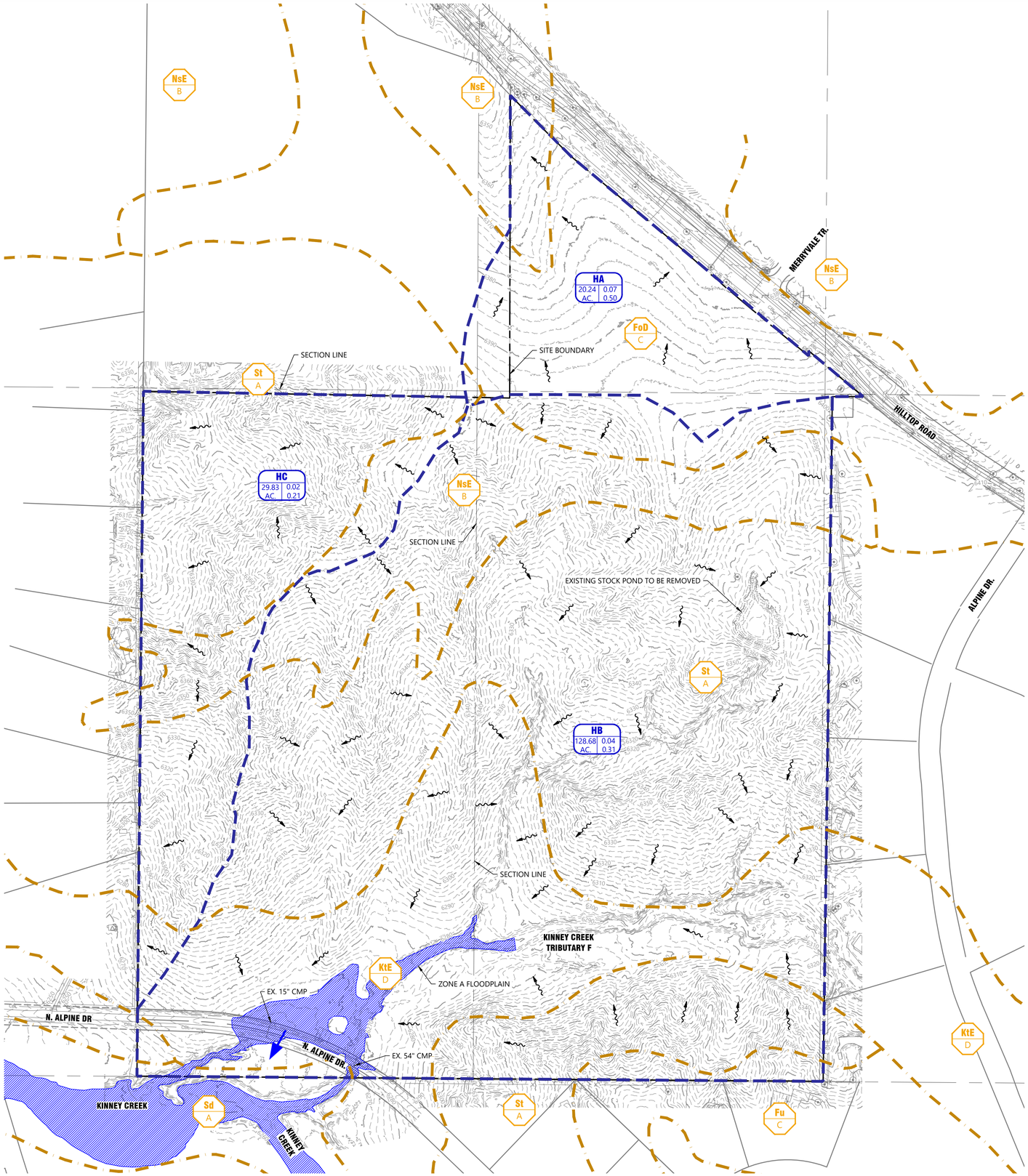
Peak Flow Summary

SWMM Conveyance Elements	10-Year Future (cfs)	50-Year Future (cfs)	100-Year Future (cfs)	100-Year Existing (cfs)	500-Year Future (cfs)*
Kinney Creek					
511	67	169	216	188	367
1601	52	151	197	173	335
531	50	129	167	141	284
521	86	247	322	283	547
581	61	147	188	164	320
541	35	90	115	107	196
532	136	377	489	425	831
1606	51	136	178	158	303
551	58	142	181	160	308
1603	21	69	91	86	155
1602	127	368	480	418	816
591	96	246	320	289	544
552	195	566	738	655	1255
661	97	192	238	123	405
651	105	211	260	214	442
1607	89	238	309	281	525
1604	178	545	716	636	1217
1613	88	143	143	121	243
671	85	162	197	197	335
1612	84	186	233	196	396
601	162	423	550	485	935
561	214	657	870	782	1479
1712	227	512	575	470	978
1608	157	417	542	483	921
1605	197	630	835	756	1420
83	114	154	423	219	719
611	182	483	627	558	1066
571	219	700	937	850	1593
1614	113	153	359	200	610
612	366	1151	1524	1366	2591
691	28	68	87	86	148
681	155	273	440	284	748
1609	343	1118	1488	1342	2530
692	181	339	503	370	855
621	350	1143	1525	1379	2593
741	61	133	167	167	284
1615	171	321	466	353	792
641	46	117	150	133	255
631	31	76	98	97	167
1610	338	1116	1515	1363	2576
84	34	59	67	67	114
701	212	449	553	473	940
642	382	1271	1725	1551	2933
1620	33	59	67	67	114
711	59	146	188	180	320

Project Site

* 1.7 x 100-Year

Appendix D. Drainage Maps



LEGEND

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- Right of Way Line
- Centerline
- Swale Line
- Storm Sewer Line
- Ex. Storm Sewer Line
- Major Basin Boundary Line
- Minor Basin Boundary Line
- Proposed Major Contour (5280)
- Proposed Minor Contour
- Existing Major Contour (5280)
- Existing Minor Contour
- Flow Direction Arrow
- Emergency Overflow Arrow
- Name / Area AC. / C5 C100 — Drainage Basin ID
- Name / Area AC. / C5 C100 — Ex. Drainage Basin ID
- Ex. Asphalt Pavement
- Ex. Concrete Pavement
- Floodplain
- Hydrologic Soil Type Boundary

Calculated Existing Runoff Rates

Basin ID	Total Area (Ac.)	Composite Imperv. %	Peak Flow (cfs) Q_5	Peak Flow (cfs) Q_{100}
HA	20.239	5%	3.46	43.97
HB	128.684	5%	12.06	170.41
HC	29.828	5%	1.80	29.94

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Prepared: RMW
Approved: XWL
Job No.: 1084-0006
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Scale Vert: N/A
Sheet: 1 of 7
Date: October 15, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Drainage Maps
Sheet Name: Preliminary Existing Overall Drainage Map

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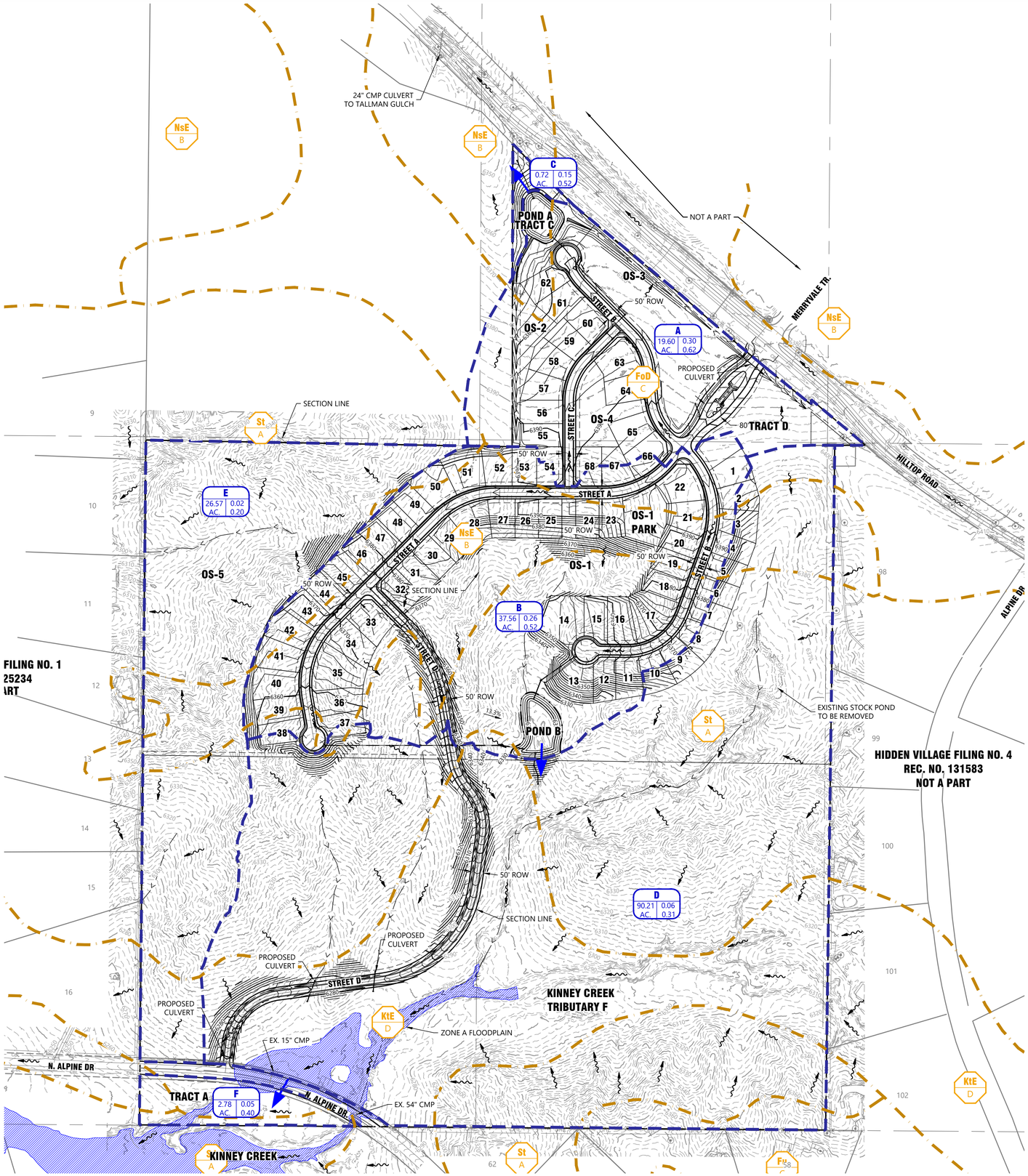

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- Existing Minor Contour
- Flow Direction Arrow
- Emergency Overflow Arrow
- Drainage Basin ID (Name; Area AC.; C5 C100)
- Ex. Drainage Basin ID (Name; Area AC.; C5 C100)
- Ex. Asphalt Pavement
- Ex. Concrete Pavement
- Floodplain
- Hydrologic Soil Type Boundary

Calculated Proposed Runoff Rates

Basin ID	Total Area (Ac.)	Composite Imperv. %	Peak Flow (cfs) Q_5	Peak Flow (cfs) Q_{100}
A1	0.75	59%	1.84	4.72
A2	2.04	50%	2.77	7.83
A3	1.67	45%	2.02	6.08
A4	2.31	36%	2.11	7.37
A5	0.66	71%	1.60	3.67
A6	4.49	18%	2.27	12.86
A7	4.47	20%	2.27	11.80
A8	0.54	80%	1.76	3.79
A9	1.11	48%	1.78	5.12
A10	1.57	20%	0.96	4.98
B1	13.28	15%	4.15	22.32
B2	4.16	44%	4.72	14.52
B3	2.85	44%	3.21	9.89
B4	3.78	40%	4.03	13.02
B5	2.11	45%	3.02	9.08
B6	4.19	43%	4.52	14.10
B7	2.07	48%	2.87	8.31
B8	1.96	26%	1.38	5.88
B9	3.17	17%	1.28	6.04
D1	67.08	6%	8.43	89.51
D2	1.97	5%	0.42	5.09
D3	0.30	47%	0.58	1.72
D4	0.22	46%	0.44	1.29
D5	1.50	11%	0.58	4.24
D6	10.53	6%	1.05	10.19
D7	6.80	8%	1.36	11.87
D8	1.43	22%	1.19	5.90
D9	0.38	29%	0.47	1.88
E1	16.66	5%	0.99	15.64
E2	9.91	5%	0.86	12.50

Detention Pond A Volume Table

	Required Vol. (ac-ft.)	Provided Vol. (ac-ft.)	Elevation (ft)	Depth (ft)
Bottom of Pond	N/A	N/A	6363.00	0.00
WQCV	0.262	0.263	6364.13	1.13
EURV	0.615	0.616	6365.40	2.40
100-yr	1.397	1.694	6368.36	5.36
Emergency Overflow Weir	N/A	N/A	6368.50	5.50
Emergency Overflow WSE	N/A	N/A	6368.92	5.92
Freeboard / Top of Pond	N/A	N/A	6369.92	6.92

Detention Pond B Volume Table

	Required Vol. (ac-ft.)	Provided Vol. (ac-ft.)	Elevation (ft)	Depth (ft)
Bottom of Pond	N/A	N/A	6318.00	0.00
WQCV	0.474	0.474	6319.33	1.33
EURV	1.123	1.124	6320.83	2.83
100-yr	2.337	2.817	6323.82	5.82
Emergency Overflow Weir	N/A	N/A	6324.00	6.00
Emergency Overflow WSE	N/A	N/A	6324.44	6.44
Freeboard / Top of Pond	N/A	N/A	6325.44	7.44

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Sheet Name: Preliminary Proposed Overall Drainage Map

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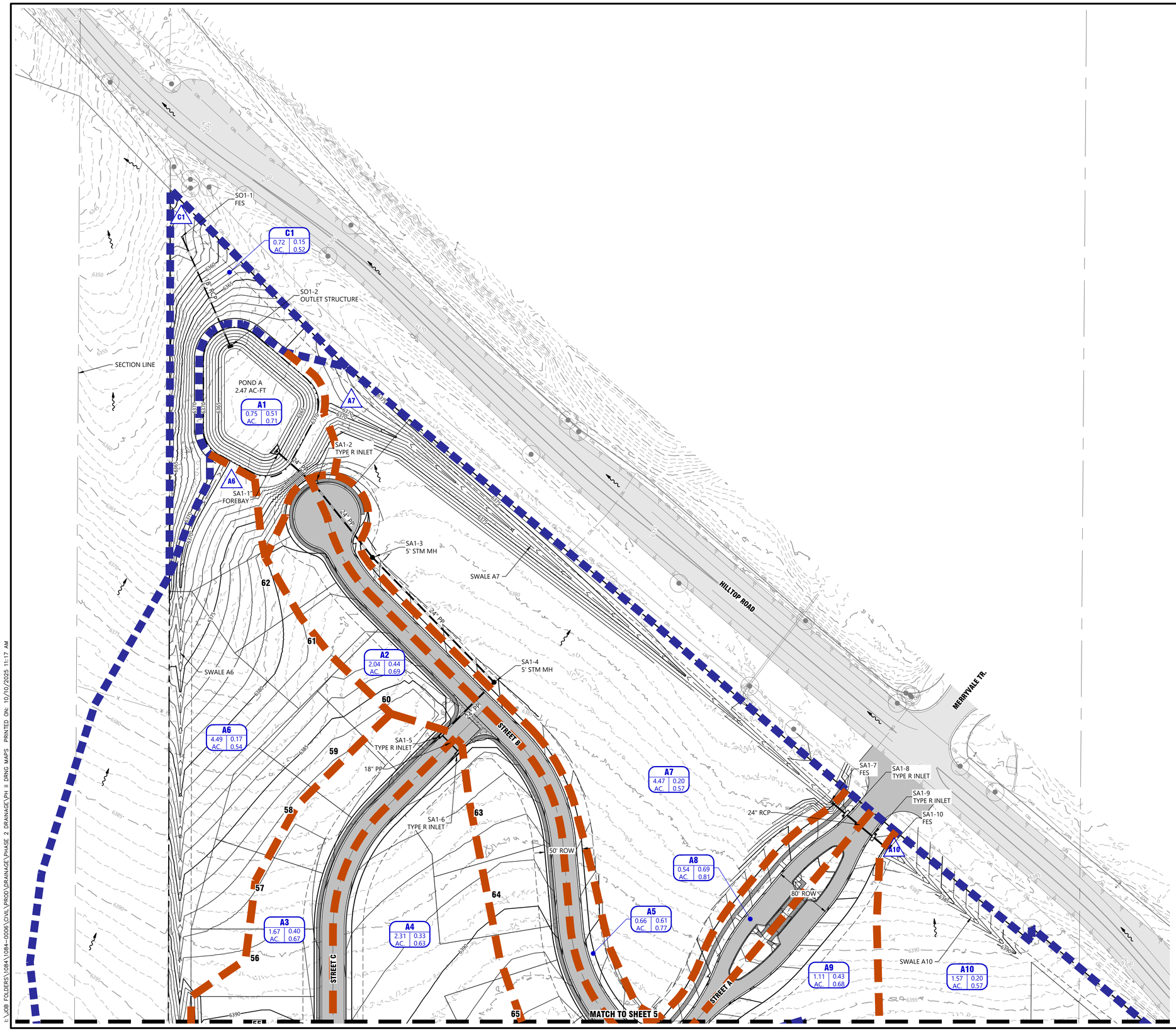

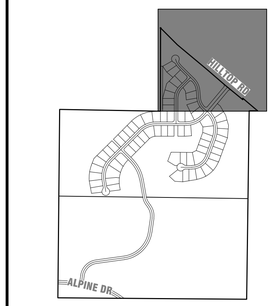

KEY MAP
1"=1000'

LEGEND

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- Storm Sewer Line
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- Major Basin Boundary Line
- Minor Basin Boundary Line
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- Proposed Minor Contour
- Existing Major Contour
- Existing Minor Contour
- Flow Direction Arrow
- Emergency Overflow Arrow
- Name (Area, AC., C5, C100) — Drainage Basin ID
- A1 — Design Point

SCALE
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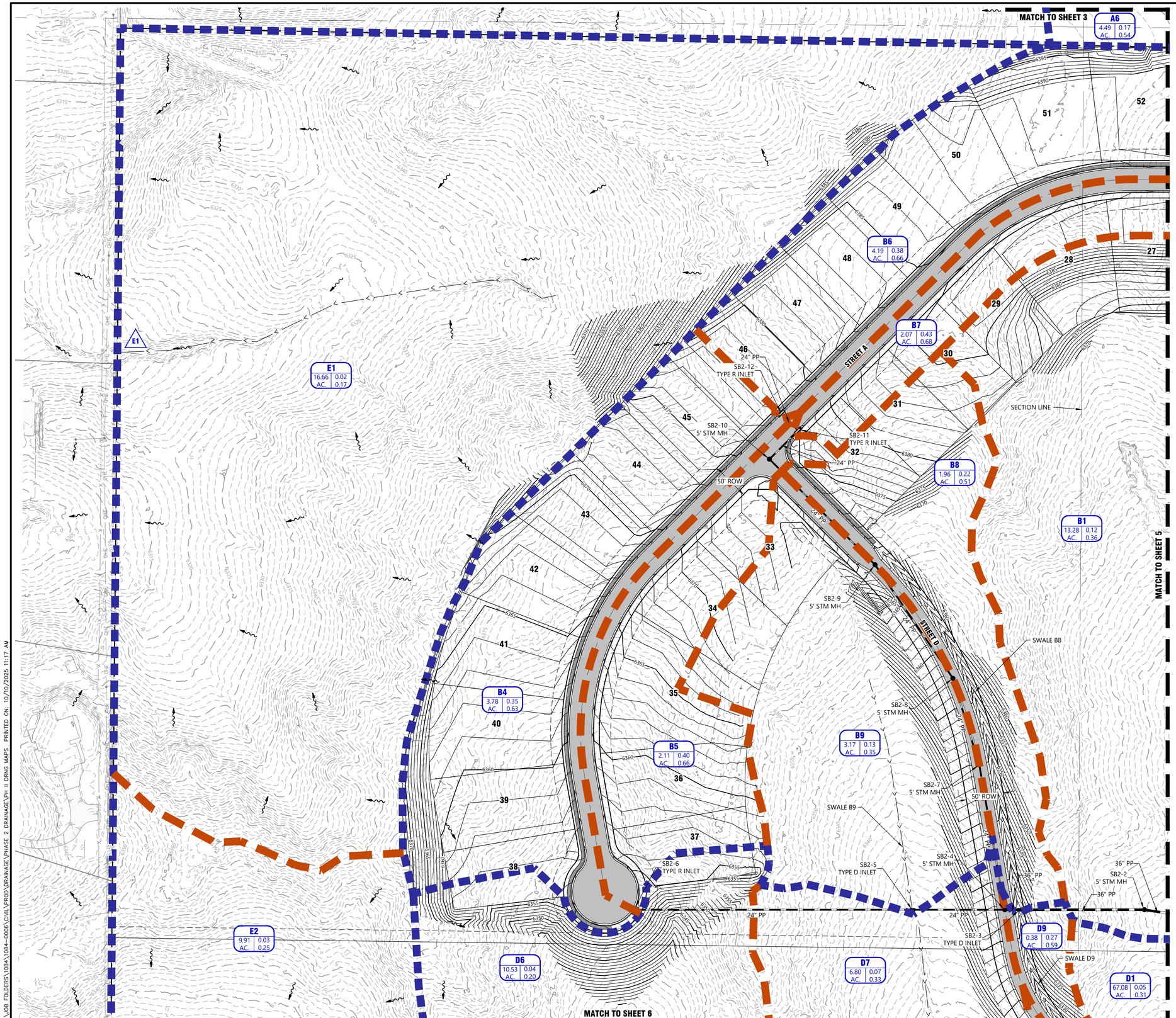

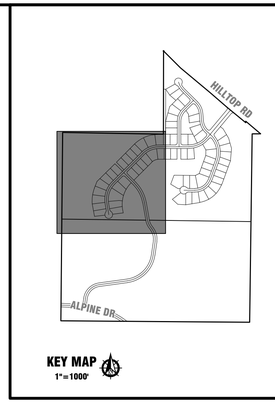

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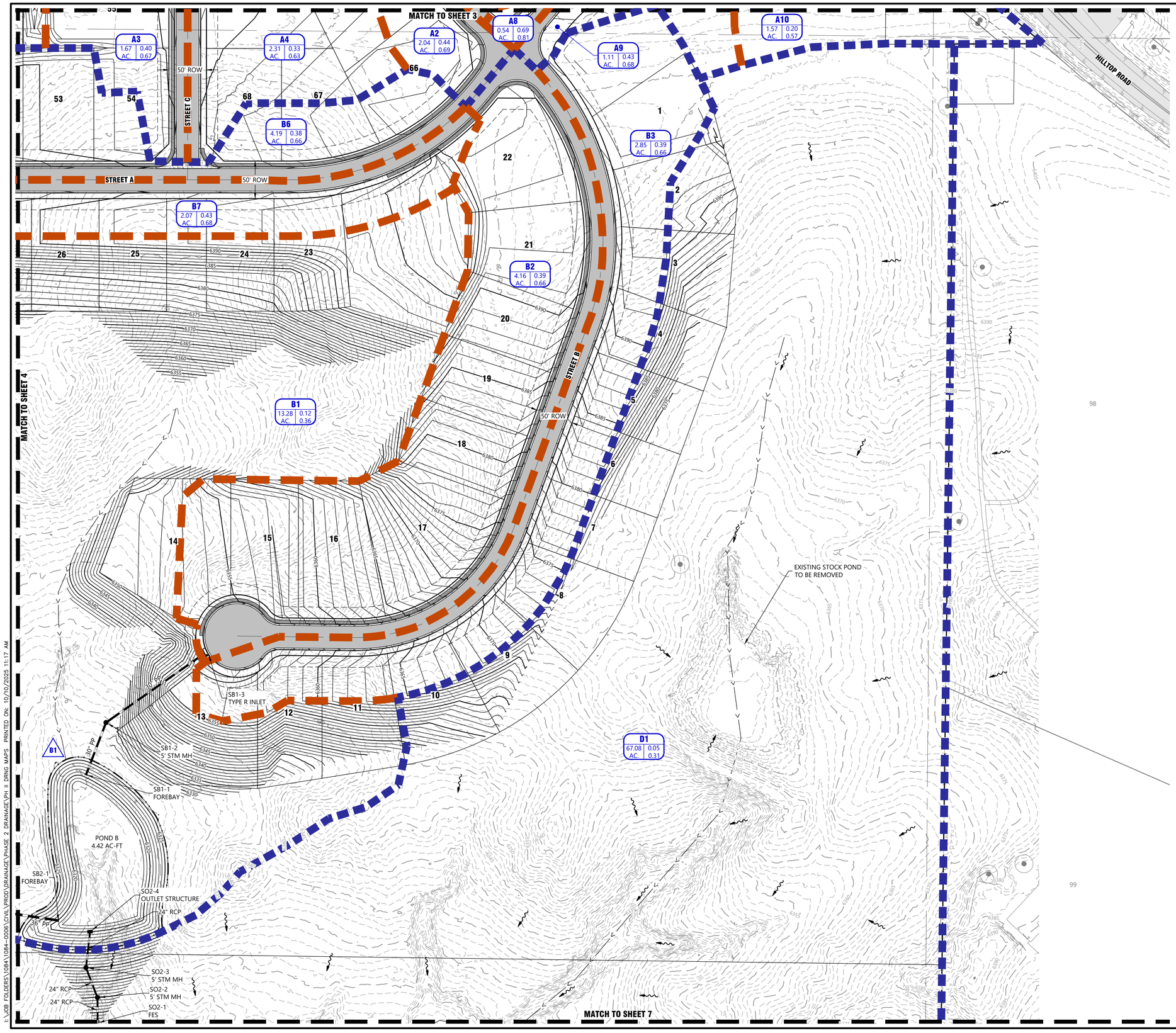

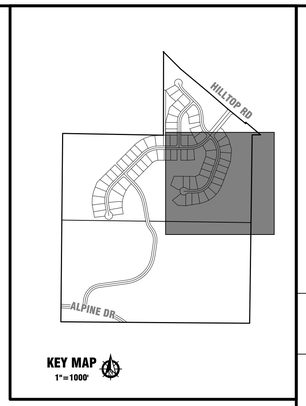

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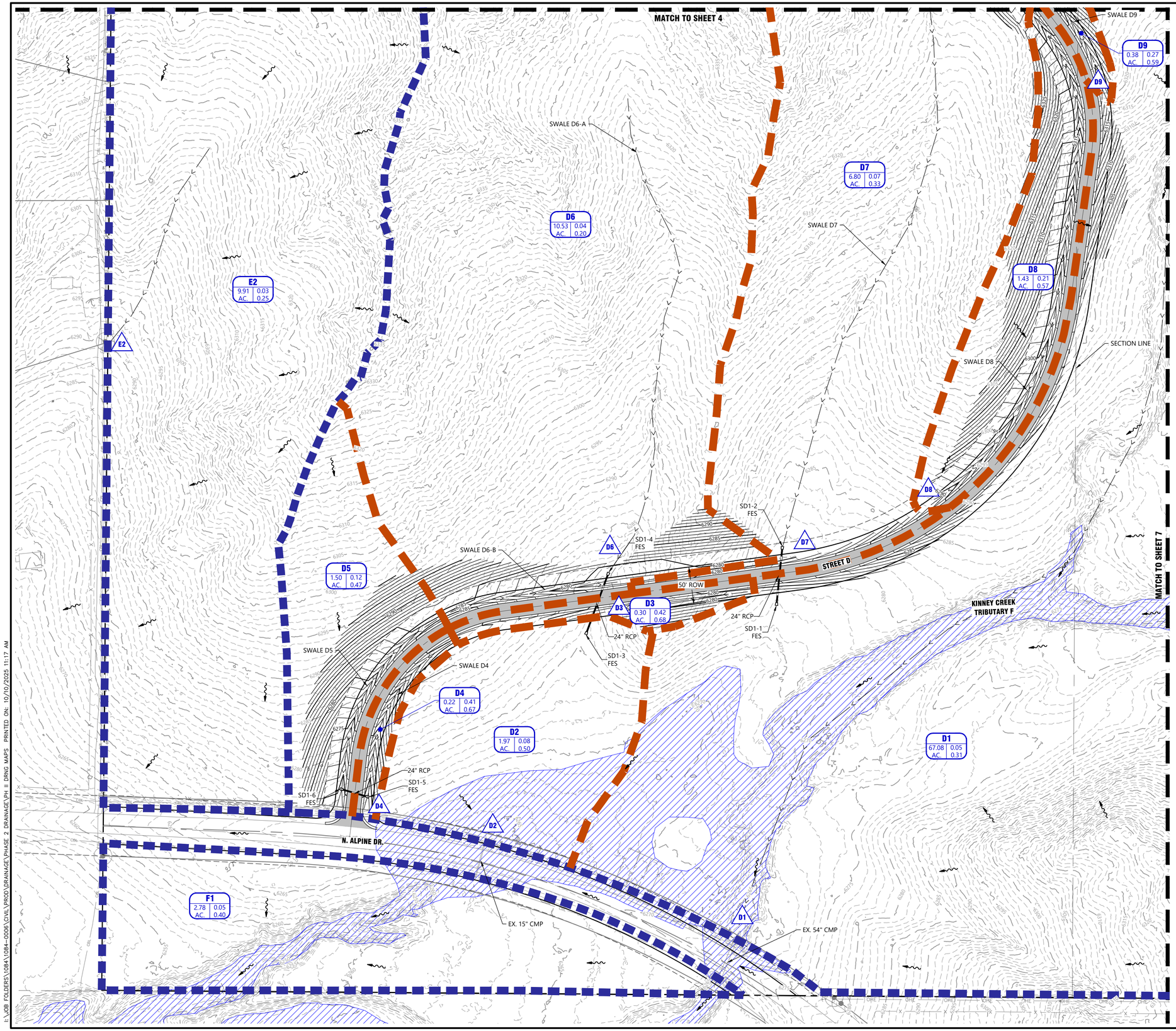

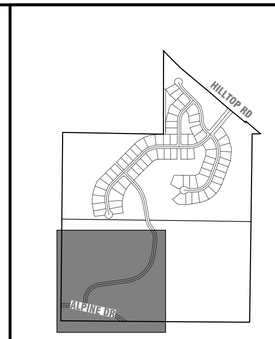

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Job No.: 1084-0006
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Sheet: 6 of 7
Date: October 15, 2025

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Location: Douglas County, Colorado
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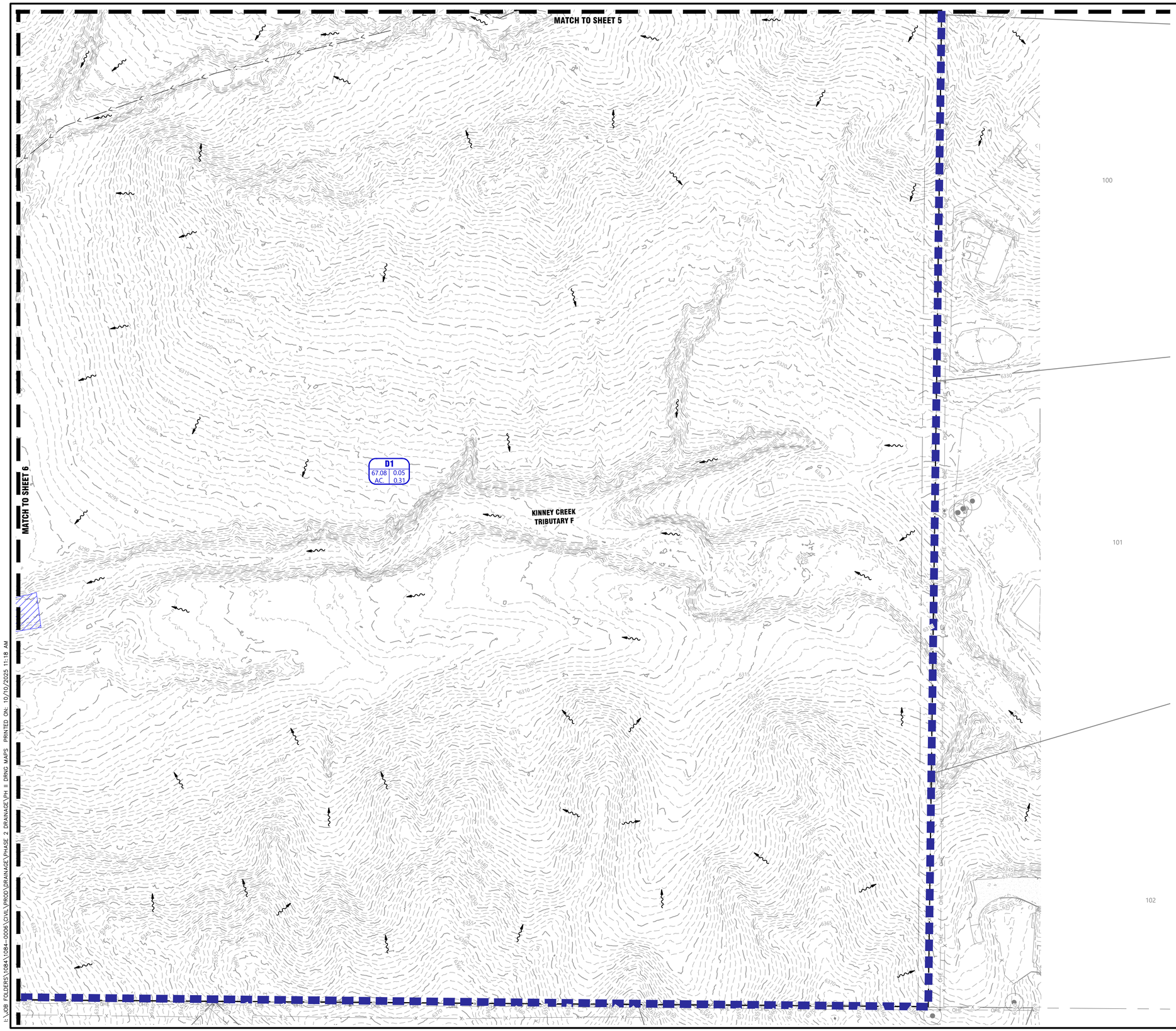

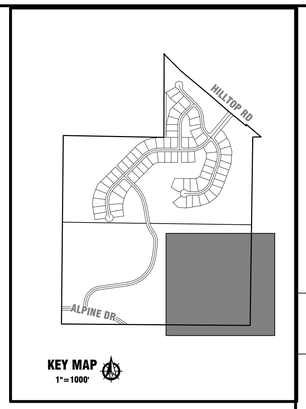

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No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: RMW
Prepared: RMW
Approved: XWL

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 7 of 7
Date: October 15, 2025

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Drainage Maps
Sheet Name: Preliminary Detailed Drainage Map

NOT FOR CONSTRUCTION

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

No. 7

I:\JOB FOLDERS\1084\1084-0006\CIVIL\PROD\DRAINAGE\PHASE 2 DRAINAGE\PH II DRNG MAPS PRINTED ON: 10/10/2025 11:18 AM

Geotechnical Due Diligence Study
Hilltop 177
Douglas County, Colorado

MU Hilltop LLC
% Miller United Real Estate
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Project Number 245004
October 9, 2024

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1.0 EXECUTIVE SUMMARY

AGW completed a geotechnical due diligence study for the proposed residential development. Our summary of the data collected during our field and laboratory work and our analysis, opinions, and conclusions are presented. The purpose of our study is to provide preliminary geotechnical concepts for planning, site grading, structures, and streets. Additional geotechnical studies will be required to provide site development recommendations, final design criteria, and construction recommendations.

The subsurface materials encountered in our test borings consist of topsoil, clay, and sand overlying sedimentary bedrock. Sandstone or claystone bedrock was encountered at depths ranging from 2½ to 11½ feet. Ground water was measured at a depth of 38 feet.

Site development considerations should include provisions for expansive soils and bedrock, moderately cemented sandstone, and natural drainages.

We anticipate the structures will be founded on spread or pad-type footing foundations or on drilled piers. Soil modification can be considered to reduce the expansion potential and to provide moisture treated fill to potentially allow for footing foundations. Densification of the loose sands may be necessary prior to foundation construction.

Slabs-on-grade may require special consideration because of the low to high expansion potential of the soils and bedrock. Structural floor systems are recommended where the basement slab risk assessment is high or very high, if the area is finished, or if slab movement cannot be tolerated. Perimeter subsurface drainage systems will be necessary for all below grade areas. Water soluble sulfate test results indicate that concrete for the site may be designed for negligible sulfate exposure. Additional recommendations are presented. We encourage the Client to read this report in its entirety and not to solely rely on the cursory information contained in this summary.

2.0 PURPOSE

This report presents results of a geotechnical due diligence study for the proposed residential development to be located south of Hilltop Road at Merryvale Trail in Douglas County, Colorado. The study was performed to determine preliminary geotechnical design criteria for planning and site development. Factual data gathered during the field and laboratory work are summarized on Figures 1 through 5 and in the Appendix. Our opinions and recommendations are based on the data generated during our field exploration, laboratory testing, our understanding of the proposed project, and our experience with similar projects and geotechnical conditions.

This study was performed in general conformance with our Proposal Number 245004, dated August 8, 2024. This report is not intended to provide design criteria for individual foundations or street construction. Additional geotechnical studies will be required to provide site development recommendations, final design criteria, and construction recommendations.

3.0 PROPOSED CONSTRUCTION

The proposed 177-acre residential development will include 68 single-family lots, a lift station, and the associated utility and roadway infrastructure. Preliminary grading plans and product type were not available.

4.0 SITE CONDITIONS

The site is vacant with vegetation consisting of grasses, bushes, cacti, yucca, scrub oak, and trees. The site is currently being used as horse pasture. A pond is located southeast of Test Boring 11. Natural, incised drainages cross the site from northeast to southwest. Cobbles were observed on the ground surface. The ground surface is rolling and slopes gently to moderately to the southwest. The site is bounded by Hilltop Road to the north, vacant parcels to the south and west, and large-lot residences to the east. No bedrock outcrops were observed.

5.0 FIELD EXPLORATION

Subsurface conditions were explored by drilling 13 test borings at the locations indicated on Figure 1. The locations for Test Borings 12 and 13 were determined by the Client and are potential locations for the future lift station. The test borings were advanced using a 4-inch diameter, continuous flight auger powered by a truck-mounted drill rig. At frequent intervals, samples of the subsurface materials were obtained using a Modified California sampler which was driven into the soil by dropping a 140-pound hammer through a free fall of 30 inches. The Modified California sampler is a 2.5-inch outside diameter by 2-inch inside diameter device. The number of blows required for the sampler to penetrate 12 inches or the number of inches that the sampler is driven by 50 blows gives an indication of the consistency or relative density of the soils and bedrock. Results of the penetration tests and locations of sampling are shown on the "Test Boring Logs", Figures 2 through 5. Ground water measurements were made at the time of drilling and after drilling. Test Borings 5, 6, 12, and 13 were backfilled after drilling due to the presence of horses in the vicinity.

6.0 LABORATORY TESTING

The samples obtained during drilling were returned to the laboratory and were visually classified by a geotechnical engineer. Laboratory testing was assigned to specific samples to evaluate their engineering properties. The laboratory tests included swell-consolidation tests to evaluate the effect of wetting and loading on the selected samples. Gradation analysis and Atterberg limits tests were performed to evaluate grain size distribution and plasticity. In addition, representative samples were tested for water soluble sulfates, pH, resistivity, and chlorides. The test results are summarized on Figures 2 through 5 and are included in the Appendix.

7.0 SUBSURFACE CONDITIONS

The subsurface materials encountered in our test borings consist of topsoil, clay, and sand overlying sedimentary bedrock. Sandstone or claystone bedrock was encountered at depths ranging from 2½ to 11½ feet. Ground water was measured at a depth of 38 feet. A more complete description of the subsurface conditions is shown on Figures 2 through 5.

7.1 Natural Soil

Topsoil was found in all 13 test borings. The topsoil encountered consisted of sandy clay up to 1-foot thick. It was organic, moist, and dark brown.

Clay was encountered in six of the 13 test borings. The clay was medium stiff to very stiff, silty, sandy to very sandy, with sand lenses, slightly moist to moist, and brown. The sample tested exhibited high plasticity. The clay has high expansion potential and low consolidation potential.

Sand was encountered in nine of the 13 test borings. The sand was loose to dense, clayey, to very clayey, with trace gravel and clay lenses, slightly moist to very moist, and brown. Loose sand was encountered in Test Boring 1 at a depth of 2½ feet and was 3½ feet thick. The sample tested exhibited moderate plasticity. The sand has low expansion potential and low to moderate settlement potential.

7.2 Bedrock

Sandstone was encountered in all 13 test borings at depths ranging from 2½ to 23 feet. The sandstone was medium hard to very hard, poorly to moderately cemented, slightly silty to very silty, clayey to very clayey, with trace gravel and claystone lenses, slightly moist to wet, and brown to gray to olive. Moderately cemented sandstone was encountered in four of the 13 test borings at depths ranging from 5 to 40 feet. The cemented lenses were between 4½ and 10 feet thick. The samples tested exhibited no to moderate plasticity. The sandstone has low expansion potential.

Claystone was encountered in nine of 13 test borings at depths ranging from 4 to 25 feet. The claystone was medium hard to very hard, silty, sandy to very sandy, with sandstone and siltstone lenses, moist to very moist, and brown to gray to olive to rust. The samples tested exhibited moderate plasticity. The claystone has high expansion potential.

7.3 Ground Water

Ground water was not encountered at the time of drilling. Test Borings 5, 6 12, and 13 were backfilled after drilling. When checked one to seven days after drilling, ground water was measured at a depth of 38 feet in Test Boring 10. Ground water levels fluctuate with changing seasons and irrigation patterns and are expected to rise after construction is complete and landscape irrigation commences.

8.0 GEOTECHNICAL CONCERNS

8.1 Expansive Soils and Bedrock

Expansive soils and bedrock with high expansion potential were encountered in areas of the site. Expansive soils and bedrock swell and can heave structures as their moisture content increases. When wetted, the clay and claystone may heave enough to damage structures without proper engineering design or site preparation. This will be a concern across portions of the site where the expansive clay or claystone is within 15 to 20 feet of the graded ground surface.

8.2 Moderately Cemented Sandstone

Moderately cemented sandstone was encountered in four of the 13 test borings at depths ranging from 5 to 40 feet. The moderately cemented portions may be excavated using a single hydraulic ripper tooth mounted on a dozer.

8.3 Natural Drainages

Numerous incised drainages traverse the site. It appears that site development is currently planned to avoid developing on top of the natural drainages. However, if fill placement is planned in the natural drainages, the drainages should be observed by AGW prior to fill placement. Vegetation found at the base of these areas must be removed. Soft or rutting soils should be removed or the subgrade should be stabilized. Existing drainages tend to collect subsurface water after fill has been placed. Where grading fill is more than 12 feet deep, a blanket or "burrito" drain should be constructed along the flow line of the drainage to a gravity daylight outfall.

9.0 SITE GRADING

Site grading may be accomplished using typical earth moving techniques common in this area. Densification of the loose sands may be necessary prior to foundation construction. Difficulty may be encountered in some areas during bedrock excavation with typical earthmoving equipment. Ripping of the bedrock with a dozer may be necessary. The use of rock buckets or hydraulic hammers may be necessary in small excavations should very hard sandstone be encountered. Excavations and fill slopes will need to be properly designed and constructed to alleviate erosion or stability concerns.

More specific site development recommendations, including overlot grading, overexcavation, and pavement design considerations should be developed once preliminary grading plans are available. Drainages should be observed by AGW prior to fill placement. Additional test borings spaced at intervals to augment the data from this study are necessary to better define the subsurface conditions and areas of geotechnical issues to develop necessary mitigation measures.

Soil modification may be performed to reduce the expansion potential of the clays and claystone bedrock. Most soil modification in this area is performed by overexcavation of the expansive materials and then placement of the excavated soils as a moisture treated fill. Based on the swell potential of the clay and claystone bedrock, the drilling of additional borings, and the product types, overexcavation depths between 10 and 12 feet below lowest foundation elevation should be expected.

10.0 SITE CONCRETE AND CORROSIVITY

Laboratory tests performed on selected soil samples indicate water soluble sulfates ranging from less than 100 parts per million (ppm) to 200 ppm. Based upon these results and our experience in the area, the site soils and bedrock have negligible (S0 or RS0) sulfate exposure per ACI 318 or ACI 332. We recommend the most recent edition of "ACI Manual of Concrete Practice" be used for proper concrete mix design properties.

The pH test results were 7.9 and 8.0, resistivity test results were 6,900 and 17,000 ohm·cm, and chloride test results were 0.0009% and 0.0016%. These results are summarized on Figures 2 through 5 and in the Appendix. The results should be used to choose the construction materials which will be resistant to the various corrosive forces. Manufacturer's representatives should be contacted regarding the specific corrosivity resistance for their products. In addition, local specifications should be consulted when selecting pipe materials.

11.0 STRUCTURE CONSTRUCTION

The following information presents preliminary foundation concepts. Additional geotechnical exploration must be performed after completion of site grading. A suitable foundation system for structures founded where moderate to highly expansive soils or bedrock are at or near the bottom of the foundation would be straight shaft piers drilled into bedrock. Where sandstone bedrock or 10 feet or more of properly placed and compacted fill is encountered at or near the bottom of the foundation, the use of shallow foundations such as spread or pad footings would likely be appropriate.

Interior floor support will be dependent upon the amount of movement the Client can tolerate. Where footing type foundations are constructed, it is likely that the risk of slab movement will be low to moderate. Where piers are constructed, the risk of slab movement will be moderate to very high. To reduce the risk of slab movement, either modification of the slab bearing soils or the use of structural floors will be necessary. If finished areas are planned or slab movement cannot be tolerated, structural floors should be constructed. Drain systems will be required where below grade areas are planned.

12.0 PAVEMENTS

Pavement thicknesses will vary by type of soil and the amount of truck-type traffic imposed. We anticipate pavement thicknesses for the local streets to be on the order of 4.5 to 6.0 inches of asphalt over either 6.0 to 8.0 inches of aggregate base course or 12.0 inches of chemically treated subgrade. The final design thicknesses could be more or less than indicated depending upon the materials sampled during the final pavement design. Overexcavation and placement of the clay and claystone as moisture treated fill within the pavement areas should be expected. Douglas County may require pavement edge drains.

13.0 FINAL DESIGN CONSULTATION AND CONSTRUCTION OBSERVATION

This report was prepared for the exclusive use of MU Hilltop LLC for the purpose of providing geotechnical criteria for the proposed project. The data gathered and the conclusions and recommendations presented herein are based upon the consideration of many factors including, but not limited to, the type of structures proposed, the configuration of the structures, the proposed usage of the site, the configuration of surrounding structures, the geologic setting, the materials encountered, and our understanding of the level of risk acceptable to the Client. The conclusions and recommendations contained in this report should not be considered valid for use by others unless accompanied by written authorization from AGW.

This study was provided as a due diligence subsurface exploration. More specific site development recommendations, including overlot grading, overexcavation and placement of moisture treated fill, and pavement design considerations can be provided once proposed site grading plans are developed and additional test borings are drilled to better define the subsurface conditions.

AGW should be contacted if the Client wants an explanation of the contents of this report. AGW should be retained to provide future geotechnical services for the site including, but not limited to, design level geotechnical studies, consultation during design, observation and testing during construction, and other geotechnical services. Failure to contract with AGW for these services or selection of a firm other than AGW to provide these services will eliminate liability for AGW.

14.0 GEOTECHNICAL RISK

The concept of risk is an important aspect of any geotechnical evaluation. The analytical methods used to develop geotechnical recommendations are not an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be tempered by engineering judgment and experience. The solutions or recommendations presented in any geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structures will perform as desired or intended. The engineering recommendations presented in the preceding sections are based on our judgement of those measures that increase the likelihood for the structures and improvements performing satisfactorily. The Developer, Builder, and Owner must understand this concept of risk as they must ultimately decide what an acceptable level of risk is for the proposed development of the site.

15.0 LIMITATIONS

We believe the professional judgments expressed in this report are consistent with that degree of skill and care ordinarily exercised by practicing design professionals performing similar design services in the same locality, at the same time, at the same site, and under the same or similar circumstances and conditions. No other warranty, express or implied, is made. In the event that any changes in the nature, design, or location of the facility are made, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing. Because of the constantly changing state of the practice in geotechnical engineering and the potential for site changes after our field exploration, this report must not be relied upon after a period of three years without AGW being given the opportunity to review and, if necessary, revise our findings.

The test borings drilled for this study were widely spaced to obtain an understanding of subsurface conditions for preliminary planning and development purposes. Variations frequently occur from these conditions which are not indicated by the test borings. These variations are sometimes sufficient to necessitate modifications in the designs. If unexpected subsurface conditions are observed by any party during site development, AGW must be notified to review our recommendations.

Our scope of services for this project did not include, either specifically or by implication, any research, identification, testing, or assessment relative to past or present contamination of the site by any source, including biological (i.e., mold, fungi, bacteria, etc.). If such contamination were present, it is likely that the exploration and testing conducted for this report would not reveal its existence. If the Client is concerned about the potential for such contamination or pollution, additional studies should be undertaken.

Our scope of services for this project did not include a local or global geological risk assessment. Therefore, issues such as mine subsidence, slope stability, faults, etc. were not researched or addressed as part of this study. If the Client is concerned about these issues, we are available to discuss the scope of such studies.

A. G. Wassenaar, Inc.

Ashley A. McDaniels, P.E.
Senior Engineer

Reviewed by:

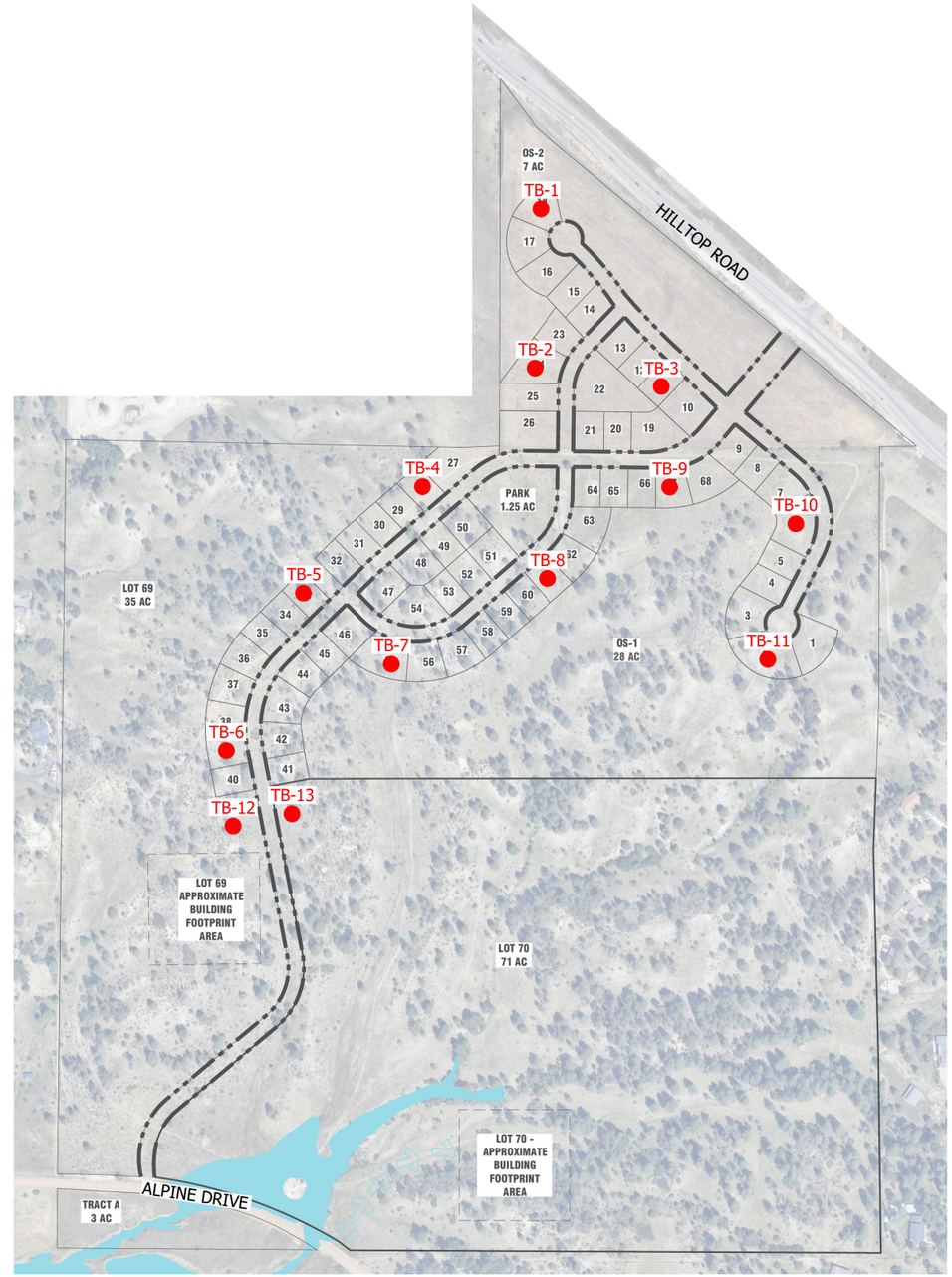
Kathleen A. Noonan, M.S., P.E.
Senior Geotechnical Engineer

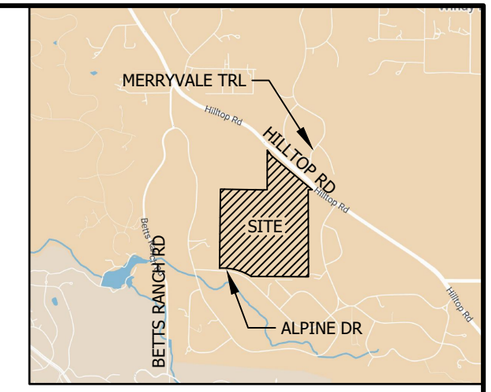
AAM/KAN/aam

HILLTOP 177
DOUGLAS COUNTY, COLORADO

N

0 500 1,000
Scale in Feet





VICINITY MAP
NOT TO SCALE

NOTES:
1. TEST BORINGS ARE OVERLAID ON THE "HILLTOP 177, DOUGLAS COUNTY, CO" PLAN, PREPARED BY NORRIS DESIGN.
2. ALL LOCATIONS ARE APPROXIMATE.

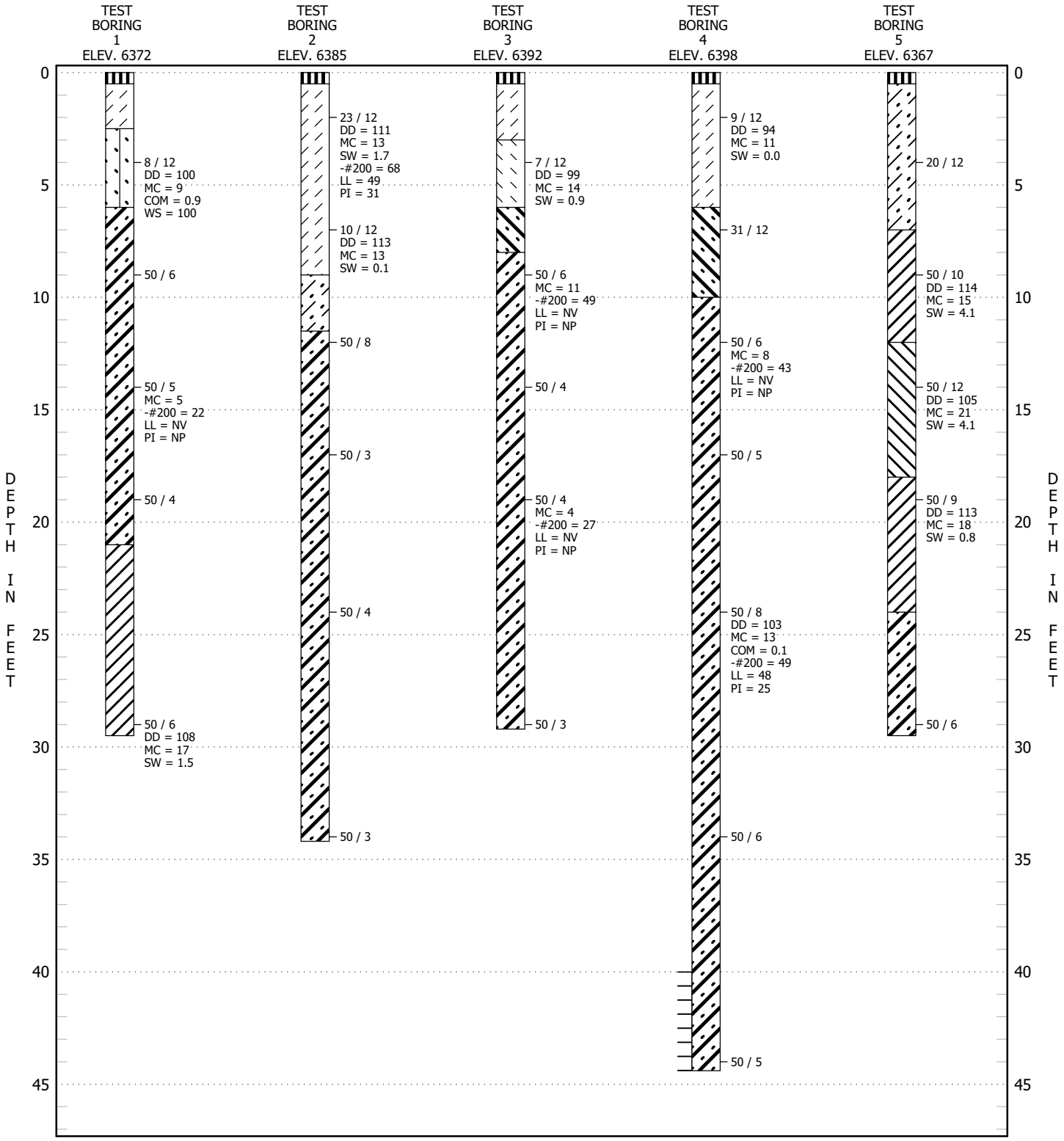
AGW

SITE PLAN
AND
VICINITY MAP

PROJECT NO. 245004
FIGURE 1

CLIENT MU Hilltop LLC **PROJECT NAME** Hilltop 177

PROJECT NUMBER 245004 **PROJECT LOCATION** Douglas County, Colorado



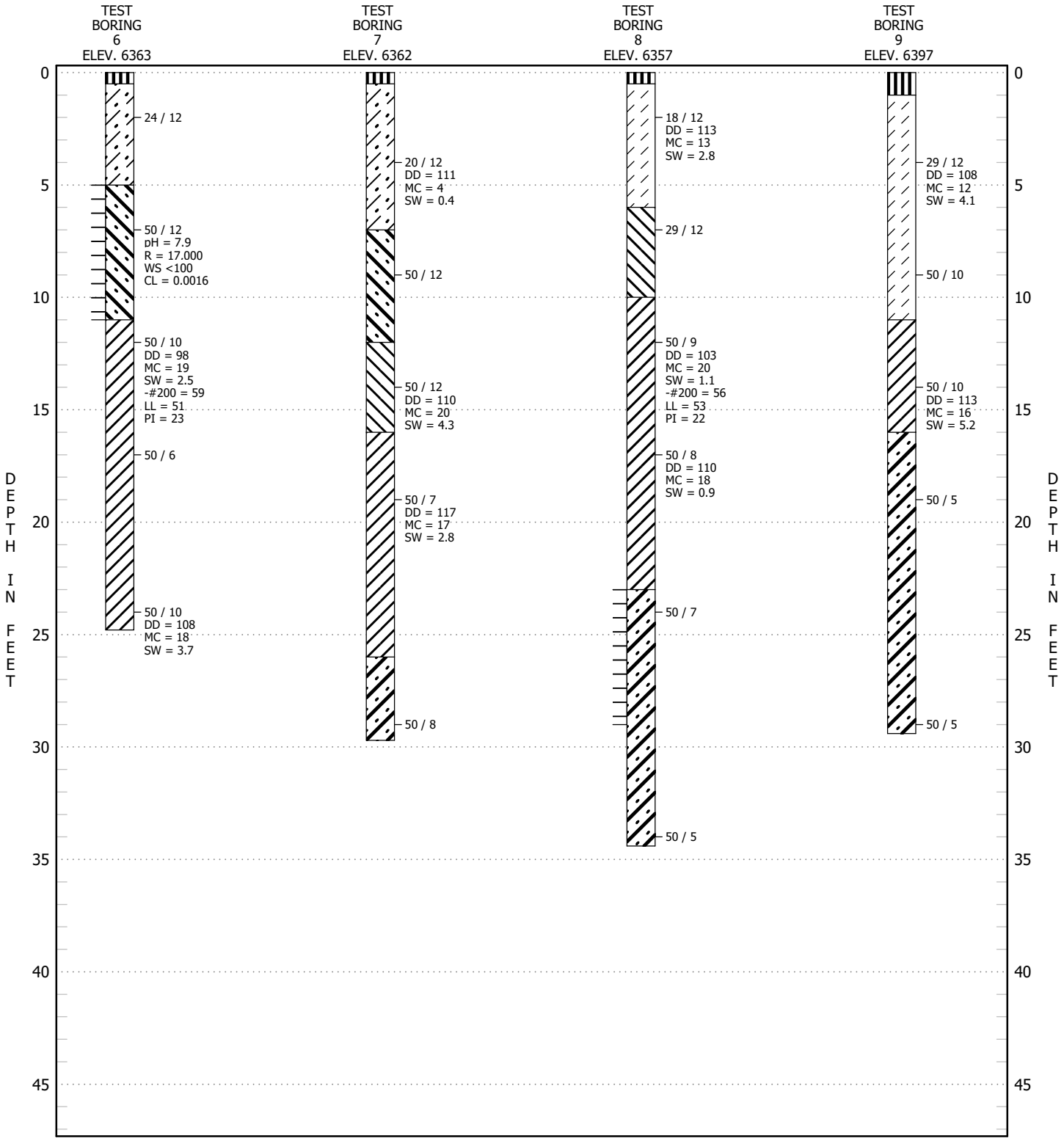
SEE FIGURE 5 FOR LEGEND AND NOTES

TEST BORING LOGS

FIGURE 2

CLIENT MU Hilltop LLC **PROJECT NAME** Hilltop 177

PROJECT NUMBER 245004 **PROJECT LOCATION** Douglas County, Colorado



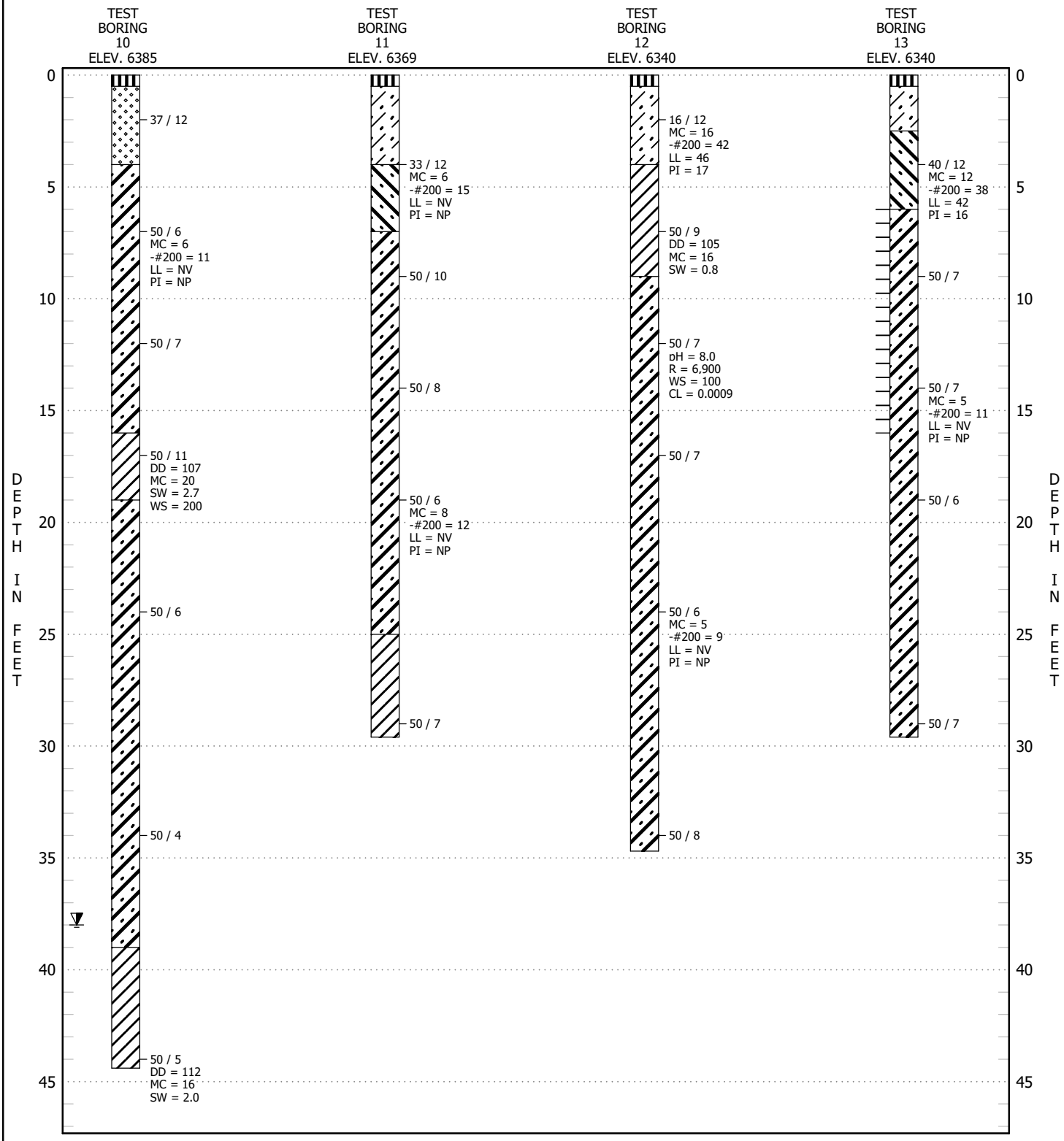
SEE FIGURE 5 FOR LEGEND AND NOTES

TEST BORING LOGS

FIGURE 3

CLIENT MU Hilltop LLC **PROJECT NAME** Hilltop 177

PROJECT NUMBER 245004 **PROJECT LOCATION** Douglas County, Colorado



SEE FIGURE 5 FOR LEGEND AND NOTES

TEST BORING LOGS

FIGURE 4

CLIENT MU Hilltop LLC

PROJECT NAME Hilltop 177

PROJECT NUMBER 245004

PROJECT LOCATION Douglas County, Colorado

SOIL DESCRIPTIONS

- Topsoil, clay, sandy, organic
- Clay, medium stiff
- Clay, stiff to very stiff
- Sand, loose
- Sand, medium dense, silty, clayey
- Claystone (Bedrock), firm to medium hard
- Claystone (Bedrock), hard to very hard
- Sandstone (Bedrock), firm to medium hard
- Sandstone (Bedrock), hard to very hard

ABBREVIATIONS

DD	Dry density of sample, pounds per cubic foot (pcf)
MC	Moisture content, percentage of dry weight of soil (%)
SW	Swell under a surcharge of 1000 pounds per square foot (psf) upon wetting (%)
COM	Compression under a surcharge of 1000 psf upon wetting (%)
UC	Unconfined compressive strength (psf)
-#200	Percent passing the No. 200 sieve (%)
LL	Liquid Limit
PI	Plasticity Index
NP	Nonplastic
NV	No Value
pH	Acidity or alkalinity of sample
R	Resistivity (ohms-cm)
WS	Water soluble sulfates, parts per million (ppm)
CL	Chlorides (%)
x/y	x blows of a 140-pound hammer falling 30 inches were required to drive a 2.5-inch outside diameter sampler y inches
x/y SS	x blows of a 140-pound hammer falling 30 inches were required to drive a 2.0-inch outside diameter sampler y inches
C-x	Depth of cut to grade of x feet
F-x	Depth of fill to grade of x feet
FG	Finished grade
NR	No sample recovered
ND	No drive taken
Bounce	Sampler bounced during driving
B	Bulk sample
AS	Auger sample
	Well to very well cemented layer
	Practical drilling refusal
	Water level at time of drilling
	Caved depth at time of drilling
	Water level 1 to 7 day(s) after drilling
	Caved depth 1 to 7 day(s) after drilling

Notes:

1. Test borings were drilled September 5, 2024 and September 6, 2024.
2. Locations of the test borings were staked by others at locations chosen by AGW, with the exception of Test Borings 12 and 13.
3. The horizontal lines shown on the logs differentiate materials and represent the approximate boundaries between materials. The transitions between materials may be gradual.
4. Elevations were obtained from information provided by others and have been rounded to the nearest foot.
5. Test boring logs shown are subject to the limitations, explanations, and conclusions of this report.

LEGEND AND NOTES

FIGURE 5

APPENDIX
LABORATORY TEST RESULTS

SUMMARY OF LABORATORY TEST RESULTS.....TABLE A-1

SWELL-CONSOLIDATION TEST RESULTS .....FIGURES A-1 THROUGH A-12

GRADATION AND ATTERBERG TEST RESULTS.....FIGURES A-13 THROUGH A-20

TABLE A-1
SUMMARY OF LABORATORY TEST RESULTS
October 9, 2024

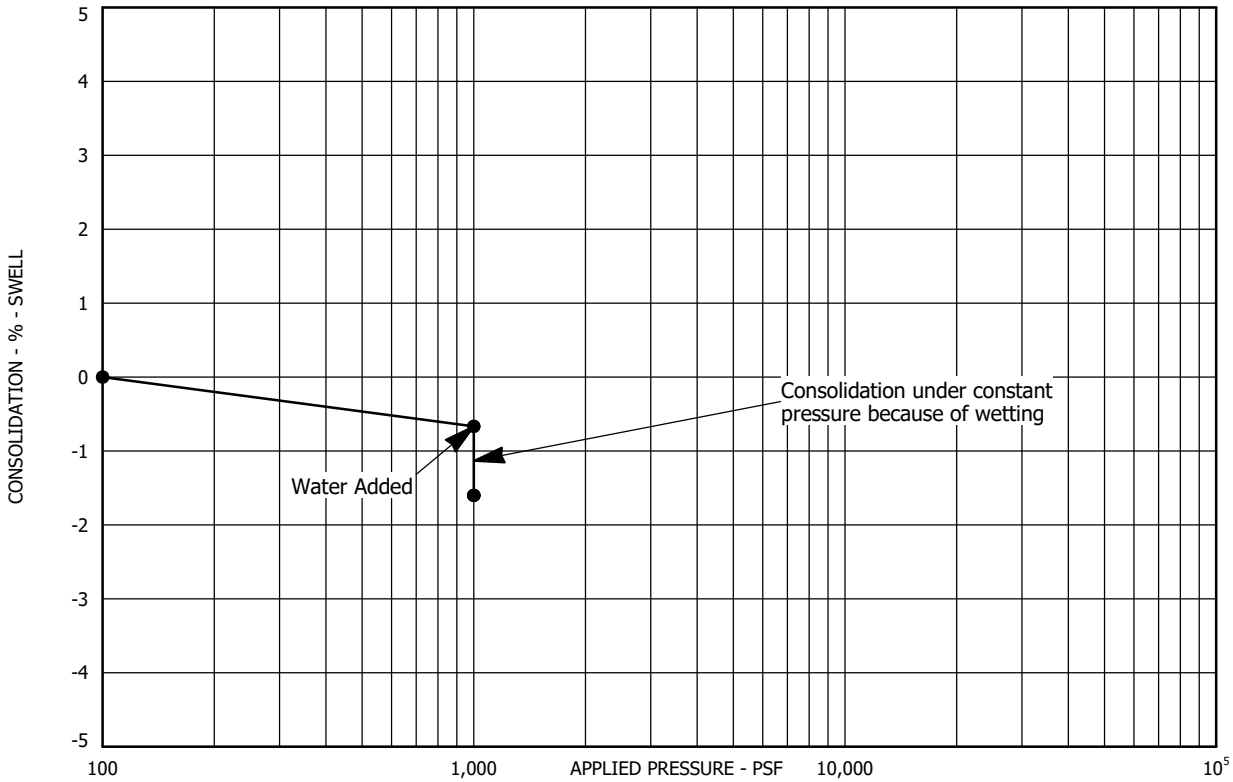
Test Boring Number	Depth (feet)	Soil Type	Natural Dry Density (pcf)	Natural Moisture (%)	Swell / Consolidation (-) (%) [1]	Swell Pressure (psf)	% Passing #200 Sieve	Atterberg Liquid Limit LL	Atterberg Plasticity Index PI	pH	Resistivity (ohm•cm)	Water Soluble Sulfates (ppm)	Chlorides (%)
1	4	Sand, clayey	100	9	-0.9							100	
1	14	Sandstone, silty		5			22	NV	NP				
1	29	Claystone, sandy	108	17	1.5	3,200							
2	2	Clay, very sandy	111	13	1.7	5,300	68	49	31				
2	7	Clay, very sandy	113	13	0.1	2,000							
3	4	Clay, sandy	99	14	0.9	2,600							
3	9	Sandstone, very silty		11			49	NV	NP				
3	19	Sandstone, silty, trace gravel		4			27	NV	NP				
4	2	Clay, sandy	94	11	0.0								
4	12	Sandstone, very silty		8			43	NV	NP				
4	24	Sandstone, very clayey, trace gravel	103	13	-0.1		49	48	25				
5	9	Claystone, sandy	114	15	4.1	10,500							
5	14	Claystone, sandy	105	21	4.1	12,600							
5	19	Claystone, very sandy	113	18	0.8	3,700							
6	7	Sandstone, silty								7.9	17,000	<100	0.0016
6	12	Claystone, very sandy	98	19	2.5	7,500	59	51	23				
6	24	Claystone, sandy	108	18	3.7	7,100							
7	4	Sand, clayey	111	4	0.4	2,100							
7	14	Claystone, sandy	110	20	4.3	11,000							
7	19	Claystone, sandy	117	17	2.8	7,700							
8	2	Clay, sandy	113	13	2.8	6,700							
8	12	Siltstone, very sandy (lens)	103	20	1.1	5,500	56	53	22				
8	17	Claystone, very sandy	110	18	0.9	4,400							

TABLE A-1
SUMMARY OF LABORATORY TEST RESULTS
October 9, 2024

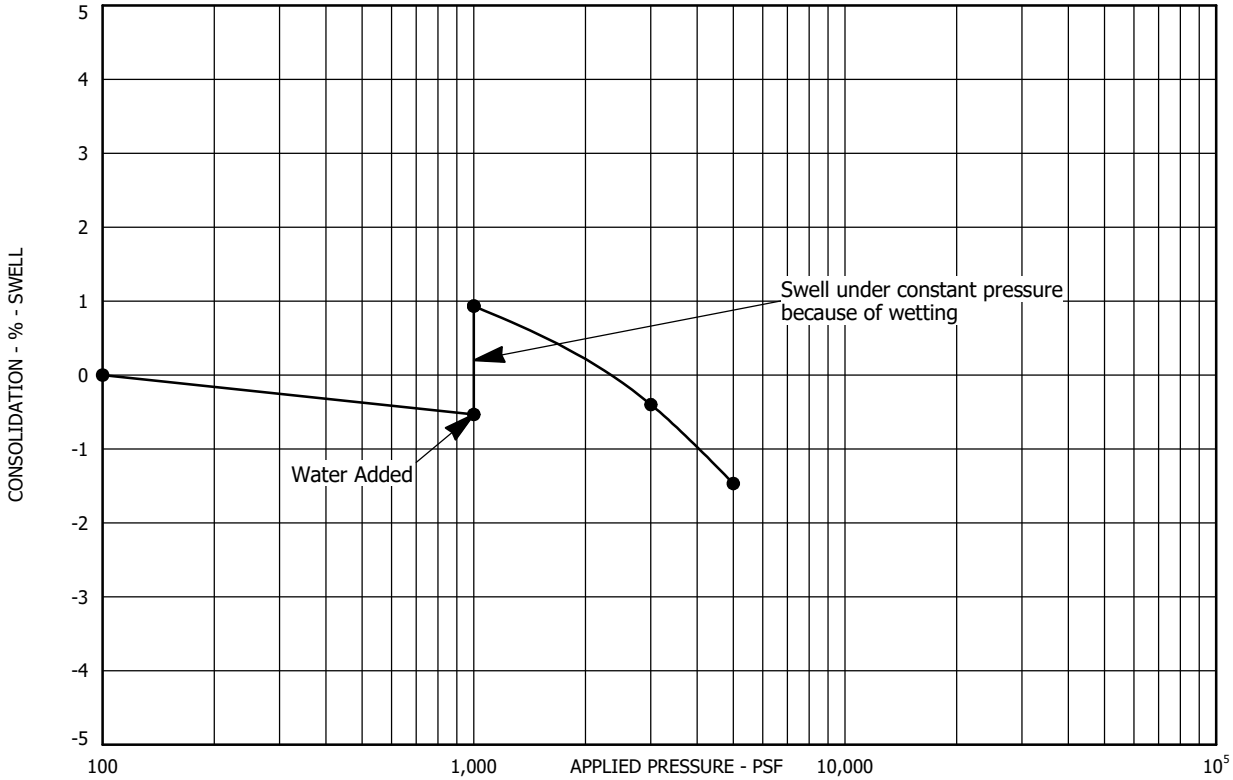
Test Boring Number	Depth (feet)	Soil Type	Natural Dry Density (pcf)	Natural Moisture (%)	Swell / Consolidation (-) (%) [1]	Swell Pressure (psf)	% Passing #200 Sieve	Atterberg		pH	Resistivity (ohm•cm)	Water Soluble Sulfates (ppm)	Chlorides (%)
								Liquid Limit LL	Plasticity Index PI				
9	4	Clay, sandy	108	12	4.1	10,000							
9	14	Claystone, sandy	113	16	5.2	12,300							
10	7	Sandstone, slightly silty, trace gravel		6			11	NV	NP				
10	17	Claystone, very sandy	107	20	2.7	8,700						200	
10	44	Claystone, very sandy	112	16	2.0	5,700							
11	4	Sandstone, silty, trace gravel		6			15	NV	NP				
11	19	Sandstone, slightly silty		8			12	NV	NP				
12	2	Sand, very clayey, trace gravel		16			42	46	17				
12	7	Claystone, very sandy	105	16	0.8	2,300							
12	12	Sandstone, clayey								8.0	6,900	100	0.0009
12	24	Sandstone, slightly silty, trace gravel		5			9	NV	NP				
13	4	Sandstone, very silty		12			38	42	16				
13	14	Sandstone, slightly silty		5			11	NV	NP				

Notes:
[1] Indicates percent swell or consolidation (-) when wetted under a 1,000 psf load

NA - Not Applicable, NV - No Value, NP - Nonplastic



Sample Location: Test Boring No. 1 at a depth of 4 feet
Dry Unit Weight (pcf): 100
Sample Description: Sand, clayey
Moisture Content (%): 9

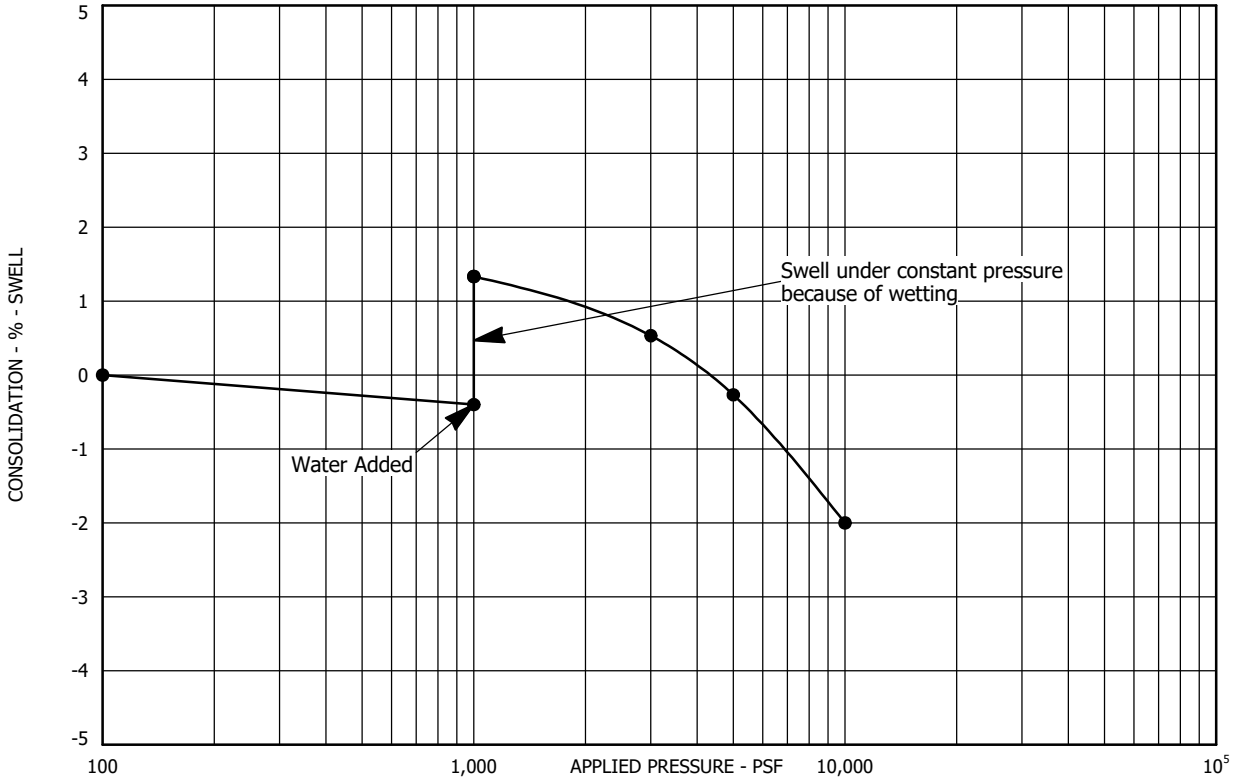


Sample Location: Test Boring No. 1 at a depth of 29 feet
Dry Unit Weight (pcf): 108
Sample Description: Claystone, sandy
Moisture Content (%): 17

SWELL - CONSOLIDATION TEST RESULTS

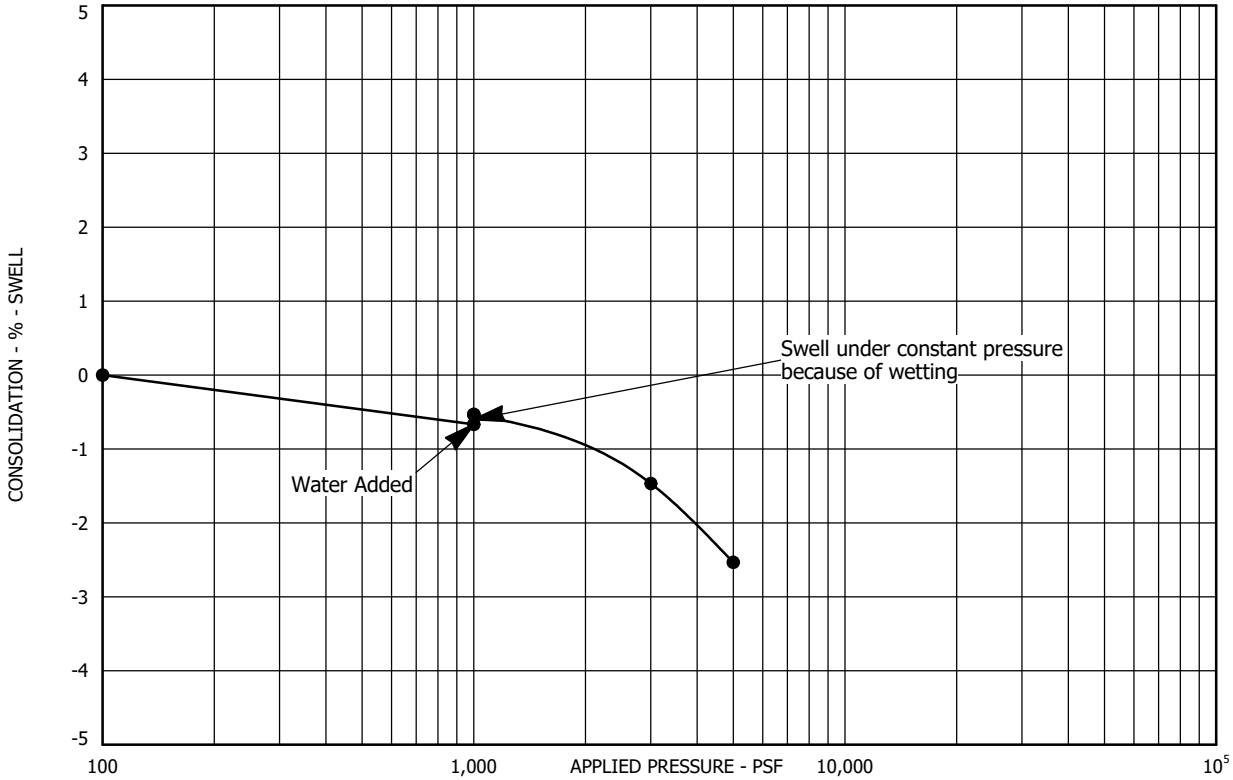
FIGURE A-1

PROJECT NO. 245004



Sample Location: Test Boring No. 2 at a depth of 2 feet — Dry Unit Weight (pcf): 111

Sample Description: Clay, very sandy — Moisture Content (%): 13



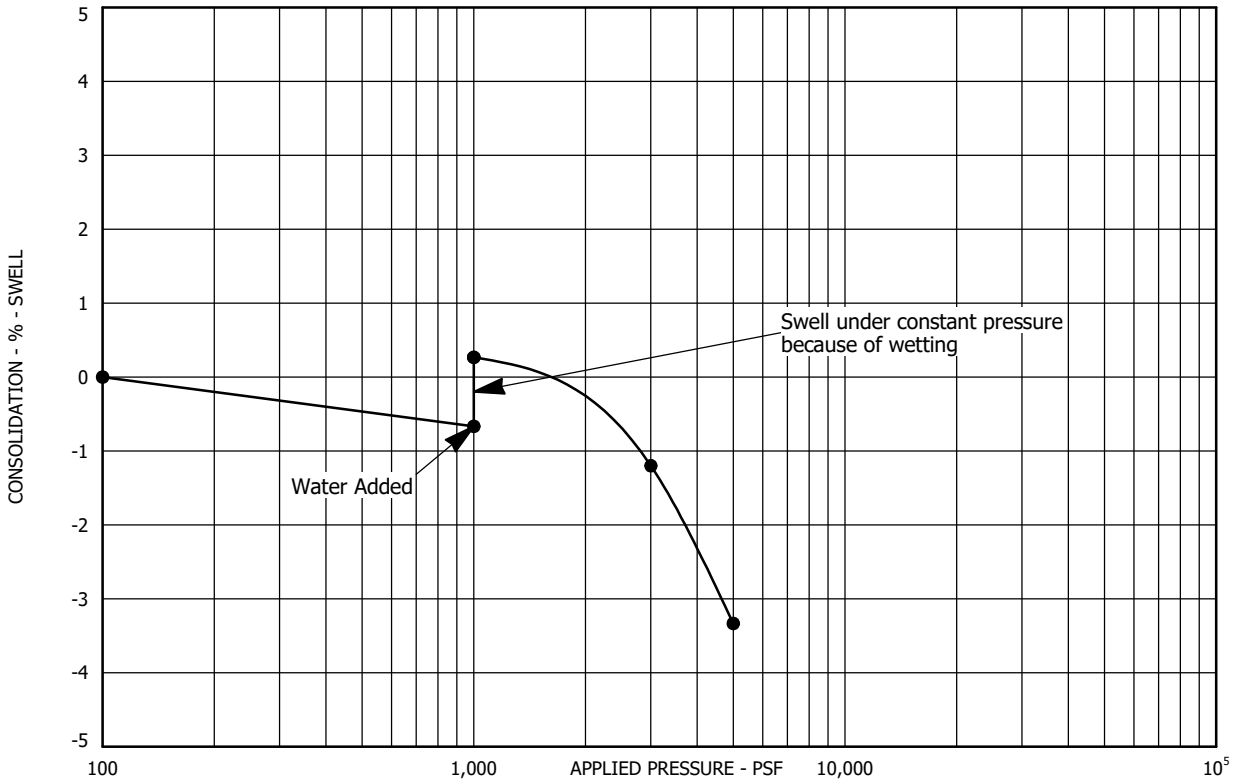
Sample Location: Test Boring No. 2 at a depth of 7 feet — Dry Unit Weight (pcf): 113

Sample Description: Clay, very sandy — Moisture Content (%): 13

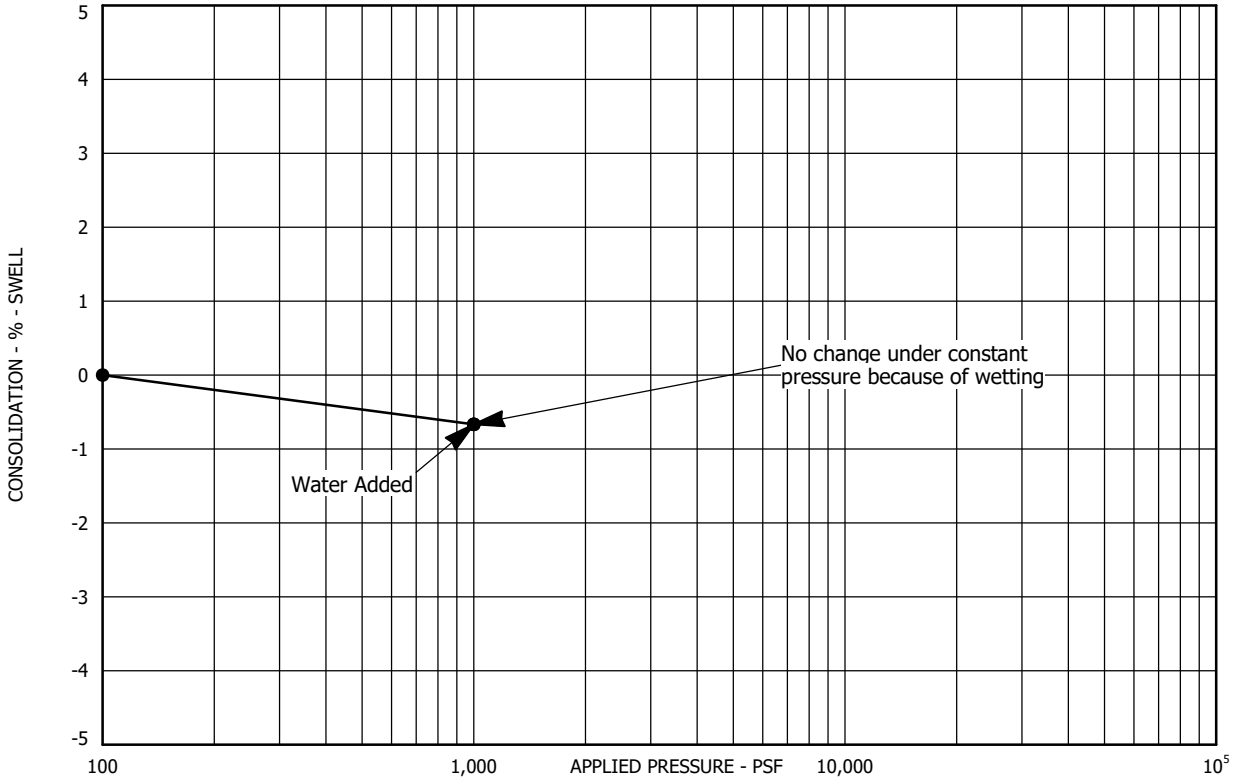
SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-2

PROJECT NO. 245004



Sample Location: Test Boring No. 3 at a depth of 4 feet
Dry Unit Weight (pcf): 99
Sample Description: Clay, sandy
Moisture Content (%): 14

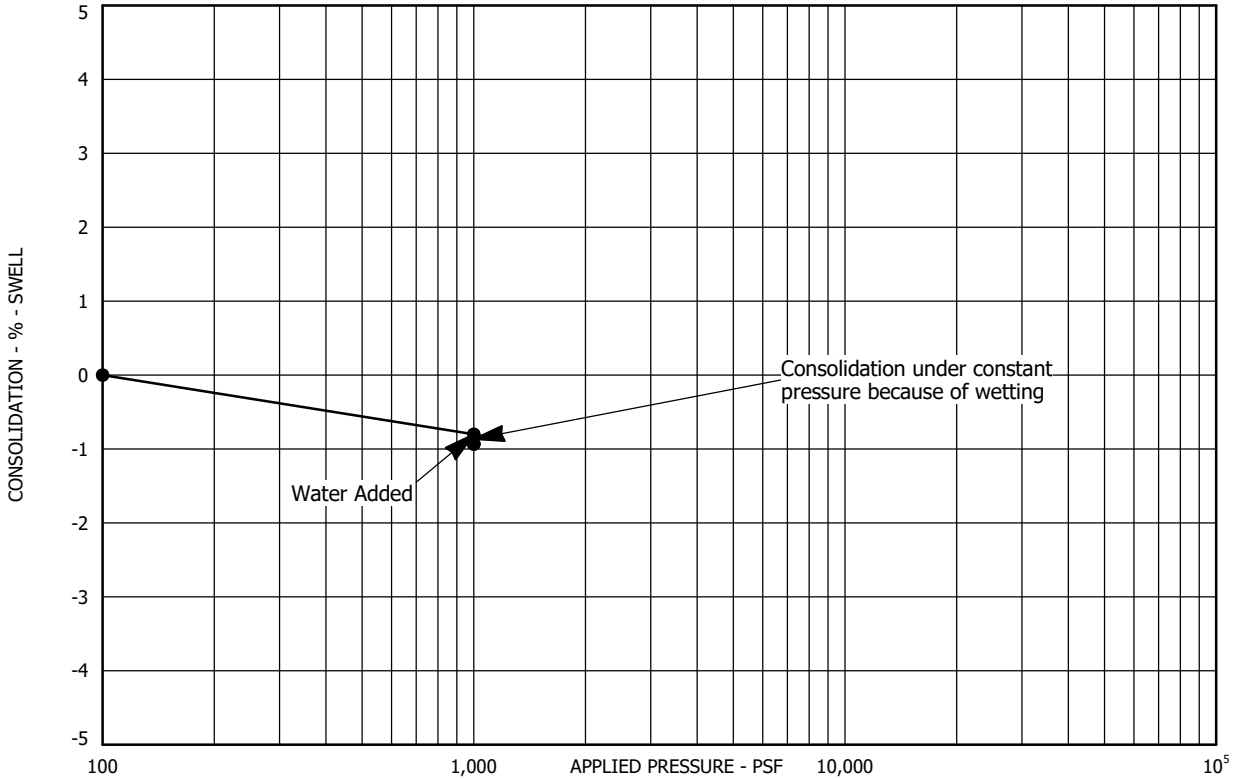


Sample Location: Test Boring No. 4 at a depth of 2 feet
Dry Unit Weight (pcf): 94
Sample Description: Clay, sandy
Moisture Content (%): 11

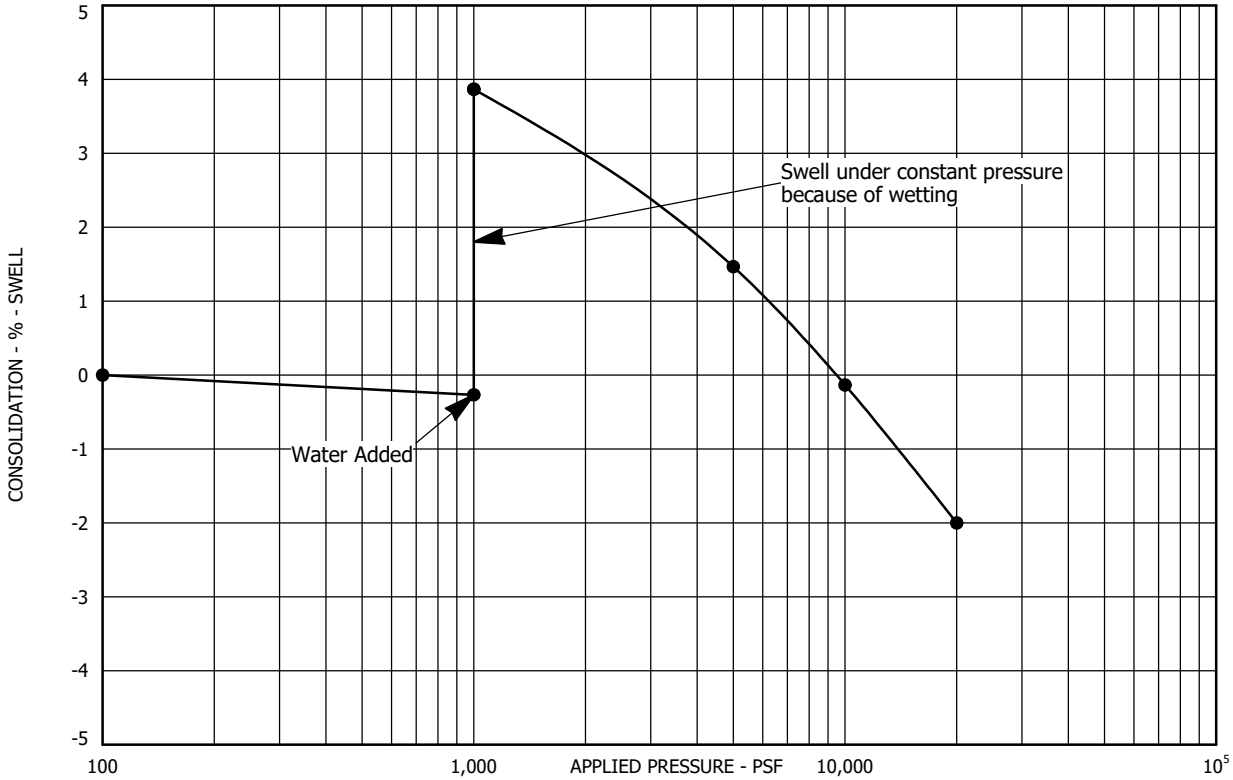
SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-3

PROJECT NO. 245004



Sample Location: Test Boring No. 4 at a depth of 24 feet
Sample Description: Sandstone, very clayey, trace gravel
Dry Unit Weight (pcf): 103
Moisture Content (%): 13

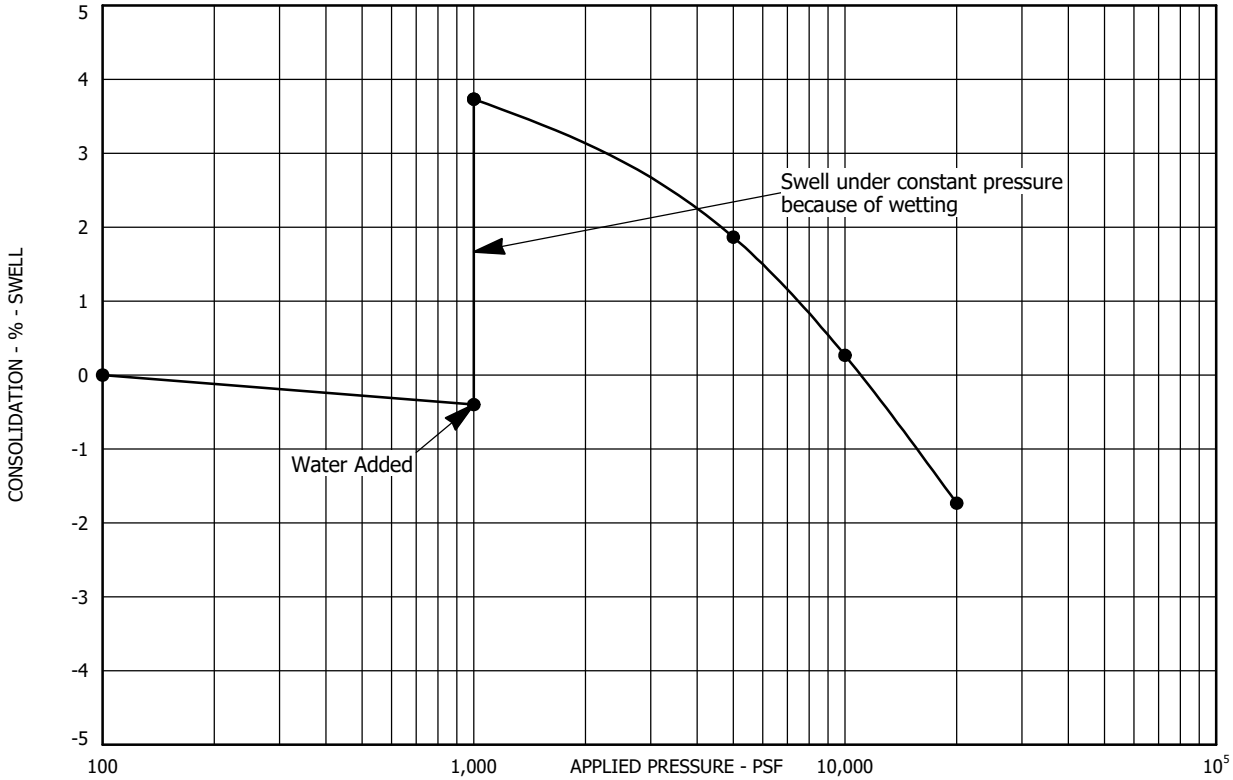


Sample Location: Test Boring No. 5 at a depth of 9 feet
Sample Description: Claystone, sandy
Dry Unit Weight (pcf): 114
Moisture Content (%): 15

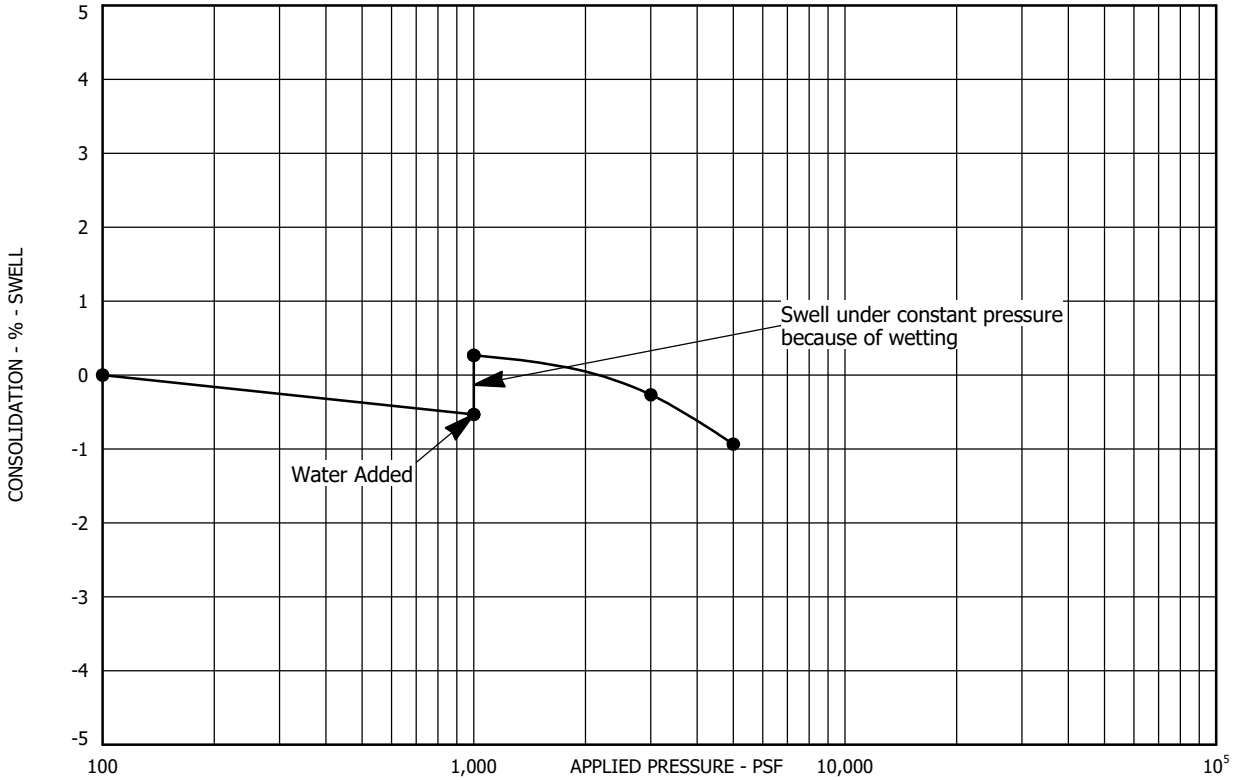
SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-4

PROJECT NO. 245004



Sample Location: Test Boring No. 5 at a depth of 14 feet
Sample Description: Claystone, sandy
Dry Unit Weight (pcf): 105
Moisture Content (%): 21

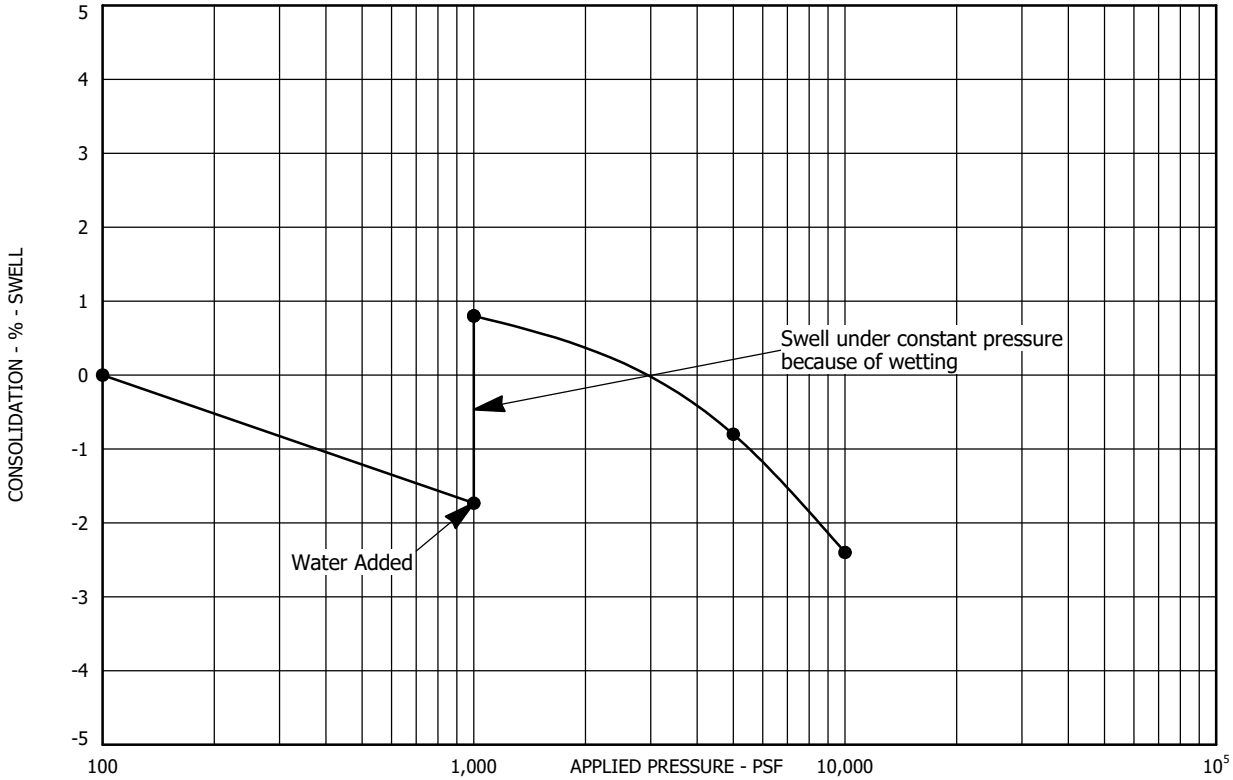


Sample Location: Test Boring No. 5 at a depth of 19 feet
Sample Description: Claystone, very sandy
Dry Unit Weight (pcf): 113
Moisture Content (%): 18

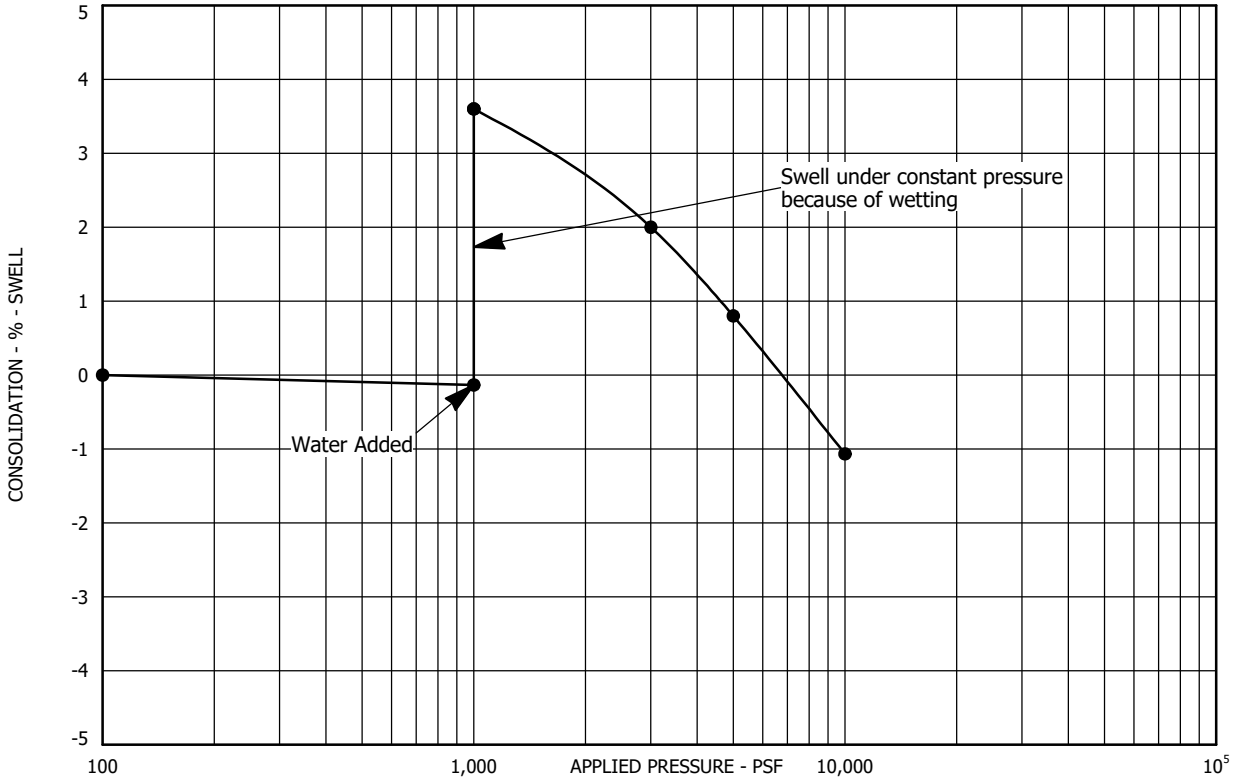
SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-5

PROJECT NO. 245004



Sample Location: Test Boring No. 6 at a depth of 12 feet
Dry Unit Weight (pcf): 98
Sample Description: Claystone, very sandy
Moisture Content (%): 19

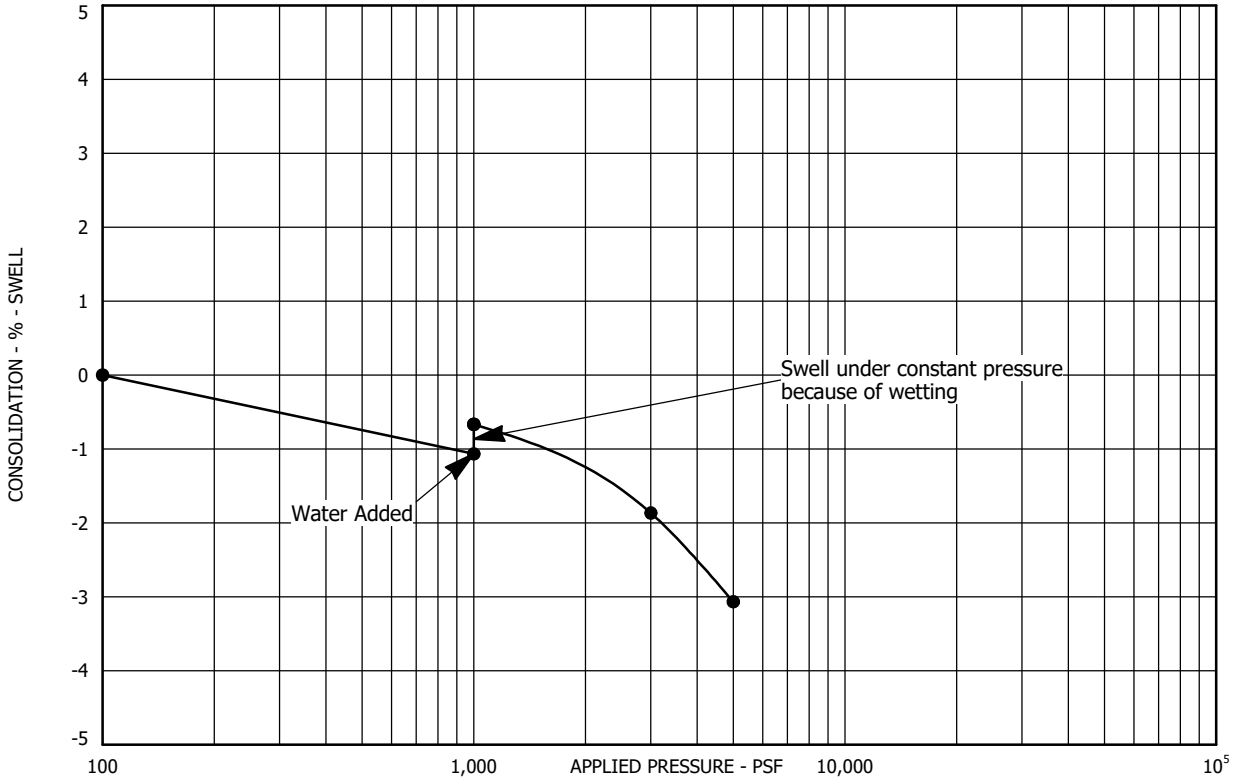


Sample Location: Test Boring No. 6 at a depth of 24 feet
Dry Unit Weight (pcf): 108
Sample Description: Claystone, sandy
Moisture Content (%): 18

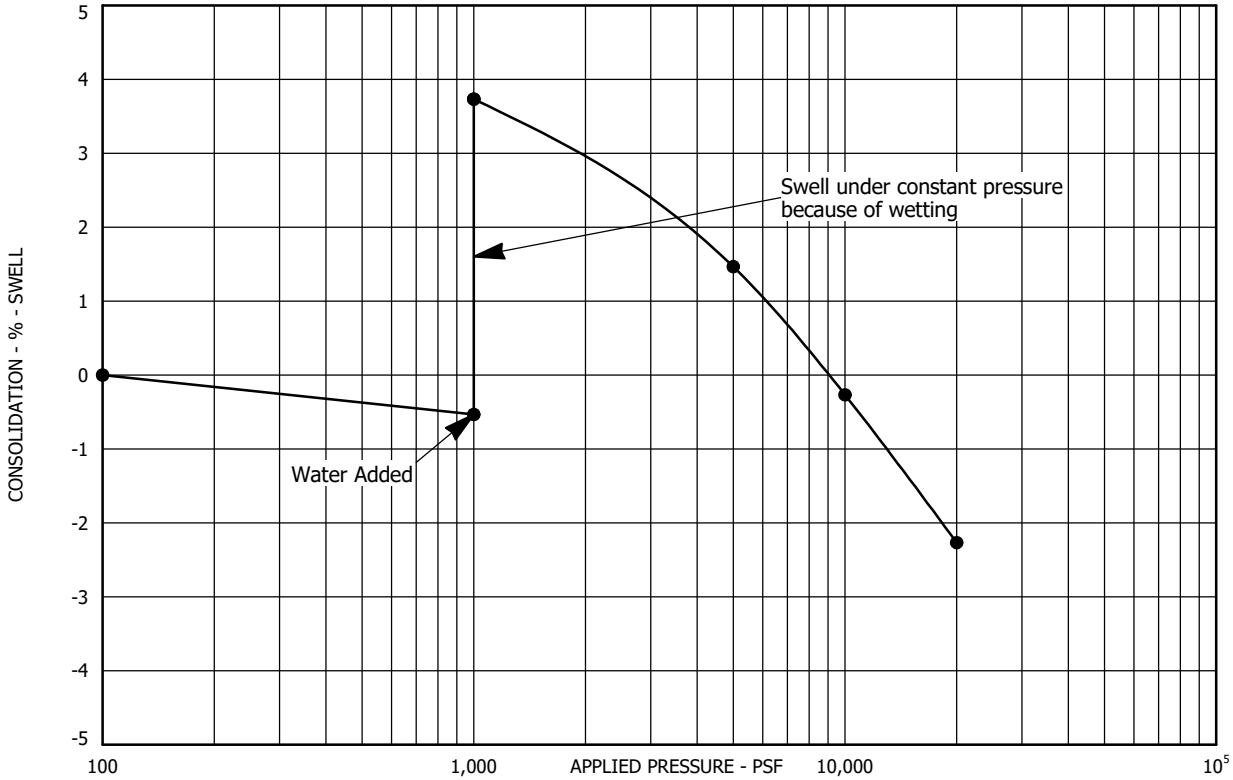
SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-6

PROJECT NO. 245004



Sample Location: Test Boring No. 7 at a depth of 4 feet
Dry Unit Weight (pcf): 111
Sample Description: Sand, clayey
Moisture Content (%): 4

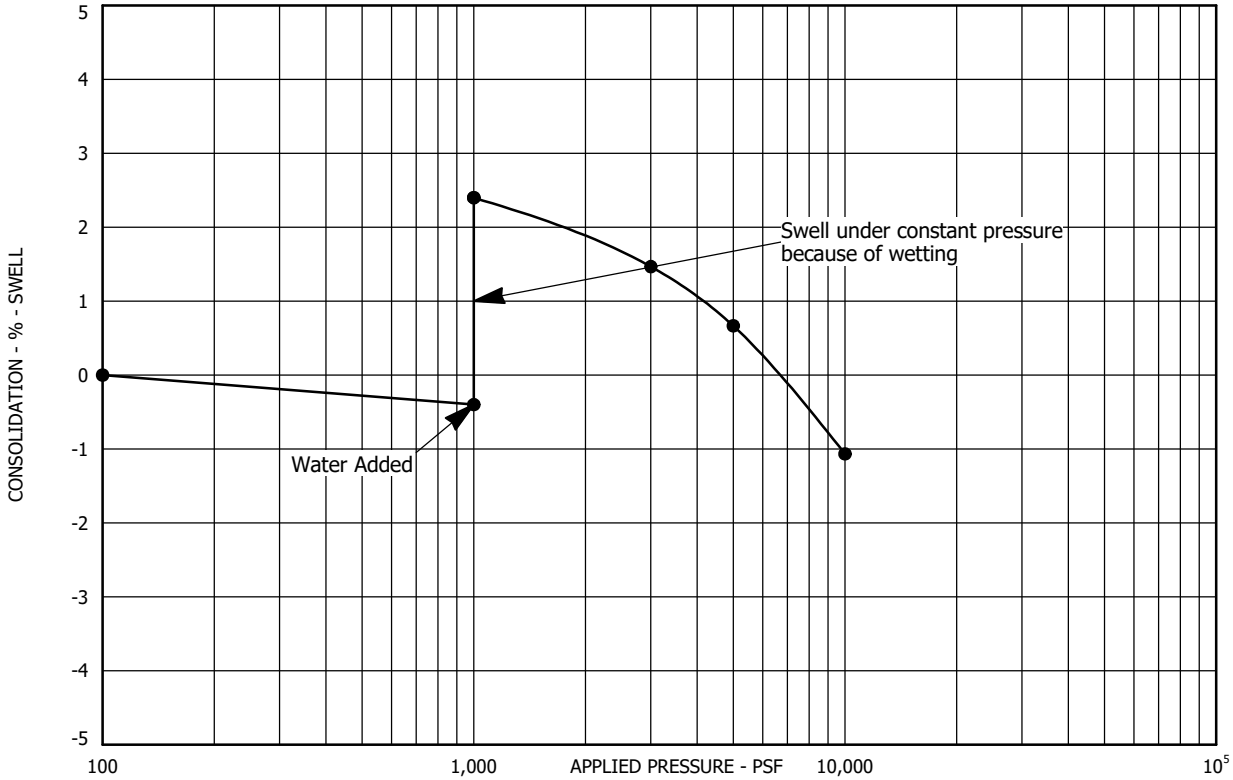


Sample Location: Test Boring No. 7 at a depth of 14 feet
Dry Unit Weight (pcf): 110
Sample Description: Claystone, sandy
Moisture Content (%): 20

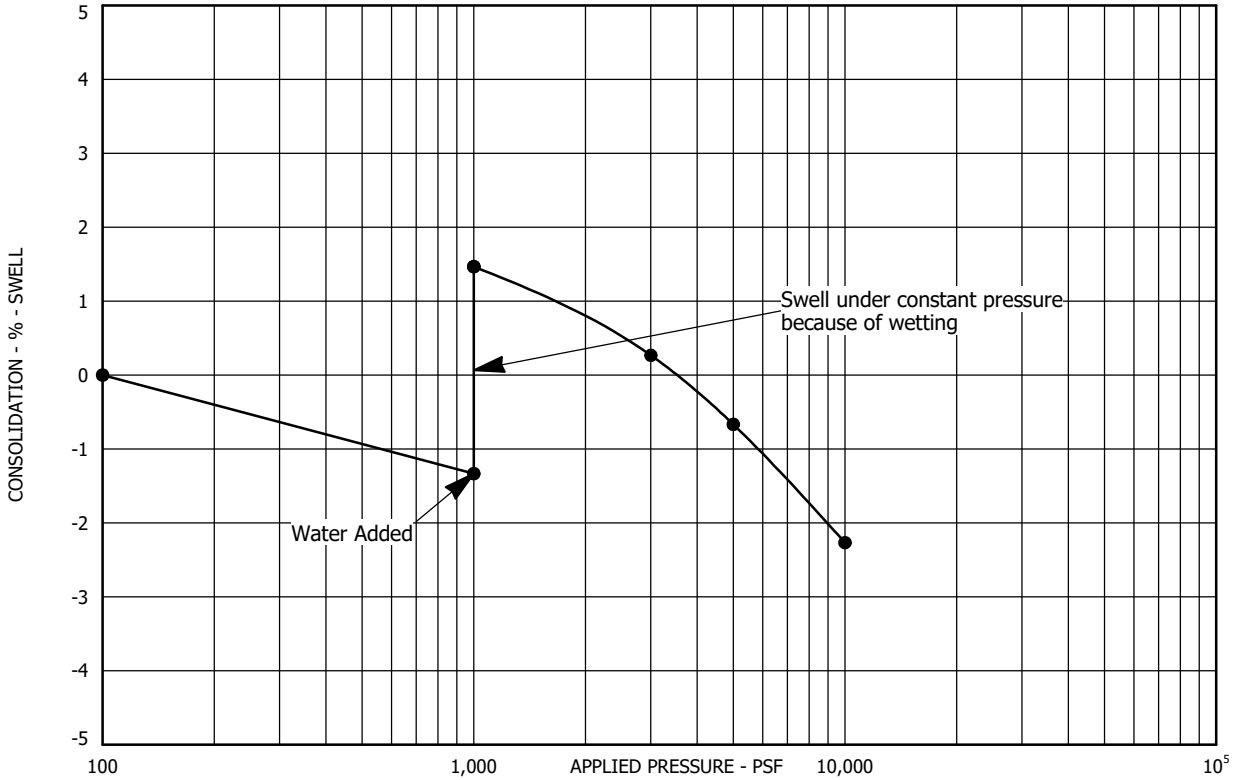
SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-7

PROJECT NO. 245004



Sample Location: Test Boring No. 7 at a depth of 19 feet
Dry Unit Weight (pcf): 117
Sample Description: Claystone, sandy
Moisture Content (%): 17

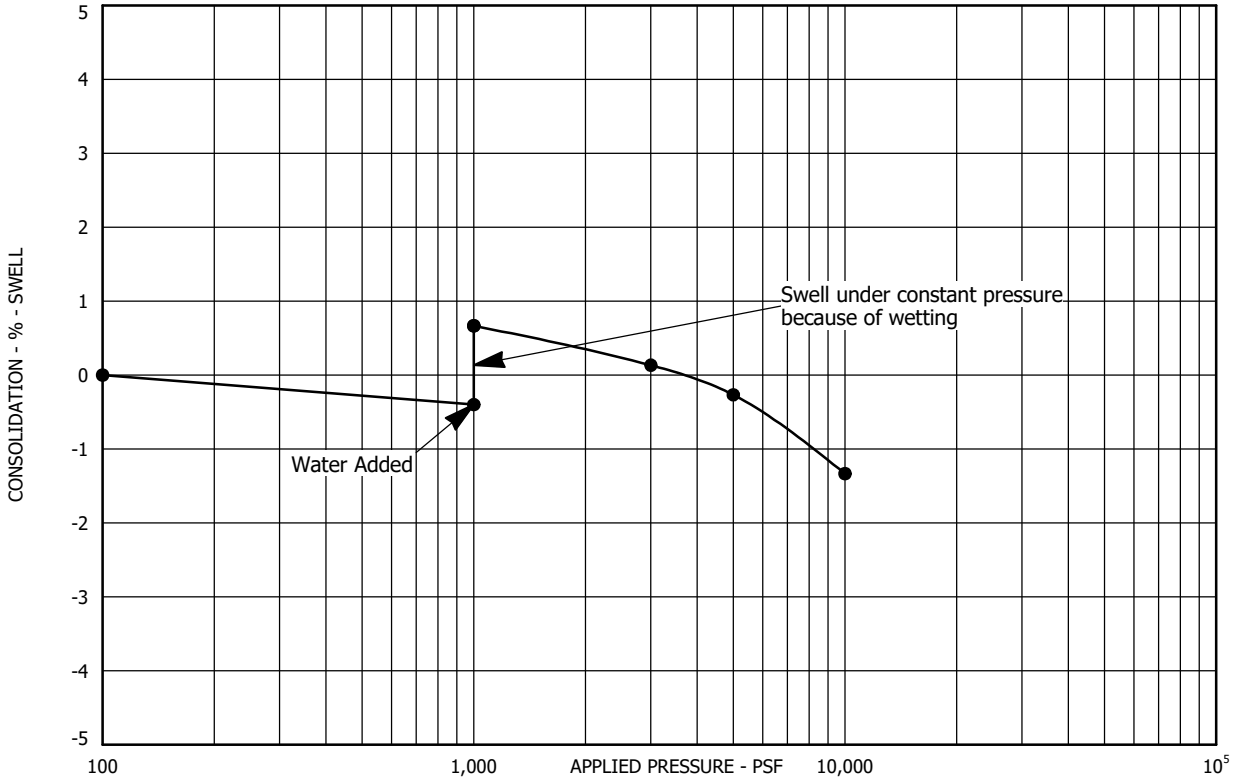


Sample Location: Test Boring No. 8 at a depth of 2 feet
Dry Unit Weight (pcf): 113
Sample Description: Clay, sandy
Moisture Content (%): 13

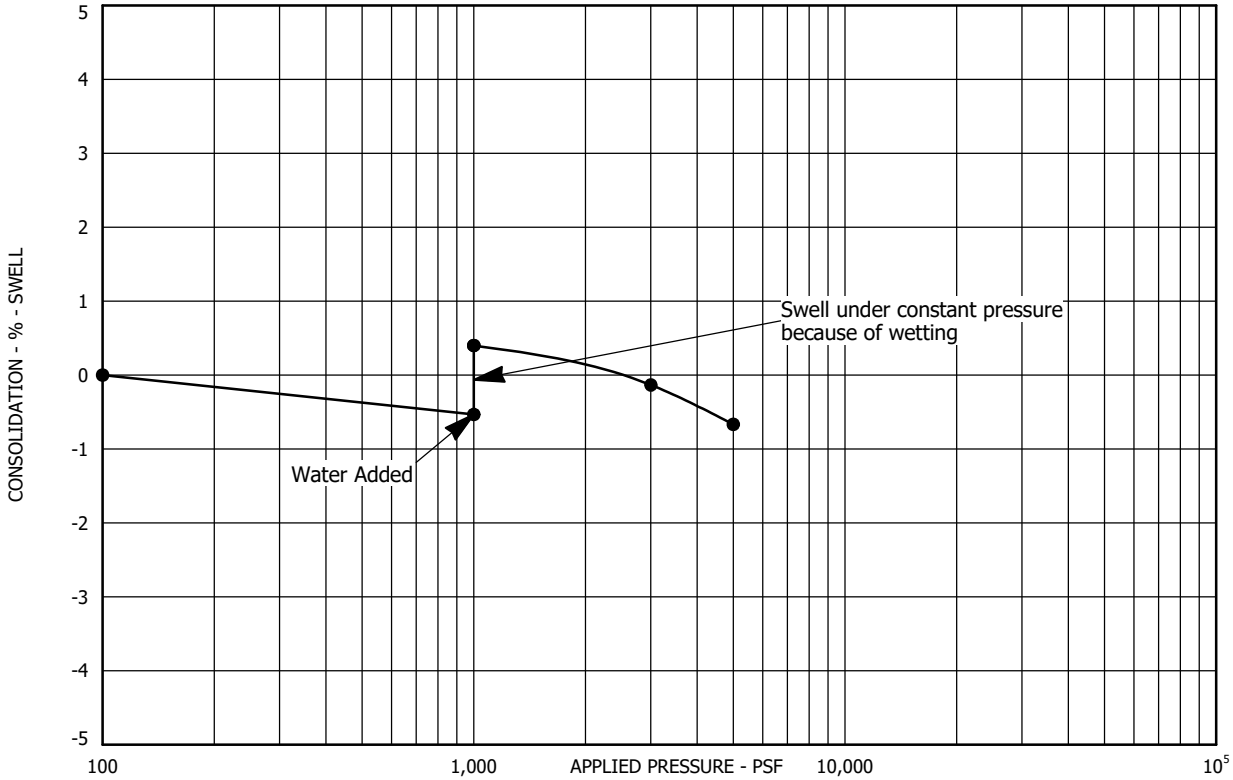
SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-8

PROJECT NO. 245004



Sample Location: Test Boring No. 8 at a depth of 12 feet
Dry Unit Weight (pcf): 103
Sample Description: Siltstone, very sandy (lens)
Moisture Content (%): 20

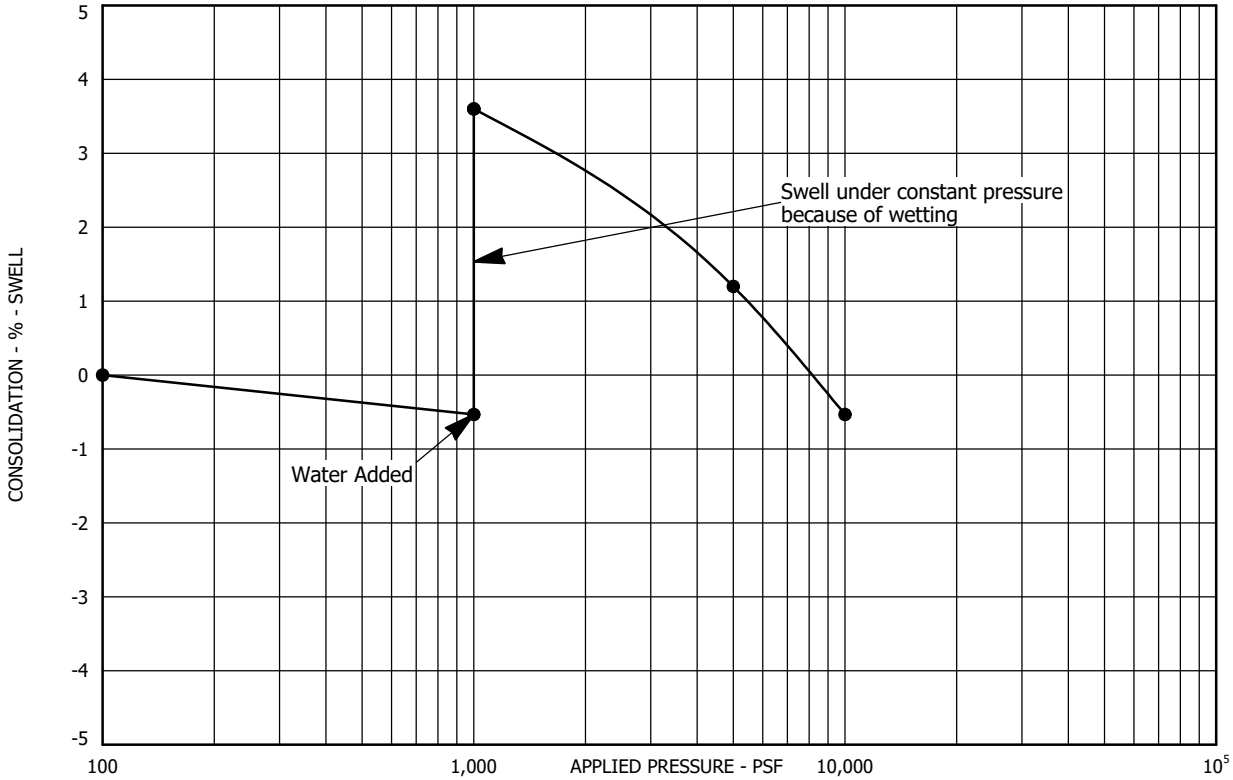


Sample Location: Test Boring No. 8 at a depth of 17 feet
Dry Unit Weight (pcf): 110
Sample Description: Claystone, very sandy
Moisture Content (%): 18

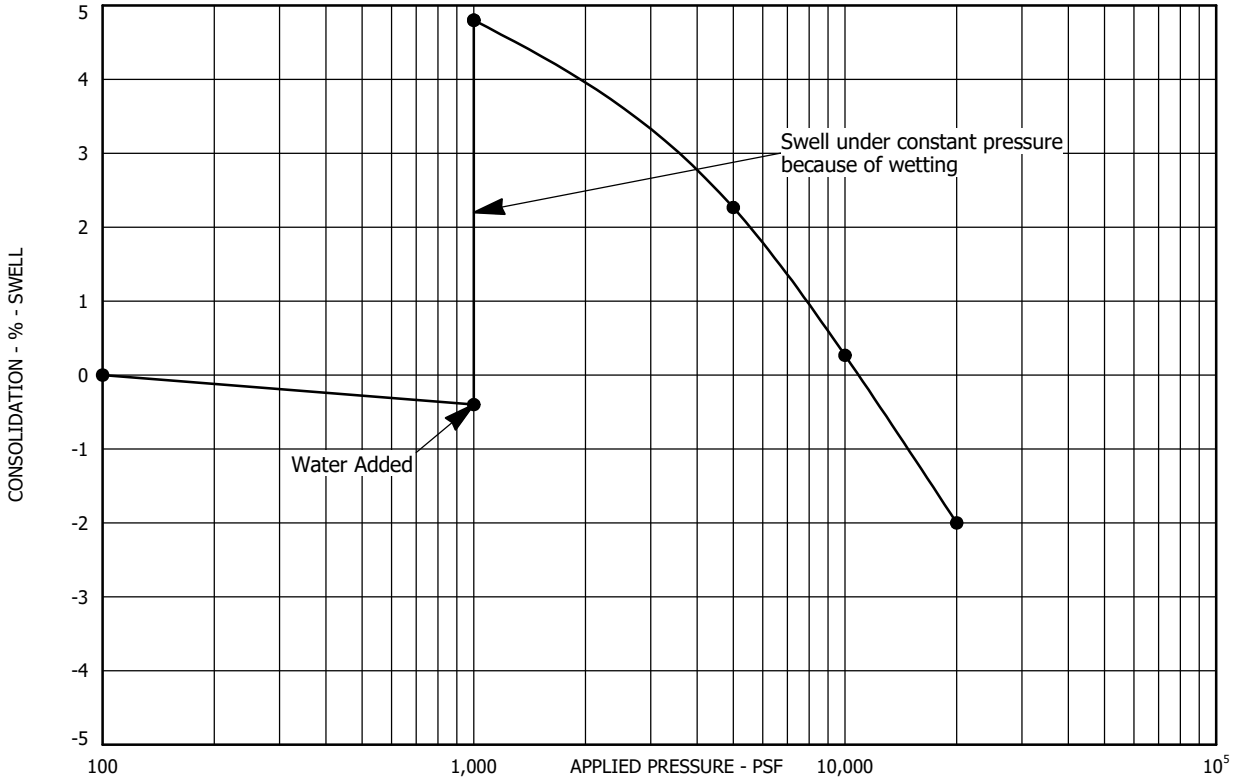
SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-9

PROJECT NO. 245004



Sample Location: Test Boring No. 9 at a depth of 4 feet
Dry Unit Weight (pcf): 108
Sample Description: Clay, sandy
Moisture Content (%): 12

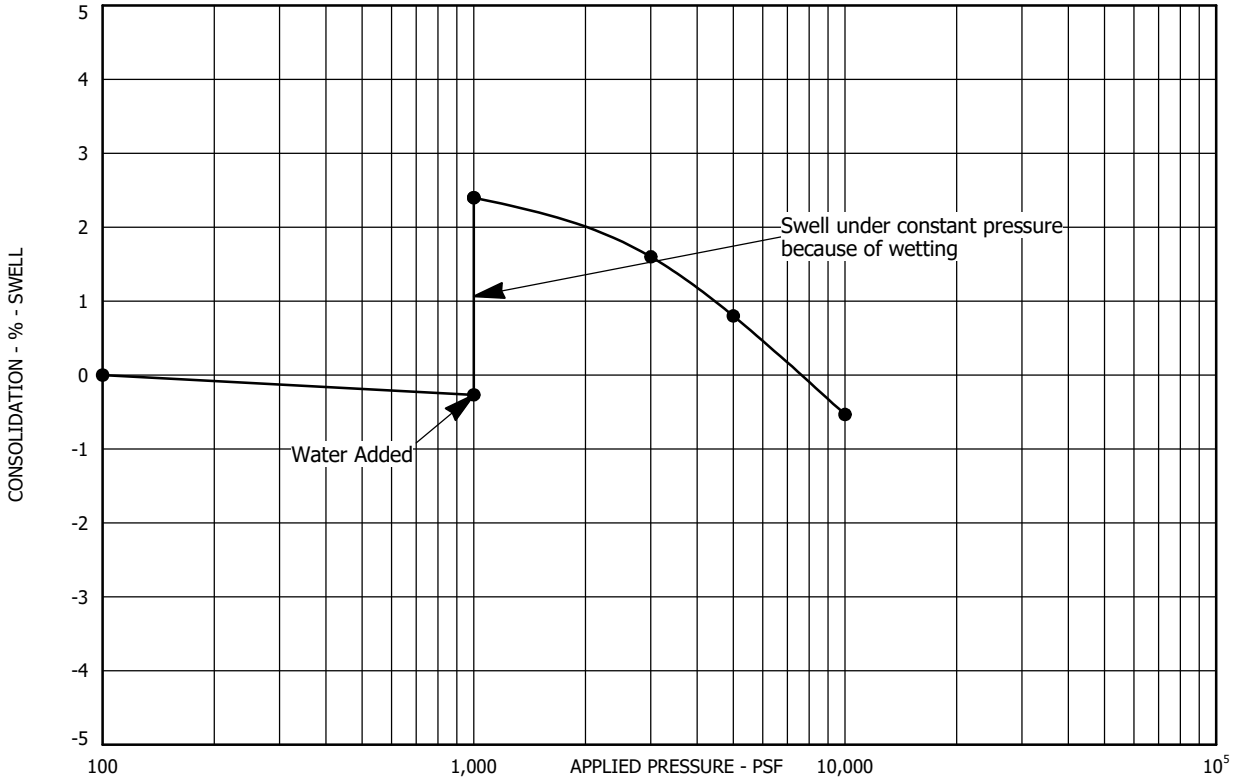


Sample Location: Test Boring No. 9 at a depth of 14 feet
Dry Unit Weight (pcf): 113
Sample Description: Claystone, sandy
Moisture Content (%): 16

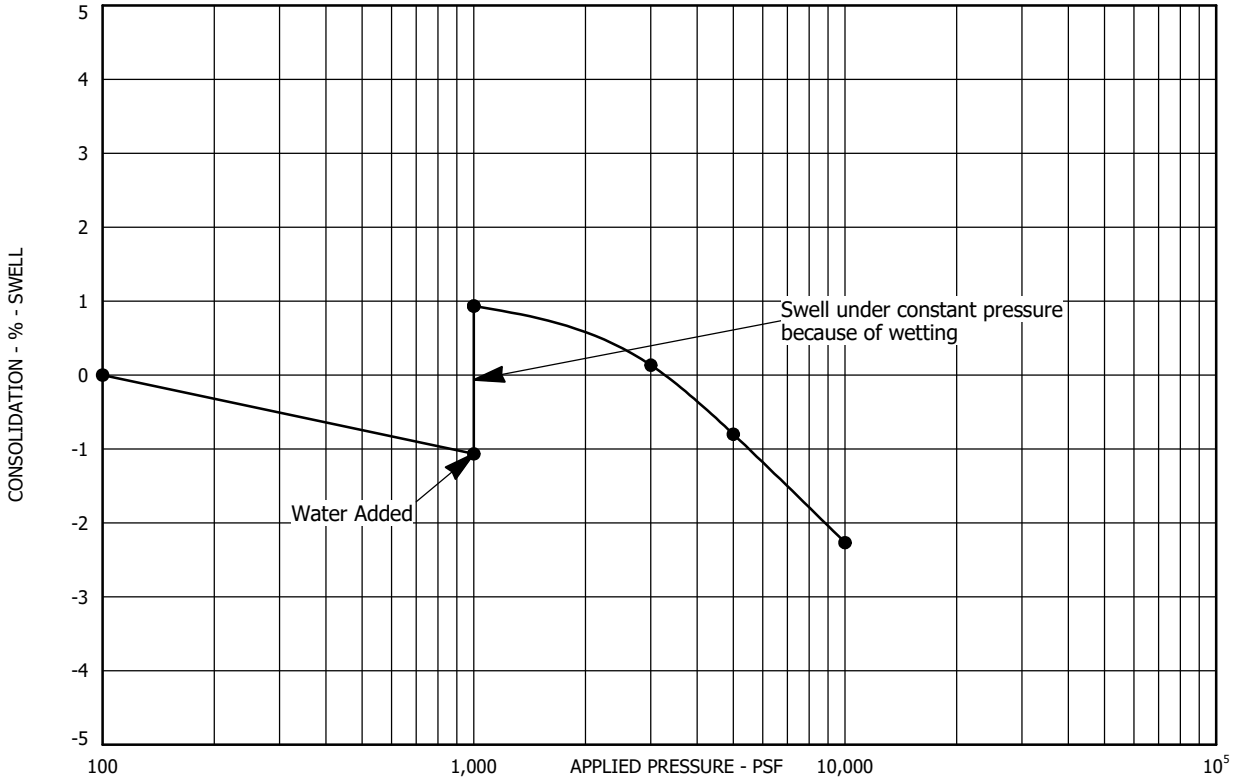
SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-10

PROJECT NO. 245004



Sample Location: Test Boring No. 10 at a depth of 17 feet
Sample Description: Claystone, very sandy
Dry Unit Weight (pcf): 107
Moisture Content (%): 20

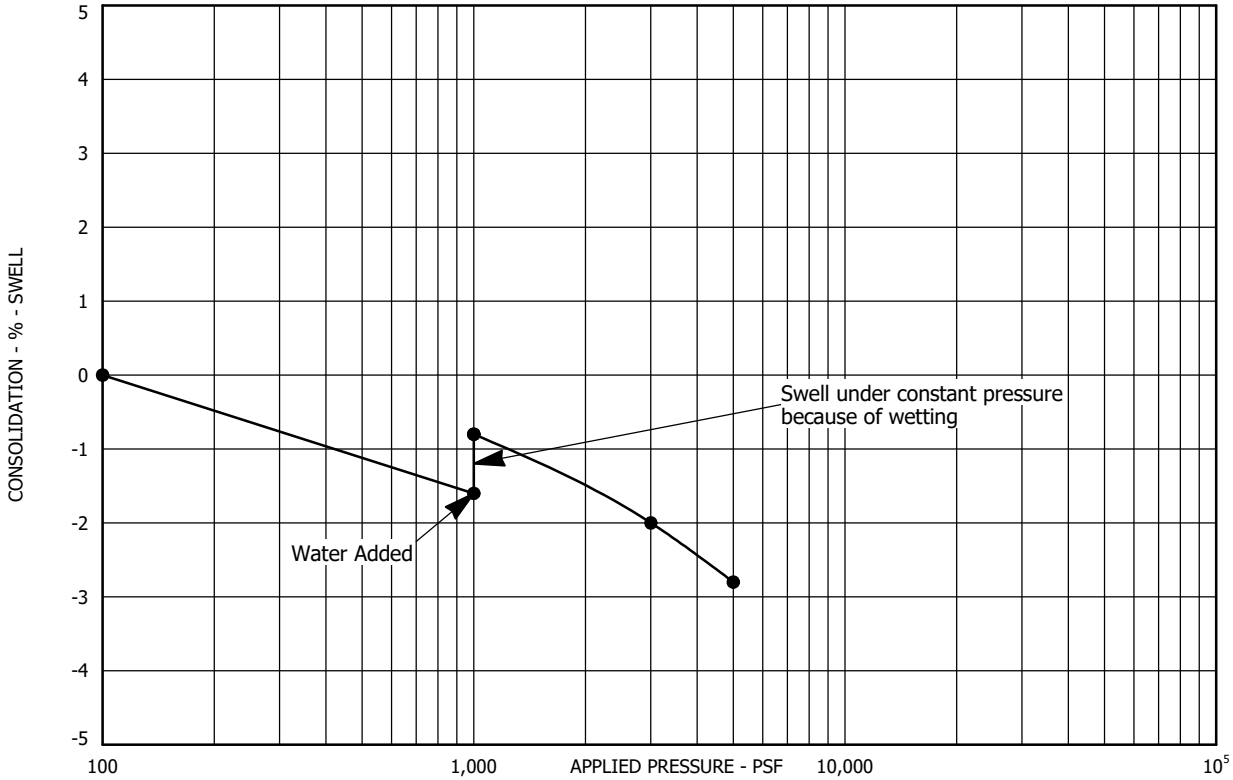


Sample Location: Test Boring No. 10 at a depth of 44 feet
Sample Description: Claystone, very sandy
Dry Unit Weight (pcf): 112
Moisture Content (%): 16

SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-11

PROJECT NO. 245004

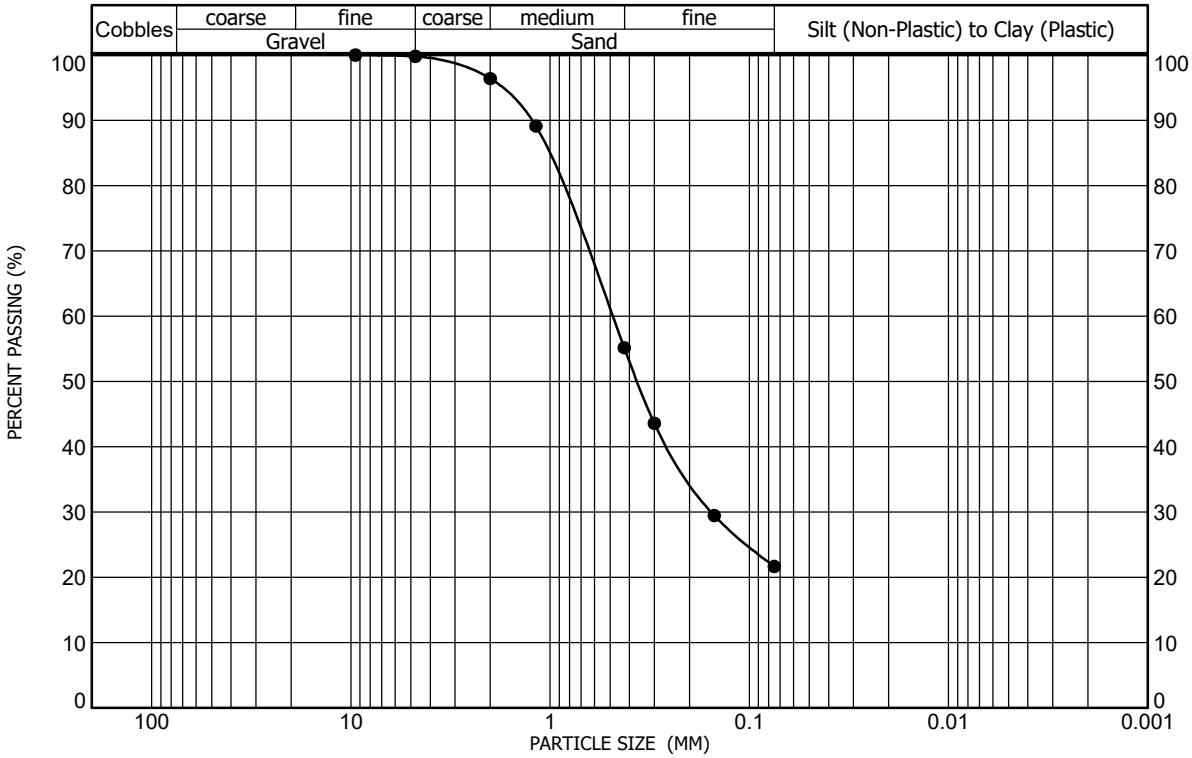


Sample Location	Test Boring No. 12 at a depth of 7 feet	Dry Unit Weight (pcf)	105
Sample Description	Claystone, very sandy	Moisture Content (%)	16

SWELL - CONSOLIDATION TEST RESULTS

FIGURE A-12

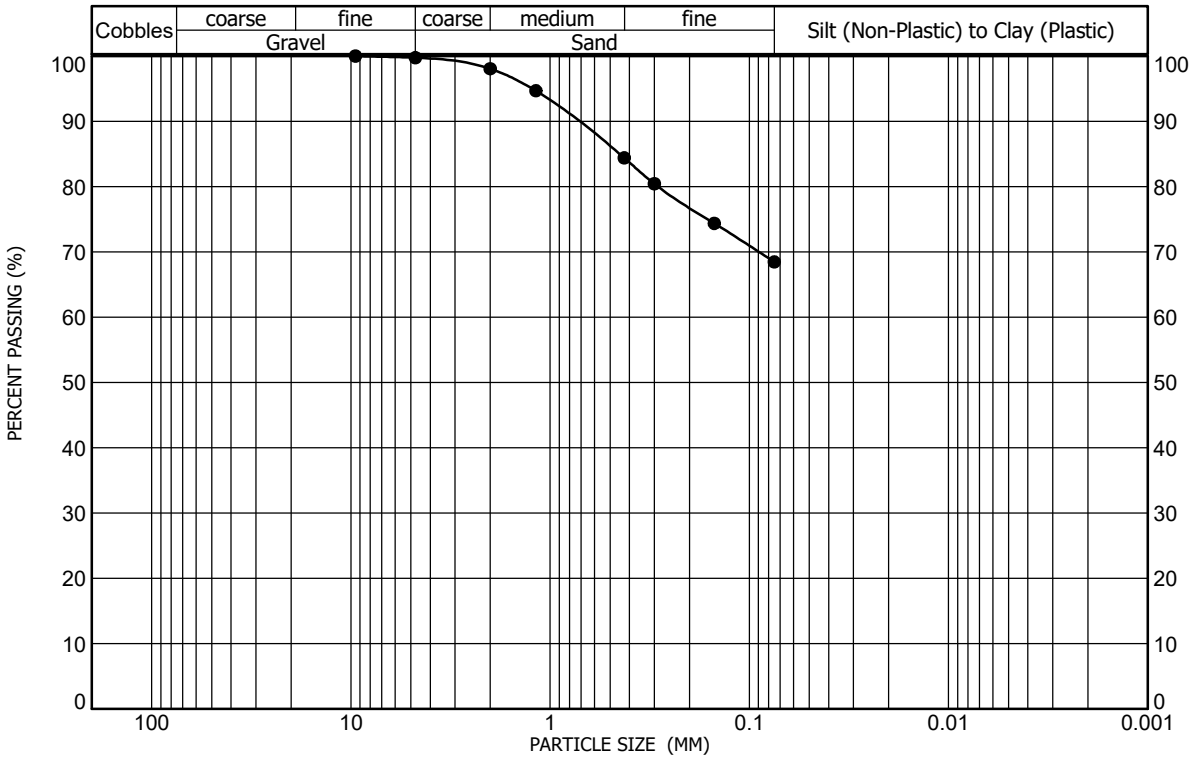
PROJECT NO. 245004



Sample Location: Test Boring No. 1 at a depth of 14 feet
Sample Description: Sandstone, silty
Classification: A-2-4(0), SILTY SAND(SM)

Gravel (%): 0
Sand (%): 78
Clay/Silt (%): 22

Liquid Limit: NV
Plasticity Index: NP



Sample Location: Test Boring No. 2 at a depth of 2 feet
Sample Description: Clay, very sandy
Classification: A-7-6(19), SANDY LEAN CLAY(CL)

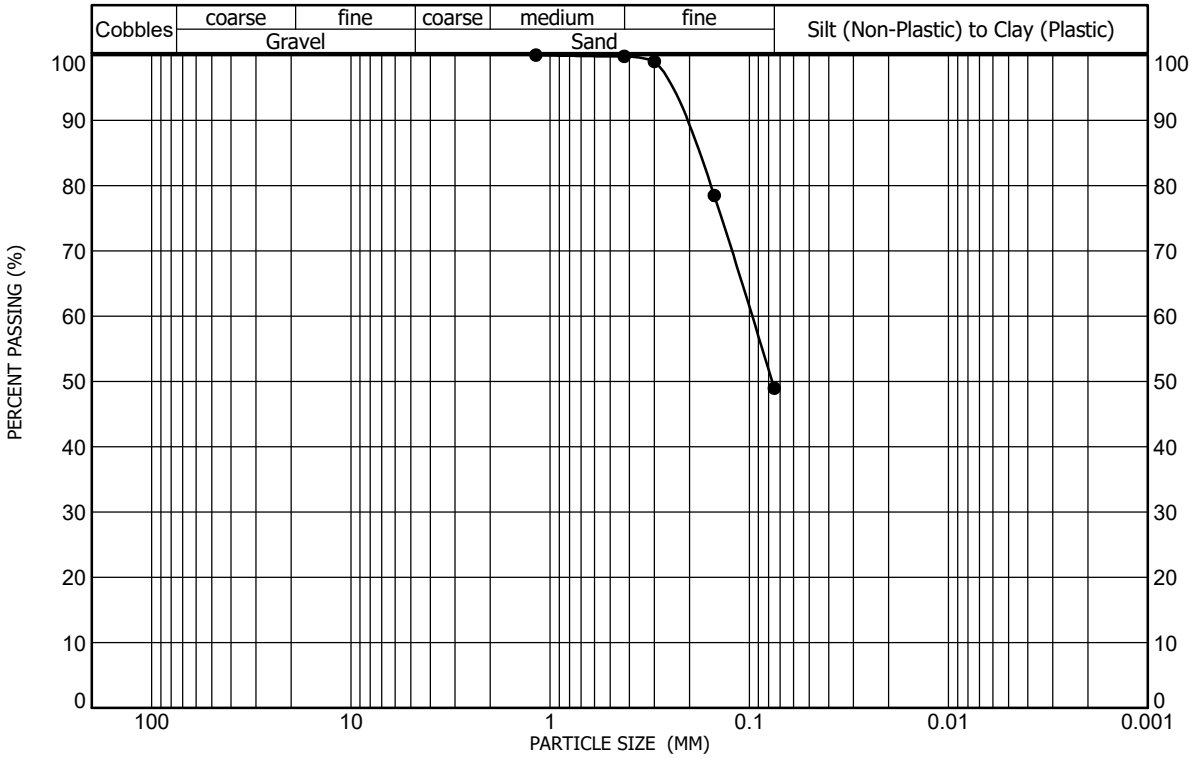
Gravel (%): 0
Sand (%): 31
Clay/Silt (%): 68

Liquid Limit: 49
Plasticity Index: 31

GRADATION AND ATTERBERG TEST RESULTS

FIGURE A-13

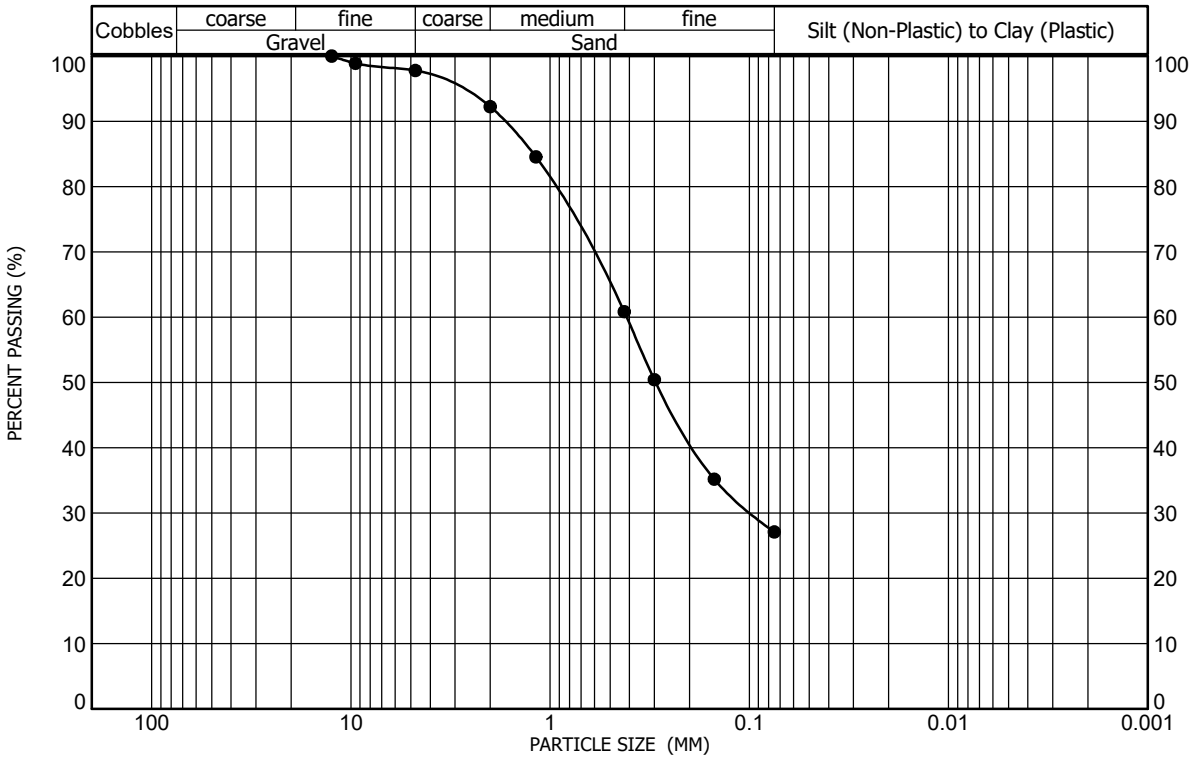
PROJECT NO. 245004



Sample Location: Test Boring No. 3 at a depth of 9 feet
Sample Description: Sandstone, very silty
Classification: A-4(0), SILTY SAND(SM)

Gravel (%): 0
Sand (%): 51
Clay/Silt (%): 49

Liquid Limit: NV
Plasticity Index: NP



Sample Location: Test Boring No. 3 at a depth of 19 feet
Sample Description: Sandstone, silty, trace gravel
Classification: A-2-4(0), SILTY SAND(SM)

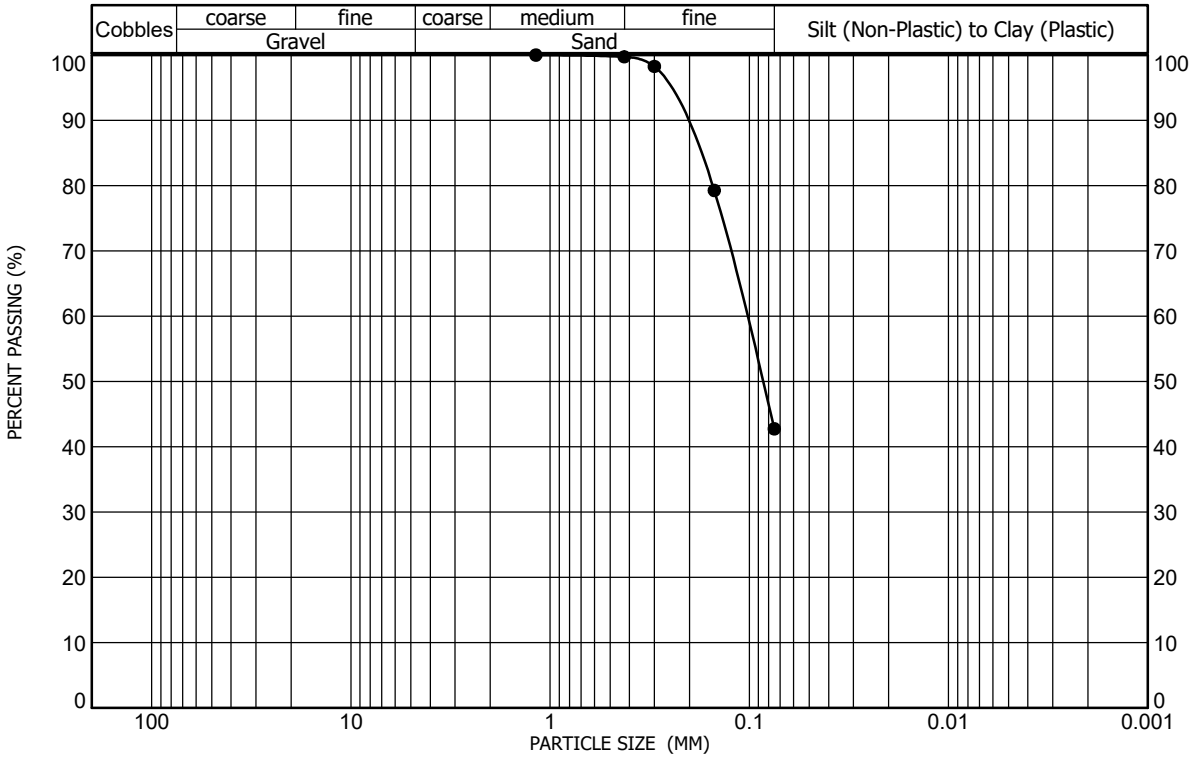
Gravel (%): 2
Sand (%): 71
Clay/Silt (%): 27

Liquid Limit: NV
Plasticity Index: NP

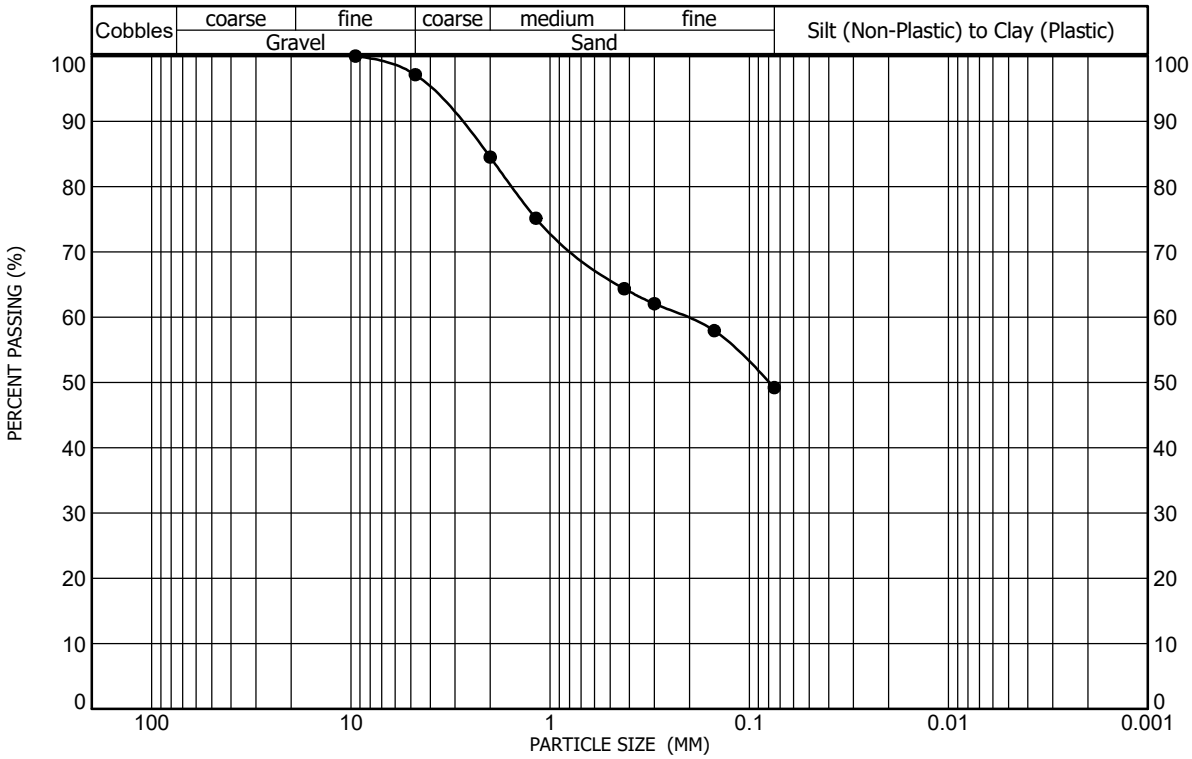
GRADATION AND ATTERBERG TEST RESULTS

FIGURE A-14

PROJECT NO. 245004



Sample Location	Test Boring No. 4 at a depth of 12 feet	Gravel (%)	0	Liquid Limit	NV
Sample Description	Sandstone, very silty	Sand (%)	57	Plasticity Index	NP
Classification	A-4(0), SILTY SAND(SM)	Clay/Silt (%)	43		

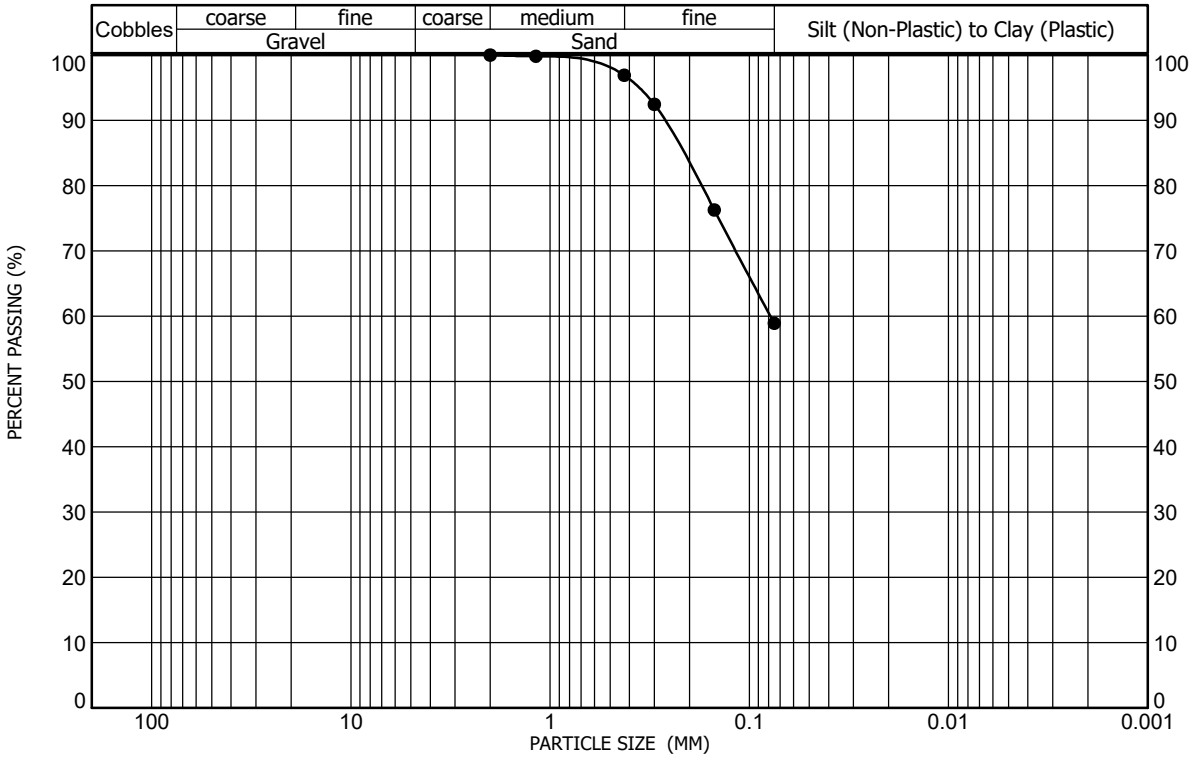


Sample Location	Test Boring No. 4 at a depth of 24 feet	Gravel (%)	3	Liquid Limit	48
Sample Description	Sandstone, very clayey, trace gravel	Sand (%)	48	Plasticity Index	25
Classification	A-7-6(8), CLAYEY SAND(SC)	Clay/Silt (%)	49		

GRADATION AND ATTERBERG TEST RESULTS

FIGURE A-15

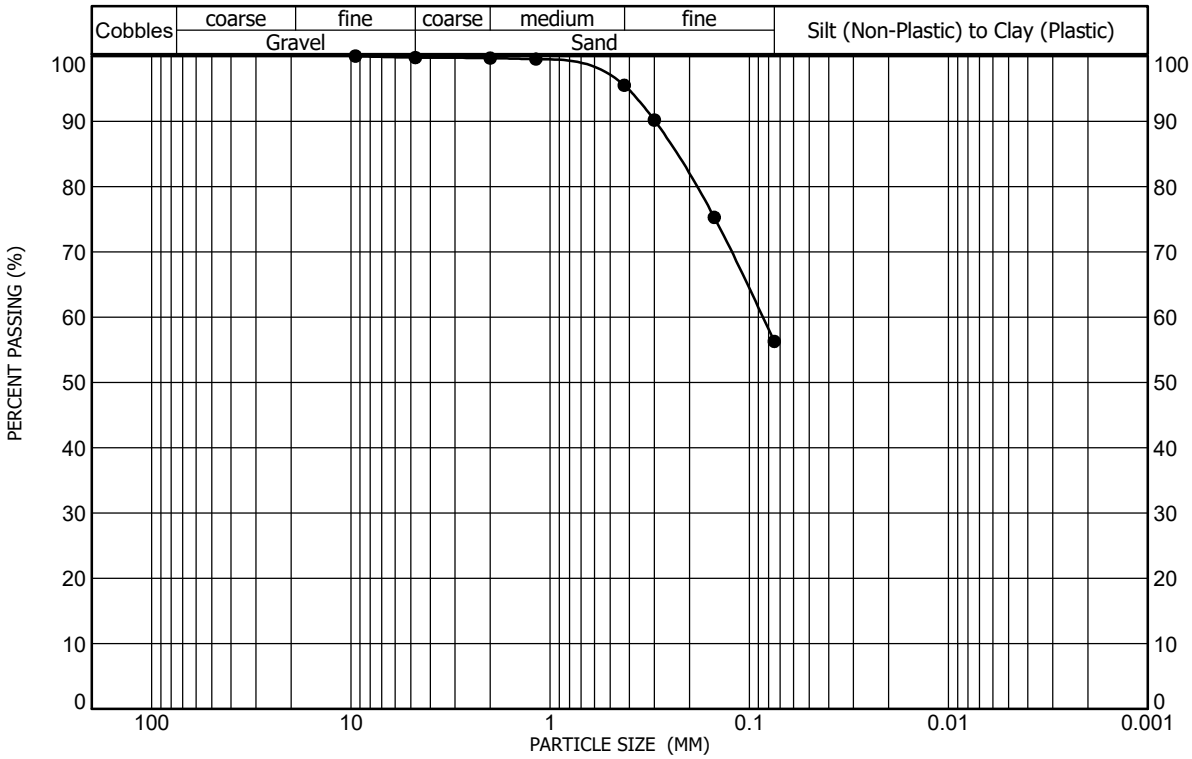
PROJECT NO. 245004



Sample Location: Test Boring No. 6 at a depth of 12 feet
Sample Description: Claystone, very sandy
Classification: A-7-6(12), SANDY FAT CLAY(CH)

Gravel (%): 0
Sand (%): 41
Clay/Silt (%): 59

Liquid Limit: 51
Plasticity Index: 23



Sample Location: Test Boring No. 8 at a depth of 12 feet
Sample Description: Siltstone, very sandy (lens)
Classification: A-7-5(10), SANDY ELASTIC SILT(MH)

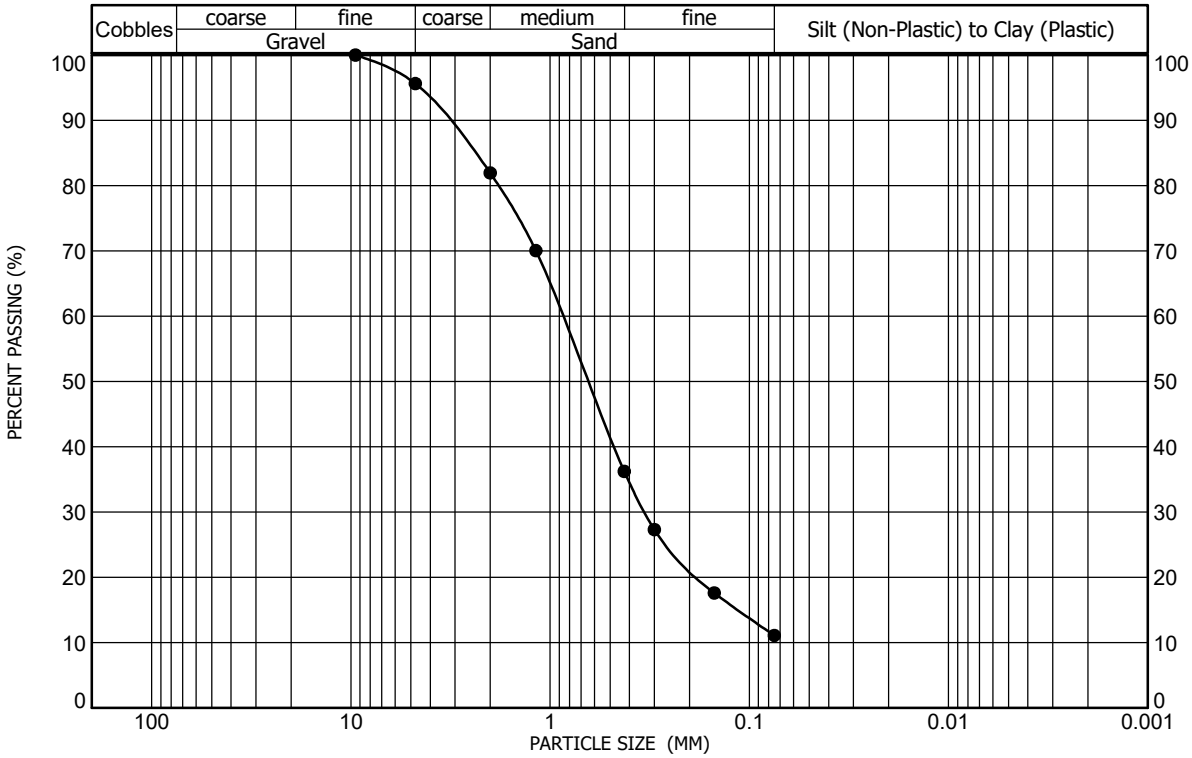
Gravel (%): 0
Sand (%): 43
Clay/Silt (%): 56

Liquid Limit: 53
Plasticity Index: 22

GRADATION AND ATTERBERG TEST RESULTS

FIGURE A-16

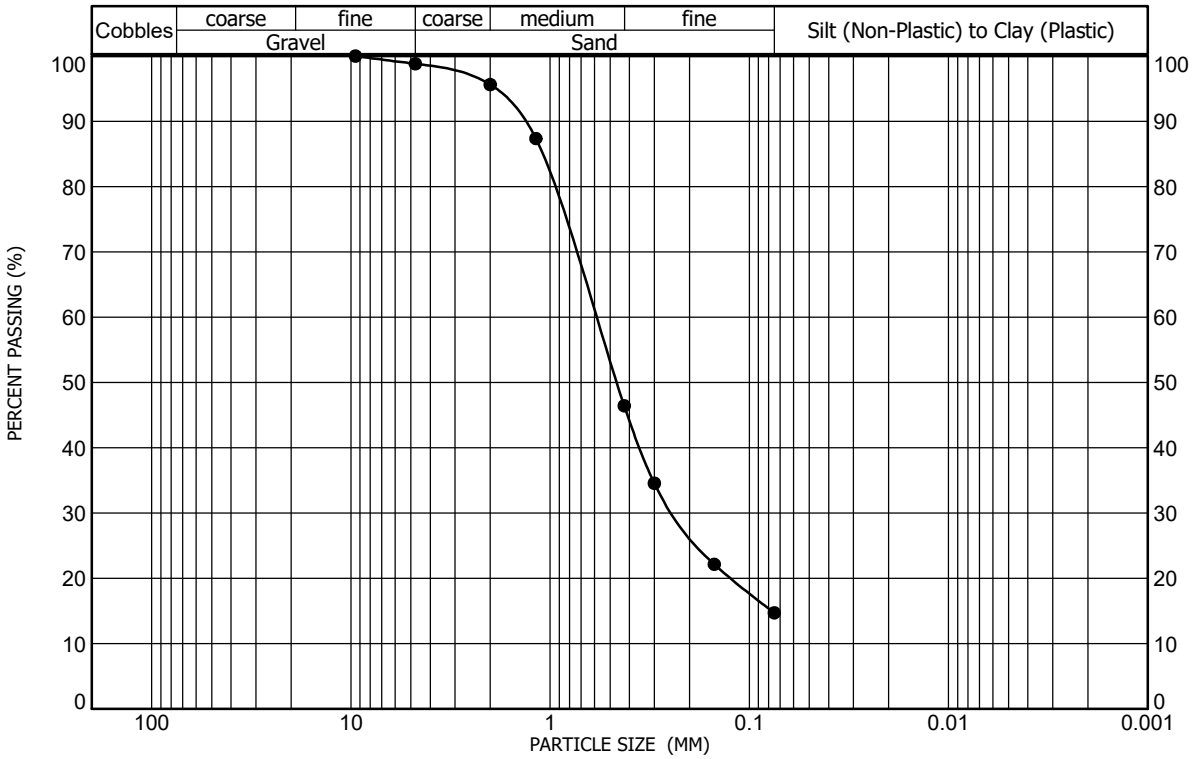
PROJECT NO. 245004



Sample Location: Test Boring No. 10 at a depth of 7 feet
Sample Description: Sandstone, slightly silty, trace gravel
Classification: A-1-b(0), WELL-GRADED SAND with SILT(SW-SM)

Gravel (%): 4
Sand (%): 85
Clay/Silt (%): 11

Liquid Limit: NV
Plasticity Index: NP



Sample Location: Test Boring No. 11 at a depth of 4 feet
Sample Description: Sandstone, silty, trace gravel
Classification: A-1-b(0), SILTY SAND(SM)

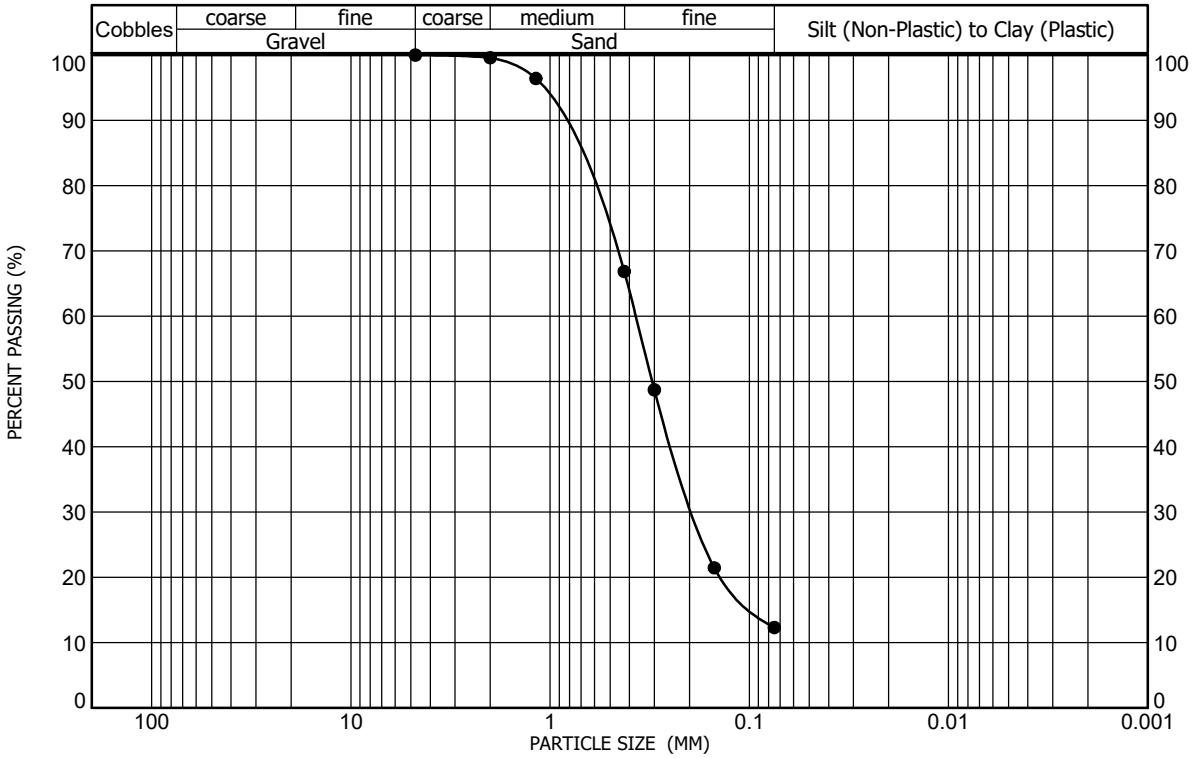
Gravel (%): 1
Sand (%): 84
Clay/Silt (%): 15

Liquid Limit: NV
Plasticity Index: NP

GRADATION AND ATTERBERG TEST RESULTS

FIGURE A-17

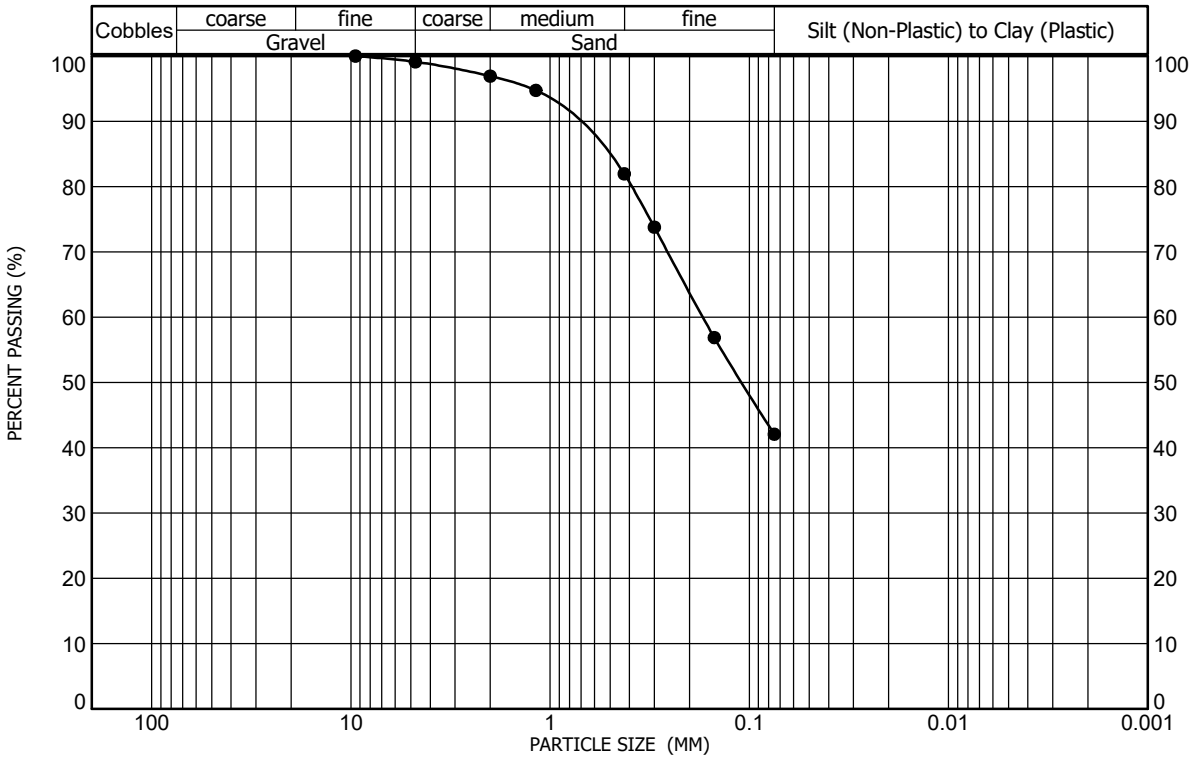
PROJECT NO. 245004



Sample Location: Test Boring No. 11 at a depth of 19 feet
Sample Description: Sandstone, slightly silty
Classification: A-2-4(0), SILTY SAND(SM)

Gravel (%): 0
Sand (%): 88
Clay/Silt (%): 12

Liquid Limit: NV
Plasticity Index: NP



Sample Location: Test Boring No. 12 at a depth of 2 feet
Sample Description: Sand, very clayey, trace gravel
Classification: A-7-6(4), SILTY SAND(SM)

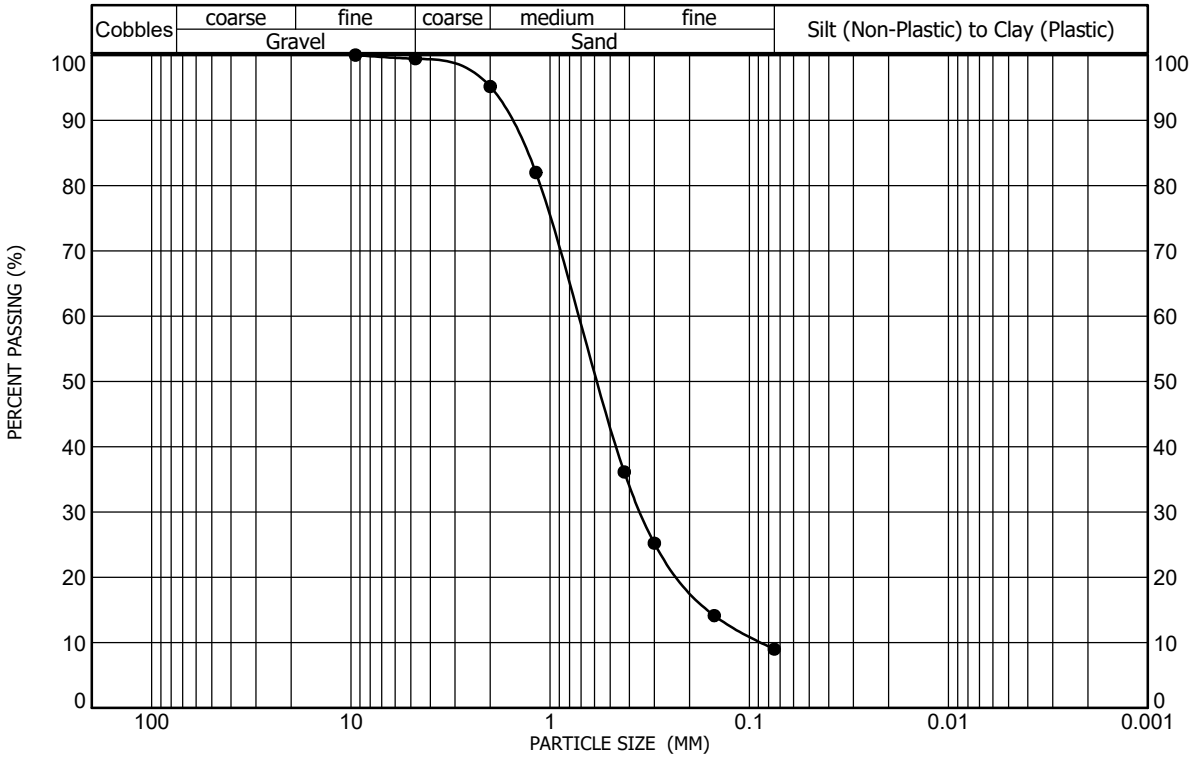
Gravel (%): 1
Sand (%): 57
Clay/Silt (%): 42

Liquid Limit: 46
Plasticity Index: 17

GRADATION AND ATTERBERG TEST RESULTS

FIGURE A-18

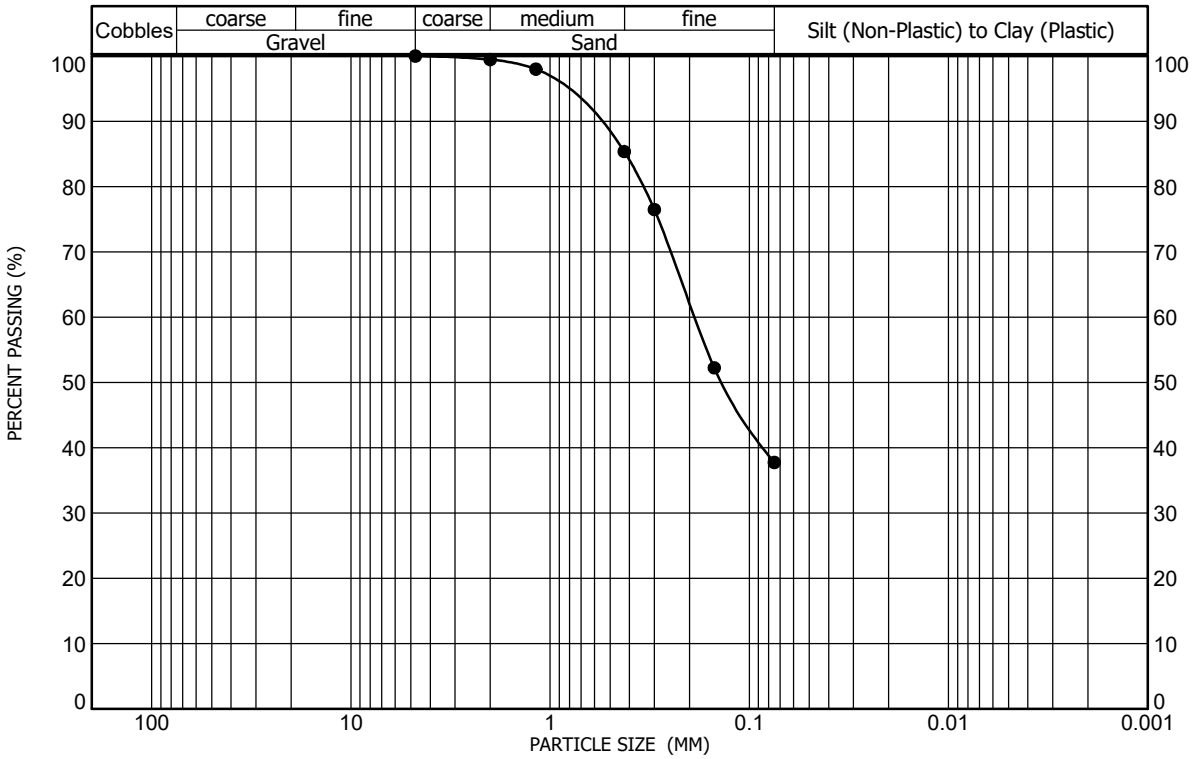
PROJECT NO. 245004



Sample Location: Test Boring No. 12 at a depth of 24 feet
Sample Description: Sandstone, slightly silty, trace gravel
Classification: A-1-b(0), WELL-GRADED SAND with SILT(SW-SM)

Gravel (%): 1
Sand (%): 90
Clay/Silt (%): 9

Liquid Limit: NV
Plasticity Index: NP



Sample Location: Test Boring No. 13 at a depth of 4 feet
Sample Description: Sandstone, very silty
Classification: A-7-6(2), SILTY SAND(SM)

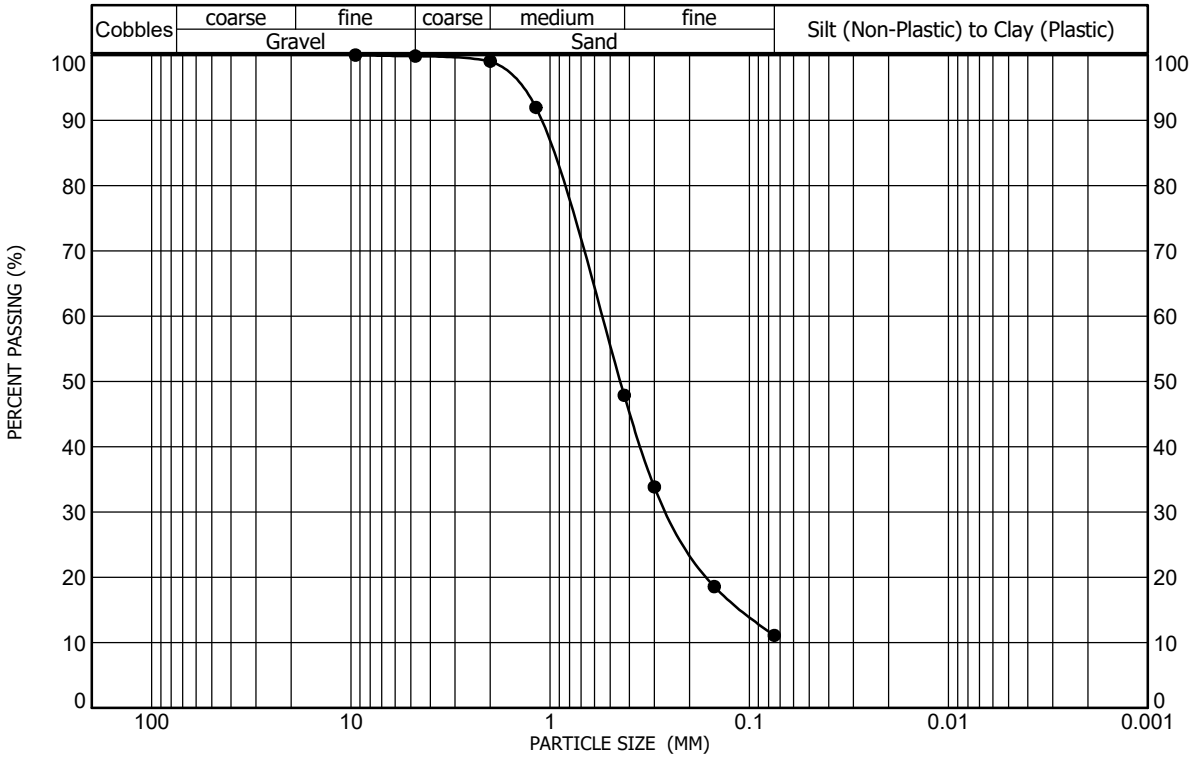
Gravel (%): 0
Sand (%): 62
Clay/Silt (%): 38

Liquid Limit: 42
Plasticity Index: 16

GRADATION AND ATTERBERG TEST RESULTS

FIGURE A-19

PROJECT NO. 245004



Sample Location	Test Boring No. 13 at a depth of 14 feet	Gravel (%)	0	Liquid Limit	NV
Sample Description	Sandstone, slightly silty	Sand (%)	89	Plasticity Index	NP
Classification	A-1-b(0), WELL-GRADED SAND with SILT(SW-SM)	Clay/Silt (%)	11		

GRADATION AND ATTERBERG TEST RESULTS

FIGURE A-20

PROJECT NO. 245004

TRAFFIC IMPACT STUDY

For

Ramblewood
Douglas County, Colorado

October 2024
Revised May 2025

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I. Introduction

Project Overview

This traffic impact study is provided as a planning document and addresses the capacity, geometric, and control requirements associated with the development entitled Ramblewood.

This traffic impact study has been revised to address County review comments made to the October 2024 version regarding updated intersection geometry and additional long-term mitigation methods.

This proposed residential is located to the southwest of Hilltop Road, north of Alpine Drive, and east of Village Road in Douglas County, Colorado.

Study Area Boundaries

The study area to be examined in this analysis encompasses the area bounded by Hilltop Road from Village Road east to Alpine Drive, Village Road from Betts Ranch Road east to Alpine Drive, and includes proposed site accesses. Site Access Drives internal to the overall development were not included in this analysis as internal intersection operations are expected to be comparable to, or better than, those projected for Hilltop Road and Alpine Drive.

Figure 1 illustrates location of the site and study intersections.

Site Description

Land for the development is currently vacant and surrounded by residential land uses.

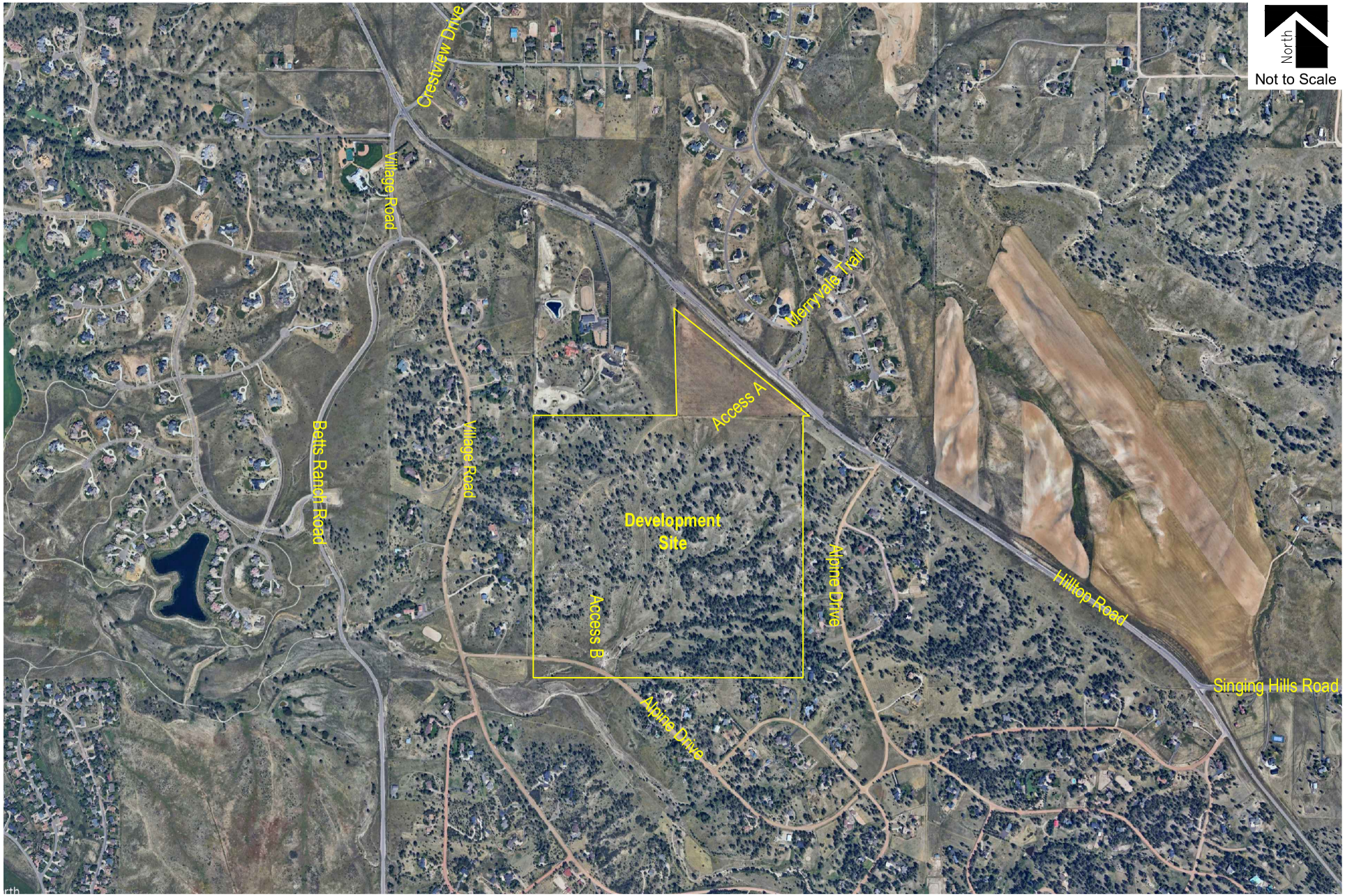
The proposed development is understood to entail the new construction of 70 single-family detached homes.

Proposed access to the development is provided at the following locations: one-full movement access onto Hilltop Road aligning with Merryvale Trail (referred to as Access A) and one full-movement access onto Alpine Drive (referred to as Access B).

For purposes of this study, it is anticipated that development construction would be completed by end of Year 2029.

General site and access locations are shown on Figure 1.

A conceptual site plan, as prepared by Norris Design is shown on Figure 2. This plan is provided for illustrative purposes only.

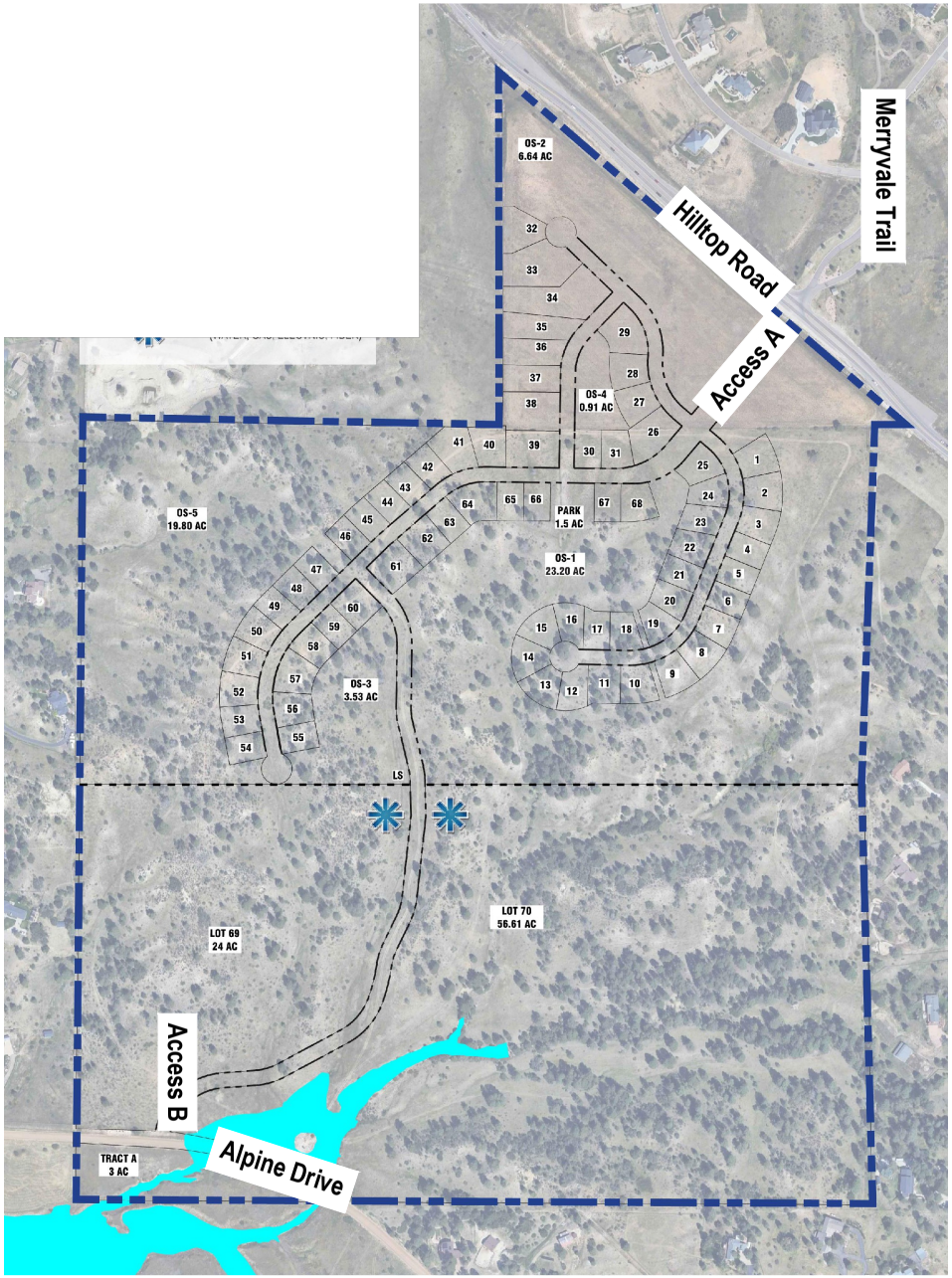


RAMBLEWOOD
Traffic Impact Study

SM ROCHA, LLC
Traffic and Transportation Consultants

Figure 1
SITE LOCATION

May 2025
Page 2



North
Not to Scale

RAMBLEWOOD
Traffic Impact Study

SM ROCHA, LLC
Traffic and Transportation Consultants

Figure 2
CONCEPTUAL SITE PLAN

May 2025
Page 3

Existing and Committed Surface Transportation Network

Within the study area, Hilltop Road and Alpine Drive are the primary roadways that will accommodate traffic to and from the proposed development. The secondary roadways include Village Road, Merryvale Trail, Crest View Drive, and Betts Ranch Road. A brief description of each roadway, based on the County's 2040 Transportation Master Plan (TMP)[1] and Douglas County Roadway Design & Construction Standards (Roadway Standards)[2], is provided below:

Hilltop Road is generally a northwest-southeast expressway roadway having two through lanes (one lane in each direction) with a combination of shared and exclusive turn lanes at the intersection within the study area. Hilltop Road provides a posted speed limit of 45 MPH.

Alpine Drive is generally a north-south roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersections within the study area. Alpine Drive is unclassified in the County's TMP. However, per Section 4.2 and Table 4-1 and the roadway's estimated right-of-way (ROW) width, Alpine Drive is assumed to be classified as a rural local roadway with a posted speed limit of 25 MPH. Alpine Drive is unpaved.

Village Road is generally a north-south roadway having two through lanes (one lane in each direction) with shared and exclusive turn lanes at the intersections within the study area. Alpine Drive is unclassified in the County's TMP. However, per Section 4.2 and Table 4-1 and the roadway's estimated ROW width, Village Road is assumed to be classified as a rural local roadway with a posted speed limit of 25 MPH. East of Betts Ranch Road, Village Road is unpaved.

Merryvale Trail is a north-south roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersection within the study area. Merryvale Trail is unclassified in the County's TMP. However, per Section 4.2 and Table 4-1 and the roadway's estimated ROW width, Merryvale Trails is assumed to be classified as a rural local roadway with a posted speed limit of 25 MPH.

Betts Ranch Road is generally a north-south roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersection within the study area. Betts Ranch Road is unclassified in the County's TMP. However, per Section 4.2 and Table 4-1, the roadway's estimated ROW width, and a posted speed limit of 40 MPH, Merryvale Trails is assumed to be classified as a rural local roadway.

Crest View Drive is generally a north-south roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersection within the study area. Merryvale Trail is unclassified in the County's TMP. However, per Section 4.2 and Table 4-1 and the roadway's estimated ROW width, Merryvale Trails is assumed to be classified as a rural Local roadway with a posted speed limit of 25 MPH.

[1] 2040 Douglas County Transportation Plan, David Evans and Associates, Inc., September 2019.
[2] Douglas County Roadway Design and Construction Standards, Douglas County, June 2020.

All study intersections operate under a stop-controlled condition. A stop-controlled intersection is defined as a roadway intersection where vehicle rights-of-way are controlled by one or more "STOP" signs.

Pursuant to the Hilltop Road (Legend High School to Crest View Drive) Improvements Project Webpage[3], Hilltop Road will be widened and reconstructed in three phases.

- Phase one (Hilltop Road from Legend High School to Crestview Drive/Village Road) – Construction is anticipated to begin in early 2025 with completion of the project taking between 12 to 18 months.

- Phase two (Hilltop Road from Crestview Drive/Village Road to Alpine Drive) - Construction is anticipated to begin in late 2025 or early 2026 with completion taking between nine to 12 months.

- Phase three (Alpine Drive on Hilltop Road to Flintwood Road on Signing Hills Road) - Construction is anticipated to begin in 2027 with completion taking between 12 to 18 months.

For purposes of this analysis, it is assumed that Hilltop Road will be widened from two to four to the east of Alpine Drive and the intersection of Hilltop Road and Village Road will be improved to a roundabout-controlled intersection by Year 2029. Additionally, it is assumed that Hilltop Road will be widened from two to four through lanes west of Alpine Drive by Year 2044.

No regional or specific improvements for the above-described roadways are known to be planned or committed at this time.

[3] Hilltop Road (Legend High School to Crest View Drive) Improvements Project, Douglas County, October 7, 2024.

II. Existing Traffic Conditions

Morning (AM) and afternoon (PM) peak hour traffic counts were collected at the Hilltop Road intersections with Village Road, Merryvale Trail, and Alpine Drive as well as the Village Road intersections with Betts Ranch Road and Alpine Drive. Average daily traffic (ADT) volumes were collected over a 24-hour period on Hilltop Road, Village Road, and Alpine Drive. Counts were collected on Wednesday, September 25, 2024, with AM peak hour counts being collected during the period of 7:00 a.m. to 9:00 a.m. and PM peak hour counts being collected during the period of 4:00 p.m. to 6:00 p.m.

Existing volumes and intersection geometry are shown on Figure 3. Traffic count data is included for reference in Appendix A.

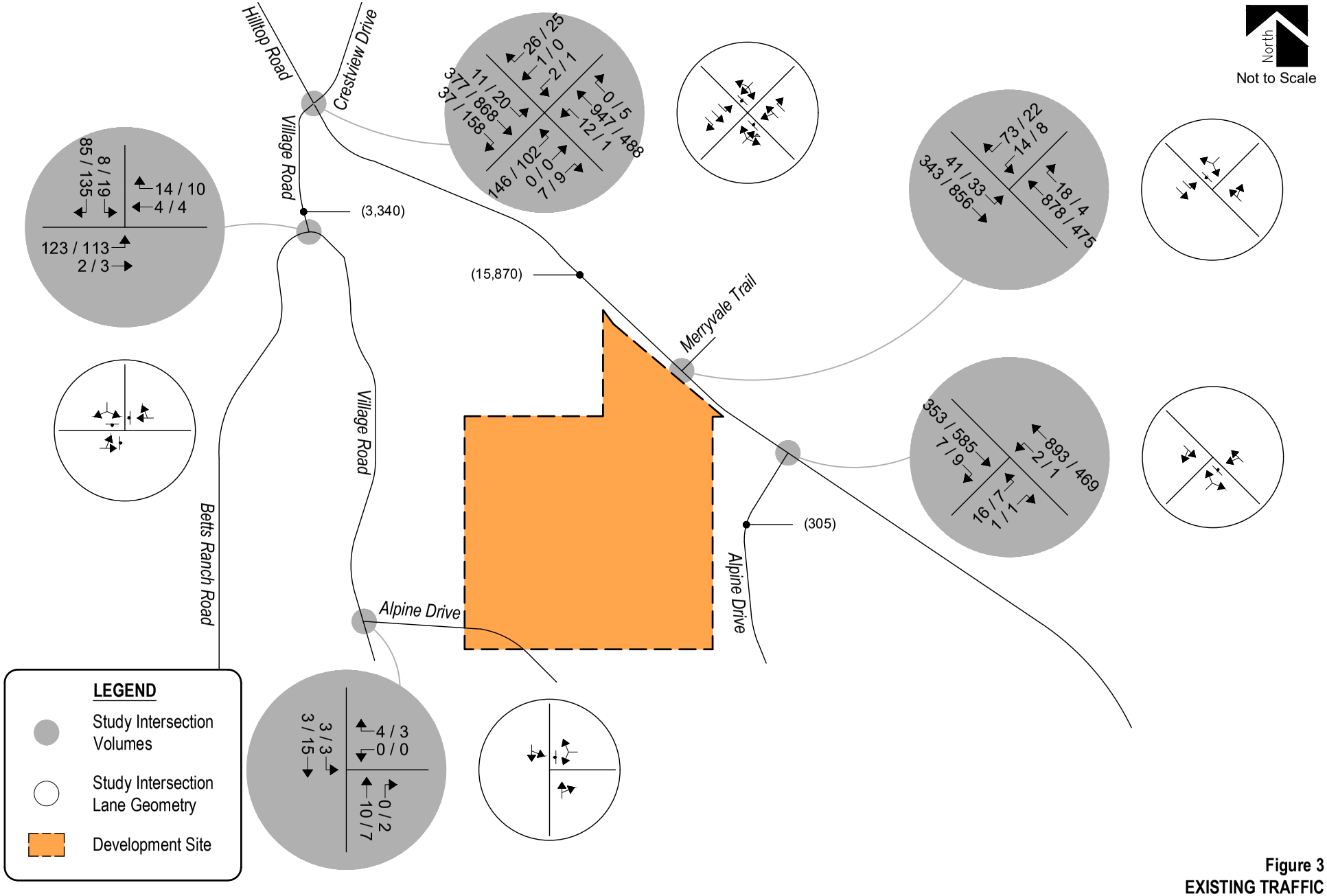


Figure 3
EXISTING TRAFFIC
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

Peak Hour Intersection Levels of Service – Existing Traffic

The Unsignalized Intersection Analysis techniques, as published in the Highway Capacity Manual (HCM), 7th Edition, by the Transportation Research Board and as incorporated into the SYNCHRO computer program, was used to analyze the study intersections for existing and future traffic conditions. This nationally accepted technique allows for the determination of intersection level of service (LOS) based on the congestion and delay of each traffic movement.

Level of service is a method of measurement used by transportation professionals to quantify a driver's perception of travel conditions that include travel time, number of stops, and total amount of stopped delay experienced on a roadway network. The HCM categorizes level of service into a range from "A" which indicates little, if any, vehicle delay, to "F" which indicates a level of operation considered unacceptable to most drivers. These levels of service grades with brief descriptions of the operating condition, for unsignalized and signalized intersections, are included for reference in Appendix B and have been used throughout this study.

The level of service analyses results for existing conditions are summarized in Table 1.

Intersection capacity worksheets developed for this study are provided in Appendix C.

Table 1 – Intersection Capacity Analysis Summary – Existing Traffic

INTERSECTION	LEVEL OF SERVICE	
LANE GROUPS	AM PEAK HOUR	PM PEAK HOUR
Hilltop Road / Village Road / Crest View Road (Stop-Controlled)		
Southeastbound Left	B	A
Northwestbound Left and Through	A	B
Northeastbound Left, Through and Right	F	F
Southwestbound Left, Through and Right	C	B
Hilltop Road / Merryvale Trail (Stop-Controlled)		
Southeastbound Left	B	A
Southwestbound Left and Right	D	C
Hilltop Road / Alpine Drive (Stop-Controlled)		
Northwestbound Through and Left	A	A
Northeastbound Left and Right	D	D
Betts Ranch Road / Village Road (Stop-Controlled)		
Eastbound Left and Through	A	A
Westbound Right and Through	A	A
Southbound Left and Right	A	A
Village Road / Alpine Drive (Stop-Controlled)		
Westbound Left and Right	A	A
Southbound Left and Through	A	A

Key: Stop-Controlled Intersection: Level of Service

Existing Traffic Analysis Results

Under existing conditions, operational analysis shows that the unsignalized intersection of Hilltop Road and Village Road has turning movement operations at LOS C or better during the morning peak traffic hour and LOS B or better during the afternoon peak traffic hour. Exceptions include the northeast turning movement which operates at LOS F during the morning and afternoon peak traffic hours. The LOS F operations are attributed to the through traffic volume along Hilltop Road and the stop-controlled nature of the intersection. However, pursuant to planned and ongoing roadway improvements as discussed in Section I, conversion of the intersection to a roundabout is anticipated to mitigate these operations.

The unsignalized intersection of Hilltop Road and Merryvale Trail has turning movement operations at LOS D or better during the morning peak traffic hours and LOS C or better during the afternoon peak traffic hours.

The unsignalized intersection of Hilltop Road and Alpine Drive has turning movement operations at LOS D or better during the morning and afternoon peak traffic hours.

The unsignalized intersection of Betts Ranch Road and Village Road has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The unsignalized intersection of Village Road and Alpine Drive has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

It is to be noted that it is not uncommon for unsignalized movements to or from an arterial roadway, in urban areas, to operate with noticeable delays during peak traffic hours. It is, however, likely that turn movements will operate better than the results obtained with this HCM Two-Way Stop-Control (TWSC) level of service analysis would indicate, as the HCM analysis may not accurately account for the effect of vehicle platooning and gaps caused by upstream signals.

III. Future Traffic Conditions Without Proposed Development

Background traffic is the traffic projected to be on area roadways without consideration of the proposed development. Background traffic includes traffic generated by development of vacant parcels in the area.

To account for projected increases in background traffic for Years 2029 and 2044, a compounded annual growth rate of approximately two percent was applied to existing traffic volumes.

It is important to note that ingress and egress traffic volumes for some roadways are not subject to annual growth patterns since these roads do not provide connection to other roadways, therefore do not serve regional traffic. The following intersections include:

- The southwest leg of Alpine Drive and Hilltop Road
- The east leg of Betts Ranch Road and Village Road
- The northeast leg of Hilltop Road and Village Road
- The intersection of Village Road and Alpine Drive

To account for projected traffic from adjacent developments not yet built, trip generations from the Fields[4] traffic study were added to background traffic volumes with an updated density as described by County Staff. Trip generation information for the Fields traffic study is included for reference in Appendix D.

Pursuant to the proposed area roadway improvements discussed in Section I, Year 2029 assumes the expansion of Hilltop Road from two to four through lanes from Village Road to Alpine Drive as well as the intersection of Hilltop Road and Village Road being converted to a roundabout-controlled intersection. Year 2044 assumes the expansion of Hilltop Road from two to four through lanes east past Alpine Drive. This assumption provides for a conservative analysis.

Projected background traffic volumes and intersection geometry for Years 2029 and 2044 are shown on Figure 4 and Figure 5, respectively.

[4] Fields: Traffic Impact Analysis, Felsberg, Holt, and Ullevig, November, 2021

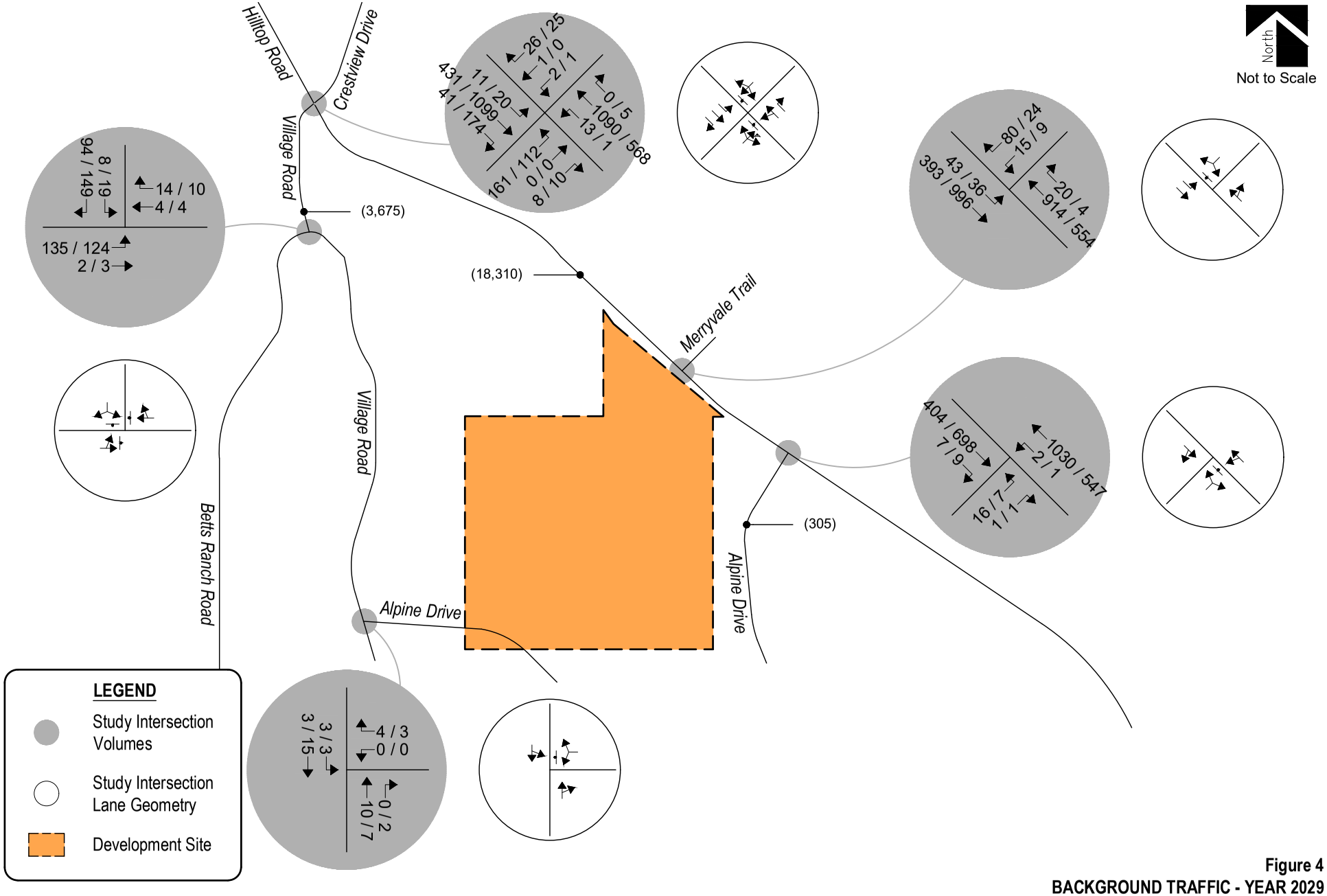


Figure 4
BACKGROUND TRAFFIC - YEAR 2029
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

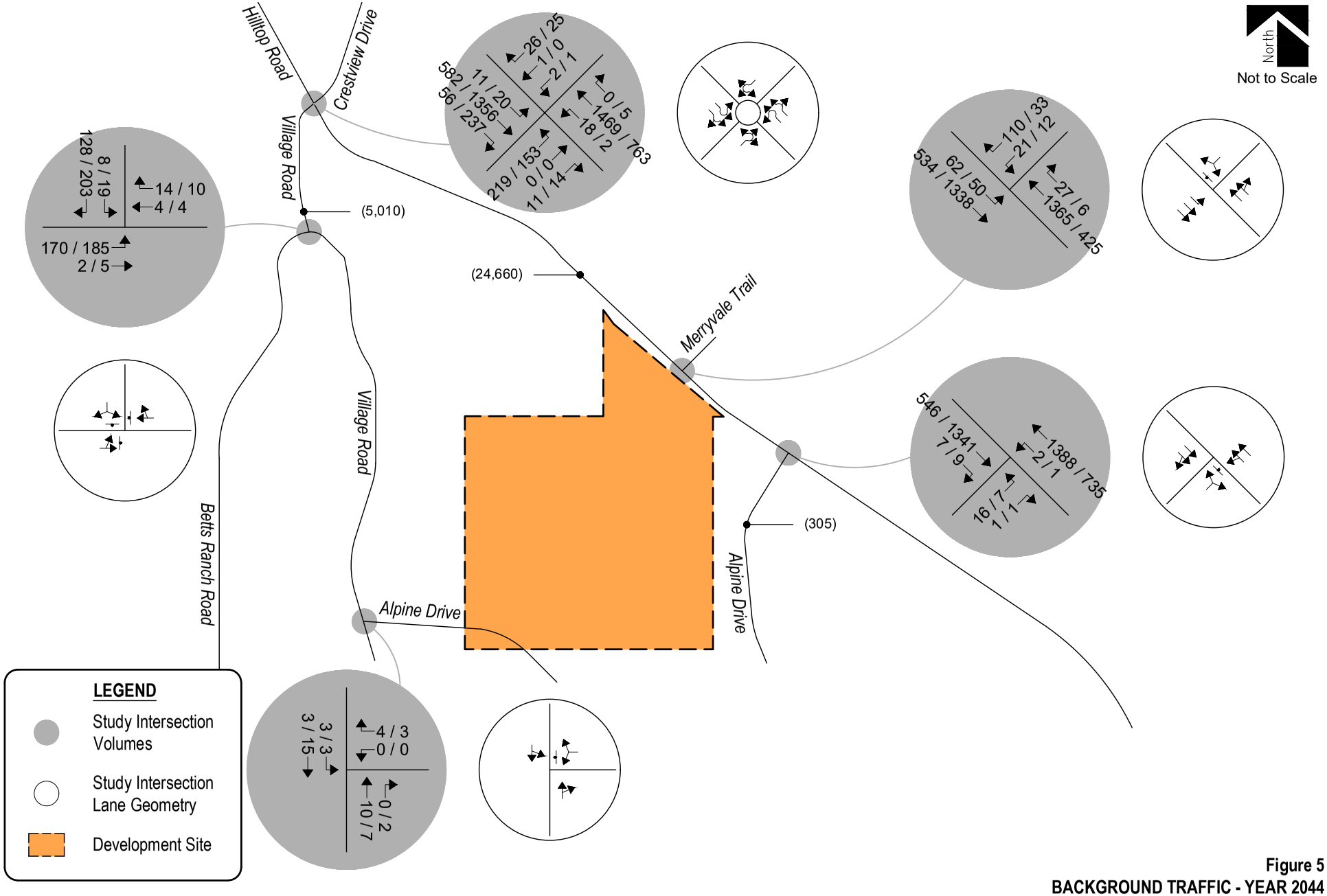


Figure 5
BACKGROUND TRAFFIC - YEAR 2044
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

Peak Hour Intersection Levels of Service – Background Traffic

As with existing traffic conditions, the operations of study intersections were analyzed under background conditions, without the proposed development, using the SYNCHRO computer program.

Background traffic level of service analysis results for Year 2029 are listed in Table 2. Year 2044 operational results are summarized in Table 3.

Definitions of levels of service are given in Appendix B. Intersection capacity worksheets are provided in Appendix C.

Table 2 – Intersection Capacity Analysis Summary – Background Traffic – Year 2029

INTERSECTION	LEVEL OF SERVICE	
LANE GROUPS	AM PEAK HOUR	PM PEAK HOUR
Hilltop Road / Village Road / Crest View Road (Roundabout-Controlled)		
Southeastbound Left and Through	A	A
Southeastbound Through and Right	A	A
Northwestbound Left and Through	A	A
Northwestbound Through and Right	A	A
Northeastbound Left, Through and Right	A	B
Southwestbound Left, Through and Right	A	A
Hilltop Road / Merryvale Trail (Stop-Controlled)		
Southeastbound Left	B	A
Southwestbound Left and Right	C	C
Hilltop Road / Alpine Drive (Stop-Controlled)		
Northwestbound Through and Left	A	A
Northeastbound Left and Right	E	D
Betts Ranch Road / Village Road (Stop-Controlled)		
Eastbound Left and Through	A	A
Westbound Right and Through	A	A
Southbound Left and Right	A	A
Village Road / Alpine Drive (Stop-Controlled)		
Westbound Left and Right	A	A
Southbound Left and Through	A	A

Key: Stop-Controlled Intersection: Level of Service
Roundabout Intersection: Level of Service

Background Traffic Analysis Results – Year 2029

Year 2029 background traffic analysis indicates that the roundabout-controlled intersection of Hilltop Road and Village Road has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The unsignalized intersection of Hilltop Road and Merryvale Trail has turning movement operations at LOS C or better during the morning and afternoon peak traffic hours.

The unsignalized intersection of Hilltop Road and Alpine Drive has turning movement operations at LOS A during the morning peak traffic hour and LOS D or better during the afternoon peak traffic hour. Exceptions include the northeastbound turning movement which has operations at LOS E during the morning peak traffic hour. The LOS E operation is attributed to the through traffic volumes along Hilltop Road and the stop-controlled nature of the intersection. Potential mitigations may include the addition of a northeastbound to a northwestbound left turn acceleration lane along Hilltop Road.

The unsignalized intersection of Betts Ranch Road and Village Road has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The unsignalized intersection of Village Road and Alpine Drive has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

Table 3 – Intersection Capacity Analysis Summary – Background Traffic – Year 2044

INTERSECTION	LEVEL OF SERVICE	
LANE GROUPS	AM PEAK HOUR	PM PEAK HOUR
Hilltop Road / Village Road / Crest View Road (Roundabout-Controlled)		
Southeastbound Left and Through	A	B
Southeastbound Through and Right	A	B
Northwestbound Left and Through	C	A
Northwestbound Through and Right	C	A
Northeastbound Left, Through and Right	A	C
Southwestbound Left, Through and Right	C	A
Hilltop Road / Merryvale Trail (Stop-Controlled)		
Southeastbound Left	B	A
Southwestbound Left and Right	F	C
Hilltop Road / Alpine Drive (Stop-Controlled)		
Northwestbound Through and Left	A	B
Northeastbound Left and Right	D	F
Betts Ranch Road / Village Road (Stop-Controlled)		
Eastbound Left and Through	A	A
Westbound Right and Through	A	A
Southbound Left and Right	A	A
Village Road / Alpine Drive (Stop-Controlled)		
Westbound Left and Right	A	A
Southbound Left and Through	A	A

Key: Stop-Controlled Intersection: Level of Service
Roundabout Intersection: Level of Service

Background Traffic Analysis Results – Year 2044

By Year 2044 and without the proposed development, the roundabout controlled intersection of Hilltop Road and Village Road has turning movement operations at LOS C or better during the morning and afternoon peak traffic hours.

The unsignalized intersection of Hilltop Road and Merryvale Trail has turning movement operations at LOS B during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hour. Exceptions include the southwestbound turning movement which has operations at LOS F during the morning peak traffic hour. The LOS F operation is attributed to the through traffic volumes along Hilltop Road and the stop-controlled nature of the intersection. Potential mitigations may include the addition of a southwestbound to southeastbound left turn acceleration lane along Hilltop Road or conversion of the intersection to either a signal-controlled intersection or a roundabout controlled intersection.

The unsignalized intersection of Hilltop Road and Alpine Drive has turning movement operations at LOS D during the morning peak traffic hour and LOS B during the afternoon peak traffic hour. Exceptions include the northeastbound turning movement which has operations at LOS F during the afternoon peak traffic hour. The LOS F operation is attributed to the through traffic volumes along Hilltop Road and the stop-controlled nature of the intersection. Potential mitigations continue to include the addition of a northeastbound to northwestbound left turn acceleration lane along Hilltop Road.

The unsignalized intersection of Betts Ranch Road and Village Road has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The unsignalized intersection of Village Road and Alpine Drive has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

It is to be noted that it is not uncommon for unsignalized movements to or from an arterial roadway, in urban areas, to operate with noticeable delays during peak traffic hours. It is, however, likely that turn movements will operate better than the results obtained with this HCM Two-Way Stop-Control (TWSC) level of service analysis would indicate, as the HCM analysis may not accurately account for the effect of vehicle platooning and gaps caused by upstream signals.

IV. Proposed Project Traffic

Trip Generation

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation Manual, 11th Edition, were applied to the proposed land use in order to estimate average daily traffic (ADT), AM Peak Hour, and PM Peak Hour vehicle trips. A vehicle trip is defined as a one-way vehicle movement from a point of origin to a point of destination.

The ITE land use code 210 (Single-Family Detached Housing) was used for estimating trip generation because of its conservative rates and best fit to the proposed land use description.

Trip generation rates used in this study are presented in Table 4.

Table 4 – Trip Generation Rates

			TRIP GENERATION RATES						
ITE			24	AM PEAK HOUR			PM PEAK HOUR		
CODE	LAND USE	UNIT	HOUR	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Detached Housing	DU	9.43	0.18	0.53	0.70	0.59	0.35	0.94

Key: DU = Dwelling Units.
Note: All data and calculations above are subject to being rounded to nearest value.

Table 5 illustrates projected ADT, AM Peak Hour, and PM Peak Hour traffic volumes likely generated by the proposed development upon build-out.

Table 5 – Trip Generation Summary

			TOTAL TRIPS GENERATED						
ITE			24	AM PEAK HOUR			PM PEAK HOUR		
CODE	LAND USE	SIZE	HOUR	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Detached Housing	70 DU	660	12	37	49	41	24	66
		Total:	*660*	*12*	*37*	*49*	*41*	*24*	*66*

Key: DU = Dwelling Units.
Note: All data and calculations above are subject to being rounded to nearest value.

Upon build-out, Table 5 illustrates that the proposed development has the potential to generate approximately 660 daily vehicle trips with 49 of those occurring during the morning peak hour and 66 during the afternoon peak hour.

Adjustments to Trip Generation Rates

A development of this type is not likely to attract trips from within area land uses nor pass-by or diverted link trips from the adjacent roadway system, therefore no trip reduction was taken in this analysis.

Trip Distribution

The overall directional distribution of site-generated traffic was determined based on the location of development site within the County, proposed and existing area land uses, allowed turning movements, and available roadway network.

Overall trip distribution patterns for the development are shown on Figure 6.

Trip Assignment

Traffic assignment is how generated and distributed vehicle trips are expected to be loaded onto the available roadway network.

Applying trip distribution patterns to site-generated traffic provides the overall site-generated trip assignments shown on Figure 6.

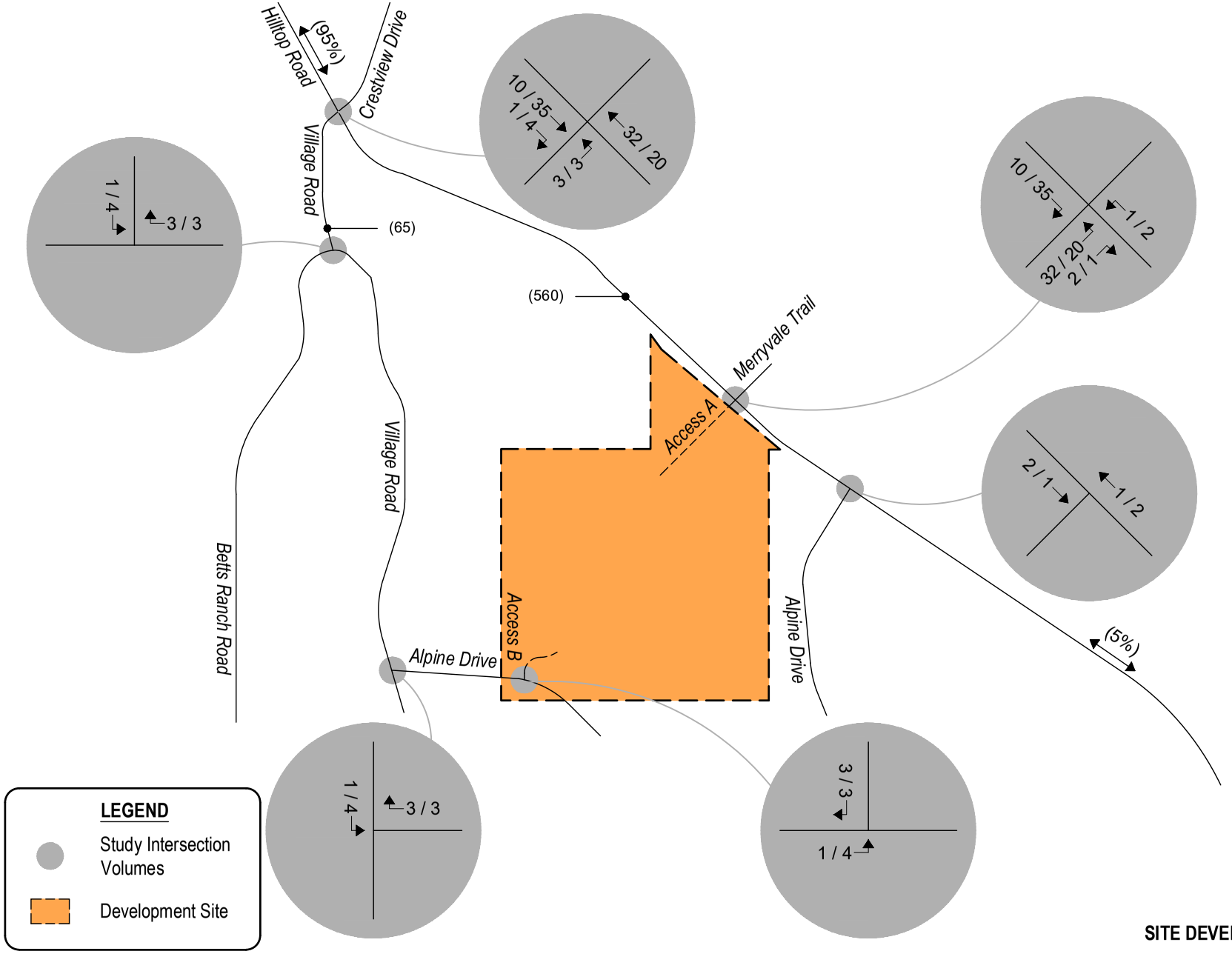


Figure 6
SITE DEVELOPMENT DISTRIBUTION
(%) : Overall
SITE-GENERATED TRIPS
AM / PM Peak Hour
(ADT) : Average Daily Traffic

V. Future Traffic Conditions With Proposed Developments

Total traffic is the traffic projected to be on area roadways with consideration of the proposed development. Total traffic includes background traffic projections for Years 2029 and 2044 with consideration of site-generated traffic. For analysis purposes, it was assumed that development construction would be completed by end of Year 2029.

Pursuant to area roadway improvement discussions provided in Section III, Year 2029 and Year 2044 total traffic conditions assume no roadway improvements to accommodate regional transportation demands. Roadway improvements associated with site development are expected to be limited to site access and frontage as required by the governing agency.

Total Traffic Auxiliary Lane Analysis

Auxiliary lanes for Hilltop Road were evaluated and are to be based on the County's Roadway Standards.

Section 4.13 of the County's Roadway Standards also indicates that the need for auxiliary lanes on roadways that have greater than two lanes are to be established by an accepted traffic impact study. Considering build-out traffic, an evaluation of auxiliary lane requirements, pursuant to Section 4.13 of the County's Roadway Standards, analysis results indicate that a shared northwestbound left turn lane operates at LOS B or better and with minimal queues. However, it is understood pursuant to County review that a left-turn lane is required with the planned widening of Hilltop Road to a four-lane roadway section.

Projected Year 2029 total traffic volumes and intersection geometry are shown in Figure 7.

Figure 8 shows projected total traffic volumes and intersection geometry for Year 2044.

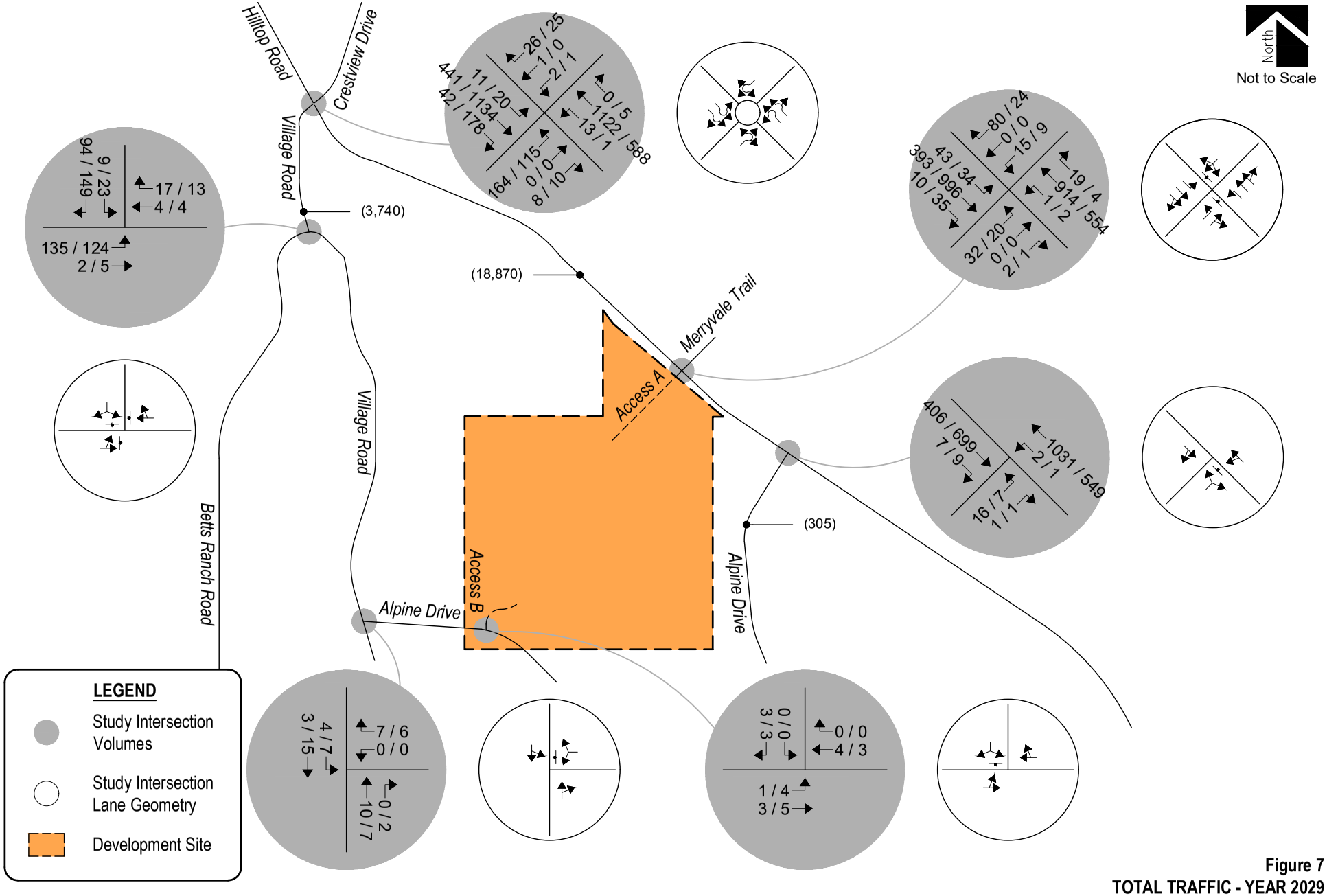


Figure 7
TOTAL TRAFFIC - YEAR 2029
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

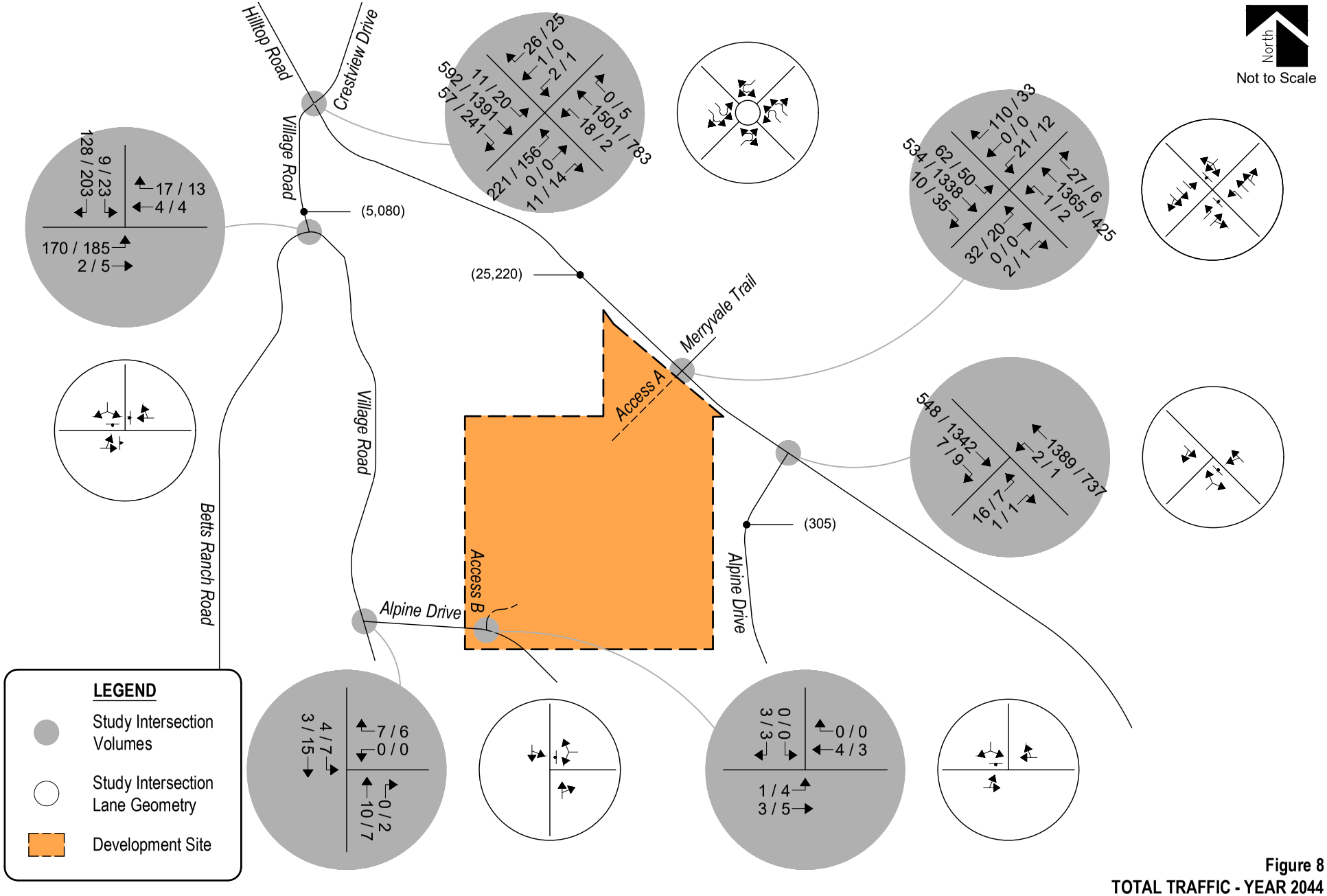


Figure 8
TOTAL TRAFFIC - YEAR 2044
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

VI. Project Impacts

The analyses and procedures described in this study were performed in accordance with the latest HCM are based upon the worst-case conditions that occur during a typical weekday upon build-out of site development and analyzed land uses. Therefore, study intersections are likely to operate with traffic conditions better than those described within this study, which represent the peak hours of weekday operations only.

Peak Hour Intersection Levels of Service – Total Traffic

As with background traffic, the operations of the study intersections were analyzed under projected total traffic conditions using the SYNCHRO computer program. Total traffic level of service analysis results for Years 2029 and 2044 are summarized in Table 6 and Table 7, respectively.

Definitions of levels of service are given in Appendix B. Intersection capacity worksheets are provided in Appendix C.

Table 6 – Intersection Capacity Analysis Summary – Total Traffic – Year 2029

INTERSECTION LANE GROUPS	LEVEL OF SERVICE AM PEAK HOUR	 PM PEAK HOUR
Hilltop Road / Village Road / Crest View Road (Roundabout-Controlled)		
Southeastbound Left and Through	A	A
Southeastbound Through and Right	A	A
Northwestbound Left and Through	A	A
Northwestbound Through and Right	A	A
Northeastbound Left, Through and Right	A	B
Southwestbound Left, Through and Right	A	A
Hilltop Road / Merryvale Trail / Access A (Stop-Controlled)		
Southeastbound Left	B	A
Northwestbound Left	A	B
Northeastbound Left	E	F
Northeastbound Through and Right	A	B
Southwestbound Left, Through and Right	C	C
Hilltop Road / Alpine Drive (Stop-Controlled)		
Northwestbound Through and Left	A	A
Northeastbound Left and Right	E	D
Betts Ranch Road / Village Road (Stop-Controlled)		
Eastbound Left and Through	A	A
Westbound Right and Through	A	A
Southbound Left and Right	A	A
Village Road / Alpine Drive (Stop-Controlled)		
Westbound Left and Right	A	A
Southbound Left and Through	A	A
Alpine Drive / Access B (Stop-Controlled)		
Eastbound Left and Through	A	A
Southbound Left and Right	A	A

Key: Stop-Controlled Intersection: Level of Service
Roundabout Intersection: Level of Service

Table 7 – Intersection Capacity Analysis Summary – Total Traffic – Year 2044

INTERSECTION LANE GROUPS	LEVEL OF SERVICE AM PEAK HOUR	LEVEL OF SERVICE PM PEAK HOUR
Hilltop Road / Village Road / Crest View Road (Roundabout-Controlled)		
Southeastbound Left and Through	A	B
Southeastbound Through and Right	A	B
Northwestbound Left and Through	C	A
Northwestbound Through and Right	C	A
Northeastbound Left, Through and Right	A	C
Southwestbound Left, Through and Right	C	A
Hilltop Road / Merryvale Trail / Access A (Stop-Controlled)		
Southeastbound Left	B	A
Northwestbound Left	A	B
Northeastbound Left	F	F
Northeastbound Through and Right	B	B
Southwestbound Left, Through and Right	F	C
Hilltop Road / Alpine Drive (Stop-Controlled)		
Northwestbound Through and Left	A	B
Northeastbound Left and Right	D	F
Betts Ranch Road / Village Road (Stop-Controlled)		
Eastbound Left and Through	A	A
Westbound Right and Through	A	A
Southbound Left and Right	A	A
Village Road / Alpine Drive (Stop-Controlled)		
Westbound Left and Right	A	A
Southbound Left and Through	A	A
Alpine Drive / Access B (Stop-Controlled)		
Eastbound Left and Through	A	A
Southbound Left and Right	A	A

Key: Stop-Controlled Intersection: Level of Service
Roundabout Intersection: Level of Service

Total Traffic Analysis Results Upon Development Build-Out

Table 7 illustrates how, by Year 2044 and upon development build-out, the roundabout-controlled intersection has turning movement operations at LOS C or better during the morning and afternoon peak traffic hours. Compared to the background traffic analysis, the traffic generated by the proposed development is not expected to significantly change the operations of the study intersection.

The stop-controlled intersection of Hilltop Road and Access A has turning movement operations at LOS B or better during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hours. Exceptions include the southwestbound turning movement, which operates at LOS F during the morning peak traffic hour, and the northeastbound left turning movement, which operates at LOS F during the morning and afternoon peak traffic hour. The LOS F operations are attributed to the through traffic volumes along Hilltop Road and the stop-controlled nature of the intersection. Similar to background traffic conditions potential mitigations include conversion of the intersection to either a signal-controlled intersection or a roundabout controlled intersection. It is important to note that this development does not significantly contribute or change operations compared to background traffic conditions.

The stop-controlled intersection of Hilltop Road and Alpine Drive has turning movement operations at LOS D or better during the morning peak traffic hour and LOS B during the afternoon peak traffic hour. Exceptions continue to include the northeastbound turning movement which has turning movement operations at LOS F during the afternoon peak traffic hour. The LOS F operation continues to be attributed to the through traffic volumes along Hilltop Road and the stop-controlled nature of the intersection. As with background traffic conditions, potential mitigations continue to include the addition of a northeastbound to northwestbound left turn acceleration lane along Hilltop Road.

The stop-controlled intersection of Betts Ranch Road and Village Road has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The stop-controlled nature of the intersection of Village Road and Alpine Drive has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The stop-controlled nature of the intersection of Alpine Drive and Access B has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

It is to be noted that it is not uncommon for unsignalized movements to or from an arterial roadway, in urban areas, to operate with noticeable delays during peak traffic hours. It is, however, likely that turn movements will operate better than the results obtained with this HCM Two-Way Stop-Control (TWSC) level of service analysis would indicate, as the HCM analysis may not accurately account for the effect of vehicle platooning and gaps caused by upstream signals.

These intersection operations are similar to background conditions.

Compared to Year 2044 background traffic conditions along Hilltop Road, a potential increase of approximately 560 trips per day is expected as shown in Figure 6. This equates to an approximate 2% increase from background traffic volumes and is considered minor. Percent contribution calculations are provided for reference in Appendix E.

Queue Length Analysis

Queue lengths for the study intersections were analyzed using Year 2044 total traffic conditions. The analysis yields estimate of 95th percentile queue lengths, which have only a five percent probability of being exceeded during the analysis time period. An average vehicle length of 25 feet was assumed. Queue lengths were modeled and are included with the Synchro worksheets in Appendix C.

Table 8 summarizes the 95th percentile queue results in comparison to the projected storage requirements for turn movements within study area for Year 2044.

Table 8 – Turn Lane Queues and Storage Requirements – Total Traffic – Year 2041

Intersection	Turn Movement		Existing Turn Lane Length (feet)	AM Peak Hour		PM Peak Hour		Recommended Turn Lane Length (feet)
				95th Percentile Queue Length (feet)	Vehicle Equivalent (vehicles)	95th Percentile Queue Length (feet)	Vehicle Equivalent (vehicles)	
Roundabout-Controlled Intersections								
Hilltop Road / Village Road / Crest View Road	SEB	L,T	-	25'	1	130'	6	-
		T,R	-	25'	1	150'	6	-
	NWB	L,T	-	175'	7	50'	2	-
		T,R	-	200'	8	50'	2	-
	NEB	L,T,R	-	25'	1	75'	3	-
	SWB	L,T,R	-	0'	0	0'	0	-
Stop-Controlled Intersections								
Hilltop Road / Merryvale Trail / Access A	SEB	L	315'	13'	0	5'	0	315'
		T,R	-	0'	0	0'	0	-
	NWB	L	-	0'	0	0'	0	315'
		T,R	-	0'	0	0'	0	-
	NEB	L	-	70'	0	45'	0	75'
		T,R	-	0'	0	0'	0	-
	SWB	L,T,R	-	185'	0	15'	0	-
Hilltop Road / Alpine Drive	SEB	T,R	-	0'	0	0'	0	-
	NWB	L,T	-	0'	0	0'	0	-
	NEB	L,R	-	10'	0	10'	1	-
Village Road / Betts Ranch Road	EB	L,T	-	23'	1	28'	2	-
	WB	T,R	-	3'	1	3'	0	-
	SB	L,R	-	15'	1	28'	0	-
Village Road / Alpine Drive	WB	L,R	-	0'	0	0'	0	-
	NB	T,R	-	0'	0	0'	0	-
	SB	L,R	-	0'	0	0'	0	-
Alpine Drive / Access B	EB	L,T	-	0'	0	0'	0	-
	WB	T,R	-	0'	0	0'	0	-
	SB	L,R	-	0'	0	0'	0	-

Note: Turn Lane Length does not include taper length.

As Table 8 shows, all turn lane lengths at stop-controlled intersections have sufficient storage to accommodate future traffic volumes.

VII. Conclusion

This traffic impact study addressed the capacity, geometric, and control requirements associated with the development entitled Ramblewood. This proposed residential development development consists of a single-family home development. The development is located to the southwest of Hilltop Road, north of Alpine Drive, and east of N Village Road in Douglas County, Colorado.

The study area examined in this analysis encompassed the area bounded by Hilltop Road from Village Road east to Alpine Drive, Village Road from Betts Ranch Road east to Alpine Drive, and includes proposed site accesses.

Analysis was conducted for critical AM Peak Hour and PM Peak Hour traffic operations for existing traffic conditions, Year 2029 and Year 2044 background traffic conditions, and Year 2029 and Year 2044 total traffic conditions.

Analysis of existing traffic conditions indicates that the unsignalized intersections within the study area have turning movement operations at LOS D or better during the morning and afternoon peak traffic hour. Exceptions include the northeastbound turning movement which operates at LOS F during the morning and afternoon peak traffic hour at the intersection of Hilltop Road and Village Road.

Without the proposed development, Year 2029 background operational analysis shows that the roundabout-controlled intersection of Hilltop Road and Village Road has turning movement operations at LOS A during the morning and afternoon peak traffic hours. The unsignalized intersections within the study area have turning movement operations at LOS D or better during the morning peak traffic hour and LOS B or better during the afternoon peak traffic hour. Exceptions include the northeastbound turning movement at the intersection of Hilltop Road and Alpine Drive which operates at LOS E during the afternoon peak traffic hour. The LOS E operation is attributed to the through traffic volumes along Hilltop Road and the stop-controlled nature of the intersection.

By Year 2044 and without the proposed development, the roundabout-controlled intersection of Hilltop Road and Village Road has turning movement operations at LOS C or better during the morning and afternoon peak traffic hours. The unsignalized intersections within the study area have turning movement operations at LOS D or better during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hour. Exceptions include the southwestbound turning movement at the intersection of Hilltop Road and Merryvale Trail which operates at LOS F during the morning peak traffic and the northeastbound turning movement at the intersection of Hilltop Road and Alpine Drive which operates at LOS F during the afternoon peak traffic hour. The LOS F operations are attributed to the through traffic volumes along Hilltop Road and the stop-controlled nature of the intersection.

Analysis of future traffic conditions indicates that the addition of site-generated traffic is expected to create no negative impact to traffic operations for the existing and surrounding roadway system upon consideration of the various roadway and intersection control improvements assumed within this analysis. With all conservative assumptions defined in this analysis, the study intersections are projected to operate at future levels of service comparable to Year 2044 background traffic conditions. Proposed site accesses have long-term operations at LOS A or better during peak traffic periods and upon build-out. Exceptions include the northeastbound left turning movement at the intersection of Hilltop Road and Access A, which operates at LOS F during the morning and afternoon peak traffic hours. Potential mitigations may include converting the intersection to a signal-control. It is again important to note that this development does not significantly contribute or change operations compared to background traffic conditions. It is recommended that County Staff monitor the study intersections in order to determine when specific mitigation measures may be necessary as planned corridor improvements occur.

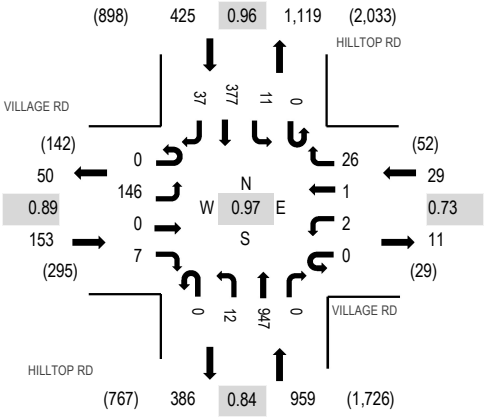
APPENDIX A

Traffic Count Data
Approved Base Assumptions

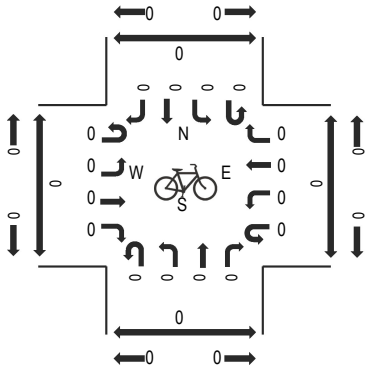
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 HILLTOP RD & VILLAGE RD AM
Date: Wednesday, September 25, 2024
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:00 AM - 07:15 AM

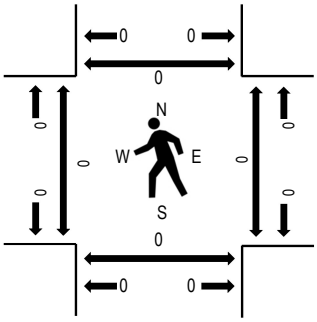
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

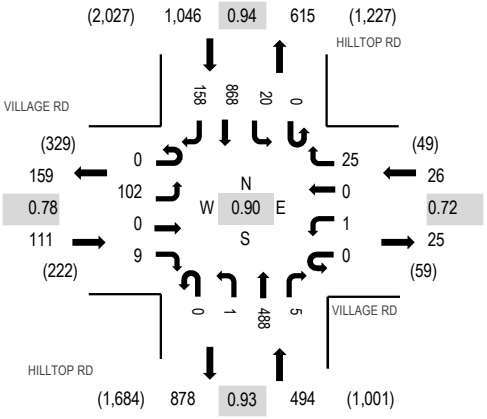
Traffic Counts - Motorized Vehicles

Interval Start Time	VILLAGE RD Eastbound				VILLAGE RD Westbound				HILLTOP RD Northbound				HILLTOP RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	42	0	0	0	1	0	6	0	1	284	0	0	0	66	5	405	1,566	0	0	0	0
7:15 AM	0	27	0	4	0	1	0	9	0	4	223	0	0	5	115	11	399	1,538	0	0	0	0
7:30 AM	0	36	0	1	0	0	1	5	0	3	215	0	0	4	101	11	377	1,494	0	0	0	0
7:45 AM	0	41	0	2	0	0	0	6	0	4	225	0	0	2	95	10	385	1,464	0	0	0	0
8:00 AM	0	40	0	0	0	0	0	5	0	2	215	1	0	4	88	22	377	1,405	0	0	0	0
8:15 AM	0	28	0	1	0	1	0	6	0	3	201	0	0	5	91	19	355		0	0	0	0
8:30 AM	0	25	0	1	0	0	0	4	0	2	194	0	0	3	99	19	347		0	0	0	0
8:45 AM	0	46	0	1	0	0	0	7	0	6	143	0	0	5	99	19	326		0	0	0	0
Count Total	0	285	0	10	0	3	1	48	0	25	1,700	1	0	28	754	116	2,971		0	0	0	0
Peak Hour	0	146	0	7	0	2	1	26	0	12	947	0	0	11	377	37	1,566		0	0	0	0

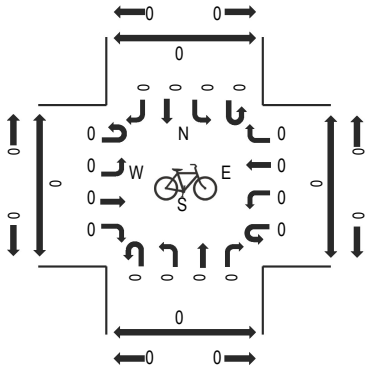
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 1 HILLTOP RD & VILLAGE RD PM
Date: Wednesday, September 25, 2024
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

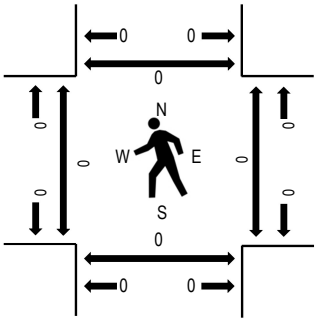
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

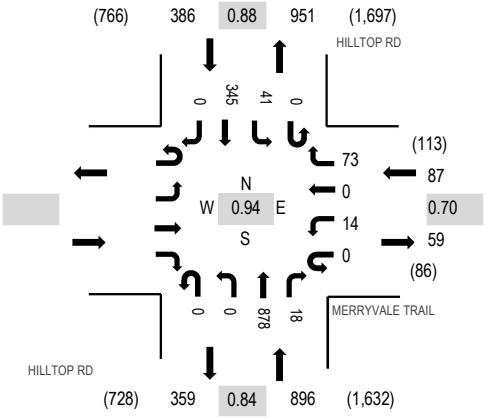
Traffic Counts - Motorized Vehicles

Interval Start Time	VILLAGE RD Eastbound				VILLAGE RD Westbound				HILLTOP RD Northbound				HILLTOP RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	30	0	5	0	0	0	4	0	0	114	0	0	4	171	32	360	1,630	0	0	0	0
4:15 PM	0	36	0	4	0	0	0	9	0	1	139	0	0	6	214	57	466	1,677	0	0	0	0
4:30 PM	0	20	0	2	0	0	0	6	0	0	128	2	0	1	218	38	415	1,641	0	0	0	0
4:45 PM	0	25	0	2	0	0	0	7	0	0	96	1	0	6	223	29	389	1,653	0	0	0	0
5:00 PM	0	21	0	1	0	1	0	3	0	0	125	2	0	7	213	34	407	1,669	0	0	0	0
5:15 PM	0	20	1	5	0	1	0	5	0	4	133	1	0	12	215	33	430		0	0	0	0
5:30 PM	0	27	0	3	0	1	0	7	0	2	136	2	0	10	198	41	427		0	0	0	0
5:45 PM	0	19	0	1	0	0	0	5	0	2	112	1	0	3	206	56	405		0	0	0	0
Count Total	0	198	1	23	0	3	0	46	0	9	983	9	0	49	1,658	320	3,299		0	0	0	0
Peak Hour	0	102	0	9	0	1	0	25	0	1	488	5	0	20	868	158	1,677		0	0	0	0

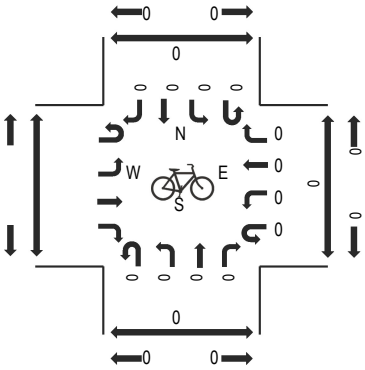
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 HILLTOP RD & MERRYVALE TRAIL AM
Date: Wednesday, September 25, 2024
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:00 AM - 07:15 AM

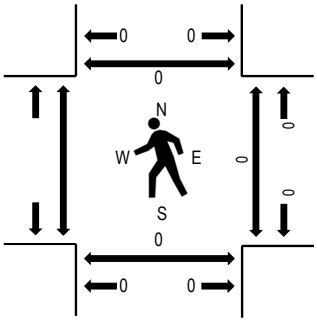
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

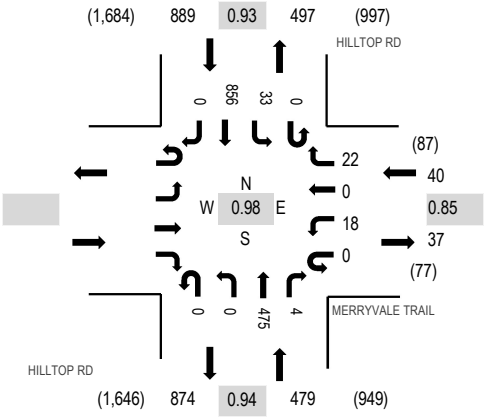
Traffic Counts - Motorized Vehicles

Interval Start Time	Eastbound U-Turn	Eastbound Left	Eastbound Thru	Eastbound Right	MERRYVALE TRAIL Westbound U-Turn	Westbound Left	Westbound Thru	Westbound Right	HILLTOP RD Northbound U-Turn	Northbound Left	Northbound Thru	Northbound Right	HILLTOP RD Southbound U-Turn	Southbound Left	Southbound Thru	Southbound Right	Total	Rolling Hour	Pedestrian Crossings West	East	South	North
7:00 AM					0	1	0	26	0	0	261	5	0	7	65	0	365	1,369		0	0	0
7:15 AM					0	6	0	25	0	0	198	5	0	12	102	0	348	1,301		0	0	0
7:30 AM					0	3	0	11	0	0	196	6	0	14	90	0	320	1,253		0	0	0
7:45 AM					0	4	0	11	0	0	223	2	0	8	88	0	336	1,223		0	0	0
8:00 AM					0	3	0	5	0	0	201	2	0	8	78	0	297	1,142		0	0	0
8:15 AM					0	0	0	5	0	0	191	4	0	5	95	0	300			0	0	0
8:30 AM					0	2	0	4	0	0	195	1	0	4	84	0	290			0	0	0
8:45 AM					0	3	0	4	0	0	141	1	0	2	104	0	255			0	0	0
Count Total					0	22	0	91	0	0	1,606	26	0	60	706	0	2,511			0	0	0
Peak Hour					0	14	0	73	0	0	878	18	0	41	345	0	1,369			0	0	0

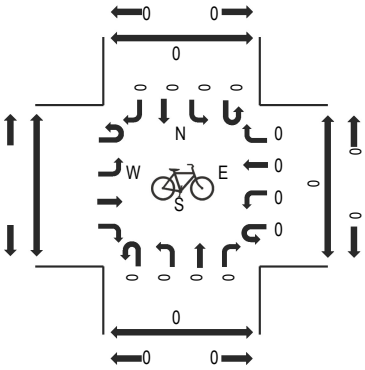
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 2 HILLTOP RD & MERRYVALE TRAIL PM
Date: Wednesday, September 25, 2024
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

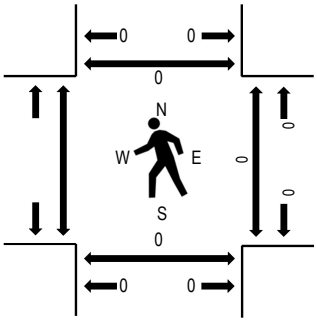
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

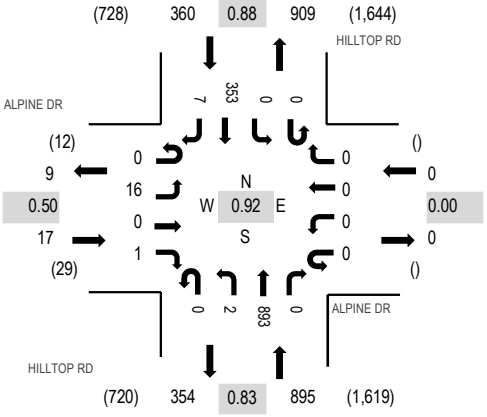
Traffic Counts - Motorized Vehicles

Interval Start Time	Eastbound U-Turn	Eastbound Left	Eastbound Thru	Eastbound Right	MERRYVALE TRAIL Westbound U-Turn	MERRYVALE TRAIL Westbound Left	MERRYVALE TRAIL Westbound Thru	MERRYVALE TRAIL Westbound Right	HILLTOP RD Northbound U-Turn	HILLTOP RD Northbound Left	HILLTOP RD Northbound Thru	HILLTOP RD Northbound Right	HILLTOP RD Southbound U-Turn	HILLTOP RD Southbound Left	HILLTOP RD Southbound Thru	HILLTOP RD Southbound Right	Total	Rolling Hour	Pedestrian Crossings West	Pedestrian Crossings East	Pedestrian Crossings South	Pedestrian Crossings North
4:00 PM					0	3	0	9	0	0	106	1	0	1	171	0	291	1,340		0	0	0
4:15 PM					0	6	0	8	0	0	128	0	0	9	207	0	358	1,408		0	0	0
4:30 PM					0	4	0	3	0	0	120	2	0	7	209	0	345	1,381		0	0	0
4:45 PM					0	4	0	6	0	0	98	0	0	6	232	0	346	1,398		0	0	0
5:00 PM					0	4	0	5	0	0	129	2	0	11	208	0	359	1,380		0	0	0
5:15 PM					0	4	0	8	0	0	121	1	0	12	185	0	331			0	0	0
5:30 PM					0	3	0	10	0	0	131	0	0	14	204	0	362			0	0	0
5:45 PM					0	4	0	6	0	0	109	1	0	10	198	0	328			0	0	0
Count Total					0	32	0	55	0	0	942	7	0	70	1,614	0	2,720			0	0	0
Peak Hour					0	18	0	22	0	0	475	4	0	33	856	0	1,408			0	0	0

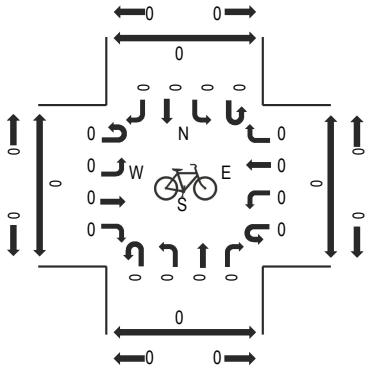
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 3 HILLTOP RD & ALPINE DR AM
Date: Wednesday, September 25, 2024
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:00 AM - 07:15 AM

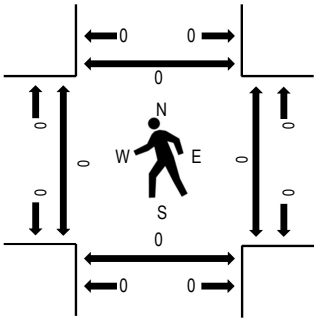
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ALPINE DR Eastbound				ALPINE DR Westbound				HILLTOP RD Northbound				HILLTOP RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	5	0	0	0	0	0	0	0	1	269	0	0	0	68	1	344	1,272	0	0	0	0
7:15 AM	0	2	0	1	0	0	0	0	0	1	201	0	0	0	105	1	311	1,215	0	0	0	0
7:30 AM	0	9	0	0	0	0	0	0	0	0	191	0	0	0	93	2	295	1,195	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	232	0	0	0	87	3	322	1,182	0	0	0	0
8:00 AM	0	3	0	0	0	0	0	0	0	0	201	0	0	0	82	1	287	1,104	0	0	0	0
8:15 AM	0	5	0	1	0	0	0	0	0	0	191	0	0	0	92	2	291		0	0	0	0
8:30 AM	0	2	0	0	0	0	0	0	0	0	193	0	0	0	87	0	282		0	0	0	0
8:45 AM	0	1	0	0	0	0	0	0	0	0	139	0	0	0	104	0	244		0	0	0	0
Count Total	0	27	0	2	0	0	0	0	0	2	1,617	0	0	0	718	10	2,376		0	0	0	0
Peak Hour	0	16	0	1	0	0	0	0	0	2	893	0	0	0	353	7	1,272		0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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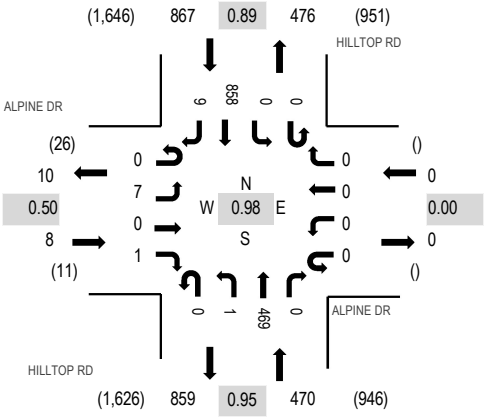
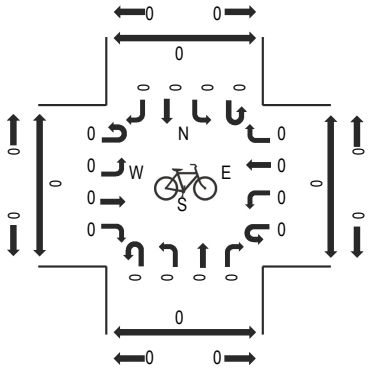
Location: 3 HILLTOP RD & ALPINE DR PM
Date: Wednesday, September 25, 2024
Peak Hour: 04:15 PM - 05:15 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

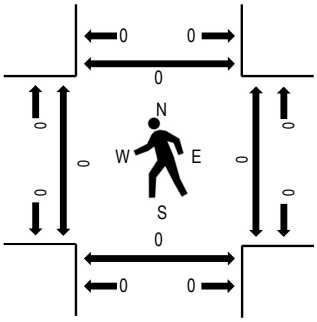
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ALPINE DR Eastbound				ALPINE DR Westbound				HILLTOP RD Northbound				HILLTOP RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	0	1	0	0	0	0	0	0	109	0	0	0	173	2	285	1,293	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	130	0	0	0	209	3	342	1,345	0	0	0	0
4:30 PM	0	3	0	0	0	0	0	0	0	0	114	0	0	0	206	1	324	1,321	0	0	0	0
4:45 PM	0	3	0	1	0	0	0	0	0	0	95	0	0	0	242	1	342	1,333	0	0	0	0
5:00 PM	0	1	0	0	0	0	0	0	0	1	130	0	0	0	201	4	337	1,310	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	1	0	123	0	0	0	190	4	318		0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	2	129	0	0	0	199	6	336		0	0	0	0
5:45 PM	0	2	0	0	0	0	0	0	0	0	112	0	0	0	203	2	319		0	0	0	0
Count Total	0	9	0	2	0	0	0	0	1	3	942	0	0	0	1,623	23	2,603		0	0	0	0
Peak Hour	0	7	0	1	0	0	0	0	0	1	469	0	0	0	858	9	1,345		0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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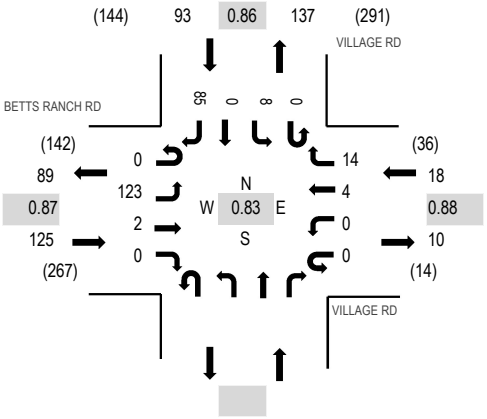
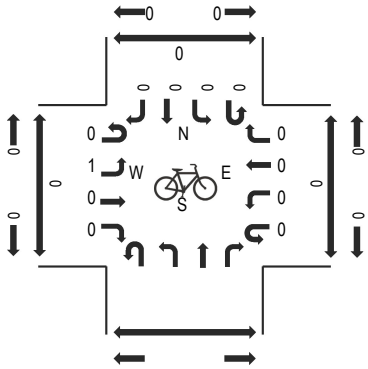
Location: 4 VILLAGE RD & VILLAGE RD AM
Date: Wednesday, September 25, 2024
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

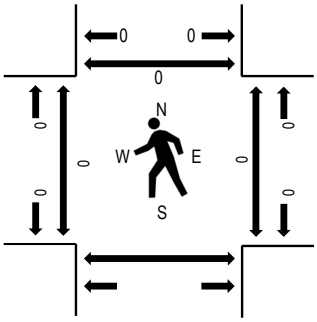
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BETTS RANCH RD Eastbound				VILLAGE RD Westbound				Northbound				VILLAGE RD Southbound				Total	Rolling Hour	Pedestrian Crossings		
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	41	0	0	0	0	1	0					0	1	0	5	48	211	0	0	0
7:15 AM	0	26	0	0	0	0	2	4					0	2	0	14	48	224	0	0	0
7:30 AM	0	35	1	0	0	0	1	5					0	0	0	14	56	231	0	0	0
7:45 AM	0	39	0	0	0	0	1	4					0	0	0	15	59	224	0	0	0
8:00 AM	0	34	0	0	0	0	1	3					0	0	0	23	61	236	0	0	0
8:15 AM	0	30	1	0	0	0	0	1					0	3	0	20	55		0	0	0
8:30 AM	0	22	0	0	0	0	1	6					0	2	0	18	49		0	0	0
8:45 AM	0	37	1	0	0	0	2	4					0	3	0	24	71		0	0	0
Count Total	0	264	3	0	0	0	9	27					0	11	0	133	447		0	0	0
Peak Hour	0	123	2	0	0	0	4	14					0	8	0	85	236		0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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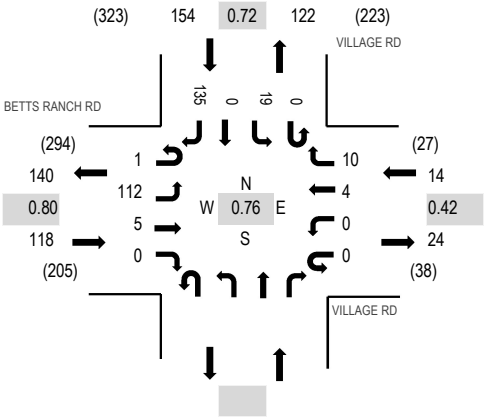
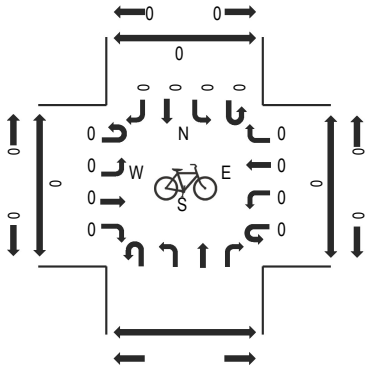
Location: 4 VILLAGE RD & VILLAGE RD PM
Date: Wednesday, September 25, 2024
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:15 PM - 04:30 PM

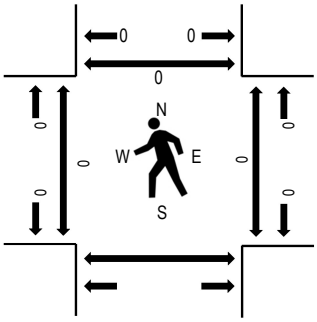
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	BETTS RANCH RD Eastbound				VILLAGE RD Westbound				Northbound				VILLAGE RD Southbound				Total	Rolling Hour	Pedestrian Crossings		
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	35	1	0	0	0	1	0					0	4	0	27	68	286	0	0		0
4:15 PM	1	35	1	0	0	0	1	3					0	9	0	44	94	272	0	0		0
4:30 PM	0	18	1	0	0	0	2	3					0	5	0	36	65	240	0	0		0
4:45 PM	0	24	2	0	0	0	0	4					0	1	0	28	59	247	0	0		0
5:00 PM	0	21	0	0	0	0	0	2					0	2	0	29	54	269	0	0		0
5:15 PM	0	25	0	0	0	0	0	0					0	0	0	37	62		0	0		0
5:30 PM	0	21	0	0	0	0	0	9					0	4	0	38	72		0	0		0
5:45 PM	0	20	0	0	0	0	0	2					1	8	0	50	81		0	0		0
Count Total	1	199	5	0	0	0	4	23					1	33	0	289	555		0	0		0
Peak Hour	1	112	5	0	0	0	4	10					0	19	0	135	286		0	0		0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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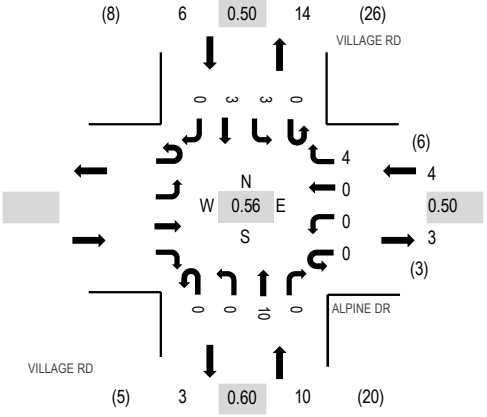
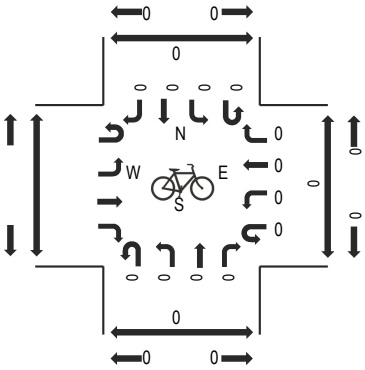
Location: 5 VILLAGE RD & ALPINE DR AM
Date: Wednesday, September 25, 2024
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

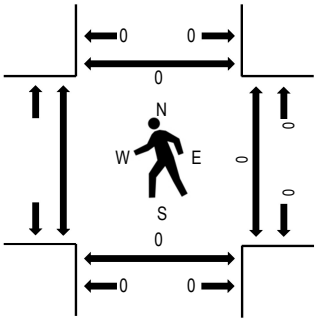
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

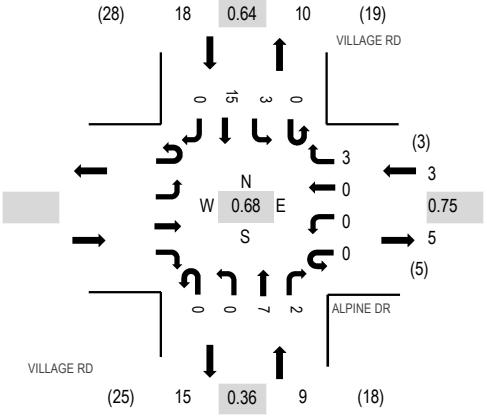
Traffic Counts - Motorized Vehicles

Interval Start Time	Eastbound				ALPINE DR Westbound				VILLAGE RD Northbound				VILLAGE RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM					0	0	0	0	0	0	0	0	0	0	0	0	0	14		0	0	0
7:15 AM					0	0	0	0	0	0	5	0	0	0	1	0	6	16		0	0	0
7:30 AM					0	0	0	2	0	0	2	0	0	0	0	0	4	14		0	0	0
7:45 AM					0	0	0	0	0	0	3	0	0	0	1	0	4	15		0	0	0
8:00 AM					0	0	0	0	0	0	2	0	0	0	0	0	2	20		0	0	0
8:15 AM					0	0	0	1	0	0	1	0	0	0	2	0	4			0	0	0
8:30 AM					0	0	0	2	0	0	2	0	0	0	1	0	5			0	0	0
8:45 AM					0	0	0	1	0	0	5	0	0	3	0	0	9			0	0	0
Count Total					0	0	0	6	0	0	20	0	0	3	5	0	34			0	0	0
Peak Hour					0	0	0	4	0	0	10	0	0	3	3	0	20			0	0	0

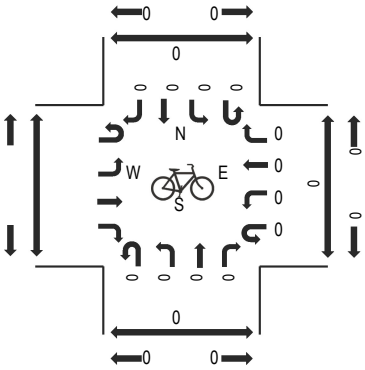
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 5 VILLAGE RD & ALPINE DR PM
Date: Wednesday, September 25, 2024
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:30 PM - 04:45 PM

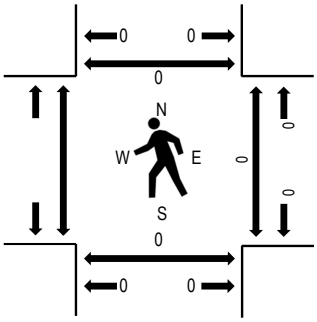
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	Eastbound				ALPINE DR Westbound				VILLAGE RD Northbound				VILLAGE RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM					0	0	0	0	0	0	1	1	0	1	2	0	5	30		0	0	0
4:15 PM					0	0	0	1	0	0	1	1	0	1	6	0	10	27		0	0	0
4:30 PM					0	0	0	1	0	0	3	0	0	1	6	0	11	18		0	0	0
4:45 PM					0	0	0	1	0	0	2	0	0	0	1	0	4	16		0	0	0
5:00 PM					0	0	0	0	0	0	0	0	0	0	2	0	2	19		0	0	0
5:15 PM					0	0	0	0	0	0	1	0	0	0	0	0	1			0	0	0
5:30 PM					0	0	0	0	0	0	7	0	0	0	2	0	9			0	0	0
5:45 PM					0	0	0	0	0	0	1	0	0	0	6	0	7			0	0	0
Count Total					0	0	0	3	0	0	16	2	0	3	25	0	49			0	0	0
Peak Hour					0	0	0	3	0	0	7	2	0	3	15	0	30			0	0	0

All Traffic Data Services
12200 W 52nd Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

Site Code: 6
Station ID: 6
HILLTOP RD N.O. MERRYVALE TRL

Start Time	25-Sep-24 Wed	NB	SB							Total
12:00 AM		5	23							28
01:00		4	8							12
02:00		9	3							12
03:00		21	4							25
04:00		107	9							116
05:00		295	31							326
06:00		707	160							867
07:00		**951**	**386**							**1337**
08:00		746	380							1126
09:00		527	349							876
10:00		494	356							850
11:00		469	383							852
12:00 PM		442	442							884
01:00		476	454							930
02:00		494	492							986
03:00		**520**	705							1225
04:00		478	**842**							1320
05:00		519	842							**1361**
06:00		384	689							1073
07:00		232	478							710
08:00		130	362							492
09:00		53	192							245
10:00		33	118							151
11:00		10	56							66
Total		8106	7764							15870
Percent		51.1%	48.9%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	951	386	-	-	-	-	-	-	1337
PM Peak	-	15:00	16:00	-	-	-	-	-	-	17:00
Vol.	-	520	842	-	-	-	-	-	-	1361
Grand Total		8106	7764							15870
Percent		51.1%	48.9%							
ADT		ADT 15,870		AADT 15,870						

All Traffic Data Services
12200 W 52nd Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

Site Code: 7
Station ID: 7
ALPINE DR W.O. HILLTOP RD

Start Time	25-Sep-24 Wed	EB	WB							Total
12:00 AM		0	0							0
01:00		0	0							0
02:00		0	0							0
03:00		1	0							1
04:00		1	0							1
05:00		1	1							2
06:00		6	2							8
07:00		**17**	9							26
08:00		12	3							15
09:00		9	**20**							**29**
10:00		12	11							23
11:00		10	11							21
12:00 PM		**17**	8							**25**
01:00		11	11							22
02:00		10	9							19
03:00		8	5							13
04:00		8	7							15
05:00		3	**19**							22
06:00		11	11							22
07:00		9	9							18
08:00		2	8							10
09:00		0	4							4
10:00		1	5							6
11:00		1	0							1
Total		150	153							303
Percent		49.5%	50.5%							
AM Peak	-	07:00	09:00	-	-	-	-	-	-	09:00
Vol.	-	17	20	-	-	-	-	-	-	29
PM Peak	-	12:00	17:00	-	-	-	-	-	-	12:00
Vol.	-	17	19	-	-	-	-	-	-	25
Grand Total		150	153							303
Percent		49.5%	50.5%							
ADT		ADT 303		AADT 303						

All Traffic Data Services
12200 W 52nd Ave
Wheat Ridge, CO 80033
www.alltrafficdata.net

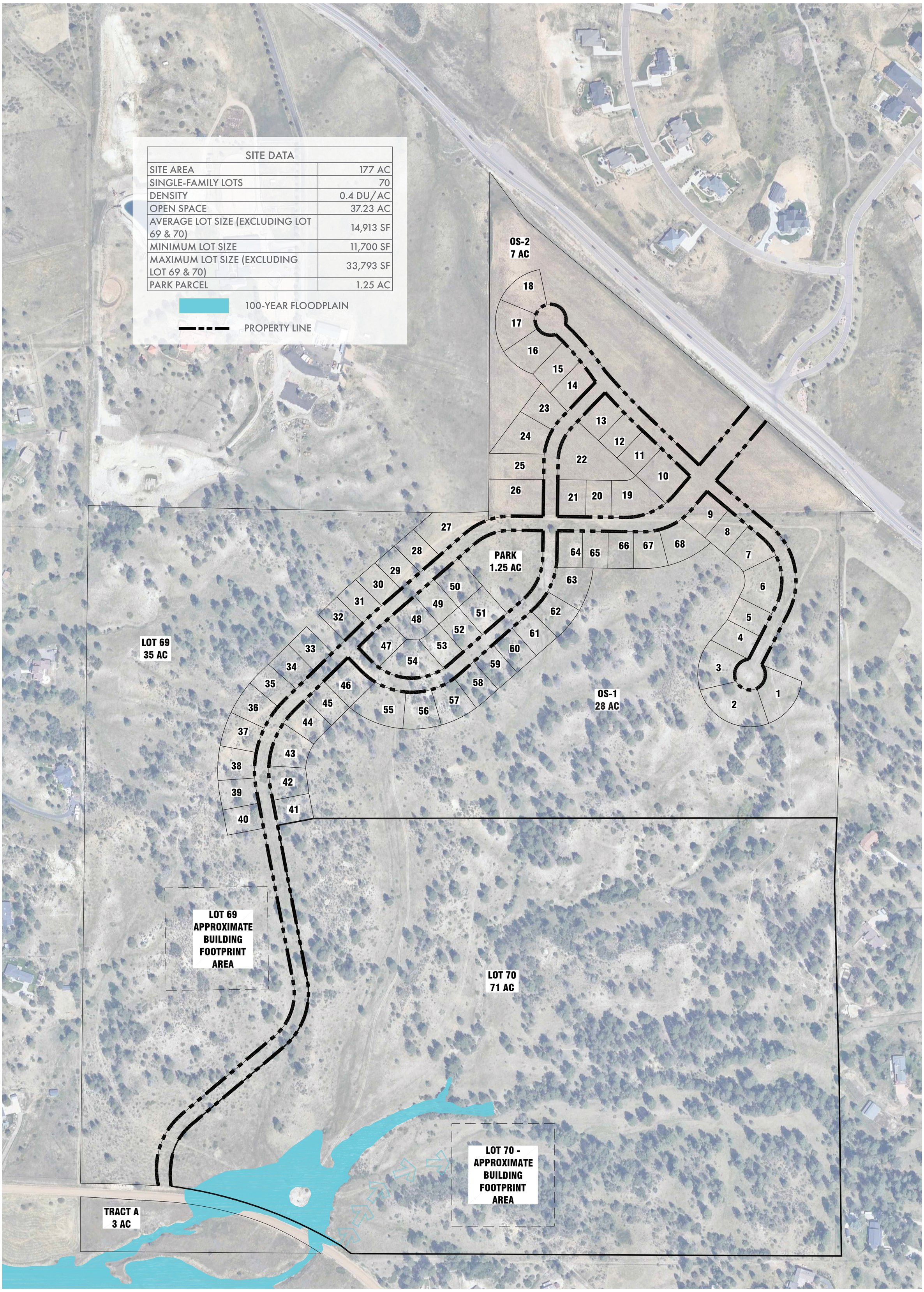
Site Code: 8
Station ID: 8
VILLAGE RD W.O. HILLTOP RD

Start Time	25-Sep-24 Wed	EB	WB							Total
12:00 AM		2	8							10
01:00		2	1							3
02:00		0	1							1
03:00		5	0							5
04:00		9	2							11
05:00		40	2							42
06:00		98	22							120
07:00		**153**	50							203
08:00		142	92							**234**
09:00		112	**99**							211
10:00		98	88							186
11:00		110	93							203
12:00 PM		97	101							198
01:00		108	114							222
02:00		119	126							245
03:00		120	147							267
04:00		**124**	157							**281**
05:00		98	**172**							270
06:00		89	153							242
07:00		51	132							183
08:00		25	75							100
09:00		12	51							63
10:00		4	25							29
11:00		2	10							12
Total		1620	1721							3341
Percent		48.5%	51.5%							
AM Peak	-	07:00	09:00	-	-	-	-	-	-	08:00
Vol.	-	153	99	-	-	-	-	-	-	234
PM Peak	-	16:00	17:00	-	-	-	-	-	-	16:00
Vol.	-	124	172	-	-	-	-	-	-	281
Grand Total		1620	1721							3341
Percent		48.5%	51.5%							
ADT		ADT 3,341		AADT 3,341						

Transportation Impact Study
Base Assumptions

Project Information			
Project Name	Hilltop 177		
Location	Douglas County, Colorado		
Study Area Boundaries	Hilltop Road from Village Road to Alpine Drive,		
	Village Road from Hilltop Road to Alpine Drive, and		
	Alpine Drive from Village Road to Hilltop Road		
Study Area Intersections	Hilltop Road / Village Road, Hilltop Road / Merryvale Trail		
	Hilltop Road / Alpine Drive, Village Road / Betts Ranch Road		
	Village Road / Alpine Drive		
	And includes proposed site accesses		
Study Assumptions			
Type of Study	Traffic Impact Study		
Trip Generation Rate Reference	ITE 11th Edition		
Study Years	Short Term: 2026	Long Term: 2044	
Peak Hour Time Period	AM: 7:00 – 9:00	PM: 4:00 – 6:00	Weekend: N/A
Overall Trip Distribution	See Attached Sketch		
Future Traffic Growth Rate	2%		
Trip Adjustment Factors	Pass-by: None Proposed	Internal Capture Rate: None Proposed	
Mode Split Assumption	None		
Committed Roadway Improvements	Expansion of Hilltop Road to four lanes to just east of Alpine Drive.		
Areas Requiring Special Study	None		
Other Traffic Studies	Fields Traffic Impact Study, Felsberg Holt, and Ullevig, November 2021.		

Date: September 17, 2024
Traffic Engineer: SM Rocha, LLC
Jurisdiction Engineer: _____



SITE DATA	
SITE AREA	177 AC
SINGLE-FAMILY LOTS	70
DENSITY	0.4 DU/AC
OPEN SPACE	37.23 AC
AVERAGE LOT SIZE (EXCLUDING LOT 69 & 70)	14,913 SF
MINIMUM LOT SIZE	11,700 SF
MAXIMUM LOT SIZE (EXCLUDING LOT 69 & 70)	33,793 SF
PARK PARCEL	1.25 AC

MILLER UNITED
REAL ESTATE

Hilltop 177 | Douglas County, CO

THIS PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE.

NORTH

0' 75' 150' 300'
SCALE

NORRIS DESIGN
PEOPLE + PLACEMAKING

ITE CODE	LAND USE	UNIT	TRIP GENERATION RATES						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Detached Housing	DU	9.43	0.18	0.53	0.70	0.59	0.35	0.94

Key: DU = Dwelling Units.
Note: All data and calculations above are subject to being rounded to nearest value.

ITE CODE	LAND USE	SIZE	TOTAL TRIPS GENERATED						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Detached Housing	70 DU	660	12	37	49	41	24	66
		Total:	*660*	*12*	*37*	*49*	*41*	*24*	*66*

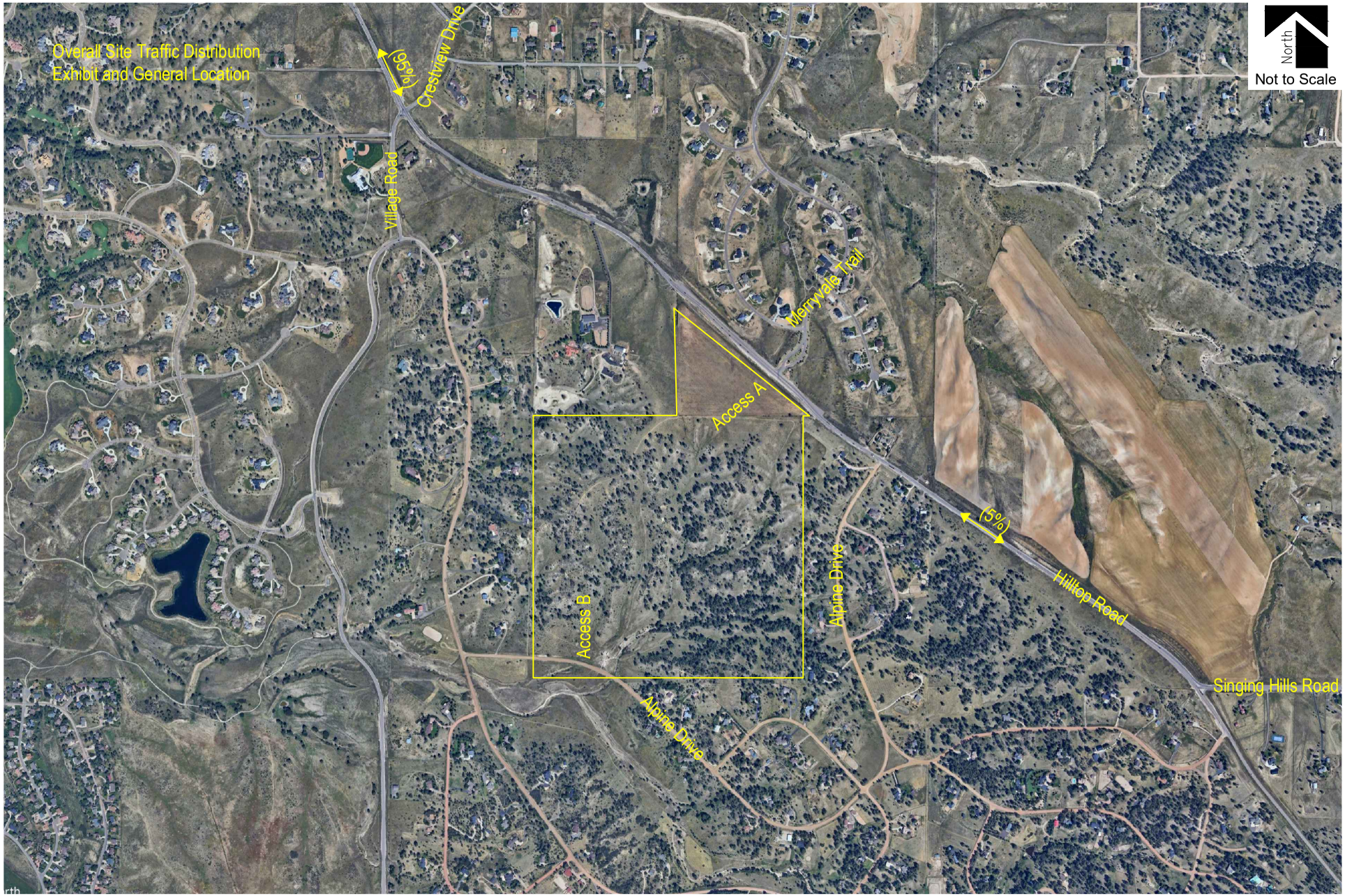
Key: DU = Dwelling Units.
Note: All data and calculations above are subject to being rounded to nearest value.

HILLTOP 177
Base Assumption

SM ROCHA, LLC
Traffic and Transportation Consultants

Figure 1
STUDY AREA INTERSECTIONS

September 2024
Page 4



HILLTOP 177
Base Assumption

SM ROCHA, LLC
Traffic and Transportation Consultants

Figure 2
OVERALL TRIP DISTRIBUTION

September 2024
Page 5

APPENDIX B

Level of Service Definitions

The following information is referenced from the Highway Capacity Manual: A Guide for Multimodal Mobility Analysis, 7th Edition, Transportation Research Board, 2022: Chapter 19 – Signalized Intersections.

Motorized Vehicle Level of Service (LOS) for Signalized Intersections

Levels of service are defined to represent reasonable ranges in control delay.

LOS A Describes operations with a control delay of 10 s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B Describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C Describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D Describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E Describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F Describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio[a]	
	$v/c \leq 1.0$	$v/c > 1.0$
≤ 10	A	F
> 10 – 20	B	F
> 20 – 35	C	F
> 35 – 55	D	F
> 55 – 80	E	F
> 80	F	F

Note: [a] For approach-based and intersectionwide assessments, LOS is defined solely by control delay.

The following information is referenced from the Highway Capacity Manual: A Guide for Multimodal Mobility Analysis, 7th Edition, Transportation Research Board, 2022: Chapter 20 – Two-Way Stop-Controlled Intersections, Chapter 21 – All-Way Stop-Controlled Intersections, and Chapter 22 - Roundabouts.

Motorized Vehicle Level of Service (LOS) for Unsignalized & Roundabout Intersections

LOS is a quantitative stratification of performance measure(s) representing quality of service. Quality of service describes how well a transportation facility or service operates from a traveler's perspective. LOS is measured on an A – F scale, with LOS A representing the best operating conditions from a traveler's perspective.

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio[a]	
	$v/c \leq 1.0$	$v/c > 1.0$
0 – 10	A	F
> 10 – 15	B	F
> 15 – 25	C	F
> 25 – 35	D	F
> 35 – 50	E	F
> 50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

[a] For approaches and intersectionwide assessment, LOS is defined solely by control delay.

APPENDIX C

Capacity Worksheets

Intersection	
Int Delay, s/veh	48.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	11	377	37	12	947	0	146	0	7	2	1	26
Future Vol, veh/h	11	377	37	12	947	0	146	0	7	2	1	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	100	-	200	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	410	40	13	1029	0	159	0	8	2	1	28

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1029	0	0	450	0	0	1490	1489	410	1489	1529	1029
Stage 1	-	-	-	-	-	-	434	434	-	1055	1055	-
Stage 2	-	-	-	-	-	-	1056	1055	-	434	474	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	675	-	-	1110	-	-	~ 102	124	642	102	117	284
Stage 1	-	-	-	-	-	-	601	581	-	273	302	-
Stage 2	-	-	-	-	-	-	272	302	-	601	558	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	675	-	-	1110	-	-	~ 87	118	642	96	112	284
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 87	118	-	96	112	-
Stage 1	-	-	-	-	-	-	590	571	-	265	294	-
Stage 2	-	-	-	-	-	-	238	294	-	583	548	-

Approach	SE	NW	NE	SW
HCM Control Delay, s/v	0.27	0.1	$ 488.55	22.33
HCM LOS			F	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	91	23	-	-	675	-	-	239
HCM Lane V/C Ratio	1.825	0.012	-	-	0.018	-	-	0.132
HCM Control Delay (s/veh)	$ 488.5	8.3	0	-	10.4	-	-	22.3
HCM Lane LOS	F	A	A	-	B	-	-	C
HCM 95th %tile Q(veh)	13.9	0	-	-	0.1	-	-	0.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	2

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	41	345	878	18	14	73
Future Vol, veh/h	41	345	878	18	14	73
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	315	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	375	954	20	15	79

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	974	0	-	0	1428	964
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	464	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	708	-	-	-	149	310
Stage 1	-	-	-	-	370	-
Stage 2	-	-	-	-	633	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	708	-	-	-	139	310
Mov Cap-2 Maneuver	-	-	-	-	139	-
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	633	-

Approach	SE	NW	SW
HCM Control Delay, s/v	1.11	0	26.72
HCM LOS			D

Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1
Capacity (veh/h)	-	-	708	- 259
HCM Lane V/C Ratio	-	-	0.063	- 0.366
HCM Control Delay (s/veh)	-	-	10.4	- 26.7
HCM Lane LOS	-	-	B	- D
HCM 95th %tile Q(veh)	-	-	0.2	- 1.6

Intersection	
Int Delay, s/veh	0.4

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	353	7	2	893	16	1
Future Vol, veh/h	353	7	2	893	16	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	384	8	2	971	17	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	391	0	1362	387
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	975	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1167	-	163	661
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	366	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1167	-	162	661
Mov Cap-2 Maneuver	-	-	-	-	162	-
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	364	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.02	28.76
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	170	4	-	-	-
HCM Lane V/C Ratio	0.109	0.002	-	-	-
HCM Control Delay (s/veh)	28.8	8.1	0	-	-
HCM Lane LOS	D	A	A	-	-
HCM 95th %tile Q(veh)	0.4	0	-	-	-

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	123	2	4	14	8	85
Future Vol, veh/h	123	2	4	14	8	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	134	2	4	15	9	92
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	8.2	6.9	7.2
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	98%	0%	9%
Vol Thru, %	2%	22%	0%
Vol Right, %	0%	78%	91%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	125	18	93
LT Vol	123	0	8
Through Vol	2	4	0
RT Vol	0	14	85
Lane Flow Rate	136	20	101
Geometry Grp	1	1	1
Degree of Util (X)	0.163	0.02	0.103
Departure Headway (Hd)	4.324	3.749	3.67
Convergence, Y/N	Yes	Yes	Yes
Cap	829	945	959
Service Time	2.352	1.812	1.757
HCM Lane V/C Ratio	0.164	0.021	0.105
HCM Control Delay, s/veh	8.2	6.9	7.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.1	0.3

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	10	0	3	3
Future Vol, veh/h	0	4	10	0	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	11	0	3	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	21	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	10	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	996	1070	-	-	1608	-
Stage 1	1012	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	994	1070	-	-	1608	-
Mov Cap-2 Maneuver	994	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1011	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.38	0	3.62
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1070	900	-
HCM Lane V/C Ratio	-	-	0.004	0.002	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	16.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	20	868	158	1	488	5	102	0	9	1	0	25
Future Vol, veh/h	20	868	158	1	488	5	102	0	9	1	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	100	-	200	-	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	943	172	1	530	5	111	0	10	1	0	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	536	0	0	1115	0	0	1520	1525	943	1520	1691	530
Stage 1	-	-	-	-	-	-	987	987	-	533	533	-
Stage 2	-	-	-	-	-	-	533	538	-	987	1159	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1032	-	-	626	-	-	~ 97	118	318	97	93	549
Stage 1	-	-	-	-	-	-	298	325	-	531	525	-
Stage 2	-	-	-	-	-	-	531	522	-	298	270	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1032	-	-	626	-	-	~ 90	115	318	92	91	549
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 90	115	-	92	91	-
Stage 1	-	-	-	-	-	-	292	319	-	529	524	-
Stage 2	-	-	-	-	-	-	503	521	-	283	264	-

Approach	SE	NW	NE	SW
HCM Control Delay, s/v	0.16	0.02	244.15	13.32
HCM LOS			F	B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	98	4	-	-	1032	-	-	461
HCM Lane V/C Ratio	1.228	0.002	-	-	0.021	-	-	0.061
HCM Control Delay (s/veh)	244.1	10.8	0	-	8.6	-	-	13.3
HCM Lane LOS	F	B	A	-	A	-	-	B
HCM 95th %tile Q(veh)	8.3	0	-	-	0.1	-	-	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	33	856	475	4	8	22
Future Vol, veh/h	33	856	475	4	8	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	315	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	930	516	4	9	24

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	521	0	-	0	1521	518
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	1002	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1046	-	-	-	131	557
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	355	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1046	-	-	-	126	557
Mov Cap-2 Maneuver	-	-	-	-	126	-
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	355	-

Approach	SE	NW	SW
HCM Control Delay, s/v	0.32	0	18.9
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1046	-	291
HCM Lane V/C Ratio	-	-	0.034	-	0.112
HCM Control Delay (s/veh)	-	-	8.6	-	18.9
HCM Lane LOS	-	-	A	-	C
HCM 95th %tile Q(veh)	-	-	0.1	-	0.4

Intersection	
Int Delay, s/veh	0.2

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	858	9	1	469	7	1
Future Vol, veh/h	858	9	1	469	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	933	10	1	510	8	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	942	0	1449	938
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	512	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	728	-	144	321
Stage 1	-	-	-	-	381	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	728	-	144	321
Mov Cap-2 Maneuver	-	-	-	-	144	-
Stage 1	-	-	-	-	381	-
Stage 2	-	-	-	-	600	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.02	29.66
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	155	4	-	-	-
HCM Lane V/C Ratio	0.056	0.001	-	-	-
HCM Control Delay (s/veh)	29.7	10	0	-	-
HCM Lane LOS	D	A	A	-	-
HCM 95th %tile Q(veh)	0.2	0	-	-	-

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	113	5	4	10	19	135
Future Vol, veh/h	113	5	4	10	19	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	123	5	4	11	21	147
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	8.3	7	7.5
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	96%	0%	12%
Vol Thru, %	4%	29%	0%
Vol Right, %	0%	71%	88%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	118	14	154
LT Vol	113	0	19
Through Vol	5	4	0
RT Vol	0	10	135
Lane Flow Rate	128	15	167
Geometry Grp	1	1	1
Degree of Util (X)	0.158	0.016	0.171
Departure Headway (Hd)	4.433	3.9	3.681
Convergence, Y/N	Yes	Yes	Yes
Cap	805	904	957
Service Time	2.478	1.984	1.77
HCM Lane V/C Ratio	0.159	0.017	0.175
HCM Control Delay, s/veh	8.3	7	7.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0	0.6

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	7	2	3	15
Future Vol, veh/h	0	3	7	2	3	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	8	2	3	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	32	9	0	0	10	0
Stage 1	9	-	-	-	-	-
Stage 2	23	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	982	1073	-	-	1610	-
Stage 1	1014	-	-	-	-	-
Stage 2	1000	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	980	1073	-	-	1610	-
Mov Cap-2 Maneuver	980	-	-	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	998	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.36	0	1.21
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1073	300	-
HCM Lane V/C Ratio	-	-	0.003	0.002	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	SE	NW	NE	SW
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	525	1199	184	31
Demand Flow Rate, veh/h	535	1223	188	32
Vehicles Circulating, veh/h	17	190	491	1401
Vehicles Exiting, veh/h	1417	488	61	12
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.3	9.1	5.9	9.7
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.469	0.531	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
A (Intercept)	1350	1420	1350	1420	1420	1420
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	8.501e-4	8.501e-4
Entry Flow, veh/h	251	284	575	648	188	32
Cap Entry Lane, veh/h	1329	1400	1133	1208	935	432
Entry HV Adj Factor	0.982	0.979	0.980	0.981	0.979	0.968
Flow Entry, veh/h	247	278	564	636	184	31
Cap Entry, veh/h	1306	1370	1111	1185	916	418
V/C Ratio	0.189	0.203	0.507	0.536	0.201	0.074
Control Delay, s/veh	4.3	4.3	9.1	9.2	5.9	9.7
LOS	A	A	A	A	A	A
95th %tile Queue, veh	1	1	3	3	1	0

Intersection	
Int Delay, s/veh	1.6

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	45	393	914	20	15	80
Future Vol, veh/h	45	393	914	20	15	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	315	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	427	993	22	16	87

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1015	0	-	0	1316	508
Stage 1	-	-	-	-	1004	-
Stage 2	-	-	-	-	311	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	679	-	-	-	149	510
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	716	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	679	-	-	-	138	510
Mov Cap-2 Maneuver	-	-	-	-	138	-
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	716	-

Approach	SE	NW	SW
HCM Control Delay, s/v	1.1	0	19.06
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1	
Capacity (veh/h)	-	-	679	-	358
HCM Lane V/C Ratio	-	-	0.072	-	0.288
HCM Control Delay (s/veh)	-	-	10.7	-	19.1
HCM Lane LOS	-	-	B	-	C
HCM 95th %tile Q(veh)	-	-	0.2	-	1.2

Intersection	
Int Delay, s/veh	0.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	404	7	2	1030	16	1
Future Vol, veh/h	404	7	2	1030	16	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	439	8	2	1120	17	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	447	0	1563	439
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	1124	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1114	-	123	618
Stage 1	-	-	-	-	650	-
Stage 2	-	-	-	-	310	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1114	-	122	618
Mov Cap-2 Maneuver	-	-	-	-	122	-
Stage 1	-	-	-	-	650	-
Stage 2	-	-	-	-	309	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.02	37.71
HCM LOS			E

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	128	3	-	-	-
HCM Lane V/C Ratio	0.144	0.002	-	-	-
HCM Control Delay (s/veh)	37.7	8.2	0	-	-
HCM Lane LOS	E	A	A	-	-
HCM 95th %tile Q(veh)	0.5	0	-	-	-

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	135	2	4	14	8	94
Future Vol, veh/h	135	2	4	14	8	94
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	147	2	4	15	9	102
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	8.3	6.9	7.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	99%	0%	8%
Vol Thru, %	1%	22%	0%
Vol Right, %	0%	78%	92%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	137	18	102
LT Vol	135	0	8
Through Vol	2	4	0
RT Vol	0	14	94
Lane Flow Rate	149	20	111
Geometry Grp	1	1	1
Degree of Util (X)	0.18	0.021	0.117
Departure Headway (Hd)	4.342	3.777	3.785
Convergence, Y/N	Yes	Yes	Yes
Cap	823	934	952
Service Time	2.381	1.855	1.785
HCM Lane V/C Ratio	0.181	0.021	0.117
HCM Control Delay, s/veh	8.3	6.9	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.7	0.1	0.4

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	10	0	3	3
Future Vol, veh/h	0	4	10	0	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	11	0	3	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	21	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	10	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	996	1070	-	-	1608	-
Stage 1	1012	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	994	1070	-	-	1608	-
Mov Cap-2 Maneuver	994	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1011	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.38	0	3.62
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1070	900	-
HCM Lane V/C Ratio	-	-	0.004	0.002	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	SE	NW	NE	SW
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	1406	623	133	28
Demand Flow Rate, veh/h	1434	635	135	29
Vehicles Circulating, veh/h	2	146	1242	754
Vehicles Exiting, veh/h	781	1231	194	27
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.1	5.4	11.5	5.4
Approach LOS	A	A	B	A

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.470	0.530	0.469	0.531	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
A (Intercept)	1350	1420	1350	1420	1420	1420
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	8.501e-4	8.501e-4
Entry Flow, veh/h	674	760	298	337	135	29
Cap Entry Lane, veh/h	1347	1418	1180	1254	494	748
Entry HV Adj Factor	0.981	0.981	0.982	0.979	0.985	0.966
Flow Entry, veh/h	661	745	293	330	133	28
Cap Entry, veh/h	1321	1390	1159	1228	487	722
V/C Ratio	0.500	0.536	0.253	0.269	0.273	0.039
Control Delay, s/veh	7.9	8.2	5.4	5.3	11.5	5.4
LOS	A	A	A	A	B	A
95th %tile Queue, veh	3	3	1	1	1	0

Intersection	
Int Delay, s/veh	0.5

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	36	996	554	4	9	24
Future Vol, veh/h	36	996	554	4	9	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	315	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	1083	602	4	10	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	607	0	-	0	1224	303
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	968	-	-	-	171	693
Stage 1	-	-	-	-	508	-
Stage 2	-	-	-	-	499	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	968	-	-	-	164	693
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	499	-

Approach	SE	NW	SW
HCM Control Delay, s/v	0.31	0	15.79
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	968	-	369
HCM Lane V/C Ratio	-	-	0.04	-	0.097
HCM Control Delay (s/veh)	-	-	8.9	-	15.8
HCM Lane LOS	-	-	A	-	C
HCM 95th %tile Q(veh)	-	-	0.1	-	0.3

Intersection	
Int Delay, s/veh	0.2

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	698	9	1	547	7	1
Future Vol, veh/h	698	9	1	547	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	759	10	1	595	8	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	768	0	1355	759
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	597	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	846	-	165	407
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	550	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	846	-	164	407
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	549	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.02	26.32
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	178	3	-	-	-
HCM Lane V/C Ratio	0.049	0.001	-	-	-
HCM Control Delay (s/veh)	26.3	9.3	0	-	-
HCM Lane LOS	D	A	A	-	-
HCM 95th %tile Q(veh)	0.2	0	-	-	-

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	124	5	4	10	19	149
Future Vol, veh/h	124	5	4	10	19	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	135	5	4	11	21	162
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	8.5	7.1	7.7
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	96%	0%	11%
Vol Thru, %	4%	29%	0%
Vol Right, %	0%	71%	89%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	129	14	168
LT Vol	124	0	19
Through Vol	5	4	0
RT Vol	0	10	149
Lane Flow Rate	140	15	183
Geometry Grp	1	1	1
Degree of Util (X)	0.174	0.017	0.192
Departure Headway (Hd)	4.459	4.041	3.794
Convergence, Y/N	Yes	Yes	Yes
Cap	798	891	951
Service Time	2.521	2.041	1.794
HCM Lane V/C Ratio	0.175	0.017	0.192
HCM Control Delay, s/veh	8.5	7.1	7.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.1	0.7

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	7	2	3	15
Future Vol, veh/h	0	3	7	2	3	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	8	2	3	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	32	9	0	0	10	0
Stage 1	9	-	-	-	-	-
Stage 2	23	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	982	1073	-	-	1610	-
Stage 1	1014	-	-	-	-	-
Stage 2	1000	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	980	1073	-	-	1610	-
Mov Cap-2 Maneuver	980	-	-	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	998	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.36	0	1.21
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1073	300	-
HCM Lane V/C Ratio	-	-	0.003	0.002	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Approach	SE	NW	NE	SW
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	706	1617	250	31
Demand Flow Rate, veh/h	720	1649	255	32
Vehicles Circulating, veh/h	23	255	660	1892
Vehicles Exiting, veh/h	1901	660	83	12
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.0	16.1	8.2	15.3
Approach LOS	A	C	A	C

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.469	0.531	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
A (Intercept)	1350	1420	1350	1420	1420	1420
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	8.501e-4	8.501e-4
Entry Flow, veh/h	338	382	775	874	255	32
Cap Entry Lane, veh/h	1322	1393	1068	1143	810	284
Entry HV Adj Factor	0.982	0.980	0.981	0.981	0.980	0.968
Flow Entry, veh/h	332	374	760	857	250	31
Cap Entry, veh/h	1298	1365	1047	1121	794	275
V/C Ratio	0.256	0.274	0.726	0.764	0.315	0.113
Control Delay, s/veh	5.0	5.0	15.6	16.6	8.2	15.3
LOS	A	A	C	C	A	C
95th %tile Queue, veh	1	1	7	8	1	0

Intersection	
Int Delay, s/veh	5.2

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	62	534	1365	27	21	110
Future Vol, veh/h	62	534	1365	27	21	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	315	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	67	580	1484	29	23	120

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1513	0	-	0	1923	757
Stage 1	-	-	-	-	1498	-
Stage 2	-	-	-	-	425	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	438	-	-	-	59	350
Stage 1	-	-	-	-	171	-
Stage 2	-	-	-	-	627	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	438	-	-	-	50	350
Mov Cap-2 Maneuver	-	-	-	-	50	-
Stage 1	-	-	-	-	145	-
Stage 2	-	-	-	-	627	-

Approach	SE	NW	SW
HCM Control Delay, s/v	1.53	0	76.86
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	438	-	178
HCM Lane V/C Ratio	-	-	0.154	-	0.801
HCM Control Delay (s/veh)	-	-	14.7	-	76.9
HCM Lane LOS	-	-	B	-	F
HCM 95th %tile Q(veh)	-	-	0.5	-	5.4

Intersection	
Int Delay, s/veh	0.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	546	7	2	1388	16	1
Future Vol, veh/h	546	7	2	1388	16	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	593	8	2	1509	17	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	601	0	1356	301
Stage 1	-	-	-	-	597	-
Stage 2	-	-	-	-	759	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	972	-	140	696
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	423	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	972	-	140	696
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	421	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.05	33.03
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	147	5	-	-	-
HCM Lane V/C Ratio	0.126	0.002	-	-	-
HCM Control Delay (s/veh)	33	8.7	0	-	-
HCM Lane LOS	D	A	A	-	-
HCM 95th %tile Q(veh)	0.4	0	-	-	-

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	170	2	4	14	8	128
Future Vol, veh/h	170	2	4	14	8	128
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	185	2	4	15	9	139
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	8.8	7.1	7.6
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	99%	0%	6%
Vol Thru, %	1%	22%	0%
Vol Right, %	0%	78%	94%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	172	18	136
LT Vol	170	0	8
Through Vol	2	4	0
RT Vol	0	14	128
Lane Flow Rate	187	20	148
Geometry Grp	1	1	1
Degree of Util (X)	0.229	0.022	0.159
Departure Headway (Hd)	4.406	3.972	3.864
Convergence, Y/N	Yes	Yes	Yes
Cap	810	904	933
Service Time	2.466	1.985	1.866
HCM Lane V/C Ratio	0.231	0.022	0.159
HCM Control Delay, s/veh	8.8	7.1	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.9	0.1	0.6

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	10	0	3	3
Future Vol, veh/h	0	4	10	0	3	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	11	0	3	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	21	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	10	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	996	1070	-	-	1608	-
Stage 1	1012	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	994	1070	-	-	1608	-
Mov Cap-2 Maneuver	994	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1011	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.38	0	3.62
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1070	900	-
HCM Lane V/C Ratio	-	-	0.004	0.002	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Approach	SE	NW	NE	SW
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	1754	836	181	28
Demand Flow Rate, veh/h	1788	853	184	29
Vehicles Circulating, veh/h	3	191	1526	1017
Vehicles Exiting, veh/h	1043	1519	265	27
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.7	6.7	20.0	6.8
Approach LOS	B	A	C	A

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.470	0.530	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
A (Intercept)	1350	1420	1350	1420	1420	1420
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	8.501e-4	8.501e-4
Entry Flow, veh/h	840	948	401	452	184	29
Cap Entry Lane, veh/h	1346	1417	1132	1207	388	598
Entry HV Adj Factor	0.981	0.980	0.980	0.981	0.984	0.966
Flow Entry, veh/h	824	929	393	443	181	28
Cap Entry, veh/h	1321	1389	1110	1184	382	578
V/C Ratio	0.624	0.669	0.354	0.374	0.474	0.048
Control Delay, s/veh	10.3	11.0	6.8	6.7	20.0	6.8
LOS	B	B	A	A	C	A
95th %tile Queue, veh	5	6	2	2	2	0

Intersection	
Int Delay, s/veh	0.6

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	50	1338	425	6	12	33
Future Vol, veh/h	50	1338	425	6	12	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	315	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	1454	462	7	13	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	468	0	-	0	1301	234
Stage 1	-	-	-	-	465	-
Stage 2	-	-	-	-	836	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1089	-	-	-	153	768
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	386	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1089	-	-	-	145	768
Mov Cap-2 Maneuver	-	-	-	-	145	-
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	386	-

Approach	SE	NW	SW
HCM Control Delay, s/v	0.31	0	16.65
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1089	-	358
HCM Lane V/C Ratio	-	-	0.05	-	0.137
HCM Control Delay (s/veh)	-	-	8.5	-	16.6
HCM Lane LOS	-	-	A	-	C
HCM 95th %tile Q(veh)	-	-	0.2	-	0.5

Intersection	
Int Delay, s/veh	0.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	1341	9	1	735	7	1
Future Vol, veh/h	1341	9	1	735	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1458	10	1	799	8	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1467	0	1864	734
Stage 1	-	-	-	-	1462	-
Stage 2	-	-	-	-	402	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	456	-	64	363
Stage 1	-	-	-	-	179	-
Stage 2	-	-	-	-	645	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	456	-	64	363
Mov Cap-2 Maneuver	-	-	-	-	64	-
Stage 1	-	-	-	-	179	-
Stage 2	-	-	-	-	643	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.06	62.15
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	72	5	-	-	-
HCM Lane V/C Ratio	0.122	0.002	-	-	-
HCM Control Delay (s/veh)	62.2	12.9	0	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	0.4	0	-	-	-

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	185	5	4	10	19	203
Future Vol, veh/h	185	5	4	10	19	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	201	5	4	11	21	221
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	9.4	7.4	8.4
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	97%	0%	9%
Vol Thru, %	3%	29%	0%
Vol Right, %	0%	71%	91%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	190	14	222
LT Vol	185	0	19
Through Vol	5	4	0
RT Vol	0	10	203
Lane Flow Rate	207	15	241
Geometry Grp	1	1	1
Degree of Util (X)	0.268	0.018	0.264
Departure Headway (Hd)	4.668	4.25	3.942
Convergence, Y/N	Yes	Yes	Yes
Cap	774	842	915
Service Time	2.668	2.276	1.956
HCM Lane V/C Ratio	0.267	0.018	0.263
HCM Control Delay, s/veh	9.4	7.4	8.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.1	0.1	1.1

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	3	7	2	3	15
Future Vol, veh/h	0	3	7	2	3	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	8	2	3	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	32	9	0	0	10	0
Stage 1	9	-	-	-	-	-
Stage 2	23	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	982	1073	-	-	1610	-
Stage 1	1014	-	-	-	-	-
Stage 2	1000	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	980	1073	-	-	1610	-
Mov Cap-2 Maneuver	980	-	-	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	998	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.36	0	1.21
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1073	300	-
HCM Lane V/C Ratio	-	-	0.003	0.002	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Approach	SE	NW	NE	SW
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	537	1234	134	31
Demand Flow Rate, veh/h	548	1258	137	32
Vehicles Circulating, veh/h	17	140	503	1386
Vehicles Exiting, veh/h	1401	500	62	12
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.4	8.7	5.4	9.5
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.471	0.529	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
A (Intercept)	1350	1420	1350	1420	1420	1420
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	8.501e-4	8.501e-4
Entry Flow, veh/h	258	290	591	667	137	32
Cap Entry Lane, veh/h	1329	1400	1187	1261	926	437
Entry HV Adj Factor	0.979	0.982	0.981	0.980	0.978	0.968
Flow Entry, veh/h	253	285	580	654	134	31
Cap Entry, veh/h	1301	1375	1164	1236	906	423
V/C Ratio	0.194	0.207	0.498	0.529	0.148	0.073
Control Delay, s/veh	4.4	4.3	8.6	8.8	5.4	9.5
LOS	A	A	A	A	A	A
95th %tile Queue, veh	1	1	3	3	1	0

Intersection	
Int Delay, s/veh	2.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	45	393	10	1	914	20	32	0	2	15	0	80
Future Vol, veh/h	45	393	10	1	914	20	32	0	2	15	0	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	315	-	-	150	-	-	150	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	427	11	1	993	22	35	0	2	16	0	87

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1015	0	0	438	0	0	1029	1548	219	1318	1542	508
Stage 1	-	-	-	-	-	-	530	530	-	1007	1007	-
Stage 2	-	-	-	-	-	-	499	1017	-	311	536	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	679	-	-	1118	-	-	188	113	785	115	114	510
Stage 1	-	-	-	-	-	-	500	525	-	258	317	-
Stage 2	-	-	-	-	-	-	522	313	-	674	522	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	679	-	-	1118	-	-	144	105	785	106	106	510
Mov Cap-2 Maneuver	-	-	-	-	-	-	144	105	-	106	106	-
Stage 1	-	-	-	-	-	-	464	487	-	258	317	-
Stage 2	-	-	-	-	-	-	433	313	-	623	484	-

Approach	SE	NW	NE	SW
HCM Control Delay, s/v	1.08	0.01	35.99	21.59
HCM LOS			E	C

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	144	785	1118	-	-	679	-	-	319
HCM Lane V/C Ratio	0.241	0.003	0.001	-	-	0.072	-	-	0.324
HCM Control Delay (s/veh)	37.6	9.6	8.2	-	-	10.7	-	-	21.6
HCM Lane LOS	E	A	A	-	-	B	-	-	C
HCM 95th %tile Q(veh)	0.9	0	0	-	-	0.2	-	-	1.4

Intersection	
Int Delay, s/veh	0.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	406	7	2	1031	16	1
Future Vol, veh/h	406	7	2	1031	16	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	441	8	2	1121	17	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	449	0	1566	441
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	1125	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1111	-	122	616
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	310	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1111	-	122	616
Mov Cap-2 Maneuver	-	-	-	-	122	-
Stage 1	-	-	-	-	648	-
Stage 2	-	-	-	-	308	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.02	37.88
HCM LOS			E

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	128	3	-	-	-
HCM Lane V/C Ratio	0.145	0.002	-	-	-
HCM Control Delay (s/veh)	37.9	8.2	0	-	-
HCM Lane LOS	E	A	A	-	-
HCM 95th %tile Q(veh)	0.5	0	-	-	-

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	135	2	4	17	9	94
Future Vol, veh/h	135	2	4	17	9	94
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	147	2	4	18	10	102
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	8.3	6.9	7.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	99%	0%	9%
Vol Thru, %	1%	19%	0%
Vol Right, %	0%	81%	91%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	137	21	103
LT Vol	135	0	9
Through Vol	2	4	0
RT Vol	0	17	94
Lane Flow Rate	149	23	112
Geometry Grp	1	1	1
Degree of Util (X)	0.18	0.024	0.118
Departure Headway (Hd)	4.346	3.76	3.798
Convergence, Y/N	Yes	Yes	Yes
Cap	823	938	949
Service Time	2.386	1.838	1.798
HCM Lane V/C Ratio	0.181	0.025	0.118
HCM Control Delay, s/veh	8.3	6.9	7.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.7	0.1	0.4

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	7	10	0	4	3
Future Vol, veh/h	0	7	10	0	4	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	8	11	0	4	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	23	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	12	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	993	1070	-	-	1608	-
Stage 1	1012	-	-	-	-	-
Stage 2	1011	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	991	1070	-	-	1608	-
Mov Cap-2 Maneuver	991	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1008	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.39	0	4.14
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1070	1029	-
HCM Lane V/C Ratio	-	-	0.007	0.003	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	3	4	0	0	3
Future Vol, veh/h	1	3	4	0	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	3	4	0	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	4	0	-	0	10	4
Stage 1	-	-	-	-	4	-
Stage 2	-	-	-	-	5	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1617	-	-	-	1010	1079
Stage 1	-	-	-	-	1019	-
Stage 2	-	-	-	-	1018	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1617	-	-	-	1010	1079
Mov Cap-2 Maneuver	-	-	-	-	1010	-
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	1018	-

Approach	EB	WB	SB
HCM Control Delay, s/v	1.81	0	8.35
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	450	-	-	-	1079
HCM Lane V/C Ratio	0.001	-	-	-	0.003
HCM Control Delay (s/veh)	7.2	0	-	-	8.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Approach	SE	NW	NE	SW
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	1448	645	136	28
Demand Flow Rate, veh/h	1477	658	139	29
Vehicles Circulating, veh/h	2	150	1281	781
Vehicles Exiting, veh/h	808	1270	198	27
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.3	5.5	12.3	5.5
Approach LOS	A	A	B	A

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.470	0.530	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
A (Intercept)	1350	1420	1350	1420	1420	1420
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	8.501e-4	8.501e-4
Entry Flow, veh/h	694	783	309	349	139	29
Cap Entry Lane, veh/h	1347	1418	1176	1250	478	731
Entry HV Adj Factor	0.981	0.980	0.981	0.980	0.978	0.966
Flow Entry, veh/h	681	768	303	342	136	28
Cap Entry, veh/h	1322	1390	1154	1225	468	706
V/C Ratio	0.515	0.552	0.263	0.279	0.291	0.040
Control Delay, s/veh	8.2	8.5	5.5	5.5	12.3	5.5
LOS	A	A	A	A	B	A
95th %tile Queue, veh	3	4	1	1	1	0

Intersection	
Int Delay, s/veh	1.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	36	996	35	2	554	4	20	0	1	9	0	24
Future Vol, veh/h	36	996	35	2	554	4	20	0	1	9	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	315	-	-	150	-	-	150	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	39	1083	38	2	602	4	22	0	1	10	0	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	607	0	0	1121	0	0	1485	1791	560	1228	1808	303
Stage 1	-	-	-	-	-	-	1180	1180	-	609	609	-
Stage 2	-	-	-	-	-	-	305	611	-	620	1199	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	968	-	-	619	-	-	86	80	471	134	78	693
Stage 1	-	-	-	-	-	-	202	262	-	449	484	-
Stage 2	-	-	-	-	-	-	679	483	-	442	257	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	968	-	-	619	-	-	80	77	471	128	75	693
Mov Cap-2 Maneuver	-	-	-	-	-	-	80	77	-	128	75	-
Stage 1	-	-	-	-	-	-	194	252	-	448	482	-
Stage 2	-	-	-	-	-	-	651	481	-	424	246	-

Approach	SE	NW	NE	SW
HCM Control Delay, s/v	0.3	0.04	63.94	17.92
HCM LOS			F	C

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	80	471	619	-	-	968	-	-	314
HCM Lane V/C Ratio	0.273	0.002	0.004	-	-	0.04	-	-	0.114
HCM Control Delay (s/veh)	66.5	12.7	10.8	-	-	8.9	-	-	17.9
HCM Lane LOS	F	B	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1	0	0	-	-	0.1	-	-	0.4

Intersection	
Int Delay, s/veh	0.2

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	699	9	1	549	7	1
Future Vol, veh/h	699	9	1	549	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	760	10	1	597	8	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	770	0	1359	760
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	599	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	845	-	164	406
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	845	-	164	406
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	548	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.02	26.42
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	177	3	-	-	-
HCM Lane V/C Ratio	0.049	0.001	-	-	-
HCM Control Delay (s/veh)	26.4	9.3	0	-	-
HCM Lane LOS	D	A	A	-	-
HCM 95th %tile Q(veh)	0.2	0	-	-	-

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	124	3	4	13	23	149
Future Vol, veh/h	124	3	4	13	23	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	135	3	4	14	25	162
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	8.5	7.1	7.8
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	98%	0%	13%
Vol Thru, %	2%	24%	0%
Vol Right, %	0%	76%	87%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	127	17	172
LT Vol	124	0	23
Through Vol	3	4	0
RT Vol	0	13	149
Lane Flow Rate	138	18	187
Geometry Grp	1	1	1
Degree of Util (X)	0.171	0.021	0.198
Departure Headway (Hd)	4.472	4.02	3.81
Convergence, Y/N	Yes	Yes	Yes
Cap	795	896	948
Service Time	2.54	2.02	1.812
HCM Lane V/C Ratio	0.174	0.02	0.197
HCM Control Delay, s/veh	8.5	7.1	7.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.1	0.7

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	6	7	2	7	15
Future Vol, veh/h	0	6	7	2	7	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	7	8	2	8	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	40	9	0	0	10	0
Stage 1	9	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	971	1073	-	-	1610	-
Stage 1	1014	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	967	1073	-	-	1610	-
Mov Cap-2 Maneuver	967	-	-	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	986	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.38	0	2.31
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1073	573	-
HCM Lane V/C Ratio	-	-	0.006	0.005	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	5	3	0	0	3
Future Vol, veh/h	4	5	3	0	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	5	3	0	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	3	0	-	0	17	3
Stage 1	-	-	-	-	3	-
Stage 2	-	-	-	-	14	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1619	-	-	-	1001	1081
Stage 1	-	-	-	-	1020	-
Stage 2	-	-	-	-	1009	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1619	-	-	-	998	1081
Mov Cap-2 Maneuver	-	-	-	-	998	-
Stage 1	-	-	-	-	1017	-
Stage 2	-	-	-	-	1009	-

Approach	EB	WB	SB
HCM Control Delay, s/v	3.21	0	8.34
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	800	-	-	-	1081
HCM Lane V/C Ratio	0.003	-	-	-	0.003
HCM Control Delay (s/veh)	7.2	0	-	-	8.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

Approach	SE	NW	NE	SW
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	717	1652	252	31
Demand Flow Rate, veh/h	731	1685	257	32
Vehicles Circulating, veh/h	23	257	670	1930
Vehicles Exiting, veh/h	1939	670	84	12
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.0	17.0	8.3	15.9
Approach LOS	A	C	A	C

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.471	0.529	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
A (Intercept)	1350	1420	1350	1420	1420	1420
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	8.501e-4	8.501e-4
Entry Flow, veh/h	344	387	792	893	257	32
Cap Entry Lane, veh/h	1322	1393	1066	1141	803	275
Entry HV Adj Factor	0.980	0.982	0.981	0.981	0.981	0.968
Flow Entry, veh/h	337	380	777	876	252	31
Cap Entry, veh/h	1295	1368	1045	1119	788	266
V/C Ratio	0.260	0.278	0.743	0.782	0.320	0.116
Control Delay, s/veh	5.1	5.0	16.4	17.6	8.3	15.9
LOS	A	A	C	C	A	C
95th %tile Queue, veh	1	1	7	8	1	0

Intersection	
Int Delay, s/veh	11.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	62	534	10	1	1365	27	32	0	2	21	0	110
Future Vol, veh/h	62	534	10	1	1365	27	32	0	2	21	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	315	-	-	150	-	-	150	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	67	580	11	1	1484	29	35	0	2	23	0	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1513	0	0	591	0	0	1465	2236	296	1926	2227	757
Stage 1	-	-	-	-	-	-	721	721	-	1501	1501	-
Stage 2	-	-	-	-	-	-	744	1515	-	425	726	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	438	-	-	980	-	-	90	42	701	40	43	350
Stage 1	-	-	-	-	-	-	385	430	-	128	183	-
Stage 2	-	-	-	-	-	-	373	180	-	578	428	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	438	-	-	980	-	-	50	35	701	34	36	350
Mov Cap-2 Maneuver	-	-	-	-	-	-	50	35	-	34	36	-
Stage 1	-	-	-	-	-	-	326	364	-	128	183	-
Stage 2	-	-	-	-	-	-	245	180	-	487	362	-

Approach	SE	NW	NE	SW
HCM Control Delay, s/v	1.51	0.01	164.82	142.14
HCM LOS			F	F

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	50	701	980	-	-	438	-	-	140
HCM Lane V/C Ratio	0.698	0.003	0.001	-	-	0.154	-	-	1.014
HCM Control Delay (s/veh)	174.5	10.2	8.7	-	-	14.7	-	-	142.1
HCM Lane LOS	F	B	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	2.8	0	0	-	-	0.5	-	-	7.4

Intersection	
Int Delay, s/veh	0.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	548	7	2	1389	16	1
Future Vol, veh/h	548	7	2	1389	16	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	596	8	2	1510	17	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	603	0	1359	302
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	759	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	970	-	140	694
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	423	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	970	-	139	694
Mov Cap-2 Maneuver	-	-	-	-	139	-
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	421	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.05	33.16
HCM LOS			D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	146	5	-	-	-
HCM Lane V/C Ratio	0.126	0.002	-	-	-
HCM Control Delay (s/veh)	33.2	8.7	0	-	-
HCM Lane LOS	D	A	A	-	-
HCM 95th %tile Q(veh)	0.4	0	-	-	-

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	170	2	4	17	9	128
Future Vol, veh/h	170	2	4	17	9	128
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	185	2	4	18	10	139
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	8.8	7.1	7.6
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	99%	0%	7%
Vol Thru, %	1%	19%	0%
Vol Right, %	0%	81%	93%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	172	21	137
LT Vol	170	0	9
Through Vol	2	4	0
RT Vol	0	17	128
Lane Flow Rate	187	23	149
Geometry Grp	1	1	1
Degree of Util (X)	0.229	0.025	0.16
Departure Headway (Hd)	4.41	3.957	3.875
Convergence, Y/N	Yes	Yes	Yes
Cap	808	908	931
Service Time	2.471	1.968	1.877
HCM Lane V/C Ratio	0.231	0.025	0.16
HCM Control Delay, s/veh	8.8	7.1	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.9	0.1	0.6

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	7	10	0	4	3
Future Vol, veh/h	0	7	10	0	4	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	8	11	0	4	3

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	23	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	12	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	993	1070	-	-	1608	-
Stage 1	1012	-	-	-	-	-
Stage 2	1011	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	991	1070	-	-	1608	-
Mov Cap-2 Maneuver	991	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1008	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.39	0	4.14
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1070	1029	-
HCM Lane V/C Ratio	-	-	0.007	0.003	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	3	4	0	0	3
Future Vol, veh/h	1	3	4	0	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	3	4	0	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	4	0	-	0	10	4
Stage 1	-	-	-	-	4	-
Stage 2	-	-	-	-	5	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1617	-	-	-	1010	1079
Stage 1	-	-	-	-	1019	-
Stage 2	-	-	-	-	1018	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1617	-	-	-	1010	1079
Mov Cap-2 Maneuver	-	-	-	-	1010	-
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	1018	-

Approach	EB	WB	SB
HCM Control Delay, s/v	1.81	0	8.35
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	450	-	-	-	1079
HCM Lane V/C Ratio	0.001	-	-	-	0.003
HCM Control Delay (s/veh)	7.2	0	-	-	8.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Approach	SE	NW	NE	SW
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	1796	858	185	28
Demand Flow Rate, veh/h	1831	875	188	29
Vehicles Circulating, veh/h	3	195	1565	1043
Vehicles Exiting, veh/h	1069	1558	269	27
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	11.1	6.9	21.6	7.0
Approach LOS	B	A	C	A

Lane	Left	Right	Left	Right	Left	Left
Designated Moves	LT	TR	LT	TR	LTR	LTR
Assumed Moves	LT	TR	LT	TR	LTR	LTR
RT Channelized						
Lane Util	0.470	0.530	0.470	0.530	1.000	1.000
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.328
A (Intercept)	1350	1420	1350	1420	1420	1420
B (Slope)	9.199e-4	8.501e-4	9.199e-4	8.501e-4	8.501e-4	8.501e-4
Entry Flow, veh/h	861	970	411	464	188	29
Cap Entry Lane, veh/h	1346	1417	1128	1203	375	585
Entry HV Adj Factor	0.980	0.981	0.981	0.980	0.984	0.966
Flow Entry, veh/h	844	952	403	455	185	28
Cap Entry, veh/h	1320	1390	1107	1179	369	565
V/C Ratio	0.640	0.685	0.364	0.386	0.501	0.050
Control Delay, s/veh	10.6	11.4	6.9	6.9	21.6	7.0
LOS	B	B	A	A	C	A
95th %tile Queue, veh	5	6	2	2	3	0

Intersection	
Int Delay, s/veh	2.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	50	1338	35	2	425	6	20	0	1	12	0	33
Future Vol, veh/h	50	1338	35	2	425	6	20	0	1	12	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	315	-	-	150	-	-	150	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	1454	38	2	462	7	22	0	1	13	0	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	468	0	0	1492	0	0	1817	2055	746	1305	2071	234
Stage 1	-	-	-	-	-	-	1582	1582	-	470	470	-
Stage 2	-	-	-	-	-	-	235	473	-	836	1601	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1089	-	-	446	-	-	49	55	356	118	53	768
Stage 1	-	-	-	-	-	-	114	167	-	543	559	-
Stage 2	-	-	-	-	-	-	747	557	-	328	164	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1089	-	-	446	-	-	44	52	356	111	51	768
Mov Cap-2 Maneuver	-	-	-	-	-	-	44	52	-	111	51	-
Stage 1	-	-	-	-	-	-	108	159	-	541	556	-
Stage 2	-	-	-	-	-	-	708	554	-	311	155	-

Approach	SE	NW	NE	SW
HCM Control Delay, s/v	0.3	0.06	143.95	19.47
HCM LOS			F	C

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	44	356	446	-	-	1089	-	-	298
HCM Lane V/C Ratio	0.496	0.003	0.005	-	-	0.05	-	-	0.164
HCM Control Delay (s/veh)	150.4	15.1	13.1	-	-	8.5	-	-	19.5
HCM Lane LOS	F	C	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.8	0	0	-	-	0.2	-	-	0.6

Intersection	
Int Delay, s/veh	0.3

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	1342	9	1	737	7	1
Future Vol, veh/h	1342	9	1	737	7	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1459	10	1	801	8	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1468	0	1866	734
Stage 1	-	-	-	-	1464	-
Stage 2	-	-	-	-	403	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	455	-	64	362
Stage 1	-	-	-	-	179	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	455	-	64	362
Mov Cap-2 Maneuver	-	-	-	-	64	-
Stage 1	-	-	-	-	179	-
Stage 2	-	-	-	-	642	-

Approach	SE	NW	NE
HCM Control Delay, s/v	0	0.06	62.37
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	71	5	-	-	-
HCM Lane V/C Ratio	0.122	0.002	-	-	-
HCM Control Delay (s/veh)	62.4	12.9	0	-	-
HCM Lane LOS	F	B	A	-	-
HCM 95th %tile Q(veh)	0.4	0	-	-	-

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	185	5	4	13	23	203
Future Vol, veh/h	185	5	4	13	23	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	201	5	4	14	25	221
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay, s/veh	9.4	7.4	8.4
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	97%	0%	10%
Vol Thru, %	3%	24%	0%
Vol Right, %	0%	76%	90%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	190	17	226
LT Vol	185	0	23
Through Vol	5	4	0
RT Vol	0	13	203
Lane Flow Rate	207	18	246
Geometry Grp	1	1	1
Degree of Util (X)	0.269	0.022	0.27
Departure Headway (Hd)	4.683	4.232	3.962
Convergence, Y/N	Yes	Yes	Yes
Cap	772	846	909
Service Time	2.683	2.259	1.978
HCM Lane V/C Ratio	0.268	0.021	0.271
HCM Control Delay, s/veh	9.4	7.4	8.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.1	0.1	1.1

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	6	7	2	7	15
Future Vol, veh/h	0	6	7	2	7	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	7	8	2	8	16

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	40	9	0	0	10	0
Stage 1	9	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	971	1073	-	-	1610	-
Stage 1	1014	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	967	1073	-	-	1610	-
Mov Cap-2 Maneuver	967	-	-	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	986	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.38	0	2.31
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1073	573	-
HCM Lane V/C Ratio	-	-	0.006	0.005	-
HCM Control Delay (s/veh)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	5	3	0	0	3
Future Vol, veh/h	4	5	3	0	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	5	3	0	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	3	0	-	0	17	3
Stage 1	-	-	-	-	3	-
Stage 2	-	-	-	-	14	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1619	-	-	-	1001	1081
Stage 1	-	-	-	-	1020	-
Stage 2	-	-	-	-	1009	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1619	-	-	-	998	1081
Mov Cap-2 Maneuver	-	-	-	-	998	-
Stage 1	-	-	-	-	1017	-
Stage 2	-	-	-	-	1009	-

Approach	EB	WB	SB
HCM Control Delay, s/v	3.21	0	8.34
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	800	-	-	-	1081
HCM Lane V/C Ratio	0.003	-	-	-	0.003
HCM Control Delay (s/veh)	7.2	0	-	-	8.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

APPENDIX D

Fields Trip Generation

ITE CODE	LAND USE	UNIT	TRIP GENERATION RATES						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Detached Housing	DU	9.43	0.18	0.53	0.70	0.59	0.35	0.94

Key: DU = Dwelling Units.
Note: All data and calculations above are subject to being rounded to nearest value.

ITE CODE	LAND USE	SIZE		TOTAL TRIPS GENERATED						
				24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
					ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Detached Housing	118	DU	1,113	21	62	83	70	41	111
-	Rural Lots	2	DU	29	1	2	3	2	1	3
-	Rural Estate Lots	6	DU	78	1	4	5	5	2	7
			Total:	*1,220*	*23*	*68*	*91*	*77*	*44*	*121*

Key: DU = Dwelling Units.
Note: All data and calculations above are subject to being rounded to nearest value.

APPENDIX E

Percent Contribution Calculation

Percent Contribution Calculations

Hilltop Road ADT (between Village & Merryvale)	
Background 2044	24,660
Total 2044	25,220
Percent Contribution	2.22%

ParkerWater
& SANITATION DISTRICT

April 29, 2025

Mr. Kevin Lovelace, P.E.
LIA Land Development
1765 West 121st Avenue, Suite #300
Westminster, CO 80234

RE: Will Serve Letter
Ramblewood, South of Hilltop Road, Douglas County Previously known as Hilltop 177 renamed to "Ramblewood";
Total of seventy lots, (sixty-eight standard SFE, two larger lots, exact size TDB)
County of Douglas, State of Colorado.

Dear Mr. Lovelace:

The Parker Water & Sanitation District (PWSD) acknowledges its willingness and ability to serve Ramblewood as described above. The parcel is identified as future build out and will be part of PWSD upon successful completion of inclusion.

COMMITMENT TO SERVE

PWSD is committed to providing service to all future developments within its service area, based on the water supply sources available within the PWSD's water rights portfolio. Such commitment to provide service is conditioned upon compliance with all PWSD Rules and Regulations, Standard and Specifications, and/or conditions specific to the property; including payment of the appropriate fees and any charges related to water and/or sanitation service, as established from time to time by PWSD Directors.

DISTRICT WATER DEMAND

The current PWSD water demand is approximately 7,700 acre-feet per year (Acre Feet/yr), while at build out, the total of 23,500 Acre Feet/yr. The proposed development of **Ramblewood** will be included in our future projections.

PROPOSED RAMBLEWOOD DEMAND (1805A)

The projected demand based on PWSD Section 3, Rules and Regulations, Landscape/Irrigation worksheet is equivalent to 92.4 Acre feet/yr. The districts demand calculation of 1.1 Acre Feet/yr. Per SFE plus additional irrigation requirements require a higher standard than the Douglas County's 1805A of 0.75 Acre Feet/Yr per residence.

DISTRICT WATER SUPPLY

PWSD has an extensive water rights portfolio of adjudicated Denver Basin aquifer groundwater rights, both junior and senior tributary water rights, storage rights in Rueter-Hess Reservoir of 71,920 AF, return flows from effluent and lawn irrigation for use in the PWSD augmentation plan.

The attached Table 1 summarizes PWSD's adjudicated first-use rights, which indicates a total of 41,134 AF/yr (the anticipated yield of these rights in both an average and dry year (Section 1805A.01.2(2)b. of the DCZR). Not included in Table 1 are the rights associated with storage in

Rueter-Hess Reservoir or any of PWSD's reuse rights, which will provide significant additional supplies to PWSD.

In summary, with the estimated buildout demand of 23,500 AF/yr, and PWSD's 41,134 AF/yr of adjudicated first-use water rights and the Denver Basin groundwater that Ramblewood will dedicate with successful inclusion, PWSD has significant excess water supplies which can serve **Ramblewood**, and all future planned buildout within PWSD.

WATERQUALITY

PWSD is in compliance with the Colorado Department of Public Health and Environment testing and quality requirements and provides a high-quality water supply to all customers.

SANITARY SERVICE

PWSD shall provide sanitary service for all water taps requested for **Ramblewood**.

FEASIBILITY OF SERVICE

It is physically and economically feasible for PWSD to provide service to the proposed development of **Ramblewood**.

If you have any questions regarding any of the information provided or PWSD's ability to provide service to the proposed development, please do not hesitate to call us.

Sincerely,
Parker Water & Sanitation District
Heather Justus
Water Resource Manager

Attachments and Links:

Exhibit Plan
Table 1 Summary of PWSD Water Rights
Map of the existing PWSD's service area (Section 1805A.01.2(2)f. of the DCZR)
2022 Evidence of potability of PWSD's water supply for the subdivision (Section 1805A.01.2(3) of the DCZR). 2022
https://www.pwsd.org/DocumentCenter/View/3584/2022-Consumer- Confidence-Report-PDF?bidId=
2023 Consumer Confidence Report
https://www.pwsd.org/DocumentCenter/View/3763/2023- PWSD-Consumer-Confidence-Report-PDF

LOT SIZE	TOTAL
SFD (90' X 130' MINIMUM)	68
RANCH LOT 1 (25 ACRES)	1
RANCH LOT 2 (58 ACRES)	1

COMMUNITY SUMMARY

- 177 Acres
- 68 SFD Lots
- 2 Ranch Lots Totaling 83 Acres
- Approximately 60 Acres of Open Space
- Located in Unincorporated Douglas County
- Douglas County School District
  - Mountain View Elementary
  - Sagewood Middle School
  - Ponderosa High School

SITE PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE

TABLE 1
SUMMARY OF PWSD WATER RIGHTS

DECREED WATER AVAILABLE FOR PWSD USE

SOURCE	Volume (ac-ft/yr) Decreed in Case No.												
	83CW348(A)	95CW039	87CW104(A) [2]	87CW104(B) [2]	95CW089 [2]	99CW006 [2]	06CW179 [2]	02CW227 [3]	94CW042 [4]	03CW258, et al[5]	82CW434 [6]	85CW448, 04CW348 [7]	TOTAL
Cherry Creek alluvium [1]	726.7	132.3										24,130	859.0
Lower Dawson-NT			742.6	631.8	391.8	430.2	868.6	30.6	178.3	821.0	364.0		4,458.9
Lower Dawson-NNT			219.4	0.0	79.5	380.8	807.6						1,487.3
Denver-NT			430.1	908.6	272.6	611.9	235.6	94.4	104.0	1258.0	422.0		4,337.2
Denver-NNT			1016.2	9.0	377.9	616.1	1980.6						3,999.8
Arapahoe-NT			1161.7	627.0	698.3	1945.7	2447.1	64.5	547.3	2954.0	487.0		10,932.6
Laramie-Fox Hills-NT			1044.1	625.3	419.2	700.8	1350.0	49.4	16.0	980.0	310.0		5,494.8
												TOTAL[8] =	**31,569.6**

DENVER BASIN WATER DEEDED AS PART OF INCLUSION (NOT CURRENTLY PART OF PWSD WELL FIELDS)

SOURCE	Annual Volume (ac-ft) Dedicated as Part of PWSD Inclusion[9]												
	Carousel Farms	Cielo	Developmental Pathways	Dransfeldt Place	Gregg East	Harvie Park	Hess Ranch	Hess Road Gailen Buck	Hess Road Town of Parker	Meadowlark	Miller Creek	Parker Parcel	Parker Homestead Parcel A
Upper Dawson - NNT		13.8				4.1	38.4						
Lower Dawson-NT		41.8	0.4	1.7	1.7	20.0	457.6	6.0	4.7	19.4	5.7	14.5	
Lower Dawson-NNT	11.2												51.0
Denver-NT		73.4			3.1	24.6	655.0	7.5	6.1	89.1	7.9	20.4	
Denver-NNT	18.1		0.5	9.1			164.6						71.0
Arapahoe-NT	17.6	75.2	0.5	8.1	3.1	0.0	780.7	8.3	6.6	108.4	7.0	21.4	75.3
Laramie-Fox Hills-NT	11.3	47.4	0.3	6.3	2.3	22.6	474.7	5.1	4.0	65.0	5.7	14.2	45.9

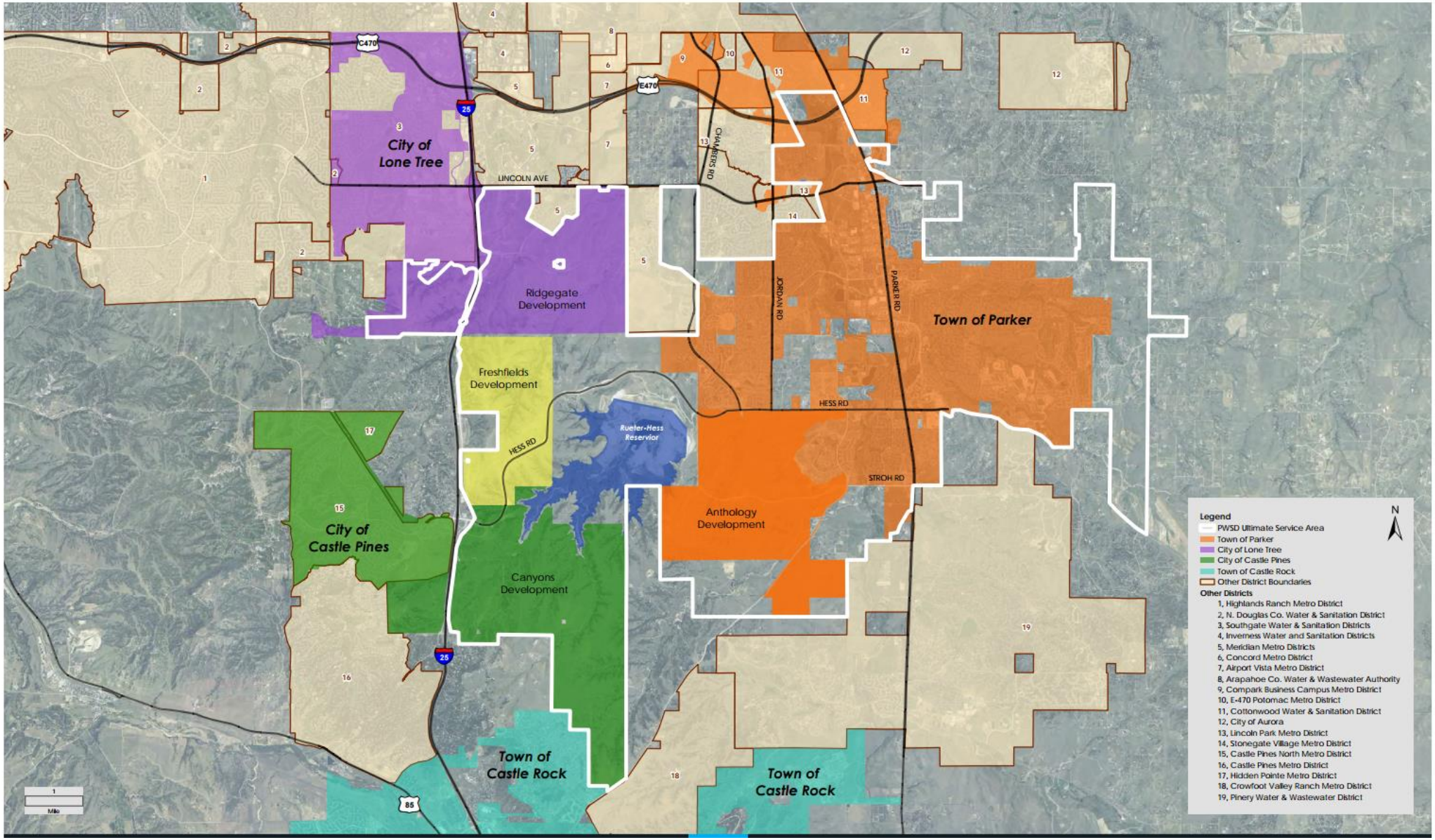
SOURCE	Annual Volume (ac-ft) Dedicated as Part of PWSD Inclusion[9]										
	Parker Point	Public Service CO Sec 20	Public Service CO Sec 21	Public Service CO Sec 22	Reata Ridge Parcel	Salisbury Heights	Sierra Ridge	Steven's Ranch	Stroh Ranch Parcel	Twenty Mile Town Center II	TOTAL
Upper Dawson - NNT								43.8			100.1
Lower Dawson-NT	4.2		3.7		15.4	4.1		442.8	595.9	0.9	1640.5
Lower Dawson-NNT		4.4		6.4			77.9				150.9
Denver-NT	5.8			10.4	21.4	5.1		318.4	855.7	1.3	2105.1
Denver-NNT		6.6	4.8				132.5	387.2			794.4
Arapahoe-NT	7.4	6.6	4.9	9.4	26.4	5.4	143.1	724.0	920.3	1.2	2960.8
Laramie-Fox Hills-NT	4.6	4.0	3.2	7.3	16.5	3.5	89.6	431.5	546.7	0.9	1812.6
										TOTAL =	**9,564.4**

GRAND TOTAL (DENVER BASIN AND CHERRY CREEK WATER RIGHTS)[10] =	41,134.0

1) Water rights changed to municipal use. All of this water is fully consumable and reusable.
2) PWSD well field decree.
3) Hover parcel.
4) Well field established between PWSD and Stroh Ranch for full Stroh Ranch water supply, but water availability limited to volume of water deeded to PWSD from Stroh Ranch.
5) Rights also include water decreed in 82CW116, W-8033, 81CW403, 83CW333, and 98CW459. Water deeded to PWSD from RidgeGate property but not part of the PWSD well fields.
6) Water deeded to PWSD from Freshfields property but not part of the PWSD well fields.
7) Combined RHR and Lake Gulch storage rights - RHR as alternate place of storage, not included in totals
8) Total potential yield of these rights
9) All wellfield inclusion volumes are preliminary and subject to change
10) Updated March, 2019

L:\Projects\Parker\PWSD Wellfields\Wellfield Inclusions\2018 Enl Application\PWSD Water Rights Update_20190328.xlsx

PWSD Service Area



January 28, 2026

Daniel R. Sheldon, Principal
Miller United Real Estate
6900 E. Belleview Avenue, Suite 300
Greenwood Village, Colorado
80111

Re: District Inclusion Deferral Request for the Ramblewood Preliminary Plan

Dear Mr. Sheldon:

Thank you for submitting your request for a deferral of the requirement to submit evidence of inclusion of the Ramblewood Preliminary Plan property into the Parker Water and Sanitation District. It is our understanding that the inclusion process is underway and will be completed prior to consideration by the Board of County Commissioners (Board) of a final plat for the project. It is also our understanding that waiting for completion of the property's inclusion into the Parker Water and Sanitation District prior to approval of the preliminary plan could result in delays for the project.

Pursuant to Section 406.07, the requested deferral of the submittal requirement for evidence of inclusion of the Ramblewood Preliminary Plan property into the Parker Water and Sanitation District is granted, on the condition that such evidence must be submitted prior to consideration of the first final plat associated with the Ramblewood Preliminary Plan by the Board.

Best regards,

Katherine E. Carter

Kati Carter, AICP
Director of Community Development

Trevor Bedford, AICP, Senior Planner
Jeanette Bare, AICP, Planning Manager
Steven E. Koster, AICP, Deputy Director of Community Development

Trevor Bedford

From: Dan Sheldon <dsheldon@miller-united.com>
Sent: Wednesday, January 28, 2026 1:44 PM
To: Kati Carter; Steve Koster; Trevor Bedford
Cc: Daniel Jennings; Sarah Tengen; Kevin Lovelace
Subject: Ramblewood - PWSD Inclusion Deferral Request
Attachments: Recorded Order and Decree Creating District - Ramblewood MD (recorded 11-17-25) 4914-8911-8842 1 .pdf; Ramblewood Inclusion Application Staff Letter ; Final Staff Letter Ramblewood Inclusion 012232026 - DRS Response - 012326.pdf

Caution: This email originated outside the organization. Be cautious with links and attachments.

Dear Ms. Carter:

Good afternoon. I hope this finds you doing well. In reference to the Ramblewood project, and in accordance with Section 406.07 of Article 4 of the Subdivision Resolution, I am formally requesting your approval for a deferral of the requirement for documentation and evidence of the property's inclusion in the Parker Water and Sanitation District (PWSD). Our team has already provided evidence of adequate water supplies and is currently in the process of finalizing the Inclusion Agreement with PWSD. The execution of the Inclusion Agreement and associated Intergovernmental Agreement between the Ramblewood Metropolitan District ("RMD"), PWSD, and Pinery Water and Sanitation District ("Pinery") are currently underway and will be completed prior to consideration by the Board of County Commissioners for the Ramblewood Final Plat application.

Section 406.07 of the subdivision code allows for this request when a "reason of good cause" is provided. The provisions from Section 406.07 are listed below. Our "reason of good cause" is as follows:

1. In order for us to get our Inclusion Agreement executed with PWSD, we are required to enter into an Intergovernmental Agreement ("IGA") with RMD, PWSD and Pinery;
2. On 9/2/25 the Douglas County Board of County Commissioners approved the Service Plan of the RMD for the purpose of entering into service agreements with PWSD and Pinery for water & sewer services;
3. On 11/17/25 the Douglas County District Court issued an Order & Decree creating the RMD for the purpose of entering into service agreements with the PWSD and Pinery for water & sewer services (attached);
4. We have submitted and are currently under review with PWSD for both our Inclusion Agreement as well as the IGA. A copy of both a) the PWSD email including their final staff report; and b) a PDF of our comment response letter (our comments are in blue) are attached evidencing that we are nearing completion of the Inclusion Agreement process;
5. We have submitted and are currently under review with the Pinery for our IGA;
6. We have executed and delivered an Agreement to Pay All Costs with PWSD and provided them with a deposit for them to draw against for the legal/engineering review fees;
7. We expect to have our Inclusion Agreement and IGA fully negotiated in the coming weeks or months, but likely not in time for the Ramblewood Preliminary Plan hearings scheduled for 2/23/26 at Planning Commission and 3/10/26 at the Board of County Commissioners.

8. We have already ordered the publication of newspaper notices and posting signs for the upcoming 2/23/26 and 3/10/26 Planning Commission and Board of County Commissioners hearings for the Preliminary Plan.

For easy reference, Article 4, Section 406.07 of the subdivision code states (and I've **bolded** and **underlined** the "*reason of good cause*" and highlighted in yellow which criteria I believe we've met):

406.07 All water supply documentation required by Section 18A, Water Supply Overlay District, of the Zoning Resolution.

The Director may defer the requirement that the water supply documentation include evidence of inclusion of the property into an Existing District or evidence of organization of a New Special District and execution of an intergovernmental agreement between the New Special District and the Existing District that is proposed to provide the water supply to the subdivision, for **reason of good cause** shown. **Such reasons may include, but shall not be limited to**:

- Demonstration that an inclusion agreement has been executed by the property owner(s) and the Existing District, and that the process of inclusion is ongoing, but not yet complete. (For example: The election to approve inclusion of the property has been scheduled, but not yet conducted, or a Motion for Order for Inclusion has been filed in District Court, but not yet ruled on.)
- Demonstration that the New Special District has been organized, and that the process of executing an intergovernmental agreement is on-going, but not yet complete.
- Demonstration that the New Special District has been approved by the Board of County Commissioners and that the process of organizing of the New Special District is ongoing, but not yet complete. (For example: The election to approve organizing of the New Special District has been scheduled, but not yet conducted.)

Such a deferral may include the provision that evidence of inclusion of the property into the Existing District or evidence of organizing of a New Special District and execution of an intergovernmental agreement between the New Special District and the Existing District be submitted prior to consideration of the application by the Planning Commission and/or the Board.

In summary, I am respectfully requesting approval of a deferral of the requirement for documentation and evidence of the property's inclusion in the Parker Water and Sanitation District.

Thank you for your consideration and continued support of Miller United's ongoing effort to provide quality subdivisions in Douglas County. Please let me know if you have any questions. Otherwise, I look forward to hearing back from you on this.

MILLER UNITED
REAL ESTATE

Daniel R. Sheldon
Principal
Miller United Real Estate
6900 E. Belleview Avenue, Suite 300
Greenwood Village, CO 80111
Cell: (303) 886-2838
Email: dsheldon@miller-united.com
Web: www.miller-united.com

Douglas County.
CERTIFIED to be a full, true and correct copy of the original in my custody.
NOV 17 2025
ANDREA K. TRUETT
Clerk of the Combined Court
By _____ Deputy

DISTRICT COURT, COUNTY OF DOUGLAS, STATE OF COLORADO 4000 Justice Way, Suite 2009 Castle Rock, CO 80109 720-437-6200	DATE FILED November 14, 2025 9:20 AM
IN THE MATTER OF RAMBLEWOOD METROPOLITAN DISTRICT	
	▲ COURT USE ONLY ▲
BY THE COURT	Case Number: 2025CV30970 Div.: 6 Ctrm.: 6

ORDER AND DECREE CREATING DISTRICT, ISSUING CERTIFICATES OF ELECTION, AND RELEASING BOND

THIS MATTER comes before the Court on the Unopposed Motion for Order and Decree Creating District, Issuing Certificates of Election, and Releasing Bond filed by the Petitioners in regard to the organization of the Ramblewood Metropolitan District (the "**District**"). The Court, being fully advised in the premises, hereby FINDS AND ORDERS:

1. That the required Notice of Election was duly published in a newspaper of general circulation in the District, one time, in compliance with law.

2. That a majority of the votes cast at the election held on November 4, 2025, in which the question of organization of the District was submitted to eligible electors, were in favor of organization, and that the election was held in accordance with Articles 1 through 13.5 of Title 1, C.R.S., and Section 20 of Article X of the Colorado Constitution.

3. The following ballots were cast on the question of organization of the District:

	VOTES CAST
FOR the Organization of the District	**9 (nine)**
AGAINST the Organization of the District	**0 (zero)**

4. That all of the provisions of law, and more particularly all of the requirements of Title 32, Article 1, Part 3, C.R.S., have been complied with, met and performed, in the organization of the District.

5. That the District shall be and is hereby duly and regularly organized in accordance with the requirements of Article 1 of Title 32, C.R.S.

6. That the District shall be known as "**Ramblewood Metropolitan District**," the corporate name as designated in the Petition filed with this Court.

7. That the District is located in the Douglas County, Colorado, as more particularly described in **Exhibit A**, attached hereto and made a part hereof.

8. That the District shall be a quasi-municipal corporation and a political subdivision of the State of Colorado with all the powers thereof.

9. That the following qualified persons were duly elected as members of the District's first Board of Directors for the indicated terms, and as further shown on the Certificates of Election, to be issued by this Court in accordance with Section 32-1-305.5(5), C.R.S., which Certificates are submitted herewith separate from this order for execution by the Court:

NAME	TERM
Michael W. Smith	Until the next regular election
No candidate for this office	Until the next regular election
Steven A. Shoflick	Until the second regular election
David J. Goldberg	Until the second regular election
Daniel R. Sheldon	Until the second regular election

10. That the Clerk of this Court shall release to Petitioners' Counsel the organizational expenses bond in the amount of $500.00, as submitted in connection with the organization of the District made payable to McGeady Becher Cortese Williams P.C., and mailed to McGeady Becher Cortese Williams P.C., 450 E. 17th Avenue, Suite 400, Denver, CO 80203-1254.

11. That in satisfaction of C.R.S. § 32-1-803.5, the Board of County Commissioners has concluded the interest of the proposed District and the public interest or necessity demand the acquisition, construction, installation, or completion of improvements or facilities and the payment of certain costs to carry out the objects and purposes of the proposed District, requiring the creation of a general obligation indebtedness.

Add Text Here

12. That in satisfaction of C.R.S. § 32-1-803.5, the Board of County Commissioners has concluded the interest of the District and the public interest and necessity demand the incurrence of indebtedness to carry out the objectives and purposes of the District requiring the creation of a general obligation indebtedness:

(a) The District has the power to provide for the acquisition, construction, installation, and completion of certain street, park and recreation, water, sanitation, transportation, mosquito control, safety protection, fire protection, television relay and translation improvements of the District, as well as the provision of covenant enforcement, design review services and security services by the District, except as may be limited by the

Service Plan of the District approved by the Board of County Commissioners of Douglas County, Colorado, on September 2, 2025 (the "**Approved Service Plan**").

(b) The estimated principal amount of the indebtedness to be authorized is not greater than: $10,000,000 for street improvements; $10,000,000 for park and recreation improvements; $10,000,000 for water improvements; $10,000,000 for sanitation improvements; $10,000,000 for transportation improvements; $10,000,000 for mosquito control improvements; $10,000,000 for safety protection improvements; $10,000,000 for fire protection improvements; $10,000,000 for television relay and translation improvements; $10,000,000 for security services; $10,000,000 for operating and maintenance expenses; $10,000,000 for refunding purposes; and $10,000,000 for intergovernmental agreements, except as may be limited by the Approved Service Plan; and the amount of principal indebtedness to be incurred does not exceed such amount;

(c) The estimated cost of the improvements to be defrayed out of any state or federal grant is unknown at this time; and

(d) The maximum net effective interest rate to be paid on such indebtedness is twelve percent (12%) per annum.

13. The District shall be a governmental subdivision of the State of Colorado, and a body corporate and politic with all the powers of a public or quasi-municipal corporation. The facilities, services and financial arrangements of the District shall conform as far as practicable to the Approved Service Plan and the Resolution of Approval of the Board of County Commissioners of Douglas County, Colorado. The Approved Service Plan and Resolution of

Approval required by Title 32, Article 1, Part 2, C.R.S., previously filed in the within action, shall be and the same are hereby incorporated by reference in this Order. Pursuant to Section 32-1-205(2), C.R.S., a copy of the Resolution of Approval is attached hereto and incorporated herein as **Exhibit B**.

14. The Board of Directors shall take such steps and proceedings as the needs of the District require; and in accordance with Section 32-1-306, C.R.S., within thirty (30) days after the date hereof, the District shall transmit the following:

(a) A certified copy of this Order and Decree Creating District, and a copy of the District's Approved Service Plan to the Clerk and Recorder of Douglas County, Colorado, and to the Division of Local Government (the "**DLG**"); and

(b) A certified copy of the Court's findings and this Order and Decree Creating District to the County Clerk and Recorder in each of the Counties in which the District or a part thereof extends for recording, as provided in Section 32-1-105, C.R.S.; and

(c) A copy of the District's Approved Service Plan to each such County Clerk and Recorder, for retention as a public record for public inspection; and

(d) A copy of the District's Approved Service Plan, together with a copy of the Court's findings and this Order and Decree Creating District to the DLG; and

(e) A copy of the District map to the County Assessor in each county in which the District or a part thereof extends and with the DLG according to its standards.

DONE IN COURT this _____ day of _____, 2025.

BY THE COURT:

_____

District Court Judge

EXHIBIT A

Legal Description

Ramblewood Metropolitan District

A PARCEL OF LAND LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARING: THE NORTH LINE OF THE SOUTHWEST QUARTER OF SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, ASSUMED TO BEAR SOUTH 89°29'26" EAST, BEING MONUMENTED ON THE WEST BY THE WEST QUARTER-SECTION CORNER OF SAID SECTION 6 BEING A 3" ALUMINUM CAP STAMPED "1988 PLS 23053" AND ON THE EAST BY THE CENTER QUARTER-SECTION CORNER OF SAID SECTION 6 BEING A 3.25" ALUMINUM CAP STAMPED "1994 PLS 12405" AS SHOWN HEREON WITH ALL BEARINGS CONTAINED HEREIN RELATIVE THERETO.

COMMENCING AT SAID WEST QUARTER-SECTION CORNER OF SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN;

THENCE SOUTH 89°29'26" EAST, ON THE NORTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 6, A DISTANCE OF 1427.29 FEET TO A POINT ON THE EAST LINE OF HIDDEN VILLAGE FILING NO. 1, RECORDED UNDER RECEPTION NO, 125234 IN THE RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER;

THENCE SOUTH 00°32'40" WEST, ON SAID EAST LINE, A DISTANCE OF 12.77 FEET TO SOUTHWEST CORNER OF A PARCEL OF LAND RECORDED UNDER RECEPTION NO. 9561360 IN THE RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER AND THE **POINT OF BEGINNING**;

THENCE SOUTH 88° 57' 09" EAST, ON THE SOUTH LINE OF SAID PARCEL OF LAND RECORDED UNDER RECEPTION NO. 9561360 AND PARCEL OF LAND RECORDED UNDER RECEPTION NO. 9561359 IN THE RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER, A DISTANCE OF 1407.99 FEET TO THE SOUTHEAST CORNER OF SAID PARCEL UNDER RECEPTION NO. 9561359;

THENCE NORTH 00° 07' 54" EAST, ON THE WEST LINE OF SAID PARCEL OF LAND RECORDED UNDER RECEPTION NO. 9561359 AND AT BOOK 1252 AT PAGE 1859 IN THE RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER, A DISTANCE OF 1164.12 FEET TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY LINE OF HILLTOP ROAD RECORDED UNDER RECEPTION NO. 2023042659 AND RECEPTION NO. 9519760 IN THE RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER;

THENCE ON SAID SOUTHERLY RIGHT-OF-WAY LINE, THE FOLLOWING SIX (6) COURSES:

1. THENCE SOUTH 44° 02' 27" EAST, A DISTANCE OF 2.71 FEET, TO THE BEGINNING OF A CURVE;

2. THENCE ON THE ARC OF SAID CURVE TO THE LEFT THROUGH AN ANGLE OF 01° 36' 15", HAVING A RADIUS OF 11805 FEET, AN ARC LENGTH OF 330.52 FEET, WHOSE LONG CHORD BEARS SOUTH 44° 50' 35" EAST, A DISTANCE OF 330.51 FEET TO A POINT OF NON-TANGENCY;

3. THENCE SOUTH 50° 08' 18" EAST, A DISTANCE OF 540.23 FEET TO THE BEGINNING OF A NON-TANGENT CURVE;

4. THENCE ON THE ARC OF SAID CURVE TO THE LEFT THROUGH AN ANGLE OF 03° 10' 02", HAVING A RADIUS OF 11775.00 FEET, AN ARC LENGTH OF 650.88 FEET, WHOSE LONG CHORD BEARS SOUTH 49°51' 00" EAST, A DISTANCE OF 650.79 FEET TO A POINT OF NON-TANGENCY;

5. THENCE NORTH 00° 25' 50" EAST FOR A DISTANCE OF 19.15 FEET;

6. THENCE SOUTH 49° 57' 20" EAST, A DISTANCE OF 272.56 FEET TO A POINT ON THE BOUNDARY LINE OF HIDDEN VILLAGE FILING NO. 4 RECORDED UNDER RECEPTION NO. 131583 AND AS REDEFINED PER PROPERTY LINE AGREEMENT RECORDED UNDER RECEPTION NO. 2008084858 IN THE RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER;

THENCE ON THE NORTHERLY AND WESTERLY LINES OF SAID HIDDEN VILLAGE FILING NO. 4, THE FOLLOWING TWO (2) COURSES:

1. THENCE SOUTH 89° 46' 53" WEST, ON THE REDEFINED PROPERTY LINE AGREEMENT UNDER RECEPTION NO. 2008084858 IN THE RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER, A DISTANCE OF 118.18 FEET;

2. THENCE SOUTH 00° 46' 02" WEST, ON THE REDEFINED PROPERTY LINE AGREEMENT UNDER RECEPTION NO. 2008084857 IN THE RECORDS OF THE DOUGLAS COUNTY CLERK AND RECORDER, A DISTANCE OF 1226.76 FEET;

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THENCE NORTH 00° 32' 40" EAST, ON SAID EASTERLY LINE, A DISTANCE OF 1211.76 FEET TO THE **POINT OF BEGINNING**.

CONTAINING A CALCULATED AREA OF 3,964,777 SQUARE FEET OR 91.019 ACRES, MORE OR LESS.

I, JOHN ROBERT MCGEHEE, A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF COLORADO,

DO HEREBY CERTIFY THAT THE ABOVE LEGAL DESCRIPTION AND ATTACHED EXHIBIT WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CHECKING.

JOHN ROBERT MCGEHEE

COLORADO LICENSED PROFESSIONAL LAND SURVEYOR NO. 38219

FOR AND ON BEHALF OF LJA SURVEYING, INC.
303.390.8510
www.LJASurvey.com
7800 E. UNION AVE., SUITE 575, DENVER, COLORADO 80237

EXHIBIT B

Resolution of Approval

Ref #2025041826, Date: 9/5/2025 9:30 AM, Pages: 1 of 5 ,
Electronically Recorded Douglas County, CO. Sheri Davis, Clerk and Recorder

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RESOLUTION NO. R-025- 072

**THE BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF DOUGLAS, COLORADO**

**A RESOLUTION APPROVING THE SERVICE PLAN OF
RAMBLEWOOD METROPOLITAN DISTRICT**

WHEREAS, on July 3, 2025, a service plan for the proposed Ramblewood Metropolitan District ("Service Plan") was filed with the Douglas County Clerk and Recorder ("Clerk"), and the Clerk, on behalf of the Board of County Commissioners ("Board"), mailed a Notice of Filing of Special District Service Plan to the Division of Local Government in the Department of Local Affairs on July 3, 2025; and

WHEREAS, on August 12, 2025, the Board set a public hearing on the Service Plan for August 26, 2025 ("Public Hearing"), and (1) ratified publication of the notice of the date, time, location and purpose of such Public Hearing, which was published in *The Douglas County News-Press* on July 31, 2025; and (2) caused notice of the date, time and location of the Public Hearing to be mailed on August 4, 2025 to the governing body of the existing municipalities and special districts which have levied an *ad valorem* tax within the next preceding tax year and which have boundaries within a radius of three miles of the proposed boundaries of Ramblewood Metropolitan District ("District") and, on August 4, 2025, to the petitioners and to the property owners, pursuant to the provisions of § 32-1-204(1.5), C.R.S.; and

WHEREAS, the Board continued the public hearing for the Service Plan from August 26, 2025 to September 2, 2025, when a Public Hearing on the Service Plan was opened at which time all interested parties, as defined in § 32-1-204, C.R.S., were afforded an opportunity to be heard, and all testimony and evidence relevant to the Service Plan and the organization of the proposed District was heard, received and considered.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF DOUGLAS, STATE OF COLORADO, THAT:

Section 1. The Board does hereby determine that all procedural requirements of §§32-1-201, *et seq.*, C.R.S., relating to the Service Plan have been fulfilled and that the Board has jurisdiction in the matter.

Section 2. The Board does hereby find:

a) that there is sufficient existing and projected need for organized service in the area to be serviced by the proposed District; and

b) that the existing service in the area to be served by the proposed District is inadequate for present and projected needs; and

c) that the proposed District is capable of providing economical and sufficient service to the area within the proposed boundaries; and

d) that the area to be included in the proposed District has, or will have, the financial ability to discharge the proposed indebtedness on a reasonable basis; and

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e) that adequate service is not, or will not be, available to the area through Douglas County or other existing municipal or quasi-municipal corporations, including existing special districts, within a reasonable time and on a comparable basis; and

f) that the facility and service standards of the proposed District are compatible with the facility and service standards of Douglas County and each municipality which is an interested party under § 32-1-204, C.R.S.; and

g) that the proposal is in substantial compliance with the Douglas County Comprehensive Master Plan; and

h) that the proposal is in compliance with any duly adopted county, regional, or state long-range water quality management plan for the area; and

i) that the creation of the proposed District will be in the best interests of the area proposed to be served; and

j) that the Service Plan, based upon the statements set forth in the Service Plan and upon all evidence presented at the Public Hearing on the Service Plan, meets all conditions and requirements of §§ 32-1-201, *et seq.*, C.R.S.

Section 3. The Board hereby approves the Service Plan without conditions; provided, however, that such action shall not imply the approval of any land development activity within the proposed District or its service area, or of any specific number of buildable units identified in the Service Plan, unless the Board has approved such development activity as part of a separate development review process.

Section 4. The legal description of the District shall be as provided in **Exhibit A**, attached hereto and incorporated herein by reference.

Section 5. A certified copy of this resolution shall be filed in the records of Douglas County.

PASSED AND ADOPTED this 2nd day of September, 2025, in Castle Rock, Douglas County, Colorado.

THE BOARD OF COUNTY COMMISSIONERS
OF THE COUNTY OF DOUGLAS, COLORADO

BY: Signed by:
Chair Abe Laydon

Signed by:

ATTEST: DocuSigned by: Hayley Hall
Deputy Clerk Hayley Hall

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EXHIBIT A

Legal Description

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Docusign Envelope ID: 2C967B13-B56D-4616-9F0C-1EDD3DD4D50E

DO HEREBY CERTIFY THAT THE ABOVE LEGAL DESCRIPTION AND ATTACHED EXHIBIT WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CHECKING.

JOHN ROBERT MCGEHEE

COLORADO LICENSED PROFESSIONAL LAND SURVEYOR NO. 38219

FOR AND ON BEHALF OF LJA SURVEYING, INC.
303.390.8510
www.LJASurvey.com
7800 E. UNION AVE., SUITE 575, DENVER, COLORADO 80237

ParkerWater
& SANITATION DISTRICT

January 23, 2026

James Helfand
Hilltop Jam, LLC
2554 Aspen Springs Drive
Park City, Utah 84060

Bradley and Joan Whittlesey
4700 E. Princeton Ave.
Littleton, Colorado 80113

RE: Ramblewood Inclusion Submittal

Dear James Helfand, Bradley A Whittlesey, and Joan V. Whittlesey:

Thank you for your petitions for inclusion of your Ramblewood Development into the Parker Water & Sanitation District ("Parker Water"). We have reviewed your submittal and have the following comments regarding items that require revisions.

1. All documents pertaining to the Petition to Include need to be updated to include the ranch lots. Completed.
2. The title commitments need to be updated. They are dated 17 October 2024. Ordered on 1/23/26 and will submit to PWSD upon receipt (expected by 1/30/26).
3. All groundwater under the proposed inclusion (177 acres) must be deeded to Parker Water. Agreed & Accepted.
4. A special warranty deed must be delivered conveying the subject groundwater under the 177 acres to PWSD from David C. Whittlesey and Cynthia L. Whittlesey and/or their estates and successors in interest in addition to a special warranty deed from current overlying landowners Bradley A. and Joan V. Whittlesey. This additional deed is required because the decree in 07CW107 in paragraph 1 states that " the ground water rights decreed herein are vested property rights decreed to the Applicants and shall be owned by all the applicants until such time as the Applicants expressly convey all the water underlying the subject property, or a portion of the water to another entity through a deed that identifies this case number, the specific aquifer, and the annual volume or total volume of ground water being conveyed." The Applicants according to the caption and decree paragraph 1 are Bradley A. Whittlesey, David C. Whittlesey and Cynthia L. Whittlesey. This indicates that David and Cynthia Whittlesey are owners of the underlying water rights in addition to Bradley and Joan Whittlesey. This was completed on 5/23/24 and recorded on 5/31/24. A copy of which is attached with our Inclusion Agreement draft.
5. Provide completed water special warranty deeds and consent forms from all current overlying landowners as shown by the title commitments plus such additional documents as are needed to clear any claims to ownership by David C. Whittlesey and Cynthia L. Whittlesey. Note that all deeds or consents from Hilltop Jam LLC

must be supported by current sworn and notarized statements of authority from any manager executing such documents. Draft special warranty deeds from the two landowners are attached to our Inclusion Agreement draft. Fully executed deeds with current sworn and notarized statements of authority will be provided with our next submittal.

6. Attach correct legal descriptions to all deeds and conveyances and consent forms. Each petition needs the correct legal description attached for the full 177 acres. Our Inclusion Agreement has been consolidated into one single agreement for both parcels making up the 177 acres. Correct legals have been attached thereto.
7. Any wells that are existing on the either the Whittlesey or Hilltop Jam LLC parcels will need to be abandoned. No wells on the property to be abandoned.
8. The agreement to pay all costs needs to be dated. The entity agreeing to pay all costs is different that the Petitioners. We need a letter or a statement of authority from the owners evidencing the authority of MU Hilltop, LLC to represent their interests in this inclusion matter. We are assuming you're referring to an agreement for us to pay all costs associated with PWSD's review. We are in agreement to pay those, but need the agreement. We will provide the signed agreement as well as a statement of authority from the owners providing MU Hilltop LLC the authority to represent their interests in this inclusion matter.
9. An agreed deferral date for the inclusion costs and recordation needs to be included in the addendum. We suggest that this date be 45 days after your anticipated final plat with the ability to request one 30-day extension. Agreed.
10. The water rights beneath the full 177 acres need to be conveyed to Parker Water at the time of inclusion and Parker Water will agree to record the conveyance documents at the same time as the inclusion fees are paid. Agreed.
11. The fee in lieu for the wellsite is required at the same time as the inclusion fees. We were under the impression that the cash in lieu of wellsite would be waived due to the proximity of surrounding PWSD and especially now that we're dedicating all of our groundwater to PWSD. Please confirm that no cash in lieu will be required.
12. Reference to the Pinery providing sanitary service to Ramblewood needs to be set forth in the addendum to the inclusion agreement and there needs to be a separate agreement between the Pinery, Parker Water and the Petitioners setting forth the terms of this arrangement. The 2018 agreement with Cielo development can serve as a template. The agreement with the Pinery needs to be completed on or before the time of Parker Water inclusion. We understand and concur with this. We will be submitting the IGA described above concurrent or very shortly.
13. The water rights supply memo needs to be updated as discussed during a Teams meeting on January 20, 2026. When deeding all the water under 177 acres, the Denver Basin Water supply availability equates to 136.3 ac-ft/yr. By not paying the additional fees for the Dawson and Laramie Fox Hills this reduces the available water supply credit to 92.6 ac-ft/yr which equates to 84 SFEs. The 84 SFEs will need to cover the demands for both the proposed development and the two ranch lots or the additional Dawson and Laramie Fox Hills fees can be paid to obtain additional water resource credits. The water rights supply memo has been updated accordingly and is included in the Inclusion Agreement draft.

14. Water reserved for the two larger ranch lots needs to be addressed in the addendum. Done.
15. A paragraph about the inclusion of the ranch lots needs to be included stating that the petitioners are paying inclusion fees for 2 acres for each ranch lot and subject to any future subdividing of the ranch lots the Petitioner will pay the additional inclusion fees. Done.
16. A paragraph regarding the reduction in the inclusion fees for open space needs to be added to the addendum. Done.

The items of concern as outlined in this letter must be addressed, and answers or corrections submitted to Parker Water for further review.

If you would like we could schedule a meeting with Parker Water staff, legal team and consultants to discuss.

Sincerely,

Heather Justus

Digitally signed by Heather Justus
DN: E=HJustus@pwsd.org, CN=Heather Justus, OU=Users, OU=Engineering OU, DC=pwsd, DC=org
Date: 2026.01.23 11:13:22-07'00'

Heather L. Justus, P.G.
Water Resource Manager
Parker Water & Sanitation District

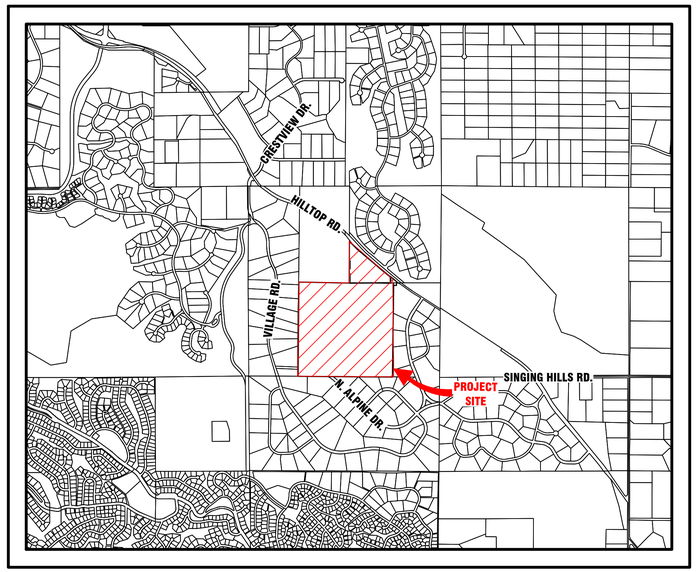
CC:
Jeff Parker
Bob Krassa
Bruce Lytle

RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO
176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040

GENERAL NOTES:

1. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OR LAND BOUNDARY MONUMENT OR ACCESSORY COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, COLORADO REVISED STATUTE.
2. PER C.R.S. 38-51-106, "ALL LINEAL UNITS DEPICTED ON THIS LAND SURVEY PLAT ARE U.S. SURVEY FEET. ONE METER EQUALS 39.37/12 U.S. SURVEY FEET, EXACTLY ACCORDING TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY."
3. LAND TITLE GUARANTEE COMPANY'S COMMITMENT NO. ABD70737260, EFFECTIVE AUGUST 20TH, 2021 WAS RELIED UPON FOR RECORD INFORMATION REGARDING RIGHTS-OF-WAY, EASEMENTS AND ENCUMBRANCES. THIS SURVEY DOES NOT REPRESENT A TITLE SEARCH BY AZTEC CONSULTANTS OR REDLAND TO DETERMINE OWNERSHIP, RIGHTS-OF-WAY, EASEMENTS OR OTHER MATTERS OF PUBLIC RECORD.
4. BASED ON A GRAPHICAL REPRESENTATION OF FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) NO. 08035C0132F, WITH AN EFFECTIVE DATE OF SEPTEMBER 30, 2005, THE SUBJECT PROPERTY LIES WITHIN ZONE "A" AND "X" WITH ZONE "A" BEING DEFINED AS "SPECIAL FLOOD HAZARD AREA SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD": "NO BASE FLOOD ELEVATIONS DETERMINED." ZONE "X" IS DEFINED AS "AREAS OF 0.2% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE." THE APPROXIMATE LIMITS OF ZONE "A" HAVE BEEN DEPICTED HEREON AND ZONE "X" BEING EVERYTHING OUTSIDE OF ZONE "A".
5. DWELLING UNITS ARE TO BE CONSTRUCTED IN A MANNER WHICH WILL ACCOMMODATE CONNECTION TO A UTILITY MONITORING AND TELECOMMUNICATION SYSTEM FOR CENTRAL SERVICE UNDER A MASTER SERVICE CONTRACTOR OR CENTRAL COMPUTER-CONTROLLED MONITORING PROGRAM. THE OWNERS OF EACH LOT SHALL FULLY PARTICIPATE IN AND BE PART OF THE UTILITY MONITORING AND TELECOMMUNICATIONS SYSTEM OR SYSTEMS.
6. STREETS A THROUGH D WILL BE OWNED AND MAINTAINED BY DOUGLAS COUNTY.
7. PROPOSED TRAILS WITHIN THE SITE BOUNDARY WILL BE OWNED AND MAINTAINED BY THE RAMBLEWOOD METROPOLITAN DISTRICT.



VICINITY MAP
1" = 2000'

Sheet List Table

Sheet Number	Sheet Title
1	Cover Sheet
2	Typical Street Section Plan
3	Overall Plan
4	Site Plan
5	Site Plan
6	Site Plan
7	Site Plan
8	Grading Plan
9	Grading Plan
10	Grading Plan
11	Grading Plan
12	Sight Distance Plan
13	Sight Distance Plan
14	Existing Features Plan
15	Offsite Sanitary Sewer Plan
16	Trails Plan

DEVELOPER
MILLER UNITED
6900 E. BELLVIEW AVE,
GREENWOOD VILLAGE, CO 80111
PHONE: (303) 799-6300
CONTACT: DAN SHELDON

CIVIL ENGINEER
LJA ENGINEERING, INC.
1765 WEST 121ST AVE, SUITE 300
WESTMINSTER, CO 80234
PHONE: (303) 421-4224
CONTACT: KEVIN LOVELACE

SURVEYOR
LJA SURVEYING, INC
1765 WEST 121ST AVE, SUITE 300
WESTMINSTER, CO 80234
PHONE: (303) 358-7002
CONTACT: DEREK BROWN

PLANNER/LANDSCAPE
NORRIS DESIGN
1101 BANNOCK STREET,
DENVER, CO 80204
PHONE: (303) 892-1166
CONTACT: DANIEL JENNINGS

GEOTECHNICAL ENGINEER
CTL THOMPSON
1971 WEST 12TH AVE.
DENVER, CO 80204
PHONE: (303) 825-0777
CONTACT: ALAN J. LISOWY, P.E.

AGENCY LIST

DOUGLAS COUNTY
100 THIRD STREET
CASTLE ROCK, CO 80104
PHONE: (303) 660-7460
CONTACT: CHUCK SMITH

PARKER WATER & SANITATION DISTRICT
19801 E. MAIN STREET
PARKER, CO 80138
PHONE: (303) 841-4627
CONTACT: JAROD BAYLIE

CORE ELECTRIC COOPERATIVE
5496 US-85
SEDALIA, CO 80135
PHONE: (800) 332-9540

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:
CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

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Westminster, CO 80234
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No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: N/A
Scale Vert: N/A

Sheet: 1 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Cover Sheet

NOT FOR CONSTRUCTION

Developer:
Miller United Real Estate, LLC
6900 Bellview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 1

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RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

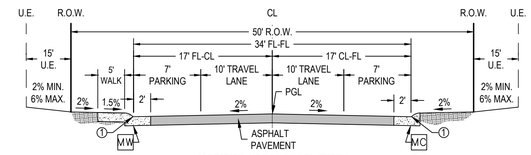
176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040

GENERAL ABBREVIATIONS

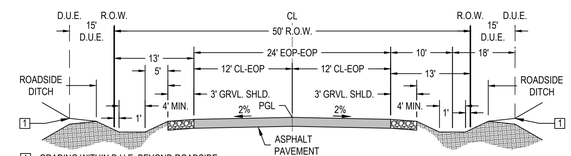
A.E.	ACCESS EASEMENT
BKL	BIKE LANE
BL CONST	BASELINE OF CONSTRUCTION
BS	BOTTOM ELEVATION OF RISE
B.S.I.	BY SEPARATE INSTRUMENT
CDS	CUL-DE-SAC
CE	CURB EXTENSION
CL	CENTERLINE
CT	CURB TRANSITION
CWN	CROWN
DBO	DESIGN BY OTHERS
DC	MEDIAN CURB & GUTTER
D.E.	DRAINAGE EASEMENT
DIST.	DISTANCE
D.U.E.	DRAINAGE & UTILITY EASEMENT
EOA	EDGE OF ASPHALT
EOP	EDGE OF PAVEMENT
E.A.E.	EMERGENCY ACCESS EASEMENT
E.ATT.E.	EXISTING AT&T EASEMENT
E.P.E.	EXISTING PIPELINE EASEMENT
ESMT.	EASEMENT
FES	FLARED END SECTION
FGB	FINISHED GROUND AT BOTTOM WALL ELEVATION
FGT	FINISHED GROUND AT TOP WALL ELEVATION
FH	FIRE HYDRANT
FL	FLOWLINE
FV	FIELD VERIFY
G	FINISHED GROUND
G.E.	GAS EASEMENT
G.O.E.	GAS & OIL EASEMENT
GV	GATE VALVE
HP	HIGH POINT
I.E.	IRRIGATION EASEMENT
LL	LOT LINE
LP	LOW POINT
LS	LANDSCAPING
LTWD	LITTLE THOMPSON WATER DISTRICT
MC	MOUNTABLE CURB & GUTTER
MH	MANHOLE
MSE	MECHANICALLY STABILIZED EARTH
P	PAVEMENT
P&P	PLAN & PROFILE
P.A.E.	PUBLIC ACCESS EASEMENT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PCR	POINT OF CURB RETURN
PERF.	PERFORATED
PGL	PROFILE GRADE LINE
PI	POINT OF INFLECTION
PRC	POINT OF REVERSE CURVATURE
PSWD	PARKER SANITATION & WATER DISTRICT
PT	POINT OF TANGENCY
RELOC	TO BE RELOCATED
R.O.W.	RIGHT OF WAY
RN	RECORDING NUMBER
S.E.	SANITARY EASEMENT
SD.E.	SIGHT DISTANCE EASEMENT
SEC	SECTION LINE
SL	SANITARY LINE
SS	SANITARY SERVICE
SW	SIDEWALK
SW.E.	SIDEWALK EASEMENT
TB	THRUST BLOCK
TC	TOP OF CURB
TEMP.	TEMPORARY
TRANS.	TRANSITION
TR.E.	TRANSPORTATION EASEMENT
TS	TOP ELEVATION OF RISER
UD	UNDERDRAIN
U.E.	UTILITY EASEMENT
U.G.E	UTILITY & GAS EASEMENT
VC	VERTICAL CURB & GUTTER
W.E.	WATER EASEMENT
WL	WATER LINE
WS	WATER SERVICE
W.S.W.	WATER SURFACE ELEVATION
WV	WATER VALVE

LEGEND

- Property Line
- Right of Way Line
- Centerline
- Lot Line
- Easement Line
- Setback Line
- Swale Line
- Storm Manhole
- Type 'R' Inlet
- Sanitary Sewer Manhole
- Fire Hydrant
- Water Valve
- Thrust Block
- Reducer
- Plug & Blow-off
- Sign
- Storm Sewer Line
- Water Line
- Sanitary Sewer Line
- Water Service Line & Meter
- Sanitary Sewer Service Line
- Ex. Sanitary Sewer Line
- Ex. Water Line
- Ex. Storm Sewer Line
- Ex. Gas
- Ex. Underground Electric
- Ex. Overhead Electric
- Ex. Fence
- Proposed Major Contour
- Proposed Minor Contour
- Existing Major Contour
- Existing Minor Contour
- Ex. Asphalt Pavement
- Ex. Concrete Pavement
- Prop. Asphalt Pavement
- Prop. Concrete Pavement
- Prop. Concrete Walk
- Floodplain



MODIFIED URBAN LOCAL TYPE I
N.T.S.



RURAL LOCAL TYPE I
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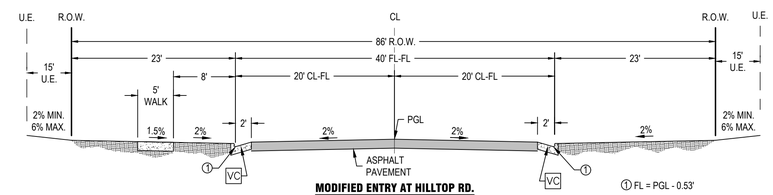
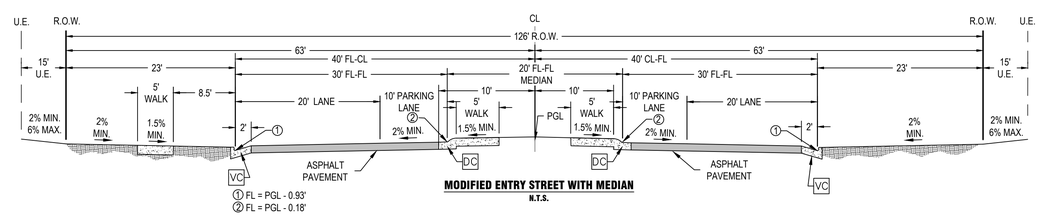


MODIFIED ENTRY AT HILLTOP RD.
N.T.S.



MODIFIED ENTRY STREET WITH MEDIAN
N.T.S.

MC	5" MOUNTABLE C&G
DC	MEDIAN C&G
VC	VERTICAL C&G

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:

CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: N/A
Scale Vert: N/A

Sheet: 2 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Typical Street Section Plan

NOT FOR CONSTRUCTION

Developer:
Meritage Homes Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 2

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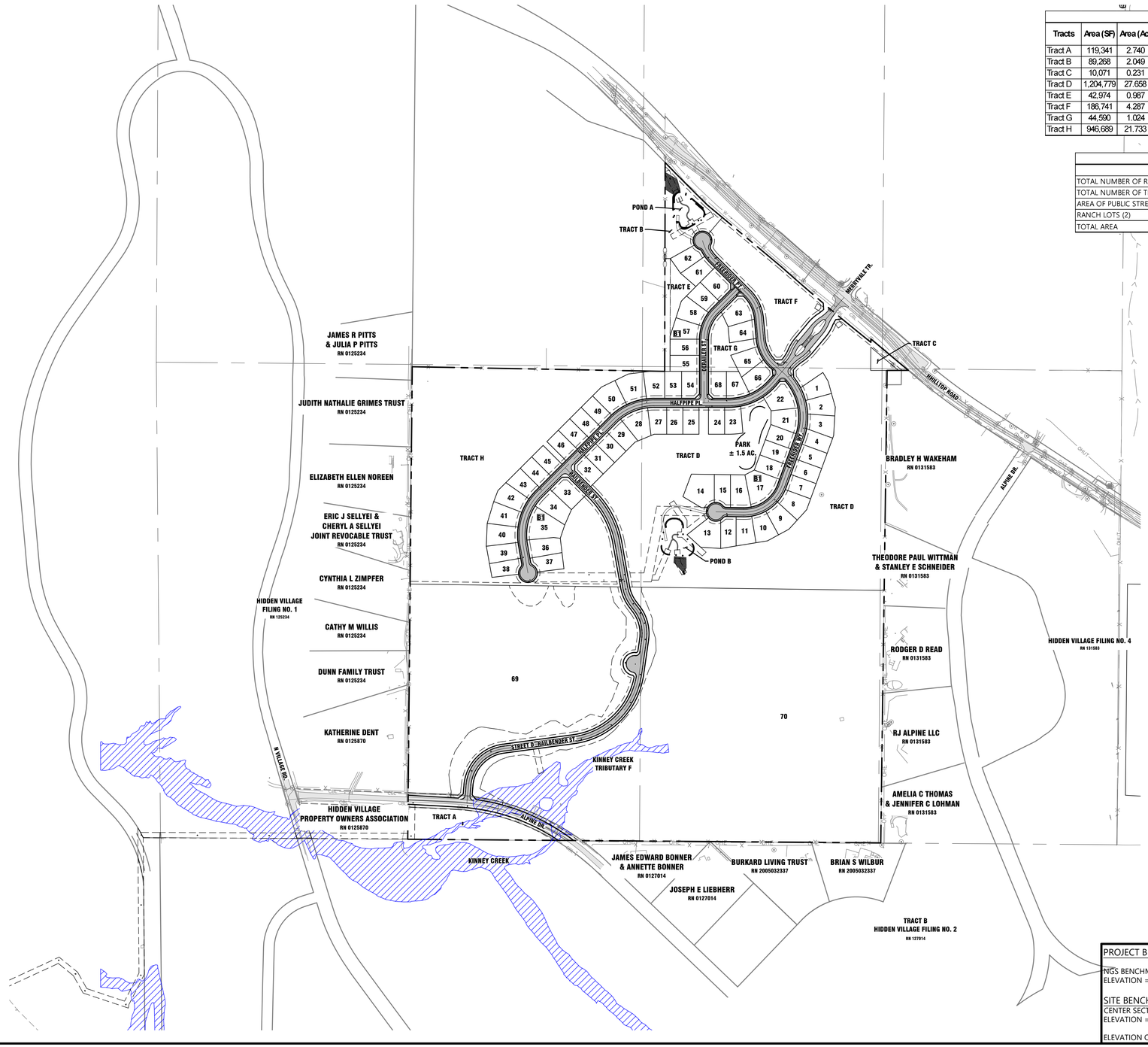
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040



TRACT USE, OWNERSHIP & MAINTENANCE CHART										
Tracts	Area (SF)	Area (Ac)	Ownership/ Maitenance	Access	Utilities	Drainage	Landscape	Open Space	Trails	Park
Tract A	119,341	2.740	OWNER		X	X		X		
Tract B	89,268	2.049	METRO DISTRICT	X	X	X	X	X		
Tract C	10,071	0.231	OWNER/METRO DISTRICT							
Tract D	1,204,779	27.658	METRO DISTRICT	X	X	X	X	X	X	X
Tract E	42,974	0.987	METRO DISTRICT	X	X	X	X	X		
Tract F	186,741	4.287	METRO DISTRICT	X	X	X	X	X	X	
Tract G	44,590	1.024	METRO DISTRICT	X	X		X	X		
Tract H	946,689	21.733	METRO DISTRICT	X	X	X	X	X		

LAND USE TABLE			
TYPE	AREA (SF)	AREA (AC)	% OF TOTAL AREA
TOTAL NUMBER OF RESIDENTIAL LOTS (68)	1,097,704	25.20	14.25%
TOTAL NUMBER OF TRACTS (8)	2,644,453	60.71	34.34%
AREA OF PUBLIC STREET DEDICATION (ROW, ONSITE)	488,625	11.22	6.34%
RANCH LOTS (2)	3,470,406	79.67	45.06%
TOTAL AREA	7,701,170	176.79	100.00%

PROJECT BENCHMARK:
NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:
CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

SCALE
1 inch = 300 ft.
300 0 150 300

NOT FOR CONSTRUCTION

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Westminster, CO 80234
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Revision Type:

No.	Rev. Date:
1	
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5	
6	

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 300'
Scale Vert: N/A

Sheet: 3 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Overall Plan

Developer:
Mike United Real Estate, LLC
6900 Belleview Ave.
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 3

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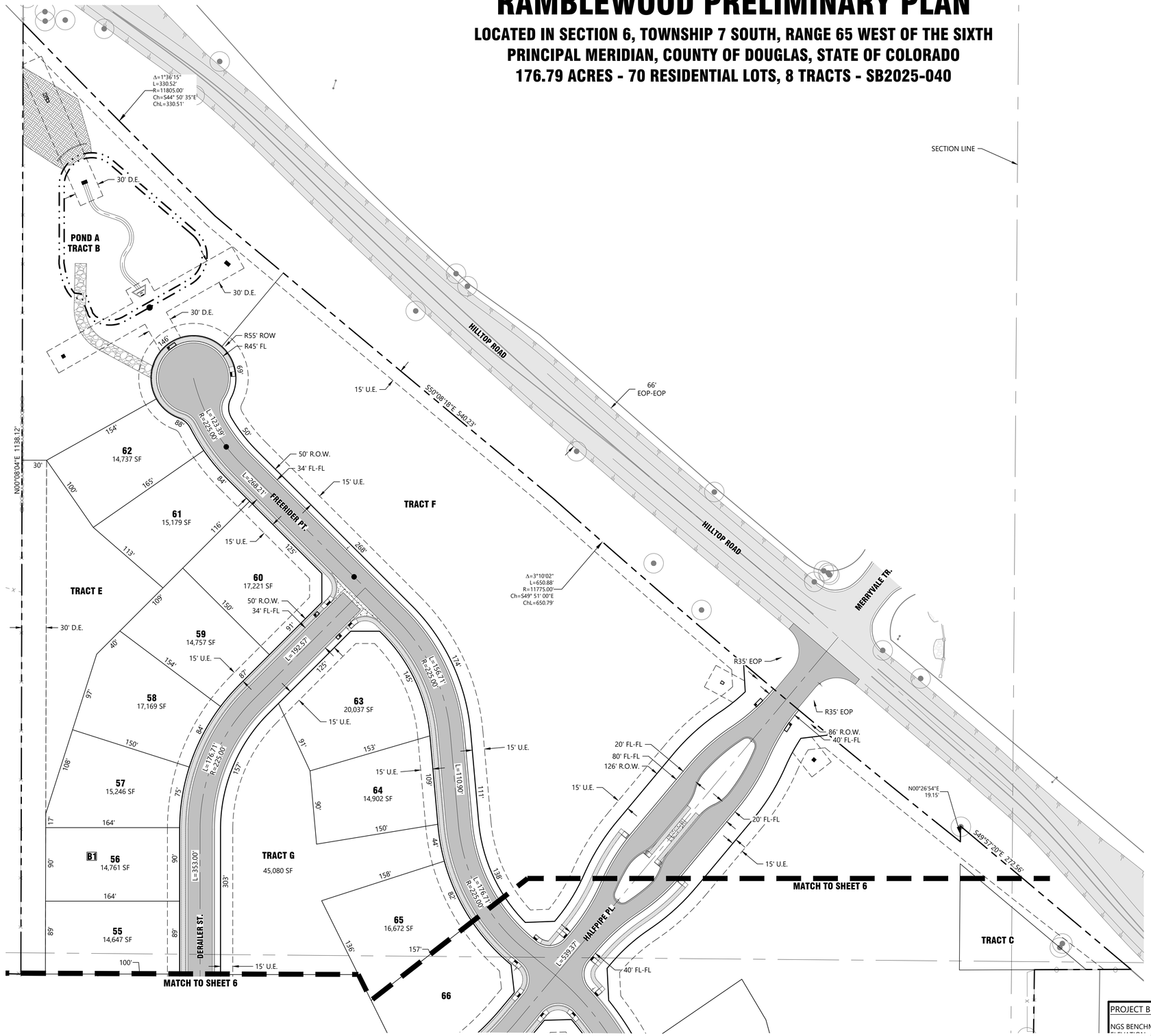
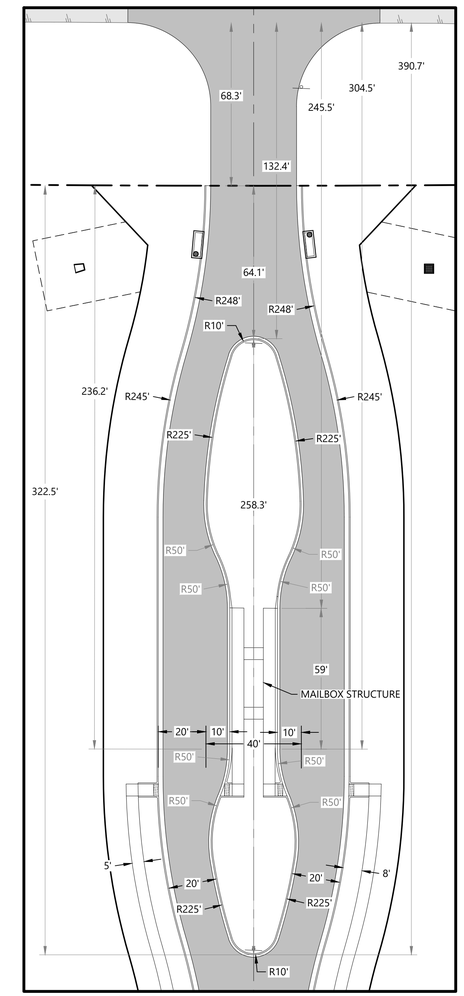
RAMBLEWOOD PRELIMINARY PLAN

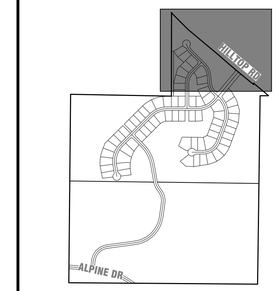
LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040





MEDIAN DETAIL VIEW
1"=30'



KEY MAP
1"=1000'

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:
CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

SCALE
1 inch = 60 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CJV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 4 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Ridgeline Allied Real Estate, LLC
6900 Wallace Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 4

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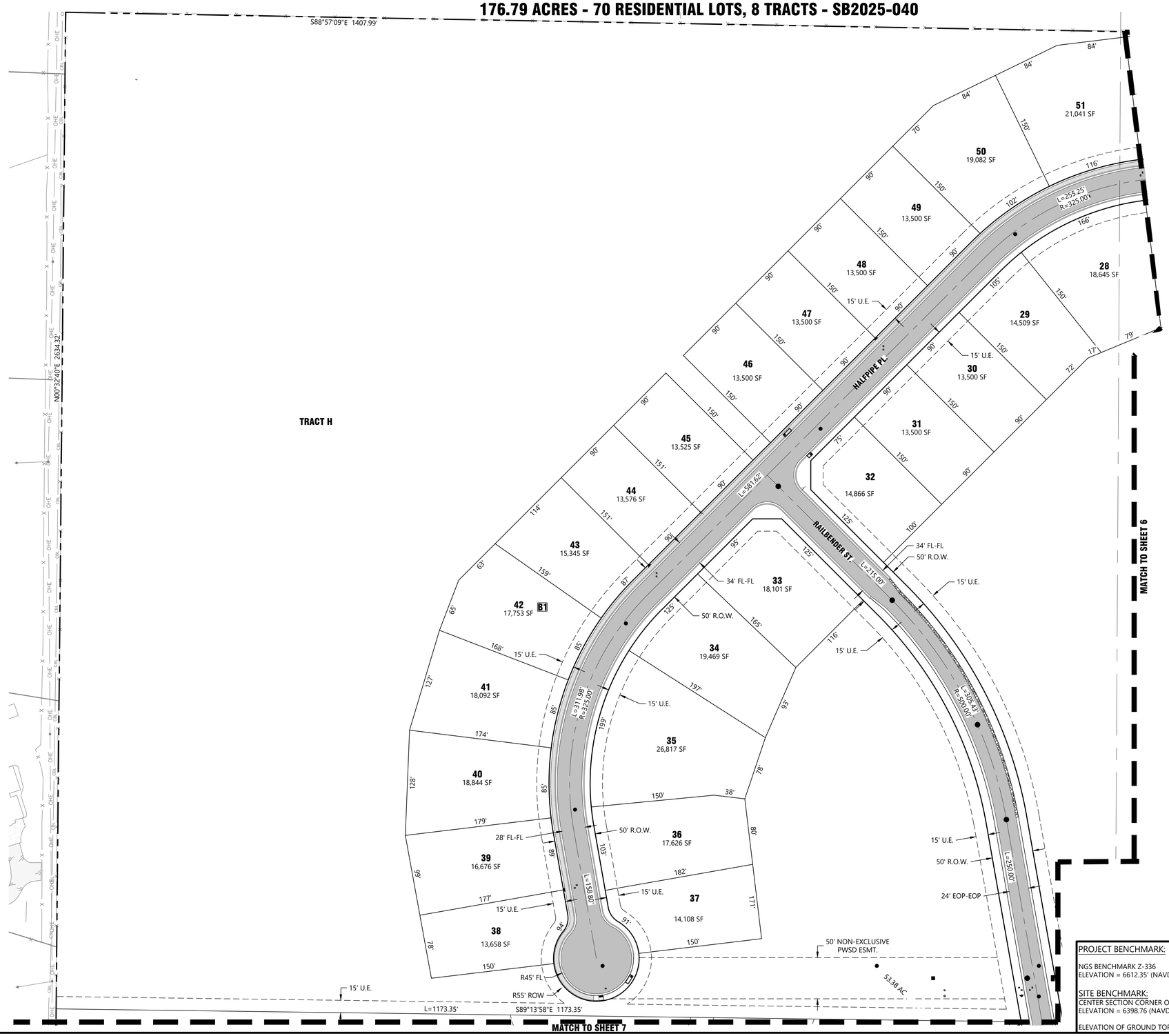
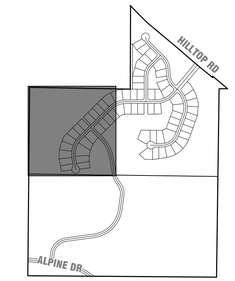
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040





KEY MAP
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PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 5 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
M/I Homes of Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 5

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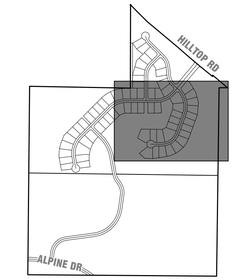
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040



KEY MAP
1"=1000'

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:
CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

SCALE
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Westminster, CO 80234
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No.	Rev. Date:	Revision Type:
1		
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4		
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6		

Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 6 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Wildflower Real Estate, LLC
6900 Wilfley Ave.
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 6

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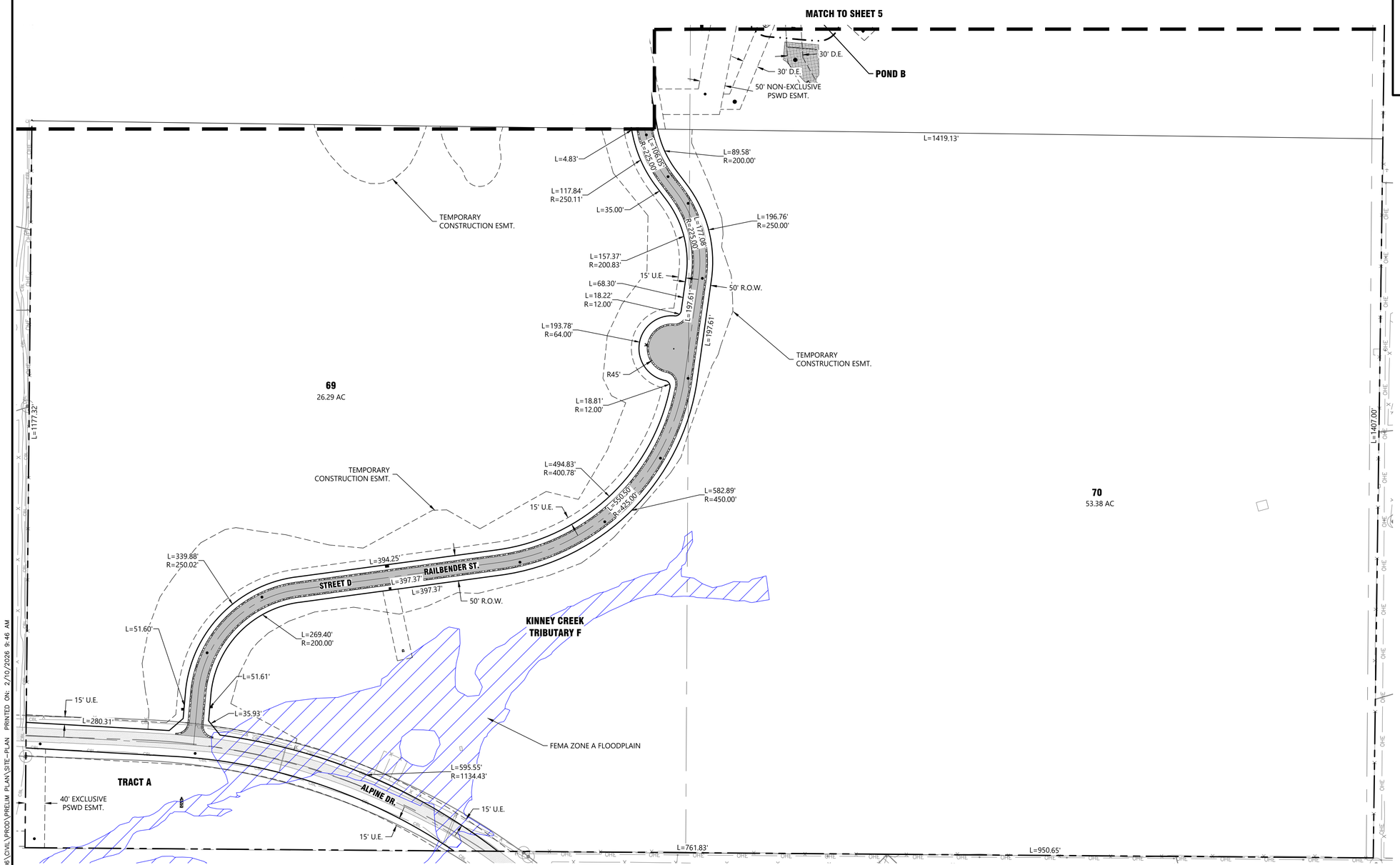
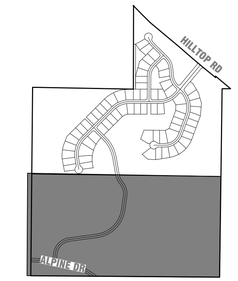
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040





KEY MAP
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PROJECT BENCHMARK:

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ELEVATION = 6612.35' (NAVD 88)

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ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

SCALE
1 inch = 100 ft.

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Westminster, CO 80234
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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/A

Sheet: 7 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Site Plan

NOT FOR CONSTRUCTION

Developer:
Mile Creek Real Estate, LLC
6600 Belview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 7

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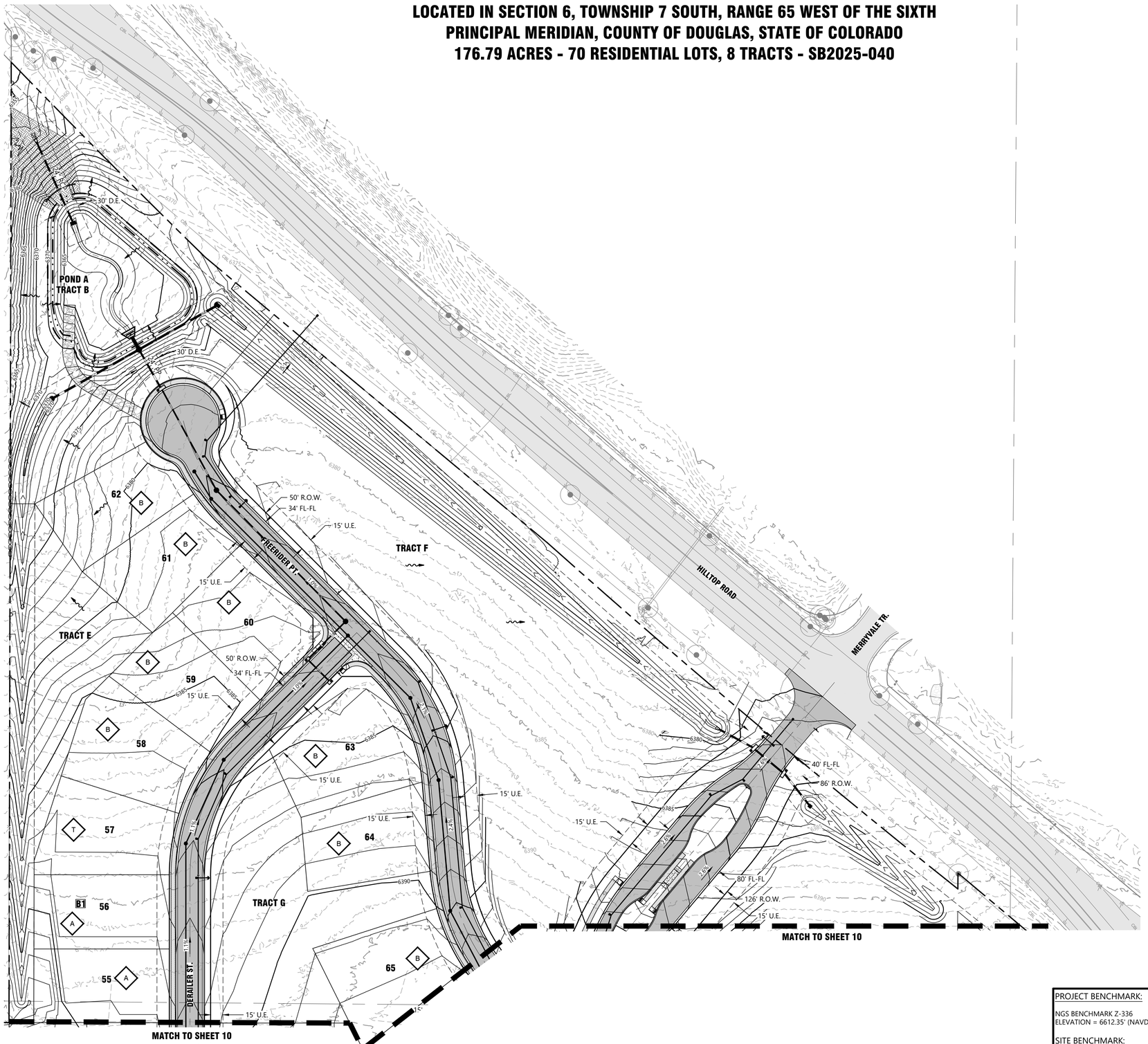
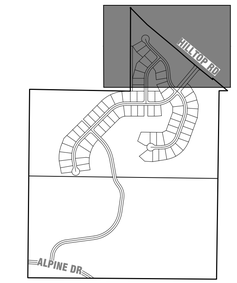
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO
176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040





KEY MAP
1"=1000'

LOT TYPE	
A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:
CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

60 0 30 60
SCALE
1 inch = 60 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 8 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Mile Hi Land Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 8

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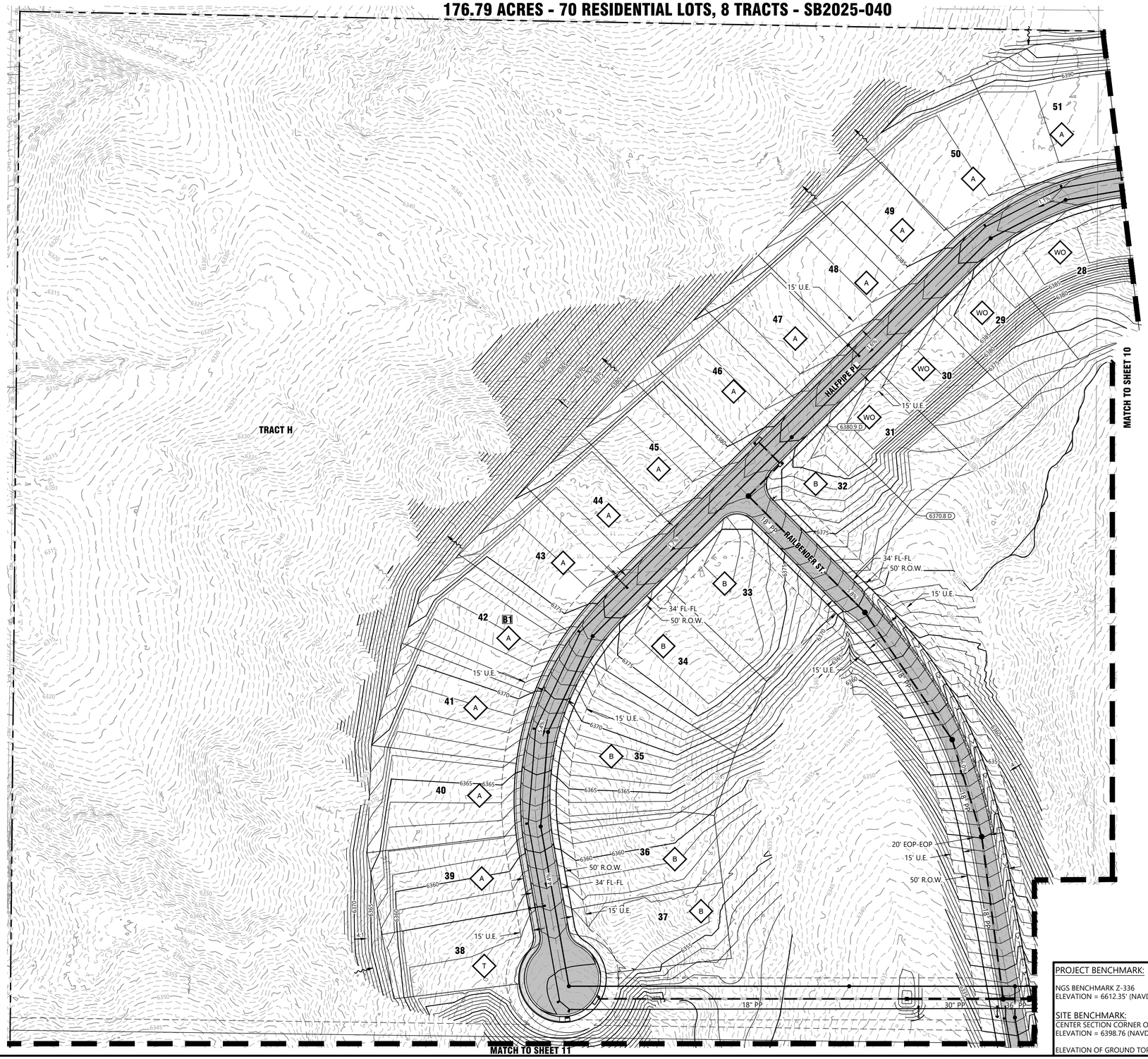
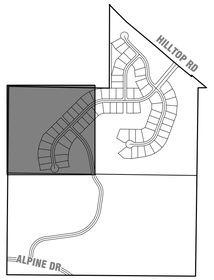
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040





KEY MAP
1"=1000'

LOT TYPE	
A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:
CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

SCALE
1 inch = 60 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 9 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Ramblewood Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 9

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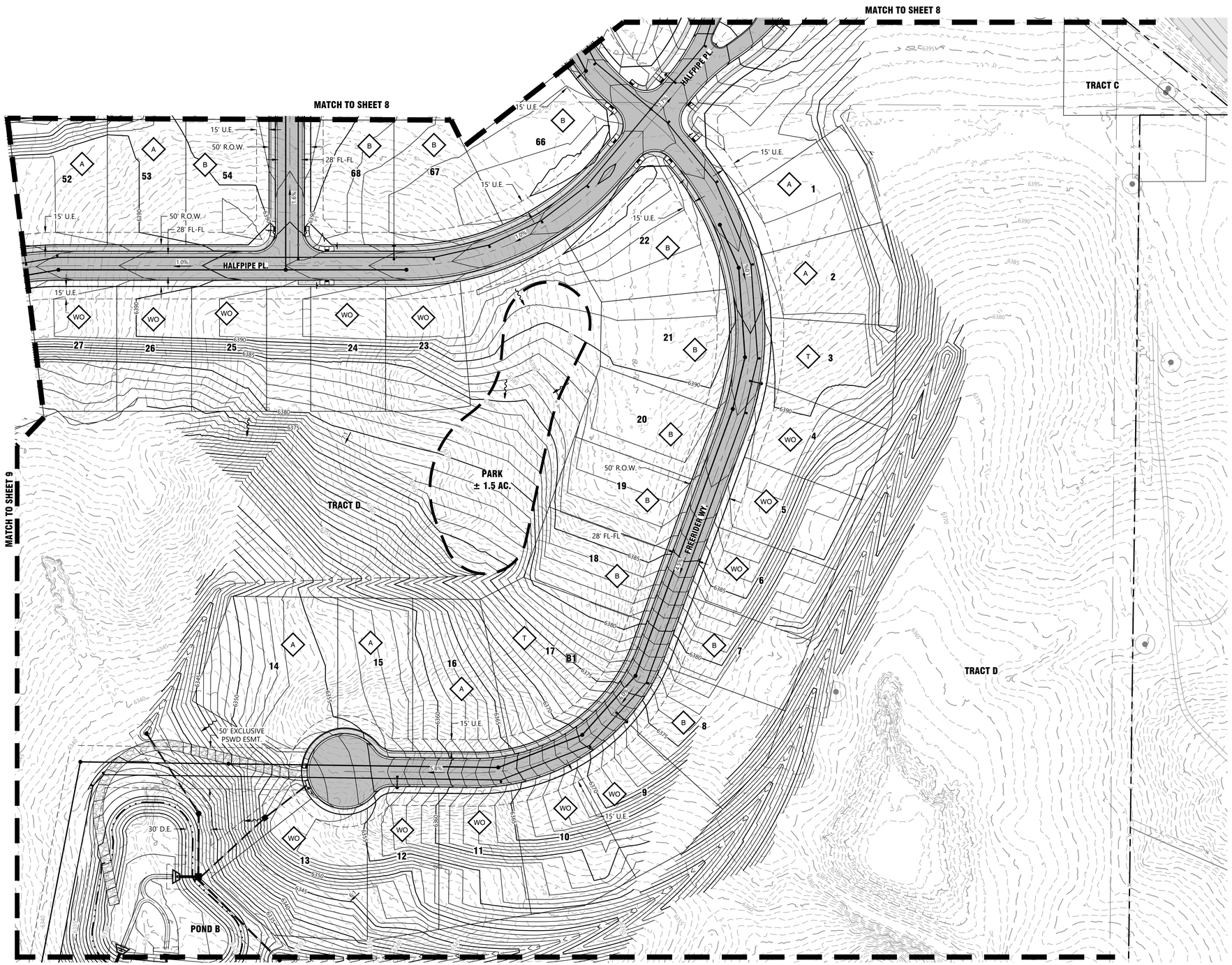
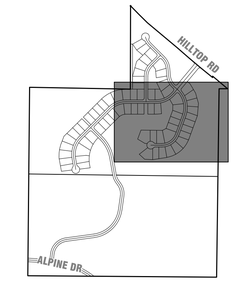
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040





KEY MAP
1"=1000'

LOT TYPE	
A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:

CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

SCALE
1 inch = 60 ft.

60 0 30 60

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 10 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Ramblewood Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 10

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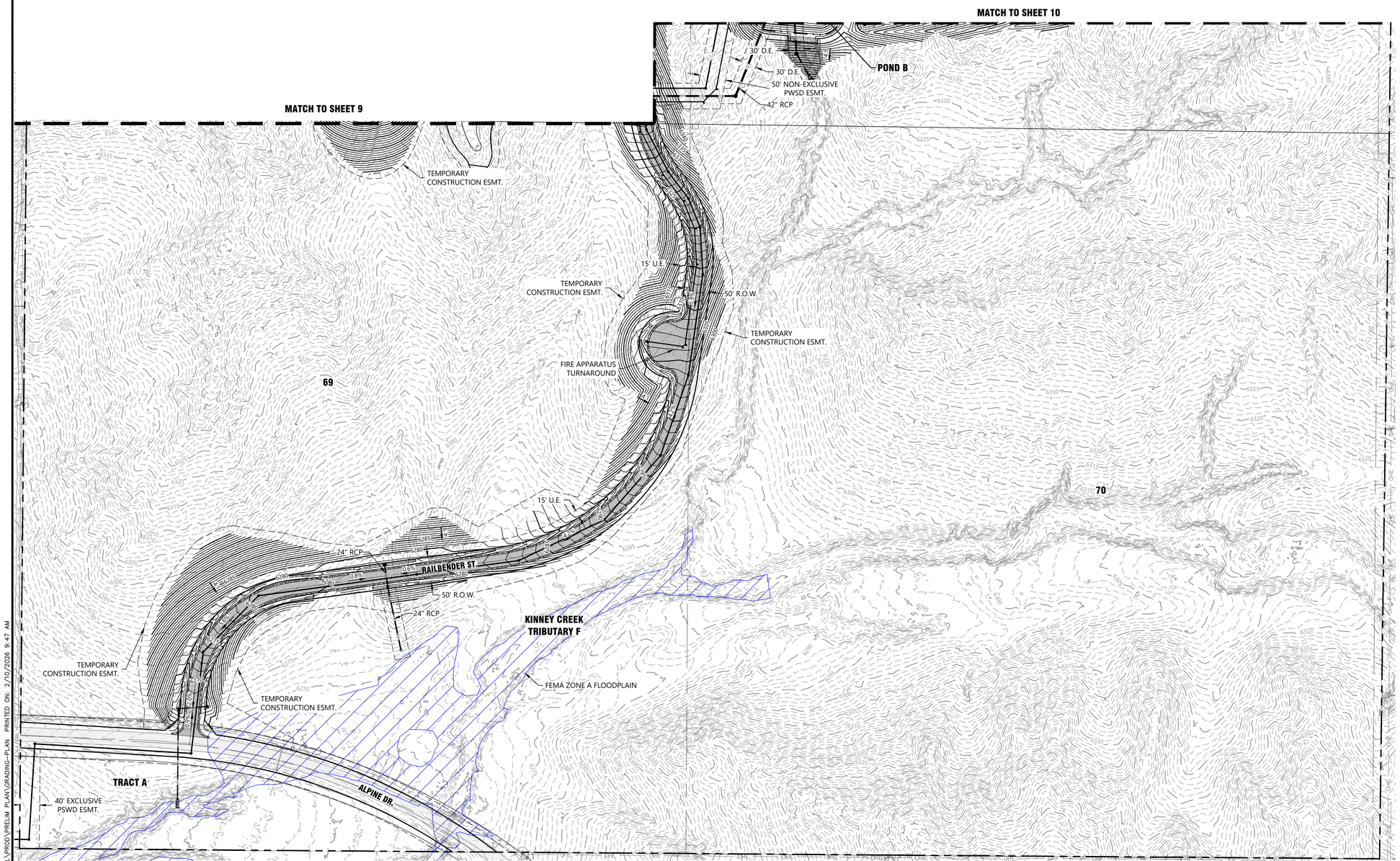
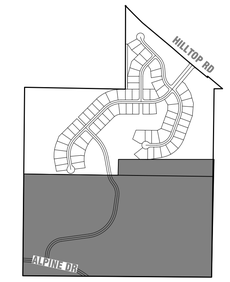
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040





KEY MAP
1"=1000'

LOT TYPE	
A	TYPE 'A' LOT
B	TYPE 'B' LOT
WO	WALK-OUT LOT
T	TRANSITIONAL LOT

OVERLOT GRADING NOTES:

1. AREAS OUTSIDE OF THE LIMITS OF THE RAMBLEWOOD FILING NO.1 ARE SHOWN FOR INFORMATION ONLY.
2. GRADING SHALL NOT EXCEED 4:1 SLOPES.
3. SEE SHEET # FOR OVERLOT GRADING LOT TEMPLATES.
4. ALL GRADES SHOWN ON THE OVERLOT GRADING PLAN REPRESENT THE FOLLOWING:
   - 4.1. FINISHED GRADE AT OVERLOT
   - 4.2. FINISHED STREET GRADE AFTER PAVING.

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:
CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

N

100 0 50 100
SCALE
1 inch = 100 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/A

Sheet: 11 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Grading Plan

NOT FOR CONSTRUCTION

Developer:
Alpine United Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 11

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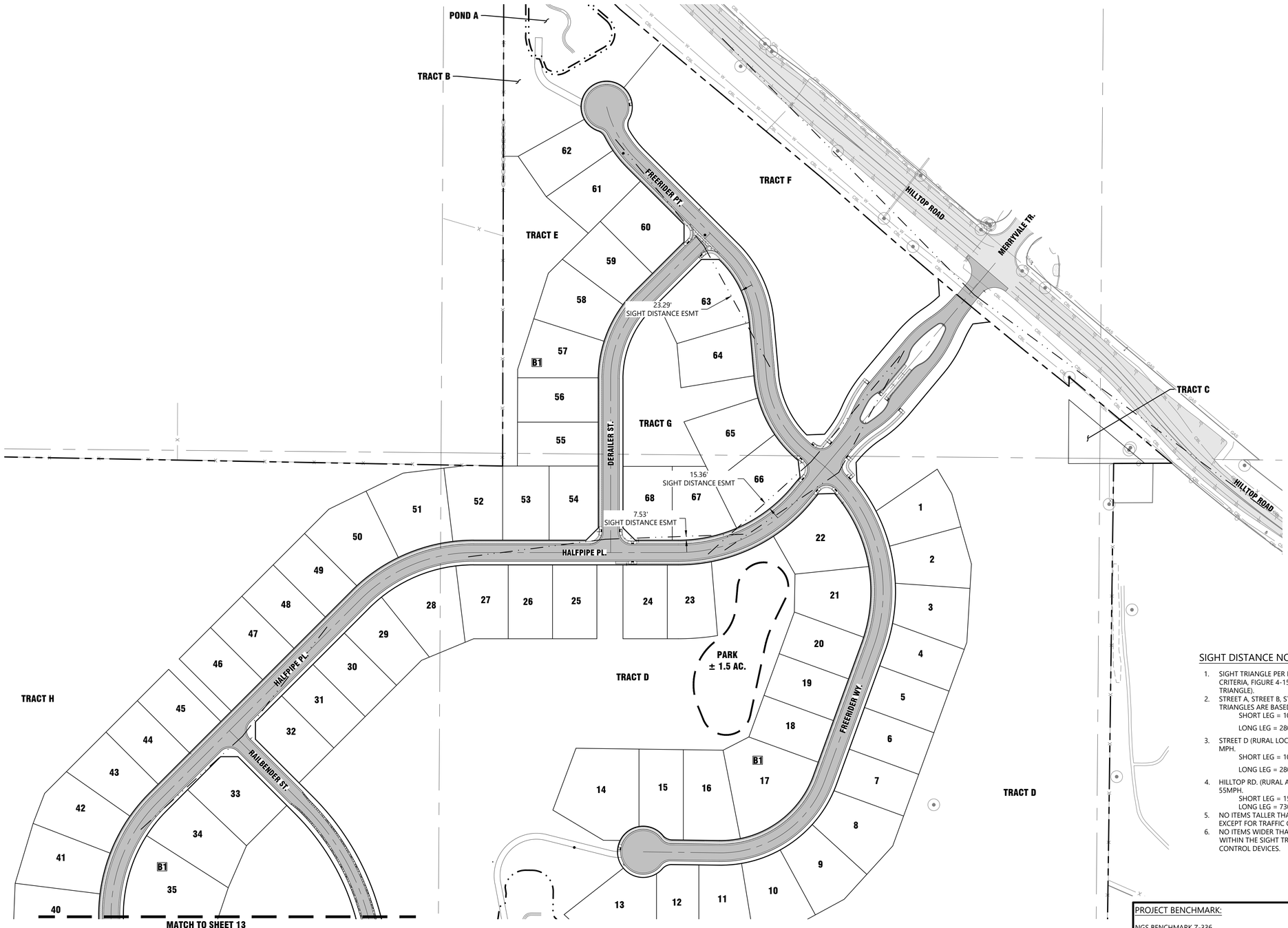
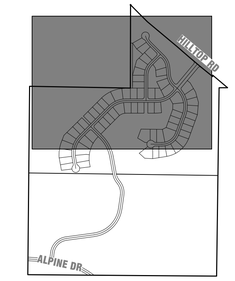
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO
176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040





KEY MAP
1"=1000'

SIGHT DISTANCE NOTES:

1. SIGHT TRIANGLE PER DOUGLAS COUNTY ROADWAY DESIGN AND TECHNICAL CRITERIA, FIGURE 4-15 INTERSECTION AND DRIVEWAY SIGHT DISTANCE (LINE OF SIGHT TRIANGLE).
2. STREET A, STREET B, STREET C, AND ALPINE DR. (URBAN LOCAL TYPE I) SIGHT TRIANGLES ARE BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
3. STREET D (RURAL LOCAL TYPE III) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM THE FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
4. HILLTOP RD. (RURAL ARTERIAL) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 55MPH.
   SHORT LEG = 15' FROM THE FLOW LINE.
   LONG LEG = 730' LINE OF SIGHT.
5. NO ITEMS TALLER THAN 30" ARE ALLOWED WITHIN THE STOPPING SIGHT TRIANGLES EXCEPT FOR TRAFFIC CONTROL DEVICES.
6. NO ITEMS WIDER THAN 18" CAN BE TALLER THAN 30" OR GREATER ARE ALLOWED WITHIN THE SIGHT TRIANGLES EXCEPT FOR STREET TREE TRUNKS AND TRAFFIC CONTROL DEVICES.

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:

CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

100 0 50 100
SCALE
1 inch = 100 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JT
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/a

Sheet: 12 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Sight Distance Plan

NOT FOR CONSTRUCTION

Developer:
Mile Hi Land Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 12

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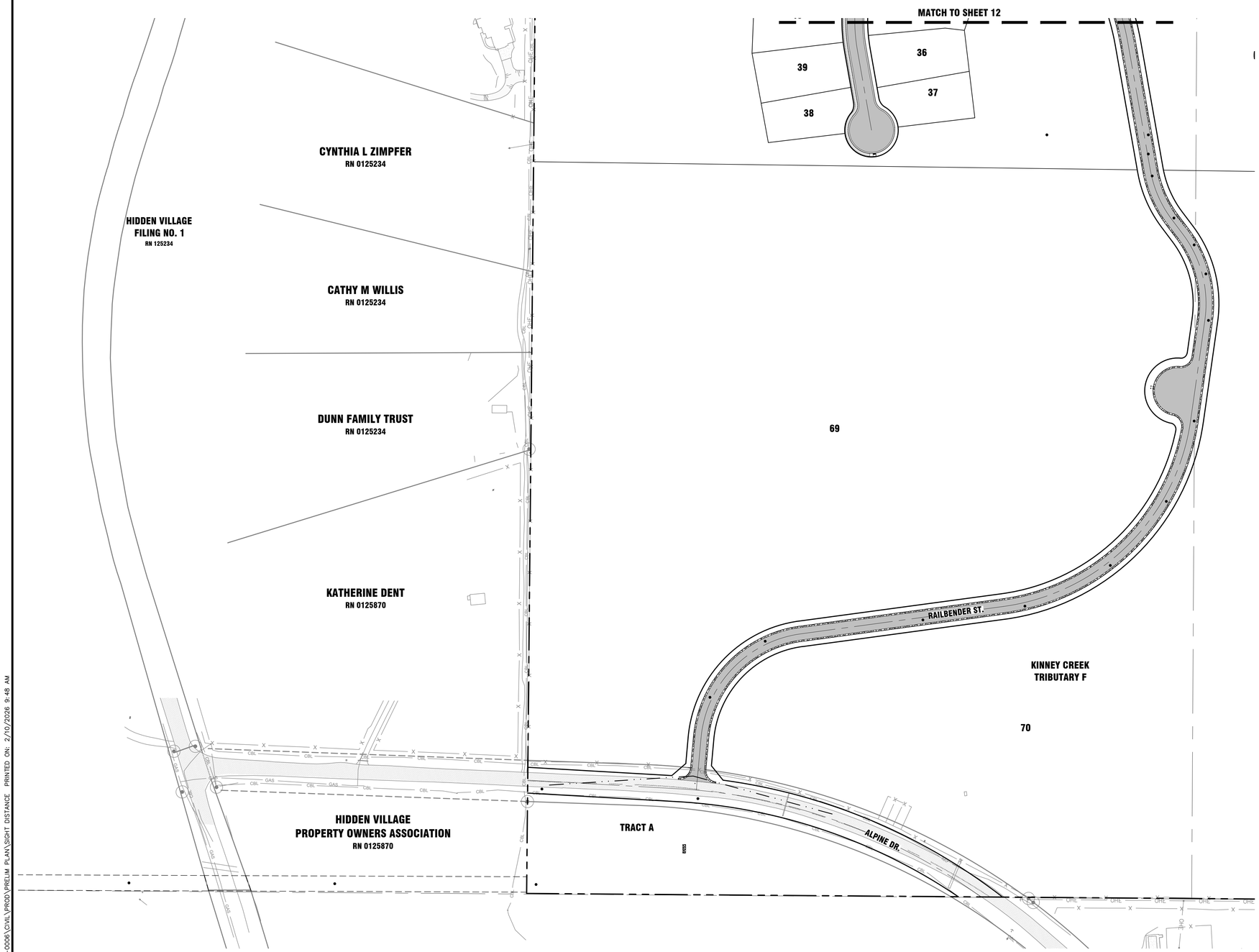
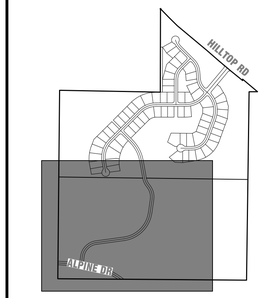
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO
176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040





KEY MAP
1"=1000'

SIGHT DISTANCE NOTES:

1. SIGHT TRIANGLE PER DOUGLAS COUNTY ROADWAY DESIGN AND TECHNICAL CRITERIA, FIGURE 4-15 INTERSECTION AND DRIVEWAY SIGHT DISTANCE (LINE OF SIGHT TRIANGLE).
2. STREET A, STREET B, STREET C, AND ALPINE DR. (URBAN LOCAL TYPE I) SIGHT TRIANGLES ARE BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
3. STREET D (RURAL LOCAL TYPE III) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 30 MPH.
   SHORT LEG = 10' FROM THE FLOW LINE.
   LONG LEG = 280' LINE OF SIGHT.
4. HILLTOP RD. (RURAL ARTERIAL) SIGHT TRIANGLE IS BASED ON A DESIGN SPEED OF 55MPH.
   SHORT LEG = 15' FROM THE FLOW LINE.
   LONG LEG = 730' LINE OF SIGHT.
5. NO ITEMS TALLER THAN 30" ARE ALLOWED WITHIN THE STOPPING SIGHT TRIANGLES EXCEPT FOR TRAFFIC CONTROL DEVICES.
6. NO ITEMS WIDER THAN 18" CAN BE TALLER THAN 30" OR GREATER ARE ALLOWED WITHIN THE SIGHT TRIANGLES EXCEPT FOR STREET TREE TRUNKS AND TRAFFIC CONTROL DEVICES.

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:
CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

100 0 50 100
SCALE
1 inch = 100 ft.

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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JT
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/a

Sheet: 13 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Sight Distance Plan

NOT FOR CONSTRUCTION

Developer:
KWG Ramblewood Real Estate, LLC
6900 Bullfinch Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 13

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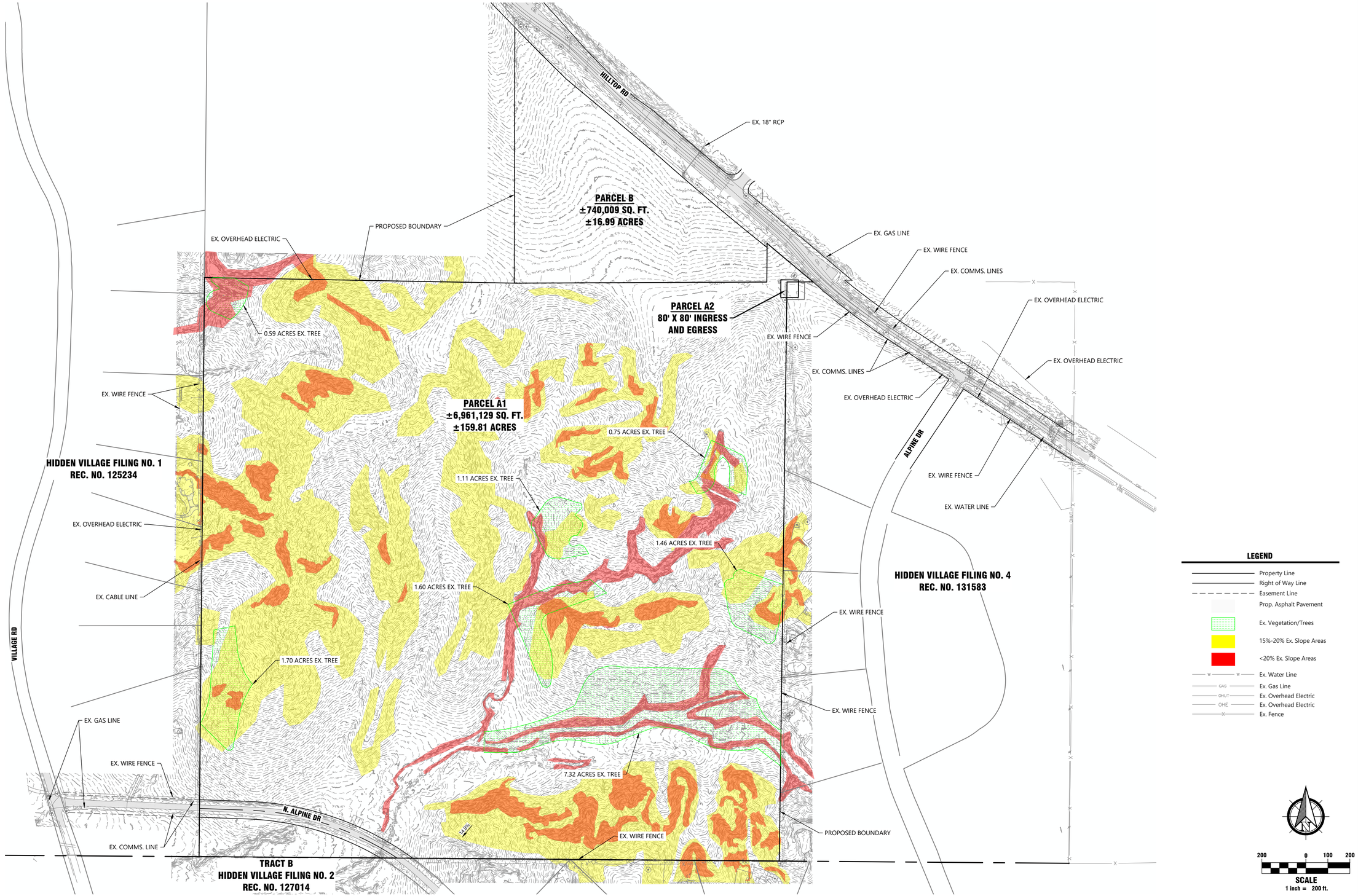
RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040



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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 200'
Scale Vert: N/a

Sheet: 14 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Preliminary Plan
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Existing Features Plan

NOT FOR CONSTRUCTION

Developer:
M/I Homes of Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

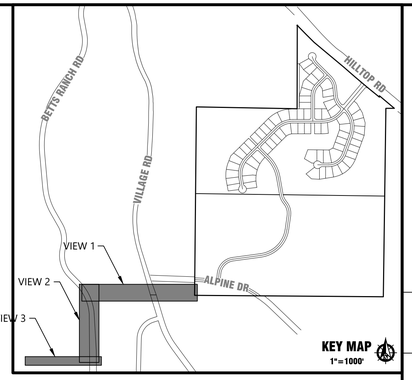
Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

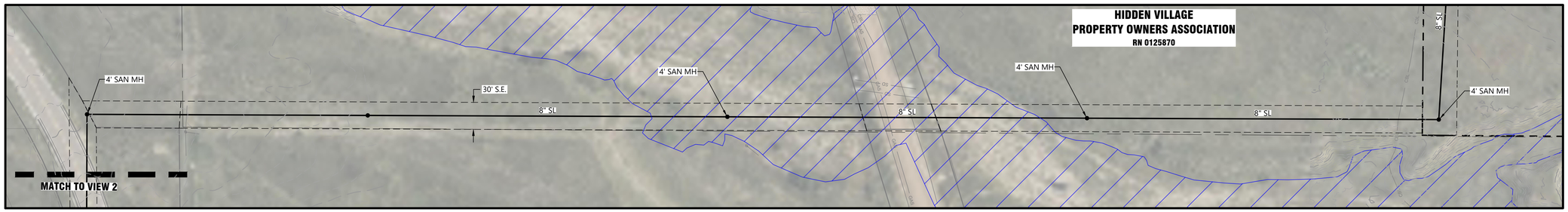
No. 14

RAMBLEWOOD PRELIMINARY PLAN

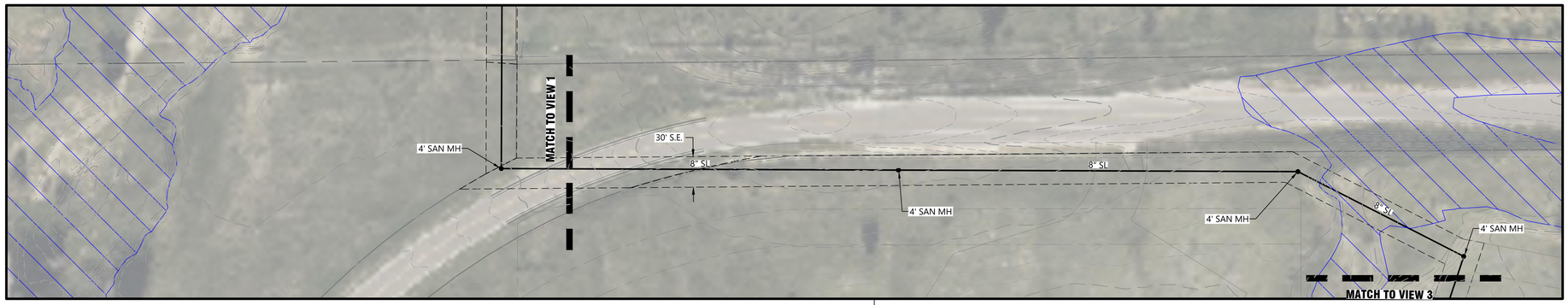
LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040

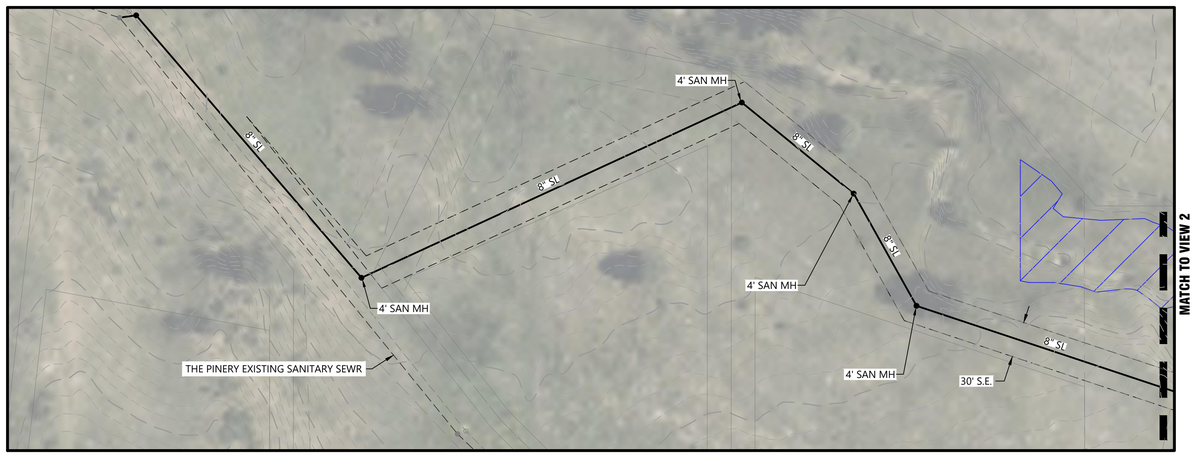




VIEW 1



VIEW 2



VIEW 3

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:
CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

60 0 30 60
SCALE
1 inch = 60 ft.

LJA
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Suite 300
Westminster, CO 80234
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No.	Rev. Date:	Revision Type:
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Designed: CIV
Prepared: JCG
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 60'
Scale Vert: N/A

Sheet: 15 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Offsite Sanitary Sewer Plan

NOT FOR CONSTRUCTION

Developer:
Miller Desert Real Estate, LLC
6900 Bellview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

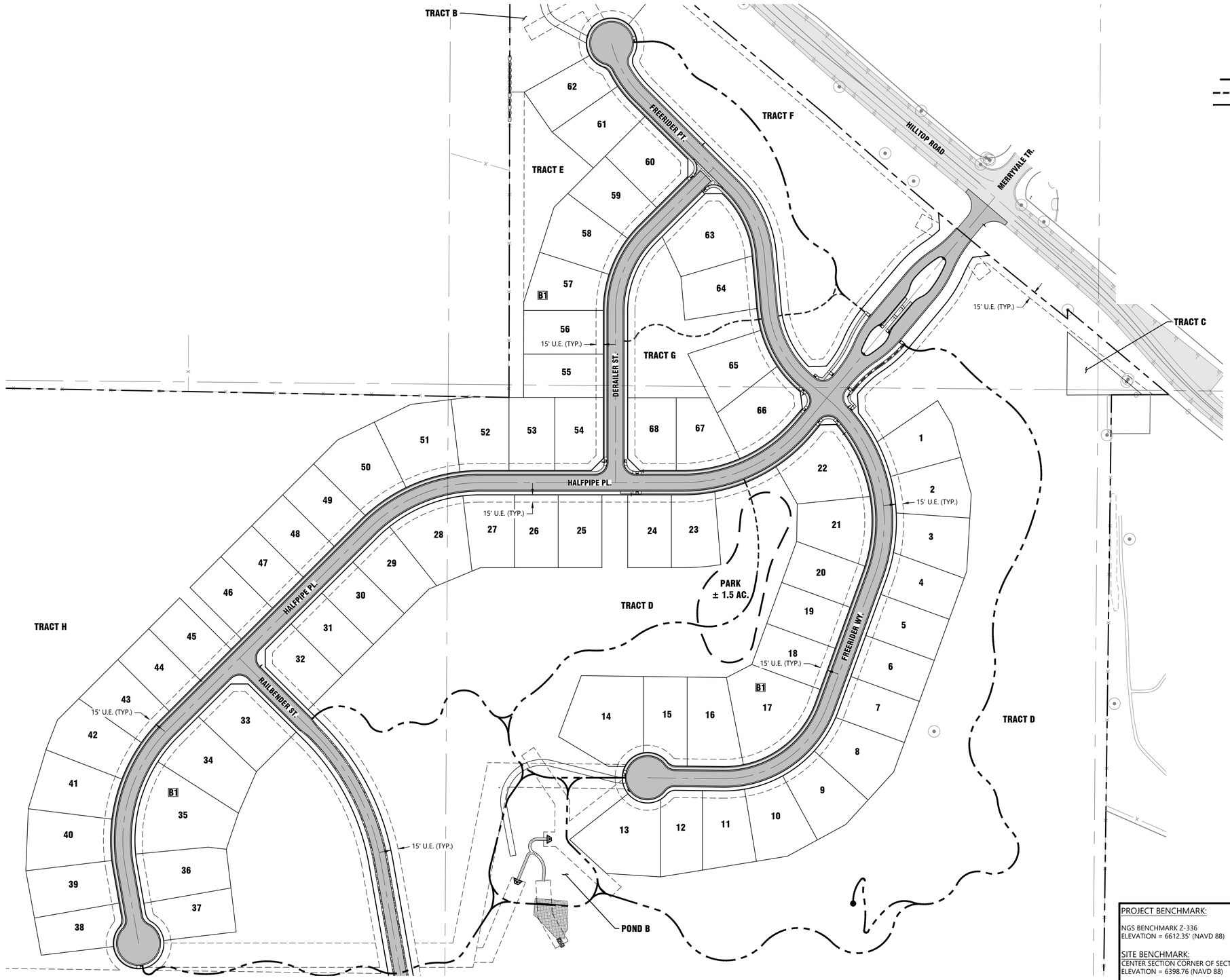
No. 15

I:\JOB FOLDERS\1084\1084-0006\CIVIL\PROD\PRELIM PLAN\UTILITY-PLAN PRINTED ON: 2/10/2026 9:56 AM

RAMBLEWOOD PRELIMINARY PLAN

LOCATED IN SECTION 6, TOWNSHIP 7 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, COUNTY OF DOUGLAS, STATE OF COLORADO

176.79 ACRES - 70 RESIDENTIAL LOTS, 8 TRACTS - SB2025-040



LEGEND

5' CONCRETE TRAIL (1,050 LF, 0.31 AC @ 13' WIDE CORRIDOR)

SOFT SURFACE TRAIL (7,125 LF, 1.31 AC @ 8' WIDE CORRIDOR)

PROJECT BENCHMARK:

NGS BENCHMARK Z-336
ELEVATION = 6612.35' (NAVD 88)

SITE BENCHMARK:

CENTER SECTION CORNER OF SECTION 6-T7S-R65W
ELEVATION = 6398.76 (NAVD 88)

ELEVATION OF GROUND TOPOGRAPHIC SURVEY CONTOUR INTERVALS ARE 1 FOOT

100 0 50 100
SCALE
1 inch = 100 ft.

LJA
1765 W. 121st Avenue
Suite 300
Westminster, CO 80234
303-421-4224 • www.lja.com

No.	Rev. Date:	Revision Type:
1		
2		
3		
4		
5		
6		

Designed: CIV
Prepared: JT
Approved: MCR

Job No.: 1084-0006
Scale Horiz: 1" = 100'
Scale Vert: N/A

Sheet: 16 of 16
Date: February 9, 2026

Proj. Name: Ramblewood Filing No. 1
Location: Douglas County, Colorado
Plan Set: Preliminary Plan
Sheet Name: Trails Plan

NOT FOR CONSTRUCTION

Developer:
Kimley-Horn Real Estate, LLC
6900 Belleview Ave
Greenwood Village, CO 80111

Surveyor:
LJA Engineering, Inc.
1765 W 121st Ave, Suite 300
Westminster, CO 80234

Planner/Landscape:
Norris Design
1101 Bannock St
Denver, CO 80204

No. 16

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